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Roadway Design Manual

Aug 2013

Roadway Design Manual

Section 100- General Information

SECTION 100 - GENERAL INFORMATION

110.00 MANUAL PURPOSE

The Roadway Design Manual has been developed to reflect policy, provide uniformity of procedures, and communicate information for projects in the Idaho Transportation Investment Program (ITIP). The manual provides guidance for the development of projects through the ITD and FHWA approved development process.

It is intended for use by the District Project Development (Design) sections. Any reference to "the district" may be replaced with "consultant," etc., depending on what entity is responsible for the development and delivery of the project.

120.00 ELECTRONIC FORMS

Most of the referenced forms are available in electronic .doc or .xls format. To complete these forms electronically, click on the word document or excel worksheet version button. This will allow the documents to be saved for future use. Most forms in this manual are listed in Appendix D and available on the internet on the online manuals site.
http://itd.idaho.gov/manuals/manualsonline.htm.
For ITD employees forms are also available on the Intranet in the form finder. The forms are listed by ITD number or other identifying notation. For further assistance to change a form, or make suggestions, contact Headquarters Design in Design/Materials/Construction (DMC).

130.00 MANUAL ORGANIZATION

The Manual is organized in the following Sections.

Quick References
Figure Table of Contents

140.00 MANUAL CHANGES

The Roadway Design Manual is generally revised and updated bi-annually to reflect changing processes, procedures, regulations, policies and organization. Feedback from users is encouraged to improve the manual. Use the ITD 0063, Request to Change Manual, for any recommended changes. Complete the form and send it to Headquarters Design in the Design/Materials/Construction section. Approved changes will be incorporated in the next manual update.

150.00 HEADQUARTERS PROJECT DEVELOPMENT RESOURCES

Headquarters Project Development resources reside in several sections. Highway Program Oversight, Resource Centers, Transportation Systems, Bridge Design, Highway Operations, and Planning/Program Management.

Headquarters Project Development resources reside in the following sections:

Highway Program Oversight (HPO) Section Manager

- DMC Engineer
  - Design Engineer
  - Materials Engineer
  - Area Coordinators
  - Contract Advertising and Award
- Consultant Administration
- Standards
- Laboratories

The function of this section is to set policy, establish procedures, provide training, and to monitor compliance as well as advertise and award highway projects.

Resource Centers Section Manager

- Environmental
- Right-of-Way
- Subject Matter Experts (SME's)
  - Geometrics Engineer
  - Pavement Engineer
  - Geotechnical Engineer

- Hydraulics Engineer
- Utilities Coordinator
- Railroad Coordinator
- Research
- Concrete Structures
- Qualified Products List Administrator
- Aerial Mapping

Transportation Systems Manager

- GIS
- TAMS
- PONTIS
- Pavement Analysis
- CADDS
- Roadway Data

Highway Operations Manager

- Traffic Services
- Mobility Services
- Office of Highway safety

Bridge Design

Planning/Program Management Manager

- Scheduling
- Planning

160.00 – APPROVAL RESPONSIBILITY

District Engineers approve charters, concepts, design exceptions, design reviews, final designs, design study reports, materials reports, official ROW plans, and other internal engineering documents relating to project development that require a professional engineer's license.

Responsible Engineers shall place their Professional Engineer's Seal on all original documents in such a manner that such seal, signature and date are reproduced when the original document is copied. The application of the licensee's seal and signature and the date shall constitute certification that the work thereon was done by the responsible engineer or under the engineer's responsible charge. Each plan or drawing sheet shall be sealed and signed and dated by the licensee or licensees responsible for each sheet (See IC 54-1215).

District Engineers shall sign the title sheet of the plans and other documents approved by the District Engineer for ITD. LHTAC Project milestone and plan approvals will be done in ITD Headquarters.

A copy of the approved charters and or concepts shall be distributed or posted and made available to the District Environmental Planner.

Copies of all Approval Documents for all milestones shall be posted and made accessible to DMC with the PS&E Submittal. If milestone dates have not been logged into Project Tracking as they are completed, then a list of approval dates shall be submitted.

DMC will review district-approved PS&E packages for compliance with bidding requirements and program adherence only.

Full Oversight projects will require additional headquarters and FHWA involvement.

170.00 FHWA OVERSIGHT

The Federal Highway Administration (FHWA) and the Idaho Transportation Department (ITD) have developed a Stewardship and Oversight (S &O) Agreement which can be found at:.

http://itd.idaho.gov/NewsandInfo/publications.htm

This agreement defines FHWA's and ITD's responsibilities for jointly administering the Federal-Aid Highway Program (FAHP) under Title 23 and other associated laws

The S &O Agreement defines the responsibilities delegated to ITD and FHWA oversight and approval requirements on each phase of project development and construction and is shown in Figure 1-1. For full oversight projects, the following project development documents are to be sent to FHWA:

Project Charter/Concept for concurrence

Preliminary Plans for review

Design Study Report for approval

Final Plans for review

Professional Services Agreements and Amendments for approval

Bidding/Contract Award Documents for concurrence

PS&E Package for approval

SEP-14 Experimental Features Work Plan for approval (all projects)

Buy America Waivers for approval (all projects)

Bid Tabulations

Proprietary Products / Sole Source requests for approval

Warranties for approval (all NHS projects)

Experimental Features for approval

Interstate Median Crossovers for approval (all projects)

Interstate Access Modifications for approval (all projects)

Interstate Interchange Modifications (all projects)

Design Exceptions (all Full Oversight NHS projects)

180.00 VALUE ENGINEERING

Section 1503(a)(3) of MAP-21 codifies in title 23 U.S.C. 106(e) which provides: "The State shall provide a value engineering analysis or other cost-reduction analysis for—

(A) each project on the Federal-aid system with an estimated total cost of $50,000,000 or more;

(B) a bridge project with an estimated total cost of $40,000,000 or more; and

(C) any other project the Secretary determines to be appropriate."

The FHWA will assure that a VE study is preformed on all Federal-aid funded NHS projects as required above. In addition, FHWA will strongly encourage State Departments of Transportation to use VE throughout highway project development, design, and construction.

Value Engineering is defined as the systematic application of recognized techniques by a multi-disciplined team to identify the function of a product or service, establish a worth for that function, generate alternatives through the use of creative thinking, and provide the needed functions to accomplish the original purpose of the project, reliably, and the lowest life-cycle cost without sacrificing safety, necessary quality, and environmental attributes of the project.

A project is defined as a portion of a highway or roadway that is proposed to be constructed, reconstructed, or improved as described in the charter or concept, or applicable environmental document. A project may consist of several contracts or phases over several years.

ITD has developed a Value Engineering Guidelines to assist in determining the need for and provide guidance through a value engineering study.

190.00 ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ACHP	Advisory Council on Historic Preservation
ADT	Average Daily Traffic
AERO	Bureau of Aeronautics
AHERA	Air Hazard Emergency Response Act
BA	Biological Analysis
BLM	Department of Interior, Bureau of Land Management
BMP	Best Management Practices
CADD	Computer Aided Drafting and Design
CAPA	Critical Aquifer Protection Area
CE	Categorical Exclusion
CFR	Code of Federal Regulations
CO	Carbon Monoxide
COE	Corps of Engineers
CRSI	Concrete Reinforcement Steel Institute
DBA	Decibels
DEQ	Division of Environmental Quality
DHV	Design Hourly Volume
DHW	Department of Health and Welfare
DOI	Department of Interior
DOL	Department of Lands
DWR	Department of Water Resources
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
F.A.	Federal-Aid
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration

FONSI	Finding of No Significant Impact
FTA	Federal Transit Authority
FWCA	Fish and Wildlife Coordination Act
FWPCA	Federal Water Pollution Control Act
FWS	Fish and Wildlife Service
GLO	Government Land Office
GREEN BOOK	A Policy on Geometric Design of Highways and Streets
HUD	Housing and Urban Development
IC	Idaho Code
ITD	Idaho Transportation Department
ITIP	Idaho Transportation Investment Program
LOS	Level of Service
LPA	Local Public Agency
LPC	Local Projects Coordinator
MAP	Mean Annual Precipitation
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MUTCD	Manual of Uniform Traffic Control Devices
NAD27	North American Datum of 1927
NAD83	Idaho Coordinate System Datum
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGS	National Geodetic Survey
NMFS	National Marine Fisheries Services
NOAA	National Oceanic and Atmosphere Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NWP	Nationwide Permit
PLS	Pure Live Seed
PM-2.5	Particulate Matter (2.5 microns or smaller)
PM-10	Particulate Matter (10 microns or smaller)
POE	Port of Entry

PS&E	Plan Specification and Estimate
REMEL	Reference Energy Mean Emission Levels
ROD	Record of Decision
SDWA	Safe Drinking Water Act
SHPO	State Historical Preservation Office
ST	State Projects
STIP	Statewide Transportation Improvement Plan
STURAA	1987 Surface Transportation and Uniform Relocation Assistance Act
TIP	Transportation Improvement Plan
TLTWO	Two-Lane, Two-Way Operation
TCP	Traffic Control Plan
UMTA	Urban Mass Transit Administration
USBR	United States Bureau of Reclamation
USDOT	United States Department of Transportation
USFS	United States Forest Service
USGS	United States Geological Survey
UST	Underground Storage Tanks
WFLHD	Western Federal Lands Highway Division of Federal Highway Administration

200.00 SECTION and TITLE ACRONYMS

TITLE	ACRONYM
- A -	
Administrative License Suspension	ALS
Administration & Aero Business Manager	AABM
Aeronautics Administrator	AA
Aeronautics Division	AERO
- B -	
Bridge Design	BD
Bridge Engineer	BE
Bridge Asset Management	BAM
Bridge Asset Management Engineer	BAME
Budget & Program Management	BPM
Business and Support Management	B&SM
Business and Support Management Manager	BSMM
- C -	
CAU Project Manager	CAUPM
Chief Engineer	CE
Chief Administrative Officer	CAO
Chief Human Resources Officer	CHRO
Chief Operations Officer	COO
Chief Technology Office	CTO

Communications	COM
Consultant Administration Unit	CAU
Contract Compliance Officer	CCO

- D -

Deputy Attorney General (Legal)	DAG
Deputy Director	DDIR
Design/Materials/Construction	DMC
Design/Materials/Construction Engineer	DMCE
Director	DIR
DBE Coordinator	DBEC
District 1	D1
District 2	D2
District 3	D3
District 4	D4
District 5	D5
District 6	D6
District 1 Trainer	D1T
District 2 Trainer	D2T
District 3 Trainer	D3T
District 4 Trainer	D4T
District 5 Trainer	D5T
District 6 Trainer	D6T
District Business Manager-District 1	DBM1

District Business Manager-District 2	DBM2
District Business Manager-District 3	DBM3
District Business Manager-District 4	DBM4
District Business Manager-District 5	DBM5
District Business Manager-District 6	DBM6
District Engineer-District 1	DE1
District Engineer-District 2	DE2
District Engineer-District 3	DE3
District Engineer-District 4	DE4
District Engineer-District 5	DE5
District Engineer-District 6	DE6
District Engineering Manager 1	DEM1
District Engineering Manager 2	DEM2
District Engineering Manager 3	DEM3
District Engineering Manager 4	DEM4
District Engineering Manager 5	DEM5
District Engineering Manager 6	DEM6
District Operations Manager 1	DOM1
District Operations Manager 2	DOM2
District Operations Manager 3	DOM3
District Operations Manager 4	DOM4
District Operations Manager 5	DOM5
District Operations Manager 6	DOM6
District Personnel Technician-District 1	DPT1

District Personnel Technician-District 3	DPT3
District Personnel Technician-District 4	DPT4
District Personnel Technician-District 5	DPT5
District Personnel Technician-District 6	DPT6
District Records Inspector-District 1	DRI1
District Records Inspector-District 2	DRI2
District Records Inspector-District 3	DRI3
District Records Inspector-District 4	DRI4
District Records Inspector-District 5	DRI5
District Records Inspector-District 6	DRI6
District Traffic Engineer-District 1	DTE1
District Traffic Engineer-District 2	DTE2
District Traffic Engineer-District 3	DTE3
District Traffic Engineer-District 4	DTE4
District Traffic Engineer-District 5	DTE5
District Traffic Engineer-District 6	DTE6
Division of Highways Training	DHT
Division of Motor Vehicles	DMV
Division Shop Superintendent	DSS
Driver Records Program Specialist	DRPS
Driver Services	DS
Driver Services Manager	DSM
Drivers License Supervisor (Program)	DLPS

- E -

Executive Assistant to the Board	EAB
Economics & Research Manager	ERM
EEO/Safety-District 1	ES1
EEO/Safety-District 2	ES2
EEO/Safety-District 3	ES3
EEO/Safety-District 4	ES4
EEO/Safety-District 5	ES5
EEO/Safety-District 6	ES6
Emergency Program Manager	EPM
Emergency Program Office	EPO
Employee Safety/Risk Manager	ESRM
Enterprise Technology Services	ETS
Environmental	ENV
Environmental Manager	ENVM
Equal Employment Opportunity Manager	EEOM
Equal Employment Opportunity Office	EEO
Equal Employment Opportunity Officer	EEOO
Executive Management	EM

- F -

Facilities	FAC
Facilities Manager	FM
Federal Highway Administration	FHWA
Federal Transit Administration	FTA
Financial Services	FS

Financial Services Manager/Controller	FSM
Fuel Systems Coordinator	FSC
- G -	
GARVEE Program Engineer	GPE
GARVEE Program Manager	GPM
Geographic Information Systems	GIS
Governmental Affairs Program	GAP
Governmental Affairs Program Manager	GAPM
- H -	
Headquarters Design Engineer	HDE
Headquarters Materials Engineer	HME
Highway Division Business Manager	HDBM
Highway Equipment Analyst	HEA
Highway Operations Engineer	HOE
Highway Program Oversight Engineer	HPOE
Highway Safety	HS
Highway Safety Manager	HSM
Human Resource Development	HRD
Human Resource Services	HRS
- I -	
Intelligent Transportation Systems Engineer	ITSE
Internal Control, Fraud Prevention & Financial Unit	ICF
Internal Review	IR
Internal Review Manager	IRM

International Fuel Tax Agreement (Tax Comm Employee)	IFTA
International Registration Program	IRP
- L -	
Legal (Deputy Attorney General)	DAG
Local Highway Technical Assistance Council	LHTAC
- M -	
Maintenance Services Manager	MSM
Management Assistant to the Director	MADIR
Manager of Transportation Investments	MTI
Materials LAB	MTLSLAB
Materials-District 1	MTLS1
Materials-District 2	MTLS2
Materials-District 3	MTLS3
Materials-District 4	MTLS4
Materials-District 5	MTLS5
Materials-District 6	MTLS6
Mobility Services Engineer	MOSE
Motor Carrier Manager	MCM
Motor Carrier Services	MCS
Motor Vehicles Administrator	MVA
Motor Vehicles Automated Systems Manager	MVASM
Motor Vehicles Business Manager	MVBM
Motor Vehicles Investigator	MVI
Motor Vehicles Management Assistant	MVMA

- N -

- O -

Office of Communications	COM
Office of Communications Manager	OCM
Office of Highway Operations and Safety	OHOS
Office of Transportation Investments	OTI

- P -

Planning/Program Management	2PM
Planning/Program Management Manager	2PMM
Policies and Procedures Coordinator	PPC
Ports of Entry	POE
Ports of Entry Manager	POEM
Project Development Engineer-District 1	PDE1
Project Development Engineer-District 2	PDE2
Project Development Engineer-District 3	PDE3
Project Development Engineer-District 4	PDE4
Project Development Engineer-District 5	PDE5
Project Development Engineer-District 6	PDE6
Public Involvement Coordinator	PIC

- Q -

Quality Assurance Engineer	QAE

- R -

Rail Road in Resource Center	RRR

Records Manager	RM
Research	RES
Resident Engineer-District 1	RE1
Resident Engineer-District 2	RE2
Resident Engineer-District 3	RE3
Resident Engineer-District 4	RE4
Resident Engineer-District 5	RE5
Resident Engineer-District 6	RE6
Resource Center	RC
Resource Center Engineer	RCE
Right of Way	RW
Right of Way Manager	RWM
Right of Way-District 1	RW1
Right of Way-District 2	RW2
Right of Way-District 3	RW3
Right of Way-District 4	RW4
Right of Way-District 5	RW5
Right of Way-District 6	RW6
Roadside Program Coordinator	RPC
Roadway Data Manager	RDM

- S -

Safe Routes to School Coordinator	SRTS
Senior Budget Analyst	SBA
State Historic Preservation Office	SHPO

Strategic Funding Specialist	SFS
Supply Administrative Operations Supervisor	SAOS
Supply Operations Supervisor	SOS
Supply Operations Supervisor-District 1	SOS1
Supply Operations Supervisor-District 2	SOS2
Supply Operations Supervisor-District 3	SOS3
Supply Operations Supervisor-District 4	SOS4
Supply Operations Supervisor-District 5	SOS5
Supply Operations Supervisor-District 6	SOS6
Supply Services	SS
Supply Services-Traffic Supply	SSTS
Supply Services Manager	SSM

- T -

Titles Operations Supervisor	TOS
Traffic Services Engineer	TSE
Traffic-Signals	TSL
Traffic-Signs	TS
Transportation Legislation & Policy Specialist	TLPS
Transportation Performance Administrator	TPA
Transportation Performance Division	TP
Transportation Performance Business Manager	TPBM
Transportation Systems Management	TSM
Transportation Systems Management Engineer	TSME

- U -

Utility Section in Right-of-Way	UTIL

- V -

Vehicle Services	VS
Vehicle Services Manager	VSM
Vehicle Size and Weight Specialist	VSWS
Volunteer Services Coordinator	VSC

SECTION 1000.00 – STRUCTURE

SECTION 1000.00 – STRUCTURE

1010.00 – GENERAL

The Bridge Design Manual provides guidelines and standard details that are workable, serviceable, and reasonably economical. In addition, these guidelines and details have been approved by FHWA for general use. Any departure or deviation from these guidelines and standard details in the Bridge Manual will require prior approval, and may result in delay caused by obtaining approval.

All new bridges that carry traffic on Interstate Highways and Ramps or US and State Highways shall be designed using the AASHTO LRFD Specifications and the guidelines in the Bridge Manual unless otherwise approved by the Bridge Engineer.

All rehabilitation, widening and modification to existing structures may use the AASHTO Standard Specification of Highway Bridges-17th Edition or the AASHTO LRFD specification if it is economically feasible.

Local and Off-System bridges should be designed using preferably the AASHTO LRFD Specification. AASHTO Standard Specification of Highway Bridges-17th Edition may also be used.

1020.00 – DESIGN STANDARDS

1020.01 Culvert vs. Bridge Designation. To determine whether a structure should be designated as a culvert or a bridge, the structure shall be measured along the centerline of roadway from the inside face of wall or abutment. If the measured length is 20 feet or less it shall be designated a culvert, if greater than 20 feet it shall be designated a bridge.

1020.02 Hydraulics. All bridges shall have an ITD 210, Hydraulic Structures Survey, approved by the Hydraulics Engineer. All culverts that require a diameter equal to or greater than 5 feet shall have an ITD 210, Hydraulic Structures Survey, approved by the Hydraulics Engineer.

1020.03 Waterway Clearances.

A. Bridges. Structures with spans 20’ or more, the minimum clearance above Q50 high water shall be 2’-0”. In addition, the 100-year flood (Q100) must also pass beneath the bridge.

B. Culverts. Box culverts, pipes, and pipe arches with a clear span of 12’ or more and all stiff-leg culverts and open bottom pipes, the minimum clearance above Q50 high water shall be 1’-0”. When debris is carried by the waterway during high water flow, a minimum clearance of 2’

should be considered. In addition, the 100-year flood (Q100) must also pass beneath the culvert.

For pipes, pipe arches, and box culverts with a clear span less than 12' , the ration of the headwater to diameter during Q25 flow should be equal to or less than 1.25 (HW/D<1.25). When debris is carried by the waterway during high water flow, a minimum clearance of 2' should be considered.

1020.04 Structure Width. The recommended width between the rail faces on the bridge will include the full approach roadway width plus shy distances shown in the Bridge Design Manual. The shy distances allow the face of bridge rail to align to the face of the roadway rail.

1020.05 Canal Crossings. Structures crossing canals are subject to canal company approval. The canal company should approve the Situation and Layout sheets sent to the district.

1020.06 Foundation Data. Refer to the Materials Manual. An approved Phase 4 Foundation Investigation Report is required for all bridges and culverts. The foundation plat is included in the structure plans.

1020.07 Highway Vertical Clearance. The recommended minimum vertical clearance on the State Highway System is 17 feet or Local and Off-System routes the minimum value is 16 feet. These clearances may be reduced with prior approval from the DMC Engineer, DMV Port of Entry Manager, and Bridge Engineer.

Bridges carrying the railroad over the highway, the vertical clearances for highway crossings shall apply.

Bridges carrying the highway over the railroad, the minimum vertical clearance shall be 23'-0" from the top of the rail at a point directly over the centerline of the track.

1020.08 Vertical Alignment. A minimum slope is necessary for drainage. Vertical curves, if necessary can be accommodated. Sag vertical curves cause drainage problems if the low point is on the bridge.

1020.09 Horizontal Alignment. Avoid the use of spirals, variable crown super elevation runoffs and flares on bridges. While these are not impossible design problems, they do cause problems in construction.

1020.10 Structure Depth.
Allowance for adequate structure depth should be made when establishing the profile grade. Contact Bridge for approximate structure depth.

1020.11 Deck Drainage. Deck drains should be eliminated and the runoff should be taken by roadway drains beyond the end of the bridge, if possible. The Bridge Manual contains the criteria for determining the need for deck drains.

1020.12 Bridge Rail. Approved standard rail types and selection criteria are listed in the Bridge Manual. Pedestrian walkways shall be separated from the adjacent roadway by a traffic railing or combination railing when the posted speed is 50 mph or more.

1020.13 Skew.

The skew angle is the angle measured from the perpendicular to the roadway centerline to the centerline of the bridge or culvert. Skew angles should be minimized and skew angles greater than 25 cause design problems. Snow plows have a fixed blade angle between 28 - 35 (left-forward). To minimize the possibility of having a snowplow blade drop into a joint, joint skews between 25 -38 (left-forward) should be avoided.

1030.00 – STRUCTURE SUBMITTAL DATA

1030.01 Structure Field Data. The district or consultant will obtain the necessary field data for all major structures and for all drainage structures requiring structural design or detailing. The district or consultant will send this data to Bridge, if Bridge is designing the structure. The following field data is required in addition to the information on the Bridge Submittal Checklist for Situation/Layout.

- Cross sections of the existing channel at the roadway centerline and one bridge length upstream and downstream, as shown on ITD-210, Hydraulic Structure Survey.
- Cross section at the existing downstream toe of a roadway slope.
- Cross section of the existing bridge at the downstream edge.
- Cross sections of the existing channel at various locations to compute water surface profile through the bridge
- Natural stream cross sections of any limiting feature immediately downstream that controls the water surface (such as a riffle at the end of a pool).
- Natural ground cross sections for at least 200 feet on each side of the centerline junction or to the station showing the change in grade at the end of the structure.
- Cross sections of any proposed channel changes along with a grade line and alignment of the proposed channel. Highway alignment, typical sections, and centerline profile must be included for the highway carried by the structure.

A contour map of the bridge site shall be furnished showing 1 foot contour intervals to a scale that will allow the structure to be shown on a standard 11”x17” sheet. However, the scale shall not be smaller than 500:1.

1030.02 Situation Layout Check List. Refer to Bridge Submittal Checklist for Situation/Layout.

1040.00 – CONSULTANT PREPARED BRIDGE PLANS & SPECIFICATIONS

1040.01 Submittal Procedure.

Local Sponsor Projects

Sponsors shall make all submittals to the LHTAC (Local Highway Technical Assistance Council), and they will make distribution to the necessary ITD sections for review. Two copies of the Drawings should be submitted in 11”x17” format. Returned transmittals by Bridge will be sent to LHTAC. This procedure is to be used on all projects to include Local Public Agencies (LPA) projects by consultants.

State Consultant Projects

Consultants shall make all submittals to the district, and the district will make distribution to the necessary ITD sections for review. Two copies of the drawings should be submitted 11”x17” format. Returned transmittals by Bridge will be sent to the district.

Structure Concept Review

A submittal of data is to be made showing the concepts of the project in general. Drilling for the foundation investigation for multi-span structures should be delayed until the charter is approved. The data should include:

- Bridge layout showing plan and elevation views
- Bridge cross-section
- Roadway cross-section
- Stream cross-section,
- Vicinity map
- Preliminary profile grade
- Draft Phase 4 Foundation Report (if available)
- Draft ITD 210 hydraulic report
- Other data pertinent to type or location selection

Show as much of the above data as possible on the layout drawing.

Consultants are encouraged to contact Bridge during development of the structure development charter.

Final Situation and Layout Review

The plans shall consist of the following:

- Situation and layout
- Foundation investigation sheet
- Sketches or views of unusual structural details

Refer to the Situation and Layout Checklist in the Bridge Manual.

The plans should also be accompanied by:

- Approved Phase 4 Foundation Report
- Approved ITD 210 Hydraulic Report
- Approved Design Standards

- District approved roadway profile and alignment data
- Topographic map with contours

Bridge shall approve the Situation and Layout plans before proceeding with final design.

Intermediate Design Reviews

If needed, these reviews can be handled informally between the Local Public Agency/State Consultant and Bridge.

Final Design Review

The submittal should include the following:

- Drawings in reproducible form
- Special Provisions
- Cost Estimate
- Quantity Calculations
- Construction Schedule
- Design Calculations

Plans, Specifications & Estimates Submittal

After the consultant has made the necessary corrections from the Final Design Review, the final drawings and the revised final design data shall be submitted.

The final drawings shall include the following:

- 22”x 34” 3 mil mylar stamped by the Engineer
- 11”x17” prints
- Electronic CADDS files in .dgn format

The 11”x17” prints should preferably be either photographically reduced or have an electronic stamp.

Bridge will publish a PS&E letter of acceptance.

In the transmittal letter for Local Sponsor Projects, Bridge will include an estimate of man-hours for checking shop plans and construction drawings. The district will arrange for a supplemental engineering agreement to cover this additional work.

1040.02 Review Procedure. Consultants are used on state bridge projects when the workload exceeds the capacity of Bridge or when special expertise is required. Counties and cities also frequently use Consultants to design bridges for LPA projects with Federal Aid funds.

A Review Engineer from Bridge will be assigned when a new bridge design project is provided to the consultant. The reviewing engineer should have experience in the design of structures similar to the one to be reviewed. The Review Engineer will then become the contact for technical questions raised by the consultant throughout the design phase. This communication allows early identification of critical design areas and reduces the chances of major revisions.

The Review Engineer will not generally perform an exhaustive check on the design. All details, plans, and related work will be reviewed to ensure conformance with the criteria that follows.

The consultant shall apply his own seal and signature to the plans, and thereby assumes full responsibility for their correctness and general conformance with good engineering practice.

The following indicates the degree and type of checking to be performed by Bridge:

Structure Development CharterReview

All development charters will be thoroughly reviewed to ensure adequate evaluation of:

- Structure types that are compatible to the site conditions
- Preliminary cost estimates
- Advantages/disadvantages of each structure type
- Economy, feasibility, and constructability
- Structure types recommended for additional study or final design

A review of the bridge layouts will be made to ensure that span lengths, clearances, and all site conditions are adequately addressed.

Final Situation and Layout

Plans should be thoroughly checked by using the checklist located in the Bridge Design Manual (*BDM*). Conformance of grades, alignments, and other data between roadway and bridge plans should be checked.

The hydraulic and foundation criteria shown on the plans shall conform to the approved ITD 210 hydraulic report and approved Phase 4 foundation report.

Final Design Review

Plans should be reviewed for completeness, constructability, compliance with current ITD standards, and good engineering practices.

A review of major structural elements should be performed. However, no stress analysis is generally required unless the detail appears questionable.

Pay items and Special Provisions should be reviewed for conformance with the Standard Specifications. Quantity calculations and rebar schedules are generally not checked in detail.

Design calculations shall be on 8 1/2"x11" paper with a proper heading, placed in a binder with an index and stamped.

Final Plan Review

Plans will be checked for all changes required by the Final Design Review.

The signature, date and Idaho seal of a registered engineer of the consulting firm shall be on each drawing.

Section 200.00- Project Programming and Development

SECTION 200.00 - PROJECT PROGRAMMING AND DEVELOPMENT

210.00 - PROJECT PROGRAMMING

The Idaho Transportation Department (Department) is required to develop construction projects that are needed, cost effective, and within the approved policies of the department and the Federal Highway Administration. Construction projects are to be selected and a multi-year construction program formulated in accordance with priorities established by various needs, studies, and long-range planning.

210.01 The Idaho Transportation Investment Program The Idaho Transportation Investment Program (ITIP) is a multi-modal program that includes highways, bridges, public transportation, railroads, aviation, and non-motorized transportation. The State of Idaho's state and local transportation systems are a network of cross-jurisdictional routes that require cooperation, coordination, and continuous planning to operate, maintain, and improve.

210.02 Selecting and Prioritizing Projects The Department's Five-Year Transportation Plan includes projects for highways, bridges, public transportation, railroads, aviation, and non-motorized transportation. The Transportation Board (Board) and department select projects to further the department's mission of improving "your safety, your mobility, and your economic opportunity". The first step in the process occurs when the Department's management team establishes program performance measures, priorities, and funding levels. Teams for each program area (pavements, bridges, etc.) then meet to:

- Collect and analyze data to make project-timing decisions, such as determining the ideal time to perform a pavement-preservation or a bridge-rehabilitation project.
- Review and prioritize needs to provide the highest return on investment performance and the most benefit to Idaho citizens.
- Recommend projects to meet performance measures within fiscal constraints. The department also seeks input and recommendations within the established guidelines from the state's metropolitan planning organizations and local governments. The Department's management team reviews recommended projects and forwards approved projects to the Board for input. Following the Board's review, the public is invited to comment. After the comment period ends, the Board again reviews the selected projects and approves a transportation program.

The Department uses road and bridge management systems to select projects that:

- Optimize current and projected funding levels
- Support federally funded local transportation agency plans and programs

- Address system priorities
- Achieve system performance goals

Teams of experienced engineers and planners assist in the project-selection process by:

- Analyzing road and bridge data provided by the management systems
- Determining specific program objectives
- Establishing engineering requirements for projects that achieve program objectives
- Making recommendations to management on funding levels required to meet objectives
- Balancing program budgets with available revenue Program Priorities

The ITIP's priorities support the Department's mission of "your safety, your mobility, and your economic opportunity". The Department:

- Is committed to providing facilities that enable the safe movement of people and goods. Safety is considered in all transportation activities, investments, and decision-making processes.
- Promotes accessible, affordable, and convenient transportation choices for the movement of people and goods.
- Strives to keep transportation infrastructure in good repair and ensure uninterrupted service.
- Applies resources to maintain, improve, and expand routes and services that contribute to the state's economic vitality.

210.03 Using Performance Measures to Improve Accountability Publication of the Five-Year Plan is another step in the Department's commitment to elected officials and taxpayers to improve transparency and accountability. Publishing what projects were selected and when they will be completed allows elected officials and the public to see if the Department delivers on its promises. The Five-Year Plan also shows what the Department's funding assumptions and needs are, and how projects are prioritized and selected. The public also can review how completion of the selected projects is driving the Department toward achieving its performance goals. The Department monitors performance measures which are published on the Department's internet website. Plans to achieve each performance measure cascades down into the organization as divisions align business plans, sections develop work plans, and supervisors generate employee performance plans to support and achieve the measures.

Each performance measure ties to the department's new mission: • Your Safety. • Your Mobility. • Your Economic Opportunity.

Initial entry and project revisions are done using the approved processes established by the Office of Transportation Investments.

210.04 Chartering The Department has introduced a business practice called Project Chartering. Project Chartering in the evaluation phase addresses scope, schedule and budget for projects prior to these projects being put into the ITIP. In an effort to improve budgeting, districts will use planning support funding to develop the engineering details sufficient to define the project scope for nomination to the ITIP. Charters are living documents established by obtaining data for the projects from the systems in place, such as the Transportation Asset Management System (TAMS), and using the available data from the Needs Data Base. Charters include a project objective statement, scope of work, environmental considerations, design standards, and key stakeholder roles and responsibilities. In addition, it serves as a contract between the Project Team and the Project Sponsors, stating what will be delivered according to the budget, time constraints, risks, resources, and standards agreed upon for the project. In the chartering process, no scope revisions are allowed during the development phase unless approved in writing by the Project Sponsor, usually the District Engineer.

210.05 Local Cooperative Project Requirements. When funding sources allow, projects may consist of a monetary payout to a local entity for a cooperative project.

To maintain uniformity in processing Local Cooperative projects, the following procedure will be used:

- After approval of the Board Item and subsequent approval of the ITD 1414, Project Program or Revision, the appropriate District provides the initial request and input and a cooperative agreement is prepared by Highways Program Oversight.

- When the agreement has been signed by all parties, the District distributes a copy to all parties with two copies to Highways Program Oversight and one copy to the Office of Transportation Investments.
- The District prepares an ITD 2101, Project Authorization and Agreement, and forwards the ITD 2101 and one copy of the agreement through The Office of Transportation Investments to Financial Services.
- Financial Services assigns work authorization, finalizes, and distributes the ITD 2101.
- The Districts, in cooperation with the local entity, prepare a chart/schedule which estimates the cash payments that are required for the project.
- Payment to the local entity is made at their request, after they obtain a contractor to perform the work or complete the work themselves. The District prepares and submits an invoice entry and tracking form.
- Exceptions to this procedure must have prior approval by the Chief Engineer.

220.00 - PROJECT DEVELOPMENT FUNDING

The initial cost of a project is required for the evaluation charter and can be estimated utilizing the "Average Cost per Lane Mile" charts (Figure 2-1a). However, all available information and data should be evaluated to determine the project costs.

Notes:

The high costs columns refer to viaducts, tunnels, projects of extraordinary expense.

Small Urban = > 1,000 - Small Urbanized => 50,000 – Large Urbanized => 200,000.

A project that is placed on the Idaho Transportation Investment Program (ITIP), with a specified year of construction, is eligible for development provided that the project meets eligibility criteria for those funds. When project development activities are ready to begin, the District Engineer submits an ITD 2101, Project Authorization and Agreement, to Planning/Programs Management for the scheduled preliminary engineering for that fiscal year. The ITD 2101 is processed, Financial Services issues the work authority, and copies are sent to all personnel who are authorized to make charges against the project.

On Federal-Aid projects, FHWA authorization is required before any work occurs or notices-to-proceed are issued or work may be deemed non-participating.

Figure 2-1a Idaho-Specific Capital Improvement Costs (in 000s of 2006 dollars per lane-mile)

	A	B	C	D	E	F	G	H	I
	Reconstruct & Widen Lanes	Reconstruct Pavement	Resurface & Widen Lanes	Resurface Pavement	Improve Shoulders	Add Lane at Normal Cost	Add Lane at High Cost	Realign Pavement at Normal Cost	Realign Pavement at High Cost
Rural Interstate									
Flat terrain	840	549	539	221	31	1,142	1,583	1,266	6,582
Rolling terrain	942	563	621	235	51	1,238	2,003	1,602	6,880
Mountainous terrain	1,112	651	747	260	78	1,586	4,999	1,879	7,490
Rural Other Principal Arterials									
Flat terrain	656	439	450	177	20	914	1,309	1,047	5,340
Rolling terrain	741	451	511	197	34	979	1,581	1,264	5,649
Mountainous terrain	851	512	596	215	54	1,191	4,430	7,214	7,214
Rural Minor Arterials									
Flat terrain	600	386	419	157	19	831	1,167	934	5,098
Rolling terrain	724	427	522	169	35	953	1,503	1,202	6,316
Mountainous terrain	840	488	613	187	54	1,173	4,430	6,914	6,914
Rural Major Collectors									
Flat terrain	632	409	433	160	25	863	863	934	5,313
Rolling terrain	692	415	487	170	33	883	883	1,148	6,044
Mountainous terrain	790	471	563	186	52	1,040	4,155	6,613	6,613
Urban Interstate, Other Freeways and Expressways									
Small urban	1,713	1,186	1,199	256	50	2,535	9,027	4,259	10,813
Small urbanized	1,841	1,196	1,240	302	66	2,770	9,862	4,654	12,155
Large urbanized	2,937	1,958	1,920	406	249	4,637	48,819	7,790	48,819
Urban Other Principal Arterials									
Small urban	1,493	1,008	1,097	214	50	2,155	7,673	3,621	9,057
Small urbanized	1,597	1,020	1,147	253	68	2,335	8,314	3,923	10,090
Large urbanized	2,282	1,495	1,678	318	217	3,417	12,166	5,058	11,625
Urban Minor Arterials and Collectors									
Small urban	1,100	761	830	157	37	1,591	5,666	2,674	7,265
Small urbanized	1,152	770	837	178	45	1,677	5,971	2,818	8,139
Large urbanized	1,551	1,029	1,145	219	122	2,325	8,277	3,906	9,096

Source: Cambridge Systematics, November 2007.

Figure 2-1b Bid Item Category Breakdown – Percentage of Cost

	Category B - Reconstruct Pavement		Category D - Resurface Pavement	
Item Category	Rural	Urban	Rural	Urban
100 - General Provisions	0.01%	-	0.01%	-
200 - Earthwork	6.49%	13.92%	1.82%	12.61%
300 - Bases	16.73%	14.43%	10.96%	14.77%
400 - Surface Courses and Pavement	59.95%	43.45%	67.05%	44.45%
500 - Structure	-	-	-	-
600 - Incidental Construction	6.83%	18.20%	10.17%	18.17%
700 - Materials	-	-	-	-
Engineering	10.00%	10.00%	10.00%	10.00%
Total	100%	100%	100%	100%

220.01 Maintenance (STM and STKP) Program Funding. STM and STKP Program estimates include contract costs only.

220.02 Charges for State-Furnished Items and Materials on State Maintenance (STM), and Stockpile (STKP) Projects.

- Construction Engineering

  Record on Engineer's estimate and ITD 2101, Project Authorization and Agreement, and charge against the project.

- Pavement Markings

  Do not record on Engineer's estimate and ITD 2101.

  Charge against Route and Milepost

- State-Furnished Material

  Signals and Light Poles:

  Record materials, including labor by Signal Shop, on Engineer's estimate and ITD 2101 and charge against the project.

  Aggregate and Miscellaneous (Materials by SF):

  Record on Engineer's estimate and ITD 2101 and charge against the project.

- Work by State Forces Record on Engineer's estimate and ITD 2101 and charge against the project.
- Preliminary Engineering

  Record on Engineer's estimate and ITD 2101 and charge against the project.

230.00 – PRELIMINARY DEVELOPMENT PROCEDURES

For projects to be placed in the program an evaluation charter must be prepared and approved by the project sponsor.

For the annual program update the evaluation charters are prepared and forwarded to the Office of Transportation Investments.

If cost changes are required, an updated ITD 1414, Project Program or Revision, and an updated version of the project charter must be prepared and approved.

230.01 Addition, Revision, or Deletion of Projects to the Highway Development Program. Until a project is approved and added to the ITIP, projects are not budgeted, nor can development begin. An ITD 1414, Project Program Entry or Revision, must be prepared and submitted for all projects proposed for addition, revision, or deletion to the Highway Development Program. Evaluation Charters or updated versions are also required.

For new locally sponsored projects, see Guidelines for Local Public Agency Projects.

Preliminary engineering (PE) and right-of-way (RW) is scheduled for each project, in each year, for the amount that will be obligated and spent.

230.02 Project Cost Changes. Cost changes on scheduled projects within the first four (4) years of the Program shall be managed by tradeoffs of planned work, project length reduction, approved cost reduction measures, and lastly by rescheduling of other projects. An ITD-1150, Cost Estimate Summary, is also required if the project is within the first five (5) years of the Program.

Cost changes for projects must be in accordance to Administrative Policy 5011, Idaho Transportation Investment Program, and an ITD 1414, Project Program or Revision, must be submitted to The Office of Transportation Investments for approval by the Chief Engineer.

Any increase in local project costs are primarily the responsibility of the local sponsoring agency.

Evaluation Charter version updates are also required.

240.00 – DONATIONS

Donated services and materials by public agencies may be acceptable on F.A.

projects. See: 23USC323, (c) Credit for Donations of Funds, Materials, or Services,

49CFR18.24 Matching or cost sharing and FHWA Project Development Guide, Chapter 6.

Donations of materials and/or services on a project to be used as a match or for reimbursement must be approved in advance of the work being done and they must be cost effective.

A cost effectiveness analysis must be completed to show the cost of labor, equipment, supplies and materials are more cost effective than bidding these items in the contract.

SECTION 300 - PRELIMINARY DESIGN

SECTION 300 - PRELIMINARY DESIGN

Preliminary design defines the general project location and design concepts. It includes, but is not limited to, preliminary engineering and other activities and analyses, such as environmental assessments, topographic surveys, metes and bounds surveys, geotechnical investigations, hydrologic analysis, hydraulic analysis, utility engineering, traffic studies, financial plans, revenue estimates, hazardous materials assessments, general estimates of the types and quantities of materials, and other work needed to establish parameters for the final design. Prior to completion of the NEPA review process, any such preliminary engineering and other activities and analyses must not materially affect the objective consideration of alternatives in the NEPA review process.

310.00 – PROJECT DEVELOPMENT

The DOH Work Breakdown Structure (WBS) Flow Chart (Figure 3-1) provides an overview of required project development activities and information, from the planning of a project through advertisement and award of the contract for construction. Figure 3-1 shows the project activities and information for a large expansion type project. Some activities and information are not necessary for some projects, while additional activities and information may be necessary for other projects.

The Project Development Checklist (Figure 3-2) can also be a useful tool to prevent overlooking a project activity and evaluating the current status of a project. Not all of the items are necessary for every project.

For all projects submitted to HQ SME's for review, three (3) weeks must be allowed from arrival date to the date of the review. Review dates shall be coordinated with the individual SME.

310.01 Constructability Constructability reviews are **required** on all projects. A constructability review is a systematic process to ensure that a project possesses clear and feasible construction techniques. The Constructability Review Process starts at the inception of the project and continues throughout project development. Several constructability reviews should be incorporated into the project planning and development. The combination of the reviews makes up the Constructability Review Process.

The purpose of constructability reviews during project development is to ensure that projects are biddable, buildable, cost-effective and maintainable. Constructability reviews involve the optimum use of construction knowledge and experience in the planning and development of a project. (See Constructability Review Guidelines)

DOH Work Breakdown Structure (WBS) Flowchart

DOH Planning Phase
WBS: 1

Corridor Studies

Corridor Charter

Corridor Study

Corridor Public Involvement

Project Specific Studies

Project Feasibility Study

Special Analysis & Report

Special Traffic Study

Needs Assessment

Major Activities TBD

Needs Tracking Database

Actual Needs

DOH Evaluation Phase
WBS: 2

Project Charter - Evaluation Phase

Transportation Investment Program (TIP) - MPO's
February - March

Idaho Transportation Investment Program (ITIP) - Submittals
February - March

PROJECT CHARTERING

IDAHO TRANSPORTATION INVESTMENT PROGRAM (ITIP)

Program Target Review (ITB)
April

Initial Statewide Balancing
April

DRAFT Idaho Transportation Investment Program (ITIP)
May

DRAFT Idaho Transportation Investment Program Publication (ITIP / STIP)
June

DRAFT ITIP Review - ITB
June

Public Involvement (STIP)
July

Final Statewide Balancing
August

Recommended Idaho Transportation Investment Program (ITIP)
August

Governor / ITB Review
September

Idaho Transportation Investment Program (ITIP) Approval - ITB
September

Approved Idaho Transportation Investment Program (ITIP) Publication
October

State Transportation Improvement Program (STIP) Approval - FHWA
Nov. - Dec.

ITIP Amendment

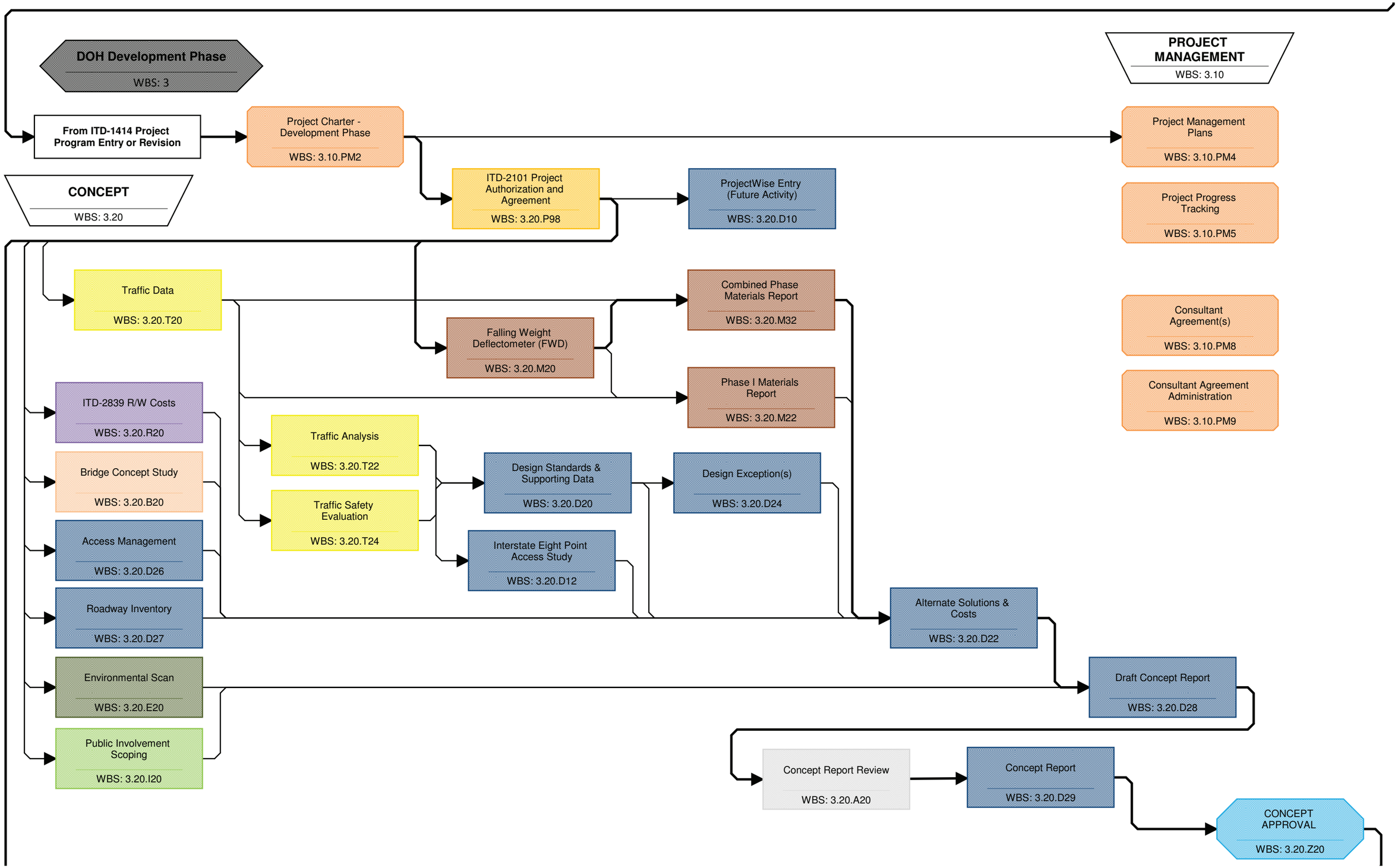
ITIP Amendment Approval - ITB

Approved State Trans. Improvement Program (STIP) Publication
Nov. - Dec.

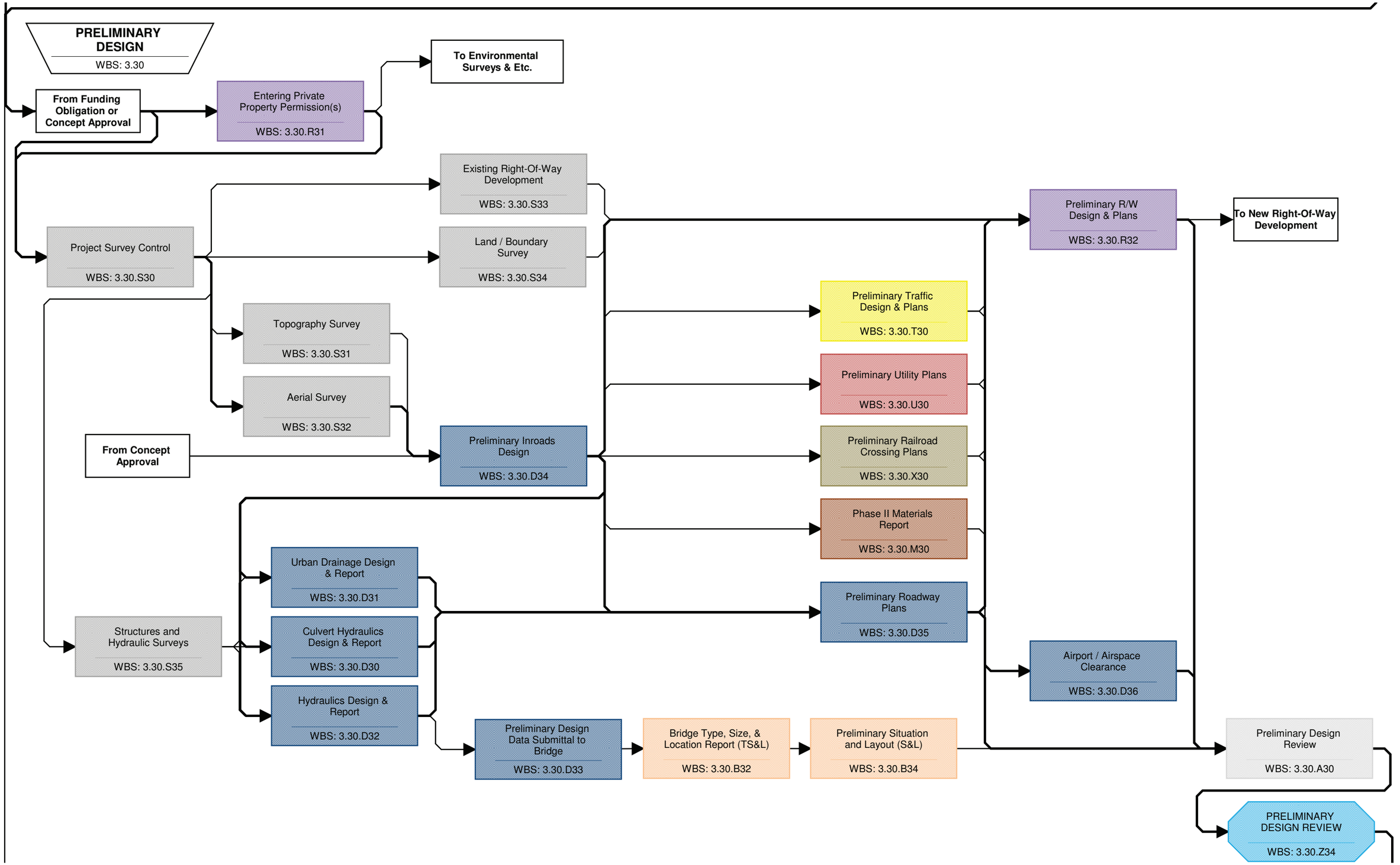
Capital Investment Program (CIP) Publication
Nov. - Dec.

ITD-1414 Project Program Entry or Revision

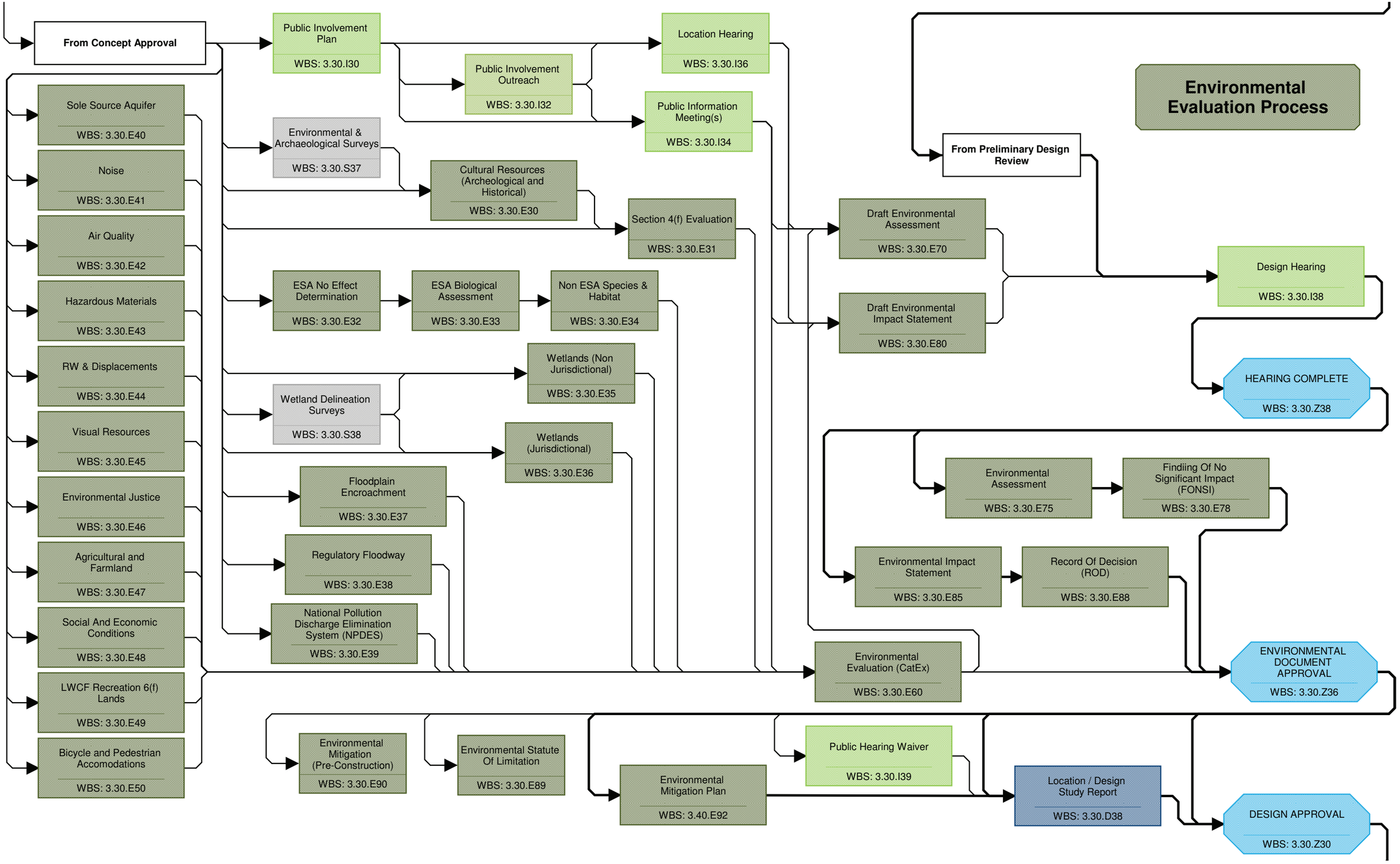
DOH Work Breakdown Structure (WBS) Flowchart



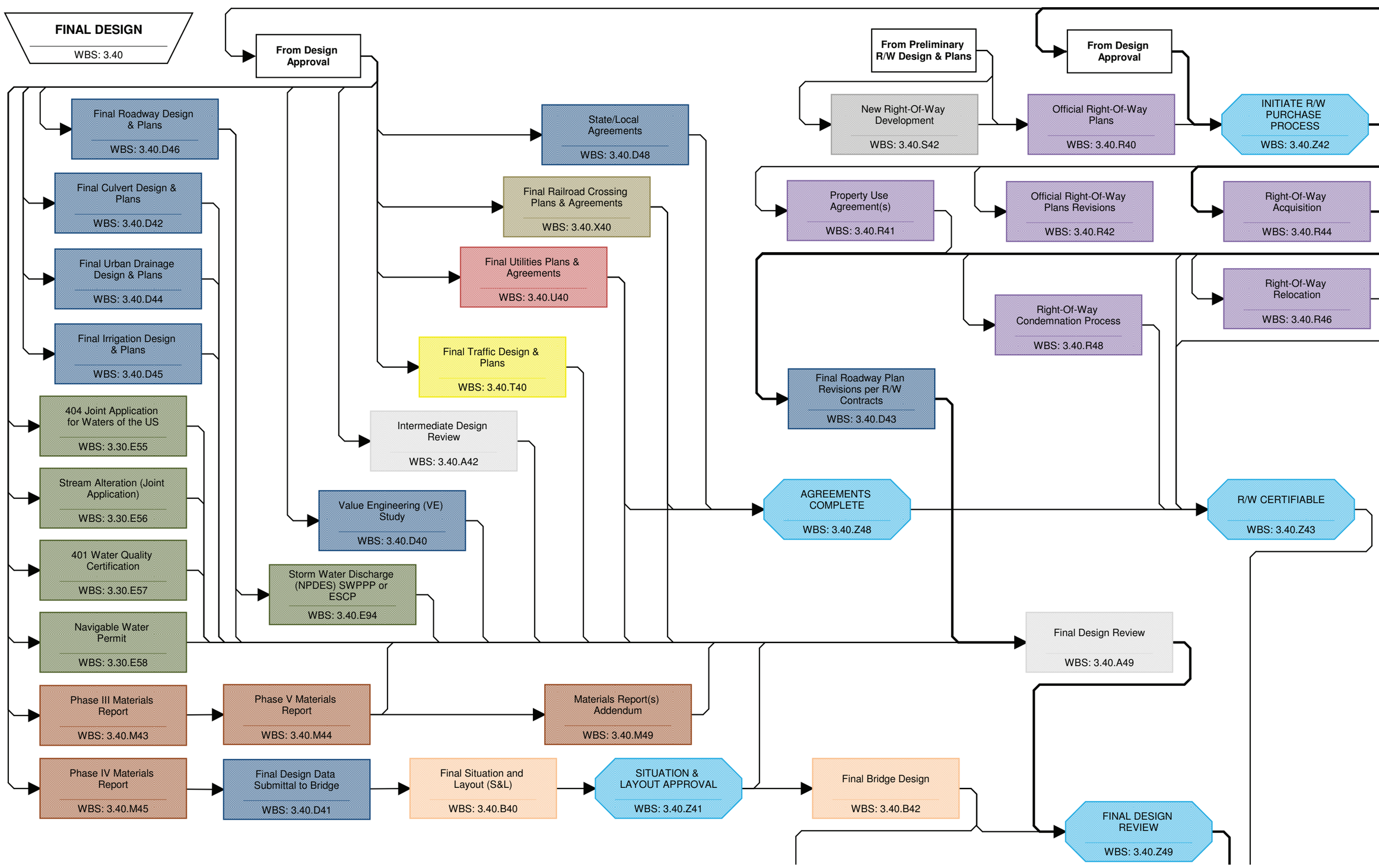
DOH Work Breakdown Structure (WBS) Flowchart



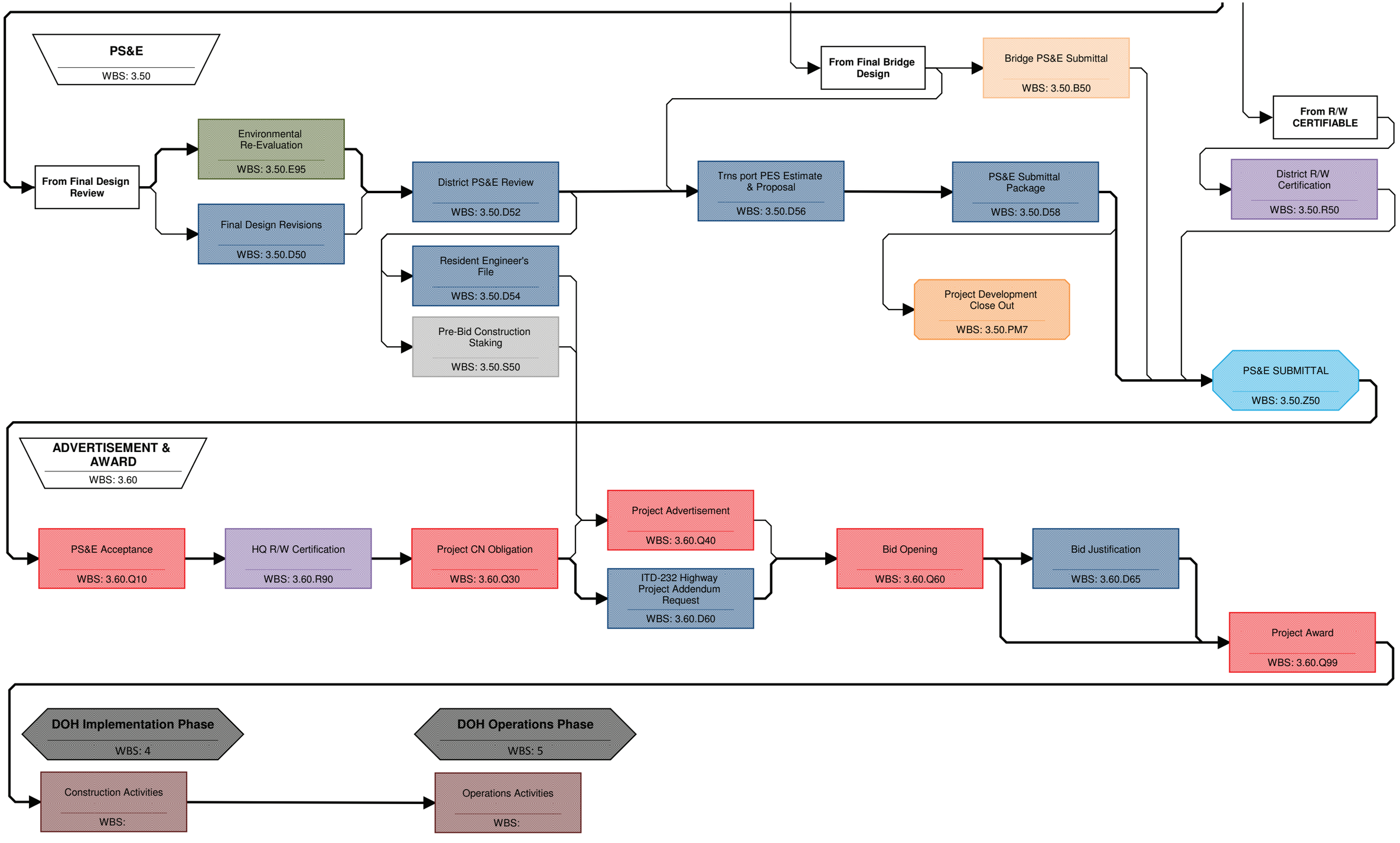
DOH Work Breakdown Structure (WBS) Flowchart



DOH Work Breakdown Structure (WBS) Flowchart



DOH Work Breakdown Structure (WBS) Flowchart



PROJECT DEVELOPMENT CHECKLIST

PROJECT NAME:

PROJECT NUMBER: **KEY NUMBER:**

	Submittal Date	Approval Completion Date
Project Planning and Programming		
Evaluation Charter completed and approved		
Complete and Submit required Programming Information		
Initiate ITD 2101, Project Authorization and Agreement. (District requests and approves funding for preliminary engineering).		
Preliminary Design		
Proceed with Development Charter Process		
Request for Survey Work, ITD 2865. (Assure that all property monuments are located, marked, and referenced)		
Complete and approve Development Charter; Design Standards, Alternate Solutions and Costs (if needed) and Proposed Design Exceptions.		
Complete Materials Phase I Report, Geological Reconnaissance Report with Pavement Life Cycle and Cost Analysis, and Corridor Defined.		
Initiate ITD 1151, Traffic Data Request Capacity Analysis		
Complete ITD 654, Preliminary Environmental Evaluation; ITD 652, Hazardous Waste/Material Initial Site Assessment Checklist; and ITD 2784, NPDES Storm Water Permit Project Checklist for Construction, after receiving approval on ITD 1414.		
Initiate NEPA/404 Permit Merger Process, if 404 Permit Required		
Initiate ITD 1500, Archaeological Reconnaissance, by Environmental Planner (requires 2-3 months lead time). Bridge Inspection Reports and Deck Studies.		
Prepare Public Involvement Plan		

Figure 3-2
Sheet 2 of 3

PROJECT DEVELOPMENT CHECKLIST

PROJECT NAME:

	Submittal Date	Approval Completion Date
Preliminary Design		
Proceed with Preliminary Design Activities		
Complete ITD 210, Hydraulic Structure Study.		
Initiate Preliminary Materials Phase II Report		
Initiate Materials Phase IV Report — Foundation Investigation Report (requires situation layouts and hydraulics report).		
Initiate Traffic Design/Traffic Control Plan — signs, signals, illumination, and pavement markings.		
Determine and document Access Control.		
Complete Draft Environmental Report/Categorical Exclusion, Draft Environmental Impact Statement(EIS) or Environmental Assessment(EA)		
Initiate Utility Process		
Make Initial Owner contacts (see R/W Procedures Manual)		
Complete ITD 759, Field Inventory.		
Complete ITD 602, Crossing Evaluation (railroad) and Airport Clearance		
Complete Preliminary Design Review and Complete Approval Letter to File		
Initiate R/W process (Plan Development)		
Initiate Materials Phase III and V Reports		
Complete Waivers of Public Hearing; **OR** prepare hearing plans and request a Public Hearing.		
Hold Location/Design Hearing.		
Complete Design Study Report, including ITD 1414 if costs increases		
Update ITD 1150, Cost Estimate Summary Sheet.		
Complete Charter Change Request if need & Update ITD 2101		
Complete Final Environmental Document — CE, EIS or FONSI		
Submit Utility Plans to Utility Companies		
Make Final Owner Contacts		
Submit Official R/W Plans		

Obtain Design Approval		

Figure 3-2
Sheet 3 of 3

PROJECT DEVELOPMENT CHECKLIST

PROJECT NAME:

	Submittal Date	Approval Completion Date
Final Design		
Proceed with Final Design Activities		
Initiate Permits (Section 358)		
Obtain Approved Phase II, III, IV, V Materials Reports		
Proceed with Right of Way Purchase Process		
Receive Final Traffic Plans		
Initiate Agreements with LPA (Cooperative, Road Closure and Maintenance) Utilities, Railroads, Irrigation companies, etc.		
Obtain Material Source Plats		
Complete NPDES Storm Water Plan		
Complete Sediment and Erosion Control Plan		
Conduct Final Design Review and Plan in Hand Field Review		
Submit official Utility Plans — Utility agreements as needed will be obtained by the Utility Coordinator or the districts and approved by the DE, DA or delegate.		
Compare right of way agreements with project plans for compliance		
Prepare Environmental Mitigation Plan Report		
Complete Final Design Letter and make plan corrections		
Complete district PS&E Review in district		
Finalize agreements with LPA, utilities, railroads, irrigation companies		
Obtain Right of Way Certificate		
Update ITD 1414, Program Entry or Revision if cost increases		
Update ITD 1150, Cost Estimate Summary Sheet		
Complete PS&E Package and send to DMC		
Send Resident Files to Resident Engineer		
Prepare and Complete Bidding Process by DMC		

315.00 – PROJECT DEFINITIONS

315.01 Short Projects. Short projects are projects that meet the following criteria and are not on the interstate and do not require a preliminary design review. Therefore, intersection improvements, turn bays, bridge rehabilitation, etc. do not qualify.

- NEPA Analysis is not expected to be with an EA or EIS
- The project does not have or expect to involve public controversy
- The project does not require a Public Hearing
- The project does not require a System Action

Short projects may follow the abbreviated procedures shown in Subsection 315.17 and Figure 3-4. The memo, written to the project file and signed by the District Engineer, granting design approval must include an explanation of why the project should be exempt from full design reviews.

315.02 Special Projects. Special projects as outlined in 23 CFR 771.117(c) include landscaping, construction of bicycle and pedestrian facilities, fencing, signs, traffic signals, railroad warning devices, pavement markings, acquiring scenic easements, and improvements to existing rest areas and weigh stations. Many project procedures that are used for standard federal-aid projects are not applicable for special projects. Most Special Projects will use the abbreviated procedures shown in Subsection 315.17 and Figure 3-4.

For ITS Projects containing networking communications, Headquarters Information Services should be consulted.

315.03 4R New Construction. This action involves the construction of a new highway facility where nothing of its type currently exists.

315.04 4R Reconstruction. This typically involves a major change to an existing facility within the same general right of way corridor. Reconstruction may involve making substantial modifications to horizontal and vertical alignment in order to eliminate safety and crash problems or making substantial modifications to the pavement section to correct structural deficiencies. These projects can be as complex as new construction and they can present more challenges because of the constraints involved with work within the existing facility and under traffic.

315.05 3R Resurfacing, Restoration, Rehabilitation.
3R Projects (NHS and Interstate) are intended to extend the service life of the existing highway and, at the same time, improve highway safety by making selective improvements to highway geometry and roadside features. The integrity of the existing ballast is maintained. The types of

improvements to existing federal aid highways include: resurfacing, cold-mill-inlay/overlay, overlay, bridge deck rehabilitation, modifying bridge rail, pavement structural and joint repair, minor lane and shoulder widening, minor alterations to vertical grades and horizontal curves, and removal or protection of roadside obstacles. A project meeting the 3R NHS standard can have as little as an 8 year design life, but any less than a 20 year design life must be justified.

315.06 1R Pavement Rehabilitation. Pavement rehabilitation projects are intended to restore the riding surface and preserve the integrity of the existing roadway while not doing other improvements associated with non-pavement related items except for High Accident Locations, substandard end sections and grossly substandard rail. The types of improvements include: cold-mill and inlay, thick overlay (0.15'or greater), cold-in-place or hot-in-place recycle with overlay. Design life of the pavement for Pavement Rehabilitation (1R) projects will be a minimum of 8 years. The primary goal of the 1R standard is to rehabilitate pavements where a maintenance treatment would not be cost effective, but has not yet deteriorated to the point of needing major treatment or reconstruction. These projects do not decrease the existing geometrics conditions.

Note that hot-in-place recycling and cold in place recycling projects do not meet the minimum eight year life requirement for federal aid.

315.07 PP Pavement Preservation. Pavement preservation consists of a series of treatments or strategies that cover a full range of activities from preservation to minor rehabilitation. Pavement Preservation activities preserve, rather than improve, the structural capacity of the pavement structure. Activities most closely associated with traditional maintenance, include roadway activities that are non-structural such as thin plant mix overlay, seal coating, fog coating, flexible pavement crack sealing, concrete pavement joint repair, grooving and grinding, pavement patching, shoulder repair and restoration of drainage systems. These types of applications normally take place early in the life of a pavement while they are still in good condition and before the onset of serious damage. It is very important for the pavement designer to know as much as possible about the pavement being treated to get the "right treatment at the right time on the right road." Pavements with significant structural deterioration are not candidates for pavement preservation.

315.07.01 Interstate Pavement Preservation: Project development procedures on interstate pavement preservation projects may follow the abbreviated procedures shown in Subsection 315.17 and Figure 3-4 (Project Development Flow Chart) and must include the following:

All work performed on interstate pavement preservation projects must meet AASHTO standards, but other previously built areas of the roadway do not need to be brought to current standards.

Most of these projects will be classified as a categorical exclusion.

All interstate pavement preservation projects are typically exempt from FHWA oversight on all design work.

315.07.02 Non-Interstate Pavement Preservation. If the district determines that design reviews are not required, the project may follow these milestones:

- Charter approval
- Environmental Approval
- PS&E submittal

It is required that a district review be completed on all projects prior to PS&E submittal.

315.10 ST (State-funded) Projects. Small non-NHS 1-R type ST projects, as determined by the District Engineer, may follow these milestones:

- Charter approval
- PS&E submittal

Large, New/Reconstruction/3-R type, non-NHS ST projects should follow these milestones:

- Development Charter approval
- Preliminary Design Review
- Final Design Review
- PS&E Submittal

For state contract maintenance (STM/STKP) projects, including those on the NHS, submittal for advertisement is required as shown below as long as there will be no reconfiguration of the lanes when striping is done.

315.11 Rest Area/Port of Entry Caretaker Services Rest Area/Port of Entry Caretaker Services may be contracted through Business and Support Management (BSM) like any other service contract. An ITD 2101, Project Authorization and Agreement, **is not required** because the contract is paid from district operating funds or Port of Entry operating funds, as appropriate. The district or Port of Entry will verify availability of funds and encumber funds with the ITD 2379, Supply Request. The Office of Highway Operations and Safety (OHS) or Port of Entry, as appropriate, shall review and approve the contract package prior to advertisement and notify Financial Services at completion of work.

NOTE: The Office of Transportation Investment and DMC have no involvement with these projects.

315.12 Building and Yard Projects The districts and Building Services shall submit an ITD 2906, Building and Yard Project Authorization, to the Facilities Manager for review. If the project requires a new building or yard number, the districts shall request a location number (ITD 0030) from the Financial Services, Fixed Asset Administrator. The Facilities Manager (FM) shall review and approve the ITD 2906 and then forward the form to the Financial Services Controller (FSC) for Aeronautics projects and to the Highways Operations Engineer (HOE) for all other projects. The FSC or HOE, as appropriate, reviews, approves and forwards the approved ITD 2906 to Financial Services, Project Accounting and Fixed Asset Administrator for assignment of a work authorization number. Plans are submitted to the FM for review and approval. The approved plans are submitted to Business and Support Management (BSM), who will issue an ITD 2379, and prepare the bid package for advertisement. Business and Support Management will also notify the FM or the FSC (for Aeronautics projects) of the award, and notify Financial Services at completion of work.

The purchase order or contract is issued after the bid is awarded and entered into the financial system to encumber the funds. Business and Support Management prepares the vouchers to pay the vendor. Facilities Management tracks project development and progress and tracks project costs. District Supply operations should be notified upon award of bid.

NOTE: Office of Transportation Investment (OTI) and DMC have no involvement with Building and Yard projects.

315.13 Minimal Contract Maintenance Projects (STM/STKP) Contract maintenance projects (STM/STKP) shall be advertised through Business and Support Management when the service or supply projects are simple in nature – have few bid items, simple special provisions, and require minimal inspection and/or quantity verification. Minimal contract maintenance projects include sweeping, mowing, herbicide application, ditch cleaning, litter pickup, and aggregate stockpiles where the material is purchased from existing commercial inventory. Minimal contract maintenance projects shall be developed according to the procedures outlined in the ITD Design Manual, except that an ITD 2101 is not required.

The district submits the completed PS&E package (see ITD Design Manual, Section 900) and an ITD 2379 to Business and Support Management for advertisement. The Program Number for the appropriate project type **must be listed** on the ITD 2379. A separate ITD 2379 should be used for each type of project, unless more than one type of project will be contracted by the same vendor. In that case, list each project type on separate lines of the ITD 2379. If a multi-year contract is requested, only the amount the district intends to purchase in the current contract maintenance program year should be put on the ITD 2379. To purchase from the same Business and Support Management contract the following year, a separate ITD 2379 will need to be completed for the future year purchase. The district shall notify Financial Services at completion of work.

Contract specifications shall require 100% payment and 100% performance bonds. The invitation for bid shall include a statement requiring construction payment and performance bonds.

The contract specifications shall also require the Contractor to furnish a certificate of insurance for Comprehensive General Liability Insurance, Automobile Liability Insurance, and Worker Compensation Insurance in accordance with the current version of the Standard Specifications for Highway Construction 107.10.

315.14 Multifaceted Contract Maintenance Projects (STM/STKP) Multifaceted contract maintenance projects (STM/STKP) and aggregate stockpile projects that require crushing and/or an advanced level of quality control shall be advertised through DMC. These projects would not normally be obtained from an existing commercial inventory, would have multiple bid items, complex special provisions, require an advanced level of inspection and quality control, and in the case of aggregate stockpiles, require crushing. These multifaceted contract maintenance projects shall be developed according to the procedures outlined in the ITD Design Manual and follow the normal project development process, including submittal of an ITD 2101. The district shall notify Financial Services at completion of work.

315.15 Congestion Mitigation and Air Quality (CMAQ) Projects. The Idaho Transportation Department's (Department) Congestion Mitigation and Air Quality Improvement Program (CMAQ) is a statewide competitive program that provides federal transportation funds to implement cost-effective activities, plans, and projects that are mutually beneficial to transportation and air quality. CMAQ projects should demonstrate the highest potential for preventing or relieving a community's particular air quality problem. Planning activities can also be funded to develop a strategic plan which identifies additional projects and programs that will reduce a community's transportation-related air quality problems. For complete information on this program including application requirements go to:

http://www.itd.idaho.gov/cmaq/

For basic project development activities see Section 310.00. For an in-depth project development activity flowchart contact the Transportation Performance Section contact shown in the above web site.

315.16 Non-Bid Projects. Non-Bid Project is a project that is not advertised for bids since all work will be done by entity(ies) like railroad, utility, local agency, etc., in accordance with agreement(s) executed with the Department that are developed by the appropriate section, i.e. Resource Center - Rail Road Coordinator for Rail Projects and Headquarters Right of Way - Utilities Coordinator for Utility work. The funding may be federal (FHWA, HUD, etc.) and/or State (ITD, Parks & Recreation, grant, etc.). The following procedures apply to Non-Bid Projects:

Project programmed for a specific fiscal year with appropriate funding in accordance with the programming procedures.

- Agreement(s) executed with appropriate entity(ies). The agreement(s) will describe work to be done, who is to do work, cost of the work, and how payment is to be made. Plans and appropriate documents (estimate of cost from entity, insurances, special project requirements, etc.) will be included as attachments to the agreement(s).
- Funding obligated by ITD 2101 regardless of source of funding.
- Copies of executed agreement(s) and approved ITD 2101 are distributed by cover letter (see Figure 3-3).

Figure 3-3

Non-Bid Project Cover Letter

TRANSPORTATION DEPARTMENT

Date

Name of Person

Title of Person

Name of Company

Mailing Address of Company

City, State Zip Code

Re: Project No. ----, **Highway**, **Project Name**, ---- County

Key No. ----

Dear (**Name of Person**):

This is a Non-Bid Project that was not advertised for bids since all work will be done by **(list name of railroad, utility, etc.)** in accordance with the attached three copies of the agreements/plans executed with the Idaho Transportation Department and approved funding by the attached approved ITD-2101.

The Resident Engineer will provide notification to proceed with the work. Please coordinate all work schedules and send billings to the Resident Engineer at:

Name, Resident Engineer

Idaho Transportation Department District **Number**

Address

City, ID zip code

Telephone number

Sincerely,

RCE

cc: **(list name of railroad, utility, etc.)** w/3 attach.

Attachments:3 agreements/plans, ITD 2101

bcc: District- w/4 attach.

RI- w/attach.

RE- (**Name of RE**) w/5 attach.

FS w/agreement without attachments

RC (Rail Road Coord) w/attach. **If railroad agreement**

DMC

RC (Mead) w/attach.

R/W(Utilities Coord)

315.17 Abbreviated Project Development Procedures Abbreviated procedures have been approved for interstate pavement preservation projects, short projects, and special projects (see Figure 3-4, Abbreviated Project Development Flow Chart). The following is a brief overview of these abbreviated procedures:

Step 1. The district prepares and submits an evaluation charter and a ITD 1414, Project Program Entry or Revision to the Office of Transportation Services (OTI) to add the project to the Idaho Transportation Investment Program (ITIP).

Step 2. After the project is approved for the ITIP and when the district is ready to begin development of the project, the district submits an ITD 2101, Project Authorization and Agreement. The request is processed and the work authorization number is assigned before beginning the preliminary engineering. All of the preliminary engineering money scheduled in the current year can be requested, noting that the request is for "Preliminary Engineering for Design of the Project."

Step 3. The district completes the development charter including the Phase I Materials Report and the life cycle cost analysis if appropriate.

Step 4. The district submits an ITD 654, Preliminary Environmental Evaluation, and a map to Environmental for an environmental determination and clearance. Note in the transmittal that this project is a pavement preservation, short, or special project.

Step 5. When the charter is complete and approved and the environmental document is cleared and it is determined that no hearing is required, the district shall complete a memo to project file signed by District Engineer (Figure 3-5, Sample Waiver and Design Approval Memorandum) indicating that the environmental clearance is complete, hearing is waived, no preliminary design review will be held and why, and granting design approval.

Step 6. A formal final design review will be required, which can be completed within the district, and should follow procedures outlined in Section 400. At this time, the project will be evaluated by the district to ensure that the environmental clearance remains valid.

Step 7. PS&E submittal to DMC will follow procedures outlined in Section 900.

Figure 3-4

ABBREVIATED PROJECT DEVELOPMENT PROCEDURE FLOW CHART

(Interstate Pavement Preservation, Short, and Special Projects)

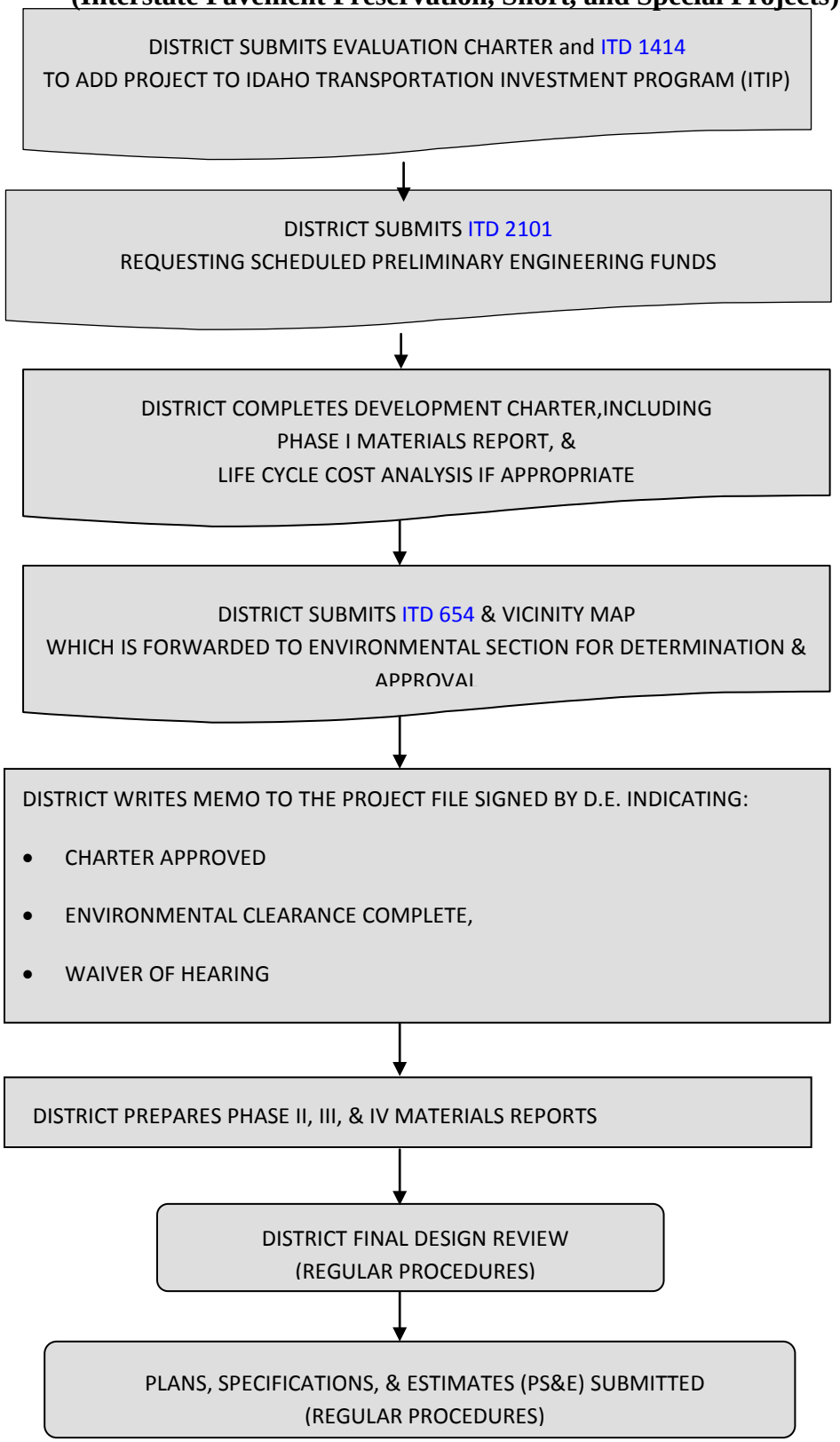


Figure 3-5

ITD 0500 (Rev.10-07)

Department Memorandum
Idaho Transportation Department

DATE: 03-02-12 **Program Number(s)** A012(297)

TO: Fran Hood, PE
Design/Materials/Construction Engineer **Key Number(s)** 12297

FROM: Damon Allen, PE
District 1 Engineer **Program ID, County, Etc.** FY13 D1 BRIDGE DECK LIFE EXTENSION

RE: Design Approval and Waiver of Public Hearing

Design approval and Waiver of Public Hearing are hereby granted for this project.

The Concept was approved on December 1, 2011. The Categorical Exclusion was approved February 16, 2012.

No Preliminary Design Review will be held.

The project will not require new right-of-way acquisition; the layout or function of connecting roadways will not be changed; no significant adverse impact on abutting property, no litigation or public controversy, and no significant social, economic, or environmental affect to the surrounding area are anticipated.

The District will proceed with project development.

If significant changes occur during final design, this waiver and design approval will be re-evaluated.

JV

cc: CE

DE-1

EM-1

PDE

320.00 – DESIGN STANDARDS

Design standards for a project dictate the requirements for both the horizontal and vertical alignments. Design standards include design speed, roadway width, horizontal and vertical curvature, grade, clear zone width, foreslope, super-elevation, design vehicle, minimum vertical clearance, level of service, etc. Selection of the appropriate design standards for a project is initially dependent upon knowledge of the functional classification, access control, terrain, traffic volumes, level of service, speed design, and super-elevation for the project route.

As early as possible, the designer needs to know what standards will apply to the project. The completion of the charter will aid the designer in determining the design standards.

The general policy of the department is that all design criteria will be met. The policies and standards are to serve as a basic guide in design work, however, they are not to be considered as inflexible, and are not intended as a substitute for engineering knowledge, experience, or judgment.

FHWA has adopted the Green Book (*A Policy on Geometric Design of Highways and Streets*) for new/reconstruction projects on the National Highway System (NHS). For Interstate System highways, the current Interstate Policy (*A Policy on Design Standards - Interstate System*) also applies. In the absence of criteria in the Interstate Policy, the values in the Green Book should be used for design of Interstate System projects.

The specified standards related to design speed, lane and shoulder widths, bridge widths, structural capacity, horizontal and vertical alignments, grades, stopping sight distance, cross slopes, super-elevation, and horizontal (not clear zone) and vertical clearances as referenced in 23 CFR 625, are the **controlling criteria** and require formal design exceptions when not met. The roadway widths indicated in any approved corridor plans shall be met unless an exception is approved through the design exception process.

320.01 Design Policies, Standards, Guides, and References. All of the following policies, standards, guides, and references are to be used in conjunction with this manual. In those instances where this manual reflects the policies of the Department and does not equal or exceed FHWA standards, documentation will be required.

320.01.01 Standards and Policies for the Design of Roadways and Appurtenances. defines which standards to use related to routes. Design speeds should be selected to achieve the desired degree of safety, mobility and efficiency within the constraints of environmental quality, economics, and social or political impacts. Projects shall be designed and constructed according to the following standards:

Interstate

New/Reconstruction = AASHTO - Interstate Policy (*A Policy on Design Standards - Interstate System*) and the Green Book — *A Policy on Geometric Design of Highways and Streets*

3R Standards = Appendix A.05

1R Standards = Appendix A.20.01

NHS (Non-Interstate)

New/Reconstruction = AASHTO - The Green Book — *A Policy on Geometric Design of Highways and Streets*

3R Standards = Appendix A.10

1R Standards = Appendix A.20.02

Non-NHS (including LPA projects)

New/Reconstruction = State Standards - Appendix A.15

3R Standards = Appendix A.15

1R Standards = Appendix A.20.03

Deviations from these standards require Design Exception approval. FHWA approval may also be required. (See Section 330.00 for further details.)

320.01.02 Guides and References. Deviations from these designated guides and references do not require approval of a design exception.

Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT < 400)

Erosion and Sediment Control on Highway Construction Projects (FHWA, 23 CFR 650, Subpart B)

Location and Hydraulic Design of Encroachments on Flood Plains (FHWA, 23 CFR 650, Subpart A)

Procedures for Abatement of Highway Traffic Noise and Construction Noise (FHWA, 23 CFR 772)

An Informational Guide for Roadway Lighting (AASHTO)

Highway Safety Design and Operational Guide (AASHTO)

Highway Capacity Manual (Transportation Research Board)

Roadside Design Guide (AASHTO)

Pavement Management Guide (AASHTO)

Standard Specifications for Transportation Materials and Methods of Sampling and Testing (AASHTO)

A Guide for Development of Rest Areas on Major Arterials & Freeways (AASHTO)

Guide for the Development of Bicycle Facilities (AASHTO)

Guide Specifications for Highway Construction (AASHTO)

Highway Drainage Guidelines, (AASHTO)

Erosion & Sediment Control Manual (ITD)

A Guide for Achieving Flexibility in Highway Design (AASHTO)

Guide for Utility Management (ITD)

Railroad Guide (ITD)

Context Sensitive Solutions Guide (ITD)

320.02 Interchange Access Requirements ITD owns and operates the Interstate System, FHWA is required to approve all new access or changes in access points pursuant to 23 U.S.C. 111. Due to the complexity of adding or revising Interstate access, FHWA has developed an Interstate System Access Information Guide (ISAIG) that defines and explains what should be included in the Interchange Access Justification Report submitted by ITD to the FHWA Division Office. The Guide is available via the link provided in 320.03.04 of this section.

The submitted report may be an Interchange Justification Report (IJR), Interchange Modification Report (IMR), Interstate Access Report (IAR), or Interchange Operational Analysis Report (IOAR). The appropriate documentation/report required will be determined through a meeting between FHWA and ITD representatives.

320.02.01 Interchange Access Justification Report Required The following changes to Interstate facilities require FHWA access approval:

- New freeway-to-freeway interchange.
- New service interchanges providing access between a non-freeway local roadway network (arterial, collector, or local road) and the Interstate.
- Modification of freeway-to-freeway interchange configuration; for example, adding new ramp(s), abandoning/removing ramp(s), completing basic movements, and reconstruction of structures.
- New partial interchanges or new ramps to-from continuous frontage roads that create a partial interchange.
- Modification of existing interchange configuration, such as adding a loop to a diamond interchange.

• Completion of basic movements at partial interchange, for example, completing a partial diamond interchange by adding a ramp.

• Locked gate access, for example, access via locked gates for emergency response.

• Abandonment of ramps or interchanges.

• Access to special use lanes such as high occupancy vehicle (HOV), high-occupancy toll (HOT) or truck only lanes (from the street network) within the Interstate System should be treated similar to any other access.

• Relocation of a terminal of a ramp to a different intersecting road.

• Changes in operation of managed-lane access to general-purpose access to the Interstate.

If the proposed changes fall under the categories listed above, coordination with FHWA for determining the level of documentation needs to be initiated. This will involve:

(1) a meeting scheduled early in project scoping process between FHWA Division representatives and ITD representatives to explicitly define the purpose and need, project goals and objectives, and establish the project study framework;

(2) a meeting at the draft report stage between FHWA Division representatives, ITD representative, and the Project Manager to properly discuss the progress and answer questions;

(3) response to the Eight Policy Requirements (ISAIG, Section 2.7) in the report that will be submitted to FHWA for review.

Final approval of access cannot precede the completion of NEPA, even if no Federal funds are used. Once NEPA has been completed, approval of access is granted as long as there are no changes to the location or design of the accepted concept/charter.

320.02.02 Interchange Access Justification Report May Not Be Required Although access approval may not be needed for the categories listed below, coordination with FHWA Division Office is recommended to determine if any analysis is required based on the context of the project. If it is determined these changes may require an analysis of the planning, environmental, design, safety, and operations of the proposed improvements, ITD will coordinate with the FHWA Division Office to determine the type and extent of analysis required.

- Modification or reconstruction of intersections (i.e. Roundabouts, Diverging Diamond) at the ramp terminus may not require an Access Justification Report; however, based on coordination with FHWA, analysis of the potential consequences of this change on the safety and operational performance of the Interstate may be required.
- Shift of a ramp's location within the same interchange configuration, which results in ramp spacing that meets FHWA's design criteria. If the interchange is reconfigured in

such a way that the travel patterns change with the same number of access points, coordination of the project should be performed with FHWA.

- Division Office to determine the type of review and process to be considered. Changing the location of a ramp could result in changes to the safety and operational performance of the Interstate System.

- Addition of lanes to an on-ramp may not require an Interstate System Access Change Request be submitted; however, based on coordination with FHWA, analysis of the potential consequences of this change on the safety and operational performance of the Interstate may be required.

- Addition of left-turn storage lanes, right-turn storage lanes, and through travel lanes at the terminus of existing ramps.

- Relocation or shifting of the existing on-ramp or off-ramp termini (i.e., moving the ramp end that connects with the intersecting road) along the same roadway.

- Addition of a single auxiliary lane between two adjacent interchange ramps where the single auxiliary lane does not function as a mainline travel lane.

- Modification of the length of acceleration or deceleration lanes involved with any ramp.

- Improvement of traffic signals at ramp termini should be reviewed to ensure that the changes in the signalization do not result in queue spillback into the mainline lanes of the Interstate and that sufficient storage is provided.

- Implementation of ramp metering or other active control of vehicles entering the Interstate System.

- Construction of new signing, striping, and/or resurfacing of an Interstate on-ramp or off-ramp, where geometric features are not changed.

- Installation of roadside guardrail and concrete barriers (such as for resurfacing and safety projects).

- Construction of overpasses or grade separation structures without ramps along Interstate facilities. The approval of air-rights over Interstate facilities is addressed as part of the location and design concept acceptance with the NEPA process and approval of plans, specifications, and estimate.

- Changes in access between managed lanes and general purpose lanes on the Interstate

Chapters 7 and 8 of the ISAIG discuss the safety and operational considerations respectively. These chapters describe in detail the analysis that may be required to verify the performance of the Interstate based on the proposed change.

320.02.03 Future Interstate In the event that a route has been approved for future interstate designation, ITD shall contact the FHWA Division representative to determine what may be necessary to ensure compliance with the interstate access requirements. Each project will be reviewed on a case-by-case basis.

320.02.04 Interchange Requirements Guides and References

Federal Register: August 27, 2009 (Volume 74, Number 165, Page 43743-43746)
http://www.gpo.gov/fdsys/pkg/FR-2009-08-27/html/E9-20679.htm

FHWA Interstate System Access Information Guide
http://www.fhwa.dot.gov/design/interstate/pubs/access/

FHWA Idaho Division Standard Operating Procedure (SOP), for New or Revised Interstate Access Points

NCHRP Report 687, Guidelines for Ramp and Interchange Spacing
http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_687.pdf

For additional information on Interchanges, Interstate/Expressways, see Appendix A.50.

320.03 Application of Design Standards. The design standards contained herein generally represent minimum values and should be considered the lowest acceptable limits in design. The policies and standards are to serve as a basic guide in design work. However, they are not to be considered as inflexible and are not intended as a substitute for engineering knowledge, experience, or judgment. Designs will embody the highest values possible, commensurate with conditions and that minimum values should be utilized only in those cases where inordinately high costs would result or where other factors must be considered. ITD's philosophy is to build cost-effective projects to achieve a good, safe and efficient transportation system. See ITD's Practical Solutions for Highway Design.

While maintaining sound safety and geometric design standards, project designers shall, to the extent practicable, locate alignments and facilities to avoid the following considerations:

- Hazardous wastes
- Wetlands
- Floodways

- Public parks/recreation areas
- Wildlife/waterfowl refuges
- Historic/archeological sites
- Displacements

Designers shall consult with environmental staff and district environmental planners regarding the location of areas of concern. Any unavoidable encounters involving the areas listed above require consideration of all practicable design measures to minimize harm (e.g., spanning a floodway). In addition, designers shall coordinate with environmental staff regarding other environmental issues that may arise and affect project design or location (e.g., noise abatement walls, bald eagle nesting sites, etc.).

320.04 Guidelines for Considering Alternate Routes. Alternate routes must be considered in the following corridors during development of plans or projects:

- On a Board-approved "Intrastate Priority Corridor" or
- A highway classified as "rural principal arterial" to support and enhance the Board Policy 4005 - Management of Department Owned Property.

When evaluating alternative routes consideration should be given to the following factors:

- Environmentally feasible – The project must be supportable through the NEPA process.
- Cost-effectiveness – This item may include rebuilding "Main Street" whether the local jurisdiction assumes responsibility of the rebuilt road or not.
- Existing access control – Access control on the State Highway System is based on the type of facility, functional classification, highway safety, vehicle operations, preservation of highway utilities, zoning, and route consistency.
- Traffic volume and destination – The benefits to be derived from bypassing a city is directly related to the volume of traffic that is being delayed by operational constraints within the city.
- Population of the community – The community's ability to adjust to economic change is a factor in any consideration to build an alternate route. The number of through trips is a function of the city population.
- The percentage of through traffic approaching a city decreases as the city size increases. Economic benefits realized from bypass construction are reflected in improved accessibility and decreased vehicle-operating costs.
- Local community desire for the alternate route – This issue should be discussed thoroughly in the Public Involvement Process.

- Existing facility capacity – The level of service issue for arterials entering a community is an important factor for efficient and safe travel.
- Distance from town of the proposed alternate route – Access to traveler services is a factor for the traveling public.
- Safety/Crash rates – Will the alternate route significantly increase safety or reduce crash rates?
- Signing of new route – Local communities should be assured that adequate and proper signing will be provided on the alternate route to encourage the traveler to use local businesses and services.

320.05 Context Sensitive Solutions. To "protect and enhance the natural environment and communities affected by highway transportation", ITD will seek opportunities to implement innovative measures that will help our projects fit within the community and natural environment in which they are located. An example of such an opportunity is the integration of context sensitive solutions and design (CSS/CSD) within the NEPA and project development process. The context sensitive solutions approach is a collaborative, interdisciplinary approach that involves all stakeholders in the development of a transportation proposal so the project will fit in with the physical setting and preserve scenic, aesthetic, historic, and natural environmental resources, while maintaining safety and mobility. See ITD's Context Sensitive Solutions Guide.

320.06 Practical Solutions. Practical Design is intended to challenge traditional standards and develop safe and efficient solutions to solve today's project needs. ITD's philosophy is to build cost-effective projects to achieve a good, safe and efficient transportation system. Innovation, creativity and flexibility are necessary for us to accomplish our growing transportation challenges. Idaho's Practical Design initiatives are parallel to and mutually support our Context Sensitive Solutions approach to project development. The goal is to get the best value for the least cost without compromising safety. See ITD's Practical Solutions for Highway Design.

325.00 – CHARTER REQUIREMENTS

The charter is a living document that provides a high level project description, defines specific project parameters and will be utilized throughout the life of the project – from the Evaluation Phase to the Development Phase and into the Implementation Phase. In addition, it serves as a contract between the Project Team and the Project Sponsors, stating what will be delivered according to the budget, time constraints, risks, resources and standards agreed upon for the project. The charter consists of scope and strategic goals, design standards, alternate solutions and costs if appropriate, and a Phase I Materials Report if appropriate. For charter requirements, see the most recently published Charter Guide.

325.01 Pedestrian and Bicycle Facilities. Vehicle, bicycle and pedestrian requirements shall be individually discussed and documented during the chartering stage of the project. In accordance with Administrative Policy A-28-04, all projects need to be analyzed to see if a need for bicycle and pedestrian facilities exist. Areas to be covered include potential usage of the corridor by bicyclists (adjacent or within populated areas), ability of highway to accommodate bicyclists (wide shoulders), coordination with local communities and plans, etc. Provide either a plan to include bicycle facilities or justification as to why not. Any issues concerning bike path standards will be addressed to the Geometrics Engineer in the Resource Center.

See Appendix A.40 for the design criteria for bicycle facilities.

325.01.01 Americans with Disabilities Act. Maintenance projects such as signing, striping, crack sealing, and seal coating do not require American with Disabilities Act (ADA) updates for existing features. Existing traversable cross-slopes, grades, gutter lips and other features need to be maintained such that no new ADA issues are introduced by the project.

All other projects are to meet Americans with Disabilities Act requirements, regardless of funding source. Included are rehabilitation projects that are being done in urban type areas. Curb ramps will be updated to meet standards on all projects, except non-resurfacing, with pre-existing curbs and sidewalks.

325.02 Intelligent Transportation Systems (ITS). Deployment of ITS technologies shall be considered on all projects as a method of addressing project goals, motorist needs, and the goals of Idaho's ITS program. For more information see Appendix A.45.

325.04 Charter. An evaluation, and development if required, charter will be approved prior to the preliminary design review. Development charters for FHWA Projects of Interest projects will also be submitted to FHWA for review.

The project charter shall be completed in accordance with the Charter Guide.

325.05 Charter Approval for Pavement and Bridge Preservation, 3R Minor Widening and Pavement Preservation Projects. Normally, these projects do not require as much detail in the charter as other projects. Therefore, the Evaluation Charter approval serves as Concept Approval for these projects. Rules of responsibility to the public for professional engineering always apply.

330.00 – DESIGN EXCEPTIONS

The general policy of the department is that all design criteria will be met. Where both minimum and desirable values are provided, every reasonable effort should be made to achieve the desirable standards.

Whenever necessary or desirable to deviate from the design policies, standards and from the 13 controlling design criteria: design speed, lane and shoulder widths, bridge widths, structural capacity, horizontal and vertical alignments, grades, stopping sight distance, cross slopes, super-elevation, and horizontal (not clear zone) and vertical clearances as referenced in 23 CFR 625, a design exception shall be required. When exceptions to standards are required during the course of project development, the district shall document the design exceptions using the Project Scheduling System (PSS), the development charter and the corresponding Project Workspace. Non-NHS design exceptions are approved by the District Engineer. NHS and FHWA Projects of Interest Design Exceptions are recommended for the State by the District Engineer. DE recommended FHWA Projects of Interest and NHS design exceptions shall be sent to FHWA for approval with a copy to DMC.

The districts may request approval through the Design Exception Committee review. The committee includes the Design Engineer, the Traffic Services Engineer, the Bridge Engineer and the FHWA Field Operations Engineer.

Copies of all Design Exception documentation will be sent to DMC for record keeping purposes.

The most common design exception request is for width. When the approved standard is met, but the corridor plan is not met, a design exception is required.

All design exceptions must be documented and justified. A design exception request should include a description of what standard is being reduced, to what extent the reduction will be, where the reduced standard will be applied, two or more justifications for reducing the standard, and the full cost to obtain the standard. Whenever possible, the deviation from the standards should be as little as possible. (Requests for exception should be justified in engineering terms rather than economic terms, since the argument that the state needed to save tax dollars is not usually a persuasive justification.)

The justification should completely describe the physical and environmental factors that make the exception necessary. Justifications should follow along those reasons that would be

considered good engineering judgment such as effect of the variance on the safety and operation of the facility, compatibility with adjacent sections of the roadway, functional classification, amount and character of traffic, type of project (new construction, reconstruction, or 3R), crash history, resultant environmental impacts, and future improvements programmed. Cost-effective justifications should be used whenever applicable and should always be used whenever standards are reduced significantly or large costs are involved. (See the following, Guidelines for Preparing a Request for Design Exception.)

330.01 Guidelines for Preparing a Request for Design Exceptions. The appropriate justification and documentation must accompany every request for a design exception. Each design exception request must be based upon a comparison of what is proposed versus the appropriate standard. Generally, the following three items should be considered in any analysis:

a. What is the degree to which the standard is being reduced?

b. Will the exception affect other standards?

c. Are there additional features being introduced, such as signing or delineation, which would mitigate the exception?

At least two justifiable reasons must be presented for each exception.

Most requests for roadway width exception are actually for a shoulder width exception. An example of this is a request to construct a 28 feet wide roadway in lieu of the 36 feet wide AASHTO standard. Since the 28 feet roadway typically has two 12 feet lanes and two 2 feet shoulders, and a 36 feet roadway typically has two 12 feet lanes and two 6 feet shoulders, the exception is really to construct the roadway with 2 feet instead of 6 feet shoulders. At least six arguments can support this width exception.

a. Recommended roadway widths based on completed corridor plans or by applicable standards. A design exception must be approved for exceptions to recommended widths established in a corridor plan. Although reference to a corridor plan should be noted for any applicable projects, the request for a width design exception to AASHTO standards cannot be based solely on this justification.

b. Capacity — a roadway width exception should not be requested unless the proposed roadway width will provide adequate capacity in the design year. An analysis that shows that adequate capacity can be attained without the full standard width is not by itself adequate justification for a design exception, but can help support other arguments.

c. Continuity of Width with Adjacent Roadway Sections — if roadway sections adjacent to the proposed project have been constructed to a lesser width than the AASHTO standard, there is often no benefit to be derived from building the proposed project to the full standard width. (Example: A project is proposed for a 22 feet section of an existing 24 feet roadway. The existing roadway at the south end of the project was constructed eight years ago to 28 feet; and the roadway at the north end of the project was constructed four years ago to a 28 feet width. Even though the AASHTO standard may call for a 36 feet roadway, no benefit will be gained by constructing to this width as long as there are no safety or capacity problems.

d. Crash History — The crash history of the roadway section should be examined to determine if there have been a significant number of crashes that can be attributed to inadequate

roadway width or shoulder width. Lack of such crashes can be cited as support for no additional widening of the section.

e. Shoulder width for local roads and collectors and a minimum "usable" shoulder width for arterials. The terms "graded" and "usable" are defined in the Green Book. The pavement foreslope may be considered part of the "graded" or "usable" shoulder if the foreslope is 6:1 or flatter. Assuming a pavement depth of 3.5", a 6:1 foreslope would give an additional 2 feet of shoulder on each side of the roadway. This would mean that a roadway constructed to meet a width requirement of 36 feet, with two 12 feet lanes and two 6 feet shoulders, could also be considered to meet an AASHTO requirement of 8 feet shoulders if the foreslope was 6:1 or flatter. The use of the 6:1 paved foreslope as part of the "graded" or "usable" shoulder must be documented in the charter.

f. Cost-Effectiveness of Incremental Changes in Cross-Section Design —widening a substandard width roadway shoulder will usually result in a reduction in the crash rate for that section of road. The cost effectiveness of widening a substandard width shoulder to a greater width can be estimated from the cost effectiveness of incremental changes in cross-section design. For certain existing shoulder widths, the safety benefit gained by widening is less than the cost of the widening itself and therefore not cost effective, thus a width design exception can be supported. Often an interim shoulder width will be more cost effective than widening to full standards.

Additional considerations — Such as environmental impacts, can be included as justification for certain width exceptions.

330.02 Cost Effectiveness. The term "cost effectiveness," is meant to apply to the general consideration of the relative worth of a highway project or individual design elements of a highway project. Are the highway projects or design elements worth the estimated costs in terms of returning to the public a benefit commensurate with the taxpayer's investment?

Cost effectiveness, benefit/cost ratio, rate of return, and payback period are some of the analytical methodologies used to quantitatively calculate the value of a proposed highway project or design element. The objective is to analyze all possible alternatives of providing the facility that will render the desired service and is used as an aid to reach the final decision on what course of action to take. Because of the objective nature of cost-effective studies, only those impacts that are quantifiable and which can be assigned a realistic monetary value can be considered. Cost effectiveness does not incorporate the impacts of such considerations as general design consistency, aesthetics, land values and uses, access, driver convenience and comfort, social ramifications, and environmental consequences. The final choice must also reflect these other considerations when given their proper weight.

In theory, design criteria generally reflect cost-effective considerations. However, because of the need to develop design criteria for widespread application, some criteria inherently assumes typical benefits and costs that would normally be encountered in the selection and design of a highway project. Obviously, what is actually encountered in the design process for a specific project may vary widely in terms of expected benefits and expected costs and therefore the cost

effectiveness of normal design criteria must be considered based on the individual project and site.

330.03 Cost-Effective Analyses. Cost-effective analyses are conducted at many levels; the most common of which is the exercise of good engineering judgment. A rough estimate of construction and maintenance costs is usually available and when intuitively compared to the expected benefits based on a designer's perception of past experience, it is often obvious whether or not a design element is cost effective. In many cases, simple analysis is the most practical in the interest of time. However, when the project represents a large dollar amount, or the actual costs and benefits cannot be reasonably estimated through judgment, or the project and its design become controversial, an in-depth cost-effective analysis is warranted. In these cases, the time and effort spent on conducting a detailed cost-effective study may be minimal when compared to the increased economies realized in the final product.

Cost-effective methodologies can calculate:

a. *User benefits and costs* for a highway project as a whole or for an individual design element within a highway project.
b. *Safety benefits* and construction costs for a highway safety project based on actual *crash experience* and the anticipated crash reduction of the proposed countermeasure.
c. *Safety benefits* and construction costs for a proposed highway safety countermeasure ***based on*** *the potential for crashes.* This methodology is applied to roadside obstacles.

Numbers 2 and 3 above are actually subsets of number 1 since crashes and safety are considered in the assessment of total user benefits and costs.

Separate cost-effective methodologies for highway safety have evolved because 1) the increased emphasis on highway safety has resulted in the designation of highway funds that are strictly for the purpose of reducing the potential for highway crashes; and 2) the "crash" information element offers an identifiable unit that is measurable, lends itself to data collection and statistical analysis, and has undergone extensive research to realistically establish social costs.

330.03.01 Cost Effectiveness Computer Programs. Use of cost effectiveness applications related to accidence or crash data must use the appropriate crash cost (see Administrative Policy A-38-02). These values are found in the current release of the Idaho Traffic Crashes report published by the Department's Office of Highway Safety. The following is a list of nationally recognized analysis tools for doing safety benefit cost comparisons on roadway projects.

Roadside Safety Analysis Program (RSAP): Cost effective analysis tool for assessing roadside safety treatments to point locations and sections of roadway.

Interactive Highway Safety Design Model (IHSDM): The IHSDM is a suite of analysis tools for evaluating safety and operational effects of geometric design decision on highways. The suite of tools include crash prediction, design consistency, intersection review, policy review, and traffic analysis.

Highway Safety Manual (HSM): Analysis tools for quantifying potential reductions in crash frequency and severity related to transportation facilities

330.04 User Benefit and Cost Analysis. Many methodologies have been developed and many references exist that address cost effectiveness for highway projects as a whole and for individual highway design elements. The basic approach is summarized in the following steps:

- Update user cost factors. Approximately every one or two years, the highway user costs for items such as time, fuel, and vehicle maintenance and depreciation should be updated.
- Select an economy study model to measure the cash outward and inward flows in equivalent dollars by use of a compound interest formula. AASHTO recommends the use of a discount rate to calculate present values.
- Estimate project costs.
- Calculate unit user costs. The user costs, as a function of traffic characteristics and highway geometry, should be estimated for the alternative designs including the "do-nothing" alternative.
- Calculate user benefits. The benefits for savings in vehicle operating costs, travel time, crash costs, and fares should be estimated.
- Estimate residual value. At the end of a facility's or design element's service life, some value will likely remain. This value should be estimated and its worth included in the methodology to offset project costs.
- Determine present values and economic desirability. The stream of user benefits and user costs over the design service life must be converted to a present value for comparisons between the two.

330.05 Safety Benefits Based on Crash Experience. Crash experience is usually the best indicator of future crashes. Therefore, if the data is available and given certain other information, the cost effectiveness of a proposed highway safety countermeasure can be accurately measured. This methodology is most frequently used for proposed projects that will be funded with money explicitly set aside for highway safety projects. However, the methodology is applicable to assess the cost effectiveness of a highway design element that is intended to reduce the frequency and severity of crashes.

A methodology for highway safety projects similar to the one presented in NCHRP 162 Methods for Evaluating Highway Safety Improvements is summarized in the following steps:

- Identify hazardous locations. By applying statistical analyses to accumulated crash data, locations can be identified that have crash rates higher than what can be attributed to chance (usually 95%).

- Identify the nature of the established crash pattern. By use of a collision diagram, the crash pattern can be established as it relates to the type of crash, weather conditions, and time of day.
- Select alternative improvements. Several countermeasures may be proposed to reduce the frequency or severity of crashes.
- Evaluate the estimated effectiveness of each alternative. Crash reduction factors can be applied for each countermeasure to estimate the impact of the countermeasure on the crash problem.
- Estimate project benefits. Based on the number and severity of the crashes, a dollar benefit can be assigned to each countermeasure.
- Estimate project costs.
- Convert project benefits and costs to an equivalent monetary value. The recommended method is to convert to an equivalent uniform annual cost over the estimated service life of the proposed countermeasure.
- Calculate a B/C ratio. A B/C ratio should be calculated for each countermeasure with the highest B/C usually considered the preferred alternative. Normally, a minimum B/C of 1.0 is used to decide whether or not a project should be undertaken.

330.06 Safety Benefits Based on the Potential for Crashes. It is unusual for a roadside location to have a sufficiently high crash experience to estimate potential crashes; however, run-off-the-road crashes represent a high proportion of highway fatalities and injuries. Therefore, roadside hazard improvements warrant consideration even if a particular location has never experienced a crash.

335.00 – PRELIMINARY DESIGN ANALYSIS

Design alternatives need to be reviewed showing the various design options with benefit/cost determinations and recommendations. The Phase I Materials Report, complete with the life cycle cost analysis, shall be included when applicable. Nonstandard design features or deviation from AASHTO and state standards that are known at this time will require approval. Alternatives to longitudinal encroachments on 100-year flood plains shall be documented. If the design alternative will be selected through the NEPA Process, it shall be documented in the Alternate Solutions and Costs.

335.01 Environmental Activities. Project development activities may begin as soon as the project is placed on the Idaho Transportation Improvement Program (ITIP). To determine the level of environmental documentation that is needed for the project, the evaluation charter should be reviewed.

District Design staff shall consult with the District Environmental Planner early in the project development process to determine if coordination with Idaho Department of Fish and Game (F&G), US Fish and Wildlife Service (USFW) or National Oceanic and Atmospheric Administration – Fisheries (NOAA) is needed. Appropriate review times for these coordination activities shall be included in the project schedule. District design staff shall provide the necessary project information to District Environmental to assist in the interagency coordination efforts.

Items identified during the project development stage as necessary for the preservation or enhancement of fish and game resources will be included in the environmental document. ITD will, to the extent possible, incorporate resource agency comments. Required items will be identified as a project commitment or mitigation, and shall be included in the project plans and specifications. Items not required, but desirable, may be added to the plans as determined by the district project team (design and environmental) in coordination with the other agencies.

The project team is encouraged to consult early with HQ Environmental Cultural Resources to determine if the cultural resource work can be accomplished either in-house or under programmatic agreement. The district may also request assistance with the scope of work for cultural resource activities.

335.02 Traffic Volume. For all rural roads other than freeways and arterials, the current year ADT (two years beyond the program year) may be used for determining standards unless the design hourly volume (DHV) is greater than 100. If the DHV is greater than 100, then the projected DHV for 22 years after the programmed year should be used.

For rural freeways and arterials, the DHV (30th highest hourly volume) for 22 years after the programmed year should be used. Routes with a high percentage of recreational traffic (where the 30th highest hourly volume is greater than 15% of the ADT) may be designed with the 200th

highest hour as the DHV if the expected maximum hourly traffic does not exceed the capacity of the highway.

Traffic volumes should be requested from the Roadway Data Unit on an ITD 1151, Traffic Data Request, for 2 years and 22 years beyond the year in which the project is programmed. The request for traffic data, including any necessary turning movements, should be made as soon as the initial ITD 1414, Project Program Entry or Revision, is approved for preliminary design and environmental studies.

335.03 Functional Classification. The functional classification for a project should be obtained from Planning/Program Management (2PM) who is responsible for the establishment of urban boundaries and the functional classification of all public roads.

335.04 Access Control. The control of highway access shall be considered on all new highway improvements.

See - Board Policy 4005 - Management of Department Owned Property

Location public hearings will include a discussion of access control that applies to the alternatives under consideration. An existing access that is allowed to remain during a highway project and does not meet criteria for the newly established access control type must be documented and shown on the "As Constructed" plans.

Any existing access removed during a highway project shall be documented on the right of way documents and the "As Constructed" plans.

Adequate right of way for frontage roads should be obtained.

To maintain system capacity, safety and efficiency, maximize signal progression, and minimize delays to the traveling public, all approaches and signals shall be spaced in accordance with Board Policy 4005 - Management of Department Owned Property. Variances to the spacing standards shall not be permitted unless a need can be demonstrated for the variance. Any variance must be fully documented.

For Type V Access See FHWA Access Policy at
http://www.fhwa.dot.gov/programadmin/fraccess.html

335.05 Terrain. The selection of the appropriate terrain type is difficult because a project can encompass portions of two or sometimes all of the three terrain types.

LEVEL ROLLING MOUNTAINOUS

Refer to the Vertical Alignment section of the Green Book for guideline definitions of the three terrain types. The Highway Capacity Manual also contains general terrain definitions. Sound engineering judgment involving consideration of all factors should be applied.

335.06 Level of Service. Recommended minimum levels of service are:

Highway Type	Type of Area and Appropriate Level of Service			
	Rural Level	Rural Rolling	Rural Mountainous	Urban/ Suburban
Freeway	B	B	C	C
Arterial	B	B	C	C
Collector	C	C	D	D
Local	D	D	D	D

(From the Green Book Level of Service section)

In some cases, the cost of construction for the recommended level of service becomes prohibitive and a lower level of service is acceptable for economic reasons. Justification for the reduced level of service must be documented.

When comparing levels of service, each highway type uses a different methodology and criteria for determining the level of service.

335.07 Design Speed. Once the functional classification, terrain, and traffic volumes have been determined, the design speed can be selected from the appropriate section of Appendix A (3R NHS Routes, Non-NHS State system and local roads) and AASHTO publications (reconstruction or new construction on NHS and Interstate routes).

335.08 Super-elevation. Chapter 3 of the Green Book discusses two predominate methods of for selecting superelevation rates on horizontal curves:

Method 2: The superelevation rate is such that the lateral force is equal to the maximum side friction value.

Method 5: Superelevation and side friction have a curvilinear relation with the inverse of the radius of the curve such that side friction and superelevation are gradually increased until a maximum superelevation rate and maximum side friction are reached.

Method 2 is appropriate to use in:

Low speed urban situation where it is anticipated there will be a high level of stop and go traffic. Values for superelevation using this method are shown in the Green Book, chapter 3, Minimum Radii and Superelevation for Low-Speed Urban tables.

Low-volume roadways that have ADTs less than 400 ADT. Method 2 is the prescribed method used in the 2001 AASHTO Guidelines for Geometric Design of Very Low-Volume

Local Roads (ADT <= 400). For these very low-volume roads superelevation tables are provided for recreational, agricultural or commercial type roadways.

Temporary road construction. Engineering judgment needs to be employed particularly when using Method 2 on a route that would normally be designed to Method 5. When selecting a method, construction duration, type of traffic, traffic volume and speed of route need to be taken into consideration. Longer construction durations, higher volumes and higher speeds should favor design practices that are consistent with the permanent route design. For further guidance see NCHRP Report 581, Design of Construction Work Zones on High-Speed Highways.

Method 5 is the prescribed method for rural highways, urban freeways and high-speed urban streets. This method involves picking an appropriate maximum superelevation (emax) value from Section 535.01 Maximum Superelevation that is consistent with the route features. Using the design speed and radius the superelevation rate can be determined from the appropriate emax table within chapter 3 of the Green Book.

When using Method 5, the emax value and the associated minimum radius are to be documented in the charter. When using Method 2, the rational and standard used are to be documented in the charter.

335.09 Roadside Hazards. Chapter 2, Roadside Safety and Economics, and Appendix A in the AASHTO Roadside Design Guide presents the approved method for evaluating countermeasures for identified roadside hazards. The analysis includes provisions for different design speeds, different roadway geometrics, and the ability to incorporate an estimated traffic growth rate. The procedure outlined assesses the potential for a given hazard to be struck and assigns a cost to the hazard. By evaluating different options, the most cost-effective option can then be selected and establishes the following countermeasures in order of desirability:

a. Remove the obstacle or redesign so obstacle can be safely traversed.
b. Relocate the obstacle to a place where it is less likely to be struck.
c. Reduce the impact severity by using an appropriate breakaway device.
d. Redirect a vehicle by shielding the obstacle with a longitudinal traffic barrier and/or crash cushion.
e. Do nothing, i.e., leave the hazard unshielded.

335.10 Warrants for Traffic Barriers. Chapter 5 in the AASHTO Roadside Design Guide presents the warrants for Roadside embankment barriers. These warrants are based on the relative severity between the hazard and the traffic barrier, but do not address the question of whether or not a traffic barrier installation is cost effective. To assess the necessity of a traffic barrier:

- Assess the potential striking the hazard by estimating the lateral placement, width and length of the hazard, traffic volumes, highway alignment (geometry), design speed, and, likely, encroachment frequency.

- Calculate the average annual cost of the existing hazard by assigning a dollar value to the crash, and the initial and maintenance costs.
- Calculate the average annual cost for each appropriate countermeasure to establish the annual cost for a modification of the hazard or for installation of a barrier (which is also analyzed as a hazard). (The calculation of the annual cost for the existing hazard represents the cost of the do-nothing alternative.)
- Compare annual costs for each countermeasure to the annual cost for the do-nothing alternative to indicate which of the alternatives will extract the least cost from the highway user.

335.11 Rumble Strips.

Shoulder Rumble Strips

Rumble strips are an extremely cost-effective means of reducing single-vehicle run-off-the-road crashes. Because of this, all projects need to be analyzed to see if a need for installation of milled-in shoulder rumble strips exists and should be added to the charter under the alternatives. The following items should be considered:

Type of project. It does not make sense to include rumble strips in certain types of projects such as some Transportation Alternatives (TA), CMAQ, Bridge, ITS, etc., nor with spot location improvements.

Single-vehicle run-off-the-road (ROR) crash rate. Calculate the Safety Index following the procedures in the Highway Safety Manual. Rumble strips will not provide a benefit where there are few incidences of ROR crash.

Bicycle usage. Refer to Appendix A.40, Pedestrian and Bicycle Facilities, and check with the Program Planning and Development Specialist in ITD Transportation Performance.

Shoulder width. Rumble strips installations should have a minimum 4 ft paved shoulder width.

Shoulder condition. If the shoulder is in poor condition and the project does not include an overlay, rumble strips should not be included.

Residential roadside development. Consider the effect of increased exterior noise levels from rumble strips.

Centerline Rumble Strips

Centerline rumble strips can be effective in reducing head-on and sideswipe crash rates in areas with curvilinear alignments. The use of centerline rumble strips should be considered where the rates for these types of crash are higher than the statewide average. Special drawings will be

required to depict the rumble strip locations and configuration. Centerline rumble strips should be no wider than 1'.

1) Apply the following criteria when evaluating the appropriateness of centerline rumble strips:

2)

- Perform an engineering analysis of the crossover collision. Review the collision history analysis to determine the frequency of collisions with contributing circumstances such as inattention, apparent fatigued, or drifting.
- Centerline rumble strips are inappropriate when the combined lane and shoulder widths in each direction are less than twelve feet.
- Determine if the roadway pavement is structurally adequate to support milled rumble strips.
- Centerline rumble strips are not appropriate where there are two-way left-turn lanes.
- Centerline rumble strips are not appropriate in areas where passing is allowed.

335.12 Project Limit Designation. Project limit designations include all major work to be performed. Isolated improvements outside the work termini of the principal work, or isolated improvements which are combined to form a project, shall be included within the project limits. Construction limits may extend beyond project limits so as to include temporary connections, transitions, and other minor work items. If project limits change during the development of a project, document why and e-mail the Office of Transportation Investments the revised milepost limits.

337.00 – SURVEY/LOCATION OF HIGHWAY PROJECTS

The location of most highway projects shall be mathematically tied to the Idaho State Plane Coordinate System, existing geodetic survey monuments, and property land corners through surveying methods and must comply with Idaho Code.

337.01 Land Surveying Required. Idaho Code requires that any department surveying for rights of way, material sources, tracts of land, or other property boundary determinations comply with the requirements for "land surveying." The term "land surveying" includes the responsible supervision of areas for their correct determination and descriptions and for conveyance, establishment, or reestablishment of land boundaries and the plotting of lands and subdivisions. Any ITD surveys involving property boundary determinations or rights of way acquisition requires that a Land Surveyor supervise the land surveys and sign and seal related documents. Projects involving 3R type of work, maintenance projects, and other projects not having right of way acquisition can usually be excluded from land surveying requirements.

337.02 Corner Perpetuation and Survey Monuments Required. Corner perpetuation and filing (Idaho Code, Section 55-16) is required so that all property monuments within highway rights of way or those adjacent thereto are protected and preserved. Land survey monuments must be shown on all project plans. Idaho Code, Section 55-1612, makes engineers subject to disciplinary action by the Board if they do not indicate on their plans the presence of land survey monument that appear on a corner perpetuation record, BLM or GLO plat, record of survey, or subdivision plat. Anyone who prepares plans that do not indicate the presence of land survey monuments and the construction of the facility results in the destruction of a land survey monument are also liable for civil penalties.

337.03 Flagging Colors. On all preliminary surveys, the following flagging colors should be used:

Control Survey	Fluorescent
Centerline Alt	Red
Centerline Alt 2	Blue
R/W Alt 1	Yellow
R/W Alt 2	White

337.04 Control Surveys. The purpose of a control survey is to establish the position of the points required to locate the position of the highway facilities. This permanent project control network serves the following advantages:

Provides a control system of horizontal and vertical survey data for establishment of photogrammetric points.

Provides a convenient network of high order horizontal and vertical control points for subsequent construction surveys.

Control surveys are generally based on the network of horizontal and vertical monuments established by the United States National Geodetic Survey (NGS) and existing established land corners. Information relative to specific NGS survey monuments and the NAD83 Idaho Coordinate System is available by calling the NGS at (301) 713-3242.

337.05 Idaho State Plane Coordinate System. The Idaho State Plane Coordinates (ISPC) shall be used and the following information must be furnished for incorporation onto the plan sheets:

- A note indicating that ISPC (adjusted or unadjusted) were used. Show on the first plan sheet in the upper left corner the Coordinate Datum, Idaho Zone number (Western, Central or Eastern), Combination Factor, and a statement that bearings are Grid Bearings.
- Show Grid Bearings on each tangent and on other parts of the plan, where required, in a standard manner.
- Show ISPC for highway control points, such as P.I.'s, section corners, major monuments, etc., and at the beginning and end of the project. There must be at least two coordinate control points for each tangent to establish the azimuth or bearing of the line on the grid.
- Show gamma correction once for each plan sheet. If property extends from one sheet to the next, calculate a delta-alpha correction for the point of beginning.

337.06 ITD Project Coordinate System. The ITD Project Coordinate System is a grid system of rectangular Northing and Easting coordinates that are used to define the location of any point in Idaho and provides a standard procedure based on a common datum referenced to a common origin. The coordinate system, based on NAD83, shall be used with coordinate points calculated for all project control survey points. All property monuments on the project should be located, marked, and referenced as part of the project control surveys. If construction will remove or disturb the property monuments, they shall be reestablished and monumented as part of the construction project by a licensed Land Surveyor.

337.07 Project Topographic Data. The project topographic data can be obtained from field surveys or photogrammetric methods. On small projects (minor structure, intersection, railroad grade crossing improvement, or small materials source), a field topographic survey is usually faster and more convenient in obtaining the field data for design purposes. On larger projects, photogrammetric surveys are recommended to provide data compatible with the ITD Computer-Aided Drafting and Design System and to allow photogrammetric re-measure applications.

Advance planning is required to establish a survey control network and photogrammetric picture points, obtain aerial photography, and digitize data for mapping. Allow at least **24 months** prior to any need for topographic data for project design activities.

The project control network traverse should be tied to two (2) separate survey control points off the project to facilitate correction and adjustment of errors of the traverse. All points of the control network should be established as permanent points of horizontal and vertical control and located so they will not be disturbed by the project construction. The specifications for traverse, triangulation, and leveling are given in the FHWA's Surveying and Mapping Manual. The survey points for the project control network shall normally be Second Order Level of Accuracy with appropriate surveying ties to NGS monuments and existing land corners. For all other survey points (photogrammetric picture points, structure control points, location surveys, and project details), a Third Order Level of Accuracy is sufficient. (See Figure 3-6, Survey Orders of Accuracy.)

Figure 3-6

SURVEY ORDERS OF ACCURACY

TYPE OF WORK	ORDER OF SURVEY			
	First	Second	Third	Lower
ADVANCE PLANNING SURVEY				XX
PRELIMINARY LOCATION SURVEY			XX	XX
MAPPING (large and high-density areas)	XX	XX		
PRIMARY CONTROL	XX	XX		
MAJOR STRUCTURES	XX	XX		
MINOR STRUCTURES		XX		
CENTERLINE SURVEY (high-density urban area)		XX		
FINAL LOCATION SURVEY			XX	

337.08 Record of Surveys. The record of surveys (Idaho Code, 55-19) by ITD that define the project rights of way and adjacent property boundaries shall be filed with the applicable County Recorder.

The survey map shall meet the requirements defined in Idaho Code, 55-1905, and shall provide the data outlined therein. The map shall contain a certificate of survey and a seal and shall be signed by a licensed Land Surveyor. (Right of way plans contain all the information necessary to prepare property descriptions, but do not contain all of the requirements for records of survey, so a separate record of survey must be prepared.)

A special record of survey may be required for material sources, maintenance sites, or small projects where only a few parcels are involved and normal rights of way plan sheets are not required. In these cases, a record of survey shall be prepared and filed.

340.00 – FLOOD CONSIDERATIONS

If the proposed route encroaches on a 100-year flood plain that has been identified by FEMA and is shown on their map, The districts must evaluate the flood hazards of the new location and various alternatives to longitudinal encroachments, and as far as practical, shall preclude the uneconomic, hazardous, or unnecessary use of the flood plain by this route.

345.00 – PRELIMINARY STRUCTURES STUDIES

All structure locations shall be studied for various points such as foundation conditions, skew possibilities, relative grade line separation, structure types, avoidance of regulatory floodways, etc. The district shall conduct these studies and may request assistance from Bridge for aid in the field studies. Contact with the Idaho Fish and Game Department's local representatives for input is essential. See Section 600.00 and Appendix B for additional information on hydraulic data and structures.

350.00 – PRELIMINARY DESIGN REVIEW

The purpose of the preliminary design review is to initiate, resolve, and approve the overall design aspects. Actions that are included in the preliminary design review are design considerations, opportunity to attend, review topics, and the preliminary design review summary report.

An evaluation, and development if required, charter will be approved prior to the preliminary design review. The ITD 759, Roadway Inventory that itemizes existing conditions, may be completed with the preliminary design review submittal. Depending on the design constraints, approval of Phase II Materials Report may be obtained prior to, concurrent with, or subsequent to the preliminary design review. Approval of the Phase II Materials Report is required prior to approval of final design.

350.01 Design Considerations. The plans, rough sketches and drawings should be prepared showing:

- Project limits, including the station and milepost,
- Length of transitions,
- Basic design vehicle at intersections (Select the design vehicle to be used in geometric design of intersections and pavement markings.),
- Number of lanes at the intersection approaches, including auxiliary lanes for turning and turning movements in design hourly volume (DHV),
- Typical Sections,

- Structure coordination,
- Passing opportunity,
- Existing utility facilities, and
- Right of Way requirements.

Potential environmental impact shall also be considered. For bridge plans and other data requirements, consult Bridge and the Bridge manual.

350.02 Opportunity to Attend. The affected district sections and Headquarters' Subject Matter Experts (SME's) that are requested to provide reviews should be notified of and offered the opportunity to attend the preliminary design review. On projects involving local public agencies and their consultants, an opportunity should be given to review plans and attend the review for their input. The Port of Entry Manager shall be involved in the review of all projects that affect a port of entry building or scale.

350.03 Review Topics. Review topics should include:

- Hearing and plan requirements,
- Available environmental documents (All environmental, Section 4(f), and historic property constraints must be identified.),
- General standards of the design that are appropriate for the conditions and the programmed cost of the project,
- Context Sensitive Solutions
- Discuss materials issues and Material Reports requirements,
- Plans for compliance to local ordinances, planning, zoning, building setback, building restrictions, fire codes, school restrictions, flood plain limits, and any other regulations that have an effect on the proposed design and right of way acquisition,
- Effects and evaluation of relocation assistance actions, and
- Recommendations and suggestions from headquarters and outside agencies.

350.04 Report on Recommendations/Suggestions. The district prepares a letter summarizing the decisions in regard to the comments and suggestions presented at the preliminary design review. Copies of this letter shall be furnished to all parties concerned.

350.05 Design Plans for the Preliminary Design Review.
Design plans that are required for the preliminary design review are a set of 11" x 17" black and white plans and are to be sent to the affected district sections and Subject Matter Experts (SME) that have been asked to provide reviews. The data supplied shall be complete enough so line, grade, and general design concepts may be approved. Show mileposts on the plan sheets at the

beginning and ending of each roadway project and equate mileposts and stationing on all projects when both are used for project control.

For signal projects, show either mileposts or the stations of intersections and ties with the existing cross streets where possible. Note on the plans the type, location, and general design features of all existing and planned facilities such as signing, illumination, intersection data and features, and other related items that will affect the project design. Detour requirements and development of the TCPs should also be shown.

350.06 Plan Sheet Checklists. The following can be used as a checklist for the usual plan sheets that are required for the preliminary design review. Also, see Figure 9-1.

Roadway Group

- **Title Sheet.** The title sheet shall be part of the preliminary design review requirements for plans and should also be used for the hearing plans.
- **Total Ownership Maps.** Preliminary total ownership maps are based on the project's preliminary design information obtained from the county tax assessor's records. The maps are used for reference by title companies in title searches and preliminary property studies involving damage and severance, economic impacts, and preliminary relocation assistance studies. The preliminary total ownership map does not require all of the ownership to be shown, but must show sufficient dimensional and graphic data to permit ready identification and correlation with the legal description of all effected ownerships. The map must show alignment, property lines (estimated), and planimetric features and topography.
- **Typical Sections.** Draft form is acceptable.
- **Plan and Profile.** Include bearings, grades, curve data, super-elevations, and R.L. and Z distance.

Special Drawings Group

Drainage. Include wetlands and flood plain limits.

- **Minor Structures.** Minor structures are structures with a span of 20' or less (headwalls, retaining walls, etc.) that may be designed by Bridge, but will be included in the roadway summary items.
- Headwalls for pipes and arches larger than 48" and bottomless arches with footings must be submitted to Bridge for design or verification of design and, therefore, require submittal of a contour map; Phase IV Materials Report; channel cross sections; an ITD 210, Hydraulic Structures Survey; and a situation and layout sheet.
- Standard Drawings D-7 through D-9 should be used for pipes and arches 48" or smaller.

Traffic Group

Delineation. Determine the extent for no delineation; partial, public road approaches and transitions only; partial, horizontal curves, and public road approaches; full delineation per Standard Drawing G-3 and the Traffic Manual; and snow poles.

- **Signing.** Show the intent legend and the approximate location of signs (existing to be retained, temporary, and permanent).
- **Illumination.** Show areas and discuss the intent to be covered, proposed intensity, minimum uniformity ratio, and type of illumination.
- **Railroad Crossings.** See Subsection 360.00.
- **Pavement Markings.** Show the location and extent, including edge lines planned; transitions lengths; stop bars and crosswalks; two-way turn lanes; turn bays – right and left; channelizing lines; bike lanes, and center lane lines. (The type of material, color, width of lines, and other minor details may be shown later. For scales of pavement marking plans, see CADD Standards Manual.)
- **Traffic Control Plans.** See Section 355.00.
- **Minor Intersections.** Show the number of lanes of each approach and the width of the approach; corner radii; design vehicles used; and signal warrant worksheet (if applicable).
- **Major Intersections or Traffic Signals.** Projects that involve intersections of major streets or highways and intersections with signal warrants within the design year should include an individual site plan showing the existing conditions. Where approach speeds are less than 40 mph, the site plan scale should be 1”=20’ and should extend at least 150 feet on each approach. Where approach speeds are 40 mph or more, the scale should either be 1”=20’ or 1”= 40’ and should extend at least 350 feet on each approach.

Site Plan Requirements

The following should be included on any site plans:

- Show north arrow.
- Show street names, route numbers, and stationing.
- Show edge of existing surfacing, lane and shoulder widths, all pavement markings, right of way and property lines, approximate grades, drainage pipes and inlets, intersection radii (curbed or uncurbed), driveways, and barriers.
- Show utility poles, street lighting, traffic islands, traffic signal poles, vehicular detectors, signal heads, and controller, if any.
- Locate no parking and restricted parking zones, hours, etc., bus stops, and direction of one-way streets, if any.
- Show all traffic control signs and the speed limits on each approach.

- Show existing buildings and locate any obstruction to sight distance for the driver approaching the intersection including trees, shrubbery, fences, billboards, walls, etc.
- Show location of any railroad grade crossings within 300’ of the intersection. Give the name of the railroad company. Indicate the existing protection and whether the railroad is a siding, mainline, etc.
- Indicate distance to the nearest existing traffic signal on each approach if 1 mile or less. Show municipal boundaries if within the area of the plan and identify the municipality.
- Show condition of pavement on all approaches where loop detection is proposed.
- Locate overhead wires, underground utilities, fire hydrants, basements, and any other appurtenances that could influence the signal design.
- Supplemental photos often furnish additional information in addition to that shown on the plan sheet. Two photos taken from each street approach, one from fairly close and the second from about 100 feet back, make a good reference for intersection details.
- Right of Way Group
- Right of Way. Show existing right of way lines and the proposed (approximating is acceptable) right of way lines for the project, meeting design requirements.
- For Railroad encroachments see Subsection 360.00.

Major Structure Group

Major structures are structures with a span over 20 feet in length and will be included in bridge summary items. Preliminary bridge plan preparation consists of a situation and layout sheet and a foundation investigation sheet (see Bridge Office Standards for situation and layout sheet requirements). Sketches or views of out-of-the-ordinary structure details should also be included in the submittal on additional sheets if necessary. The submittal should be accompanied by district approved roadway profile and alignment data.

Plan preparation will always include a separate roadway sheet showing the plan and profile for the bridge location and all related items and a typical section sheet showing the existing and proposed work to be done, even if it's by the county or others. This requirement applies especially to “bridge only” projects. The bridge situation and layout sheet does not replace the separate plan and profile sheet requirement.

A Foundation Plat, prepared in accordance with Section 250 of the Materials manual and showing test hole locations, should also be included.

Guardrail Requirements

Guardrail requirements are based upon an economic analysis that considers:

- The cost of right of way and grading to preclude the need for guardrail.
- The cost of the guardrail.

- The crash costs.

355.00 – TRAFFIC CONTROL PLAN (TCP)

A TCP shows ways of handling traffic through a specific highway or street work zone or project. The TCP may range in scope from a very detailed plan designed solely for the specific project to standard plans, from the Manual of Uniform Traffic Control Devices, or from a standard highway agency manual. The detail in the TCP will depend on the project complexity and traffic interference with construction activity.

Consideration should be given to the safe storage of materials and equipment during construction. Include designated storage and staging areas when limitations exist inside the right of way. See Figure 5-7 and Figure A-2.

355.01 Public Convenience Measures. Public convenience must be considered on every project. All contract construction plans will include a traffic control plan with public convenience being considered. Public convenience measures can be optional (not required) if the level of service is C or better under the construction restriction and if the daily road user cost is less than liquidated damages. To minimize inconvenience to the motorist and maintain property owner access at all times, consider the following measures.

Analyze the capacity of the highway during construction to determine construction traffic control needs and detours. Use two-lane two-way detours when the ADT exceeds 6,000 or DHV exceeds 1,000. Projects should contain lane rental provisions when the roadway is near capacity with the number of lanes provided in each direction.

Use restrictive specifications on commuter routes with high directional split or high peak hour volumes. Schedule traffic-delaying work (use a contractor's note) to avoid rush hour commuter traffic in major urban areas, heavy holiday traffic, and events that may cause peaks and associated congestion. Consider requiring nighttime construction operations.

Consideration should be given to access for emergency vehicles on projects with considerable traffic control and narrow work zones and detours. Also, pullouts on .5 mile intervals should be created for disabled vehicles and staging of incident management and law enforcement vehicles. For large projects in congested areas controlled access areas, motorist guidance programs and contractor furnished courtesy patrols should be considerations.

Use incentive provisions for early completion on projects that are in urban areas (highways where traffic exceeds 3,000 ADT on a 2-lane or 6,000 ADT on a 4-lane) or on projects that will significantly impact traffic and do not have practical detours. Incentive provisions should not exceed five percent (5%) of construction costs on major projects. Incentives on intersections, small bridges, and other minor projects should only be considered on a case-by-case basis.

Incentives should not be specified for minor projects if either the short duration of the project or the value of the contract would make the incentive infeasible.

Do not use incentives if utility work by others will interfere with construction, if construction is anticipated to extend through more than one construction season, if moisture-sensitive soils may be encountered during wet-weather construction, or if there is uncertainty about subsurface materials.

355.02 Development. A TCP shall be developed and included in the contract plans for all federal-aid highway projects and should be developed for non-federal-aid projects where significant interference is expected. The scope of the TCP should be determined in the preliminary design stage of a project and the TCP should be completed and included in the plans prior to the final design review. Separate TCPs should be prepared for each stage of construction.

TCPs for interstate projects should provide for minimum interference with the free flow of the traffic. Stopping interstate traffic should be avoided unless no other feasible alternative exists. If traffic must be stopped on interstate projects, traffic signals are recommended. Consideration should also be given to access for emergency vehicles, pullouts for disabled and emergency vehicles, motorist guidance programs, and courtesy patrols.

Contractors may develop and use their own TCPs if approved by the department and determined to be as good as or better than those provided in the contract.

355.03 Widths. Construction zones should be wide enough to handle 18 feet wide loads. If the construction zone restricts below the 18 feet, the contractor must notify the Port of Entry Over-Legal Permit Unit at (208) 334-8418 at least seven days prior to opening the roadway to traffic. Further instructions should be covered in the Special Provisions.

355.04 Two-Lane, Two-Way Operation (TLTWO). Guidelines for proposing the use of TLTWO of traffic on one roadway of a normally divided highway are as follows:

- TLTWO shall be used only after careful consideration of other available methods of traffic control.
- The desirable length of TLTWO is 3 miles or less and should not exceed 5 miles.
- The safe speed of median crossovers for TLTWO should equal the design speed of the highway facility.
- Consideration for emergency vehicles access to all lanes of traffic should be given.
- Pullouts on 1 mile intervals are recommended for disable vehicles, staging of incident management and law enforcement vehicles.
- Courtesy patrols for disable vehicles and incident management should be considered.

- If the TLTWO is proposed, the TCP shall meet the required specifications in the Traffic Manual for appropriate durations.

355.05 Signing and Channelization. Sequential arrow boards may be used in addition to the other signing and delineation whenever closure of lanes is necessary on rural multilane highways.

Auxiliary advisory speed signs shall not be used alone. Auxiliary speed signs may be used when mounted under standard warning signs.

The Slow to "XX," signs, may be used when necessary to advise traffic that a given speed is desirable at that location.

If reduced speed limits are necessary, speed limit signs may be used, provided that the speed zones are properly established and approved in accordance with the Construction manual, Regulatory Speed Control Zones.

When concrete guardrail is used adjacent to traffic lanes, the guardrail should be adequately delineated so as to be highly visible to nighttime drivers.

Pavement markings (temporary tape, painted lines and symbols, thermoplastic markings, and raised markers) that are no longer applicable and that might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as possible.

355.06 Construction Crossovers. Construction crossovers for use by the traveling public should be designed to the speed of the roadway and anticipated volume of traffic during construction. The crossover shall be located at logical project termini and shall be left in place for future projects. A positive restriction (earth berms, concrete guardrail, etc.) shall be placed on the crossovers to prevent random use when the project is completed.

355.07 Bid Items. Item 626-100A, Rent Incidental Traffic Control Item, Item 626-105A, Traffic Control Maintenance, and other items in Sections 626 or 630 in the Standard Specifications shall be used as payment coding for:

Incidental traffic control devices and hardware that is not included in other pay items;

Relocation and maintenance of devices paid for or rented under other bid items; and

Costs associated with providing, monitoring, and supervising traffic control devices.

358.00 – GOVERNMENTAL PERMITS

Projects may require one or more permits from state, federal, or local agencies. Permits are normally obtained through an application process. Project approvals are obtained through coordination and negotiation with the approving agency. Most permits are related to environmental documentation and can also require supplemental materials. A table with regulatory provisions is outlined in The Environmental Process Manual, Government Permits.

360.00 – RAILROAD ENCROACHMENTS – GENERAL

ITD has developed the "Railroad Guide" with information and procedures regarding highway projects impacting railroads.

Most highways encroach onto railroad property by easements granted from the railroad companies. Refer to Section 400 of the latest version of the "Railroad Guide" for information of acquiring property rights from railroads. Refer to Section 500 of the latest version of the "Railroad Guide" for information concerning the design process involving railroad.

365.00 – AIRPORT CLEARANCE REQUIREMENTS

Any proposed new construction or alteration of an existing facility that may impose an obstruction to present or future air navigation must be coordinated with the Federal Aviation Administration (FAA) and with the department's Division of Aeronautics (Aeronautics). The FAA and Aeronautics require notification of proposed construction or alteration that contain vertical elements exceeding limitations established in Federal Aviation Regulations Part 77. The federal regulations ensure that the expenditure of public funds is in the public interest, coordinate airport expansion and highway construction, provide for safety of the public in the air and on the ground, and inform FAA and Aeronautics of potential hazards so as to prevent or minimize the hazard. Construction that does not exceed the general limitations are considered to have little or no potential for a hazard to air navigation. Additional reference material on airport clearance can be found in:

FHWA, Highway Improvements in the Vicinity of Airports

Federal Aviation Regulations Part 77, Objects Affecting Navigable Air Space

Division of Aeronautics, Marking of Obstructions to Air Flight, *Idaho Airport Facilities Directory*, Idaho Aeronautical Chart, and IDAPA Rule 39.04.01
Idaho Code 21-513 through 21-520

Coordination with Local Airport Officials

Projects within 2 miles of an airport will be carefully examined. If FAA and Aeronautics must be notified of the proposed construction, or for any project when considered appropriate, the district will contact the local airport authority. Planned or probable expansion of the airport that may cause substandard clearances to the highway project should be discussed. Proposals to eliminate conflicts should be initiated by the district when practical. Unusual or controversial highway-airport situations will be brought to the attention of the FHWA.

Conditions Requiring Notification

Aeronautics requires notification of any structure that would be 150 feet above the ground or water surface. FAA requires notification of any structure that would be 200 feet above the ground or water surface. Aeronautics and FAA also require notification of any proposed construction or alteration of a greater height than an imaginary surface sloping outward and upward at one of the following slopes around runways and heliports:

- 100 to 1 for a horizontal distance of 2,000 feet from the nearest runway for airports or seaplane bases with at least one runway longer than 3,200 feet.
- 50 to 1 for a horizontal distance of 10,000 feet from the nearest point of the nearest runway for airports or seaplane bases with no runway longer than 3,200 feet.
- 25 to 1 for a horizontal distance of 5,000 feet from the nearest point of the nearest landing and takeoff area of heliports.

Vertical elements for a highway include the height of the vehicles using them and any structure elements such as signs, lights, and signals. The height of vehicles is 17 feet on interstate highways, 15 feet on other public roads, and 10 feet or the height of the highest mobile object expected to use private roads and driveways.

Notification requirements apply to military bases and airports that are available for public use and are listed in the Airport Directory of the current *Airmen's Information Manual or the Idaho Airport Facilities Directory* published by the Idaho Transportation Department.

Exceptions to Notification Requirements

Notification is not required for the following:

- Airports available for private use only.
- Highway projects on which structures, the highway, and mobile objects would be shielded by existing structures of a permanent and substantial character or by natural terrain or topographic features of equal or greater height.
- Highway projects on which structures would be located in the congested area of a city, town, or settlement where it is evident beyond all reasonable doubt that the structure so shielded that it will not adversely affect safety in air navigation.
- Projects that may be considered stage construction of projects previously coordinated with FAA and Aeronautics.
- Minor improvements such as pavement overlays, seal coats, updating signing, or guardrail unless vertical elements such as lights, signals, overhead signs, or relatively tall construction equipment are involved.

The district shall place a memo in the project file stating that notification is not required and how the "no notification" determination was made.

Procedures for Notification

When FAA and Aeronautics notification is required, the district will prepare a *FAA Form 7460-1, Notice of Proposed Construction or Alteration*, for projects originating in the district. Outside agencies involved in plan preparation may prepare this form and submit it with the required project data to the District. The FAA Form 7460-1 is a five-page packet with carbons that can be obtained by contacting the Idaho Transportation Department, Bureau of Aeronautics, 3483 Rickenbacker Street, Boise, Idaho, 83705; telephone number (208) 334-8775. The notification must use an original of the form, not a reproduction.

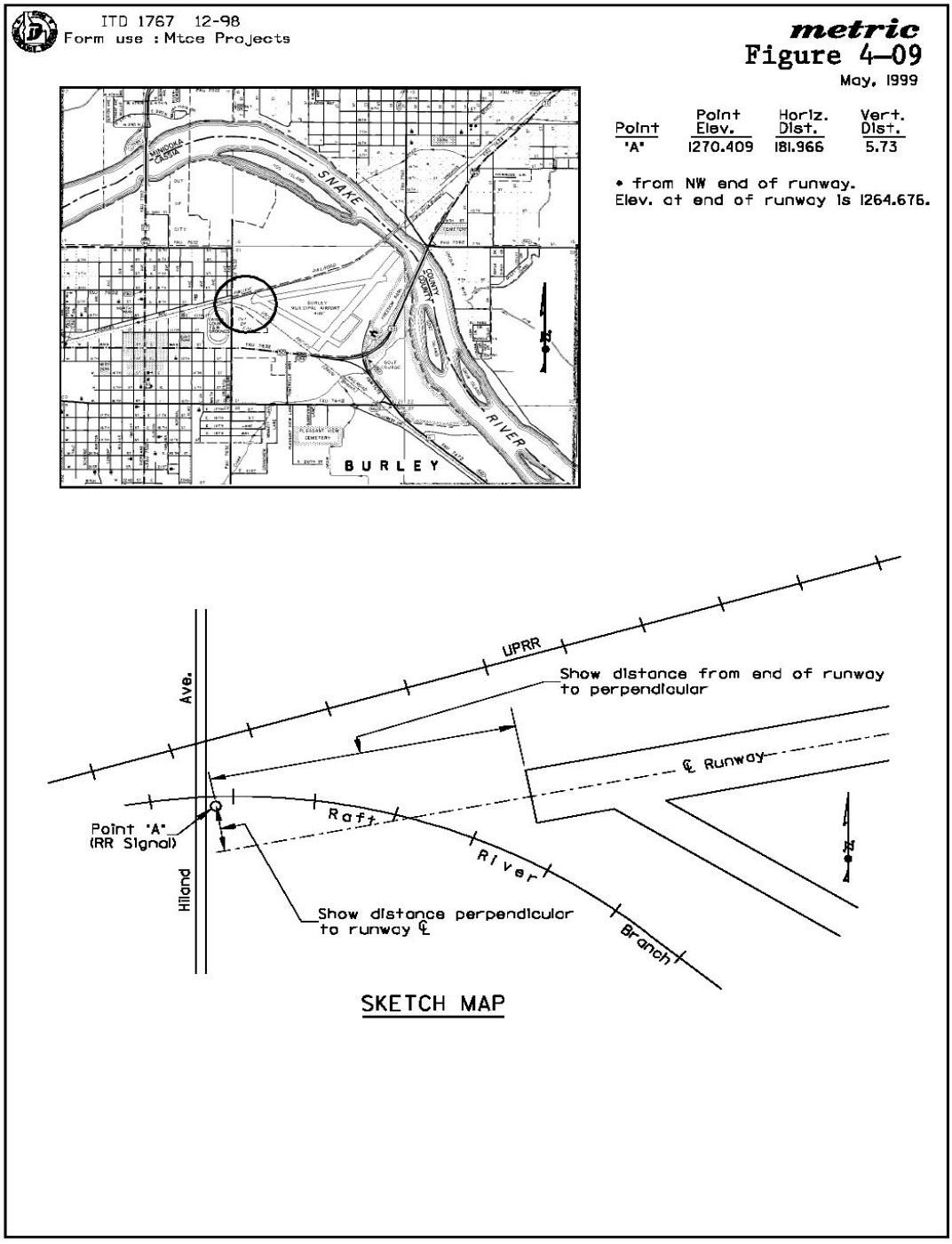
Complete the form and create a highway map or drawing showing the airport and the construction, as shown on the Sketch Map (Figure 3-7). The map or drawing may be made on county or city maps or on separate sketches and shall be sufficiently detailed both vertically and horizontally to show the effect of the highway project on the airport and the effect of the airport on the highway project.

Once complete, the form and map will be sent by the district to FAA's Northwest Mountain Regional Office in Renton, Washington and a copy will be sent to Aeronautics. FAA or Aeronautics will determine if the highway project will be a hazard to air navigation and require any special lighting or marking. When considered appropriate, additional study may be required.

365.01 Cooperation with Aeronautics and Public Transportation. Aeronautics will receive copies of all construction programs, including state maintenance and stockpiles. When requested by Aeronautics and approved by the District Engineer, the district will include airport paving, seal coats, or crushed aggregate for airport construction or maintenance with ITD projects for similar work.

Figure 3-7

SKETCH MAP



370.00 – UTILITIES – GENERAL

Utility facilities shall mean all privately, publicly, or cooperatively owned lines, facilities, and systems for producing, transmitting, or distributing communications, cable television, electricity, light, heat, gas, oil, crude products, ore, water, steam, waste, storm water not connected with highway drainage, and other similar items. Idaho Code grants Utility Companies the right to occupy public right of way with their facilities and authorizes the Idaho Transportation Board to control the use of the right of way.

ITD has developed the "*Guide for Utility Management*" with information and guidance regarding the coordination and administration of utility facilities installation, relocation and adjustment within the right of way of the State Highway System and for highway improvement projects using Federal-Aid funds. Refer to Section 400 of the latest version of the "*Guide for Utility Management*" for information concerning the design process incorporating utility facilities.

375.00 – PUBLIC INVOLVEMENT

ITD's public involvement is the process of including stakeholders in the development of transportation projects. "The U.S. Department of Transportation defines public involvement as "two-way communication aimed at incorporating the views, concerns and issues of the public into the decision-making process."

For ITD's Guide to Public Involvement for Programs, Planning and Projects go to:

http://itd.idaho.gov/POP/assets/PIguide.pdf

ITD has developed an interactive online tool called the Public Outreach Planner (POP) that assists staff in analyzing and quantifying public outreach needs. Through the POP, staff can determine what public involvement methods and tools are the best fit for their project and budget, and learn more about how to effectively design, develop and execute them. The POP can be found online at http://itd.idaho.gov/POP.

375.01 Public Hearings. Public hearings provide the department with an opportunity to summarize studies, new developments, and public input on a proposed project. The hearings also give ITD opportunities to share project information with the public and, in turn, receive more input before final design.

375.01.01 Public Hearing Need The District Engineer determines whether a hearing will be held based on the following criteria and the results of the public information meetings.

Projects involving federal funds must have a hearing, or an opportunity for hearing, when there is:

- Acquisition of significant amounts of right of way.
- Substantial change to the layout or function of the connecting roadways or of the facilities being improved.
- Significant adverse impact on abutting property or when litigation or public controversy is anticipated.
- Significant social, economic, and/or environmental effect on the surrounding area.

Projects financed totally with state funds must have a public hearing when:

- The state highway serving or traversing any city is to be abandoned, relocated, or replaced.
- There is significant public interest or controversy surrounding the project.

FHWA may request a public hearing when a hearing may be in the public interest.

For complete information on public hearings see ITD's Guide to Public Involvement for Programs, Planning and Projects at:

http://itd.idaho.gov/POP/assets/PIguide.pdf

375.01.02 Waiver of Public Hearing The District Engineer may waive public hearings when public awareness and support for the project is apparent and non-controversial.

Whether a question about the amount of right of way required is significant or not, a hearing waiver may be solicited from effected property owners. The hearing waiver must be in the form shown in Figure 3-8, Waiver of Public Hearing.

A team of ITD personnel consisting of personnel as the district deems necessary, should make all property owner contacts.

Figure 3-8

WAIVER OF PUBLIC HEARING

Project No.: _____

Parcel No.: _____

I, the undersigned, have been fully informed concerning Project _____, including the project's effect on my property.

I am aware of the amount of right of way to be acquired, the relationship to the remainder of my property, and have been informed that I will receive fair compensation for right of way acquisition on the project.

I am aware that I have the right to request a public hearing and I hereby waive said right to a public hearing.

_____ _____

Property Owner **Date**

_____

Address

380.00 – DESIGN or LOCATION/DESIGN APPROVAL

380.01 Design Approval Project determination and approvals shall be in accordance with Administrative Policy A-13-02. The District Engineer approves the design for projects that do not require a hearing, no hearing is requested after an opportunity for hearing is given or when the hearing is waived. Design approval shall not be given until environmental documentation is complete.

380.02 Location and/or Design Study Report Approval When a hearing is held the District Engineer or HQ appropriate management staff shall prepare a Location and/or Design Study Report. The Location and/or Design Study Report is a formal document that records considerations and conclusions that were reached by the district in the development of a project through environmental documentation, preliminary design, and the public hearing phase. The Location and/or Design Study Report is used to obtain concurrence in preliminary project design. The Location and/or Design Study Report shall be prepared on all federal-aid projects that have a hearing and is required to obtain Design approval.

The Location and/or Design Study Report documents:

- ITD's consideration of transportation needs, socioeconomic, environmental impacts of the project and context sensitive solutions by summarizing significant design considerations and decisions. Included in the report are design criteria changes from the charter approval and preliminary design approval.
- Recommendations and proposed changes that were made as a result of the public hearing testimony. This information must also be included in an environmental re-evaluation.

380.03 Location and/or Design Study Report Contents. Essential items that must be included in the Location and/or Design Study Report, and any other information that clarifies the design intentions and improves the understanding of the highway improvement project should be included.

Essential items for the Location and/or Design Study Report are:

- A narrative description of the project.
- Vicinity sketch.
- Any changes in project charter (including design exceptions).
- A summary of public hearing testimony, proposed resolutions of identified concerns, and any changes made in design that were based on the hearing.
- Waivers of public hearing or documentation of the hearing being waived by the District Engineer.

- Location and/or Design Study Report Checklist (Figure 3-10).
- Significant items that have changed since the charter approval that effect the project (include environmental-related commitments).

Optional items that can be included at the discretion of the districts are:

- Approval Cover Sheet (Figure 3-9)
- Copy of the approved charter and alternate solutions and costs,
- Typical sections

Four examples of Location and/or Design Study Reports are included as Figures 3-11 through 3-14. The examples are for the following types of projects:

- Non-controversial pavement rehabilitation project with no right of way purchase and no environmental impacts.
- Small structure replacement and approaches project. Temporary easements for detour and approach work.
- Highway relocation project with a public hearing held and environmental assessment prepared. No major controversy or testimony presented.
- Major relocation project with high environmental impacts and several controversial issues addressed in the hearing testimony.

Follow the example that is nearest to the type of project being designed.

The Location and/or Design Study Report shall not be approved until after the:

- Environmental documentation is complete;
- Public hearing transcript has been analyzed and determinations have been made on the issues and concerns addressed at the hearing or until the hearing has been waived; and
- Project determinations and approvals are settled, as outlined in Administrative Policy A-13-02, Public Involvement for Location and Design Determinations.

For FHWA Projects of Interest, the Location and/or Design Study Report will be submitted by the district to FHWA for concurrence of ITD approval with a copy to DMC. Exempt projects shall follow the FHWA Oversight Matrix (Figure 1-1)

Final design of a project cannot commence until Design Approval is given or the Location and/or Design Study Report is approved.

Figure 3-9

LOCATION AND/OR DESIGN STUDY REPORT

PROJECT NO.

KEY NO.

PROJECT DESCRIPTION

LOCATION

WORK AUTHORITY

COUNTY

Prepared by: Designer Name Date: 00/00/01

Approved by: DE Name Date: 00/00/01

Figure 3-10

LOCATION AND/OR DESIGN STUDY REPORT CHECKLIST

Evaluation Charter _____

Date approved

Development Charter _____

Date approved

Preliminary Design Review _____

Date held

Environmental Document _____ _____

Type Date approved

Public Hearing _____ or _____

Date held Date waived

Transcription of Public Hearing Testimony _____

Date submitted

Figure 3-11

LOCATION AND/OR DESIGN STUDY REPORT EXAMPLE 1

IR-15-1(102)54
Inkom to Portneuf
Bannock County
Key No. 3720
WA #I875190

This project consists of pavement rehabilitation of I-15, south of Pocatello, in the travel lane and full width over structures with a full width seal throughout. The project length is 1.5 miles from MP 54.70 to MP 53.20.

The roadway width was originally constructed to current standards of 40 feet in 1969 and 1970 with no widening for guardrail. The last construction was in 1982 with a seal to the travel lane and 1983 with a seal to the passing lane.

The project was approved for rehabilitation and sealing by the Idaho Transportation Board on January 21, 1996, for FY98.

The current ADT is 10,440 with a projected ADT of 16,080 and design hourly volume of 1,790 for the year 2011. The project will be designed to AASHTO Standards for Interstate Systems with no design exceptions. Horizontal and vertical alignment will remain the same. Fill slopes where guardrail removal will occur will be flattened to 4:1 minimum, 6:1 maximum. Full access control was approved under original construction.

Drainage in areas of guardrail removal will be extended appropriately to accommodate the flatter slopes. Detours are not practical for this project but, rather, traffic will be controlled through proper Channelization into one lane.

A revised concept was approved by headquarters on September 21, 1997.

Pavement rehabilitation consists of cold milling and inlaying plant mix pavement in the travel lanes to remove ruts and full width over structures to remove excess dead load and repair deck joints. A full width seal coat will be applied to interstate roadways and ramps, with a scrub and seal in the Inkom Port of Entry and an interchange crossroad. Bridge rail updating will be accomplished by the beam retrofit and some guardrail will be removed or updated on crossroads or selected areas on the interstate.

All proposed construction will be on existing right of way or in state-owned sources. A categorical exclusion for environmental concerns was approved September 2, 1996.

Figure 3-12

LOCATION AND/OR DESIGN STUDY REPORT EXAMPLE 2

BRF-5152(200)
Evans Creek Bridge Replacement SH-3
Kootenai County
Key No. 1754
WA #P861140

This section of roadway and bridge was constructed in 1936 under Project WPSS 179-C. Due to the rolling terrain, the alignment along this portion of roadway consists of a 10o curve left, with a substandard vertical curve at the Evans Creek Bridge location. The bridge is a three-span wooden bridge sitting on wood piles. The bridge width is 26 feet out to out with substandard metal guardrail and has a 7.9 sufficiency rating.

Due to the location and the adjacent wetlands, it is not economically feasible to upgrade the entire roadway to AASHTO standards at this time. The district is proposing to replace the existing bridge at the present location with clear-span, pre-stressed box girder/pre-stressed girder bridge having a curb-to-curb width of 32 feet, and upgrading the existing roadway approaches to the bridge. Approximately 800 feet of roadway will be upgraded by widening from 26 feet to 29 feet using 4:1 foreslopes, 1 ½:1 fill slopes, and 7' guardrail posts. The slopes mentioned above were chosen to minimize the impact to the wetland and are part of the wetland mitigation and to stay within the existing right of way. The vertical curve considered will be improved to meet the required standards.

The bridge replacement will require building a detour south of the existing structure. When the detour is no longer needed, the fill material will be removed and used to construct roadway embankment on the future Rose Lake project.

No right of way purchase will be required on this project. Temporary easements will be required from two property owners for the purpose of improving approaches and constructing the temporary detour.

The following changes need to be made in the concept, submitted April 24, 1990. The design speed of 55 mph should be changed to 45 mph. The 6:1 foreslopes on the typical sections should be changed to 4:1, which has been approved.

An exception for the 32 foot bridge width was approved November 9, 1990.

The Archeological Clearance on this project was approved July 16, 1992.

The Idaho Fish and Game have no objection to the replacement of Evans Creek Bridge, but were concerned regarding the detour. No in-stream work is to be done between April 1 and July 1 to protect cutthroat trout spawners, eggs, and fry.

A Preliminary Design Review was held on this project November 4, 1992.

A categorical exclusion was approved on December 30, 1992.

A waiver of public hearing was requested and approved on January 19, 1993.

Figure 3-13
Sheet 1 of 5

LOCATION AND/OR DESIGN STUDY REPORT EXAMPLE 3

Project No. F-4113(77)
Ferdinand-Lawyer's Canyon

The section of roadway proposed for improvements is a portion of U.S. Highway 95 from a point approximately .5 mile southeast of Ferdinand and continuing northerly to a proposed structure over Lawyer's Canyon Creek at the Idaho-Lewis County line. Reconstruction of this section of highway will be part of the improvement program planned for US-95 between Ferdinand and Craigmont, as explained in the Final Environmental Statement dated July 1978 (FHWA-IDA-EIS-77-02-F).

EXISTING AREA CONDITIONS

US-95 is the major link between northern and southern Idaho. The highway begins at the southwestern Oregon/Idaho border approximately 30 miles south of Caldwell, Idaho. From this point, the route extends northward approximately 530 miles to the Idaho/Canadian border.

The project area lies in the northern part of Idaho County. The county is rural in nature, being largely public-owned U.S. Forest Service land that supports an extensive timber industry. Large farms and ranches dominate the privately owned land in this county.

The project will begin approximately 0.5 miles southeast of Ferdinand and end at the proposed structure over Lawyer's Canyon Creek. Ferdinand has a few stores and grain elevators and provides basic services for the surrounding rural area. The town had a population of 144 at the 1980 census.

Ferdinand does not have a hospital (Cottonwood, Grangeville, and Lewiston have the nearest medical facilities). During recent years, basic services in the form of schools, full-service grocery outlets, and retail gasoline stations have closed. These services are available in Craigmont, 8.6 miles to the north, and Cottonwood, approximately 8.0 miles to the south. The majority of the school children are transported to Cottonwood; therefore, US-95 serves as a school bus route for the local schools. Improved sight distances and shoulder widths are important for the safe transportation of school children along the route.

The majority of the people living within the project corridor have been residents of the area for many years. The communities have changed very little in the past and no major changes due to roadway improvements are expected in the future.

EXISTING ROAD DESCRIPTION

The existing highway is classified as a principal arterial under the 1990 Functional Classification System. Characteristics of the 4 miles of existing highway proposed for improvement are a 22 ft. roadway with no shoulders, a basic right of way width of 80 feet, and an alignment that is well below current standards. Present access control is governed by the Standard Approach Policy.

Figure 3-13
Sheet 2 of 5

Current maintenance operations on this portion of US-95 include spot patching and seal coating as needed. Should this portion not be reconstructed, maintenance requirements foreseen will include major surface overlays and extensive shoulder rehabilitation for the entire length.

REASON FOR IMPROVEMENT

The project would be the final stage of an overall project to improve approximately 10 miles of US-95 from Ferdinand to Craigmont.

The project is needed to accommodate existing and future traffic volumes and to correct the following deficiencies:

- Slow operating speed due to narrow roadway pavement width, inadequate shoulders, and restrictive passing sight distance.
- Limited safety because of unrestricted access control and dangerous conditions adjacent to the roadway.
- Substandard surfacing that creates hazardous driving in wet or freezing weather and is subject to considerable breakup during freezing and thawing conditions.

The improvement would minimize or eliminate the deficiencies cited and increase the efficiency and safety of the highway for the increasing traffic volumes projected for this section of highway.

ALTERNATIVES

In May 1977, the project was addressed in an environmental impact statement and a location hearing was held in July 1977. As a result of this hearing, the Idaho Transportation Board selected the Existing Improved Alternate. This alignment has changed slightly from the approved one due to Lawyer's Creek Bridge being shifted upstream approximately 500 feet. This was done so the bridge could be constructed on a tangent rather than a curve.

In October 1988, the Idaho Transportation Board directed that the East Alternate from Ferdinand to Lawyer's Canyon be reconsidered, as it is a shorter route and would not involve railroad crossings for US-95.

A No Major Improvement Alternate would not meet current and future transportation needs. Other construction alternatives are not compatible with the selected route from Lawyer's Canyon to Craigmont and only the Existing Improved Alternate and East Alternate are being considered.

PROJECT DESCRIPTION

Existing Improved Alternate

The Existing Improved Alternate begins 0.5 miles southeast of Ferdinand; crosses the Camas Prairie Railroad with an at-grade, signalized crossing; and then bypasses

Figure 3-13
Sheet 2 of 5

Ferdinand to the south. The alignment then swings north following the existing US-95 west of Ferdinand. The route then follows the east breaks of Moody Gulch, crosses beneath the Camas Prairie Railroad where an underpass would be built, and then continues north to the bridge over Lawyer's Creek. The overall project length is approximately 4 miles.

This would provide a roadway surface width of 34 feet (consisting of two 12 foot lanes – one in each direction – and two 5 foot shoulders). The subgrade would be built to accommodate a future 40 foot paved surface width.

The horizontal and vertical alignments would result in a design speed of 60 mph. The maximum radius of curve being 1315' with a maximum grade of 4.595 percent. Two truck climbing lanes are included, the first being constructed south of Ferdinand to aid the northbound traffic and the other being south of the new Lawyer's Canyon Creek Bridge to aid the southbound traffic.

A basic right of way width of 200 feet to 425 feet would be needed for the project. Access control for the proposed alignment allows public and private at-grade crossings that would require temporary easements during construction. Access to Ferdinand would be provided by constructing two connections to the existing highway (one from the north and the other from the south of town).

Upon completion of the project, approximately 2.5 miles of existing US-95 would be removed from the state system and relinquished to local jurisdictions for maintenance

East Alternate

The East Alternate route would begin approximately .5 miles southeast of Ferdinand. The route runs northerly, bypasses Ferdinand on the east, and then parallels the Camas Prairie Railroad. The alignment continues northwesterly to the proposed structure over Lawyer's Canyon Creek. The alignment is approximately 3.5 miles in length and would not involve any railroad crossings.

This route would provide a roadway surface width of 34 feet (consisting of two-12 foot lanes and two-5 foot shoulders). The subgrade would be constructed to handle a future 40 foot roadway.

Curvature and sight distance on the finished project would have a design speed of 60 mph. The maximum radius of curve on the alignment would be 1650 feet with a maximum grade of 3.268 percent.

A truck-climbing lane would be built south of the Lawyer's Canyon Creek Bridge and extend approximately 1.3 miles to aid the southbound traffic.

A basic right of way width of 190 feet to 350 feet would be required, with larger widths in larger embankment areas. Access control for the proposed alignment allows for public and private approaches that would require temporary easements during construction. On this improvement, one connection to Ferdinand would be provided by use of an existing road on the south end of town.

Figure 3-13
Sheet 4 of 5

Upon completion of the project, approximately 0.5 miles of the existing US-95 would be relinquished to local jurisdictions for maintenance.

SOCIAL, ECONOMIC, AND ENVIRONMENTAL IMPACTS

An Environmental Assessment was prepared and approved on August 24, 1989, which addresses the impacts of the project. A copy of this document is attached.

SYNOPSIS OF DESIGN HEARING TESTIMONY

A public location/design and systems action hearing was held in Ferdinand, Idaho on November 8, 1989. There were 67 interested citizens in attendance including Ferdinand Mayor Eugene Kuther, Craigmont Mayor David Boknecht, and Ferdinand Highway District Commissioners Dennis Seubert, Jerry Schwartz, and Donald Bieker. The Idaho Transportation Board was represented by Vice Chairman Marion Davidson and Executive Assistant Mary Detmar.

Both written and oral testimony was given by 72 citizens. By organization of this testimony, 21 favored the Existing Improved Alternate, 41 favored the East Alternate, and 10 offered no preference. Five individuals supported a state-maintained business loop for Ferdinand. Five of those persons favoring the Existing Improved Alternate indicated the loss of prime farmland as a major concern.

Twelve testimonies requested an underpass be furnished on the local farm-to-market roads to provide access to Ferdinand, regardless of the selected alternate. Two petitions were also received supporting the underpass for the east or west city access. The petition for the east underpass had 89 signatures and the petition of the west underpass had 121 signatures.

Other testimonies referred to individual problems relating to specific ownerships such as drainage, access, severance, etc.

CONCLUSION

As requested by the public testimony, the feasibility of underpasses for the public road connections to Ferdinand was investigated for the two alternates.

Based on the AASHTO publication entitled “A Policy on Geometric Design of Highways and Streets, 1984,” an underpass is not warranted in this case. The traffic volumes on these local roads are low and no crashes have been recorded at the present at-grade intersections. The proposed projects will provide adequate sight distance and roadway alignment to allow for crossing by the anticipated users.

An underpass structure of the size needed to accommodate farm trucks and equipment would increase the estimated cost of the Existing Improved Alternate by $173,000 and the East Alternate by $278,000. If the East Alternate was selected, the underpass would also require approximately two acres of prime farmland for additional right of way. As no warrant for these grade separations is apparent and as safe, adequate at-grade

Figure 3-13
Sheet 5 of 5

intersections would be provided. It is concluded that expenditure of federal funds for the underpasses probably could not be made. The Ferdinand Highway District has offered to participate in the cost of the structure. If this offer was accepted, the structure could be included in the project.

The removal of the existing US-95 from the State Highway System was addressed at the July 1977 location hearing and a determination was issued by the Idaho Transportation Board on October 16, 1977. This determination was reaffirmed on August 15, 1988, by a letter from Board Chairman John M. Ohman to Ferdinand Mayor Eugene Kuther. Repairs to the existing facility will be negotiated with the city of Ferdinand and will be accomplished prior to the relinquishment of the roadway to the city.

Problems relating to individual concerns will be resolved with minor design corrections or by compensation during the appraisal process.

Based upon public testimony, engineering, and cost considerations, the district recommends that the East Alternate be selected for development and construction.

Figure 3-14
Sheet 1 of 4

LOCATION AND/OR DESIGN STUDY REPORT EXAMPLE 4

Project No. F-3271(33)
Eagle Alternate Route

The section of roadway proposed for improvement and new alignment is a portion of SH-44 and SH-55 in and near Eagle, Idaho. The project is located between MP 16.000 and MP 19.45 of SH-44 and MP 17.79 and 18.000 of SH-55.

EXISTING AREA CONDITIONS

SH-44 goes through downtown Eagle on an east-west route. SH-55 enters from the south and currently joins SH-44 in downtown Eagle. The project is located in Ada County and goes from west of Ballantine Road eastward to the new SH-55 North intersection.

EXISTING ROAD CONDITIONS

The existing SH-44 is classified as a minor arterial from the west to junction with SH-55 and a principal arterial from that junction to the SH-55 North junction. The existing SH-55 is classified as a principal arterial. All are under the 1995 Functional Classification System. The present SH-44 roadway consists of a two-lane facility with a 40 feet ☐ width in the rural downtown Eagle. The present SH-55 roadway consists of a two-lane facility with a 22 feet ☐ width. Present acc Policy. Current maintenance operations on these portions of state highways include spot patching and sanding for winter maintenance.

REASON FOR IMPROVEMENT

The existing roadways are inadequate to handle current traffic volumes and substandard for projected traffic. The current junction has very poor geometrics and sight triangles and is extremely hard for trucks to maneuver even with lane encroachments. The existing SH-44 is a good roadway except through downtown Eagle where additional room is required. The existing SH-55 is deteriorating and is in need of repair. It is also substandard in width.

PROPOSED IMPROVEMENTS

A public information meeting was held February 1, 1989. The public was presented with seven alternatives. Approximately 120 people attended and the district received 35 report forms back as of April 10, 1989. The forms indicated that 27 favored the Long West Option (see Table 1 for “con” comments and the response), 5 favored the Short West Option, 2 favored the Couplet System Option, and 1 favored the Do Nothing Option.

Figure 3-14
Sheet 2 of 4

Table 1
LONG WEST OPTION "CON" COMMENTS

Comment	No. of Comments	Response
This option would be a waste (or irresponsible use) of tax dollars.	7	The additional cost of this option is minimal considering its benefits in improved traffic mobility, gas saving, and travel time reduction. All four alternatives for the project show a positive benefit/cost ratio. For the two that include the Long West Option, the values were 10.7 (Alt. 1) and 13.7 (Alt. 3). The Short West Option costs $200,000 less than the Long West Option– approximately 3% of total expenditures– but does not offer the transportation and economic growth advantages associated with the Long Option. A west option is needed to avoid extreme traffic congestion in Eagle in the near future.
Consider the high cost of acquiring river front land on the Long West Option. It is not zoned farmland any more and the owners will fight for subdivision prices. Fair value must reflect the residential development potential.	2	The price paid for riverfront land will be based on current use and comparable land values at the time of appraisal. If there has been no capital improvement, there can be no compensation for it.
On the Long West Option, the cost of buying right of way and replacing the Chevron pipeline should be taken into account. These costs may be quite high.	1	The cost of buying right of way will be as described above. The Chevron pipeline was taken into account in the design of the roadway location.
The Long West Option serves populated areas (at the expense of rural landowners). It puts unwanted congestion in the rural area.	1	This is a recognized impact of the project. However, without the project, traffic congestion will increase to intolerable levels in the near future that would also affect rural landowners.

Four alternatives were presented to the public at a combined design location hearing held March 13, 1991, at Centennial High School auditorium. These alternatives were two directional, five-lane sections requiring 140 feet of right of way, 70 feet on either side of the centerline on new alignment, and an existing right of way of 119 feet with 60 feet on both sides of the centerline.

Figure 3-14
Sheet 3 of 4

Option 1: Long West North

This option would leave existing SH-44 near Ballantine Road on the west at MP 16.223, proceed southeasterly, and cross existing SH-55 approximately 1800 feet south of the existing SH-44 and SH-55 intersection in Eagle. It would then continue in an easterly direction to an intersection with existing SH-44 approximately 1000 feet east of Edgewood Lane at MP 18.952.

This would involve removal of 2.8 miles of SH-44 and 0.28 miles of SH-55 from the State Highway System. It would also involve an addition of 2.7 miles to SH-44 along the new alignment. The net result is a decrease of .38 miles.

Option 2: Short West North

This option would leave existing SH-44 just east of the Dry Creek Bridge at MP 16.852, proceed southeasterly, and cross existing SH-55 approximately 0.5 mile south of the existing SH-44 and SH-55 intersection in Eagle. It would then continue in an easterly direction to an intersection with existing SH-44 approximately 0.19 miles east of Edgewood Lane at MP 18.952. This would involve removal of 2.1 miles of SH-44 and 0.3 miles of SH-55 from the State Highway System. It would also involve an addition of 2.15 miles to SH-44 along the new alignment. The net result is a decrease of 0.34 miles.

Option 3: Long West South

This option would leave existing SH-44 near Ballantine Road on the west at MP 16.223, proceed southeasterly, and cross existing SH-55 approximately 0.34 miles south of the existing SH-44 and SH-55 intersection in Eagle. It would then continue easterly and south of the trailer park at MP 19.0 to an intersection with existing SH-44 at MP 19.401. This would involve removal of 3.2 miles of SH-44 and 0.3 miles of SH-55 from the State Highway System. It would also involve an addition of 3 miles to SH-44 along the new alignment. The net result is a decrease of 0.34 miles.

Option 4: Short West South

This option would leave existing SH-44 just east of the Dry Creek Bridge at MP 16.852, proceed southeasterly, and cross existing SH-55 approximately 0.34 miles south of the existing SH-44 and SH-55 intersection in Eagle. It would then continue easterly and south of the trailer park at MP 19.0 to an intersection with existing SH-44 at MP 19.401. This would involve removal of 2.6 miles of SH-44 and 0.34 miles of SH-55 from the State Highway System. It would also involve an addition of 2.5 miles to SH-44 along the new alignment. The net result is a decrease of 0.5 miles.

Figure 3-14
Sheet 4 of 4

CONCLUSIONS

With any of these options, there would be connector roads constructed to provide adequate access to Eagle and meet all current geometric standards.

All horizontal curve super-elevation rates would meet current standards according to ITD and AASHTO requirements.

Signing would be new except where existing signs are deemed current with ITD policy and MUTCD requirements.

An Environmental Assessment was published February 11, 1991.

In addition to the new route selected in the System Action decision, it was agreed that the existing SH-44 between Alternate Route connections will receive a new pavement overlay before being turned over to the Ada County Highway District.

The district submitted all testimony from the combined design location hearing to the Idaho Transportation Board. As a result of the combined hearing testimony, a few changes were incorporated into the district's recommendations to the Idaho Transportation Board.

The district agreed that with no access allowed from the new route, a full 14 foot median was not required and that a 4.0 feet median will meet all AASHTO and ITD minimums. This recommendation reduces pavement width from 80 feet to 70 feet and will help contain costs. One other change was recommended to the Idaho Transportation Board: The removal of the two-way turn lane on Eagle Road between the new intersection and State Street. A near unanimous response to remove it was included in the district's recommendations. The district formally recommended Option 3 to the Idaho Transportation Board.

The Idaho Transportation Board initially selected Option 4, but left a loophole for the city of Eagle to alter the decision with a written request within 30 days. The city of Eagle did make a formal request that the Idaho Transportation Board change their decision. On July 9, 1991, the Board issued the revised decision adopting Alternate 3 (South Option and Long West Option) for the Eagle Alternative.

The Idaho Transportation Board, in its decision of July 9, 1991, further ordered a committee to study wetland, noise mitigation, river access, bike paths, wildlife protection, and natural preservation. This committee held an information meeting in Eagle on October 3, 1991. The results of that meeting and the committee recommendation were presented to the Idaho Transportation Board at their November 1991 meeting. The Board approved the committee's recommendation on November 15, 1991

SECTION 400.00 – FINAL DESIGN

480.00 – SPECIAL ROADWAY PLANS

SECTION 400.00 – FINAL DESIGN

Final design means any design activities following preliminary design and expressly includes the preparation of final construction plans and detailed specifications for the performance of construction work.

405.00 – FINAL DESIGN INTRODUCTION

Final design is the culmination of detailed assessments about environmental requirements, design guidelines, plans reviews, right of way, utilities location, materials, drainage, special provisions, agreements, estimates of cost, etc., that must all be addressed before finalizing a project. As has been discussed in previous chapters and in the following information, consideration of these requirements must be made before a final design review can be requested. The final design review indicates that design features have been resolved, review requirements have been completed, no further changes or major problems are anticipated, and plan preparation is in accordance with this Design manual. This chapter covers several additional considerations that have not been previously addressed and the requirements for final design and the plans, specifications, and estimates (PS&E) submittal.

410.00 INTERMEDIATE DESIGN REVIEW (OPTIONAL)

The district may hold an intermediate design review at any time on specific items when input is desired from other sections, or when items with anticipated controversy could be resolved early in the project design. The intermediate design review allows the district, Resource Center, Design/Materials/Construction (DMC), Environmental, Bridge, Traffic, and others when appropriate, an opportunity to review and comment on design details of the roadway, bridge, and traffic plans prior to completion of the plans for the plans, specifications and estimates submittal. Intermediate design reviews that affect a port of entry building or scale must also include the Port of Entry Manager.

Pavement marking, delineation, signing, traffic signals, illumination, and intersection designs plans especially should have an intermediate design review by Traffic. These plans should include existing and proposed utility pole location; street illumination; traffic islands and traffic signal poles; vehicular directors; signal heads and controller; locate "no parking" and "restricted parking" zones, hours, etc.; bus stops and direction of one-way streets; and all traffic control signs.

The plans should show all approaches where loop detection is proposed; locate overhead and underground utility wires, fire hydrants, basements, or any other appurtenances that could influence the design.

For an intermediate design review, the district shall transmit the plans to the subject matter expert in the appropriate headquarters' sections. The plans may be in a semiformal form, however, the information and design details shall be complete and in a form that can be reproduced. The district shall

notify and coordinate with local public agencies/consultants and other outside agencies that are involved in the project of the Intermediate design review.

The recommendations and comments discussed at the review and decisions made will be recorded and published by the district in the intermediate design review report. All additions and corrections that result from the intermediate design review are to be completed prior to the next review. The district then finalizes the plans for the next design review, or if the intermediate design review was held after the final design review, the plans are finalized for the plans, specifications and estimates submittal.

415.00 - RIGHT OF WAY PROCEDURES AND REQUIREMENTS

GENERAL

The project scope is determined during the preliminary engineering phase of a project. The approved charter/concept will address the project needs. Using data from the charter/concept, aerial mapping, or survey data, the initial line and grade for the project is established. When an early line and grade are established, the need for additional right-of-way can be determined. If the proposed improvements will be constructed within the existing right-of-way, no right-of-way plans are required. Projects that need additional right-of-way and/or Easements, Permanent (P) or Temporary (T), require the preparation and submission of "Right-of-way Plans" along with the required documentation necessary for the completion of the plans.

NOTE- Property Use Agreements

Definition: An agreement between a property owner and the Department, wherein ITD and/or its contractor is granted permission to temporarily occupy/access a specific area for minor construction activity. The specific temporary use area is located outside of the existing right-of-way and the use of such area provides mutual benefit to both parties. Property Use Agreements can ONLY be utilized if no other property interest (additional right-of-way or easements) is needed for the highway project. If there is property to be acquired on the parcel, the action must be a temporary easement not a Property Use Agreement.

The area represented in the Property Use Agreement shall be designated as ROE (right-of-entry) on the project construction plans. No compensation will be paid to the property owner for such, nor will the Property Use area be condemned. If the particular item that necessitates a Property Use Agreement, such as matching pavement elevation to private driveway, can be eliminated from the project without adverse impacts to the project or to the adjoining property owner(s), and the owner denies signing a Property Use Agreement, the item will be eliminated from the plans and will not be constructed on the project.

When the use of a Property Use Agreement is applicable, District Design: 1.) obtains the last vesting deed of record and a copy of the county assessor's ownership record for the subject property, 2.) identifies the area for use, 3.) coordinates with ROW Staff for the preparation of the Property Use

Agreement which may include drawings such as plan view, profiles, cross section, details, etc. and 4.) Makes arrangements with ROW Staff to jointly meet with the property owner to explain the need for the temporary use, the mutual benefit, and to obtain property owner's signature on the Property Use Agreement. The copy of the last vesting deed of record, the print-out of the county assessor's ownership record and the executed Property Use Agreement are kept in the Design file for documentation. The area for construction use (referred to as the right-of-entry area , or ROE area) granted by the property owner in the Property Use Agreement is depicted on the Construction Plans and is specifically identified with the boundary and notation specifying the use, i.e. ROE for driveway pavement match. Property Use Agreement areas are not shown on the 'Official Right-of-Way plans.' A copy the Property Use Agreement is provided to Construction Staff.

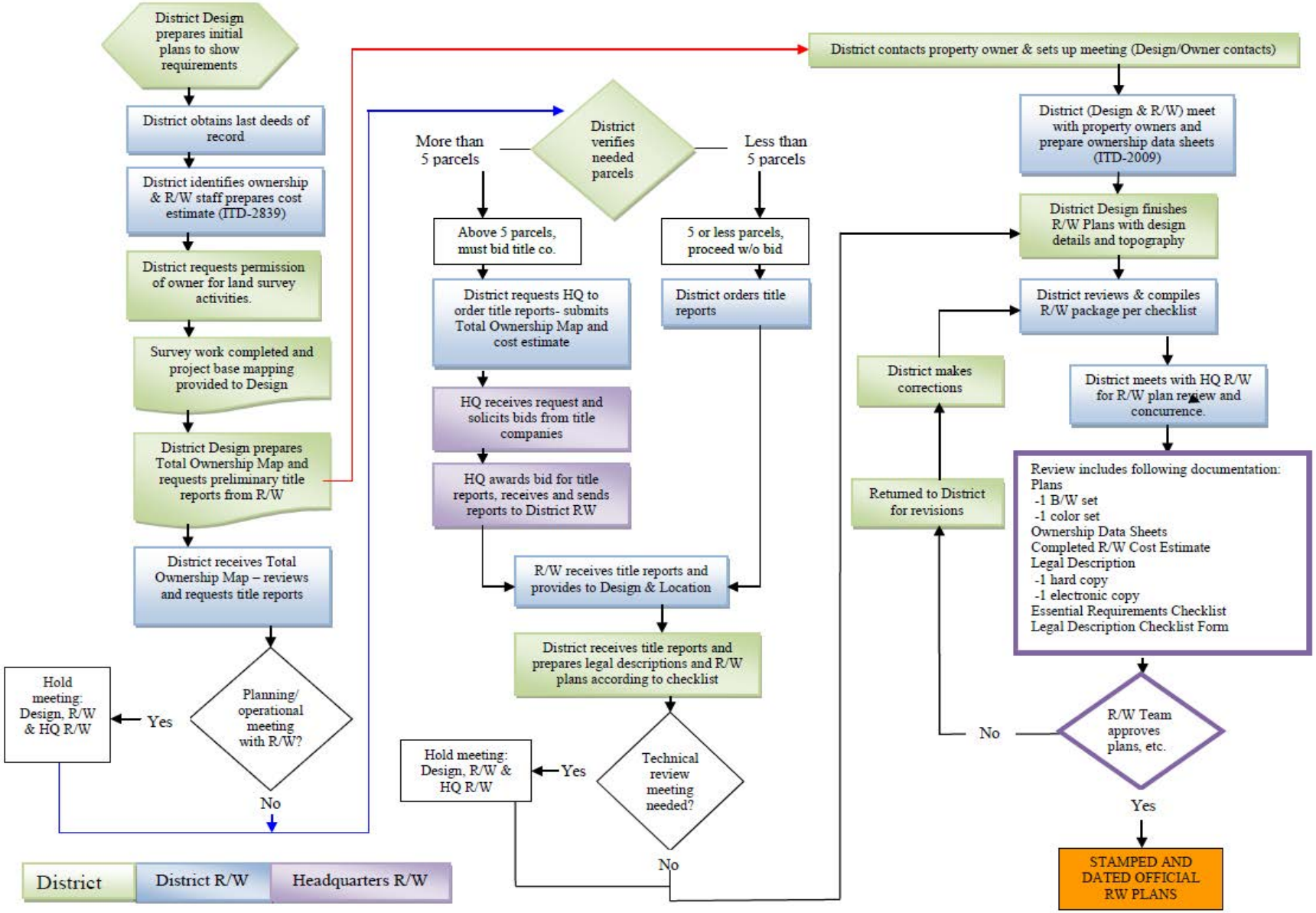
NOTE- Early Acquisition

Definition: Prior to completion of the NEPA process, the Department may initiate acquisition of real property at any time it has the legal authority to do so based on program or project considerations. The Department may undertake early acquisition for corridor preservation, access management, or other purposes. Two types of early acquisition meet the requirements of 23 CFR Subpart E – Property Acquisition Alternatives §710.501 Early Acquisition and 710.503 Protective buying and hardship acquisition. Use of either of these alternatives requires approval from the Federal Highway Administration. Design Staff shall seek guidance and direction from ROW Staff. ROW Staff shall serve as the liaison to FHWA. Each potential early acquisition is evaluated on a case by case basis.

If the project requires construction improvements and/or work to be completed beyond the existing right-of-way limits, thus indicated the need to purchase additional right-of-way and/or easement, the Designer shall prepare the right-of-way plans using the following steps and Right-of-Way Plan Preparation Flowchart, Figure 4-1.

Figure 4-1

RIGHT-OF-WAY PLANS FLOW CHART



415.10 Preparation of Right-of-Way Plans. Official right-of-way plans are required when additional/new right-of-way and/or permanent easements and/or temporary easements are required for the construction of the project. The right-of-way plans are started and developed along with preliminary roadway design plans. In preliminary design, once it has been determined that there is a need to acquire or use property outside the existing right-of-way, begin the process of preparing the right-of-way plans and Property Use Agreements, if applicable.

Note about the use of Right-of-Way Plans vs. Right-of-Way Plat. The designer should consult with Right-of-Way Staff to assist in determining the most appropriate format to utilize for the specific project. Generally, the standard 'Official Right-of-Way Plans' format is recommended. Alternatively there is a process for the use of a 'Right-of-way Plat' provided in the Idaho Code, Section 40-209. Historically, the use of the Right-of-Way Plat has been problematic, therefore, is rarely used. If used, the Right-of-Way Plat must be recorded prior to the acquisition of right-of-way; if revisions to the plat are required, the plat must be re-recorded. Idaho Code states that Right-of-Way Plat must be created on 18" x 27" vellum for recording purposes. The Right-of-Way Plat replaces the need for legal descriptions used as attachments in the title transferring documents. If using the Right-of-Way Plat format for a project, a metes and bounds legal description prepared by a Professional Land Surveyor is required in addition to the Plat when property is to be acquired from State of Idaho agencies or the Federal Government, i.e. Forest Service, Bureau of Land Management. Right-of-Way Plats are sometimes not sufficient in detail for use by Right-of-Way Staff during negotiations. In those cases, 'Official Right-of-Way Plans' are produced in addition to the Plat.

415.10.01 Obtain Property Ownership Information. Obtain 1.) copies of the current county assessor's record and 2.) copies of the last vesting deeds of record from the county recorder's office or from a title company (seek assistance from the Right-of-Way Staff, if necessary).

415.10.02 Request Location/Survey staff do survey work/provide base map. Provide a copy of the last vesting deeds of record to Location/Survey Staff for their use in preparing the project base mapping.

415.10.03 Start the preparation of the Right-of-Way Plans. Designer shall incorporate the ownership information from the last deed of record along with base mapping data and survey information provided by Location Staff onto the Right-of-Way plans; prepare the Total Ownership Map and begin the layout/design of the detail sheets. Property lines are established on the drawings so a record of activities that affect the property and its value can be documented throughout the development process. The replacement/relocation of utilities and/or irrigation facilities within or impacted by the project construction and/or acquisition must be included and addressed on the Right-of-Way Plans. If any construction work must be done outside the existing and/or new right-of-way, the boundaries/width of Temporary Easements and their purpose must be identified on the Right-of-Way Plans. Permanent Easements must be included for the construction of items outside the right-of-way if there is a need to install and maintain improvements into perpetuity. The width and specific use of each Permanent Easement must be noted on the Right-of-Way Plan detail sheets. Requirements and Permanent Easement(s) must be depicted on the Right-of-Way Plans with: 1.) bearings and distances noted, 2.) station and offset calls, and 3.) accompanied by an Idaho Professional Land Surveyor stamped legal description. Note: The Right-of-Way Plans are a fluid document and continue to be refined as the design process continues.

415.10.04 Parcel Identification (ID) numbers. For tracking purposes, ITD assigns a unique parcel identification number to each parcel on the project with a requirement. The Designer provides a copy of the preliminary Total Ownership Map to Right-of-Way Staff requesting Parcel Identification Number(s) for requirements of additional right-of-way and/or Permanent Easement(s). These Parcel ID Number(s) are added to the Total Ownership Map and the detail sheets as the plans are developed. If requirement consists of only a Temporary Easement for a particular parcel, the Parcel ID Number shall be composed of the project Key Number, followed by the letter "E" then by the Parcel Number, i.e., 7771E01.

415.10.05 Internal Operational Meeting: Design & Right-of-Way. Set up and hold a planning/operational meeting with Right-of-Way Staff to review preliminary Total Ownership Map and requirements for the project. Review project schedule, get input and make plans for the acquisition of the requirements for the project. It is important to identify and initiate right-of-way activities as early as possible to improve efficiency, optimize time, and avoid delays. Environmental document approval must be obtained prior to the acquisition of right-of-way. (Appraisals may be obtained prior to environmental approval; however, the appraisal review process and subsequent negotiations cannot begin until the environmental document has been approved.)

415.10.06 Property Owner Contacts. Coordinate with R/W to schedule property owner meeting(s) to discuss the alignment, and the potential impacts the project will have on the property.

Contact and schedule 'Design/Owner Contact Meetings' with property owner(s) whose realty will be impacted by the project. Purpose of meetings is to provide project information and obtain input from owners.

Prior to meeting, review discussion items with Right-of-Way Staff.

District Design and Right-of-Way Staff meet with each property owner to:

1. Explain the alignment and design features of the project.
2. Explain the appraisal process to the property owner and the purpose of the appraisal report.
3. Encourage the property owner to take the opportunity to meet, and discuss items of value related to the property with the real estate appraiser.
4. Explain to the property owner the acquisition process, and the relocation assistance program if applicable.
5. Get the pertinent information from the property owner to complete the ITD-2009 Property Ownership Data sheet/form.
6. Provide contact information and ITD Property Acquisition brochure to the property owner(s).

Document the Design/Owner contact meeting in design/owner contact diary.

415.10.07 Request Title Reports.

415.10.08 Title Reports. Designer provides a copy of the Total Ownership Map to Right-of-Way Staff to request title reports for the parcel(s) with requirements. Right-of-Way Staff obtains the preliminary Title Reports and provides copies of reports to Designer. Designer uses the information in the reports to confirm ownership, establish property boundaries, and locate easement encumbrances on the property(ies). Designer provides a copy of the preliminary Title Reports to Location/Survey Staff for use in preparing the legal descriptions of the requirement areas.

415.10.08 Update ITD-2839 Right-of-Way Cost Estimate Form. The Right-of-Way cost estimate form is completed with the concept/charter. Periodically ask the Right-of-Way Staff to review and/or update the ITD-2839 Right-of-Way Cost estimate form when acquisition areas are determined or are modified, or when there are possible property market value changes. This update will provide justification for project budget modifications and ensure appropriate funding has been programmed.

415.20 Legal Description Preparation. Legal descriptions for the requirement areas are prepared by or under the supervision of a Professional Land Surveyor licensed in the State of Idaho. The legal descriptions must be sealed and signed by said Professional Land Surveyor. The ITD 0130, Legal Description Essential Requirements Checklist shall accompany each legal description when the Right-of-Way Plans are submitted to Right-of-Way Staff for approval as 'Official Right-of-Way Plans.'

415.20.01 Legal Description Essential Requirements Checklist Reviews. The Professional Land Surveyor prepares a legal description for the property areas to be acquired including the Permanent Easements. The Surveyor completes and initials each element on the ITD 0130, Legal Description Essential Requirements Checklist. The legal description(s) and completed checklist(s) are delivered to the Designer. Upon receipt of the legal descriptions, the Designer shall review and initial approval of each element on the checklist.

If the legal descriptions are in compliance, the Designer will sign and date the checklists for incorporation into the Right-of-way Plans Package submittal, See Subsection 415.50 – Official Right-of-way Plans.

If the legal descriptions are not in compliance, the Designer returns the descriptions to the Surveyor with comments and corrections needed.

415.30 Right-of-Way Total Ownership Map and Detail Sheet(s) Preparation. The ITD 0131, Plans Essential Requirements Checklist shall be utilized and properly completed throughout the development of the Right-of-Way Plans. Use the example Right-of-Way Plans in Appendix C, to prepare the final Right-of-Way Plans. Right-of-Way Plans are prepared on standard 11" x 17" sheets of good quality, reproducible material. The Right-of-Way Plans must be provided in colored format.

As the plans are being developed, the elements in the checklist will be completed and initialed by the Designer. The elements on the Plans Essential Requirements Checklist are necessary for the purchase additional right-of-way and Permanent and Temporary Easements.

415.40 Right-of-Way through Federal Lands. The U.S. Bureau of Land Management and the U.S. Forest Service are responsible for U.S. Public Lands under their jurisdiction and have special requirements for right-of-way transfers. To initiate the transfer, the Designer prepares right-of-way (plan view) map depicting the Federal Land needed for the project and transmits it along with a legal description of the area needed. The legal description shall be prepared by or under the supervision of Professional Land Surveyor licensed in the State of Idaho. The legal description shall be sealed and signed by said Surveyor and accompanied by a completed ITD 0130, Legal Description Essential Requirements Checklist. Right-of-Way Staff shall coordinate the Federal Land Transfer request through FHWA.

415.50 Submittal of Final Right-of-Way Plans.

The final Right-of-Way Plans are submitted to Right-of-Way Staff accompanied by a signed and dated ITD 500 Memo requesting plans approval. Full submittal consists of the following:

- ✓ One set of final Right-of-Way Plans in 11" x 17" colored format, stamped "Recommended For Approval"
- ✓ Completed ITD 0131, Plans Essential Requirements Checklist
- ✓ Completed ITD 2009, Ownership Data Sheet for each parcel with a requirement
- ✓ Updated ITD 2839, Right-of-Way Cost Estimate form
- ✓ Professional Land Surveyor sealed and signed legal description for each requirement and Permanent Easement - - in hard copy and electronic format
- ✓ Completed ITD 0130, Legal Description Essential Requirements Checklist for each legal description
- ✓ Copy of Environmental document approval

415.60 Official Right-of-Way Plans. Upon receipt of the "Recommended For Approval" right-of-way plans submittal package, Right-of-Way Staff reviews the submittal for compliance and completeness. If the submittal package meets requirements, Right-of-Way will approve and date/stamp each sheet in the set as "Official Right-of-Way Plans." This set of stamped "Official Right-of-Way Plans" becomes the official set of plans utilized throughout the acquisition process on the project. This document not only serves as a visual tool when negotiating with property owners, but may be used as an exhibit in litigation if negotiations are unsuccessful. Detail accuracy is important on this document.

Note: If the submittal package does not comply with requirement standards, Right-of-Way Staff will return the entire submittal package with comments and transmittal letter, to District Design. The plans will not be stamped 'Official' until all of the requirements are met.

415.60.01 Distribution of Official Right-of-Way Plans. Right-of-Way Staff distributes a set of the Official Right-of-Way Plans to the Designer. Right-of-Way Staff uses the Official Right-of-Way Plans as a visual aid throughout negotiations and frequently distributes copies of specific plan sheets to the property owners and/or their representatives.

415.70 Revisions to Official Right-of-Way Plans. After the Official Right-of-Way Plans have been approved, if revisions are needed to all or any of the sheets in the Official Right-of-Way Plans, an official written revision request is submitted to Right-of-Way Staff. For example: Modifications in design features that come about during Right-of-Way Negotiations, such as the location of an approaches, fence type, etc. require a Right-of-Way Plans revision.

415.70.01 Revision Preparation.

Designer shall revise the sheet(s) of the Official Right-of-Way plans as needed and complete an ITD 0131, Plans Essential Requirements Checklist for the revised sheet(s). The revision box on each modified plan sheet shall be completed noting the modification made. Every time a plan sheet is modified another revision line shall be completed. The Professional Land Surveyor responsible for the original legal description(s) shall prepare revisions if necessary to the legal description(s). With any modification to a legal description a new ITD 0130, Legal Description Essential Requirements Checklist shall be prepared and initialed by the Surveyor. Designer shall complete an ITD 405, Revision to Right-of-Way Plans.

415.70.02 'Official Right-of-Way Plans' Revision Submittal. Official Right-of-Way Plans revision submittals shall be transmitted from the Designer to Right-of-Way Staff for review/approval. The submittal shall include the following:

- ✓ One 11" x 17" black and white copy of the revised plan sheet(s) with the modifications highlighted
- ✓ One 11" x 17" colored set of the revised plan sheets (submit only the revised sheets, not a full set the Right-of-Way Plan)
- ✓ Completed and signed ITD 405, Revision to Right-of-Way Plans
- ✓ If applicable, Revised legal descriptions, and
- ✓ If applicable, ITD 0130, Legal Description Essential Requirements Checklist prepared and initialed by the Surveyor for each revised legal description.

If revisions affect utilities or the railroad, a separate set of right-of-way plan sheets showing the revisions shall be provided to the Utilities Coordinator of Right-of-Way Section.

Revised sheets, when approved, will be stamped/dated Official Right-of-Way Plans and will be distributed for insertion into the Official Right-of-Way Plans' sets.

415.80 Preparation of Condemnation Exhibits. These specialized right-of-way plan sheets are necessary when negotiations have been unsuccessful and ITD must exercise its power of eminent domain to acquire a needed parcel through court proceedings, commonly referred to as "condemnation." These exhibits are highly detailed and specific to a contiguous ownership (can be more than one parcel).

The Designer shall use the Official Right-of-Way Plans, legal description(s), and title report to verify that the ownership boundaries and existing easement(s) and the required right-of-way are shown on the plans correctly.

The Designer shall utilize all plan sheets (plan & profile) showing the parcel from the current construction plans as the basis for the condemnation exhibits. See example Condemnation Exhibits in Appendix C. The condemnation exhibit plan set shall be a compilation of the following 11" x 17" colored sheets:

- ✓ Sheet 1: "Title Sheet" - which is specific to the parcel being condemned

1)

2) In addition to the Project Name, call-out the parcel number(s) and name of property owner(s) in the lower right-hand corner of the title block (left of the County/Key/Sheet block). Do not include mortgagees, trustees, or lien holders. If the property owner is a corporation or partnership, use the full name (i.e., Gambles, Inc., or L & H Company, a partnership). If there are several parties involved, show Gambles, Inc., et al., or Greene, et al. This title block information remains constant on all sheets of the condemnation exhibit set.

3)

4) Near the Vicinity Map, call-out the following three items in bold print: 1. Condemnation Exhibit, 2. Parcel No. XX, and 3. Condemnee's/Owner's Name.

5)

✓ Sheet 2: "Total Ownership Map" – this sheet is a simplified version of the Total Ownership Map from the Official Right-of-Way Plans. Its purpose is to show where the parcel being condemned is located on the project and emphasize the ownership boundaries, acreage, requirements, remainders, etc.

6)

7) Highlight in pastel color(s) the parcel(s) being condemned and label the Parcel Number(s) on the plan view. In a tabulated format, replicating the format used in the Official Right-of-Way Plans, note Parcel number, Parcel Identification number, Record Owner and acreages.

8)

✓ Sheet 3, 4, etc.: "Right-of-Way Plan" and "Right-of-Way Profile" sheets – create a base map for the condemnation exhibits utilizing all construction plan sheets (plan & profile views) showing the parcel being condemned.

9)

10) On the plan view sheets:

- REMOVE references that relate to other parcels, such as property owner names, colorings, etc.

11)

- RETAIN AND SHOW property features and topography pertaining to the parcel being condemned as shown on construction and Official Right-of-Way Plans, such as, but not limited to: irrigation and drainage features, approaches, culverts, septic system, well, property line, fences, buildings, trees, etc.

12)

- If applicable, call-out on the plans: subdivision name, lot & block references and dimensions, existing easements and their purpose (permanent or temporary), government lot references and boundaries.

13)

- Show requirement area(s) shaded in pastel colors as follows (or similar color shades):
    1. Fee simple requirement color in yellow
    2. Permanent Easement required color in orange
    3. Temporary Easement requirement color in blue
    4. If applicable, Prescriptive Right-of-Way within requirement area color in light brown/tan
    5. Outline the property boundaries in light green. This will appear as a narrow solid line highlighted over the black P/L line type.
    6. Uneconomic remnant or landlocked tract color in lavender.

14)

- Prepare and show a legend on each plan sheet of the condemnation exhibit set. Legend shall include, but not limited to, the following :

1. Project No. .... *Use the project number from the Official Right-of-Way Plans if different than construction plans.*
2. Parcel No(s).
3. Parcel ID No(s)..... *Obtain this data from Official Right-of-Way Plan*s.
4. Total Contiguous Ownership.... *Obtain this from Official Right-of-Way Plans and Appraisal Report (via District RW Staff), acreages should be equivalent.*
5. Right-of-way to be Acquired.... *Surveyor's legal description and Official Right-of-Plans acreages should be equivalent.*
6. Public Road.... *This is referring to any prescriptive right-of-way adjoining the parcel being acquired. This acreage is referenced in the table on the Total Ownership Map of the Official Right-of-Way Plans and also referenced in the Surveyor's legal description of the requirement.*
7. Permanent Easement.... *Surveyor's legal description and Official Right-of-Plans acreages should be equivalent.*
8. Temporary Easement.... *Surveyor's legal description and Official Right-of-Plans acreages should be equivalent.*
9. Owners of Record/Parcel Owner.... *Obtain from the title report, Official Right-of-Way Plans, etc.*
10. Line type examples for centerline, Property Line, Existing R/W, Proposed R/W, access control designation, etc.
11. Drawing "bar scale"

15)

16) Include profile sheet(s) for the roadway directly related to the parcel being condemned.

415.90 Right-of-Way Certificate. All construction projects require a Right-of-Way Certificate. The certificate verifies that legal and physical possession of the right-of-way has been obtained, or that all work to be done in connection with the captioned project will be contained within the existing right-of-way. Clearance for relocation of utilities, material sources, hazardous materials and a statement addressing any displaced persons is included in the Right-of-Way Certificate.

A right of way certificate is not required for materials purchase projects that do not involve right of way; i.e. railroad equipment, trucks, buses, plant mix, etc

415.90.01 Right-of-Way Certificate Preparation. District (LHTAC if LHTAC administered) requests R/W to prepare a Right-of-Way Certificate. Headquarters' Right-of-Way Staff confirms utility agreements/waivers are complete, material sources are available, hazardous materials are/are not known, and confirms displaces are relocated, if any. Headquarters' Right-of-Way Staff prepares and the Right-of-Way Program Manager signs the Right-of-Way Certificate to be submitted along with the submittal for PS&E. Whenever a right of way certificate is prepared on a LPA project, an ITD 1983, Local Public Agencies Certificate of Completion, must also be submitted.

415.90.02 Conditional Right-of-Way Certificate. If extenuating circumstances require the PS&E submittal prior to obtaining the clearances required for a Right-of-Way Certificate, i.e., if possession of all of the right-of-way required for the project has not been obtained and it is in in the public's interest for the project construction to proceed, a request can be made for a 'Conditional Right-of-Way Certificate' that, if approved, will provide for the exception. In this scenario, the District shall request Headquarters' Right-of-Way prepare a Conditional Right-of-Way Certificate. At such time as all right-of-way is fully possessed by the State, a (unconditioned) Right-of-Way certificate shall be issued.

Figure 4-2

IDAHO TRANSPORTATION DEPARTMENT			
Department Memorandum			
DATE:		**Project No.(s):**	
TO:	**TOM COLE** **CHIEF ENGINEER**	**Key No.(s):**	
FROM:	**NAME OF DE** **DISTRICT X ENGINEER**	**Project Identification, County, Etc.:**	
RE:	**RIGHT OF WAY CERTIFICATE**		

This is to certify that all work to be done in connection with the caption project by the IDENTIFY AGENCY will be contained within the existing right of way.

The utility facilities owned by IDENTIFY UTILITIES are to be relocated at company OR project expense and arrangements have been made to coordinate their activities with the contractor.

Materials are available to the contactor from a state approved commercial source OR a state source.

No persons, families or businesses were displaced as a result of this project.

Idaho Transportation Department has no knowledge of any hazardous materials use or contamination on this project.

XXX: xxx

cc: RCE

DE-#

PDE-#

DIST #

R/W – UTIL COORD

LEGAL

Figure 4-3

(Print on Department Letter head)

CURRENT DATE

Mr. Peter Hartman
Division Administrator
Federal Highway Administration
3050 Lake Harbor Ln.
Boise, Idaho 83703

RE: Project No.: IM-NH-IMG-IG-IRG-I-2222 (020)
Key No.: 2222
Project Name: Interstate Project Anywhere Idaho

RIGHT OF WAY CERTIFICATE

This is to certify that all work to be done in connection with the caption project by the IDENTIFY AGENCY will be contained within the existing right of way.

The utility facilities owned by IDENTIFY UTILITIES are to be relocated at company OR project expense and arrangements have been made to coordinate their activities with the contractor.

Materials are available to the contractor from a state approved commercial source OR a state source.

No persons, families or businesses were displaced from their dwellings as a result of this project.

Idaho Transportation Department has no knowledge of any hazardous materials use or contamination on this project.

AUTHORIZING INDIVIDUAL

Right of Way Manager

XXX: xxx

bcc: RCE LEGAL
DE-# DIST #
PDE-# R/W – UTIL COORD
FHWA

420.00 – MATERIALS SOURCE LOCATION AND ACQUISITION DATA

The district shall locate, investigate, and establish material sites to be purchased or leased for project use. Appropriate parts of the Materials manual and Right of Way Procedures handbook shall be used to meet this requirement. In establishing the boundaries, shape, and size of the material deposit, the following shall be considered:

- Pit boundaries should be symmetrical where conditions permit. Boundary lines may be parallel to highway right of way lines or to the political subdivision. Do not sever or isolate small parts of an ownership, which may add to the cost, yet be retained by the landholder.
- Investigate ownership boundaries and study effect on the complete parcel.
- Give consideration to purchase or long-term lease on land for access road. Be sure that means of access is shown on the pit site sketch. Outline the proposal in the letter of request for acquisition.
- Consider the materials source as a future stockpile site or maintenance area.
- If a portion of an existing right of way is to be used as a materials site, check with the Headquarters Right of Way to determine how the original acquisition was made. If the right of way was part of a governmental land withdrawal for right of way, a supplemental withdrawal is required to convert this land to a materials site. (The use of right of way granted under our old right of way deeds for materials sites would be questionable and could be contested as the granting clause in the deeds read, "for a right of way for a public highway.") This may also apply in the allowance covered in 106.10.
- Arrange for a complete site survey to secure a good legal description for deed and monumenting purposes.
- Where a new tract purchase is to be added onto a previous right of way or site purchase, survey information must be compatible. Bearings, distances, and curve data must be identified with the deed descriptions of the original purchase. Check the records for existing property descriptions. Adjust survey data along the lines common to the old and new purchase. Make any necessary survey closure corrections in the outer limits of the new land purchase.
- For Federal-Aid Highway Systems, all new material sources shall be located out of sight of the main roadways, unless economic consideration prohibits. This

setback restriction applies not only to sources that are purchased, but also to sources that are used under a lease arrangement.

420.01 Materials from State-Owned or Controlled Sources. When materials from sources owned or controlled by the Idaho Transportation Department are designated to a contractor for incorporation into the construction of project, the following shall apply:

- The material should be listed in the Special Provisions as "At cost of $X.XX per cubic yard, payable to the Idaho Transportation Department."
- Values should be shown for tax purposes even if state reimbursement is zero. Reimbursement is based on accounting records and approved by FHWA. The Materials report should list the amount to be used in the above situations.
- Material offered to the contractor from sources owned by the State Land Board is to be established in the Special Provisions at a unit cost, payable electronically to the Idaho Transportation Department regardless of the type of project involved, and based on the price per unit as established by the lease agreement with the State Land Board.
- Material furnished by the state in Stockpile shall be at no cost to the Contractor. Reimbursement for this material should be listed in the Special Provisions for tax purposes and shown on the Preliminary Cost Estimate under "Material Furnished by State" (to include cost of material plus 15% for the state's overhead)
- Cost. For ITD controlled sources, the source recovery fee shall be the applicable rate as established in the ITD Materials manual Section 270.02.05 Source Control at the time of bidding.

(ALTERNATE WORDING FOR LOCAL FUNDED PROJECTS)

Contractor furnished sources. Furnish approved source(s) for all materials to be embanked or processed for placement. ITD owned or controlled sources will not be allowed for this project.

445.00 – PREPARATION FOR FINAL DESIGN REVIEW

The final design review indicates that design features have been resolved, review requirements have been completed, no further changes or major problems are anticipated, and plan preparation is in accordance with this design manual. The plans and other documentation that will be submitted for the final design review should be completed as near to a plans, specifications, and estimates (PS&E) submittal as possible. The plans and documentation shall be distributed to all district sections involved, including the Resident Engineer for review and comments prior to the final design review being held. Locally involved agencies (City, County, and Local Highway Districts that have been involved in the development process) shall be given an opportunity to review the final design project plans and attend the review.

The final design review is primarily to review the following major items.

445.01 Environmental Considerations. At final design review, the plans should be reviewed for compliance with permit requirements, mitigation and commitments made in environmental documents (EIS/ROD, EA/FONSI, Categorical Exclusion, etc.). For requirements see: http://www.itd.idaho.gov/enviro/Stormwater/Overview/default.htm

Plans should also be reviewed to determine if the project scope has changed since the environmental document was approved.

Concurrent with plans, specifications and estimates (PS&E) submittal, the District Environmental Planner and the Designer/Project Manager shall verify required mitigation measures are included in the construction and the scope of work has not changed since the environmental approval. See the Environmental Process Manual for specific guidance on Verification process.

Sewer Treatment

Check that all plans and specifications for the construction of new, or the modification/alteration of sewage systems, sewage treatment plants/systems, other waste treatment/disposal facilities, public water supply systems/public water treatment systems have been submitted to the Department of Health and Welfare for approval.

Approval must be obtained before construction may begin and all construction shall be in compliance therewith. *No deviation shall be made from the approved plans and specifications without prior approval of the Department of Health and Welfare.*

Within thirty (30) days of the completion of construction, alteration, or modification of any new sewage systems, sewage treatment plants/systems, other waste treatment/disposal facilities, public water supply systems/public water treatment systems, complete and accurate plans and specifications depicting the actual construction, alteration, or modification performed must be submitted to the Department of Health and Welfare. If construction does not deviate from the

original plans previously submitted for approval, a statement to that effect shall be filed with the department.

All plans and specifications submitted to satisfy the requirements of this section shall conform in style and quality to regularly accepted engineering standards. The Health and Welfare board may require that certain types of plans and specifications be certified by registered professional engineers. If the Department of Health and Welfare determines that any particular facility or category of facilities will produce no significant impact on the environment or on the public health, the department shall be authorized to waive the submittal or approval requirement for that facility or category of facilities.

"Public water supply" means all mains, pipes, and structures through which water is obtained and distributed to the public, including wells and well structures, intakes and cribs, pumping stations, treatment plants, reservoirs, storage tanks and appurtenances, collectively or severally, actually used or intended for use for the purpose of furnishing water for drinking or general domestic use in incorporated municipalities; or unincorporated communities where ten (10) or more separate premises or households are being served or are intended to be served; or any other supply which serves water to the public and which the Department of Health and Welfare declares to have potential health significance.

Disposal of Property

Whenever the sale or disposal of any ITD-owned property is contemplated, the District Environmental Planner must examine the property for consideration of potential mitigation uses (Environmental Process Manual).

445.02 Design Guidelines.

- Check previous design reports for compliance with the design features established at the time of the Preliminary Design Review.
- Note any changes in major design features (i.e., typical sections, line, and grade) previously approved in the preliminary design stage in the final design letter of transmittal.

445.03 Plans Review.

- Review the plans and special provisions with special attention given to local ordinances, zoning, planning, building setback, building restrictions, fire codes, school restrictions, planned municipal or airport construction, and any other regulations that may affect the project design.

- Review the effects of relocation assistance actions. Proximity to the right of way line is critical for buildings or dwellings.
- Review the Bridge Summary, Layout Sheets, and the coordination of bridge rail and roadway guardrail connections.
- Review safety features such as sight distance, guardrail location and terminal types, delineation and transitions.
- Complete Project Clearance Summary Sheet and show any pending actions. Check EXPIRATION DATE column to ensure dates will cover the construction time.

Use the following table (Figure 4-4) for plan set groupings.

Figure 4-4

PLANS REVIEW

Project Plan Sheet Requirements							
The following list establishes the requirements for a near maximum number of plans sheets required for a project; some projects may have less.	Roadway/Bridge Reviews				PS&E Submission Only		
	Preliminary Design	**Intermediate Design**	**Final Design**	**PS&E Transmittal**	**Mtce**	**Federal Aid Constr. By Agreement**	**Building & Non Rdwy Projects**
ROADWAY GROUP							
Title Sheet	**X**	**X**	**X**	**X**			**X**
Standard Drawing Index			**X**	**X**			**X**
Standard Drawings				**X**			**X**
Vicinity, Total Ownership, & Special Maps	**X**	**X**	**X**	**X**		**PLANS AS REQUIRED**	**X**
Project Clearance Summary		**X**	**X**	**X**			**X**
Typical Sections	**X**	**X**	**X**	**X**			
Roadway Summary			**X**	**X**			
Plan and Profile Sheets	**X**	**X**	**X**	**X**			
SPECIAL DRAWING GROUP							
Minor Structure Drawings		**X**	**X**	**X**			
Drainage Plans		**X**	**X**	**X**			
Paving, Concrete Joint Approach Slab Details			**X**	**X**			
Roadside Dev & Landscaping		**X**	**X**	**X**			
Bike Lanes & Pedestrian Paths		**X**	**X**	**X**			
Source Plat-Reclamation Plan			**X**	**X**			
TRAFFIC GROUP							
Illumination	**X**	**X**	**X**	**X**			
Traffic Signals	**X**	**X**	**X**	**X**			**TO INCLUDE ANY OTHER SHEETS REQUIRED** **(Plan Sheet only)**
RR Signals & Crossing	**X**	**X**	**X**	**X**			
Pavement Marking, Delineation Signing & Raised Channelization	**X**	**X**	**X**	**X**		**PLANS AS REQUIRED**	
Traffic Control Plan (Const)	**X**	**X**	**X**	**X**			
***UTILITY PLANS**			**X**	**X**			
***RIGHT OF WAY PLANS**			**X**	**X**			
***MAJOR STRUCTURE GROUP**	**Situation & Layout**	**X**	**X**	**X**			
***BRIDGE**	**Situation & Layout**	**X**	**X**	**X**			
***STATE MTCE GROUP**					**X**		
***** **Optional Separate Numbering**							

445.04 Right-of-Way.

- Verify that complete and updated Right of Way Plans have been submitted.
- Review Right of Way Agreement and make changes, if needed, to construction plans.
- For Access Control Determination see:

  Board Policy 4005 - Management of Department Owned Property

445.05 Utilities and Utility Companies.

- Check that plans are furnished to and contacts made with the utility companies involved on the project.
- Submit to the Utilities Coordinator in Headquarters Right of Way:
  - Utility plans in accordance with Section 370.
  - Project plans for railroad involvement and other data required for agreement preparation.

445.06 Port of Entry Projects.

- The Port of Entry/Special Permits Manager must be involved in the final design review of all projects that affect a port of entry building or scale.

445.07 Materials.

- The following activities occur during the course of project development. Read the entire text of the approved Materials Phase II, III, IV, and V Reports and all addenda. Issues may be presented in the text of the reports that need to be addressed in the design. Develop plans and contract documents in accordance with the recommendations in the Phase reports and in a manner consistent with the boring logs and soils profile(s). This shall include checking the line and grade and structure elevations. Coordinate with the District Materials Engineer and materials consultant as needed.
- Review information on foundations.
- Check that all foundation problems are resolved.

445.08 Drainage

- Verify that hydraulic items are identified.

- Check that special drainage problems are resolved.
- Verify that the Resource Center has reviewed the Hydraulic Study Report.

445.09 Estimate of Cost. The Preliminary Cost Estimate, or parts thereof, are not considered public information and shall not be released until after the award of the contract (see Board Policy B-14-06, Approval of Plans/Specifications/Estimates and the Award of Construction Projects). The cost estimate is accessible to only those department employees whose job responsibilities require access to the project cost estimate.

- Check the average unit prices for individual bid items. The average unit prices are based on actual contractors' bid prices from past contracts, is used as a guide for cost estimating, and takes into account various factors, such as, item quantity, project location, distance to source of material, project terrain, etc.. The prices are available on-line in a computer program or in the Average Unit Price Report. The Annual Average Unit Price Report can be found at:

  http://itd.idaho.gov/business/docs/Average%20Unit%20Price%20Report%202011.pdf.

- Review the Estimate of Cost to determine if it is within the programmed amount. An ITD 1414 is required to support any estimate of an increase in total project cost in excess of $100,000 or 5% of the programmed amount.
- Review total project cost in relation to bidding competition. Increased bidding competition is encouraged by keeping most projects within a medium cost range to encourage smaller contractors to submit bids.

450.00 – AGREEMENTS

Check the availability of the information for agreements with Local Public Agencies, utilities, railroad, and irrigation companies (see following sections for details).

Railroad Agreements, Utility Agreements, and Professional Service Agreements may be approved by the appropriate District Engineer, Division Administrator, or delegate.

450.01 Construction Agreements. Agreements covering the construction phase are required on all locally sponsored projects and those projects when the local agency is participating either in the costs of construction, performance of a portion of the construction, or maintenance of any portion of the project after construction. The district determines the local agency's share of labor and expenses involved in the construction and/or maintenance of the project and prior to PS&E submittal sends the information to HPO. Information should be submitted as early as it is known. Highway Program Oversight (HPO) prepares the construction agreement. On some projects, the term "Cooperative Agreement" is used.

Agreements need to cover who owns and who maintains drainage, illumination, landscaping, etc.

For better public relations, an agreement should be prepared on projects located within cities, even when the cities have no involvement requiring a construction and/or road closure and maintenance agreement. This philosophy could apply to rural areas as well.

450.02 Road Closure and Maintenance Agreements.
For projects where there is a change in maintenance responsibility, road closure, and or full jurisdictional and title transfer the district shall prepare a Road Closure and Maintenance Agreement. The Road Closure Maintenance Agreement consists of a written legal agreement with attached exhibits, project plans, etc., that show the responsibility for a state highway and the public road connections. The agreement shall identify those public road connections to be closed and the mileage of roads to be maintained by the local authorities. Parties to the agreement are the State of Idaho and the local elected authorities having jurisdiction and responsibility for the local public roads. See Figure 4-5 for a sample showing legal format and information required in the agreement, exhibits and plan sheets. The agreement should not contain commitments to have other construction or improvement projects in conjunction with this agreement. This agreement must be executed prior to advertisement for construction. Additional documents may be necessary depending on what is intended to be transferred with this action including but not limited to: maintenance responsibilities, access control, and title transfer of ownership. If a transfer of title is contemplated, a deed to the local agency should be prepared and approved by the Transportation Board. Any transfer of title or change in access

control may require approval from the FHWA and may require reimbursement of federal monies expended.

System Actions

If a Road Closure and Maintenance Agreement involves a state highway which traverses or serves a city, the system action must include an opportunity for public hearing. The directive to hold public hearings on the state highway systems is in Board Policy B-13-02, Public Involvement for Location and Design Determinations, and the procedure for initiating a system action public hearing is defined in Administrative Policy A-13-02, Public Involvement for Location and Design Determinations, and A-20-03, Public Hearings. Planning/Program Management reviews and comments on Road Closure and Maintenance Agreements when a system action is involved. The public hearing should be held after review of the draft Agreement and before final approval.

The agreement must be executed prior to advertisement for bids for construction. (The Road Closure map, see Figure 4-6, shall be part of the construction plans.) When construction is complete, the District Engineer sends a letter to 2PM requesting that systems actions specified in the agreement be formalized. 2PM prepares documents required to complete systems action for Board approval.

Following Board action, the Division of Transportation Planning notifies affected local jurisdictions of systems actions.

Road Closure and Maintenance Agreement Format

The district prepares a draft of the agreement including the exhibit and submits a copy for comments to the HPO Section, Planning/Program Management Unit and the Chief Legal Counsel who return comments to the district. After the draft agreement is completed, the HPO Section obtains final approval from the Legal Section and prepares four copies of the agreement. Those copies are sent to the district to obtain the signature of the local entity authority. After obtaining the signatures, the district engineer signs as the recommending party and the district then transmits the signed copies of the agreement back to the HPO section, who obtains the Chief Engineer's approval and distributes copies to the HPO Section, Planning/Program Management Unit, and two copies back to the district. The district sends one signed agreement with original signatures to the local jurisdiction.

Figure 4-5

ROAD CLOSURE AND MAINTENANCE AGREEMENT

PARTIES

This Agreement is made and entered into this _____ day of _____, _____, by and between the **IDAHO TRANSPORTATION DEPARTMENT**, hereafter called the State, and **>,** hereafter called **>.**

PURPOSE

The State has programmed the construction of Project No. >, >, to consist of >, which construction will require the relinquishment of certain roads to the local jurisdiction, as shown on the attached print marked "Exhibit A" and made part of this Agreement. This Agreement is entered into pursuant to Idaho Code, Section 40-203B.

The Parties agree as follows:

SECTION I: That the State will:

1. Construct and assume all costs of right-of-way acquisition, construction and engineering necessary to complete the work of this project, excepting those items hereafter stated as obligations of the > in accordance with the attached Exhibit A. If the project is not ultimately constructed, this agreement will be null and void.

2. During construction of this project, install and maintain proper signing necessary to guide and regulate motorists traveling >. The signing shall conform to the Manual on Uniform Traffic Control Devices for Streets and Highways as adopted by the State.

3. Construct an approach from >.

4. Reconstruct the intersection of >.

5. Designate the new route, as shown on Exhibit A, as >, between the connection to the existing route and >.

6. Relinquish and abandon to the > by official notification from the Idaho Transportation Board, the following streets as shown on Exhibit A:

   a. >, including the right-of-way appurtenant thereto

   b. >, including the right-of-way appurtenant thereto

SECTION II: That **>** will:

1. Consent to the abandonment by the State and, upon acceptance of the completed project by the State, accept the jurisdiction of and responsibility for, in full and every respect, that portion of existing > between MP > and MP >, including the right-of-way appurtenant thereto, as shown on Exhibit A, as of the date set by the Idaho Transportation Board.

2. Maintain, erect or install, within the limits of this project, any traffic control devices, including signs, in conformity with the Manual on Uniform Traffic Control Devices for Streets and Highways, as adopted by the State.

SECTION III: Approval and Effect

1. This Agreement will become effective when it is signed by all parties and then reviewed and approved by the Idaho Transportation Board.

17)

EXECUTION

This Agreement is executed for the State by its Chief Engineer; and executed for > by the >, attested to by the >, with the imprinted corporate seal of the **>.**

IDAHO TRANSPORTATION DEPARTMENT

APPROVED

_____

Chief Engineer

APPROVED AS TO FORM:

_____

Deputy Attorney General

RECOMMENDED BY:

_____

District Engineer

ATTEST: **>**

_____

_____

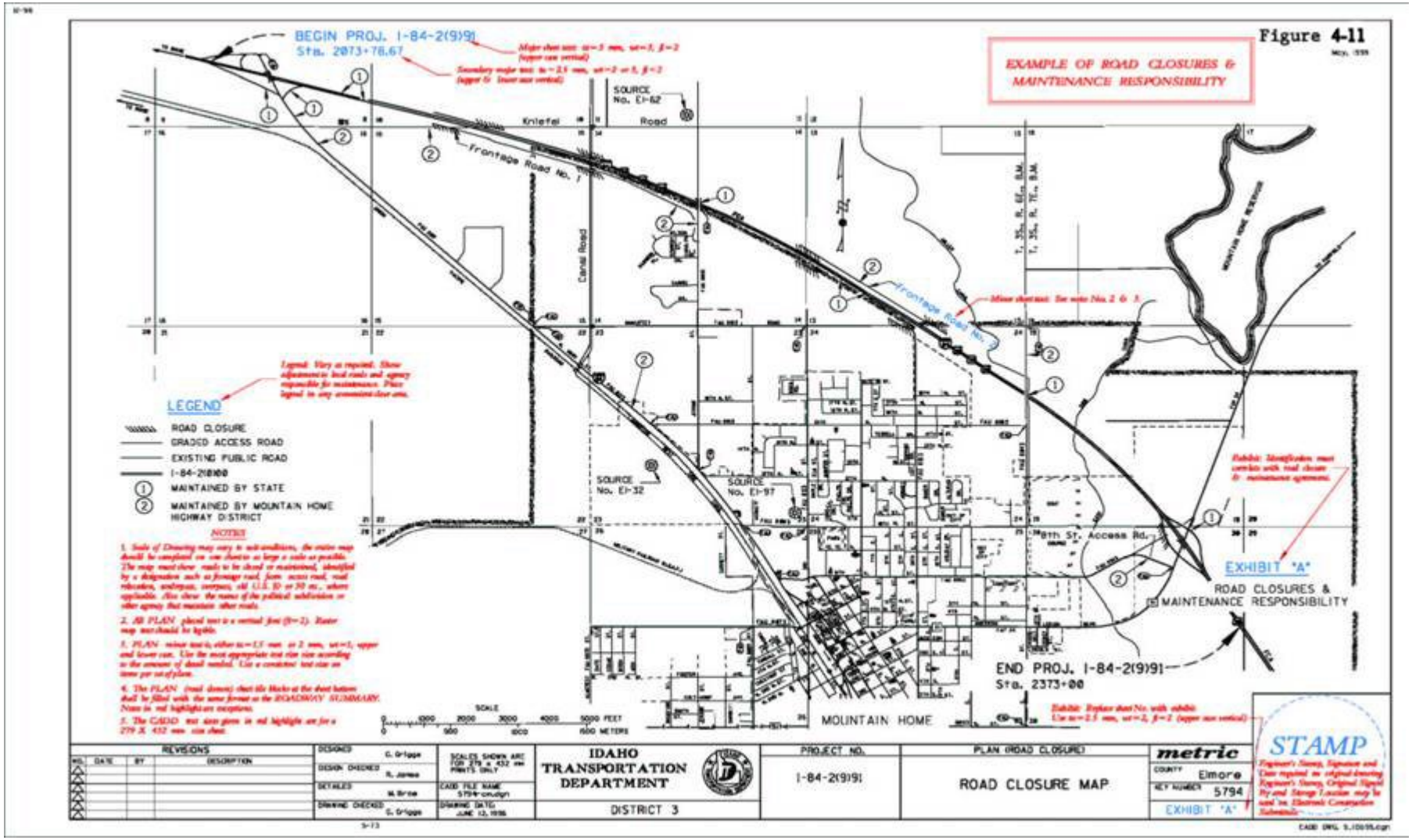
(SEAL)

By regular/special meeting on

_____

Figure 4-6

ROAD CLOSURE MAP



455.00 – SPECIAL PROVISION ITEMS – SP

Special Provisions are required for any feature of a project not covered by the Standard Specifications; where the Standard Specifications are being amended; and for deviation from the Standard Specifications. When in doubt regarding the necessity for Special Provisions, study the Standard Specification item by item to prevent duplication. Review Sections 104 to 109 in the Standard Specifications to determine any general, overall contract requirements, which may cover the situation.

- Check that Special Provision Pay Items are written fully and accurately to describe the work to be done, the method of measurement and basis of payment, and when necessary has supporting drawings. A Special Provision is not a recommendation, a suggestion, or any discretionary statements; it must be clear and a distinct direction of work. Repetition or highlighting of Standard Specifications via Special Provisions is not recommended and should be avoided.
- The Special Provision items which involve the furnishing and/or installation of electrical and/or mechanical equipment shall include the following clause:

  "All manufacturer's warranties, or guarantees on electrical and mechanical equipment, materials or products purchased for use in the project which are consistent with those provided as customary trade practice must be obtained by the Contractor; and upon acceptance of the project, the Contractor shall assign such warranties or guarantees to the State."
- In addition, at the discretion of the State, the following clause may be required:

  "The Contractor shall warrant the satisfactory in-service operation of the electrical and mechanical equipment, materials and products for a period of time (not to exceed six months) following the project acceptance."

455.01 Special Provision Preparation. The following guidelines should be followed for preparation and submission:

Specifications shall ensure full opportunity for competition among equivalent materials, equipment, and methods. In exceptional cases, where satisfactory specifications cannot be developed or obtained from organizations maintained for the specific purpose of developing specification requirements based on laboratory tests or other performance requirements; there will be no objection to the use of trade name designations, provided all or at least a reasonable number of acceptable materials or products are listed.

Sole Source/Certification

A project may require a specific material or product (Sole Source). References to single trade name materials or proprietary products in specifications and on plans shall be justified in writing including a public interest finding and will be provided to DMC on all projects. Documentation shall be approved prior to PS&E Submittal.

FHWA will not participate, directly or indirectly, in payment for any premium or royalty on any patented or proprietary material, specification, or process specifically set forth in the plans and specifications for a project, unless:

1. The item is purchased or obtained through competitive bidding with equally suitable unpatented items or
2. ITD /local public agency certifies either that the proprietary or patented item is essential for synchronization with the existing highway facilities or that no equally suitable alternative exists,
3. A Public Interest Finding (PIF) is approved for a proprietary product when other acceptable products are available, or
4. The item is used for research or for a special type of construction on relatively short sections of road for experimental purposes.

If a project requires specifying a proprietary product for reasons 2 or 3 (listed above), it may be approved if it can be found that its utilization is in the best interest of the public.

Proprietary product documentation will fall into one of two categories: Certifications or Public Interest Findings (PIF).

A Certification is used if a product is essential for synchronization or if the contracting agency specifies a unique product for which no equally suitable alternative exists.

A PIF is used if a contracting agency elects to require a specific product when other acceptable products are available.

Public Interest Findings (PIF)

Guidance and Questions/Answers regarding the PIF's and the process can be found at http://www.fhwa.dot.gov/programadmin/contracts/011106qa.cfm

In general stating:

The PIF request should document the reasonableness of the minimum needs and the best method to meet these needs consistent with the requirement for the broadest practical competition. The supporting material may include engineering and economic considerations, product availability and compatibility, logistical concerns, and other unique considerations.

Depending on the facts and circumstances present, one or more of the following factors may need to be evaluated in a PIF request:

- A description of how the proprietary product requirement will benefit the public;
- An evaluation of the pool of other equally acceptable products;
- An estimate of additional costs incurred as a result of this proprietary product requirement;
- Description of need, including limitations and conditions (types of roadways, traffic volumes, and other critical factors);
- Engineering / economic analysis supporting the requested action;
- Duration of approval

A Certification approval process may be followed, when the patented or proprietary products are:

a. Necessary for synchronization within existing facilities; or

b. A unique product for which there is no equally suitable alternative.

Synchronization may be based on:

- *Function* (the proprietary product is necessary for the satisfactory operation of the existing facilities)
- *Aesthetics* (the proprietary product is necessary to match the visual appearance of existing facilities),
- *Logistics* (the proprietary product is interchangeable with products in an agency's maintenance inventory) or any combination thereof.

When products that meet the above requirements are certified, the submittal should contain supporting documentation upon which the Certification was based. Such documentation may include, as appropriate, a description of:

- How the proprietary product requirement will benefit the public.
    - The unique needs that are being addressed that result in no equally suitable alternative.
    - Identified safety locations or critical decision points that would justify a higher standard.
- An evaluation of the pool of potential products, and a description of why these products cannot meet the contracting agency's needs.
- An estimate of additional costs, if any, incurred as a result of this proprietary product requirement.

Guidance and Questions/Answers regarding Certification's and the process can be found at

http://www.fhwa.dot.gov/programadmin/contracts/011106qa.cfm.

Approval

DISTRICT and LPA PROJECTS - District Engineers approve proprietary products requests for Certifications, PIF's and Experimental Product Work Plans (EPWP) for their districts. When local public agencies certify proprietary products, the District Engineer will concur. The District Engineer will approve local public agencies PIF's. Proprietary products requests for Certifications, PIF's and EPWP's, on FHWA Projects of Interest, require FHWA approval and shall be submitted to FHWA by the district. Coordination with ITD Headquarters' subject matter experts (SME's) during the approval process is at the district's discretion.

LHTAC and HQ SECTION PROJECTS - The State Design Engineer will concur with Certifications and approve PIF's and EPWP's for LHTAC administered Federal Aid projects and ITD headquarter's sections (District 9) projects. Proprietary products requests for Certifications, PIF's and EPWP's, on FHWA Projects of Interest, require FHWA approval and shall be submitted to FHWA by the State Design Engineer. Coordination with ITD Headquarters' subject matter experts (SME's) during the approval process is at the State Design Engineer's discretion.

In accordance with the requirements of MAP-21 Section 1525, 23 CFR 635.411 allows the Department the *"autonomy to determine culvert and storm sewer material types to be included in the construction of a project on a Federal-aid highway"*. The use of the word autonomy gives to the Department the sole authority and discretion to make a decision regarding culvert and storm sewer materials types without the input or approval from FHWA.

These materials must still comply with all applicable Federal requirements, including Buy America, culvert design standards in 23 CFR Part 625, and the restriction against the use of patented and proprietary products in 23 CFR 635.411.

Special Provision Examples are available from DMC. These Special Provision Examples are versions of Special Provisions (SP's) dated in the heading to show the current version. They are stored in dmc(\\itdhwy\hwyfiles\programoversight)\pse\Standards and have been assigned a unique item number. When using any of these dated special provision examples with minor modification, the heading date must have "MOD" (modified) added. In addition a number of SP's also include (Required) in the heading to show these SP's are restricted from modification without appropriate approval.

The following guidelines should be followed for SP preparation:

- Fully and accurately describe the work, method of measurement, basis of payment, and include supporting drawings, when necessary.
- Do not use recommendation, suggestion, or discretionary statements; provide a clear and distinct direction of work.
- Do not reference proprietary specifications of national, regional, or local trade associations (Western Pipe Association, etc.). Proprietary specifications are subject to change without notice to, or acceptance by, the State or FHWA.
- Follow the general wording and five-part format of the Standard Specifications, in particular, the measurement and payment subsections.

A heading for each respective subsection shall include:

Description of Work — A short, condensed statement of the work to be done, together with references to Standard Specifications, other Special Provisions, or plans that further define the work. When necessary or desirable for clarity, establish the relationship of the work item to other work items or other phases of the construction.

Materials — Designate the materials to be used in the work items and establish the requirements therefore. Material specifications for the work item may be either shown in this article or grouped with those of other items in a separate heading. Complete specifications of the properties of each material and the method of test shall be detailed when applicable, and reference may be made to applicable specifications under other work items, or to AASHTO, ASTM, or Federal Specifications.

Construction Requirements — Show the sequence of construction operations and the end product to be obtained. While specification requirements should be sufficiently detailed to ensure satisfactory completion of the work, specific requirements pertaining to methods and equipment should be held to a minimum to permit the use of improved equipment and encourage contractors to apply new and advanced ideas in construction methods.

Method of Measurement — Measurement shall be clearly denoted for each item.

Basis of Payment — Use Standard Wording “The Department will pay for accepted quantities at the contract unit prices as follows:” Other items noted in the work, but measured in other items shall be clearly noted.

The use of version dates in special provisions shall conform to the following:

1 - Version Dates are only for **approved** inserts/SP’s.

Although some sp's and modifications are being used repeatedly by individual districts, dates will not be added until the bidder/contractor can be assured this is the same note statewide.(Must be a standard insert or an approved SP – i.e. with required wording)

2 - Version Dates are intended to show the insert is current.

Inserts/Special Provisions should be reviewed at advertisement and replaced with the most current dated version.

3 - Version Dates are there to show the insert is standard version and not modified.

When date of an insert includes the word Modified (Modif) the readers of special provisions can tell that this normally standard insert has been changed for this particular project.

460.00 – ADDITIONAL CONSIDERATIONS

460.01 Project Completion Time. The number of working days or calendar days for the various construction stages and/or the entire project shall be included in the project proposal. For the contract time calculations, use the "Contract Time Determination Manual" prepared by DMC.

Contract time determination worksheets one, two, and three are required on all Federal-Aid projects and are optional on State-funded projects. Worksheet three may be computerized.

460.02 Liquidated Damages and Cost of Plans. Unless otherwise recommended by the district or management, the following Schedule of Liquidated Damages will be used for selecting the Liquidated Damages to be applied to a given contract. On projects requiring a greater number than usual of state construction personnel, the district should recommend higher liquidated damages than is indicated by the following schedule. Justify any changes in the project file.

SCHEDULE OF LIQUIDATED DAMAGES		
Contract Estimate (Bid Amount)	**Liquidated Damages (Daily Charge)**	Cost of Plans Produced on CD/DVD
$0 -50,000	$175	Plan Costs will be $5.00.
$50,000 -300,000	$500	
$300,000 -500,000	$900	
$500,000 -1,000,000	$1,200	
$1,000,000 - 3,000,000	$1,500	
$3,000,000 - 4,000,000	$2,000	
$4,000,000 - 5,000,000	$3,300	
$5,000,000 –10,000,000	$4,100	
$10,000,000 or greater	$7,700	

460.03 No-Bid Items of Work.

Any work done by state or local forces on federal-aid projects must document that the work is in the public interest and may be done on an ITD 2395, Request for Federal Aid on No-Bid Items of Work (Force Account). A Cost Effectiveness Analysis of the work to be performed by the state or local forces and a comparison of the cost for the same work to be performed by the contractor is required. This is also required for projects with local public agencies. Utility work by the utility companies or their contractors does not require this documentation.

On FHWA Projects of Interest documents shall be recommended by the districts or the State Design Engineer and submitted to FHWA for approval. Exempt project documents will be approved by the District Engineer for district and LPA projects and by the State Design Engineer for LHTAC and headquarters' (District 9) projects. Approval is required prior to PS&E Submittal. The Department has a state-wide blanket approval for the following items:

Pavement Markings	approved:	5/18/11
Seed	approved:	5/6/11
Hydro Seeding Applications	approved:	5/1/09

Requests for no-bid items of work for striping are completed by Traffic Services. Requests for no-bid items of work for seed and hydro seeding application are completed by Maintenance.

These approvals are to be updated annually (by October 1) if the items are to be used the following year. The appropriate section submits the blanket requests to FHWA for approval. Copies of the latest approvals shall be sent to DMC.

460.04 Utility Coordination. A statement is received from the State, either separately or combined with the information required by 23 CFR, Section 635.309 (c), that either all right of way clearance, utility, and railroad work has been completed or that all necessary arrangements have been made for these activities to be undertaken and completed as required for proper coordination with the physical construction schedules. Where it is determined that the completion of such work in advance of the highway construction is not feasible or practical due to economy or there are special operational problems, appropriate notification shall be in the bid proposals noting the right of way clearance, utility, and railroad work which shall be underway concurrently with the highway construction.

460.05 Construction Trainees.

Each major Federal-Aid highway construction project shall consider a contract special provision for construction-related trainee positions prior to bid letting. The district and HQ EEO determine which construction contracts will contain a training special provision and the number of training hours that can be accomplished on each project. A bid item shall be included in the project estimate.

Before and throughout each construction season, an evaluation of potential availability of work under contracts, the duration of the work (to ensure adequate time for completion of training), and the potential long-term benefits to the trainees shall be determined by the district.

Assignment of training "hours" to specific contracts shall be based on:

- The availability of minorities, women, and disadvantaged.
- The potential for effective training.
- Duration of the contract.
- Dollar value of the contract.
- Total normal work force that the average bidder could be expected to use.
- Geographic location.
- Type of work.
- Need for additional journeymen in the area.
- Total goals established.
- Ratio of journeymen to trainees during normal operations.

The provisions for Trainees shall be considered and determined during the project development phase with the project records documented on the basis for establishing, or not establishing, trainee positions and the number of positions. An ITD-2324 Process for Setting DBE Goal and TSP Hours on Federal Aid Projects shall be initiated by the district and submitted to HQ EEO for

completion. Based on this determination a bid item will be included in the contractor proposal if trainee positions are provided. The project programming, ITD 2101, for construction will also indicate the number of trainee hours proposed for the project.

Training hours will be included in the final contract as a separate line item and construction shall not commence until the contractor's Training Program is approved by FHWA, U.S. DOL, and/or ITD.

460.06 Disadvantaged Business Enterprise (DBE). Federal-aid projects must be reviewed for the percentage of contract work that could be accomplished by DBEs on a case by case basis. (ITD reserves the right to establish, or not establish, DBE project requirements on state-funded projects.)

Using the criterion outlined in this section, individual contract requirements are fluctuated above and below the established statewide goal in order to achieve the DBE participation calculated to create a level playing field. Items considered in establishing contract requirements will include, but are not limited to, the following:

- Location of project,
- Type of project,
- Availability of qualified DBEs,
- Estimated cost of the project or portions thereof, and
- Consideration of line items with the most DBE subcontracting, services, or supplier potential.

Prior to solicitation of bids, all proposed Federal-Aid construction contracts will be reviewed by the districts and HQ EEO to identify work which could be performed by DBEs. An ITD-2324 Process for Setting DBE Goal and TSP Hours on Federal Aid Projects will be initiated by the district and submitted to HQ EEO for completion.

460.07 Prime Contractor. Federal-Aid projects should be reviewed for the percentage of contract work that could be accomplished by the bidder (prime contractor). The Standard Specifications for Highway Construction, Subsection 108.01 - Subletting of Contract, specifies the percentage of work that may be subcontracted. If necessary, the percentage of contract work to be accomplished by the prime contractor on federal-aid projects may be reduced to 30% of the contract amount.

The following circumstances may be reason to reduce the percentage of work by the prime contractor:

- deciding which phase of work should be primary (an example is a combination roadway and bridge project)

- rest areas or roadway projects with buildings
- when DBE requirements create a hardship for the prime contractor to perform 50% of the work

460.08 Tribal Employment Rights Ordinances (TERO) Requirements. Highway construction projects located, in whole or in part, on Indian reservation lands may be subject to tribal ordinances governing employment practices and fees. Early in the project development, the Designer should determine if the project will be affected by TERO requirements.

Federal-aid projects that are subject to TERO requirements shall identify these requirements in the contract proposal under the heading "Tribal Special Provisions." The Special Provision requires the contractor to contact the TERO office on the reservation to administer employment of tribal personnel on the project, and/or provide trainee positions.

Before commencing work on a project covered by Tribal Employment Rights Ordinances, the Resident/Regional Engineer must have received a facsimile copy of the agreement between the Contractor and the Tribal Representative establishing preferential employment rights for Indians and the amount of the TERO fee, if applicable. The District Engineer, or a designated representative, shall periodically (at least monthly) contact the appropriate TERO Representative for assurance that the agreement is being honored. A memorandum concerning the periodic contact shall be sent to HQ EEO.

The Indian reservation boundaries in Idaho are displayed in the following Figures 4-7 through 4-10.

460.09 Salvage Credits

Salvage credit is required to be shown on the ITD-2101 unless one of the following circumstances are met:

• the salvaged item has a value less than $5,000,

• the salvaged item becomes the contractor's property by virtue of the contract

provisions, or

• the salvaged item will be reused in future projects eligible under Title 23 U.S.C.

until its useful life is expended.

When salvage is required, careful attention should be given to the contract provisions

for salvage to ensure that the cost of the operation (i.e., removal or salvage) does not

exceed the value of the item(s) to be salvaged. Items to be salvaged may be unused

construction materials, salvaged highway appurtenances, or other equipment or material for which the useful life is greater than one year.

Figure 4-7

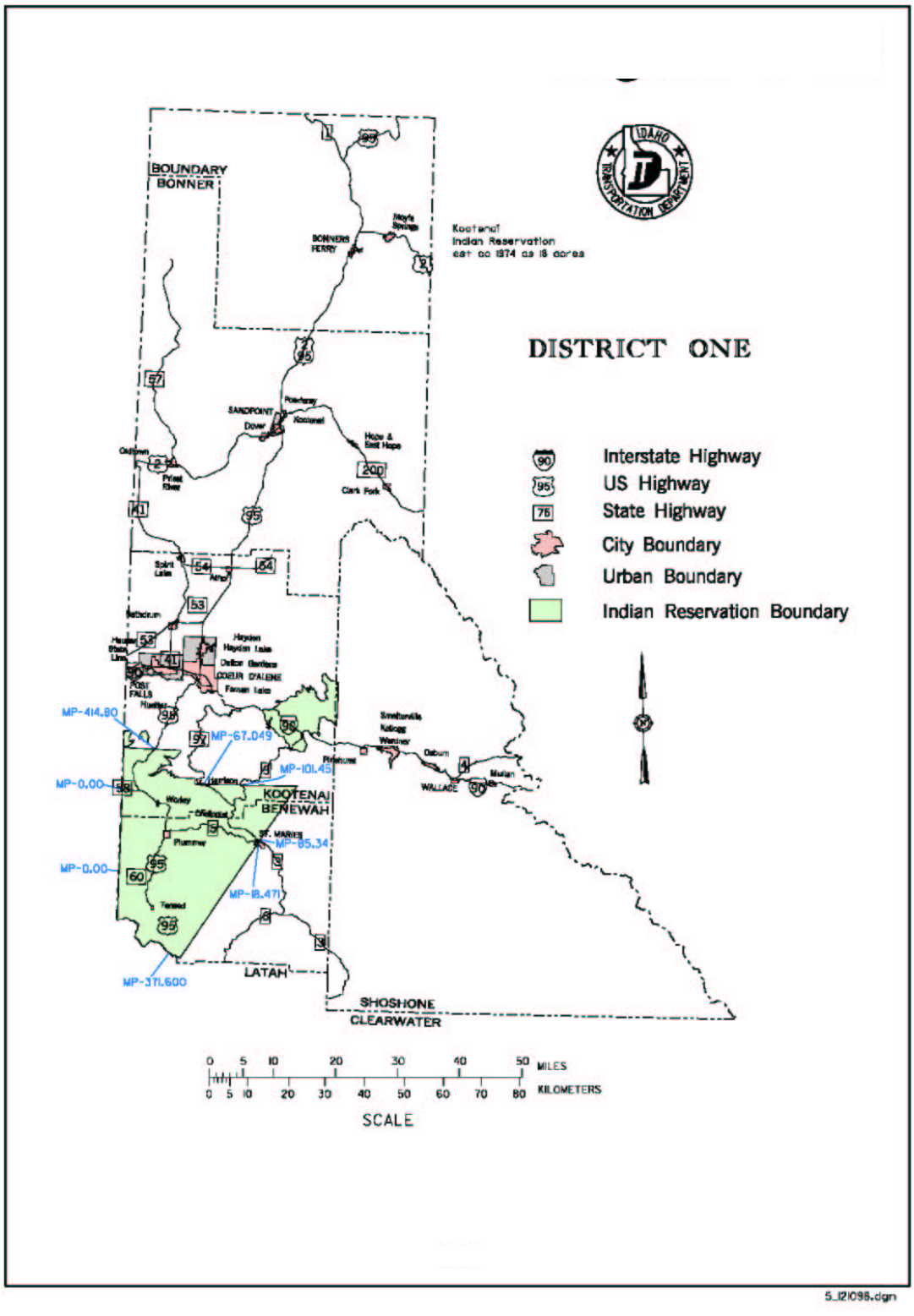

DISTRICT ONE
Interstate Highway
US Highway
State Highway
City Boundary
Urban Boundary
Indian Reservation Boundary
BOUNDARY
BONNER
KOOTENAI
BENEWAH
SHOSHONE
CLEARWATER
LATAH
MP-414.80
MP-67.049
MP-101.45
MP-0.00
MP-85.34
MP-0.00
MP-18.471
MP-371.600
MILES
KILOMETERS
SCALE
5_121098.dgn

Figure 4-8

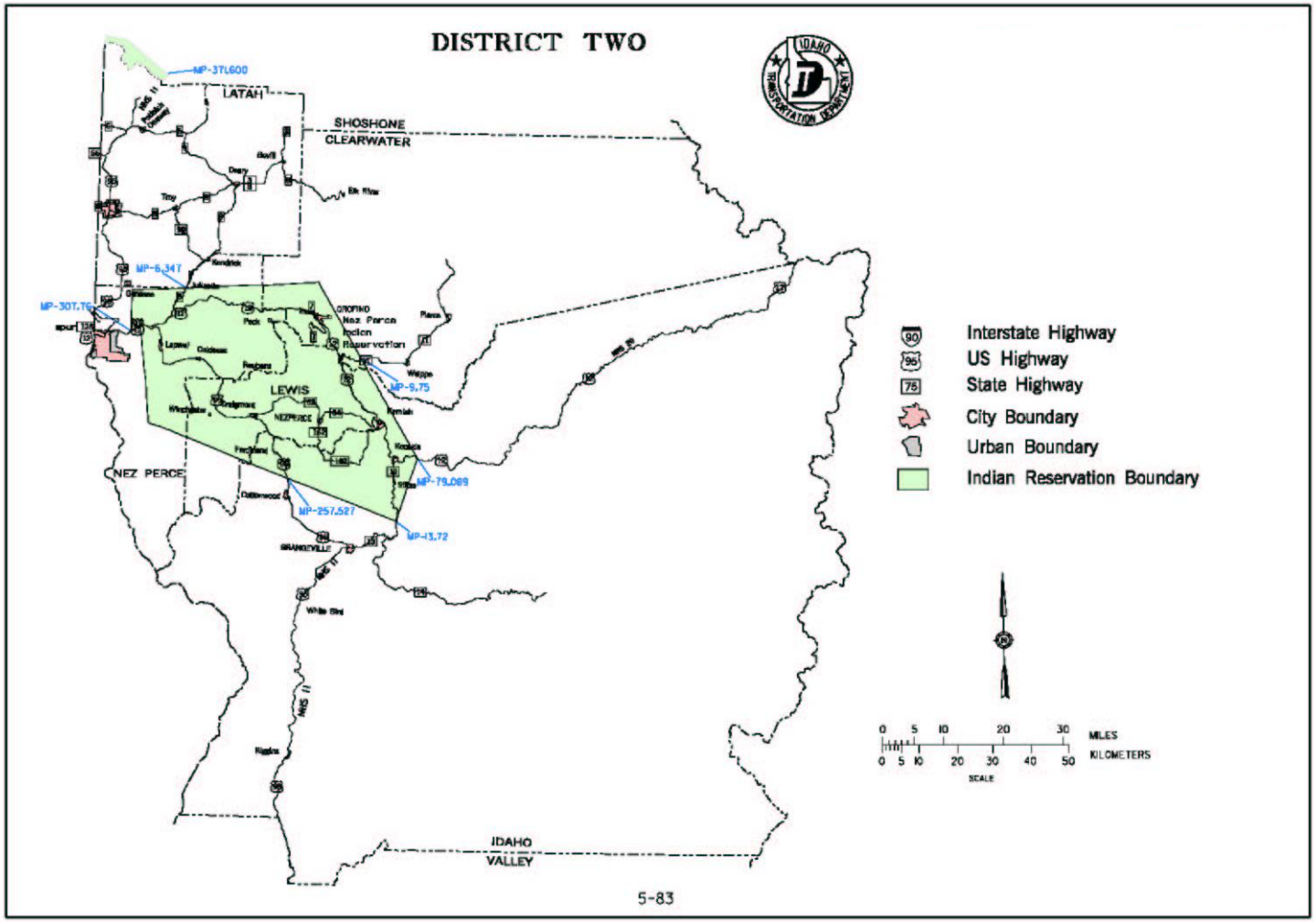

DISTRICT TWO
LATAH
SHOSHONE
CLEARWATER
LEWIS
NEZ PERCE
IDAHO
VALLEY
Nez Perce Indian Reservation
Interstate Highway
US Highway
State Highway
City Boundary
Urban Boundary
Indian Reservation Boundary
MILES
KILOMETERS
SCALE
5-83

Figure 4-9

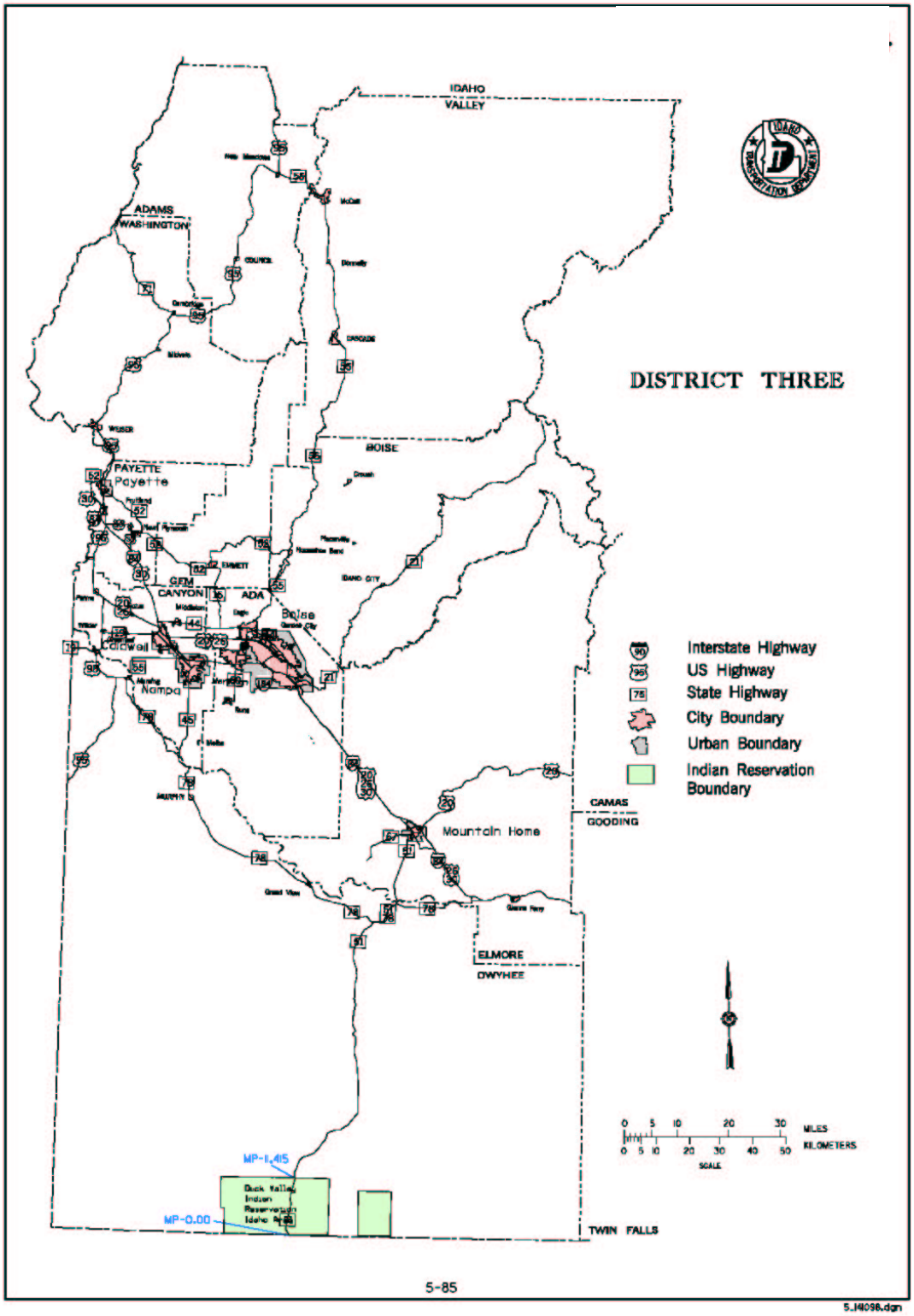
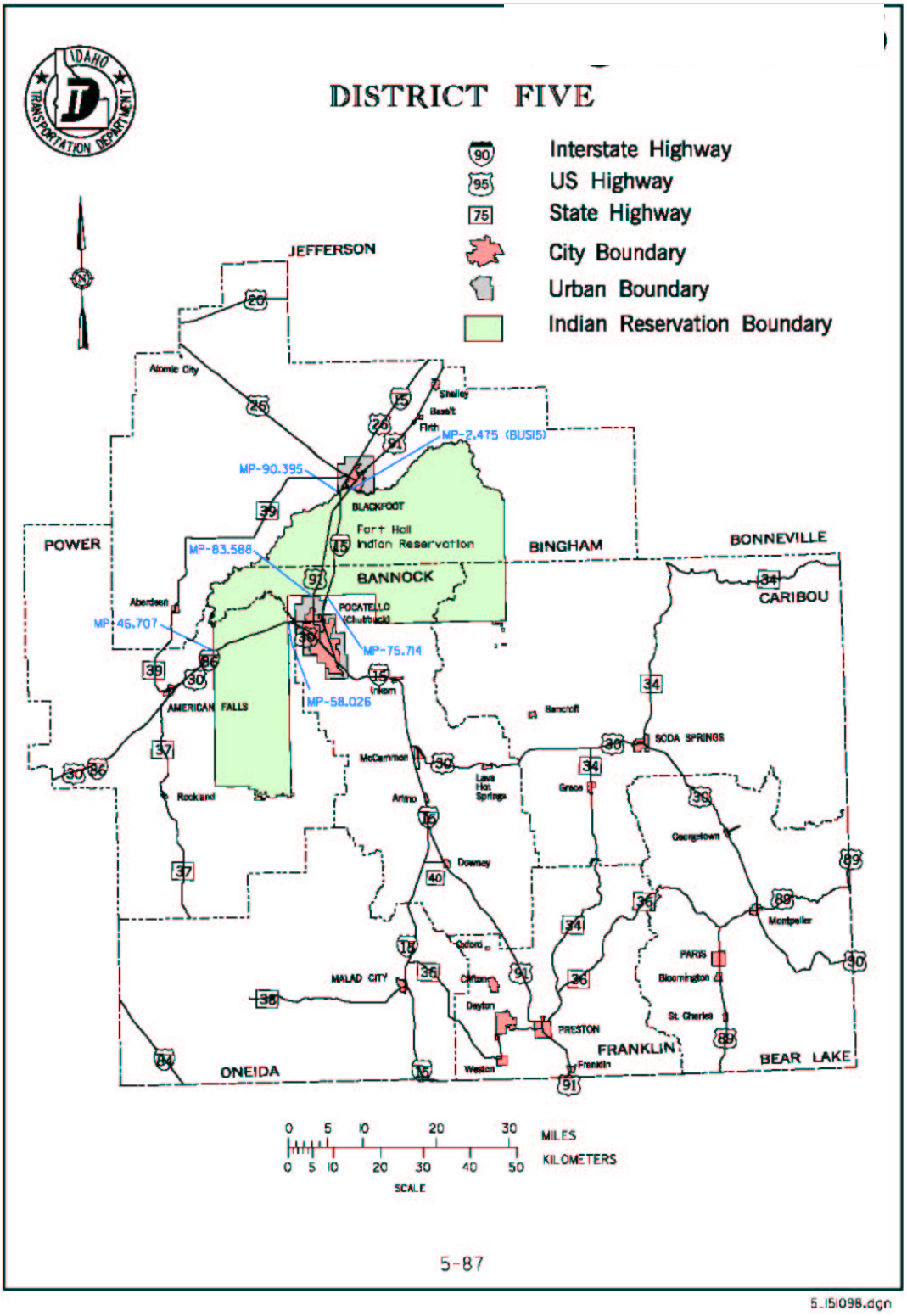

DISTRICT THREE
IDAHO
VALLEY
ADAMS
WASHINGTON
BOISE
PAYETTE
Payette
GEM
CANYON
ADA
Boise
Caldwell
Nampa
CAMAS
GOODING
Mountain Home
ELMORE
OWYHEE
TWIN FALLS
Interstate Highway
US Highway
State Highway
City Boundary
Urban Boundary
Indian Reservation Boundary
MP-11.415
MP-0.00
MILES
KILOMETERS
SCALE
5-85
5_14098.dgn

Figure 4-10


DISTRICT FIVE
Interstate Highway
US Highway
State Highway
City Boundary
Urban Boundary
Indian Reservation Boundary
JEFFERSON
POWER
BINGHAM
BONNEVILLE
CARIBOU
BANNOCK
ONEIDA
FRANKLIN
BEAR LAKE
BLACKFOOT
Fort Hall Indian Reservation
POCATELLO (Chubbuck)
AMERICAN FALLS
SODA SPRINGS
PRESTON
PARIS
MALAD CITY
Atomic City
Shelley
Aberdeen
Rockland
McCammon
Lava Hot Springs
Grace
Georgetown
Montpelier
Bloomington
St. Charles
Downey
Oxford
Dayton
Weston
Franklin
Inkom
Arimo
Bancroft
MP-90.395
MP-2.475 (BUS15)
MP-83.588
MP-46.707
MP-75.714
MP-58.026
0 5 10 20 30 MILES
0 5 10 20 30 40 50 KILOMETERS
SCALE
5-87
5_151098.dgn

465.00 – PROPOSAL DOCUMENTS

Proposal documents are the plans, specifications, etc., that are assembled to define advertised projects. The contract proposals are to be written following the specification format. The proposal inserts are available in a department's server—Design on dmc http://www.itd.idaho.gov/design/contractors/Special%20Provision%20Format%20Example/Bid inserts 01-12.zip supplemental Specification) and are also available on the web at http://www.itd.idaho.gov/design/contractors/Special%20Provision%20Format%20Example/bidinsert04.htm.

465.01 Proposal Document Preparation. Special provision documentation (proposal document preparation) is to be typed on an MSWord readable program and transmitted to DMC. Number the sheets from cover to back to ensure all sheets have been received. All material for the Contractor's Bid Proposal shall be 8 ½ inches x 11 inches (letter-sized) material.

The following steps should be worked through in order to complete each proposal.

- Review latest edition of DMC inserts. Complete by filling in the project number, project name, and county. Fill in the latest edition of the supplemental specification. Follow the instruction sheet to get the correct Supplemental Specifications, Standard Special Provisions and Inserts.
- Add Source Identification from the Phase III Materials Report.
- Insert liquidated damages and working days.
- Insert contractor's notes from the Phase V Materials Report, and notes concerning items not tied to specific pay items, concerning utility adjustment, etc.
- Insert applicable current proposal inserts

Insert any revision to Standard Specifications from the Phase V Materials Report, Bridge, or revisions that you have determined necessary.

Insert special provisions from the Phase V Materials Report, Bridge, or nonstandard items that you have added as special provisions.

If modifications to the method of measurement and the basis of payment in your proposal are needed, it should be done by writing a Special Provision.

465.02 Plan Quantity.
Only those items that will not be measured during construction can be designated as a plan quantity item. When an item other than those currently covered in the Standard Specifications are selected for designation of plan quantity, the Standard Specifications Method of

Measurement or Basis of Payment will need to be modified to required Plan Quantities in accordance with the Standard Specifications for Highway Construction, Subsection 109.01.

465.03 Modification of Standard Specifications. When standard specifications are to be modified for a project, the sequence of modification shall follow the order of items, page by page, in the Standard Specifications book. In making modifications to the existing specifications, it is desirable; to delete entire paragraphs and substitute one or more new paragraphs that are written to cover the deleted or additional specifications.

465.04 Contingency Items. The use of items as contingencies should be clearly addressed at the final design review.

The definition in Section 101.04 of the Standard Specifications defines Contingency Item as an item with a set price. Keep in mind that adding the words "Contingency Item" to the supplemental description line in your estimate does not do anything.

When you have an item that

- you are not sure you will need
- you cannot estimate the quantity

consider the following options:

Use a standard Bid Item

Use a standard Bid Item and include a contractors note

Use a Set Unit Price (Contingency Item) - The Resident Engineer will need to approve this method.

The way to accomplish this in your Transport estimate is to toggle the "Pre-Established Price" entry in under your pay item to say yes (this is the 3rd from the bottom entry)

Use a Contingency Item with Force Account Method of Measurement – This will result in a total $ amount being pre-entered on the bid schedule. The quantity will be 1 and the unit will be CA (Contingency Amount). If the work is needed, it is paid by force account.

The way to accomplish this in your Transport estimate is to use the unit SPCA . Toggle the "Pre-Established Price" entry in under your pay item to say yes (this is the 3rd from the bottom entry)

470.00 – SPECIFICATIONS

Specifications detail project requirements, modifications, and other restrictions and must follow a specific format (see dmc) http://www.itd.idaho.gov/design/contractors/Special%20Provision%20Format%20Example/Bid inserts 01-12.zip or http://itd.idaho.gov/design/cadd/SpecialProvisions/bidinsert04.htm . In the Complete Bid Insert Document Set file, the specifications are shown in the Format.doc and an example in shown in the Sample.doc.

475.00 - FINAL DESIGN REVIEW

475.01 Plans and Data Required for Final Design Review. The final design review may occur before acquisition of right of way or during right of way acquisition and without final bridge design approval. The Final Design Checklist (Figure 4-11) should be completed to ensure that all details are completed before submittal. If the districts are requesting Headquarters' sections to review final plans, the district shall transmit the review plans by submitting a letter (Figure 4-12) to the reviewing sections that specifies the time and date for the review, and includes all documents to support the design criteria. A copy of the letter should be included with the plans to enable prompt action to be taken. For FHWA Projects of Interest a copy of the review plans shall be sent to the FHWA official mail box.

475.02 Plan-in-Hand Review.

Either before or during the final design review, a plan-in-hand field review to check constructability and maintainability is required for all projects except:

- Review of projects that are under heavy snow cover at the final design review time may be impractical.
- Preventive Maintenance type projects.

The plan-in-hand field review will be attended by the Project Development Engineer, Designer, Resident Engineer and/or Project Engineer, and others including FHWA Operations Engineer as invited.

475.03 Final Design Review Report. A letter summarizing the decisions in regard to the comments and suggestions presented at the final design review shall be prepared by the district. Copies of this letter shall be furnished to all concerned.

Figure 4-11

FINAL DESIGN CHECK LIST			
Project No.		Reviewed by	
Key No.		Date	
Project Name			
District No.			
District Projected Bid Opening Date			
Program Amount			
☐	Check Project Tracking and Charter		
☐	Update 1414/Charter?		
☐	Check that all Transmittals are included.		
☐	Review Files, Materials Reports, and Plans.		
☐	**DESIGN:** Distribute Letter and/or Plans and Proposal to: ☐Bridge ☐Materials ☐FHWA ☐Right-of-Way ☐ Utilities		
PROPOSAL			
☐	Check for proper format: Project number and location against Project Tracking.		
☐	Are all applicable supplemental special provisions and applicable Federal and State requirements called out?		
☐	Does it include the source identification and cost of materials?		
☐	Are the liquidated damages correct?		
☐	Are all notes to the contractor applicable and not duplication of		
☐	Tribal regulation included, if appropriate?		
☐	Partnering insert included, if needed.		
☐	Can prime contractor do 50% of contract on federal-aid project		
☐	Are there building projects warranties up to 6 months for electrical and mechanical?		
☐	Determine working days or completion date using the Contract Time Determination Manual.		
☐	Is utility coordination Contractor Note included?		
☐	Review specification modifications for intent.		
☐	Are Materials Special Provisions supported by the Materials Report?		
☐	Has estimated cost been shown for furnished material? (Use Tax)		

Figure 4-11

FINAL DESIGN CHECK LIST		
	PROPOSAL (continued)	
☐	Do approved proprietary items have “or equals” statement? If category II research items are used — highlight and do not allow “or equal” statement.	
☐	Describe areas requiring RR insurance (each separate project on multi-project contracts).	
☐	Compare SP’s name and number to plan summary and cost estimate.	
☐	Erosion control statement or plan included?	
☐	Seed requirements and seed windows specified?	
☐	Class aggregate size and PG binder plant mix.	
☐	Ensure contractors protect bridge joints during seal coat operations. Resident & Regional Engineers need to protect all items near bridges and roadways (i.e., ice detectors, etc.).	
ESTIMATE		
☐	Check if contingency items are tied down and are not open ended.	
☐	Are all programmed items included on the engineers estimate?	
☐	Are there estimates separated for roadway, structures, etc.?	
☐	Review prices.	
☐	Seeding Items Included?	
☐	Are there any items that have salvage value?	
☐	Are furnished items listed?	
☐	Should the project include trainees? ITD-2324 Complete?	
☐	Railroad Flagging?	
☐	Is there any work to be done by others? (State, County, Utilities, Etc.)	
☐	Is this work justified and approved?	
☐	Compare costs to program amount (all programmed items); if necessary update ITD1414.	
	PLANS	
GENERAL		
☐	Are plan sheets legible?	
☐	Do they show the work to be done?	
☐	Check for appropriate scale for reduction (buildings, etc.).	
☐	Has recommended changes on previous review been made?	
☐	Review EIS for any special environmental conditions specified.	
☐	Right-of-Way agreement changes made?	
TITLE SHEET		
☐	Is the project title correct?	

Figure 4-11

FINAL DESIGN CHECK LIST		
PLANS (continued)		
	Are applicable standard drawing, structural drawings, traffic control, bridge drawings listed?	
☐	Are the sources shown?	
TYPICAL SECTION		
☐	Are station limits shown?	
☐	Is the estimating data complete?	
☐	Are the slopes specified?	
☐	Are the basic R/W lines shown?	
CLEARANCE SUMMARY		
☐	Is the estimating data complete and agreeable with Materials Report?	
☐	Check all clearances. (Are there any needing renewed?)	
☐	Has Mitigation Plan been approved?	
AGREEMENTS COMPLETED		
☐	State/Local	
☐	Cooperative	
☐	Construction	
☐	Road Closure & Maintenance	
ROADWAY AND BRIDGE SUMMARIES		
☐	Check items number and nomenclature.	
☐	Check bridge items against situation layout summary for each structure.	
☐	Check all summary items against engineer's cost estimate items.	
☐	Check that there are separate summaries for roadway and bridge.	
PIPE SUMMARY SHEETS		
☐	Check for completeness and if acceptable alternates are shown.	
SOURCE PLATS		
☐	Is the area to be worked clearly shown?	
☐	Does the log hole date show sufficient data to draw a reasonable conclusion?	
☐	Does it have archeological clearance?	
☐	Is it cleared by right of way?	
☐	Is the Reclamation Plan approved?	

Figure 4-11

FINAL DESIGN CHECK LIST		
MILEPOST CHANGES		
☐	Proposed milepost changes. ITD 2184	
☐	Milepost log work sheet. ITD 2185	
☐	Are plan sheets indicating milepost equations attached to ITD 2184?	
☐	Are mileposts indicated at beginning, end, and one mile increments on projects?	
COMMENTS:		

Figure 4-12

ITD-500

IDAHO TRANSPORTATION DEPARTMENT

Department Memorandum

DATE: _____ **Project No**.(s):_____(____)

TO: REVIEW SME **Key No**.(s):_____

FROM: PROJECT DEVELOPMENT ENGINEER **Project Identification, County, Etc.:**
DISTRICT # PROJECT NAME (as it appears in the six-year program & Project tracking), _____CO., WA # _____

RE: FINAL DESIGN SUBMITTAL

A final design review is being held for this project on (date, time, and location). Included for review are plans, Proposal cost estimate for this project.

Calculations for Contract Time
Permits and Application
Mitigation Summary

Additional information that may be included are:
Comments on any unusual aspect of the project
Approved Request for Federal-Aid on No-Bid Items of Work

Waiver of scheduled reviews or when held.

(Note any changes made to a Consultant project that have been discussed with the consultant.)

MG:wc
Attach.
cc:

480.00 – SPECIAL ROADWAY PLANS

480.01 Abbreviated Project Plans.
Abbreviated project plans may be used provided there is sufficient information to properly complete the project, particularly for special type projects such as Projects by Agreements, Emergency Relief (ER), and Safety Projects. Abbreviated project plans are also adaptable to special projects for Resurfacing, Restoration, Rehabilitation, and Reconstruction.

480.02 Projects by Agreement. Projects by agreement are generally constructed by local public agencies (City, County, etc.), Utility, and Railroad companies with their forces after an agreement is made between the department and the entity. The Contract Proposal and contents are not required since the construction requirements as written in the agreement are shown on the plans.

480.03 Emergency Relief (ER) Projects. Emergency Relief projects are funded with emergency funds authorized for the repair or reconstruction of highways and bridges which have suffered serious damage as the result of acts of nature.

480.04 Safety Projects. Safety projects are funded with federal and state funds that are authorized for expenditures to update and repair features effecting safety on the roadway, such as minor signing, delineation, pavement marking, guardrail, and railroad crossings. Safety projects must have a final design review and comply with the applicable parts of the review.

480.05 Additional Data Requirements for Special Projects.
Additional data that is required for the above mentioned Special Projects are:

- Agreements, exhibits and/or appendices, records, and other data to support the cost expenditures for use of men and equipment.
- Right of way data showing all features of existing and any new acquisitions of right of way including easements.
- Copies of the right of way certificate or data previously submitted to Headquarters Right of Way.

SECTION 500.00 – DESIGN GUIDELINES AND STANDARDS

SECTION 500.00 – DESIGN GUIDELINES AND STANDARDS

510.00 – INTRODUCTION

The development and preparation of a highway improvement project requires compliance with design guidelines that have been proven effective for traffic operations and highway safety based on past usage. However, design personnel are allowed sufficient flexibility to develop a cost-effective, efficient and safe highway facility that is compatible with the terrain and adjacent development considering Context Sensitive Solutions.

Most nationally adopted guidelines such as AASHTO, while representing a national perspective, may not specifically address design considerations in Idaho. This chapter contains those design guidelines that are applicable to the Idaho State Highway System and that are not adequately addressed in other reference material. Additionally, this manual is more responsive to acceptable revisions than other nationally adopted publications and may represent the most recent expert opinions in design.

This chapter provides the following guideline materials:

- Additional information on existing guidelines for clarification purposes.
- Adoption of specific Idaho guidelines for situations not presently addressed in other publications.
- Adoption of revisions to existing guidelines to reflect the current design considerations, adapts to the Idaho State Highway System, or upgrade existing criteria.

Duplication of other approved design guidelines that are considered acceptable for application in Idaho is not intended. Other applicable reference publications are noted in Subsection 320.01.

The inclusion of these design values in this manual does not imply that existing streets and highways are unsafe or that other design criteria is not an acceptable approach to roadway facilities off the Idaho State Highway System. The values and guidelines provided herein are applicable only to new construction and improvements on the State Highway System in Idaho and exclude all maintenance activities. Modifications to these design guidelines are acceptable if the modification can be justified. Modification is encouraged if the results are an improved roadway facility.

The design guidelines contained in the Green Book (*AASHTO Policy on Geometric Design)* are accepted as the design criteria for the State Highway System.

510.01 Project Determination and Scope. As early as possible, a determination should be made by the district relative to project design guidelines. Roadway widths determined in corridor plans shall be adhered to unless lesser widths are approved as a design exception. The recommended widths in the corridor plans will be based on functional classification, area type and development, traffic volumes, safety requirements and route continuity. The recommendations shall also include consideration of community concerns and public involvement regarding environmental, scenic, historic, and preservation issues.

The project data shall be summarized and design criteria documented by completing a Project Charter. Refer to Section 300 for additional information relative to preliminary design analysis.

The following shall be used to determine project standards and FHWA oversight on projects.

PROJECT STANDARDS				
STANDARDS	AASHTO	STATE	3R	1R
ROUTE TYPE	NHS - Interstate(IS)	Non-NHS	NHS - IS	All
PROJECT TYPE	New/Reconstruction	New/Reconstruction (Include all LPA Projects)	3R (Resurfacing, Restoration, Rehabilitation)	Rehabilitation

FHWA OVERSIGHT	
FHWA Projects of Interest	EXEMPT
Annual list of projects agreed to by FHWA/ITD based on criteria established in February 2006.	All projects not on the annual FHWA Projects of Interest list

*The Interstate is part of the National Highway System, but for clarification of this chart it is considered separate.

515.00 – VERTICAL CLEARANCE FOR INTERSTATE STRUCTURES

All new structures are to be designed for 17 feet of vertical clearance over the entire roadway including the useable width of shoulder. This clearance may be reduced with prior approval from the DMC Engineer, DMV Port of Entry Manager and the Bridge Engineer, but is not to be less than 16 feet. (Refer to the Bridge Manual)

Any exceptions to the 16 feet vertical clearance standard for the rural interstate and the single routing in urban areas, whether the project is new construction, a project that does not provide for correction of an existing substandard condition, or a project which creates a substandard condition at an existing structure, will be coordinated with the Military Traffic Management Command Transportation Engineering Agency.

520.00 – PASSING LANES ON TWO-LANE HIGHWAYS

The capacity of a two-way, two-lane highway is a function of several variable traffic characteristics such as traffic volumes, number of commercial vehicles, roadway width, and passing opportunity. As traffic volumes increase, traffic queues can develop and create vehicle delays because the opportunity to pass another vehicle is restricted. The passing problem may be alleviated and the capacity of a two-lane highway improved when passing lanes are provided.

The purpose of a passing lane is to reduce vehicle delays at bottleneck locations such as on steep upgrades and to break up traffic platoons that can also cause following vehicle delays. The normally applied passing lane concept on hills are classified as climbing lanes which accommodate slow moving commercial vehicles on grades while allowing other faster vehicles to pass. The application and design of climbing lanes are addressed in the Green Book.

Passing lanes are also an acceptable alternative on two-lane highways in level or rolling terrain to reduce traffic queue delays and improve the roadway capacity. Passing lanes are a cost-effective approach towards providing an adequate level of service on a two-lane facility where a four-lane highway may not be either economically or environmentally feasible.

520.01 Need for Passing Lanes. The need for passing lanes should be based on level of service calculations in accordance with the Highway Capacity Manual (HCM), Chapter 8, and utilizing the traffic and roadway characteristics for the roadway segment under study. The need for passing lanes on an existing highway can be determined from a field study of traffic platooning.

Spot platooning or percentage of following vehicles is defined as the percentage of vehicles with headways (time gaps) of 5 seconds or less. This measure of spot platooning provides a lower value estimate of the percentage of time delay.

The field study should be made at several spot locations to determine the percent of vehicles delayed. The field study will provide the following data:

- Identification of localized sections where passing lanes would be desirable.
- Field evaluation of a longer roadway section having a minimum total section time delay, but includes an isolated section of higher vehicle time delays.
- Field evaluation of segments with longer platoons at relatively uniform high speeds where engineering judgment is needed to determine drivers' acceptance of the platoon speed and constraints to select their own desirable speed.

A rural, two-lane highway will normally accommodate the following AADTs, assuming the design hourly flow is fifteen percent (15%) of AADT and there is a 50/50 directional traffic distribution.

RURAL, TWO LANE HIGHWAY SERVICE TRAFFIC FLOWS EXPRESSED AS AADT (passenger car equivalents per day — 50/50 directional)							
Level of Service		Percent No Passing					
		0%	20%	40%	60%	80%	100%
Level Terrain	B	5,040	4,480	3,920	3,545	3,175	2,985
	C	8,025	7,280	6,720	6,345	6,160	5,975
	D	11,945	11,575	11,200	11,015	10,825	10,640
Rolling Terrain	B	4,855	4,295	3,545	3,175	2,800	2,425
	C	7,840	7,280	6,535	5,975	5,600	5,225
	D	11,575	10,640	9,705	8,960	8,585	8,025
Mountainous Terrain	B	4,665	3,735	2,985	2,425	2,240	1,865
	C	7,280	6,160	5,225	4,295	3,735	2,985
	D	10,825	9,335	8,400	7,465	6,905	6,160

The values in the table above can be adjusted for uneven directional distribution of traffic, lane, and shoulder width. The values are expressed as passenger car equivalents per day; requiring that the effects of heavy vehicles, trucks, buses, and recreational vehicles in the traffic stream be converted to equivalent passenger car volumes.

The minimum level of service criteria for two-lane highways related to time delay is as follows:

Level of Service	Percentage of Time Delay on General Segments
A	30% or less
B	45% or less
C	60% or less
D	75% or less
E	75% or more
F	100%

If the traffic volumes (equivalent to passenger cars/day) exceed the tabular ADTs, or if the spot time delays exceed the value for the selected level of service, then passing lanes should be considered.

> Any geometric improvements to the existing highway can affect field data, making the above level of service criteria erroneous.

520.02 Location of Passing Lanes. The location and configuration of a passing lane may be influenced by the need to alleviate an operational problem, adjacent development, terrain, or other factors. The following objectives should be considered relative to location:

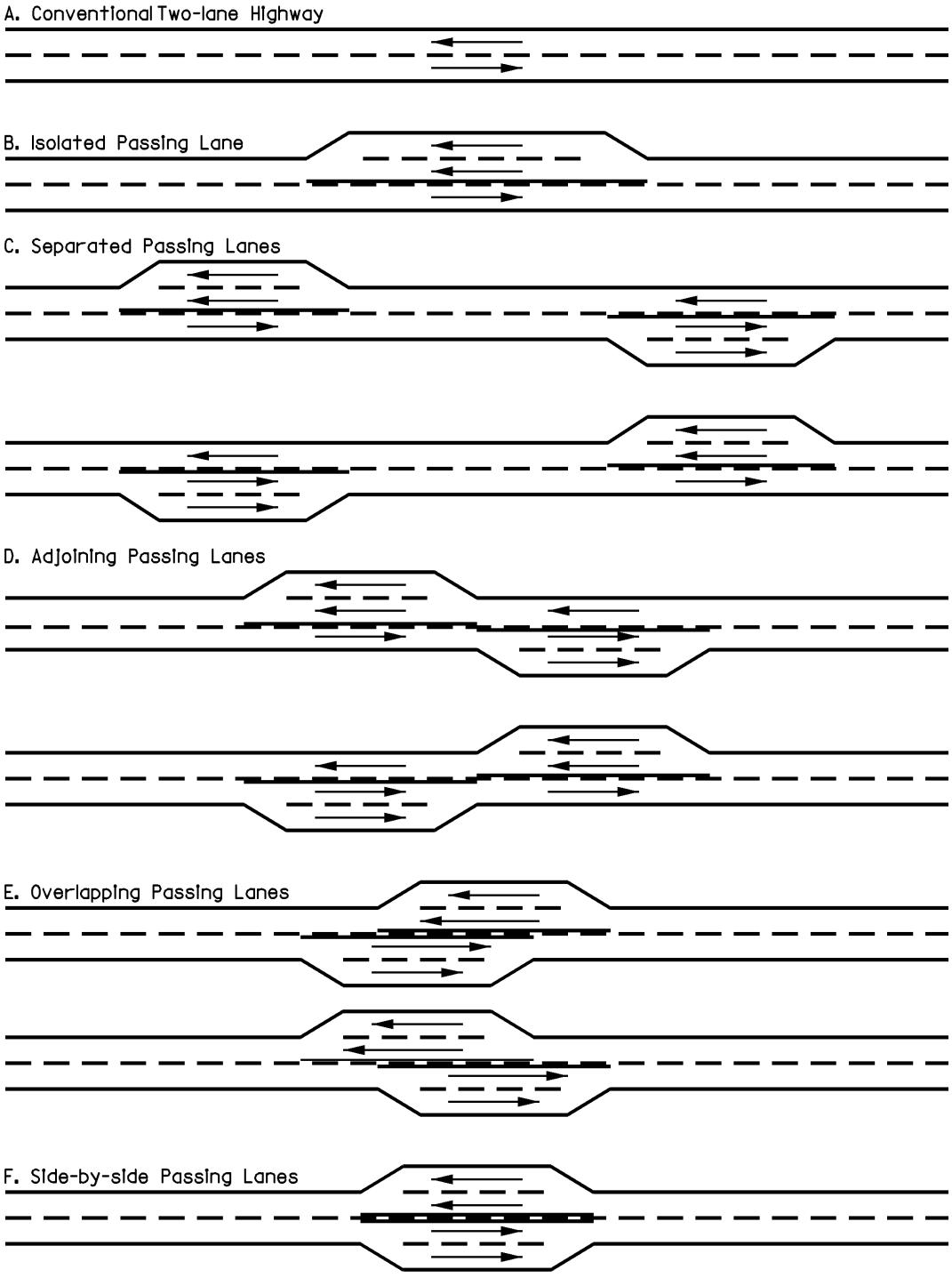
- Choose a location that minimizes construction costs.
- Prohibit access to the highway within the passing lane section.
- Passing lane location should appear logical to the driver, i.e., on grades or where passing sight distance is restricted.
- Location should provide adequate sight distance for entrance and termination.
- Physical constraints such as bridges, culverts and vertical cuts or drop-offs should be avoided because of costs.
- Passing lanes can also be considered when a realignment shift is needed to provide the width in the appropriate direction.

The configuration of multiple passing lanes are shown in Figure 5-1, with desirable and undesirable patterns noted. If separate passing lanes are used, the lanes should be separated by at least 1500 feet to reduce any conflicts between opposing traffic flows.

A frontage road may be needed if private accesses fall within the limits of the proposed passing lanes and other locations are not available.

Figure 5-1

ALTERNATIVE CONFIGURATIONS FOR PASSING LANES



520.03 Length and Spacing. The minimum length of passing lanes should be 0.25 mile since anything shorter in length is not effective in reducing traffic platooning. Design lengths for passing lanes should be:

One-Way Flow Rate (Veh/Hr)	Optimal Passing Lane Length (mi)
100	0.50
200	0.50 – 0.75
400	0.75 – 1.00
700	1.00 – 2.00

The spacing of passing lanes will depend primarily on the need to achieve satisfactory traffic operation. Normally, the operational benefits of a passing lane typically extend down stream from 3 to 8 miles. It is usually desirable to provide passing lanes at longer spacing with plans for intermediate passing lanes as the traffic volume increases. However, the spacing must be flexible to permit selection of suitable and inexpensive sites.

520.04 Geometrics. The geometrics of the passing lane should be similar to the adjacent two-lane highway. A minimum lane width of 12 feet is desirable with an adequate shoulder. The shoulder for the adjacent two-lane highway should be carried through the passing-lane section. The normal practice is to drop the right-hand lane, merging the traffic with the left lane (i.e., passing lane). Roadway transition length at the start and end of the passing-lane section should be in accordance with the Green Book.

520.05 Traffic Control Devices. The pavement markings, delineations and signing should conform to all Department standards and the Manual on Uniform Traffic Control Devices (MUTCD), as adopted by the State. Advance signing along a highway segment with passing lanes, to advise motorists of the distance to the passing lane, is desirable to reduce driver impatience and forced passing maneuvers.

525.00 – PAVEMENT EDGE SLOPE

The vertical or near vertical face of pavement edges affect the steering and recovery of a vehicle onto a surfaced roadway when the right wheels drop over the pavement edge. Backfilling against the pavement edge with foreslope material is a temporary solution. Roadway drainage tends to flow along the pavement edge, eroding this backfill material and causing either a re-occurring maintenance requirement or an exposed pavement edge.

Asphalt pavement design must consider the requirement for future pavement overlays and a need to backfill foreslopes against a new overlay. The roadway foreslopes with each overlay requires additional material and can disturb existing established plant growth adding to the potential for slope erosion.

Pavement construction provisions in Idaho for asphalt pavements require a shoe on the edge of asphalt laydown machines to provide a tapered edge on the asphalt mat.

- On initial pavement placement, the shoe may be 18 inches wide for pavement depths of 0.2 feet or less.
- For depths greater than 0.2 feet the shoe shall be 24 inches wide.
- On all pavement overlays the shoe shall be 24 inches wide.

The “Safety Edge” is a 30 degree tapered edge on the asphalt mat. The “Safety Edge” should be considered in the areas where the tapered edge provided by use of a shoe is not feasible. Information on the “Safety Edge” may be found at;
http://www.fhwa.dot.gov/everydaycounts/technology/safetyedge/intro.cfm

535.00 - SUPERELEVATION

The guidelines for superelevation, and superelevation runoff length, are provided in the Green Book, Chapter 3, "Elements of Design." Section 335.08 Superelation of this manual gives guidance on the AASHTO methods for selecting superelevation values. Method 5 is the prescribed method for rural highways, urban freeways and high-speed urban streets. The accepted maximum superelevation (emax) values to use in Idaho are shown below:

535.01 Maximum Superelevation. The maximum rate of superelevation shall be 0.08 foot/foot (8%), except that the following should be considered:

- Mountainous terrain where significant snow and ice may be encountered — 0.06 foot/foot (6%)
- Slower speed curves — 0.06 foot/foot (6%)
- Urban typical sections — 0.04 foot/foot (4%)
- Low-speed curves approaching a stop condition — 0.04 foot/foot (4%)
- Interchange ramps — 0.06 foot/foot (6%)
- Curves through intersections with public roads — 0.06 foot/foot (6%)

535.02 Axis of Rotation – General. The axis of rotation for superelevation runoff shall normally be about the centerline of the roadway as shown in Figure 5-4 except as follows:

- Curves in cut sections and grades flatter than 1.2% should be rotated around the inner edge of the traveled way. Drainage must be checked for adequacy on grades flatter than 0.75%.
- Curves in flat country at the end of tangents approximately three miles long or longer should be rotated about the inner edge of the traveled way to improve the driver's perception of the curve.
- Special combinations of horizontal alignment, grades, and topography may indicate that the roadway should be rotated about one or the other of the edges.

535.03 Axis of Rotation – Divided Highways. On four-lane divided highways, the axis or axes of rotation should normally be the center of traveled way or as shown in Figure 5-5. Consideration should be given to the size and design of the median, as well as minimum critical grades for drainage. The following items should be considered:

- Raised and/or depressed medians up to 40 feet in width may be rotated about the edges of the median. When the median is paved flush with the travel lanes, a single axis

of rotation should be used. Straight superelevation across paved medians makes it easier to construct median guardrail, left-turn bays and intersections with crossroads.

For medians greater than 40 feet in width, the axis of rotation will be about their respective centerlines, except for situations outlined under two-lane highways.

Figure 5-4

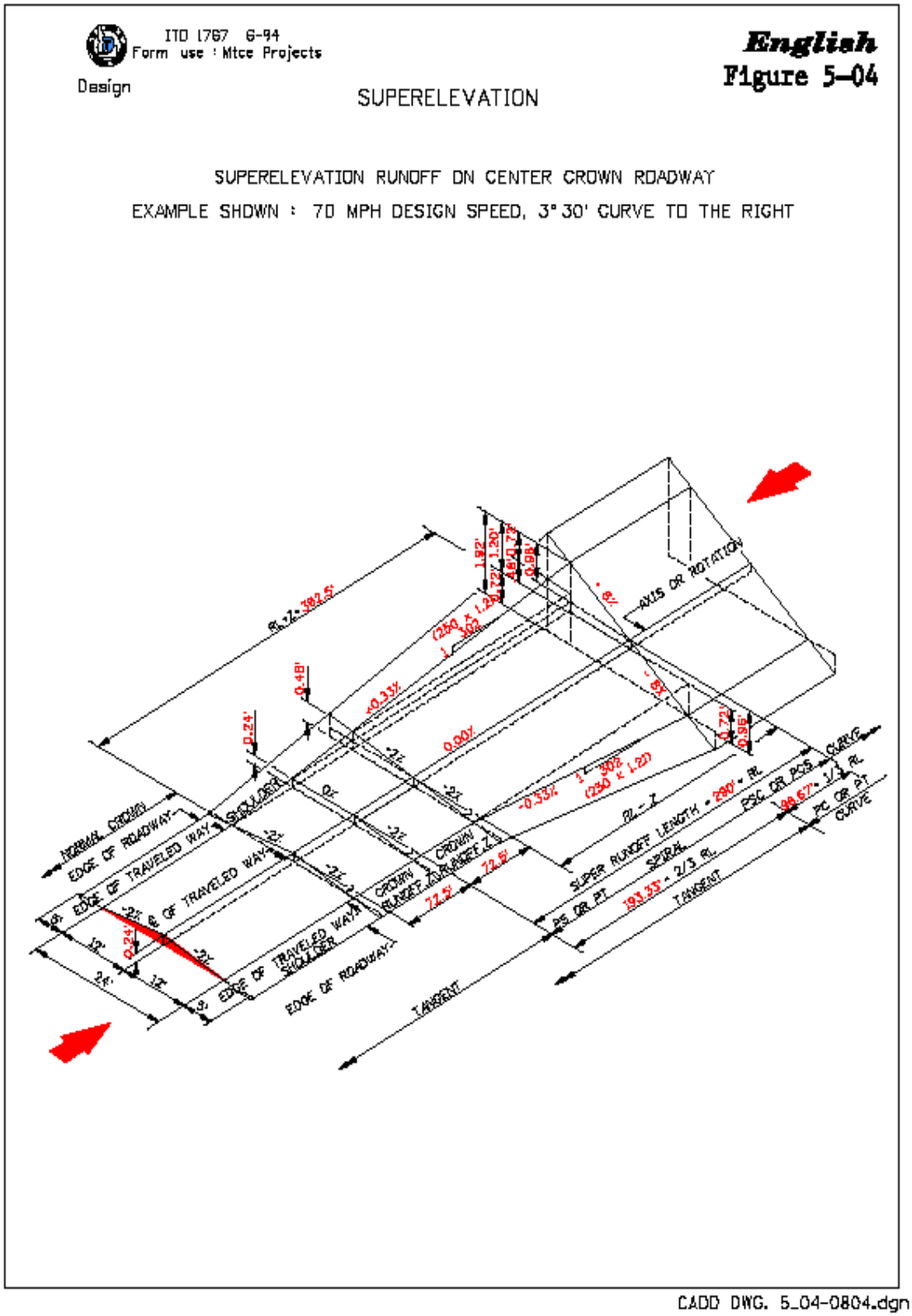


Figure 5-5

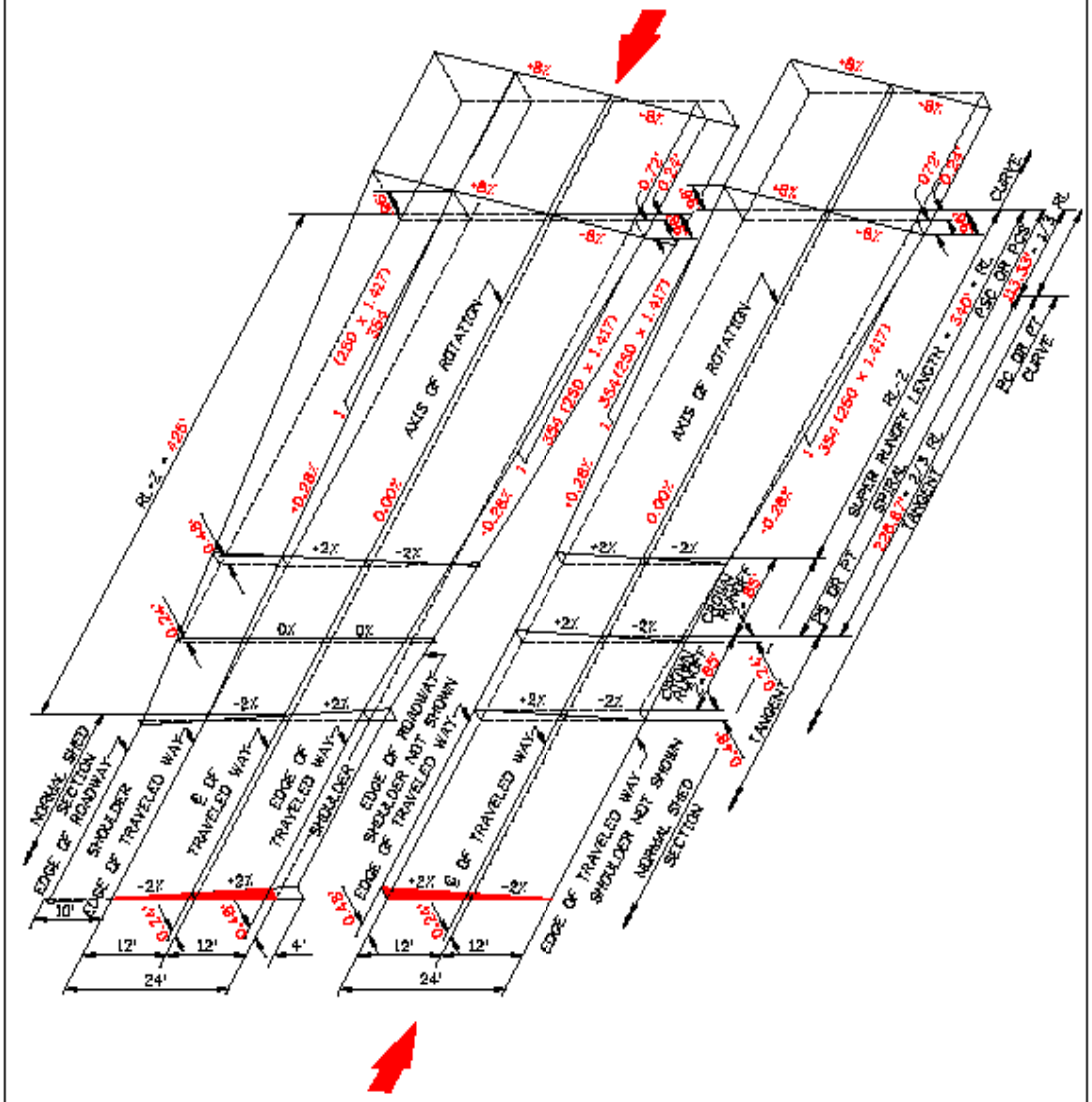
ITD 1767 9-97
Form use : Mtce Projects
Design

English
Figure 5-05

SUPERELEVATION

SUPERELEVATION RUNOFF ON SHED SECTION ROADWAY

EXAMPLE SHOWN : 70 MPH DESIGN SPEED, 3° 30' CURVE TO THE RIGHT



CADD DWG. 5_05-0804.dgn

535.04 Superelevation Runoff Lengths. The superelevation runoff length shall be obtained from the design superelevation tables for general design conditions and from the provided formula for low-speed urban streets in the Green Book.

The Z distance (runoff length from normal crown to flat section) shall be calculated from the following formula:

$$Z = \frac{NC}{e}(RL)$$

Where:

Z = Runoff length from normal crown to flat section

NC = Normal crown rate %

e = Superelevation rate %

RL = Runoff Length (from design superelevation tables)

Distances may be rounded to the nearest 25 feet for both Z and RL.

Normally two-thirds (2/3) of the superelevation runoff length is placed before the P.C. or after the P.T. of the horizontal curve.

This method of calculating the runoff length and Z distance is consistent with the engineering software currently being used by the Idaho Transportation Department.

535.05 Superelevation Runoff Between Adjacent Curves. The superelevation runoff length and transition into and out of full superelevation on horizontal curves must be reviewed carefully where there are two adjacent curves. Frequently, an unnecessary dip in the shoulder elevation or "birdbath" will occur when the superelevation is rotated about the control line as the superelevation is transitioned from a horizontal curve to tangent to another horizontal curve. Correction of this problem on the plans will ensure appropriate subgrading to eliminate expressive correction with the roadway surfacing.

Therefore, the pavement edge profile MUST be reviewed carefully, viewed from the driver's perspective, and adjusted to eliminate these unnecessary dips or "birdbaths." Two adjacent horizontal curves should be separated by sufficient tangent distances to eliminate any overlap of superelevation runoff length between the two curves.

Roadway tangent length between two adjacent horizontal curves would normally be two-thirds (2/3) of the sum of the superelevation runoff lengths plus the tangent runoff lengths (Z) for the two respective curves.

Field conditions may require the location of two adjacent horizontal curves closer than the above minimum tangent distance. Also, a minimum of 200 feet of normal crown roadway is

desirable between two consecutive horizontal curves. If this 200 feet minimum cannot be obtained, the superelevation runoff length should be extended to meet at a proportionate point between the curves. The superelevation runoff lengths should be increased until they abut, thus providing one single-level cross section.

535.06 Horizontal Curves Based Side Friction Equation.

From chapter 3 in the Green Book the following side friction equation formula is given:

$$f = (V^2 \div (15 \times R)) - 0.01 \times e$$

Solving for R this equation can be written:

$$R = V^2 \div (15 \times (0.01 \times e + f))$$

Solving for V this equation can be written:

$$V = (R \times 15 \times (0.01 \times e + f))^{0.5}$$

Where :

V = Velocity in mph

f = Side friction

e = Superelevation in %

R = Radius of horizontal curve in feet

Using the maximum side friction values given in Chapter 3, the radius of a given curve and the superelevation of a given curve the calculated horizontal curve velocity will be indicative of the advisory speed for that curve (“ball bank indicator speed”).

Using a given velocity, the maximum side friction values given in Chapter 3 for that velocity, and a range of superelevations up to a maximum superelevation value will generate horizontal curve radius values indicative of Method 2 for developing superelevation on horizontal curves in the Green Book. Refer to Section 335.08 Superelation of this manual for guidance on using Method 2.

540.00 – ACCESS CONTROL

The control of highway access shall be considered on all new highway improvements.

See - Idaho Administrative Procedures Act - IDAPA 39 TITLE 03 CHAPTER 42 39.03.42 - RULES GOVERNING HIGHWAY RIGHT-OF-WAY ENCROACHMENTS ON STATE RIGHTS-OF-WAY

Where a highway connects to a facility with full control of access via an interchange, the full control of access shall be extended each direction outside the ramp terminals as outlined in Figure 5-6. If economic considerations or physical limitations require that a public road or an approach be located closer than 300 feet, appropriate analysis and justification shall be prepared for District Engineer approval. When acceleration or deceleration lanes are provided on the interchange crossroads, then the full control of access limits shall be carried 100 feet beyond the extra lane or 300 feet, whichever is greater.

545.00 – HIGHWAY LOCATION RELATING TO PROPERTY OWNER LINES

Where the new location of a highway is along property lines, the most desirable option is to take right-of-way from both properties rather than to lie to one side and take from one side only. However, economic and/or engineering features of the location shall be the controlling factors and may dictate the taking of right-of-way from one side.

550.00 – MAINTENANCE MEDIAN CROSSOVERS

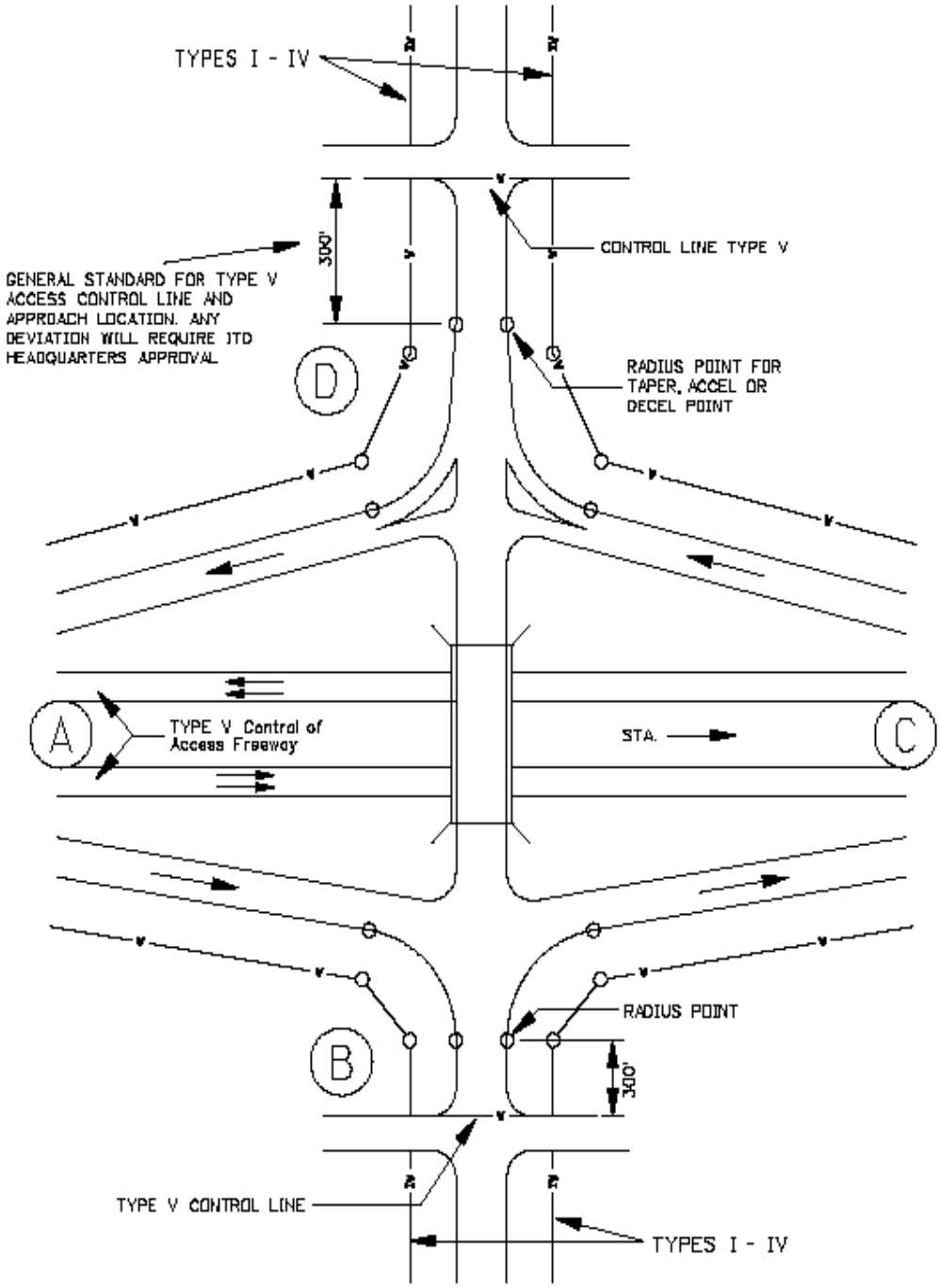
Maintenance median crossovers should not be located between interchanges located less than 5 miles apart. The District Engineer shall approve all new median crossovers, either as a portion of a construction project or an addition after initial construction. FHWA approval is required for median crossovers on the interstate. A request for a median crossover should outline the need and include a sketch showing the location relative to other highway features, planned design concept, milepost location, photos, as-built drawings, traffic data, accident data and environmental impacts. If insufficient information is provided, the request could either be denied or delayed until the necessary information has been assembled and/or a field review and site analysis has been completed.

Generally, the median crossover should be constructed at least1500 feet from existing or planned ramp tapers. Existing median crossovers that are located closer than 1500 feet to a ramp should be field evaluated for traffic operational problems, terrain considerations, and sight distance. If feasible, the median crossover shall be rebuilt to existing standards and relocated to new distance requirements. Existing median crossovers that are not a safety hazard shall remain in place. The design of median crossovers shall be in accordance with Standard Drawing A-7.

Figure 5-6

Figure 5-06

CONTROL OF ACCESS TO BE APPLIED TO ALL HIGHWAYS WHICH CONNECT TO FULL CONTROL OF ACCESS FREEWAYS



555.00 – DESIGN FOR OVERSIZED VEHICLES

Intersections on the State Highway System should be designed to accommodate the trucks using the system. The AASHTO guidelines provide vehicle dimension information and minimum turning templates for various sizes and combinations of commercial vehicles. The Geometrics Engineer also has turning templates for various scales on transparencies. The templates are particularly useful for intersection design to determine offtracking and channelization adjustments. A software product (Auto Track) is available for determining offtracking in the CADD environment.

The Idaho Transportation Board has designated specific highway routes for special vehicle combinations as outlined in the *Overlegal Permit Conditions* manual. Any highway design for these specific routes should accommodate the specified vehicle combination. Please note that for special vehicle authorization, the vehicle is permitted to travel from the designated highway route to appropriate terminals or vehicle breakdown areas. Highway interchanges and intersections must be designed to allow the extra-length vehicle to make appropriate turns to access the local terminal or breakdown area. However, this accommodation of turning maneuvers does permit encroachment on other traffic lanes and shoulders providing encroachment into opposing traffic lanes is minimized. The amount of encroachment permitted prior to a turn and in completing a turn shall be consider in the total traffic volumes and the ability of the extra-length vehicle to make the turning maneuver under forecasted traffic volumes.

The following guidelines are suggested for selecting the design vehicle and design application for a particular intersection to accommodate oversize vehicles:

555.01 Oversize Vehicles Offtracking. The offtracking of commercial vehicles must be considered on all horizontal curves with particular attention on ramps and at intersections. For track width, overhang determinations and adjusted roadway width, see appropriate tables and figures in Chapter 3 of the Green Book under “Travel Way Widening on Horizontal Curves” and “Width for Turning Roadways at Intersections”..

Roadways (under 30 feet total width) may require curve widening dependent on the size of the vehicle allowed and sharpness of the curvature.

555.02 Intersection Design for Oversize Vehicles. The design vehicles that will be accommodated on highway improvement projects, potential terminal facility locations, and interchange or intersection offtracking considerations shall be established inthe project charter . Intersections on the State Highway System should be designed using the WB-67 (truck and 53 feet semitrailer). All moves should be possible without running over curbs, edge of pavement, or encroaching into conflicting traffic lanes.

Provisions for the WB-67 on county arterials and major collectors should also be made. On all local roads the project charter should include the appropriate design vehicle when a WB-67 is not anticipated on these roadways.

When using the Single Unit (SU) standard turning template to design pavement markings through an intersection, the edge lines and channelization lines are normally located 2 feet outside the track width shown on the turning templates. For larger design trucks and physical obstructions such as curbs, raised islands and edge pavements, the desirable clearance is 3 feet between the track width. In no case should the clearance be less than 2 feet.

These guidelines may not provide a cost-effective design in some situations. The situation should be analyzed recognizing traffic volumes, special truck volumes, encroachment on other lanes, and construction costs to provide a reasonable design.

555.03 Oversize Vehicle Considerations for Interchange Areas. Interchange areas should be designed using the WB-109D (truck and two semitrailers – 48 feet each). All moves should be possible without running over curbs, edge of pavement, or encroaching into conflicting traffic lanes at all interchanges with a State highway or major off-system highway on the crossroads. A WB-67 template can be used on low volume interchanges where the use of WB-109D trucks is not anticipated. The DMV Port of Entry Manager can supply information regarding the anticipated WB-109 traffic volumes at specific interchanges.

555.04 Oversize Vehicle Considerations for Pavement Markings. Pavement markings (lane lines, centerlines, channelizing lines and painted islands) should be designated by using the SU truck. All moves should be possible without encroaching on the pavement markings. Edge lines should be located a minimum of 2 feet from the edge of pavement on the inside edge of a curve and guide the motorist along a natural path.

560.00 – INTERSECTION CHANNELIZATION GUIDELINES

The general design criteria for intersections and channelization are provided in the Green Book. Additional criteria and helpful suggestions are also included in NCHRP Report 279, "Intersection Channelization Design Guide". However, the above-mentioned reference material relative to trucks, vehicle operating characteristics, curb radii, and other user data should use criteria in the most recent AASHTO policy.

560.01 Intersection Sight Distance. The Green Book outlines the desirable assumptions and criteria for intersection sight distance that should be considered for new construction. However, these requirements may not be applicable to the operation of existing intersections and need only be considered if the intersection is being completely reconstructed. Terrain features, roadway alignment, major buildings, or other significant obstructions may exist that prevent attaining these desirable sight distances; however, the minimum intersection sight distance should not be less than the minimum vehicle stopping sight distance as reflected under the "Elements of Design," in the Green Book.

The application of special signing of safe approach speeds for limited intersection sight distance problems on either roadway is usually not very effective. Drivers usually do not perceive that there are sight distance limitations and are hesitant to reduce vehicle operating speeds when there are neither geometric nor apparent operational constraints. Limited intersection sight distance problems can be partially corrected by installing traffic control devices, such as a stop sign on a minor roadway, curb lines, crosswalks, and stop bars to ensure that a driver has adequate sight distance to enter or cross the major roadway safely.

In all intersection configurations and operational cases, the roadway design and minimum motorist sight distance must allow for collision avoidance. Avoidance can be accomplished by using, in the most restrictive cases, an approach "stop" control on the minor approach, and by providing minimum stopping sight distance on the major roadway.

565.00 – ROADSIDE CLEAR ZONES

The roadside clear zone is an area, outside the roadway travel lane, that is clear of obstacles, steep slopes, cut sections, or other features that would interfere with a motorist controlling his/her vehicle or may result in a collision. Ideally the roadside would be traversable throughout its length and contain no fixed objects, or, if significant hazards existed, shielding would be used to prevent a collision with the hazardous feature. Since this approach is seldom cost effective, appropriate ranges of clear zone distances rather than an absolute number are shown in following table (Figure 5-7).

Figure 5-7

Clear Zone Distances (Distance from edge of driving lane)

DESIGN SPEED	DESIGN ADT	FILL SLOPES			CUT SLOPES		
		6:1 or flatter	5:1 to 4:1	3:1	3:1	5:1 to 4:1	6:1 or flatter
40 mph	Under 750	7-10	7-10	**	7-10	7-10	7-10
	750-1500	10-12	12-14	**	10-12	10-12	10-12
	1500-6000	12-14	14-16	**	12-14	12-14	12-14
	Over 6000	14-16	16-18	**	14-16	14-16	14-16
45-50MPH	Under 750	10-12	12-14	**	8-10	8-10	10-12
	750-1500	12-14	16-20	**	10-12	12-14	14-16
	1500-6000	16-18	20-26	**	12-14	14-16	16-18
	Over 6000	18-20	24-28	**	14-16	18-20	20-22
55mph	Under 750	12-14	14-18	**	8-10	10-12	10-12
	750-1500	16-18	20-24	**	10-12	14-16	16-18
	1500-6000	20-22	24-30	**	14-16	16-18	20-22
	Over 6000	22-24	26-32*	**	16-18	20-22	22-24
60mph	Under 750	16-18	20-24	**	10-12	12-14	14-16
	750-1500	20-24	26-32*	**	12-14	16-18	20-22
	1500-6000	26-30	32-40*	**	14-18	18-20	24-26
	Over 6000	30-32*	35-44*	**	20-22	24-26	26-28
65-70mph	Under 750	18-20	20-26	**	10-12	14-16	14-16
	750-1500	24-26	28-36	**	12-16	18-20	20-22
	1500-6000	28-32*	34-42*	**	16-20	22-24	26-28
	Over 6000	30-34*	38-46*	**	22-24	26-30	28-30

** Where a site specific investigation indicates a high probability of continuing accidents, or such occurrences are indicated by accident history, the designer may provide clear zone distances greater than 30 feet as indicated. Clear zones may be limited to 30 feet for practicality and to provide a consistent roadway template if previous experience with similar projects or designs indicates satisfactory performance.*

*** Since recovery is less likely on the unshielded, traversable 3:1 slopes, fixed objects should not be present in the vicinity of the toe of these slopes. Recovery of high speed vehicles that encroach beyond the edge of the shoulder may be expected to occur beyond the toe of the slope. Determination of the width of the recovery area at the toe of the slope should consider right-of-way availability, environmental concerns, economic factors, safety needs, and accident histories. Also, the distance between the edge of the travel lane and the beginning of the 3:1 slope should influence the recovery area provided at the toe of the slope.*

565.01 Clear Zone Criteria.

The area within the clear zone shall meet one of the following criteria:

- The roadside is cleared of all obstructions within the appropriate clear zone distance (see AASHTO Roadside Design Guide).
- The cleared distance is justified by a cost-effective analysis using the program specified by the AASHTO Roadside Design Guide.
- Determination of whether a fixed object or non-traversable terrain feature warrants relocation, modification, removal, shielding, or no treatment by "Application of the Clear Zone Concept" of the AASHTO Roadside Design Guide.

The clear zone distance that is selected shall be noted in the Charter.
Any deviations shall be analyzed and the analysis shall be attached.

565.02 Clear Zone Modifications. The designer may also choose to modify the clear zone distance for horizontal curvature by using the adjustment table in the AASHTO Roadside Design Guide. These modifications are normally only considered where accident histories indicate a need; or a specific site investigation shows a definitive accident potential which could be significantly lessened by increasing the clear zone width and the increase is cost effective.

The following formula is used to figure the clear zone distance for horizontal curvatures:

$$CZc = (Lc)\ (Kcz)$$

Where: CZc = clear zone of curvature in feet
Lc = clear zone distance in feet
Kcz = curve correction factor

> Clear zone correction factors are applied to outside curves only.
> Curves flatter than 2865 feet Radius (2.0 degrees)
> do not require an adjusted clear zone.

Isolated objects that are located on the roadside, but are outside the selected clear zone distance should be analyzed for cost-effectiveness to determine the optimal solution.

Application of clear zone distances may be limited by physical factors, but an additional factor that must be considered when determining a maximum desirable recovery area is the fill slope parameters.

570.00 – GUARDRAIL

The purpose of guardrail is to make highway improvements safer by reducing accident severity. Properly designed installations reduce accident severity by:

- Preventing errant vehicle penetration; (Guardrail reduces accident severity by excluding vehicles from dangerous areas.)
- Redirecting errant vehicles to a direction parallel to the traffic flow, thus minimizing danger to following adjacent traffic flow; and
- Minimizing hazards to vehicle occupants during impact.
- Desirable guardrail performance characteristics are:
- Minimizing vehicle damage so the auto can be maneuvered after impact;
- Being resistive to impact damage;
- Being economical in construction, installation, and maintenance; and

- Having a pleasing and functional appearance.

570.01 Guardrail on Scenic Routes.

Many of the highways in Idaho traverse areas where the "scenic view" from the vehicle is important to the occupants. Many of these areas are located along streams, high fill area, or other hazards that warrant extensive use of guardrail.

2PM shall maintain a map showing the current Scenic or Historic Byways as designated by the Board.

Selection of the type of guardrail to be used on State highways located within National Forests, along rivers, and in areas of significant scenic value will be made as follows:

New Construction:

Concrete guardrail may be used at potential high accident locations and on cut slopes. Metal guardrail shall be used at all other locations, except where engineering studies warrant the use of concrete guardrail.

Rehabilitation and Preservation Projects:

Concrete guardrail may be used at high accident locations, rock cuts and fills, and areas where there is insufficient room between the roadway and the fill slope to obtain adequate support for wood guardrail posts. Metal guardrail shall be used at all other locations.

Guardrail type will be addressed in the project charter narrative.

When appropriate, existing concrete rail on these highways will be replaced with metal rail except as noted above.

The actual installation of guardrail on scenic routes may be limited to areas with a high accident potential such as the outside of curves and high precipices.

570.02 Guardrail Placement Determination. Guardrail placement determination is also based on physical characteristics of the roadway and is applicable to highways in general. Where guardrail installations are indicated, the designer should examine the roadway to determine the feasibility of adjusting site features (e.g., flattening an embankment slope or removing a tree) so guardrails would not be required. For borderline cases the action guideline is: GATHER MORE DATA.

Detailed analysis of guardrail determination and design should be based on this manual and the AASHTO Roadside Design Guide. Guardrail installations may be required by any combination of the following shoulder features:

- Embankment geometry,
- Roadside obstacles (e.g., drop-off) in close proximity to the roadway,

- Nontraversable roadside hazards, and
- Highway – Railroad At-Grade Crossing Signals (see Railroad Guide, Section 530.04)

Actual accident experience for specific sections of highway may also dictate guardrail placement even though guardrail installation may not have been indicated by these guidelines.

570.03 Guardrail Installation. Guardrail installations, are formidable roadside hazards and provide errant vehicles with only a relative degree of protection. Although guardrail installations should decrease accident severity, the frequency of accident occurrence may increase with some guardrail installations because the guardrail system is usually a larger target and is located closer to the roadway.

Guardrail installations should be kept to a minimum and installation should be considered only when clearly justified.

570.04 Fill Slope Parameters. The height and slope of roadway embankments are the basic factors in determining shoulder guardrail need. For low, flat embankments, out-of-control vehicles can "ride out" a slope with fewer hazards than associated with striking a guardrail. For high, steep embankments, the hazard of being redirected by a guardrail is less than if the vehicle is permitted access to the slope.

For guidance and consideration charts see the current Roadside Design Guide figures.

Additionally, other conditions such as fixed hazards, length of advancement, horizontal and/or vertical alignment, route discontinuity, narrow lanes, narrow shoulders, inadequate superelevation on curves, long grades, lane drops, skid resistance, etc., are based on probable collision frequencies and may warrant a higher level of protection than that suggested in the figures. Where guardrail is required for appropriate embankments, the length should be extended to prevent vehicle penetration behind the guardrail into the protected area.

570.05 Standard Guardrail and Terminal Usage. Figure 5-8 addresses Standard Guardrail and Terminal Usage. Included are the bid item numbers, corresponding standard drawings, names of the items, and the uses for each. Additionally, various Barrier Terminals are addressed in the "Guidelines for Crash Cushion and Barrier Ends Manual".

When providing alternates, such as a transition or additional guardrail, any additional cost associated with one system as compared to another should be accounted for.

Figure 5-8

STANDARD GUARDRAIL AND TERMINAL USAGE

BID ITEM	STANDARD DRAWING	NAME AND USE
612-005A	**G-1-A-1,2,3**	**W-Beam Metal Guardrail** - Standard Metal Guardrail Installation with 3’ and 7’4” posts.
612-050A	**G-1-B**	**Metal Terminal Section Type 1** - Use on trailing ends of guardrail installations when rail extends 50’beyond the point of need.
612-055A	**G-1-B**	**Metal Terminal Section Type 1A** - Use on trailing end of guardrail installation when rail does not extend 50’ beyond the point of need.
612-060A	**G-1-C**	**Metal Terminal Section Type 2** - Use in conjunction with a back slope.
612-065A	**G-1-E**	**Metal Terminal Section Type 3** - Use to attach metal rail with concrete bridge parapet or concrete to metal guard rail connector, G-2-D (m).
612-070A	**G-1-J**	**Metal Terminal Section Type 4** - Use for rural installation to terminate metal rail at a railroad crossing.
612-075A	**G-1-F**	**Metal Terminal Section Type 5** - Use to terminate metal rail under normal conditions.
612-077A	**G-1-G**	**Metal Terminal Section Type 6** – Use to replace old bull nose.
612-080A	**G-1-H**	**Metal Terminal Section Type 7** - Use to terminate metal rail when an approach roadway must be accommodated and a type 5 cannot be installed.
612-085A	**G-1-H**	**Metal Terminal Section Type 8** - Use at the end of the type 7 when located outside the clear zone or the approach roadway speed is less than 35 mph
612-090A	**G-1-K**	**Metal Terminal Section Type 9** - Use as a retrofit for the old type 3 terminals only. Not used on new construction
612-150A	**G-2-A**	**Concrete Guardrail** - Standard Concrete Guardrail Installation.
612-155A	**G-2-A**	**Concrete Terminal Section Type A** - Use to terminate concrete rail. Not used in the clear zone except on trailing ends.
612-165A	**G-2-D**	**Precast Concrete Guardrail Connector**- Use to connect metal rail to concrete rail.
612-170A	**G-2-E**	**Precast Concrete Guardrail Transition** - Use to connect Bridge Type IV Parapet to concrete rail.
	G-1-L	**Guardrail Placement For Minor Structures And Large Culverts** - Use to span structures up to 24’ without mounting posts on the structure.

	G-2-F	**Interim Bridge Rail Retrofit** - Use to bring substandard bridge parapet up to present standards.
	G-2-H	**Special Cast In Place Concrete Guardrail** - Use when structure piers are within the clear zone and there is insufficient room for Standard Rail Installation.
612-095A	**G-1-M**	**Metal Terminal Section Type 10 –** Use in place of type 5 when cannot construct pad for 4’ offset.

570.06 Guardrail Adjacent to Piers. To protect motorist from grade separation piers, use following guidelines to keep guardrail design consistent:

Situation 1: Face of guardrail 4 feet or greater from the pier

Option a: Guardrail can be continued past the pier with no modification.

Situation 2: Face of guardrail 2' 6" to 4' from the pier

Option a: Use W-beam guardrail with double rail and 3 feet 1 ½ inches post spacing. If pier footing interferes with post lengths, attach to footings according to Bridge Design Manual Page H-13 (CADD s042h13.dgn). Special effort will be needed to get this drawing in the plans when it is needed.

Option b: Use concrete guardrail.

Situation 3: Face of guardrail less than 2' 6" from pier

Option a: Use special cast-in-place concrete guardrail (Standard Drawing No. G-2-H). The guardrail may be placed closer to or farther from the shoulder than the 2' as shown on Standard Drawing No. G-1-A. However, the guardrail should not encroach onto the shoulder.

570.07 Safety Barriers. All blunt ends, unconnected bridge rails, and grossly substandard rail (including cable, half-moon, non-blocked out rail and rail that varies more than 3" from standard) will be upgraded to current standards on all projects. (See Figure 5-10 for approved devices).

570.08 MASH/NCHRP-350 Implementation. The Division of Highways is dedicated to a safe and efficient highway system and is committed to replacing or removing all blunt ends, turned-down ends, unconnected bridge rails and grossly substandard on all projects. Cable, half moon, non-blocked rail and rail that varies by more than 3 inches from standard is considered grossly substandard.

The DOH will follow MASH/NCHRP-350 (safety and crashworthiness of roadway features) requirements. MASH/NCHRP-350 only applies to routes on the National Highway System (NHS), however, to avoid confusion and dual inventories (NHS vs. non-NHS); MASH/NCHRP-350 will apply to all portions of the State Highway System. All construction, maintenance, and utility work on the State Highway System shall utilize crashworthy hardware. On non-NHS roadways under local control, the DOH encourages the implementation of the MASH/NCHRP-350 requirements.

The Division of Highways is committed to replacing or removing the remaining blunt ends and unconnected bridge rail on the NHS.

Figure 5-9

MASH/NCHRP-350 Crash Test Requirements for Work Zone Safety Devices

Work zone safety devices shall conform to the following requirements:

Category	Included Devices	Compliance Requirements	Other Information
1	Low-mass, single piece traffic cones, single piece drums, tubular markers, flexible markers and delineators. Note: If auxiliary lights or signs are attached, it is considered a Category 2 device.	New units purchased after October 1, 1998 must comply with MASH/NCHRP-350. Contractors must submit a signed affidavit listing vendor's names and model numbers for all devices used on the project. This list must be approved by ITD before use.	
2	Barricades (Types 1, 2 & 3), portable sign stands with signs, vertical panels, drums w/lights, intrusion alarms & other devices under 100 lbs.	New units purchased after October 1, 2000 must comply with MASH/NCHRP-350.	
3	Includes Category 2 devices exceeding 100 lbs. and/or "expected to cause significant occupant velocity change"; work zone crash cushions, portable concrete barriers and truck mounted attenuators (TMAs).	All TMAs, crash cushions, and concrete barriers purchased after October 1, 2002 shall comply with MASH/NCHRP 350.	All existing devices that comply with NCHRP-230 and/or 350 and/or MASH may be used until their service life is exhausted.
4	Portable	Purchased after October	

	changeable message signs, arrow displays & other trailer type devices (portable traffic signals, etc.).	1, 2002 shall comply with MASH/NCHRP 350.	

Figure 5-10

NCHRP-350 Requirements for Permanent Installations

Devices installed for permanent use shall conform to the following requirements and dates(1):

Safety Hardware Type	New Installations[2]	3R Projects[3]	System-wide Replacement
Guardrail to Bridge Rail Transitions	October 1, 2002 (By October 1, 1998 devices must meet NCHRP-230)	October 1, 2002 (Replacement of existing hardware meeting NCHRP-230 is not required.)	According to ITD/FHWA agreement, all unconnected bridge rails shall be upgraded.
Guardrail Terminals	October 1, 1998	October 1, 1998 (Replacement of existing hardware not meeting MASH/NCHRP-350 is required.)	All blunt end terminals shall be upgraded.

(1) The indicated deadlines reflect the date a construction project is advertised for bid or when the feature is installed by state forces.

(2) New installations are defined as follows: The placement of a device where none previously existed or where an existing feature is extended. Unless otherwise indicated and at the district's discretion, existing features may be retained in part or in their entirety if left undisturbed. Replacement of damaged longitudinal barriers may be replaced in kind.

(3) On new construction and 3R (Resurface, Restoration, and Rehabilitation work that retains the integrity of the existing ballast, including such work as rotomill-inlay/overlay, overlay, bridge deck rehabilitation, and modifying bridge rail) projects, all TMAs and crash cushions purchased after October 1, 1998 shall comply with MASH/NCHRP-350.

Breakaway support hardware previously found acceptable under the breakaway requirements of either the 1985 or 1994 editions of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals are acceptable under NCHRP-230, 350 or MASH guidelines. The July 25, 1997, FHWA memorandum exempts utility poles and signal supports from the NCHRP-350 requirements.

575.00 – GRADING FOR GUARDRAIL

Roadway subgrade must receive special grading to accommodate the subsequent installation of guardrail, regardless of the type. As noted in the Standard Drawings, a desirable distance of 2' subgrade should be provided behind the guardrail posts with special grading for guardrail end flares. Special grading for guardrail should be noted on the roadway profiles so the grading for guardrails is not overlooked during subgrade construction. The roadway pavement must be widened, with or without an embankment protection curb, to extend underneath the guardrail face to eliminate base subgrade erosion that could create a vehicle wheel trap adjacent to the guardrail**.** Special attention of this additional paving should be noted as the widening must be constructed prior to the guardrail installation.

Collision research testing indicates that a longer guardrail post, 7' 2" (4 feet 8 inches minimum embedment), is adequate on steeper foreslopes. While it is still desirable to provide 2' of embankment behind guardrail posts, the aggregate base can be hinged behind the post when 7' 2" guardrail posts are specified. If the 7' 2" posts are used, the surfacing shall continue beyond the posts to the hinge point. The 7' 4" posts should only be considered for existing roadways where additional embankment fill material would be expensive, inconvenient, and environmentally undesirable, or in special cases, where a wider embankment is not economical.

Justification for using the 7' 2" guardrail posts, including a cost-effective analysis, must be in the Project Charter narrative or within the Alternate Solutions and Costs.

580.00 - MAILBOXES

Mailboxes may be a hazard to the traveling public and should be considered an intrusion into the clear zone.

New mailboxes conforming to the standard drawings shall be included on all projects that require removal of the existing mailboxes during construction. The height of the mailbox should be coordinated with the local postmaster.

Mailbox turnouts should be included on all NHS Highways and on all non-NHS highway projects with a current ADT of 400 or greater.

585.00 – SPECIFIC PROJECT DESIGN STANDARDS

The following types of projects have specific project design standards that are detailed in Appendix A:

- 3R Improvements — Interstate System
- 3R Improvements — National Highway System
- State Design Standards for Non-NHS
- Pavement Rehabilitation (1R) Standards
- Rest Area Design
- Pedestrian Overpasses, Underpasses, and Ramps
- Bicycle Facility Design
- Intelligent Transportation System
- Interchanges, Interstate/Expressway
- Parkways

REFER TO APPENDIX A FOR DESIGN CRITERIA FOR SPECIFIC PROJECTS

Section 600.00 Hydraulics

SECTION 600.00 – HYDRAULICS

610.00 – HYDRAULICS INTRODUCTION

Highway projects that will impact waterways, wetlands, flood plains, etc. have numerous considerations that must be reviewed and approved. An ITD 210, Hydraulics Structures Survey, will be completed by the district and may be submitted to the Hydraulics Engineer in the Resource Center for review of culverts with a diameter of 5 feet or larger, and for all bridges. The Hydraulics Engineer is also available for review of all unusual and complex hydraulic designs such as river modeling, inverted siphons, energy dissipators, storm sewers, detention/retention facilities, pump stations, etc.

Additional hydraulic specifications are in Appendix B. Refer to this data whenever necessary.

610.01 Structure Choice. In order to make an intelligent choice of structure type, all of the questions on the ITD 210, Hydraulic Structures Survey, must be accurately answered. The following hydraulic reports should accompany the ITD 210:

- Structure Field Data
- Hydrologic and Hydraulic Backwater Calculations
- Scour Data and Riprap Requirements
- Comments on Channel Stability
- Permit Status
- FEMA Status

615.00 – DESIGN METHODS

Technical hydraulic design information is presented in the *Model Drainage Manual*, S-MDM-3-CD and is available from:

American Association of State Highway and Transportation Officials (AASHTO)

444 N. Capitol St. NW, Suite 249

Washington, DC 20001

1.800.231.3475

The manual was created for counties and highway districts to insert their own policy on various items and then adopt the information as a hydraulic manual. The *Model Drainage Manual* is an excellent technical reference that can be used for most aspects of hydraulic design, but should not be considered as Idaho Transportation Department policy.

A self-taught design manual, Hydrology and Hydraulics, Idaho Transportation Department, January 2002, is available for design guidance in Hydrology, Culverts, Open Channels and Pavement Drainage.

These courses are not considered ITD policy, but are available as references with design examples from the Resource Center.

620.00 – HYDROLOGY METHODS

The following hydrology methods are approved and listed in the order or reliability.

http://idaho.usgs.gov/PDF/wri024170/regression.pdf

If a USGS Gaging station is close enough to the project to be used, the discharge in cubic feet per second(cfs), based on the period of record for a given recurrence interval in years, and exceedance probability, in percent, can be obtained for most U.S. Geological Survey (USGS) Gaging stations on the internet at http://pubs.usgs.gov/wri/2002/4170/report.pdf. "Estimating the Magnitude of Peak Flows at Selected Recurrence Intervals for Streams in Idaho ".

If there is no gaging station nearby, determine if a FEMA Flood Insurance Study (FIS) has been prepared for the river reach of the project. The FIS will have the peak discharges for the 10, 50, 100, and 500 recurrence intervals.

If there is no gaging station or Flood Insurance Study available "StreamStats", the USGS interactive on-line application for streamflow statistics and basin characteristics should be used. The web address for "StreamStats" is http://water.usgs.gov/osw/streamstats/idaho.html . Water Resources Investigations report 02-4170, *"Estimating the Magnitude of Peak Flows at*

*Selected Recurrence Intervals for Streams in Idaho", (*Appendix B.40.01*),* is the publication "StreamStats" was built from.. Where the use of "StreamStats" is not possible (certain areas in the Snake River Plain) , at least three methods should be used and either averaged or the maximum value selected for the design flood depending on the closeness of the results of three methods and the preference of the conservancy of the Hydraulic's Engineer. The following USGS Regression Equation Methods outlined in Appendix B are listed in order of reliability.

Open File Report No. 81-909, "*Method of Estimating Flood Frequency Parameters for Streams in Idaho.*" (Appendix B.40.07)

Water Resources Investigation No. 80-32, "*Using Channel Geometry to Estimate Flood Flows at Ungauged Sites in Idaho*." (Appendix B.40.06)

Open File Report No. 93-419 "*Methods for Estimating Magnitude and Frequency of Floods in Southwestern United States*" (Arid Study). Not applicable in Districts 1 & 2.

Water Resources Investigation No. 7-73, "Magnitude and Frequency of Floods in Small Drainage Basins in Idaho," (Appendix B.40.02)

- **Small Area Nomograph.** Can be used for ungauged drainage basins of less than 10 square miles
- **NRCS TR-55 Method.**
- **Rational Method.** Is generally used for storm sewer design and is limited to small watersheds preferably no larger than 200 Acres.

625.00 – DESIGN FLOOD

For bridges and culverts 12 feet or more wide, and all culverts that have an open bottom, the design flood will be a 50-year flood. For culverts less than 12 feet wide that have a closed bottom (including those with the invert lowered) the design flood will be a 25-year flood.

625.01 100-Year Flood. 100-year flood data is required for those locations that have been identified by FEMA as flood hazard areas and when the 100-year flood is greater than the overtopping flood, as shown on ITD 210, Hydraulic Structures Survey. The 100-year flood will be determined from the flood Insurance Study (FIS) for the community (City or County) published by the Federal Emergency Management Agency (FEMA).

625.02 Scour Review Flood. The scour review flood will be the overtopping flood or the 500-year flood if the scour review flood is less than the overtopping flood. The 500-year flood can be established by gauge records if sufficient data is available. An approximate value for ungauged basins can be established using U.S. Geological Survey Open File Report No. 81-909.

630.00 - PERMITS

The following permits are required for construction projects that will affect stream channels or involve bridges.

630.01 Joint Application for Permit. A stream channel permit is required from the Idaho Department of Water Resources for bridges and other channel work. The Department of Water Resources coordinates the joint application with the Corps of Engineers, the Department of Lands, and the permits are issued by the appropriate agency or agencies. (Refer to Federal Register 33 CFR 320). Instructions for the Joint Application for Permit, IDWR Form 3804-B, are available from the Idaho Department of Water Resources, 332 E Front, P.O. Box 83720, Boise, Idaho 83720-0098.

630.02 Coast Guard Bridge Permit. A Coast Guard bridge permit continues to be required for the improvement or construction of a bridge over waters that are:

- Used as a means to transport interstate or foreign commerce.
- Susceptible to improvement for this use.
- Tidal and used by boats 20 feet or greater in length.

Early coordination during the environmental process is still required.

630.03 Exemptions to Coast Guard Section 9 Permits. Section 123(b) of the *Federal Aid Highway Act of 1987* eliminates the need for Section 9 permits for bridges over certain waters that are not used or not likely to be used in their natural condition or by reasonable improvement as a means to transport interstate or foreign commerce and that are:

- Nontidal, or
- Tidal, but used only by recreational boating, fishing, and other small vessels less than 20 feet in length.

The FHWA Division Administrator has the authority to make the determination of a Section 9 permit. To do this, the district will prepare a statement explaining why the project is exempt from a Section 9 permit using the criteria in Item A. The statement will be attached to the environmental classification summary prepared for the project and submitted to headquarters for processing to FHWA. The district will do the necessary coordination with Bridge.

If there are questions regarding the potential for reasonable improvement of the stream, the Army Corps of Engineers should be contacted. The Coast Guard should be contacted if the types of vessels using the waterway are unknown.

635.00 – UNUSUAL OR COMPLEX HYDRAULIC DESIGNS

The design of energy dissipaters, detention/retention facilities, pump stations, and all other unusual or complex hydraulic designs will be submitted to the Resource Center for the Hydraulic Engineer's approval.

638.00 – EMBANKMENT PROTECTORS

Embankment protectors and slotted drains (Standard Drawing D-1-A) function very efficiently with metal guardrail (see Figure 6-1, Example of Determination of Embankment Protector Type). Slotted drains can also be used with concrete guardrail or curb (Standard Drawings D-4-B and D-1-B).

Figure 6-1

Example of Determination of Embankment Protector Type

Given: 3cfs flow and 4% grade. Solution: Find 3cfs flow in the first vertical column of the Length of Slotted Drain or Embankment Protector table below. Proceed horizontally to the intersection with the 4% grade. The intersection yields 50 feet (see the highlighted row and column).

LENGTH OF SLOTTED DRAIN OR EMBANKMENT PROTECTOR							
Flow in cfs	**Grade Percentage**						**Discharge Pipe Size in in.**
	1	**2**	**3**	**4**	**5**	**6**	
1	6	7	8	9	10	10	12
2	8	10	11	12	13	13	12
3	9	12	13	14	15	16	12
4	10	13	15	16	17	18	12
5	12	14	16	18	18	20	12
6	12	15	17	19	20	21	15
7	13	16	18	20	21	23	15
8	14	17	20	21	23	24	15
Cross Slope =0.02 ft./ft.							

From the Dimension Table in Meters for Embankment Protector table below, find the "L" closest to 46 feet. In this case, an "L" of 50 feet with a "D" of 36’ produces a type 4 embankment protector.

DIMENSION TABLE IN FEET FOR EMBANKMENT PROTECTOR		
Type of Embankment Protector	**L**	**D**
1	20	6
2	30	16
3	40	26
4	50	36
5	60	46
6	80	66

639.00 BRIDGES

639.01 Clearances

BRIDGES OVER WATERWAYS OTHER THAN CANALS

All bridges with a clear span of 20 ft or greater shall have a minimum clearance of 2.0 ft above the Q50 flow. In addition, the Q100 flow must pass beneath the structure without touching the lowest cord.

BRIDGES OVER CANALS

All bridges with a clear span of 20 ft or greater over canals shall have a minimum of 1.0 ft of clearance above the design flow, and the maximum flow must pass beneath the structure without touching the lowest cord.

640.00 – CULVERTS

It is highly recommended the HY-8 computer program be used for culvert design. This is one of the better culvert design software programs available and can be downloaded from the Federal Highway Administration web site. (Include the HY-8 output with your ITD-210/Hydraulic Report submittals).

On all the highway systems, a culvert is a structure having a clear span length between abutments of 20 feet or less, measured along the highway centerline.

The procedure for the design of culverts is discussed in "Drainage Design II Cross Drainage - A Self-Taught Design Course," published by the Idaho Transportation Department.

Whenever culverts with a diameter equal to or greater than 60 inches are part of the project, an ITD 210, Hydraulic Structures Survey, must be submitted to the Hydraulics Engineer for review and approval.

Other requirements for culverts are as follows:

640.01 Special Pipe Problems. Where a pipe flows at least 3/4 full over a period of a month or more during the year, or pipes are under pressurized flow, then gasketed CMP, rubber gasket concrete, or plastic pipe shall be specified.

Pipe that is on a flat grade may have its capacity lowered simply by being made longer. The size should be reviewed when this occurs.

The condition of the pipe should be carefully studied to be sure the pipe is in good condition. Old pipe in good condition may be left in place and extended on widening projects. Any pipe that will not be used shall be removed, unless prior approval is obtained to fill the pipe with concrete and leave it in place. **Under no circumstances shall any pipe be abandoned that is within the limits of the roadway prism.**

New culvert pipe shall be used on all highway construction. (The average bid price of salvage and removal of existing pipe has proven excessive — to the point that new pipe is more economical. Salvaging structural plate pipe culverts may be considered an exception.) Where pipe culverts are to be removed, enter on the plan only: "Remove Pipe Culvert." This notation is not a separate bid item when shown in this manner and the cost of work is included in the bid price of other items.

Exposed PVC pipe will be protected from ultraviolet radiation by coating, sleeving, or other approved methods.

640.02 Minimum Pipe Size. The minimum pipe diameter shall be 18 inches for pipe culverts under roadways until the culvert length of 70 feet is reached. All culverts over 70 feet long shall be 24 inches or more in diameter. Minimum pipe diameter for culverts under driveways and approach roads and for median drains shall be 12 inches. The minimum diameter of pipe for storm sewers, siphons, and irrigation systems shall be 12 inches. Pipe carrying drainage from irrigated lands shall be considered as culverts and the appropriate minimum size used.

Rubber gasketed concrete pipe arches are not available in Idaho, so the advantage of using concrete arches where clearance is limited cannot be realized. The equivalent size of corrugated metal pipe arches require more cover than round pipe through 30 inches in diameter. The total height from stream bed to road surface is about the same for arch or round pipe in the smaller sizes so round pipe is more economical to use. When an installation requires round pipe of 36 inch diameter or over, the arch pipe will require less total clearance from stream bed to road surface because it provides a shallower, wider passageway. CMP arch pipe may be used to reduce flooding of land upstream from a culvert site. Two other solutions may also be considered (economics is the deciding factor):

A larger round pipe may be partially buried below stream bed to provide the same clearance in that opening area as the required arch.

A box culvert meeting the conditions may be used.

Pipe arches should normally be limited to sites where headroom is limited. Pipe arches do not necessarily provide better fish passage than round culverts, unless they are embedded to provide a natural stream bed through the culvert. On streams with a wide fluctuation in flow (including most streams), the use of a pipe arch results in a thin layer of flow across a relatively wide invert during low periods of flow. This condition is not conducive to fish passage.

640.03 Clearance for Culverts. Culverts 12 feet or more wide and all culverts with an open bottom shall have a minimum clearance above high water of 1 foot. High Water is defined as the water surface elevation at the inlet of the culvert for the 50-year flood event.

Circular culverts, box culverts, and pipe arches under 12 feet wide that have a closed bottom (including those with the invert lowered) should be designed so that the ratio of the headwater (HW) to diameter (D) during the 25-year flow event is less than or equal to 1.25 (HW/D < 1.25). HW/D ratios larger than 1.25 are permitted, provided that the existing site conditions dictate or warrant a larger ratio. An example of this might be an area with high roadway fills, little stream debris, and no impacted upstream property owners. The justification for exceeding the HW/D ratio of 1.25 must be discussed with the Hydraulics Engineer. The headwater from the 100-year event shall not overtop the roadway and should also be investigated for flooding damage. The culvert must be design so that the 100-year flood can be passed through the culvert without overtopping the roadway.

640.04 Culvert Life. Culvert life for fills greater than 10 feet shall be equal to or greater than the project life unless a cost study shows the total cost including replacement to be less. Project life for the purpose of selecting culvert material shall be as follows:

Interstate	100 years
Primary	80 years
Secondary	50 years

Culvert life for fills **10 feet or less** shall be 50 years.

All PVC pipe will be protected from ultraviolet radiation by either being covered or coated.

640.05 Culvert Alternates. The following alternates shall be accepted as equivalent to each other, subject to the pipe selection table requirements.

- **Side Drains Only**: Corrugated Metal, Concrete Irrigation Pipe, Concrete Bell and Spigot Pipe, or Plastic Pipe.
- **Cross Drains:** Corrugated Metal, Concrete Pipe, or Plastic Pipe.

640.06 Procedure for Selection Culvert Pipe Material. The selection of pipe culverts of 8 feet diameter or less for Idaho highways is to be made in accordance with the following step-by-step procedures. Alternate pipes are to be specified in the pipe summaries wherever several kinds of pipe are found to be satisfactory. Separate designs for the various acceptable alternates are to be made at every installation. If only one kind of pipe is found to be adequate, then only that kind of pipe should be specified.

- The Joint Materials Report, Phase II - Pipe, will list pH and resistivity values for use in pipe materials selection. Limits of pH values for various types of culverts are shown in the Culvert Materials Selection Tables (see Figure 6-2). The estimated life of steel or aluminum culverts can be determined by using the Estimated Life of Steel or Aluminum Culverts, that is (see Section 672.00).
- Determine the earth and traffic loads to be carried by the pipe. Do not specify any pipe that will not carry these loads. Refer to Pipe Selection Tables, for charts of fill heights above the top of the pipe and loadings that are located (see Section 675.00).
- Determine whether or not water tightness is required at the pipe installation. If required, specify only those pipes that are acceptable as watertight pipe.
- Determine the design flood during the life of the project (see Section 625.00). Specify the size of pipe that will carry this flow of water at the culvert site.
- At each site where pipe is to be used, specify on the pipe summary sheets the various alternates that meet the requirements.

640.07 Specific Pipe Requirements. In addition to the above general procedures, designers are to apply the following specific rules.

Inlet and Outlet Protection

High velocity flow at a culvert outlet will often scour a large hole in the natural channel that results in undermining the culvert barrel and/or roadway embankment. Rigid sectional type pipes placed in erodible soil are vulnerable to disjointing under scour conditions. Most of the **inlet** failures reported by FHWA have occurred on large, metal pipe culverts with projected or mitered entrances without a headwall. Most of the outlet failures have occurred on rigid (concrete) sectional type pipes subjected to scour or erosion washing.

The forces acting on the culvert at both inlet and outlet during flood conditions are variable and compounded by lodged debris. Soils adjacent to the inlet can become saturated and slump into the flood waters, thereby increasing the length of the projected culvert that in turn is subjected to increased buoyant forces. The pipe culvert can then be bent upward by the buoyant force. Mitered or skewed ends on corrugated metal pipe often scour; and erosion beneath the discharge end of rigid sectional pipe results in sections of pipe falling into the channel as the support soil progressively fails.

Attention must be given to evaluation for protection at the ends of culverts. Pipes 48 inches and larger in diameter are more susceptible to inlet or outlet failure than smaller pipe. Inlet protection features should be anchored or designed so that the headwall, slope paving, or riprap will not fall off or slough away from the end of pipe.

Inlets placed on rural sections should be selected to function with the type of guardrail placed on the roadway.

When scour potential at the outlet is great, energy dissipaters or channel design should be designed so that scour is reduced or eliminated.

Headwalls and Bevels for Culverts

All pipe culverts with a concrete headwall and all box culverts shall have their inlet headwalls beveled to improve the inlet flow characteristics. (See Standard Drawings D-2-A, D-7, D-8, and D-9. The only exception to this is if the culvert is flowing under outlet control. Culvert performance is not enhanced by improved inlet conditions when the culvert is flowing under outlet control. It is important however to verify if the culvert remains under outlet control through all ranges of flow under which the culvert will be operating.)

Side Drains

Do not use pipe less than 12 inches in diameter. Do not specify bituminous coatings on corrugated metal pipe for side drains under residential or farm approaches. If side drains pass under commercial or public road approaches, design them as cross drains.

Cross Irrigation and Cross Drains

Cross irrigation pipe shall be designed as watertight. Water tightness for cross drains will be required only if the pipe flows at least 3/4 full for one or more months out of the year. Specify siphon-type corrugated metal pipe or rubber gaskets for concrete pipe cross drains where water tightness is required.

Median Drains

If median drain inlets are protected from debris with grates, use a minimum pipe diameter of 12 inches. If the median drain inlet is not protected with a grate, design the median drain on the same basis that you would if it were a cross drain.

Sewers (Sanitary and Storm)

Generally, concrete or PVC pipe will be used for sanitary sewers. Concrete, PVC, or corrugated polyethelene (PE) pipe will be used for storm drains, unless a special situation would require a different type of pipe. The minimum size for a storm sewer will be 12 inches.

Extensions

If extensions of an existing pipe are required, specify either the same kind of pipe as is already in place or a compatible type.

Pipe Cover

Pipe cover for a flexible pavement is the vertical distance from the outside surface of the pipe crown to the bottom of the flexible pavement at the lowest point. For a rigid pavement, the pipe cover is the distance from the outside surface of the pipe to the finished grade. Ignore the bell when measuring the cover for the bell and spigot pipe. ***Pipes should not be placed in the ballast section.*** Refer to Section 675.00, Pipe Selection Tables for minimum and maximum cover requirements.

645.00 – STORM SEWERS

Procedures for designing storm sewers are outlined in FHWA publication "Urban Drainage Design Manual", Hydraulic Engineering Circular No. 22.

The Hydraulic Grade Line (HGL) will be calculated and documented in the Hydraulics Report and the HGL profile will be shown on the roadway plans. The minimum diameter of pipe for storm sewers, siphons, and irrigation systems shall be 12 inches. Pipe carrying drainage from irrigated lands shall be considered as culverts and the appropriate minimum size used.

Design storm frequency will be in accordance with the table shown below.

RECOMMENDED STORM FREQUENCIES TO BE USED IN DESIGN OF STORM SEWERS	
Design Average Daily Traffic	**Storm Frequency**
Up to 20,000	10 years
20,000 and over, depressed underpasses, and interstate	25 years

Project life for the purpose of selecting storm sewer material will be 100 years. The limits of flooding for a Design Storm will not encroach on the traveled way beyond one-half of the adjacent travel lane.

The design flood for encroachments by through lanes of Interstate highways shall not be less than the flood with a 2 percent chance (50 year flood) of being exceeded in any given year.

The design data for storm sewers (over 24 inches) in diameter will be submitted to the Resource Center and Environmental for review.

650.00 – INSTALLATION OF UTILITIES ON NEW BRIDGES

When utility installations are to be incorporated in new bridges, the preferred procedure is to have the required installations and mode of attachment shown on the plans.

When utilities are to be installed on a new bridge, the details of the installations must be furnished to the Bridge section as early as possible.

Adhere to Section 5.8 of the "Utility Accommodation Policy" (GUM-Appendix A) regarding utility installation on structures and coordinate with Utility Engineer for required agreements per the "Guide for Utility Management".

655.00 – TIMING OF REQUESTS FOR BRIDGE PLANS AND CHANGES

The district should indicate on an ITD 1414, Project Program Entry or Revision, whenever waterway structures are involved in the project. If waterway structures information was omitted, please notify the Bridge Engineer so that design and detailing can proceed in a routine manner.

Before proceeding with detailed design of a structure, the Bridge Engineer will distribute the layout drawing of that structure to the district in which the structure will be built, and (if FHWA Project of Interest) to FHWA. Features that are likely to be controversial will be shown or described in the drawing and/or the forwarding letter.

A complete review of the plans should be made at this time to eliminate changes in the structure design after the design is well advanced.

Requests for changes, including addition of one or more structures to a project, may be made on an ITD 1414, Project Program Entry or Revision, or may be in letter form. In either case, the required content is as follows:

- Description of the change desired.
- Justification for the change.
- Estimated increase or decrease in cost resulting from the change.
- Signature and title of person making the request.

670.00 – CULVERT MATERIALS SELECTION TABLE

Figure 6-2 should be used when selecting culvert materials.

Figure 6-2

CULVERT MATERIALS SELECTION TABLE

PIPE	pH Value									
	3	4	5	6	7	8	9	10	11	12
Galvanized Steel				X	X	X				
Bituminous-Coated Galvanized Steel*			X	X		X	X	X		
Aluminized Steel			X	X	X	X				
Bituminous-Coated Aluminized Steel*			X	X	X	X	X	X		
Polymer-Coated Steel		X	X	X	X	X	X	X		
(AASHTO M245/M246)										
Aluminum			X	X	X	X				
Bituminous-Coated Aluminum*		X	X	X	X	X	X	X		
Reinforced & Non-Reinforced Concrete			X	X	X	X	X	X	X	X
Plastic		X	X	X	X	X	X	X	X	X
*Use bituminous-coated ONLY when required (increasing metal thickness by one gauge increment is an acceptable substitute for bituminous coating whenever pipe life is 20 years or more).										

NOTES:

1. The chart covers structural plate, culvert, siphon, irrigation, sewer, embankment protector, and under drain pipe where applicable.

Non-metallic pipe, bituminous-coated aluminum pipe or bituminous-coated aluminized steel pipe shall be used when the soil resistivity is less that 1000 ohm-cm and the pH is above 5.

If bed-load velocities of abrasive materials exceed 5 ft/sec, specify 3” x 1” corrugations for steel pipe. Pipes less than 36” exposed to these conditions will have special evaluation.

If the bed load velocities of abrasive materials exceed 5 ft/sec aluminum or aluminized steel pipe 60” and larger should not be used. Steel pipe can be used, but its invert should be paved with concrete.

Aluminum or aluminized steel CMP must be asphalt-coated where in direct contact with fresh concrete. Special notes in the pipe summary for field coating the concrete-aluminum contract surface may be used in lieu of coating the entire length of pipe.

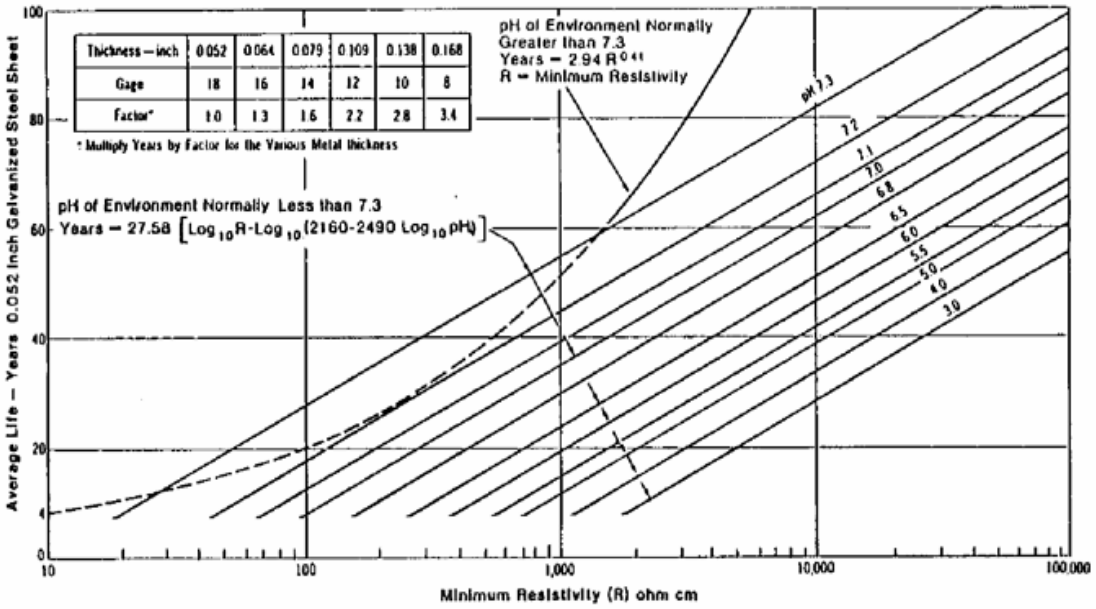
Metallic pipe of unlike materials shall not be joined together. Galvanized steel hook bolts may be used to tie aluminum plate pipe to concrete headwalls.

Aluminum pipe shall not be bedded in or backfilled with soils classified as CH or CL. Granular bedding backfill material should be imported.

Metal pipe shall not be used in sewer under high type pavement if there are underground utilities that have cathodic protection or if such protection is planned to be installed in the future. For the purpose of this limitation, a high type pavement is defined as Portland cement concrete or plantmix with a 5" plastic pipe (PVC or Polyethylene) is limited in size and fill height, requires protection for culvert ends.

All PVC and Polyethylene pipe will be protected from ultraviolet radiation by either being covered or coated.

672.00 – ESTIMATED LIFE OF STEEL OR ALUMINUM CULVERTS



Source: "Handbook of Steel Drainage & Highway Construction Products, "American Iron and Steel Institute (1994), page 339. To purchase online www.steel.org, select Shop, Search for Steel Drainage.

675.00 – PIPE SELECTION TABLES

The following tables can be used to select appropriate pipe.

CORRUGATED STEEL PIPE 2” x 1/2” x 2-2/3” Annular Corrugations						
Minimum Thickness		0.064” 16 Gage	0.079” 14 Gage	0.109” 12 Gage	0.138” 10 Gage	0.168” Gage
Pipe Diameter	Minimum Cover*	*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement. ***Pipes should not be placed in the ballast section.***				
INCHES		Maximum Fill Heights Above Top of Pipe in Feet				
12	12	92	100+	100+	100+	100+
15	12	74	80	100+	100+	100+
18	12	61	67	86	90	94
24	12	46	50	65	68	71
30	12	37	40	52	54	56
36	12	30	33	43	45	47
42	12	34	47	74	77	81
48	12	30	41	65	68	71
54	12	-	36	57	60	63
60	12	-	-	52	54	57
66	12	-	-	-	49	51
72	12	-	-	-	45	47
78	12	-	-	-	-	43
84	12	-	-	-	-	40
Thickness to 0.168” may be provided where required for abrasion, corrosion, or other factors						

CORRUGATED STEEL PIPE-ARCH 2" x 1/2" or 2-2/3" x 1/2 " Annular or Helical Corrugations							
Pipe Dimensions	Corner Radius	Minimum Cover*	Minimum Thickness	Maximum Fill Heights Above Top of Pipe for Corner Bearing Pressures in Tons/ Square Feet			Round Pipe Equivalent Diameter
Inches	Inches	Inches	Inches/ Ga.	2 Tons	3 Tons	4 Tons	Inches
17 x 13	3-1/2	27	0.064 / 16	13	20	27	15
21 x 15	4-1/8	28	0.064 / 16	13	19	26	18
24 x 18	4-7/8	27	0.064 / 16	13	20	27	21
28 x 20	5-1/2	28	0.064 / 16	13	19	26	24
35 x 24	6-7/8	28	0.064 / 16	13	19	26	30
42 x 29	8-1/4	28	0.064 / 16	13	19	26	36
49 x 33	9-5/8	28	0.079 / 14	13	19	26	42
57 x 38	11	28	0.109 / 12	12	19	25	48
64 x 43	12-3/8	28	0.109 / 12	12	19	25	54
71 x 47	13-3/4	28	0.138 / 10	12	19	25	60
77 x 52	15-1/8	28	0.168 / 8	13	19	26	66
83 x 57	16-1/2	28	0.168 / 8	13	19	26	72

Thickness to 0.168" may be provided where required for abrasion, corrosion, or other factors.

Pipes should not be placed in the ballast section.

*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement.

CORRUGATED STEEL PIPE **3" x 1" Annular Corrugations**						
Minimum Thickness		0.064" 16 Gage	0.079" 14 Gage	0.109" 12 Gage	0.138" 10 Gage	0.168" 8 Gage
Pipe Diameter	Minimum Cover*	*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement. ***Pipes should not be placed in the ballast section.***				
Inches		Maximum Fill Heights Above Top of Pipe in Feet				
36	12	53	66	98	100+	100+
42	12	45	56	84	100+	100+
48	12	39	49	73	88	98
54	12	35	44	65	78	87
60	12	31	39	58	70	78
66	12	28	36	53	64	71
72	12	26	33	49	58	65
78	12	24	30	45	54	60
84	12	22	28	42	50	56
90	12	21	26	39	47	52
96	12	-	24	36	44	49
102	24	-	23	34	41	46
108	24	-	-	32	39	43
114	24	-	-	30	37	41
120	24	-	-	29	35	39

Thickness to 0.168" may be provided where required for abrasion, corrosion, or other factors.

CORRUGATED STEEL PIPE-ARCH 3" x 1" Annular or Helical Corrugations						
Pipe Dimensions	Corner Radius	Minimum Cover*	Minimum Thickness	Maximum Fill Heights Above Top of Pipe for Corner Bearing Pressures in Tons/Sq. Ft.		
Inches	Inches	Inches	In / Gage	2 Tons	3 Tons	4 Tons
60 x 46	18-3/4	24	0.079 / 14	20	31	39
66 x 51	20-3/4	24	0.079 / 14	20	31	36
73 x 55	22-7/8	24	0.079 / 14	20	31	32
81 x 59	20-7/8	24	0.079 / 14	17	25	29
87 x 63	22-5/8	24	0.079 / 14	17	26	27
95 x 67	24-3/8	24	0.079 / 14	17	25	25
103 x 71	26-1/8	24	0.109 / 12	16	25	33
112 x 75	27-3/4	24	0.109 / 12	16	24	31
117 x 79	29-1/2	24	0.109 / 12	16	25	30
128 x 83	31-1/4	24	0.138 / 10	16	24	32
137 x 87	33	24	0.138 / 10	16	24	30
142 x 91	34-3/4	24	0.168 / 8	16	24	32
Thickness to 0.168" may be provided where required for abrasion, corrosion, or other factors.						

NOTE: Fill heights are invalid if gauge is changed.

Pipes should not be placed in the ballast section.

*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement.

CORRUGATED STEEL PIPE **5” x 1” Annular Corrugations**						
Minimum Thickness		0.064” 16 Gage	0.079” 14 Gage	0.109” 12 Gage	0.138” 10 Gage	0.168” 8 Gage
Pipe Diameter	Minimum Cover*	Maximum Fill Heights Above Top of Pipe in Feet ***Pipes should not be placed in the ballast section.***				
Inches	Inches					
36	12	53	66	98	100+	100+
42	12	45	56	84	100+	100+
48	12	39	49	73	88	98
54	12	35	44	65	78	87
60	12	31	39	58	70	78
66	12	28	36	53	64	71
72	12	26	33	49	58	65
78	12	24	30	45	54	60
84	12	-	28	42	50	56
90	12	-	26	39	47	52
96	12	-	24	36	44	49
102	24	-	23	34	41	46
108	24	-	-	32	39	43
114	24	-	-	30	37	41
120	24	-	-	29	35	39

*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement.

CORRUGATED STEEL PIPE **2" x 1/2" or 2-2/3" x 1/2" Helical Corrugations**						
Minimum Thickness		0.064" 16 Gage	0.079" 14 Gage	0.109" 12 Gage	0.138" 10 Gage	0.168" 8 Gage
Pipe Diameter	Minimum Cover*	*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement. ***Pipes should not be placed in the ballast section.***				
Inches	Inches	Maximum Fill Heights Above Top of Pipe in Feet				
12	12	100+	100+	100+	-	-
15	12	100+	100+	100+	-	-
18	12	100+	100+	100+	100+	-
24	12	100+	100+	100+	100+	100+
30	12	85	100+	100+	100+	100+
36	12	71	88	100+	100+	100+
42	12	60	76	100+	100+	100+
48	12	53	66	93	100+	100+
54	12	-	59	82	100+	100+
60	12	-	-	74	95	100+
66	12	-	-	-	87	100+
72	12	-	-	-	79	97
78	12	-	-	-	-	86
84	12	-	-	-	-	75

CORRUGATED STEEL PIPE **3" x 1" Helical Corrugations**						
Minimum Thickness		0.064" 16 Gage	0.079" 14 Gage	0.109" 12 Gage	0.138" 10 Gage	0.168" 8 Gage
Pipe Diameter	Minimum Cover*	*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement. ***Pipes should not be placed in the ballast section.***				
INCHES		Maximum Fill Heights Above Top of Pipe in Feet				
36	12	81	100+	100+	100+	100+
42	12	69	87	100+	100+	100+
48	12	61	76	100+	100+	100+
54	12	54	68	95	100+	100+
60	12	48	61	85	100+	100+
66	12	44	55	78	100+	100+
72	12	40	51	71	92	100+
78	12	37	47	66	84	100+
84	12	34	43	61	78	96
90	12	32	40	57	73	90
96	12	-	38	53	69	84
102	24	-	36	50	64	79
108	24	-	-	47	61	75
114	24	-	-	45	58	71
120	24	-	-	42	55	67
126	24	-	-	-	52	64
132	24	-	-	-	50	61
138	24	-	-	-	48	58
144	24	-	-	-	-	56
150	24	-	-	-	-	52

NOTE: Fill heights are invalid if gauge is changed.

CORRUGATED STEEL PIPE **5" X 1" Helical Corrugations**						
Minimum Thickness		0.064" 16 Gage	0.079" 14 Gage	0.109" 12 Gage	0.138" 10 Gage	0.168" 8 Gage
Pipe Diameter	Minimum Cover*	*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement. ***Pipes should not be placed in the ballast section.***				
INCHES		Maximum Fill Heights Above Top of Pipe in Feet				
36	12	72	90	100+	100+	100+
42	12	62	77	100+	100+	100+
48	12	54	68	95	100+	100+
54	12	48	60	84	100+	100+
60	12	43	54	76	98	100+
66	12	39	49	69	89	100+
72	12	36	45	63	81	100+
78	12	33	41	58	75	92
84	12	31	38	54	70	85
90	12	29	36	50	65	80
96	12	-	34	47	61	75
102	24	-	32	44	57	70
108	24	-	-	42	54	66
114	24	-	-	40	51	63
120	24	-	-	38	49	60
126	24	-	-	-	46	57
132	24	-	-	-	44	54
138	24	-	-	-	42	52
144	24	-	-	-	-	50
150	24	-	-	-	-	48

CORRUGATED ALUMINUM PIPE 2" x 1/2" or 2-2/3" x 1/2" Annular Corrugations Specified in AASHTO M196 or M211						
Minimum Thickness		0.060"	0.075"	0.105"	0.135"	0.164"
Pipe Diameter	Minimum Cover*	*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement. ***Pipes should not be placed in the ballast section.***				
INCHES		Maximum Fill Heights Above Top of Pipe in Feet				
12	12	50	50	86	90	93
18	12	33	33	57	60	62
24	12	25	25	43	45	46
30	12	20	20	34	36	37
36	12	16	16	28	30	31
42	12	22	28	50	52	53
48	12	-	25	43	45	47
54	12	-	-	38	40	41
60	12	-	-	-	36	37
66	12	-	-	-	33	34
72	12	-	-	-	-	31

CORRUGATED ALUMINUM PIPE-ARCH 1/4", 7/16" or 1/2" Annular or Helical Corrugations Specified in AASHTO M196 or M211							
Pipe Dimensions	Corner Radius	Minimum Cover*	Minimum Thickness	Maximum Fill Heights Above Top of Pipe			Round Pipe Equivalent Diameter
INCHES	INCHES	INCHES	INCHES	2 TONS	3 TONS	4 TONS	INCHES
17 x 13	3-1/12	18	0.060	13	20	27	15
21 x 15	4-1/8	18	0.060	13	19	26	18
24 x 18	4-7/8	18	0.075	13	20	27	21
28 x 20	5-1/2	18	0.075	13	19	26	24
34 x 24	6-7/8	18	0.105	13	20	26	30
42 x 29	8-1/4	18	0.105	13	19	26	36
49 x 33	9-5/8	18	0.135	13	19	26	42
57 x 38	11	18	0.135	12	19	25	48
64 x 43	12-3/8	18	0.135	12	19	25	54
71 x 47	13-3/4	18	0.164	12	19	25	60

Pipes should not be placed in the ballast section

*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement.

CORRUGATED ALUMINUM PIPE 3" x 1" Annular Corrugations Specified in AASHTO M196 or M211						
Minimum Thickness		0.060"	0.075"	0.105"	0.135"	0.164"
Pipe Diameter	Minimum Cover*	*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement. ***Pipes should not be placed in the ballast section.***				
Inches	Inches	Maximum Fill Heights Above Top of Pipe in Feet				
36	12	30	37	51	77	100
42	12	26	32	44	66	86
48	12	22	28	38	58	75
54	12	20	25	34	51	67
60	12	18	22	31	46	60
66	12	16	20	28	42	55
72	12	15	18	25	38	50
78	12	-	17	23	35	46
84	12	-	-	22	33	43
90	12	-	-	20	31	40
96	12	-	-	19	29	37
102	12	-	-	-	27	35
108	12	-	-	-	25	33
114	12	-	-	-	-	31

CORRUGATED ALUMINUM PIPE **6" x 1" Annular Corrugations Specified in AASHTO M196 or M211**						
Minimum Thickness		0.060"	0.075"	0.105"	0.135"	0.164"
Pipe Diameter	Minimum Cover*	*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement. ***Pipes should not be placed in the ballast section.***				
Inches	Inches	Maximum Fill Heights Above Top of Pipe in Feet				
36	12	25	32	45	-	-
42	12	22	27	38	-	-
48	12	19	24	33	43	-
54	12	17	21	30	38	-
60	12	15	19	27	34	42
66	12	14	17	24	31	38
72	12	12	16	22	29	35
78	13	-	14	20	26	32
84	13	-	-	19	24	30
90	13	-	-	18	23	28
96	13	-	-	-	21	26
102	13	-	-	-	20	25
108	14	-	-	-	19	23
114	14	-	-	-	-	22
120	15	-	-	-	-	21

CORRUGATED ALUMINUM PIPE **2" x 1/2" or 2-2/3" x 1/2" Helical Corrugations Specified in AASHTO M196 or M211**						
Minimum Thickness		0.060"	0.075"	0.105"	0.135"	0.164"
Pipe Diameter	Minimum Cover*	Maximum Fill Heights Above Top of Pipe in Feet ***Pipes should not be placed in the ballast section.***				
Inches	Inches					
12	12	100+	100+	100+	100+	100+
18	12	100+	100+	100+	100+	100+
24	12	77	96	100+	100+	100+
30	12	62	77	100+	100+	100+
36	12	51	64	90	100+	100+
42	12	44	55	77	99	100+
48	12	-	-	66	86	100+
54	12	-	-	54	70	87
60	12	-	-	-	57	71
66	12	-	-	-	-	57
70	12	-	-	-	-	45

*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement.

CORRUGATED ALUMINUM PIPE **3" x 1" Helical Corrugations Specified in AASHTO M196 or M211**						
Minimum Thickness		0.060"	0.075"	0.105"	0.135"	0.165"
Pipe Diameter	Minimum Cover*	*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement. ***Pipes should not be placed in the ballast section.***				
Inches	Inches	Maximum Fill Heights Above Top of Pipe in Feet				
30	12	71	89	100+	100+	100+
36	12	59	74	100+	100+	100+
42	12	50	63	89	100+	100+
48	12	44	55	78	100+	100+
54	12	39	49	69	92	100+
60	12	35	44	62	83	98
66	12	32	40	56	75	89
72	12	29	37	52	69	81
78	12	-	34	48	63	75
84	12	-	-	44	59	70
90	12	-	-	41	55	65
96	12	-	-	38	51	60
102	12	-	-	-	46	54
108	12	-	-	-	41	49
114	12	-	-	-	-	44
120	12	-	-	-	-	40

*** PLASTIC PIPE -- CORRUGATED POLYETHYLENE PIPE – AASHTO M294 & MP-7**			
Minimum Cover for Roadway and Public Approaches			Maximum Height of Cover
Size (IN)	Minimum Cover* (FT)		Cover (FT)
12-60	2		25

All plastic pipe shall be installed to manufacturer's specifications.

CONCRETE PIPE

Type 1 bedding is to be specified on 24" or less pipe, except where fill height calls for Type 3.
Type 2 bedding is to be specified on larger than 24" pipe, unless fill height calls for Type 3.

Minimum Cover* for Roadway and Public Approaches				
Size (IN)	Reinforced Concrete Pipe			
	II	III	IV	V
12	2.5	2.0	1.5	1.0
18	2.5	2.0	1.5	1.0
24	2.5	2.0	1.5	1.0
30	2.5	2.0	1.5	1.0
36	2.5	2.0	1.5	1.0
Over 36	2.5	2.0	1.5	1.0

Maximum Height of Cover		
Class of Pipe	Type 1-2 Bedding	Type 3 Bedding
II	Not Used	-
III	10	-
IV	16	-
V	24	35
DO NOT USE CLASS II CONCRETE PIPE UNDER PUBLIC ROADS		

CONCRETE PIPE

Minimum Cover** for Concrete Pipe Under Private Approaches ***Pipes should not be placed in the ballast section.***				
Pipe Diameter (in)	Irrigation Pipe (ft)	Class II (ft)	Class III (ft)	Class IV (ft)
12	1.9	1.9	1.4	1.0
15	2.0	1.8	1.2	1.0
18	2.0	1.6	1.0	-
21	2.0	1.6	1.0	-
24	2.0	1.6	1.0	-
30 & Over	2.5	1.5	-	-

Maximum Cover for Irrigation Pipe Under Private Approaches	
Pipe Diameter (in)	Maximum Cover (ft)
12	7.5
15	6.5
18	6.0
21	5.5
24	5.0

CORRUGATED METAL PIPE UNDER PRIVATE APPROACHES

When corrugated metal pipe is used under private approaches, the minimum cover or H-10 loading may be one(1) foot, provided the following thicknesses are used:

Pipe Diameter	12" – 36"	42" – 48"	54" - 66"	72" – 84"
Minimum Thickness	0.064"	0.079"	0.109"	0.138"

*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement

Minimum cover for rigid pavement over concrete pipe shall include a minimum of 9” of compacted granular fill between the top of the pipe and the bottom of the pavement slab. ***Pipes should not be placed in the ballast section.*

STRUCTURAL PLATE STEEL PIPE 6" x 2" Corrugations Bolted Fabrication										
Minimum Thickness		0.109"	0.138"	0.168"	0.188"	0.218"	0.249"	0.280"	0.280", E 1400*	
		4-3/4 inch A-325 Bolts Per Foot of Seam							6 Bolts	8 Bolts
Pipe Diameter	Minimum Cover**	*Excellent backfill, 95% density, E = 1400, K 22. **Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement. ***Pipes should not be placed in the ballast section.***								
FT/IN	IN	Maximum Fill Heights Above Top of Pipe in Feet								
5'- 0"	12	47	68	90	100+	100+	100+	100+	100+	100+
5'-6"	12	43	62	81	94	100+	100+	100+	100+	100+
6'-0"	12	39	57	75	86	100+	100+	100+	100+	100+
6'-6"	12	36	52	69	79	95	100+	100+	100+	100+
7'-0"	12	34	49	64	73	88	100+	100+	100+	100+
7'-6"	12	31	45	60	68	82	97	100+	100+	100+
8'-0"	12	29	43	56	64	77	91	100+	100+	100+
8'-6"	12	28	40	52	60	73	86	94	100+	100+
9'-0"	24	26	38	50	57	69	81	88	100+	100+
9'-6"	24	25	36	47	54	65	77	84	100+	100+
10'-0"	24	23	34	45	51	62	73	80	100+	100+
10'-6"	24	22	32	42	49	59	69	76	95	100+
11'-0"	24	21	31	40	46	56	65	72	90	97
11'-6''	24	20	30	39	44	54	63	69	86	93
12'-0"	24	19	28	37	43	51	61	66	83	89
12'-6"	24	19	27	36	41	49	58	64	80	86
13'-0'	24	18	26	34	39	47	56	61	76	82
13'-6"	24	17	25	33	38	46	54	59	74	79

14’-0”	24	16	24	32	36	44	52	57	71	76
14’-6”	24	15	23	31	35	42	50	55	68	74
15’-0”	24	15	22	30	34	41	48	53	66	71
15’-6”	24	15	22	29	33	40	47	51	64	69
16’-0”	24	-	21	28	32	38	45	50	62	67
16’-6”	36	-	20	27	31	37	44	48	60	65
17’-0”	36	-	20	26	30	36	43	47	58	63
17’-6”	36	-	-	25	29	35	41	45	57	61
18’-0”	36	-	-	25	28	34	41	44	55	59
18’-6”	36	-	-	24	27	33	39	43	54	58
19’-0”	36	-	-	24	27	32	38	42	52	56
19’-6”	36	-	-	-	26	31	37	41	51	55
20’-0”	36	-	-	-	25	31	36	40	50	53
20’-6”	36	-	-	-	-	30	35	39	48	52
21’-0”	36	-	-	-	-	30	34	38	-	51

STRUCTURAL STEEL PIPE-ARCH 6" x 2" Corrugations Bolted Fabrication					
Pipe Dimensions	Corner Radius	Minimum Cover*	Maximum Fill Heights Above Top of Pipe for Corner Pressures of 4000 Lbs/Sq Ft		
Span Rise			Minimum Thickness		
Feet-Inches	Inches	Inches	0.109"	0.138"	0.168"
6'-1 x 4'-7"	18	24	16	16	-
7'-0" x 5'-1"	18	26	14	14	-
7'-11" x 5'-7"	18	29	12	12	-
8'-10" x 6'-1"	18	31	11	11	-
9'-9" x 6'-7"	18	34	10	10	-
10'-11" x 7'-1"	18	36	9	9	-
11'-10" x 7'-7"	18	36	8	8	-
12'-10" x 8'-4"	18	36	7	7	-
14'-1" x 8'-9"	18	36	7	7	-
15'-4" x 9'-3"	18	36	6	6	-
15'-10" x 9'-10"	18	36	6	6	-
16'-7" x 10'-1"	18	36	6	6	-
13'-3" x 9'-4"	31	24	12	12	-
14'-2" x 9'-10"	31	24	12	12	-
15'-4" x 10'-4"	31	24	11	11	-
16'-3" x 10'-10"	31	25	10	10	-
17'-2" x 11'-4"	31	26	10	10	-
18'-1" x 11'-10"	31	28	9	9	-
19'-3" x 12'-4"	31	29	-	8	8
19'-11" x 12'-10"	31	30	-	7	7
20'-7" x 13'-2"	31	31	-	7	7
Thickness 0.168" may be provided where required for abrasion, corrosion, or other factors.					

Pipes should not be placed in the ballast section.

*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement.

STRUCTURAL STEEL PIPE-ARCH 6" x 2" Corrugations Bolted Fabrication					
Pipe Dimensions	Corner Radius	Minimum Cover*	Maximum Fill Heights Above Top of Pipe for Corner Pressures of 6000 Lbs/Sq Ft		
Span Rise			Minimum Thickness		
Feet-Inches	Inches	Inches	0.109"	0.138"	0.168"
6'-1 x 4'-7"	18	24	24	24	-
7'-0" x 5'-1"	18	24	21	21	-
7'-11" x 5'-7"	18	24	18	18	-
8'-10" x 6'-1"	18	24	16	16	-
9'-9" x 6'-7"	18	24	15	15	-
10'-11" x 7'-1"	18	24	13	13	-
11'-10" x 7'-7"	18	24	12	12	-
12'-10" x 8'-4"	18	24	11	11	-
14'-1" x 8'-9"	18	24	10	10	-
15'-4" x 9'-3"	18	24	9	9	-
15'-10" x 9'-10"	18	24	9	9	-
16'-7" x 10'-1"	18	25	9	9	-
13'-3" x 9'-4"	31	24	18	19	19
14'-2" x 9'-10"	31	24	16	18	18
15'-4" x 10'-4"	31	24	15	16	16
16'-3" x 10'-10"	31	25	14	15	15
17'-2" x 11'-4"	31	26	13	15	15
18'-1" x 11'-10"	31	28	13	14	14
19'-3" x 12'-4"	31	29	-	13	13
19'-11" x 12'-10"	31	30	-	12	12
20'-7" x 13'-2"	31	31	-	12	12
Thickness to 0.168" may be provided where required for abrasion, corrosion, or other factors.					

Pipes should not be placed in the ballast section

*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement.

STRUCTURAL STEEL PIPE-ARCH 6" x 2" Corrugations Bolted Fabrication					
Pipe Dimensions	Corner Radius	Minimum Cover*	Maximum Fill Heights Above Top of Pipe for Corner Pressures of 8000 Lbs/Sq Ft		
Span Rise			Minimum Thickness		
Feet-Inches	Inches	Inches	0.109"	0.138"	0.168"
6'-1 x 4'-7"	18	24	32	32	-
7'-0" x 5'-1"	18	24	28	28	-
7'-11" x 5'-7"	18	24	25	25	-
8'-10" x 6'-1"	18	24	22	22	-
9'-9" x 6'-7"	18	24	20	20	-
10'-11" x 7'-1"	18	24	18	18	-
11'-10" x 7'-7"	18	24	16	16	-
12'-10" x 8'-4"	18	24	15	15	-
14'-1" x 8'-9"	18	24	14	14	-
15'-4" x 9'-3"	18	24	13	13	-
15'-10" x 9'-10"	18	24	12	12	-
16'-7" x 10'-1"	18	25	12	12	-
13'-3" x 9'-4"	31	24	18	25	25
14'-2" x 9'-10"	31	24	16	24	24
15'-4" x 10'-4"	31	24	15	22	22
16'-3" x 10'-10"	31	25	14	21	21
17'-2" x 11'-4"	31	26	13	20	20
18'-1" x 11'-10"	31	28	13	19	19
19'-3" x 12'-4"	31	29	-	17	17
19'-11" x 12'-10"	31	30	-	17	17
20'-7" x 13'-2"	31	31	-	16	16
Thickness to 0.168" may be provided where required for abrasion, corrosion, or other factors.					

Pipes should not be placed in the ballast section.

*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement.

ALUMINUM STRUCTURAL PLATE PIPE 9" x 2 1/2" Corrugations Steel Bolts								
Minimum Thickness		0.100"	0.125"	0.150"	0.175"	0.200"	0.225"	0.250"
Pipe Diameter	Minimum Cover*							
Inches	Feet	Maximum Fill Heights Above Top of Pipe in Feet						
72	1.25	25	37	50	58	67	77	86
78	1.40	23	35	46	54	62	71	79
84	1.50	22	32	42	50	58	66	73
90	1.50	20	30	40	47	54	57	68
96	1.50	19	28	37	44	50	61	64
102	1.70	18	26	35	41	47	54	60
108	1.75	17	25	33	39	45	51	57
114	1.90	16	23	31	37	42	48	54
120	2.00	15	22	30	35	40	46	51
126	2.00	14	21	28	33	38	44	49
132	2.25	14	20	27	32	37	42	47
138	2.40	13	19	26	30	35	40	44
144	2.50	12	18	25	29	33	38	43
150	2.50	12	18	24	28	32	36	41
156	2.50	-	17	23	27	31	35	39
162	2.70	-	-	22	26	30	34	38
168	2.75	-	-	21	25	29	33	36
174	2.90	-	-	20	24	28	31	35
180	3.00	-	-	-	23	27	30	34

Pipes should not be placed in the ballast section

*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement.

ALUMINUM STRUCTURAL PLATE PIPE-ARCH 6" x 2" Corrugations Bolted Fabrication									
Pipe Dimensions	Corner Radius	Minimum Cover*	Maximum Fill Heights Above Top of Pipe for Corner Pressures of 4000 Lb/Sq Ft						
Span Rise			Minimum Thickness						
Feet-Inches	Inches	Inches	0.100"	0.125"	0.150"	0.175"	0.200"	0.225"	0.250"
6'-7" x 5'-8"	31.8	24	23	26	26	-	-	-	-
8'-1" x 6'-1"	31.8	24	19	21	21	-	-	-	-
9'-7" x 6'-6"	31.8	24	16	18	18	-	-	-	-
11'1" x 7'-0"	31.8	24	14	15	15	-	-	-	-
12'-7" x 7'-5"	31.8	24	12	14	14	-	-	-	-
13'-11" x 8'-5"	31.8	24	11	12	12	-	-	-	-
14'-8" x 9'-8"	31.8	24	-	12	12	-	-	-	-
16'-1" x 10'-4"	31.8	25	-	10	10	-	-	-	-
17'-3" x 11'-0"	31.8	26	-	-	10	10	-	-	-
18'-8" x 11'-8"	31.8	28	-	-	-	9	9	-	-
20'-1" x 12'-3"	31.8	31	-	-	-	-	8	8	-
21'-6" x 12'-11"	31.8	33	-	-	-	-	-	8	8

Pipes should not be placed in the ballast section

*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement.

ALUMINUM STRUCTURAL PLATE PIPE-ARCH 6" x 2" Corrugations Bolted Fabrications									
Pipe Dimensions	Corner Radius	Minimum Cover*	Maximum Fill Heights Above Top of Pipe for Corner Pressures of 8000 Lbs/Sq Ft						
Span Rise			Minimum Thickness						
Feet-Inches	Inches	Inches	0.100	0.125	0.150	0.175	0.200	0.225	0.250
6'-7" x 5'-8"	31.8	24	23	34	45	53	53	-	-
8'-1" x 6'-1"	31.8	24	19	28	37	43	43	-	-
9'-7" x 6'-6"	31.8	24	16	23	31	36	36	-	-
11'-1" x 7'-0"	31.8	24	14	20	27	31	31	-	-
12'-7" x 7'-5"	31.8	24	12	18	23	28	28	-	-
13'-11" x 8'-5"	31.8	24	11	16	21	25	25	-	-
14'-8" x 9'-8"	31.8	24	-	15	20	24	24	-	-
16'-1" x 10'-4"	31.8	25	-	14	18	21	21	-	-
17'-3" x 11'-0"	31.8	26	-	-	17	20	20	-	-
18'-8" x 11'-8"	31.8	28	-	-	-	18	18	-	-
20'-1" x 12'-3"	31.8	31	-	-	-	-	17	17	-
21'-6" x 12'-11"	31.8	33	-	-	-	-	-	16	16

Pipes should not be placed in the ballast section.

*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement.

ALUMINUM STRUCTURAL PLATE PIPE-ARCH 6" x 2" Corrugations Bolted Fabrication									
Pipe Dimensions	Corner Radius	Min Cover*	Maximum Fill Heights Above Top of Pipe for Corner Pressures of 6000 Lbs/Sq Ft						
Span Rise			Minimum Thickness						
Feet-Inches	Inches	Inches	0.100"	0.125"	0.150"	0.175"	0.200"	0.225"	0.250"
6'-7" x 5'-8"	31.8	24	23	34	40	40	-	-	-
8'-1" x 6'-1"	31.8	24	19	28	32	32	-	-	-
9'-7" x 6'-6"	31.8	24	16	23	27	27	-	-	-
11'-1" x 7'-0"	31.8	24	14	20	23	23	-	-	-
12'-7" x 7'-5"	31.8	24	12	18	21	21	-	-	-
13'-11" x 8'-5"	31.8	24	11	16	19	19	-	-	-
14'-8" x 9'-8"	31.8	24	-	15	18	18	-	-	-
16'-1" x 10'-4"	31.8	25	-	14	16	16	-	-	-
17'-3" x 11'-0"	31.8	26	-	-	15	15	-	-	-
18'-8" x 11'-8"	31.8	28	-	-	-	14	14	-	-
20'-1" x 12'-3"	31.8	31	-	-	-	-	13	13	-
21'-6" x 12'-11"	31.8	33	-	-	-	-	-	12	12

Pipes should not be placed in the ballast section.

*Minimum cover is measured from the bottom of flexible pavement and finished grade of rigid pavement.

SECTION 700.00 – LOCAL PUBLIC AGENCY PROJECTS

SECTION 700.00 – LOCAL PUBLIC AGENCY PROJECTS

710.00 – PROGRAMMING A LOCAL PROJECT

A local public agency (LPA) project is initiated when the LPA officials submit their request for a federal-aid project to the district. The request must include an ITD 2435, Local Federal-Aid Project Request, An Evaluation Charter, a vicinity map, an ITD 1150, Cost Summary Sheet, and a cover letter explaining other details.

The district shall review and evaluate the submitted request to ensure that the project is eligible for federal aid. A field review may be conducted by interested parties The field review may be held after the project is programmed, unless it is believed the field review might affect eligibility for federal aid.

Projects that are eligible for federal aid will be submitted to the Office of Transportation Investments by the district for scheduling and development of the comprehensive program. Once the project request is approved and placed on the five year program, and prior to any development, a State/Local Agreement for preliminary engineering shall be prepared. (Refer to the Guidelines for Local Public Agency Projects for more information.)

715.00 – PROJECT DEVELOPMENT CONTROLS

The district reviews and reports status on all local public agency projects, excluding Local Highway Technical Assistance Council (LHTAC) administered projects The district shall request LPA official representation in addition to their engineer at the pre-operational, preliminary, intermediate (as needed), and final design reviews. A written letter or report is required for documentation for each review, even if a formal review is not held. When independent reviews are made (such as by Bridge, DMC and/or Resource Center, Right of Way and/or Traffic), project review reports shall be provided to all interested parties. Project reviews may be held at the district office, unless specified elsewhere, and should include a field inspection. Plans and other submittals requiring reviews must be submitted to the district.

The district coordinates with the appropriate sections and sets the review date to meet the schedules of all interested parties. Complete all reviews within thirty (30) days from the time the plans are received. The district will make the transmittal to the involved sections. The LPA and the district must be knowledgeable of the status on all phases of project development. The following is a chronological list of required and optional reviews for locally sponsored projects:

- Consultant Selection Meeting (Optional)
- Negotiation Meeting (Required - When federal-aid funds are used for preliminary engineering)

- Pre-Operational Conference (Required - Discuss alternative designs)
- Charter Preparation/Approval (Required - With design standards & exceptions)
- Preliminary Design Review (depends on type of project, may be required)
- Pre-Hearing Meeting (Optional)
- Public Hearing or Waiver (depends on type of project)
- Design Approval (Required)
- Intermediate Design Review (Optional)
- Soils Profile & Materials Review (depends on type of project, may be required)
- Final Design Review (Required)
- PS&E Submittal (Required)

720.00 – PRE-OPERATIONAL CONFERENCE

The sponsor's engineer, whether on staff or retained, shall request a pre-operational conference. The district shall conduct the conference. Attendance will be the LPA sponsor, the engineer, appropriate district personnel, and other ITD representatives as appropriate. Attendance by District or HQ R/W personnel on any projects requiring additional right of way activities is recommended. The purpose of the pre-operational conference is to discuss project funding, design standards, procedures, future activities, responsibilities of the parties, and the regulations to be met in project development. Discussions shall cover as much detail as possible, depending upon the type of project and the scope of work involved (i.e., project charters, environmental evaluation and report, grading, drainage, base, paving structures, traffic controls, right of way, etc.).

Before the conference is held, design information such as project number, present and future average daily traffic, and the percentage of commercial traffic should be obtained from ITD. Traffic data will be provided by the sponsor for off state system routes.

The following items, along with other applicable items, should be discussed when the sponsor's engineer is a consultant. More information on Consultant selection can be found in the Professional Service Agreement Procedures found at http://www.itd.idaho.gov/manuals/ManualsOnline.htm.

- The terms of the engineering agreement.
- Project funding and construction scheduling.
- Any applicable planning studies.

- Environmental considerations and requirements. Provide and explain charter, required environmental documentation and 23 CFR 771. The explanation should include discussion of archeological, historic, and cultural resources; Department of Fish and Game clearances; wetlands; prime and unique land encroachments; threatened and endangered species; and flood plain encroachments.
- Applicable design standards. (Project Charter, Alternate Solutions and Costs, should be completed and must be signed by the sponsor and ITD prior to a request for a preliminary design review.) Exceptions that do not meet standards must be submitted for approval as shown in Section 330 Design Exceptions. The charter submittal shall include the following:

  Proposed roadway width versus approved standards,

  Traffic volumes,

  Vertical and horizontal alignment if there are anticipated problems or design exceptions,

  Proposed railroad protection (if applicable),

  Planned traffic control devices,

  Provisions for pedestrians and bicycles,

  Accident history and analysis, including high accident locations and proposed improvements to reduce accidents, and

  Cost-effective analysis (Alternate Solutions and Costs).
- Alternate Solutions and Costs. An alternate solution and costs study is not needed on all projects, but should be done when controversy exists and problems of design need attention.
- Utility adjustments. The consultant should notify their district project contact in writing of the utilities within the project as soon as they are known. The district shall then write letters of introduction to the utility companies so the consultant can work directly with the companies (Figure 7-1).
- Requirements for the preliminary design review.
- Hearing requirements and procedures. If necessary, distribute examples illustrating the types of material required. Explain the hearing advertising sequence required and the relationship to environmental reports.
- Design study reports and requests for location/design approval.
- Item identified on the checklist for briefing LPA's per Right of Way Procedures Handbook – Section 700.

- Soils profiles and materials information requirements. Discussion shall define which organization shall do the materials testing, the number of samples to be taken and sent to the district if testing is to be done by ITD, and the costs involved. The appropriate section(s) in the Materials manual shall be followed as a guide for preparing the applicable materials reports.
- Highway projects that will impact waterways, wetlands, flood plains, etc. have numerous considerations that must be reviewed and approved. An ITD 210, Hydraulics Structures Survey, will be completed andapproved. The ITD 210 may be submitted to the Hydraulics Engineer in the Resource Center for review of culverts with a diameter of 5 feet or larger, and for all bridges. The Hydraulics Engineer is also available for review of all unusual and complex hydraulic designs such as river modeling, inverted siphons, energy dissipators, storm sewers, detention/retention facilities, pump stations, etc. Additional hydraulic specifications are in Appendix B. Refer to this data whenever necessary.

- Flood evaluation report. Approvals of the Department of Water Resources and the U.S. Army Corps of Engineers for the Water Resource and 404 Permits are required. A Floodplain Development Permit must be obtained from the community (city or county) for any encroachment in a 100-year floodplain, and accompany the ITD-210/ Hydraulic Report submittal.
- Railroad encroachments and crossings.
- Public road and private approach connections.
- Other special clearances such as airports.
- Traffic control plans for construction including detours, pavement markings, signing, and barriers.
- Permanent traffic control plans including pavement markings, signs, and traffic signals.
- Structures and layout.
- Federal aid on work by local forces (Force Account).

During the discussions, the sponsor's engineer shall be made aware of various manuals published by ITD that are to be used and followed during project development and shall make reference to various sections when applicable.

A pre-operational conference report with suggestions, discussions, and requirements covered at the conference shall be prepared by the district and distributed to the attending parties.

725.00 – PRELIMINARY DESIGN REVIEW REQUIREMENTS

In addition to the preliminary design review requirements for all projects as outlined in Section 300.00 of this manual, LPA reviews shall include any comments from the local sponsor or its engineer. These comments shall be made a part of the review report and copies of the report shall be furnished to all in attendance.

730.00 – MATERIALS/SOILS PROFILE REVIEW (DISTRICT & DMC and / or resource center)

A materials and soils profile review, if required, shall meet the requirements as outlined in the Materials manual and will be held at the district, unless specified elsewhere. The review should include a field inspection. In addition, the following shall be covered in the review:

- The soils profile, tentative soils report summary, information on proposed sources, and proposed special provisions for materials.
- The requirements for each phase report shall be reviewed in detail. The district will retain a copy of the reviewed checklist for use with the final design and PS&E submittals.
- District Materials shall be responsible for writing and distributing the meeting report.

Figure 7-1

IDAHO TRANSPORTATION DEPARTMENT

P.O. BOX 7129 BOISE, ID 83707-1129 (208) 334-8000

Date

Name of Person
Title of Person
Name of Company
Mailing Address of Company
City, State Zip Code

RE: Project No. ----, **Highway**, **Project Name**, ---- County

Key No. ----

Dear (**Name of Person)**:

The Idaho Transportation Department intends to **describe project and location, including mileposts**. Present scheduling indicates the project will be advertised for construction this **spring-summer-fall/in 20--.**

The consulting firm of **name** is developing the project design. A representative from the consulting firm will be contacting the company regarding utility facilities located within the project limits. Please furnish the consultant with requested information. Your company's preliminary engineering costs covering the preparation of plans and the estimates of cost covering utilities to be removed, adjusted or relocated at state expense will be eligible for federal participation after the date of this letter. If utility removal, adjustment, or relocation is at company expense, Federal participation is not available and preliminary engineering costs will be at company expense. A field review will be arranged if requested. The company will be provided with additional information in the future after the existing utility facilities are identified, located, and the impact by the proposed project on these facilities is determined.

Please contact me at **telephone number** if there are any questions.

Sincerely,

Name

Title or Section

Attachments: one set of plans

bcc: **appropriate distribution**

RD

735.00 – FINAL DESIGN REVIEW

The following items are in addition to the final design review requirements for all projects as outlined in Section 400.00 of this manual:

- Public and Private Approach Connections: Are the approaches safe as designed and do the plans correspond to the sponsor's arrangements for right of way acquisition, including the right of way, design, and quantities of the approaches? Do plans show which, if any, approaches are to be surfaced and to what width and design?
- Easements: Do plans indicate and will the sponsor acquire necessary easements for construction outside the normal right of way limits, such as for ditch moves, channel changes and approaches that may extend into private property, etc.?
- Utility Facilities: Have the necessary utility adjustments been adequately discussed, including an estimate of cost and a utility agreement when utility adjustments are to be made at the sponsor's expense? Will or has the sponsor arranged for necessary utility adjustments as soon as the right of way is acquired?
- Structures: Does the design proposed for irrigation canal crossing structures have the approval of the canal-owning agency? If originals are not signed by the canal agency, copies of correspondence approving the design should be obtained for documentation.
- Materials: Are all necessary materials sources located, tested, and approved? Have copies of borrow permits or free use permits (public land) been furnished to show the right to use the materials sources, including access? If not, has the sponsor or consultant been informed of the requirements in this respect?
- Old Road Abandonments: Are abandoned sections of relocated roads to be obliterated, abandoned in place, or retained in use and do local officials concur with the proposed actions?
- Non-Federal Participating Items: Are they marked on the Preliminary Estimate of Cost and listed in the Roadway Summary?
- Work by Local Forces: Include in the preliminary cost estimate a record of work performed for federal participation with a request for Local Force Account Work (Subsection 460.03).

The final design review plans shall be distributed to all district sections determined to be involved, including the Resident Engineer and HQ SME's as determined necessary for review and comments prior to the final design review being held.

During the final design review, a plan-in-hand field review to check constructability and maintainability is required. This field review will be attended by the district project contact, , or a delegate, the Resident Engineer, or a delegate, the consultant, and the sponsor (if the sponsor chooses to attend), and others (including the FHWA Operations Engineer) as invited.

During winter months, the final design review may have to be delayed until an adequate field review can be held.

750.00 – RIGHT OF WAY PLANS

In accordance with the procedures required by FHWA in enforcement of Title II and Title III of the U.S. Code (P.L. 91-646), ITD must certify the right of way for all federal-aid projects. FHWA regulations require that local federal-aid projects contain the same right of way information on the plans as is required for state federal-aid projects (see Section 415.00).

For project Right of Way Certificates, see Section 415.90.

Projects that require additional right of way or easements shall comply with the following procedures to obtain federal-aid for construction, regardless of whether or not federal-aid is used for right of way acquisition:

- As outlined in the Right of Way Procedures Handbook - Section 700.
- Preparation and submission of right of way plans for these projects shall meet the same requirements, as for all projects, when submitted for "Official Right of Way Plans" (see Right of Way Plans in Subsection 415.10 of this manual).
- A copy of all field survey data that was needed to establish existing right of way lines or property line intersections with the new right of way line shall be maintained on file and shall be available to resolve discrepancies.
- Right of way **appraisals cannot proceed** until Environmental approval has been given and Official Right of Way Plans have been received by the district and transmitted to the LPA/local sponsor. Acquisition of right of way cannot begin without the plans having been stamped Official Right of Way Plans and receipt of notification of funding approval.

The sponsor's engineer will submit the right of way package to the district for review and approval.

After review by the District, the right of way package will be transmitted to Headquarters Right of Way for review.

Following the review by Headquarters Right of Way, the right of way package will be transmitted back to the District.

The district will approve and stamp as Official Right of Way Plans and transmit the right of-way package to the local sponsor with authorization to proceed with the approved activities.

Regular submittal of the ITD-2161, Monthly Status Report Form, will begin at this time.

760.00 – PS&E

Projects prepared by consultants for local public agencies through the district or through LHTAC shall meet the same PS&E requirements as all other projects. See Section 900 Plans Specifications and Estimates. For projects administered through LHTAC, they will perform the work shown to be by the district in section 900. The Resident Engineer will get a PS&E package for review during the project PS&E Review on all projects.

770.00 – CONTRACT ADVERTISING SUBMITTAL

Projects prepared by consultants for local public agencies shall meet the same advertising requirements as all other projects. In addition, a check shall be made with the sponsor to assure that all right of way has been acquired or stipulated and that utilities will be moved in advance of construction, unless otherwise provided in the plans and specifications.

780.00 – CONSTRUCTION (STATE/LOCAL) AGREEMENT

All local projects that are submitted for advertising must have a signed Construction Agreement and the local public agency's matching funds for construction prior to obligation of construction funds (see Section 900 of the Guidelines for Local Public Agency Projects).

785.00 – PROJECT QUALITY EVALUATION

Quality of the consultant's engineering design will be evaluated by the districts and reported to the sponsor. An ITD 2759 Consultant Services Performance Evaluation will be completed by the district after the project development process is complete. An ITD 767, Project Quality Evaluation, will be completed by the Resident Engineer after completion of the construction. Both forms shall be provided to the sponsor and the consultant.

790.00 – PROJECTS NOT ON THE HIGHWAY DEVELOPMENT PROGRAM

Local public agency projects that are not on the Highway Development program, but are being developed by the LPA sponsor or consultants will follow these procedures:

- The district and headquarters sections will continue to review these projects as requested by the sponsor.
- When the final design is complete, the project documents will be retained by the sponsor until the year the project is programmed for construction. This will eliminate the need to return project document to the sponsor (or the consultant) for updating at the time of the contract advertising review.
- As per federal regulations, projects that receive federal funding must be advanced to the right of way (ROW) purchase or construction within ten (10) years of obligation for preliminary engineering. Projects that advance to the ROW phase must advance to construction within twenty (20) years of ROW obligation. If this is not done, the federal funds that have been received must be returned.
- Before all of the funds deposited by the sponsor are exhausted for review of the projects, additional funds must be requested and received before any increase in the work authorization can be requested

795.00 – LOCAL PROJECT ADMINISTRATION

General

When a project is located on a street or highway over which ITD does not have legal jurisdiction, or when special conditions warrant, ITD may allow the LPA having jurisdiction to perform the work under the direction of ITD with concurrence from FHWA. Concurrence from FHWA will be accomplished by entering a note on the Project Authorization and Agreement (form ITD-2101) indicating that the project will be locally administered. Under unusual circumstances prior concurrence may be necessary and will be requested by letter.

ITD has responsibility for the construction of all federal aid projects in accordance with 23 CFR 635.105. ITD will provide a State engineer to be in responsible charge for all projects including local jurisdiction projects. The local public agency must be adequately staffed and equipped to undertake and satisfactorily complete the work; and in those instances where a consultant is used for construction engineering services, the local public agency must provide an employee of the agency to manage the project.

ITD, in general, only allows local administration of federal contracts when the work is not standard highway construction or it is off of the federal-aid system. Conditions where this may be desirable are; specialty work such as historical restoration, architectural in nature, items ITD specifications do not cover, work is of a nature that it would be beneficial to attract specialty contractors who would not normally monitor ITD bid lists or where our standard contracting agencies would not be suited to perform the work.

Pre-Award

The project is developed following state procedures for federal-aid projects including environmental & right of way requirements.

ITD will review and approve all PS&E's prior to advertisement. The State Design Engineer will sign the 2101 for LHTAC projects certifying that the required milestones have been met to obtain Federal Aid for the projects. The district will do the same for all other LPA projects.

The advertisement follows the provisions of Section 900 in the ITD Design Manual including all Federal requirements (EEO, DBE, Davis Bacon, etc.)

Addenda shall be reviewed and approved by ITD.

Contract Administration

ITD must concur in the award prior to execution of the contract.

Contract administration follows the provisions of the ITD Contract Administration Manual.

Materials testing and acceptance will be in accordance with the ITD Materials Testing Requirements unless provided for in the project specifications.

Project documentation will be retained by ITD on LPA projects, however on LHTAC projects the documentation will be retained by the LPA.

Section 800.00 – Plans

SECTION 800.00 – PLANS

805.00 – INTRODUCTION

The Idaho Transportation Department produces plan sheets for several purposes such as design information, construction bidding documents, historical information, legal records of survey, or departmental records. The plan sheets should include, in necessary detail, all construction features required to complete the project such as right of way details, items to be removed, new items to be constructed, etc. A continuous effort should be made to simplify and clarify the project plans through discussions with the appropriate construction personnel. Special drawings may be required to clarify construction details or nonstandard items included in the project. This section is concerned with the design aspects of the plan sheets. For drafting and CADD standards see Section 700 - Project Plan Sets in the CADD Standards Manual.

810.00 – PLANS AND DRAWINGS

The U.S. Survey Foot shall be the basic unit for all plans and drawings and is also the basic unit on the CADD system, with 100 subunits and 10 positional units per subunit.

810.01 Dimension Units. Common practice is to show all dimensions in feet with the unit symbol shown.

Lineal English land measurements shall be carried out to three decimal points and rounded to two. Area land measurements shall be carried out to 3 places and rounded to 2 places and be expressed in acres except as noted below. Coordinates will be carried to 4 decimal places.

In Urban or other areas where the real estate values are expected to be high, and when a requirement is very small, it is appropriate to express land area in square feet rather than acres. In the event that land area is expressed in square feet, then it shall be express the same way in all documents affecting the parcel.

On some standard drawings, bridge plans, and other detail drawings, it may be more practical to use the inch as the basic unit. In such cases, include a note stating that "All dimensions on this sheet are in inches (“) unless otherwise noted" and show the unit symbol.

810.02 Accuracy. Measurements or dimensions shall be shown to the nearest foot, tenth of a foot, or hundredth of a foot. Always consider the acceptable tolerance in construction practices and product dimensions when deciding what level of accuracy to use.

810.03 Station. For ITD, the station is defined at 100 feet. Station labeling will follow the standard nomenclature, using a plus sign (+) to separate the station number and the distance past that station.

12+40 (1240 feet from 0+00) or 2+65.78 (265.78 feet from 0+00)

Depending on the scale, stationing labels and major tick marks typically shall be shown for every 5 station (every 500 feet). Minor tick marks shall be shown every 100 feet. Depending on the required level of accuracy, station callouts may be to the nearest whole foot, tenth of a foot, or hundredth of a foot. (Two significant figures following the decimal point). Features such as culverts or approaches may be shown to the foot or tenth of a foot. Control points and property lines must be shown to the hundredth of a foot.

810.04 Curves. Horizontal curves shall be described by the Degree of curve and dimensions should be shown to 2 decimal places. Vertical curves are shown by length and designed to the nearest 100 feet. Dimensions for grades should be shown to 3 decimal places with elevations shown to 2 decimal places.

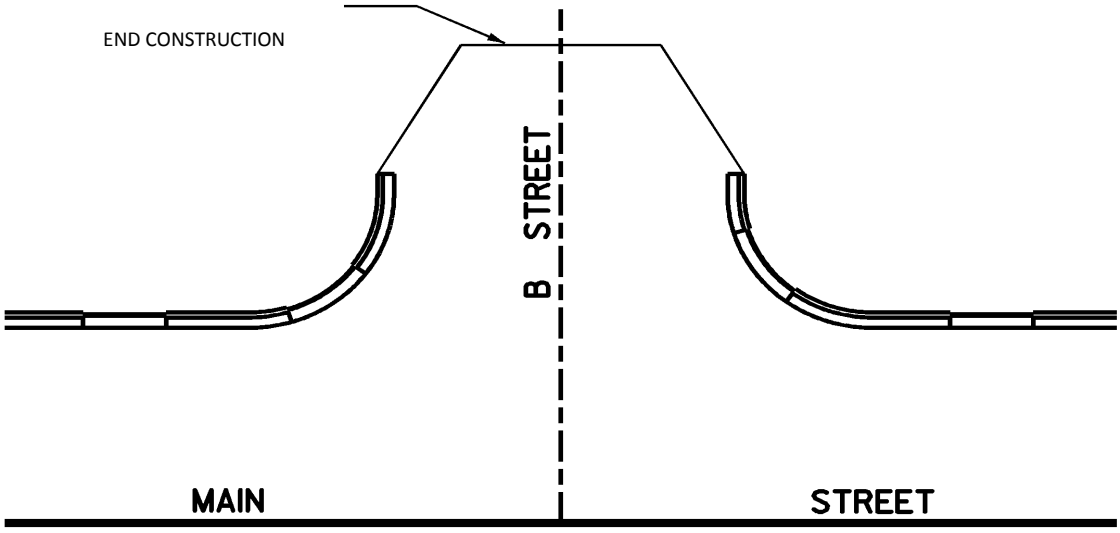
810.05 Angles. Angles will be shown in degrees, minutes, and seconds.

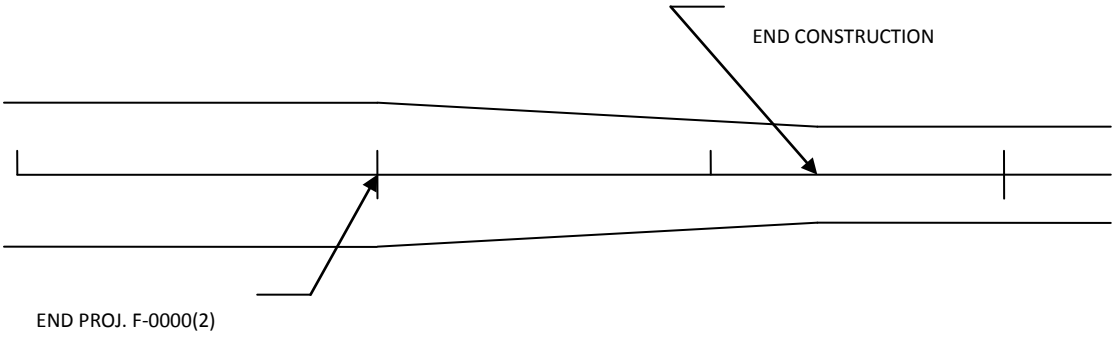
810.06 Culverts. Culvert diameters will be shown in inches according to the sizes available from suppliers. Culvert lengths will be to the nearest foot.

810.07 Standards and Manuals. The Standard Drawings are available in English units.

823.00 – ROADWAY TRANSITIONS

The termination of a roadway project usually involves a segment where the roadway width is varied to connect the new roadway pavement with the other existing roadway pavements. This connecting segment of pavement shall be appropriately labeled on the plan sheets as "BEGIN CONSTRUCTION" and "END CONSTRUCTION." The appropriate plan sheet notations are as follows:



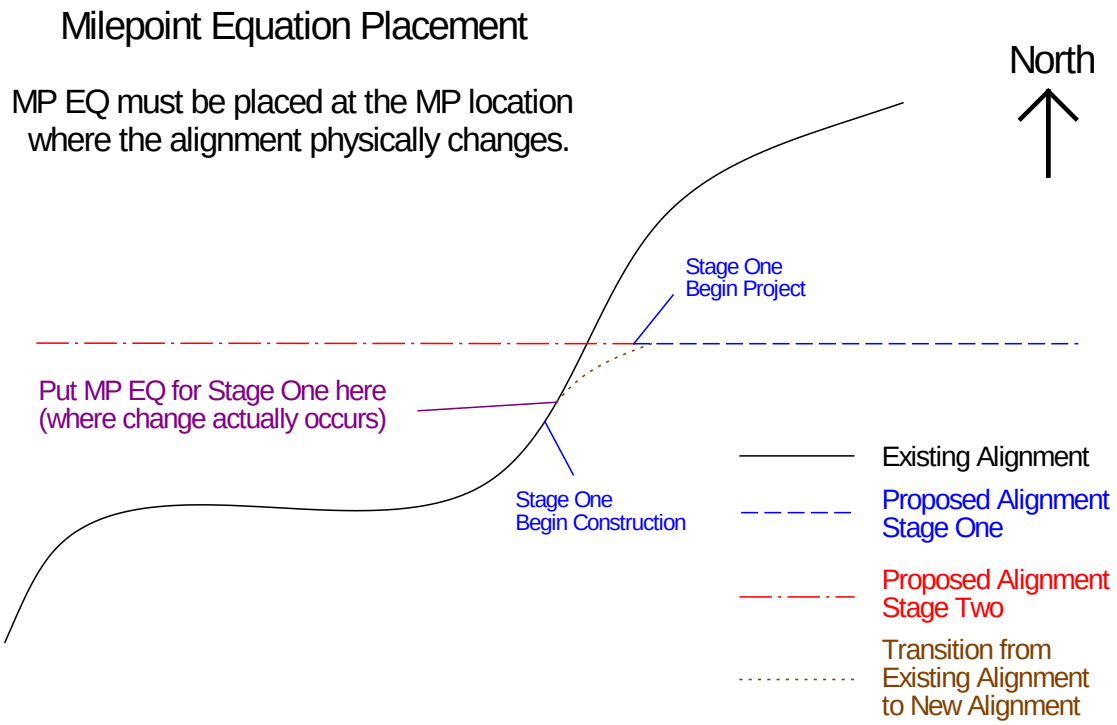


825.00 – MILE POSTS & MILEPOINT EQUATIONS

Mileposts shall be indicated on the roadway plans both by numeric sequence and appropriate roadway stationing. The Title Sheet shall note the milepoint for the beginning and end of the project with the appropriate road segment code.

When the centerline length of the project differs from that of the existing route by more than the minimum requirement (see below), a milepoint equation (MP EQ) will be required on the plans with the appropriate roadway stationing. The following guidelines are provided for the placement of MP EQ.

- *General Placement*: MP EQ will be placed at either the beginning or ending of the physically changed (realigned) portion of the project, not the project limits (see diagram below).



- *Successive Realignment Projects—Descending*: For a series of successive roadway realignment projects where the realigned portions of each project are contiguous or less than 52.8 ft distance apart and are to be constructed during successive fiscal years in descending milepost order, the MP EQ will be placed at the beginning of the realigned portion of the first project. As each contiguous project is built, the value of the preceding project MP EQ will be added to or subtracted from the value of the current project MP EQ so that a single MP EQ

accurately accounts for all changes resulting from contiguous, successive realignments.

- *Successive Realignment Projects—Ascending*: For a series of successive roadway realignment projects where the realigned portions of each project are contiguous or less than 52.8 ft distance apart and are to be constructed during successive fiscal years in ascending milepost order, the MP EQ will be placed at the end of the realigned portion of the first project. As each contiguous project is built, the value of the preceding project MP EQ will be added to or subtracted from the value of the current project MP EQ so that a single MP EQ accurately accounts for all changes resulting from contiguous, successive realignments.
- *Isolated realignment projects*: MP EQ will be placed at the end of the realigned portion of the project.
- *Minimum Realignments:* On projects with only a minimum of realignment, a milepost equation shall not be used unless the effective change in centerline length exceeds 52.8 ft. This reduces the number of milepost equations and retains the historical data on previous roadway segments.

For all realignment projects, there are two (2) conditions under which a new Segment Code must be assigned to a new alignment. If any part of the existing alignment greater than 52.8 ft in centerline length is left open for use by the traveling public, a new Segment Code must be assigned to the new alignment; or, if the centerline length of a new alignment exceeds the length of the existing alignment by 52.8 ft or more, a new Segment Code must be assigned to the new alignment.

830.00 – TITLE SHEET

A title sheet must be created by the district prior to the preliminary design review. Project Tracking contains roadway historical data, if needed, relative to project designations and beginning and ending locations. The data required to complete the title sheet (see Figure 8-4) is as follows:

Project Number Designation

- Add the project number to the main heading.
- Add the project number to the title block. If there are different project numbers for Preliminary Engineering, Right of Way, or Construction, show all of the project numbers on the title sheet but only the Construction number on the remaining sheets.
- Add the key number and county name to title block.
- Add the project number, project location, and roadway segment code to the state map.

Index of Plan and Profile Sheets (include all prepared sheets)

- List the sheets in sequential order. Similar sheets (typical sections, summaries, plans, and profile) can be grouped together. See Section 700 of the CADD Standards Manual for the order of plan sheets.
- Expand the size of the index box as needed.

Bridge Drawings

- List Bridge drawings with the appropriate drawing number either consecutively with the other drawings or separately numbered by Bridge.

Standard Drawings

- Determine which Standard drawings are required and list separately under the index box or use the Standard Drawing Index Sheet in Appendix C and mark the appropriate drawings.

Date Title Sheet

- Use the month and year nearest to the PS&E submittal date of the plans.

Scales

- Show graphically (bar scales) the scales used on the plan and profile sheets.

Project Limits (on the vicinity map, show project limit designations)

- Show project limits by brackets (make project limits stand out).

- Show stationing of project limits.
- Black in route and project area.

Locate Sources on Vicinity Map

- Locate materials sources and show pit numbers.
- Show stockpile sites (if included in project).
- Show any other sites applicable to the project.

Design Designation

- Obtain the latest design designation data and add this information to the title sheet.

Total Sheets

- Determine the actual number of sheets (may be exclusive of the Utility plans, Right of Way plans, or Bridge drawings) and add to the title block.

835.00 – MAPS AND EXHIBITS

A vicinity sketch map is a multipurpose, small-scale plan or map showing the entire project. The vicinity map shown on the Title Sheet may be all that is needed on some projects. If a separate vicinity sketch map is necessary to show more detail or for a road closure and maintenance segment, the map may be a copy of the total ownership map, a section of county map, a specially drawn map, or any other type of map that shows the entire project on a realistic scale.

Where a Road Closure and Maintenance Exhibit is required to show an entire project, then that exhibit can be used as the Vicinity Sketch Map and included in the plans. Data on the preparation of the exhibit for the Road Closure and Maintenance Agreement are covered in Section 450.00.

A Total Ownership Map must be prepared for the Right of Way portion of the plans. The Total Ownership Map can be included in the project plans in lieu of the Vicinity Sketch Map.

840.00 – TYPICAL SECTION SHEETS

Typical sections for roadways, approaches, frontage roads, streets, curbs, gutters, medians, channels, dikes, and other appropriate cross sectional data must be shown. These illustrations are to be completed with station limits, dimensions of widths, and depths of material to be constructed. Overall widths on typical sections shall be shown to the nearest tenth of a foot. Intermediate widths for separate types of base, etc., may also be shown to the nearest full tenth of a foot. Thickness of various courses shall be established to the nearest hundredth of a foot, which is the basis for all computations and construction operations. The district shall review Materials Reports to ensure that all design features are correct and complete on the Typical Sections.

Progressive instructions for completing the Typical Section Sheets are as follows:

Typical Roadway Sections

- Draw sections at a size that is easily readable.
- Show the station limits ABOVE each typical section to include transition stations.
- Dimension clearly to the nearest tenth of a foot overall width from finished shoulder to subgrade shoulder. Dimension clearly to the nearest tenth of a foot intermediate widths for separate courses.
- Specify roadway crown slopes (in percent slope).
- Specify fore- and back-slopes and Standard Drawing Number.
- Denote location of "Profile Grade" and/or Control Line.
- Show any special ditch treatment.
- Specify minimum ditch depths.
- Show "Basic" right of way widths.
- Specify median treatment, if any.
- Dimension clearly the depth of the various courses of material using multiples of hundredth of a foot. Show construction fabrics. State the class and number of courses of plantmix.
- Black in or highlight pavement courses that are different form Base Courses.
- Show lane and paved shoulder widths to the nearest tenth of a foot.
- Show the seal width or state "Seal Full Width" if appropriate.

Quantities

- Quantities for base and surfacing must be computed from the approved Project Materials Report.
- Compute base and surfacing, rounding up to the nearest ton per station.
- Surfacing quantities for plantmix shall include additives in the T/Sta. figures.
- List the base courses by type of material for each layer of the base. For example: 0.4’ compacted ¾” Aggregate Base Estimated at 150 T/Sta.
- See Figure 8-2 for the standard methods of computing quantities of various bid items.

Title Blocks

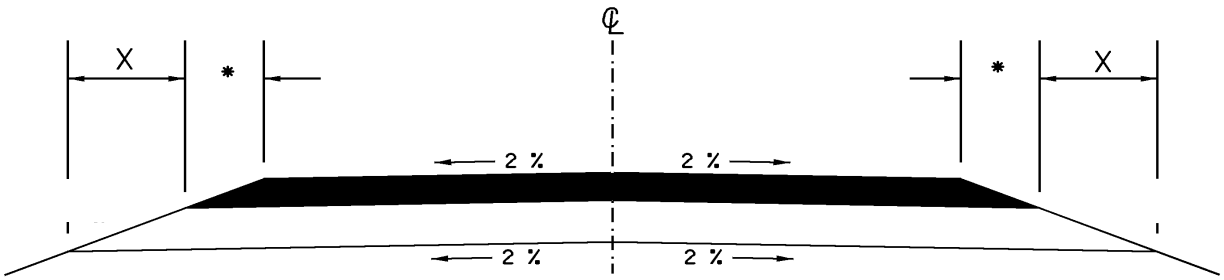
- Add title block information.
- Show drafter's or designer's name and the date in the title block.

Notes

- Typical section and estimating notes, when placed on the typical sheets, are to be placed on the right-hand side of the sheet (see Figure 8-3).
- The Phase 3 Materials Report should be used as a reference for estimating notes.

Figure 8-2

STANDARD METHODS OF COMPUTING QUANTITIES



TYPICAL CROWN SECTION

TYPICAL SECTION COMPUTATION

Choose foreslope width for plant mix pavement. * Subsection 405.03 K. of the 2012 State Standard Specifications: The Engineer will allow 18 in. wide shoe for depths 0.2 ft. or less on initial pavement placement. The shoe must be 24 in. wide for depths greater than 0.2 ft. The shoe must be 24 in. wide on pavement overlays. The "Safety Edge" is a 30 degree tapered edge on the asphalt mat. The "Safety Edge" should be considered in the areas where the tapered edge provided by use of a shoe is not feasible. Information on the "Safety Edge" may be found at; http://www.fhwa.dot.gov/everydaycounts/technology/safetyedge/intro.cfm

Step 1:

Step 2: Calculate X distance. (Suggest Rounding to the Nearest Foot)

$$X = \frac{\text{Depth of material at foreslope}}{\text{Algebraic difference of foreslope and crown slope}}$$

Example: Depth of material at foreslope (0.5' base plus 1.0' rock cap) is 1.5; foreslope slope is 4:1 or 0.25'/ft; crown slope is 0.02'/ft.

Calculate X Distance: X = 1.5' / (0.25 - 0.02) = 1.5' / 0.23 = 6.52'

Step 3: Calculate foreslope width for base: 0.5' / (0.25 - 0.02) = 2.17'

Calculate foreslope width for rock cap: 1.0' / (0.25 - 0.02) = 4.35'

For this example, assume the following information from the Phase 3 Materials Report:

- ¾" Aggr. at 145 lbs./c.f. for Plant Mix Pavement including Asphalt & Additives.
- ¾" Aggr. at 144 lbs./c.f. for Base including 7% water.

- Rock Cap at 138 lbs./c.f..

The following formula calculates tons per station:

T/Sta. = Width x Depth x Weight x Ton/2000 lbs x 100'/ Station

Figure 8-2
(continued)

0.3’ Plant Mix Pavement

(17’ + 19’) x 0.3’ x 145 lbs./c.f. x ton/2,000 lbs x 100’/Sta = 78.3 T/Sta., round to 78 T/Sta.

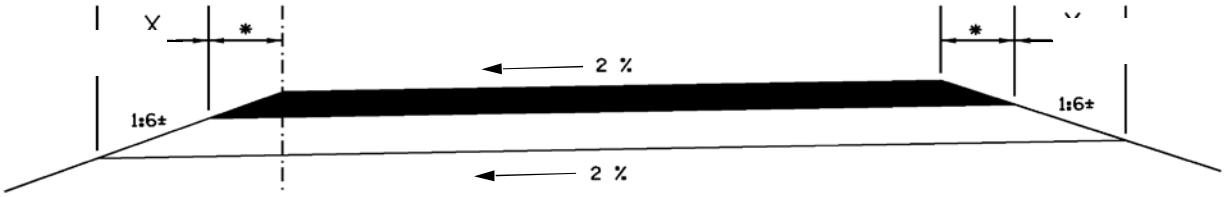
0.50’ Comp. ¾” Aggr. for Base

(19’ + 21.2’) x 0.5’ x 144 lbs./c.f. x ton/2,000 lbs. x 100’/Sta = 144.72 T/Sta., round to 145 T/Sta.

1.0’ Rock Cap

(21.2’ + 26’) x 1.0 x 138 lbs./c/f. x ton/2,000 lbs x 100’ Sta. = 325.68 T/Sta., round to 326 T/Sta.

Choose foreslope width for plant mix pavement. * Subsection 405.03 K. of the 2012 State Standard Specifications: The Engineer will allow 18 in. wide shoe for depths 0.2 ft. or less on initial pavement placement. The shoe must be 24 in. wide for depths greater than 0.2 ft. The shoe must be 24 in. wide on pavement overlays. The “Safety Edge” should be considered in the areas where the tapered edge provided by use of a shoe is not feasible.



TYPICAL SHED SECTION

$$X = \frac{\text{Depth of material at foreslope}}{\text{Algebraic difference of foreslope and crown slope}}$$

$$Y = \frac{\text{Depth of material at foreslope}}{\text{Algebraic sum of foreslope and crown slope}}$$

- Algebraic sum of foreslope and crown slope **Notes for Second Typical Section Sheet**
  - Notes are needed on other Typical Section Sheets only if there are special notes required for Typical Sections shown on those specified sheets.
- **Method of Computing Typical Section Quantities**

- Figure 8-2 gives a progressive method for the computation of ballast materials to be placed on the roadway. The following provides guidelines that will eliminate recomputation of quantities at various design stages:

- Subgrade section width (X & Y distances) suggest rounding to the nearest foot.
- Base material is to be computed, rounding to the nearest ton per station.
- Bituminous and shoulder material is to be computed, rounding to the nearest ton per station.

845.00 – PROJECT CLEARANCE SUMMARY SHEET

All project clearances are to be verified by the district as part of the final project approval. The Project Clearance Summary, is used to make a permanent plan record of those clearances. The Project Clearance Summary provides a record and reference for clearances when a legal challenge occurs after the project is under contract.

The use of a rough draft of the summary by the designer to record clearances as they are obtained in project development eliminates lengthy file searches. Use the date column is for the date of the letter or approval document from the approving agency. In the case where a specific person has responsibility for approval, the date of that approving signature, if shown on the document, is the date to be recorded on the summary. Hearing dates shall be the date when the hearing was held.

Figure 8-3

TYPICAL SECTION SHEET NOTES

Project combination adjustment factor is _____.

Class _____ compaction specified.

Estimating Basis

Reconditioning: Reconditioning is required from Sta. _____ to Sta. _____.

Water for Reconditioning will be _____ MG.

Treated Base: _____ Asphalt for _____ (Emulsion Treated., Road Mix) Base

Course at ____%

by weight. Source _____ Lab No. _____.

_____% Hydrated Line Filler.

_____ Asphalt for Curing Seal at _____ Gals/Sq.Yd.

Blotter Material at _____ Lbs/Sq.Yd. Source _____.

Cover Coat Material Type _____ at _____ Lbs/Sq.Yd. Source _____ .

Tack and Prime: _____ for Prime at _____ Gals/Sq.Yd.

_____ for Tack at _____ Gals/Sq. Yd.

Blotter Material at _____ Lbs/Sq.Yd. Source _____.

Surface Treatment: Type _____ Surface Treatment.

First Application _____ at _____ Gals/Sq.Yd.

Blotter Material at _____ Lbs/Sq.Yd. Source _____.

Cover Coat Material Type _____ at _____ Lbs/Sq.Yd.

Source _____ .

Second Application _____ at _____ Gals/Sq.Yd.

Cover Coat Material Type _____ at _____ Lbs/Sq.Yd.
Source _____ .

Third Application _____ at _____ Gals/Sq.Yd.

Cover Coat Material Type _____ at _____ Lbs/Sq.Yd. Source_____.

Paving: _____ for Road Mix at _____% and Additives at _____% by weight.

Source _____ Lab No. _____.

_____ for Plant Mix at _____% and Additives at _____% by weight. Source _____ Lab No. _____.

Concrete Pavement using Coarse Aggregate Size No. 3.
Source _____ Lab No. _____.

Seal: _____ for Seal at _____ Gals/Sq.Yd.

Cover Coat Material Type _____ at _____ Gals/Sq.Yd. Source _____.

_____ for optional Fog Coat at _____ Gals/Sq.Yd.

Blotter Material at _____ Gals/Sq.Yd. Source _____.

Aggregate: Size, Est. Aggregate Compacted mass density (Lbs./C.F.), including additions.

_____ "Aggr. at _____Lbs./C.F. for Base, including _____% Water.

Lab No. _____.

_____"Aggr. Type B at ____Lbs./C.F. for Cement Treated Base, including _____% Water. Lab No. _____

_____"Aggr. at ____ Lbs./C.F. for Road Mix Pavement, including 4% Water*. Lab No. _____

_____"Aggr. at _____ Lbs./C.F. for Emulsion Treated Base, including Asphalt and Additives. Lab No. _____.

_____ "Aggr. at _____ Lbs./C.F. for Superpave Hot Mix Asphalt, including Asphalt and Additives. Lab No. __.

Blotter Material at _____ Lbs./C.F. Source _____.

Reject Material at _____ Lbs./C.F. Source _____.

Cover Coat Material at _____ Lbs./C.F. (loose weight). Source _____.

*Add the 4% water to Summary Quantities ONLY - Use Dry Weight(Ton/Sta) on Typical Section.

850.00 – PLAN SUMMARY SHEETS

To summarize the project plan, the following project plan summary sheets are available on the CADD only. Contact Transportation Systems for information.

Roadway Summary

Bridge Summary

Pipe Culvert Summary

Pipe Siphon Summary

Irrigation Pipe Summary

Sewer Pipe Summary

Pipe Underdrain Summary

The Roadway Summary should be prepared separately for each designated project in the set of project plans. The title block and name of persons compiling and checking data shall be indicated on the summary sheets. The sheet numbers for plan and profile with stations are shown in each column for items that are shown on the plan or profile sheets. The Item No., Item (description), and Unit of Measurement shall be compatible with the project bid schedule. **Abbreviations should be used only when necessary**. Totals can be used for any items that are uniform quantities from sheet to sheet, or totals for items that are calculated from the typicals, such as base and pavement.

Any structures that are 20 feet or more span, as measured along the centerline, are classified as Bridges and should be listed separately on a Bridge Summary Sheet. The Bridge summary sheets shall include quantities for the structure such as structural excavation, backfill, concrete steel, etc., with these quantities excluded from the roadway summaries. These project quantities will be furnished by Bridge upon completion of the bridge plans.

All pipe summary sheets (See Appendix C - Plans) shall be completed for applicable types of pipe to be used on the project. Appropriate data shall be completed for the appropriate columns of the pipe summary sheets. The total pipe length by size should be noted in the total columns without reference to type of pipe material. The quantities for pipe installation such as structural excavation, backfill, concrete, catch basins, etc., should be included in the total for specific roadway summary items.

855.00 – PLAN AND PROFILE SHEETS

The plan and profile for a project can be combined on a single plan sheet or separated on two sheets. The typical plan-profile sheets provide an example of how the project data should be presented on the project plans, should be used as guidelines for the design personnel, and periodically reviewed to reestablish the requirements.

Items on the profile shall be limited to profile and corresponding data, benchmarks and earthwork quantities (mass diagram), and showing installed pipes (locations and elevations without callouts).

Standard symbols should be representative of the feature, should indicate whether the item is existing or proposed, and should not need a note to explain the symbol.

Utility and right of way data may be shown on a separate set of plans.

Use item number ovals for identifying pay items, with all identical items referenced together on the right-hand side of the sheet. Future development of an automated estimate system on the CADD system will use this method. Construction items shall be indicated by a number or pay item and detailed with a corresponding number or pay item on the plan sheet only.

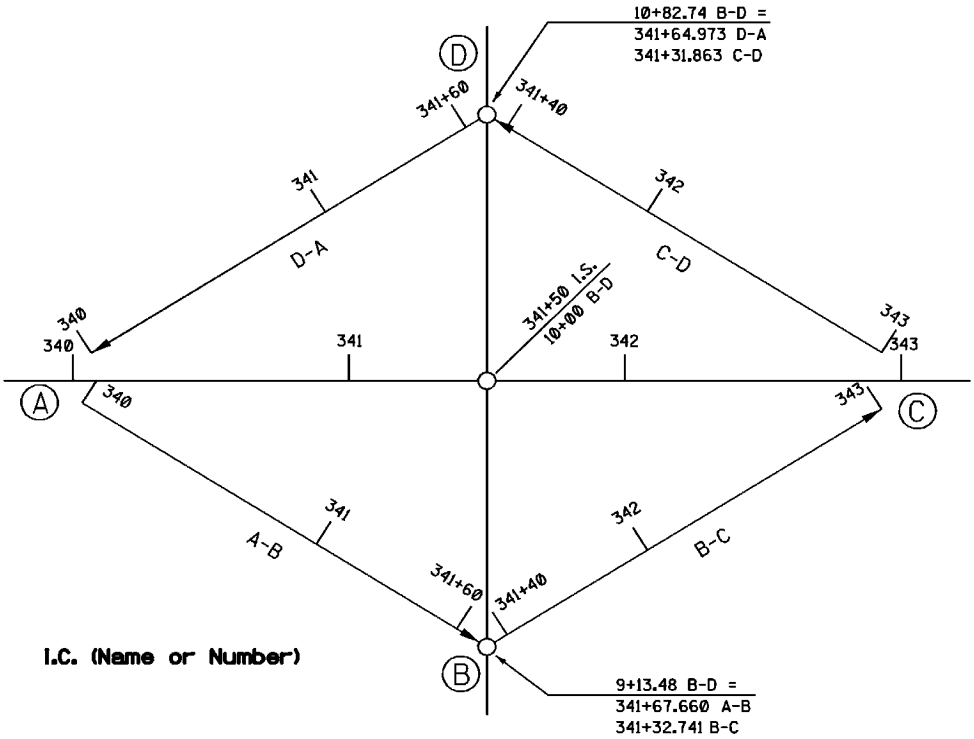
Non-pay items such as pipe removal shall be shown on the top portion of the plan sheet, but shall not be assigned a number.

Highlighted notes can be used to point out special requirements that have been overlooked in previous projects.

860.00 – INTERCHANGE PLAN AND PROFILE

An adequate scale should be selected for the interchange to show all the interchange details while providing room for notes and control data. Several plan sheets may be required for an interchange; i.e., having a plan sheet for each half of the interchange and a sheet for the cross road with necessary profile sheets. Do not include details on the plan and profile for bridge and pipe data that is on the bridge plans and the pipe summary sheets.

The interchange should be referenced and stationed in accordance with the following diagram:



Stationing on the ramps is in the same sequence as the main Interstate Roadways. Stationing for ramps C-D and B-C are backed up from Interstate Station 343 at point C. The ramp survey control line is to be located on the inside ramp shoulder. The ramp beginning point is the intersection of the outside edge of the Interstate travelway and the ramp control line to eliminate unnecessary ramp stationing and allow better control of grade transitions to and from the ramps.

The ramp profile grades at the beginning or end of the ramps should be reviewed carefully relative to Interstate grade and shoulder slope that may cause grade sag. A straight-line grade transition from the ramp beginning or end, which is the Interstate grade, to the shoulder edge of the Interstate will eliminate this problem.

The ballast for the ramps is usually a different depth than for the Interstate. To simplify the ballast transition, the ballast depth for the Interstate can be carried along the ramp beyond the common point of the Interstate and ramp subgrade.

865.00 – SIGNING AND PAVEMENT MARKING PLAN

Each roadway project requires traffic signing and roadway pavement marking plans even though the work may not involve federal-aid participation. If the work is to be performed by state forces, the use of state forces should be clearly noted on each plan sheet. Typical signing plan and signing erection specifications sheets are available as a preprinted sheet or from the CADD files. Other detail signing sheets, such as sign post details or sign legends, are available fromTraffic. On signing and pavement marking plan sheets, two roadway sections may be on the same signing and pavement marking plan sheet if there is room and match lines are used.

870.00 – MASS DIAGRAMS

Mass Diagrams are graphical and mathematical tabulations of project excavation, embankment, borrow, and haul quantities to guide placement of subgrade materials, determine the most economical distribution of subgrade materials, and provide estimates of project bid quantities. A Mass Diagram shall be prepared on each grading project, used in the determination of estimates, and provided to the Resident Engineer and Contractor for guidance during construction.

875.00 – SOURCE PLAT

The plat and record is intended to furnish all the information required to establish the quality and quantity of material in the source, amount of overburden, required reclamation, and property ties and boundaries required for securing use of the source.

880.00 – STANDARD DRAWINGS

Standard Drawings are prepared and maintained by Highway Program Oversight. Most Standard Drawings are available on the CADD. Complete sets of all approved Standard Drawings are available upon request.

A project should be designed using a specific Standard Drawing as the standard the contractor shall use for that project. The Standard Drawing numerical designation (A 4) and Title (Rural Minor Collector Grading) shall be shown on the project Title Sheet or the Standard Drawing Index Sheet, inserted into the plans, and the required Standard Drawings marked.

Occasionally, projects have been designed with a specific Standard Drawing in effect with a revision occurring before the project goes to contract. This inconsistency causes confusion on construction and in some cases has resulted in unnecessary contract change orders or claims. Every effort should be made to provide Standard Drawings that reflect current design and construction practices and provides standard details that are used on recurring projects. The availability of CADD systems provides an opportunity to develop three dimensional views on Standard Drawings that give the inspector and contractor an improved visual illustration of the final product, reduce construction errors, and improve communication. Suggestions and recommendations on new Standard Drawings or revisions are strongly encouraged. A sketch of the change or a marked-up existing drawing should be directed to the Standards Engineer for approval.

It is now possible to plot the Standard Drawings locally for inclusion with plan sets. The procedure utilizes the Engineer's disclaimer rather than the signature.

885.00 – "AS-CONSTRUCTED" PLANS

An electronic copy of As-Constructed plan sets is created for each project and indexed into the Department's Image Database called File360 (formerly known as KoVIS). These electronic documents are then accessible to ITD personnel via the ITD network and File360 software. There are many advantages to using the Image database. Among these are quick retrieval of information and the ability to save images to disk or e-mail information to ITD customers and contractors. Another benefit is the potential savings in physical storage space.

This process consists of two principal phases: 1) Scan-index existing As-Constructed Plans and 2) Scan-index new As-Constructed plans as they are created.

885.01 Existing As-Constructed Plans. The districts shall provide their As-Constructed plan sets to the ITD Image Center for scanning and indexing into the File360 Image Management Database.

District Responsibilities:

- **Plans Preparation**: The plans preparation process varies depending on the age and/or condition of the plan set. The required procedures for prepping plan sheets are available to the districts by following this link to the Image Center website:http:/itdportal/sites/Admin/BSM/sitepages/BSM_IC.aspx
- **Pre-Indexing**: ITD Image Center policy determines those circumstances where a Pre-Indexing form (ITD 0140) needs to be filled out as completely as possible for each plan set. The standard format for indexing plan sheet data is explained in the Manual entitled. "Indexing Plan Sheets" on the Image Center website.
- **Shipping**: The district plans should be submitted directly to the Image Center. The district shall notify the Image Center as soon as they are shipped. Large collections of completed plans, i.e., archives, will need to be shipped according to a scanning schedule to be arranged between the Image Center and the district.
- **Indexing**: Each district will index the data for their own As-Constricted plans into File360. The indexing must closely follow the established format that is documented in the File360 Manual for indexing available on the Image Center Website.
- **After scanning**: The images are made available for indexing via the File360 Inbasket and the original plans are returned to the district office.

Image Center Responsibilities:

- **Plans Prepping**: Establish plans prepping procedure and provide training and assistance as needed.
- **Scan**: Scan the plans received from the districts, Resource Center, and in some cases the region offices.
- **Quality Check (QC)**: All images will have to pass through the QC phase. Any images found to be substandard will be re-scanned until they meet the Image Center standard of quality.
- **Indexing**: Establish indexing format in conjunction with the Resource Center. Determine the turnaround time for indexing completion. The Image Center staff will index any and all plans that come to the Image Center pre-indexed. All other indexing will be done by the respective offices.
- **Shipping**: Return plans to the district.

- **Training and Documentation**: Training classes will be provided to teach File360 Users how to use File360 for indexing and retrieving plan sets. Imaging documentation will be written and posted on the Image Center intranet site.

Resource Center Responsibilities:

- **Indexing**: Work with the Image Center to establish the indexing format and provide instruction and guidance on issues as they arise.
- **Quality Check**: QC all completed indexing and correct indexing errors when they are encountered.
- **Training**: Assist the Image Center in training ITD personnel on prepping, pre-indexing, indexing and retrieving plan sheets.

885.02 New As-Constructed Plans. The original project plans are returned to the district when the project contract has been awarded for construction. A digital copy of project plans shall be made available to the Image Center from the ITD Print Shop in the form of a PDF file at the time they are copied and sent to the district. The PDF copy of the construction plans will be indexed into File360. These plans are used to document project design, construction activities, and modifications to the highway system in case of legal action, public inquiry, or other requests.

As the project is constructed, appropriate major revisions to the roadway such as extra lanes, added width, signalization, roadway illumination, additional right of way requisition, or spot major improvements need to be indicated on existing plan sheets for As-Constructed submissions by the districts. These submittals should show date of completion, revisions to roadway, and persons performing the work. A white print reflecting these changes should be forwarded to the Image Center for scanning and indexing into File360 thus updating the master file of roadway plan sheets.

At the completion of each project, a set of As-Constructed plans with the completion date shall be prepared by the Resident Engineer. All project corrections, revisions, and change order modifications shall be noted on these As-Constructed plans. The “As-Constructed” stamp shall be used after the changes are made.

Newly created As-Constructed plans can be shipped immediately to the Image Center.

The procedure for creating and submitting an As-Constructed plan set is as follows:

- One set of plan sheets (11” X 17”) must be provided to the ITD Image Center (HQ) to be scanned and indexed into File360. The Image Center will then forward the indexed plan set to The Office of Aerial Photography and Plans in the Resource Center (HQ).
- If the project includes a structure, then an additional set must be forwarded to Bridge.

- If the project plans were prepared on the CADD system, the changes shall be made on the project CADD file with the revised original drawings filed with the original project plans in the district and an As-Constructed copy provided to the Resource Center.
- If the plans were manually drafted, they should be scanned and revisions made on the color printout of the scanned image. They should be stamped as the As-Constructed copy and sent to the Image Center for scanning. Any questions on CADD file updates, revised project details, or record files should be directed to the Resource Center Engineer.

The district shall provide a set of the "Official Right of Way" plans to the County Assessor following purchase and property revisions that occur during construction. Any property revisions or relocation of property access points shall also be indicated on the "As-Constructed" plans. At the completion of the project, when all right of way monuments have been installed, a "record of survey" shall be filed with the respective County Recorder.

885.03 Updating As-Constructed Plans Previously Archived into File360. Follow the procedure below whenever a modification is made to a district As-Constructed plan set following its initial entry into the electronic Archive (File360).

District Responsibilities:

- **Preparation:** Prior to making any modifications (including writing) to an As-Constructed plan sheet, the district will print out a color copy of the plan sheet from File360 unless the district's original As-Constructed plan set is available.
- **Make modifications to the As-Constructed sheets:** If the printout from FILE360 was the previous As-Constructed sheet, make current As-Constructed modifications in red ink. If the As-Constructed markings are being added to the Design or Construction plans, duplicate all of the markings and writing on the clean printed copy that are made to the sheet from the plan set – observing the identical use of color(s).
- **Mail to Image Center:** Clip together the copies of all modified sheets for each plan set; keep copies from different projects separate. Attach a "Document Imaging Request" Form (ITD 0143) to each group identifying the plan set by Key Number, Project Number, Construction Year, Highway Number, and the date and time that the electronic archive version was originally created. Mail the copies to the Image Center to be scanned.

Image Center Responsibilities:

- **Scan**: Scan the copy/copies received from the district.
- **Quality Check**: All scanned plan sheet images are quality checked and substandard images and re-scanned until they meet the Image Center's standard of quality.

- **Replace**: Replace the outdated plan sheet(s) in the File360 Image Archive with the newly modifies one(s).

Resource Center's Responsibilities:

- **Replace**: Aide the Image Center in replacing outdated plan sheet(s) in the File360 Image Archive with the newly modified one(s).

890.00 – MAINTENANCE PROJECT PLANS

The size and the type of the maintenance project and work to be done will dictate the number of sheets that are used for each project. The sheet size for maintenance projects with six or fewer plan sheets may be 8 ½" x 11" or 11" x 17" prepared on durable paper. If the plans have more than six plan sheets (excluding standard drawings), a standard 11"x 17" set of plans should be prepared. Underground storage tank (UST) projects are an example of projects that will typically require standard sized plans. Each project shall include but shall not necessarily be limited to the following:

- Sketch Map: Portion of a county map showing the project area with the following information:
  - Source number with symbol, milepost (or equivalent), and highway name or number.
  - Stockpile number with symbol, site number, milepost (or equivalent), and highway name and number.
  - Bracketed project limits and milepost (or equivalent) of project.
  - Approval signature block for District Engineer.
- Typical Sections: Sufficient data to show how the project affects the existing roadway.
- Summary of Quantities: Use the same format as required for other projects (heading, etc.).
- Sheets: Number all project sheets.
- Standard and Special Drawings: List all Standard Drawings, Special Drawings, Reclamation Plat, etc., to give an account of sheets to be included in the project.

895.00 – PLAN SHEET CHECKLISTS

To ensure there are no errors or omissions, Figure 8-4 shall be used when checking the various plans prepared for a project.

Figure 8-4 (1 of 4)

PLAN SHEETS CHECKLIST

Project No. _____ Key No. _____ _____ Date_____

Engineer's stamp, date, and signature are required on all sheets except Title sheet, which requires approval signature and date.

TITLE SHEET ..... _____
Complete Title Block ..... _____
Highway Number or Road Number ..... _____
Project No. and Key No. ..... _____
County or Counties ..... _____
Place and Date of Drawings ..... _____
Horizontal and Vertical Scales (shown graphically) ..... _____
State Map (upper right side) Showing Mileposts, Project Name and Road Segment Code ..... _____
Sheet Index Box (upper left corner) ..... _____
List of Structure and Standard (including date) Drawings (upper left corner or on a separate sheet) _____
Design Designation ..... _____

LAYOUT MAP (on Title Sheet or a separate Exhibit) ..... _____
North Arrow ..... _____
Scale (shown graphically) ..... _____
Section, Township and County Lines ..... _____
General Course of Proposed and Present Road ..... _____
Town (with population), Railroads, Streams ..... _____
Station at Begin and End of Project ..... _____
Location of Project Materials Sources ..... _____

VICINITY SKETCH MAP ..... _____
Complete Title Block ..... _____
Show Information for Road Closure and Maintenance Agreement ..... _____
Scale (shown graphically) ..... _____
Section, Township, City Limits ..... _____
Name of Towns (with current census), Railroads, Streams (with direction of flow) ..... _____
Existing Road ..... _____
Begin and End of Project with Milepost and Station Equation to Adjoining Projects ..... _____
Proposed Alignment ..... _____

TOTAL OWNERSHIP MAP ..... _____
Complete Title Block ..... _____
Scale (shown graphically) ..... _____
Section, Township, City Limits ..... _____
Name of Towns (with population), Railroads, Streams (with direction of flow) ..... _____
Existing Roads ..... _____
Begin and End of Project with Milepost and Station Equation to Adjoining Projects ..... _____
Proposed Alignment ..... _____
Ownership Tabulation (Parcel No., Owner's Name, Area of Ownership with Subtotals of New and Existing R/W, Remainders Left and Right, Permanent and Temporary Easements) ..... _____

Figure 8-4 (2 of 4)

CLEARANCE SUMMARY ..... _____
Complete Title Block ..... _____
Check all Clearances in Project Files ..... _____
Estimating Date, Class of Compaction, and Increased Quantity Note (or show on Typical Section Sheet) _____

TYPICAL SECTION SHEET ..... _____
Complete Title Block ..... _____
Check Phase 3 Materials Report ..... _____
Relation of Control Profile Grade Line and Survey Centerline ..... _____
Location of Profile Grade Same as Profile Sheets ..... _____
Dimensions Shown in Decimals of a Foot ..... _____
Show Location of Subgrade ..... _____
Crown and Shoulder Slope ..... _____
Depths of Compacted Ballast Materials ..... _____
Number of Plant Mix Courses and Class of Plant Mix ..... _____
Basic Right of Way Width ..... _____

ROADWAY AND BRIDGE SUMMARIES ..... _____
Complete Title Block ..... _____
Summary by Sheets, Headings for all Columns, Item Numbers ..... _____
Sheet Number, Stationing and Length of Each Sheet ..... _____
Pay Quantities from Other Summary Sheets ..... _____
Total Length in feet to 2 Decimal Places, Bridges and Non-participation Items Separate ..... _____
Check Item Numbers and Nomenclature ..... _____
Bridge Summary Agrees with Situation and Layout Summary ..... _____
Separate Summaries are Required for each Fund Source (i.e., F, HES, etc.) ..... _____
All Pay Quantities from Other Summary Sheets (Pipe, Structure, etc.) ..... _____
Non-Participating Items Should have Separate Summary ..... _____
Check Summaries with Engineer's Cost Estimate ..... _____

PIPE SUMMARIES ..... _____
Complete Title Block ..... _____
Check Phase 2 Materials Report ..... _____
Review that Acceptable Alternates are Shown ..... _____

SOURCE PLAT ..... _____
Complete Title Block ..... _____
All Bearings and Distances are Shown ..... _____
Source Area to be worked is Shown ..... _____
Test Holes are in or Around Area to be Worked ..... _____
Reclamation Plan Approved ..... _____
Note on Plat or in Special Provisions Whether or not Source Reclamation is Required ..... _____
Right of Way and Archeological Clearance ..... _____
Materials Engineer Should Stamp and Sign the Source Plat ..... _____
Material to be Obtained Includes Those Specified in Special Provisions ..... _____
Requirements (washing, blend sands, etc.) Included in Special Provisions ..... _____

Figure 8-4 (3 of 4)

PLANS _____

Complete Title Block ..... _____
Check Review Letters (preliminary and final) ..... _____
Check Horizontal Alignment for Standards ..... _____
Mark Every Station – Number Every 5 Stations ..... _____
Equations of Stationing ..... _____
Bearings (check with adjacent projects) ..... _____
Curve Data (Radius, Delta, Tangent, Length, Super) ..... _____
Station at P.C., P.T. and Spiral Points ..... _____
Station and Deflection at Angle Points ..... _____
R/W Lines and Width of R/W at Breaks and Each End of Sheets ..... _____
Matchlines at each end of sheets and elsewhere as needed ..... _____
R/W Symbol for Access and Easements (note specific purpose of easement) ..... _____
Utility Relocations Present and Proposed at Whose Expense ..... _____
Vertical Clearance of Utilities ..... _____
Railroads, Showing Name, R/W and Encroachments ..... _____
Fences _____
Drainage Shown, Including Intermittent ..... _____
Buildings, Trees, Septic System, etc. (note removal items) ..... _____
Ditches, Canals, Streams, Lakes (names and direction of flow) ..... _____
Station, Type, and Symbol of Drainage Structures (both proposed and existing) ..... _____
Channel Change, Small Ditches and Dikes ..... _____
Guardrail, Delineators, Riprap, Other Misc. Items ..... _____
Marshes and Swampy Ground, Cliffs and Bluffs ..... _____
Present Road, Showing Portion to be Obliterated ..... _____
Towns (Name-Limits-Names of Streets, Blocks, Pop., etc.) ..... _____
Section Lines, Showing Corners Found and Section Ties ..... _____
Township and Range ..... _____
Section Subdivisions, Designations (as NE4 SW4 23 or Lot No.) ..... _____
County Lines, State Lines, City Limits ..... _____
Stationing of Property Line Intersections and Easements ..... _____
Land Use and Ownership Parcel No. with Acreage Figures ..... _____
Approaches with Dimensions (check R/W Use Policy) ..... _____
North Arrow ..... _____
Begin and End of Project with Mile Post and Station Equation to Adjoining Projects ..... _____
Project and R/W Markers ..... _____
R/W Widths Against X-Sections, Including Slope Rounding ..... _____
Show Limits of Cut and Fill Slopes ..... _____
If Multiple Funding Sources, Show Funding Break on Plans or by Narrative ..... _____

Figure 8-4 (4 of 4)

PROFILE _____

Complete Title Block ..... _____

Check Vertical Alignment for Standards ..... _____

Ground Line ..... _____

Indicate Grade Location (check typical section) ..... _____

Percentage of Grade (three decimal places) ..... _____

Special Ditch Grades ..... _____

Vertical Curve Data (length, elevations, stations) ..... _____

Mark Every Station – Number Every 5 Stations ..... _____

Equations of Stationing ..... _____

Grade Point Excavation and Backfill ..... _____

Structures (check station and grades) ..... _____

Benchmarks ..... _____

Begin and End of Project and Ties to Adjoining Project ..... _____

Excavation, Embankment, Borrow and Waste (sheet totals) ..... _____

Haul Showing Placement ..... _____

Roadway Length (less bridge length) ..... _____

Embankment Foundation Compaction ..... _____

Depth and Location of Sub-Subgrading ..... _____

BRIDGE SHEETS ..... _____

Complete Title Block ..... _____

Check Phase 4 Materials Report (Piles or Pile Points) ..... _____

Proper Transition of Guardrail to Bridge ..... _____

Standard Drawings Referenced Shown on Title Sheet ..... _____

Check Pay Quantities with Bridge, Situation/Layout Sheet, and Roadway Summaries ..... _____

SECTION 900.00 – PLANS, SPECIFICATIONS, AND ESTIMATES

945.11 Time Constraints During Award of Contract.
945.12 Award of Contract.

SECTION 900.00 – PLANS, SPECIFICATIONS, AND ESTIMATES

910.00 PLANS, SPECIFICATIONS, AND ESTIMATES (PS&E) SUBMITTAL

Projects reaching the PS&E stage of development must be complete and potentially ready for advertising. **All the right-of-way shall have been acquired and right-of-way contracts checked against the project plans**. The utility companies shall have been notified of removal or relocation of utilities as shown on the plans. The district shall begin the PS&E submittal by gathering the appropriate project data and documents as follows.

910.01 Engineer's Endorsement of Plans. All original project plans (Roadway, Traffic, Bridge, and Materials) shall be endorsed (stamped, dated, and signed). The endorsement certifies that the endorser is familiar with the plan sheet, has verified its accuracy, and ensures that the design complies with all current laws, regulations, ordinances, standards, policies, and guidelines. This endorsement is typically challenged in subsequent years by tort liability cases questioning the accuracy or design standard compliance of the drawing. The District Engineers shall approve their district's projects for ITD by signing and dating the title sheet. All other title sheets shall be approved by the Highway Program Oversight Engineer. The plans shall be endorsed by the licensed Engineer closest to or in direct charge of the project, or the person most familiar with the design determinations, i.e., Roadway Plans — Development Engineer; Structures — Bridge Engineer; Materials Source plats — District Materials Engineer; Signs/Signals/Markings — Traffic Engineer; and Record of Land Surveys — licensed Land Surveyor as noted below:

The endorsement stamp shall be placed in the space provided on the standard plan sheets and is available to be electronically reproduced.

Idaho Code, 54-1215(3)(c), states "*The seal, signature, and date shall be placed on all original documents.*" The law goes on to say that copies of electronically produced documents (specifications, land surveys, reports, plats, drawings, plans, and design information) distributed for informational uses such as for bidding purposes or working copies, may be issued with the registrant's seal and a notice that the original document is on file with the registrant's signature and date. The words "Original Signed By" and "Date Original Signed" shall be placed adjacent to or across the seal on the electronic original. The storage location of the original document shall also be provided.

Any revisions made to the plans after the Engineer's Endorsement shall be coordinated with the endorsing Engineer and identified on the individual original plan sheets with the date, description, and the initials of the person making the revision.

910.02 Plans Review. Use the following table (Figure 9-1) for plan set groupings and assemble in accordance with Section 800.00.

Figure 9-1

Project Plan Sheet Requirements							
The following list establishes the requirements for a near maximum number of plans sheets required for a project; some projects may have less.	Roadway/Bridge Reviews				PS&E Submission Only		
	Prel Design	Interm Design	Final Design	PS&E Transmittal	Mtce	Federal Aid Constr. By Agreement	Building & Non Rdwy Projects
ROADWAY GROUP							
Title Sheet	X	X	X	X			X
Standard Drawing Index			X	X			X
Standard Drawings				X			X
Vicinity, Total Ownership, & Special Maps	X	X	X	X		PLANS AS REQUIRED	X
Project Clearance Summary		X	X	X			X
Typical Sections	X	X	X	X			
Roadway Summary			X	X			
Plan and Profile Sheets	X	X	X	X			
SPECIAL DRAWING GROUP							
Minor Structure Drawings		X	X	X			
Drainage Plans		X	X	X			
Paving, Concrete Joint Approach Slab Details			X	X			
Roadside Dev & Landscaping		X	X	X			
Bike Lanes & Pedestrian Paths		X	X	X			
Source Plat-Reclamation Plan			X	X			
TRAFFIC GROUP							
Illumination	X	X	X	X			
Traffic Signals	X	X	X	X			TO INCLUDE ANY OTHER SHEETS REQUIRED (Plan Sheet only)
RR Signals & Crossing	X	X	X	X			
Pavement Marking, Delineation Signing & Raised Channelization	X	X	X	X		PLANS AS REQUIRED	
Traffic Control Plan-Const	X	X	X	X			
*UTILITY PLANS			X	X			
*RIGHT-OF-WAY PLANS			X	X			
*MAJOR STRUCTURE GROUP	Situation & Layout	X	X	X			
*BRIDGE	Situation & Layout	X	X	X			
*STATE MTCE GROUP					X		
* Optional Separate Numbering							

910.03 Estimate of Cost. The project estimate of cost is to be prepared in accordance with the requirements as shown in Figure 9-2 for all projects. When more than one project number is included in the Contractor's Bid Proposal, separate SUB-PROJECT (SPRJ) for each individual Key number should be prepared. Each of these estimates shall be further separated into roadway and bridge quantities to facilitate assigning codes and categories. All quantities are recombined into one bid summary for bidding purposes.

910.04 Multi-Funded Projects. Limit multi-funded projects as much as possible. On projects with two or more sources of funding:

- Attach a letter describing the areas of the project that each funding source applies to. This letter should be written as a letter to the file as early in the project development phase as the limits can be described.
- Delineate on the plans the areas where the funding split takes place.
- Prepare a separate roadway summary and engineer's estimate for each funding source. Like items should be combined on the bid schedule.

915.00 – NEWS RELEASE INFORMATION

Basic project data that can be used to answer inquiries for projects at PS&E is posted by DMC.

920.00 PS&E SUBMITTAL BY THE DISTRICT

All projects, with the exception of maintenance projects such as stockpiles, seal coats, overlays or other comparative projects (see Subsection 920.01, PS&E for State-Financed and Maintenance Projects), shall have a Pre-PS&E check in the district (see Figure 9-2) and a District PS&E Review.

920.01 PS&E for State-Financed Projects. State financed projects may include stockpiles, seal coats, pavement overlays or repairs and other contracts financed wholly by state funds.

These projects must meet the same requirements for PS&E Submittal as any other project, but they do not require a title sheet and other detail plan information as required to complete a federal-aid type project. All documents must be complete and submitted to the appropriate section in accordance with the PS&E Submittal instructions. Use 8 1/2” x 11” plans — either ITD 1767, Maintenance Projects, or a Computer Aided Drafting Design (CADD) reproduction is acceptable and encouraged.

For plan requirements and preparation, see Section 800.00 of this manual.

Figure 9-2

PS&E SUBMITTAL CHECKLIST

Project No. _____ Reviewed By _____

Project Name _____Date _____

Key No. _____ District No. _____

PLANS

GENERAL

_____ Approved Request for Federal-Aid on No-Bid Items of Work, for work done by others (utilities, state forces, etc.)
_____ Approved Certifications or Public Interest Findings for Proprietary Items
_____ Sheets signed by Engineer
_____ Previous review comments incorporated into plans
_____ ITD- 674 - Environmental Re-evaluation is approved
_____ All phases of construction have required bid items

TITLE SHEET

_____ Structure or bridge drawings listed
_____ Sources shown

TYPICAL SECTION

_____ Station limits shown

CLEARANCE SUMMARY

_____ Line items with a project number have corresponding completion and/or expiration date
_____ Estimating basis complete and agreeable with Phase III Materials Report
_____ Clearances renewal (if needed)
_____ If local project is State/Local Construction agreement complete
_____ Utilities are identified with retain & protect, waiver of hearing, or agreement

ROADWAY AND BRIDGE SUMMARY

_____ Item number and nomenclature
_____ Each item is quantified and matches cost estimates
_____ Separate summaries for Roadway and Bridge
_____ Bridge items against situations layout summary for each structure

PIPE SUMMARY

_____ Completeness and if acceptable alternates are shown

SOURCE PLAT

_____ Area to be worked is clearly shown
_____ Log hole data show sufficient information to draw a reasonable conclusion
_____ Archaeological clearance
_____ Cleared by Right-of-way
_____ Reclamation Plan approval
_____ Compare Source Identification in proposal

BUILDING

_____ Appropriate plan scale shown (appropriate if reduced)

STRUCTURE

_____ Do pile lengths exceed depth of soil investigation

_____ Pre-boring item included if appropriate
_____ Bridge deck plant mix overlays include concrete waterproofing system (Administration Policy A-15-02, Sealcoat Applications and Bituminous Treatment on Bridges)

PROPOSAL

_____ Project number and name as shown in program
_____ Applicable supplemental special provisions included
_____ Source Identification included if appropriate
_____ Completion Time matches the time determination calculation
_____ Liquidated amount matches the schedule
_____ Applicable Contractor Notes included
_____ Tribal Special Provisions included or Regulations noted when appropriate
_____ Erosion and sediment control plan or SWPP insert included
_____ Seed requirements and seeding windows specified
_____ Utility coordination note included
_____ Special Provisions in standard format and supported by Phase 5 Materials Report
_____ Estimated cost for furnished materials shown for Use Tax
_____ Partnering insert included, if needed
_____ Lane rental and public convenience considered and included, if needed
_____ Is DBE RN (race neutral) appropriate for contract work if on federal-aid project? Modify to DBE RC with ___ percentage per CCO?
_____ Lead based paints not allowed
_____ Can prime contractor do 50% of contract on federal-aid project? Need to modify subsection 108.01, to as low as 30%? (Coordinated with DBE/EEO Office?)
_____ Proprietary items approved & have "or equals" statement
_____ RR Agreement included if needed: Describe areas requiring RR Insurance (each separate project on multi-project contracts)
_____ Compare SP's name and number to plan summary and cost estimate
_____ 404 Permit and application included, if applicable
_____ Training SP included if needed (Federal Aid)

COST ESTIMATE

_____ Prices review
_____ Seeding Items Included
_____ Separate group estimate for roadway, walls, and structures
_____ Salvage value shown for federal-aid projects
_____ Approved work by others (local, utilities, railroad, etc.) shown (do not show pavement markings for non-federal-aid projects)
_____ E & C shown (not shown for state furnished seed, trainees, PE, and right-of-way)
_____ Railroad flagging included on appropriate projects
_____ Compare costs to program amount (all programmed items); if necessary update ITD 1414, Project Program Revision
_____ Trainees included if appropriate. Cost pre-entered to show in bid schedule
_____ Specialty items shown, if appropriate

_____ Items reviewed to verify FA eligibility and if not, shown as Non-participating? (including Maintenance items)

OTHER INFORMATION

_____ Specify if construction windows must be met and/or intermediate milestones are required
_____ PS&E Advertisement information provided (Figure 9-3)
_____ Milepost changes (submit ITD 2184 and 2185)
_____ Does Traffic Control Plan provides a suitable travel surface? Traffic delays are 15 minutes or less and avoid rush hour traffic (Adm. Policy A-12-04, Traffic Control during Construction, Maintenance, Utility, or Private Development Operations)? Stopping of traffic on Interstate avoided?
_____ Other Applications and Permits are included and current
_____ Agreements Completed (signed with a number)
_____ Construction Agreement (signed with a number)
_____ Road Closure & Maintenance Agreement (signed with a number)

920.02 PS&E Submittal Document Package. The PS&E Submittal Document Package contains final documents necessary for preparing, advertising, and awarding projects.

PS&E SUBMITTAL PACKAGE

The PS&E Submittal Package should contain at least, but not necessarily limited to, the following material, depending on the type of project submitted:

- Copy of the PS&E Submittal Letter
- Plans:

  All plans for Roadway, Traffic, and Special Drawings, less the plans prepared by Bridge, shall be transmitted to Design/Materials/Construction (DMC).

  Original plans are to be high quality reproducible, 11” x 17”, and the engineer's seal **may not** be a reduced size. The original plans may be retained in the districts. A reproducible paper copy may be submitted for bidding purposes. The plans should be examined to ensure they will produce good copies.

Electronically produced plans may be submitted for bidding purposes.

- Contractor's Bid Proposal: Supplemental Specifications and attachments that are in package form(SP-SA, FHWA-1273, SSP’s, EEO Special Provisions, etc) are inserted in contracts by DMC. Items for the Contractors Bid Proposal that shall be prepared by the district are:

  (1) PS&E Advertisement Sheet (Figure 9-3); District enters all known data

  (2) Special Provisions (to include those written in the Approved Materials Report) shall be incorporated into the Contractor's Bid Proposal which includes the Source Identification, Contract Time, Liquidated Damages, Contractor's Notes, etc.;

  (3) Modification of Standard Specifications, Pay Items;

  (4) 404 Permits including the construction application, Water Resource Stream Alteration Permits, and DEQ Water Quality Certification for all applicable projects; and

  (5) Utility Agreements
- Cost Estimates: Computer printout of the estimate will be included and computer file transmitted to DMC’s computer library for recall purposes.
- List of non-bid project items with costs i.e.: Material by State, etc.
- Right-of-way Certificate, see 415.70.

- Completed ITD-2324 – Process for Setting DBE Goals and Training Hours on Federal Aid Projects. If training is setup then include TSP in the first paragraph of the Special Provisions.
- Copy of Environmental Re-evaluation approval letter.
- Proposed Milepost Changes (ITD 2184) and Milepost Log Worksheet (ITD 2185): The districts will submit these forms for incorporation of the data into the department's MACS System.
- Calculations for Contract Time: Use "Contract Time Determination Manual" in conjunction with Microsoft Project.
- Verify Materials Reports with addendums, Phases II, III, and V are complete and approved and necessary data included in proposal and plans.

Figure 9-3

Project Advertisement

JOB DESCRIPTION					
ADVERTISE		BID OPENING		CALL	
NEWSPAPER		TO PAPER BY			
COUNTY		DISTRICT			
PROJECT NO					
KEY NO					
LOCATION					
HIGHWAY					
CONTRACTOR COMP		BOARD LTR COMP			
ENG EST RANGE		LIQ DAMAGES			
FHWA REVIEW STATUS (EX-NF-FULL)		STANDARDS			
DBE %		FA %			
WORK AUTHORITY					
RESIDENT ENGINEER		TELEPHONE			
FIRST PAGE SSP'S					

Note:

THIS SECTION TO BE COMPLETED BY TRS			
DOCUMENT NAME		DATE FAXED OR EMAILED	-

BRIDGE		NPDES		GARVEE (1)		UTILITIES	
RAILROAD		LOCAL		CIP (5)		SIGNALS	
ELECTRICAL		LHTAC		ARRA/STIMULUS		BUILDING	

920.03 PS&E Submittal Letter. The District or headquarters Traffic and Maintenance sections shall transmit the project data to DMC for PS&E. All projects are to have a letter of transmittal that lists all material being sent in the Submittal Document Package or under a separate cover. Included in the PS&E Submittal letter (see Figure 9-4) should be:

- comments regarding any unusual aspects of the project, including construction windows/start and/or finish dates that must be met
- justification for deviation from departmental policies for items not previously approved,
- any information on required clearances,
- agreements,
- participation by others including dollar amounts, and
- other pending data.
- Date of district PS&E review.
- Date of environmental commitment or re-evaluation.
- Date of mitigation summary completion.

Figure 9-4

PS&E Submittal Letter

ITD-500 3-98

Idaho Transportation Department

Department Memorandum

DATE: _____, 20 _____ **Project No.(s):**_____(____)

TO: DMC ENGINEER **Key No.(s):**_____

FROM: PROJECT DEVELOPMENT ENGINEER **Project Identification, County, Etc.:**

DISTRICT # PROJECT NAME (6-Year Program)
_____COUNTY, WA # _____

RE: PS&E Submittal

The attached plans and proposal are ready for advertising at this time. The following are enclosed.

- Plans
- Contract bid proposal
- Preliminary cost estimate
- List of non-bid project items with costs
- Environmental re-evaluation date
- Materials reports (list the link URL)
- Request for federal-aid on No-Bid Items of Work (Force Account forms (ITD-2395) are to be approved prior to this submittal)
- Calculations for Contract Time
- PS&E Advertisement Sheet – (Figure 9-3) Including Description of Project
- Permits

PS&E Submittal Letter

(Project No., etc.)

TRANSMITTAL OF PROJECT DATA (PS&E Submittal)

(Date)

Page 2

Include in the Letter of Transmittal:

- Comments on any unusual aspect of the project (*use of other than approved standards requires approval*) including construction windows/start and/or finish dates that must be met.
- Waiver of scheduled reviews
- Clearance summary items not completed (indicate actions required to complete)

Statement on who will issue the Right-of-way Certificate

Participation by others including dollar amount

Pending information

Review Dates:

Preliminary Design Review (*Date*)

Intermediate Design Review (*Date*)

Final Design Review (*Date*)

FHWA Operations Engineer Reviewed Plans (FHWA Projects of Interest only) (*Date*)

District PS&E Review (*Date*)

Environmental commitment verification/certification (*Date*)

Mitigation summary (*Date*)Note that any changes made to a consultant project have been discussed with the consultant

Attachment

Cc:

920.04 Resident's File. When the PS&E Submittal is sent to DMC, a Resident's File is also sent to the Resident Engineer with a cover letter.

The Resident's File should contain the following:

- Charter,(including Design Standards, Design Exceptions)
- Field Inventory (if completed)
- Field information
- Field notes
- Topographical information
- Special sections
- Preliminary survey notes
- Quantity calculations
- Computation sheets, earthwork runs, etc.
- Grade books – Levels and intervals need to be determined for each project
- Special procedures for designs
- Environmental Commitments from an Environmental Evaluation and Clearance
- Correspondence that affects construction
- Copies of permits (Water Resources, Corp., etc.)
- Basic items covered on Project Clearance Summary
- Mitigation Summary
- Right-of-way agreements
- Phone numbers and affiliation of contact persons
- County, city contacts
- Utilities with Contact for each
- Consultants with Contact Name
- Suppliers
- Brochures, etc.
- Information on specialty items, new materials, out of the ordinary procedures, etc.
- Other information needed to build the project

- Public Involvement Summary (Relevant public involvement material)
- Context Sensitive Solution Obligations
- Agreements
    - Construction
    - Cooperative
    - Road Closure & Maintenance

925.00 – PS&E CHECK

DMC inspects the PS&E Submittals by using Figure 9-5, Advertisement Checklist.

Charters, design exception documentation, preliminary review minutes, final reviews minutes, materials reports, official ROW plans, etc., and approval documents should be available for review in Projectwise and for record keeping to ensure project history documentation when projects are submitted for PS&E and when obligation of funds are needed.

A copy of the plans, special provisions, and estimate are sent to FHWA for projects designated as FHWA Projects of Interest.

Projects that are submitted to DMC for PS&E, which are incomplete or cannot be advertised, will be returned to the district.

Projects that have been completed and put "on the shelf" for more than one year must be updated by the district to assure the incorporation of any updated specifications, standards, prices, etc. before submitting to DMC.

Figure 9-5

ADVERTISEMENT CHECK LIST

PROJECT NO._____ REVIEWED BY _____

PROJECT NAME_____ DATE_____

KEY NO._____ DISTRICT NO._____

COORDINATE THE FOLLOWING:	
	Bridge Section — Collect Original bridge drawings if not included.
	Right-of-way Section — Verify Source certificate and/or Right-of-way certificate if appropriate.
	Local Projects — Verify Agreement complete and matching funds if appropriate.
	Utilities — Verify Agreements complete if appropriate.
	Verify Approval of ITD 2101 (requires Right-of-way certificate, environmental re-evaluation, and ITD 2395, Request for Federal-Aid on No-Bid Items of Work).
	FHWA — Send packet if a full-oversight project.
REVIEW	
	Plans, special provisions, cost estimate, and project information submitted in PS&E Submittal.
	Review Final Design Checklist.
ADVERTISING	
	Set or update information for advertising.
	Advertisement period is normally 3 weeks (4 week desirable for large projects).
	Advertise in newspaper located in County seat ; 2 issues

930.00 – PROJECT ADVERTISING

Wherever work on the state highway system is let by contract, sealed bids must be called for by public advertisement. Potential bidders are alerted of projects out for bid in several ways. Projects are advertised by:

- Legal notices in local newspapers
- Notices are placed on internet sites

930.01 Legal Notice. Legal notice of a project shall be advertised in a newspaper with general circulation in the area of the project normally in the county seat in which the project is located, if possible. If a project is in more than one county, advertisement shall be in the paper having the greatest circulation, but need not be advertised in each county. Advertisement shall be published in conformance with Idaho Code 40-902.

930.02 Short or Long Advertising Periods. Federal Highway Administration, CFR 635.112, requires that for federal-aid projects, the first publication must be published at least three (3) weeks prior to opening of bids unless shorter advertisement is approved. If a shorter advertising time is desired for Federal Aid projects, approval from FHWA shall be obtained.

Longer advertising periods are desirable for large, complicated, or unusual projects that will require considerable time for study and development of cost data to prepare realistic bids.

Legal notices for advertising projects can be either mailed or faxed directly to the newspaper. (See Figures 9-6 and 9-7).

930.03 Pre-Bid Meeting. Pre-bid meetings can be of value to both contractors and ITD/consultant design and construction personnel on large or complex projects. For contractors, they provide an opportunity to learn about unusual or unique project features and get answers to questions prior to bid submittal. For design personnel pre-bid meetings provide one last chance to evaluate and improve, if necessary, the bid ability and constructability of the contract. For construction personnel they provide the same opportunities as well as an opportunity to clarify the intent of design and specification details, which is an integral step of the claims prevention process.

Note the following excerpt from Section 102.03 of the Standard Specifications : “If the Department discovers any information, specifications, plans, data, or interpretations important for the bidding process to be deficient, the Department will provide this data to all bidders as addenda”. This means that any changes resulting from a pre-bid meeting that are necessary to be contractually binding must be included in an addendum.

When a pre-bid meeting is held, allow at least three (3) weeks between the pre-bid meeting and bid opening so there is ample time to issue an addendum if necessary. Minutes from pre-bid meetings must be clearly marked “FOR INFORMATION ONLY” and distributed to all plan holders at least ten (10) days prior to bid opening.

Mandatory attendance at Pre-Bid Meetings should not be required.

Figure 9-6

DEPARTMENT LETTERHEAD

(“*Notice of Letting” Advertisement Letter*)

October 7, 1998

Idaho County Free Press

PO BOX 690

Grangeville ID 83530

Idaho Federal Aid Nos. STP-BROS-2500(007) & STP-BRS-4710(003)

Rock Creek Bridge South & Rock Creek Bridge North

Idaho County, Key Nos. 4792 & 4791

Gentlemen:

We have enclosed the "Notice of Letting" for the captioned project, to be published in your paper on the following dates:

OCTOBER 6 (WED) AND OCTOBER 13 (WED), 2004

In order to secure payment for this service, submit your invoice in triplicate. Payment will be made in accordance with Section 60-105, Idaho Code, and as amended.

Please attach a copy of the publication to an affidavit of publication, along with your invoice in triplicate, and send to the Idaho Transportation Department , District 2, PO Box 837, Lewiston, ID 83501.

If the above instructions cannot be met, please immediately notify the Idaho Transportation Department, Division of Highways, (208) 334-8430.

WE REQUIRE A COPY OF YOUR NEWSPAPER CONTAINING THE FIRST PUBLICATION OF THIS NOTICE. IT IS IMPORTANT THAT IT BE MAILED IMMEDIATELY.

Sincerely,

Frances Hood, P.E.
DMC Engineer

Enclosure

FJH:lj

Figure 9-7

N O T I C E O F L E T T I N G

Sealed proposals will be received by the IDAHO TRANSPORTATION BOARD only at the office of the IDAHO TRANSPORTATION DEPARTMENT, 3311 WEST STATE STREET, BOISE, IDAHO 83703, ATTN: ROADWAY DESIGN until two o'clock p.m., on January 15, 2013, for the work of cold milling, overlaying, and seal coating 6.529 miles of I-90, MP 51.971 to MP 58.500; I-90 Elizabeth Park Rd to Osburn, known as Idaho Federal Aid Project No. A012(966), in Shoshone County, Key No. 12966.

[ADDITIONAL INFORMATION CONTACT: RESIDENT ENGINEER ***JASON MINZGHOR*** AT (208) 772-1223.]

Plans, specifications, form of contract, proposal forms, and other information may be obtained at the office of the Idaho Transportation Department, Boise, Idaho, and are on file for examination at the office of the District Engineer at **Coeur d'Alene** Idaho.

A non-refundable handling and mailing charge of FIVE DOLLARS ($5.00) plus applicable sales tax will be made for bid documents. Phone orders to (800) 732-2098 (in Idaho) or (208) 334-8430 shall be made by credit card (Visa or Mastercard). Written requests shall be made by check or money order to the Idaho Transportation Department, Attn: Revenue Operations, P. O. Box 34, Boise, ID 83731-0034.

Dated August 9, 2013

TOM COLE, P.E.

Chief Engineer

930.04 Notice to Contractors. The Notice to Contractors (Figure 9-8) is an advertisement for sealed bids for each project advertised. The notice provides:

- a brief description of the work,
- list of bid items and quantities,
- date of bid opening,
- locations where plans can be examined,
- cost of bid documents, and
- address to obtain bid documents.

The notice shall be posted on the internet.

930.05 Notice to Others. The Notice to Contractors shall be furnished, free of charge on the internet site.

Figure 9-8

ITD PROJECT **OPENING DATE**

KEY NO. «KEY_NO» «BID_OPENING»

NOTICE TO CONTRACTORS

IDAHO FEDERAL AID PROJECT NO. «PROJECT_NO» Estimate Range: «EELow» - «EEHigh»

«LOCATION» «COUNTY» COUNTY

Sealed bids will be received only at the office of the Idaho Transportation Department, 3311 West State Street, Boise, Idaho, until two (2) o'clock p.m., «BID_OPENING», on the items below. Bids will be publicly opened and read by the Idaho Transportation Board or their representatives. Proposal guaranty is required in an amount equal to five percent (5%) of the bid. This proposal guaranty must be in the form of a Cashier's Check or a Certified Check in favor of the Idaho Transportation Department, on some bank in the State of Idaho, or a Bidder's Bond.

The Idaho Transportation Department, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252) and the regulations of the Department of Commerce (15 C.F.R., Part 8), issued pursuant to such act, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, religion, color, sex, national origin, age, or disability in consideration for an award.

On this contract the specified DBE participation goal is not a set percentage requirement. The ITD FFY2010 DBE overall annual statewide goal is 10.5%. The DBE Directory can be accessed at www.itd.idaho.gov/civil/dbeforms.htm.

NOTICE TO PROSPECTIVE FEDERALLY-ASSISTED CONSTRUCTION CONTRACTORS

By signing a proposal, the Contractor certifies that he does not maintain segregated facilities, as required by the May 9, 1967, order (32 F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor.

Plans and detailed information can be secured from the Idaho Transportation Department website at http://www.itd.idaho.gov/design/contractors/contrinfo.htm.

The Fair Labor Standards Act of 1938 (U.S.C.A. Title 29, Paragraphs 201-219, Chapter 8) shall apply in the employment of labor for this project.

The Contractor will be required to pay not less than the minimum wage rates of Form SP-L-IN predetermined by the Secretary of Labor for the project, as set out in the advertised specifications and bid proposal. Such rates will be made a part of the contract covering the project.

(Contractors bidding this project must hold a Public Works Contractors License prior to award of the contract.)

The work contemplated under this contract consists of «JOB_DESCRIPTION»; «LOCATION», known as Idaho Federal Aid Project No. «PROJECT_NO», in «COUNTY» County, Key No. «KEY_NO», and includes the following quantities: (FOR ADDITIONAL INFORMATION CONCERNING THIS PROJECT, PLEASE CONTACT RESIDENT ENGINEER **(Play Resident Engineer Macro)**).

Completion of the work on this project will be required **«COMPLETION_TIME»**, as stated in the Proposal Form.

The Idaho Transportation Board reserves the right to reject any or all bids and to waive technicalities as may be deemed necessary and of interest to the State.

The Idaho Transportation Board may reject a proposal, after due consideration, if the evidence revealed by questionnaire and other factors indicates the bidder is incapable of performing the work contemplated to the satisfaction of this Department, within the time limit as specified by the proposal.

The Idaho Transportation Board may reject the proposal if past work performed by the bidder for this Department has been unsatisfactory, either from the standpoint of workmanship or progress, or if he has work under contract which is incomplete and which may, in the judgment of the Idaho Transportation Board, endanger the completion of the work herein contemplated, within the time limit specified.

TOM COLE, P.E.
Chief Engineer

Figure 9-9

IDAHO FEDERAL-AID PROJECT

IDAHO FEDERAL AID PROJECT NO. CM-2800(129)

MEYER RD. SURFACING

ITEM NO	DESCRIPTION	QUANTITY	UNITS
405-035A	PL MIX PAV INCL ASPH & ADD CL III	6920.00	TON
405-245A	APPROACH	25.00	EACH
626-005A	RENT CONST SIGN CL A	123.00	SF
626-010A	RENT CONST SIGN CL B TY III	280.00	SF
626-040A	RENT CONST BARR CL B TY III	11.00	EACH
626-050A	RENT DRUM CL B	20.00	EACH
626-100A	RENT INCIDENTAL TRAF CONT ITEM	1.00	LS
626-105A	TRAF CNTL MAINTENANCE	82.00	MNHR
630-005A	FLAGGING	80.00	HR
S904-05A	SP SURFACING SHAPING	1.00	LS
Z629-05A	MOBILIZATION	LUMP	LUMP

The Idaho Transportation Board reserves the right to reject any or all bids and to waive technicalities as may be deemed necessary and of interest to the State.

The Idaho Transportation Board may reject the proposal, after due consideration, if the evidence revealed by questionnaire and other factors indicates the bidder is incapable of performing the work contemplated to the satisfaction of this Department, within the time limit specified by the proposal.

The Idaho Transportation Board may reject the proposal if past work performed by the bidder for this Department has been unsatisfactory, either from the standpoint of workmanship or progress, or if the contractor has work under contract which is incomplete and which may, in the judgment of the Idaho Transportation Board, endanger the completion of the work herein contemplated, within the time limit specified.

TOM E. COLE, P.E.
Chief Engineer

Boise, Idaho

Sheet 2 of 2

935.00 – BID DOCUMENTS

Bid documents(Proposal Forms) are the plans, contractor's bid proposal, a packet containing unsigned legal pages, blank bid schedules, blank bonding pages, etc., that are required for bidding. The pages for signature are designated "For Bidding Purposes."

Plans and detailed information can be secured from the Idaho Transportation Department website at http://www.itd.idaho.gov/design/contractors/contrinfo.htm.

The applicable costs are set forth on the web site. A list of all those who download bid documents is maintained in DMC and when an addendum is added, the list is used to notify bidders. The list is considered public information to the extent allowed by Idaho Code 9-348.

935.01 Bid Document Assembly.

Federal Aid Proposal

Cover

P-2-F Form

Proper wage determination reference sheet. (Reference to USDOL web site in proposal with actual copy included in Contract.)

Special Provisions .

QA Special Provisions, Permits etc.

Current Supplemental Specifications

FHWA-1273

EEO and DBE Special Provisions

Training (When required in bid schedule and specials first page.)

Other applicable SSP's and Forms

P-3-F Forms

Bid Schedule

Subcontract Requirements Form

Proposal Bond

State Proposal

Cover

P-2 Form

Special Provisions, including copies of permits etc.

QA

Current Supplemental Specifications

SP-SA Special; Provisions – State Aid

SSP's and Forms

P3's

Bid Schedule

Subcontract Requirements Form

Proposal Bond

935.02 Addendum. After the bid documents are available for sale/download, any change or correction of information, specifications, plans, data, or interpretations which the department discovers is lacking and may be important to all bidders will be furnished to all bidders in the form of an addendum. Addenda information shall be provided to DMC by completion of **Form 0232** and shall be submitted in the time limit described in **Section 935.03**.

ITD's intent is to provide all bidders equal opportunity to access and acquire all available pertinent information necessary to formulate a responsive bid.

An addendum which affects the bid should be sent to bid document holders at least ten days (10) prior to bid opening. An addendum affecting correctness of form should be sent to bid document holders at least four (4) days prior to bid opening. If there is inadequate time for bid document holders to respond to an addendum, the bid opening date shall be postponed.

All addenda shall be distributed to bid document holders by e-mail (receipt may be tracked thru the QUEST-CDN web site when necessary). The recipient is instructed to attach the addenda sheets to the corresponding sheets in their proposal or plans and to acknowledge inclusion by fastening the letter of transmittal to the back inside cover of the proposal form submitted (adding addenda date in electronic bids).

Include a notice of Addenda with an entry on the Planholder's List, posted to web.

Highway Project Addendum Request

Idaho Transportation Department

ITD 0232 (Rev. 02-13)
itd.idaho.gov

Design Manual, Section 935.03 - Addenda on all projects, except full oversight projects, should be received by Design, Materials, and Construction (DMC) no later than fourteen calendar days before the bid opening. Addenda on full oversight projects should be received no later than twenty calendar days before the bid opening. This will allow adequate time to obtain approval of the addendum from the DMC Engineer and FHWA. Addenda not received within the above limits will result in postponement of the bid.

Key Number	Project Number	Project Name	District

Addendum Requested By	Designer/Project Manager Name	Phone Number

Addendum Reviewed With Designer	Changes Reviewed With Resident Engineer
☐ Yes ☐ No	☐ Yes ☐ No

Changes Reviewed With Local Agency (if applicable)	If No, Explain
☐ Yes ☐ No	

Additional Standard Drawings are Required	If Yes, List
☐ Yes ☐ No	

Bid Schedule Changes - Put in Item Number order. Complete applicable information.

Check N/A if there is no change to the Bid Schedule. ☐ **N/A**

	Item Number	Quantity	Unit	Unit Price	Other
☐ Add ☐ Revise ☐ Delete					
☐ Add ☐ Revise ☐ Delete					
☐ Add ☐ Revise ☐ Delete					

Proposal Changes - Put in Page Number Order. Do not resend the proposal in entirety, only the parts to be modified.

Check N/A if there is no change to the Proposal. ☐ **N/A**

☐ Add ☐ Revise ☐ Delete	Page Number ———	
☐ Add ☐ Revise ☐ Delete	Page Number ———	
☐ Add ☐ Revise ☐ Delete	Page Number ———	

Figure 9-10

STATE OF IDAHO

TRANSPORTATION DEPARTMENT

BOISE, IDAHO

DATE: March 26, 2004

ADDENDUM NO. 1

Idaho Federal Aid Project No. STP-3330(103)

Firebird South Passing Lanes

Ada County, Key No. 8429

NOTICE TO PLANHOLDERS:

Enclosed are Revised Sheets 4, 10, 11, 11a,13, and 21 of 28 of the Special Provisions and Standard

Drawing I-20.

Enclosed is the Revised General Wage Decision reference sheet.

All addenda shall be distributed to bid document holders by e-mail (receipt may be tracked thru Quest cdn web site when necessary). The recipient is instructed to attach the addenda sheets to the corresponding sheets in their proposal or plans and to acknowledge inclusion by fastening the letter of transmittal to the back inside cover of the proposal form submitted (adding addenda date in electronic bids).

Include a notice of Addenda with an entry on the Planholder's List, posted to web.

Sincerely,

FRANCES HOOD, P.E.

DMC Engineer

FJH:ds

Enclosures - as above

CERTIFIED MAIL

Bid document holders may also be informed verbally of an upcoming addendum so they can consider the addendum in their bid. Oral explanations, instructions, and interpretations given to bidders prior to award of a contract shall not be binding.

935.03 Addendum Approval. All addenda must be approved by the District Engineer or Designee prior to submittal.

Addenda involving FHWA Projects of Interest require approval from FHWA (see Figure 9-11). Wage determination updates, production errors, minor conflicts between plans and specifications, and extensions of advertising period are considered to have been considered in FHWA approval and do not require individual submittals. These minor changes will be posted on the ITD Project folders on the ITD PS&E Sharepoint site for FHWA information.

Addenda on all projects, except FHWA Projects of Interest, should be received by DMC no later than fourteen calendar days before the bid opening. Addenda on FHWA Projects of Interest should be received no later than twenty calendar days before the bid opening. This will allow adequate time to obtain approval from FHWA if required and for DMC to process the addendum. Addenda not received within the above limits will result in postponement of the bid opening.

Figure 9-11

Idaho Transportation Department Letterhead

(*Federal Approval of Addendum*)

Date

Peter Hartman
Division Administrator
Federal Highway Administrator
Idaho Division
Boise, ID 83707

Subject: Idaho Federal-Aid Project No.

Dear Mr. Hartman:

Enclosed is Addendum No. ___ for the above project that requires revisions to the Special Provisions, Bid Schedule, and Plans.

Your approval is requested.

Sincerely,

Frances Hood, P.E.
DMC Engineer

940.00 – BID OPENINGS

The procedures for receiving and publicly opening sealed bids are governed by Idaho Code 40-902 and ITD Standard Specifications for Highway Construction Sections 102 and 103. Federal-aid projects are also governed by FAPG Section 635.113.

Bid openings are scheduled on a weekly basis and more often during peak load periods, as projects are developed and to provide unsuccessful bidders an opportunity to offer bids on additional projects. The separate packet of bid documents that is designated "For Bidding Purposes" (or electronic version) must be completed and returned by a bidder before bid opening.

940.01 Proposal Guaranty. A proposal guaranty, sometimes called a bidder's bond, proposal bond, or government obligation proposal bond, is a requirement for each bidder's bid and will be a reason for disqualification if not provided (see Figures 9-12 and 9-13). The purpose of this bond or other form of guaranty is to ensure that the bidder will accept a contract if offered. The guaranty is for five percent (5%) of the bid amount and may be in the form of a surety bond, cashier's check/certified check drawn on an Idaho bank, or government obligation bond.

Individual surety bonds and AIA 310 surety bonds are unacceptable.

The proposal guaranties of the two lowest bidders are retained in DMC until award of contract. The guaranty is retained on the second low bidder in the event a contract is not awarded to the first low bidder. The proposal guaranties of the other bidders are returned except for surety bonds. Proposal bonds or Surety proposal bonds are not returned.

Figure 9-12

S U R E T Y

PROPOSAL BOND

KNOW ALL MEN BY THESE PRESENTS, That we _____

of_____

as Principal, and _____

as Surety, are held and firmly bound unto the State of Idaho (hereinafter called the State) in the full and penal sum of Five Percent of the total amount of the proposal of said Principal for the work hereinafter described, for the payment of which will and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, firmly by these presents.

The Condition of this obligation is such, that whereas the Principal has this day submitted a sealed proposal for:

(Type either "Idaho" or "Idaho Federal Aid") Project No. «PROJECT_NO»

«LOCATION»

«COUNTY» County, Key No. «KEY_NO»

NOW THEREFORE, the above obligation is void if the Principal – (a) obtains relief pursuant to Idaho Code, Section 54-1904B; or (b) upon award by the State of the bid identified above is authorized by State and Federal law or regulation to enter into the contract, executes the contractual documents and provides the bonds required by the terms of the bid as accepted, within 15 days after presentation of the contract; otherwise this proposal bond shall remain in full force and effect.

IN WITNESS WHEREOF, The above bounden parties have executed this

instrument, this_____day of_____, 20__.

Witness: _____ _____

(If Individual or Firm) (Principal)

Attest: _____ By _____

(If Corporation)

_____

(Corporate Seal) (Title)

_____

(Surety)

_____

(Business Address)

Attest: _____ By _____

(Signature)

_____

(Print Name) (Title)

SURETY AGENT'S POWER-OF-ATTORNEY MUST BE ATTACHED

Figure 9-13

GOVERNMENT OBLIGATION

PROPOSAL BOND

KNOW ALL MEN BY THESE PRESENTS, That we _____
_____ of _____
as Principal, and _____
as Pledgor of government obligations and the government obligations described herein, are held and firmly bound unto the State of Idaho (hereinafter called the State) in the full and penal sum of Five Percent of the total amount of the proposal of said Principal for the work hereinafter described, for the payment of which will and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, firmly by these presents.

The Condition of this obligation is such that whereas the Principal has this day submitted a sealed proposal for: Idaho Federal-Aid Project No. NH-4110(108)
Culdesac to Webb Road
Nez Perce County, Key No. 6289

PLEDGE

To secure payment and performance of all obligations contained herein, _____ (Pledgor), does hereby grant unto the State of Idaho a security interest in and assigns, transfers, pledges, and delivers to the State of Idaho government obligations as described in the following paragraph and further warrants that said government obligations meet the criteria set forth in Idaho Code, Section 54-1901, are in an amount equal at par value to the total amount of this bond and are not currently pledged or otherwise encumbered or obligated. Pledgor further authorizes the State of Idaho to collect or sell the described government obligations if Principal defaults by failing to enter a contract as provided herein.

The government obligations pledged are described as follows:

(**see note below) _____
_____
_____

NOW THEREFORE, If the said Principal shall be awarded and shall duly make and enter into a contract with the State in accordance with the terms of said proposal and award and shall within fifteen (15) days after presentation of the contract, furnish a bond acceptance to the State for faithful performance of such contract, then this obligation shall be null and void, otherwise it shall be and remain in full force and effect.

****Note:** Description must include the obligation type, CUSIP No., par value, current market value, and maturity date.

7/86 GO/PB

Page 1 of 2

IN WITNESS WHEREOF, The above bounden parties have executed this instrument,
this _____ day of _____, 20_____.

Witness: _____ _____
(If Individual or Firm) (Principal)

Attest: _____ By _____
(If Corporation)

_____
(Title)

(Corporate Seal) _____
(Surety)

_____
(Business Address)

Attest: _____ By _____
(Signature)

_____ _____
(Print Name)

_____
(Title)

7/86 GO/PB Page 2 of 2

940.02 Receiving Sealed Bids. When bid proposals are received, record and number each envelope to correspond with bid sequence number. Bids must be recorded in a secluded area where contractors have no knowledge of the number of bids or who has submitted bids. (see ITD-2377).

A bidder may withdraw or revise a proposal after it has been deposited with the state, provided the request for such withdrawal or revision is received by the state in writing, or fax transmittal before the time set for opening proposals. If request are made that concern the number of bids or who has submitted bids, they should be informed that we are not allowed to release this information.

940.03 Revising a Sealed Bid. A bidder may withdraw or revise a sealed bid by written request (fax is acceptable). The request shall be received prior to the time and date set for public opening of the sealed bids. Requested revisions are attached to the sealed bid.

If an individual requests to personally revise a sealed bid, written and signed authorization from the bidder authorizing that individual to modify contract documents is required.

940.04 Public Opening of Sealed Bids. Sealed bids are delivered to the public bid opening area at the appointed time and date advertised. The sealed bids for each proposal are publicly opened by designated department employees.

All bids for each contract shall have the following publicly read:

- Project number and name.
- Contractor's name and city (city and state for out-of-state bidders).
- Total amount of bid.

The apparent low bidder is publicly announced for each proposal.

After all bids are opened and publicly read, the unit prices of bid items from each of the three low bidders will be posted on the internet except when only one bid is received for a contract.

The bid documents shall be examined for proper preparation.

940.05 Irregular Bids. Irregular bids are unacceptable bids which did not have the bid documents completed appropriately, or are from bidders debarred from bidding on federal-aid projects. A bid considered irregular shall be handled in accordance with Administrative Policy A-14-09.

The name and bid amount of the bidder along with the statement "apparent irregular bid" shall be posted on the department web site .

945.00 – CONTRACT AWARD

The procedures for awarding a contract are governed by Idaho Code Section 40-902; ITD Standard Specifications for Highway Constructions Sections 102, 103, 107; and Board Policy B-14-06, Approval of Plans/Specifications/Estimates and the Award of Construction Projects. Federal-aid projects are also governed by 23 CFR, Subsection 635.114.

945.01 Pre-Award Activities for All Bids. All bids are entered into the computer to verify bid item extensions and total bid amounts. The bids for each proposal are reviewed for collusion or complementary bidding.

The following factors are used to detect collusion by contractors for each proposal:

- Number of bids submitted. If less than three (3) bids were received, the reason for lack of response investigated.
- Number of potential bidders.
- Comparison of unit prices against Engineer's Estimate and all bidders by the Bid Line Item Profile (BLIP) computer program. (See Figure 9-14).
- Identical bid amounts on a contract pay item by two or more bidders.
- Distribution or range of bids received.
- Identity and geographic location of each bidder in order to determine if particular bidder is always being low bidder in a certain geographic area.
- Different groups of bidders who appear to specialize exclusively in federal, state or local projects.
- Successful bidder repeatedly subcontracting work to other bidders that submit higher bids.
- A frequent bidder that never submits a low bid.
- Joint venture bids where either bidder could have bid as a prime contractor.
- Bidders who were previously convicted of bid rigging in other states.

The unit bid prices of the apparent low bid shall be examined for reasonable conformance with the engineer's estimated prices. A bid with extreme variations from the engineer's estimate, or where obvious unbalancing of unit prices has occurred, shall be thoroughly evaluated.

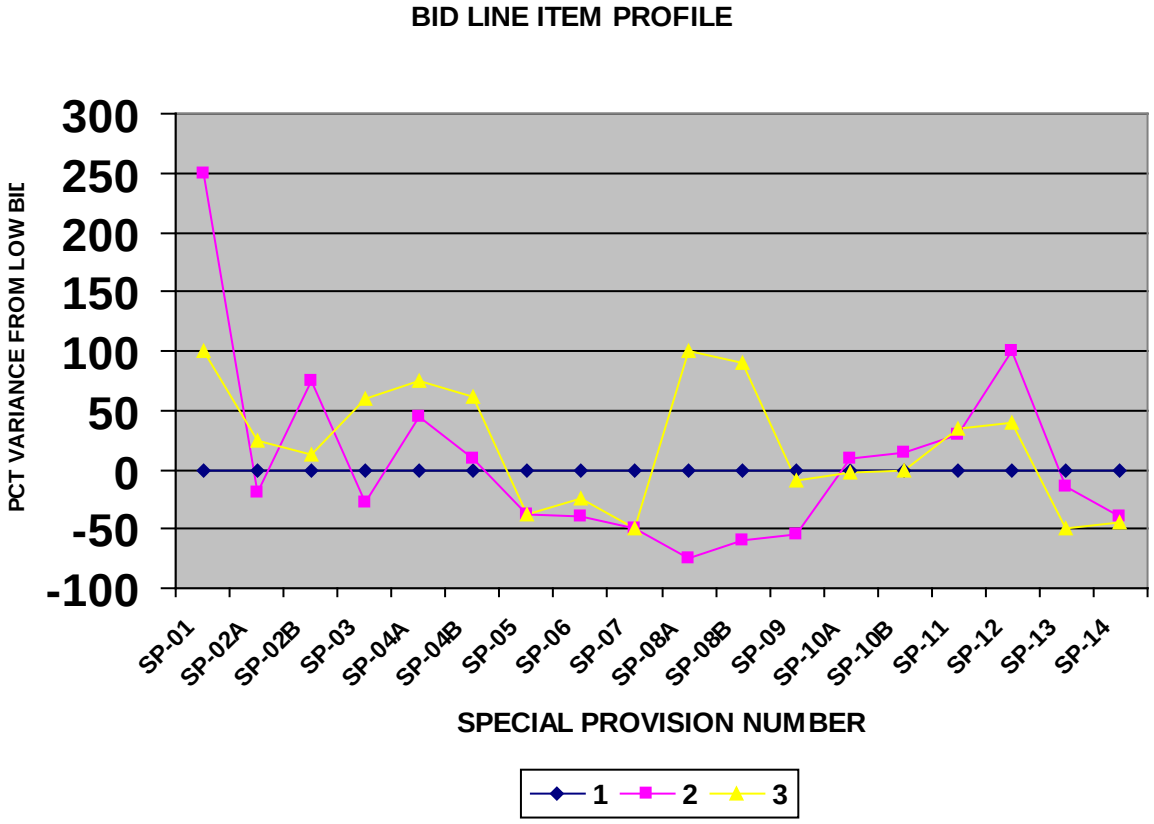
Where obvious unbalanced bid items exist, the decision to award or reject a bid shall be supported by written justification. A bid found to be mathematically unbalanced, but not found to be materially unbalanced, may be awarded.

Figure 9-14

North Idaho Centennial Trail 10-22-96

LOW BID IS THE NORM FOR COMPARISON

Key No=5533



1 = Low Bid

2 = Next Lowest Bid

3 = Next Lowest Bid

945.02 Contractor's Public Works License. The low bidder shall be checked for a Contractor's Public Works License. Totally funded State projects require bidders to have a Contractor's Public Works License prior to bid opening. Not having the Contractor's Public Works License is reason for not awarding a contract.

Federal-aid projects allow bidders to obtain a Contractor's Public Works License after the bid opening and prior to award of contract. The department will remind those bidders without this license to obtain one, both verbally and in the apparent low bid letter. The apparent low bid letter is sent by certified mail to verify the date the letter is received.

945.03 Foreign Bidders. Incorporated foreign contractors shall be qualified to do business in Idaho, as required by Idaho Code, Section 30-1-1501, for projects with a time duration of thirty (30) days or longer.

945.04 Disadvantaged Business Enterprise (DBE). Approval of the Disadvantaged Business Enterprise (DBE) commitments for federal-aid with the DBE RC Special Provisions is the responsibility of the Department's Contract Compliance Officer. The ITD 2396, Proposed DBE Commitments, will be sent to the Contract Compliance Officer immediately after the signed form has been received from the accepted bidder. All bidders are required to complete the Bidders Registration Form - Figure 9-15 annually per DBE Program.

945.05 Determination to Accept or Reject Bids. DMC shall analyze all bidding information including the collusion check, license check, and appropriate bid justifications. A determination will be made by the DMC Engineer to accept or reject the low bid for each proposal. FHWA Projects of Interest require concurrence from FHWA for acceptance or rejection of low bid.

Low bids that do not exceed the Preliminary Estimate of Cost by more than ten percent (10%), or are under the Preliminary Estimate of Cost by less than twenty-five percent (25%) may be accepted for award without justification.

Bids on STM and STKP projects will be accepted or rejected by the District Engineer. The District will document their intent by memo. No bid justification will be necessary.

Figure 9-15

Bidder's Registration Form

Disadvantaged Business Enterprise (DBE) Regulations as stated in 49 CFR 26.11(c) require the Idaho Transportation Department (ITD) to create and maintain a comprehensive bidders list, consisting of all firms bidding on prime contracts and quoting/bidding subcontracts on federally-funded transportation projects. For every firm, we require the following information:

Firm Name: _____

Contact Name: _____

Title: _____

Firm Mailing Address: _____

Phone Number: _____

☐ This firm IS NOT DBE-certified by ITD ☐ This firm IS DBE-certified by ITD

Year Firm Was Established: _____

Annual Gross Receipts: $_____

ITD requires annual registration from all bidders. If you have already registered as a bidder with ITD this year, please disregard this form. If you have not registered for this year, submittal of this registration is considered a condition of the pre-award requirements. For further information about the Bidder's List, call ITD's Bureau of Civil Rights at (208) 334-4442.

Submit form to: Office of Civil Rights
Idaho Transportation Department
P.O. Box 7129, Boise, ID 83707-1129
FAX (208) 332-7812

945.06 Bid Justification. When the low bid exceeds the Engineer's Estimate of Cost by more than ten percent (10%) the bid shall be justified by the District Engineer. Each District Engineer shall insure that sufficient funds are obligated at all times to cover all current estimated costs, including incentives and contingencies, on each project under contract in their respective District. Projects with the low bid more than twenty-five percent (25%) below the engineers estimate shall also have the bid justified. The justifications shall be completed within 15 days of the bid openings to keep projects on schedule for award. For example of the justification letter, see Figure 9-16. The following items should be considered in the bid justification:

- Comparison of the low bid (including unit prices) to the Engineer's Estimate,
- Number of bidders,
- Urgency of the project, and
- Potential savings if bids are accepted or rejected.

Per Administrative Policy A-14-06, the Director or a delegate can approve advertisements and award current-year construction contracts.
DMC shall advise the board of:

- all project advertisement and bid opening dates,
- the bid status of highway projects for the current fiscal year on a monthly basis, and
- the justification for awarding or rejecting contracts when the bid exceeds the engineer's estimate by more than ten percent (10%).

(see Figure 9-17). FHWA receives copies of this recommendation on FHWA Projects of Interest.

Figure 9-16

ITD-500 3/97

IDAHO TRANSPORTATION DEPARTMENT
Department Memorandum

DATE: APRIL 12, 2004 Project No.(s): STP-4110(146)
TO: FRANCES HOOD, P.E. Key No.(s): 8358
DMC ENGINEER

FROM: JAMES F. CARPENTER, P.E. Project Identification, County, Etc.:
DISTRICT TWO ENGINEER ADAMS CO LN TO HAMMER CREEK.
IDAHO COUNTY, W.A. P012070

RE: **BID JUSTIFICATION**

Dist Two has received and reviewed the bids for the referenced project. Two bids were received, ranging from 118.6% to 144.3% of the Engineer's Estimate. The source of the Engineer's Estimate was the Average Unit Price Reports.

Two main difference between our estimate and the low bid is encompassed within the following items: ¾" Aggregate Type A for Base. The difference between the bid amount and the Engineers Estimate is $90,396.00. The low bid price for this item is within 10% of the second lowest bid received on this project. District Two Design failed to compare our estimate with two previous projects recently completed within the District by the same contractors that bid on this project. On Project STP-4210(101), the amount bid was $107.42 per metric ton ($97.45 per English ton) and on Project STP-4200(133), the amount bid was $100.00 per metric ton ($90.72 per English ton).

As a result of our review, adjust the ¾ aggregate Type A item to $95.00 per ton which is representative of this type of work. The adjustment will make the low bid 90.1% of the engineers estimate. We did not discover any other obvious errors in the Engineer's Estimate and recommend that the project be awarded

Cc: DE
ADE

Figure 9-17

DATE OF BID OPENING - OCTOBER 22, 1996 - STATE-FINANCED PROJECT

Idaho Project No. ST-8313(600)
Intersection SH-45 & W. Iowa Avenue, Nampa
Canyon County, Key No. 6184

DESCRIPTION: The work on this project consists of traffic signal installation on SH-45 at MP-25.7, Intersection SH-45 & W. Iowa Avenue, Nampa, known as Idaho Project No. ST-8313(600), in Canyon County, Key No. 6184

ESTIMATED COMPLETION: May 1997

BIDDERS: Quality Electric Boise, Idaho $99,804.65

1 BID RECEIVED & 1 BID WITHDRAWN*

ENGINEER'S ESTIMATE - $86,387.00

LOW BID - 116 Percent of the Engineer's Estimate

(AWARD)

*Romar Electric bid $69,203.52, but found a clerical error which should have added approximately $17,000.00 to their bid. Bid was withdrawn in accordance with Idaho Code 54-1904C.

Attached is the District's justification stating the need for the project and the lack of a way to allow a major change in project design or time which could make re-bidding equitable, therefore DMC concurs with the city and District's recommendation to award this project.

Approval to award or reject this project is based on Bid Review and Evaluation.

_____

FRANCES HOOD, P.E.

DMC Engineer

_____

Date

945.07 Rejection of Bids. When the DMC Engineer recommends rejection of bids, the bidders are notified by letter. (See Figure 9-18).

FHWA Projects of Interest require approval from FHWA for rejection of bids.

945.08 Bond Requirements. The accepted bidder is required to provide performance and payment bonds as part of the contract in conformance with Idaho Code, Title 54, chapter 19. (See Figures 9-19 thru 9-22). A performance bond guarantees and ensures performance and completion of the contract in accordance with the plans, specifications, and conditions thereof. A payment bond guarantees and ensures that a bidder will pay every claimant who has furnished labor, materials and rental equipment, as well as pay all taxes when due.

These bonds are normally required for all contracts. The bond amount is for 100% of the contract amount for improvement projects and a minimum of $20,000 for service type contracts. Each bond shall be executed by a surety company authorized to conduct business in Idaho.

The bond forms are sent to the accepted bidder for execution by the contractor, surety company, or government obligation representative prior to award of the contract by the Idaho Transportation Department. DMC is responsible for assuring that the bonds are fully executed.

The department's official copies of each bond are retained by the appropriate District. Government obligations are deposited with the State Treasurer or bank acceptable to the State Treasurer.

Figure 9-18

Idaho Transportation Department Letterhead

(Bid Rejection)

May 25, 2004

«CONTRACTOR»
«CONTRACTOR_ADDRESS»
«CONTRACTOR_CITY_STATE__ZIP»

(Type either "Idaho" or "Idaho Federal Aid") Project No. «PROJECT_NO»
«LOCATION»
«COUNTY» County, Key No. «KEY_NO»

Contractor:

It has been determined that the bid for «PROJECT_NO» exceeded the Engineer's Estimate by more than ten percent. After careful evaluation of the bid received, the Idaho Transportation Department has determined it is in the best interest of the State to reject the bid and re-advertise the project at a later date.

Your interest in performing work for the Idaho Transportation Department is greatly appreciated.

If you wish to discuss this in greater detail, please contact this office.

Sincerely,

FRANCES HOOD, P.E.
DMC Engineer

FJH:lj

bcc: CE
DMC-Area Engineer
RC-Greg Mead
DMC-Sharon
Traffic
Legal
Dist Engr #«DISTRICT»
FS
2PM-Trish
Environmental
Bridge

Figure 9-19

SURETY

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, That we KEYBOARD (Insert Contractor's Name)_____, **A CORPORATION**, as Principal, and _____ as Surety are held and firmly bound unto the State of Idaho in the penal sum of

KEYBOARD (Insert worded contract amount.)

$ KEYBOARD (Insert numerical amount.) lawful money of the United States, which sum is agreed to be the maximum liability hereunder, well and truly to be paid, and for the payment of which we and each one of us bind ourselves, our heirs, executors, administrators, and assigns, jointly and severally, firmly by these presents.

The condition of this instrument is such that whereas the Principal has entered into a certain agreement, hereto attached, with the State of Idaho, dated _____, 20 ____, for the work KEYBOARD (Insert cut 1.).

NOW, THEREFORE, If the Principal shall well and truly perform and fulfill all the undertaking, covenants, terms, conditions, and agreements of said contract and any extensions thereof that may be granted by the State, with or without notice to the Surety and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, then this obligation to be null and void, otherwise to remain in full force and effect.

PROVIDED, However, that this bond is executed pursuant to the provisions of the Public Contracts Bond Act, and all liabilities on this bond shall be determined in accordance with said provisions to the same extent as if set forth in full herein.

IN WITNESS WHEREOF, The Principal and Surety have executed this instrument to become effective on the date the contract agreement as set forth above.

CB-1-B

Figure 9-20

SURETY

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, That we KEYBOARD (Insert Contractor's Name)_____,
A CORPORATION, as Principal, and _____
as Surety are held and firmly bound unto the State of Idaho in the penal sum of

KEYBOARD (Insert worded contract amount.)

$ KEYBOARD (Insert numerical amount.) lawful money of the United States, which sum is agreed to be the maximum liability hereunder, well and truly to be paid, and for the payment of which we and each one of us bind ourselves, our heirs, executors, administrators, and assigns, jointly and severally, firmly by these presents.

The condition of this instrument is such that whereas the Principal has entered into a certain agreement, hereto attached, with the State of Idaho, dated _____, 20 ____, for the work KEYBOARD (Insert cut 1.).

NOW, THEREFORE, If the Principal shall pay all claimants supplying labor or materials to him or his subcontractors in the prosecution of the work provided for in said contract, and any and all authorized modifications of said contract that may hereafter be made, notice of which modifications to the Surety being hereby waived and shall pay all taxes when due, as required by Title 63, Chapter 15, Idaho Code, then this obligation shall be null and void, otherwise to remain in full force and effect.

PROVIDED, However, that this bond is executed pursuant to the provisions of the Public Contracts Bond Act, and all liabilities on this bond shall be determined in accordance with said provisions to the same extent as if set forth in full herein.

IN WITNESS WHEREOF, The Principal and Surety have executed this instrument to become effective on the date the contract agreement as set forth above.

CB-1-A

Figure 9-21

GOVERNMENT OBLIGATION

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, That we KEYBOARD (Insert Contractor's Name)_____,
A CORPORATION, as Principal, and _____
as Pledgor of government obligations and the government obligations described herein, are held and firmly bound unto the State of Idaho in the penal sum of

KEYBOARD (Insert bid amount.)

$ KEYBOARD (Insert numerical bid amount.) lawful money of the United States, which sum is agreed to be the maximum liability hereunder, well and truly to be paid, and for the payment of which we and each one of us bind ourselves, our heirs, executors, administrators, and assigns, jointly and severally, firmly by these presents.

The condition of this instrument is such that whereas the Principal has entered into a certain agreement, hereto attached, with the State of Idaho, dated _____, 20 ____, for the work of
KEYBOARD (Insert cut 1.).

NOW, THEREFORE, If the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract and any extensions thereof that may be granted by the State, with or without notice to the Pledgor and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the Pledgor being hereby waived, then this obligation to be null and void, otherwise to remain in full force and effect.

PROVIDED, However, that this bond is executed pursuant to the provisions of the Public Contracts Bond Act, and all liabilities on this bond shall be determined in accordance with said provisions to the same extent as if set forth in full herein.

GO-B-1

Figure 9-22

GOVERNMENT OBLIGATION

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, That we KEYBOARD (Insert Contractor's Name)_____,
A CORPORATION, as Principal, and _____
as Pledgor of government obligations and the government obligations described herein, are held and firmly bound unto the State of Idaho in the penal sum of

KEYBOARD (Insert bid amount.)

$ KEYBOARD (Insert numerical bid amount.) lawful money of the United States, which sum is agreed to be the maximum liability hereunder, well and truly to be paid, and for the payment of which we and each one of us bind ourselves, our heirs, executors, administrators, and assigns, jointly and severally, firmly by these presents.

The condition of this instrument is such that whereas the Principal has entered into a certain agreement, hereto attached, with the State of Idaho, dated _____, 20 ____, for the work of
KEYBOARD (Insert cut 1.).

NOW, THEREFORE, If the said Principal shall pay all claimants supplying labor or materials to him or his subcontractors in the prosecution of the work provided for in said contract, and any and all authorized modifications of said contract that may hereafter be made, notice of which modifications to the Pledgor being hereby waived and shall pay all taxes when due, as required by Title 63, Chapter 15, Idaho Code, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, However, that this bond is executed pursuant to the provisions of the Public Contracts Bond Act, and all liabilities on this bond shall be determined in accordance with said provisions to the same extent as if set forth in full herein.

GO-A-1

945.09 Insurance. The required insurance for each contract are specified by the Standard Specifications for Highway Construction and the special provisions of each contract.

The accepted bidder is given a copy of the standard insurance specifications and examples of insurance certificates for the insurance agent. These copies are provided to encourage the bidder's insurance agent to comply with the department's specifications.

The following information is provided for some of the common insurance coverage:

- The name of the "***State of Idaho, Idaho Transportation Department***" shall be placed on the insurance certificates so as to enable the State to use the bidder's insurance company for protection without having to investigate questions of negligence on the part of the State.
- The language "***Contractor's Insurance Primary***" shall be used because the State is named as an additional insured. The intent is for the bidder's insurance company to respond to any loss under the contract and make payment before the State's insurance company becomes involved.
- ***Railroad***: Certificates of coverage will be provided to the railroad company.
- ***Underground Explosion And Collapse Hazard***: Sometimes this coverage is only carried by a blasting subcontractor.
- ***Workers' Compensation***: This coverage is generally required by law and provides protection to the employees of a contractor in case of personal injury or death while in the course and scope of their employment.
- ***Comprehensive Automobile Liability***: This coverage provides a broad range of liability protection to the contractor while using an automobile. This coverage should be required whenever the use of a vehicle is substantially important to the completion of the work under the contract.
- ***Commercial (or Comprehensive) General Liability***: This coverage insures against a broad range of liability hazards arising from the performance of the contract. This coverage should be viewed as the most basic of liability coverage required of a contractor and generally protects against the hazards of premises and operations, independent contractors, and completed operations. This coverage is also the basic coverage to which the subsequent endorsements are attached.
- ***Broadform Liability Endorsement***: This endorsement is a comprehensive addition to the Comprehensive General Liability policy and includes up to 12 other coverage depending on how it is written. This endorsement provides liability protection in many

areas not covered by the Comprehensive General Liability policy. This coverage may be used as a substitute for any of the following: personal injury liability, Broadform property damage, State of Idaho named additional insuree, contractor's insurance Primary, and severability of interest clause.

- ***Personal Injury Liability***: This coverage provides protection for the contractor from such acts as libel, slander, humiliation, loss of reputation, false arrest, malicious prosecution, and invasion of privacy. The typical contract requiring this coverage would be one in which the contractor exercises some degree of control over another person while discharging the duties of his contract. Typical examples of this type of situation would be group homes and sheltered workshops or quasi-police type functions.
- ***Broadform Property Damage***: This coverage modifies an exclusion in the contractor's comprehensive General Liability coverage dealing with property over which the contractor is exercising care, custody, and control. As such, this endorsement is necessary whenever the contractor is performing a substantial amount of his services on state property. This would be particularly relevant to janitorial contracts and other contracts where the contractor has actual possession of State property.
- ***Various insurance coverage***: May include standard restrictions or exclusions.

When the insurance certificates are received by DMC, the certificates are reviewed for compliance with the specifications, and determination of acceptability of restrictions and exclusions. When items do not comply or are omitted, then the contractor or his insurance agent is contacted and requested to send revised certificates. When acceptable certificates are received and approved, the insurance certificates are transmitted to the District. (See Figure 9-23).

Figure 9-23

ACORD.	CERTIFICATE OF INSURANCE		
PRODUCER	THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND, OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.		
	COMPANIES AFFORDING COVERAGE		
	COMPANY LETTER	A	COMPANY NAME
INSURED	COMPANY LETTER	B	
	COMPANY LETTER	C	
	COMPANY LETTER	D	
	COMPANY LETTER	E	

COVERAGE

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN. THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES, LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

COLTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY	POLICY EXPIRATION DATE (MM/DD/YY)	ALL LIMITS IN THOUSANDS	
	GENERAL LIABILITY				GENERAL AGGREGATE	$2,000,
	X COMMERCIAL GENERAL LIABILITY				PRODUCTS-COMP/OPS AGGREGATE	$2,000,
	CLAIMS MADE X OCCUR	MXX80222603	1-2-93	1-2-94	PERSONAL & ADVERTISING INJURY	$1,000,
A	OWNER'S & CONTRACTOR'S PROT.				EACH OCCURRENCE	$1,000,
	X SEPARATION OF INSUREDS - PRIMARY INSURANCE INCLUDED				FIRE DAMAGE (Any one fire)	$ 50,
	(AGGREGATE LIMIT $2,000,000.00 IF SPECIFIED)				MEDICAL EXPENSE (Any one person)	$ 5,
	AUTO LIABILITY					
	X ANY AUTO				COMBINED	
A	ALL OWNED AUTOS	MXX80222603	1-2-93	1-2-94	SINGLE LIMIT	$1,000,
	SCHEDULED AUTOS				BODILY INJURY (Per person)	$
	HIRED AUTOS					
	NON-OWNED AUTOS				BODILY INJURY (Per accident)	$
	GARAGE LIABILITY					
					PROPERTY DAMAGE	$
	EXCESS LIABILITY				EACH OCCURRENCE	AGGREGATE
	OTHER THAN UMBRELLA FORM				$2,000	$2,000
	WORKER'S COMPENSATION				STATUTORY	
					$ 100,	(EACH ACCIDENT)
A	AND	WP80265-094	1-2-93	1-2-94	$ 500,	(DISEASE - POLICY LIMIT)
	EMPLOYER'S LIABILITY				$ 100,	(DISEASE - EACH EMPLOYEE)
	OTHER					
	THE STATE OF IDAHO, TRANSPORTATION DEPARTMENT, ITS AGENTS, OFFICIALS, EMPLOYEES, AND THE STATE OF IDAHO ARE ADDITIONAL INSUREDS FOR LIABILITY ARISING OUT OF THIS PROJECT.					
DESCRIPTION OF OPERATIONS/'LOCATIONS/VEHICLES/SPECIAL ITEMS PROJECT NO., LOCATION, COUNTIES, KEY NO., AND CONTRACT NO.						

CERTIFICATE HOLDER	CANCELLATION
STATE OF IDAHO TRANSPORTATION DEPARTMENT PO BOX 7129 BOISE ID 83707	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT. XXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXX XXX XXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXX XXX
	AUTHORIZED REPRESENTATIVE ***MUST BE SIGNED***
ACCORD	© ACORD CORPORATION 1989

945.10 Acceptance of Bid. Once the bid has been appropriately accepted by the DMC Engineer, the low bidder is notified by letter. FHWA Projects of Interest require concurrence from FHWA for acceptance of a bid.

The accepted bidder is mailed the "apparent low bid letter" by certified mail. If the bidder needs to obtain a Public Works license, this requirement is noted in the apparent low bid letter (see Figure 9-24). The contract documents are also sent to the accepted bidder by certified mail (see Figure 9-25).

DMC distributes the Preliminary Abstract of Bids and Preliminary Bid Summary for the District to use in justification of award.

945.11 Time Constraints During Award of Contract. The requirements for the award of a contract specify specific time limits for both the department and the accepted bidder. Time limits may be extended by mutual agreement between both parties. Time extension requests and acceptance should be in writing.

The award of a contract should be made within forty-five (45) calendar days after the bid opening. The accepted bidder has fifteen (15) calendar days to sign and return the contract after receipt. ITD has fifteen (15) calendar days to award the contract after receiving the signed contract from the accepted bidder.

A reasonable time extension can be allowed for the accepted bidder to obtain a Contractor's Public Works License for federal-aid projects, provided the License Board has received the bidder's application no later than the first business day following receipt of the apparent low bidder letter.

945.12 Award of Contract. After the signed contract documents are received from the accepted bidder, the contract documents are executed on behalf of ITD by the Highway Program Oversight Engineer or higher authority and attested to by the DMC Engineer. An executed contract is returned by certified mail to the accepted bidder.

A Detailed Estimate of Cost is used by DMC for the project agreement with FHWA on federal-aid projects, and distributed to various headquarters sections.

DMC distributes the Abstract of Bids and Bid Summary to the District and various headquarters sections upon award.

Figure 9-24

Idaho Transportation Department Letterhead

(Apparent Low Bidder)

DATE

KEYBOARD (Insert Contractor Cut (ADD))

KEYBOARD (Insert Cut 2)

Gentlemen:

This is to notify you that you are the apparent low bidder on the project for the work of KEYBOARD (Insert Cut 1), in the amount of $KEYBOARD (Insert Contract Numerical Amount Cut (#)).

If awarded, this contract will operate under the following Idaho Department of Labor Office:

Idaho Department of Labor
KEYBOARD (Type Address Information from Green Proposal)

KEYBOARD (Delete if state project or no DBE ** to **.) **The enclosed Form 2396, Proposed DBE Commitments, must be completed and approved by the Department before this contract can be awarded. The percentage of designated subcontract work by DBE suppliers, manufacturers, equipment lessors, or construction firms should meet the goals specified in the Disadvantaged Business Enterprise Special Provisions, or adequate documentation of "good faith effort" must be furnished. PLEASE LIST ALL QUOTES FROM ALL SUBCONTRACTORS. Early return of the form will allow time to verify DBE commitments and will expedite the award process. The form MUST be returned no later than the contract due date as specified in Subsection 103.05 and 103.06 of the Standard Specifications. If the commitment is being met through a joint venture arrangement, a copy of the joint venture agreement must be attached to the commitment form. If you have any questions on completing the form, please contact the Contract Compliance Officer at (208) 334-8458.**

Enclosed are two copies of the plans and specifications. A proposed contract will be forwarded in the next few days. Award of the contract does not take place until all contract documents are fully executed by both parties. No work shall begin on the project until the contract has been fully executed.

KEYBOARD (Delete if state project ** to **.) ** We are also enclosing a supply of Appointment Affidavit forms on which to certify the individual authorized to make payrolls and to pay employees. Please complete these forms and return them to the Resident Engineer.**

Sincerely,

Frances Hood, P.E.
DMC Engineer

Enclosures
FLH:lj

Bcc: Dist Engr KEYBOARD (type #)
Res Engr Ins. Agent
Dist Matls Engr Bonding Co
DMC-Area Engr

Figure 9-25

Idaho Transportation Department Letterhead

(Contract Enclosures)

DATE

KEYBOARD (Insert Contractor Cut (ADD))

KEYBOARD (Insert Cut 2)

Gentlemen:

We are hereby submitting triplicate copies of Contract No. KEYBOARD (Type Contract Number) for this project.

Enclosed is one copy of this letter with a copy of Subsection 107.10 of the Idaho Standard Specifications (Responsibility for Damage)which **needs to be forwarded to your insurance agent.** Attention is directed to this Subsection. Please advise your insurance agent that the Insurance Certificate must cover all provisions of the Subsection. KEYBOARD (Delete if no railroad involvement from ** to **.) **Railroad protective insurance policies are a requirement of this project, as stated in the contract on page __ of __ of the Special Provisions.**** No work shall commence on this project until a certificate of insurance** KEYBOARD (Delete if no railroad involvement from ** to **.) ** and Railroad Insurance Policy, if required **** is accepted by this office** and the contract has been fully executed by both parties.

Also enclosed are two copies of the State Tax Collector's Form WH-5. Please complete this form and return one copy to this office with the contract documents.

Please execute and return the State's and Contractor's copies of the contract after using the following instructions to complete. Complete page CA-2. If using Surety Bonding, complete pages CB-2-A and CB-2-B. If using Government Obligations, complete pages GO-A-2, GO-A-3, GO-B-2, and GO-B-3. The third copy should be retained by the bonding company, who will be advised of the award date, which they may then insert. Please do not break the seal or remove pages from this contract. KEYBOARD (Delete if State Project from ** to **.) **The previously provided DBE Good Faith Efforts Summary form must be completed and approved by the Department prior to award of this contract. If the completed DBE Summary has not been returned previously, it must be returned along with the completed contracts to this office.**

Section 103.00 of the Standard Specifications required that the contract, payment, and performance bonds be executed and filed with the Department. Failure to execute the contract and file acceptable bonds within 15 calendar days after the contract has been received shall be just cause for the refusal to award and forfeiture of the proposed guaranty to the Idaho Transportation Department as liquidated damages.

Sincerely,

Frances Hood

DMC Engineer

CERTIFIED MAIL
Enclosures
FJH:lj

Bcc:

Dist Engr D-#	
Res Engr	Public Affairs
Dist Matls Engr	State Tax Commission
FS (Controller)	County Tax Commission
2PM-Trish	OTI
DMC	Bridge KEYBOARD (Delete if not applicable)

APPENDIX A – Design Criteria for Specific Projects

A.55.03 Access onto Right of Way.
A.55.04 Median.
A.55.05 Vehicular Travel Lanes.
A.55.06 Travel Lane(s)-Horizontal Alignment and Curvature.
A.55.07 Bicycle and Shared-use Lanes.
A.55.08 Pavement Edge (outer).
A.55.09 Sidewalks, Shared-use paths and Equestrian Trails.
A.55.10 Utilities.
A.55.11 Signs.
A.55.12 Other Elements, Monuments, Markers-Architectural, Utilitarian or Artistic.
A.55.13 Landscape.
A.55.14 Drainage.
A.55.15 Maintenance.

APPENDIX A – Design Criteria for Specific Projects

A.05 - 3R IMPROVEMENT - INTERSTATE SYSTEM

The following design standards are applicable for resurfacing, restoration and rehabilitation (3R) projects on the Interstate Highway system in Idaho. The projects may include resurfacing, structure replacement, or other major construction activity with other minor improvements included as a portion of the project. The purpose of Interstate 3R projects is to extend the service life of the existing highway and improve highway safety by making selective improvements to existing facilities.

Funding limitations may not allow all existing Interstate system segments to be improved to current new construction standards. When pavements approach the end of their service life, cost effective pavement improvement projects are needed. 3R projects include safety facets to improve the Interstate segment to current design standards.

Many factors influence the scope of a 3R project, including:

- Roadside conditions,
- Funding limitations,
- Environmental concerns,
- Changing traffic and land use patterns,
- Surfacing deterioration rate, and
- Crash rates.

Although 3R-type improvements are normally made within the existing right-of-way, the acquisition of limited amounts of additional right-of-way to facilitate the improvements may be considered.

A.05.01 3R – Interstate Project Determination and Scope.

As early as possible a determination should be made by the Department on the scope of 3R improvements for the specific section of Interstate Highway. The project data shall be summarized and design criteria documented in the charter and must provide the greatest improvement feasible for the funds expended. As noted, even though it has been determined that 3R guidelines are appropriate, documentation of project characteristics and justification of the level of improvement are required for several elements of the design. The project charter should be reviewed and coordinated with department traffic personnel relative to planned safety improvements and expected benefits. Please refer to Section 300.00 for additional information relative to project preliminary design analysis.

A.05.02 3R – Interstate Environmental Considerations. All Interstate 3R projects require some form of environmental documentation. A Evaluaton Charter shall be completed for the project and submitted to the Environmental section. Refer to the Environmental Manual, Pre-Design — Environmental, for procedures to follow relative to project environmental documentation.

A.05.03 3R – Interstate Design Guidelines. The minimum design guidelines for various elements of Interstate 3R design are addressed in the following sections with some discussion of the factors that should be considered for each element.

> The appropriate highway data and analysis must be provided to document the improvement concepts being recommended for a highway improvement.

A.05.04 3R – Interstate Sideslopes.

If the original construction was based on a 4:1 maximum sideslope, then the existing sideslope may be maintained.

Fixed objects and steep slopes within the clear zone will have a benefit-cost analysis. Use the Roadside Safety Analysis Program (RSAP) to compare existing conditions with regarding of the slope, removal or reduction of the area of concern, and shielding the area of concern with guardrail or concrete barrier. If the annual do-nothing cost exceeds the cost of guardrail, then the obstacle must be protected or removed.

If the roadway is to be reconstructed, design the sideslopes in accordance with the standard drawings.

A.05.05 3R – Interstate Structures. Structures repair should be programmed with the adjacent interstate section. If the deck is being repaired, then the bridge rail should also be retrofitted to current standards.

A.05.06 3R – Interstate Roadway Width. The existing width of the traffic lanes and shoulders should be maintained on all overlays. The standard specifications state, "On all pavement overlays the shoe shall be 2 feet wide" or a 10:1 sideslope. This should allow overlays of 0.2 feet without having to regrade the slope.

If complete project slope regrading is required in conjunction with resurfacing, then the movement of roadway centerlines towards the median with only regrading of the median slopes may be considered. This approach reduces the material and construction requirements while preserving existing established vegetation on the outside slopes. If this centerline movement is considered, care should be taken to ensure that existing longitudinal cracks are not in the wheel path of the travel lane when the overlay is placed.

A.05.07 3R – Interstate Roadside Barrier. See sections 570.00 and 575.00 for guidelines on guardrail or concrete barrier use. Ensure that guardrail post spacing and hardware is in accordance with the Standard Drawings or approved systems on the Qualified Products List. Upgrade the following terminals or transitions:

- Blunt End Terminals for W-beam guardrail or median barrier
- Turned-down terminals
- Bridge approach guardrail that is not connected to the bridge railing

Select the appropriate terminal from the Standard Drawings or the Qualified Products List.

Type 1 or Type 1-A terminals (blunt end terminals) may remain in place if used on the downstream end of the barrier and are not exposed to approaching traffic.

Those segments of the guardrail that are functional will not be replaced. Items like post length, slope widening and minor height variances do not warrant removing and replacing the guardrail. When the guardrail height is 3" lower than the heights shown on the standard drawings, attempts will be made to adjust the height in lieu of removing and replacing.

Also, unless major grading is involved on the project, the guardrail will remain in place in lieu of slope flattening.

A.05.08 3R – Interstate Bridge Rail. If the structure is scheduled for rehabilitation, then the bridge rail shall be brought up to current criteria. However, if the structure is not scheduled for rehabilitation, then an approved bridge rail retrofit should be installed.

A.05.09 3R – Interstate Bridge Separations. Interstate Over Minor Road (Elephant Trap). Adequate guardrail to protect motorists from reaching the obstacle must be installed. Structures 24 feet or less in length and 100 feet or less on center will be studied for closure between structures.

Minor Road Over Interstate. See Subsection 570.06 Guardrail Adjacent to Piers.

A.05.10 3R – Interstate Clear Zone. Every effort should be made to remove or shield obstacles located within the clear zone based on the latest guidelines for Interstate systems.

Remove trees within the clear zone unless the trees are part of a continuous group. If the trees are part of a continuous group they will be analyzed according to procedures in the Roadside Design Guide.

A.05.11 3R – Interstate Signs. Signs that are functional and that do not need to be moved because of project grading requirements will be retained in place.

Functional Requirements: Ensure that signs are installed on an approved breakaway support, if located within the clear zone, and should have good legibility day and night.

The sign should be in compliance with the MUTCD. Ensure that sign colors on guide signs and tourist information signs are in accordance with Part 2 of the MUTCD.

Replace signs that do not have an approved breakaway support and that are located within the clear zone. Replace sign that have poor legibility in day or night conditions.

Signs that need to be replaced or parts of signs that need to be replaced should be done in accordance with current sign standards related to safety, reflectivity, etc.

A.05.12 3R - Interstate Pavement. The pavement design should be based on a life cycle cost analysis with the concurrence of the headquarters Materials Laboratory, based on an approved materials report. Staged construction, i.e., inlay now and overlay in ten years, may be used if approved.

With plant-mix pavements, consider rotomilling and inlaying to minimize impact on the sideslopes and guardrail.

A.05.13 3R – Interstate Crossovers. Ensure that crossover dimensions, grading, drainage, and signs are in accordance with Standard Drawing A-7.

A.05.14 3R – Interstate Culverts. If possible, culverts in the median should be adjusted to allow construction of a Type 8 inlet.

Miter pipe culverts within the clear zone to match the slope, either with a manufactured end section or a concrete headwall.

Cross drain pipes with diameters of 3 feet and larger and parallel pipes larger than 2 feet in diameter will have a traversable grate or be extended beyond the clear zone.

A.05.15 3R – Interstate High-Crash Locations. Traffic crash records within the project zone will be analyzed to see if any locations exist where there is a concentration of crashes, especially fatal and serious injury. Such locations will be analyzed for corrective action.

A.05.16 3R – Interstate Other Features. Ensure that other features of a project are in accordance with the *AASHTO A Policy on Geometric Design of Highways and Streets* (Green Book), "Interstate System", *A Policy on Design Standards – Interstate System* and other referenced requirements.

A.05.17 3R – Interstate Design Criteria Approval.
Analyze and document recommended design criteria for a specific project in the charter. Generally, the 3R Design Criteria for a specific project will be established with the approval of the charter. Distribute a copy of the charter to the FHWA Idaho Division Office for information.

A.10 – 3R IMPROVEMENT – NATIONAL HIGHWAY SYSTEM

The following design standards are applicable for resurfacing, restoration, and rehabilitation (3R) projects on the National Highway System (NHS) in Idaho, excluding the Interstate System. The projects may include resurfacing and other pavement repairs, minor widening, realignment, bridge improvements, and removal of roadside hazards. The purpose of NHS 3R projects is to extend the service life and improve safety by making selective improvements to geometry and roadside features.

A.10.01 3R – NHS Project Determination and Scope. As early as possible, a determination should be made by the Department relative to project design guidelines. Roadway widths determined in Corridor Plans shall be adhered to unless lesser widths are approved as a design exception. The recommended widths in the corridor plans will be based on functional classification, area type and development, traffic volumes, safety requirements and route continuity. The recommendations shall also include consideration of community concerns and public involvement regarding environmental, scenic, historic, and preservation issues.

The project data shall be summarized and design criteria documented by completing a charter. Even when it has been determined that 3R guidelines are appropriate, documentation of project characteristics and justification of the level of improvement are required for several elements of the design. The charter should be reviewed and coordinated with the department's traffic personnel relative to planned safety improvements and expected benefits.

Project support shall be prepared and approved prior to any requests for project preliminary design review. Please refer to project preliminary design analysis for additional information. The documentation for specific 3R-NHS design guidelines are outlined in the following sections.

A.10.02 3R – NHS Environmental Considerations. All 3R projects require some form of environmental documentation. An ITD 654, Preliminary Environmental Evaluation, shall be completed for the project and submitted to the Environmental section. Refer to project environmental documentation procedures for further instruction.

A.10.03 3R – NHS Design Guidelines. The minimum design guidelines for various elements of 3R design are addressed in the following subsections with some discussion of the factors that should be considered.

> Appropriate highway data and specified analysis must be provided to justify the 3R design guidelines being recommended.

A.10.04 3R – NHS Design Speed. The project route design speed considerations for a 3R project are different from what would normally be used for new construction. For 3R improvements, the design must consider the existing highway geometrics and enhancement of the existing conditions.

The project route design speed should be logical with respect to the character of terrain, adjacent land use, traffic characteristics, operating speeds, and planned improvements. The geometric conditions of adjacent sections must be reviewed and a uniform design speed for a significant segment of highway should be provided.

The 3R project route design speed shall be use throughout the project length for determination of lane widths, shoulder widths, vertical alignment features and horizontal alignment features.

The charter shall indicate the route design speed being used for the project. This design speed can be checked by making several drive-throughs of the project observing and recording the average speed of other vehicles. If there are special problems due to vehicle speeds, the report shall supply supporting field data.

A.10.05 3R – NHS Design Traffic Volumes. The normal practice is to design the project for traffic volumes forecasted 20 years after the expected date of construction. For 3R projects, the Design Traffic Volumes will be based on anticipated service life of the improvement, but not less than 8 years. The basis for the traffic volume design year selected must be explained in the charter if the time frame is less than a 20-year forecast.

A.10.06 3R – NHS Roadway Widths. The design of a 3R project should not decrease the existing geometrics of the roadway section. In the evaluation charter, route continuity should be analyzed; and the widths selected should be consistent throughout a given section of the route with changes to be made where the route characteristics change. The width selected for two-lane rural highways shall equal or exceed the requirements listed in Figure A-1.

Figure A-1

Minimum Roadway Widths

Two Lane Rural Highway & Local Roads

DESIGN YEAR VOLUME (ADT)	DESIGN SPEED (mph/h)	Less Than 10% Trucks			10% or More Trucks**		
		Lane Width	Shoulder Width	Total Width*	Lane Width	Shoulder Width	Total Width*
Less than 750 Vehicles	Under 50 mph	9	2	22	10	2	24
	50 mph and over	10	2	24	10	2	24
750 to 2,000 Vehicles	Under 50 mph	10	2	24	11	2	26
	50 mph and over	11	3	28	12	3	30
Over 2,000 Vehicles	All Speeds	11	6	34	12	6	36

The charter must include data to support minimum width requirements.

*****Note: The total width may be reduced 2 feet in mountainous terrain.

******Trucks are defined as heavy vehicles, single unit configuration or larger (6 or more tires).

Minimum width requirements for traffic lanes and shoulders have not been recommended for urban highways. Upgrading roadway widths in urban areas is not always cost effective because of physical constraints and right-of-way limitations. The scope of widening improvements for urban highways will be based upon an operations/safety analysis and will be determined on an individual project basis and should include consultation with the urban area jurisdiction. Multi-lane rural highways will be constructed to full *AASHTO* policy unless design exceptions are justified.

A.10.07 3R – NHS Horizontal Curvature. The improvement of horizontal curvature should be considered on the basis of existing operating characteristics and traffic volumes with curve reconstruction proposed only after full evaluation of cost effectiveness. Inconsistencies in highway geometry that require motorists to make abrupt or frequent speed changes should be analyzed for possible improvements.

Crash history provides a good indicator of horizontal curve operational problems. Detailed crash data should be studied to determine appropriate curve improvements and used for benefit cost analysis of proposed improvements. Measures such as lane widening, shoulder improvements, sideslope flattening, obstacle removal, added traffic control devices, higher standard pavement markings, and delineators are all possible minor alternatives that can be considered as options rather than curve reconstruction.

Frequently, the alignment of a highway segment consists of a series of reverse curves or curves connected by short tangents. A series of curves may be analyzed as a unit rather than as individual curves.

The improvement criteria for horizontal curves shall be as follows:

A. **Curve Improvements-Speed Difference Less Than 15 mph** Where the curve design speed is less than 15 mph below the project design speed, then the curve will be reviewed for possible minor improvements other than reconstruction. If a horizontal curve in this category is identified as a high accident location, then the curve must be analyzed for possible reconstruction.

B. **Curve Improvements-Speed Difference More Than 15 mph and ADT 750 or Less** Where the curve design speed is more than 15 mph below the project design speed and the design traffic volumes are less than 750 ADT, the improvement criteria in A are applicable.

C. **Curve Improvements-Speed Difference More Than 15 mph and ADT 750 or More** Where the curve design speed is more than 15 mph below the project route design speed and the design traffic volume exceeds 750 ADT, then the curve shall be upgraded to current superelevation design criteria or reconstructed unless an analysis demonstrates that the improvements are not cost effective.

Any horizontal curves not meeting the design speed of the project will need to be evaluated for signage requirements specified in the Idaho Department's Traffic Manual.

Evaluation of horizontal curve reconstruction must fully address right-of-way requirements, construction costs, road user benefits, and crash savings.

A.10.08 3R – NHS Vertical Curve – Hill Crests. The reconstruction of a crest vertical curve is usually not cost effective unless there are specific operational problems associated with the restricted sight distance. Improving a vertical curve has no travel time cost benefit, so the requirement for vertical curve reconstruction must be based entirely on safety.

On 3R projects, the reconstruction of a crest vertical curve shall be considered if meeting the a or b criteria below:

a. The average daily traffic exceeds 1,500 vehicles per day and if either of these conditions exist:
    - The vertical curve design speed (based on stopping sight distance) is more than 20 mph below the project route design speed;
    - The vertical curve hides from view a major hazard such as intersections, sharp horizontal curves or a narrow bridge.

b. Re-occurring crashes in the vicinity of the hill crest can be attributed to the stopping sight distance of the vertical curve.

The charter shall document the, design speed of the vertical curve based on minimum stopping sight distance, and the accident history related to the vertical curve. No additional data is required if the above criteria does not warrant reconstruction. Where the the reconstruction of a vertical curve is being considered, the following items shall be reviewed in the field and addressed in the charter:

- Analysis of crash data that may be related to restricted vertical curve sight distance.
- Proximity of hidden hazards to a vertical curve, such as intersections, horizontal curves, narrow bridges, and private approaches.
- Potential for objects on roadway, such as fallen rock from rock cut or debris.
- Cost analysis of alternatives being considered, such as doing nothing, removing hidden hazards, traffic control devices, or vertical curve improvement.

A.10.09 3R – NHS Pavement Design. Pavement design for a particular project will be based on a resurfacing survey. The district will develop the pavement structure design with the concurrence of DMC based on an approved Materials Report.

Asphalt pavement designs shall include a beveled pavement edge. The outside edge treatment of pavements should be specifically reviewed. Foreslope material should be provided and the drainage designed to prevent any erosion or rutting that could result in a pavement edge drop off.

On tangent sections the normal crown slopes for the traveled way shall meet the *AASHTO* design criteria. Pavements not in conformance with normal crown criteria shall be reconstructed to attain the required cross slope unless analysis indicates that reconstruction is not cost effective.

A.10.10 3R – NHS Bridge. A decision must be made to retain, widen or replace any bridge within the limits of a 3R project. For bridges longer than 100 feet, replacement or widening should only be considered if required for structural adequacy or if the width is less than the approach. Should the bridge require replacement, the new bridge shall be designed in accordance with *AASHTO LRFD Bridge Design Specifications*.

For bridges less than 100 feet in length, replacement or widening will be considered if the usable width is less than as follows in Table A-1:

Table A-1

DesignYear Volumes (ADT) Planned	Usable Bridge Width Versus Width of Approaches
0 - 750	Width of approach traffic lanes
750-2000	Width of approach traffic lanes plus 2 feet
2000-4000	Width of approach traffic lanes plus 4 feet
Over 4000	Width of approach traffic lanes plus 5 feet

Evaluation of a bridge for replacement or widening shall include the following considerations in the charter:

- Cost of replacing the existing bridge,
- Cost of widening the existing bridge if the bridge is structurally adequate, and
- Safety benefits if the bridge is widened or replaced.

If the bridge is less than 100 feet in length and will remain in place, then an evaluation must be made to determine what treatment, if any, is required to support the adequacy of the structure. The evaluation will address the following items:

- Structural adequacy of the bridge, bridge condition survey, and estimated life of the bridge.
- Bridge width, approach roadway widths, and roadway transition geometrics. The bridge crash experience shall be reviewed; and if there is a potential problem, then appropriate corrective measures such as improved transitions, traffic control, or other improvement measures should be recommended.
- Analysis of existing bridge rail and approach guardrail, considering structural adequacy, crash history, and potential crash risk, if existing approach and/or bridge rail is retained. Selective improvements such as guardrail upgrading, structure attachment, and

guardrail retrofit must be considered and implemented unless shown by an analysis to not be cost effective.

All signing and pavement markings for bridges within a 3R project shall be upgraded to meet the requirements of the *Manual on Uniform Traffic Control Devices*.

Vertical clearances at existing underpass structures shall meet existing Department requirements or be adequately signed to warn oversized vehicles. Roadway or structure modifications shall be considered if the vertical clearance will be less than 14 feet after the planned improvements.

A.10.11 3R – NHS Sideslopes and Clear Zones. The need for safety of roadway slope improvements and the attainment of adequate roadside clear zones are highly dependent on project site specific conditions. Other roadway features, whether improved or not, can also have a significant influence on the roadside improvement requirements. As a general rule, the following slope and clear zone improvements should be made.

- Flatten sideslopes of 3:1 or steeper at locations where run-off-road crashes are likely to occur.
- Retain current slope widths (without steepening sideslopes) when widening the roadway.
- Remove or shield isolated boulders within 10 feet of travelway.
- Remove or shield cut slopes of 3:1or steeper within 10 feet of travelway. Rock cut slopes beyond 10 feet of travelway should have a smooth surface. If slopes with protruding rock cannot be made smooth by removal of the protruding rock, placement of an earth berm or guardrail should be evaluated.

For safety purposes, a roadside recovery area that is as wide as practical should be provided. Because of existing topographic features and right-of-way limitations associated with 3R work, considerable judgment must be used. The clear zone must be given particular attention at identified high roadside crash locations (fixed object crashes). An evaluation should be made to determine the consistency of the clear zone throughout the project limits and then a determination of the severity of each situation should be made. The minimum clear zone width criteria in Figure A-2 can be applied to tangent roadway segments.

Additionally, in the clear zone:

- All utility poles shall be moved outside the clear zone. However, if this requires the pole to be moved beyond the right-of-way line, the pole may be placed inside the right-of-way, but as close to the right-of-way line as practical.
- All trees within the right-of-way and within the clear zone shall be removed. If the clear zone extends beyond the right-of-way, then approval for not removing the trees must be obtained through the approval of the Design Study Report and may be granted for

such items as decorative trees, inability to negotiate with the owner, etc. Approval for leaving other point obstacles that exist in these clear zone distances, such as minor irrigation structures, is required.

- All culverts must be protected with traversable bars, extended outside the clear zone, or extended to the right-of-way.

Appropriate adjustments must be made for clear zones on the outside of horizontal curves. If the roadway slopes and obstacle locations provide more than the minimum clear zone distance, no further analysis is required except for those locations identified as a significant roadside crash site. Where the minimum clear zone criteria are not met, a benefit cost analysis of appropriate corrective measures to mitigate the situation shall be performed with recommendations provided in the charter for approval.

Figure A-2

3R Minimum-NHS Clear Zone Distances

(Distance from edge of driving lane)

Design Speed	Design ADT	FILL SLOPES			CUT SLOPES		
		6:1 or flatter	5:1 to 4:1	3:1	3:1	4:1 to 5:1	6:1 or flatter
40 mph or less	Under 750	7	7	**	7	7	7
	750-1500	10	12	**	10	10	10
	1500-6000	12	14	**	12	12	12
	Over 6000	14	16	**	14	14	14
45-50 mph	Under 750	10	12	**	8	8	10
	750-1500	12	16	**	10	12	14
	1500-6000	16	20	**	12	14	16
	Over 6000	18	24	**	14	18	20
55 mph	Under 750	12	14	**	8	10	10
	750-1500	16	20	**	10	14	16
	1500-6000	20	24	**	14	16	20
	Over 6000	22	26	**	16	20	22
60 mph	Under 750	16	20	**	10	12	14
	750-1500	20	26	**	12	16	20
	1500-6000	26	30	**	14	18	24
	Over 6000	30	30	**	20	24	26
65/70 mph	Under 750	18	20	**	10	14	14
	750-1500	24	28	**	12	18	20
	1500-6000	28	30	**	16	22	26
	Over 6000	30	30	**	22	26	28

**Since recovery of vehicles is less likely on 3:1 slopes, this area should not be included in the clear zone distance.
The calculated clear zone should encompass the usable shoulder and the area beyond the toe of a 3:1 slope.

A.10.12 3R – NHS Guardrail and Bridge Rail. See sections 570.00 and 575.00 for guidelines on guardrail or concrete barrier use. Ensure that guardrail post spacing and hardware is in accordance with the Standard Drawings or approved systems on the Qualified Products List. Upgrade the following terminals or transitions:

- Blunt End Terminals for W-beam guardrail or median barrier
- Turned-down terminals
- Bridge approach guardrail that is not connected to the bridge railing

Select the appropriate terminal from the Standard Drawings or the Qualified Products List.

Type 1 or Type 1-A terminals (blunt end terminals) may remain in place if used on the downstream end of the barrier and are not exposed to approaching traffic.

Those segments of the guardrail that are functional will not be replaced. Items like post length, slope widening and minor height variances do not warrant removing and replacing the guardrail. When the guardrail height is 3" lower than the heights shown on the standard drawings, attempts will be made to adjust the height in lieu of removing and replacing.

Also, unless major grading is involved on the project, the guardrail will remain in place in lieu of slope flattening.

A.10.13 3R – NHS Right-of-Way and Access Control. Normally, additional right-of-way should not be considered for 3R projects. Additional right-of-way must be justified on the basis of cost effective operational and safety benefits.

Access control will not be established except for special circumstances where right-of-way is being obtained and access control is beneficial to satisfy future operational considerations.

A.10.14 3R – NHS Other Various Improvements. Although 3R projects generally address pavement and major geometric improvements, other minor improvements such as intersections, traffic control devices, highway approaches, and drainage structures can be considered where appropriate. If a 3R project involves grading work, then the safety benefits of slope improvements for drainage facilities and roadway approaches should be reviewed. The need for other miscellaneous operational improvements in relation to safety benefits and cost effectiveness should be analyzed.

Intersections normally account for a major portion of highway crashes. Accordingly, the crash history, traffic characteristics, and intersection operational problems should be reviewed and addressed in the charter if there are apparent operational problems that contribute to or have a potential safety problem. Intersection improvement alternatives, such as improved traffic control devices, roadway widening, approach relocations, and special turning lanes, should be considered and justified relative to need, cost effectiveness and safety benefits.

A.10.15 3R – NHS Design Criteria Approval. Recommended design criteria shall be analyzed and documented in the charter. In a number of circumstances, a safety benefit cost effectiveness analysis of potential improvements is also necessary. Incremental analyses of safety cost effectiveness for various levels of improvements, both above and below the cited minimum guidelines, are sometimes an appropriate approach in this analysis study. Highway geometric consistency, long-range route improvements, new construction requirements, and available resources are reasonable considerations in conjunction with the incremental improvement analysis. Generally, the 3R Design Criteria will be established with the approval of the charter.

A.10.16 3R – NHS Design Exceptions. In specific instances, deviation from minimum design guidelines may be appropriate and cost effective if properly analyzed and justified. The 3R design exceptions shown in Table A-2 require approval of a Design Exception and must be supported by engineering analysis.

Table A-2

3R DESIGN EXCEPTIONS	CRITERIA
Design Traffic Volume	Based on service life of improvement, but not less than 8 years.
Roadway Widths	Roadway widths less than applicable table.
Horizontal Curvature	Rural horizontal curve improvement alternatives where the curve design speed is more than 15 mph below the project route design speed and the design ADT exceeds 750 vehicles per day and conditions per A.10.7.
Superelevation & Pavement Crown Cross Slope	Curve superelevation and pavement crown that is not reconstructed to current design criteria.
Vertical Curve on Hill Crests	Vertical curve improvements for design ADTs over 1500 vehicles where the vertical curve design speed (based on stopping sight distance) is more than 20 mph below the project route design speed and conditions per A.10.8.
Bridge Retention & Rehabilitation	Bridge widths less than the applicable table, bridge design loading less than H-15 and vertical clearance less than 14 feet.
Signs and Pavement Markings	MUTCD

The 3R-NHS Project Checklist (Figure A-3) can be used to ensure that all requirements have been met on a specific project.

Figure A-3

Sheet 1 of 3

Sheet 1 of 3
3R - NHS PROJECT CHECKLIST

Project No.:		Key No.:		
Project Title:				
Prepared by:		Date:		
1.	**Project Determination and Scope**	**YES**	**NO**	**N/A**
	(a) Charter reviewed and coordinated with traffic personnel on safety improvements			
	(b) Project data documented and summarized in Charter			
2.	**Environmental**			
	(a) Documented in Charter			
3.	**Design Speed**			
	(a) Design Speed(s) established.			
	(b) Average running speed determined and being used for project			
	(c) Horizontal and vertical curves - 85th percentile speed determined			
	(d) Any special speed problems noted.			
4.	**Design Traffic Volumes**			
	(a) Traffic volume is 20-year forecast, or			
	(b) Less than 20-year forecast and is explained.			
5.	**Roadway Widths**			
	(a) Basis for lane and roadway width is explained.			
	(b) Exceptions to Corridor Plans approved.			
	(c) Route continuity is maintained and transitions are consistent with route characteristic changes.			

Figure A-3
Sheet 2 of 3

6.	**Horizontal Curves**	**YES**	**NO**	**N/A**
	(a) Super-elevations are corrected.			
	(b) Horizontal curve design speed			
	(c) Curve improvements required: None Minor Improvement Curve Reconstruction			
	(d) Curve reconstruction analyzed based on R/W, construction, road user benefits and safety.			
7.	**Vertical Curvature on Hill Crest**			
	(a) Charter contains the following: 85th percentile vehicle speeds Design speed of vertical curve Hazard hidden over hill crest or potential for roadway object. Crash history in vicinity of hill crest			
	(b) Reconstruction criteria are applicable.			
	(c) Reconstruction analysis prepared.			
8.	**Pavement**			
	(a) Materials report prepared for pavement improvement.			
	(b) Beveled pavement edge or foreslope grading included in project.			
	(c) Pavement crown reconstruction analyzed.			
9.	**Bridges**			
	(a) Data included in Charter structural adequacy of bridge: Bridge width, roadway approach width and transition length. Bridge crash history. Analysis of bridge rail and approach guardrail. Bridge signing and delineator relative to MUTCD. Structure vertical clearances.			
	(b) Analysis for bridge replacement.			
	(c) Analysis for bridge widening.			
	(d) Analysis for minor improvements.			

Figure A-3

Sheet 3 of 3

10.	**Sideslopes and Clear Zones**			
	(a) Evaluation made for clear zone distances, existing slopes and objects within clear zone.			
	(b) Crash data provided on ran-off-road and fixed-object crashs.			
	(c) Benefit cost analysis prepared on corrective measure improvements.			
11.	**Guardrail**			
	(a) Guardrail meets AASHTO Guidelines.			
	(b) Guardrail upgrading proposal prepared			
12.	**Right-of-way**			
	(a) Additional R/W required and justified.			
13.	**Intersections**			
	(a) Intersection operations and crash history are documented.			
14.	**Traffic Control Devices**			
	(a) Field review for MUTCD compliance.			
15.	**Design Criteria Approval**			
	(a) Project 3R Design Criteria analyzed and documented.			
	(b) Incremental analysis of safety cost effectiveness on major improvements considered and prepared.			
	(c) Deviations from 3R Design Guidelines documented for FHWA approval.			

A.15 – STATE DESIGN STANDARDS FOR NON-NHS

The following standards are applicable for Federal-Aid construction on State and local highways excluding highways on the National Highway System (NHS). Prior approved local agency standards may be acceptable on local projects, but will need to be approved in the charter.

A.15.01 Non-NHS Level of Service.

Table A-3

Level of Service (lowest acceptable)	LOS
Heavily Developed Urban Area, High Traffic Areas, Rolling or Mountainous	**D**
Flat Rural Areas of Underdeveloped Urban Areas	**C**

In some cases the recommended level of service becomes prohibitive and a lower level of service is acceptable. Justification for the reduced level of service must be documented.

A.15.02 Non-NHS Traffic Volume.

Table A-4

Design Traffic Volumes	Design Life	Less than 1000 ADT	Greater than 1000 ADT
New Construction	20 Years	Current ADT	Projected 20-Year ADT
Rehabilitation	10 Years	Current ADT	Projected 10-Year ADT

A.15.03 Non-NHS Design Speed . Once the functional classification, terrain, and traffic volumes have been determined, the project route design speed can be selected from the appropriate section of the AASHTO policy. Design speeds should be selected to achieve the desired degree of safety, mobility and efficiency within the constraints of environmental quality, economics, and social or political impacts.

A.15.04 Non-NHS Rural Roadway Width

Table A-6

Traffic Volume	Design Speed mph	Minimum Total Width* feet	Desirable Total Width feet
Current ADT Under 400	Under 50 50 and Over	22 24	24 24
Current ADT 400-1,000	Under 50 50 and Over	24 26	24 28
Design ADT 1,000-2,000	Under 50 50 and Over	26 28	28 36
Design ADT over 2,000	All Speeds	34	36
*Widths may be 2 feet narrower in rugged or mountainous terrain. Widen 2 feet on inside of small radius curves.			

If the proposed widths do not meet the widths recommended in the corridor plans the proposed widths must be approved as design exceptions.

A.15.05 Non-NHS Urban Street Width.

Table A-7

Number of Lanes Determined by Highway Capacity Analysis		
Feature Width	Minimum feet	Desirable feet
Travel Lanes	10	12
Parking Lanes	8	10
Median		
Painted-Striped Median	2	4
Raised or Curbed Median	2	6
Separate Left-Turn Lane	11	14

A typical 4-lane street with a median turn bay should be 65 feet from the face of curb to the face of curb including 3 feet for gutter widths. A typical two-lane street with parking on both sides should be 44 feet from face of curb to face of curb. Travel lane widths do not include the gutter width. Parking lane widths include the gutter width.

Standard widths, as approved by the local agency, may be acceptable but will need approval in the charter.

(Street lane widths do not include gutter pan. Parking lane widths include gutter pan.)

A.15.06 Non-NHS Horizontal Curvature. Whenever possible, the horizontal curvature should match the project design speeds. Crash data should be studied, and if the curve is a high crash location, additional improvements may be warranted.

On new projects, horizontal curves with a design speed less than 15 mph below the project route design speed may be constructed under conditions such as mountainous terrain with appropriate documentation. Inconsistencies in highway geometry that require motorists to make abrupt frequent speed changes should be avoided.

On rehabilitation projects, horizontal curves with a design speed less than 15 mph below the project route design speed may be retained. However, improvements such as restoring superelevation, signing, lane widening, and delineation should be considered.

In all situations, adequate signing shall be installed in accordance with the MUTCD.

A.15.07 Non-NHS Vertical Curvature. On new construction, the vertical curvature should match the project route design speed.

On rehabilitation projects, the reconstruction of a crest vertical curve shall be considered if meeting the a or b criteria:

a. The average daily traffic exceeds 1,500 vehicles per day and either of the following conditions exist:
    - The vertical curve design speed (based on stopping sight distance) is more than 20 mph below the project route design speed.
    - The hill crest hides from view a major hazard such as intersections, sharp horizontal curves or a narrow bridge.
b. Re-occurring crashes in the vicinity of the hill crest can be attributed to the stopping sight distance of the vertical curve.

A.15.08 Non-NHS Sideslopes.

Table A-8

Sideslopes	Minimum	Desirable
Pavement Structure Slopes	3:1	6:1

Fill Slope (High Fill)	1.5:1	2:1
Fill Slope (Low Fill)	3:1	6:1
Cut Foreslope	3:1	6:1
Cut Backslope (Max)	*1.5:1	6:1
*1.5:1 allowable in rock.		

A.15.09 Non-NHS Rural Clear Zone.

Table A-9

Clear Zone (Rural)	Design ADT	Clear Zone in feet
40 mph or Less	Under 400 Over 400	7 10
45-50 mph	Under 400 400-750 Over 750	10 12 15
55 mph and Over	Under 400 400-750 Over 750	12 14 20

Additional Notes for Clear Zone

1. All utility poles shall be moved outside the clear zone, however, if the pole would be moved beyond the right-of-way line, the pole may be placed inside the right-of-way, but as close to the right-of-way line as practical.

    - All trees within the right-of-way and within the clear zone shall be removed. If the clear zone extends beyond the right-of-way, then approval for not removing the trees must be obtained through the approval of the Design Study Report and may be granted for such items as decorative trees, inability to negotiate with the owner, etc.

Approval for leaving other point obstacles that exist in these clear zone distances, such as minor irrigation structures, is required.

2. All culverts larger than 30 inches must be protected with traversable bars, extended outside the clear zone, or extended to the right-of-way.

A.15.10 Non-NHS Horizontal Clearance to Obstructions (Urban). The preservation and enhancement of the environment are of major importance in the design and construction of urban streets. A wide and level border area should be provided along urban streets for the safety of the motorist and pedestrian as well as for aesthetic reasons. The street alignment should be selected on the basis of minimizing cut and fill slopes.

Urban streets, which are curbed with no shoulders, a minimum clearance of 1.5 feet or wider where possible beyond the face of the curb, should be provided. Urban streets with shoulders and without curbs should have clear zones the same as on rural highways.

Where a continuous parking lane is provided, no clearance is required but a minimum 2 feet setback to obstructions is desirable to avoid interference with opening car doors. Preferably these obstructions are located at or near the right-of-way line and outside of the sidewalks.

Other off-roadway obstacles (trees, etc.) that might seriously damage out-of-control vehicles should be removed from the roadside wherever feasible. However, the potential benefits from the removal of trees should be weighed against the adverse effects that their removal may have on the roadside environment; and trees should only be removed when necessary for reasons of safety. Depending on the conditions, only those fixed objectives that are in very vulnerable locations may be subject to removal.

Roadside barriers are not required on urban streets except where there are safety concerns or environmental considerations such as along sections with steep fore slopes and at approaches to overcrossing structures.

A.15.11 Non-NHS . See sections 570.00 and 575.00 and the Standard Drawings for guidelines on guardrail or concrete barrier use. Ensure that guardrail post spacing and hardware is in accordance with the Standard Drawings or approved systems on the Qualified Products List. Consider upgrading the following terminals or transitions:

- Blunt End Terminals for W-beam guardrail or median barrier
- Turned-down terminals
- Bridge approach guardrail that is not connected to the bridge railing

Select the appropriate terminal from the Standard Drawings or the Qualified Products List.

Type 1 or Type 1-A terminals (blunt end terminals) may remain in place if used on the downstream end of the barrier and are not exposed to approaching traffic.

Those segments of the guardrail that are functional will not be replaced. Items like post length, slope widening and minor height variances do not warrant removing and replacing the guardrail. When the guardrail height is 3" lower than the heights shown on the standard drawings, attempts will be made to adjust the height in lieu of removing and replacing.

Also, unless major grading is involved on the project, the guardrail will remain in place in lieu of slope flattening.

A.15.12 Non-NHS Right-of-Way. No minimum right-of-way width is specified. The right-of-way width shall be sufficient to accommodate the design cross section, adequate drainage and proper maintenance.

A.15.13 Non-NHS Access Control. Access control on the State Highway System shall conform to Board Policy 4005 - Management of Department Owned Property.

On local projects the sponsoring agency shall determine the type of Access Control.

A.15.14 Non-NHS Traffic Control Devices. All traffic control devices will conform to the Manual on Uniform Traffic Control Devices.

A.15.15 Non-NHS Environmental Considerations. All projects require environmental documentation. A Preliminary Environmental Evaluation (ITD 654 and ITD 652) shall be completed for the project. Refer to relative project environmental documentation procedures. A determination will be made based on submitted documentation as to whether additional reports or clearances will be required. A cultural resource clearance is also required, as is the wetland mitigation plan, when needed. An Environmental Mitigation Summary will be submitted with the Final Design Review Package for approval.

A.15.16 Non-NHS Bicycle/Pedestrian Facilities. New emphasis has been placed on providing facilities for bicyclists and pedestrians on or adjacent to public highways. Consider bicycle/pedestrian facilities on all projects in or adjacent to urban areas and recreation areas. Bikeways should be provided when identified in a local bikeway plan.

The charter shall include a discussion on how the project will handle bicycle/pedestrian facilities.

See A.40 for the criteria for bicycle facilities development.

A.15.17 Non-NHS Design Exceptions. In specific instances it may be appropriate and cost effective to deviate from the minimum design guidelines as noted in the preceding discussion.

Deviations require an approved design exception and must be properly supported with an adequate cost-effective analysis, or discussion based on engineering judgment or practicality.

A.15.18 Non-NHS Exceeding Standards. The standards contained herein are considered to be minimum and may be exceeded where warranted. A discussion of these areas should be included in the charter.

A.15.19 Non-NHS Structure Standards.

Structure - New Construction

Design shall be in accordance with the AASHTO LRFD Bridge Design Specifications, current edition.

The recommended width between the rail faces on the bridges will include the full approach roadway width plus shy distances, as shown in the ITD Bridge Design Standards, Section B-1. The width between the bridge rails should match the roadway guardrail width. If these recommendations are not met, the variances shall be discussed in the charter.

Structures shall be designed for a minimum HS-20 live load for Local Highways and HS-25 live load for the State System.

Rails shall be any approved crash-tested bridge rail that meets the required Performance Level. Deck slab shall have a minimum thickness of 8 inches as noted in the ITD Bridge Design Manual.

Structure – Rehabilitation

Existing structures that are structurally adequate may remain in place if they have a minimum live load capacity of HS-15, are not Load Posted, and are a width equal to the existing roadway.

Structures built as part of a rehabilitation project or without reconstruction of the roadway may be the width of the existing roadway if there are no foreseeable plans (20 years) to reconstruct the adjacent roadway.

Structure - Single-lane Bridges (Local Highways Only).

When a full-width structure is not economically feasible, a single-lane bridge may be constructed if the following conditions are met:

1. The location is primarily on a stubbed route with limited possibilities for sizable increase in ADT.

ADT is 100 or less.

Minimum width curb to curb is 16 feet.

Minimum HS-20 live load.

A.20 – REHABILITATION (1R) STANDARDS

For Bridge rehabilitation projects contact ITD Bridge for policies and required standards.

The following Pavement Rehabilitation (1R) standards have been approved by FHWA and are the standards to be used to meet the goals of the ITD Board in their approved pavement rehabilitation program.

The following issues must be addressed in the charter.

Design life. Design Life of the pavement will be a **minimum** of 8 years.

Existing geometrics. The standards outlined in the 1R standards must be met.

Crash data. There should be no high crash locations on the section of roadway. The crash rate needs to be equal to or below the statewide average for the particular type of highway. If the project does not meet these criteria, then steps to upgrade the safety must be included in the project or programmed as a separate project.

Guardrail. Upgrade substandard guardrail end terminals and grossly substandard guardrail. Blunt ends, turned-down ends and unconnected bridge rails are considered substandard end terminals. Half moon, non-blocked out rail and rail that varies by more than 3 inches from the height shown on the Standard Drawings are considered grossly substandard guardrail. Additional guardrail upgrades are allowed at the district's discretion.

If the guardrail is upgraded, clear definition of the guardrail work and costs is needed during programming and future cost updates. This will allow proper tracking of the costs of the rehabilitation and safety work separately.

Safety. Safety considerations may be met by phased construction. In situations where it is desirable to perform safety work along a corridor, which would combine several projects, or in conjunction with other similar safety projects, the projects may follow each other by up to three years. Phasing of safety work should only be used where it will result in improved efficiencies and significant economies of operation and have no adverse effect on safety.

Americans with Disabilities Act (ADA). Existing curb ramps must be improved to meet current standards and is included in the scope of 1R projects.

> If extensive shoulder work or major widening of the roadway is planned, then the project should be programmed as a 3R or Reconstruction Project.

A.20.01 1R – Interstate Resurfacing. The existing width of the roadway should be maintained on all overlays.

Substandard guardrail end terminals will be upgraded. Grossly substandard guardrail will be upgraded.

Unconnected bridge rails will be upgraded.

High crash locations will be addressed.

A.20.02 1R – NHS Resurfacing. The existing roadway must meet 3R-NHS width requirements to qualify for a resurfacing project. The design should not decrease the existing geometric conditions. ***If a section does not meet these requirements, then a design exception is required.***

Pavement widths that do not meet 3R-NHS requirements **require a design exception**.

Substandard guardrail end terminals will be upgraded. Grossly substandard guardrail will be upgraded. Structure attachments will be upgraded.

High crash locations will be addressed.

A.20.03 1R – NON-NHS Resurfacing. The existing roadway should meet the minimum geometric requirements shown in the State Standards. The design should not decrease the existing geometric conditions. The existing width should be maintained on all overlays.

Substandard guardrail end terminals will be upgraded. Grossly substandard guardrail will be upgraded. Structure attachments will be upgraded.

High crash locations will be addressed.

A.30 – REST AREA DESIGN

A.30.01 Rest Area – Site Location. The district is responsible for field reconnaissance and the selection of possible rest area sites that are geographically located in conformance with approved sites. A site analysis will be prepared in accordance with Landscape Architecture practices.

Preliminary environmental impact assessment must accompany the site analysis regardless of the type of funds to be used on the Rest Area project.

After the district has selected possible sites it shall prepare a charter. The charter will determine the site location for construction of the Rest Area. Items to be included in the charter, for one or more sites, are as follows:

- Geological investigation recommendations for availability of water,
- Projected traffic volumes for the design year,
- Design number of users per day,
- The type of facilities to be provided,
- Amount of area required for present use and future expansion,
- Site analysis, and
- Assessment of environmental impact.

A.30.02 Rest Area – Property Purchase. If a site is to be purchased with State funds, an "option to purchase agreement" is recommended where it is advisable to ensure the State's ability to purchase the proposed site. If a site is to be purchased with Federal-aid funds, authority and approval for advance purchase must be secured from the Federal Highway Administration before a purchase agreement may be consummated. Federal-aid funds are not available if an option has been negotiated***. Extensive design work will be deferred until the ultimate purchase has been assured.***

A.30.03 Rest Area – Field Surveying and Mapping. Major field surveying and mapping for the rest area are not to be started until the ultimate site purchase has been ensured by an executed option or by actual purchase. After the right-of-way has been secured, the following engineering and map preparation work is required.

- Establish base lines and evaluation for the preparation of a contour map.
- Locate and show on the map terrain features such as rock outcrops, crevasses, and waterways.
- Locate and show by name all trees of significant size. Also show the location of large masses of vegetation.

A.30.04 Rest Area – Health Department Regulations. In the design of rest areas, attention must be given to the distance between the arbors, the toilet buildings, and the location of wells. A specific minimum distance from arbors to toilets cannot be made because of variations in terrain and prevailing winds. However, the following points are to be considered in all rest area design:

- Direction of prevailing winds should be placed on the preliminary design plans.
- Arbors shall be located so as to take the best advantage of the terrain and prevailing winds.

The Idaho Department of Health and Welfare must approve all plans for water supplies and waste disposal areas. To expedite approval, plans are to be sent directly to the Regional Public Health Engineer.

In addition to the above main offices, there are Sanitarians in many of the Counties who may be consulted on plan development. In the development of any rest area where drinking water or sewage disposal systems are proposed, a contact is to be made with the Sanitarian at the County level regarding permits or other requirements the Health and Welfare Department may have.

A.30.05 Rest Area – Well Development. The designer shall locate the well in an area removed from the proposed location of all other rest area facilities. Well locations must meet "Idaho Drinking Water Standards" of the Idaho Department of Health and Welfare and must comply with the *Manual of Individual Water Supply Systems*, U.S. D.H.E.W.

It may be advisable to drill the well prior to design of the rest area if the well depth and quantity of water is in doubt. This will permit design of the pump, water storage and irrigation to fit the well depth and water quantity.

A.30.06 Rest Area – Design Criteria. The design of the rest area shall meet the requirements of the Uniform Building Code, Federal Accessibility Standards, and State and Local Codes while providing an open and relaxing atmosphere that is aesthetically pleasing. Past experience in rest area design and operation indicates that the following functional design criteria should be incorporated in the design:

- Toilet room fixture proportion should be approximately: men 40%, women 60%.
- Double-entry service or use handicap stall to allow shutdown of a portion for maintenance while another portion is open for each sex.
- Concrete circulation service (paved plaza) as wide as the building on auto approach side at least, preferably both sides. Minimum 8 feet completely around building where terrain permits.
- Limited lawn type turf grass adjacent to plaza.

- Lighted on all sides of building.
- No plantings that will cause shadows near building.
- Parking areas fully lighted.
- Parking areas a short distance from buildings - no winding sidewalks to building from parking areas.
- Sidewalks 8 feet wide along curbs and in heavy traffic areas.
- Orient buildings and arbors for best protection from prevailing winds and snowdrift.
- Frost-free water faucets at curbs near parking areas.
- Generous roof overhang with benches under roof.
- Trash receptacles on expanded concrete surface - not on square blocks. Large size near building - small size near arbors.
- Adequate cigarette snuffers at buildings.
- Good light inside rooms.
- Provisions for fresh air exchange in toilet rooms and low speed constant or timed-intermittent fan. Adjustable outside air inlet to furnace.
- Adequate storage shelves in custodial room.
- Minimum of two hand dryers per room. Where handicap is separate an additional dryer will be required for this room.
- Outside electrical outlet accessible to organizations serving beverages on special holidays, etc.
- Locate the 4 x 8 feet ITD-COMMERCE signs near buildings approach and where they will not conflict with tourist information efforts.
- Provide a flagpole for U.S. and/or State flags.
- Provide display racks in information centers.
- Locate telephones, vending machines, weather stations, etc., so they do not conflict with each other.
- Place State seal on glass entry doors.
- Water source for coffee vending machine at those locations which have information centers.
- Provide for additional telephones.
- Screened garbage (dumpster) areas.

- Provide 4 feet high chain-link security fence with locking gates around caretaker's residence.

A.35 – ACCESSIBILITY REQUIREMENTS AND CURB RAMPS

On new construction or on alterations to existing facilities ensure that pedestrian access routes, including curb ramps accommodate all pedestrians, including those who use mobility aids. Alter existing facilities to comply with the requirements for new construction to the maximum extent feasible.

Where existing physical constraints make it impractical for altered facilities to fully comply with new construction requirements, compliance is required to the extent practicable within the scope of the project. Existing physical constraints include, but are not limited to, underlying terrain, right-of-way availability, utilities or underground structures, drainage, or the presence of a notable natural or historic feature. An alternate pedestrian access route may be provided where practicable.

At existing conforming facilities, maintain appropriate slopes, grades, maximum vertical surface discontinuities, and other features so no new accessibility issues are introduced by the project. Resurfacing projects are subject to the requirements of the American with Disabilities Act (ADA) Accessibility Guidelines. Included are rehabilitation projects that are being done in urban type areas. Existing traversable cross-slopes, grades, gutter lips and other features need to be maintained such that no new ADA issues are introduced by the project.

Maintenance projects such as signing, striping, crack sealing, and seal coating do not require American with Disabilities Act (ADA) updates for existing features. Curb ramps or sloped areas will be provided on all projects, except non-resurfacing, with pre-existing curbs and sidewalks.

See Standard Drawings H-2-A, H-2-B, and the Field Guide for Accessible Public Rights-of-Way for additional information.

A.40 – BICYCLE FACILITY DESIGN

A.40.01 Bicycle Facilities – Glossary of Terms.

ACCOMMODATION	Any facility, design feature, operational change, or maintenance activity that improves the environment in which bicyclists and pedestrians travel.
AASHTO	American Association of State Highway & Transportation Officials.
BICYCLE	A vehicle having two tandem wheels, propelled solely by human power, upon which any person or persons may ride.
BICYCLE FACILITIES	A general term denoting improvements and provisions made by public agencies to accommodate or encourage bicycling, including parking facilities, all bikeways, and shared roadways not specifically designated for bicycle use.
BICYCLE ROUTE (BIKE ROUTE)	A segment of a system of bikeways designated by the jurisdiction having authority with appropriate directional and informational markers, with or without specific bicycle route number.
BIKE/BICYCLE LANE	A portion of a roadway which has been designated by signing, and pavement markings for the preferential or exclusive use of bicyclists.
BIKEWAY	Any road, path, or way open to bicycle travel, regardless of whether such facilities are designated for the preferential use of bicycles or are to be shared with other transportation modes.
CLEARANCE (Lateral)	Width required for safe passage of a bicycle as measured in a horizontal plane.
CLEARANCE (Vertical)	Height necessary for the safe passage of a bicycle as measured in a vertical plane.
CLEAR ZONE	The distance between the bikeway's edge and any fixed object capable of injuring a cyclist using the facility.
COMMUTER/ UTILITY CYCLIST	An individual who uses a bicycle primarily to reach a particular destination for practical purposes, such as to purchase or deliver goods and services, or to travel to and from work or school. Messengers are classified as utility cyclists.
CROSSWALK	(a) That part of a highway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs or in the absence of curbs, from the edges of the traversable highway; and in the absence of a sidewalk on one side of the highway, that part of a highway included within the extension of the lateral lines of the existing sidewalk at right angles to the centerline.

	(b) Any portion of a highway at an intersection or elsewhere distinctly indicated for pedestrian crossing by lines or other markings on the surface.
GRADE SEPARATION	Vertical separation of travelways through use of a structure so that traffic crosses without interference.
HIGHWAY	A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way. Idaho Code Section 40-109 reads "Roads, streets, alleys, and bridges laid out or established for the public or dedicated to the public."
LEGEND	Words, phrases, or numbers appearing on all or part of a traffic control device.
MOTOR VEHICLE	A vehicle that is self-propelled or designed for self-propulsion.
MUTCD	Abbreviation for *Manual on Uniform Traffic Control Devices*, approved by the FHWA as a national standard for placement and selection of all traffic control devices on or adjacent to all highways open to public travel and accepted for use by Idaho law.
PAVEMENT MARKING	Painted or applied line(s) or legend placed on any pavement surface for regulating, guiding, or warning traffic.
PEDESTRIAN	A person whose mode of transportation is on foot and any person operating a wheelchair or a motorized wheelchair. A person "walking a bicycle" becomes a pedestrian.
RIGHT-OF-WAY	A general term denoting land or property (or interest therein), usually in a strip, acquired for or devoted to transportation purposes.
RIGHT-OF-WAY	The right of one vehicle or pedestrian to proceed in a lawful manner in preference to another vehicle or pedestrian.
ROADWAY	The portion of the highway for vehicle use, including bicycles.
RULES OF THE ROAD	That portion of a motor vehicle law which contains regulations governing the operation of vehicular and pedestrian traffic.
SEPARATED, MULTI-USE PATH	A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way.
SHARED ROADWAY	A type of bikeway where bicyclists and motor vehicles share the same roadway.
SHOULDER	A portion of a highway contiguous to the roadway that is primarily for use by pedestrians, bicyclists, and emergency

	use of stopped vehicles.
SHOULDER BIKEWAY	A type of bikeway where bicyclists travel on the shoulder of the roadway.
SHY DISTANCE	The distance a cyclist maintains from a fixed object such as guardrail, fences, etc.
SIDEWALK	That portion of a roadway that is intended for pedestrian use and lies between the curb lines, or the lateral lines of the travel way and the adjacent property lines.
SIDEWALK BIKEWAY	Usually discouraged except in a few special circumstances covered in the AASHTO Guide for the Development of Bicycle Facilities.
SIGHT DISTANCE	The length of a roadway or pathway ahead, visible to the cyclist.
TRAFFIC CONTROL DEVICES	Signs, signals, or other fixtures, whether permanent or temporary, placed on or adjacent to a travelway by authority of a public body having jurisdiction to regulate, warn, or guide traffic.
TRAFFIC VOLUME	The given number of vehicles that pass a given point for a given amount of time (hour, day, year).
TRAVELWAY	Any way, path, road, or other travel facility used by any and all forms of transportation.
VEHICLE	Any device in, upon, or by which any person or property is or may be transported or drawn upon a public highway and includes vehicles that are self-propelled or powered by any means.

A.40.02 Bicycle Facilities – The "Design Bicyclist." Transportation improvements intended to accommodate bicycle use must address the needs of both experienced and less experienced riders. One solution to this challenge is to develop the concept of a "design bicyclist" and adopt a classification system for bicycle users which includes the following:

A.40.02.01 Group A-Advanced Bicyclists Experienced riders who can operate under most traffic conditions, these bicyclists comprise the majority of the current users of shoulder bikeways and shared lanes on arterial streets and are best served by:

- Direct access to destinations, usually via the existing street and highway system.
- The opportunity to operate at maximum speed with minimum delays.

- Sufficient operating space on the roadway or shoulder to reduce the need for either the bicyclist or the motor vehicle operator to change position when passing.

A.40.02.02 Group B-Basic Casual Bicyclists These bicyclists are less confident of their ability to operate in traffic without special provisions for bicycles. They include casual or new adult and teenage riders as well as serious riders who are uncomfortable cycling in traffic. These bicyclists require:

- Comfortable access to destinations, preferably by a direct route, and either low-speed, low -traffic-volume streets or designated bicycle facilities.
- Well-defined separation of bicycles and motor vehicles on arterial and collector streets (bike lanes or wide shoulders) or on separated, multiple-use paths.

A.40.02.03 Group C-Children Preteen riders whose roadway use is initially monitored by parents. Eventually these riders are accorded independent access to the system. Children and their parents require provisions of separated, multiple-use paths and:

- Access to key destinations surrounding residential areas, including schools, recreational facilities, shopping, or other residential areas.
- Residential streets with low motor vehicle speed limits and volumes.
- Physical separation (multi-use pathways) of bicycles and motor vehicles on arterial and collector streets.

Generally, Group A bicyclists will be best served by designing all roadways to accommodate shared use by bicycles and motor vehicles. Group B/C bicyclists will be best served by a network of low volume neighborhood streets and separated, multi-use pathways.

Full implementation of this approach will result in a condition where every street will incorporate at *least* the design treatments recommended for group A bicyclists. In addition, a network of routes will be *enhanced* by incorporating the bicycle facilities recommended for group B/C bicyclists.

A.40.03 Bicycle Facilities - Types and Design Standards

Bicycles are legally classified as vehicles and can be ridden on all public roadways in Idaho. Therefore, proper accommodations must be designed to allow bicyclists to ride in a manner consistent with motor vehicle operation. Four basic types of facilities (urban-arterial, collector, residential, and all rural roadways) can accommodate bicycle travel. Figures A-4 thru A-9 describes each type of facility.

Figure A-4

FACILITY IMPROVEMENTS FOR EXPERIENCED BICYCLISTS
(Group A & Some Group B)

		Roadway Type		
		Urban		**Rural**
KEY: XXX Most appropriate XX May be appropriate X Least appropriate --- Not required	**Arterial**	**Collector**	**Residential**	**All Roads**
OVER/UNDERPASS	**XX**	**---**	**---**	**---**
TRAFFIC SIGNAL	**XX**	**XX**	**---**	**---**
SHARED LANE*	**XX**	**XXX**	**---**	**XX**
SHOULDER BIKEWAY**	**XX**	**XX**	**---**	**XXX**
BICYCLE LANE***	**XXX**	**XXX**	**---**	**X**
MULTI-USE PATH******	**XX**	**XX**	**---**	**XX**

Figure A-5

FACILITY IMPROVEMENTS FOR CASUAL (Group B) &

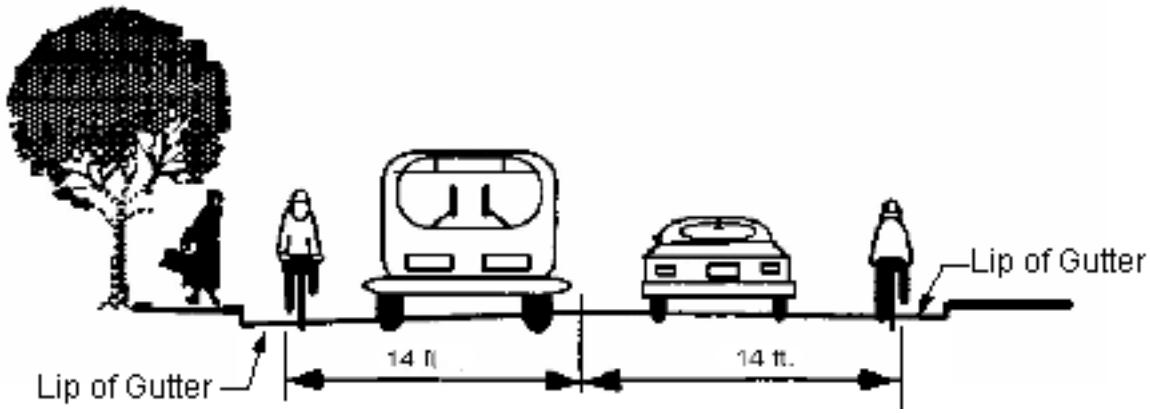
CHILDREN (Group C) BICYCLISTS

		Roadway Type		
		Urban		**Rural**
KEY: XXX Most appropriate XX May be appropriate X Least appropriate --- Not required	**Arterial**	**Collector**	**Residential**	**All Roads**
OVER/UNDERPASS	**XXX**	**XX**	**---**	**---**
TRAFFIC SIGNAL	**XXX**	**XX**	**---**	**---**
SHARED LANE*	**X**	**X**	**XXX**	**X**
SHOULDER BIKEWAY**	**X**	**X**	**---**	**XX**
BICYCLE LANE***	**X**	**XX**	**XX**	**X**
MULTI-USE PATH****	**XXX**	**XXX**	**XX**	**XX**

* Shared Lane

On a shared facility, bicyclists and motorists share the same travel lanes. Shared facilities are common on city street systems and roads with limited right-of-way. Shared lanes can be considered an acceptable solution when there is inadequate width to designate bike lanes or provide shoulder bikeways.

Figure A-6



A lane with 14 feet of usable width is desired in an urban setting, which allows a motor vehicle and a bicycle to operate side by side. Usable width normally would be from edge stripe to lane stripe or from the longitudinal joint of the gutter plan to lane stripe (the gutter pan should not be included as usable width). Widths greater than 14 feet may encourage the undesirable operation of two motor vehicles in one lane.

In this situation, consideration should be given to striping a bicycle lane or shoulder bikeway.

**** Shoulder Bikeway**

Smooth, paved roadway shoulders provide a suitable area for bicycling, conflicting little with faster-moving motor vehicle traffic. Rural bicycle travel on the state highway system is accommodated on shoulders. *Optimum shoulder width for bicyclist allows for a minimum 4 ft of clear path that is void of rumble strips, gutter pans, grates or other surface discontinuities.*-Shoulder areas against an ordinary curb face should have a 5 foot minimum width or 4 feet from the longitudinal joint between a monolithic curb and gutter and the travel way. Shoulder widths of 5 feet are recommended from the face of a guardrail or other roadside barriers. Adding or improving shoulders can often be the best way to safely accommodate bicyclists in rural areas, and they are also a benefit to motor vehicle traffic. In severely restricted areas, even minimal width shoulders, 2-3 foot, is an improvement over no shoulder at all.

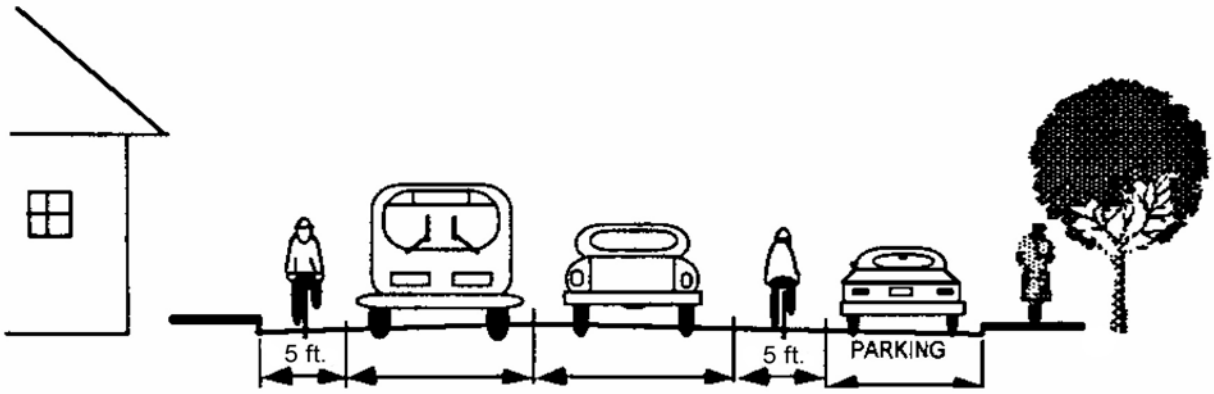
***** Bicycle Lane**

A bicycle lane is a portion of the roadway that is designated for preferential use by bicyclists. Bicycle lanes are very common in urban areas and must always be well marked and signed to call attention to their preferential use by bicyclists (refer to Manual on Uniform Traffic Control Device & *AASHTO Guide for the Development of Bicycle Facilities*).

Bicycle lanes are established on urban arterial and major collector streets. The minimum width for a bike lane is 4 feet, or 5 feet from the face of a curb or guardrail. A clear riding zone of 4 feet should be present if there is a longitudinal joint between the pavement and the monolithic curb and gutter section. Bicycle lanes in excess of 6 feet in width are undesirable as they may be mistaken for a motor vehicle lane or parking area.

Refer to the Traffic manual or the Manual on Uniform Traffic Control Devices & *AASHTO Guide for the Development of Bicycle Facilities* for detailed specifications for pavement striping, stenciling, and signing of bicycle lanes.

Figure A-8



*Min: 5 ft. against curb or guardrail, 5 ft. lane next to parking

If parallel parking is permitted, the bike lane must be placed between the parking area and the travel lane and have a minimum width of 5 feet.

Bicycle lanes must always be one-way facilities and carry bicycle traffic in the same direction as adjacent motor vehicle traffic. On one-way streets the bicycle lane should be on the right side of the roadway, except in areas where a bike lane on the left will decrease the number of conflicts (e.g., those caused by heavy bus traffic or dual right-turn lanes, etc.).

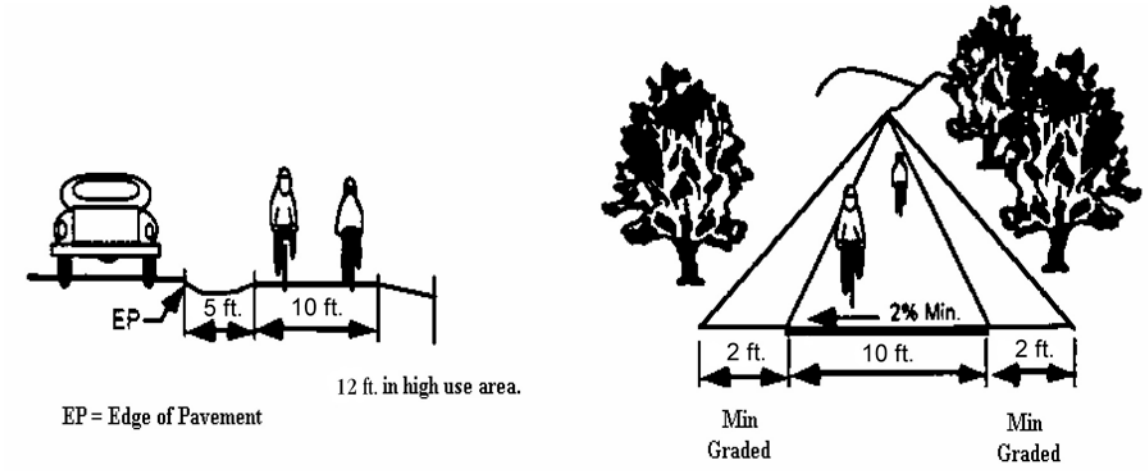
****** Separated, Multiple-Use Path**

A multiuse facility for use by pedestrians ad/or bicycles that is physically separated from motorized vehicular traffic by an open space or barrier, that is within either the highway right-of-way or an independent right-of-way. Separated paths are normally two-way facilities. They may be appropriate in corridors not served by other bikeways, if there are few intersecting roadways.

If there is less than a 5 foot width separating the multiple use path and the roadway, a physical barrier or railing must be installed. Refer to the AASHTO Guide for the Development of Bicycle Facilities, Chapter 5 Design of Shared Use Paths for guidance on selecting the appropriate barrier to separate the path from the roadway.

Ten feet is the standard width for a separated, multiple-use path. Paths should be 12 feet wide in areas with high bicycle volumes or when used by a combination of bicyclists, pedestrians, skaters, and joggers. A minimum 2 feet clear zone should be maintained adjacent to both sides of the pathway to provide clearance from poles, trees, fences, and other obstructions.

Figure A-9



Multiple-use paths provide excellent bicycle transportation, especially where the path is truly isolated from motor vehicles, such as along greenways or railroad corridors. *Special care must be taken to limit the number of at-grade crossings with streets or driveways.* Poorly designed paths can put cyclists in a position where the driver of a motor vehicle does not expect them. Motorists are generally looking for traffic on the roadway and may not see a cyclist on a separated pathway.

Paths with two-way bicycle traffic should not be placed on or adjacent to roadways. Otherwise, a portion of the cyclists ride against the normal flow of motor vehicle traffic, which is contrary to the rules of the road, with the following consequences:

- Bicyclist and motorists may collide, as right-turning drivers at intersections and driveways rarely look to their right. The drivers simply fail to see approaching bicyclists who are riding against traffic.
- Some bicyclists ride improperly against the normal flow of traffic to reach the path or continue on against traffic where the path ends. Wrong-way riding is a major cause of bicycle/motor vehicle crashes.

Pathways of 8 feet are not recommended in most situations because they attract users and soon become overcrowded. If necessary, they should only be constructed where long-term usage is expected to be low, where there is minimum pedestrian use, and with proper horizontal and vertical alignment, which ensure good sight distances. Multiple-use paths built along streams and in wooded areas present special challenges. The roots of shrubs and trees, especially

cottonwoods, can pierce through the path surface and cause it to bubble up and break apart in a short period of time. Preventative methods include removal of vegetation, realignment of the path away from trees, and placement of root barriers along the edge of the path.

A.40.04 Bicycle Facilities – Reference Publications. The Design manual guidelines are adequate for most situations. However, many factors affect the specific application for any given roadway or traffic situation. Therefore, the design professional should consult other sources for more detailed specifications prior to finalizing facility design. These publications are considered supplements to this manual and the standards described adopted by reference:

ITD Maintenance Manual: Facility maintenance, repair, and operations.

ITD Traffic Manual: Signing, marking, and striping.

Manual on Uniform Traffic Control Devices: Signing, marking, and striping.

AASHTO Guide for the Development of Bicycle Facilities: Width and clearance, design speed, horizontal alignment and super elevation, grade, sight distance, and others.

For additional technical assistance, reference material and designing to accommodate bicycles, contact the Geometric Engineer in the Resource Center. For guidance related to bicycle usage and planning activities associated with bicycles, contact the Bicycle and Pedestrian Coordinator, Division of Transportation Performance (currently the Sr Transportation Planner, Multi-Modal Programs within the Motor Vehicles section has been given these duties).

A.40.05 Bicycle Facilities – Design Exceptions. In certain instances it may be necessary and cost effective to deviate from minimum design guidelines. These deviations require design exception approval and must be properly supported with an adequate analysis and discussion of justification for the exception.

A.40.06 Bicycle Facilities – Preliminary Checklist. Figure A-10 is a checklist of items that are required for consideration of Bicycle Facilities. For project development procedures see Special Projects Subsection 315.04.

Figure A-10

Sheet 1 of 3

Bicycle Facilities Preliminary Checklist		
Date:	Project No.:	Key No.:
Project Name:		
Project Location:		
A) Standard Plan Sheets REQUIRED (11 x 17 format)		
All references are to the Design Manual unless otherwise stated		
	Title Sheet	
	Standard Drawing List	
	Vicinity Sketch (8 ½ x 11 format)	
	Project Clearance Summary	
	Typical Sections	
	Erosion Control Plan	
	Horizontal Alignment Plan, vertical	

Figure A-10
Sheet 2 of 3

	B) Optional Sheets	YES	NO
	Profile Sheet		
	Roadway		
	Bridge(s)		
	Pipe Culvert(s)/Pipe Siphon(s)		
	Irrigation Pipe(s)		
	Sewer Pipe(s)		
	Pipe Underdrain(s)		
	Total Ownership Map		
	Signing Plan		
	Pavement Markings		
	Traffic Control Plan		
	Drainage Plans		
	Minor Structure Plans		
	Source Plats		
C)	**Standard Specification REQUIRED**		
	SSP 637, Bikeways and Pathways		
	Special Provisions, Standard Inserts		
	Sediment and Erosion Control Plan		
	NPDES Storm Water Control Plan (if over 5 acres)		
	Preliminary Cost Estimates		
D)	**Preliminary Environmental Checks (ITD-654 & 654A)**		
Bicycle Facilities Preliminary Checklist (continued)			
E)	**Charter Approval Inclusions**		
	Project Description and Typical Sections		
	Vicinity Sketch (same as “A” above)		
	Design Standards		
	Project Estimate and Right-of-way Certification		

Figure A-10

Sheet 3 of 3

F) ITD Material Phase Report(s) — Bicycle Path Projects	
A Phase 2,3, and 5 combined materials report REQUIRES an abbreviated discussion of the following items.	
___	Introduction and General Project Description
___	Vicinity Sketch
___	Typical Section
___	Borrow Source Data (commercial sources)
___	Borrow and Aggregate Source Plats
___	Aggregate Estimating Data
___	Aggregate Sources (commercial sources)
___	Surface and Sub-surface Water
___	Topsoil
___	Base
___	Paving
___	Compaction
___	Dust Abatement
___	Source and Material Cost
___	Special Provisions
___	Notes to the Contractor
A Phase 2, 3, and 5 combined materials report MAY ALSO INCLUDE discussion of the following items.	
___	Aggregate Inventory Report
___	Soils Report Summary
___	Sub-subgrading
___	Slope Design Summary
___	Retaining Walls
___	Blanket Coarse or Filter Material
___	Pipe
___	Riprap
___	Surface Treatment
___	Seal

A.45 – INTELLIGENT TRANSPORTATION SYSTEM

"Consideration of ITS elements will include analysis of cost effectiveness and comparison of Idaho's current ITS planning documents with the project location and goals. The State of Idaho Intelligent Transportation Systems Strategic Plan identifies specific applications for deployment on various routes throughout the state and should be used as a guide in determining the types of ITS elements to consider. Results from the consideration may include identification of ITS elements as part of a larger project or a project that consists exclusively of ITS deployment.

"ITS projects are eligible for all categories of Federal funds as long as they comply with the National ITS Architecture. Within Idaho's ITS planning document a statewide architecture has been detailed from the National Architecture and should be followed in designing specific ITS project components."

A.50 – INTERCHANGES, INTERSTATE/EXPRESSWAY

An interchange is defined as a system of interconnecting roadways in conjunction with one or more grade separations that provides for the movement of traffic between two or more roadways or highways on different levels. Interchanges are utilized on freeways and expressways where access control is important. They are used on other types of facilities only where crossing and turning traffic cannot be accommodated by a normal at-grade intersection.

A.50.01 Interchange Spacing. Interchanges should be located close enough together to properly discharge and receive traffic from other highways or streets, and far enough apart to permit the free flow and safety of traffic on the main facility. In general, more frequent interchange spacing is permitted in urbanized areas. Minimum spacing is determined by weaving requirements, ability to sign, lengths of speed change lanes, and capacity of the main facility.

In consideration of the varying nature of the highway, street or road systems with which the freeway or expressway must connect, the spacing between individual adjacent interchanges will vary considerably. Guidance for interchange spacing is available in the AASHTO publication - A Policy on Design Standards -- Interstate System and in NCHRP Report 687- Guidelines for Ramp and Interchange Spacing. Consistency with corridor plans recommendations must be taken into consideration.

A.50.02 Interchange Type. The most commonly used types of interchanges are the diamond, cloverleaf and directional.

The diamond interchange is the most common type where a major facility intersects a minor facility. The capacity is limited by the at-grade intersections at the crossroad.

Cloverleaf or partial cloverleaf designs may be used in lieu of a diamond when development or other physical conditions prohibit construction in a quadrant, or where heavy left turns are involved. A continuous flow design is required where two major facilities intersect. In this case, a cloverleaf interchange is the minimum design that can be used.

Directional interchanges are the highest type and most expensive. They permit vehicles to move from one major highway to another major highway at design speeds.

A.50.03 Interchange Ramp Design. An interchange ramp is a roadway that connects two legs of an interchange. Elements contributing to horizontal and vertical alignments are designed similar to any roadway once the ramp design speed has been determined.

A.50.04 Interchange Ramp Design Speed. In order to design horizontal and vertical alignment features, a design speed must be determined for each ramp. Since the driver expects a speed adjustment on a ramp, the design speed may vary within the ramp limits.

A.50.04.01 Diamond Ramp Design Speeds. When ramps terminate at an intersection where all traffic is expected to make a turning movement or come to a complete stop, the minimum design speed along the ramp should be 30 mph. When a "through" movement is provided at the ramp terminus, the minimum ramp design speed should meet or exceed the design speed of the highway facility for which the through movement is provided. The design speed along the ramp will vary depending on alignment and controls at each end of the ramp. An acceptable approach to determining design speed along the ramp is to set the design speed at the exit or entrance nose equal to the posted mainline speed limit and 30 mph at the ramp terminus. The appropriate design speed for any intermediate point on the ramp is then proportional and based on its location relative to those two points.

A.50.04.02 Loop Ramp Design Speeds. Loop ramps may have a high-speed condition at one end and, either a slow or high-speed condition at the other. Loop ramps, because of their short radius, usually have design speeds in the lower range for the middle and slow speed end of the ramp, with middle range design speeds occasionally used nearer the high speed terminal. See Exhibit 10-56 (*AASHTO* Green Book).

A.50.04.03 Directional Ramp Design Speeds. Directional ramps generally have high-speed conditions at both ends. They are normally designed using a design speed in the upper range of Exhibit 10-56 (*AASHTO* Green Book). The absolute minimum should be the middle range design speeds.

A.55 – PARKWAYS

Parkways are defined as high-volume, high-capacity facilities that provide for regional mobility rather than local traffic movements. Direct access is limited. Parkways may have scenic easements that give the added attraction of native landscaping along these routes. Scenic easements may be located outside of the defined right of way.

Scenic corridors are intended to enhance the aesthetic qualities of the right of way corridor. All performance and safety requirements are to be retained.

A.55.01 Parkway Components.

The components of a parkway include:

- Landscaped median
- Vehicular travel lanes
- Bicycle lanes
- Pedestrian walkways/Shared-use paths
- Utility strips
- Parkway edge landscaping
- Trails
- Drainage structures**A.55.02 Right of Way Width.** The widths of the planned ultimate right of way for scenic corridors should conform to Standard Drawings A-11 thru A-13.

A.55.03 Access onto Right of Way. Access should be limited to half-mile and quarter-mile access points. Property owners not having frontage to these alignments should acquire cross property access agreements or access onto interior streets.

A.55.04 Median. A raised median should be included as shown in the standard drawings. The median should have concrete curb and gutter and should be landscaped with native vegetation at densities similar to the surrounding area.

A.55.05 Vehicular Travel Lanes. The ultimate planned section should contain a minimum of two (2) lanes in each direction. If fewer lanes are constructed prior to the planned ultimate cross section, the outer most lanes should be constructed first leaving an extra wide median that may be used for future expansion purposes. A two-lane divided roadway (one lane in each direction) requires a full safety shoulder in each direction of travel.

A.55.06 Travel Lane(s)-Horizontal Alignment and Curvature. Gradual shifts in the horizontal alignment off the true orthogonal grid are encouraged within the limits of traffic safety and right of way widths. Additional separation of alignment to preserve natural features is encouraged.

A.55.07 Bicycle and Shared-use Lanes. Bicycle lanes should be provided at the outer pavement edge for each direction of travel. Separate shared-use pathways may also be provided.

A.55.08 Pavement Edge (outer).

- Rural: No curb with a graded recovery shoulder. The recovery shoulder area should meet *AASHTO* guidance on clear zones. No fixed object of more than 4 inches in diameter including trees, power poles, and light poles may be located with in this recovery clear zone unless they are of an approved breakaway design. A graded shoulder should be provided with shrub planting no closer than 8 feet from edge of pavement and tree planting no closer than 15 feet from edge of pavement.
- Urban/suburban: Curb and gutter. All fixed objects (4 inches diameter or greater) should be located a minimum of 10 feet behind the face of curb unless otherwise permitted by applicable *AASHTO* guidance.

A.55.09 Sidewalks, Shared-use paths and Equestrian Trails.

- **Rural:** A gravel shared-use path not less than 10 feet in width should be installed along each side of the entire length of scenic corridors. The path should be separated from the vehicular travel lanes by a landscaped buffer not less than 10 feet in width. The path should meander gradually and return to the curb line at bus stops, intersections and driveways. Wherever possible, the path should be located within the scenic landscape setback and may require its own easement or share the planned trail easement where such easement exists.

- **Urban/suburban:** A concrete sidewalk/shared-use path not less than 10 feet in width should be installed along each side of the entire length of scenic corridors. The walk/path should be separated from the vehicular travel lanes by a landscaped buffer not less than 10 feet in width. The walk/path should meander gradually and return to the curb line at bus stops, intersections and driveways. Wherever possible the walk/path should be located within the scenic landscape setback and may require its own easement or share the planned trail easement where such easement is wide enough to be shared.

A.55.10 Utilities.

- All new utilities should be located underground.
- All existing utilities currently located above ground should be planned for future placement underground at the next period of upgrade.
- Re-vegetation with a balanced mixture of mature and smaller sizes of native plant materials including native trees (min. 5-gal.), shrubs (min. 1-gal.), and ground cover should be required to repair all scarring as a result of under-grounding and other similar construction that disturbs the shoulder area and or scenic setback. Scarring of rock formations or other natural features should be camouflaged.
- All abandoned and/or non-operational equipment should be removed from the right of way.
- Sending and/or receiving antennae and their related equipment (microwave, cellular, broadband, etc.) should not be allowed in the right of way of scenic corridors unless they are integrated into existing or required highway hardware and the surrounding landscape/hardscape setting.
- All utility cabinets, bollards, poles, power pedestals, valves, vaults, or other exposed apparatus should be installed plumb and square with the road alignment and logically arranged with other similar cabinets and hardware to facilitate screening. Any above grade appurtenance should be screened by landscape, decorative screening, a low wall, and/or painted to match the surrounding area or other finish as approved. (Exception: those items required for life safety or local fire code to be colored a specific color).
- The location of streetlights should focus on the intersections with minor collector streets or greater capacity designations or as required for specific safety reasons.
- The number of streetlights should be kept to the minimum required for highway safety purposes.
- All streetlights and other exterior lights should be full cutoff shielded. Care should be taken to reduce opportunities of unwanted direct glare.

- The use of low direct pedestrian scale lighting is encouraged in lieu of using the spillage of streetlights.
- Urban areas may have higher street lighting requirements than the rural areas in order to meet minimums standards. In all cases the lowest minimum standard for the related ambient light area should be used in designing street lighting.

A.55.11 Signs. Only transportation signage, scenic corridor markers, adopt-a-highway markers, city entry markers, and safety related signage should be allowed in the right of way. All signs should meet the standards for safety vision clearances.

A.55.12 Other Elements, Monuments, Markers-Architectural, Utilitarian or Artistic.

All other elements found in the right of way should be constructed from materials found in or made from the setting or interpret such materials in form texture and color. For rural areas, the method of assembling these materials should produce a result that appears to be an extension of the adjacent surroundings. A more contemporary interpretation may be used for the urban areas.

A.55.13 Landscape.

- Medians: Natural native pallet of trees, shrubs and ground covers at densities matching surrounding undisturbed (or previously undisturbed) area. Trees should be located in the center of the median.
- Off Shoulder Planting: Native trees, shrubs and ground covers at densities matching surrounding undisturbed area. Trees and boulder features should be located no closer than 15 feet from back of curb. Shrubs and ground cover no closer than 8 feet from the face of the curb. Safety requirements for sight/safety triangles must be met.

A.55.14 Drainage.

- Drainage improvements when required should be landscaped and constructed in a manner that replicates a natural waterway. Where bridged crossings are required, the design should consider clearances that allow wildlife to cross the road at a grade separation.
- Detention Basins should not be placed within the right of way, unless it is part of a regional drainage solution. In such cases, detention basins should be built to resemble a natural waterway and should not occupy more that 25 percent of any portion of back of curb area between vehicular accesses. All edges and basin bottoms should be revegetated to a native-like state.

- Channel improvements required to control channels as they cross the right of way and scenic setback or move collected runoff to major waterways should be rounded to blend with the natural form of the terrain and should be built to recreate a natural waterway.
- Bridges and Drainage Structures should be constructed with materials possessing color tones and textures of the adjacent area. Colors should be darker than the native soil. Smooth, reflective, metallic, streamlined structures, crisp tooled masonry, etc., should be avoided. Materials such as native stone, integrally colored shot Crete, etc., are suggested materials. Retaining walls for channel sides should not be greater than 4 feet in height. All surfaces disturbed by construction cuts should be treated. Re-vegetate all channel edges.
- Railings and all metal work related to drainage structures should be finished to blend in with surrounding landscape/hardscape setting.

A.55.15 Maintenance.

- Maintenance of all public elements within the right of way between curbs shall be as established by the department.
- Maintenance of privately owned items such as utility cabinets and related screening shall be the responsibility of the corresponding utility or agency.
- Maintenance of sidewalks, trails, shared-use paths, street signage, and transit facilities shall be as established by the department.
- Maintenance of the landscape plant materials directly adjacent to shared-use paths & trails shall be as established by the department.
- Maintenance of landscaping behind curbs, but adjacent to private property, should become the responsibility of the adjacent private property owner except as otherwise established by the department.

APPENDIX B - Hydraulics

APPENDIX B - Hydraulics

B.10 – HYDRAULIC CONSIDERATIONS

Appendix B begins with a general examination of various hydraulic terminology, computer aides and considerations and then moves into specific requirements and analysis for several technical aspects of hydraulic determinations.

B.10.01 Definitions Relating to Hydraulics

BASE FLOOD: The flood having a 1% chance of being exceeded in any given year, or a 100-year flood.

BASE FLOOD PLAIN: The area subject to flooding by the 100-year flood.

DESIGN FLOOD: The peak discharge, volume (if appropriate), stage, or wave crest elevation of the flood associated with the probability of exceedance selected for the design of a highway encroachment. By definition, the highway will not be inundated by the design flood.

ENCROACHMENT: A highway and/or appurtenant feature within the limits of a flood plain. Encroachments may be transverse or longitudinal. A transverse encroachment is one that crosses the flood plain, such as a highway bridge project. A longitudinal encroachment is one that extends along the flood plain, such as a highway project along a river.

FEMA: Federal Emergency Management Agency

FHBM: Flood Hazard Boundary Map

FIRM: Flood Insurance Rate Map

FREEBOARD: The vertical clearance of the lowest structural superstructure above the water surface elevation of the 50-year flood.

NATURAL AND BENEFICIAL FLOOD PLAIN VALUES: Including (but are not limited to) fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and groundwater discharge.

NFIP: National Flood Insurance Program

OVERTOPPING FLOOD: The flood described by the probability of exceedance and water surface elevation at which flow occurs over the highway, over the watershed divide, or through structures provided for emergency relief.

REGULATORY FLOODWAY: The flood plain area that is reserved in an open manner by federal, state, or local requirements, i.e., unconfined or unobstructed either horizontally or vertically, to provide for the discharge of the base flood so that the cumulative increase in water surface elevation is no more than a designed amount (not to exceed one foot as established by FEMA for administering the National Flood Insurance Program).

RISK: The consequence associated with the probability of flooding attributable to an encroachment. It shall include the potential for property loss and hazard to life during the service life of the highway.

RISK ANALYSIS: An economic comparison of a design alternative using expected total costs (construction costs plus risk costs) to determine the alternative with the least total expected cost to the public. It shall include probable flood-related costs during the service life of the facility for highway operation, maintenance, and repair for highway aggravated flood damage to other property and for additional or interrupted highway travel.

SCOUR REVIEW FLOOD: The overtopping flood or greatest flood drainage structures where overtopping is not practicable. The greatest flood used in the analysis is subject to a state-of-the-art capability to estimate the exceedance probability. This "greatest flood" shall be limited to a 500-year flood.

SIGNIFICANT ENCROACHMENT: A highway encroachment and any direct support of likely base flood plain development that would involve one or more of the following construction or flood-related impacts:

- A significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route.
- A significant risk.
- A significant adverse impact on natural and beneficial flood plain values.

SUPPORT BASE FLOOD PLAIN DEVELOPMENT: To encourage, allow, serve, or otherwise facilitate additional base flood plain development. Direct support results from an encroachment, while indirect support results from an action out of the base flood plain.

B.10.02 PC Programs. The following hydraulic programs are available in Roadway Design for use by the districts:

- HEC-RAS (River Analysis System)

Water surface program produced by the Corps of Engineers. This program should be used for all bridge and open channel hydraulics, bridge scour calculations, etc.

- HYDRAIN

A compilation of several hydraulic programs produced by a joint effort of several states including Idaho. The following programs are included:

- HYDRO

A command line hydrology program that uses the rational, U.S. Geological Survey Regression, and log-Pearson Type III methods to determine the peak flow for a site. This program also develops >n IDF curve for any location in the United States.

- NFF

A compilation of statewide regression equations.

- HYDRA

A command line gravity pipe network hydraulics program that can be used either to analyze an existing storm drain/sanitary sewer system or design a new system.

- HYCHL

A command line as well as an intersection program that assists in the analysis and design of roadside channels and riprap lining.

- WSPRO

A command line step backwater program for natural channels with an orientation to bridge constrictions.

- HY8

An interactive and user-friendly program for design of highway culverts, design of energy dissipators, storm hydrograph generation, and reservoir routing upstream of a culvert.

B.10.03 Scour, Riprap, and Stream Stability. Scour, riprap, and stream stability are discussed in the following references which can be found www.fhwa.dot.gov/engineering/hydraulics/library_listing.cfm

(Hydraulic Engineering - General Publications):

- Drainage Design III, Open Channels, ITD
- Hydraulic Analysis for the Location and Design of Bridges, Highway Drainage Guidelines, AASHTO
- HRE Highways in the River Environment
- HEC 11 Design of Riprap Revetment
- HEC 15 Design of Roadside Channels with Flexible Linings

- HEC 18 Evaluating Scour at Bridges
- HEC 20 Stream Stability at Highway Structures
- HEC 23 Bridge Scour and Storm Instability Countermeasures

B.10.04 Hydraulic Concept Studies. Collect available data on runoff, discharges, flood plains, and alternative highway locations from:

- Alternative highway alignment maps.
- National Flood Insurance Program maps.
- Previous highway drainage studies.
- High-water marks.
- USGS, COE, etc., report.
- Location of water courses.
- Drainage areas.
- Present and future land uses.

Determine runoff and discharges for waterway crossings on each alternative highway alignment from (determine for normal design flood and for 100-year flood):

- Existing studies.
- Computations.
- Determine 100-year flood plain from:
- Existing studies.
- National Flood Insurance Program maps.
- Computation of elevations and boundaries as necessary to assess risk.

B.10.05 Analysis of Highway Alternatives. Identify encroachments on all 100-year flood plains.

Identify impacts of alternative alignments on the 100-year flood plain:

- Environmental.
- Risk.
- Support flood plain development.
- If impacts are large, measures to minimize, restore, and preserve natural and beneficial flood plain values.

Identify National Flood Insurance Program status and constraints on flood plain encroachments (see following section).

Identify significant flood plain encroachments, as necessary. Determine size of drainage structure:

- A significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route.
- A significant risk.
- A significant adverse impact on natural and beneficial flood plain values.

Evaluate alternative alignments to avoid longitudinal and significant encroachments in 100-year flood plains.

Coordinate studies with federal, state, and local water resource/environmental agencies.

Through public hearing notices, advise the public of significant encroachments under consideration.

Identify all 100-year flood plain encroachments in public hearings.

B.10.06 Draft Environmental Document. Review issues raised through public involvement procedures. For projects being processed as a categorical exclusion, document results of any charters, studies, public involvement, etc., and should be included in the project records.

Present results of studies in draft environmental review documents:

- Include an exhibit that displays both the alternatives and the approximate 100-year flood plain, as appropriate. Data from FEMA maps must be used, if available.
- Summarize the results of the concept hydraulic studies for each alternative.
- Indicate the consistency with existing or proposed regulatory floodways and the appropriate coordination (see the following section).
- Discuss the practicability of alternatives to significant encroachments.

B.10.07 Final Environmental Document. Review issues raised through public involvement procedures. Reevaluate the alternatives on the basis of the comments received and the water resources concerns, including potential support of any incompatible flood plain development.

After selection of the preferred location alternative for the final environmental document, review the alignment to see if any further efforts can be made to minimize encroachments or

their impacts, considering input from the public and review agencies. Review the adequacy of hydrologic and hydraulic studies for assessment purposes, expanding them as necessary.

Prepare responses to the comments received. Meet with water resources agencies and the public, as necessary, to attempt to satisfy concerns.

Prepare a discussion of the flood plain impacts (including an "only practicable alternative finding," if appropriate, for significant encroachments).

Document the results of the preliminary hydraulic location studies and any commitments made in the environmental process. Make this information available to designers for use in further project development.

Make an "only practicable alternative finding" available to regional planning agencies.

B.10.08 Design Studies. Obtain the alignment and profile of the selected alternative. Review commitments made in environmental documents and document constraints. Review National Flood Insurance Program maps and flood plain zoning at www.fema.gov/ Prepare the hydrologic analyses for the project and for specific appropriate sites. List the available flood-frequency records, flood studies, etc.

- Evaluate the potential for changes in watershed characteristics that would change magnitude of flood peaks, e.g., urbanization, channelization, etc.
- Plot the flood-frequency curve.
- Determine the distribution of flood and velocities for several discharges or stages in the natural channel for existing conditions.
- Plot the stage-discharge-frequency curve.

Determine the need for a site map, which is used for estimating flood flow distribution, selecting cross sections of a stream, showing locations of the proposed encroachment and structure(s), and indicating the existing features (stream controls, encroachments, development and highway structures, etc.)

- Specially prepared map showing contours, vegetation, and improvements.
- In some cases, cross sections normal to flood flow are acceptable in lieu of a map. Determine the number of sections necessary.

Use survey data to select encroachments to review in the field and initiate a survey data report that includes the following:

- Photographs (showing existing structures, past floods, main channel, and flood plain) to document existing conditions and to use in assigning resistance values.

- Comments on drift, ice, nature of streambed, bank stability, bend meanders, vegetation cover, and land use.
- Factors affecting water stages, such as high water from other streams, reservoirs (existing or proposed and approximate date of construction), flood control projects (give status), and other controls.
- Locations and elevations of high-water marks along stream, giving dates of occurrence.
- The relative importance and/or value of the adjacent property and, where appropriate, a list of facilities susceptible to flooding and first-flood elevations.
- Features that are constraints to modifying the upstream water surface elevation.
- The evaluation of the need for riprap and/or scour protection, including the need for spur dikes, energy dissipaters, countermeasures, etc.
- The location of existing structures (including relief or overflow structures) with respect to the proposed crossing or encroachment (upstream, downstream, as well as the existing roadway) and describe each fully, giving the:
    - Type, including span lengths and number of spans, bent design, pier orientation, culvert size, and number of cells.
    - Foundation type (spread footing, piling. etc.) and depth.
    - Scour history at abutments, bents, culvert outlets; headcutting; and stream aggradation and degradation.
    - Cross section beneath structures, noting clearance to superstructure and skew with direction of the current during extreme floods (add to the survey party instructions).
    - Flood history, high-water marks (dates and elevation), nature of flooding (including overtopping), damages, and sources of information.
    - Damage from abrasion, corrosion, wing wall failure, and culvert end failure.
- Site map preparation.

A field review should be performed by the designer to review all the locations that will require drainage structures.

B.10.09 Hydraulic Analyses. For each encroachment, determine the appropriate method for studying the design alternatives: mathematical model, physical model, or both.

Rate the capacity of the existing features and, if necessary, adjust the stage-discharge-frequency relationship.

Prepare the design of the bridge waterways:

- Identify the features that are constraints to modifying the upstream water surface elevation:
  - Land use.
  - Development.
  - Watershed divides.
  - Flood plain values, e.g., wetlands, etc.
- Determine the navigation requirements and evaluate the need for channel modifications and controls.
- Compute the backwater for various bridge lengths, approach profiles, and discharges:
  - Review the flow distribution and consider the need for auxiliary structures.
  - Plot the data as a family of curves on the stage-discharge-frequency curve developed for the existing conditions.
- Design the encroachments using minimum criteria and evaluate and document the risks.
- Calculate the contraction scour and scour depth at piers. Attach copy of HEC-RAS scour analysis report.
- Do not calculate bridge abutment scour. Calculate appropriate riprap size, blanket thickness for detail to protect bridge abutments, and attach to the Hydraulic Report.
- Design the embankment, bank, and channel protection and scour attenuation devices, if required. Investigate the need for the design spur dikes.

Prepare the design culverts:

- Identify the features that are constraints on headwater elevation and highway profile.
- Evaluate the abrasion and corrosion potential (see Figure 6-2):

    - Eliminate from consideration the materials that will give unsatisfactory service life.
    - Choose the protective measures.
- Compute and plot the performance curves for trial culvert sizes.
- Evaluate the need and provisions for fish passage.
- Select the culvert design:
    - Design encroachments using minimum criteria.
    - Evaluate and document risks.
- Determine the hydraulically equivalent sizes for bid alternatives.
- Evaluate the need and design for debris control.
- Evaluate the need and design for outlet protection.
- Investigate the need and design for protection against failure by buoyancy and/or by separation at joints.

Prepare the design of longitudinal encroachments. Determine the navigation requirements and evaluate the need for channel modifications and controls:

- Determine the effect of the proposed encroachment on water-surface profiles using various roadway profile alternatives.
- Design the encroachments using minimum criteria and evaluate and document the risks.
- Evaluate the effects on scour and deposition in channel and tributaries.
- Design the embankment, bank, and channel protection.

B.10.10 Documentation. Show the final layout of encroachments in the plan and profile, including the magnitude, elevation, and exceedance probability of the scour review flood and the base flood, if appropriate (the overtopping flood for interstate mainlines shall not be less than the 50-year flood).

Complete project files should include:

- Hydrologic and hydraulic data and design computations.
- As appropriate, information on:
    - The need for emergency supply and evaluation routes.
    - Hydraulic controls that affect the proposed drainage structure.

- Constraints imposed by requirements for highway geometrics.
- Navigation requirements.
- Channel modification.
- Effects on stream stability.
- Effects on stream ecology.
- The need for stream controls to protect highway.
- The need and provisions for fish passage.
- Consistency with the National Flood Insurance Program.

HYDRAULICS REPORT OUTLINE

A. Existing Structure
Vicinity sketch
Problems and adverse conditions
a. Scour
Stream stability
Photos - Aerial (if available) and ground
Hydrology
a. Floods
Design - 50-year
Flood insurance consistency - 100-year
Scour design - 100-year
Scour review - Lesser of overtopping or 500-year
b. Methods
Gage data - 20 years of records or more, including a log-Pearson printout
Four U.S. Geological Survey methods, including data
Hydraulics

B. Proposed Structure
Hydraulics - Include calculations or computer printout
Problems and adverse conditions - Solutions
Information (as appropriate) on:
a. Hydraulic controls that affect the proposed structure
b. Channel modification
c. Effects on stream stability
d. Need and provisions for fish passage
e. Navigation requirements
f. Need for stream controls to protect highway
Such as guide banks or trash racks
g. Constraints imposed by highway geometrics
h. Effects on stream ecology
i. Need for emergency supply and evacuation routes

C. Evaluate Scour Data and Need for Riprap at Piers and Abutments
Show typical section, size and toe detail
Show placement

D. Site Map With Contours

E. Cross Sections

F. Permit Status and Consistency With Flood Insurance Requirements

G. ITD 210, Hydraulic Structures Survey
Clearance

B.10.11 Deck Drainage. Slotted drains and embankment protectors can be used to intercept runoff at each end of a bridge. The length of the slotted drain or embankment protector can be determined from Figure 6-1 in Section 600.

The slotted drain or embankment protector lengths for super elevated roadways not covered in this table can be determined from the following equation:

$$L_T = 0.6\ Q^{0.42} S^{0.3} (1/nSx)^{0.6}$$

where

L_T = Length of slotted inlet required to intercept 100% of the gutter flow in feet

Q = Discharge in cfs

n = Mannings n value of pavement (typically 0.016)

Sx = Cross slope of pavement in feet per foot

Slotted drains should terminate in a standard catch basin with a facility for removing sand (Standard Drawing D-1-B).

References:

1. Urban Drainage Design Manual, HEC-22 FHWA-SA-96-078
2. Design of Bridge Deck Drainage, HEC-21 FHWA-SA-92-010

B.10.12 Culvert Design Guide. Determine the design discharges for the proposed culvert using Water Resources Investigations report 02-4170, "*Estimating the Magnitude of Peak Flows at Slected Recurrence Intervals for Streams in Idaho*". (Appendix B.40.01) A computerized application for this publication is currently available on the USGS interactive website,

http://water.usgs.gov/osw/streamstats/idaho.html

Establish the stage discharge diagram for tailwater from the cross section of stream and slope. Use the HY-8 orthe Mannings Equation.

Determine the length of the slope and allowable headwater depth from the field data.

Determine the headwater from HY-8. Repeat the process for various sizes.

Establish the stage discharge curve for the culvert, if necessary.

Check the minimum freeboard and determine the outlet velocity from HY-8

Determine the need for outlet protection, FHWA, HY-8 Culvert Design Program, HEC-11 (pp. 11-6), HEC 14, and previous experience.

Determine the height and type of fill material, culvert material, required gage, if applicable, and other pertinent data.

Check for the existing culvert at the same station or near the station.

Talk with landowners and maintenance crews for problems, flooding, and over-the-ramp floods.

List the final determination on the Pipe Culvert Summary.

B.10.13 Head Determinations.

Allowable Headwater

The allowable headwater is the difference in elevation above the inlet invert that water is allowed to rise in order to allow a given amount of water to flow through a culvert.

Drift and Ice

Trash racks can be installed in the event of unusual drift problems. However, they require periodic maintenance and should only be used where necessary. Highway Engineering Circular No. 9, Debris Control Structures, by the FHWA contains several designs for trash racks.

Minimum Freeboard To Subgrade

The allowable headwater (AHW) should not exceed the total head minus a freeboard of two feet to the bottom of the subgrade elevation. **(Subgrade elevation is interpreted to be the bottom of the aggregate base course.)** However, if the top of the pipe is less than 2.0' below subgrade, then the allowable headwater shall not exceed the pipe diameter.(top of pipe)

Embankment Material - Entrance Erosion

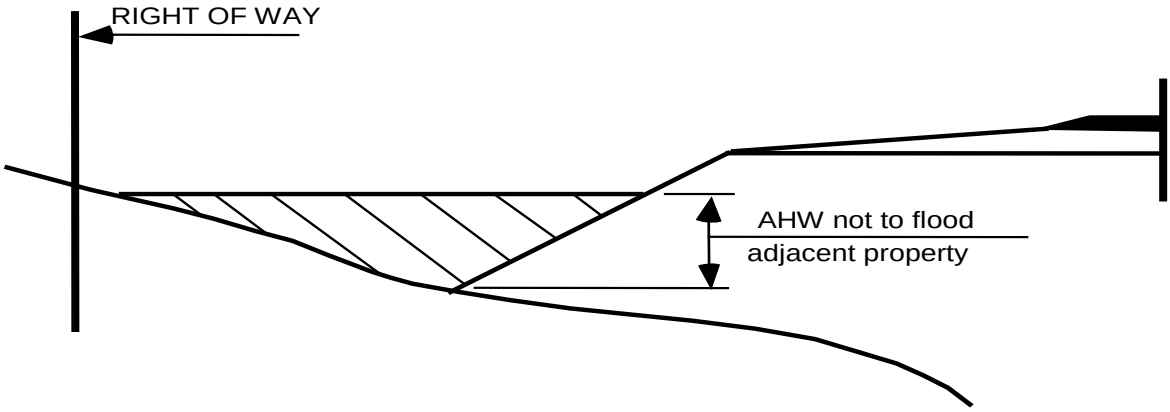
Depending on the embankment material used, headwater at pipe entrances can cause erosion. Additional head may reduce cost of installation if a smaller pipe diameter can be used. This savings is lost, however, if expensive erosion protection at the entrance must be provided. A brief economic analysis will give the desired solution.

Backwater on Adjacent Property

The allowable headwater shall not cause backwater of the design storm to accumulate beyond the right-of-way.

Where additional headwater would result in savings of pipe diameter, the price of purchasing additional right-of-way should be compared to the possible savings of installation costs. In cases where adjacent properties consist of low value land, the extra right-of-way cost may well be less than larger pipe sizes. (See Figure B-1).

Figure B-1



B.20 – FLOOD PLAIN ENCROACHMENT

B.20.01 National Flood Insurance Program Constraints on Flood Plains. The National Flood Insurance Program (NFIP) was initiated to reduce future and recurring damages due to flooding. Every community located in a flood hazard area has the opportunity to participate in the program. The program makes subsidized flood insurance available to property owners at reasonable rates. A condition of participation is that each community must pass and enforce ordinances to control development in 100-year flood plains.

Every highway encroachment in an NFIP-identified 100-year flood plain must be located and designed to be consistent with ordinances that are passed to qualify a community for the NFIP. If this is not done, the affected community's participation in the program (subsidized insurance) is jeopardized.

A Floodplain Development Permit must be obtained from the community (city or county) for any encroachment in a 100-year floodplain. The floodplain development permit should accompany the ITD-210, Hydraulic Report submittal. If the community does not use a formal permit form, a letter from the community's Floodplain Ordinance Administrator approving the encroachment is acceptable. If the district is forwarding a consultant design, make sure the consultant has obtained the permit or letter before forwarding to Roadway Design.

If the encroachment is in the regulatory floodway, the new structure or replacement structure cannot increase the water surface elevation unless a Letter of Map Revision (LOMR) is processed through the Federal Emergency Management Agency (FEMA). A computer analysis may or may not be needed to verify this. Check with Hydraulics Engineer if a regulatory floodway is involved. Each community has a set of Flood Insurance Rate Maps (FIRM), Floodway Maps and Flood Insurance Studies (FIS) for use in making these determinations.

Any proposed encroachment in a 100-year flood plain must be evaluated to determine the NFIP status of the area and the constraints on encroachments. The following items are the various situations with corresponding constraints that will occur in a community participating in the NFIP. (Replacement of an existing bridge will be consistent with the NFIP if the waterway under the new bridge is equal to or greater than that of the existing bridge and no additional encroachment in the regulatory floodway is involved.)

1. A "Regulatory Floodway" Has Been Established (see FEMA maps, which are available from the Local jurisdiction (City or County)

    a. An encroachment is consistent with the regulatory floodway if the regulatory floodway is spanned in both vertical and horizontal dimensions – that is, there are no encroachments into the regulatory floodway.

    b. An encroachment can be consistent with the regulatory floodway if the only regulatory floodway encroachment is by bridge piers. Hydraulic calculations may show that the piers have no discernible effect and, if so, no compensation would be required. Channel or other improvements at the structure may be necessary to compensate for the pier encroachment.

    c. An encroachment can be made consistent with the "regulatory floodway" by revising the regulatory floodway. Many regulatory floodways and flood plains were delineated without sufficient detail to accurately define their boundaries. Therefore, it may be prudent and cost effective to revise the floodway rather than meet the requirement of 1.a. or 1.b. A regulatory floodway may be revised by moving it horizontally. However, the following criteria will apply:

        (1) Backwater cannot be increased – that is, the elevation of the top of regulatory floodway (the water surface profile published in the flood insurance study) cannot be raised above the 1.0 foot maximum.

        (2) The community and FEMA must agree to revision of the regulatory floodway.

    d. When it is "demonstrably inappropriate" to design an encroachment to fit under 1.a., 1.b., or 1.c., an alternative regulatory floodway with increased backwater may be approved. However, this option should be considered only as a last resort.

    e. For any of the above situations, encroachments in the flood fringe area are consistent with the NFIP. However, buildings constructed in the 100-

year flood plain must be flood-proofed so the 100-year flood will not damage them.

2. A "Regulatory Floodway" Has Not Been Established (see FEMA maps)

   a. In a flood plain shown on a Flood Insurance Rate Map (FIRM), where no regulatory floodway has been designated, highway encroachments should be designed to allow no more than a 1-foot increase in the base flood elevation based on technical data.

   b. In a flood plain shown on a Flood Hazard Boundary Map, where no regulatory floodway has been designated, highway encroachments should be designed to allow no more than a 1-foot increase in the base flood elevation based on technical data.

   c. In a flood plain shown on a FIRM, where no regulatory floodway has been designated, highway encroachments causing less than 1 foot of backwater for the delineated 100-year flood surface are acceptable.

3. Encroachment of Highway on Floodway

Where it is not cost effective to design a highway crossing to avoid encroachment on an established floodway, a second alternative would be a modification of the floodway itself. Often, the community will be willing to accept an alternative floodway configuration to accommodate a proposed crossing provided NFIP limitations on increases in the base flood elevation are not exceeded. This approach is useful where the highway crossing does not cause more than 1 foot rise in the base flood elevation. In some cases, it may be possible to enlarge the floodway or otherwise increase conveyance in the floodway above and below the crossing in order to allow greater encroachment. Such planning is best accomplished when the floodway is first established. However, where the community is willing to amend an established floodway to support this option, the floodway may be revised.

The responsibility for demonstrating that an alternative floodway configuration meets NFIP requirements rests with the community. However, this responsibility may be borne by the agency proposing to construct the highway crossing. Floodway revisions must be based on the hydraulic model that was used to develop the currently effective floodway but updated to reflect existing encroachment conditions. This will allow determination of

the increase in the base flood elevation that has been caused by encroachments since the original floodway was established.

Alternate floodway configuration may then be analyzed. Base flood elevation increases are referenced to the profile obtained for existing conditions when the floodway was first established.

Data submitted to FEMA in support of a floodway revision request should include the following:

a. Copy of the current regulatory Flood Boundary Floodway Map showing existing conditions, proposed highway crossing, and revised floodway limits.

b. Copy of computer printouts (input, computation, and output) for the current 100-year model and current 100-year floodway model.

c. Copy of computer printouts (input, computation, and output) for the revised 100-year floodway model. Any fill or development that has occurred in the existing flood fringe area must be incorporated into the revised 100-year floodway model.

d. Copy of the engineering certification is required for work performed by private subcontractors.

The revised and current computer data required above should extend far enough upstream and downstream of the floodway revision area in order to tie back into the original floodway and profiles using sound hydraulic engineering practices. This distance will vary depending on the magnitude of the requested floodway and the hydraulic characteristics of the stream.

A floodway revision will not be acceptable if development that has occurred in the existing flood fringe area since the adoption of the community's floodway ordinance will now be located within the revised floodway area unless adversely affected adjacent property owners are compensated for the loss.

If the input data representing the original hydraulic model are unavailable, an approximation should be developed. A new model should be made using the original cross section topographic information, where possible, and the discharges contained in the Flood Insurance Study that establish the original floodway. The model should then be run confining the effective flow area to the currently established floodway and calibrated to reproduce, within 0.10 foot, the "With Floodway" elevations provided in the Floodway Data Table for the current floodway. Floodway revisions may then be evaluated using the procedures outlined above.

4. Floodway Encroachment Where Demonstrably Appropriate

When it would be demonstrably inappropriate to design a highway crossing to avoid encroachment on the floodway and where the floodway cannot be modified such that the structure could be excluded, FEMA will approve an alternate floodway with backwater in excess of the one foot maximum only when the following conditions have been met:

a. A Hydraulic Report has been prepared and FHWA finds the encroachment is the only practicable alternative.

b. The constructing agency has made appropriate arrangements with the affected property owners and the community to obtain flood easements or otherwise compensate them for future flood losses due to the effects of the structure.

c. The constructing agency has made appropriate arrangements to ensure that the National Flood Insurance Program and Flood Insurance Fund do not incur any liability for additional future flood losses to existing structures that are insured under the program and grandfathered in under the risk status existing prior to the construction of the structure.

d. Prior to initiating construction, the constructing agency provides FEMA with revised flood profiles, floodway and flood plain mapping, and background technical data necessary for FEMA to issue revised Flood Insurance Rate Maps and Flood Boundary and Floodway Maps for the affected area upon completion of the structure.

5. Flood Plain Encroachment

   Floodplain Development Permit must be obtained from the community (city or county) for any encroachment in a 100-year floodplain, and accompany the ITD-210/Hydraulic Report submittal.

6. Temporary Construction

Temporary construction, such as forms, coffer dams, retaining walls, etc., within a Regulatory Floodway must be approved by the local government. The rise in water surface elevation must be limited to 0.2 to 0.3 foot. The construction should be scheduled so all restrictions will be removed by November 1, if possible.

Temporary crossings are considered as temporary construction and can only be left in for 12 months. The floodway must be revised according to FEMA regulations (www.fema.gov) if the crossing is left in more than 12 months (see Figure B-3).

Figure B-2

U.S. Department of Transportation
Federal Highway Administration

Memorandum

Room 312 Mohawk Building
708 S.W. Third Avenue
Portland, Oregon 97204

Subject: Temporary Construction In Floodways

Date: August 10, 1989

530

FEMA - IDAHO DIVISION
AUG 14 1989

	DIV ADMIN		AREA ENGR 1
	DA SEC		AREA ENGR 2
	ASST DIV AD		AREA ENGR 3
	HEAD OPS		ASST DR ENG
	PLANNER		DMC
	PROP OFF		SI 1
	FIN MGR		SI 2
	FIN SP		SI 3
	FISCAL CLK		DMCS SEC
	FILE		

From: J. P. Clark
Deputy Regional Administrator

Reply to Attn of: HST-010.3
File: 530.5

To: DIVISION ADMINISTRATORS
Mr. R. E. Ruby, Juneau, Alaska (HBR-AK)
Mr. J. T. Coe, Boise, Idaho (HFO-ID)
Mr. D. E. Wilken, Salem, Oregon (HBR-OR)
Mr. B. F. Morehead, Olympia, Washington (HBR-WA)

and Mr. J. N. Hall, Division Engineer
Western Federal Lands Highway Division (HDF-17.221)
Vancouver, Washington

Due to a recent inquiry from the Idaho Division, we requested that FEMA provide us with some guidance regarding temporary construction practices and also temporary crossings in regulatory floodways. Attached is their regional response which was also sent to their Headquarters Office for confirmation.

To summarize, strict interpretations of FEMA's regulations makes no allowances for temporary structures. They are handled the same as permanent structures, i.e., if cofferdams or falsework, etc., creates more than the allowable amount of backwater, floodway and ensuing map revisions are required. However, FEMA does provide some latitude when temporary construction or structures are considered. They feel that the only reasonable course of action is to have the local government permit the final structure design regardless of the shape or timing of the temporary construction practice. Otherwise, there would be lengthy delays while map revisions were made for the temporary structures and then again when the falsework, etc., was removed and the final structure was in place. It is this offices opinion that the FEMA policy is reasonable and prudent.

Additionally, we concur with FEMA's recommendations that preliminary calculations should be made by the constructing agency to assure that the backwater effects created by the temporary structure or construction is within tolerable limits; a 0.2' or 0.3' rise. Also, if at all possible, construction practices should occur during low flow months; June 1 through October 31. Finally, it is FEMA's opinion that any increased flooding caused by temporary construction is the responsibility of constructing agency. Therefore, it is recommended that the policies stated in their August 3, 1989 letter be strictly followed.

If further guidance is provided by FEMA's Headquarters office, I will be sure to forward it on to you. Also, if you have any comments or questions, please call.

Christopher N. Dunn, P.E.
Hydraulic Engineer

Attachment

B.30 – TECHNICAL DATA

B.30.01 Small Areas Nomograph. Tables and nomographs of Figures B-3 and B-5 and the following information can be used to determine the design discharge for small areas.

The nomograph gives maximum discharge for both snowmelt and thunderstorm runoff. Runoff is figured for both cases and the higher discharge is used.

B.30.02 Thunderstorm Runoff. The following information must be obtained (the first three factors can be determined from aerial photos and contour maps, the fourth factor can be determined from the map on the nomograph, and the fifth factor can be determined from Figure B-3):

1. Elevation drop in the drainage (H).
2. Length of the drainage (L).
3. Area of the drainage (A).
4. Design storm area classification (Area I, II, or III).
5. Runoff factor (Kt).

B.30.03 Snowmelt Runoff. The following information must be obtained:

1. Snowmelt zone (Zone A, B or C).
2. Area of drainage (A).
3. Runoff factor (Kt).

The snowmelt zone is determined from Figure B-4, the area of drainage is determined from aerial photos and contour maps, and the runoff factor is determined from the following information:

1. Runoff factors (snowmelt).
2. Assume the basic runoff factor for snowmelt to be 55 percent.

Figure B-3

RUNOFF FACTORS

THUNDERSTORMS

FINAL Q VALUES FROM NOMOGRAPH WILL BE CONVERTED FROM CU. FT./SECOND TO CU. METERS/SECOND

TABLE FOR RUNOFF VALUES - Kb

Vegetative Ground Cover	"Vegetative ground cover" = Area of leaves, needles / Area of ground	Average side slopes 0%	25%	50%	75%	100%
200%		5	10	20	30	40
150%		10	20	30	40	50
100%		17	30	40	50	60
50%		22	35	50	60	70
10%		27	39	52	62	78
0%		30	40	55	67	80

Ex: Closed stand of timber 200%
Pasture land 75-150%
Cheat Grass 15-50%
Sagebrush 20-60%
Wheat field 0-50%

Modification for infiltration:

Granular - Cohesionless soils	0.5 - 0.7
Silt, loam	0.9 - 1.1
"Heavy" soils, clay	1.3 - 1.5

Example: Ground cover is cheat grass, with average side slopes of 50% and the soil type is loam 50% vegetative ground cover and 50% side slope gives a Kb of 50 from the table. Modification for infiltration 1 (for loam). Kb is equal to 50.

Example: (Thunderstorm) See figures 456-03

A culvert site in Area 7 is 4,500 ft. downstream and 700 ft. lower than the most remote point on the watershed. The tributary basin has an area of 500 acres, and the average ratio of runoff to precipitation (Kt) is found to be 15% as shown on Nomograph. The line passes through Il = 700 ft., L = 4,500 ft., I = 1.9., A = 500 ac., P = 1000., Xt = 15 and results in Q = 140 Cu. Ft./Second.

Figure B-4

Figure D-4

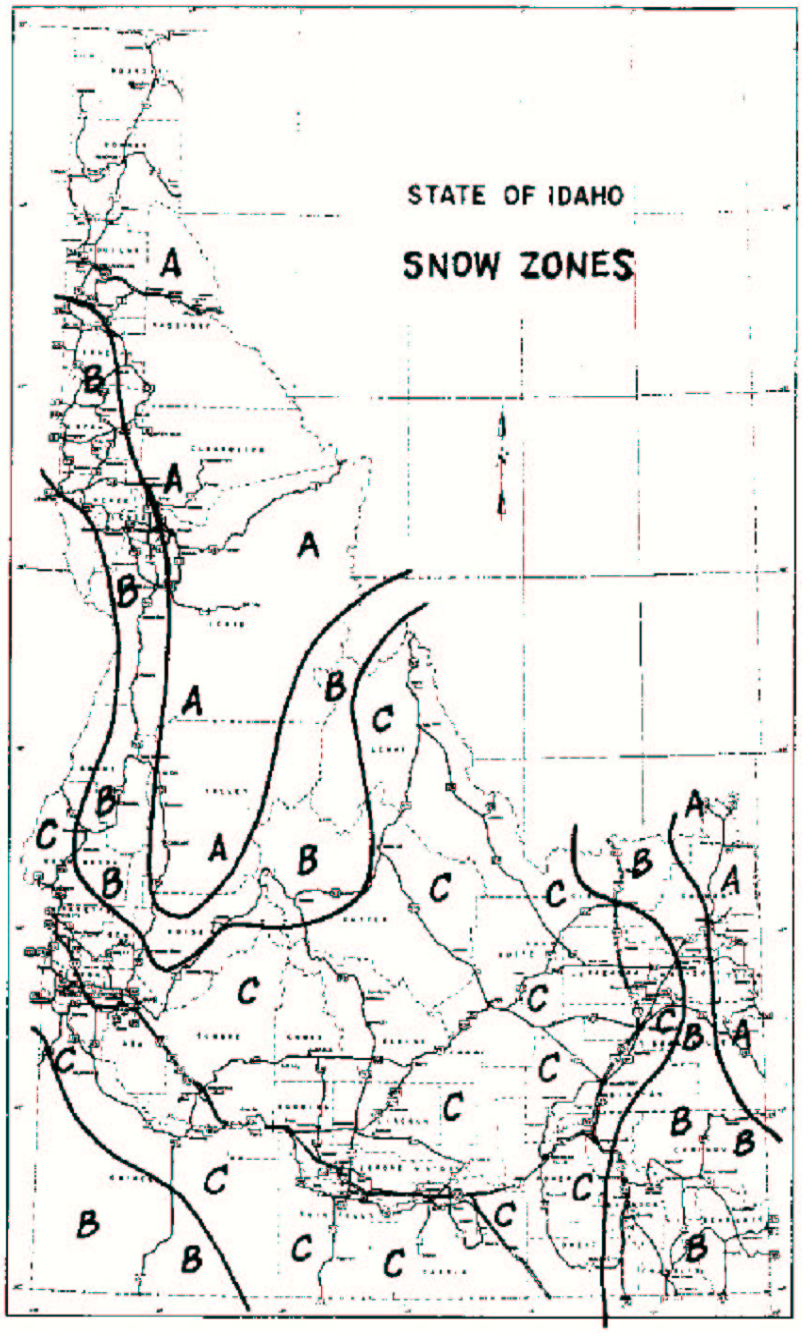
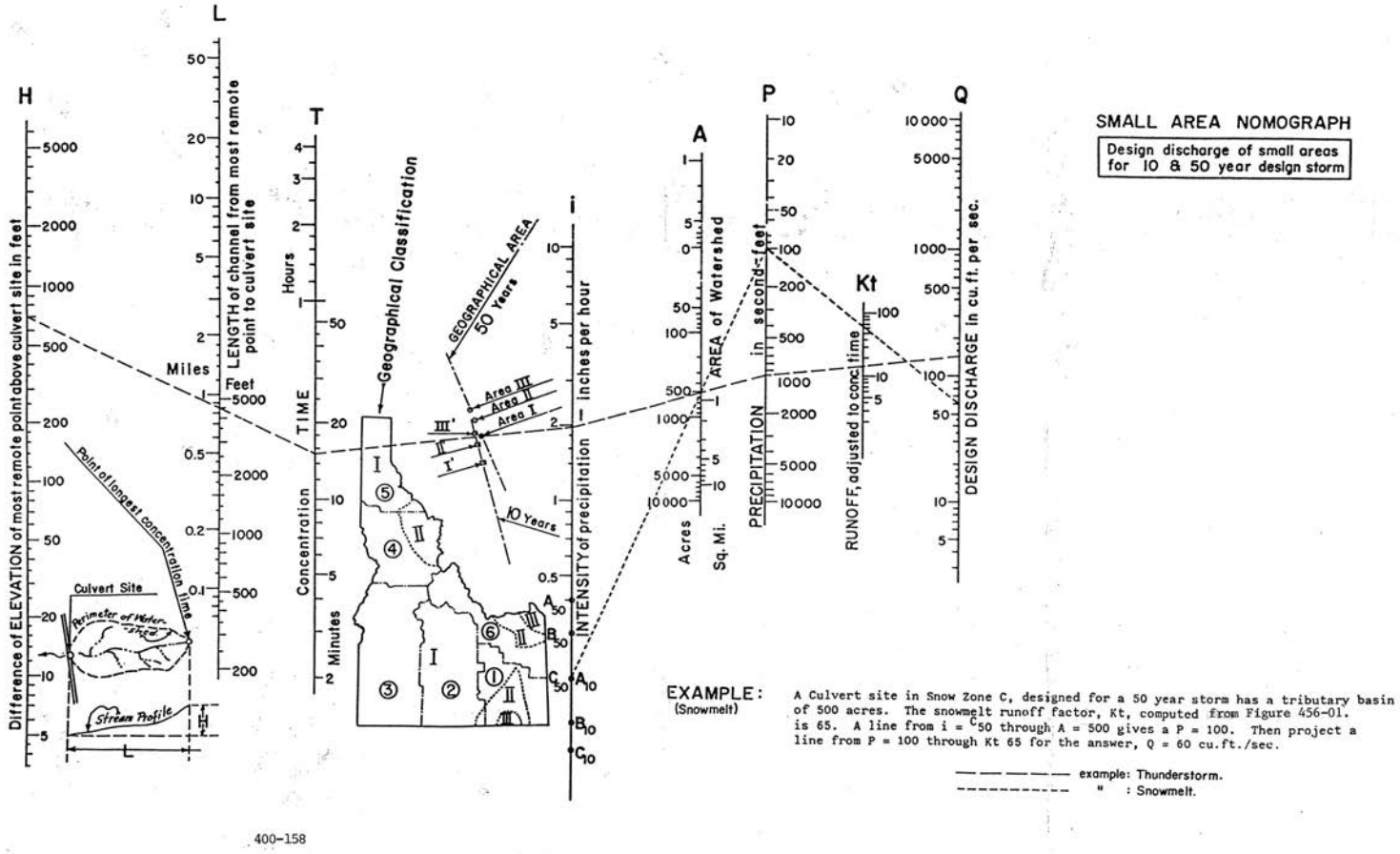


Figure B-5

Figure 456-03



B.30.04 Discharge Determination.

Step One: Determine:

- Exposure of watershed, e.g., NE.
- Vegetative ground cover of watershed (see Figure B-3).
- Area of watershed.

Step Two: Add to the basic runoff factor the following amounts, depending on average exposure, as follows:

- N 0%
- NE, NW 2%
- E, W 4%
- SE, SW 6%
- S 8%

Step Three: Add the following amounts depending on vegetative ground cover, as follows:

- 200% 0%
- 150% 4%
- 50% 8%
- 0% 12%

> Use weighed averages if distribution is uneven.

Step Four: Add the following amounts depending on the area of the watershed, as follows:

- 0 - 2 square miles 10
- 2 - 5 square miles 6
- 5 - 8 square miles 3
- over 8 square miles 0

Example: A NW exposed watershed with average vegetative ground cover of 120 percent contains 6.5 square miles.

Runoff factor (K_t) is 55 + 2 + 5 + 3 = 65

B.30.05 Snowmelt Zones. Very little is known of the rate of snowmelt throughout Idaho. Before snow can melt, heat has to be transferred from the atmosphere or the soil into the snow layers. The laws governing this heat exchange are rather complex. Snow melts rapidly when air temperatures and wind velocities are high.

Idaho has been divided into three different snowmelt zones. Again, this information is used when computing snowmelt runoff by the "Small Area Nomograph" method. Figure B-4 shows the location of these three snowmelt zones.

B.30.06 Flood Type Zones. Major streams in Idaho have their peak discharge in winter or spring. These high discharges are caused by snowmelt or a combination of rain and snowmelt. When analyzed, the cause of high discharges for small watersheds, particularly in southern Idaho, have their maximum runoff in summer as a result of convective storms.

In some isolated areas, drainage problems exist not so much because of the high discharges but because the terrain is so flat that water simply cannot get away fast enough.

Finally, in other areas of Idaho, drainage problems are directly related to the flow of irrigation and irrigation-drainage water. Figure B-6 shows various causes for floods in small watersheds. This map does not show all the details, but the designer can use it to determine the principal causes of floods in the immediate area of a project.

B.30.07 Basic Data. Based on U.S. Weather Bureau records, Idaho has been divided into different intensity-duration-frequency (IDF) zones. The map in Figure B-7 shows the different areas. The graphs (nine pages) in Figure B-8 give IDF information for each zone.

When using these graphs, it must be kept in mind that the data from which they are drawn are sporadic and much more information is needed for short-duration storms in order to arrive at more definitive answers. These graphs provide various rainfall intensities depending upon the length of the storm and the return period.

IDF curves were used as a basis for the Small Area Nomograph (Figure B-5) for runoff based on precipitation.

Figure B-6

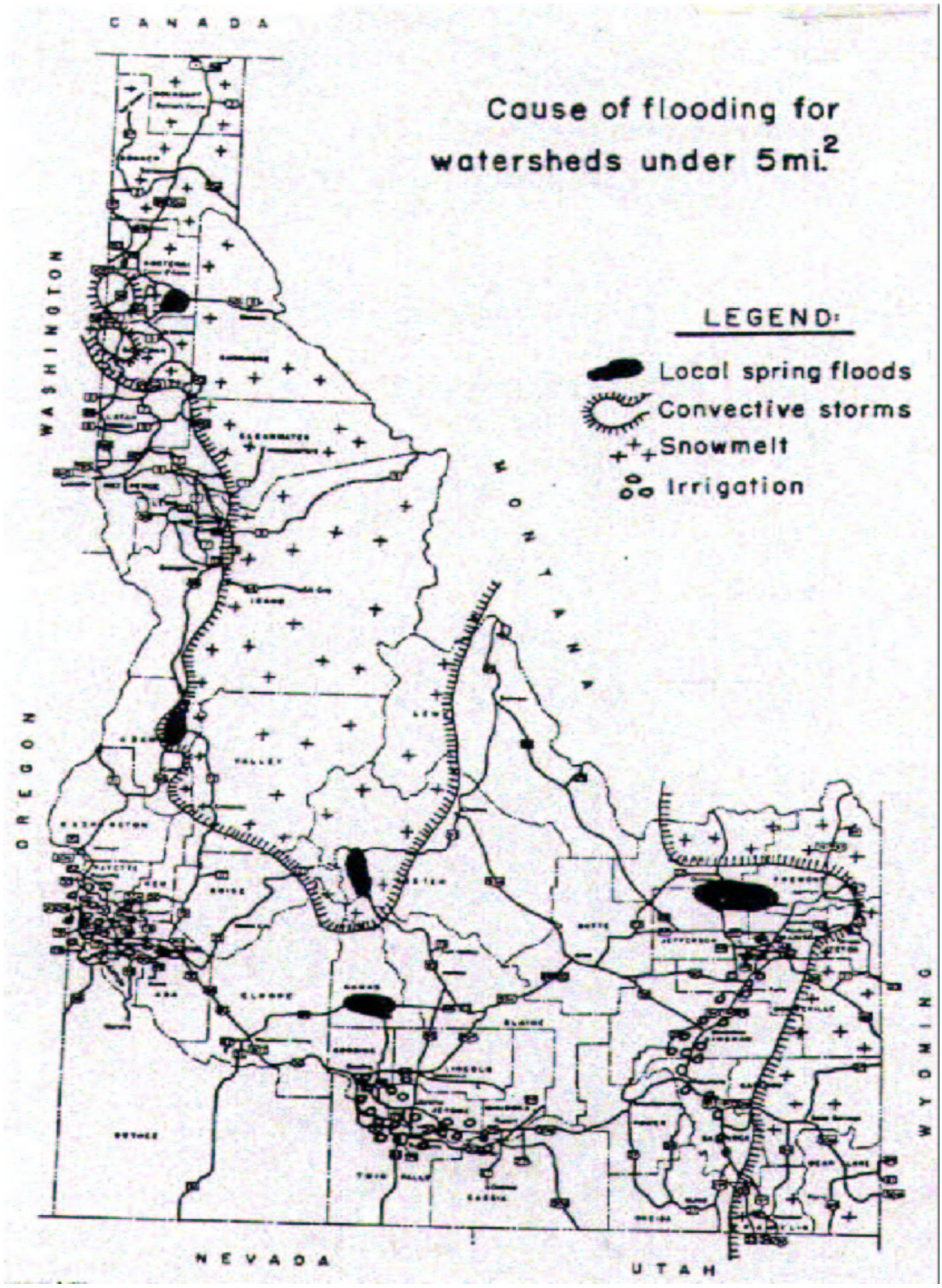

CANADA
Cause of flooding for watersheds under 5mi.²
LEGEND:
Local spring floods
Convective storms
Snowmelt
Irrigation
WASHINGTON
OREGON
NEVADA
UTAH
WYOMING

Figure B-7

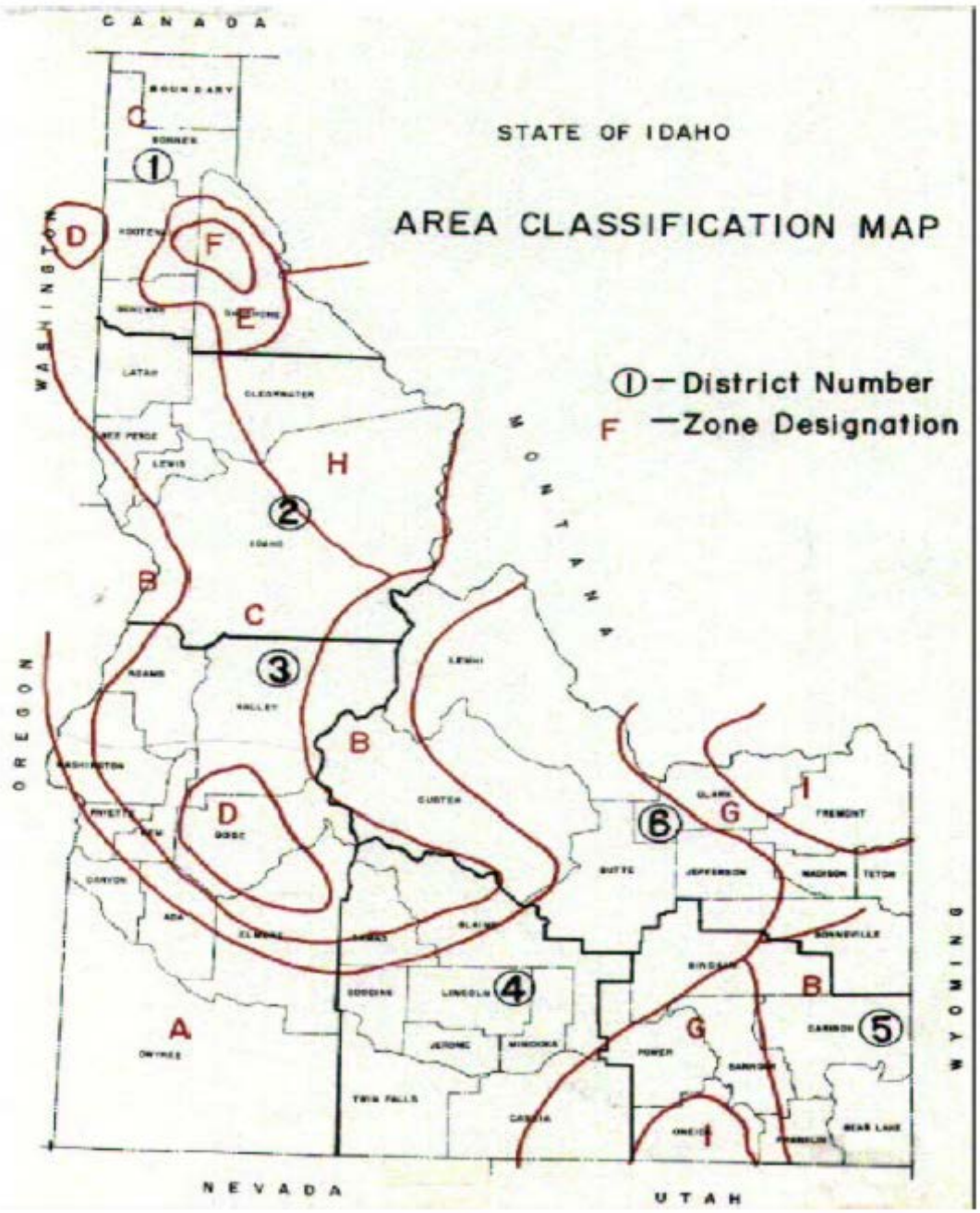

CANADA
STATE OF IDAHO
AREA CLASSIFICATION MAP
①—District Number
F —Zone Designation
WASHINGTON
OREGON
NEVADA
UTAH
WYOMING

Figure B-8
Sheet 1 of 9

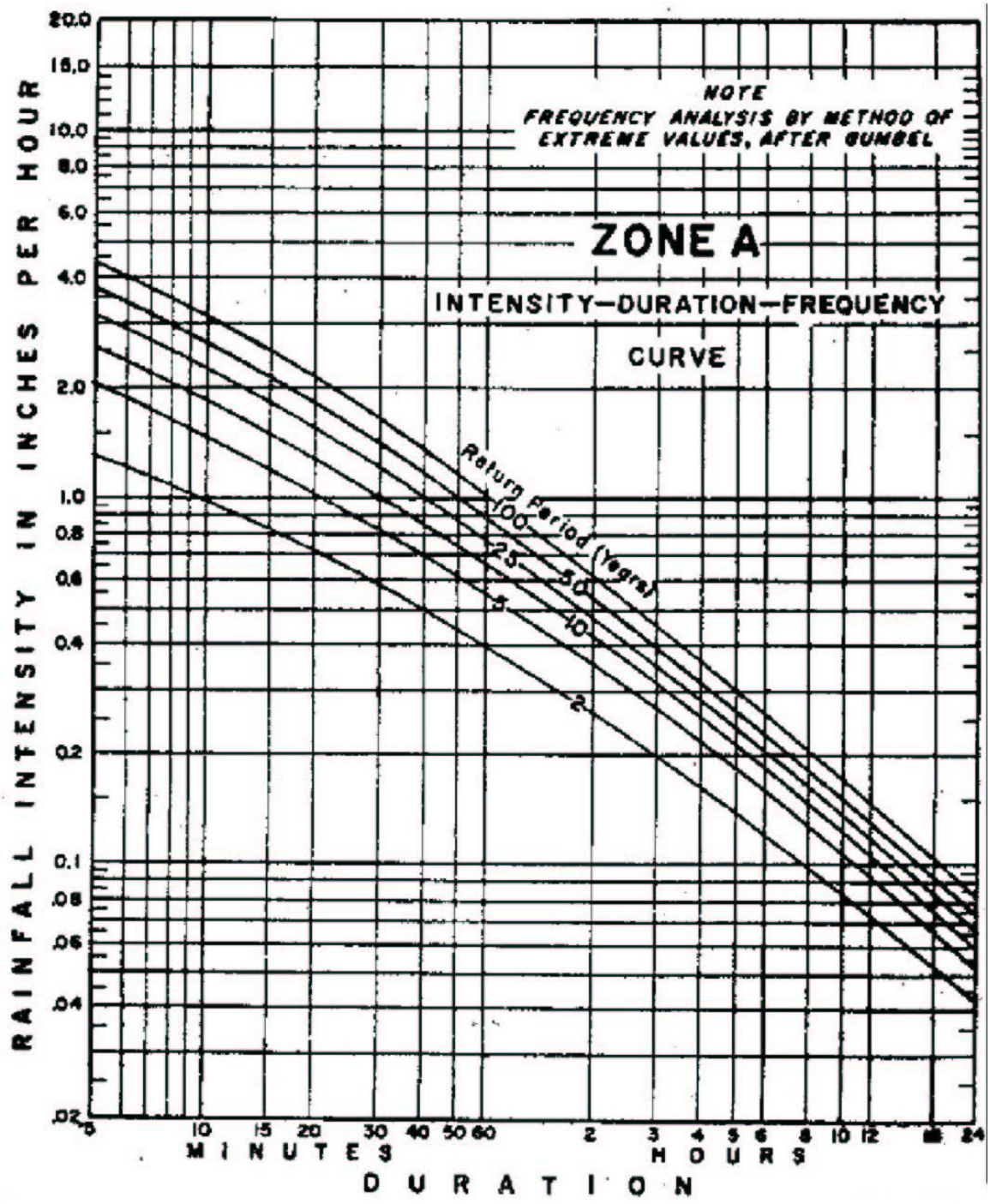


Figure B-8
Sheet 2 of 9

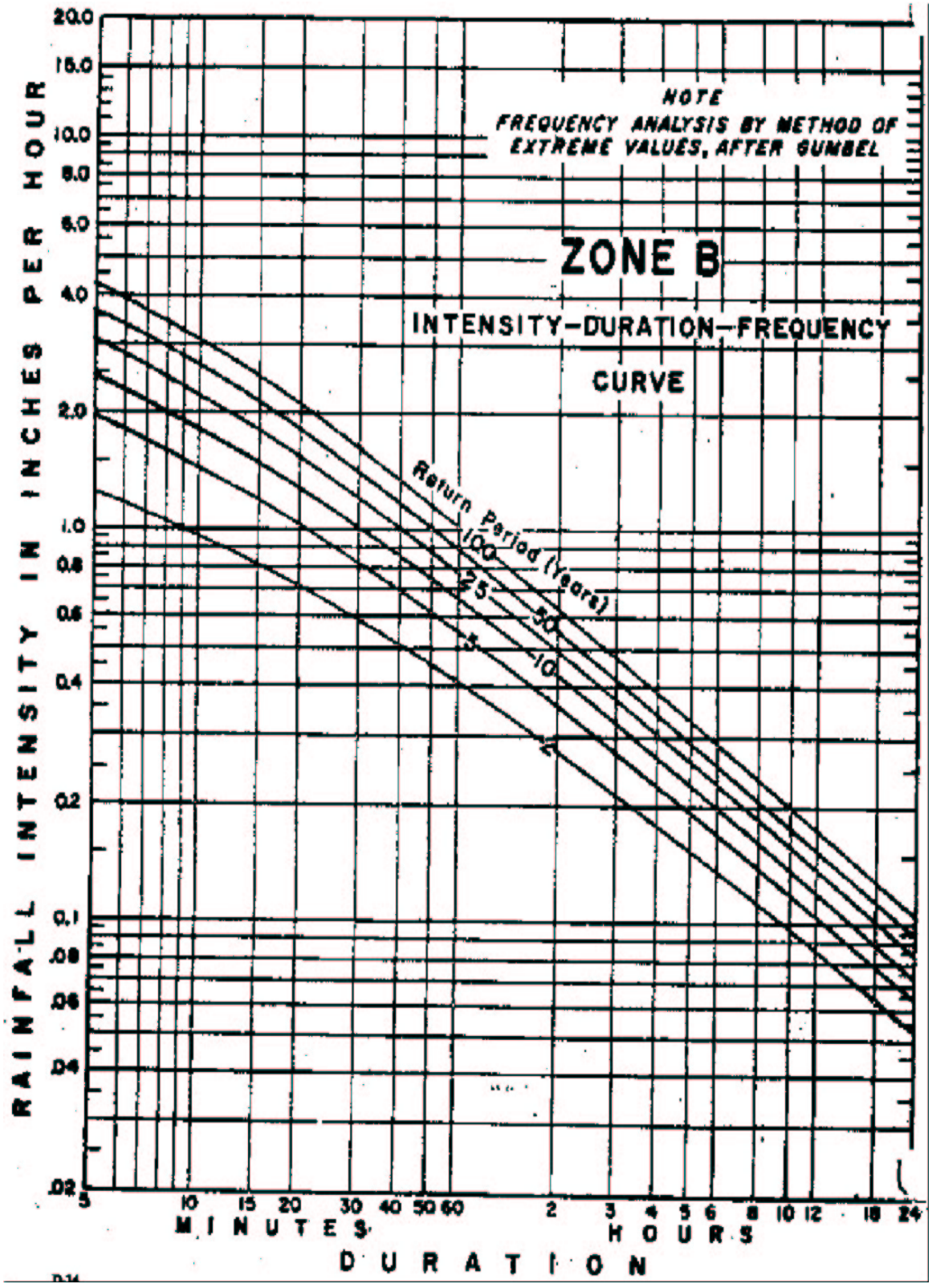


Figure B-8
Sheet 3 of 9

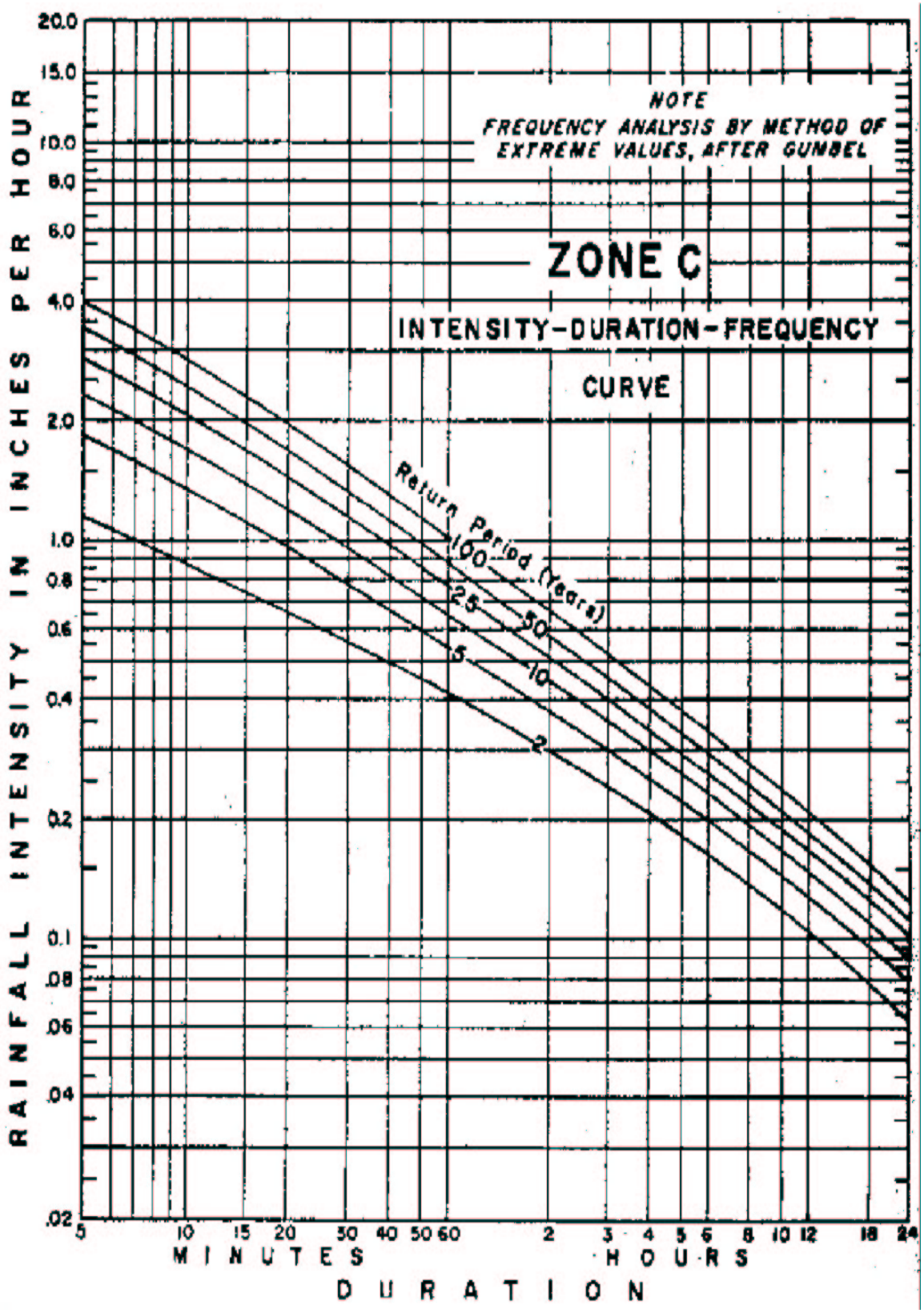


Figure B-8
Sheet 4 of 9

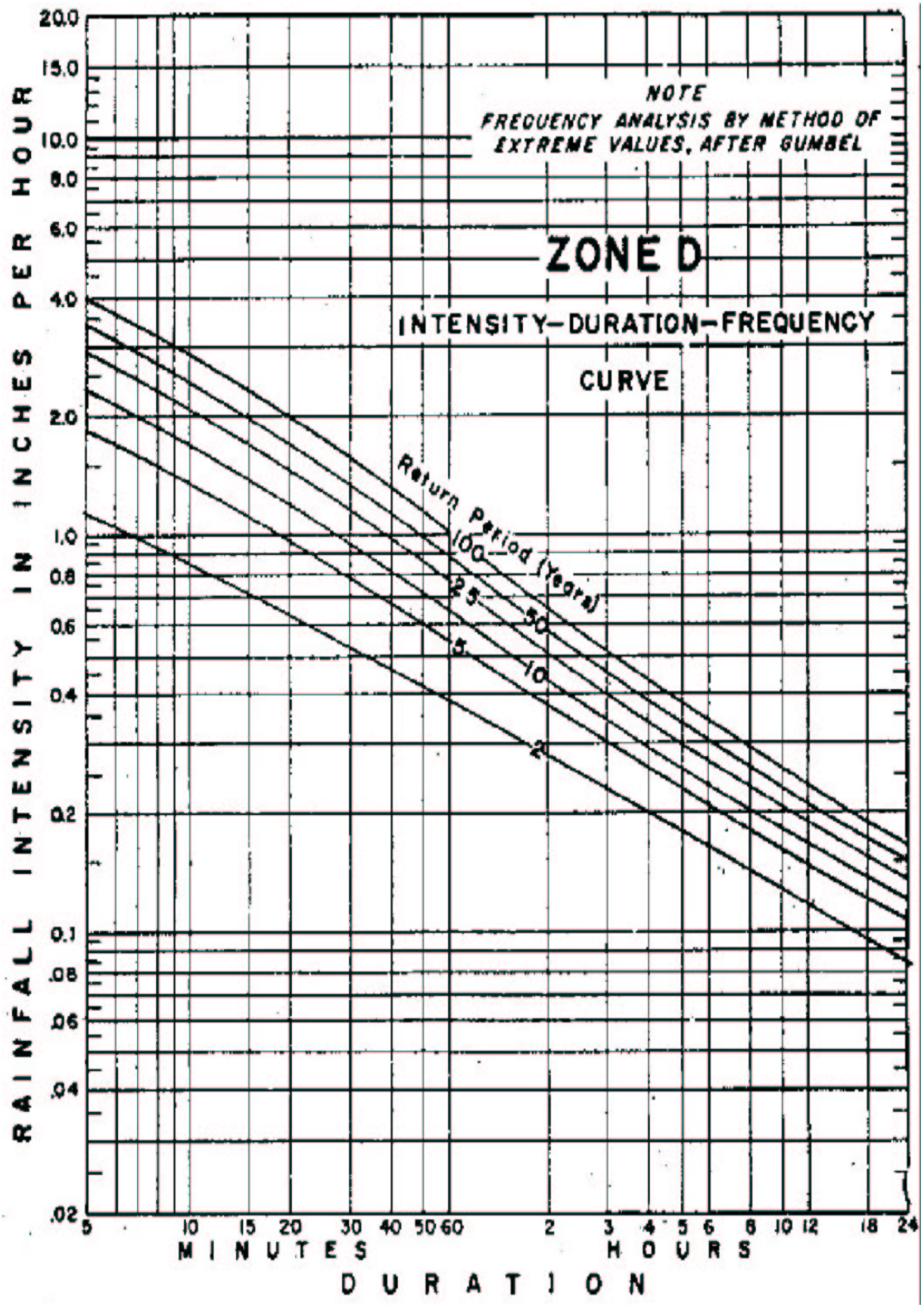


Figure B-8
Sheet 5 of 9

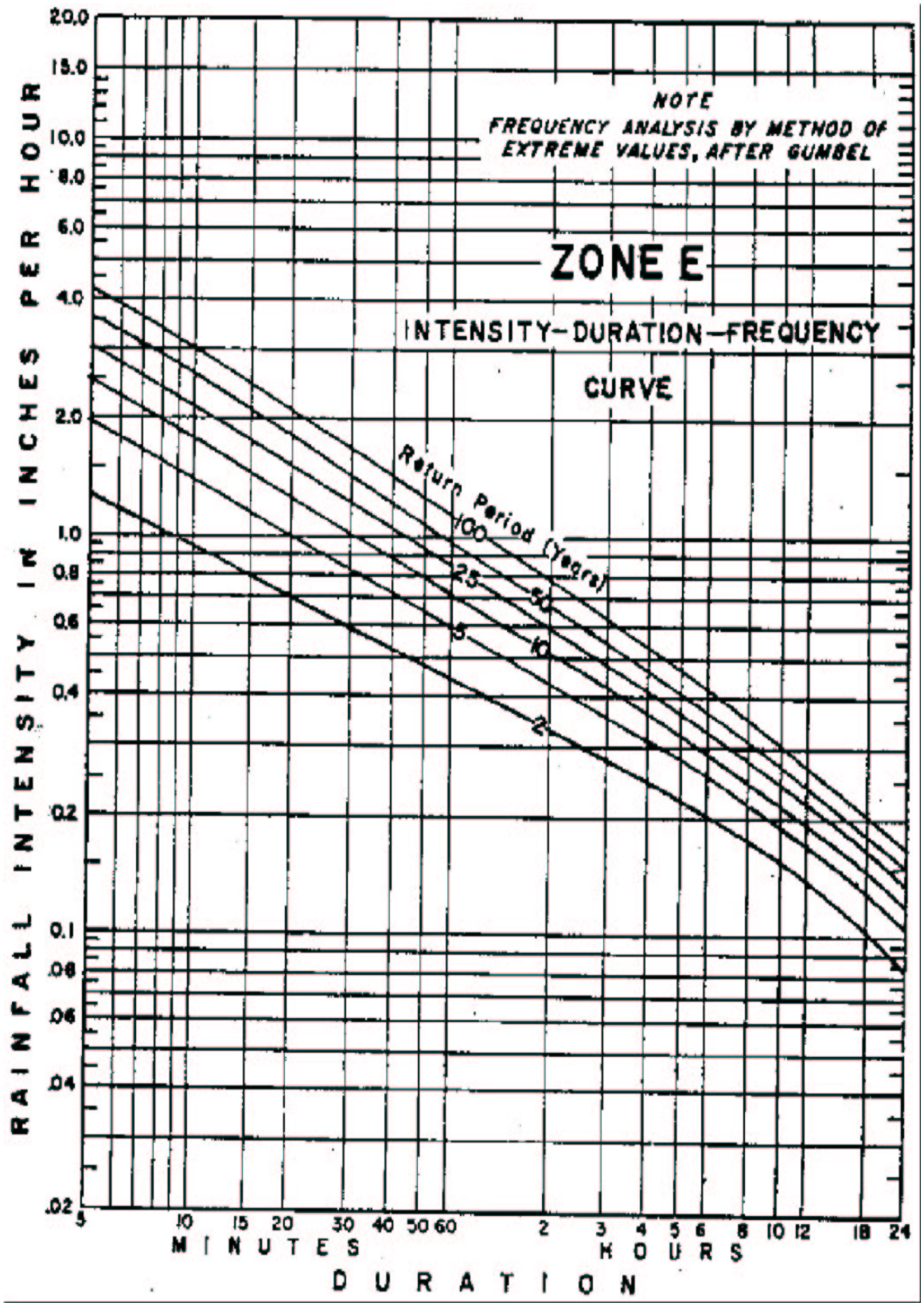


Figure B-8
Sheet 6 of 9

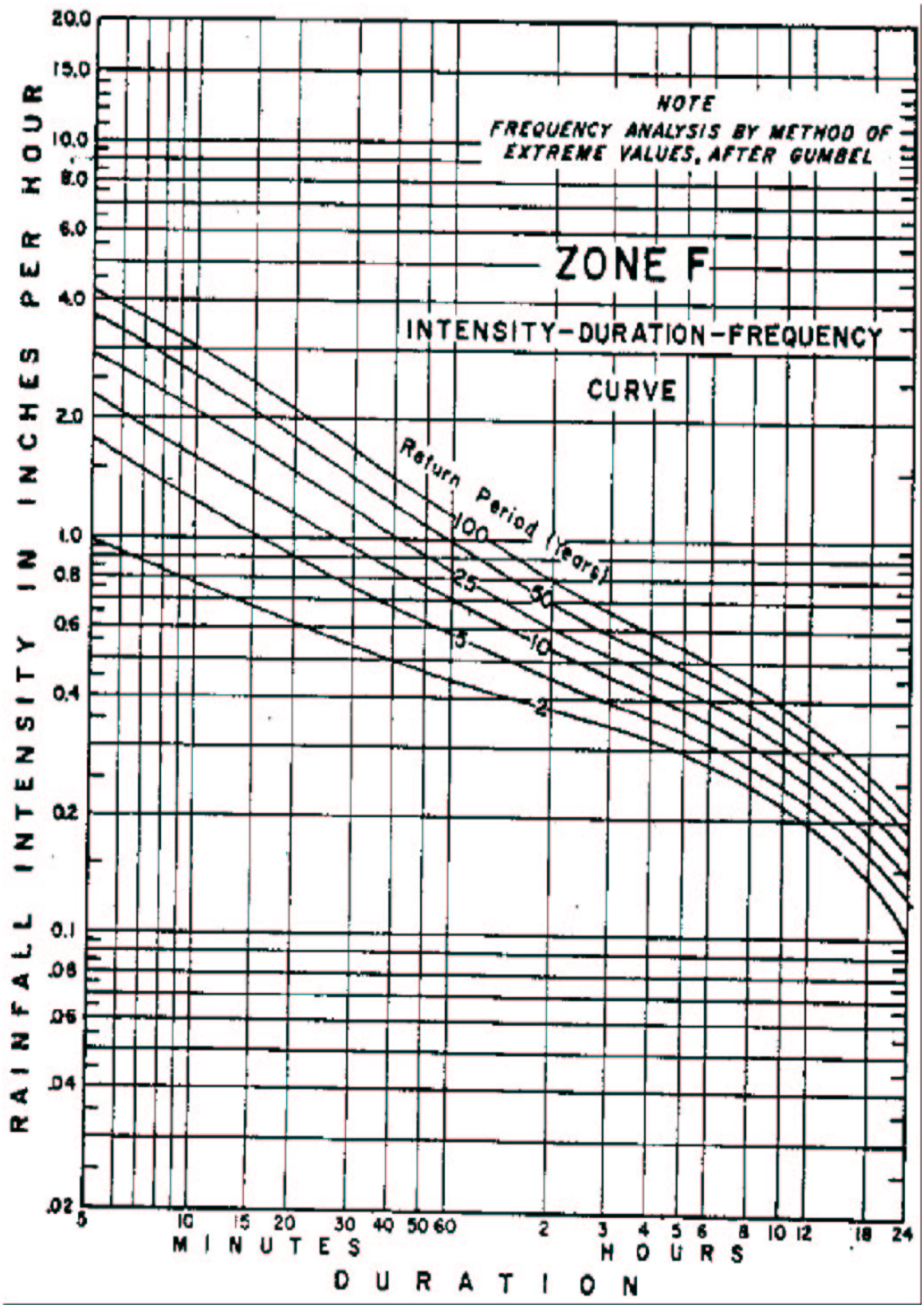


Figure B-8
Sheet 7 of 9

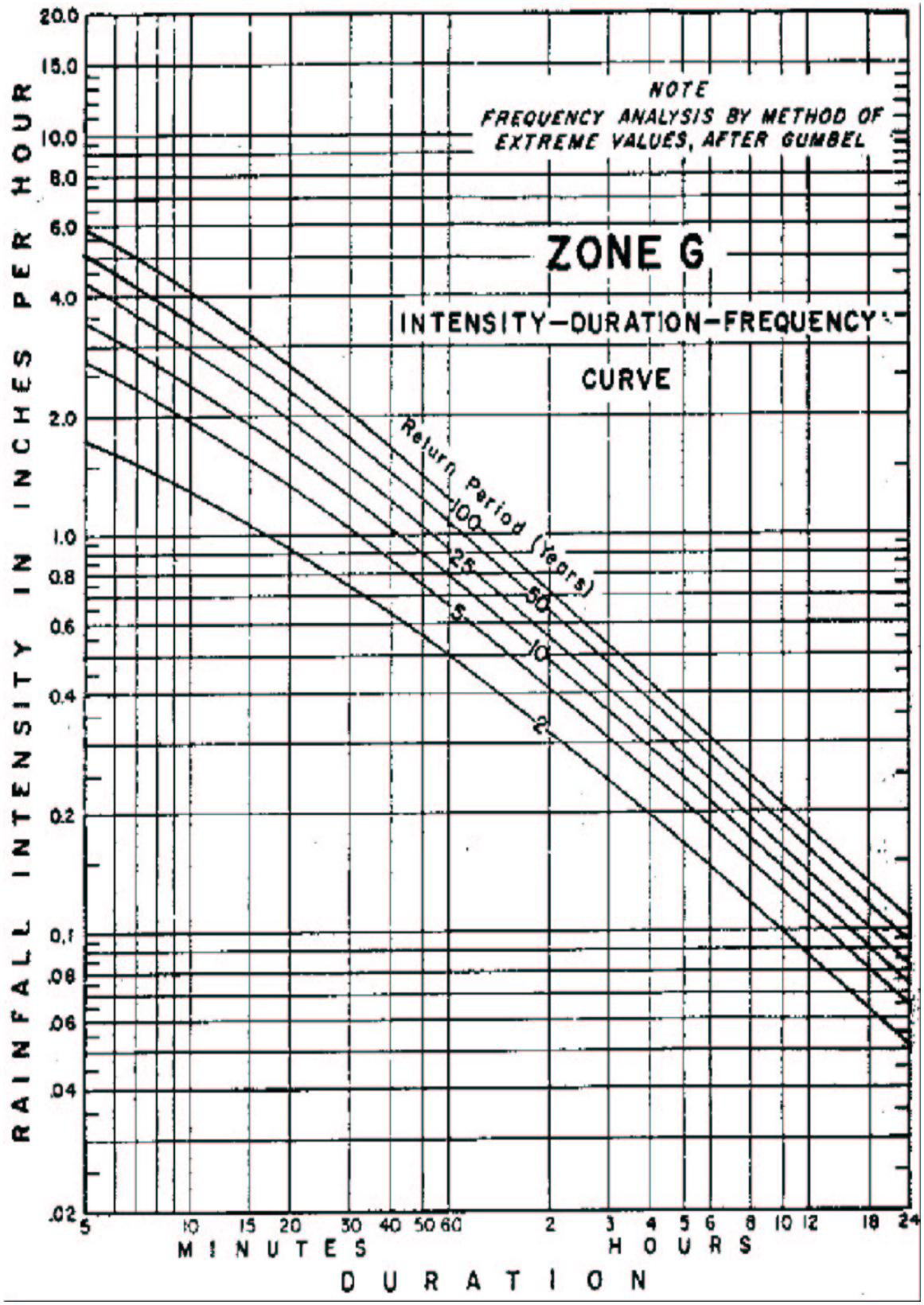


Figure B-8
Sheet 8 of 9

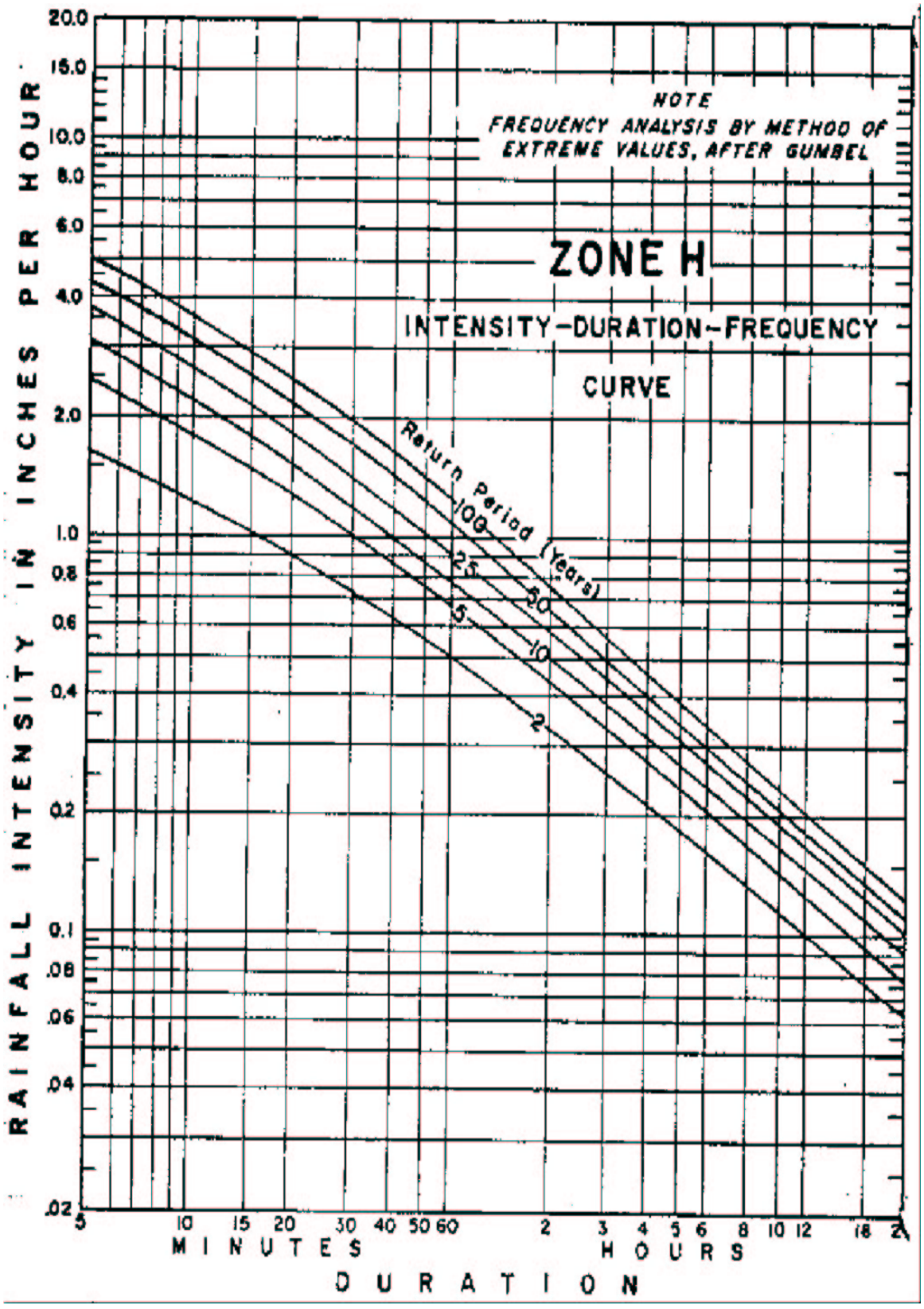
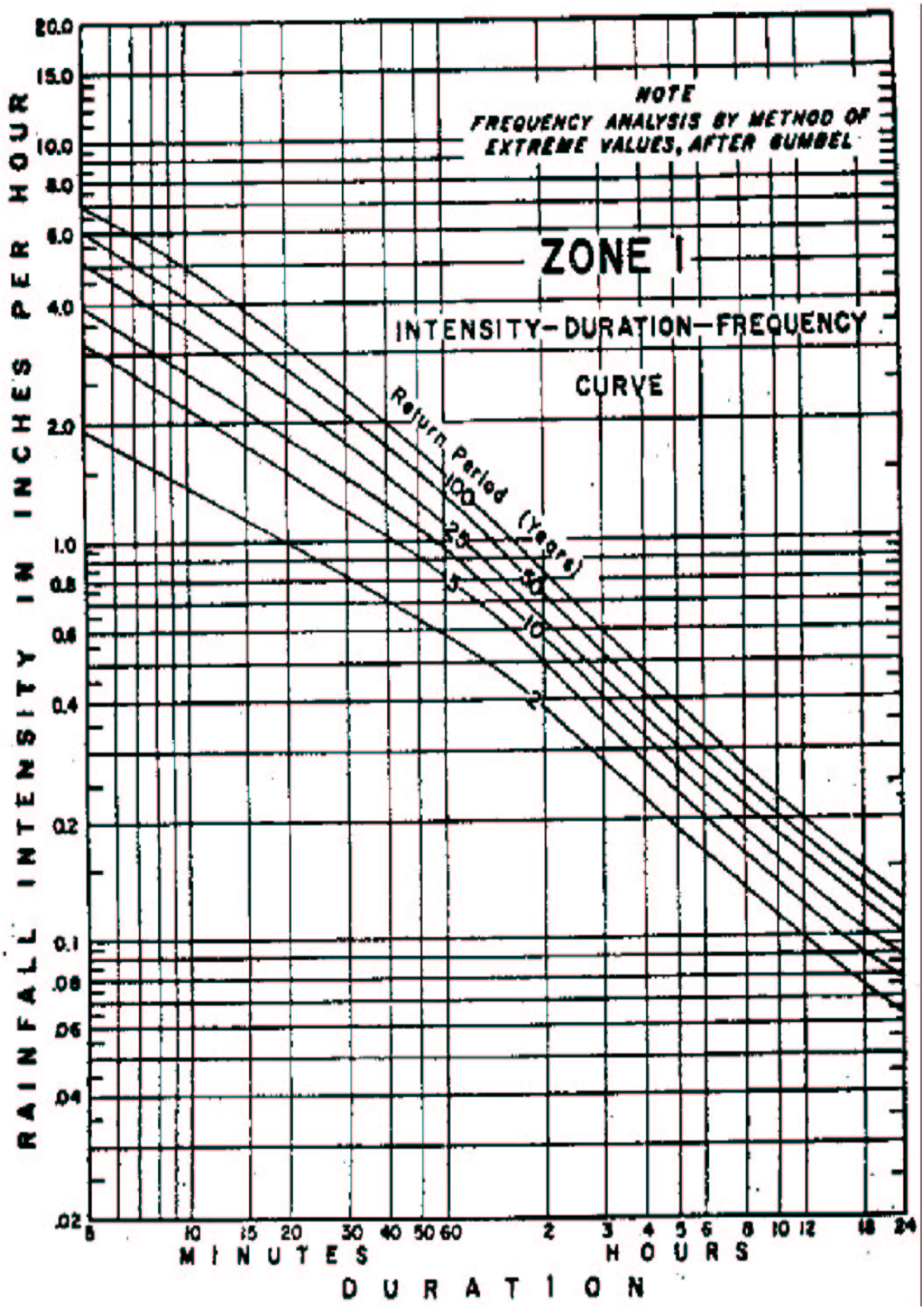


Figure B-8
Sheet 9 of 9



B.40 – REGIONAL REGRESSION METHODS

Four technical reports are summarized.

B.40.01 Estimating the Magnitude of Peak Flows at Selected Recurrence Intervals for Streams in Idaho; Water-Resource Investigations 024170.

http://pubs.usgs.gov/wri/2002/4170/

B.40.02 Magnitude and Frequency of Floods in Small Drainage Basins in Idaho by U.S. Geological Survey; Water-Resource Investigations 7-73. The following is a portion of this report. The report was modified for ITD projects with forest cover between 0 and 30 percent. It was discovered that abnormally high results were obtained for watersheds with a low percentage of forest cover. Details are shown in Table B-1. The revision was reviewed and concurred with by L. C. Kjelstrom and W. A. Harenberg of the U.S. Geological Survey. Minor changes have been made in the text for consistency.

A design method to determine the magnitude and frequency of floods in small drainage basins in Idaho has been compiled by the U.S. Department of the Interior, Geological Survey, in cooperation with the Idaho Transportation Department, Idaho Department of Water Administration, and the U.S. Forest Service.

Authors and compilers of this report are C. A. Thomas, W. A. Harenberg, and J. M. Anderson.

B.40.02.01 Introduction to Flood Design Method. This report describes a method for estimating peak discharges at 10-, 25-, and 50-year recurrence intervals for most small streams in Idaho. Reliable estimates can be obtained using this method, but there are significant limitations and variations that should be considered.

The method of estimating peak discharges developed for this report is for sites on streams with natural flow. Therefore, for sites on regulated streams, the effect of the regulation must be superimposed on results obtained from the method described herein. Regulation may be caused either by works of man or by interaction with groundwater systems. Estimates of peak discharge may be poor for streams draining basins on or flowing across extensive areas of deep, coarse alluvium, or lava flows; for streams whose basins are urbanized; for streams draining irrigated agricultural lands; and for streams draining basins having less than about 30 percent forest cover. Computed flows in those parts of the state subject to recurrent high-intensity thunderstorms over small areas may be too low to be acceptable as reasonable estimates. Some anomalous areas have been identified where the method developed does not apply. A determination of peak discharge should not be considered complete until an assessment of the limitation has been made.

Table B-1

SUMMARY OF REGRESSION EQUATIONS BY REGION FOR PEAK DISCHARGES IN IDAHO

Region	Regression Equation for Q10	Value of Exponent n	Standard Error of Estimate (percent)	Q25/Q10 Ratio	Q50/Q10 Ratio
1	$Q10 = 49.8\ A^{0.862}$		41	1.3	1.5
2	$Q10 = 66.5\ A^{0.801}$(Forest Factor)	-0.236	61	1.3	1.5
3	$Q10 = 3.81\ A^{0.875}$(Forest Factor) $N^{2.02}$	-0.216	51	1.3	1.5
4	$Q10 = 43.4\ A^{0.857}$(Forest Factor)	-0.210	62	1.4	1.8
5	$Q10 = 13.0\ A^{0.918}$		61	1.3	1.5
6	$Q10 = 188\ A^{0.873}La^{0.773}\ N^{-1.82}$		41	1.2	1.3
7	$Q10 = 20.6\ A^{0.806}W^{-1.05}$		59	1.2	1.4
8	$Q10 = 193\ A^{0.758}$(Forest Factor) $N^{-4.25}$		45	1.4	1.7

EXPLANATION:

A = Drainage area in square miles (0.5 – 200 mi^2).
F = Percentage of forest cover plus 1 percent.
La = Percentage of area of lakes and ponds on the basin plus 1 percent.
N = Latitude of centroid of basin in degrees minus 40 degrees.
W = Longitude of centroid of basin in degrees minus 110 degrees.

MODIFICATION FOR USE ON ITD PROJECTS

The Forest Factor, F^n, has been modified in the appropriate equations as follows:

PERCENT FOREST 0 TO 30	PERCENT FOREST 30 TO 100
Forest Factor = $\frac{(31 - F)(30^n - 32^n)}{} + 31^n$	Forest Factor = F^n

Where:

n = exponent of F in each applicable regional equation.

B.40.02.02 Design Method. Subject to the limitations outlined in the section on UNDEFINED AREAS WHERE REGRESSION RELATIONS DO NOT APPLY, peak discharges at selected recurrence intervals can be determined for small streams as follows:

Locate the site on the map of Figure B-9 and determine if a gage has been operated nearby on the same stream. An explanation of the gaging-station-numbering system used by the U.S. Geological Survey is included later (B.40.05) and, for convenience, also on Figure B-9.

If a gage site is located nearby on the same stream and the basin characteristics above the gaged and ungaged sites are relatively homogenous, check Table B-1 for peak discharge at the desired recurrence interval at the gaged site and adjust the peak to the ungaged site on the basis of drainage area. If the stream has not been gaged nearby, inspect Figure B-9 to determine if the basin is outside the undefined areas and, if so, determine in which region the site is located.

1. By inspection of the applicable regression equation in Table B-1, determine which basin characteristics are needed. A description of the equation symbols and methods of determining the basin characteristics are shown below.
2. Determine the required basin characteristics from the best available topographic map. A U.S. Geological Survey 7-1/2-minute topographic map is suggested. Complete coverage of the state is available in the U.S. Geological Survey 1:250,000 scale map series. Determine the forest cover (F) that is needed for evaluation purposes, even though it may not appear in the equation.
3. Having determined the basin characteristics, use the regression equations from Table B-1 to compute the peak discharges at 10-, 25-, and 50-year recurrence intervals.
4. Regression equations are valid for drainage basins from 0.5 to 200 square miles.
5. Investigate further to determine if limitations apply that invalidate the use of the regression equation or if adjustments to the discharge should be made that would improve the design discharge. Check peak discharges for reasonableness by comparing with peak discharges of record for nearby streams (see examples).

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
IDAHO DEPARTMENT OF HIGHWAYS,
THE IDAHO DEPARTMENT OF WATER ADMINISTRATION,
AND THE U.S. FOREST SERVICE

WATER RESOURCES INVESTIGATIONS 7-73

Gaging-Station-Numbering System

Each gaging station and partial-record station has been assigned a number in downstream order in accordance with the permanent numbering system used by the Geological Survey. Numbers are assigned in a downstream direction along the main stream, and stations on tributaries between main-stream stations are numbered in the order they enter the main stream. A similar order is followed on other ranks of tributaries. The complete 8-digit number, such as 13038900 includes the part number "13" plus a 6-digit station number. Only the 6-digit station number is shown in this illustration.

Summary of regression equations by region for peak discharges in Idaho.

Region	Regression equation for Q_{10}	Standard error of estimate (percent)	Q_{25}/Q_{10} ratio	Q_{50}/Q_{10} ratio
1	$Q_{10} = 49.8\ A^{0.862}$	41	1.3	1.5
2	$Q_{10} = 66.5\ A^{0.801_F - 0.236}$	61	1.3	1.5
3	$Q_{10} = 3.81\ A^{0.875_F - 0.216_N 2.02}$	51	1.3	1.5
4	$Q_{10} = 43.4\ A^{0.857_F - 0.210}$	62	1.4	1.8
5	$Q_{10} = 13.0\ A^{0.918}$	61	1.3	1.5
6	$Q_{10} = 188\ A^{0.873_{La}0.773_N - 1.82}$	41	1.2	1.3
7	$Q_{10} = 20.6\ A^{0.806_W - 1.05}$	59	1.2	1.4
8	$Q_{10} = 193\ A^{0.758_P 0.222_N - 4.25}$	45	1.4	1.7

EXPLANATION

A = Drainage area in square miles.
F = Percentage of forest cover plus 1 percent.
La = Percentage of area of lakes and ponds on the basin plus 1 percent.
N = Latitude of centroid of basin in degrees minus 40 degrees.
W = Longitude of centroid of basin in degrees minus 110 degrees.

EXPLANATION

Part 13

River basin boundary and number

Region boundary

4

Region number

Boundary of undefined area (hatchered area)

Known gaining stream reach

Known losing stream reach

Irrigated area

Gaging stations

▲128900
Active station and number

△303000
Discontinued station and number

■317200
Active crest-stage station and number

□312000
Discontinued crest-stage station and number

●172666
Active station and number operated by Agricultural Research Service

Parts and numbers are those permanently assigned in Geological Survey system and used in this report.

FIGURE 1.--MAP OF IDAHO SHOWING LOCATIONS OF GAGING STATIONS USED IN THE ANALYSES, REGIONS, AND SOME AREAS AND STREAMS FOR WHICH REGRESSION EQUATIONS DO NOT APPLY.

Part 12 Part 6 Part 10

Base from U.S. Geological Survey 1:500,000

Table B-2
Sheet 1 of 8

DRAINAGE AREAS, FLOOD DISCHARGES AT SELECTED FREQUENCIES, AND MAXIMUM FLOWS OF RECORD FOR STREAMS DRAINING LESS THAN 50 SQUARE MILES WITH 8 YEARS OR MORE OF RECORD

Station No.	Station Name	Drainage Area (square miles)	Discharge (cfs) Recurrence Interval (years) 2	5	10	20	25	50	Maximum of Record
			Missouri River Basin						
06011900	Red Rock River Trib.	1.0	4.2	8.7	15	21	-	-	15
			Bear River Basin						
10040000	Thomas Fork	45.3	147	262	337	-	505	-	418
10040500	Salt Creek	37.6	169	294	377	-	476	-	382
10043350	Sheep Cr. Trib. No. 2	.34	3.2	6.1	8.3	11	-	-	5.4
10047500	Montpelier Creek	50.9	105	155	186	-	222	25	224
10058600	Bloomington Creek	24.4	140	187	215	245	-	3	222
10072800	Eightmile Creek	23.3	98	128	145	157	-	-	144
10090800	Battle Creek Trib.	4.5	43	81	104	121	-	-	98
10093000	Cub River	19.4	564	657	705	-	753	-	715
10099000	High Creek	16.2	204	231	245	250	-	-	250
10125000	Deep Creek	30.1	59	102	136	-	178	- -	172
			Tributaries Between Great Salt Lake Desert and Bear River						
10172930	Right Hand Fk. Dove Cr.	12.2	4.1	13	25	40	-	-	32
10172940	Dove Creek	33.2	7.5	30	72	-	170	-	275
10172960	West Fork Tenmile Cr.	5.93	83	21	38	700	-	-	460
10172970	Rock Creek	44.0	167	0 43 7	0 74 1	1,100	-	-	1,390

Table B-2
Sheet 2 of 8

Station No.	Station Name	Drainage Area (square miles)	Discharge (cfs) Recurrence Interval (years) 2	5	10	20	25	50	Maximum of Record
Kootenai River Basin									
12304250	Whitetail Creek	2.61	27	42	53	64	-	-	49
12304300	Cyclone Creek	5.66	127	163	190	216	-	-	220
12304400	Fourth of July Creek	7.70	197	233	242	280	-	-	258
12310800	Trail Creek	16.1	175	284	390	520	-	-	341
12316800	Mission Creek	23.0	333	470	560	-	660	-	528
Pend 'Oreille River Basin									
12345800	Camas Creek	6.01	149	230	280	-	360	-	265
12347500	Blodgett Creek	26.4	637	753	814	-	880	-	836
12350200	Gash Creek	3.37	107	157	195	-	250	-	200
12350500	Kootenai Creek	28.9	830	1,100	1,330	-	1,400	-	1,300
12353800	Thompson Creek	12.2	60	101	132	165	-	-	190
12353850	East Fork Timber Cr.	2.72	35	52	65	78	-	-	66
12354100	N. Fk. Little Joe Cr.	14.7	190	210	220	225	-	-	212
12392100	Trapper Creek	1.12	34	47	56	65	-	-	52
12392800	Hornby Creek	2.2	37	44	48	56	-	-	48
12393600	Binarch Creek	10.7	64	104	132	160	-	-	117
12394300	Benton Creek	1.48	13	18	20	-	24	27	22.5

Table B-2
Sheet 3 of 8

Station No.	Station Name	Drainage Area (square miles)	Discharge (cfs) Recurrence Interval (years) 2	5	10	20	25	50	Maximum of Record
			Spokane River Basin						
12413100	Boulder Creek	3.13	97	130	150	173	-	-	144
12413200	Montgomery Creek	4.53	75	132	178	230	-	-	155
12415100	Cherry Creek	7.07	97	168	222	280	-	-	247
12415200	Plummer Creek Trib.	2.10	57	92	120	155	-	-	122
12416000	Hayden Creek	22.0	377	620	800	-	1,050	-	790
12423550	Hangman Creek Trib.	2.18	40	117	184	250	-	-	155
12423700	S. Fk. Rock Cr. Trib.	.59	27	34	39	43	-	-	41
12423900	Stevens Creek Trib.	2.02	22	44	68	-	117	-	125
12429600	Deer Creek	31.9	136	250	360	490	-	-	391
12430370	Bigelow Gulch	2.07	19	61	120	260	-	-	1,510
			Tributaries to Snake River above Henrys Fork						
13027200	Bear Canyon	3.30	45	84	112	140	-		
13030000	Indian Creek	36.8	204	267	306	-	3		
			Henrys Fork Basin						
13038900	Targhee Creek	20.8	235	300	335	370	-	-	340
13050700	Mail Cabin Creek	3.27	36	50	61	77	-	-	81
13050800	Moose Creek	21.4	285	360	410	450	-	-	390
13054400	Milk Creek	17.9	98	400	833	1,500	-	-	1,350

Table B-2
Sheet 4 of 8

Station No.	Station Name	Drainage Area (square miles)	Discharge (cfs) Recurrence Interval (years) 2	5	10	20	25	50	Maximum of Record
Tributaries to Snake River between Henrys Fork and Blackfoot River									
13057600	Homer Creek	26.4	220	410	550	700	-	-	448
13061100	Snake River Trib.	7.64	58	175	322	510	-	-	450
Blackfoot River Basin									
13062700	Angus Creek	13.9	188	272	334	400	-	-	375
13063500	Little Blackfoot River	38.8	140	209	275	-	318	-	292
Portneuf River Basin									
13073700	Robbers Roost Creek	5.70	14	21	26	29	-	-	24
13074000	Birch Creek	6.56	24	35	56	-	94	-	95
13075300	East Fork Mink Creek	14.7	28	45	54	63	-	-	49
13075600	N. Fk. Pocatello Cr.	14.0	23	42	58	76	-	-	57
13075700	S. Fk. Pocatello Cr.	4.3	2.3	5.0	8.0	13	-	-	9
Raft River Basin									
13077700	George Creek	7.84	67	102	124	150	-	-	146
13079000	Clear Creek	20.2	120	185	225	-	375	490	386
13079800	Heglar Canyon Trib.	7.72	185	360	580	900	-	-	1,930
Bruneau River Basin									
13152500	Columbet Creek	3.37	15	27	35	44	-	-	35
13170100	Sugar Creek Trib.	3.04	28	56	78	105	-	-	105

Table B-2
Sheet 5 of 8

Station No.	Station Name	Drainage Area (square miles)	Discharge (cfs) Recurrence Interval (years) 2	5	10	20	25	50	Maximum of Record
Tributaries to Snake River between Bruneau River and Boise River									
13172200	Fossil Creek	19.7	22	135	175	240	-	-	195
13172668	ARS, W-13	.16	3.6	5	8.8	11	-	-	5.9
13172735	ARS, W-2	14.0	87	6.6	524	900	-	-	1,007
13172800	Little Squaw Cr. Trib.	1.81	12	279	75	115	-	-	93
				44					
Boise River Basin									
13184200	Roaring River	23.3	370	500	580	660	-	-	575
13184800	Beaver Creek	9.3	103	149	181	218	-	-	195
13185500	Cottonwood Creek	20.9	74	190	310	475	-	-	166
13196500	Bannock Creek	5.75	12	23	32	-	45	-	46
13200500	Robie Creek	15.8	59	106	160	-	255	-	274
13207000	Spring Valley Creek	20.9	50	129	206	-	336	-	244
13210300	Bryans Run	7.94	68	180	290	430	-	-	420

Table B-2
Sheet 6 of 8

Station No.	Station Name	Drainage Area (square miles)	Discharge (cfs) Recurrence Interval (years) 2	5	10	20	25	50	Maximum of Record
			Payette River Basin						
13234300	Fivemile Creek	7.8	158	214	247	280	-	-	290
13235100	Rock Creek	14.6	144	275	390	530	-	-	400
13237300	Danskin Creek	10.1	36	60	76	94	-	-	71
13237600	Cabin Creek	.42	3.2	7.8	12	17	-	-	18
1323700	Control Creek	.59	3.8	11	18	27	-	-	6.6
13238300	Deep Creek	4.38	337	430	499	620	-	-	540
13240000	Lake Fork Payette R.	48.9	1,380	1,750	1,980	-	2,260	2,460	2,600
13245400	Tripod Creek	8.63	80	118	144	175	-	-	183
13248900	Cottonwood Creek	6.53	80	142	220	300	-	-	303
13250600	Big Willow Creek	47.4	890	1,600	2,140	2,700	-	-	2,100
13250650	Fourmile Creek	6.5	120	320	510	760	-	-	500
13250700	Langley Gulch	3.88	0	3.3	32	62	-	-	39
			Weiser River Basin						
13251300	West Branch Weiser R.	3.96	34	53	76	103	-	-	84
13251500	Weiser River	36.5	460	660	790	-	1,020	1,200	1,320
13252500	East Fk. Weiser River	2.0	53	70	80	91	-	-	77
13257500	Johnson Creek	4.81	132	179	211	248	-	-	222
13267100	Deer Creek	4.6	67	112	140	170	-	-	156

Table B-2
Sheet 7 of 8

Station No.	Station Name	Drainage Area (square miles)	Discharge (cfs) Recurrence Interval (years) 2	5	10	20	25	50	Maximum of Record
Tributaries to Snake River between Weiser River and Salmon River									
13289600	East Brownlee Creek	7.97	78	190	290	420	-	-	325
Salmon River Basin									
13292400	Beaver Creek	15.0	138	176	200	230	-	-	225
13293000	Alturas Lake Creek	35.7	475	610	680	-	785	-	633
13297100	Peach Creek	7.62	26	62	95	136	-	-	105
13298300	Malm Gulch	9.38	85	300	471	600	-	-	440
13301700	Morse Creek	18.0	132	200	245	290	-	-	230
13301800	Morse Creek	19.9	18	70	105	246	-	-	90
13302200	Twelvemile Creek	22.0	41	61	75	89	-	-	70
13305700	Dahlonega Creek	32.0	95	162	216	273	-	-	235
13305800	Hughes Creek	15.7	146	193	218	240	-	-	220
13311000	E. Fk. S. Fk. Salmon R.	19.5	177	252	298	-	358	-	369
13311500	E. Fk. S. Fk. Salmon R.	42.5	340	510	620	-	780	-	783
13313800	Tailholt Creek	2.46	7.7	13	20	-	33	-	27
13315500	Mud Creek	15.8	200	290	350	-	435	510	395
13316000	Boulder Creek	5.84	160	220	265	307	-	-	244
13316800	N. Fk. Skookumchuck Cr.	15.3	130	240	360	-	580	-	471
13317200	Johns Creek	6.67	96	240	380	580	-	-	400

Table B-2
Sheet 8 of 8

Station No.	Station Name	Drainage Area (square miles)	Discharge (cfs) Recurrence Interval (years) 2	5	10	20	25	50	Maximum of Record
Tributaries to Snake River between Salmon River and Clearwater River									
13335200	Critchfield Draw	1.8	19	245	500	-	1,300	-	705
Clearwater River Basin									
13336600	Swiftwater Creek	6.19	83	114	133	145	-	-	150
13336650	E. Fk. Papoose Creek	4.51	77	114	135	147	-	-	125
13336850	Weir Creek	12.2	270	440	550	660	-	-	470
13337200	Red Horse Creek	9.13	92	141	185	220	-	-	200
13337700	Peasley Creek	14.2	79	120	158	220	-	-	240
13338200	Sally Ann Creek	13.9	191	251	284	320	-	-	305
13339700	Canal Gulch Creek	5.9	112	167	210	270	-	-	291
13339900	Deer Creek	6.8	79	215	350	550	-	-	485
13341100	Cold Springs Creek	8.25	59	140	215	310	-	-	200
13341300	Bloom Creek	3.15	51	94	133	175	-	-	151
13341400	E. Fk. Potlatch River	41.6	610	936	1,200	1,580	-	-	1,740
Palouse River Basin									
13344700	Deep Creek Trib.	2.90	54	82	104	130	-	-	157
13344800	Deep Creek	36.6	799	1,220	1,480	1,730	-	-	1,700
13346300	Crumarine Creek	2.41	13	19	24	28	-	-	24
13348400	Missouri Flat Cr. Trib.	.88	30	90	190	-	430	-	234
13348500	Missouri Flat Creek	27.1	315	520	940	-	1,600	-	1,500

B.40.02.03 Basin Characteristics. Descriptions and methods of determination of the five basin characteristics used in the regression equations are given below.

Drainage Area (A)

Drainage area is in square miles and is determined by outlining on the best available topographic map the surface water divide upstream from the point of interest on the stream and determining the area from the map using a planimeter. U.S. Geological Survey 7-1/2 or 15-minute quadrangle maps are recommended when available.

Forest Cover (F)

Forest cover is expressed as the percentage plus 1 percent of the drainage area covered by forests and is determined from a U.S. Geological Survey 1:250,000 scale map. A recommended procedure is to lay a grid over the basin outline, count the number of grid intersections lying within the forested (green) areas and the number of grid intersections within unforested areas and, from this, calculate the percentage of the basin that is forested.

Areas of Lakes and Ponds (La)

Areas of lakes and ponds are expressed as the percentage plus 1 percent of the drainage area covered by water (lakes, ponds, or swamps) and is determined by the grid method. See forest cover (F) above. U.S. Geological Survey 7-1/2 or 15-minute quadrangle maps are recommended when available.

Latitude (N)

Latitude is the latitude of the centroid of the basin in decimal degrees minus 40 degrees. It is determined from inspection of the basin as outlined on a U.S. Geological Survey 1:250,000 scale map.

Longitude (W)

Longitude is the longitude of the centroid of the basin in decimal degrees minus 110 degrees. It is determined from inspection of the basin as outlined on a U.S. Geological Survey 1:250,000 scale map.

B.40.02.04 Relative Magnitude of Floods. Comparison of estimates of floods at ungaged sites with the maximum floods known is useful in evaluating the relative magnitude and to ascertain the credibility of the estimates. The maximum known flood is often used as the design flood. Relative magnitude of floods is desirable for use in both planning and design.

The maximum discharges of record for streams in Idaho that are significant for comparative purposes are plotted against drainage areas in Figure B-10. The plot includes significant maximum discharges at miscellaneous sites as well as at short-term gaging stations. The plot

also shows the wide range of peak discharges that have been recorded. Peak discharges, as computed by the outlined method, should be checked for credibility by plotting on the graph and comparing with the flows experienced at nearby stations. Only the stations with maximums of record greater than 100 cfs/mi2 have been identified by station number. A specific site in Table B-3 can be identified on the graph using the drainage area and maximum discharge from the figures.

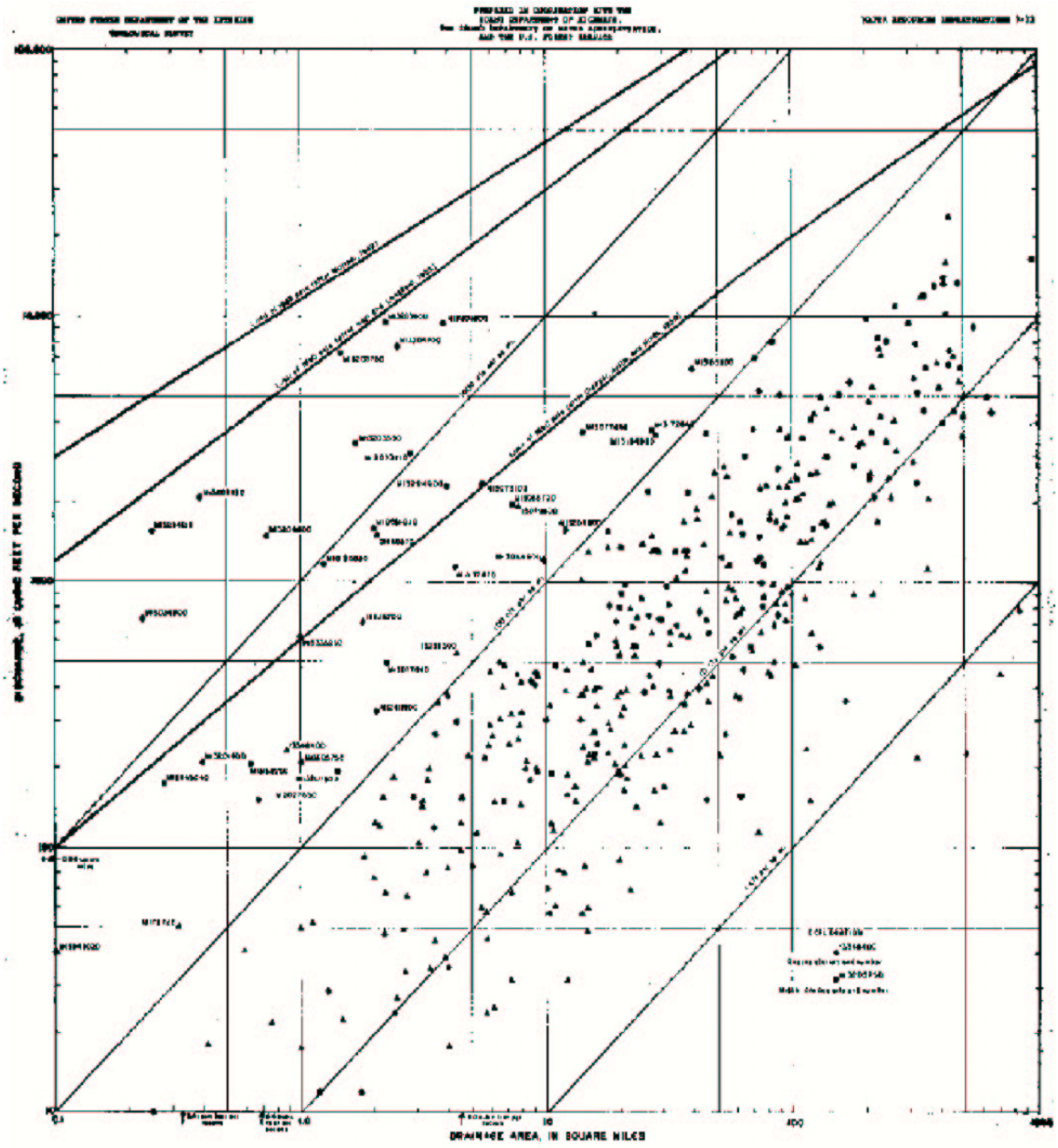
For comparative purposes, three curves are shown in Figure B-10: The Matthai curve (Matthai, 1969, p. B6) is an average through the highest known floods recorded in the United States up to 1965; the Hoyt and Langbein curve (Matthai, 1969, p. B6) is an average through the maximum floods recorded prior to 1950; and the Creager, Justin, and Hinds curve (Matthai, 1969, p. B6) is an average through the maximum known flood data available in 1890. Concerning the increase between the 1890 and 1950 curves, Hoyt and Langbein (Matthai, 1969, p. B6) stated: "This is no evidence that flood conditions are changing. The upward shift of the curves is due entirely to an increased number of gaging stations and increased period of record."

As more records become available, the upper limits of the maximum known flood plot will move upward as additional rare floods are measured. Nevertheless, Figure B-10 is indicative of what can be expected in the future.

Generalizations regarding magnitude and frequency of floods in Idaho can be made from Figure B-10. Floods greater than about 300 cfsm have rarely been observed on basins greater than 4 square miles. Most floods having rates greater than 300 cfsm occur in unforested basins, a few of which have been denuded by range fires. This large a flow has been recorded at only one site on a forested basin, Canyon Creek tributary near Lowman (M13234215), and there the forest cover was light.

All floods greater than 300 cfsm were from intense thunderstorms and were unassociated with snowmelt. All basins with floods greater than 100 cfsm have drainage areas less than 40 square miles, and only five of these floods were not caused by intense thunderstorms. Conversely, a flood greater than 100 cfsm has not yet been recorded in Idaho on a basin larger than about 400 square miles. Evidently, floods that plot to the left of any of the three curves in Figure B-10 have long recurrence intervals and are rare.

Figure B-10



MAXIMUM DISCHARGES IN RELATION TO DRAINAGE AREA

Table B-3
Sheet 1 of 9

MAXIMUM DISCHARGES AT SELECTED SITES

Station No.	Stream Name	Drainage Area (sq. mi.)	Date	Discharge (cfs)
	Bear River Basin			
10041000	Thomas Fork near Wyoming-Idaho State Line	113	05-18-50	869
10047000	Montpelier Creek near Montpelier	28.2	04-24-43	224
10071500	Skinner Creek near Nounan	5.41	06-08-44	60
10087500	Mink Creek below Dry Fork	19.3	05-29-48	600
M10091030	Battle Creek Tributary No. 2	a2	08-21-61	1,600
10119000	Little Malad River	120	02-10-62	1,450
M10120030	Little Danish Canyon	1.25	08-25-61	1,170
10091200	Deep Creek near Clifton	119	03-31-69	152
10120500	Little Malad River	223	02-11-62	1,720
M10122550	Devil Creek	15	02-01-63	585
M10172966	Deep Creek	a72	02-11-62	1,220
	Tributaries to Great Basin between Great Salt Lake Desert and Bear River			
M10172973	Rock Creek	93	02-10-62	1,630
M10172974	Wood Canyon	a1.3	02-10-62	29
	Kootenai River Basin			
12305500	Boulder Creek	53	05-30-69	2,720
12309000	Cow Creek near Bonners Ferry	14.7	06-09-33	60
12311000	Deep Creek at Moravia	133	05-18-54	1,670
12311500	Snow Creek near Moravia	19.5	06-14-33	572
12312000	Caribou Creek near Moravia	14.0	06-15-33	376
12313000	Myrtle Creek near Bonners Ferry	a37	06-05-33	1,260
12313500	Ball Creek near Bonners Ferry	a27	06-15-33	644
12315200	Rock Creek near Copeland	14.3	04-26-23	86
12315400	Trout Creek near Copeland	a20	06-16-33	533
12317000	Mission Creek at Copeland	a31	05-22-32	370
12317500	Brush Creek near Copeland	a7.2	04-26-33	68
12319500	Parker Creek near Copeland	16.5	06-15-33	400
12320500	Long Canyon Creek near Porthill	a29	05-27-48	1,300
12321000	Smith Creek near Porthill	a70	06-23-55	3,810
12321500	Boundary Creek near Porthill	a97	06-23-55	3,280

Table B-3
Sheet 2 of 9

Station No.	Stream Name	Drainage Area (sq. mi.)	Date	Discharge (cfs)
	Pend 'Oreille River Basin			
M12392120	East Fork Creek	20.4	06-08-64	903
M12392150	Lightning Creek	90	05-27-48b	5,100
12392300	Pack River	124	05-30-69	4,370
12392400	Rapid Lightning Creek	45	04-20-65	718
M12392950	Indian Creek	20	05-27-48b	800
	Spokane River Basin			
M12411800	East Fork Eagle Creek	9.13	06-08-64	457
M12411900	Cottonwood Creek	2.05	06-08-64	328
M12413120	Canyon Creek	18.1	06-08-64	817
12413140	Placer Creek at Wallace	14.9	12-23-64	a1,300
12413700	Latour Creek near Cataldo	24.8	02-19-68	1,400
M12413450	Pine Creek	74.0	12-23-64	5,290
M12413470	South Fork Coeur d'Alene River	310	02-21-61	9,440
M12413900	St. Joe River	472	05-29-48	13,400
M12413950	North Fork St. Joe River	111	05-28-48	3,500
12415000	St. Maries River	437	12-22-33	23,800
	Salt River Basin			
13025500	Crow Creek near Fairview, WY	114	04-19-46	236
13026000	Stump Creek near Auburn, WY	103	05-18-48	490
	Tributaries to Snake River between Salt River and Henrys Fork			
M13034900	Snake River Tributary No. 7	.23	06-01-63	729
13035500	Pine Creek near Swan Valley	63.2	05-16-36	799
M13037600	Birch Creek	21	02-11-62	980
M13038410	Lyons Creek	a18	02-11-62b	1,560
	Henrys Fork Basin			
13041500	Sheridan Creek near Island Park	82.1	05-31-38	447
13047800	N. Fk. Squirrel Cr. near Squirrel	2.40	05-16-64	184
13051000	Trail Creek near Victor	47.6	06-07-52	445
13051500	Teton Creek near Driggs	33.8	06-06-52	1,030
13052500	Horseshoe Creek near Driggs	11.7	05-03-52	81
13053000	Packsaddle Creek near Tetonia	5.7	05-19-49	58
M13054600	Canyon Creek	a76	02-11-62b	814
M13-55320	Moody Creek	a88	02-11-62b	2,700

Table B-3
Sheet 3 of 9

Station No.	Stream Name	Drainage Area (sq. mi.)	Date	Discharge (cfs)
	Willow Creek Basin			
13058000	Willow Creek	622	02-11-62	5,080
	Tributaries to Snake River between Shelley and Blackfoot			
M13059100	Snake River Tributary No. 5	5.2	02-11-62	114
M13059200	Snake River Tributary No. 4	3.55	02-11-62	270
M13059300	Snake River Tributary No. 3a	3.5	02-11-62	120
M13059400	Snake River Tributary No. 3	16	02-11-62	632
M13062600	Snake River Tributary No. 6	63.5	02-11-62	1,540
	Blackfoot River Basin			
M13066600	Sand Creek Tributary	a9.8	02-11-62	1,210
M13066700	Black Canyon	7.29	08-09-63	1,940
M13066800	Henrys Creek	a29	02-11-62	716
M13066900	Cedar Creek	10.5	02-11-62	194
	Portneuf River Basin			
13071500	Topons Creek near Chesterfield	45.7	05-21-12	355
M13072100	Portneuf River Tributary	a130	02-01-63	574
M13072300	Portneuf River	332	02-11-62b	2,380
M13072750	Fish Creek	20.1	02-01-63	1,360
M13072900	Dempsey Creek	42	02-01-63	400
M13073100	Jenkins Canyon	5.50	08-01-60	2,350
M13073710	Green Canyon Tributary	2.82	08-12-61	3,060
M13073720	Portneuf River	650	02-13-62	4,380
M13073750	Marsh Creek	a68	02-12-62	573
13074000	Birch Creek near Downey	6.56	07-15-38	95
M13075100	Rapid Creek	57.2	02-01-63	526
M13075400	Gibson Jack Creek	10.3	02-12-62	57
	Bannock Creek Basin			
13076000	Bannock Creek	227	12-24-64	7,790
M13076100	Rattlesnake Creek	a77	02-11-62b	1,170
M13076200	Bannock Creek	413	02-11-62	4,010
	Rock Creek Basin			
M13077100	Trail Creek	a11	09-09-61	487
M13077200	Rock Creek	96	02-11-62	1,770
M13077400	Rock Creek	156	02-01-63	5,100
M13077550	Rock Creek	216	02-11-62	2,120
M13077630	Spring Canyon Tributary	6.77	08-18-61	152
M13077640	Rocky Hollow Tributary	2.26	05-30-63	498
M13077650	Rock Creek	320	12-23-64	7,950

Table B-3
Sheet 4 of 9

Station No.	Stream Name	Drainage Area (sq. mi.)	Date	Discharge (cfs)
Tributaries to Snake River between Rock Creek and Raft River				
M13077652	Dairy Canyon	26.2	01-17-71	750
M13077655	Fall Creek	14.2	07-10-70	3,700
Raft River Basin				
13079070	Meadow Creek near Sublett	37.7	05-09-71	626
13079100	Cassia Creek above Stinson Creek	7.2	06-24-69	32
13079200	Cassia Creek near Elba	a84	12-23-64	982
M13079750	Heglar Canyon	a45	02-11-62	153
M13079820	Heglar Canyon	62.0	01-17-71	471
M13079890	Calder Creek	23.6	01-17-71	735
Tributaries to Snake River between Raft River and Big Wood River				
13082300	Marsh Creek near Albion	a86	01-17-71	828
13083000	Trapper Creek near Oakley	53.7	08-17-41	270
M13084800c	"D" Drain Tributary	5.0	12-23-64	86
M13084900c	"F" Drain	64.7	12-23-64	2,990
13088500	Big Cottonwood Creek near Oakley	a29	05-30-12	125
13092000	Rock Creek near Rock Creek	a80	05-19-70	461
13108500	Camas Creek at Eighteenmile Shearing Corral	a210	05-08-69	2,590
13113000	Beaver Creek at Spencer	a120	04-24-69	642
13114000	Beaver Creek at Camas	510	04-21-62	229
13116000	Medicine Lodge Creek	165	04-15-62	361
13117000	Birch Creek near Reno	320	04-01-62	220
13117300	Sawmill Creek near Goldburg	74.3	06-12-65	651
13119000	Little Lost River near Howe	703	08-11-36	450
13120000	N. Fk. Big Lost R. at Wild Horse	114	06-12-65	1,420
13129800	Alder Creek below South Fork	27.6	05-24-67	165
13130900	Antelope Creek above Willow Creek	93.4	05-24-67	829
M13132540	Big Lost Tributary	a20	02-11-62	190
M13132555	Big Lost River Tributary No. 2	a8.7	02-11-62	424
Big Wood River Basin				
13135500	Big Wood River near Ketchum	137	05-24-67	1,690
13136500	Warm Springs Creek at Guyer Hot Springs	a96	05-21-58	961
M13142850	Big Wood River Tributary	15.8	02-12-62	226
M13145800	Thorn Creek	a46	02-11-62	647
M13145900	Preacher Creek	a26	12-23-64	2,210
M13147100	Dry Creek	a84	12-22-64d	8,050
13150500	Silver Creek	a88	02-04-63	757

Table B-3
Sheet 5 of 9

Station No.	Stream Name	Drainage Area (sq. mi.)	Date	Discharge (cfs)
	Clover Creek Basin			
M13153800	Clover Creek	71.2	12-23-64	7,000
M13153900	Calf Creek	39.4	12-23-64	6,400
13154000	Clover Creek near Bliss	140	02-13-70	4,500
M13154400	Clover Creek	265	12-23-64	10,100
	Big Wood River Basin (continued)			
	Tributaries to Snake River between Clover Creek and Bruneau River			
13155000	King Hill Creek near King Hill	78.9	02-01-63	2,320
M13155100	Rosevear Gulch	55.9	08-31-63	1,160
13155400	Little Canyon Cr. at Berry Ranch	26.9	12-23-64	1,330
13156500	Bennett Creek near Bennett	21.3	04-02-43	204
13157000	Bennett Creek near Hammett	68.6	02-16-13	550
M13161050	Squaw Creek	61.5	09-16-61	368
	Bruneau River Basin			
13163200	Sheep Creek	a180	06-05-63	2,760
M13168380	Hot Creek	42.2	08/13/68	772
M13169250	Bruneau River Tributary	.63	08-13-68	208
13169500	Big Jacks Creek	253	02-21-43	2,100
13170000	Little Jacks Creek	100	01-21-43	908
M13170200	Sugar Creek	33.6	08-13-68	1,300
	Tributaries to Snake River between Bruneau River and Boise River			
M13172100	Browns Creek	a31	08-13-68	967
M13172300	Sinker Creek	a74	12-23-64	1,500
M13172600	Rabbit Creek	a45	06-19-62	3,640
M13172620	Rabbit Creek Tributary	4.3	06-19-62	1,140
M13172640	West Rabbit Creek	27.0	06-20-62	3,740
M13172700	Nancy Gulch	a4	06-19-62	375
13172720	Macks Creek	12.3	01-28-65	390
13172725	Reynolds Creek Tributary	.32	06-19-69	50.7

Table B-3
Sheet 6 of 9

Station No.	Stream Name	Drainage Area (sq. mi.)	Date	Discharge (cfs)
Tributaries to Snake River between Bruneau River and Boise River (continued)				
13172740	Reynolds Creek	90.2	12-23-64	3,800
13173500	Sucker Creek	413	02-01-63	13,300
13178000	Jordan Creek	440	12-24-64	7,530
Boise River Basin				
M13184950	Sheep Creek	28.2	12-23-64	3,590
13187000	Fall Creek	55.3	04-27-52	1,150
M13192400	Rattlesnake Creek	37.8	12-23-64	1,320
M13192900	Willow Creek	57.0	12-23-64	1,820
13198000	Elk Creek	13.1	08-17-41	172
M13201400	Sheep Creek	0.40	08-20-59	210
M13203520	Highland Valley Gulch	.39	08-20-59	2,100
M13203530	Highland Valley Gulch	1.69	08-20-59	3,370
M13203600	Maynard Gulch	2.25	08-20-59	9,540
M13203750	Squaw Creek	1.47	08-20-59	7,320
M13203800	Warm Springs Creek	3.84	08-20-59	9,390
M13204600	Orchard Gulch	.73	08-20-59	1,500
M13204700	Picket Pin Creek	2.50	08-20-59	7,720
M13204800	Cottonwood Gulch	12.0	08-20-59	1,580
M13204900	Curlew Gulch	3.95	08-20-59	2,300
M13205650	Ussery Street Gulch	.06	06-21-67	90
M13205700	Stuart Gulch	9.04	01-29-65	412
M13205750	Polecat Gulch	1.01	06-21-67	210
M13205800	Boise River Tributary	.25	06-21-67	9.8
M13205850	Pierce Gulch	1.18	06-21-67	12
M13206100	Seaman Gulch	1.76	06-21-67	12
M13207650	Goose Creek	1.42	05-20-68	195
Payette River Basin				
M13234215	Canyon Creek Tributary	a.25	07-09-68	1,550
13234500	Clear Creek	59.6	05-31-43	754
13235500	Deadwood River	10.4	06-15-52	354
13236500	Deadwood River	112	05-26-28	2,150
M13237820	Lightning Creek	24.4	12-23-64	864
M13237840	Scriver Creek	27.3	12-22-55	406
Payette River Basin				
M13237900	Anderson Creek	34.0	12-22-55	690
13247000	Porter Creek	21.2	08-11-41	181
M13248800	Shafer Creek	74.6	12-22-55	1,240
M13249050	Cottonwood Creek	29.6	12-22-55	722
M13249100	Little Squaw Creek	75.3	12-22-55	1,000
M13249200	Squaw Creek	345	12-22-64	12,000
M13250680	Big Willow Creek	138	01-15-56	1,640

Table B-3
Sheet 7 of 9

Station No.	Stream Name	Drainage Area (sq. mi.)	Date	Discharge (cfs)
	Weiser River Basin			
13253000	East Fork Weiser River	31.6	12-22-55	821
13253500	Weiser River at Starkey	106	03-27-40	2,450
M13260100	West Fork Pine Creek	a29	12-22-55	499
13255500	Hornet Creek near Council	107	12-22-55	2,090
13257000	Middle Fork Weiser River	86.5	12-22-55	1,710
13259500	Rush Creek	32.0	03-16-38	582
13260000	Pine Creek	a54	02-25-58	850
13261000	Little Weiser River	81.9	02-24-25	a1,840
M13261600	Little Weiser River	206	12-22-55	4,800
M13261650	Weiser River	952	12-22-55	16,600
M13263700	Crane Creek	a120	12-22-55	4,120
M13263750	Hog Creek	a25	12-22-55	338
M13263800	Mill Creek	a10	12-22-55	305
M13263950	South Fork Crane Creek	a52	01-17-70	1,240
13267000	Mann Creek	a56	03-27-40	1,540
13268500	Monroe Creek	a32	02-27-40	a650
	Tributaries to Snake River between Weiser River and Salmon River			
M13269230	Hog Creek	22.5	01-17-70	681
M13289650	Brownlee Creek	a62	12-22-55	159
M13289900	Wildhorse Creek	a120	12-22-55	2,550
M13289950	Wildhorse Creek	a140	12-22-55	2,990
13290190	Pine Creek	a230	02-21-68	2,110

Table B-3
Sheet 8 of 9

Station No.	Stream Name	Drainage Area (sq. mi.)	Date	Discharge (cfs)
	Salmon River Basin			
13292500	Salmon River	94.7	05-29-52	721
13295000	Valley Creek	147	05-24-56	2,000
13296000	Yankee Fork Salmon River	195	06-12-21	3,360
M13297200	Slate Creek	a28	08-09-63	1,580
13297300	Holman Creek	6.10	06-13-65	a25
13297450	Little Boulder Creek	18.4	06-25-71	279
13299200	Challis Creek	91.2	06-12-65	918
13302000	Pahsimeroi River	845	06-08-57	796
13306000	North Fork Salmon River	214	06-13-33	901
13308500	Middle Fork Salmon River	138	05-24-561	2,980
13309000	Bear Valley Creek	180	05-27-56	3,860
13310000	Big Creek	470	06-03-48	5,800
13310500	South Fork Salmon River	92	05-27-56	1,620
M13310700	South Fork Salmon River	324	05-28-48	5,200
13312000	East Fork South Fork Salmon River	104	06-14-33	2,050
13312500	Johnson Creek	54.7	05-27-48	1,510
13313000	Johnson Creek	213	05-27-56	5,440
M13313200	East Fork South Fork Salmon River	424	05-28-48	10,400
13313500	Secesh River	104	06-03-48	2,500
13314500	Warren Creek	37	06-03-48	1,100
M13315800	Little Salmon River	189	06-01-48	3,300
M13316200	Little Salmon River	345	12-22-55	4,480
M13316300	Indian Creek	2.66	05-20-70	34
M13316400	Rapid River	122	05-29-48	1,600
M13316450	Little Salmon River	550	06-01-48	9,200
M13316600	Slate Creek	127	06-01-48	2,600
M13317050	White Bird Creek	a96	05-22-48	3,500
13317500	Deer Creek	19.1		209
	Tributaries to Snake River between Salmon River and Clearwater River			
M13335250	Snake River Tributary No. 8	1.0	06-08-64e	622

Table B-3
Sheet 9 of 9

Station No.	Stream Name	Drainage Area (sq. mi.)	Date	Discharge (cfs)
	Clearwater River Basin			
M13335420	Selway River	211	05-28-48	3,700
M13336620	White Sand Creek	244	05-29-48	8,100
M13336630	Crooked Fork	172	05-29-48	5,700
13336800	Warm Springs Creek	74.7	06-13-59	2,260
13336900	Fish Creek	89.2	05-20-64	2,280
M13337550	South Fork Clearwater River	434	05-29-48	6,600
M13338300	Cottonwood Creek	81.7	01-29-65	1,740
M13338950	Lawyer Creek	208	01-29-65	2,460
13339500	Lolo Creek	243	06-08-64	3,430
M13340200	North Fork Clearwater River	201	05-28-48b	9,900
M13340400	Kelly Creek	380	05-28-48b	13,000
M13340800	Little North Fork Clearwater River	414	05-29-48	14,000
M13341140	Big Canyon Creek	225	01-29-65	8,360
13341500	Potlatch River	424	01-29-65	16,000
M13341800	Lapwai Creek	37.9	01-29-65	2,190
13342000	Mission Creek	a16	01-29-65	a400
M13342400	Lapwai Creek	235	01-29-65	4,380
M13343020	Lindsay Creek Tributary No. 1	.10	07-16-64	40.6
M13343040	Lindsay Creek Tributary No. 2	.28	07-16-64	176
M13343060	Lindsay Creek Tributary No. 3	4.25	07-16-64	300
13345000	Palouse River	317	01-00-48	12,000

a Approximately.
b Date may have been day following that indicated.
c Flood discharge may be affected by canals, drains, or other works of man.
d Date may have been 12-24-64.
e Date may have been 07-16-64.

Example One – Application of the Design Method

Determine the 10-, 25- and 50-year floods for Bloom Creek at the mouth near Bovill.

Step 1: The mouth of Bloom Creek is in Section 3, Township 41 North, Range 1 East, and the basin is entirely on the U.S. Geological Survey Bovill 15-minute quadrangle map. A continuous-record gage (Station 13341300) was operated at the site (Figure B-9, sheet 1). Records are available from 1959 to 1971. Figures of peak discharge through the 20-year flood computed by the log-Pearson Type III method (Water Resources Council, 1967) are listed in Table B-2. A check of Figure B-9 indicates the design method applies. The site and basin are in Region 1.

Step 2: Table D-1 indicates drainage area (A) is the only basin characteristic that needs to be determined for the Region 1 regression equation. Forest cover (F) also should be determined for evaluation purposes.

Step 3: The drainage area for the Bloom Creek, as previously determined by planimetering from the Bovill quadrangle, is 3.15 square miles. Forest cover (F) is determined to be 101.

Step 4: Using the nomograph or the regression equation and the ratios for Region 1, the 10-year flood is found to be about 135 cfs, the 25-year flood is about 175 cfs, and the 50-year flood is about 200 cfs. From Table B-2, Q10 by the modified log-Pearson Type III method for Bloom Creek is 133 cfs, which closely checks the figure from the nomograph and the equations.

Step 5: No limitation appears to apply to this stream. None of the basin is urbanized. Forest cover index is 101, well above the recommended minimum requirement of 30 for application of the Q25/Q10 and Q50/Q10 ratios. No regulation or diversion that affects the peaks is known. Base flow (the flow after direct runoff from rain or snowmelt has stopped) as observed in late summer is low, indicating no significant effect from groundwater runoff. Alluvium, lava flows, or intense thunderstorms do not appear to affect this area significantly. Also, there are no anomalous areas nearby. Discharge plotted against the drainage area in Figure B-10 appears reasonable compared with plots for nearby streams. For example, a crude check of the data is provided by plotting the 175 cfs (Q25 for Bloom Creek) against its drainage area (3.15 square miles) and comparing it with a plot of Q25 versus the drainage area for East Fork Potlatch River (No. 13341400) and other basins nearby. They appear to plot near the same position with respect to the 100 cfsm line.

Example Two – Application of the Design Method

Determine the 25-year flood for a site on Targhee Creek below the confluence of the East Fork with Targhee Creek.

Step 1: The site is located in the NE 1/4 NE 1/4 of Section 1, Township 16 North, Range 43 East, which is on the U.S. Geological Survey Targhee Pass 7-1/2 minute quadrangle map. The basin lies on Targhee Pass and Targhee Peak 7-1/2 minute quadrangle maps and the Hebgen Dam 15 minute quadrangle map. A crest-stage gage (Station 13038900)

was operated from 1963 to 1971 at a site 5 miles downstream (Figure B-9). From Figure B-9, the site and basin are in Region 6.

Step 2: Table B-1 indicates the basin characteristics to be determined are area (A), area of lakes and ponds (La), and latitude of the basin centroid (N). Forest cover should be determined for evaluation purposes.

Step 3:

$$A = 10.5$$

$$La = 0.4 + 1.0 = 1.4$$

$$N = 4.7$$

$$F = 44 + 1 = 45$$

Step 4: Using the appropriate regression equation, a 25-year flood of 136 cfs is indicated. The details of the computation using the regression equation are as follows:

$$Q_{10} = (188\ A^{0.873})\ (La^{0.733})\ (N^{-1.82}) = (188)\ (10.5^{0.873})\ (1.4^{0.773})\ (4.7^{-1.82}) =$$

$$(188)\ (7.79)\ (1.30)\ (0.060) = 113 \text{ cfs}$$

$$Q_{25} = (113)\ (1.2) = 136 \text{ cfs}$$

The peak discharge should be rounded to two significant figures, but were used as computed for ease of checking.

Urbanization or regulation does not affect the peaks. Small diversions for irrigation probably do not affect the peaks because peaks normally occur before the irrigation season. Base flows, as observed in late summer is low, indicating no significant effect from groundwater runoff. Alluvium and lava flows do not appear to alter the peak characteristics.

The relative magnitude of the Q_{25} from the nomograph can be compared with a Q_{25} for the crest-stage gage on Targhee Creek (Station 13038900). From Table B-3, Q_{10} for Targhee Creek is 335 cfs. Using the regional ratio for Q_{10}/Q_{25} of 1.2, Q_{25} equals 335 x 1.2 = 402 cfs. The ratio of the drainage areas at the subject site and the crest-stage gage site is 10.5/20.8, or 0.50. On the basis of the drainage area ratio and the record at the crest-stage gage, Q_{25} at the subject site would be 402 x 0.50 =201 cfs. This is 48 percent greater than the 136 cfs from the equation. In Region 6, Q_{50} is only 1.1 times Q_{25}, therefore, the design flood might be chosen on basis of maximum discharges at nearby sites rather than that for a selected recurrence interval. On Figure B-10, maximum discharges at nearby stations, including Stations 1311300, 13047800 and 13051500, plot above and below the Q_{25} of 136 cfs. Because the relation with the gaging station on Targhee Creek indicates a higher discharge and since maximum discharges at several nearby sites are considerably higher, a conservative discharge may be obtained by increasing the Q_{10} discharge by one standard error, or 41 percent (see Table B-1).

Design Discharge = 1.41 (113) 1.2 = 191 cfs

Example Three – Application of the Design Method

Determine the 50-year flood for Cottonwood Creek at the mouth near Horseshoe Bend.

Step 1: The site is in Section 3, Township 6 North, Range 2 East, which is on the Horseshoe Bend 7-1/2 minute quadrangle map. The basin lies on the Horseshoe Bend and Cartwright Canyon 7-1/2 minute quadrangle maps. A crest-stage gage (Station 13248900) was operated at this site from 1961 to 1971. From Figure B-9, the site is in Region 3.

Step 2: Table B-1 indicates the basin characteristics to be computed are area (A), forest cover (F), and latitude of the basin centroid (N).

Step 3: A = 6.53 square miles

F = < 30

$$\text{Forest Factor} = \frac{(31\text{-}F)(30^{-0.216} - 31^{-0.216}) + 31^{-0.216}}{2}$$

Forest Factor = 0.476

N = 3.85

Step 4: The nomograph gives a Q50 flood of 440 cfs using the regression equation. The 10- and 50-year floods are as follows:

$$Q_{10} = (3.81A^{0.875})\ (\text{Forest Factor})\ (N^{2.02}) = (3.81)\ (6.53^{0.875})\ (0.476)\ (3.85^{2.02}) =$$

$$(3.81)\ (5.16)\ (0.476)\ (15.2) = 143 \text{ cfs}$$

$$Q_{50} = (143)\ (1.5) = 214 \text{ cfs}$$

Step 5: Urbanization or regulation does not affect the peaks. Field inspection indicates that some flow will bypass the site during extreme floods. Peaks generally occur during the winter and would not be affected by irrigation diversions.

The channel is dry for long periods, indicating that no large springs feed the stream. The generalized geologic map of Idaho (Ross, 1947) shows that above 40 percent of the basin is on granitic rock, which is relatively impermeable, and about 60 percent is on the weakly consolidated sedimentary rocks that are variable in permeability from one location to another. Course alluvium or fractured lava deposits are not extensive. Extreme floods from thunderstorms have been recorded within 20 miles to the southeast (Figure B-11). There is no significant forest cover on the basin, and forest cover (F) is 0 + 1 = 1. A Q_{10} of 220 cfs by the modified log-Pearson Type II method is reasonably well defined by 10 years of record. However, the Q_{50}/Q_{10} ratio is not well defined for this or other forested basins in any region of the state. Comparison with plots of discharge for nearby streams in Figure B-10 also indicates a wide divergence of peak flows for this area.

Because of uncertainties of the definition of discharges at long recurrence intervals, the designer should consider several alternatives. No intense thunderstorms have been recorded in the immediate area, although some have been experienced just over the ridge to the south [see Site M13207650 (Figure B-11 and Table B-3) and others on the Boise front, near Boise (Figure B-11)]. In addition to the thunderstorm floods nearby, maximums for Big Willow Creek near Emmett, Fourmile Creek near Emmett, Bryans Run near Boise, Spring Valley Creek near Eagle, and the magnitude and frequency data for the subject site should be considered in assessing the flood potential and risk at long recurrence intervals.

A reasonable design discharge for all but the extremely rare events could be determined by increasing the Q_{50} discharge by percentages equivalent to one standard error as follows: Q50 at the site was determined to be 450 cfs. Standard error for Region 3 is 51 percent. Increasing 450 by 51 percent gives a more conservative discharge of 680 cfs. If damage would be extreme from a structural failure, a discharge equivalent in percent to some larger multiple of the standard error may be added to the discharge from the nomograph.

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
IDAHO DEPARTMENT OF HIGHWAYS,
THE IDAHO DEPARTMENT OF WATER ADMINISTRATION,
AND THE U.S. FOREST SERVICE

WATER RESOURCES INVESTIGATIONS 7-73

EXPLANATION

Drainage basin boundary

Subbasin boundary

MI3335420
Station number

(18)
Unit discharge in cubic feet per second per square mile

FIGURE 2.--MAP OF IDAHO SHOWING BASIN BOUNDARIES AND MAXIMUM KNOWN UNIT DISCHARGES AT MISCELLANEOUS SITES.

Base from U.S. Geological Survey
1:500,000

B.40.03 Undefined Areas Where Regression Relations Do Not Apply. Regional regression relations should apply to areas that are homogenous with respect to variables that affect the flow. Regression equations may not apply to basins in which the basin or flow characteristics are outside the range of those characteristics used to define the regional regression relations. Variations in topography, climate, geology, land use, and regulation or stream flow in Idaho often result in abrupt changes in flow and basin characteristics. Some of these variations are inadequately defined by available data. The following sections describe the poorly defined areas and discuss the reasons the regression relations are inapplicable.

Areas in which regional regression relations are not defined total about 20,000 square miles and are outlined in Figure B-9. In addition to these areas, smaller undelineated areas are scattered throughout Idaho.

In general, the undefined areas are mostly arid or semiarid. Stream flow in small streams is usually ephemeral (flowing only in direct response to precipitation or short-lived snowmelt) or intermittent (flowing only part of the time, such as during the snowmelt period or during wet periods in winter). Records are sparse and short in length. Therefore, flood flow magnitudes and frequencies have not been defined.

In addition to areas of poor definition, peak flows in many small basins are affected by urbanization, regulation, significant quantities of groundwater runoff, and large losses or gains associated with alluvial valleys and lava flows, intense thunderstorms, unusual climatic or physical basin characteristics, or a combination of these factors.

B.40.03.01 Unforested Areas. Most of the unforested areas of the state are in the arid or semiarid areas where precipitation is too low to support forestation. Nearly all of the area designated as undefined in Figure B-9 are unforested. Small streams are usually ephemeral or intermittent and the volume of runoff is low. Only a few records are available to define the magnitude and frequency of floods on these areas, and very few records are available to define the Q25/Q10 and Q50/Q10 ratios.

Because a small percentage of forest cover appears to be indicative of the ephemerality of streams in small basins, basins with less than 30 percent forest cover (F <30) are assumed not defined by methods used in this report.

Judgment and the maximum unit discharge of record for nearby streams, as shown in Figure B-11, are the best bases that can be recommended for the determination of discharge in unforested basins.

B.40.03.02 Urbanized Areas. Urbanization drastically changes basin features, which increase in paved areas, and the addition of sewerage are the most obvious. Both decrease the concentration time of the basin, which increases the intensity of floods and the frequency of flooding. Climates have been observed to change in or near large cities. Precipitation, temperature, humidity, cloudiness, and wind speed may be altered to some degree in urban areas. Also, urbanization is often accompanied by infringements on the natural flood channel and the flood plain, thus increasing flood heights. On the other hand, storm sewers may bypass surface flows past some sites, thus reducing peaks in natural channels.

Studies in other parts of the country indicate that for a basin of 1 square mile that is completely storm sewered and whose surface is completely (or 100 percent) impervious, the mean annual flood (approximately the 2-year flood) is about eight times larger than for the natural basin. The mean annual flood from a basin of 1 square mile that is completely storm sewered but 0 percent impervious is about 1.7 times as large as the natural basin. The mean annual flood for a basin that is completely impervious but not sewered is about 2.5 times as large as for the natural basin (Leopold, 1968). Very little information of this type is available regarding discharges from urbanized areas in Idaho.

B.40.03.03 Regulated Streams. South of about 45° 30' north latitude, most agriculture (except grazing and dry farming) requires irrigation. Roughly 5,500 sq. mi. (or nearly 7 percent of the total area of the state) is irrigated, of which nearly 80 percent is irrigated from surface streams. Irrigated areas in the state are shown in Figure B-9.

Streams that reach the irrigated lands may be affected by one or a combination of the following: regulation, diversion, consumptive use, and return flow from irrigation. The impact on natural flood peaks is significant. Peak flows in many natural channels are drastically reduced and regional regression equations usually do not apply directly.

Determination of realistic design discharges requires that manmade effects be considered. Sources of data for estimating peak flows in these streams include records of performance of existing structures such as canals, bridges, ditches, drains, etc.; watermaster records of water use; streamflow records; verbal reports from local residents; and estimates of natural peak flows using basin characteristics. Contributing areas upstream during flood periods are sometimes difficult to define because of storage in reservoirs or upstream diversions that may divert floodwater outside the basin. Composite effects from works of man including canals, roads, levees, dams, and storage behind fills during floods are difficult to evaluate. Only a few floods have been measured in channels of this type and most of these have been on large streams.

Flows in Robbers Roost Creek (13073700), Spring Valley Creek (13207000), Morse Creek (13301800), and Twelve Mile Creek (13302200) in Table B-3 are known to be affected by diversions above the gaging sites. Likewise, floods in "D" drain tributary (M13084800), "F" drain, and some others listed in Table B-3 may be affected in varying degrees by works of man.

B.40.03.04 Streams With Losing or Gaining Reaches. A large number of streams, both large and small, gain or lose flow by interaction with the groundwater system. Streams flowing over permeable formations tend to gain in discharge if they are below adjacent groundwater tables and lose if above them. These streams are especially common in the areas marked "undefined" in Figure B-9. The characteristics of floods in such streams can be very different from streams fed more directly by overland flow.

Peaks in gaining reaches may be greatly subdued because all or part of the peak flow originates from groundwater runoff, which is regulated by slowly changing water tables. For example, the discharge of Birch Creek near Reno (Station 13117000) is practically all groundwater runoff that originates a few miles above the gage. The maximum flow in 15 years of record is 220 cfs (Table B-3). This peak flow is only 2.8 times the average discharge for the period of record. The channel is usually dry over the alluvium above the reach of discharge from groundwater. The stream then loses below the gage, never flowing past the Birch Creek Sinks about 30 miles downstream. A more normal stream nearby, Sawmill Creek near Goldburg (13117300), had a maximum flow of 651 cfs in 10 years of records, which is 13.4 times its average flow for the period.

Other streams, such as Cub River near Preston (10093000) and Birch Creek near Downey (13074000), are fed by large underground flows from solution cavities in limestone mountains and respond relatively quickly to changing rates of snowmelt. They may drain areas much larger or smaller than their surface drainage indicates. Flood flows in such streams may be at high rates while the flooding in adjacent streams may be considerably smaller.

A decrease in flood discharge occurs in many small streams as they flow from the impervious rocks of the mountain ranges onto the alluvial valleys. Peak flows are often further decreased by diversion for irrigation. For example, the maximum discharge of record for Morse Creek above diversions near May (13301700) is 230 cfs, while the maximum for Morse Creek near May (13301800), 2.7 miles downstream, across an alluvial fan, and below irrigation diversions, was 81 cfs.

Stream channels known to be affected by significantly large gains or losses are shown in Figure B-9. Data other than or in addition to the discharge determined by regional regression equations are needed in these areas.

B.40.03.05 Alluvial Valleys and the Snake Plain. Closely related to the streams with losing or gaining reaches, discussed previously, are streams draining basins entirely in alluvial or glacial valleys or on the Snake Plain. Other basins include both mountain and valley areas. Large areas of intermontane valleys and lowlands are underlain by deep alluvium. Other areas, especially the Snake Plain, are underlain by fractured basalt, and both types of formation can absorb large quantities of floodwater. Percolation rates are considerably reduced by deep soil cover or by lacustrine deposits, both of which vary considerably in thickness, extent, and permeability.

In most years, floods are not generated on the alluvial valleys and plains because the rate of infiltration greatly exceeds the snowmelt or precipitation rate. Natural streams are ephemeral unless the channel intercepts the groundwater table, in which case the stream is intermittent or perennial. Large parts of the Snake Plain are unchannelized or have very poorly developed channels, indicating that overland flow may be rare and short-lived.

Occasionally as the snow melts, the melt water freezes in place and a glaze is formed over the permeable alluvial or basaltic surfaces, making the surface very impermeable. If more snow accumulates and a quick snowmelt then occurs, high rates of runoff result. The floods of February 1962, February 1963, and December 1964 resulted from this sequence of hydrologic conditions and caused extensive flooding on the lowland areas of southern Idaho. Many miscellaneous measurements of these flood discharges were obtained and are shown within basin boundaries (Figure B-11). The measurement results are listed in Table B-3. No frequency data are available for this type of flood, but the data are indicative of the size of flood that can be expected from this type of event.

Much of the irrigated land in the state is in this area, and natural streams are usually affected by regulation, diversions, return flow, or changing land use (Figure B-9).

B.40.03.06 Intense Thunderstorm-Prone Areas. Intense thunderstorms may produce rates of runoff in small basins that are much higher than those computed using the regression equation. Of the peak discharges listed in Table B-3, those that were summer floods and were not associated with snowmelt were assumed to be caused by intense thunderstorms. Of those, 11 discharges exceeded 1,000 cfsm, of which three were higher than 5,000 cfsm. Five more measurements showed rates between 500 and 1,000 cfsm, 13 showed rates between 500 and 1,000 cfsm, and 13 showed rates between 100 and 500 cfsm. Reference to Figure B-10 and B-11 and the "Relative Magnitude of Floods" section indicates that most of the extremely high rates of runoff of record in Idaho are caused by intense thunderstorms. Storm cells are often small and may be confined to a small part of the basin.

All of the intense thunderstorm-prone areas measured to date are essentially unforested, except Canyon Creek tributary near Lowman, which is only sparsely forested. Practically all of the extreme floods caused by thunderstorms, which have been documented, are in southern

Idaho near the Snake Plane except for a few floods near Lewiston. Areas near the Boise front, in the Portneuf-Bear River section, and near American Falls, Murphy, Bruneau, and Lewiston appear to occur near the foothills or the base of the mountains adjacent to extensive valley areas such as the Snake Plain, Cache Valley, or Columbia Basin.

No series of annual peak flows has been established for any of these intense thunderstorm-produced floods and recurrence intervals have not been established. Probably the best basis for establishment of recurrence intervals at a design site would be from the newspaper or other local accounts. Hazard from this type of flood does exist and should be considered when designing structures for several areas of the state.

B.40.03.07 Anomalous Areas. Variations in topography, geology, climate, and land use are extreme in the state. The basin characteristics determined do not define all combinations of these variables, and the effects of the variables on flood flows have not been defined by the limited number of sites where flow data have been collected. The discharges given by the simplified equations proposed do not fit all the records of discharge within reasonable limits. The actual discharge for a given recurrence interval for some ungaged streams will likewise be more or less than the discharge given by the regression equations of this report.

Table B-3 is a list of the gaged sites for which the Q_{10}, determined by the modified log-Pearson Type III method, exceeds or is less than the Q_{10} from the regression equations by more than 70 percent. Reasons for departures from regional data are not always apparent, but at nearly all sites listed in Table B-3, several flood events have been recorded that exceed or were less than the regional 10- or even 50-year peaks as determined by the applicable regional equations. Reference to Table B-3 will enable users to determine areas where peaks of records are well above or below the estimated discharges using the regional equations.

The percentage of departure of an anomalous area from the regional data can be used as a guide in the application of the regional data to ungaged small streams. Estimates of peak flow for streams within anomalous basins or for nearby basins that appear to have similar flow or basin characteristics can be raised or lowered accordingly, especially if underdesigning or overdesigning would result in extensive damage or prohibitive costs.

B.40.04 Sources of Information. The U.S. Geological Survey publishes streamflow data for Idaho and is the major source of streamflow information. Each volume of the series of Geological Survey water-supply papers entitled "Surface Water Supply of the United States" contains a listing of the numbers of all water-supply papers in which records of surface-water data were published for the area covered by that volume. Each volume also contains a list of water-supply papers that give detailed information on major floods for the area.

Records through September 1950 for the state have been compiled and published in Water-Supply Papers 1314, 1316, and 1317. Records for October 1950 to September 1960 have been compiled and published in Water-Supply Papers 1734, 1736, and 1737. These reports contain

summaries of monthly and annual discharge or month-end storage for all previously published records, as well as some records not contained in the annual series of water-supply papers. The yearly summary table for each gaging station lists the numbers of the water-supply papers in which daily records were published for that station.

The new series of water-supply papers containing daily surface-water records for the 5-year period from October 1, 1960 to September 31, 1965 (Water-Supply Papers 1927, 1933, and 1935) also contain lists of annual and special reports published as water-supply papers.

Records since October 1, 1965, are published in annual volumes entitled "Water Resources Data for Idaho."

Discharge measurements made at miscellaneous sites and peak discharges at partial-record stations are compiled for the period 1894-1967 in a special basic-data report, "Miscellaneous Streamflow Measurements in Idaho, 1894-1967."

Special reports on major floods or droughts or other hydrologic studies for the area have been issued in publications other than water-supply papers. Information relative to these reports may be obtained from the U.S. Geological Survey.

B.40.05 Gaging Station Numbering System. Each gaging station and partial-record station has been assigned a number in downstream order in accordance with the permanent numbering system used by the U.S. Geological Survey. Numbers are assigned in a downstream direction along the main stream, and stations on tributaries between mainstream stations are numbered in the order they enter the main stream. A similar order is followed on other ranks of tributaries. The complete 8-digit number, such as 13038900, includes the part number "13" plus a 6-digit station number. Miscellaneous measurement sites are designated by the letter "M" preceding the station number.

Table B-4

GAGING STATIONS AT WHICH THE Q10 IS DETERMINED BY THE MODIFIED log-PEARSON METHOD DIFFER BY MORE THAN 70 % FROM THE Q10 DETERMINED BY THE REGIONAL EQUATION

	Station No.	Station Name	Difference (percent)
2	13302200	Twelvemile Creek near Salmon	-72
2	13336100	Meadow Creek near Lowell	206
2	13348400	Missouri Flat Creek Tributary near Pullman, WA	208
3	13154000	Clover Creek near Bliss	97
3	13155000	King Hill Creek near King Hill	142
3	13238300	Deep Creek near McCall	203
3	13240000	Lake Fork above Jump Creek, near McCall	80
3	13240500	Lake Fork above reservoir, near McCall	75
3	13249000	Squaw Creek near Gross	214
3	13290150	North Fork Pine Creek near Homestead, OR	218
3	13335200	Critchfield Draw near Clarkston, WA	156
4	13172680	Reynolds Creek Station W4	143
4	13172725	Reynolds Creek Station W12	323
4	13172730	Reynolds Creek Station W11	121
4	13172740	Reynolds Creek Station W1	135
4	13235100	Rock Creek at Lowman	137
5	13293000	Alturas Lake Creek near Obsidian	96
5	13297300	Holman Creek near Clayton	-75
5	13298300	Malm Gulch near Clayton	364
6	13027200	Bear Canyon near Freedom	130
6	13057600	Homer Creek near Herman	85
7	13075700	South Fork Pocatello Creek near Pocatello	-70
7	10084500	Cottonwood Creek near Cleveland	122
7	10090800	Battle Creek Tributary near Treasureton	164
7	10096500	Maple Creek near Franklin	98
7	10099000	High Creek near Richmond	120
7	13062700	Angus Creek near Henry	262
8	13161300	Meadow Creek near Rockland, NV	106
8	13162200	Jarbridge River at Jarbridge, NV	120

B.40.06 Using Channel Geometry to Estimate Flood Flows at Ungaged Sites in Idaho by U.S. Geological Survey; Water-Resources Investigations 80-32. The following is a summary of a portion of this report: Equations using Q200 and Q500 as dependent variables are not presented because of the uncertainties associated with extending the frequency curve too far. Most of the gaging stations used have less than 25 years of record.

B.40.06.01 Application to Ungaged Sites. Use the following procedure for bankfull width to estimate peak discharges at ungaged sites:

At the site of interest, make 5 to 10 measurements of bankfull width and average them. The measurements should be at least a channel width apart and at the level of bankfull discharge. Riggs (1974), in describing his whole-channel section, said, "The reference level for this section is variously defined by breaks in bank slope, by the edges of the flood plain, or by the lower limits of permanent vegetation." Wahl (1977) pointed out that on perennial streams, this is virtually the same as bankfull stage as described by Leopold, Wolman, and Miller (1964). More detailed descriptions are available in Emmett (1975) and Lowham (1976).

Use either of the sets of equations below to solve an estimate of the peak of interest:

$Q_{1.25}$ = 0.43 WB1.78 SE = 98%, -49%

Q_2 = 0.76 WB1.73 SE = 92%, -48%

Q_5 = 1.31 WB1.68 SE = 90%, -47%

Q_{10} = 1.73 WB1.66 SE = 90%, -47%

Q_{25} = 2.29 WB1.64 SE = 92%, -48%

Q_{50} = 2.73 WB1.62 SE = 93%, -48%

Q_{100} = 3.21 WB1.61 SE = 95%, -49%

or:

$Q_{1.25}$ = 0.48 AREA0.33 (I24_2)1.21 WB1.22 SE = 79%, -44%

Q_2 = 0.94 AREA0.34 (I24_2)1.06 WB1.16 SE = 74%, -42%

Q_5 = 1.74 AREA0.35 (I24_2)0.93 WB1.10 SE = 72%, -42%

Q_{10} = 2.37 AREA0.35 (I24_2)0.86 WB1.07 SE = 73%, -42%

Q_{25} = 3.24 AREA0.36 (I24_2)0.81 WB1.03 SE = 75%, -43%

Q_{50} = 3.92 AREA0.37 (I24_2)0.78 WB1.01 SE = 77%, -43%

Q_{100} = 4.65 AREA0.37 (I24_2)0.78 WB.99 SE = 79%, -44%

The first set of equations requires that only WB be measured to make an estimate of the selected peak discharge(s). The second set requires that AREA and I24_2 also be obtained. The

second set is included because the estimated peaks may be better estimates, as indicated by the lower standard error.

If the second set of equations is used, an estimate of I24_2 must be made. The map on Figure B-12 can be used to determine the correct value for each drainage basin of interest. The drainage basin should be located on the map and an average value of I24_2 selected.

B.40.06.02 Definitions.

AREA – Drainage area in square miles.

I24_2 – Precipitation intensity in inches for a 24-hour period with a recurrence interval of 2 years.

Q1.25 – Peak discharge in cubic feet per second with a recurrence interval of 1.25 years.

Q2 to Q100 – Peak discharges for recurrence intervals of 2 to 100 years.

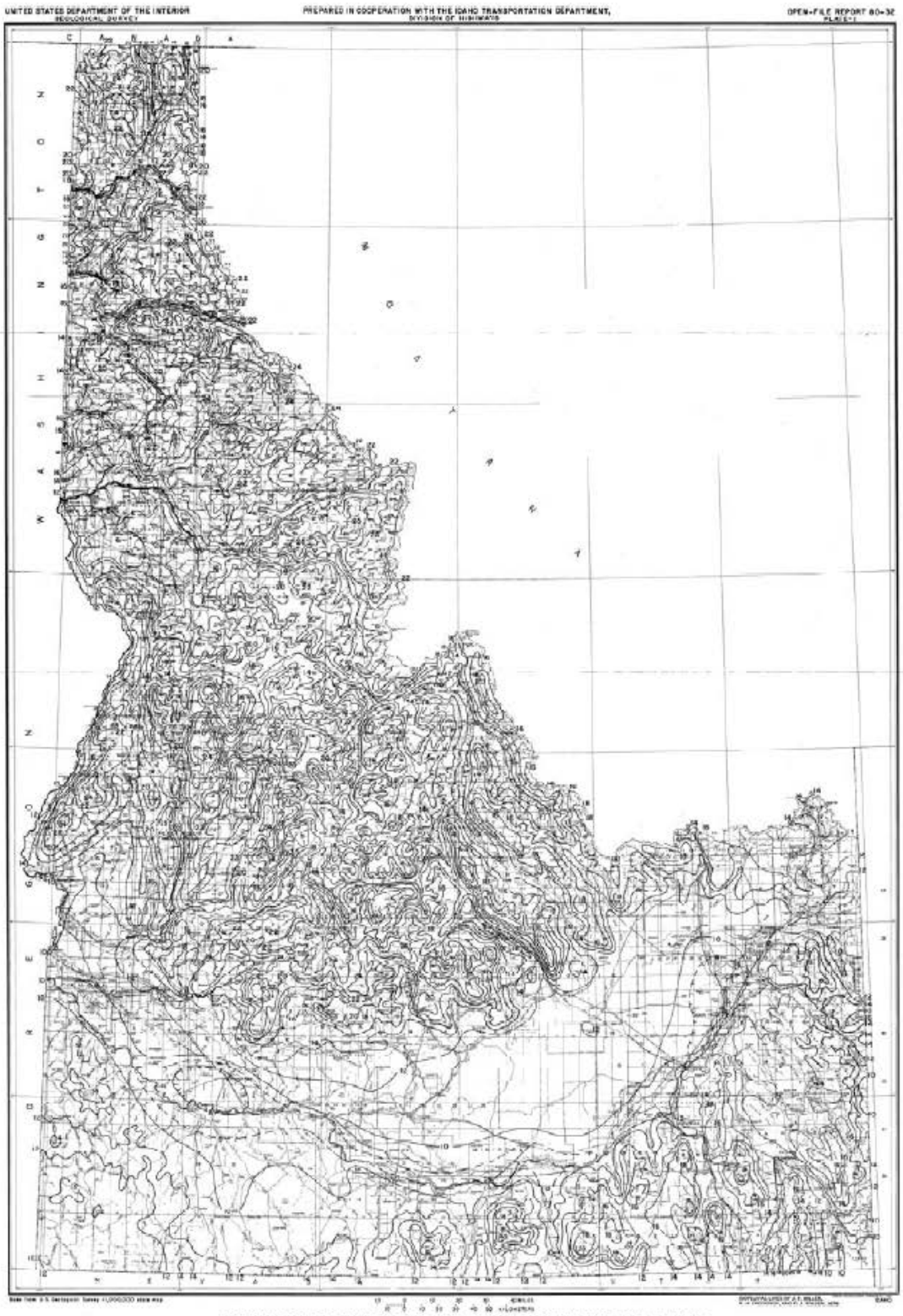
SE – Standard error in percent. The two figures following SE show the plus and minus percentages and the result because variables were computed in logarithmic form.

WB – Width of water surface at bankfull stage (average of 5 to 10 field measurements).

B.40.06.03 Conclusions. The study shows that estimates of flood flows can be made at ungaged sites in Idaho by using regression equations that relate selected floods to bankfull width or bankfull area.

The study indicates that estimates of flood flow made by using channel measurements as the independent variable are slightly better than estimates made by using basin characteristics as the independent variable. It also indicates that estimates made by using both basin and channel characteristics as the independent variables are even better.

Figure B-12



DISTRIBUTION OF 2-YEAR, 24-HOUR PRECIPITATION INTENSITY FOR IDAHO

B.40.07 A Method of Estimating Flood-Frequency Parameters for Streams in Idaho by U.S. Geological Survey, Open-File Report 81-909. The following is a summary of a portion of this report: The report was modified for ITD projects with forest cover between 0 and 30 percent. It was discovered that abnormally high results were obtained for watersheds with a low percentage of forest cover. Details are shown in Figure B-13. The revision was reviewed and concurred with by L. C. Kjelstrom and W. A. Harenberg of the U.S. Geological Survey.

B.40.07.01 Flood-Frequency Analysis for Ungaged Sites. Estimates of the most important statistic of the log-Pearson Type III distribution – the mean logarithm of annual peak discharges – can be predicted by basin characteristics. If reasonable estimates of the standard deviation of logarithms of annual peak discharges, which ranged from 0.084 to 0.538, could also be predicted by basin characteristics, the log-Pearson Type III equation could be used to develop a frequency curve for ungaged sites. Because generalized skew coefficients seem to give reasonable results when used directly for the 120 stations having less than 25 years of record, the generalized skew maps can also provide estimates of skew for ungaged basins. Regression analyses of the mean and standard deviations of logarithms of annual peaks with basin characteristics were made using 269 gaging stations (Figure B-14) having 10 or more years of systematic record.

After investigating several methods, it was determined that the two statistics could best be predicted by: (1) regionalizing the data on the basis of significant basin characteristics, for example, drainage area, mean altitude, and mean annual precipitation; and (2) separating the regionalized data by basin size. The comparison of various regression equations, correlation coefficients, and computer plots of dependent and independent variables aided in defining the regions and drainage basin sizes in some cases where different sets of variables were effective. Some subjective judgment was necessary to make the finer distinctions, but the division into subareas and drainage size was largely dictated from analyzing the data. For this study, the area was divided into three regions on the basis of similarity of basin characteristic effect; each region was analyzed separately (Figure B-15).

For both the mean and standard deviation in region 1 and the standard deviations in regions 2 and 3, a separation of basin size was required because of changes in statistically significant basin characteristics. Regression equations for region 1 could not be defined for drainage basins greater than 250 square miles because nearly all larger basins are affected by diversions or regulation. Multiple regression was done by using stepwise and step-backward techniques. Regression equations (Figure B-13) with two or three independent variables were selected on the basis of coefficients of determination, correlation coefficients, and statistical tests. The form of the equations remains in logarithmic units so an estimate of the statistics can be used in the log-Pearson Type III equation.

Figure B-13

Regionalized Regression Equations for Annual Maximum Discharges

Region	See Figure 6 for division of Regions.	MAP	Mean Annual Precipitation.
DA	Drainage Area, in square miles.	ALT	Mean Altitude of the Basin.
S	Average Slope of Main Channel between points at 85 and 10 percent of the length above the gage to the basin divide. Units are feet per mile.	INT24HR	Rainfall Intensity of a 24-hour period at the 50 percent exceedance probability.
F	Percentage of Forest Cover plus 1 percent.	MMJT	Mean Minimum January Temperature.

MODIFICATION FOR USE ON ITD PROJECTS

1. Delete -0.157xlogF (as shown) from appropriate equations in Regions 2 & 3 (DA greater than 250 square miles.)
2. Multiply computed Q by Forest Factor, defined below, when calculated from these same two equations.

PERCENT FOREST = 0-30	PERCENT FOREST = 30-100
Forest Factor = $\frac{(10^{(-0.157xKxlog\ 30)}-10^{(-0.157xKxlog\ 32)})(31-F)}{2} + 10^{(-0.157xKxlog\ 30)}$	Forest Factor = $10^{(-0.157xKxlog\ F)}$

Region	Drainage area (mi)	**M = MEAN LOG** Regression equation for mean logarithm of annual maximum discharges	**S = STANDARD DEVIATION** Regression equation for standard deviation of logarithms of annual maximum discharges	**Q = DISCHARGE K = FREQUENCY FACTOR** for log-Pearson Type III distribution, determined from Skew & desired frequency
1	≤35	1.477 + 1.280 log DA - 0.399 log S	3.289 – 0.175 log DA – 0.739 log ALT	$Q = 10^{(M + KS)}$
	>35 to <250	0.637 + 0.808 log DA + 0.155 log F	3.250 - 0.083 log F - 0.732 log ALT - 0.523 log INT24HR	$Q = 10^{(M + KS)}$
2	≤250	-0.037 + 0.839 log DA + 0.834 log MAP	1.877 - 0.067 log DA - 0.193 log MAP - 0.337 log ALT	$Q = 10^{(M + KS)}$
	>250	-0.037 + 0.839 log DA + 0.834 log MAP	0.600 – 0.157 log F –0.123 log MAP + 0.060 log MMJT	$Q = (Forest\ Factor)(10^{(M + KS)})$

3	≤250	0.800 + 0.993 log DA + 0.169 log S	0.751 - 0.050 log DA - 0.111 log ALT - 0.057 log MAP	$Q = 10^{(M + KS)}$
	>250	0.800 + 0.993 log DA + 0.169 log S	0.600 – 0.157 log F – 0.123 log MAP + 0.060 log MMJT	$Q = (\text{Forest Factor})(10^{(M + KS)})$

Figure B-14
Sheet 1 of 5

Data Table D. – Magnitude and frequency of flood data for selected gaging stations using the log-Pearson Type III distribution - Continued

STA_NO	STA_NAME	Discharge, in ft³/s						DATE	YRS_REC
		_50_PCT	_10_PCT	_4_PCT	_2_PCT	_1_PCT	MAX_PEAK		
13113000	BEAVER C AT SPENCER, ID	321	570	702	803	906	1190	05-18-75	21
13116000	MEDICINE LODGE C AT ELLIS RCH NR ARGORA, ID	105.0	192	241	279	320	361	04-15-62	31
13117000	BIRCH C NR RENO, ID	100.0	125	137	145	154	220	04-01-62	16
13117200	MAIN FORK NR GOLDBURG, ID	134.0	238	288	324	*	273	06-12-65	10
13117300	SAWMILL C NR GOLDBURG, ID	164.0	650	788	888	*	651	06-12-65	13
13118700	LITTLE LOST R BLW WET C NR HOWE, ID	307.0	490	574	632	687	609	06-16-75	17
13120000	N F BIG LOST R AT WILDHORSE NR CHILLY, ID	733.0	1150	1360	1500	1650	1420	06-12-65	34
13120500	BIG LOST R AT HOWELL RANCH NR CHILLY, ID	2120.0	3400	3930	4290	4620	4420	05-25-67	74
13128900	LOWER CEDAR C AB DIVERSIONS NR MACKAY, ID	155.0	247	289	318	*	256	06-08-72	11
13135200	PRAIRIE C NR KETCHUM, ID	167.0	285	314	380	*	293	05-24-63	10
13135500	BIG WOOD R NR KETCHUM, ID	891.0	1430	1690	1870	2050	1690	05-24-67	24
13135800	ADAMS GULCH DR KETCHUM, ID	40.0	113	161	199	*	124	1971	10
13141400	DEER C NR FAIRFIELD, ID	54.0	112	147	175	*	150	04-03-65	11
13141500	CAMAS C NR BLAINE, ID	2650.0	7150	9720	11700	13600	9780	04-08-43	53
13145700	SCHOOLER C NR GOODING, ID	23.0	55	76	93	112	68	02-01-63	16
13147900	LITTLE WOOD R AB HIGH FIVE C NR CAREY, ID	930.0	1800	2450	3200	4500	3000	12-22-55	41
13154000	CLOVER C NR BLISS, ID	1410.0	5160	8640	12200	16800	11000	12-22-64	24
13155200	BURNS GULCH NR GLENNS FERRY, ID	5.3	17	27	35	*	22	02-01-63	10
13155300	L CANYON C AT STOUT XING NR GLENNS FERRY, ID	88.0	230	338	438	555	500	12-23-64	15
13161100	BRUNEAU R NR CHARLESTON, NV	20.0	181	404	678	1080	1890	02-11-62	15
13161200	SEVENTY SIX C NR CHARLESTON, NV	24.0	74	108	136	166	89	05-00-75	15
13161300	MEADOW C NR ROWLAND, NV	180.0	533	1010	1380	1820	940	06-04-63	15
13161500	BRUNEAU R NR ROWLAND, NV	710.0	1580	2130	2590	3100	2120	02-11-62	22
13161600	MCDONALD C NR ROWLAND, NV	43.0	76	95	109	124	85	06- -75	16
13162200	JARBIDGE R AT JARBIDGE, NV	299.0	606	790	940	*	700	06- -70	15
13162400	BUCK C NR JARBIDGE, NV	79.0	261	410	550	*	380	06- -71	16
13162500	E F JARBIDGE R NR THREE CREEK, ID	436.0	735	894	1020	1140	798	06-22-71	22
13162600	COLUMBET C NR JARBIDGE, NV	11.0	35	52	69	88	46	05- -75	16
13167500	E F BRUNEAU R NR HOT SPRING, ID	194.0	486	687	861	1060	619	06-08-63	27
13169500	BIG JACKS C NR BRUNEAU, ID	162.0	712	1290	1940	2810	2100	01-22-43	23
13170000	L JACKS C NR BRUNEAU, ID	138.0	756	1430	2180	*	908	01-21-43	11
13170100	SUGAR C TRIBUTARY NR GRASMERE, ID	24.0	83	131	177	233	105	06-10-69	17
13172666	WEST FORK REYNOLDS C NR REYNOLDS, ID	4.7	13	20	25	*	14	06-02-75	14
13172668	EAST FORK REYNOLDS C NR REYNOLDS, ID	4.0	9	13	16	*	11	04-29-65	16
13172680	REYNOLDS C AT TOLLGATE WEIR NR REYNOLDS, ID	207.0	307	355	390	*	404	05-10-69	13
13172720	MACKS C NR REYNOLDS, ID	89.0	345	566	780	*	1200	12-23-64	15
13172735	SALMON C NR REYNOLDS, ID	75.0	269	429	580	*	1010	12-23-64	15
13172740	REYNOLDS C AT OUTLET WEIR NR REYNOLDS, ID	414.0	1460	2310	3110	*	3800	12-23-64	16
13172800	L SQUAW C TRIBUTARY NR MARSING, ID	9.0	45	80	117	164	93	01-31-63	17
13178000	JORDAN C AB LONE TREE C NR JORDAN VALLEY, OR	2050.0	3800	5000	6040	7470	7530	12-24-64	24
13184200	ROARING R NR ROCKY BAR, ID	326.0	537	635	704	*	575	06-22-67	14
13184800	BEAVER C NR LOWMAN, ID	102.0	182	224	257	*	195	1971	10
13185000	BOISE R NR TWIN SPRINGS, ID	7200.0	11300	13500	15000	16800	22700	1872	67
13186000	S F BOISE R NR FEATHERVILLE, ID	4550.0	6540	7380	7950	8490	7580	05-24-56	33
13186500	LIME C NR BENNETT, ID	649.0	1180	1470	1690	*	1180	04-27-52	11
13187000	FALL C NR ANDERSON RANCH DAM, ID	521.0	838	998	1120	*	1150	04-27-52	12
13191000	S F BOISE R NR LENOX, ID	4800.0	8540	10500	12000	13600	9550	04-17-43	35
13196500	BANNOCK C NR IDAHO CITY, ID	13.0	34	47	59	72	46	04-22-65	24
13200000	MORES C AB ROBIE CR NR ARROWROCK DAM, ID	2000.0	3880	5100	6080	7100	5270	04-08-43	62
13200500	ROBIE C NR ARROWROCK, ID	69.0	135	179	215	256	274	01-29-65	21
13207000	SPRING VALLEY C NR EAGLE, ID	51.0	241	442	665	*	435	02-11-79	16
13207500	DRY C NR EAGLE, ID	93.0	386	649	908	*	373	01-29-65	14
13210300	BRYANS RUN NR BOISE, ID	67.0	217	334	440	565	420	01-16-71	19
13214000	MALHEUR R NR DREWSEY, OR	2080.0	5400	8080	11100	14900	12000	12-23-64	57

Figure B-14
Sheet 2 of 5

Data Table D. – Magnitude and frequency of flood data for selected gaging stations using the log-Pearson Type III distribution - Continued

STA_NO	STA_NAME	Discharge, in ft³/s						DATE	YRS_REC
		_50_PCT	_10_PCT	_4_PCT	_2_PCT	_1_PCT	MAX_PEAK		
12413200	MONTGOMERY C NR KELLOGG, ID	72	160	218	288	*	155	01-31-71	10
12413500	COEUR D'ALENE NR CATALDO, ID	18900	36700	51500	69000	90100	79000	01-16-74	54
12413700	LATOUR C NR CATALDO, ID	608	1140	1450	1700	*	1900	01-16-74	10
12414500	ST JOE R AT CALDER, ID	16400	26200	32200	38400	45400	53000	12-23-33	59
12414900	ST MARIES R NR SANTA, ID	2470	5450	7370	8980	*	10700	01-15-74	13
12415000	ST MARIES R AT LOTUS, ID	4780	10900	15200	19000	23500	23800	12-22-33	44
12415100	CHERRY C NR ST MARIES, ID	115	198	245	283	*	317	01-16-74	12
12415200	PLUMMER C TRIB AT PLUMMER, ID	67	115	140	161	182	150	01-15-74	16
12416000	HAYDEN C BW NORTH FORK, NR HAYDEN LAKE, ID	328	644	825	968	1120	790	12-23-64	23
12424000	HANGMAN C AT SPOKANE, WA	7170	14100	18400	21900	25600	20600	02-03-63	30
12427000	LITTLE SPOKANE R AT ELK, WA	108	149	169	184	193	205	01-16-74	29
12431000	LITTLE SPOKANE R AT DARTFORD, WA	1490	2360	2800	3130	3460	3170	02-17-70	35
12465000	CRAB C AT IRBY, WA	1120	4310	7070	9720	12900	8370	02-27-57	35
13011500	PACIFIC C AT MORAN, WY	2460	3300	3650	3880	4090	3790	06-15-74	31
13011900	BUFFALO FORK AB LAVA C NR MORAN, WY	4250	5200	5570	5810	*	6020	06-19-74	12
13014500	GROS VENTRE R AT KELLY, WY	3100	4590	5290	5790	*	8960	06-16-18	15
13023000	GREYS R ABOVE RES NR ALPINE, WY	3420	5280	6110	6690	7240	7230	06-19-71	25
13024500	COTTONWOOD C NR SMOOT, WY	243	360	411	445	479	438	06-02-56	25
13025000	SWIFT C NR AFTON, WY	506	710	795	853	907	793	07-06-75	36
13025500	CROW C NR FAIRVIEW, WY	227	334	379	411	*	346	02-01-63	10
13027500	SALT R ABOVE RES. NR ETNA, WY	2140	3510	4130	4570	4980	3870	06-01-71	23
13029500	MCCOY C ABOVE RES. NR ALPINE, ID	915	1330	1500	1610	1720	1670	05-10-74	19
13030000	INDIAN C ABOVE RES. NR ALPINE, ID	207	304	345	373	400	350	06-14-18	18
13030500	ELK C ABOVE RES. NR IRWIN, ID	476	702	799	866	928	870	05-15-18	18
13032000	BEAR C ABOVE RES. NR IRWIN, ID	521	754	853	920	983	784	05-05-36	22
13038900	TARGHEE C NR MACKS INN, ID	274	379	423	452	479	458	05-23-70	15
13044500	WARM R AT WARM RIVER, ID	467	729	846	928	1000	900	05-02-12	18
13045500	ROBINSON C AT WARM RIVER, ID	596	998	1180	1320	1440	1140	05-28-12	18
13047500	FALL R NR SQUIRREL, ID	3480	4790	5370	4770	6150	6440	06-27-27	65
13050700	MAIL CABIN C NR VICTOR, ID	39	59	68	74	*	81	05-21-71	10
13050800	MOOSE C NR VICTOR, ID	281	371	407	431	*	390	06-23-71	10
13052200	TETON R ABOVE S LEIGH C NR DRIGGS, ID	1290	2030	2350	2580	2800	2270	05-19-74	22
13054400	MILK C NR TETONIA, ID	102	519	891	1250	1670	1350	02-01-53	16
13055000	TETON R NR ST ANTHONY, ID	3260	5270	6320	7120	7940	11000	02-12-52	67
13058000	WILLOW C NR RIRIE, ID	1720	3130	3890	4490	5100	5080	02-11-62	25
13061100	SNAKE R TRIB NR OSGOOD, ID	89	330	540	747	1000	450	01-21-69	17
13062700	ANGUS C NR HENRY, ID	266	667	906	1100	*	1060	05-11-76	13
13063000	BLACKFOOT R ABOVE RES. NR HENRY, ID	1260	2140	2550	2840	3120	2150	04-26-74	22
13063500	L BLACKFOOT R AT HENRY, ID	143	254	307	346	*	292	04-19-14	12
13068500	BLACKFOOT R NR BLACKFOOT, ID	1650	2650	3130	3490	3840	3500	05-01-52	55
13073700	ROBBERS ROOST C NR MCCAMMON, ID	13	27	35	42	*	24	04-22-69	11
13075000	MARSH C NR MCCAMMON, ID	294	476	585	680	780	1120	02-12-62	23
13075600	N F POCATELLO C NR POCATELLO, ID	21	46	62	75	*	57	03-13-71	11
13077700	GEORGE C NR YOST, UT	66	110	131	146	160	146	06-10-63	18
13078000	RAFT R AT PETERSON RH NR BRIDGE, ID	130	430	828	1390	2270	2060	01-17-71	24
13079000	CLEAR C NR NAF, ID	121	226	278	317	355	386	06-15-67	28
13079200	CASSIA C NR ELBA, ID	163	438	642	827	*	982	12-23-64	11
13079800	HEGLAR CANYON TRIBUTARY NR ROCKLAND, ID	117	396	652	916	1260	1930	07- -58	16
13082500	GOOSE C AB TRAPPER NR OAKLEY, ID	300	810	1360	2140	3280	3240	02-11-62	64
13083000	TRAPPER C NR OAKLEY, ID	58	105	142	173	216	270	08-17-41	61
13092000	ROCK C NR ROCK CREEK, ID	197	420	538	625	712	461	05-19-70	36
13105000	SALMON FALLS C NR SAN JACINTO, NV	760	1560	2200	3000	4300	2430	05-18-75	65
13106500	CAMAS C AT 18 M SHEARING CORRAL NR KILGORE, ID	870	1640	2020	2310	2590	2590	05-08-69	29
13112900	HUNTLEY CANYON AT SPENCER, ID	10	23	30	36	*	36	05-15-69	10

Figure B-14
Sheet 3 of 5

Data Table D – Magnitude and frequency of flood data for selected gaging stations using the log-Pearson Type III distribution – Continued

STA_NO	STA_NAME	Discharge, in ft³/s						DATE	YRS_REC
		_50_PCT	_10_PCT	_4_PCT	_2_PCT	_1_PCT	MAX_PEAK		
13113000	BEAVER C AT SPENCER, ID	321	570	702	803	906	1190	05-18-75	21
13116000	MEDICINE LODGE C AT ELLIS RCH NR ARGORA, ID	105.0	192	241	279	320	361	04-15-62	31
13117000	BIRCH C NR RENO, ID	100.0	125	137	145	154	220	04-01-62	16
13117200	MAIN FORK NR GOLDBURG, ID	134.0	238	288	324	*	273	06-12-65	10
13117300	SAWMILL C NR GOLDBURG, ID	164.0	650	788	888	*	651	06-12-65	13
13118700	LITTLE LOST R BLW WET C NR HOWE, ID	207.0	490	574	632	687	609	06-16-75	17
13120000	N F BIG LOST R AT WILDHORSE JCT NR CHILLY, ID	733.0	1150	1360	1500	1650	1420	06-12-65	34
13120500	BIG LOST R AT HOWELL RANCH NR CHILLY, ID	2120.0	3400	3930	4290	4620	4420	05-25-67	74
13128900	LOWER CEDAR C AB DIVERSIONS NR MACKAY, ID	155.0	247	289	318	*	256	06-08-72	11
13135200	PRAIRIE C NR KETCHUM, ID	167.0	285	314	380	*	293	05-24-63	10
13135500	BIG WOOD R NR KETCHUM, ID	891.0	1430	1690	1870	2050	1690	05-24-67	24
13135800	ADAMS GULCH DR KETCHUM, ID	40.0	113	161	199	*	124	1971	10
13141400	DEER C NR FAIRFIELD, ID	54.0	112	147	175	*	150	04-03-65	11
13141500	CAMAS C NR BLAINE, ID	2650.0	7150	9720	11700	13600	9780	04-08-43	53
13145700	SCHOOLER C NR GOODING, ID	23.0	55	76	93	112	68	02-01-63	16
13147900	LITTLE WOOD R AB HIGH FIVE C NR CAREY, ID	930.0	1800	2450	3200	4500	3000	12-22-55	41
13154000	CLOVER C NR BLISS, ID	1410.0	5160	8640	12200	16800	11000	12-22-64	24
13155200	BURNS GULCH NR GLENNS FERRY, ID	5.3	17	27	35	*	22	02-01-63	10
13155300	L CANYON C AT STOUT XING NR GLENNS FERRY, ID	88.0	230	338	438	555	500	12-23-64	15
13161100	BRUNEAU R NR CHARLESTON, NV	20.0	181	404	678	1080	1890	02-11-62	15
13161200	SEVENTY SIX C NR CHARLESTON, NV	24.0	74	108	136	166	89	05-00-75	15
13161300	MEADOW C NR ROWLAND, NV	180.0	533	1010	1380	1820	940	06-04-63	15
13161500	BRUNEAU R NR ROWLAND, NV	710.0	1580	2130	2590	3100	2120	02-11-62	22
13161600	MCDONALD C NR ROWLAND, NV	43.0	76	95	109	124	85	06- -75	16
13162200	JARBIDGE R AT JARBIDGE, NV	299.0	606	790	940	*	700	06- -70	15
13162400	BUCK C NR JARBIDGE, NV	79.0	261	410	550	*	380	06- -71	16
13162500	E F JARBIDGE R NR THREE CREEK, ID	436.0	735	894	1020	1140	798	06-22-71	22
13162600	COLUMBET C NR JARBIDGE, NV	11.0	35	52	69	88	46	05- -75	16
13167500	E F BRUNEAU R NR HOT SPRING, ID	194.0	486	687	861	1060	619	06-08-63	27
13169500	BIG JACKS C NR BRUNEAU, ID	162.0	712	1290	1940	2810	2100	01-22-43	23
13170000	L JACKS C NR BRUNEAU, ID	138.0	756	1430	2180	*	908	01-21-43	11
13170100	SUGAR C TRIBUTARY NR GRASMERE, ID	24.0	83	131	177	233	105	06-10-69	17
13172666	WEST FORK REYNOLDS C NR REYNOLDS, ID	4.7	13	20	25	*	14	06-02-75	14
13172668	EAST FORK REYNOLDS C NR REYNOLDS, ID	4.0	9	13	16	*	11	04-29-65	16
13172680	REYNOLDS C AT TOLLGATE WEIR NR REYNOLDS, ID	207.0	307	355	390	*	404	05-10-69	13
13172720	MACKS C NR REYNOLDS, ID	89.0	345	566	780	*	1200	12-23-64	15
13172735	SALMON C NR REYNOLDS, ID	75.0	269	429	580	*	1010	12-23-64	15
13172740	REYNOLDS C AT OUTLET WEIR NR REYNOLDS, ID	414.0	1460	2310	3110	*	3800	12-23-64	16
13172800	L SQUAW C TRIBUTARY NR MARSING, ID	9.0	45	80	117	164	93	01-31-63	17
13178000	JORDAN C AB LONE TREE C NR JORDAN VALLEY, OR	2050.0	3800	5000	6040	7470	7530	12-24-64	24
13184200	ROARING R NR ROCKY BAR, ID	326.0	537	635	704	*	575	06-22-67	14
13184300	BEAVER C NR LOWMAN, ID	102.0	182	224	257	*	195	1971	10
13185000	BOISE R NR TWIN SPRINGS, ID	7200.0	11300	13500	15000	16800	22700	1872	67
13186000	S F BOISE R NR FEATHERVILLE, ID	4550.0	6540	7380	7950	8490	7580	05-24-56	33
13186500	LIME C NR BENNETT, ID	649.0	1180	1470	1690	*	1180	04-27-52	11
13187000	FALL C NR ANDERSON RANCH DAM, ID	521.0	838	998	1120	*	1150	04-27-52	12
13191000	S F BOISE R NR LENOX, ID	4800.0	8540	10500	12000	13600	9550	04-17-43	35
13196500	BANNOCK C NR IDAHO CITY, ID	13.0	34	47	59	72	46	04-22-65	24
13200000	MORES C AB ROBIE CR NR ARROWROCK DAM, ID	2000.0	3880	5100	6080	7100	5270	04-08-43	62
13200500	ROBIE C NR ARROWROCK, ID	69.0	135	179	215	256	274	01-29-65	21
13207000	SPRING VALLEY C NR EAGLE, ID	51.0	241	442	663	*	435	02-11-79	16
13207500	DRY C NR EAGLE, ID	93.0	386	649	908	*	373	01-29-65	14
13210300	BRYANS RUN NR BOISE, ID	67.0	217	334	440	565	420	01-16-71	19
13214000	MALHEUR R NR DREWSEY, OR	2080.0	5400	8080	11100	14900	12000	12-23-64	57

Figure B-14
Sheet 4 of 5

Data Table D - Magnitude and frequency of flood data for selected gaging stations using the log-Pearson Type III distribution - Continued

STA_NO	STA_NAME	Discharge, in ft³/s								
		_50_PCT	_10_PCT	_4_PCT	_2_PCT	_1_PCT	MAX_PEAK	DATE	YRS_REC
13216500	N F MALHEUR R AB BEULAH RES, NR BEULAH, OR	860.0	1900	2910	4000	5360	5910	03-20-10	41
13226500	BULLY C AT WARMSPRINGS NR VALE, OR	1280.0	4350	6910	9540	12800	12800	02-24-57	53
13234300	FIVEMILE C NR LOWMAN, ID	145.0	253	312	358	*	520	06-17-74	14
13235000	S F PAYETTE R AT LOWMAN, ID	4220.0	6010	6780	7310	7810	8980	06-16-74	37
13235100	ROCK C AT LOWMAN ID	150.0	310	404	480	*	400	05-13-71	10
13237300	DANSKIN C NR GRIMES PASS, ID	34.0	69	90	106	*	71	04-22265	10
13238300	DEEP C NR MCCALL, ID	349.0	490	553	597	*	540	06-06-70	10
13240000	LAKE FORK PAYETTE R AB JUMBO C NR MCCALL, ID	1360.0	2120	2460	2690	2910	2770	06-26-71	52
13245400	TRIPOD C AT SMITHS FERRY, ID	84.0	160	203	237	*	183	1971	16
13248900	COTTONWOOD C NR HORSESHOE BEND, ID	68.0	170	244	311	*	303	02-01-63	17
13250600	BIG WILLOW C NR EMMETT, ID	814.0	1490	1860	2150	2450	2100	12-22-64	18
13250650	FOURMILE C NR EMMETT, ID	90.0	367	578	764	*	500	12-22-64	10
13251300	W BRANCH WEISER R NR TAMARACK, ID	38.0	74	94	110	126	87	05-04-71	18
13251500	WEISER R AT TAMARACK, ID	480.0	800	945	1060	1200	1320	12-22-55	37
13252500	EF WEISER R NR COUNCIL, ID	56.0	71	76	80	*	77	06-16-38	10
13253500	WEISER R AT STARKEY, ID	992.0	1940	2480	2920	*	2800	12-22-55	12
13257000	MF WEISER R NR MESA, ID	778.0	1290	1540	1720	1890	1710	12-22-55	19
13258500	WEISER R NR CAMBRIDGE, ID	4830.0	8000	9790	11300	12800	10100	12-22-55	39
13260000	PINE C NR CAMBRIDGE, ID	260.0	498	632	737	847	850	02-25-58	24
13261000	LITTLE WEISER R NR INDIAN VALLEY, ID	790.0	1250	1550	1820	2120	1840	02-04-25	39
13263500	WEISER R AB CRANE C NR WEISER, ID	7700.0	13500	16400	19300	22400	19800	12-23-55	69
13266000	WEISER R NR WEISER, ID	9780.0	17500	21600	24700	27900	23500	12-23-55	58
13267000	MANN C NR WEISER, ID	412.0	790	1110	1460	1880	1540	03-27-40	32
13267100	DEER C NR MIDVALE, ID	61.0	152	211	262	*	156	01-27-70	10
13269300	N F BURNT R NR WHITNEY, OR	693.0	1050	1220	1340	*	1190	04-06-71	13
13270800	S F BURNT R ABOVE BARNEY C NR UNITY, OR	75.0	150	190	220	*	186	04-29-65	14
13273000	BURNT R NR HEREFORD, OR	659.0	1440	1890	2240	2610	2220	04-17-43	28
13275500	PPOWDER R NR BAKER, OR	706.0	1290	1580	1800	2010	1860	1921	52
13288200	EAGLE C ABOVE SKULL C NR NEW BRIDGE, OR	2030.0	3230	3850	4310	4780	5310	07-12-75	23
13290150	M PINE C NR HOMESTEAD, OR	72.0	185	262	328	*	226	04-30-65	13
13290190	PINE C NR OXBOW, OR	2740.0	6360	8650	10600	*	7110	02-21-68	13
13292000	IMNAHA R AT IMNAHA, OR	2600.0	4800	6450	8190	11500	10100	01-17-74	49
13292500	SALMON R NR OBSIDIAN, ID	518.0	714	794	849	*	721	05-29-52	12
13293000	ALTURAS LAKE C NR OBSIDIAN, ID	469.0	658	736	789	*	633	06-07-52	12
13295000	VALLEY C AT STANLEY, ID	990.0	1540	1780	1950	2110	2000	05-24-56	56
13295500	SALMON R BELOW VALLEY C AT STANLEY, ID	3050.0	4650	5350	5830	6290	5660	06-17-74	35
13296000	YANKEE FORK SALMON R NR CLAYTON, ID	1480.0	2790	3490	4020	4550	4900	06-17-74	28
13296500	SALMON R BELOW YANKEE FORK NR CLAYTON, ID	5040.0	8170	9530	10500	11300	10500	06-17-74	56
13297300	HOLMAN C NR CLAYTON, ID	9.1	20	25	30	*	25	06-13-65	10
13298000	E F SALMON R NR CLAYTON, ID	1510.0	2900	3620	4160	4710	4020	06-17-74	15
13298300	MALM GULCH NR CLAYTON, ID	85.0	391	672	948	*	440	04-01-69	10
13299000	CHALLIS C NR CHALLIS, ID	260.0	455	552	624	696	872	06-12-65	27
13301700	MORSE C ABOVE DIVERSIONS NR MAY, ID	142.0	228	267	295	*	270	06-16-75	14
13305700	DAHLONEGA C AT GIBBONVILLE, ID	98.0	211	272	319	*	235	1971	10
13305800	HUGHES C NR NORTH FORK, ID	138.0	256	320	268	417	250	01-16-74	17
13306500	PANTHER C NR SHOUP, ID	1780.0	3050	3630	4050	4440	3050	06-16-74	33
13308500	M F SALMON R NR CAPE HORN, ID	1650.0	2510	2890	3150	3390	3320	06-17-74	44
13309000	BEAR VALLEY C NR CAPE HORN, ID	2100.0	3210	3700	4040	4360	3860	05-27-56	39
13310000	BIG CREEK NR BIG CREEK, ID	3740.0	5380	6070	6540	*	5800	06-03-48	14
13310500	S F SALMON R NR KNOX, ID	1040.0	1500	1690	1830	1950	1620	05-27-56	31
13311000	E F SOUTH FORK SALMON R AT STIBNITE, ID	174.0	261	299	326	*	369	05-14-33	14
13311500	EF SOUTH FORK SALMON R NR STIBNITE, ID	356.0	559	698	775	*	783	06-15-33	12
13312000	E F SOUTH FORK SALMON R NR YELLOW PINE, ID	942.0	1370	1550	1670	*	2050	06-14-33	15
13313000	JOHNSON C AT YELLOW PINE, ID	3020.0	4630	5350	5850	6340	6230	06-17-74	49

Figure B-14
Sheet 5 of 5

Data Table D - Magnitude and frequency of flood data for selected gaging stations using the log-Pearson Type III distribution - Continued

STA_NO	STA_NAME	Discharge, in ft^3/s						DATE	YRS_REC
		_50_PCT	_10_PCT	_4_PCT	_2_PCT	_1_PCT	MAX_PEAK		
13313500	SECESH R NR BURGDORF, ID	1410.0	2000	2250	2420	*	2500	06-03-48	10
13314000	S F SALMON R NR WARREN, ID	11600.0	17300	19800	21500	*	23000	05-28-48	12
13315500	MUD C NR TAMARACK, ID	199.0	335	405	458	511	395	04-27-52	26
13316500	LITTLE SALMON R AT RIGGINS, ID	5180	8040	9490	10600	11600	12600	06-17-74	27
13316800	N F SKOOKUMCHUCK C NR WHITE BIRD, ID	129	231	289	335	384	471	06-08-64	12
13317200	JOHNS C NR GRANGEVILLE, ID	97	309	472	621	*	400	01-29-65	12
13319000	GRANDE RONDE R AT LAGRANDE, OR	3290	5900	7700	9600	12000	14100	01-30-65	69
13320000	CATHRINE C NR UNION, OR	764	1190	1380	1520	1660	1740	05-27-48	56
13323600	INDIAN C NR IMBLER, OR	405	637	752	838	*	818	05-27-48	13
13325000	E F WALLOWA R NR JOSEPH, OR	105	190	239	278	319	450	07-25-37	53
13329500	HURRICANE C NR JOSEPH, OR	537	858	1010	1130	1240	1110	06-09-48	55
13330000	LOSTINE R NR LOSTINE, OR	1580	2200	2470	2650	2810	2550	06-16-74	53
13330500	BEAR C NR WALLOWA, OR	912	1400	1630	1800	1970	1730	06-15-74	55
13331500	MINAM R AT MINAM, OR	3280	5100	5980	6620	7260	6260	06-16-74	13
13334700	ASOTIN C BELOW KEARNEY GULCH NR ASOTIN, WA	362	1040	1660	2300	3130	3700	01-15-74	49
13336500	SELWAY R NR LOWELL, ID	26200	39000	45100	49500	53800	43900	05-29-48	49
13336600	SWIFTWATER C NR LOWELL, ID	72	145	188	221	*	150	01-29-65	10
13336650	E F PAPOOSE C NR POWELL RANGER STA, ID	78	125	148	166	*	125	04-20-65	10
13336850	WEIR C NR POWELL RANGER STATION, ID	264	526	677	796	*	500	05-20-64	10
13336900	FISH C NR LOWELL, ID	1630	2400	2760	3020	*	2280	05-20-64	10
13337000	LOCHSA R NR LOWELL, ID	19300	28700	33000	36100	39100	35100	06-08-64	50
13337200	RED HORSE C NR ELK CITY, ID	89	177	228	268	*	200	05-21-64	10
13337500	S F CLEARWATER R NR ELK CITY, ID	1910	3130	3750	4210	4670	4040	06-08-64	30
13337700	PEASLEY C NR GOLDEN, ID	79	169	224	268	*	240	06-08-64	14
13338000	S F CLEARWATER R NR GRANGEVILLE, ID	5030	8140	9860	11200	12700	15000	05-30-17	51
13338200	SALLY ANN C NR STITES, ID	184	292	348	390	*	305	06-08-64	11
13339700	CANAL GULCH C AT PIERCE RANGER STATION, ID	116	230	298	352	*	291	04-20-65	16
13339900	DEER C NR ORofino, ID	96	306	473	629	*	485	01-29-65	15
13340500	N F CLEARWATER R AT BUNGALOW R S, ID	16300	23000	26100	28400	30700	27400	05-29-48	25
13341000	N F CLEARWATER R NR AHSAHKA, ID	31500	48000	60000	75200	98500	100000	12-23-33	58
13341100	COLD SPRINGS C NR CRAIGMONT, ID	47	155	244	328	429	200	01-29-65	15
13341300	BLOOM C NR BOVILL, ID	55	113	150	180	213	151	01-29-65	18
13341400	E F POTLATCH R NR BOVILL, ID	633	1130	1410	1630	*	1740	12-24-64	12
13341500	POTLATCH C AT KENDRICK, ID	6380	11600	14500	16900	19400	16000	01-29-65	30
13343800	MEADOW C NR CENTRAL FERRY, WA	600	2240	3680	5080	*	2380	09-13-66	13
13344500	TUCANNON R NR STARBUCK, WA	1850	5470	8180	10600	13500	7980	12-22-64	24
13344700	DEEP C TRIBUTARY NR POTLATCH, ID	56	103	130	152	*	157	12-23-64	11
13344800	DEEP C NR POTLATCH, ID	726	1480	1950	2340	*	2330	01-16-74	16
13345000	PALOUSE R NR POTLATCH, ID	3460	6070	7560	8740	*	10100	01-16-74	16
13346100	PALOUSE R AT COLFAX, WA	4620	8550	10800	12700	14600	12600	01-16-74	21
13346800	S F PALOUSE R AT PULLMAN, WA	1050	2610	3750	4770	5970	5000	02-26-48	30
13348500	MISSOURI FLAT C AT PULLMAN, WA	387	813	1120	1390	1720	1500	02-26-48	23
13349210	PALOUSE R BELOW SOUTH FORK AT COLFAX, WA	6750	14400	19300	23500	*	16800	01-16-74	14
13349400	PINE C AT PINE CITY, WA	1920	5080	7400	9500	*	10600	02-03-63	15
13350500	UNION FLAT C NR COLFAX, WA	877	2010	2770	3420	4150	2930	01-29-65	23
13352500	COW C AT HOOPER, WA	114	496	876	1280	1800	1250	02-05-52	17
14010000	S F WALLA WALLA R NR MILTON, OR	783	1490	1940	2320	2730	2530	01-29-65	56
14013000	MILL C NR WALLA WALLA, WA	918	1940	2600	3160	3780	3680	01-29-65	41
14013500	BLUE C NR WALLA WALLA, WA	314	733	1010	1240	1500	1320	01-06-69	31
14016500	E F TOUCHET R NR DAYTON, WA	1100	2310	3090	3750	4480	5450	12-23-64	21
14017500	TOUCHET R NR TOUCHET, WA	3860	8080	10800	13100	15600	15100	1965	13
14018500	WALLA WALLA R NR TOUCHET, WA	7370	15500	20700	25100	30000	33400	12-22-64	26

Descriptions and a brief explanation of computation procedures for the basin characteristics are given below.

Drainage Area (DA)

Drainage area is expressed in square miles, is the total area contributing to flood discharge, and is obtained from USGS "StreamStats".

Drainage Area Below 6,000-Foot Altitude (PL6T)

Drainage area below 6,000-foot altitude is expressed as a percentage of the total drainage area and is obtained by outlining the 6,000-foot contour and is obtained from USGS "StreamStats".

Forest Cover (F)

Forest cover is expressed as a percentage of the drainage covered by forests and is obtained by a grid-overlay method. The grid is selected so that approximately 30 intersections are within the basin. The number of intersections within forested areas are then counted and expressed as a percentage of all intersections.

Length

Length is the total distance, expressed in miles, along the main channel between the divide and the gage.

Slope (S)

Slope is the average fall in the main channel, expressed in feet per mile, in a reach from the 10th to the 85th percentile of the length upstream from the gage.

Mean Altitude (ALT)

Mean altitude, expressed in feet, is computed by a grid-overlay method. The grid selected should have at least 20 points inside the basin. (This may not be possible for very small basins.) Altitudes at the intersection points are then averaged.

Mean Annual Precipitation (MAP)

Mean annual precipitation, expressed in inches, is computed by a grid-overlay method on a 1930-1957 mean annual precipitation map (National Oceanic and Atmospheric Administration, 1965). The grid selected should have at least 20 points inside the basin. (This may not be possible for very small basins.) Precipitation at the intersection points is then averaged.

Precipitation Intensity for 24 Hours With a 50 Percent Exceedance Probability (INT24HR)

Precipitation intensity, expressed in inches, is computed by using a grid-overlay method and a map of isopluvials of 2-year, 24-hour precipitation (National Oceanic and Atmospheric Administration, 1973, or Harenberg, 1980).

Mean Minimum January Temperature (MMJT)

Mean minimum January temperature, expressed in degrees Fahrenheit, is determined from a map (Figure B-16) based on the period 1931-1952 (National Oceanic and Atmospheric Administration, 1971).

Figure B-15

Figure B-15

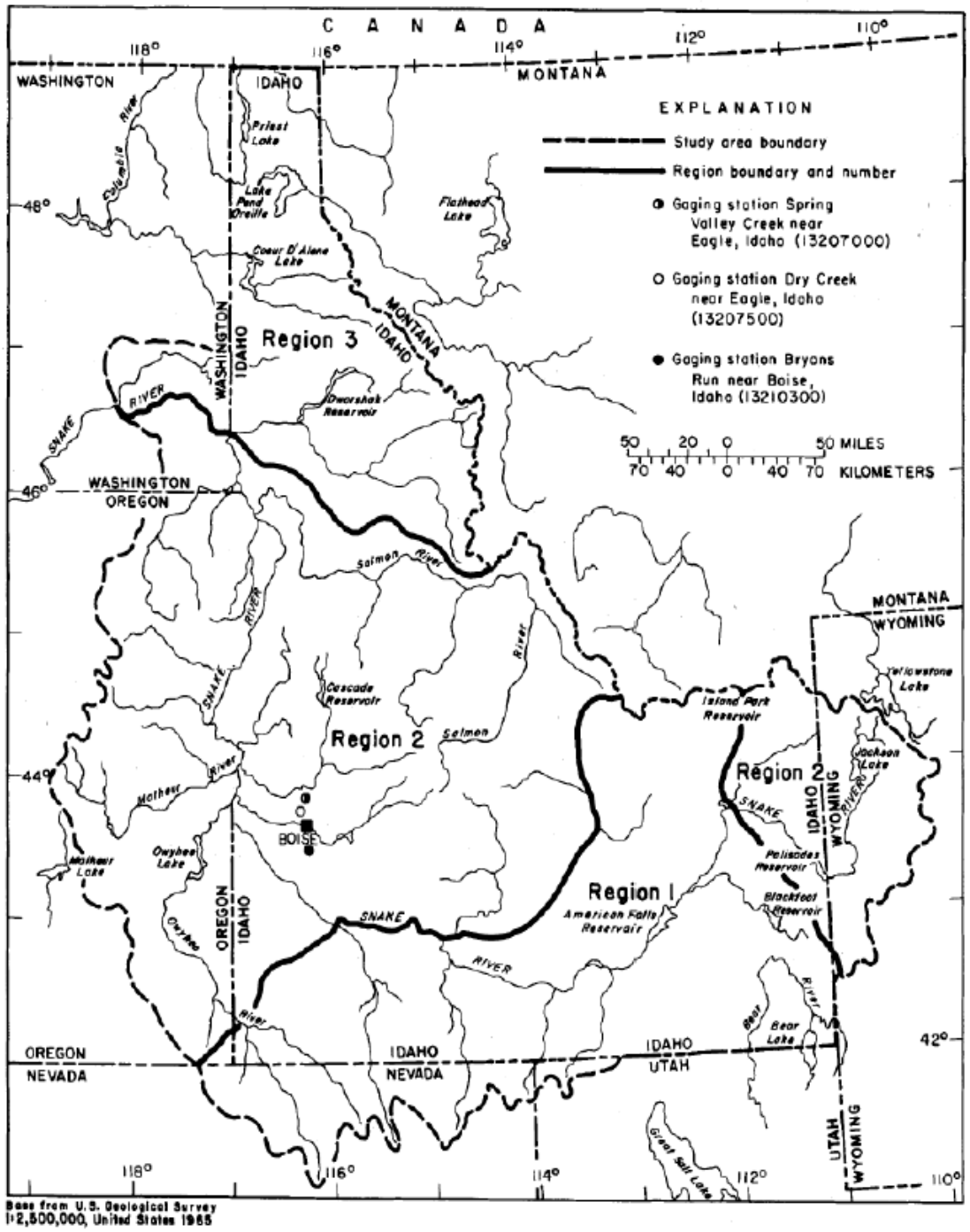
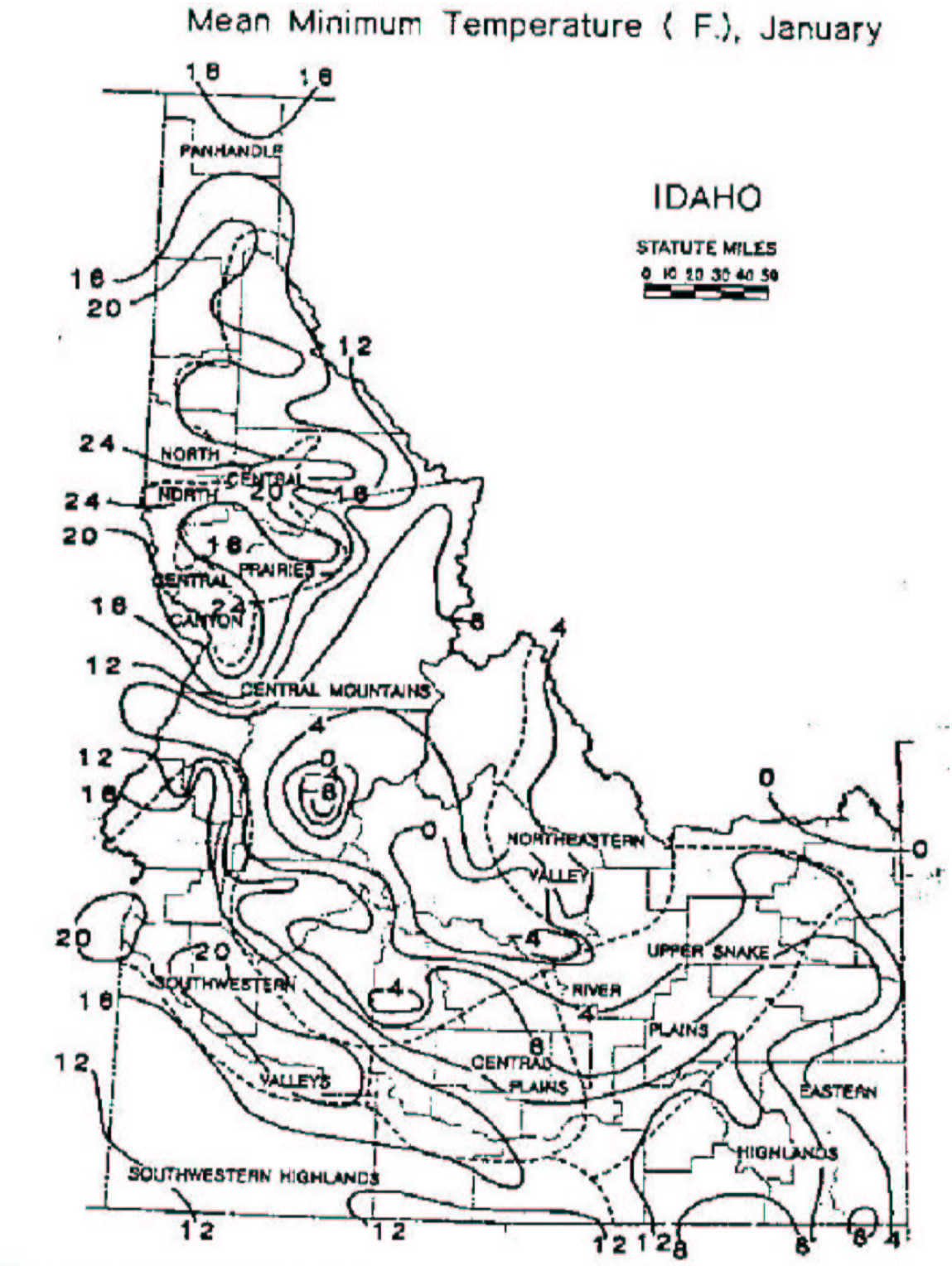


Figure 6.-- Regions where different sets of regression equations are effective and locations of gaging stations cited on page 26.

Figure B-16


Mean Minimum Temperature (F.), January
IDAHO
STATUTE MILES
0 10 20 30 40 50
PANHANDLE
NORTH CENTRAL PRAIRIES
CENTRAL CANYON
CENTRAL MOUNTAINS
NORTHEASTERN VALLEY
UPPER SNAKE RIVER PLAINS
SOUTHWESTERN VALLEYS
CENTRAL PLAINS
EASTERN HIGHLANDS
SOUTHWESTERN HIGHLANDS
Based on period 1931 – 52
Isolines are drawn through points of approximately equal value.
Caution should be used in interpolating on these maps, particularly in mountainous areas.

The regression equations were used to estimate the standard deviation and mean of the logarithms of annual peak discharges for each gaging station in the study area. The generalized skew coefficient previously determined for each station was used to obtain a value for the log-Pearson Type III frequency factor – a function of the skew coefficient and exceedance probability (Bulletin 17A, appendix 3) – at the 2 percent exceedance probability. The log-Pearson equation was then computed and the results were compared with the discharge listed in the data in Figure B-14, based on the gaging-station record. This comparison, which indicates the relative accuracy of the regression equations, is expressed as the standard error of estimate. For a large sample, two out of every three observations can be expected to be within one standard error. The standard error, in percent, for the 2 percent exceedance probability is shown in Figure B-13 for each set of equations. The lost degrees of freedom in computing the standard error were obtained by summing the number of constants in each regression equation and adding one for the skew coefficient.

The regression equations should be used only for streams that have some homogeneity with the streams that defined the equations. Regression equations are not well defined for very small drainage basins and it is not recommended that equations be used for drainage areas less than 0.5 square miles. Also, the regression equations are poorly defined in a range of about 1,500 to 2,000 square miles and are undefined above that range. The regression equations would not apply to streams that are ephemeral, that are subject to intensive thunderstorms, or that drain areas significantly affected by man's activities. Streams that drain unforested basins or that flow through alluvial valleys may also be poorly defined.

The following is a series of steps employed to estimate the discharge at a given exceedance probability for an ungaged site, using Spring Valley Creek near Eagle, Idaho (13207000) as an example (Figure B-15).

Step 1: Locate the drainage basin in Figure B-15 and determine the region in which it is located (in this case, region 2).

Step 2: From Figure B-13 determine the equations to be used from the basin size and compute the mean and standard deviation of logarithms of annual peak discharges. For the example given, drainage area, mean annual precipitation, and altitude are 20.9 square miles, 14 inches, and 3,990 feet, respectively. Mean logarithm is 2.026 and standard deviation of the logarithms is 0.354.

Step 3: The annual peak discharge can be caused by snowmelt or rainstorm runoff because the drainage basin is completely below 6,000 feet and the mean altitude is 3,990 feet. Therefore, sheet 3 of Figure B-17 is used to identify the generalized skew coefficient (G), which, in this case, is 0.

Step 4: For a log-Pearson Type III variable at exceedance probability (P_e):

$$\text{Log } Q_{Pe} = M + K_{Pe}S \quad (3)$$

Here, M = 2.026; S = 0.354. From data table F, at P_e = 0.02 and G = 0, K is 2.054; therefore:

$$\text{Log } Q = 2.026 + 2.054\ (0.354) \quad (4)$$

and

$$Q = 566\ ft^3/s \quad (5)$$

where

Q = discharge

M = Mean log of annual maximum discharge.

S = Standard Deviation

Step 5: Compare with nearby gaging stations (Figure B-17). In this case, Dry Creek near Eagle, Idaho (13207500), drainage area 59.4 square miles, and Bryans Run near Boise, Idaho (13210300), drainage area 7.94 square miles, have runoffs of 15.3 $(ft^3/s)/mi^2$ and 55.4 $(ft^3/s)/mi^2$, respectively. The 27.1 $(ft^3/s)/mi^2$ runoff from Spring Valley Creek appears to be reasonable from this comparison.

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH
U.S. ARMY CORPS OF ENGINEERS,
U.S. BUREAU OF RECLAMATION,
U.S. BUREAU OF LAND MANAGEMENT,
AND IDAHO TRANSPORTATION DEPARTMENT

OPEN-FILE REPORT 81-909
PLATE 1

Each gaging station has been assigned a number in downstream order in accordance with the permanent numbering system used by the U.S. Geological Survey. Numbers are assigned in a downstream direction along the main stream, and stations on tributaries between main-stream stations are numbered in the order they enter the main stream. A similar order is followed on other ranks of tributaries. The complete 8-digit number, 13186000 includes the part number "13" plus a 6-digit station number. Only the part number and the first 4 digits are shown when the last 2 digits are zero.

EXPLANATION

Boundary line of study area outside Idaho

● Location and number of long-term gaging station

131860
−.29 Skew coefficient
3.651 Mean logarithm
.732 Standard deviation

Note. -- A generalized skew coefficient of -0.3 should be used for snowmelt floods for the entire study area.

INDEX MAP OF STUDY AREA

Base from U.S. Geological Survey 1:1,000,000
Columbia River Basin, 1948

GENERALIZED SKEW COEFFICIENT MAP FOR PEAKS CAUSED BY SNOWMELT

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AND IDAHO TRANSPORTATION DEPARTMENT

OPEN-FILE REPORT 81-909
PLATE 2

C A N A D A

Each gaging station has been assigned a number in downstream order in accordance with the permanent numbering system used by the U.S. Geological Survey. Numbers are assigned in a downstream direction along the main stream, and stations on tributaries between main-stream stations are numbered in the order they enter the main stream. A similar order is followed on other ranks of tributaries. The complete 8-digit number, 13186000 includes the part number "13" plus a 6-digit station number. Only the part number and the first 4 digits are shown when the last 2 digits are zero.

EXPLANATION

+.3 / +.4 — Boundary line of generalized skew coefficient

Boundary line of study area outside Idaho

▲ Location of short-term gaging station

● Location and number of long-term gaging station

133155

−.10 Skew coefficient

2.299 Mean logarithm

.176 Standard deviation

INDEX MAP OF STUDY AREA

Base from U.S. Geological Survey 1:1,000,000

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AND IDAHO TRANSPORTATION DEPARTMENT

OPEN-FILE REPORT 81-909
PLATE 3

Each gaging station has been assigned a number in downstream order in accordance with the permanent numbering system used by the U.S. Geological Survey. Numbers are assigned in a downstream direction along the main stream, and stations on tributaries between main-stream stations are numbered in the order they enter the main stream. A similar order is followed on other ranks of tributaries. The complete 8-digit number, 13186000 includes the part number "13" plus a 6-digit station number. Only the part number and the first 4 digits are shown when the last 2 digits are zero.

EXPLANATION

+.1 / 0 — Boundary line of generalized skew coefficient

Boundary line of study area outside Idaho

▲ Location of short-term gaging station

● Location and number of long-term gaging station

13260 — 13260 Location and number of long-term gaging station

+.18 Skew coefficient

2.734 Mean logarithm

.222 Standard deviation

INDEX MAP OF STUDY AREA

Base from U.S. Geological Survey 1:1,000,000
Columbia River Basin, 1948

GENERALIZED SKEW COEFFICIENT MAP FOR ANNUAL MAXIMUM PEAKS CAUSED BY EITHER SNOWMELT OR RAINSTORMS

B.40.07.02 Summary and Conclusions. Generalized skew coefficient maps (sheets 1, 2, and 3 of Figure B-17) were prepared for the study area for (1) snowmelt, (2) rainstorm, and (3) snowmelt or rainstorm floods. Average skew coefficients for gaging stations shown on each of the skew maps are indicative of the differences in skew coefficients resulting from separate analysis of flood types. Skew values determined from the three categories of floods mentioned above averaged -0.31, 0.17, and -0.05, respectively. The values used to compute each of these averages are, however, widely spaced and have standard deviations of 0.27, 0.32, and 0.38, respectively.

Generalized skew maps for peaks caused by rainstorms and annual maximum peaks caused by either snowmelt or rainstorms were made by plotting the station skews and determining a regional pattern. Most of the generalized skew boundary lines coincide with hydrologic unit boundaries (U.S. Geological Survey, 1975). In attempting to develop a method to estimate generalized skew, regression equations using basin characteristics did not adequately define variability of the skew coefficient.

Generalized skew coefficients range from +0.2 to +0.5 for analysis of rainstorm floods, and -0.1 to +0.2 for analysis of annual maximum peaks caused by either snowmelt or rainstorms. Although the skew maps provide considerably different values, some consistency between the findings of this study and the generalized skew coefficient map in Bulletin 17A should be noted. Bulletin 17A applies a generalized skew coefficient of -0.3 to much of Idaho. This coefficient was based on gaging stations having 25 or more years of record. In developing the Bulletin 17A skew map, greater weight was given to long-term record stations. The floods at many of these long-term stations are caused only by snowmelt. Thus, the skew on the Bulletin 17A map would seem to correspond to the generalized skew obtained for snowmelt floods in the present study.

The generalized skew coefficients on sheets 1 and 2 of Figure B-17 should be used only where the annual maximum peak is dominated by one type of flood or where separate snowmelt and rainstorm flood arrays are available for analysis. At stations where it is not possible to develop separate flood arrays, the annual maximum peaks and the generalized skew coefficients from sheet 3 of Figure B-17 should be used.

Percentage of drainage area below 6,000-foot altitude can be used as a guideline for determining the type of flood. Except for the southwestern corner of the study area, stations having less than 20 percent of drainage area below 6,000 feet should be considered as being dominated by snowmelt floods. Except for southeastern Washington, few gaging stations were observed to be dominated by rainstorm floods. The generalized skew coefficient map for rainstorm floods (sheet 2 of Figure B-17) should be used when a combined frequency curve for both types of floods is being prepared or where the mean altitude of the basin is below 3,000 feet.

B.50 – OPEN CHANNELS AND BRIDGES

B.50.01 Field Data Cross Sections for Backwater Computations. An example of this procedure is illustrated in an application to the Red Fox River, Colorado. Figure B-18 is a plan view showing the river, contours on the flood plain, and the location and alignment of cross sections. The stream flows from west to east. Cross sections are plotted in Figure B-19. The cross sections start at some point downstream and progress upstream. They are measured from left to right when looking downstream. The data will be more adaptable if some reference distance such as 500 is assigned to the low point of the channel.

The location and alignment of cross sections are very important because they describe the geometric model that is the basis for the entire series of computations. Contour lines are used in orienting sections perpendicular to the expected current directions, and the results often require angle points to model both channel and overbank flow. In this example, no cross sections intersect. In cases where cross sections do tend to cross, the cross section alignments should run parallel to each other to high ground and some small, positive value should be assigned for each reach length. Zero reach lengths should be avoided so that dividing by zero will not occur in subsequent computations.

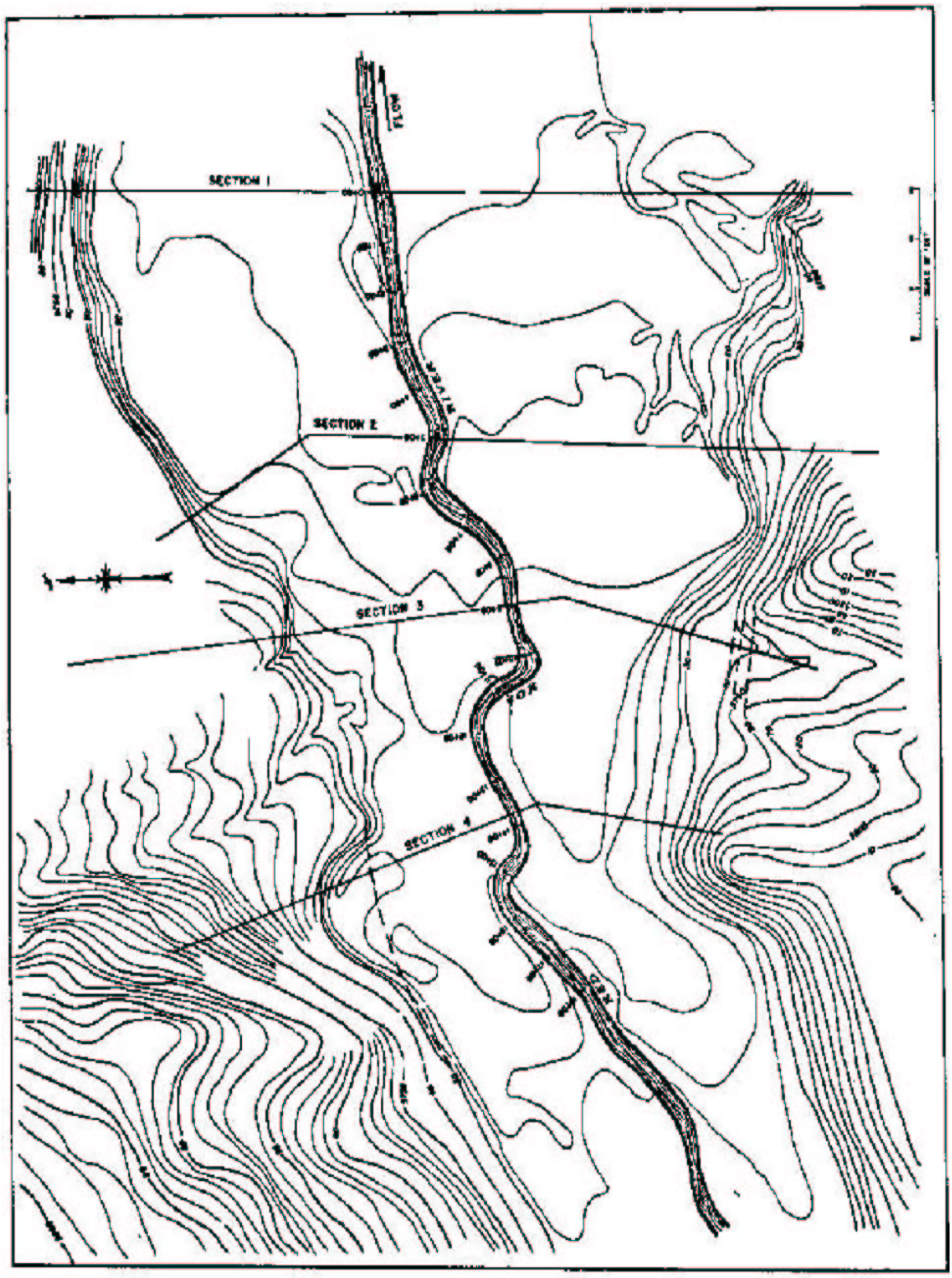
Hydraulic roughness values or n values should be obtained from the field. Each cross section represents a reach of the river that extends half way to the next cross section in each direction. This should be kept in mind when determining the n values.

Examples of cross sections taken to measure a flood by the U.S. Geological Survey are shown in Figure B-21. The roughness values should be shown on each cross section, as they are helpful in locating where a cross section should be subdivided to determine distributed properties. Mannings n values (Chow, Open Channel Hydraulics 1959) are shown in Table B-5.

B.50.02 Hydrologic Regional Calculations. U.S. Geological Survey hydrologic regional equations can be computed using the National Flood Frequency (NFF) option under the HYDRAIN, HYDRO computer program

B.50.03 Hydraulic Backwater Calculations. Hydraulic backwater calculations for bridges over natural streams should be done using the Army Corps of Engineers, River Analysis System (HEC-RAS) computer program. Selected examples of riprap typical sections are given in Figures B-24 through Figure B-28.

Figure B-18



Plan view of the Red Fox River, Colorado

Figure B-19
Sheet 1 of 2

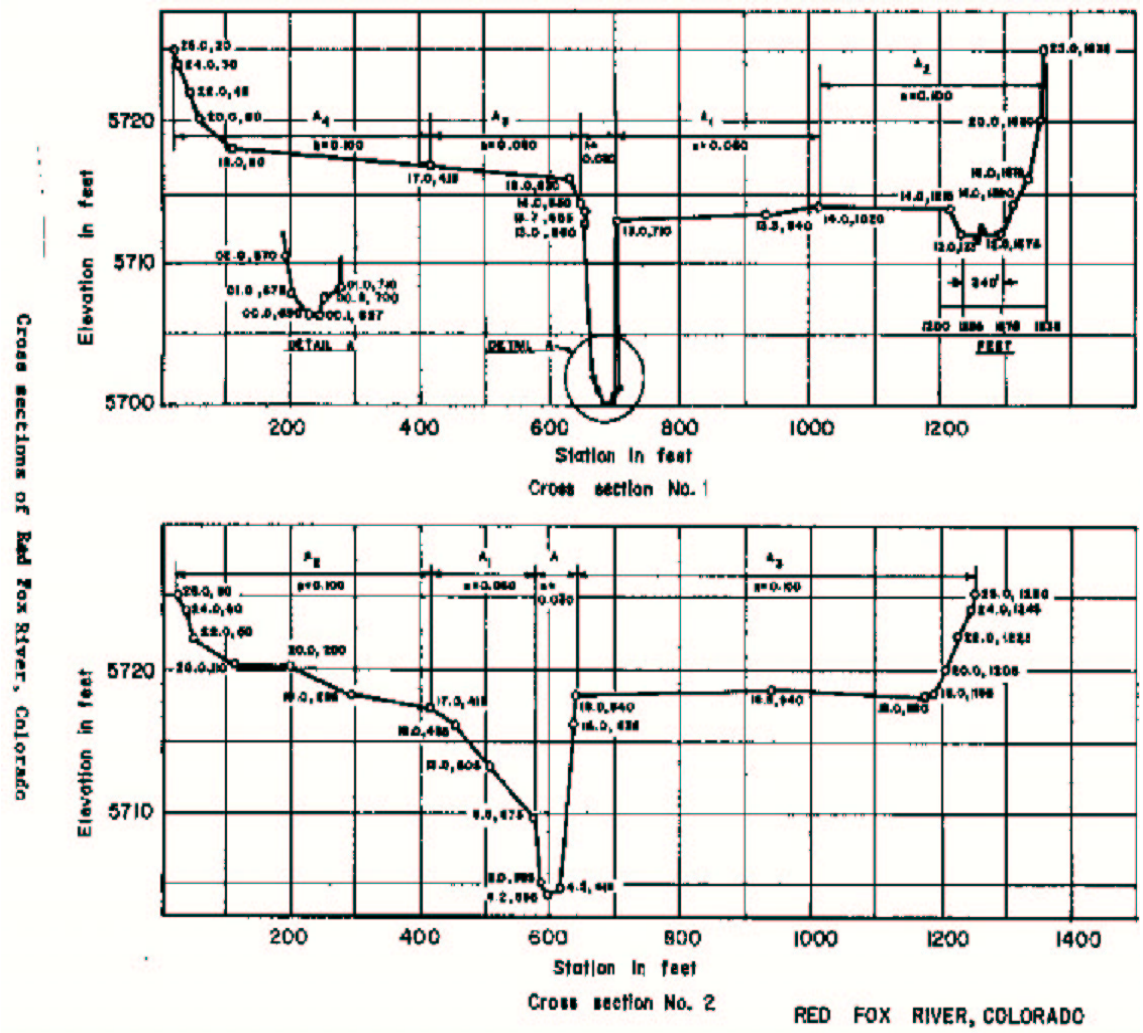


Figure B-19
Sheet 2 of 2

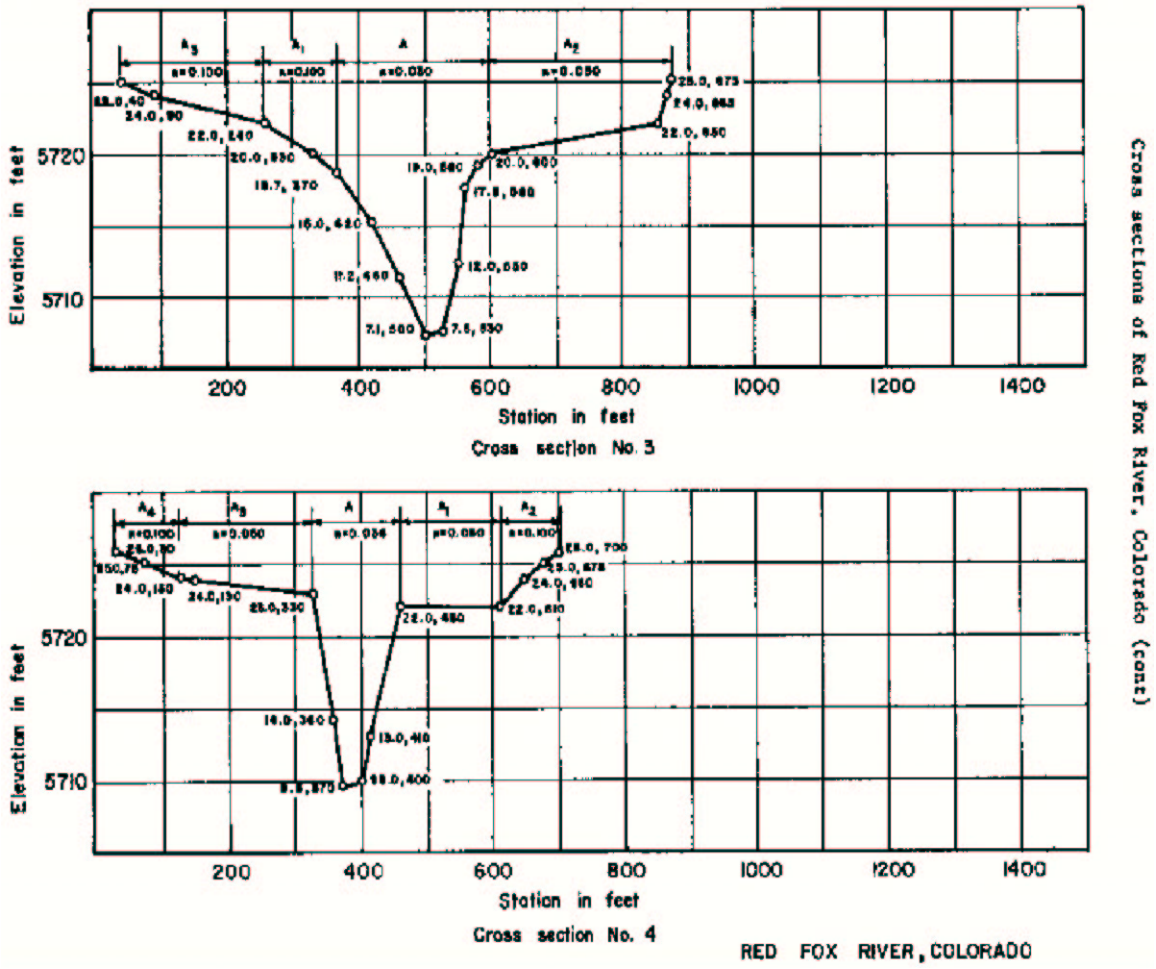


Figure B-20

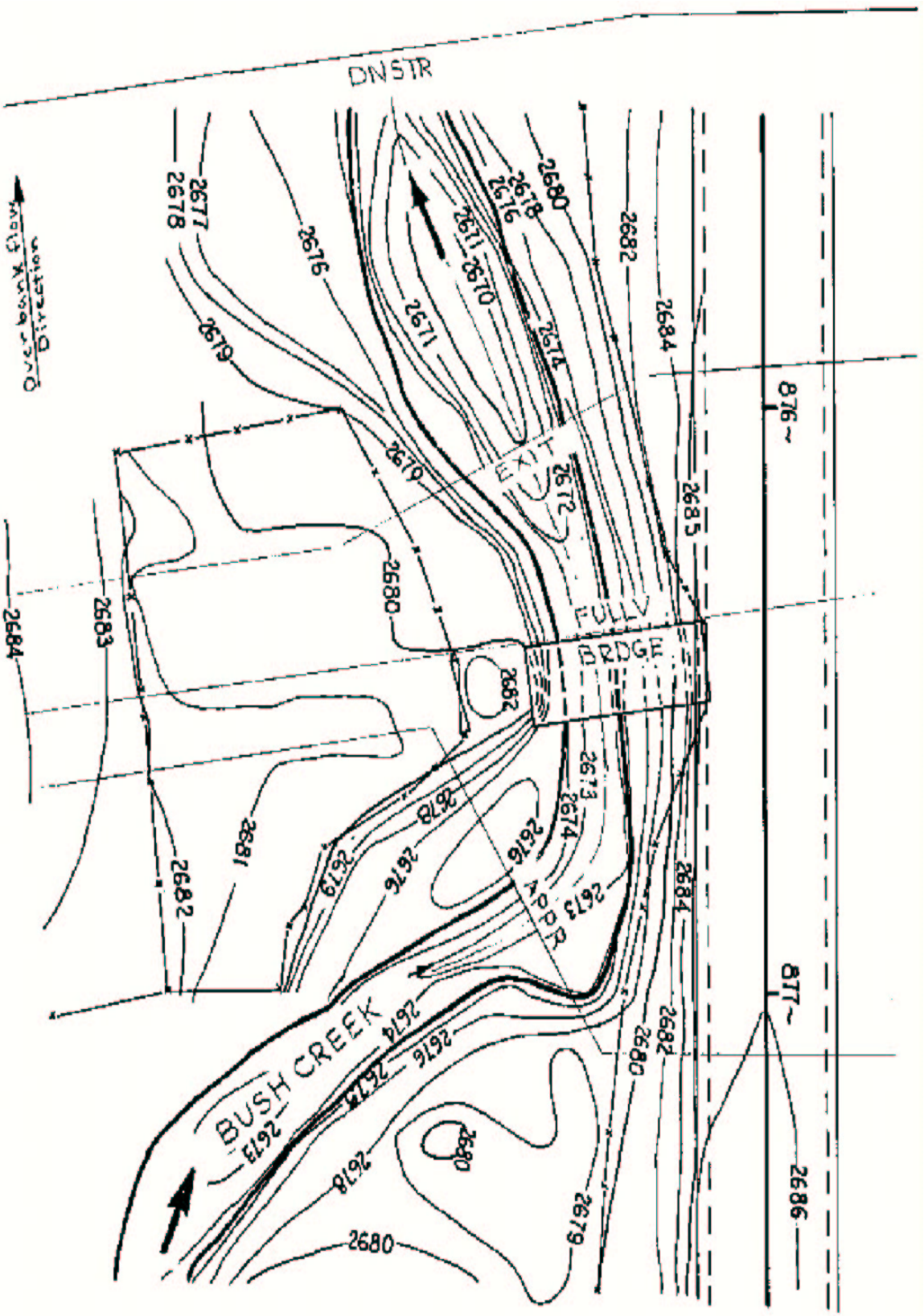

DNSTR
Overbank Flow Direction
EXIST
FULL
BRDGE
ROAD
BUSH CREEK
876~
877~
2677
2678
2676
2679
2671
2670
2674
2680
2682
2684
2685
2672
2683
2681
2673
2686

Figure B-21

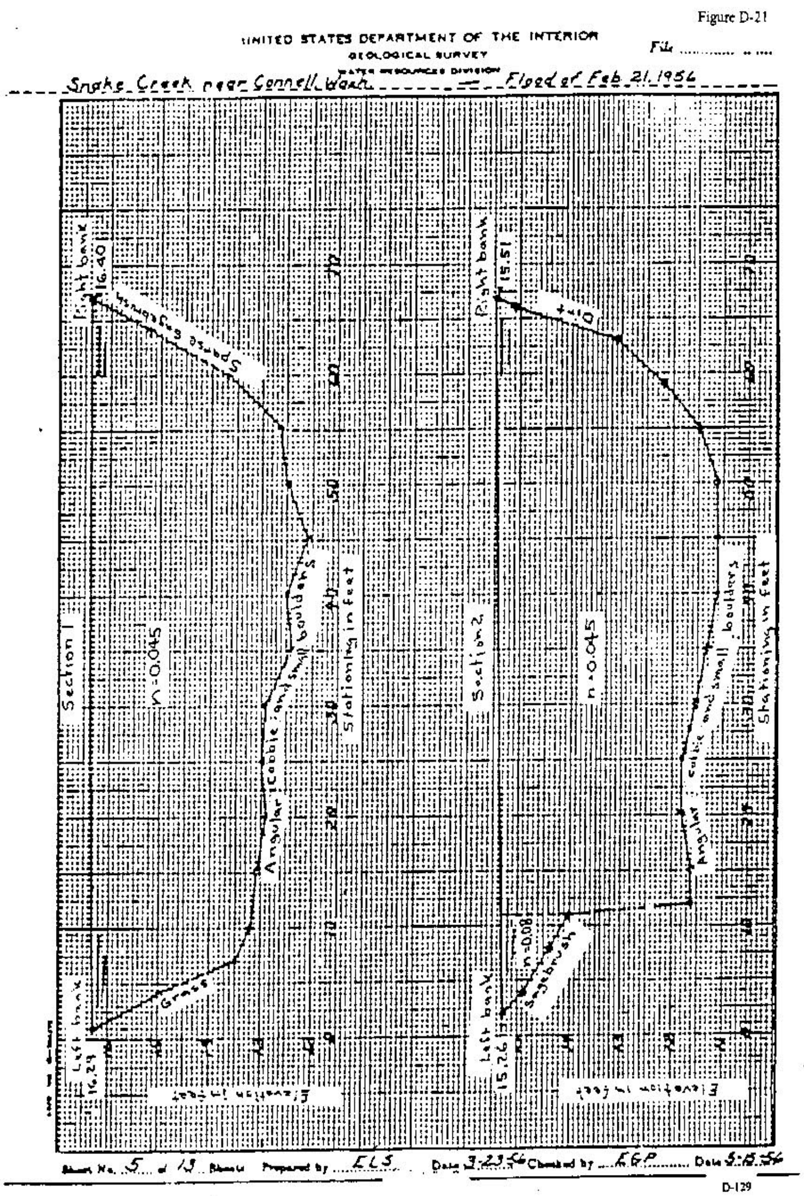


Figure D-21
UNITED STATES DEPARTMENT OF THE INTERIOR
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WATER RESOURCES DIVISION
File
Snake Creek near Connell, Wash.
Flood of Feb. 21, 1956
Section 1
n=0.045
Section 2
n=0.045
n=0.08
Right bank 16.40
Right bank 15.51
Left bank 16.29
Left bank 15.26
Grass
Sagebrush
Dirt
Angular; cobble and small boulders
Stationing in feet
Elevation in feet
Sheet No. 5 of 13 Sheets Prepared by E.L.S. Date 3-23-56 Checked by E.G.P. Date 5-15-56
D-129

Table B-5
Sheet 1 of 5

VALUES OF THE ROUGHNESS COEFFICIENT n

Type of Channel and Description	Minimum	Normal	Maximum
A. Lined or Built-up Channels			
A-1. Metal			
a. Smooth steel surface			
1. Unpainted	0.011	0.012	0.014
2. Painted	0.012	0.013	0.017
b. Corrugated	0.021	0.025	0.030
A-2. Nonmetal			
a. Cement			
1. Neat, surface	0.010	0.011	0.013
2. Mortar	0.011	0.013	0.015
b. Wood			
1. Planed, untreated	0.010	0.012	0.014
2. Planed, creosoted	0.011	0.012	0.015
3. Unplaned	0.011	0.013	0.015
4. Plank with battens	0.012	0.015	0.018
5. Lined with roofing paper	0.010	0.014	0.017
c. Concrete			
1. Trowel finish	0.011	0.013	0.015
2. Float finish	0.013	0.015	0.016
3. Finished, with gravel on bottom	0.015	0.017	0.020
4. Unfinished	0.014	0.017	0.020
5. Gunite, good section	0.016	0.019	0.023
6. Gunite, wavy section	0.018	0.022	0.025
7. On good excavated rock	0.017	0.020	
8. On irregular excavated rock	0.022	0.027	

Table B-5
Sheet 2 of 5

VALUES OF THE ROUGHNESS COEFFICIENT n

Type of Channel and Description			Minimum	Normal	Maximum
A.	Lined or Built-up Channels (continued)				
A-2.	**Nonmetal (continued)**				
	d.	Concrete bottom float finished with sides of:			
		1. Dressed stone in mortar	0.015	0.017	0.020
		2. Random stone in mortar	0.017	0.020	0.024
		3. Cement rubble masonry, plastered	0.016	0.020	0.024
		4. Cement rubble masonry	0.020	0.025	0.030
		5. Dry rubble or riprap	0.020	0.030	0.035
	e.	Gravel bottom with sides of:			
		1. Formed concrete	0.017	0.020	0.025
		2. Random stone in mortar	0.020	0.023	0.026
		3. Dry rubble or riprap	0.023	0.033	0.036
	f.	Brick			
		1. Glazed	0.011	0.013	0.015
		2. In cement mortar	0.012	0.015	0.018
	g.	Masonry			
		1. Cemented rubble	0.017	0.025	0.030
		2. Dry rubble	0.023	0.032	0.035
	h.	Dressed ashlar	0.013	0.015	0.017
	i.	Asphalt			
		1. Smooth	0.013	0.013	
		2. Rough	0.016	0.016	
	j.	Vegetal lining	0.030	.....	0.500
B.	Excavated or Dredged				
	a.	Earth, straight and uniform			
		1. Clean, recently completed	0.016	0.018	0.020
		2. Clean, after weathering	0.018	0.022	0.025
		3. Gravel, uniform section, clean	0.022	0.025	0.030
		4. With short grass, few weeds	0.022	0.027	0.033

Table B-5
Sheet 3 of 5

VALUES OF THE ROUGHNESS COEFFICIENT n

Type of Channel and Description			Minimum	Normal	Maximum
B. Excavated or Dredged (continued)					
b.	Earth, winding and sluggish				
	1.	No vegetation	0.023	0.025	0.030
	2.	Grass, some weeds	0.025	0.030	0.033
	3.	Dense weeds or aquatic plants in deep channels	0.030	0.035	0.040
	4.	Earth bottom and rubble sides	0.028	0.030	0.035
	5.	Stony bottom and weedy banks	0.025	0.035	0.040
	6.	Cobble bottom and clean sides	0.030	0.040	0.050
c.	Dragline-excavated or dredged				
	1.	No vegetation	0.025	0.028	0.033
	2.	Light brush on banks	0.035	0.050	0.060
d.	Rock cuts				
	1.	Smooth and uniform	0.025	0.035	0.040
	2.	Jagged and irregular	0.035	0.040	0.050
e.	Channel not maintained, weeds & brush uncut				
	1.	Dense weeds, high as flow depth	0.050	0.080	0.120
	2.	Clean bottom, brush on sides	0.040	0.050	0.080
	3.	Same, highest stage of flow	0.045	0.070	0.110
	4.	Dense brush, high stage	0.080	0.100	0.140

Table B-5
Sheet 4 of 5

Type of Channel and Description				Minimum	Normal	Maximum
C.	Natural Streams					
C-1.	**Minor streams (top width at flood stage less than 100 ft.)**					
	a.	Streams on plain				
		1.	Clean, straight, full stage, no rifts or deep pools	0.025	0.030	0.033
		2.	Same as above, but more stones and weeds	0.030	0.035	0.040
		3.	Clean, winding, some pools/shoals	0.033	0.040	0.045
		4.	Same as above, but some weeds and stones	0.035	0.045	0.050
		5.	Same as above, lower stages, more ineffective slopes and sections	0.040	0.048	0.055
		6.	Same as 4, but more stones	0.045	0.050	0.060
		7.	Sluggish reaches, weedy, deep pools	0.050	0.070	0.080
		8.	Very weedy reaches, deep pools, or floodways w/heavy stand of timber and underbrush	0.075	0.100	0.150
	b.		Mountain streams, no vegetation in channel, banks usually steep, trees & brush along banks submerged at high stages			
		1.	Bottom—gravels/cobbles/boulders	0.030	0.040	0.050
		2.	Bottom—cobbles w/large boulders	0.040	0.050	0.070
C-2.	**Flood plains**					
	a.	Pasture, no brush				
		1.	Short grass	0.025	0.030	0.035
		2.	High grass	0.030	0.035	0.050
	b.	Cultivated areas				
		1.	No crop	0.020	0.030	0.040
		2.	Mature row crops	0.025	0.035	0.045
		3.	Mature field crops	0.030	0.040	0.050

Table B-5
Sheet 5 of 5

Type of Channel and Description			Minimum	Norma	Maximum
C. Natural Streams (continued)					
	c. Brush				
		1. Scattered brush, heavy weeds	0.035	0.050	0.070
		2. Light brush and trees in winter	0.035	0.050	0.060
		3. Light brush and trees in summer	0.040	0.060	0.080
		4. Medium to dense brush, winter	0.045	0.070	0.080
		5. Medium to dense brush, summer	0.070	0.100	0.160
	d. Trees				
		1. Dense willows, summer, straight	0.110	0.150	0.200
		2. Cleared land w/tree stumps, no sprouts	0.030	0.040	0.050
		3. Same as above, but w/heavy growth of sprouts	0.050	0.060	0.080
		4. Heavy stand of timber, a few down trees, little undergrowth, flood stage below branches	0.080	0.100	0.120
		5. Same as above, but with flood stage reaching branches	0.100	0.120	0.160
C-3.	**Major streams (top width at flood stage >100 ft.), the n value is less than that for minor streams of similar description, because banks offer less effective resistance**				
	a. Regular section w/no boulders or brush		0.020		0.060
	b. Irregular and rough section		0.035		0.100

B.60 – RIPRAP DETAILS

Figures B-22 to B-28 are to be used to determine riprap.

Figure B-22

Procedure for Determining if Filter Fabric is Required

Obtain sieve analysis of parent (base) material.

Plot Gradations on the following Gradation Curve Chart. (Figure B-23)

From the Gradation Curve Chart, determine the D_{15}, D_{50}, and D_{85} sizes.

Determine the D_{15}, D_{50}, and D_{85} riprap size as outlined in HEC-11 or HEC-18.

Determine if filter fabric is required from:

$$\frac{\textbf{D}_{15}\ \textbf{Riprap}}{\textbf{D}_{85}\ \textbf{Base}} < 5 < \frac{\textbf{D}_{15}\ \textbf{Riprap}}{\textbf{D}_{15}\ \textbf{Base}} < 40$$

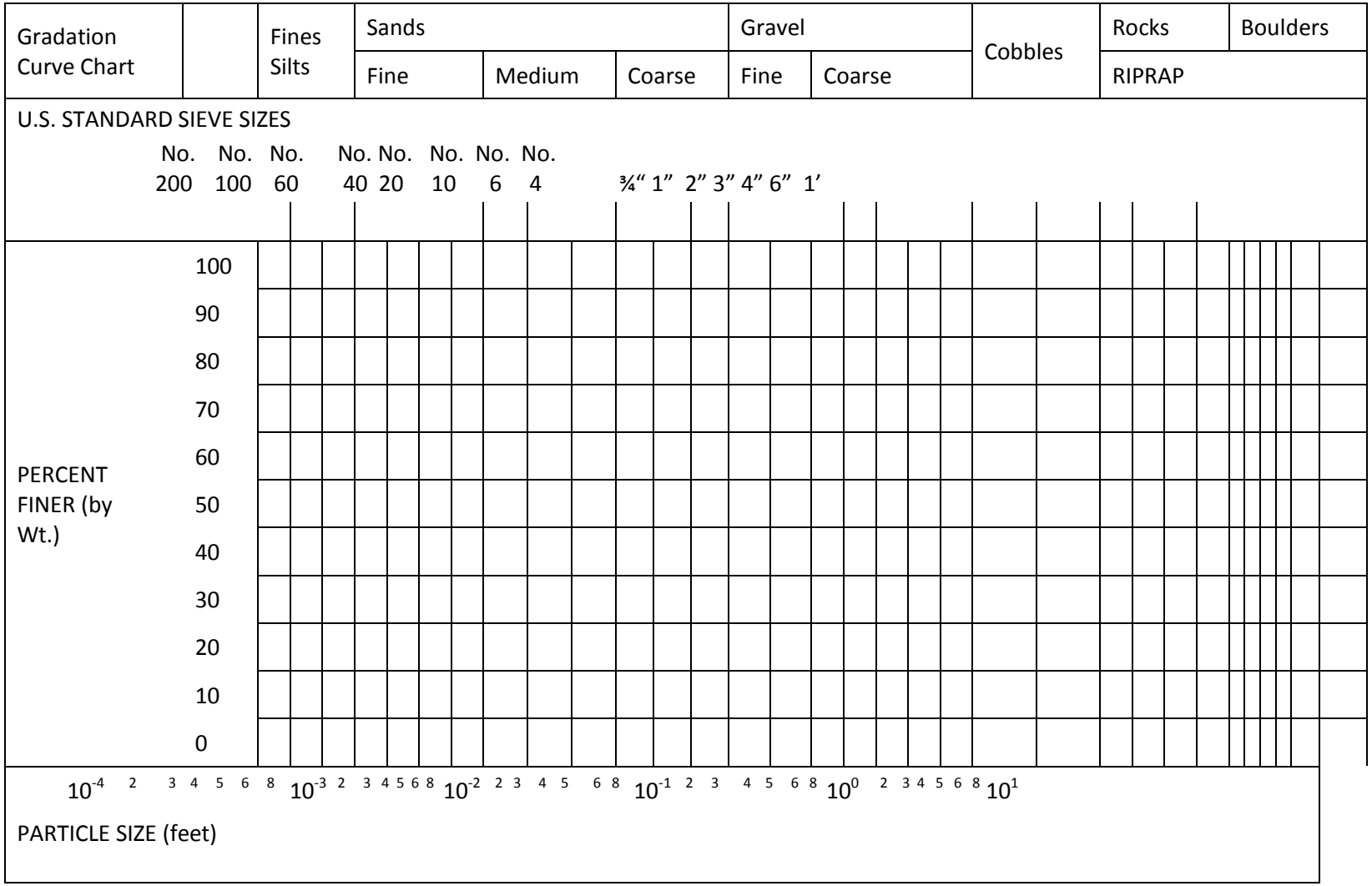
$$\frac{\textbf{D}_{50}\ \textbf{Riprap}}{\textbf{D}_{50}\ \textbf{Base}} < 40$$

If the above *criterion is met*, no filter fabric is required. If the above criterion is not met, a filter fabric will be required.

Select approved filter fabric.

Figure B-23

Gradation Curve Chart



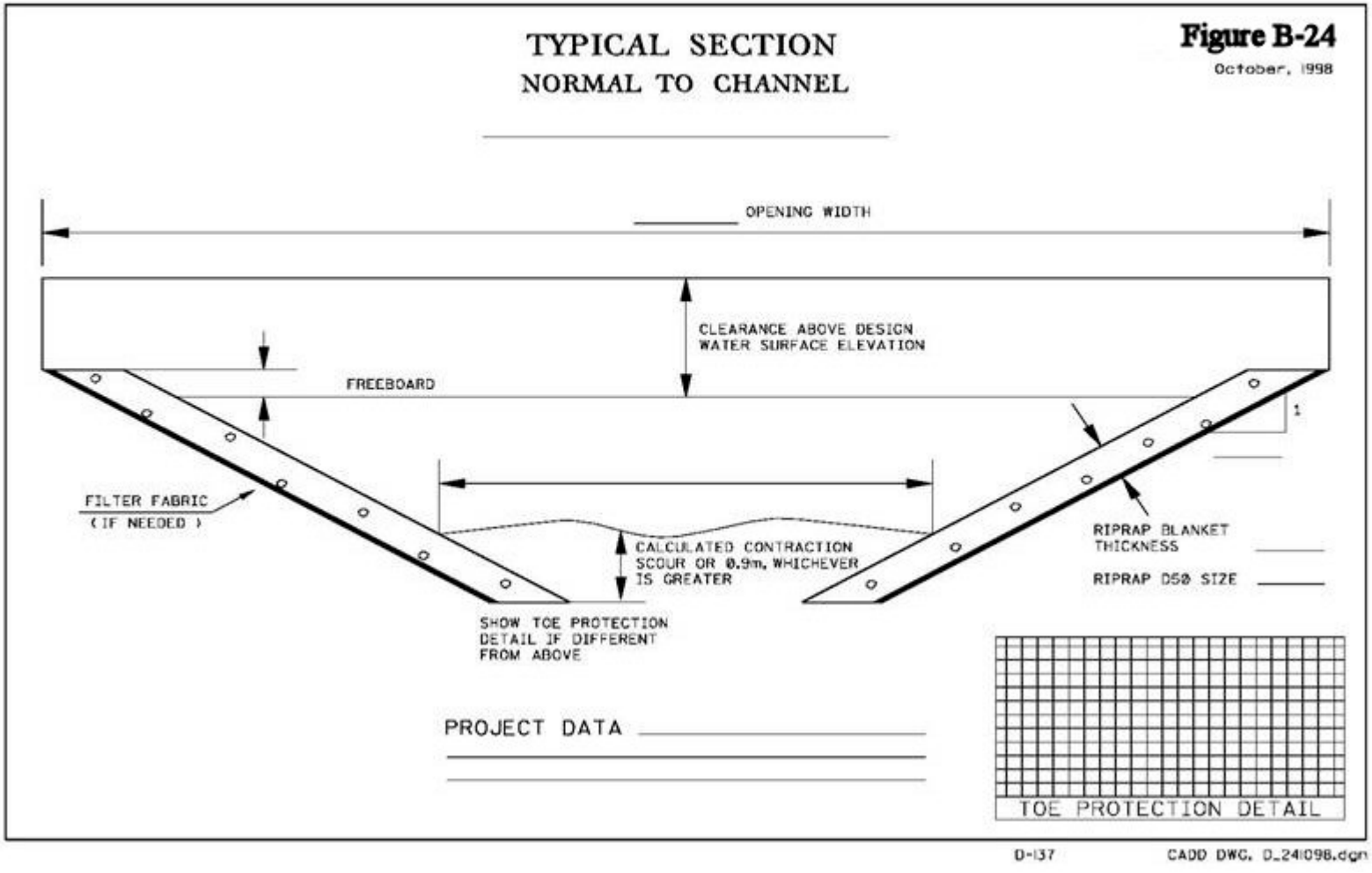

TYPICAL SECTION
NORMAL TO CHANNEL
Figure B-24
October, 1998
OPENING WIDTH
CLEARANCE ABOVE DESIGN
WATER SURFACE ELEVATION
FREEBOARD
1
FILTER FABRIC
(IF NEEDED)
CALCULATED CONTRACTION
SCOUR OR 0.9m, WHICHEVER
IS GREATER
RIPRAP BLANKET
THICKNESS
RIPRAP D50 SIZE
SHOW TOE PROTECTION
DETAIL IF DIFFERENT
FROM ABOVE
PROJECT DATA
TOE PROTECTION DETAIL
D-137
CADD DWG. D_241098.dgn

Figure B-25

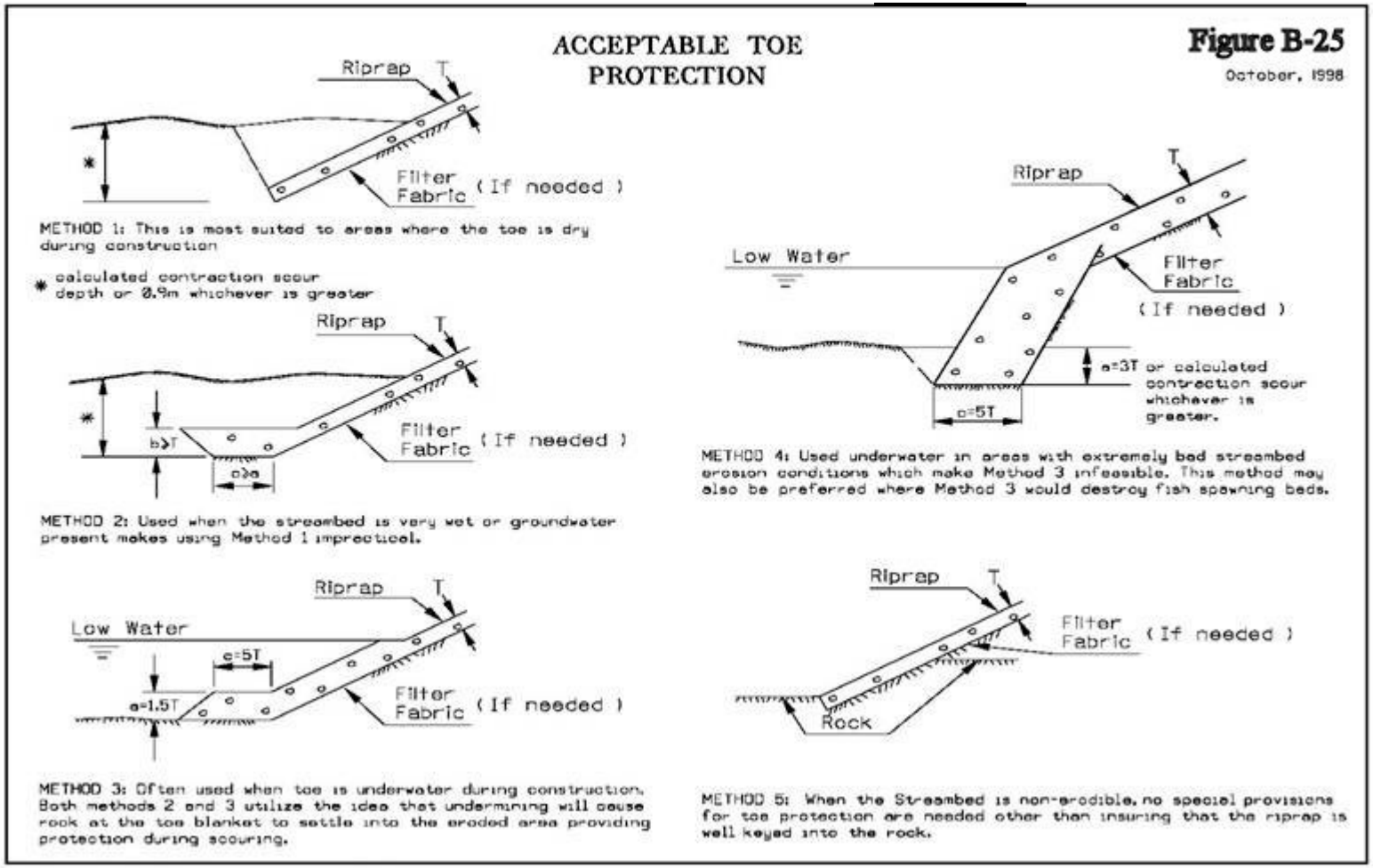

ACCEPTABLE TOE PROTECTION
Figure B-25
October, 1998
Riprap
T
Filter Fabric
(If needed)
METHOD 1: This is most suited to areas where the toe is dry during construction
* calculated contraction scour depth or 0.9m whichever is greater
b≥T
a≥a
METHOD 2: Used when the streambed is very wet or groundwater present makes using Method 1 impractical.
Low Water
a=1.5T
a=5T
METHOD 3: Often used when toe is underwater during construction. Both methods 2 and 3 utilize the idea that undermining will cause rock at the toe blanket to settle into the eroded area providing protection during scouring.
a=3T or calculated contraction scour whichever is greater.
METHOD 4: Used underwater in areas with extremely bad streambed erosion conditions which make Method 3 infeasible. This method may also be preferred where Method 3 would destroy fish spawning beds.
Rock
METHOD 5: When the Streambed is non-erodible, no special provisions for toe protection are needed other than insuring that the riprap is well keyed into the rock.
CADD DWG. D_251098.dgn
D-138

Figure B-26

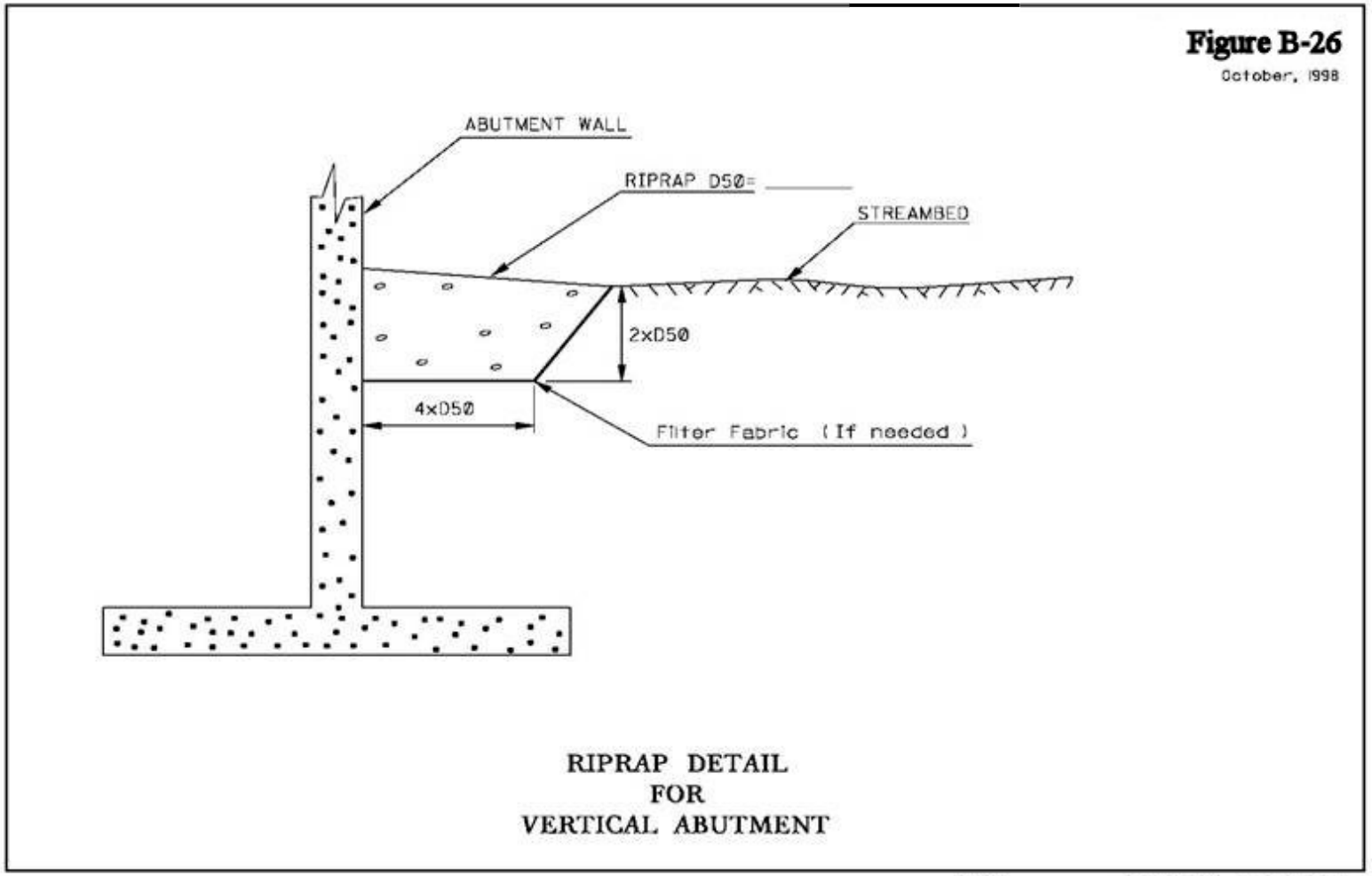


Figure B-26
October, 1998
ABUTMENT WALL
RIPRAP D50= _____
STREAMBED
2xD50
4xD50
Filter Fabric (If needed)
RIPRAP DETAIL
FOR
VERTICAL ABUTMENT
D-139
CADD DWG. D_261098.dgn

Figure B-27

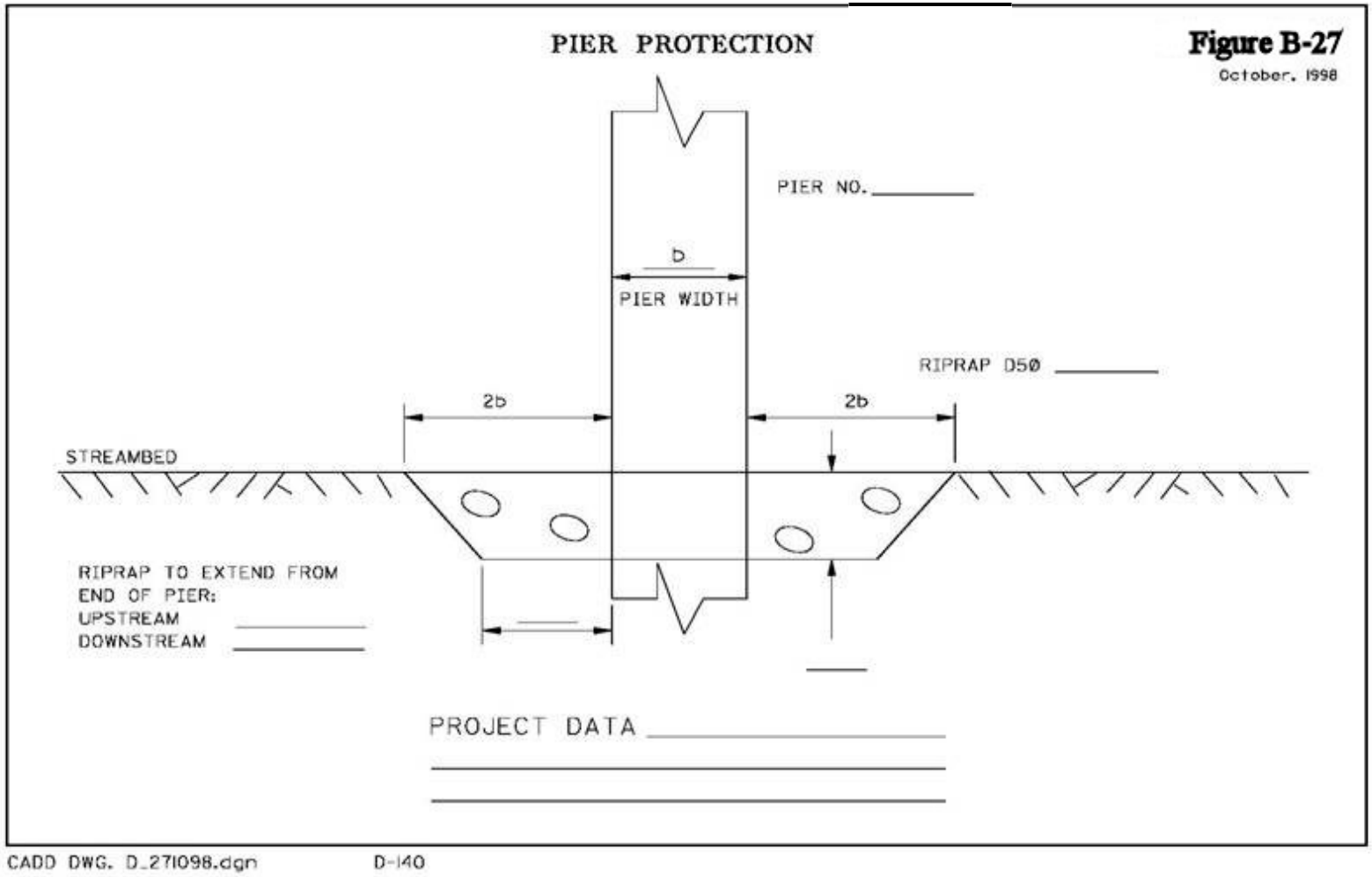

PIER PROTECTION
Figure B-27
October, 1998
PIER NO. _____
b
PIER WIDTH
RIPRAP D50 _____
2b
2b
STREAMBED
RIPRAP TO EXTEND FROM
END OF PIER:
UPSTREAM _____
DOWNSTREAM _____
PROJECT DATA _____
CADD DWG. D_271098.dgn
D-140

Figure B-28

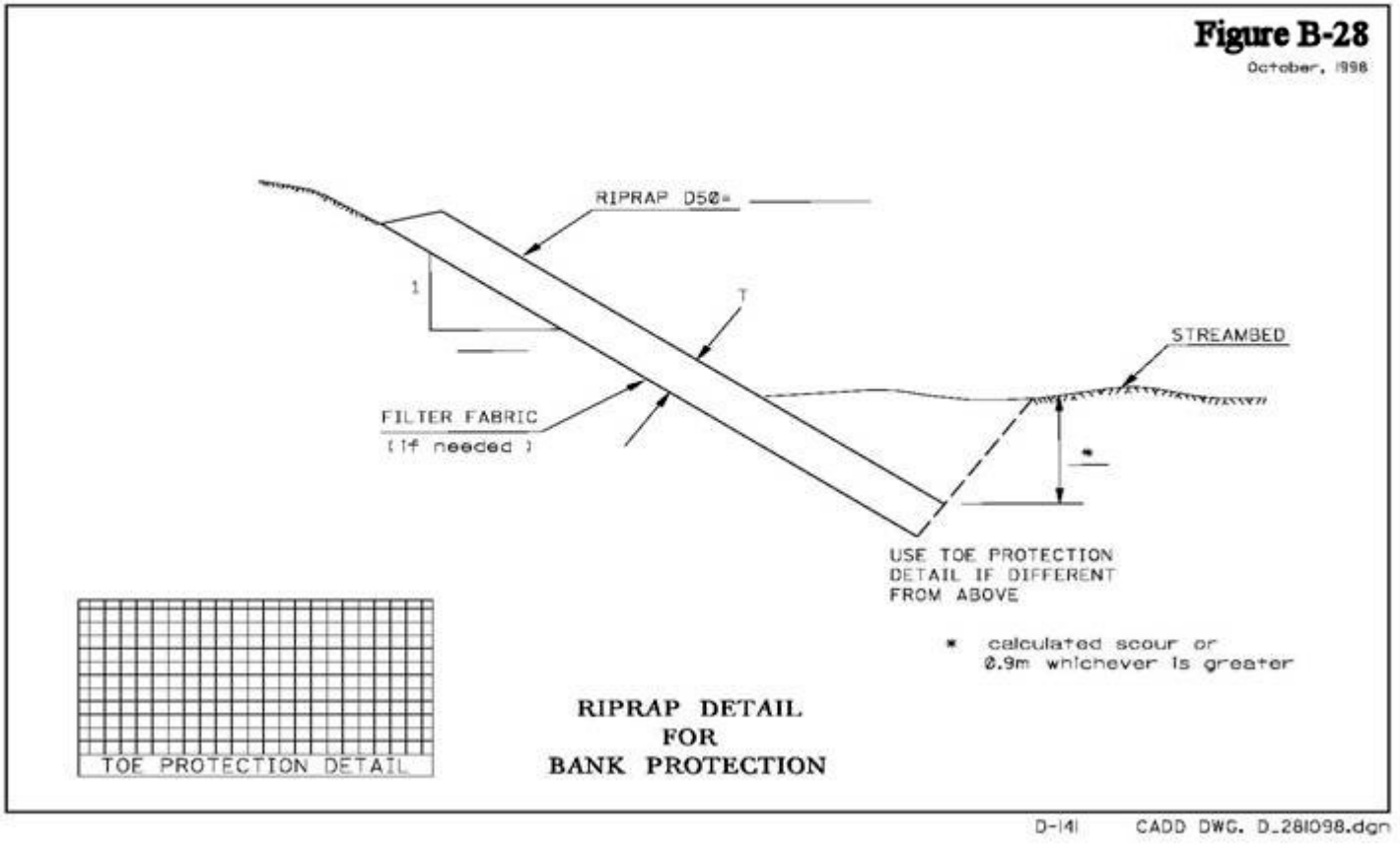


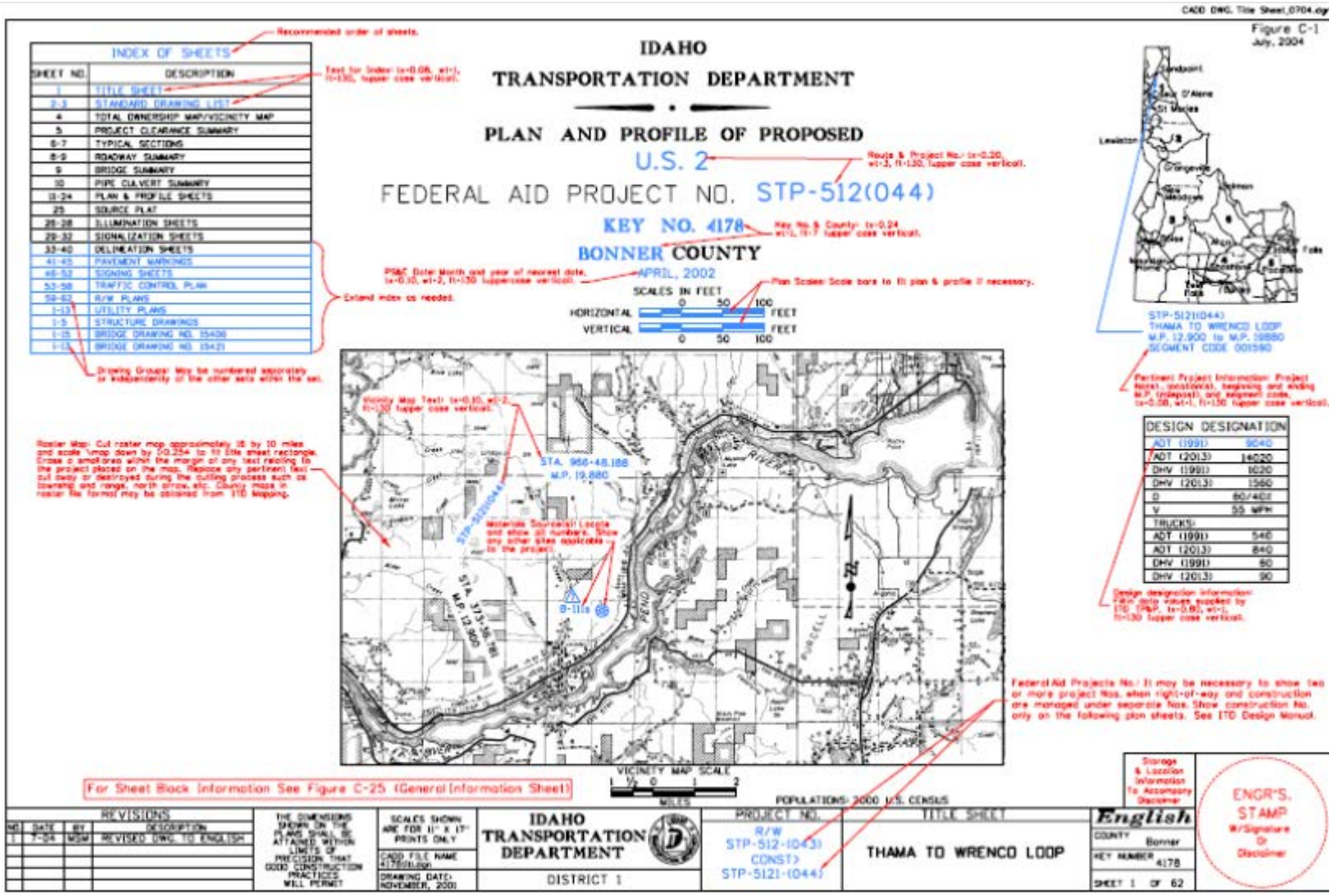
Figure B-28
October, 1998
RIPRAP D50=
1
T
STREAMBED
FILTER FABRIC
(If needed)
*
USE TOE PROTECTION
DETAIL IF DIFFERENT
FROM ABOVE
* calculated scour or
0.9m whichever is greater
TOE PROTECTION DETAIL
RIPRAP DETAIL
FOR
BANK PROTECTION
D-141 CADD DWG. D_281098.dgn

APPENDIX C - PLANS

Appendix C – Plans (UNDER CONSTRUCTION)

C.10 – Plans Introduction The Idaho Transportation Department produces plan sheets for several purposes such as design information, construction bidding documents, historical information, legal records of survey, or departmental records. DMC is in the process of updating the example plans in Appendix C - Plans. The following plans have been left in for informational purposes. Follow the guidance provided in SECTION 700 - Project Plan Sets of the CADD Standards Manual for required standards in preparing an ITD plan set. For the required design elements of the plans see Section 800 – Plans in this Manual.

For assistance/revisions/etc., please contact the CADD Group at 334-8494.


CADD DWG. Title Sheet_0704.dgn
Figure C-1
July, 2004
IDAHO
TRANSPORTATION DEPARTMENT
PLAN AND PROFILE OF PROPOSED
U.S. 2
FEDERAL AID PROJECT NO. STP-512(044)
KEY NO. 4178
BONNER COUNTY
APRIL, 2002
SCALES IN FEET
HORIZONTAL 0 50 100 FEET
VERTICAL 0 50 100 FEET
INDEX OF SHEETS
SHEET NO. DESCRIPTION
1 TITLE SHEET
2-3 STANDARD DRAWING LIST
4 TOTAL OWNERSHIP MAP/VICINITY MAP
5 PROJECT CLEARANCE SUMMARY
6-7 TYPICAL SECTIONS
8-9 ROADWAY SUMMARY
9 BRIDGE SUMMARY
10 PIPE CULVERT SUMMARY
11-24 PLAN & PROFILE SHEETS
25 SOURCE PLAT
26-28 ILLUMINATION SHEETS
29-32 SIGNALIZATION SHEETS
33-40 DELINEATION SHEETS
41-45 PAVEMENT MARKINGS
46-52 SIGNING SHEETS
53-58 TRAFFIC CONTROL PLAN
59-62 R/W PLANS
1-13 UTILITY PLANS
1-5 STRUCTURE DRAWINGS
1-15 BRIDGE DRAWING NO. 15408
1-13 BRIDGE DRAWING NO. 13423
STP-5121(044)
THAMA TO WRENCO LOOP
M.P. 12.900 to M.P. 19.880
SEGMENT CODE 001580
DESIGN DESIGNATION
ADT (1991) 9040
ADT (2013) 14020
DHV (1991) 1020
DHV (2013) 1560
D 60/40
V 55 MPH
TRUCKS:
ADT (1991) 540
ADT (2013) 840
DHV (1991) 80
DHV (2013) 90
STA. 956+48.188
M.P. 19.880
STA. 373+46.788
M.P. 12.900
VICINITY MAP SCALE
½ 0 1 2
MILES
POPULATIONS: 2000 U.S. CENSUS
For Sheet Block Information See Figure C-25 (General Information Sheet)
REVISIONS
NO. DATE BY DESCRIPTION
1 7-04 MSM REVISED DWG. TO ENGLISH
IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 1
PROJECT NO.
R/W STP-512-(043)
CONST) STP-5121-(044)
TITLE SHEET
THAMA TO WRENCO LOOP
English
COUNTY Bonner
KEY NUMBER 4178
SHEET 1 OF 62
ENGR'S. STAMP W/Signature Or Disclaimer

CADD DWG. Standard Drawing List\...0704.dgn

Figure C-2
July, 2004

ENGLISH STANDARD DRAWING LIST
JUNE, 2004

DRAWING BY: NUMBER — NAME (additional required materials) — • DATE

- A-1 ..... Freeway Grading 7-03
- A-2 ..... Rural Principal Arterial Grading 7-03
- A-3 ..... Rural Minor Arterial Grading 7-03
- A-4 ..... Rural Major Collector Grading 7-03
- A-5 ..... Superelevation 3-00
- A-6 ..... Typical Roadside Slope Treatment 6-04
- A-7 ..... Median Crossovers 1-00
- A-8 ..... Standard Template 1-00
- A-9 ..... ITD Roadway Nomincalture Location & Examples (requires sheets 1 of 4, 2 of 4, 3 of 4 & 4 of 4) 4-04
- A-10 ..... Parabolic Crown (requires sheets 1 of 2 & 2 of 2) 7-03
- C-1-A ..... Urban Concrete Pavement Details 6-98
- C-1-B ..... Doweled Concrete Pavement Details (requires sheets 1 of 2 & 2 of 2) 11-01
- C-1-C ..... Ramp Gore Details (refer to C-1-B) 6-03
- C-2-A ..... Rumble Strips for Multi-lane Roadways (requires sheets 1 of 2 & 2 of 2) 9-02
- C-2-B ..... Rumble Strips for Two-way Roadways 9-02
- D-1-A ..... Runoff Drain or Embankment Protector 7-02
- D-1-B ..... Runoff Drain or Embankment Protector with Slotted Drain (requires sheets 1 of 2 & 2 of 2) 7-02
- D-2-A ..... Culvert Inlet Headwall 7-02
- D-3-C ..... Metal Safety Slope Aprons (requires sheets 1 of 2 & 2 of 2) 11-00
- D-4-A ..... Watertight Coupling Bands for Corrugated Metal Pipes (requires sheets 1 of 2 & 2 of 2) 6-02
- D-4-B ..... 12" Thru 30" Slotted Drain 6-02
- D-5 ..... Galvanized Steel Aprons for Pipe Culverts 11-01
- D-5-A ..... Concrete Aprons for Pipe Culverts 2-00
- D-6 ..... Precast Concrete Headgate 9-01
- D-7 ..... Concrete Headwall for Twin Pipe Culverts (requires sheets 1 of 2 & 2 of 2) 6-03
- D-8 ..... Concrete Headwall for Single Pipe Culvert (requires sheets 1 of 2 & 2 of 2) 6-03
- D-9 ..... Concrete Headwall for Arch Pipe Culvert (requires sheets 1 of 2 & 2 of 2) 6-03
- D-10 ..... Concrete Headwall for Siphons (requries sheet 1 of 2 & 2of 2) 6-02
- D-12 ..... Conduit Installation for New Roadways & Approaches 11-01
- D-13 ..... Conduit Installation for Existing Roadways & Approaches (requires D-12) 11-01
- E-6-A ..... Inlets & Catch Basins Types 1, 2, & 3 6-01
- E-6-B ..... Inlets & Catch Basins Types 1A, 2A, & 3A 3-01
- E-6-C ..... Inlets & Catch Basins Types 4 & 5 3-01
- E-6-D ..... Catch Basin Type 6 3-01
- E-6-E ..... Catch Basin Type 7 8-02
- E-6-F ..... Inlet Type 8 3-01
- E-7 ..... Manhole Type A (requires E-9) 6-03
- E-7-C ..... Manholes Type C & D (refer to E-9) 11-01
- E-8 ..... Manhole Type B (refer to E-9) 11-01
- E-9 ..... Standard Manhole Frame, Cover, & Concrete Collar 11-01
- F-1-A ..... Cattle Guard Type A 9-02
- F-1-B ..... Cattle Guard Type B (requires sheets 1 of 2 & 2 of 2) 7-02
- F-1-C ..... Painted Cattle Guard 1-04
- F-2-A ..... Standard Barbed, Woven, Mesh, Combination Wire Fences, & Fencing Details (requires sheets 1 of 3, 2 of 3, & 3 of 3) 5-04

DRAWING BY: NUMBER — NAME (additional required materials) — • DATE

- F-2-B ..... High Tension 8 Wire Fence 10-00
- F-2-C ..... Gate Types 1, 1A, & 2 (requires sheets 1 of 2, 2 of 2, & dwg. F-2-A) 6-03
- F-2-D ..... Chain Link Fence Fence Type 4 (requires sheets 1 of 2 & 2 of 2) 1-04
- F-2-E ..... Wildlife Fence Fence Type 9 1-04
- G-1-A-1 ..... Guardrail Slope Treatment Types A & B & Curb/Gutter Installation (requires G-1-A-2) 1-04
- G-1-A-2 ..... W-Beam Metal Guardrail, Bolting Hardware, Wooden Post & Blockout Assembly (requires G-1-A-1) 6-04
- G-1-A-3 ..... Steel Post & Blockout for W-beam & Thrie Beam Guardrail (requires G-1-A-1 & 2) 9-03
- G-1-B ..... Guardrail Terminals Type 1 & 1-A (requires sheets 1 of 2, 2 of 2, & dwgs. G-1-A-1, & G-1-A-2) 7-03
- G-1-C-1 ..... Guardrail Terminal Type 2-A With 10:1 or Flatter Foreslope (requires sheets 1 of 2, 2 of 2, & dwgs. G-1-A-1 & G-1-A-2) 7-03
- G-1-C-2 ..... Guardrail Terminal Type 2-B for Less Than 10:1 to 6:1 Foreslope (requires sheets 1 of 2, 2 of 2, & dwgs. G-1-A-1 & G-1-A-2) 11-03
- G-1-E ..... Guardrail Terminal Type 3 (requires sheets 1 of 2, 2 of 2, & dwgs. G-1-A-1, G-1-A-2, G-1-A-3, & H-1) 6-04
- G-1-F-1 ..... Guardrail Terminal Type 5 Alternate "A" (requires G-1-A-1 & G-1-A-2) 1-03
- G-1-F-2 ..... Guardrail Terminal Type 5 Alternate "B" (requires G-1-A-1 & G-1-A-2) 1-03
- G-1-G ..... Guardrail Terminal Type 6 Options 1, 2, & 3 (Bullnose Guardrail System) (requires sheets 1 of 2, 2 of 2, & dwgs. G-1-A-1 & G-1A-2) 11-03
- G-1-H ..... Guardrail Terminals Type 7 & 8 (requires G-1-A-1 & G-1-A-2) 3-03
- G-1-I ..... Guardrail Terminal Type 11 (requires sheets 1of 2 & 2 of 2) 6-03
- G-1-J ..... Guardrail Terminal Types 4-A & 4-B (refer to G-1-A-1 & 2) 5-04
- G-1-K ..... Guardrail Terminal Type 9 (requires sheets 1 of 2, 2 of 2, & dwgs. G-1-A-1, G-1-A-2, & G-1-A-3) 6-01
- G-1-L ..... Guardrail Installation for Minor Structures & Large Culverts (requires sheets 1 of 2, 2 of 2, & dwgs. G-1-A-1 & G-1-A-2) 7-03
- G-1-M ..... Guardrail Terminal Type 10 (refer to G-1-A-1, G-1-A-2, & G-1-B) 1-04
- G-2-A ..... Concrete Barrier & Terminal Type A 1-00
- G-2-A-1 ..... 20' Concrete Barrier (requires sheets 1 of 2 & 2 of 2) 6-04
- G-2-A-2 ..... 10' Concrete Barrier (requires sheets 1 of 2 & 2 of 2) 6-04
- G-2-C ..... Concrete Parapet to Thrie Beam Connector (requires sheets 1 of 2, 2 of 2, & dwgs. G-1-E, & G-1-A1) 12-02
- G-2-D ..... Concrete Barrier to Thrie Beam Guardrail Connector (requiers sheets 1 of 2, 2 of 2, & dwgs. G-1-E & G-2-A-1) 5-04
- G-2-E ..... Concrete Transition Barrier 9-02
- G-2-F ..... Interim Bridge Rail Retrofit 9-02
- G-2-H ..... Special Cast-in-place Concrete barrier (requires to G-2-A-1 & G-2-A-2) 6-03
- G-3-A ..... Delineators & Installation (requires sheets 1 of 2 & 2 of 2) 12-02
- G-3-B ..... Snow Poles 12-02
- H-1 ..... Curbs, Gutters, Traffic Separators, & Raised Channelization End Treatment 12-01
- H-2-A ..... Urban Approaches & Concrete Sidewalk (requires sheets 1 of 2, 2 of 2, & dwg. H-1) 6-04
- H-2-B ..... Urban Approaches Handicapped/Bicycle Type A5 & A6 (requires sheets 1 of 2, 2 of 2 dwg. H-2-A) 7-03
- H-4-A ..... Rural Approaches (Private, Commercial, & Public) 10-02
- H-4-B ..... Mailbox Turnout & Installation 11-02
- H-5-A ..... Mailbox Assemblies & Mounting Hardware (requires sheets 1 of 3, 2 of 3, & 3 of 3, & dwg. H-4-B) 7-02

Drawing Block: Check or Fill block sold when standard drawing is used in plans (See sheet 2 of 2 for "STANDARD DRAWING LIST" notes).

N/A - DRAWING NOT AVAILABLE
• DATE OF LAST REVISION.
•• ENGLISH DRAWING IS NOT AVAILABLE. REFER TO METRIC DRAWING(S) AND USE APPROXIMATE/PROPORTIONAL METRIC CELL AND LINE STYLE VALUES ON ENGLISH SIZE SHEETS.

For Sheet Block Information See Figure C-25 (General Information Sheet)

Storage & Location Information To Accompany Disclaimer

ENGR'S. STAMP W/Signature Or Disclaimer

REVISIONS				DESIGNED	SCALES SHOWN ARE FOR 8"x11" PRINTS ONLY	IDAHO TRANSPORTATION DEPARTMENT	PROJECT NO.	STANDARD DRAWING LIST (1 of 2)	English
NO.	DATE	BY	DESCRIPTION	E. Krugger			STP-5121(004)	THAMA TO WRENCO LOOP	COUNTY Bonner
				DESIGN CHECKED V.P. Price					KEY NUMBER 4178
				DETAILED E. Krugger	CADD FILE NAME: 4178sl.dgn				SHEET 2 OF 62
				DRAWING CHECKED S. King	DRAWING DATE: NOVEMBER, 2002	DISTRICT 1			

Figure C-3
July, 2004

ENGLISH STANDARD DRAWING LIST
JUNE, 2004

DRAWING BY: NUMBER	NAME (additional required materials)	• DATE
☐ I-1-A	Traffic Control Methods for Lane Closure	N/A
☐ I-2-A	Monument Markers & Witness Posts	6-02
☐ I-2-B	Street Monument Marker & Installation (requires I-2-A)	10-02
☐ I-5	Loop Detectors - 10 ft/sec² Deceleration Rate	7-03
☐ I-6-A	Mast Arm Traffic Signal Poles	12-01
☐ I-6-B	Pedestal Traffic Signal Poles	12-01
☐ I-7-A	Foundation Details for Signal Cabinets	8-96
☐ I-7-B	Electronic Cabinet Foundation Detail	8-96
■ I-7-C	Mastarm Signal Pole, Lighting Pole and Pedestrian Pole Foundation Details	7-03
☐ I-8-A-1	Breakaway Sign Post Installation Type A-1 (requires I-8-A-2)	12-99
☐ I-8-A-2	Breakaway Sign Post Installation Type A-1 (requires I-8-A-1)	12-99
☐ I-8-B-1	Breakaway Sign Post Installation Type A-2, A-3, & A-4 (requires I-8-B-2)	12-99
■ I-8-B-2	Breakaway Sign Post Installation Type A-2, A-3, & A-4 (requires I-8-B-1)	12-99
☐ I-8-C-1	Breakaway Sign Post Installation Type A-8 & A-9 (requires I-8-C-2)	12-99
☐ I-8-C-2	Breakaway Sign Post Installation Type A-8 & A-9 (requires I-8-C-1)	12-99
☐ I-8-D-1	Breakaway Sign Post Installation Type B-1 (requires I-8-D-3)	12-99
■ I-8-D-2	Breakaway Sign Post Installation Type B-2, B-3, & B-4 (requires I-8-D-3)	12-99
■ I-8-D-3	Breakaway Sign Post Installation Type B-1, B-2, B-3, B-4 (requires I-8-D-1 or I-8-D-2)	12-99
■ I-8-E	Breakaway Sign Posts Type D	8-96
■ I-8-F	Breakaway Sign Posts Type E	12-01
■ I-9-A-1	B Post and Brace Angle Detail (requires I-9-A-2)	12-01
☐ I-9-A-2	B Post and Brace Angle Detail (requires I-9-A-1)	12-01
■ I-9-B	Cardinal Route Marker Assemblies (requires I-8-D-2 & I-8-D-3)	7-03
■ I-9-C	Route Marker Bracket Details	12-01
☐ I-10-A	Extruded Aluminum Signs	12-01
☐ I-10-B	Exit Number Panel (requires I-10-A)	1-04
☐ I-11-A	Standard Route Markers (requires I-11-B & I-12-F)	7-03
☐ I-11-B	Route Marker Numeral Details (requires I-11-A)	12-01
☐ I-11-C	Route Marker Auxiliary Panels (requires I-12-F)	7-03
☐ I-12-A	Standard Regulatory Signs (requires I-12-F)	7-03
☐ I-12-D	Standard Warning Signs (requires I-12-F)	7-03
☐ I-12-F	Punching Schedule for Type "B" or Type "E" Signs	12-01
☐ I-13-A	Standard Guide and Service Signs	12-01
☐ I-20	Mileposts	12-01
☐ I-21	Standard Pavement Markings for Primary and Secondary Roadways	7-03
☐ I-22-A	Standard Pavement Markings Freeways with 22 Foot Wide Ramps	12-01
☐ I-22-B	Standard Pavement Markings Freeways with 28 Foot Wide Ramps	12-01
☐ K-7	Methods of Planting Trees and Shrubs	N/A
■ K-10	Rest Area & Roadside Facilities Symbols	12-02

DRAWING BY: NUMBER	NAME (additional required materials)	• DATE
☐ P-1-A	Temporary Erosion Control Slope Drains (requires P-1-D & refer to P-1-E)	6-96
☐ P-1-B	Temporary Erosion Control Erosion Dams, Barriers, & Fence Devices (requires P-1-D)	6-96
☐ P-1-C	Temporary Erosion Control Sediment Trap (requires P-1-D)	2-96
☐ P-1-D	Temporary Erosion Control Diversion Devices & Site Example (refer to P-1-E)	6-96
☐ P-1-E	Temporary Erosion Control Earth Berms/Dikes & Swales (requires P-1-D)	2-96
☐ P-1-F	Temporary Erosion Control for Temporary Roads (requires P-1-D)	6-96
☐ P-1-G	Temporary Erosion Control Siltation Berm & Stabilized Construction Entrance (requires P-1-D)	2-96
☐ P-1-H	Temporary Erosion Control Inlet & Basin Protection (requires sheets 1 of 2, 2 of 2, & dwg. P-1-D)	6-96
☐ P-2-A	Permanent Erosion Control Gabions & Revet Mattresses	2-96
☐ P-2-B	Permanent Erosion Control Stone Filter Weirs/Berms/Dams (requires P-2-A)	2-96
☐ P-2-C	Permanent Erosion Control Slope & Channel Protection (requires P-2-A)	2-96
☐ P-2-D	Permanent Erosion Control Paved Flume (requires sheets 1 of 2, 2 of 2, & dwg. P-2-A)	1-97
☐ P-2-F	Permanent Erosion Control Culvert Outlet Protection (requires P-2-A)	2-96
☐ P-3-A	Water Pollution Control Sediment Control Catch Basin	2-96
■ P-3-B	Water Pollution Control Sediment & Oil Trap (refer to E-9)	6-96
☐ P-3-D	Water Pollution Control In Street Sediment & Oil Trap (requires E-7-C, refer to E-9)	12-95
☐ P-3-E	Water Pollution Control Equipment Washdown	12-95
☐ P-4-A	Sediment Control Sediment Basin	2-96
☐ P-4-B	Sediment Control Grassed Swale & Wattling (requires P-4-A)	12-95
☐ P-5-A	Hazardous Materials Containment Petroleum Storage (refer to P-1-G)	12-95
☐ R-1-A	Railroad - Highway Crossing Signals Type 1	3-04
☐ R-1-A	Railroad - Highway Crossing Signals Type 2 (requires sheet 1 of 2 & 2 of 2)	3-04
☐ R-1-C	Railroad - Highway Crossing Signals Type 2 (requires sheet 1 of 2 & 2 of 2)	3-04
☐ R-2	Railroad - Highway Crossing Area	3-04
☐ S-1-A(m)	Celled Standard Conventional Symbols (requires sheets 1 of 2 & 2 of 2)	** 1-99
☐ S-1-B(m)	Non-Celled Standard Conventional Symbols	** 1-99
☐ S-1-C(m)	Custom Line Styles (requires sheets 1 of 2 & 2 of 2)	** 12-98

NOTES

1. WARNING: This drawing is for an example only and the information contained concerning standard drawing sheets may not be accurate.
2. The current "ENGLISH STANDARD DRAWING LIST" is the only appropriate document to denote which specific standard drawings are utilized in IDAHO TRANSPORTATION DEPARTMENT (ITD) project plans. Contact Roadway Design for availability of the current "LIST".
3. The Standard Drawing List shall immediately succeed the title sheet.

Drawing Block: Check or Fill/Mark solid when standard drawing is used in plans.

N/A - DRAWING NOT AVAILABLE
• DATE OF LAST REVISION.
** ENGLISH DRAWING IS NOT AVAILABLE. REFER TO METRIC DRAWING(S) AND USE APPROXIMATE/PROPORTIONAL METRIC CELL AND LINE STYLE VALUES ON ENGLISH SIZE SHEETS.

For Sheet Block Information See Figure C-25 (General Information Sheet)

Storage & Location Information To Accompany Disclaimer

ENGR'S. STAMP W/Signature Or Disclaimer

REVISIONS NO.	DATE	BY	DESCRIPTION

DESIGNED E. Krugger
DESIGN CHECKED V.P. Price
DETAILED E. Krugger
DRAWING CHECKED S. King
SCALES SHOWN ARE FOR 8" X 11" PRINTS ONLY
CADD FILE NAME: 413Std.dgn
DRAWING DATE: NOVEMBER, 2002

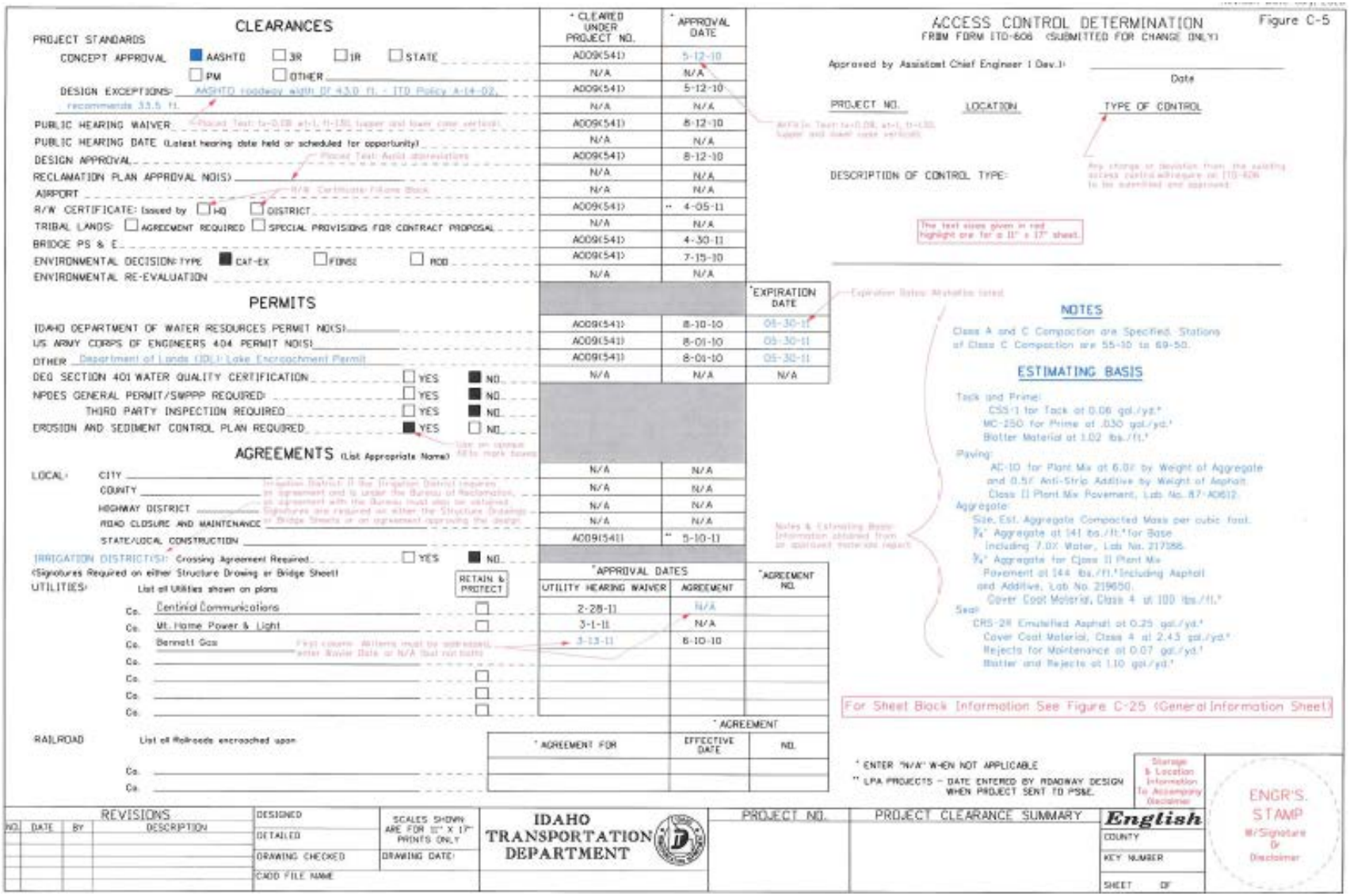
IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 1

PROJECT NO. STP-5121(004)

STANDARD DRAWING LIST (2 of 2)

THAMA TO WRENCO LOOP

English
COUNTY Bonner
KEY NUMBER 4178
SHEET 3 OF 62



CLEARANCES

PROJECT STANDARDS
CONCEPT APPROVAL ■ AASHTO ☐ 3R ☐ 1R ☐ STATE ☐ PM ☐ OTHER
DESIGN EXCEPTIONS: AASHTO roadway width of 43.0 ft. - ITD Policy A-14-02 recommends 33.5 ft.
PUBLIC HEARING WAIVER:
PUBLIC HEARING DATE (Latest hearing date held or scheduled for opportunity)
DESIGN APPROVAL
RECLAMATION PLAN APPROVAL NO(S)
AIRPORT
R/W CERTIFICATE: Issued by ☐ HQ ☐ DISTRICT
TRIBAL LANDS: ☐ AGREEMENT REQUIRED ☐ SPECIAL PROVISIONS FOR CONTRACT PROPOSAL
BRIDGE PS & E
ENVIRONMENTAL DECISION: TYPE ■ CAT-EX ☐ FONSI ☐ ROD
ENVIRONMENTAL RE-EVALUATION

PERMITS

IDAHO DEPARTMENT OF WATER RESOURCES PERMIT NO(S):
US ARMY CORPS OF ENGINEERS 404 PERMIT NO(S):
OTHER: Department of Lands (DL): Lake Encroachment Permit
DEQ SECTION 401 WATER QUALITY CERTIFICATION ☐ YES ■ NO
NPDES GENERAL PERMIT/SWPPP REQUIRED ☐ YES ■ NO
THIRD PARTY INSPECTION REQUIRED ☐ YES ■ NO
EROSION AND SEDIMENT CONTROL PLAN REQUIRED ■ YES ☐ NO

AGREEMENTS (List Appropriate Name)

LOCAL: CITY
COUNTY
HIGHWAY DISTRICT
ROAD CLOSURE AND MAINTENANCE
STATE/LOCAL CONSTRUCTION
IRRIGATION DISTRICT(S): Crossing Agreement Required ☐ YES ■ NO
(Signatures Required on either Structure Drawing or Bridge Sheet)
UTILITIES: List all Utilities shown on plans — RETAIN & PROTECT
Co. Centinel Communications ☐
Co. Mt. Home Power & Light ☐
Co. Bennett Gas ☐
Co. ☐
Co. ☐
Co. ☐
Co. ☐

RAILROAD List all Railroads encroached upon
Co.
Co.

* CLEARED UNDER PROJECT NO.	* APPROVAL DATE	* EXPIRATION DATE
A009(541)	5-12-10	
N/A	N/A	
A009(541)	5-12-10	
N/A	N/A	
A009(541)	8-12-10	
N/A	N/A	
A009(541)	8-12-10	
N/A	N/A	
N/A	N/A	
A009(541)	** 4-05-11	
N/A	N/A	
A009(541)	4-30-11	
A009(541)	7-15-10	
N/A	N/A	
A009(541)	8-10-10	05-30-11
A009(541)	8-01-10	05-30-11
A009(541)	8-01-10	05-30-11
N/A	N/A	N/A
N/A	N/A	
N/A	N/A	
N/A	N/A	
N/A	N/A	
A009(541)	** 5-10-11	

* APPROVAL DATES		* AGREEMENT NO.
UTILITY HEARING WAIVER	AGREEMENT	
2-28-11	N/A	
3-1-11	N/A	
3-13-11	8-10-10	

* AGREEMENT FOR	* AGREEMENT EFFECTIVE DATE	NO.

ACCESS CONTROL DETERMINATION
FROM FORM ITD-606 (SUBMITTED FOR CHANGE ONLY)
Figure C-5

Approved by Assistant Chief Engineer (Dev.) Date

PROJECT NO. LOCATION TYPE OF CONTROL

DESCRIPTION OF CONTROL TYPE:

Any change or deviation from the existing access control require an ITD-606 to be submitted and approved.

The text sizes given in red highlight are for a 11" x 17" sheet.

NOTES

Class A and C Compaction are Specified. Stations of Class C Compaction are 55-10 to 69-50.

ESTIMATING BASIS

Tack and Prime:
CSS-1 for Tack at 0.06 gal./yd.²
MC-250 for Prime at .030 gal./yd.²
Blotter Material at 1.02 lbs./ft.²

Paving:
AC-10 for Plant Mix at 6.0% by Weight of Aggregate and 0.5% Anti-Strip Additive by Weight of Asphalt
Class II Plant Mix Pavement, Lab No. 87-A0612.

Aggregate:
Size, Est. Aggregate Compacted Mass per cubic foot.
¾" Aggregate at 141 lbs./ft.³ for Base Including 7.0% Water, Lab No. 217556.
¾" Aggregate for Class II Plant Mix Pavement at 144 lbs./ft.³ Including Asphalt and Additive, Lab No. 219650.
Cover Coat Material, Class 4 at 100 lbs./ft.³

Seal:
CRS-2P Emulsified Asphalt at 0.25 gal./yd.²
Cover Coat Material, Class 4 at 2.43 gal./yd.²
Rejects for Maintenance at 0.07 gal./yd.²
Blotter and Rejects at 1.10 gal./yd.²

For Sheet Block Information See Figure C-25 (General Information Sheet)

* ENTER "N/A" WHEN NOT APPLICABLE
** LPA PROJECTS - DATE ENTERED BY ROADWAY DESIGN WHEN PROJECT SENT TO PS&E.

Storage & Location Information To Accompany Disclaimer

ENGR'S. STAMP W/Signature Or Disclaimer

REVISIONS				DESIGNED	SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY	IDAHO TRANSPORTATION DEPARTMENT	PROJECT NO.	PROJECT CLEARANCE SUMMARY	English
NO.	DATE	BY	DESCRIPTION	DETAILED					COUNTY
				DRAWING CHECKED	DRAWING DATE:				KEY NUMBER
				CADD FILE NAME					SHEET OF

Figure C-6
July 2005

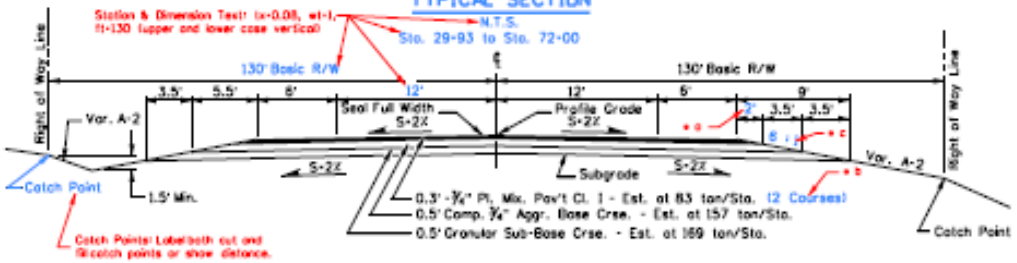
RURAL TYPICAL

Major Titles: ls=0.12, wt=3, ft=130, upper case vertical. Underline same weight as text when used.

TYPICAL SECTION

Station & Dimension Text: ls=0.08, wt=1, ft=130 upper and lower case vertical

N.T.S.
Sta. 29+93 to Sta. 72+00



Catch Points: Label both cut and fill catch points or show distance.

* a 1.5 ft. for plantmix pavement 0.2 ft. or less thickness. 2.0 ft. for plantmix pavement greater than 0.2 ft thick.
* b Two or more courses required for pavement thickness greater than 0.25 ft. unless otherwise specified in the approved Joint Phase 3 Materials Report.
* c Subgrade shoulder slopes flatter than 1 : 6 may be specified.

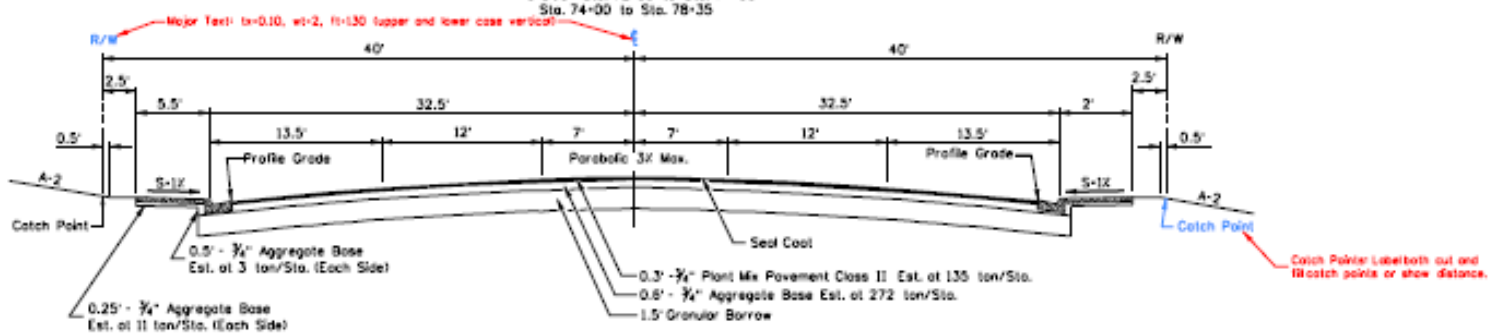
NOTES

1. Draw typicals large enough to be legible on 17" x 11" plans.
2. PROJECT NOTES and ESTIMATING BASIS may be placed on this sheet if not shown on the GENERAL INFORMATION SHEET.
3. Dimension all lanes, total roadway width, and right-of-way width both directions from centerline. Dimension sidewalks, curb and gutters, and other features from the preceding features.
4. Roadway materials, ballast requirements, and special drainage features are to be as determined by materials report.
5. The text sizes given in red highlight are for a 17" x 11" sheet.

URBAN TYPICAL

TYPICAL SECTION

N.T.S.
Transition Sta. 72+00 to Sta. 74+00
Sta. 74+00 to Sta. 78+35



Catch Points: Label both cut and fill catch points or show distance.

For Sheet Block Information See Figure C-25 (General Information Sheet)

Storage & Location Information To Accompany Disclaimer

ENGR'S. STAMP W/Signature Or Disclaimer

REVISIONS				DESIGNED	SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY	IDAHO TRANSPORTATION DEPARTMENT	PROJECT NO.	TYPICAL SECTION	English
NO.	DATE	BY	DESCRIPTION	J. Gonzales					COUNTY Nez Perce
				DESIGN CHECKED T. Smith			STP-4326(4)	PLUMMER TO ST. MARIES PHASE 1	KEY NUMBER 9234
				DETAILED D. Ng	CADD FILE NAME 4178typ1.dgn				SHEET 2 OF 18
				DRAWING CHECKED A. Gongbi	DRAWING DATE: MARCH, 2004	DISTRICT 1			

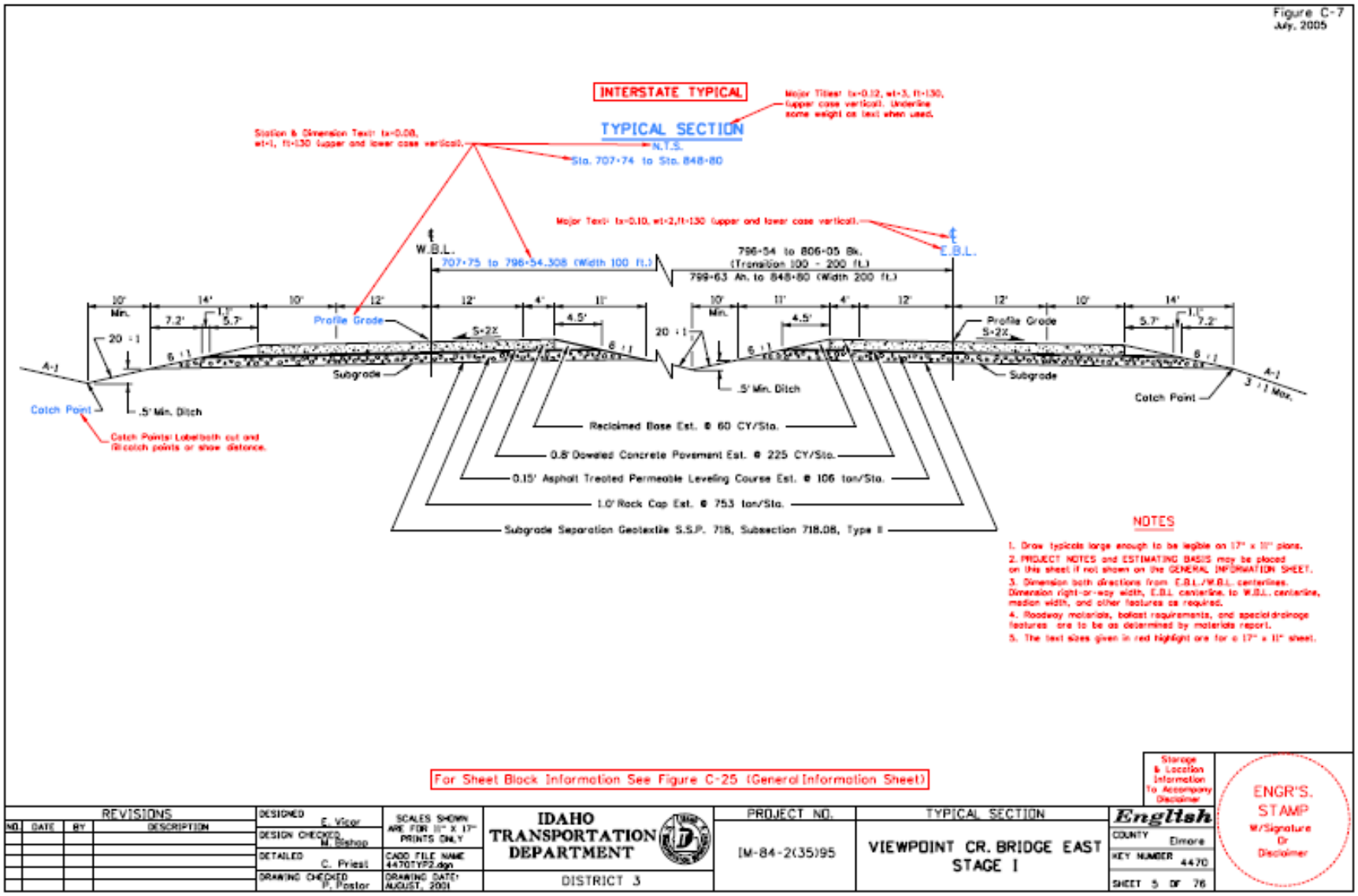


Figure C-7
July, 2005
INTERSTATE TYPICAL
TYPICAL SECTION
N.T.S.
Sta. 707+74 to Sta. 848+80
Major Titles: ht=0.12, wt=3, ft=130, Upper case vertical. Underline some weight on text when used.
Station & Dimension Text: ht=0.08, wt=1, ft=130 Upper and lower case vertical.
Major Text: ht=0.10, wt=2, ft=130 Upper and lower case vertical.
℄ W.B.L.
707+75 to 798+54.308 (Width 100 ft.)
798+54 to 806+05 Bk.
(Transition 100 - 200 ft.)
799+63 Ah. to 848+80 (Width 200 ft.)
℄ E.B.L.
10' Min.
14'
1.5'
7.2'
5.7'
10'
12'
12'
4'
11'
4.5'
20 : 1
6 : 1
S=2%
Profile Grade
Subgrade
A-1
Catch Point
.5' Min. Ditch
Catch Points: Label both cut and fill catch points or show distance.
3 : 1 Max.
Reclaimed Base Est. @ 60 CY/Sta.
0.8' Doweled Concrete Pavement Est. @ 225 CY/Sta.
0.15' Asphalt Treated Permeable Leveling Course Est. @ 106 ton/Sta.
1.0' Rock Cap Est. @ 753 ton/Sta.
Subgrade Separation Geotextile S.S.P. 718, Subsection 718.08, Type II
NOTES
1. Draw typicals large enough to be legible on 17" x 11" plans.
2. PROJECT NOTES and ESTIMATING BASIS may be placed on this sheet if not shown on the GENERAL INFORMATION SHEET.
3. Dimension both directions from E.B.L./W.B.L. centerlines. Dimension right-of-way width, E.B.L. centerline, to W.B.L. centerline, median width, and other features as required.
4. Roadway materials, ballast requirements, and special drainage features are to be as determined by materials report.
5. The text sizes given in red highlight are for a 17" x 11" sheet.
For Sheet Block Information See Figure C-25 (General Information Sheet)
Storage & Location Information To Accompany Disclaimer
ENGR'S. STAMP w/Signature Or Disclaimer
REVISIONS
NO. DATE BY DESCRIPTION
DESIGNED E. Vigor
DESIGN CHECKED M. Bishop
DETAILED C. Priest
DRAWING CHECKED P. Pastor
SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME 4470TYP2.dgn
DRAWING DATE: AUGUST, 2001
IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 3
PROJECT NO.
IM-84-2(35)95
TYPICAL SECTION
VIEWPOINT CR. BRIDGE EAST STAGE I
English
COUNTY Elmore
KEY NUMBER 4470
SHEET 5 OF 76

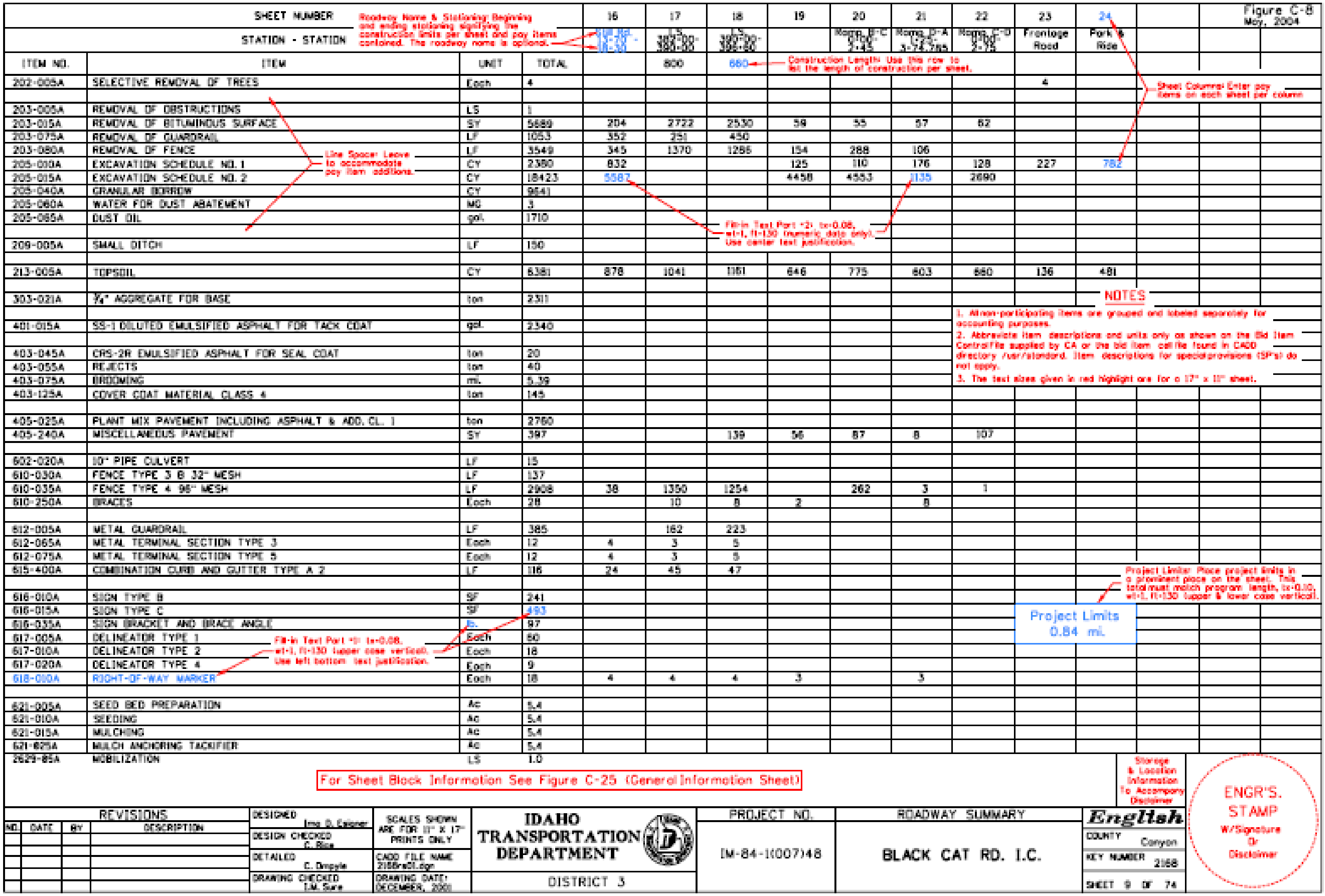


Figure C-8
May, 2004

ITEM NO.	ITEM	UNIT	TOTAL	16	17	18	19	20	21	22	23	24		
SHEET NUMBER				16	17	18	19	20	21	22	23	24		
STATION - STATION				[illegible]	I.S. 387+00- 395+00	I.S. 387+00- 395+60		Ramp B-C 0+00- 2+45	Ramp D-A 1+25- 3+74.785	Ramp C-D 0+00- 2+75	Frontage Road	Park & Ride		
					800	660								
202-005A	SELECTIVE REMOVAL OF TREES	Each	4								4			
203-005A	REMOVAL OF OBSTRUCTIONS	LS	1											
203-015A	REMOVAL OF BITUMINOUS SURFACE	SY	5689	204	2722	2530	59	55	57	62				
203-075A	REMOVAL OF GUARDRAIL	LF	1053	352	251	450								
203-080A	REMOVAL OF FENCE	LF	3549	345	1370	1286	154	288	106					
205-010A	EXCAVATION SCHEDULE NO. 1	CY	2380	832			125	110	176	128	227	782		
205-015A	EXCAVATION SCHEDULE NO. 2	CY	18423	5587			4458	4553	1135	2690				
205-040A	GRANULAR BORROW	CY	9641											
205-060A	WATER FOR DUST ABATEMENT	MG	3											
205-065A	DUST OIL	gal.	1710											
209-005A	SMALL DITCH	LF	150											
213-005A	TOPSOIL	CY	6381	878	1041	1161	646	775	603	660	136	481		
303-021A	¾" AGGREGATE FOR BASE	ton	2311											
401-015A	SS-1 DILUTED EMULSIFIED ASPHALT FOR TACK COAT	gal.	2340											
403-045A	CRS-2R EMULSIFIED ASPHALT FOR SEAL COAT	ton	20											
403-055A	REJECTS	ton	40											
403-075A	BROOMING	mi.	5.39											
403-125A	COVER COAT MATERIAL CLASS 4	ton	145											
405-025A	PLANT MIX PAVEMENT INCLUDING ASPHALT & ADD. CL. 1	ton	2760											
405-240A	MISCELLANEOUS PAVEMENT	SY	397			139	56	87	8	107				
602-020A	10" PIPE CULVERT	LF	15											
610-030A	FENCE TYPE 3 B 32" MESH	LF	137											
610-035A	FENCE TYPE 4 96" MESH	LF	2908	38	1350	1254		262	3	1				
610-250A	BRACES	Each	28		10	8	2		8					
612-005A	METAL GUARDRAIL	LF	385		162	223								
612-065A	METAL TERMINAL SECTION TYPE 3	Each	12	4	3	5								
612-075A	METAL TERMINAL SECTION TYPE 5	Each	12	4	3	5								
615-400A	COMBINATION CURB AND GUTTER TYPE A 2	LF	116	24	45	47								
616-010A	SIGN TYPE B	SF	241											
616-015A	SIGN TYPE C	SF	493											
616-035A	SIGN BRACKET AND BRACE ANGLE	lb.	97											
617-005A	DELINEATOR TYPE 1	Each	60											
617-010A	DELINEATOR TYPE 2	Each	18											
617-020A	DELINEATOR TYPE 4	Each	9											
618-010A	RIGHT-OF-WAY MARKER	Each	18	4	4	4	3		3					
621-005A	SEED BED PREPARATION	Ac	5.4											
621-010A	SEEDING	Ac	5.4											
621-015A	MULCHING	Ac	5.4											
621-025A	MULCH ANCHORING TACKIFIER	Ac	5.4											
2629-05A	MOBILIZATION	LS	1.0											

Figure C-9
May, 2004

STRUCTURE DWG. NO.				STR. NO. 15299	STR. NO. 15322	STR. NO. 15349
NAME & STATION				WALKER CANAL	BIG PINE CREEK	RETAINING WALL
ITEM NO.	ITEM	UNIT	TOTAL	1288+46	1288+17	1282+71 TO 1287+91
210-005A	STRUCTURE EXCAVATION SCH. NO. 1	C.Y.	604	288	316	
210-010A	STRUCTURE EXCAVATION SCH. NO. 2	C.Y.	335			335
210-015A	COMPACTING BACKFILL	C.Y.	1175	257	292	626
502-055A	CONC. CLASS 30	C.Y.	245			245
502-165A	CONCRETE CLASS 40B SCH. NO. 1	C.Y.	436	198	238	
502-310A	CONCRETE CLASS 40A SCH. NO. 2	C.Y.	1320	606	714	
502-420A	PRESTRESSED STRINGER 66" BEAM	C.Y.	3716.7	1821.4	1895.3	
502-435A	APPROACH SLAB	S.Y.	522	258	264	
	Line Spacer: Leave extra space between item categories to accommodate additional pay items					
503-005A	METAL REINF.	lbs.	23378			10520
503-010A	METAL REINF. SCH. NO. 1	lbs.	38072	17760	21312	
503-015A	METAL REINF. SCH. NO. 2	lbs.	69003	31365	37638	
503-020A	EPOXY COATED METAL REINF.		88872	39487	47385	
504-015A	STRUCTURAL STEEL	lbs.	2096	453	1143	75
504-025A	STRUCTURAL STEEL HANDRAIL	FT.	410	152	183	
505-025A	FURNISHING & DRIVING PILE HP 12X53	L.F.	1765	802	963	
505-205A	FURNISH & INSTALL PILE POINT	EACH	132	60	72	
5500-10A	DEWATERING FOUNDATION	CA	1	0.5	0.5	
5501-05A	EXPANSION JOINT	C.F.	1	0.4	0.6	
5501-10A	PRECAST STRUCTURES	L.F.	20		20	
5501-35A	TEXTURED CONCRETE SURFACE	S.Y.	20	20		
5505-05A	PREDRILLING	L.F.	205	93	112	
	Alt Fill-in Text: tx=0.08, wt=1, ft=130 (upper case vertical). Use left bottom text justification.					

NOTES

1. District Design or Consultant will prepare bridge summary from data supplied by ITD Bridge Section.
2. All non-participating items are grouped and labeled separately for accounting purposes.
3. Abbreviate item descriptions and units only as shown on the bid item call-up found in ITD CADD Directories. Item descriptions for special provisions (SP's) do not apply.
4. The sizes given are for 11" x 17" sheets.

For Sheet Block Information See Figure C-25 (General Information Sheet)

Storage & Location Information To Accompany Disclaimer

ENGR'S. STAMP W/Signature Or Disclaimer

REVISIONS			
NO.	DATE	BY	DESCRIPTION

DESIGNED: Irma D. Falconer
DESIGN CHECKED: C. Rice
DETAILED: C. Dingyle
DRAWING CHECKED: I.M. Rice

SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY

CADD FILE NAME: 2168be01.dgn
DRAWING DATE:

IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 3

PROJECT NO.: IM-84-1(007)48

BRIDGE SUMMARY: BLACK CAT RD. I.C.

English
COUNTY: Canyon
KEY NUMBER: 2168
SHEET 11 OF 74

Figure C-10
May, 2004

STATION	PIPE CULVERT (LENGTH IN FEET) PIPE SIZE (INCHES) 120" x 78"	12"	18"	24"	36"	PLASTIC PIPE: RIBBED POLYETHYLENE (PE)	CORRUGATED POLYETHYLENE (PE)	RIBBED POLYVINYL CHLORIDE (PVC)	METAL PIPE: STEEL PIPE: GALVANIZED STEEL	ALUMINIZED STEEL	½" CORRUGATION DEPTH THICK. (")	¼" CORRUGATION DEPTH	COATED	ANNULAR CORR.	HELICAL CORR.	ALUMINUM PIPE: ¼" TO ½" CORRUGATION DEPTH THICK. (")	¾" CORRUGATION DEPTH	COATED	ANNULAR CORR.	HELICAL CORR.	CONCRETE PIPE: REINFORCED CLASS	IRRIGATION OR DRAINAGE	TYPE OF BEDDING	RUBBER GASKET JOINTS REQUIRED	FILL HEIGHT FT.	STR. EXC. C.Y.	COMP. BKFILL C.Y.	MINOR STRUCTURES: DRAWING NUMBER	STRUCTURE EA.	CONCRETE C.Y.	METAL REINF. LBS.	TIMBER MFBM	GRATES EA.	APRONS EA.	INLETS TYPE	CATCH BASINS TYPE	REMARKS (INDICATE ELONGATION WHEN REQUIRED)
						X	X	X	X	X	THICK. (")		X	X	X	THICK. (")		X	X	X	II-V	X	1,2,3	X													
144+38	10									X	2.8		X	X				X	X						0.5	14	93										Cross Drain Ext. Rt.
144+38	10									X	2.8		X	X				X	X						0.5	14	93										Cross Drain Ext. Lt.
160+61		15							X		1.6				X	1.5				X	IV		1	X	1	12											Side Drain Lt.
165+45		22							X		1.6				X	1.5				X	IV		1	X	1	7											Side Drain Rt.
168+79		15				X	X		X		1.6				X	1.5				X	III		1		4	19	44						2				Cross Drain
176+85			20			X	X	X	X		1.6				X	1.5				X	III		1		3		14						2				X.D. Skewed 45° Lt.
177+23					22	X	X	X	X		1.6				X	1.5				X	III		1		2		56						2				S.D. Appr. Rt.
181+90		18				X	X	X	X		1.6				X	1.5				X	III		1		3.5	7	8						2				Cross Drain
184+14				18					X		1.6				X	1.5				X	IV		1			2	25						2				X.D. Skewed 45° Rt.
187+25				22		X	X	X	X		1.6				X	1.5				X	III		1	X	5		41					2					X.D., 2-Hdwls. Req'd.
192+42		16				X	X	X	X		1.6				X	1.5				X	III		1		2		12						2				Side Drain Lt.
195+87			16						X		1.6				X	1.5				X	IV		1					1					1				S.D. Lt., Str. Req'd.
196+50		22				X	X	X	X		1.6				X	1.5				X	III		1										2				S.D. Appr. Lt.
198+97					20				X		1.6				X	1.5				X	IV		1										2				X.D., Safety Apron
201+54		16							X		1.6				X	1.5				X	IV		1														Req'd Lt. & Rt.
205+67			21			X	X	X	X		1.6				X	1.5				X	III		1														Cross Drain
																																					S.D. Appr. Rt.
208+68		16							X		1.6				X	1.5				X	IV		1										2				Cross Drain
210+31				18		X	X	X	X		1.6				X	1.5				X	III		1										2				Side Drain Rt.
210+90		18				X	X	X	X		1.6				X	1.5				X	III		1										2				Cross Drain
211+65		18				X	X	X	X		1.6				X	1.5				X	III		1										2				Side Drain Lt.
212+95				16					X		1.6				X	1.5				X	IV		1														S.D. Appr. Lt.
215+50		16				X	X	X	X		1.6				X	1.5				X	III		1										2				Side Drain Rt.
218+74		18				X	X	X	X		1.6				X	1.5				X	III		1		1.0	5	7						2				Cross Drain
SHEET TOTAL	20	218	57	74	42																					211	355					2	29			
PROJ. TOTAL	20	344	186	146	64																					453	795					9	64			

NOTES

1. Plastic pipes shall require aprons or headwalls.
2. An increased thickness of pipe may be specified in place of the coating.
3. If more than one PIPE CULVERT SUMMARY sheet is required to list culverts, show a sheet total on each sheet and on the last sheet show a project total.
4. When safety aprons are required indicate in the "remarks" column for each culvert it applies to.
5. For details on bituminous or polymer coatings and other related details refer to ITD Design Manual.
6. Rubber gaskets are required when a culvert flows (0.75) full for more than one month per year.
7. The pipe culvert station reflects the midpoint of the culvert at the roadway centerline. The skew angle should be indicated in the "remarks" column.
8. The PIPE CULVERT SUMMARY title blocks at the sheet bottom shall be filled with the same format as the the GENERAL INFORMATION SHEET.
9. The text sizes given in red highlight are for a 17" x 11" sheet.

Drawing Number: List standard drawing number or structure drawing number.

Remarks Column: Indicate side drain (rt./lt.) or cross drain (w/skew angle), use of safety apron, if minor structure is required, and unique features of pipe culvert. Use abbreviations as needed, ie=0.05, wt=5, 11-130 (upper and lower case vertical). Use lower left bottom justification.

Sheet Fill In Text: ie=0.05, wt=1, 11-130 (upper and lower case vertical). Use center (ex) justification except for "Remarks" Column.

Sheet & Project Total See note No. 5, ie=0.35, wt=2, 11-130 (upper case vertical).

Fill In Text: Same as the rest of the sheet.

For Sheet Block Information See Figure C-25 (General Information Sheet)

Storage & Location Information To Accompany Disclaimer

ENGR'S. STAMP W/Signature Or Disclaimer

REVISIONS NO.	DATE	BY	DESCRIPTION

DESIGNED K. Bryant
DESIGN CHECKED K. Malone
DETAILED S. O'neal
DRAWING CHECKED G. Payton

SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME 4178pcal.dgn
DRAWING DATE: MAY, 2002

IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 1

PROJECT NO. STP-5121-(044)

PIPE CULVERT SUMMARY
THAMA TO WRENCO LOOP

English
COUNTY Bonner
KEY NUMBER 4178
SHEET 9 OF 62

Figure C-11
May 2004

STATION TO STATION	IRRIGATION PIPE (LENGTH IN FEET) PIPE SIZE (INCHES) 6"	12"	15"	18"	32"	54"				PLASTIC PIPE: CORRUGATED POLYETHYLENE (PE)	RIBBED POLYVINYL CHLORIDE (PVC)	SOLID WALL POLYVINYL CHLORIDE (PVC)	SIPHON TYPE METAL PIPE: STEEL ½in CORR. DEPTH	STEEL CORR. DEPTH	ALUM. ½in TO ½in CORR. DEPTH	ALUM. CORR. DEPTH	CONCRETE PIPE: REINFORCED CLASS	NON REINFORCED CLASS	TYPE OF BEDDING	FILL HEIGHT FT	MINOR STRUCTURES: DRAWING NUMBER	STRUCTURE EA.	CONCRETE CY	METAL REINF. lb	TIMBER MFBM	GRATES EA.	REMARKS
										X	X	X	THICKNESS (INCHES)				II-V		1,2,3								
196+83					66								0.64				V			3	D-5	2					1 Apron
196+55			14								X		0.64		0.60		III			8'-6"	D-5 & 26-3	2					Appr. Lt., 1 Apron
197+10			12										0.64		0.60		III			7'-6"	26-4	1					Appr. Lt.
197+20		12											0.64		0.60		IV			5'-6"	26-4	1					1-45° Elbow
199+15		15											0.64		0.60		III			11'-10"	D-5	1					1 Apron
197+05		3											0.64		0.60		IV			5'-0"	30-1	1					45° Skew Lt.
201+60		140											0.64		0.60		III				26-4	1					
203+90		12											0.64		0.60		III			15'-9"	30-1 & 30-2	1					
207+58		224											0.64		0.60						D-5 & 30-2	2					
207+58		224											0.64		0.60		III			7'-2"	31-1 & 32-2	2					
211+60		17											0.64		0.60		III			11'-2"	34-1	2					
211+60		17											0.64		0.60		III			14'-10"	31-1	2					
233+23													0.64		0.60		IV			6'-3"	32-1	1					Appr. Lt., 1 Apron
244+30	55												0.64		0.60		III			7'-6"	32-2 & 57-1 &	2					
245+90			43								X		0.64		0.60		III			18'-9"	37-3	1					
304+20		9									X		0.64		0.60		III			7'-0"	39-1	1					
308+50	244												0.64		0.60		III			12'-2"	39-1 & 39-2	2					Pressurized
316+00		9											0.64		0.60		III				46-1 & 46-2	2					
320+00													0.64		0.60					3'-3"	46-2	2					45° Skew Lt.
363+70		14									X		0.64		0.60		IV			20'-4"	53-1	2					
365+10													0.64		0.60		IV			8'-10"		2					Connect To Exist., Irr. Pipe
383+81													0.64		0.60		III			6'-3"	53-3	2					Connect To Conc., Lined Ditch
457+03													0.64		0.60		IV			7'-10"							1-120° Elbow Connect to Siphon
473+20													0.64		0.60		III			5'-3"							Connect To Conc. Lined Ditch Ends
SHEET TOTAL	299	662	696	314	66	67																					
PROJECT TOTAL	507	434	1819	958	175	67																				35	

Metal Reinforcement: Round to the nearest pound.

REMARKS: Remarks Column: Indicate pipe skew angle, use of minor str(s)., sheet No. (optional), and unique features of irrigation pipe. Use abbreviations as needed, ie-0.08, wt-1, ft-1.30 (upper and lower case vertical). Use lower left bottom justification.

Sheet Fill In Text: (ie-0.08, wt-1, ft-1.30 (Upper and lower case vertical). Use center justification except for "Remarks" column.

Sheet Project Total: See note No. 3. (ie-0.10, wt-2, ft-1.30, (upper case vertical).

Fill In Text: Same as the rest of the sheet.

NOTES

1. Plastic pipes require aprons, headwalls, or minor structures as end treatment.
2. If more than one IRRIGATION PIPE SUMMARY sheet is required to list pipes, show a sheet total on each sheet and on the last sheet show a project total.
3. The irrigation pipe station reflects the midpoint of the pipe at the roadway centerline. The skew angle should be indicated in the "remarks" column.
4. The IRRIGATION PIPE SUMMARY title blocks at the sheet bottom shall be filled in the same format as the the GENERAL INFORMATION SHEET.
5. The text sizes given in red highlight are for a 11" x 17" sheet.

For Sheet Block Information See Figure C-25 (General Information Sheet)

Storage & Location Information To Accompany Disclaimer

ENGR'S. STAMP W/Signature Or Disclaimer

REVISIONS NO.	DATE	BY	DESCRIPTION

DESIGNED C. Block
DESIGN CHECKED G. Briggs
DETAILED W. Nelson
DRAWING CHECKED G. Sraight

SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME 417Bpsl.dgn
DRAWING DATE: MAY, 2004

IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 2

PROJECT NO. STP-5121-(044)

IRRIGATION PIPE SUMMARY
THAMA TO WRENCO LOOP

English
COUNTY Bonner
KEY NUMBER 4178
SHEET 14 OF 62

Figure C-12
June, 2004

STATION TO STATION	SEWER PIPE (LENGTH IN FEET) PIPE SIZE (INCHES) 12"	15"	18"	36"	PLASTIC PIPE: CORRUGATED POLYETHYLENE (PE)	RIBBED POLYVINYL CHLORIDE (PVC)	SOLID WALL POLYVINYL CHLORIDE (PVC)	ABS COMPOSITE	SIPHON TYPE METAL PIPE: STEEL ½IN CORR. DEPTH	STEEL ---- CORR. DEPTH	ALUM. ½IN TO ½IN CORR. DEPTH	ALUM. ---- CORR. DEPTH	BITUMINOUS OR POLYMER COATING	CONCRETE PIPE: REINFORCED CLASS	NON-REINFORCED CLASS	TYPE OF BEDDING	MAN-HOLES TYPE A	MAN-HOLES TYPE B	CATCH BASINS TYPE ----	CATCH BASINS TYPE ----	CATCH BASINS TYPE ----	INLETS TYPE ----	INLETS TYPE ----	INLETS TYPE ----	REMARKS
					X	X	X	X	THICKNESS (INCHES)				X	II-V	X	1,2,3	EA.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	Remarks Column: Indicate manhole(s) required, and unique features of sewer pipe. Use abbreviations as needed. (x=0.08, w=1, ℓ=130 (upper and lower case, vertical). Use lower left bottom justification.
172-19	14								1.6		1.5			IV		1						1			Inlet Req'd. Lt.
172-50	3							X	1.6		1.5			IV		1						1			Inlet Req'd. Rt.
29-28				125					1.6		1.5			III		2	1								Manhole Req'd. Rt.
25-99				25					1.6		1.5			III		1									
24+61				9		X		X	1.6		1.5				X	1									
173-47								X	1.6		1.5			III		1									
174-77						X			1.6		1.5			IV		1						1			Inlet Req'd. Rt.
																									Manhole Req'd. Rt.
175-00	8								1.6		1.5			IV		1						1			Inlet Req'd. Lt.
175-08	17								1.6		1.5			IV		1						1			Inlet Req'd. Lt.
176-60		97				X		X	1.6		1.5			III		1									
		97							1.6		1.5			III		2	1								Manhole Req'd. Rt.
																									Manhole Req'd. Lt.
83-85	9								1.6		1.5			IV		1		1				1			Inlet Req'd. Rt.
182+45	10					X		X	1.6		1.5			III		1									
181+94	14								1.6		1.5														
														IV		1						1			Inlet Req'd. Rt.
182-30	11								1.6		1.5			IV		1		1				1			Manhole Req'd. Rt.
85-81	92								1.6		1.5			IV		1		1							Inlet Req'd. Rt.
																									Manhole Req'd. Lt.
87+04	18								1.6		1.5			IV		1		1				1			Inlet Req'd. Lt.
87+65	21																					1			Inlet Req'd. Rt.
SHEET TOTAL	217	194	94	288													2	4				10			
PROJECT TOTAL	1255	398	94	443													5	9				17			

NOTES

1. An increased thickness of pipe may be specified in place of the coating.
2. If more than SEWER PIPE SUMMARY sheet is required to list pipes, show a sheet total on each sheet and on the last sheet show a project total.
3. The sewer pipe station reflects perpendicular line from the roadway centerline to the midpoint of the pipe.
4. The SEWER PIPE SUMMARY title blocks at the sheet bottom shall be filled in the same format as the the GENERAL INFORMATION SHEET.
5. For details on bituminous or polymer coatings and other related details refer to ITD Design Manual.
6. The text sizes given in red highlight are for a 17" x 11" sheet.

Sheet & Project Total: See note No. 2. (x=0.10, w=2, ℓ=130, (upper case vertical).

Fill in Text: Same as the rest of the sheet.

Fill in Text: (x=0.08, w=1, ℓ=130 (upper and lower case vertical). Use center — text justification except for "Remarks" column.

For Sheet Block Information See Figure C-25 (General Information Sheet)

Storage & Location Information To Accompany Disclaimer

ENGR'S. STAMP W/Signature Or Disclaimer

REVISIONS NO.	DATE	BY	DESCRIPTION

DESIGNED A. Christi
DESIGN CHECKED L. M. Alcott
DETAILED E. A. Poe
DRAWING CHECKED R. D. Thoreau

SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME 4178sps1.dgn
DRAWING DATE: MAY, 2002

IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 1

PROJECT NO. STP-5121-(044)

SEWER PIPE SUMMARY
THAMA TO WRENCO LOOP

English
COUNTY Bonner
KEY NUMBER 4178
SHEET 21 OF 62

Figure C-13
December, 2006

GASKETED JOINTS REQUIRED

STATION	PIPE SIPHONS (LENGTH IN FEET) PIPE SIZE (INCHES) 12"	15"	24"	PVC PIPE CLASS PS 46 PVC	PVC PIPE RIBBED PVC	SIPHON TYPE METAL PIPE STEEL ¼ IN CORR. DEPTH (THICKNESS (INCHES))	STEEL 1 IN CORR. DEPTH (THICKNESS (INCHES))	ALUM. ¼ IN TO ½ IN CORR. DEPTH (THICKNESS (INCHES))	CONCRETE PIPE REINFORCED CLASS (II-V)	CONCRETE PIPE TYPE OF BEDDING (1,2,3)	STRUCTURE EXC. CY	COMP. BACKFILL CY	MINOR STRUCTURES DRAWING NO.	STRUCTURE EA.	CONCRETE CY	MET. REINF. lb	TIMBER MFBM	GRATES EA.	REMARKS
108+10			80	X	X	1.6		1.5	V	1	182	156	D-10	3.4	50			2	30° Skew, 2 Hdwls. Req'd.
115+05			80	X	X	1.6		1.5	V	1	182	156	D-10	3.4	50			2	63° Skew, 2 Hdwls. Req'd.
155+30			54	X	X	1.6		1.5	V	1	126	108	D-10	1.7	25			1	5° Skew, 1 Hdwl. Req'd., Str. Dwg. NO. 14-3
155+85			68	X	X	1.6		1.5	V	1	154	132	D-10	1.7	25			1	1 Hdwl. Req'd., Str. Dwg. NO. 21-1
156+15			68	X	X	1.6		1.5	V	1	154	132	D-10	1.7	25			1	Connect To Exist. Str., 1 Hdwl. Req'd.
170+15			60	X	X	1.6		1.5	V	1	137	117							15° Skew, Str. Dwgs. NO. 22-1 & NO. 22-2
172+95			52	X	X	1.6		1.5	V	1	119	102							Str. Dwgs. NO. 25-1 & NO. 26-1
237+25			68	X	X	1.6		1.5	V	1	154	132	D-10	1.7	25			1	1 Hdwl. Req'd., Str. Dwg. NO. 37-3
																			55° Skew, Str. Dwg. NO. 39-1, Conn.To Exist. siphon,
243+50			128						V	1	294	252							1 Reducer
276+90			70						V	1	161	138	D-10	1.7	25			1	1 Hdwl. Req'd., Str. Dwg. NO. 43-3
280+20			80	X	X	1.6		1.5	V	1	182	156	D-10	1.7	25			1	35° Skew, 1 Hdwl. Req'd., Str. Dwg. NO. 44-1
304+50			76	X	X	1.6		1.5	V	1	175	150	D-10	3.4	50			2	2 Hdwls. Req'd.
																			30° Skew, Str. Dwg. NO. 47-1, Conn. To Exist. Siphon,
333+80			70						V	1	161	138							1 Reducer
347+60			68	X	X	1.6		1.5	V	1	158	135							10° Skew, Str. Dwg. NO. 49-1, Conn. To Exist. Siphon,
																			1 Reducer
356+80	80								V	1	104	96							30° Skew, Connect To Exist. Siphon
357+20		86							V	1	140	122							35° Skew, Connect To Exist. Siphon
364+45			76	X	X	1.6		1.5	V	1	193	165							60° Skew, Str. Dwgs. NO. 63-1 & NO. 53-1
385+40			134	X	X	1.6		1.5	V	1	308	264						1	60° Skew, Str. Dwgs. NO. 65-1 & NO. 53-3
387+25			66	X	X	1.6		1.5	V	1	151	129						1	Str. Dwgs. NO. 65-1 & NO. 54-1
410+20			100						V	1	231	198	D-10	1.7	25				15° Skew, Connect To Exist. Siphon,
461+75			140	X	X	1.6		1.5	V	1	221	189							1 Hdwl. & 1 Reducer Req'd.
																			65° Skew, Str. Dwgs. NO. 72-2 & NO. 75-2
SHEET TOTAL	80	86	1470								3697	4167		22.1	325			14	
PROJECT TOTAL	380	560	6090								264252	4354		45.2	574			35	

Sheet Fill In Text: tx=0.08, wt=1, ft=130 (upper and lower case vertical). Use center text justification except for "Remarks" column.

Drawing Number: List standard drawing number or structure drawing number.

Metal Reinforcement: Round to the nearest pound.

Remarks Column: Indicate pipe skew angle, use of headwall(s), sheet No. (optional), and unique features of pipe siphon. Use abbreviations as needed, tx=0.08, wt=1, ft=130 (upper and lower case vertical). Use lower left bottom justification.

Sheet & Project Total: See note No. 3, tx=0.08, wt=1, ft=130, (upper case vertical).

Fill In Text: Same as the rest of the sheet.

NOTES

1. An increased thickness of pipe may be specified in place of the coating.
2. For details on bituminous or polymer coatings and other related details refer to ITD Design Manual.
3. If more than (1) PIPE SIPHON SUMMARY sheet is required to list pipes, show a sheet total on each sheet and on the last sheet show a project total.
4. The pipe siphon station reflects the midpoint of the pipe at the roadway centerline. The skew angle should be indicated in the "remarks" column.
5. The PIPE SIPHON SUMMARY title blocks at the sheet bottom shall be filled with the same format as the the GENERAL INFORMATION SHEET.

For Sheet Block Information See Figure C-25 (General Information Sheet)

Storage & Location Information To Accompany Disclaimer

ENGR'S. STAMP W/Signature Or Disclaimer

REVISIONS			
NO.	DATE	BY	DESCRIPTION

DESIGNED W. Goldberg
DESIGN CHECKED H. Pfister
DETAILED H. Ford
DRAWING CHECKED J. Roberts
SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME 4178psel.dgn
DRAWING DATE: MAY, 2002

IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 1

PROJECT NO. STP-5121-(044)

PIPE SIPHON SUMMARY
THAMA TO WRENCO LOOP

English
COUNTY Bonner
KEY NUMBER 4178
SHEET 13 OF 62

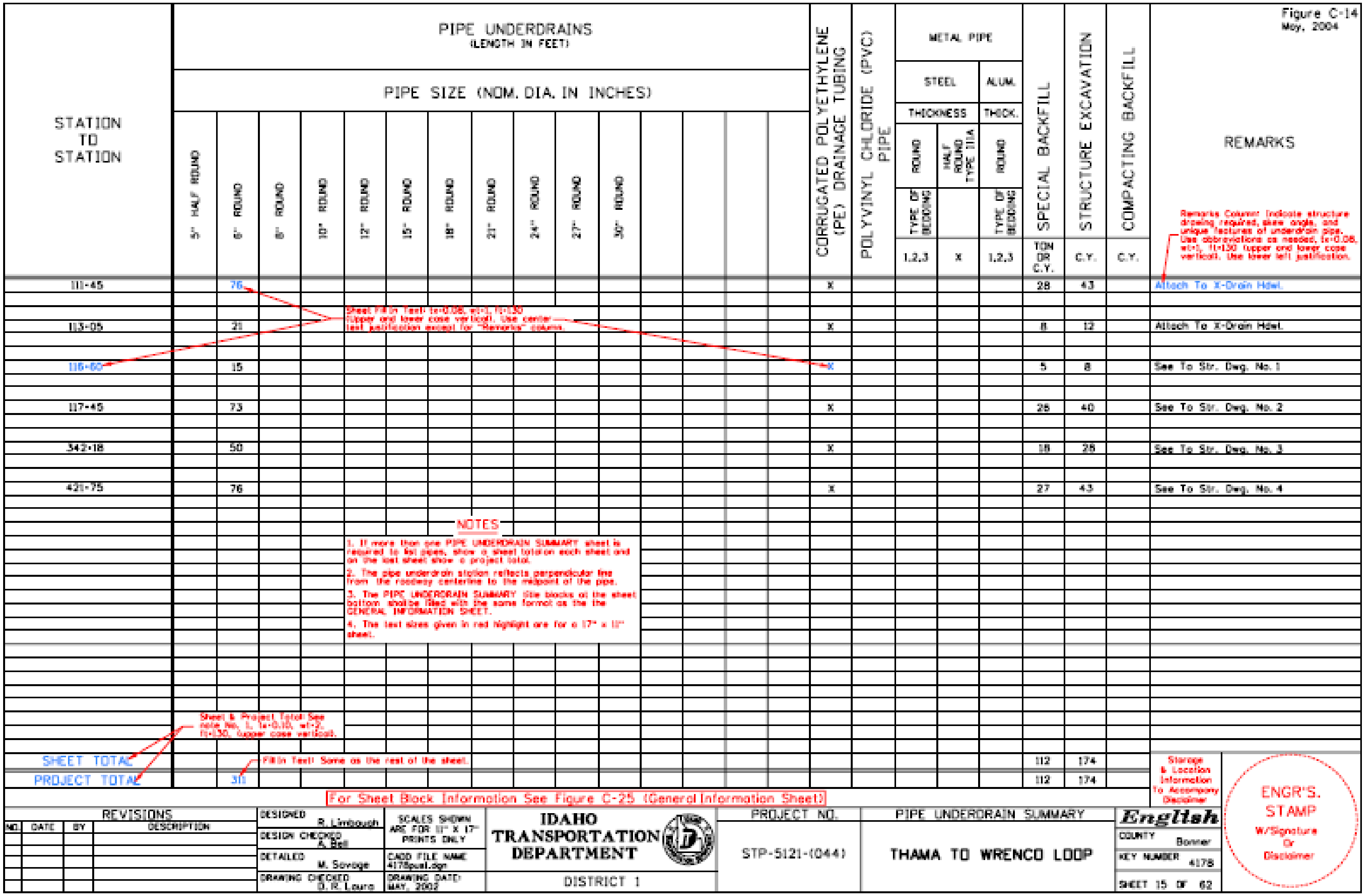
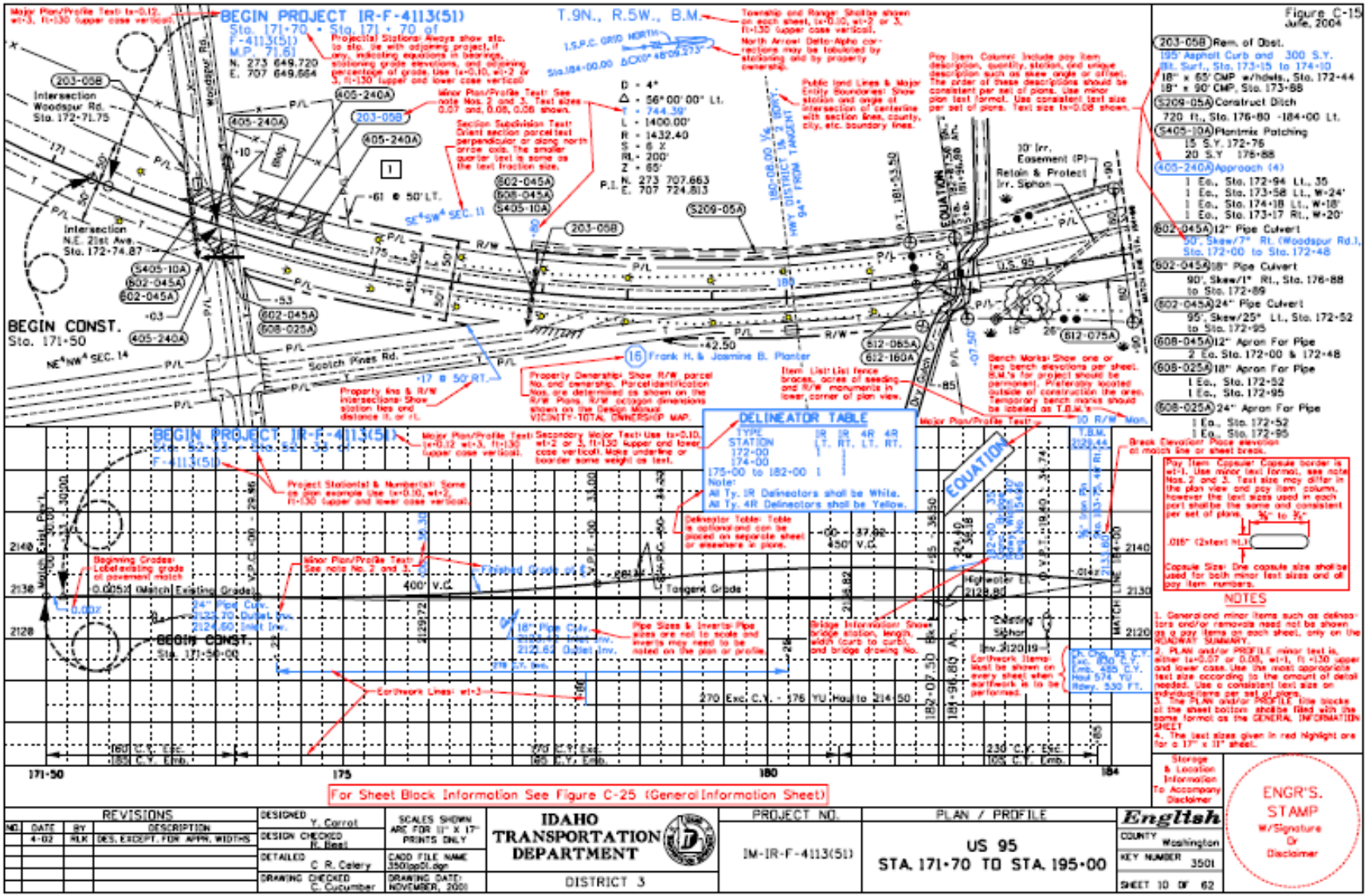


Figure C-14
May, 2004
STATION TO STATION
PIPE UNDERDRAINS (LENGTH IN FEET)
PIPE SIZE (NOM. DIA. IN INCHES)
5" HALF ROUND
6" ROUND
8" ROUND
10" ROUND
12" ROUND
15" ROUND
18" ROUND
21" ROUND
24" ROUND
27" ROUND
30" ROUND
CORRUGATED POLYETHYLENE (PE) DRAINAGE TUBING
POLYVINYL CHLORIDE (PVC) PIPE
METAL PIPE
STEEL
ALUM.
THICKNESS
THICK.
ROUND
HALF ROUND TYPE IIIA
ROUND
TYPE OF BEDDING
TYPE OF BEDDING
1,2,3
X
1,2,3
SPECIAL BACKFILL
TON OR C.Y.
STRUCTURE EXCAVATION
C.Y.
COMPACTING BACKFILL
C.Y.
REMARKS
Remarks Column: Indicate structure drawing required, skew angle, and unique features of underdrain pipe. Use abbreviations as needed, tx=0.08, wt=1, ft=130 (upper and lower case vertical). Use lower left justification.
111+45 76 X 28 43 Attach To X-Drain Hdwl.
Sheet Fill-In Text: tx=0.08, wt=1, ft=130 (Upper and lower case vertical). Use center text justification except for "Remarks" column.
113+05 21 X 8 12 Attach To X-Drain Hdwl.
116+60 15 X 5 8 See To Str. Dwg. No. 1
117+45 73 X 26 40 See To Str. Dwg. No. 2
342+18 50 X 18 28 See To Str. Dwg. No. 3
421+75 76 X 27 43 See To Str. Dwg. No. 4
NOTES
1. If more than one PIPE UNDERDRAIN SUMMARY sheet is required to list pipes, show a sheet total on each sheet and on the last sheet show a project total.
2. The pipe underdrain station reflects perpendicular line from the roadway centerline to the midpoint of the pipe.
3. The PIPE UNDERDRAIN SUMMARY title blocks at the sheet bottom shall be filled with the same format as the the GENERAL INFORMATION SHEET.
4. The text sizes given in red highlight are for a 17" x 11" sheet.
Sheet & Project Total: See note No. 1, tx=0.10, wt=2, ft=130, (upper case vertical).
SHEET TOTAL 112 174
PROJECT TOTAL 311 112 174
Fill-In Text: Same as the rest of the sheet.
For Sheet Block Information See Figure C-25 (General Information Sheet)
REVISIONS
NO. DATE BY DESCRIPTION
DESIGNED R. Limbaugh
DESIGN CHECKED A. Bell
DETAILED M. Savage
DRAWING CHECKED D. R. Laura
SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME 4178pual.dgn
DRAWING DATE: MAY, 2002
IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 1
PROJECT NO.
STP-5121-(044)
PIPE UNDERDRAIN SUMMARY
THAMA TO WRENCO LOOP
English
COUNTY Bonner
KEY NUMBER 4178
SHEET 15 OF 62
Storage & Location Information To Accompany Disclaimer
ENGR'S. STAMP
W/Signature Or Disclaimer


BEGIN PROJECT IR-F-4113(51)
Sta. 171+70 • Sta. 171 + 70 of
F-4113(51)
M.P. 71.61
N. 273 649.720
E. 707 649.664
T.9N., R.5W., B.M.
BEGIN CONST.
Sta. 171+50
Intersection Woodspur Rd. Sta. 172+71.75
Intersection N.E. 21st Ave. Sta. 172+74.87
Scotch Pines Rd.
Woodspur Rd.
U.S. 95
EQUATION
Frank H. & Joanne B. Planter
DELINEATOR TABLE
TYPE IR IR 4R 4R
STATION Lt. Rt. Lt. Rt.
172+00
174+00
175+00 to 182+00 1
Note:
All Ty. IR Delineators shall be White.
All Ty. 4R Delineators shall be Yellow.
Figure C-15
July, 2004
203-05B Rem. of Obst.
195' Asphalt Curb and 300 S.Y. Rt. Surf., Sta. 173+15 to 174+10
18" x 65' CMP w/hdwls., Sta. 172+44
18" x 90' CMP, Sta. 173+88
S209-05A Construct Ditch
720 ft., Sta. 176+80 -184+00 Lt.
S405-10A Plantmix Patching
15 S.Y. 172+76
20 S.Y. 178+88
405-240A Approach (4)
1 Ea., Sta. 172+94 Lt., 35
1 Ea., Sta. 173+58 Lt., W=24'
1 Ea., Sta. 174+18 Lt., W=18'
1 Ea., Sta. 173+17 Rt., W=20'
602-045A 12" Pipe Culvert
50', Skew/7° Rt. (Woodspur Rd.), Sta. 172+00 to Sta. 172+48
602-045A 18" Pipe Culvert
90', Skew/1° Rt., Sta. 176+88 to Sta. 172+89
602-045A 24" Pipe Culvert
95', Skew/25° Lt., Sta. 172+52 to Sta. 172+95
608-045A 12" Apron For Pipe
2 Ea. Sta. 172+00 & 172+48
608-025A 18" Apron For Pipe
1 Ea., Sta. 172+52
1 Ea., Sta. 172+95
608-025A 24" Apron For Pipe
1 Ea., Sta. 172+52
1 Ea., Sta. 172+95
NOTES
1. General and minor items such as delineators and/or removals need not be shown as a pay items on each sheet, only on the ROADWAY SUMMARY.
2. PLAN and/or PROFILE minor text is, either ht=0.07 or 0.08, wt=1, fi =130 upper and lower case. Use the most appropriate text size according to the amount of detail needed. Use a consistent text size on individual items per set of plans.
3. The PLAN and/or PROFILE title blocks at the sheet bottom shall be filled with the same format as the GENERAL INFORMATION SHEET.
4. The text sizes given in red highlight are for a 17" x 11" sheet.
For Sheet Block Information See Figure C-25 (General Information Sheet)
REVISIONS
NO. DATE BY DESCRIPTION
4-02 RLK DES. EXCEPT. FOR APPN. WIDTHS
DESIGNED Y. Carrot
DESIGN CHECKED R. Best
DETAILED C. R. Celery
DRAWING CHECKED C. Cucumber
SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME 350lap01.dgn
DRAWING DATE: NOVEMBER, 2001
IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 3
PROJECT NO.
IM-IR-F-4113(51)
PLAN / PROFILE
US 95
STA. 171+70 TO STA. 195+00
English
COUNTY Washington
KEY NUMBER 3501
SHEET 10 OF 62
Storage & Location Information To Accompany Disclaimer
ENGR'S. STAMP W/Signature Or Disclaimer

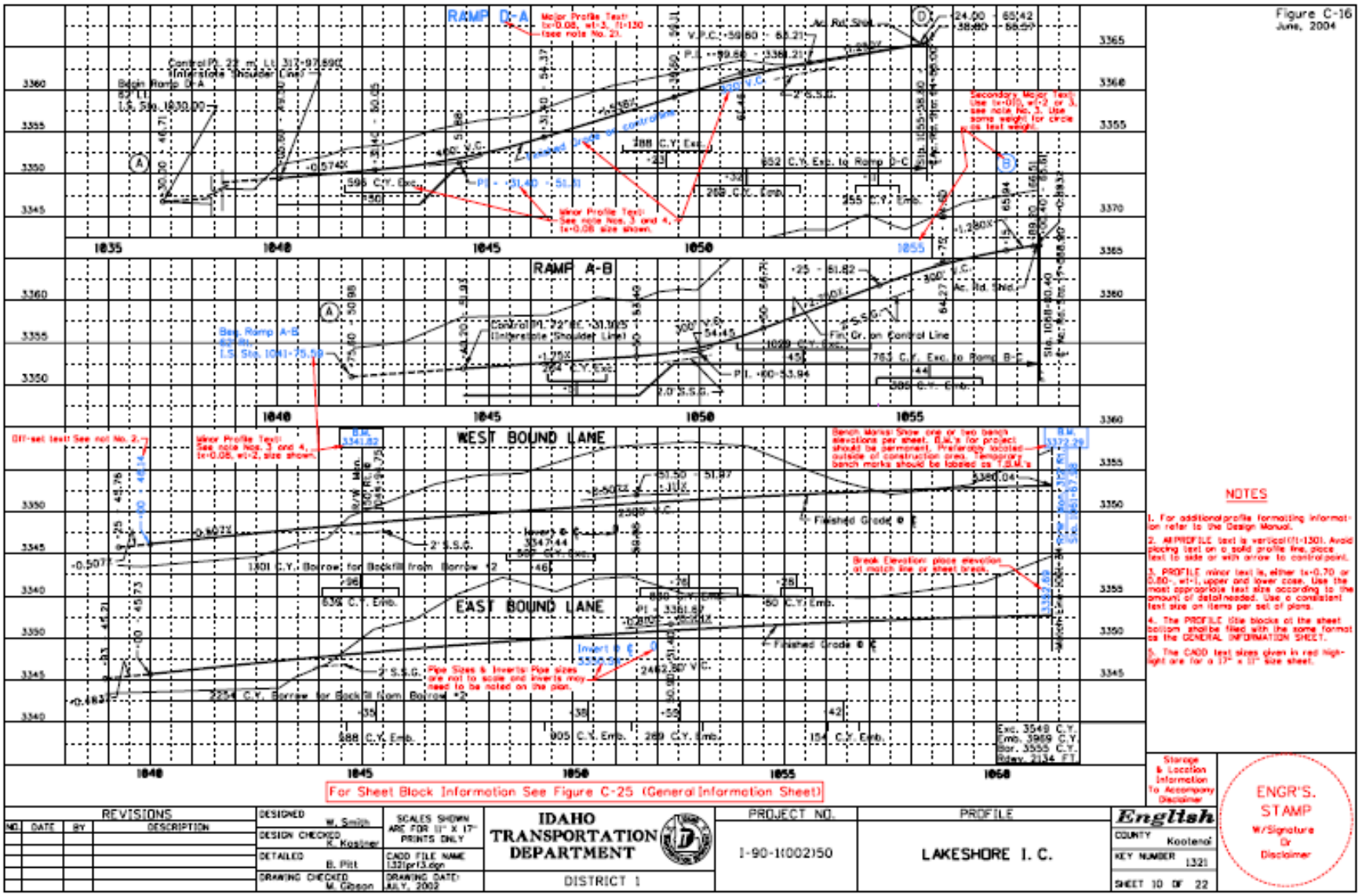


Figure C-16
June, 2004
RAMP D-A
RAMP A-B
WEST BOUND LANE
EAST BOUND LANE
NOTES
1. For additional profile formatting information refer to the Design Manual.
2. All PROFILE text is vertical (1:1301). Avoid placing text on a solid profile line, place text to side or with arrow to control point.
3. PROFILE minor text is, either 1x=0.70 or 0.80, wt=1, upper and lower case. Use the most appropriate text size according to the amount of detail needed. Use a consistent text size on items per set of plans.
4. The PROFILE title blocks at the sheet bottom shall be filled with the same format as the GENERAL INFORMATION SHEET.
5. The CADD text sizes given in red highlight are for a 17" x 11" size sheet.
For Sheet Block Information See Figure C-25 (General Information Sheet)
REVISIONS
NO. DATE BY DESCRIPTION
DESIGNED W. Smith
DESIGN CHECKED R. Kastner
DETAILED B. Pitt
DRAWING CHECKED M. Gibson
SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME 1321pr13.dgn
DRAWING DATE: JULY, 2002
IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 1
PROJECT NO.
I-90-1(102)150
PROFILE
LAKESHORE I. C.
English
COUNTY Kootenai
KEY NUMBER 1321
SHEET 10 OF 22
Storage & Location Information To Accompany Disclaimer
ENGR'S. STAMP W/Signature Or Disclaimer

Figure C-17a
May, 2007

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	TITLE
2-6	VICINITY / TOTAL OWNERSHIP
7-48	RIGHT OF WAY PLAN AND PROFILE
49-61	COUNTY ROAD PLAN AND PROFILE
62-104	APPROACH PLAN AND PROFILE

IDAHO

TRANSPORTATION DEPARTMENT

PLAN AND PROFILE OF PROPOSED

Project Name

US 95 TOP OF LEWISON HILL TO GENESEE

Highway No. FEDERAL AID PROJECT NO. NH-EXAMPLE

Project No.

Key No. **KEY NO. 1234**

NEZ PERCE AND LATAH COUNTIES

JANUARY 2005

SCALES IN FEET

HORIZONTAL 0 FEET

VERTICAL 0 FEET

NH-EXAMPLE

US 95 TOP OF LEWISTON HILL TO GENESEE

Project Name

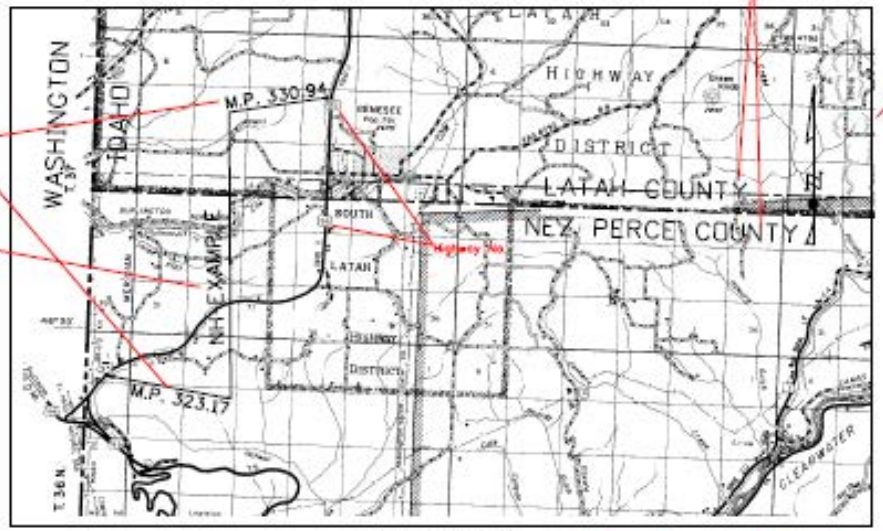
M.P. 323.17- M.P. 330.94

SEGMENT CODE 000540

Begin & End Mileposts

Segment Code

County Name



Vicinity Map with North Arrow

Begin & End Mileposts

Project No.

Highway No.

DESIGN DESIGNATION	
ADT (2005)	5790
ADT (2025)	8070
DHV (1999)	590
DHV (2025)	910
D	60/40
V	60 MPH
TRUCKS:	
ADT (2005)	1130
ADT (2025)	1770
DHV (1999)	70
DHV (2025)	140

Plan and/or profile minor text is either 1x=0.70, or 0.80, wt=1, Fi=130 upper and lower case. Use the most appropriate text size according to the amount of detail needed. Use a consistent text size on individual items per set of drawings.

RIGHT-OF-WAY PLANS

VICINITY MAP SCALE

1 ½ 0 1 2

MILES

Project No. Highway No. Project Name Key No.

POPULATIONS: 2000 U.S. CENSUS

REVISIONS			
NO.	DATE	BY	DESCRIPTION

THE DIMENSIONS SHOWN ON THE PLANS SHALL BE ATTAINED WITHIN LIMITS OF PRECISION THAT GOOD CONSTRUCTION PRACTICES WILL PERMIT

SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY

CADD FILE NAME

DRAWING DATE

IDAHO TRANSPORTATION DEPARTMENT

PROJECT NO.	TITLE SHEET	
NH-EXAMPLE	US 95 TOP OF LEWISTON HILL TO GENESEE	English COUNTY NEZ PERCE/LATAH KEY NUMBER 1234 SHEET 1 OF 104

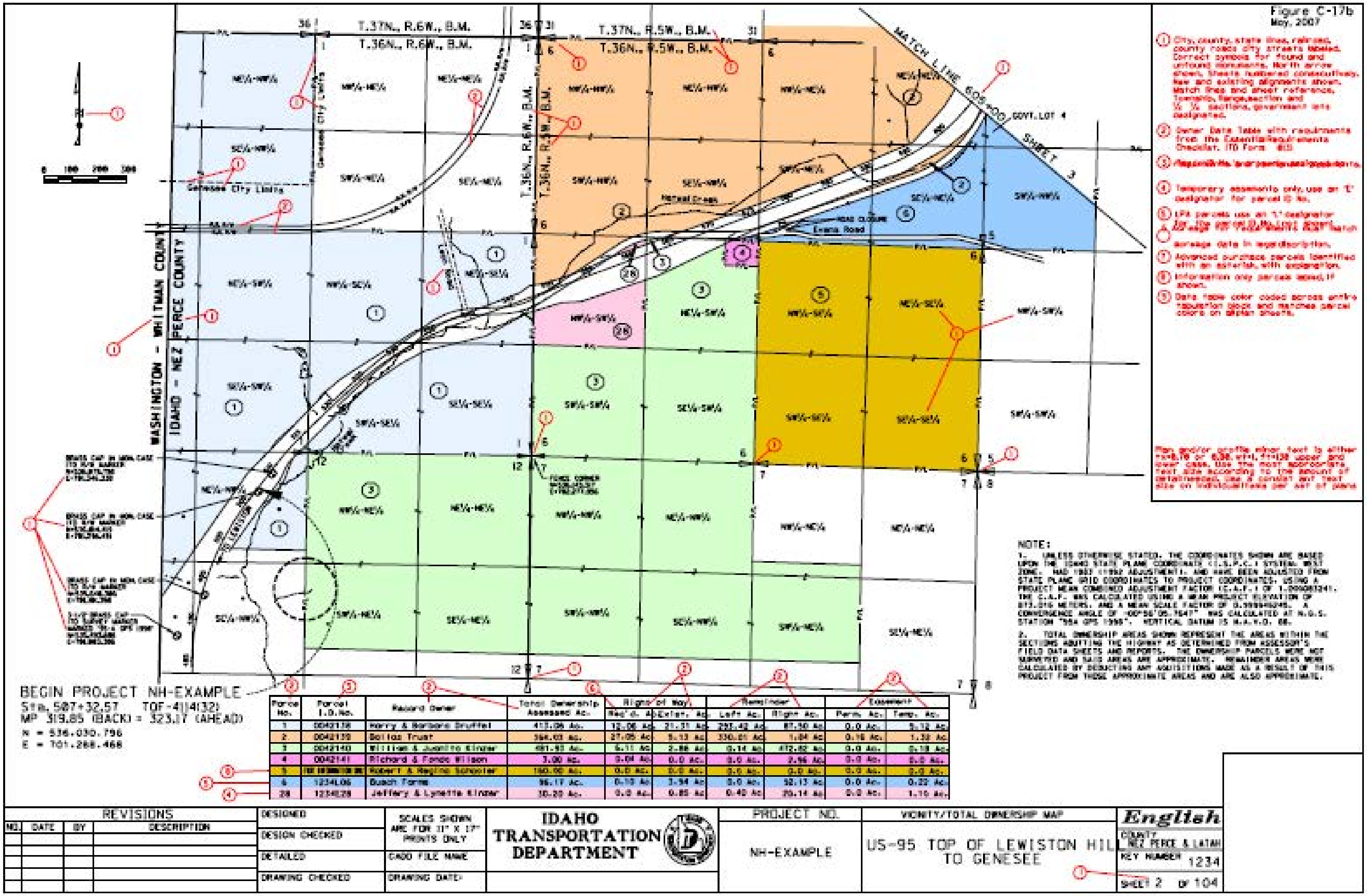
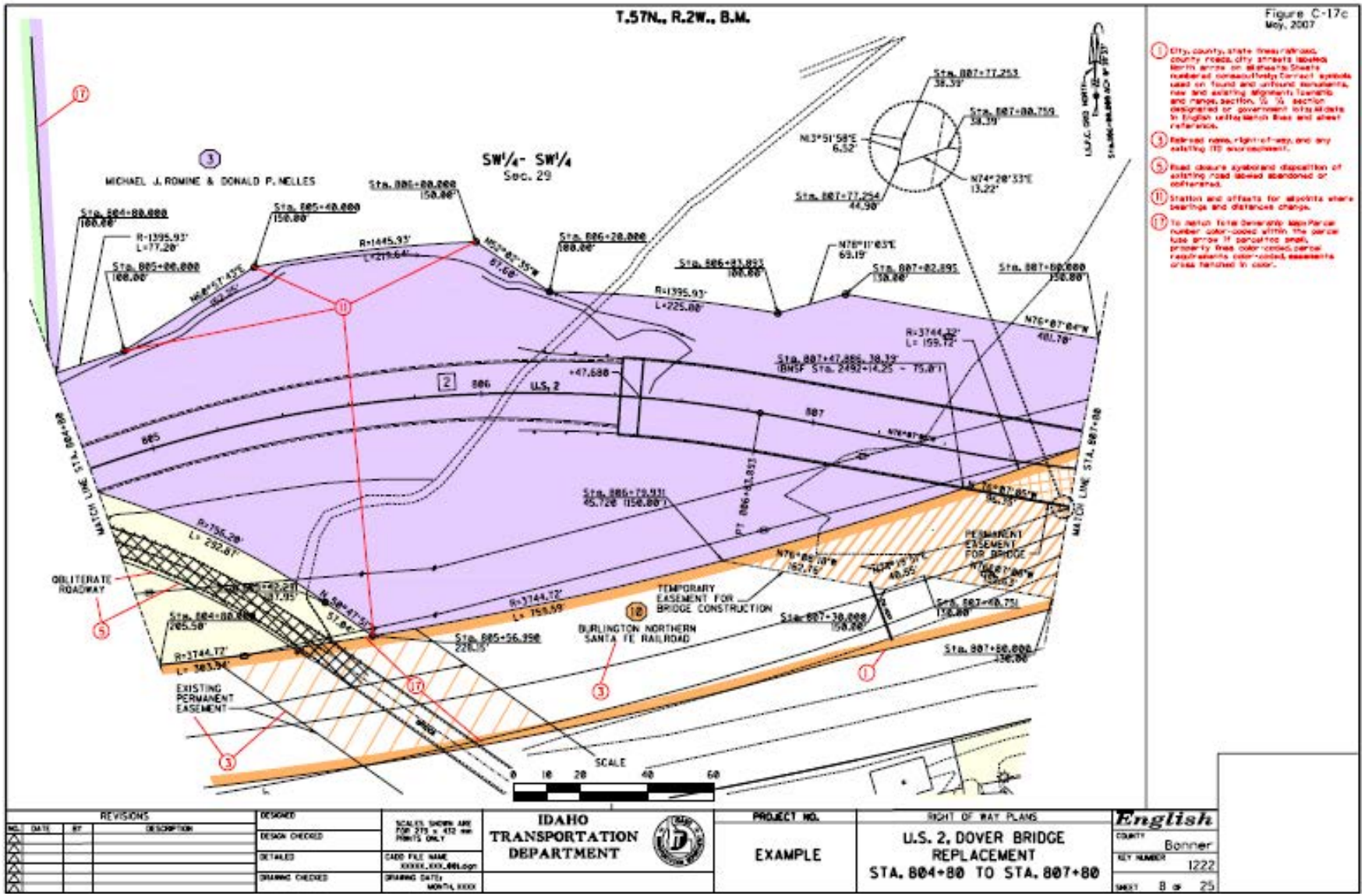


Figure C-17b
May, 2007
T.37N., R.6W., B.M.
T.36N., R.6W., B.M.
T.37N., R.5W., B.M.
T.36N., R.5W., B.M.
MATCH LINE 606+00 SHEET 3
WASHINGTON - WHITMAN COUNTY
IDAHO - NEZ PERCE COUNTY
Genesee City Limits
Evans Road
BEGIN PROJECT NH-EXAMPLE
Sta. 507+32.57 TOF-4114(32)
MP 319.85 (BACK) = 323.17 (AHEAD)
N = 536,030.796
E = 701,288.468
NOTE:
Parcel No.
Parcel I.D.No.
Record Owner
Total Ownership Assessed Ac.
Right of Way
Remainder
Easement
REVISIONS
NO. DATE BY DESCRIPTION
DESIGNED
DESIGN CHECKED
DETAILED
DRAWING CHECKED
SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME
DRAWING DATE
IDAHO TRANSPORTATION DEPARTMENT
PROJECT NO.
NH-EXAMPLE
VICINITY/TOTAL OWNERSHIP MAP
US-95 TOP OF LEWISTON HILL TO GENESEE
English
COUNTY NEZ PERCE & LATAH
KEY NUMBER 1234
SHEET 2 OF 104


T.57N., R.2W., B.M.
Figure C-17c
May, 2007
SW¼- SW¼
Sec. 29
MICHAEL J. ROMINE & DONALD P. NELLES
U.S. 2
BURLINGTON NORTHERN SANTA FE RAILROAD
TEMPORARY EASEMENT FOR BRIDGE CONSTRUCTION
PERMANENT EASEMENT FOR BRIDGE
OBLITERATE ROADWAY
EXISTING PERMANENT EASEMENT
SCALE
0 10 20 40 60
REVISIONS
NO. DATE BY DESCRIPTION
DESIGNED
DESIGN CHECKED
DETAILED
DRAWING CHECKED
IDAHO TRANSPORTATION DEPARTMENT
PROJECT NO.
EXAMPLE
RIGHT OF WAY PLANS
U.S. 2, DOVER BRIDGE REPLACEMENT
STA. 804+80 TO STA. 807+80
English
COUNTY Bonner
KEY NUMBER 1222
SHEET 8 OF 25

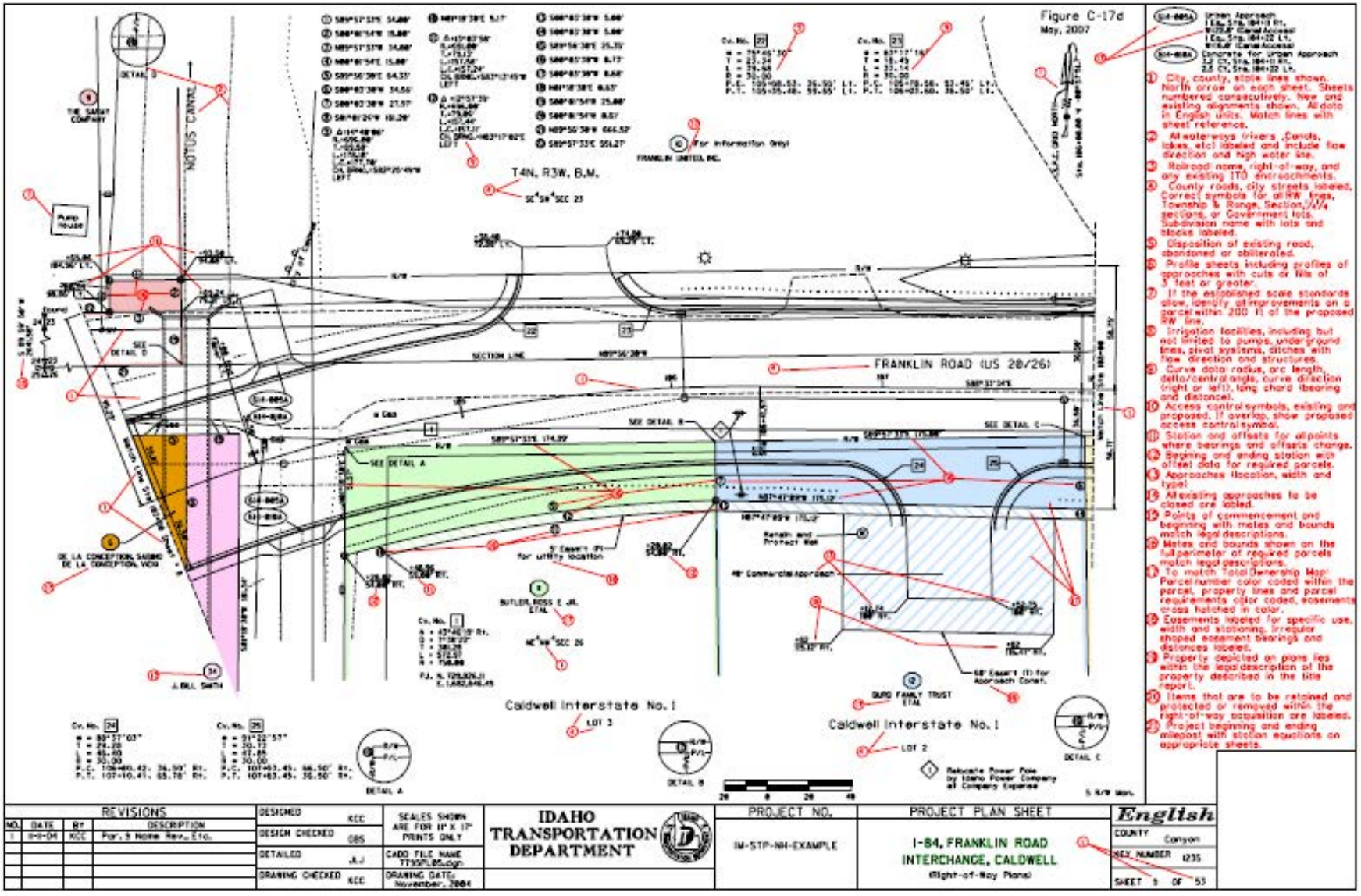


Figure C-17d
May, 2007
FRANKLIN ROAD (US 20/26)
NOTUS CANAL
T4N, R3W, B.M.
Caldwell Interstate No. 1
LOT 3
Caldwell Interstate No. 1
LOT 2
IDAHO TRANSPORTATION DEPARTMENT
REVISIONS
DESIGNED KCC
DESIGN CHECKED GBS
DETAILED JLJ
DRAWING CHECKED KCC
SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME T7305P1.85.dgn
DRAWING DATE: November, 2004
PROJECT NO. IM-STP-NH-EXAMPLE
PROJECT PLAN SHEET
I-84, FRANKLIN ROAD INTERCHANGE, CALDWELL
(Right-of-Way Plans)
English
COUNTY Canyon
KEY NUMBER 1235
SHEET 3 OF 53

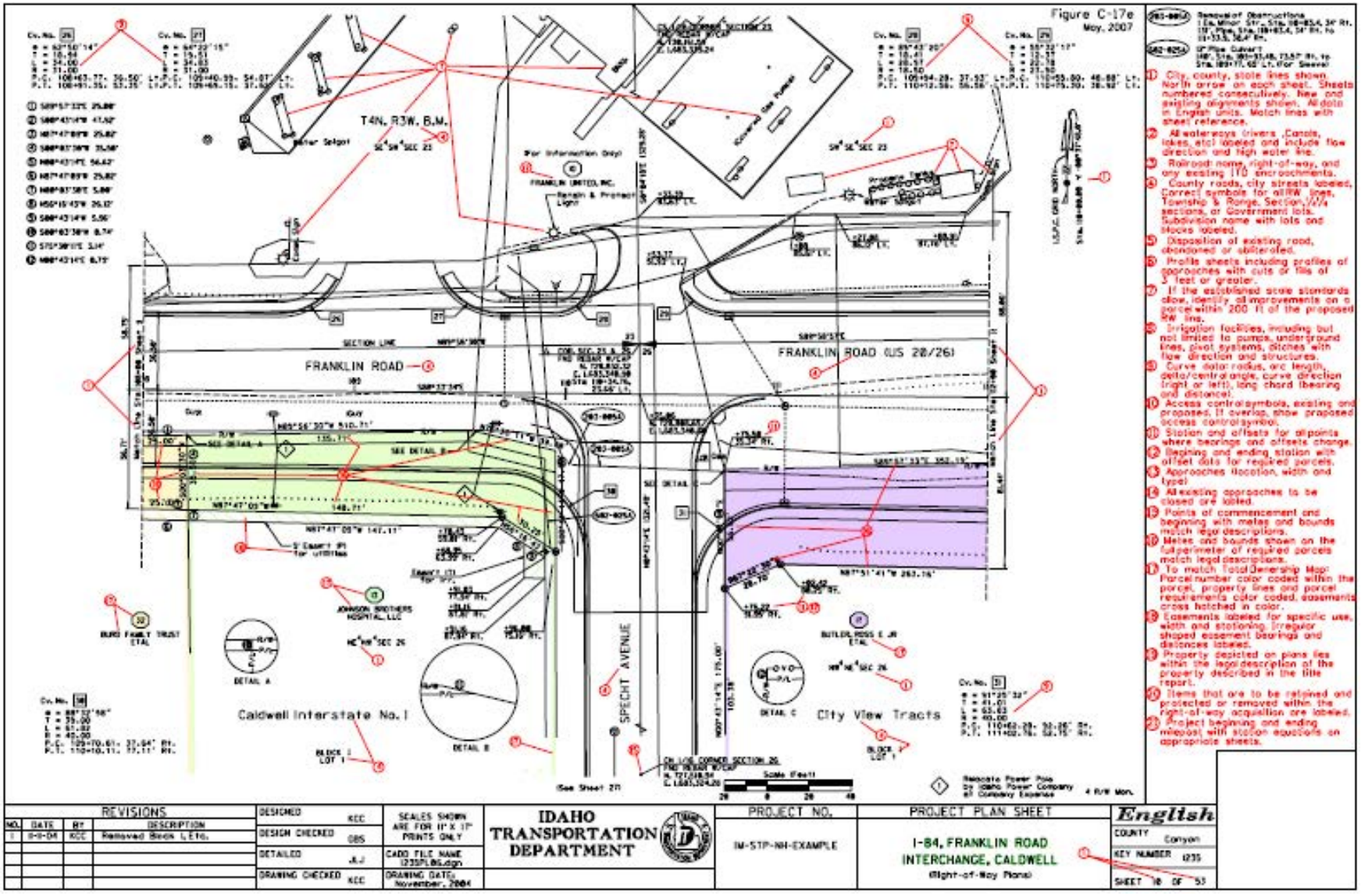


Figure C-17e
May, 2007
T4N, R3W, B.M.
FRANKLIN ROAD
FRANKLIN ROAD (US 20/26)
SPECHT AVENUE
Caldwell Interstate No. 1
City View Tracts
DETAIL A
DETAIL B
DETAIL C
REVISIONS
IDAHO TRANSPORTATION DEPARTMENT
PROJECT NO.
IM-STP-NH-EXAMPLE
PROJECT PLAN SHEET
I-84, FRANKLIN ROAD INTERCHANGE, CALDWELL
(Right-of-Way Plans)
English
COUNTY Canyon
KEY NUMBER 1235
SHEET 18 OF 53

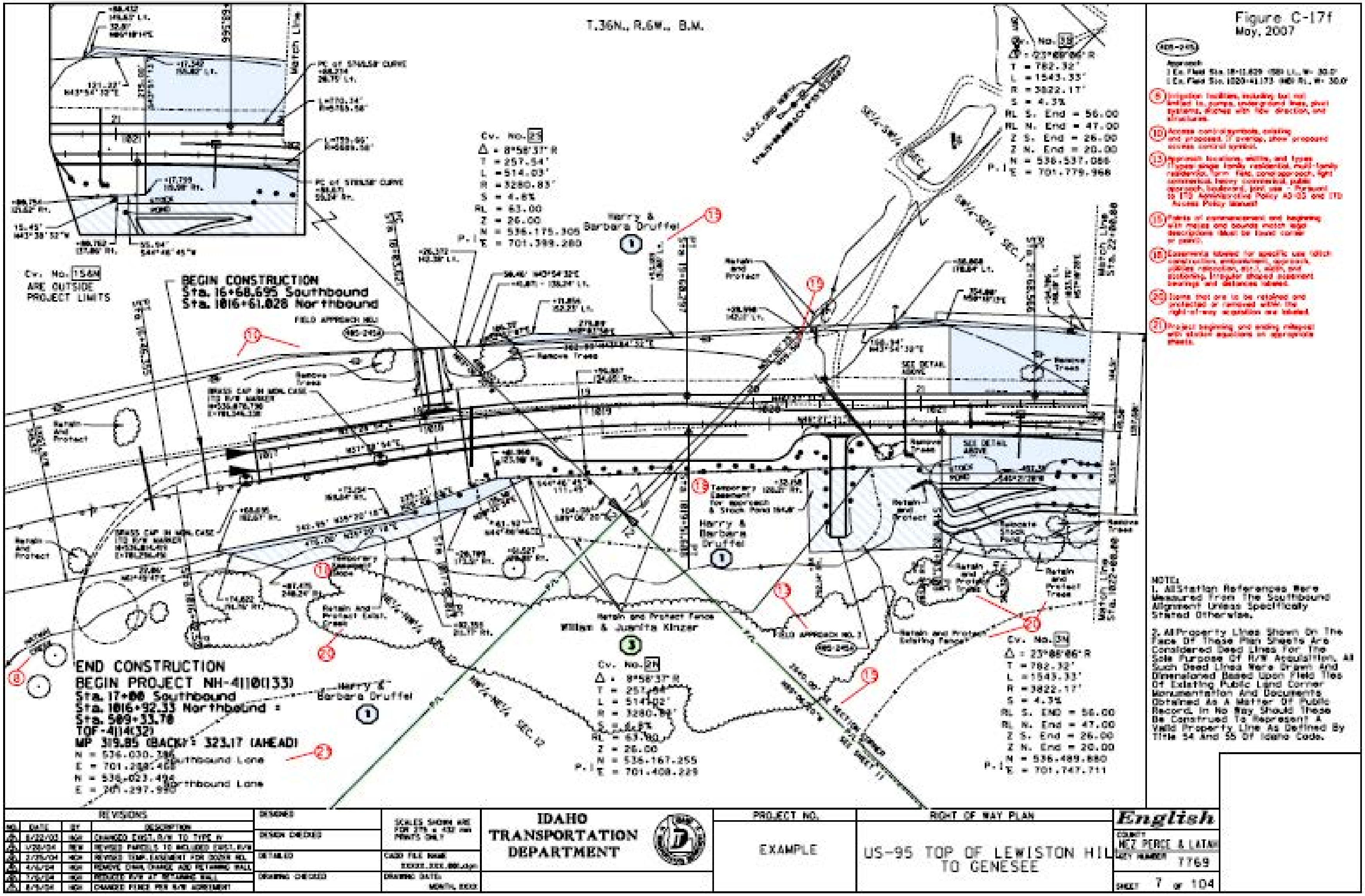


Figure C-17f
May, 2007
T.36N., R.6W., B.M.
BEGIN CONSTRUCTION
Sta. 16+68.695 Southbound
Sta. 1016+61.028 Northbound
END CONSTRUCTION
BEGIN PROJECT NH-4110(133)
Sta. 17+00 Southbound
Sta. 1016+92.33 Northbound =
Sta. 509+33.78
TOF-4114(32)
MP 319.85 (BACK) = 323.17 (AHEAD)
Cv. No. 156N ARE OUTSIDE PROJECT LIMITS
Harry & Barbara Druffel
William & Juanita Kinzer
NOTE:
1. All Station References Were Measured From The Southbound Alignment Unless Specifically Stated Otherwise.
2. All Property Lines Shown On The Face Of These Plan Sheets Are Considered Deed Lines For The Sole Purpose Of R/W Acquisition. All Such Deed Lines Were Drawn And Dimensioned Based Upon Field Ties Of Existing Public Land Corner Monumentation And Documents Obtained As A Matter Of Public Record. In No Way Should These Be Construed To Represent A Valid Property Line As Defined By Title 54 And 55 Of Idaho Code.
IDAHO TRANSPORTATION DEPARTMENT
PROJECT NO. EXAMPLE
RIGHT OF WAY PLAN
US-95 TOP OF LEWISTON HILL TO GENESEE
English
NEZ PERCE & LATAH
7769
SHEET 7 of 104

Figure C-17g
May 2013

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	TOTAL OWNERSHIP MAP
3-5	RIGHT OF WAY PLAN

IDAHO
TRANSPORTATION DEPARTMENT

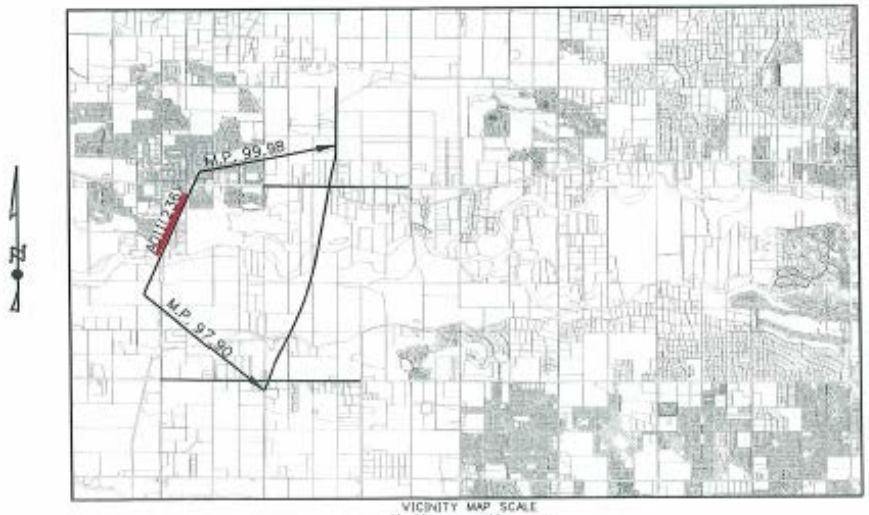
FINAL RIGHT-OF-WAY PLANS

SH-16
CHINDEN BLVD TO JCT. SH-44
FEDERAL AID PROJECT NO. A011(236)

KEY NO. 11236
ADA COUNTY
JANUARY 2012

SCALES IN FEET
50 0 50 100
HORIZONTAL FEET

CONDEMNATION EXHIBIT
PARCEL NO. 68
TERRY OWENS



VICINITY MAP SCALE
½ ¼ 0 ½ 1
MILES

POPULATIONS: 2000 U.S. CENSUS

REVISIONS NO.	DATE	BY	DESCRIPTION

THE DIMENSIONS SHOWN ON THE PLANS SHALL BE ATTAINED WITHIN LIMITS OF PRECISION THAT GOOD CONSTRUCTION PRACTICES WILL PERMIT

SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME: 11236_TITL_001.DGN
DRAWING DATE: JANUARY 2012

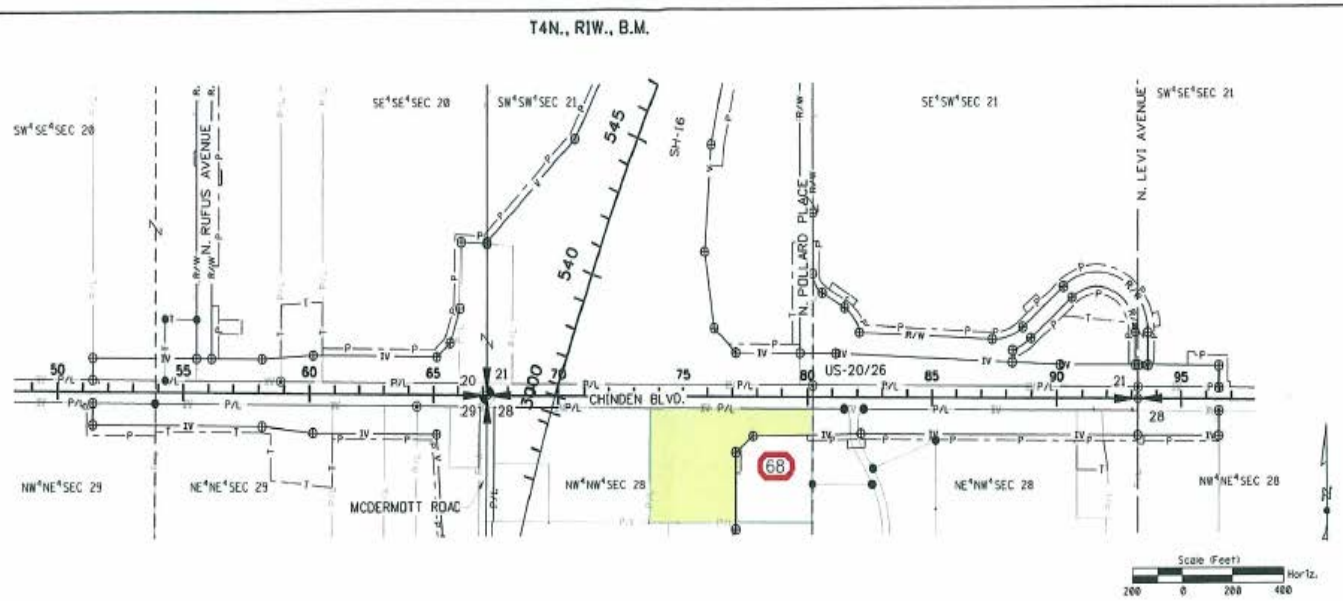
IDAHO TRANSPORTATION DEPARTMENT
T-O ENGINEERS

PROJECT NO.: A011(236)

TITLE SHEET
PARCEL NO. 68
TERRY OWENS
SH-16
CHINDEN BLVD. TO JCT. SH-44

English
COUNTY: ADA
KEY NUMBER: 11236
SHEET 1 OF 5

Figure C-17h
May 2013



Parcel No.	Parcel I.D. No.	Record Owner	Total Ownership Assessed Ac.	Right of Way		Remainder		Easement	
				Req'd Ac.	Exist Ac.	Left Ac.	Right Ac.	Perm. Ac.	Temp. Ac.
68	0044510	TERRY OWENS	6.07	3.874	0.0	0.0	2.196	0.046	0.0

NOTES:
1. TOTAL OWNERSHIP AREAS SHOWN REPRESENT THE AREAS WITHIN THE SECTIONS AS DETERMINED FROM ASSESSOR'S FIELD DATA SHEETS AND REPORTS. THE OWNERSHIP PARCELS WERE NOT SURVEYED AND SAID AREAS ARE APPROXIMATE. REMAINDER AREAS WERE CALCULATED BY DEDUCTING ANY ACQUISITIONS MADE AS A RESULT OF THIS PROJECT FROM THOSE APPROXIMATE AREAS AND ARE ALSO APPROXIMATE.

REVISIONS
NO. DATE BY DESCRIPTION

DESIGNED HGF
DESIGN CHECKED SJF
DETAILED KWW
DRAWING CHECKED SJF

SCALES SHOWN ARE FOR 8" X 11" PRINTS ONLY
CADD FILE NAME: 11236_emap_002.sht
DRAWING DATE: JANUARY 2012

IDAHO TRANSPORTATION DEPARTMENT
T-O ENGINEERS

PROJECT NO.
A011(236)

TOTAL OWNERSHIP MAP
PARCEL NO. 68
TERRY OWENS
SH-16
CHINDEN BLVD. TO JCT. SH-44

English
COUNTY Ada
KEY NUMBER 11236
SHEET 2 OF 5

PROFESSIONAL LAND SURVEYOR REGISTERED 8961 1-19-12 STATE OF IDAHO STEVEN J. FRISBIE

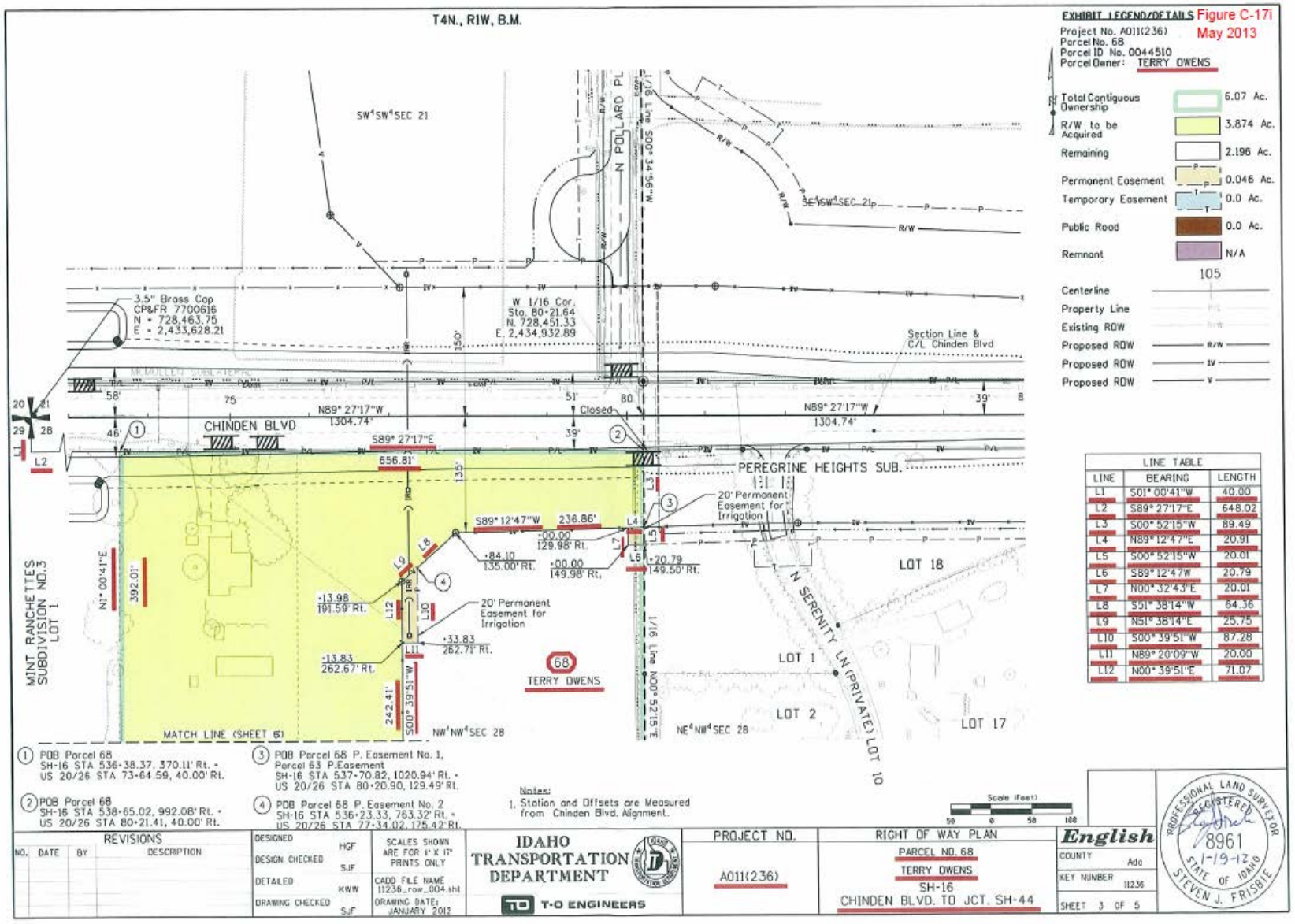
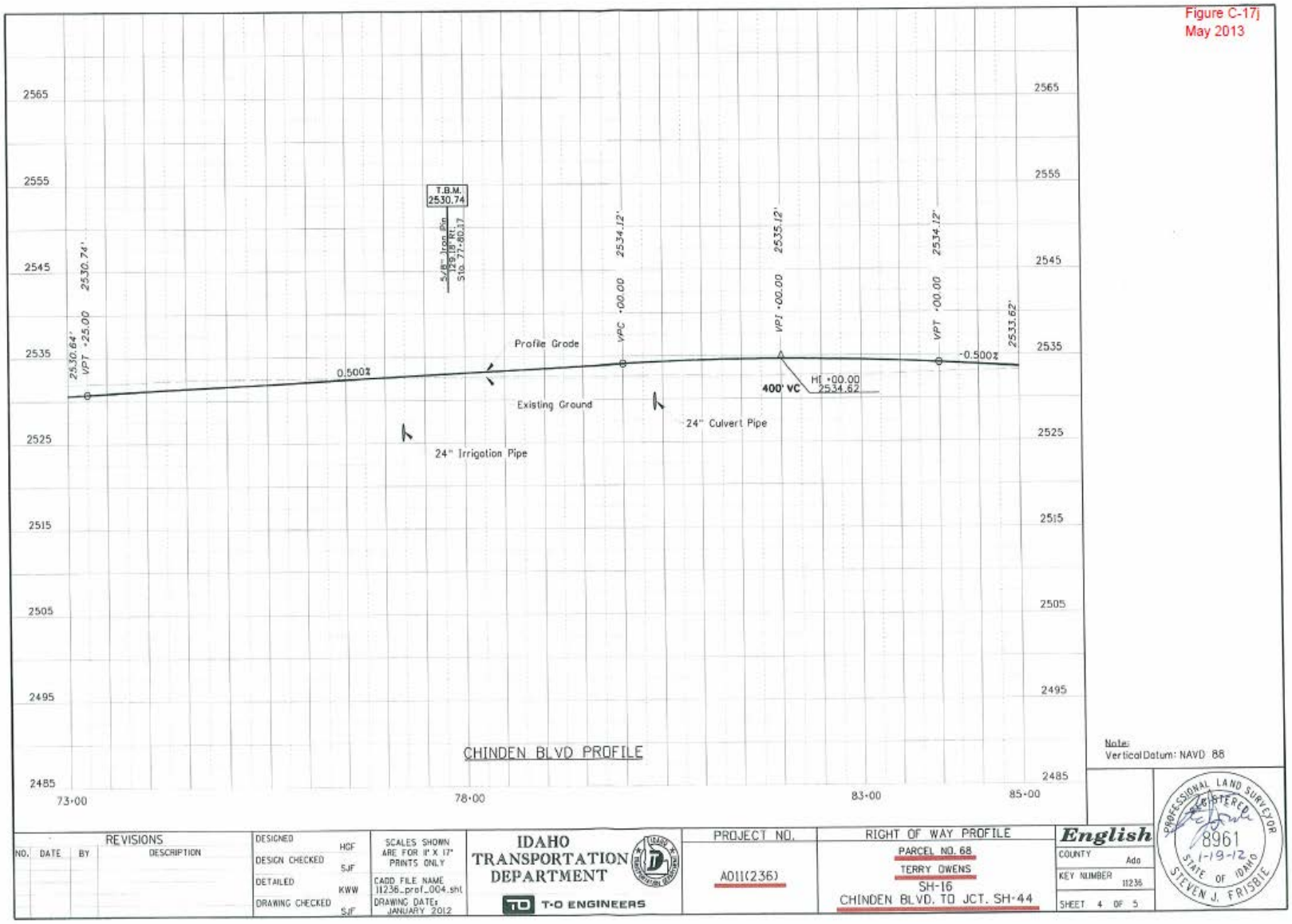

T4N., R1W, B.M.
EXHIBIT LEGEND/DETAILS Figure C-17i
May 2013
Project No. A011(236)
Parcel No. 68
Parcel ID No. 0044510
Parcel Owner: TERRY OWENS
Total Contiguous Ownership 6.07 Ac.
R/W to be Acquired 3.874 Ac.
Remaining 2.196 Ac.
Permanent Easement 0.046 Ac.
Temporary Easement 0.0 Ac.
Public Road 0.0 Ac.
Remnant N/A
Centerline
Property Line
Existing ROW
Proposed ROW
Proposed ROW
Proposed ROW
N. POLLARD PL
SW¼SW¼SEC 21
SE¼SW¼SEC 21
3.5" Brass Cap CP&FR 7700616 N = 728,463.75 E = 2,433,628.21
W 1/16 Cor. Sec. 80-21.64 N. 728,451.33 E. 2,434,932.89
Section Line & C/L Chinden Blvd
CHINDEN BLVD
N89° 27'17"W 1304.74'
S89° 27'17"E 656.81'
PEREGRINE HEIGHTS SUB.
MINT RANCHETTES SUBDIVISION NO.3 LOT 1
N1° 00'41"E 392.01'
S89° 12'47"W 236.86'
20' Permanent Easement for Irrigation
20' Permanent Easement for Irrigation
LOT 18
LOT 1
LOT 2
LOT 17
N. SERENITY LN (PRIVATE) LOT 10
TERRY OWENS
MATCH LINE (SHEET 5)
NW¼NW¼SEC 28
NE¼NW¼SEC 28
S00° 39'51"W 242.41'
N00° 52'15"E
LINE TABLE
LINE | BEARING | LENGTH
L1 | S01° 00'41"W | 40.00
L2 | S89° 27'17"E | 648.02
L3 | S00° 52'15"W | 89.49
L4 | N89° 12'47"E | 20.91
L5 | S00° 52'15"W | 20.01
L6 | S89° 12'47"W | 20.79
L7 | N00° 32'43"E | 20.01
L8 | S51° 38'14"W | 64.36
L9 | N51° 38'14"E | 25.75
L10 | S00° 39'51"W | 87.28
L11 | N89° 20'09"W | 20.00
L12 | N00° 39'51"E | 71.07
1 POB Parcel 68 SH-16 STA 536+38.37, 370.11' Rt. = US 20/26 STA 73+64.59, 40.00' Rt.
2 POB Parcel 68 SH-16 STA 538+65.02, 992.08' Rt. = US 20/26 STA 80+21.41, 40.00' Rt.
3 POB Parcel 68 P. Easement No. 1, Parcel 63 P.Easement SH-16 STA 537+70.82, 1020.94' Rt. = US 20/26 STA 80+20.90, 129.49' Rt.
4 POB Parcel 68 P. Easement No. 2 SH-16 STA 536+23.33, 763.32' Rt. = US 20/26 STA 77+34.02, 175.42' Rt.
Notes:
1. Station and Offsets are Measured from Chinden Blvd. Alignment.
Scale (Feet)
REVISIONS
NO. DATE BY DESCRIPTION
DESIGNED HGF
DESIGN CHECKED SJF
DETAILED KWW
DRAWING CHECKED SJF
SCALES SHOWN ARE FOR 1" X 17" PRINTS ONLY
CADD FILE NAME 11236_row_004.shl
DRAWING DATE: JANUARY 2012
IDAHO TRANSPORTATION DEPARTMENT
T-O ENGINEERS
PROJECT NO.
A011(236)
RIGHT OF WAY PLAN
PARCEL NO. 68
TERRY OWENS
SH-16
CHINDEN BLVD. TO JCT. SH-44
English
COUNTY Ada
KEY NUMBER 11236
SHEET 3 OF 5
PROFESSIONAL LAND SURVEYOR REGISTERED 8961 1-19-12 STATE OF IDAHO STEVEN J. FRISBIE

Figure C-17j
May 2013



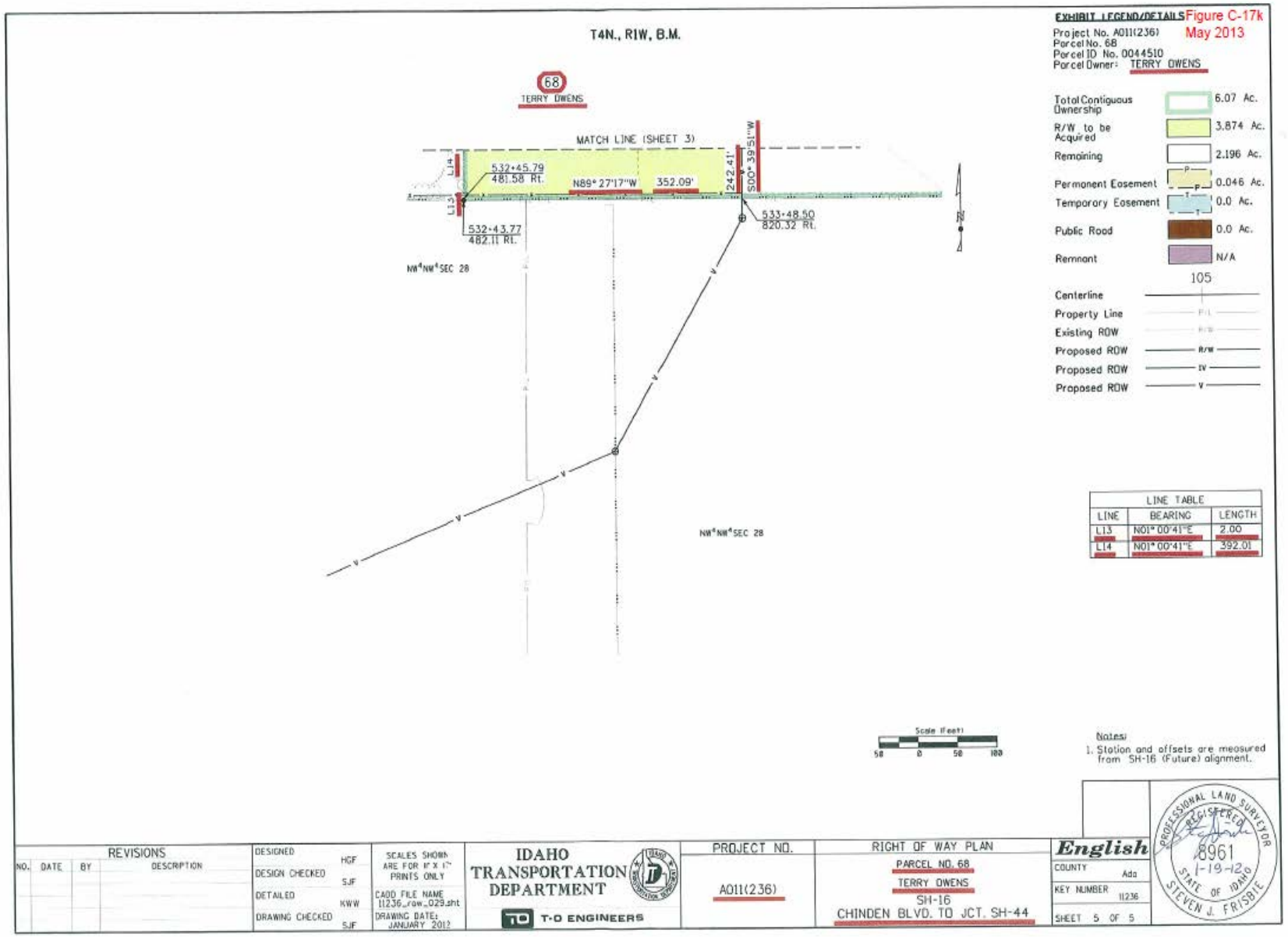


Figure C-17k May 2013

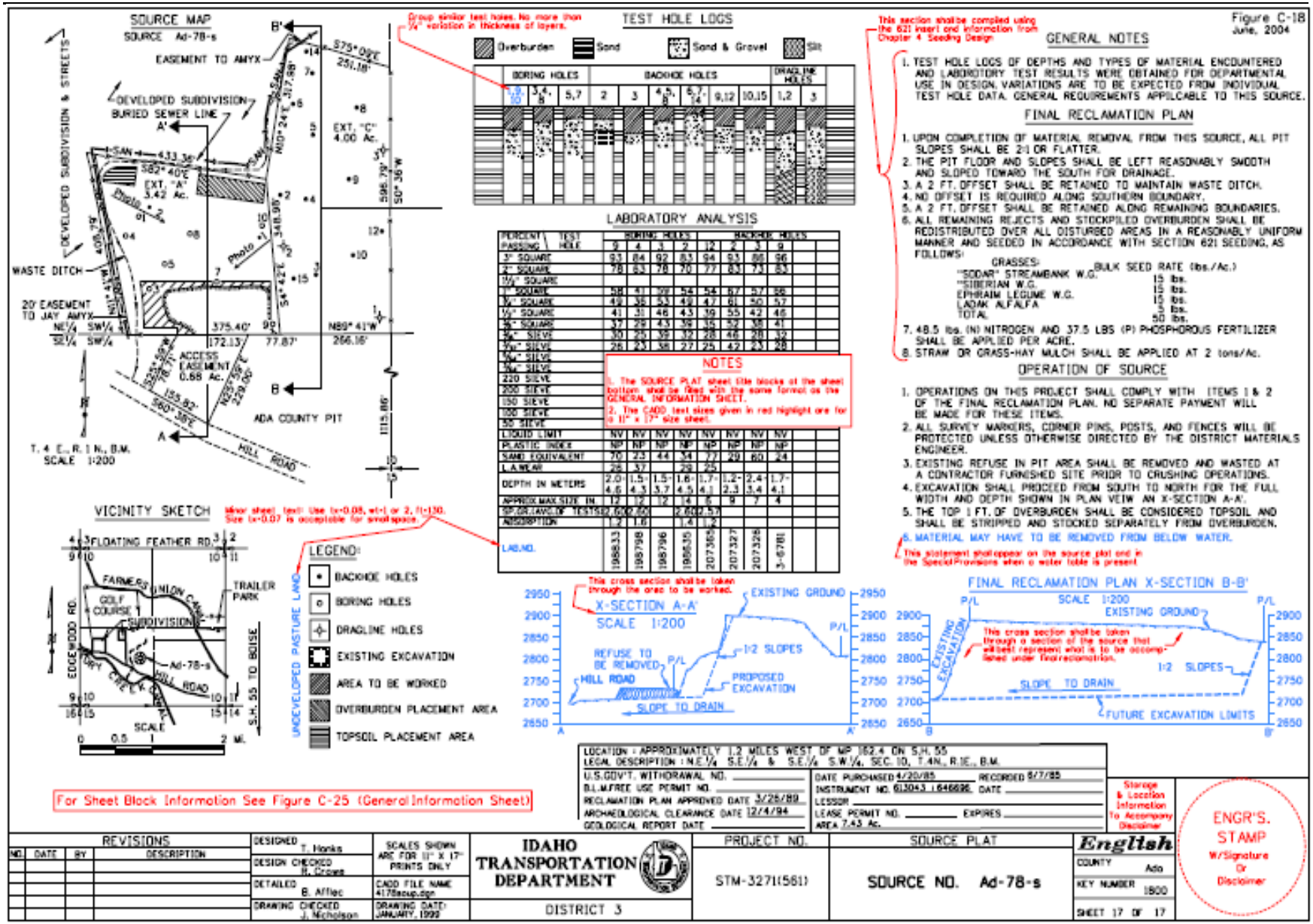
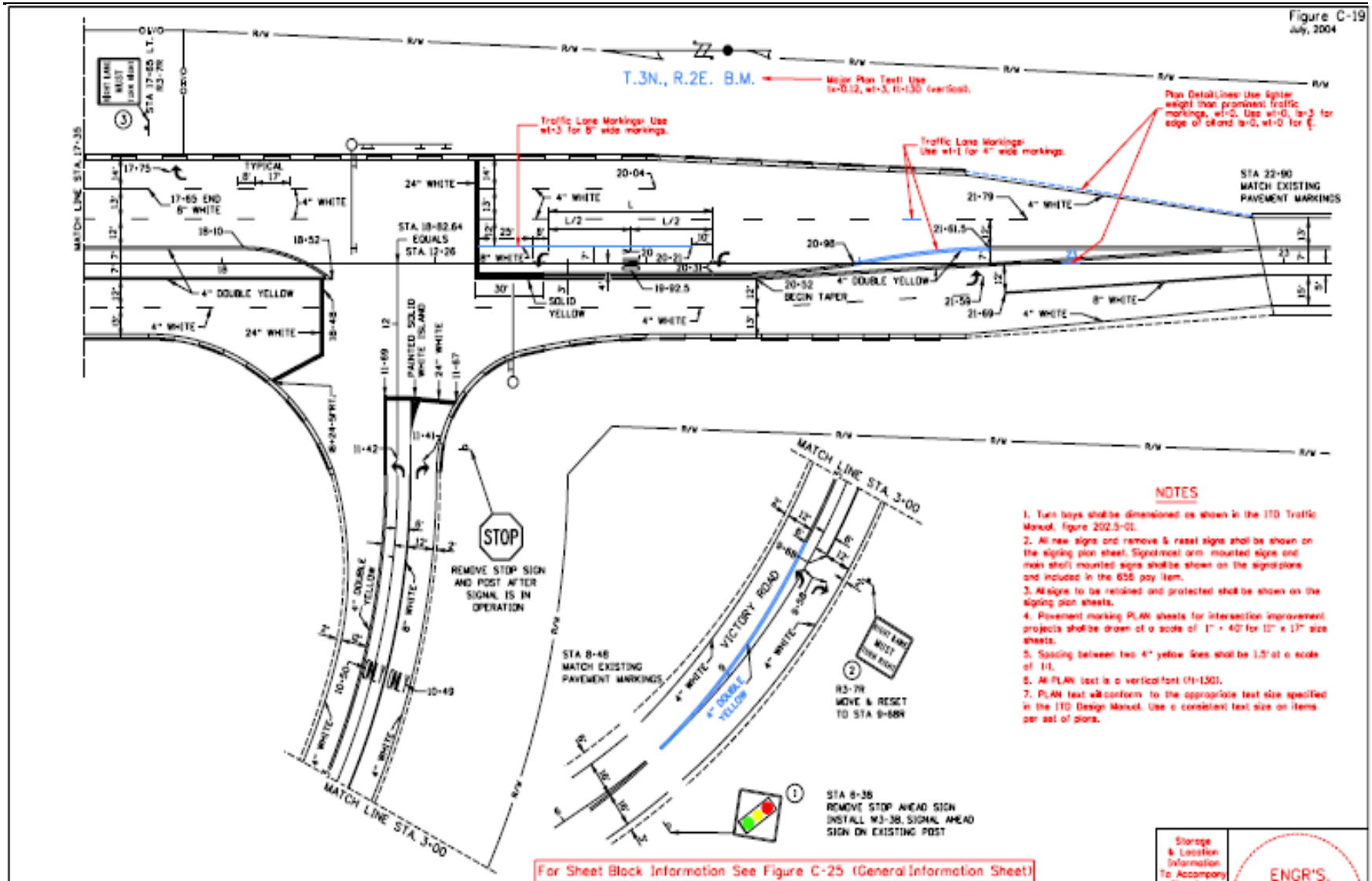


Figure C-18
June, 2004

Figure C-19
July, 2004



NOTES

1. Turn bays shall be dimensioned as shown in the ITD Traffic Manual, figure 202.5-01.
2. All new signs and remove & reset signs shall be shown on the signing plan sheet. Signal mast arm mounted signs and main shaft mounted signs shall be shown on the signal plans and included in the 638 pay item.
3. All signs to be retained and protected shall be shown on the signing plan sheets.
4. Pavement marking PLAN sheets for intersection improvement projects shall be drawn at a scale of 1" = 40' for 11" x 17" size sheets.
5. Spacing between two 4" yellow lines shall be 1.5' at a scale of 1:1.
6. All PLAN text is a vertical font (11-130).
7. PLAN text will conform to the appropriate text size specified in the ITD Design Manual. Use a consistent text size on items per set of plans.

For Sheet Block Information See Figure C-25 (General Information Sheet)

REVISIONS							
NO.	DATE	BY	DESCRIPTION	DESIGNED T. Silva	SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY	IDAHO TRANSPORTATION DEPARTMENT	PROJECT NO.
				DESIGN CHECKED N. Abrams			IRG-842(B)51
				DETAILED R. Cook	CADD FILE NAME 3121spmg.dgn		
				DRAWING CHECKED R. Trethewey	DRAWING DATE JUNE, 2002	DISTRICT 3	

SIGNING & PAVEMENT MARKING PLAN
ORCHARD STREET & VICTORY ROAD INTERSECTION

English
COUNTY Ada
KEY NUMBER 3121
SHEET 10 OF 25

Storage & Location Information to Accompany Disclaimer

ENGR'S. STAMP W/Signature Or Disclaimer

Figure C-20

SIGN ASSEMBLY NO.	STATION LT. OR RT.	RAMP NO.	FOUNDATION TYPE	POST TYPE	NO. OF POSTS	POST SPACING	APPROX. LENGTH OF 1st POST	APPROX. LENGTH OF 2nd POST	POST LENGTH ABOVE FINISH SHOULDER.	C	E	SIGN TYPE	SIGN DETAIL NUMBERS	SIGN SIZE W" x H"	APPROX. SQ. FT. OF SIGN	SIGN BACKGROUND COLOR	SIGN BRACKETS & BRACE ANGLES WEIGHT (LBS)	BRACKET NO.	REMARKS May 2013
1	7+00 LT.			D-3	1		18'-6"		11'-0"	10'-0"	7'-0"	B	R2-1A	36 x 48	12.0	WHITE	20.31		
2	7+00 RT.			D-2	1		18'-0"		11'-6"	10'-0"	7'-0"	B	M2-1	21 x 15	2.2	WHITE			tx-0.08, Wt-1, Font-130 (Vertical). All text shown for a 11" x 17" size sheet.
												B	M1-7	24 x 24	4.0	BLACK			
												B	M6-4	21 x 15	2.2	WHITE			
3	10+47 RT.			D-3			18'-6"		11'-0"	10'-0"	7'-0"	B	R2-1A	36 x 48	——	WHITE	44.26		MOVE & RESET SIGN. S901-XXX INSTALL NEW POST
4	12+00 LT.			D-2	2	5'-0"	15'-0"	15'-6"	10'-0"	15'-0"	7'-0"	E	D1-3	90 x 36	22.5	GREEN			
5	12+32.5 RT.			D-3	1		20'-0"		12'-6"	14'-0"	7'-0"	B	I-6001	36 x 36	——	WHITE	16.61		STATE SUPPLIED
6	12+65 RT.		E-1	E-1	1		12'-0"		8'-0"	10'-0"	7'-0"	B	R1-1	30 x 30	6.2	RED			
7	15+49 LT.	C-D	A	B-2	1		10'-10"		9'-6"	9'-10"	7'-0"	B	R1-1B	48 x 48	16.0	RED	22.30		
												B	R5-1A	36 x 36	9.0	WHITE	14.80		
												B	R6-1L	36 x 12	3.0	BLACK	7.40		
												B	R6-1R	36 x 12	3.0	BLACK	7.40		
8	15+50 RT	C-D	A	B-2	1		11'-10"		10'-6"	10'-0"	7'-0"	B	R1-1B	48 x 48	16.0	RED	22.30		
												B	R5-1A	36 x 36	9.0	WHITE	14.80		
												B	R6-1L	36 x 12	3.0	BLACK	7.40		
												B	R6-1R	36 x 12	3.0	BLACK	7.40		
9	15+81 LT.	C-D	A	B-2			7'-9"		7'-9"	6'-6"	5'-0"	B	R5-9A	36 x 24	6.0	RED	14.80		
10	13+25 LT.		A	A-1	2	5'-0"	14'-0"	14'-10"	12'-4"	20'-0"	7'-0"	C	E-7	96 x 60	40.0	GREEN			SEE SIGN DETAIL NO. 10
11	24+02 LT.		C	A-8	2	8'-0"	20-0"	21'-4"	18'-4'	20'-0"	7'-0"	C	E1-5	108 x 36	27	GREEN	25.44		
												C	E1-1	150 x 132	137.5	GREEN			SEE SIGN DETAIL NO. 11
													M1-5A	36 x 36		WHITE			
12	36+09 LT.		C	A-9	2	14'-6"	18'-8"	24'-1"	20'-4"	20'-0"	7'-0"	C	E1-5	108 x 36	27	GREEN	25.44		SEE SIGN DETAIL NO. 12
												C	E4-1	246 x 120	205	GREEN			
													M1-5A	36 x 36		WHITE			
13	55+65 RT.											B	D10-2	10 x 27	——	GREEN			MP XX PAID FOR UNDER ITEM 617-XXX. SEE STD DWG I-20
14	75+80 RT.											C	E1-5	108 x 36	27	GREEN	25.44		MOUNTED ON OVERHEAD SIGN STRUCTURE
												C	E6-3	180 x 108	135	GREEN			
													M1-1A(3)	45 x 36		BLUE			
													M1-1A	36 x 36		BLUE			
15	90+95 RT.		B	A-4	2	7'-0"	21'-0"	22'-2"	19'-4"	20'-0"	7'-0"	C	E1-5	108 x 36	——	GREEN	25.44		MOVE & RESET SIGNS. S901-XXX INSTALL NEW POST
												C	E1-1	114 x 144	——	GREEN			
													M1-5A	36 x 36		WHITE			
													M1-5A	36 x 36		WHITE			

For Sheet Block Information See Figure C-25 (General Information Sheet)

COLUMN C, DISTANCE FROM SHOULDER TO CENTER LINE OF FIRST POST
COLUMN E, BOTTOM OF MAJOR SIGN ABOVE FINISHED SHOULDER

POST LENGTHS SHOWN ARE APPROXIMATE. FINAL VALUES SHALL BE DETERMINED IN THE FIELD PRIOR TO FABRICATION

Storage & Location Information To Accompany Disclaimer

ENGR'S. STAMP W/Signature Or Disclaimer

REVISIONS				DESIGNED	SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY	IDAHO TRANSPORTATION DEPARTMENT	PROJECT NO.	SIGNING ERECTION SPECIFICATIONS	English
NO.	DATE	BY	DESCRIPTION	DESIGN CHECKED			NUMBER	PROJECT NAME	COUNTY
				DETAILED	CADD FILE NAME s22signercspec.dgn				KEY NUMBER
				DRAWING CHECKED	DRAWING DATE:				SHEET OF

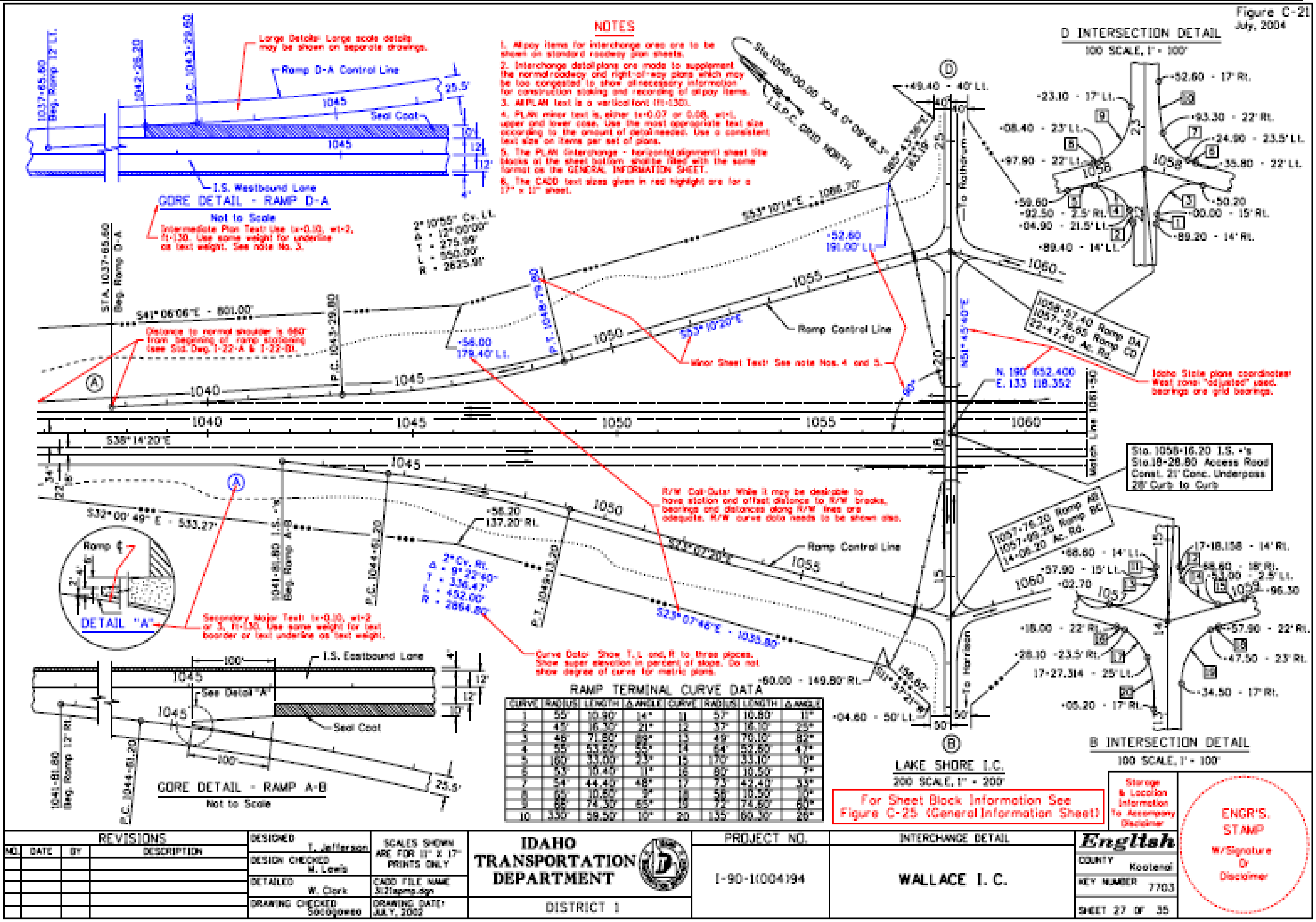


Figure C-21
July, 2004
NOTES
1. All pay items for interchange area are to be shown on standard roadway plan sheets.
2. Interchange detail plans are made to supplement the normal roadway and right-of-way plans which may be too congested to show all necessary information for construction staking and recording of all pay items.
3. All PLAN text is a vertical font (ff=130).
4. PLAN minor text is either tx=0.07 or 0.08, wt=1, upper and lower case. Use the most appropriate text size according to the amount of detail needed. Use a consistent text size on items per set of plans.
5. The PLAN (interchange - horizontal alignment) sheet title blocks at the sheet bottom should be filled with the same format as the GENERAL INFORMATION SHEET.
6. The CADD text sizes given in red highlight are for a 17" x 11" sheet.
Large Details: Large scale details may be shown on separate drawings.
Ramp D-A Control Line
Seal Coat
I.S. Westbound Lane
GORE DETAIL - RAMP D-A
Not to Scale
Intermediate Plan Text: Use tx=0.10, wt=2, ff=130. Use same weight for underline as text weight. See note No. 3.
Distance to normal shoulder is 660' from beginning of ramp stationing (see Std. Dwg. I-22-A & I-22-B).
Minor Sheet Text: See note Nos. 4 and 5.
Ramp Control Line
Idaho State plane coordinates: West zone "adjusted" used, bearings are grid bearings.
N. 190 652.400
E. 133 118.352
Sta. 1058+16.20 I.S. ='s
Sta. 18+28.80 Access Road
Const. 21' Conc. Underpass
28' Curb to Curb
R/W Call-Outs: While it may be desirable to have station and offset distance to R/W breaks, bearings and distances along R/W lines are adequate. R/W curve data needs to be shown also.
Secondary Major Text: tx=0.10, wt=2 or 3, ff=130. Use same weight for text boarder or text underline as text weight.
DETAIL "A"
I.S. Eastbound Lane
See Detail "A"
Seal Coat
GORE DETAIL - RAMP A-B
Not to Scale
Curve Data: Show T, L and R to three places. Show super elevation in percent of slope. Do not show degree of curve for metric plans.
D INTERSECTION DETAIL
100 SCALE, 1" = 100'
B INTERSECTION DETAIL
100 SCALE, 1" = 100'
LAKE SHORE I.C.
200 SCALE, 1" = 200'
For Sheet Block Information See Figure C-25 (General Information Sheet)
Storage & Location Information To Accompany Disclaimer
ENGR'S. STAMP W/Signature Or Disclaimer
REVISIONS
NO. DATE BY DESCRIPTION
DESIGNED T. Jefferson
DESIGN CHECKED M. Lewis
DETAILED W. Clark
DRAWING CHECKED Sacagawea
SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME 3121apmp.dgn
DRAWING DATE: JULY, 2002
IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 1
PROJECT NO.
I-90-1(004)94
INTERCHANGE DETAIL
WALLACE I. C.
English
COUNTY Kootenai
KEY NUMBER 7703
SHEET 27 OF 35

RAMP TERMINAL CURVE DATA

CURVE	RADIUS	LENGTH	Δ ANGLE	CURVE	RADIUS	LENGTH	Δ ANGLE
1	55'	10.90'	14°	11	57'	10.80'	11°
2	45'	16.30'	21°	12	37'	16.10'	25°
3	46'	71.80'	89°	13	49'	70.10'	82°
4	55'	53.60'	56°	14	64'	52.60'	47°
5	160'	33.00'	23°	15	170'	33.10'	10°
6	53'	10.40'	1°	16	80'	10.50'	7°
7	54'	44.40'	48°	17	73'	42.40'	33°
8	65'	10.60'	9°	18	58'	10.50'	10°
9	66'	74.30'	65°	19	72'	74.60'	60°
10	330'	59.50'	10°	20	135'	60.30'	28°

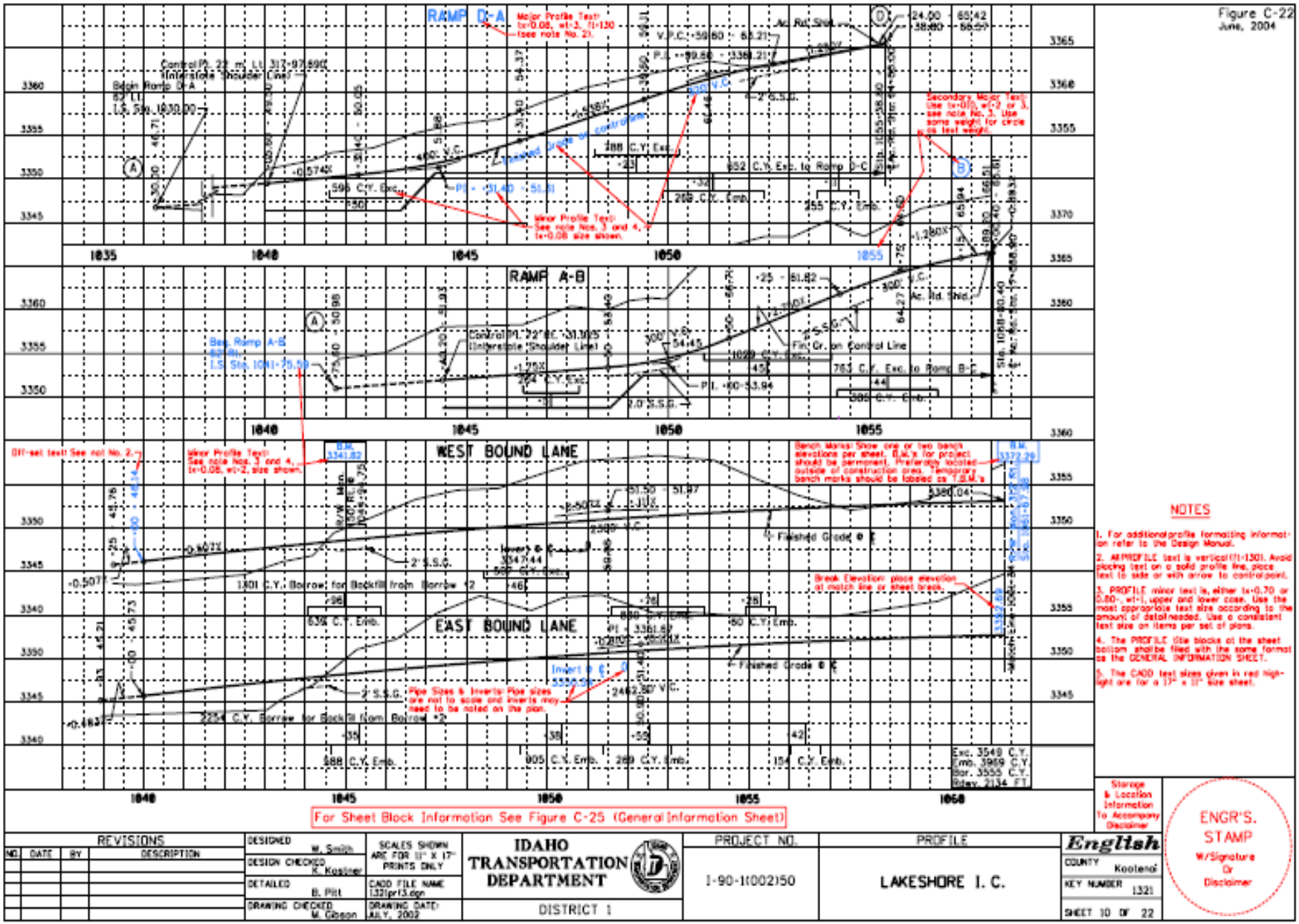


Figure C-22
June, 2004

NOTES

1. For additional profile formatting information refer to the Design Manual.
2. All PROFILE text is vertical (fl=130). Avoid placing text on a solid profile line, place text to side or with arrow to control point.
3. PROFILE minor text is, either h=0.70 or 0.80-, wt=1, upper and lower case. Use the most appropriate text size according to the amount of detail needed. Use a consistent text size on items per set of plans.
4. The PROFILE title blocks at the sheet bottom shall be filled with the same format as the GENERAL INFORMATION SHEET.
5. The CADD text sizes given in red highlight are for a 17" x 11" size sheet.

Storage & Location Information To Accompany Disclaimer

ENGR'S. STAMP W/Signature Or Disclaimer

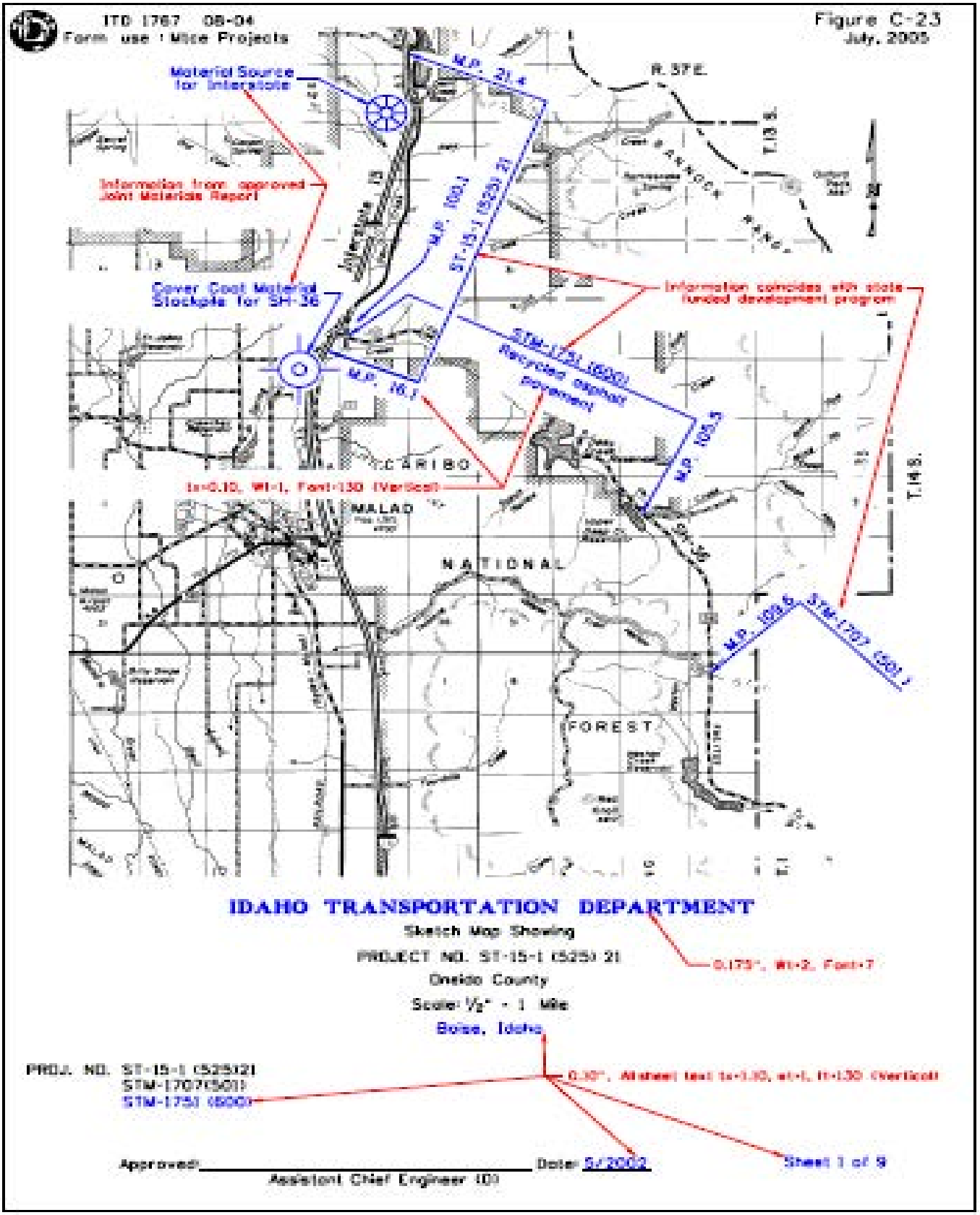
REVISIONS			
NO.	DATE	BY	DESCRIPTION

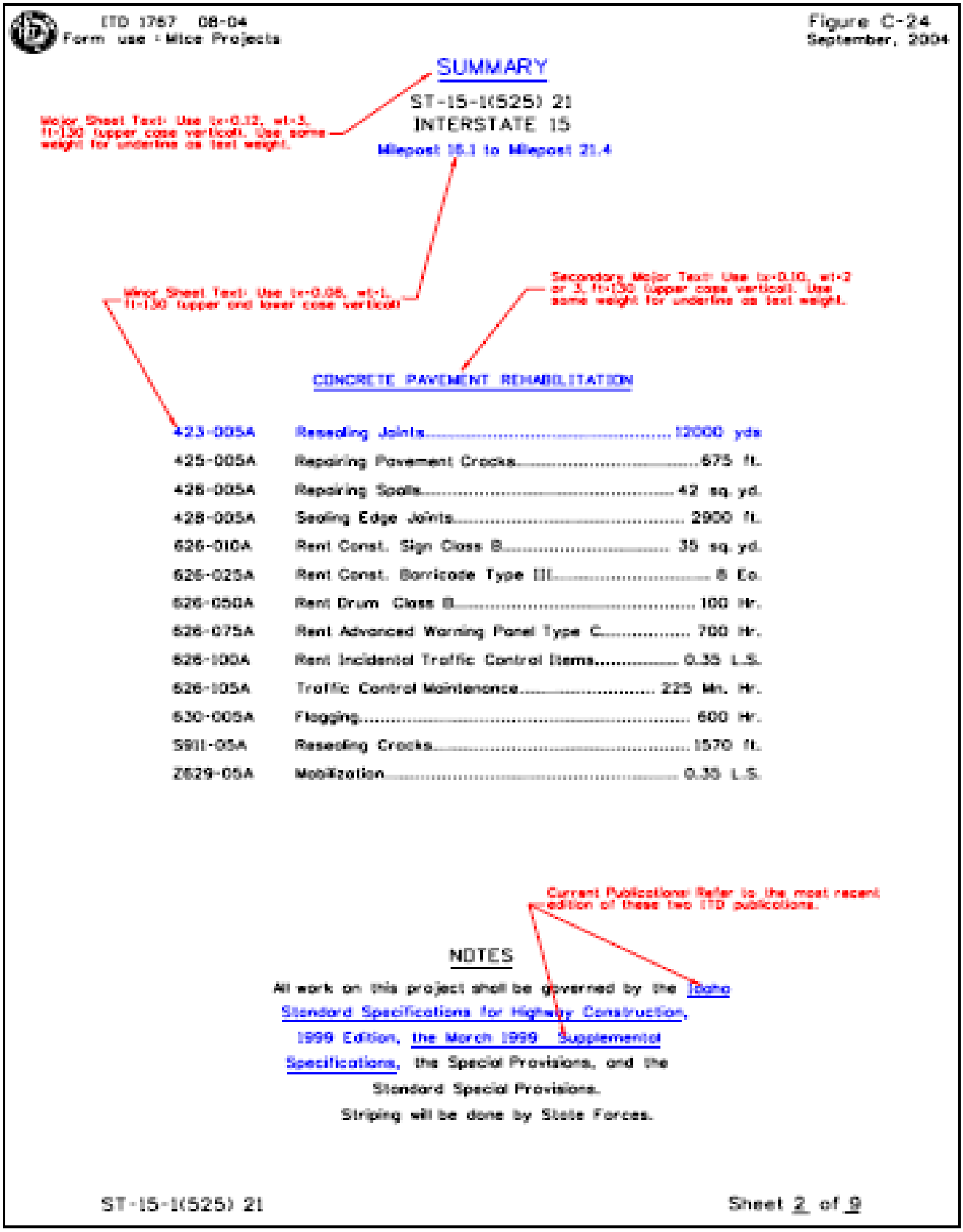
DESIGNED	M. Smith	SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY	
DESIGN CHECKED	K. Kostner		
DETAILED	B. Pitt	CADD FILE NAME	1321pr13.dgn
DRAWING CHECKED	M. Gibson	DRAWING DATE	JULY, 2002

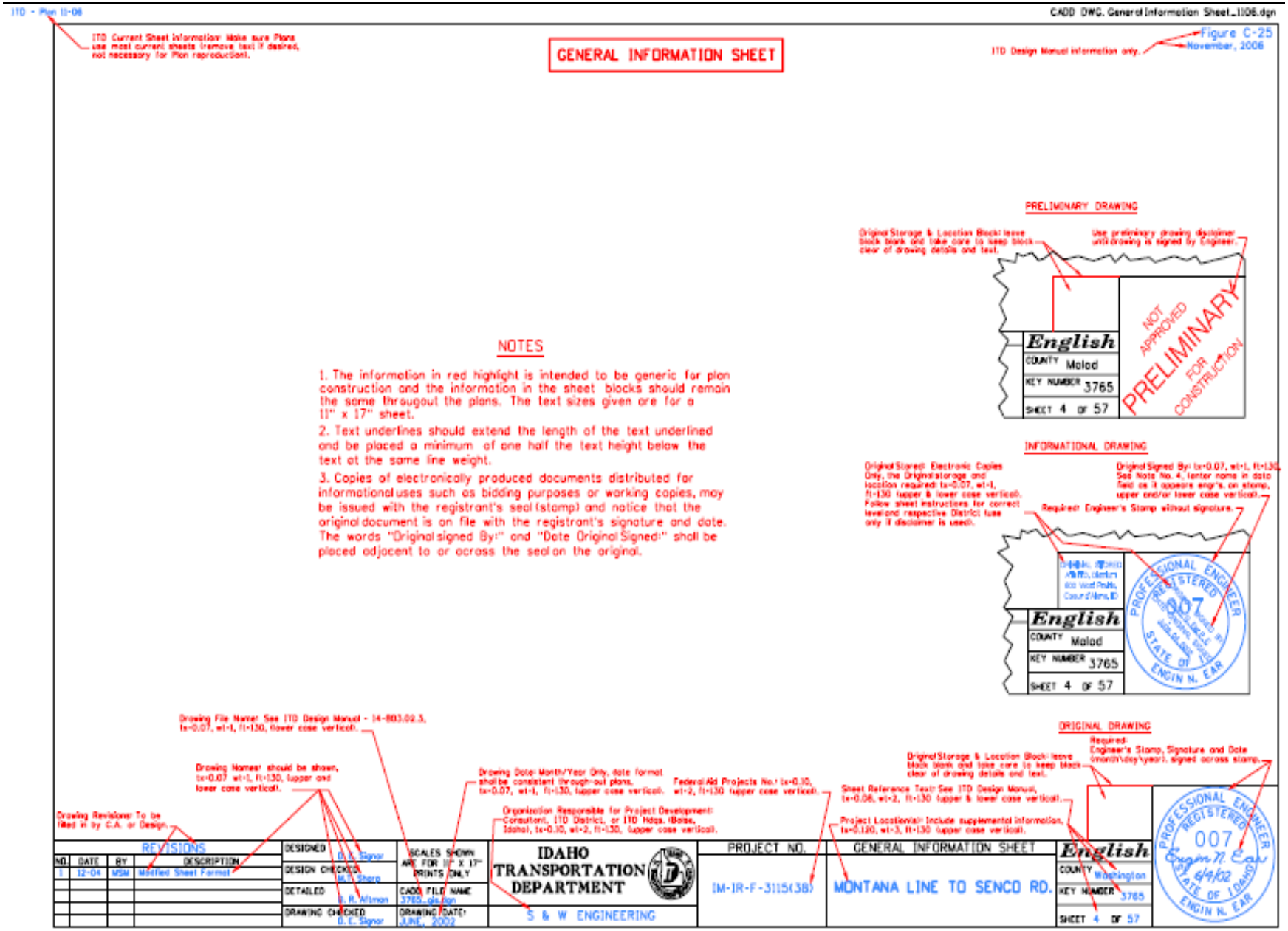
IDAHO TRANSPORTATION DEPARTMENT
DISTRICT 1

PROJECT NO.	PROFILE
I-90-1(002)150	LAKESHORE I. C.

English
COUNTY Kootenai
KEY NUMBER 1321
SHEET 10 OF 22


ITD 1767 08-04
Form use : Misc Projects
Figure C-23
July, 2005
Material Source for Interstate
Information from approved Joint Materials Report
Cover Coat Material Stockpile for SH-36
M.P. 21.4
M.P. 16.1
ST-15-1 (525) 21
STM-175) (600)
Information coincides with state funded development program
M.P. 105.7
M.P. 109.6
STM-1707 (501)
R.37E.
T.13 S.
T.14 S.
CARIBO
MALAD
NATIONAL
FOREST
IDAHO TRANSPORTATION DEPARTMENT
Sketch Map Showing
PROJECT NO. ST-15-1 (525) 21
Oneida County
Scale: ½" = 1 Mile
Boise, Idaho
PROJ. NO. ST-15-1 (525)21
STM-1707(501)
STM-175) (600)
Approved: _____ Date: 5/2002
Assistant Chief Engineer (D)
Sheet 1 of 9


ITD 1757 08-04
Form use - Misc Projects
Figure C-24
September, 2004
SUMMARY
ST-15-I(525) 21
INTERSTATE 15
Milepost 16.1 to Milepost 21.4
Major Sheet Text: Use lx=0.12, wt=3, ft=130 (upper case vertical). Use same weight for underline as text weight.
Minor Sheet Text: Use lx=0.08, wt=1, ft=130 (upper and lower case vertical)
Secondary Major Text: Use lx=0.10, wt=2 or 3, ft=130 (upper case vertical). Use same weight for underline as text weight.
CONCRETE PAVEMENT REHABILITATION
423-005A Resealing Joints 12000 yds
425-005A Repairing Pavement Cracks 675 ft.
426-005A Repairing Spalls 42 sq. yd.
428-005A Sealing Edge Joints 2900 ft.
626-010A Rent Const. Sign Class B 35 sq. yd.
626-025A Rent Const. Barricade Type III 8 Ea.
626-050A Rent Drum Class B 100 Hr.
626-075A Rent Advanced Warning Panel Type C 700 Hr.
626-100A Rent Incidental Traffic Control Items 0.35 L.S.
626-105A Traffic Control Maintenance 225 Mn. Hr.
630-005A Flagging 600 Hr.
5911-05A Reseeding Cracks 1570 ft.
2629-05A Mobilization 0.35 L.S.
Current Publications: Refer to the most recent addition of these two ITD publications.
NOTES
All work on this project shall be governed by the Idaho Standard Specifications for Highway Construction, 1999 Edition, the March 1999 Supplemental Specifications, the Special Provisions, and the Standard Special Provisions.
Striping will be done by State Forces.
ST-15-I(525) 21
Sheet 2 of 9


ITD - Plan 11-06
CADD DWG. General Information Sheet_1106.dgn
ITD Current Sheet Information: Make sure Plans use most current sheets (remove text if desired, not necessary for Plan reproduction).
GENERAL INFORMATION SHEET
Figure C-25
November, 2006
ITD Design Manual information only.
NOTES
1. The information in red highlight is intended to be generic for plan construction and the information in the sheet blocks should remain the same throughout the plans. The text sizes given are for a 11" x 17" sheet.
2. Text underlines should extend the length of the text underlined and be placed a minimum of one half the text height below the text at the same line weight.
3. Copies of electronically produced documents distributed for informational uses such as bidding purposes or working copies, may be issued with the registrant's seal (stamp) and notice that the original document is on file with the registrant's signature and date. The words "Original signed By:" and "Date Original Signed:" shall be placed adjacent to or across the seal on the original.
PRELIMINARY DRAWING
Original Storage & Location Block: leave block blank and take care to keep block clear of drawing details and text.
Use preliminary drawing disclaimer until drawing is signed by Engineer.
NOT APPROVED
PRELIMINARY
FOR CONSTRUCTION
English
COUNTY Malad
KEY NUMBER 3765
SHEET 4 OF 57
INFORMATIONAL DRAWING
Original Stored Electronic Copies Only, the Original storage and location required: tx=0.07, wt=1, ft=130 upper & lower case vertical. Follow sheet instructions for correct level and respective District use only if disclaimer is used.
Original Signed By: tx=0.07, wt=1, ft=130. See Note No. 4, enter name in date field as it appears engr's. on stamp, upper and/or lower case vertical.
Required: Engineer's Stamp without signature.
PROFESSIONAL ENGINEER REGISTERED 007 STATE OF IDAHO ENGIN N. EAR
ORIGINAL DRAWING
Required: Engineer's Stamp, Signature and Date (month/day/year), signed across stamp.
Original Storage & Location Block: leave block blank and take care to keep block clear of drawing details and text.
Drawing File Name: See ITD Design Manual - 14-803.02.3, tx=0.07, wt=1, ft=130, lower case vertical.
Drawing Names: should be shown, tx=0.07 wt=1, ft=130, upper and lower case vertical.
Drawing Revisions: To be filled in by C.A. or Design.
Drawing Date: Month/Year Only, date format shall be consistent through-out plans. tx=0.07, wt=1, ft=130, upper case vertical.
Federal Aid Projects No.: tx=0.10, wt=2, ft=130 upper case vertical.
Organization Responsible for Project Development: Consultant, ITD District, or ITD Hdqs. (Boise, Idaho), tx=0.10, wt=2, ft=130, upper case vertical.
Sheet Reference Text: See ITD Design Manual, tx=0.08, wt=2, ft=130 upper & lower case vertical.
Project Location: Include supplemental information, tx=0.120, wt=3, ft=130 upper case vertical.
REVISIONS
NO. DATE BY DESCRIPTION
1 12-04 MSM Modified Sheet Format
DESIGNED D.L. Signor
DESIGN CHECKED M.S. Sharp
DETAILED D. R. Wilmon
DRAWING CHECKED D.E. Signor
SCALES SHOWN ARE FOR 11" X 17" PRINTS ONLY
CADD FILE NAME 3765_gis.tpp
DRAWING DATE: JUNE, 2002
IDAHO TRANSPORTATION DEPARTMENT
S & W ENGINEERING
PROJECT NO. IM-IR-F-3115(38)
GENERAL INFORMATION SHEET
MONTANA LINE TO SENCO RD.
English
COUNTY Washington
KEY NUMBER 3765
SHEET 4 OF 57
PROFESSIONAL ENGINEER REGISTERED 007 Eugene M. Cole 6/4/02 STATE OF IDAHO ENGIN N. EAR

APPENDIX D – ROADWAY DESIGN FORMS

D.10 Forms Introduction

ITD 0063 Request To Change Manual

ITD 0130 Legal Description Essential Requirement Check List

ITD 0131 Plans Essential Requirement Check List

ITD 0210 Hydraulics Structures Survey

ITD 0332 Project Charter

ITD 0602 Crossing Evaluation Report

ITD 0606 Access Control Determination

ITD 0652 Hazardous Wastes/Materials — Preliminary Site Assessment Checklist

ITD 0654 Preliminary Environmental Evaluation

ITD 0759 Roadway Inventory

ITD 0767 Project Quality Evaluation

ITD 1150 Project Cost Summary Sheet

ITD 1414 Project Program Entry Or Revision

ITD 1500 Cultural Resource Investigation Request

ITD 1502 Determination Of Significance And Effect

ITD 1983 Local Public Agencies — Certificate Of Right-Of-Way Of A Federal-Aid Project

ITD 2101 Project Authorization And Agreement

ITD 2161 Local Public Agency Project Monthly Right-Of-Way Status Report

ITD 2184 Proposed Milepost Changes

ITD 2185 Milepost Log Work Sheet

ITD 2395 Request For Federal-Aid On No-Bid Items Of Work

ITD 2435 Local Federal-Aid Project Request

ITD 2665 Floodway Revision Requirement

ITD 2760 Request For Consultant Services

ITD 2784 NPDES/Storm Water Permit

ITD 2802 Environmental Monitoring Report

NPDES/Storm Water Permit Program — Inspector's Report Form

ITD 2839 Right-Of-Way Cost Estimate

ITD 2865 Request For Survey Work

Bridge Submittal Checklist For Situation/Layout

APPENDIX D – ROADWAY DESIGN FORMS

D.10 – Forms Introduction

The following section contains examples of the forms that are used by Roadway Design to process various design information. Most are available on the department's Intranet form finder. The most current version of the form is stored electronically in an individual file that is identified by the ITD form number or other similar identification.

Copies can be made by opening the individual file, double clicking on the attachment, and then printing the document. To use electronically, save the opened attachment to your directory and then use appropriately.

ITD 0063 (Rev. 6-03)

Request To Change Manual

Title of Manual Affected			Manual Revision Date
Chapter Number	Section Number	Heading Title	Page Number(s)

This manual is (choose one) ☐ Hard copy only ☐ Electronic and Hard Copy ☐ Available on the Intranet

This change is a(n) ☐ Addition ☐ Deletion ☐ Revision

This change will be beneficial statewide. ☐ Yes ☐ No

Proposed Change (attach an example or additional sheets if needed)

Explain why the change is needed.

This change affects other portions of the manual. ☐ Yes ☐ No

Please list chapter number, section number, heading title and page number of affected portions.

Chapter Number	Section Number	Heading Title	Page Number

This change affects a picture, figure or standard drawing in the manual. ☐ Yes ☐ No

Please list chapter number, section number, heading title and page number of affected picture, figure or standard drawing.

Chapter Number	Section Number	Heading Title	Page Number

This change affects an administrative or board policy. ☐ Yes ☐ No Please list any policy affected.

Policy Number	Title	Policy Number	Title

This change affects an ITD form (any form with a four digit ITD number in the upper left corner). ☐ Yes ☐ No Please list form(s) affected.

Form Number	Title	Form Number	Title

Submitted By (see Section Manager for submittal procedures)	Title	Section/District	Date

To be Completed by Authorized Section Representative

☐ Approved ☐ Disapproved	Request Number	Authorized Section Representative's Signature	Date

Information distribution as appropriate: ☐ Policy and Procedures Coordinator ☐ Forms Analyst ☐ Web Services

ITD 0130 (Rev. 4-07)

Legal Description Essential Requirements Checklist

Idaho Transportation Department – Right of Way

Project Number	Project Name	Key Number

Parcel Number	Parcel ID Number	Date

Legal Descriptions – One required for each description
Initial each item that has been reviewed. Mark N/A for items that are not applicable.

	1st Dist. Reviewer	2nd Dist. Reviewer	
1.			Heading: Project Number, Key Number, Parcel Number, Parcel ID Number and date prepared (not an autofill date.) Titled fee acquisition or permanent easement, etc.
2.			Preamble: State, County name, Township and Range, ¼ ¼ sections or government lots designated, section, subdivision name, lots, blocks, and tracks
3.			Points of commencement and beginning shown on plans (must be a found Public Land Survey System (PLSS) corner or a found Corner Perpetuation & Filing (CP&F) recorded point)
4.			Multiple requirement areas within a parcel use the same point of commencement
5.			Curve data contains: radius, arc length, delta/central angle, curve direction (right or left) long chord (bearing and distance)
6.			Centerline stations for beginning and end of parcel
7.			Closing tolerance within State Standard (minimum 1:5,000)
8.			All calls and acreage match the plans exactly
9.			Bearing expressed in degrees, minutes, and whole seconds
10.			Acreages carried to four decimal places and rounded to three places
11.			Distances carried to three decimal places and rounded to two places
12.			Parcel requirement legal description lies within the boundaries of the property described within the title report
13.			Existing non-fee title prescriptive highway RW described with separate acreage - can be described separately or encompassed within description of the new RW requirement parcel, with acreage data broken out for both existing RW and new RW
14.			Stamped, dated, and signed by a professional land surveyor registered by the State of Idaho
15.			Electronic and original (not a copy) of legal description, typed in font size 12

I have reviewed and accepted this legal description.

District Right-of-Way Supervisor's Signature	Date

Headquarters Right-of-Way Signature	Date

Printed Name	Title

Distribution: District Right-of-Way

ITD 0131 (Rev. 4-07)
itd.idaho.gov

Plans Essential Requirements Checklist

Idaho Transportation Department – Right of Way

Project Number	Project Name
Key Number	Date

Initial each item that has been reviewed. Mark N/A for items that are not applicable.

Title Sheet – Initial each line

	District	HQ RW	
1.			Includes Highway Number, Project Number, County Name, Segment Code, Vicinity Map with North arrow, Begin and End Milepost, Key Number, Project Name. District RW Supervisor date, stamp, and signature are recommended for approval as official Right of Way plans

Total Ownership Map

	District	HQ RW	
1.			City, county, state lines are labeled; railroad, county roads are labeled; North arrow on all sheets; Sheets numbered consecutively; Correct symbols used on found and unfound monuments, new and existing alignment; Township and range, section, ¼ ¼ sections designated or government lots; All data in English units; Match lines and sheet reference
2.			Owner Data Table for each parcel includes (required): parcel number, parcel ID number, record owner name, total ownership assessed, RW required, RW existing, remainder left, remainder right, easement permanent, easement temporary
3.			Parcel ID numbers properly assigned to requirements and permanent easements
4.			Temporary easements use an "E" designator for parcel ID number if there is no other acquisition on the parcel. Example: Key number, then "E" and parcel number (7771E01)
5.			LPA parcels use an "L" designator for the parcel ID number. Example: Key number, then "L" and parcel number (6495L02)
6.			Acreage for requirement matches acreage data in legal description (required)
7.			Advanced purchased parcels identified by an asterisk with an explanation
8.			Information only parcels are labeled "info only" and identified by an asterisk
9.			Data table color-coded across entire tabulation block and matches parcel colors on all plan sheets. (For legibility, use transparent pastel colors over text and use contrasting colors on adjacent parcels.)

Plan Sheets

	District	HQ RW	
1.			City, county, state lines are labeled; railroad, county road, city streets are labeled; North arrow on all sheets; Sheets numbered consecutively; Correct symbols used on found and unfound monuments, new and existing alignment; Township and range, section, ¼ ¼ sections designated or government lots; All data in English units; Match lines and sheet reference
2.			All waterways (rivers, lakes, canals, etc.) are labeled and include flow direction and current ordinary high water/meander line
3.			Railroad name, right-of-way, and any existing ITD encroachment are labeled
4.			Correct symbols for all RW lines; township, range, section, ¼ ¼ sections or government lots; Subdivision name, lots, blocks, tracts, and dimensions of subdivision lots are labeled

5.			Road closure symbol and disposition of existing road are labeled abandoned or obliterated
6.			Profile sheets, including profile of approaches having a cut or fill height of three feet or greater
7.			If the established scale standards allow, identify (show and label) all improvements on a parcel within 200 feet of the RW line, including, but not limited to, houses, sheds, wells, septic tanks, drain fields, fences, trees, signs
8.			Irrigation facilities, including but not limited to, pumps, underground lines, pivot systems, ditches with flow direction, and structures
9.			Curve data contains radius, arc length, delta/central angle, curve direction (right or left), long chord (bearing and distance)
10.			Access control symbols, existing and proposed. If overlap, show proposed access control symbol
11.			Station and offsets for all points where bearings and distances change
12.			Beginning and ending station and offset data for all requirement parcels, including permanent easements
13.			Approach locations, widths, and types (Types: single family residential, multi-family residential, farm field, canal approach, light commercial, heavy commercial, public approach, boulevard, joint use - Pursuant to ITD Administrative Policy A3-03 and ITD Access Policy Manual)
14.			All existing approaches to be closed are labeled
15.			Points of commencement and beginning with metes and bounds match legal descriptions (Must be a found corner or point), including bearings and distances from commencement to beginning
16.			Metes and bounds shown on the full perimeter of requirement parcels match legal descriptions
17.			To match Total Ownership Map: Parcel number color-coded within the parcel (use arrow if parcel too small), property lines color-coded, parcel requirements color-coded, easements cross hatched in color
18.			Easements are labeled for specific use (ditch construction, embankment, approach, utilities relocation, etc.), width, and stationing. Irregular shaped easements must have bearings and distances shown
19.			Property depicted on plans lies within the legal description of the property described in the title report
20.			Items that are to be retained and protected or removed within the right-of-way acquisition are labeled
21.			Project beginning and ending milepost with station equations on appropriate sheets

I have reviewed and stamped the plans and recommend for approval.

District Right-of-Way Supervisor's Signature	Date

I have reviewed and stamped the plans as official right-of-way plans.

Headquarters Right-of-Way Signature		Date
Printed Name	Title	

ITD 0210 (Rev. 1-04)

Hydraulics Structures Survey

A hydraulic report should accompany this form for natural streams with Q_{50} of 500cfs (14 m^3/s) or more and canals.

Project No.	Key No.	Station	Date

Project Title	Local Name

Location	County

Roadway Identification

Crossing ☐ Creek ☐ River ☐ Canal	A Tributary Of

HYDROLOGIC DATA

Hydrology Methods Used to Determine Design Flows ☐ USGS Website ☐ Flood Insurance Study ☐ USGS Regression Equations ☐ Other (Describe)

Description of Watershed

Drainage Basin Area ☐ mi^2 (km^2) ☐ acres (m^2)	Community Name	
Flood Insurance Rate Map (FIRM) Panel No.*	Regulatory Floodway ☐ Yes ☐ No	If Yes, Floodway Map Panel No.*

*Attach 8 1/2" x 11" copy of map panel at the structure location.

STREAM DATA

☐ Natural Stream ☐ Canal	Months Dry, If Any	Streambed Elevation of Structure	Streambed Slope (ft/ft)

Stream Carries an Appreciable Amount of Ice ☐ Yes ☐ No	Ice Thickness in (mm)	Stream Carries an Appreciable Amount of Driftwood ☐ Yes ☐ No

Character of Streambed ☐ Stable ☐ Agrading ☐ Degrading ☐ Headcutting	Describe Streambed

Flow Controlled ☐ Upstream ☐ Downstream	If Controlled, Explain

EXISTING STRUCTURE

☐ Bridge ☐ Culvert (Describe the Bridge or Culvert)

General Condition	Year Constructed

Describe Any Existing Adverse Conditions

Type of Bridge Piers ☐ Spread Footings ☐ Piles	Number of Piers	Bridge or Culvert Type	Structure Dimensions, Diameter, Etc.

Total Bridge Opening Area Normal to Channel ft^2 (m^2)	Bridge Clearance Above Q_{50} High Water ft (m)	Velocity Through Structure fps (m/s)

Existing Culvert Carried Flow Adequately ☐ Yes ☐ No	If No, Explain

Distribution: Consultant – Signed Original to Project Development Engineer or Consultant Agreement Administrator
District – Signed Original to Hydraulics Engineer

No additional copies required

ITD 0210 (Rev. 1-04)

Hydraulics Structures Survey

DESIGN FLOW DATA			
Flood	**Discharge**	**Water Surface Elevation**	**Velocity**
Design [Q]*	cfs (m^3/s)	ft (m)	fps (m/s)
Base [Q_{100}]	cfs (m^3/s)	ft (m)	fps (m/s)
Scour [Q_{500}]	cfs (m^3/s)	ft (m)	fps (m/s)
Canal Flow	cfs (m^3/s)	ft (m)	fps (m/s)

*Use Q_{50} for bridges and culverts 12 ft (3600mm) or more in width/diameter and for open bottom culverts. Use Q_{25} for all other culverts.

PROPOSED BRIDGE		
Type	Ordinary High Water Elevation ft (m)	Number and Length of Spans
Skew Angle °	Calculated Riprap Size, D_{50} ft (m)	Bottom of Girder Elevation ft (m)
Flow Angle to Pier °	Calculated Contraction Scour Depth ft (m)	Q_{50} Water Surface Elevation ft (m)
Streambed Material Size, D_{50} in (mm)	Calculated Pier Scour Depth ft (m)	Q_{50} Freeboard ft (m)

PROPOSED CULVERT		
Type	Dimensions	Inlet Type
Culvert Flowing Under ☐ Inlet Control ☐ Outlet Control	Invert Inlet Elevation ft (m)	Outlet Elevation ft (m)
Outlet Protection Required ☐ No ☐ Yes	Tailwater Elevation ft (m)	Bottom of Gravel Course Elevation ft (m)
Channel Change ☐ No ☐ Yes	Tailwater Depth ft (m)	Calculated Headwater Elevation (HW) ft (m)
Energy Dissipater (If Yes, Describe) ☐ No ☐ Yes	Culvert Slope ft/ft	Bottom of Gravel Course Freeboard ft (m)
Riprap Required (If Yes, D_{50}) ☐ No ☐ Yes ft (m)	Finished Grade Elevation Centerline Roadway	HW/D Ratio
Proposed Culvert Will Carry the Base Flood (Q_{100}) Without Overtopping the Roadway ☐ No ☐ Yes		

In addition to the above information, submit and check each of the following that apply.

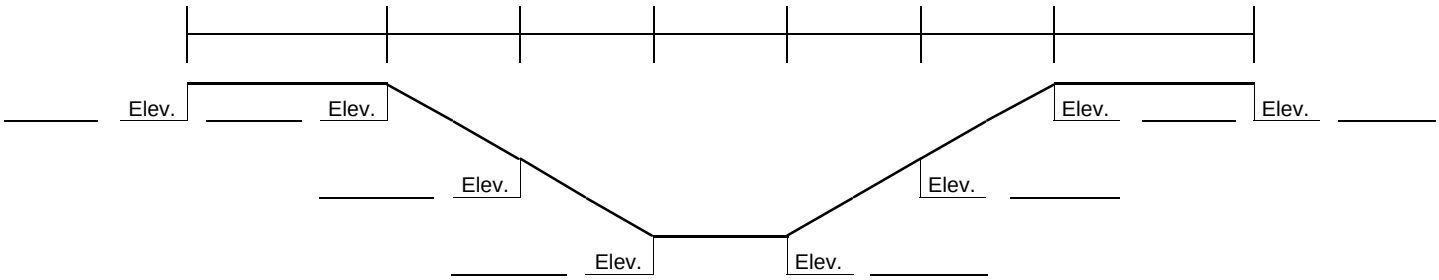
- ☐ A typical proposed roadway section at the structure.
- ☐ A 11" x 17" (279 mm x 432 mm) contour map of the structure site showing 1 foot (300 mm) contours.
- ☐ A centerline profile to the same scale as the contour map.
- ☐ A vicinity map, such as a county map, with the location of the structure clearly indicated.
- ☐ A streambed profile 500 to 1,000 feet (150 to 300 meters) above and below the structure.
- ☐ Riprap details (typical section, limits, size, toe embedment, etc.) for proposed locations.
- ☐ Photographs of the existing structure and channel upstream and downstream from the site.
- ☐ Channel change or canal lining details (typical section, plan and profile, and limits).
- ☐ Computations for scour based on Q_{sc} or canal flow. (Attach HEC-RAS contraction scour and, if applicable, pier scour report.)
- ☐ Hydraulic report. (See Design Manual for format.)
- ☐ Letter of approval from canal company or irrigation district.
- ☐ Floodplain Development Permit from the city/county if the structure is located in the 100-year floodplain.

Distribution: Consultant – Signed Original to Project Development Engineer or Consultant Agreement Administrator
District – Signed Original to Hydraulics Engineer

No additional copies required

Hydraulics Structures Survey

Remarks/Sketches (Dimensions in ☐ Feet ☐ Meters)



Channel Cross Section at Upstream Face of Proposed Bridge (From HEC-RAS)

Prepared By	Title
Consultant's Signature and Seal	
Approved by Project Development Engineer or Consultant Agreement Administrator	
Approved by Hydraulics Engineer	Approved by Roadway Design Engineer

Distribution: Consultant – Signed Original to Project Development Engineer or Consultant Agreement Administrator
District – Signed Original to Hydraulics Engineer

No additional copies required

Project Charter

Idaho Transportation Department

ITD 0332 (Rev. 08-11)
itd.idaho.gov

Project Information

Key Number	Project Number	Project Name			
District/Section/Division	**Highway Route**	**Beginning Mile Post**	**Ending Mile Post**	**Program Number**	**Fiscal Year**

This Project Charter is a living document that provides a high-level project description, defines specific project parameters and will be utilized throughout the life of a project – from the Evaluation Phase to the Development Phase and into the Implementation Phase. In addition, it serves as a contract between the Project Team and the Project Sponsors, stating what will be delivered according to the budget, time constraints, risks, resources, and standards agreed upon for the project.

- Completion and Approval of the Project Charter in the **Evaluation Phase** authorizes and initiates a project. It also serves as Concept Approval for PM, 1R and 3R paving and minor widening projects. Refer to the Roadway Design Manual, Appendix A, for specific design criteria and standards.

  Therefore, in the **Evaluation Phase** there is great responsibility to define the project parameters and assumptions before a project is programmed into the Capitol Investment Program (CIP).

  DOH's **Evaluation Phase** includes project prioritization, selection, and programming tasks.

- The **Development Phase** reviews the project information contained in the Project Charter and updates it as necessary, but also customizes the sections pertinent to this phase of work.

  DOH's **Development Phase** includes environmental and design tasks.

- The **Implementation Phase** reviews the project information contained in the Project Charter and updates it as necessary, but also customizes the sections pertinent to this phase of work.

  DOH's **Implementation Phase** includes contracting and construction tasks.

All sections in this form are required, although the level of detail may vary depending on project complexity. The Project Charter is intended to improve delivery, accountability, and establish a baseline for the project.

Project Charter Version Control

Version	Date	Author	Change Summary	Sponsor Initials	Owner Initials

TABLE OF CONTENTS

1 Evaluation Phase

1.1 Project Objective Statement

1.2 Business Case/Strategic Alignment/Performance Measure

1.3 Scope of Work (Attach Vicinity Sketch)

1.4 Environmental Considerations

Anticipated Environmental Document/Decision

☐ EE/Cat Ex ☐ EA/FONSI ☐ EIS/ROD

Narrative

1.5 Design Standards

Project Type						
Project Standards	☐ AASHTO	☐ 3R	☐ 1R	☐ State	☐ PM	☐ Other - _____

Pavement Type (Attach Typical Section)				
AASHTO Standard Width	3R Standard Width	State Standard Width	ITD Standard Width **Corridor Plan*	Other Standard Width

Design Data			
Proposed Design Vehicle	Design Year	Posted Speed	Design Speed

Traffic ADT		Traffic DHV		Clear Zone	
Present	Future	Present	Future	Cut	Fill

Accident History	
Accident Base Rate (ACC/MV)	Existing Accident Rate within Project Limits (ACC/MV)
Spot Locations within Project Limits that exceed the Base Rate (list Milepost)	

1.6 Funding and Cost Summary

Source of Funding	Amount

Estimated Project Cost (in thousands)	FY __	FY __	FY __	FY __	FY __	Comments
Development (PE, PC)						
Right-of-way (RW, LP)						
Utilities (UT)						
Construction (CE, CC, CN)						

1.7 Resource Plan (Attach Milestone/Major Task Schedule)

Project Design Services	
☐	All design work anticipated to be accomplished in-house within project's District
☐	All/Some design work anticipated to be accomplished by another District / Consultant

Narrative

1.9 Project Organizational Chart

Project Sponsor

Project Owner

Project Manager

Stakeholders (Organization or Individual)	Interest or Involvement in Project

1.10 Exit Criteria

Exit Criteria	Complete		Comments
Project Charter – Evaluation Phase Complete	Y/N		
Project Included in STIP	Date		

1.11 Project Approvals

Evaluation Phase Completion Acceptance

Project Manager's Name (Printed)	Project Manager's Signature	Date
Project Owner's Name (Printed)	Project Owner's Signature	Date
Project Sponsor's Name (Printed)	Project Sponsor's Signature	Date

Once complete and approved, the Evaluation Phase Project Charter allows a project to be included in the Draft STIP. The Evaluation Phase Project Charter serves as Concept Approval for PM, 1R and 3R paving and minor widening projects. The completed Evaluation Phase Project Charter will be transferred to the Development Phase Project Manager for review and updating as necessary.

2 Development Phase

2.1 Project Objective Statement

2.2 Business Case/Strategic Alignment/Performance Measure

2.3 Scope of Work (Attach Vicinity Sketch)

2.4 Environmental Considerations

Need

Indicate the **primary** need below with **xx** and **other relevant items** with **+**

_____ Maintenance _____ System Linkage _____ Traffic Flow

_____ Deficient - structurally _____ Safety _____ Enhancement

_____ Deficient - standards _____ Capacity _____ Other _____

Major Environmental Deliverables

☐ EE/Cat Ex ☐ EA/FONSI ☐ EIS/ROD

Cultural

- ☐ Field Survey and/or Test Investigations
- ☐ Archaeological & Historic Survey Report
- ☐ Determination of Adverse Effect Report
- ☐ Memorandum of Agreement
- ☐ Mitigation

Section 4F

- ☐ Section 4f Deminimus
- ☐ Section 4f Evaluation incl. Alternatives Analysis

Noise, Air Quality and HazMat

- ☐ Modeling
- ☐ Noise Report
- ☐ Barrier Analysis
- ☐ Air Quality Report
- ☐ Haz Mat Phase 1

Miscellaneous

- ☐ LWCF Recreation Areas/6(f) Lands Report
- ☐ Visual Impact Report
- ☐ Prime Farmland Report
- ☐ Environmental Justice Report
- ☐ FAA Airspace Intrusion

Wetlands/Stream Alteration

- ☐ Field Survey
- ☐ Wetland Report (Jurisdictional Determination)
- ☐ Delineation
- ☐ Permit Application
- ☐ Mitigation Plan
- ☐ Mitigation

Navigable Waters

- ☐ Navigable Waters Permit Application

Floodway/Floodplain

- ☐ Field Survey
- ☐ Floodplain Encroachment Report
- ☐ Floodplain Encroachment Permit App
- ☐ Floodway Encroachment Report
- ☐ Sole Source Aquifer Packet

Species And Habitat

- ☐ No Effect Report
- ☐ Biological Assessment
- ☐ Wildlife, Migratory Birds, Mag-Ste Fisheries

Stormwater

- ☐ Stormwater Pollution Prevention Plan

Environmental Narrative

2.5 Design Standards

Project Oversight ☐ Full ☐ Exempt

Design Exceptions
Standards Revised After Evaluation Phase Approval

2.6 Funding and Cost Summary

Source of Funding	Amount

Estimated Project Cost	FY __	FY __	FY __	FY __	FY __	Comments
Development (PE, PC)						
Right-of-way (RW, LP)						
Utilities (UT)						
Construction (CE, CC, CN)						

2.7 Resource Plan

Project Design Services	
☐	All design work anticipated to be accomplished in-house within project's District

Project Design Services	
☐	All/Some design work anticipated to be accomplished by another District ☐ ITD 2760 – Request for District or Consultant Services completed and attached
☐	All/Some design work anticipated to be accomplished by Consultant ☐ ITD 2760 – Request for District or Consultant Services completed and attached
☐	Project Schedule Complete and Loaded in Project Scheduling System

Narrative

2.8 Project Constraints

Project Constraints refer to the critical factors that may impede or contribute to the success of a project.
Designate what priority is assigned to each of the following categories. Indicate only one "High" and one "Low" priority.

	Scope	Schedule	Budget
High			
Medium			
Low			

Narrative

2.9 Project Organizational Chart

Project Sponsor

Project Owner

Project Manager

Project Team Role and Name(s)	Responsibilities

Stakeholders (Organization or Individual)	Interest or Involvement in Project

2.10 Exit Criteria

Exit Criteria	Complete		Comments
Milestone Deliverables Completed on Schedule	Y/N		
PS&E Package Delivered	Date		
Contract Awarded	Date		
On Schedule (per approved)	Y/N		
On Budget (within 10 %)	Y/N		
Within Approved Scope	Y/N		

2.11 Project Approvals

Development Phase Completion Acceptance

Project Manager's Name (Printed)	Project Manager's Signature	Date
Project Owner's Name (Printed)	Project Owner's Signature	Date
Project Sponsor's Name (Printed)	Project Sponsor's Signature	Date

The completed Development Phase Project Charter will be transferred to the Implementation Phase Project Manager for review and updating as necessary.

3 Implementation Phase

3.1 Project Objective Statement

3.2 Business Case/Strategic Alignment/Performance Measure

3.3 Scope of Work (Attach Vicinity Sketch)

3.8 Project Constraints

Project Constraints refer to the critical factors that may impede or contribute to the success of a project. Designate what priority is assigned to each of the following categories. Indicate only one "High" and one "Low" priority.

	Scope	Schedule	Budget
High			
Medium			
Low			

Narrative

3.9 Project Organizational Chart

Project Sponsor

Project Owner

Project Manager

Project Team Role and Name(s)	Responsibilities

Stakeholders (Organization or Individual)	Interest or Involvement in Project

3.10 Exit Criteria

Exit Criteria	Complete (Y/N)	Comments
Milestone Deliverables Completed on Schedule		
Objective Met or Underway		
On Schedule		
On Budget (Within 105%)		
Within Scope		

3.11 Project Approvals

Implementation Phase Completion Acceptance

Project Manager's Name (Printed)	Project Manager's Signature	Date
Project Owner's Name (Printed)	Project Owner's Signature	Date
Project Sponsor's Name (Printed)	Project Sponsor's Signature	Date

The completed Implementation Phase Project Charter will summarize the life of the Project and can be used during the project closeout process.

ITD 0602 (Rev. 9-08)

Crossing Evaluation Report

DOT No.	Rank	Street/Road Name	City	County	Priority Index	Review Date

Diagnostic Review

Diagnostic Team

1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Can two or more trains occupy crossing at the same time? ☐ Yes ☐ No

Can one train block the view of another train at the crossing? ☐ Yes ☐ No

Crossing Surface

Track No.	Track Type	Rail Weight	Surface Width	Surface Material

Existing Roadway Data

Agency having jurisdiction:

Shoulders	☐ Yes	☐ No	School Bus Operation	☐ Yes	☐ No	Roadway Width
Sidewalk	☐ Yes	☐ No	Hazardous Material	☐ Yes	☐ No	Roadway Condition
Pedestrians	☐ Yes	☐ No	Curb and Gutter	☐ Yes	☐ No	Roadway Surface

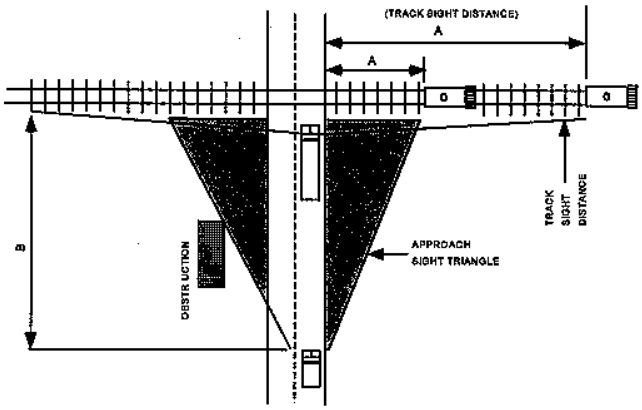
Five-Year Accident Data

Date	Fatality	Injury	Property Damage Only
Totals			

Adjacent Crossing (*Only If Closure Proposed*)

DOT Number:	Street/Road Name	Warning Device	AADT

DOT Number:		



Distance (d_T) Along Railroad from Crossing (feet)

Vehicle Speed (mph) → / Train Speed (mph)	0	10	20	30	40	50	60	70
10	240	145	105	100	105	115	125	135
20	480	290	210	200	210	225	245	270
30	720	435	310	300	310	340	370	405
40	960	580	415	395	415	450	490	540
50	1200	725	520	495	520	565	615	675
60	1440	870	620	595	620	675	735	810
70	1680	1015	725	690	725	790	860	940
80	1920	1160	830	790	830	900	980	1075

Distance (d_H) Along Highway From Crossing "B" (feet)

NA	70	135	225	340	490	660	865

Note: All calculated distances are rounded up to next higher 5-foot increments.

Sight Distance				Stopped Vehicle Sight Distance			
Maximum Train Speed	mph	Required Distance "A"	ft	Posted Highway Speed	mph	Required Distance "B"	ft

Northwest Quadrant	Northeast Quadrant
Sight Obstruction:	Sight Obstruction:
Actual Distance:	Actual Distance:
"B" = ft	"B" = ft

Southwest Quadrant	Southeast Quadrant
Sight Obstruction:	Sight Obstruction:
Actual Distance:	Actual Distance:
"B" = ft	"B" = ft

Proposed Cost Apportionment (Funding Ratio)

Type of Improvement	Yes	No	Proposed Funding: Federal	State	Local	Railroad	Other	Work to be Performed By
Site Improvement	☐	☐						
Crossing Surface	☐	☐						Railroad Company
Crossing Signals	☐	☐						Railroad Company
Crossing Closure	☐	☐						
Illumination	☐	☐						
Roadway Approaches	☐	☐						
Traffic Signal	☐	☐						
Preliminary Engineering	☐	☐						

Comments

DOT Number:

Recommendations

Are improvements to the crossing recommended? ☐ Yes ☐ No

If no, explain:

Type of Improvement	Yes	No	Describe
Site Improvement	☐	☐	
Crossing Surface	☐	☐	
Signals and Detection	☐	☐	
Crossing Closure	☐	☐	
Illumination	☐	☐	
Roadway Approaches	☐	☐	
Traffic Signals	☐	☐	
Other	☐	☐	

If yes, what improvements?

DOT Number:	**Site Photos**

Current Access Purchase Determination

Idaho Transportation Department

ITD 0606 (Rev. 03-13)
itd.idaho.gov

1. Complete all blanks as indicated.
2. Refer to "Right-of-Way Memo: Access Control, Board Policy 4005, and IDAPA Rule 39.03.42" for further information.
3. Indicate the units under "Limits" as either Milepost (MP) or Station (Sta.)
4. Provide justification for the proposed limits of Access Purchase. Attach Traffic Impact Study as needed.
5. Attach an 8 1/2" x 11" Vicinity Map showing the limits of purchased access if the limits are not readily understood (e.g., an interchange or major intersection).
6. Complete the ITD 0606 and send a copy to Headquarters Right-of-Way in concurrence with the Right-of-Way plans.

Key Number	Project Number	Location	District

Route Number	Highway Access Type (see IDAPA 39.03.42)	Design Year	ADT	DHV	Design Speed

Access Purchased

Limits	Justification for Purchase

Remarks

Recommended By

District Traffic Engineer	Date
District R/W Property Mgr	Date
District PDE	Date

Approved By

District Engineer	Date

Distribution: Original - District Project File Copies - HQ ROW HQ Traffic DCM

Types of Access Spacing

Effective December 12, 2012, the Idaho Board approved Board Policy 4005 - Management of Department-Owned Property, which incorporated the recently revised IDAPA Rule 39.03.42 - Rules Governing Right-of-Way Encroachments on State Rights-of-Way.

Under the revised IDAPA Rule 39.03.42, all routes on the State Highway System are classified into one of six tiers; Interstate, Freeway, Expressway, Statewide, Regional, and District. Segments of highway are further classified according to whether they are rural, transitional, urban high-speed, or urban low-speed. A map of these classifications is attached to this memo and is available at: September 2012 Access Map.

Any existing access removed during a highway project shall be documented on the right-of-way documents and the "As Constructed" plans.

To maintain system capacity, safety and efficiency, maximize signal progression, and minimize delays to the traveling public, all approaches and signals shall be spaced in accordance with ITD standards. Variances to the spacing standards shall be handled as follows (from IDAPA 39.03.42):

The District Engineer shall have the authority to approve a decrease in the minimum access spacing distances set forth in Table 1, provided that the basis for any exception is justified and documented. The basis for the exception may include overriding economic opportunity considerations. For any exception that would result in a decrease in access spacing of more than ten percent (10%) of the distances set forth in Table 1, a Traffic Impact Study will be required in order to determine whether auxiliary lanes or other appropriate mitigation must be included in the permit's conditions. (10-1-12)T

A copy of this required documentation shall be available in the Project File.

Idaho Administrative Code IDAPA 39.03.42 - Rules Governing Highway Right-of-Way
Idaho Transportation Department Encroachments on State Rights-of-Way

Table 1 – Access Spacing*

Highway Type	Area Type	Signalized Road Spacing	Public Road Spacing **(A)**	Driveway Distance Upstream from Public Road Intersection **(B)**	Driveway Distance Downstream from Unsignalized Public Road Intersection **(C)**	Distance Between Unsignalized Accesses Other Than Public Roads **(D)**
Interstate	All	Accessible only by interchanges (ramps) and requires approval by the Board and Federal Highway Administration				
Freeway	All	Accessible only by interchanges (ramps)				
Expressway	All	Accessible only at locations specified by the Department				
Statewide Route	Rural	5,280 ft.	5,280 ft.	1,000 ft.	650 ft.	650 ft.
	Transitional	5,280 ft.	2,640 ft.	760 ft.	500 ft.	500 ft.
	Urban >35 mph	2,640 ft.	1,320 ft.	790 ft.	500 ft.	500 ft.
	Urban <35 mph	2,640 ft.	1,320 ft.	790 ft.	250 ft.**	250 ft.**
Regional Route	Rural	5,280 ft.	2,640 ft.	1,000 ft.	650 ft.	650 ft.
	Transitional	2,640 ft.	1,320 ft.	690 ft.	360 ft.**	360 ft.**
	Urban >35 mph	2,640 ft.	660 ft.	660 ft.	360 ft.**	360 ft.**
	Urban <35 mph	2,640 ft.	660 ft.	660 ft.	250 ft.**	250 ft.**
District Route	Rural	2,640 ft.	1,320 ft.	760 ft.	500 ft.	500 ft.
	Transitional	2,640 ft.	660 ft.	660 ft.	360 ft.**	360 ft.**
	Urban >35 mph	1,320 ft.	660 ft.	660 ft.	360 ft.**	360 ft.**
	Urban <35 mph	1,320 ft.	660 ft.	660 ft.	250 ft.**	250 ft.**

*Distances in table are minimums based on optimal operational and safety conditions such as adequate sight distance and level grade. Definitions of spacing designated by (A), (B), (C), and (D) are represented on Figure 1.

**Where the public road intersection or private access intersection is signalized, the distances in the table are for driveways restricted to right-in/right-out movements only. For unrestricted driveways the minimum distance shall be 500 feet from a signalized intersection.

ITD 0652 (Rev. 1-08)
itd.idaho.gov

Hazardous Material (HM) Administrative Review

Complete all sections. Attach additional sheets and/or maps as needed to provide information pertinent to the proposed project.

Key Number	Project Number	District

Project Name/Location

Mark features involved in this project

☐ New R/W	☐ Subsurface utility relocation
☐ Excavation	☐ Structures (buildings, bridges, etc.)
☐ Railroad involvement	☐ Other (list):

Contacts *(Contact each of the following and provide information below)*

	Contact Name	Date	Summary
EPA			
DEQ			
Health Dept.			

Review of Published Lists *(Review all lists. Check off as they are reviewed and note findings in right hand column)*

☐ NPL	
☐ CERCLIS	
☐ CERCLIS/NFRAP	
☐ RCRA Corrective Actions	
☐ RCRA TSD	
☐ RCRA Generators	
☐ ERNS	
☐ SWLF	
☐ LUST	
☐ UST	

Windshield Survey *(List and comment on suspect land uses/operations identified.)*

Person(s) Performing Survey	Survey Date

Results

HM conclusion (*No evidence or low probability of encountering HM; evidence of probable HM (Phase I), warrants more detailed assessment/sampling/testing (Phase II); site will be avoided without further analysis, etc.*)

HM Review Conducted By (Print Name)	Company

Signature	Date

ITD 0654 (Rev. 1-08)

Environmental Evaluation

Key Number	Project Number	Program	Project Name	Date

District	City/County	Route Number	Beginning Milepost	Ending Milepost	Program Year

Acres of New Public R/W	Acres of New Private R/W	(Discuss the existing use of R/W to be acquired, plus adjacent land use, zoning, development plans, etc. on attached Environmental Summary Sheet)

Tribal Impact
☐ Cultural ☐ Archeological ☐ Reservation ☐ None

Public Interest Expected?
☐ Yes ☐ No

Air Quality
☐ Attainment Area ☐ Non-Attainment Area ☐ CO ☐ PM Exempt Project ☐ Yes ☐ No

Type One Project (i.e., New Location, Substantial Alignment Change, Addition of a Through-Traffic Lane) ☐ Yes ☐ No

Construction Impacts Requiring Special Provisions (Enter Details on Reverse Side) ☐ Yes ☐ No

Program Year				Design Year			
ADT	DHV	% Trucks	Posted Speed	ADT	DHV	% Trucks	Posted Speed

Distance of Nearest Noise Receptor to Centerline
Existing Proposed

Project Purpose and Benefits

Double mark (xx) only the item that best describes the Primary Reason for Proposing this Project
Single mark (x) all Other Relevant Items

___ Maintain/Improve User Operating Conditions
___ Maintain/Improve Traffic Flow
___ Time Savings
___ Increase Capacity
___ Reduce Congestion
___ Reduce Hazard(s)
___ Reduce Highway User Operating Costs
___ Other, List (e.g., Driver Convenience and Comfort regarding Rest Area Projects)

___ Enhance Accessibility for the Disabled/Safety
___ Enhance Pedestrian Safety and/or Capacity
___ Enhance Bicycle Safety and/or Capacity
___ Traffic Composition Enhancement (e.g., Truck Route, HOV Lane, Climbing Lane)
___ Visual/Cultural Enhancement (e.g., Landscaping, Historic Preservation)
___ Environmental Enhancement (e.g., Air Quality, Noise Attenuation, Water Quality)
___ Economic Prudence (e.g., Repair Less Expensive than Replacement, B/C Ratio)

Check Any of the Following That Require Avoidance, Minimization, or Discussion (If Yes, describe in the Environmental Document or CE)

		Yes	No
1.	Noise Criteria Impacts*	☐	☐
2.	Change in Access or Access Control	☐	☐
3.	Change in Travel Patterns	☐	☐
4.	Neighborhood or Service Impacts	☐	☐
5.	Economic Disruption	☐	☐
6.	Inconsistent W/Local or State Planning	☐	☐
7.	Minorities, Low Income Populations	☐	☐
8.	Displacements*	☐	☐
9.	Section 4(f) Lands-DOT Act 1966* (i.e., Public Parks/Rec Areas/Trails, Wildlife/Waterfowl Refuges, Wild or Scenic Rivers, Historic Sites/Bridges, Archaeological Resources	☐	☐
10.	LWCF Recreation Areas/6(f) Lands*	☐	☐
11.	Section 106-Nat. Hist. Preserv. Act*	☐	☐
12.	FAA Airspace Intrusion**	☐	☐
13.	Visual Impacts	☐	☐
14.	Prime Farmland*, Parcel Splits	☐	☐
15.	Known/Suspected "Hazmat" Risks	☐	☐
16.	Wildlife/Fish Resources/Habitat**	☐	☐

		Yes	No
17.	Threatened/Endangered Species*	☐	☐
	☐ Listed ☐ Proposed	☐	☐
18.	Air Quality Impacts	☐	☐
19.	Inconsistent With Air Quality Plan	☐	☐
	☐ SIP ☐ TIP		
20.	Stream Alteration/Encroachment**	☐	☐
	☐ IWDR ☐ F&G ☐ COE (404)		
21.	Flood Plain Encroachment*	☐	☐
	☐ Longitudinal ☐ Traverse		
22.	Regulatory Floodway	☐	☐
	☐ PE Cert. & FEMA Approval ☐ Revision		
23.	Navigable Waters**	☐	☐
	☐ CG (Sec 9) ☐ COE (Sec 10) ☐ Dept. Lands		
24.	Wetlands*	☐	☐
	☐ Jurisdictional** (404) ☐ Non-Jurisdictional		
25.	Sole Source Aquifer	☐	☐
	☐ Exempt Project ☐ Non-Exempt**		
26.	Water Quality, Runoff Impacts	☐	☐
27.	NPDES-General Permit	☐	☐
	(If no, complete sediment-erosion control plan)		

*If yes to these items, supplemental reports or documentation are required (e.g., Relocation Report; Wetlands Determination/Finding; Fish and Wildlife Species List Update; SCS Form AD-1006, *Biological Assessment*, etc.)

**If yes to these items, a letter of input is required from the appropriate agency.

Recommendation

☐ A. The project does not individually or cumulatively have a significant adverse effect on the human environment (Categorical Exclusion) ☐ 23 CFR 771.117(c), i.e., Special and Programmatic ☐ 23 CFR 771.117(d), i.e., FHWA Approval
☐ B. There is insufficient information to support A above or no precedent exists. (Environmental Assessment)
☐ C. The project will result in a significant effect on the human environment. (Environmental Impact Statement)

Prepared By (Consultant, District Environmental Planner, or LHTAC Signature*)	Date
Reviewed By (District Environmental Planner, Project Development Engineer, or LHTAC Signature*)	Date

***One Signature by a Planner and one by Engineer or Consultant**

Construction Impacts Requiring Special Provisions

Project Description (if not attached)

Roadway Inventory

Idaho Transportation Department

Project Number	Project Title	Key Number

Vertical Alignment Proposed Design Speed: _____ Safe Stopping Distance at Design Speed: _____

Milepost to Milepost	Length of VC*	K*	Stopping Sight Distance (Speed)	Action Needed to Meet Standards	Recommended Action (by District)	Final Action (by Roadway Design)

*As shown on "as constructed" plans or as determined from field survey.

S.S.D. for crest VC's: When S<L, $S=(2158\ L/A)^{0.5}$. When S>L, $S=0.5\ (L + 2158/A)$. Ref. AASHTO Green Book.

S.S.D. for sag VC's: When S<L, $S=(3.5\ L + ((3.5\ L)^2 + 1600\ AL)^{0.5})/2A$. When S>L, $S=(AL + 400)/(2A - 3.5)$. Ref. AASHTO Green Book.

Horizontal Alignment Proposed Design Speed: _____ Safe Stopping Distance at Design Speed: _____

Milepost to Milepost	Degree of Curve*	Spiral Length*	Safe Speed*	Super*	Action Needed to Meet Standards	Recommended Action (by District)	Final Action (by Roadway Design)

*As shown on "as constructed" plans or as determined from field survey.
Safe Speed: $V=(15\ R(e/100 + f))^{0.5}$. Ref. AASHTO Green Book *or* as posted from ball bank determinations.

Structures

Milepost to Milepost	Length	Deck* Width C-C	Vert. Clear.*	Horizontal Clearance*		Loading Design	Suffi-ciency Rating*	Bridge Rail*	Shoulder Width*		Action Needed to Meet Standards	Recommended Action (by District)	Final Action (by Roadway Design)
				LT	RT				LT	RT			

*As shown on "as constructed" plans or as determined from field survey.

Note: Approach guardrail on page 6.

Drainage Facilities

Milepost to Milepost	Pipe Size*	Pipe Material*	Distance*		End Treat-ment*	Fill Slope*	Action Needed to Meet Standards	Recommended Action (by District)	Final Action (by Roadway Design)
			LT	RT					

*As shown on "as constructed" plans or as determined from field survey.

Roadside Obstacles (Ditches, Fences, Rock Outcrops, Etc.)*

Milepost to Milepost	Type of Obstacle	Distance**		Slope Rate		Clear Zone	Action Needed to Meet Standards	Recommended Action (by District)	Final Action (by Roadway Design)
		LT	RT	Cut	Fill				

*As determined from field survey.
**From edge of travelway.

Guardrails

Milepost to Milepost	LT*	RT*	Type*	HT.*	Block Out*	End Treatment*			Action Needed to Meet Standards	Recommended Action (by District)	Final Action (by Roadway Design)
						Type	Mound	Flare			

*As shown on "as constructed" plans or as determined from field survey.

Pedestrian And Bicycle Facilities

Milepost to Milepost	Bike or Pedestrian	Distance*	Location			Width	Curb Cuts	Action Needed to Meet Standards	Recommended Action (by District)	Final Action (by Roadway Design)
			On Shldr.	Behind Curb	Free Align					

*Distance from edge of travelway.

Signs

Milepost	RT or LT	Sign			Post		Action Needed to Meet Standards	Recommendation Action (by District)	Final Action (by Roadway Design)
		Legend	Number	Size	Type	Break-away			

*As determined from field survey or sign inventory.

Illumination*

Milepost to Milepost	LT	RT	Luminaire			Pole Break-away	Action Needed to Meet Standards	Recommended Action (by District)	Final Action (by Roadway Design)
			M.H.**	Type	Watts				

*As determined from field survey and "as constructed" plans.
**M.H. = mounting height.

Utilites (Including Railroads)

Milepost to Milepost	Type of Utility	Distance*		Length	Action Needed to Meet Standards	Recommended Action (by District)	Final Action (by Roadway Design)
		LT	RT				

*From edge of travelway.

Special Problems (Right-of-Way, Intersections, Climbing Lanes, Environmental, Etc.)*

Milepost to Milepost	Type of Problem	SSD**	Action Needed to Meet Standards	Recommended Action (by District)	Final Action (by Roadway Design)

*As determined from field survey.
**SSD = Stopping sight distance.

Proposed Design Exceptions (Describe and Justify all Design Exceptions to the AASHTO Green Book and ITD Standards)

ITD 0767 (Rev. 4-05)
itd.idaho.gov

Project Quality Evaluation

Idaho Transportation Department

This form must be completed by the Resident/Regional Engineer for all consultant designed projects upon final inspection. Distribute the completed form as shown below.

Dist	Project Number	Location	Agreement Number	Consultant

Date	Work Description	Resident/Regional Engineer

Overall Assessment Rating: 3 - Exceeds Satisfactory 2 - Satisfactory 1 - Unsatisfactory

Design Elements Rated	**Rating**
Field Survey - Consultant provided accurate elevations and line and grade control, including construction staking if applicable, prior to construction	
Foundation Investigation - Subsurface information reasonably reflected conditions in the field	
Errors and Ommissions - Not numerous, serious, or costly	
Design Elements - All work described; easy to read and interpret with sufficient detail; constructed as designed; well coordinated among the elements	

	Rating		**Rating**
Contract Time Determination		Roadway Plans and Profiles	
Contractor's Notes		Staging/Phasing Plans	
Special Provisions		Irrigation Drainage	
SWPP		Roadway, Bridge and Pipe Summaries	
Environmental Permits		Major Structures	
Bid Schedule		Temporary Traffic Control Plans	
Utilities/Railroad		Permanent Traffic Control Plans	
Right of Way Plans		Signals	
Typical Sections		Illumination	

Total Score

Average Rating

Comments - Explain any elements that are unsatisfactory; Use additional sheets as necessary

Resident/Regional Engineer Signature	Date	Project Development Engineer Signature	Date

Distribution: CAU; DE, ACE(D); ACE(O); RDE; Construction; ADE

ITD 1150 (Rev. 3-08)

Project Cost Summary Sheet

Round Estimates to Nearest $1,000

Key Number	Project Number	Date

Location	District

Segment Code	Begin Mile Post	End Mile Post	Length in Miles

	Previous ITD 1150	Initial or Revise
1. Preliminary Engineering		
2. Right-of-Way: Number of Parcels Number of Relocations		
3. Utility Adjustments: ☐ Work ☐ Materials ☐ By State ☐ By Others		
4. Earthwork		
5. Drainage and Minor Structures		
6. Pavement and Base		
7. Railroad Crossing:		
Grade/Separation Structure _____		
At-Grade Signals ☐ Yes ☐ No		
8. Bridges/Grade Separation Structures:		
☐ New Structure		
Location _____		
Length/Width _____		
☐ Repair/Widening/Rehabilitation		
Location _____		
Length/Width		
9. Traffic Items (Delineators, Signing, Channelization, Lighting, and Signals)		
10. Construction Traffic Control (Sign, Pavement Markings, Flagging, and Traffic Separation)		
11. Detours		
12. Landscaping		
13. Mitigation Measures		
14. Other Items (Roadside Development, Guardrail, Fencing, Sidewalks, Curb and Gutter, C.S.S. Items)		
15. Cost of Constructions (Items 3 through 14)		
16. Mobilization % of Item 15		
17. Construction Engineer and Contingencies % of Items 15 and 16		
18. Total Construction Cost (15 + 16 + 17)		
19. Total Project Cost (1 + 2 + 18)		
20. Project Cost Per Mile		

Prepared By:

ITD-1414 (Rev. 3-02)
27-081000-5

PROJECT PROGRAM ENTRY OR REVISION

ITD Board Approved _____

Date:	4/15/2004	Highway No.		FA Route No.		District	1	Key #	0002

PREVIOUSLY APPROVED

Amounts in thousands of dollars ($000)

Fiscal Year		Project No.			Project Name				
Segment Code		No. Lanes		Length		Cost/Lane-Mile		Functnl Class	
Beg. km/MP		End km/MP		Type Work					
Subclasses									
Lifetime Totals	PE	PECnslt	RW	Util	CE	Const	Total		

REQUESTED REVISION

Only Changes to Above are Shown Below

Amounts in thousands of dollars ($000)

Fiscal Year		Project No.			Project Name				
Segment Code		No. Lanes		Length	0	Cost/Lane-Mile	#Error	Functnl Class	00
Beg. km/MP	0.000	End km/MP	0.000	Type Work	0 -				
Subclasses									
Lifetime Totals	PE 0	PECnslt 0	RW 0	Util 0	CE 0	Const 0	Total 0		

This document is provided as an example only.

To submit a real 1414, please use the Project Tracking application.

Budget Code		Bridge#		RR Crossing		National Forest	
Reservation				Public Lands			
Companions					Sponsor	2900000044 - STATE OF IDAHO (ITD)	(M) ☐ (R) ☐ (G) ☐

County (1-5)	00 -	100%	00 -	0%	00 -	0%	00 -	0%	00 -	0%

HP Comment					
Est. prepared by		Date		Recommended for approval		Date	

Signature, Highway Programming Manager	Signature, Assistant Chief Engineer, Development	Signature, Chief Engineer
Date ☐ Not Approved	Date ☐ Not Approved	Date ☐ Not Approved

Route to: District __, Roadway Design (2)__, Environmental__, Financial Services__,
Bridge Design __, Bridge Inspection __, Right of Way __, Public Transportation Div __, Planning Div __, LHTAC__

ITD 1500 (Rev. 12-04)

Cultural Resource Investigation Request

Project Number	Project Title			District
Authority	Key Number	Priority	County	

Right-Of-Way	← (Complete One Only) →	Aggregate Or Borrow Sources

Project Length			Type of Source		
MP/Sta. _____	To MP/Sta. _____	Miles _____	☐ Aggregate Quarry	☐ Aggregate Pit	☐ Borrow Source
Description of Work			Source Description:		
			Legal Description:		

Cultural Resources Known in Area		Additional Information and Comments
Location	Description	
Potential for Cultural Resource Sites		
☐ High ☐ Medium ☐ Low		

Signature	Extension Number	Date

ITD 1502 (Rev. 4-06)
itd.idaho.gov

Determination Of Significance And Effect

Idaho Transportation Department – State or Tribal Historic Preservation Office

Key Number	Project Number	Project Title	
District	County		Township/Range/Section
Clearance Authorized Without Survey ☐ PA ☐ ER ☐ Review			Field Notes

Determination of Eligibility

	Site Numbers	Comments
☐ No Sites		
☐ Not Eligible		
☐ Eligible		

Determination of Effect

	Rationale	Sites/Comments
☐ No Historic Properties Affected	☐ They are outside the project area	
	☐ They are outside impact zones	
	☐ Final project plans will avoid them	
	☐ NR character will not be changed	
☐ No Adverse Effect to Historic Properties	Sites will be affected (See Comments section below or attached explanation)	
☐ Adverse Effect to Historic Properties	Sites will be affected (See Comments section below or attached explanation)	

Comments:

☐ Project will be monitored during construction due to the potential for cultural resources

Highway Archeologist's Signature	Date

SHPO or THPO 106 Comment: I have reviewed the documentation and recommendations provided by ITD and

☐ I agree with the above determination of eligibility and effect and with the conditions of compliance.

☐ I agree with the above determinations of eligibility and effect given stipulations explained below or in the attached letter.

☐ I disagree with the above determinations of eligibility and effect as explained below or in the attached letter.

State or Tribal Historic Preservation Officer's Signature	Date

Determination Of Significance And Effect

Idaho Transportation Department – State or Tribal Historic Preservation Office

SHPO or THPO 4(f) *De minimis* Comment (applies only when a determination of effect results in a *No Historic Properties Affected* or *No Adverse Effect* determination under Section 106):

☐ *De minimis* impacts related to historic sites are defined as the determination of either "no adverse effect" or "no historic properties affected" in compliance with Section 106 of the National Historic Preservation Act (NHPA). I understand that the FHWA Division Administrator or FTA Regional Administrator may make a *de minimis* impact finding for one or more Section 4(f) resources based on Section 106 findings in this document.

State or Tribal Historic Preservation Officer's Signature	Date

ITD 1983 (Rev. 8-02)

Local Public Agency's Certificate Of Completion Of Right-Of-Way Activities

Local Public Agency	Project No.	
Project Name		Key No.

PART A

The proposed construction project did not require the acquisition of additional real property rights.

☐ Check here if Part A pertains, then skip to Part C below and complete date and signature area of form.
(If Part A is not applicable, please complete Parts B and C below.)

PART B

The proposed construction project required the acquisition of additional real property rights. There were _____ ownerships involved and _____ relocations of persons as a result of said acquisitions.

I hereby certify that all acquisitions and relocations, if any, were performed in accordance with our assurances to comply with state and federal laws and regulations related to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and amendments thereto.

It is further certified that in all cases where the real property rights were obtained through donation, that the property owner(s) was fully informed of the right to receive just compensation and the owner has released our agency from its obligation to appraise the property in the event that the estimated value may exceed $2,500.00.

PART C

☐ Check here if there is no utility involvement on this project.

☐ Check here if arrangements have been made to coordinate the relocation of any/all utility facilities.

Date	Agency
Attest (Clerk or Secretary)	Chairman's, President's or Mayor's Signature

ITD 02101 (Rev. 3/01)
(For Building and Yard Projects, use ITD 02906)

Printed on: 10/22/2002

PROJECT AUTHORIZATION AND AGREEMENT

Project Tracking Report

KEY	8316	WA	T021550	Project Number	CM-0900(121)	Original		Modification	X
				Urbanized	U	STD Code	72100 C	Hwy Type	L	System	Z
District:	1	Budget Code	623190	Location	OFFSYS, LINCOLN AVE, SANDPOINT				
Auth. Yr.	2003	Inventory Route No.	OFFSYS0	Beg MP	000.000	End MP	000.000	Length	0.000M
County	(017)BONNER-100%								
SF Cost Effective		Cong. District	1	FHWA Oversight	A	RW Date		Env Date		Env Type	
Indian Res.		Public Land		Forest Hwy					

Appr. Code		Calc	Total Est. Cost	Federal Share	State Share	Other Share	Total This Issue	Fed Aid This Issue
Q400	90.00	90.00	43,000.00	38,700.00	0.00	4,300.00	24,000.00	21,600.00
			43,000.00	38,700.00	0.00	4,300.00	24,000.00	21,600.00

Type Code	G	Type of Work	ENVIRONMENTAL PRESERVATION	Rule A	Rule E

Fct.	Date	ImpTyp	Description	App.	Participating	Non-Part.
PC	11-07-01	15	Contract Work	Q400	43,000.00	0.00

Remarks: This project is being revised to increase total cost by $24,000.00 (FA-$21,600.00) from Q40 funds to cover additional PC.

Offset is from decreased CE on this project

Fund	Federal Aid Limit
CMAQ (L)	319,600

Other Name
SANDPOINT

Prepared By/Date	Approved By/Date	RD Reviewed By/Date	HP Reviewed By/Date
Don Davis	Jim Roletto	Dee Moffat	ne
10/8/2002	10/8/2002	10/10/2002	10/10/2002

Federal Projects: The State stipulates that (1) it accept and will comply with the agreement provisions set forth in 23 CFR 630.307, and (2) the signature below constitutes the making of the certifications set forth in 23 CFR 630.307.

ITD 2161 (Rev. 8-02)

Local Public Agency Project
Monthly Right-Of-Way Status Report

Complete and Return to Idaho Transportation Department

Local Sponsor	Project No.	Key No.
Project Name	Work Authority No.	
R/W Dollars Programmed	Construction Year Scheduled	

Submittal of Monthly Status Report Commences After Completion of Item 5

1. State and Local Agreement Date	6. Environmental Approval Date
2. Total Number of Parcels on Project	7. Right-of-Way Funding Approval Date
3. Total Number of Relocations on Project	8. Local Right-of-Way Certification (ITD 1983) Date
4. Anticipated Number of Donations	9. Close-Out Project Review Completed Date
5. Right-of-Way Plans Approval Date	10. Reimbursement Requested Date

Individual Parcel Status

Parcel Number	Appraisal		Appraisal Review		Formal Offer		Acquisition	
	Date	Amount	Date	Amount	Date	Amount	Date	Amount

Information or action required in order to avoid delays: _____

_____

_____

_____

_____

Monthly Report Submitted Either by the Local Public Agency or Consultant

Status Report Submitted By	Title	Date

Report Review

Local Project Coordinator's Signature	Date	ITD District R/W Supervisor's Signature	Date

Note: Right-of-Way Status Reporting is Required for any Local Public Agency Project

Reporting Path: Local Sponsor → Local Project Coordinator → District R/W Supervisor

ITD 2184 (Rev. 7-04)

Proposed Milepost Changes

See Design Manual Sections 400 and 800; See Traffic Manual Section 185

See page 2 for Instructions

To			Date
Transportation Planning Section			
From			By
Project Number	Key	Location (Attach Vicinity Map)	Proposed Const. Yr.

Reason for Change

☐ New Route	Route	
☐ Relocation	Milepost	to
☐ Reconstruction/Realignment	Segment Code	
☐	Milepost	to
	Segment Code	

Note: If project traverses multiple segment codes, list Milepost and segment codes for each.

Description of Changes

Approved	Yes	No	Date	Signature
District __ Engineer	☐	☐		
Traffic Engineer	☐	☐		
Transportation Planning Mgr.	☐	☐		

Instructions For
Proposed Milepost Changes

Description of Changes

Describe the change or changes. If necessary, complete the Milepost Log Work Sheet indicating the Mileposts of boundaries, geographical features, and physical features including structures and pipe culverts. If additional space is needed, attach an ITD 2185, Milepost Log Work Sheet.

Milepost Equation

If an equation is being installed on the project, attach the plan sheet showing the Milepost equation.

Interchange

Complete this for listing the segment code and Mileposts of the main route. Also, list the ramps and cross-road segment codes and Mileposts on the Mileposts Log Work Sheet. A separate ITD 2184 is not required for each ramp or cross road. Attach an interchange layout plan sheet.

Distribution

Route the original through the offices listed on the first page for obtaining approval signatures. The Traffic Section will schedule video logging of the highway and distribute the new video to the district. The Transportation Planning Section will record the Milepost location(s) and update the maps.

Milepost Log Work Sheet

Segment Code	Milepost	Milepost Description

ITD 2185 (Rev. 7-04)
Supply# 27-167000-2

Milepost Log Work Sheet

See Design Manual Sections 400 and 800
See Traffic Manual Section 185

Project Number	

Segment Code	Milepost	Milepost Description

ITD 2395 (Rev. 5-06)
itd.idaho.gov

Request For Federal Aid
On No-Bid Items Of Work (Force Account)
(Reference 23 CFR 635, Subpart B)

Project Number	Key Number	Location	Date

Work to be Performed By

Nature of Work

List of Items to be Furnished Under Force Account:

Labor	Equipment*	Materials	Supplies

*Indicate source of rental rates

The above materials or supplies were obtained through competitive bidding process

☐ Yes	Project Number	**or**	Purchase Order Number	Purchase Date	Supplier

☐ No

Cost Effective Analysis (Total Cost for Force Account Work (a) / Total Cost for Work By Contract (b))
(a) List unit price for the above items and indicate basis for arriving at the total cost of work (or attach estimate)

No-Bid Request for Federal Aid Items of Work (Force Account), Continued

(b) Estimate cost, including work by contract, and indicate basis for estimate.

List reasons it is "in the public interest" to perform the above work by Force Account procedures

It is requested that the above work be performed by force account based on the cost effectiveness analysis and/or statement of public interest for an estimated total of $ federal funds.

Recommended By (District or Section)

Approved By (Roadway Design Engineer)

ITD 2435 (Rev. 01-09)

Local Federal-Aid Project Request

Instructions

1. Under Character of Proposed Work, mark appropriate boxes when work includes Bridge Approaches in addition to a Bridge.
2. Attach a Vicinity Map showing the extent of the project limits.
3. Attach an ITD 1150, Project Cost Summary Sheet.
4. Signature of an appropriate local official is the only kind recognized.

Note: In Applying for a Federal-Aid Project, You are Agreeing to Follow all of the Federal Requirements Which Can Add Substantial Time and Costs to the Development of the Project.

Sponsor (City, County, Highway District, State/Federal Agency)	Date

Project Title (Name of Street or Road)	F.A. Route Number	Project Length	Bridge Length

Project Limits (Local Landmarks at Each End of the Project)

Character of Proposed Work (Mark Appropriate Items)

☐ Excavation	☐ Bicycle Facilities	☐ Utilities	☐ Sidewalk
☐ Drainage	☐ Traffic Control	☐ Landscaping	☐ Seal Coat
☐ Base	☐ Bridge(s)	☐ Guardrail	☐ _____
☐ Bit. Surface	☐ Curb & Gutter	☐ Lighting	

Estimated Costs (Attach ITD 1150, Project Cost Summary Sheet)

Preliminary Engineering (ITD 1150, Line 1) $ _____

Right-of-Way (ITD 1150, Line 2) $ _____

Construction (ITD 1150, Line 18) $ _____

Preliminary Engineering By: ☐ Sponsor Forces ☐ Consultant

Checklist (Provide Names, Locations, and Type of Facilities)

Railroad Crossing	
Within 2 miles of an Airport	
Parks (City, County, State or Federal)	
Environmentally Sensitive Areas	
Federal Lands (Indian, BLM, etc.)	
Historical Sites	
Schools	
Other	

Additional Right-of-Way Required: ☐ None ☐ Minor (1-3 Parcels) ☐ Extensive (4 or More Parcels)

Will any Person or Business be Displaced: ☐ Yes ☐ No ☐ Possibly

Standards	Existing	Proposed	Standards	Existing	Proposed
Number of Lanes			Roadway Width (Shoulder to Shoulder)	ft	ft
Pavement Type			Right-of-Way Width	ft	ft

Sponsor's Signature	Title

Additional Information to be Furnished by the District

Functional Classification	Terrain Type	20	ADT/DHV

ITD-2665 1-98 W

FLOODWAY REVISION REQUIREMENT

Project No.		Station Limits	
Location		County	
Roadway Identification			
☐ Crossing	☐ Adjacent to ☐ Creek ☐ River		
Flood Plain Description			
Preferred Alternative			

Describe consistency of action with regulatory floodway:

The enclosed analysis complies with Part 65.7, 44 CFR, Floodway Revisions (*National Flood Insurance Program Regulations*)	☐ Yes ☐ No
If no, the enclosed analysis complies with "Procedures for Coordinating Highway Encroachments of Flood Plains with F.E.M.A."	☐ Yes ☐ No
Cost of revision is estimated at: $	

Revision of regulatory floodway is acceptable to the following agencies:

Signature Local Agency		Local Agency	Date
Signature F.E.M.A.*		Title	Date

*F.E.M.A. approval is required only for encroachment in a regulatory floodway.

ITD 2760 (Rev. 5-03)

Request For Consultant Services

Send completed form to the Consultant Administration Unit of the Roadway Design Section for processing

Project Name	Key Number	Project Number	Fiscal Year	District

Local Sponsor (if applicable)	Local Sponsor Contact Name	Phone Number (208)

Reason For Requesting Consultant Services	Project Type ☐ ITD ☐ Local
☐ Special expertise required	State/Local Agreement Executed (if applicable) ☐ Yes ☐ No
☐ Consultant services needed to meet project schedule	Full Federal Oversight Project ☐ Yes ☐ No
	Utility/RR Coordination and/or Involvement Needed ☐ Yes ☐ No

Estimated Time to Perform Services Months	Estimated Cost of Services $	Estimated Construction Cost $	Obligated/ Available Funding* $	* If amount entered is $0, in the Summary of Work Required section, please explain resources you're exploring to obtain funding.

Provide Summary of Work Required

Agreement Administrator	Phone Number (208)

Requested by	Title	Date

This part shall be completed by the Consultant Administration Unit of the Roadway Design Section

Type of Agreement Recommended

PATS Request Number

☐ 1. Services to be performed under an existing term agreement.
☐ 2. Individual project solicitation and consultant selection. (Attach Selection Committee List)
☐ 3. Local project less than $250,000
☐ 4. Noncompetitive selection
- ☐ a. The service is available only from a single source.
- ☐ b. There is an emergency that will not permit the time necessary to conduct competitive negotiations.
- ☐ c. After solicitation of a number of sources, competition is determined inadequate.

☐ 5. Minor agreement procedures.

Recommended Consultant For Items 1, 3, 4 or 5	Board Agenda Item Required ☐ Yes ☐ No

Coordinated by Consultant Administration Unit	Date

Concurrence (if applicable) by Environmental Manager	Date

Reviewed by Roadway Design Engineer	Date

Approved by Assistant Chief Engineer (Development)	Date

ITD 2784 (Rev. 11-04)

NPDES Storm Water Permit
Project Checklist For Construction*

Project Number	Key Number	Work Authority
Location		

An NPDES Storm Water Discharge Permit is required for this project only if the answers to both questions below are yes.

Will there be 1 acre of ground disturbance on the project? ☐ Yes ☐ No

(To determine the total acreage of ground that will be disturbed, use the Ground Disturbing Activities Checklist below to calculate the total acreage of disturbance on the project.)

Will the project discharge storm water to waters of the U.S.? ☐ Yes ☐ No

(See the reverse side for Definition of Waters of the U.S.)

If the answer to the second question is no, provide a written explanation in the Comments section on the reverse side of this form as to why there will be no discharge.

(If the project does not discharge off-site to waters of the U.S., an NPDES Storm Water Discharge Permit is not required.)

Ground Disturbing Activities Checklist

		Area Disturbed
Clearing	This includes areas of vegetative removal, topsoil removal, (see Definition of Soil on reverse side), sideslope grading, shoulder construction, and fence installation, removal, or replacement.	
Grubbing	This includes both hand- and machine-removed vegetative materials such as roots and root balls.	
Grading	All areas disturbed by grading must be included.	
Excavation	Excavated areas are figured on the surface area of disturbance, including that disturbed by heavy equipment working in the area.	
	Total Area	

*Construction does not include maintenance activities, such as ditch cleaning, shoulder reshaping, etc., unless there is new construction included as part of the maintenance project.

Definition of Waters of the U.S.

Waters of the U.S. essentially mean all lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, natural ponds, and irrigation canals that connect to any of the above, the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce.

Definition of Soil

EPA Region X gives the definition of soil as "any unconsolidated material that will pass through a 4.75 mm or smaller sieve."

Comments

Name	Date

ITD 2802 (Rev. 3-07)
itd.idaho.gov

Environmental Monitoring Report

→ **See instructions on last 2 pages**

Inspected By (Check all that apply) ☐ ITD Environmental Inspector ☐ 3rd Party Inspector ☐ WPCM Inspector

Key Number	Date

Project Name		Project Number		Program (Work Authority)
District	Resident Engineer	Inspected By		IQP Number

Inspection Date	Accompanied By	Last Inspection Date	No. of Days Since Last Inspection	Current SWPPP Date

Contractor	Inspection Number

Inspection Location

Weather Conditions at Time of Inspection	Temperature
☐ Clear ☐ Cloudy ☐ Rain ☐ Sleet ☐ Fog ☐ Snowing ☐ Drifting ☐ High Winds	

Section I - NPDES Storm Water Permit Program Inspector's Report

Weather Information Since Last Inspection (For each storm event, include a best estimate of the beginning, duration, approximate precipitation, and whether discharges occurred):

General Site Conditions/Comments:

Project Area Discharge Points

Station Number	Description	Inspected	Observation
		☐ Yes ☐ No*	
		☐ Yes ☐ No*	
		☐ Yes ☐ No*	
		☐ Yes ☐ No*	
		☐ Yes ☐ No*	
		☐ Yes ☐ No*	

***If No, explain in Project Areas Not Inspected field.**

Action Item Number System – From paragraph 8.J. of the Consent Decree, the following lists of action items are identified using a two-part numbering system. The first number identifies the inspection number that first identified the action. The second number identifies the action from that inspection.

Location	Station Numbers or Location	Inspected
Limits of active construction		☐ Yes ☐ No*
Site entrances		☐ Yes ☐ No*
Storage areas / contractor yards		☐ Yes ☐ No*
Onsite waste / borrow areas / topsoil		☐ Yes ☐ No*
Offsite waste / borrow areas / topsoil		☐ Yes ☐ No*
Potential discharge points		☐ Yes ☐ No*

***If No, explain in Project Areas Not Inspected field.**

New Action Items Noted During This Inspection

-

Action Items Fixed Since Last Project Inspection – Include dates and changes made to SWPPP

-

Action Items Not Fixed or Resolved Since Last Project Inspection – Include explanation

-

Priority Action Items Not Addressed for One Week or Longer

-

Project Areas Not Inspected – Include explanation

-

List Permit/Special Conditions (Completed by Environmental Section)

-

Other Special Conditions

-

Section II – Environmental Commitments Tracking

Mitigation Summary and Tracking – The following table is submitted to ensure that all mitigation measures addressed in the environmental evaluation for this project are implemented during project construction. Please verify that the following items are included in the project construction, so that commitments set forth under the environmental clearance of the project are met. (See Section I, Permit Conditions, for mitigation commitments required by permit.)

Mitigation Commitment	Completion Date:
Action Taken	
Mitigation Commitment	Completion Date:
Action Taken	
Mitigation Commitment	Completion Date:
Action Taken	

☐ **Check here if there were no observed incidents of noncompliance**

Environmental or 3rd Party Inspector's Name (Type or Print)	Position Title
Inspector's Signature	Date Signed
WPCM Inspector's Name (Type or Print)	Position Title
Inspector's Signature	Date Signed

Acknowledge Receipt – Must be signed by Prime Contractor or Duly Authorized Representative

Prime Contractor's Name (Type or Print)	Position Title
Prime Contractor's Signature	Date Signed
If Disagree, Specify Reason(s)	

ITD Certification - Must be signed by District Engineer or Duly Authorized Representative

☐ I certify that on the date of this inspection, this Project was found to be in compliance with the terms of its Storm Water Pollution Prevention Plan and the current Construction General Permit.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

District Engineer's Name (Type or Print)	Position Title
District Engineer's Signature	Date Signed

For Third Party Inspections Only

Acknowledge Receipt – Must be signed by Resident Engineer, Environmental Inspector or Duly Authorized Representative

Name (Type or Print)	Position Title
Signature	Date Signed

Distribution: Original – DE Copies – RE Asst. Dist. Eng. Dist. Env. HQ Env. Contractor

ITD Environmental Inspector: Inspection Procedures (Instruction Sheet for ITD-2802 Form)

The procedures shall be binding on all ITD personnel and all Contractors working for ITD on all projects. The inspection procedures shall follow the Construction General Permit requirements and include the following:

- Each Project needs to be inspected by a trained Environmental Inspector. Each Project needs to be inspected every seven days and within 24 hours after the conclusion of a 0.5 inch or greater rain event and every 24 hours during an extended rain event. (Recommend placing a rain gage on site.) Within 24 hours of each storm water inspection, ITD shall make the Contractor aware of any deficiencies found.

- A description of the weather since last inspection and a description of any discharges that occurred during the weather event.

- General site conditions should include an estimate of the amount of land currently opened up by construction. This includes areas of vegetative removal (both hand and machine removed vegetative materials), topsoil removal, side slope grading, shoulder construction, and fence installation, removal, or replacement. All areas disturbed by grading must be included. Excavated areas are figured on the surface area of disturbance, including those disturbed by heavy equipment working in the area. General site conditions should also include a current estimate of the amount of land that has been temporarily stabilized or has temporary sediment and erosion controls in place, as well as an estimate of the amount of land that has been permanently stabilized or has the permanent sediment and erosion controls in place.

- To comply with Paragraph 8.j. of the Consent Decree, fill out the table concerning: Limits of active construction, Site entrances, Storage areas/contractor yards, Onsite waste/borrow areas, Offsite waste/borrow areas and Potential discharge points. Record a description of each area and its station number or milepost. The items down the left column stay the same with each inspection, while the other two columns would be filled in each time by the inspector. Explain any areas listed but not inspected in the “Project Areas Not Inspected” box.

- Action items include the Location(s) by station (MP allowed if no stationing is available) of discharges of sediment or other pollutants from the site; of BMPs (Best Management Practices - structural pollution control measures) that need to be maintained; of BMPs that failed to operate as designed or proved inadequate for a particular location; and of where additional BMPs are needed that did not exist at the time of inspection. Include the corrective action required (including any changes to the SWPPP necessary) and implementation dates.

- Inspectors must note "NC" to distinguish “Non-compliance” action items from other actions items, when filling out the expandable boxes, starting at the top of page 2. Remember that not every action item will indicate non-compliance.

- Identify locations examined. Indicate where pollution control efforts are working successfully as well as where changes are needed, (measures not properly installed or maintained, or not effective for intended purpose). Record where and when you see a problem and how it was corrected. Move item to the appropriate comment box if it is corrected at a later time. Inspections need to include all areas, both on-site and off-site areas, disturbed by construction activity and areas used for storage of materials. Inspectors need to look for evidence of, or the potential for, pollutants entering the storm water conveyance system. Erosion and sedimentation control measures identified in the SWPPP need to be observed to ensure proper operation. Discharge locations need to be inspected to ascertain whether erosion control measures are effective in preventing impacts to waters of the United States. Locations where vehicles enter or exit the site need to be inspected for evidence of off-site sediment tracking.

- The Contractor shall sign the ITD 2802 form acknowledging that the contractor has been informed of the current conditions (in the event the Contractor refuses to sign, ITD shall note that refusal on the form);

- The Contractor and ITD shall correct all deficiencies identified during the inspection as soon as possible and **no later than five days** after the inspection **or prior to** the next rain event, whichever is sooner. The ITD inspector and the Contractor shall both sign in the appropriate signature boxes on ITD 2802 certifying that the corrective action has been satisfactorily completed.

  A copy of the NPDES General Construction Permit from the Code of Federal Regulations and a copy of the current NPDES SWPPP must be available on the project site. If any changes to the SWPPP were identified, the changes must be incorporated to reflect on an updated SWPPP **no later than five days** after the inspection **or prior to** the next rain event, whichever is sooner. SWPPP revisions need be signed by ITD and the Contractor. The revisions are required to be made on plan sheets (similar to “as constructed” drawings). Refer to the Construction General Permit for all of the requirements. If there are any questions on the NPDES SWPPP or the Permit/Special Conditions or the Environmental Commitments Tracking and Mitigation Commitments, contact the Senior Environmental Planner in the District.

Third Party Inspector: Inspection Procedures (Instruction Sheet for ITD-2802 Form)

The procedures shall be binding on all Third Party Inspectors working for ITD on projects meeting the Consent Decree requirements for a third party inspection. The inspection procedures shall follow the Construction General Permit and the Consent Decree requirements and include the following:

- Third Party inspections shall be performed for all projects that disturb five acres or more of soil and that are located in environmentally sensitive areas. Such inspections shall occur at least once every 30 days during the construction season and shall be unannounced. If significant deficiencies are found, a follow-up inspection shall be performed within 14 days. The Third Party Inspector shall provide to ITD and the responsible Contractor within twenty-four (24) hours of each inspection written findings and recommendations that contain at least the information on the ITD-2802 form. The inspector shall also provide any follow-up written report if changes to the SWPPP or BMP's are necessary within seven (7) days of each inspection.

- Environmentally sensitive area means any area which would be directly impacted by storm water discharges from the Project, and which is designated critical habitat for any listed threatened or endangered species, or which contains an immediate downstream water body that is listed as impaired for sediment by the Idaho Department of Environmental Quality under section 303(d) of the CWA.

- A description of the weather since last inspection and a description of any discharges that occurred during the weather event. (Include a review of the Environmental Inspector reports since last inspection.)

- General site conditions should include an estimate of the amount of land currently opened up by construction. This includes areas of vegetative removal (both hand and machine removed vegetative materials), topsoil removal, side slope grading, shoulder construction, and fence installation, removal, or replacement. All areas disturbed by grading must be included. Excavated areas are figured on the surface area of disturbance, including those disturbed by equipment working in the areas of routine access. General site conditions should also include a current estimate of the amount of land that has been temporarily stabilized or has temporary sediment and erosion controls in place, as well as an estimate of the amount of land that has been permanently stabilized or has the permanent sediment and erosion controls in place.

- To comply with Paragraph 8.j. of the Consent Decree, fill out the table concerning: Limits of active construction, Site entrances, Storage areas/contractor yards, Onsite waste/borrow areas, Offsite waste/borrow areas and Potential discharge points. Record a description of each area and its station number or milepost. The items down the left column stay the same with each inspection, while the other two columns would be filled in each time by the inspector. Explain any areas listed but not inspected in the "Project Areas Not Inspected" box.

- Action items include the Location(s) by station (Mile Post allowed if no stationing is available) of discharges of sediment or other pollutants from the site; of BMPs (Best Management Practices - structural pollution control measures) that need to be maintained; of BMPs that failed to operate as designed or proved inadequate for a particular location; and of where additional BMPs are needed that did not exist at the time of inspection. Include the corrective action required (including any changes to the SWPPP necessary) and implementation dates.

- Inspectors must note "NC" to distinguish "Non-compliance" action items from other actions items, when filling out the expandable boxes, starting at the top of page 2. Remember that not every action item will indicate non-compliance.

- Identify locations examined. Indicate where pollution control efforts are working successfully as well as where changes are needed, (measures not properly installed or maintained, or not effective for intended purpose). Record where and when you see a problem and how it was corrected. Move item to the appropriate comment box if it is corrected at a later time. Inspections need to include all areas, both on-site and off-site areas, disturbed by construction activity and areas used for storage of materials. Inspectors need to look for evidence of, or the potential for, pollutants entering the storm water conveyance system. Erosion and sedimentation control measures, along with non-storm water and waste management controls identified in the SWPPP, need to be observed to ensure proper operation. Discharge locations need to be inspected to ascertain whether erosion control measures are effective in preventing impacts to waters of the United States. Locations where vehicles enter or exit the site need to be inspected for evidence of off-site sediment tracking.

- The Contractor shall sign the ITD 2802 form acknowledging that the contractor has been informed of the current conditions (in the event the Contractor refuses to sign, ITD shall note that refusal on the form);

- The Contractor and ITD shall correct all deficiencies identified during the inspection as soon as possible and **no later than five days** after the inspection **or prior to** the next rain event, whichever is sooner. The ITD inspector and the Contractor shall both sign in the appropriate signature boxes on ITD 2802 certifying that the corrective action has been satisfactorily completed.

A copy of the NPDES General Construction Permit from the Code of Federal Regulations and a copy of the current NPDES SWPPP must be available on the project site. If any changes to the SWPPP were identified, the changes must be incorporated to reflect on an updated SWPPP **no later than five days** after the inspection **or prior to** the next rain event, whichever is sooner. SWPPP revisions need be signed by ITD and the Contractor. The revisions are required to be made on plan sheets (similar to “as constructed” drawings). Refer to the Construction General Permit for all of the requirements. If there are any questions on the NPDES SWPPP or the Permit/Special Conditions or the Environmental Commitments Tracking and Mitigation Commitments, contact the Senior Environmental Planner in the District.

Right of Way Cost Estimate

Date: December 31, 2008

Key No:
Project No:
Project Name:

No. of parcels requiring acquisitions:

Number of parcels requiring relocations:

New Alignment: miles

Basic R/W Width: ft.

Existing Alignment: miles

Additional R/W Width: ft.

DIRECT ACQUISITION COSTS:

A. Land only

Agriculture	Irrigated	0.00	acres @	$0	/acre	=	$0
	Dry	0.00	acres @	$0	/acre	=	$0
	n/a	0.00	acres @	$0	/acre	=	$0
Graze	Irrigated	0.00	acres @	$0	/acre	=	$0
	Dry	0.00	acres @	$0	/acre	=	$0
		0.00	acres @	$0	/acre	=	$0
Timber	Income Producing	0.00	acres @	$0	/acre	=	$0
	Harvestable	0.00	acres @	$0	/acre	=	$0
	Non-Harvestable	0.00	acres @	$0	/acre	=	$0
Residential	Developed	0.00	acres @	$0	/acre	=	$0
	Undeveloped	0.00	acres @	$0	/acre	=	$0
Commercial\Industrial	Developed	0.00	acres @	$0	/acre	=	$0
	Undeveloped	0.00	acres @	$0	/acre	=	$0
Damages Anticipated						=	
Miscellaneous						=	

B. Site Improvements

Agriculture	No. of Structures	0	@	$0	(average)	=	$0
Residential	No. of Structures	0	@	$0	(average)	=	$0
Commercial\Industrial	No. of Structures	0	@	$0	(average)	=	$0
Damages Anticipated							
Miscellaneous						=	

C. Relocation

Developed Agriculture	No. Expected	0	@	$0	(average)	=	$0
Developed Residential							
Single Family	No. Expected	0	@	$0	(average)	=	$0
Multi-Family	No. Expected	0	@	$0	(average)	=	$0
Developed Comm\Ind	No. Expected	0	@	$0	(average)	=	$0
Miscellaneous						=	

INDIRECT ACQUISITION COSTS:

Appra./Imp.Agri.	No. Expected	0	@	$0	(average)	=	$0
Appra./Imp.Resid.							
2685	No. Expected	0	@	$0	(average)	=	$0
2288	No. Expected	0	@	$0	(average)	=	$0
B & A	No. Expected	0	@	$0	(average)	=	$0
Appra./Imp.Com.-Ind.	No. Expected	0	@	$0	(average)	=	$0
Appraisals/Land	No. Expected	0	@	$0	(average)	=	$0
Negotiations	No. Expected	0	@	$0	(average)	=	$0
Demolitions	No. Expected	0	@	$0	(average)	=	$0
					Sub-Total		$0

INCIDENTALS:

Estimated as a percentage of overall costs. 0.00 % $0

(Includes Title Costs, Admin. Settle., Legal Settle., Attorney & Court Costs, Property Mngmnt. & Misc.)

Total Estimated Project R/W Costs: $0

Proposed R/W Plans Approval Date | Projected R/W Expenditure Years | Contruction Year(s)

Estimtd. By: Title: Date:

ITD 2865 (Rev. 5-04)

Request For Survey Work

To: District Land Surveyor

Date:

From:

Approved By:

Subject: Request For Survey Work

Project:

Please perform the following described work:

Please Complete By (Date): _____

Project No.: _____

Work Auth.: _____

Key No.: _____

Contact _____ at _____ for details concerning the work.

Location Use Only

Assigned to	Date Assigned	Date Completed	Date Delivered

cc: District Project Development Engineer

BRIDGE SUBMITTAL CHECKLIST FOR SITUATION/LAYOUT

Project Name:			
Project No.:		Key No.:	
Route No.		Milepost	
Feature Intersected:			

A. PLANS					
	1. Contour Map of Bridge Site (.dgn.)				
	2. Roadway Plan of Bridge Site (.dgn)				
	3. Roadway Profile Grade (.dgn)				
	4. Existing Groundline Profile (.dgn)				
	5. Roadway Typical Section w/Traffic Data (or .dgn)				
	6. Structure Typical Section w/Traffic Data (or .dgn)				
B. GENERAL					
	1. Roadway Guardrail				
	Concrete Median Barrier				
	Metal Rail				
	Curb and Gutter				
	Sidewalk				
	Other (specify)				
	2. Roadway Pavement Type		Travel Way		Shoulders
		Concrete			
		Asphalt			
	3. Corrosion Protection				
	Level of De-icing Salt Application				
	High		Moderate		Low
	4. Phase IV Report				
	5. Photographs				
			Looking AHEAD on line at bridge site		
			Looking BACK on line at bridge site		
			Looking through the bridge to LEFT		
			Looking through the bridge to RIGHT		
			Unusual features of the site		
	6. Utilities [*attach drawing showing locations, size, number (including existing and future), and weight*]				
		Lighting		Gas	
		Signing		Water	
		Electrical		Sewer	
		Telephone		Irrigation	

C. STRUCTURES OVER WATER				
	1. Approved ITD-210 (Hydraulic Structures Survey)			
	2. Streambed Profile (Reproducible)			
	3. Riprap (Attach plan)			
	4. Navigational Clearances (Indicate if stream is navigable and boat traffic requirements)			
	Vertical	Feet		
	Horizontal	Feet		
D. STRUCTURES OVER ROADWAY				
	1. Roadway Profile Grade			
	2. Roadway Typical Section			
	3. Minimum Clearance			
	Vertical	Feet		
	Horizontal	Feet		
	4. Slope Protection (Indicate slope and any special grading)			
		Slope paving		
		Rock		
		Other (specify)		
		None		
E. STRUCTURES OVER RAILROADS				
	1. Roadway Profile (dgn.)			
	2. Railroad Typical Section (Include any future tracks) or dgn.			
	3. Minimum Clearance			
	Vertical	Feet		
	Horizontal	Feet		
	4. Splashboard Requirements			
	5. Fencing Requirements			
F. SPECIAL FEATURES				
	1. Stage Construction			
		Plan of Proposed detour		
		Detour typical section		
	2. Future Widening			
		Typical section of roadway/structure		
	3. Remote Site			
		Concrete available		
		Restricted loads on haul road		
		Other (specify)		
	4. Aesthetic Requirements			
	5. Other (specify)			

Appendix E- Roadside Design

APPENDIX E – ROADSIDE DESIGN

E.10 – CONTOUR DESIGN

The development of contour grading and drainage plans is a technique long practiced in the design of a wide variety of projects and is recommended for the development of integrated design as a prelude to highway beautification. Contour grading and drainage plans are very advantageous for highway projects, particularly for complex urban or interstate design. Plans for contour grading and drainage shall be prepared for all interchange and other special areas including new alignments, at-grade intersections, grade separations, bridge sites, roadside service and rest areas, and borrow and waste areas.

The objective is to correlate the design and construction elements with each other and with the topography, to reduce maintenance, to increase safety, and to improve the appearance of the entire area. Contour lines shall be developed so as to have lines that are flowing and that well rounded curves are provided at junction points, and where a structure and roadway meet.

Contour plans provide a three-dimensional total design concept that:

- Gives visual proof of the correlation of proposed construction with existing topography and adjacent environment;
- Facilitates the visual study and review of the plans, in-the-field inspection, construction, and later for maintenance;
- Provides a basis for the design of seeding and planting plans; and
- Includes ditch designs addressing rockfall mitigation and erosion control where appropriate. Refer to the Materials Phase II report or special geotechnical report for further information.
- Design control information for contour grading plans is developed from computer data. In the case of consultant designs, the Designer should supply the following information to the district for preparing a template of the road section:
- Profile grade lines on the roadway and ramps.
- Ballast depths.
- The bottom of the ditches; crown for subgrade, subbase, base, surfacing; slopes; etc.
- Lines on which elevations are to be shown including center line or control line.
- Any other special design information considered necessary.

E.20 – SLOPE DESIGN

Refer to Materials Phase II, IV, and/or Special Geotechnical reports as appropriate. Also, see Standard Drawing P-2-E, Permanent Erosion Control Roadside Slope Treatment.

The steeper the slope and the more severe the erosion and surface runoff problems, the greater the need for proper slope design. Serrations and minibenches are most commonly used to stabilize slopes, assist in seeding, control surface runoff, and reduce erosion. Major benches are a structural feature intended to increase slope stability and their use is highly dependent on the geologic structure, terrain, slope aspect, soil texture and composition. Interceptor ditches are one method of controlling runoff over cut slopes.

E.20.01 Serrations, Terraces, Minibenches, and Major Benches.

Serrations are defined as having horizontal and vertical dimensions or grooves of less than 1 foot apart and not more than 8 inches deep, while terraces and minibenches are defined as having horizontal and vertical dimensions or steps measuring approximately 1 to 4 vertical feet, with 4 feet being the largest optimum size. Major benches (have horizontal and vertical dimensions of more than 4 feet, usually 10 feet are often applied as a standard unless there are recommendations in the Materials reports to the contrary. Major benches should be designed on an individual project basis. Refer to Materials Phase II, IV, and/or Special Geotechnical reports as appropriate for specific recommendations.

Major Bench Considerations

The benches are to remain functional indefinitely and will require continuous maintenance. A design accommodating access to the major benches for maintenance purposes is necessary. In many instances, major benches can reduce local stability and create maintenance problems. Accumulations of material on major benches may act as a ramp to launch rocks into the roadway. Major benches constructed under adverse or extreme geologic structure or terrain may increase the potential for slope failure. Increases in ditch width may be more effective in retaining rock-fall than major benches. Refer to the Phase II Materials Report or Special Geotechnical Report for specific recommendations.

E.20.02 Design Options for Slopes.

Recommendations regarding slope stability and slope design are typically contained in the Phase II Materials report. In special cases involving very steep or high slopes and unusual geologic or drainage conditions, it may be necessary to refer to a Special Geotechnical Report prepared for that specific portion of the project.

To determine the need for slope design with respect to vegetation reestablishment, slopes may be separated into three (3) types:

- *Sloping* (3:1 or flatter) (Sloping areas generally do not contain serrated or mini-benches since conventional tillage equipment can be used and topsoil, if used, will stay in place on a roughened surface and water can be controlled by cross-slope tillage.)

- *Steep* (steeper than 3:1 to 2:1) (Steep slopes may be considered for either serrating, terracing or minibenching.)
- *Very Steep* (steeper than 2:1) (Very steep slopes should be terraced or minibenched in most cases and major benched in specific areas. In areas with high moisture accumulation, vegetation establishes well for a distance of 30 to 40 feet on the slope immediately below a major bench that diverts the surface runoff. Major benches must be designed with adequate outlets such as grass-lined waterways, vegetated areas or other suitable outlets. However, treatment should be coordinated with geotechnical requirements.) Slopes steeper than ¾:1 that are typically in rock may require blasting to remove. Serrations or minibenches will be extremely difficult and expensive to construct on slopes requiring blasting (particularly pre-splitting) and would have minimal value. Avoid benching rock slopes and consider using wider ditches.

Additionally, when planning the size and design of various slopes, three (3) variables that should be considered are material, water, and vegetation. The following questions should be answered when designing slopes.

Material

- Is the material suitable for serration, terracing or minibenching?
- Is the material prone to rock-fall?
- Is major benching feasible or desirable

These questions will be addressed in the Phase II Materials Report or a special geotechnical report.

Water

Refer to the Materials Phase II Report or Special Geotechnical Report.

- Should water be removed or retained?
- Is the area subject to cloudbursts or heavy snow?
- Will underground water seep out on the slopes?
- Is it a low-moisture <15” or a high-moisture >15” area? (check mean annual precipitation) A general guide is under 15” retain water; over 15” divert water.
- Is the material particularly susceptible to erosion?

Determine the water source. If diversion is desired, refer to the Phase II Materials Report or Special Geotechnical Report and design accordingly.

Vegetation

- Can a good cover be obtained?
- If so, what kind of vegetation is suitable for the location and feasible for the conditions?
- What will the appearance and function of the cover be like after a few years?

- Can top soil be used to assist in re-vegetation? (A thin layer of topsoil 1inch to 2 inches is especially valuable on rocky benches and particularly south-and west-facing slopes, but care should be taken to not apply so much topsoil that the value of the benches is destroyed.)

When these questions are answered and conditions and needs are properly correlated with each other, the slope configuration can be designed to best stabilize the disturbed soil or rock and provide good seeding conditions. Access to major benches for both construction and maintenance equipment should be provided. A water disposal system at one or both ends consisting of a suitable waterway with erosion controlled by channel liners, seeding, or other suitable treatment should also be added. Serrations and minibenching should also be noted. Refer to Standard Drawing A-6.

E.30 – LANDSCAPING

A landscaping project is defined as "any action taken as part of a highway construction project, or as a separate action to enhance the aesthetics of a highway through the placement of plant materials consistent with a landscape design plan." Idaho's landscape projects are normally confined to rest areas, pedestrian and bicycle pathway's, urban areas and interchanges and differ from roadside seeding that is primarily for erosion control and roadway slope stability.

All work performed in association with the landscaping action shall be included in the total landscaping expenses. Functional planting shall be on the basis of engineering judgment and may include planting for erosion control, headlight screen, noise barriers, traffic safety, noxious weed control, native habitat restoration, wetland restoration or mitigation, roadway delineation, aesthetics, etc.

E.30.01 Roadside Landscaping. Projects for roadside landscaping shall be included in the annual construction program to allow the project costs to be viewed in proper perspective to the overall construction program. Unless otherwise specified, the degree of landscaping will be limited to what is necessary to ensure that the appearance of the highway is compatible with native or undisturbed landscape and the aesthetics of the surrounding area.

Local agencies shall be contacted before projects are designed for consideration of roadside landscaping. Landscaping projects shall be developed in coordination with local agencies and be consistent with their desire and ability to assume maintenance costs. The local agency shall enter into an agreement with the department to assume full responsibility for all future maintenance of the landscaping.

Unless otherwise specified, the degree of landscaping will be limited to what is necessary to insure that the appearance of the airport or highway is compatible with the appearance of the surrounding area and will not interfere with public safety and overall maintenance operations. Functional planting shall be on the basis of engineering and environmental judgment and may include planting for erosion control, headlight screen, noise barriers, traffic safety, noxious weed control, roadway delineation,

aesthetics, etc. (See the AASHTO Publication, *A Guide for Landscape and Environmental Design.*) The Maintenance section's Roadside Program Coordinator shall be given the opportunity to review all landscaping plans for concurrence with landscaping and roadside vegetation regulations and requirements.

Selection of the appropriate landscaping level of development shall follow these guidelines:

- Low Level Development: Use of primary grass, native shrubs and trees requiring minimal or no mowing and minimum water application. Cumulative maintenance costs expected to equal construction costs in 20-35 years.
- Medium Level Development: Use of primary grass, native shrubs and trees that require installation of a minimal irrigation system for limited watering. Mowing frequency equals irrigating frequency. Native dry-land shrubs and trees are desired. Cumulative maintenance costs are expected to equal construction costs in 10-15 years.
- High Level Development: Use of lawn grass, shrubs and trees that require installation of a complete irrigation system and frequent watering and mowing. Cumulative maintenance costs are expected to equal construction costs in 6-10 years.

Alternatives may be derived from combining elements of different levels to meet maintenance cost constraints.

E.30.02 Urban Structures Landscaping.

The following procedures and standards shall be applied to interchanges, bridges and similar large structures when landscaping on an urban project has been approved.

- The proposed structures shall be given special study as to their form and composition of construction materials, to ensure a pleasing appearance and harmony with the surrounding area.
- The earthwork incident to any structure will be designed to use "contour grading and drainage plans" so as to blend with the surrounding topography. The earthwork will have rounded and gentle slopes and be covered with a layer of topsoil of sufficient quantity and depth to support a good vegetation cover.
- The availability of irrigation water will be one of the factors in determining the type of vegetation to be established. Water sources may be secured with the project right of way, or be furnished by the community. If a sprinkler system is to be installed, a determination of the water source must be made.
- Vegetative cover must be planned and designed to prevent erosion by wind and water, reduce invasive weed growth and fire hazard, and promote aesthetic values.
- Additional vegetation may be planned and designed to delineate structures and their approaches, reduce headlight glare, screen adjacent areas, provide barriers, etc.

E.30.03 Reclamation of Material Sources. All ITD materials sources, either owned or leased by the department will be reclaimed by vegetative or landscape means when the source site is retired. Source reclamation will include cleanup, leveling, smoothing of pit floors, visual inspection for existence of noxious or invasive species, and resloping of banks to a 2:1 or flatter slope whenever feasible. Top-soiling and seeding may be needed for sources where portions of the source have been depleted and can be restored to a natural appearance. A reclamation plan is required, prior to the operation of the materials source, and this reclamation plan will be submitted to the Idaho Department of Lands (DOL) for final approval.

For Federal-Aid Highway Systems, all new material sources shall be located out of sight of the main roadways, unless economic consideration prohibits. This setback restriction applies not only to sources that are purchased, but also to sources that are used under a lease arrangement. Existing sources that are along the present highway that must be used because of the State's investment, or new sources in view of the highway that are used because there is no feasible alternate, are to be given special landscaping treatment.

Gravel bars in and along rivers are excluded where excavation can be done in a manner that will not change the natural appearance of the river channel. When channels are present, emphasis must be placed on obliterating apparent damages from the excavation operation.

Reclamation shall be done upon closure and prior to disposal of the site if it is determined by the department that the material site is no longer operational or of benefit to the department. Beneficial uses such as potential use of the site for wetland mitigation, stockpile location, future construction staging area, etc. may be considered.

Each material source may receive different or special revegetation considerations depending on location or ownership of the site. Partial reclamation may be needed for source sites where portions of the source have been depleted. All source reclamation should be incorporated into highway construction contracts whenever feasible.

For more detailed information on materials source reclamation and operation, contact the district or headquarters Materials Engineer or refer to the Materials manual.

The department has a Memorandum of Understanding with DOL to allow retirement of our own material sources, but we must notify DOL that the site is being retired.

E.30.04 Wildflowers and Other Native Species Planting Requirements. All landscape projects require the use of native wildflowers and other native plants, however, waivers can be granted by FHWA when the state certifies that native wildflowers or seedlings cannot be grown satisfactorily, regional native wildflowers or seedlings are not available commercially, available plants or planting areas are scarce, or available planting areas will be used for agricultural purposes. Waivers must be considered on a project-by-project basis. Idaho's native wildflower planting approach will be to comply with the native wildflower requirements in a positive manner on all landscape projects. The department does not intend to try for a waiver or to do only the minimum required amount (1/4 of 1% of the landscaping costs), but wants to develop well-planned wildflower seedings and/or planting on each landscape project.

The planting of native wildflowers within the highway environment should be accomplished through proper planning and forethought, not haphazardly. According to the 1987 Surface Transportation and Uniform Relocation Assistance Act (STURAA) federal-aid projects must comply with "Guidance Material on the Native Wildflower Planting Requirement" (Figure E-01).

In general, planting areas are those locations within the highway right of way where landscape design, highway maintenance, and topographical features are conducive for planting wildflowers and or other native plants. Similarly, native wildflower planting areas in an urban setting may differ from rural settings. The following criteria should be considered for native wildflower planting sites:

- Visible to travelers
- Accessible to follow-up care and maintenance
- Outside the functional roadway zone (beyond the foreslope)
- Soil that lends itself to proper seed bed preparation or rocky or sandy areas where seeds will plant themselves or lodge in crevices
- Free of invasive or noxious plants
- Low-erosion risks

The "native seed" lists (see Subsection E.40.07) for south and north sites are the basic guides for species selection for landscape wildflower plantings. Do not apply grass or fertilizer to the native wildflower area. Selective noninvasive grass can be included but must be approved by the department. Certified noxious weed-free mulch, soil amendments, mulch mixtures, and/or combinations shall be used. Extra care should be taken with regard to weed control. Spraying, tilling, fumigating or other methods may be utilized to remove all weeds and weed seeds from these selected areas prior to planting. Additional species may be included as desired and as conditions warrant. Temporary irrigation or establishment water, when provided; may enhance plant establishment and increase growth. However, if no supplemental water can be provided, the listed species should be adhered to.

Any species used in addition to those shown in the standard lists should be indigenous or naturalized varieties. Generally, any "wildflowers" or other natives selected should originate in the Intermountain

Region or similar eco-regions in the Northwest and be certified to true genus, species, and/or variety. Do not use “exotics” or selections from endangered, invasive, or noxious weed categories. Cost of seed can also be a factor as to the suitability of a species.

Figure E-01

GUIDANCE MATERIAL

FOR

WILDFLOWER AND OTHER NATIVE SPECIES

PLANTING REQUIREMENTS

OFFICE OF ENVIRONMENTAL POLICY
ENVIRONMENTAL ANALYSIS DIVISION

TABLE OF CONTENTS
GUIDANCE MATERIAL ON THEWILDFLOWER

AND OTHER NATIVE SPECIES PLANTING REQUIREMENT

STATUTORY REQUIREMENT

Section 130 of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (STURAA) amended 23 USC, Section 319 by adding a requirement that native wildflower seeds or seedlings, or both, be planted as part of any landscaping project undertaken on the Federal-aid highway system. At least 1/4 of one percent of funds expended for a landscaping project must be used to plant wildflowers on that project. This provision requires every landscaping project to include the planting of native wildflowers unless a waiver has been granted. Federal-Aid Highway Program Manual, 6-2-5-1, has been changed to reflect the STURAA amendment.

OPERATION WILDFLOWER

The Federal Highway Administration has administered a voluntary, cooperative program titled "Operation Wildflower" with the National Council of State Garden Clubs and State highway agencies since 1973. Unlike Operation Wildflower, the program requirements of STURAA **are mandatory.** STURAA does not prohibit the acceptance of native wildflower seeds or seedlings donated by civic organizations or other organizations or individuals to be used in landscaping projects. State garden clubs may continue to pay for or supply wildflower seeds or seedlings. Neither the donated funds, nor the value of donated plant materials can be counted toward the minimum expenditure required by STURAA.

The new program requirement does not discontinue the program policies of Operation Wildflower. Federal funds are still available for participation in the cost of planting wildflowers supplied by garden clubs and other organizations or individuals, even though the planting may not be part of a landscaping project.

LANDSCAPING PROJECTS

The native wildflower planting requirement is applicable only to landscaping projects, not every Federal-aid highway construction project. A landscaping project is defined as "any action taken as part of a highway construction project or as a separate action to provide an environmentally beneficial landscape that shall complement and enhance the local environment, minimize adverse effects that landscaping may have on the natural environment, or enhance the aesthetics of a highway through the placement of plant materials consistent with a landscape design plan."

Seeding, temporary or permanent, undertaken for erosion control purposes does not constitute a landscaping project. This would include projects that do not have any plant materials (i.e., forbs, legumes, shrubs, trees, etc.) involved in the planting, but would only entail seeding, grass or sod to revegetate disturbed areas. Similarly, planting vegetation to screen certain areas or activities from view does not constitute a landscaping project. Activities falling within this category include screening for headlight glare and junkyard screening. In these instances, vegetative materials are primarily used to serve as a visual barrier rather than an act of landscaping. However, when plant materials are combined with other screening elements (walls, fences, berms, etc.) to enhance their

EXPENDITURE FORMULA

The 1/4 of 1 percent expenditure requirement is intended to establish a minimum amount of project landscaping expense that is to be devoted to planting native wildflowers or other natives. If the State chooses, they can expend more than this amount. The expenditure formula is to be applied only to the cost associated with the landscaping project. It does not include the total highway construction cost. However, all work performed in association with the landscaping action is to be included in the total landscaping expenses. This would include, but is not limited to, costs associated with development of the landscaping design plan, site preparation, irrigation systems, purchase of plant materials, planting activities and plant establishment periods.

WAIVERS

The FHWA may grant a waiver to the wildflower requirement only when the State certifies that:

1. Native wildflowers or seedlings cannot be grown satisfactorily; or
2. Regional native wildflowers or seedlings are not available commercially; or
3. There is a scarcity of available planting areas; or
4. The available planting areas will be used for agricultural purposes.

Waivers can only be considered on a project-by-project basis. The conditions on one project cannot automatically trigger a waiver on another, even when circumstances on one project are prevalent on another. Similarly, waivers cannot be based on geographic exclusions. That is, areas or regions of a State cannot be categorically exempted from wildflower planting.

Requests for waivers are to be forwarded to the FHWA Division Administrator for review and approval prior to the approval of the project's plans, specifications and estimate (PS&E). If the landscaping activities are being handled as a separate action, the waiver request should predate the PS&E approval for the landscaping project.

The States are to provide adequate information, justifying any waiver certification made concerning wildflower plantings. To simply state that wildflowers cannot be satisfactorily grown is not adequate to justify a waiver. There should be an identification of contributing factors that support this conclusion. Additionally, a waiver can be considered only on the basis of the three exemption criteria identified above. However, prior to issuing a waiver under criterion 2 or 3, clarification as to what shall be considered "planting areas" is needed. This is discussed in

E.40 – ROADSIDE SEEDING

Permanent and well established vegetation is a key component in roadside soil stabilization, erosion and dust control (surface runoff, wind and soil movement), sediment containment, beautification, and protection of wildlife habitat preservation, and valuable ground cover. It is the Department's policy and practice to promote sustainable vegetative growth and enhance native and other adaptable vegetation establishment, and management along roadsides. Revegetation or seeding of ITD property, in conjunction with the wise and discriminate reuse of excavated topsoil, should be incorporated into every applicable construction project, materials source reclamation, right of way encroachment, wetland mitigation or reclamation, and maintenance activities that disturb existing soils and/or vegetation on all properties under ITD jurisdiction.

The term, "seeding" as specified in this section, includes all seeding practices or "classes" and application methods to be used (i.e., soil preparation, fertilizing, mulching, mulch anchoring, and/or soil amendments) to obtain desirable and sustainable stands of vegetation on ground that has been disturbed by roadway construction. Seeding areas and practices should be carefully selected and may include site specific or sensitive areas for beautification or restoration improvements. Beautification resources are limited and these "Special Areas" have additional considerations (Subsection E.40.16, Special Areas) to consider when developing suitable seeding and planting alternatives and their related costs.

E.40.01 Seeding Design Procedures. Once the contours, terraces, minibenching, serrations, and major benches have been determined (if required) for the project and/or landscaping projects have been designated, the following seeding design procedures should be considered.

Select the seeding sites (foreslope, back slope, embankment, wetland, etc.); (most slopes are 6:1 in current reclamation plans) that require seeding considerations. When appropriate specify Special Areas (Subsection E.40.16) and Native Wildflower seeding sites (refer to the Wildflower Planting Requirement in Figure E-01).

Specify the *class for seeding* to be used by determining the amount of land to be disturbed and identifying seeding practices to be used (i.e., seed bed preparation, fertilizer, mulch, mulch anchoring, soil amendments, etc.) to obtain desirable and sustainable stands of vegetation on each site.

Designate the *season of seeding*. Site requirements should be determined by considering the "Mean Annual Precipitation" Map (Figure E-02), evaluating soil characteristics, regional climate, and local precipitation forecasts to determine the season for seeding.

Determine *fertilizer needs*. Determine if topsoil (overburden or excavated topsoil) consisting of the "plow layer" or "A horizon" on the plans will be reused and/or redistributed to areas within the project to be reseeded. Include the soil profile reports showing texture, fertility, soil components (macro-nutrients and micro-nutrients) and pH of the topsoil. Include Special Provisions for organic compost-based products and biological soil stimulants or amendments when needed.

Determine the *standard seed mix* including natives species to be seeded, for all disturbed areas including shoulder-foreslope mixes, and special use grasses, wetland, legumes and shrubs. Include requirements for any shrub and/or tree species that will be planted appropriate distances from the edge of pavement.

Determine need for *mulch, mulch anchoring, and erosion blankets*, as appropriate.

Include a *water plan* when establishment watering is necessary, or beautification plans are included in the project.

A further explanation regarding each seeding practice continues in the following subsections.

E.40.02 Seeding Site Selection. Seeding sites (foreslope, back slope, embankment, special areas, wetlands, etc.) shall be designated to enhance and assist with soil stability and erosion control along roadsides. Categories that will be used in the project shall be identified and specified.

E.40.03 Class of Seeding. The purpose of “class of seeding” is to designate the practices that will be used and to estimate the amount of land that will be involved for each seeding site within the project.

E.40.04 Season of Seeding.

Seedling survival and establishment are critical and careful consideration should be given to selecting the proper season during which seeding work is permitted to ensure successful results. Even if all other specifications are correct, if the timing of the seeding is incorrect, germination, establishment, and survival are likely to fail.

Although there is constant pressure to broaden the seasons which seeding work is permitted, the ideal time is usually a three to four week time period for sowing seed and should be specified when planning roadside seeding.

Site Type Determination

Site requirements should be determined by referring to the Mean Annual Precipitation (MAP) (Figure E-02), evaluating soil characteristics, regional climate, and local precipitation forecasts. Each roadside seeding project will usually fall under one of the following regions:

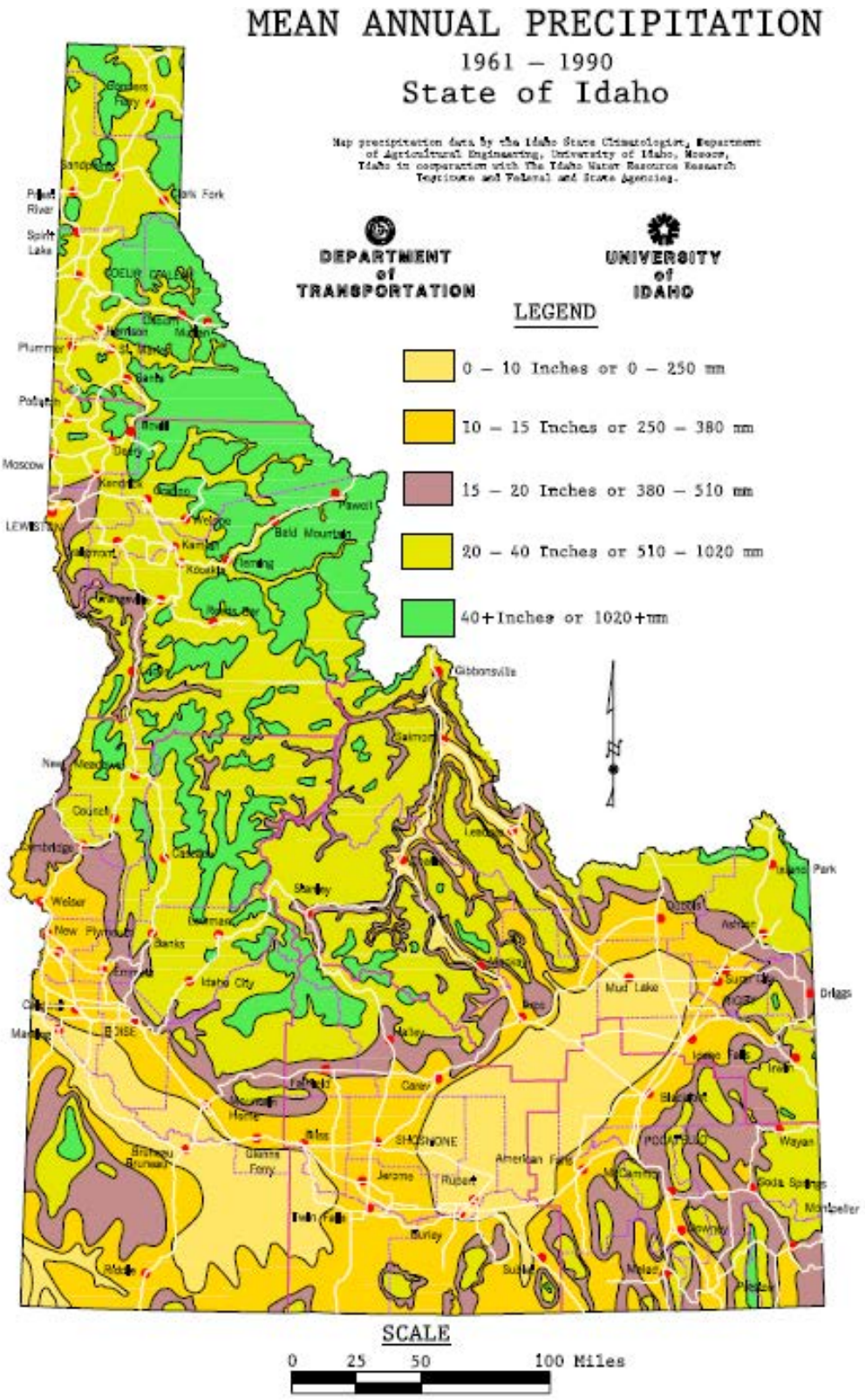
South Region: <10”, and 10 to 15 inches MAP

North Region: 15 to 20 inches, and >20 inches MAP

The terms "south" and "north" refer to the regions where the bulk of the seeding sites are located.

(“south region” or the “north region” precipitation range) Some judgment is necessary, particularly in regions that overlap or where the MAP of a project might fall between the two regions and requires educated decisions on which seed mix to use or whether to combine the seed mixes.

Figure E-02


MEAN ANNUAL PRECIPITATION
1961 – 1990
State of Idaho
Map precipitation data by the Idaho State Climatologist, Department of Agricultural Engineering, University of Idaho, Moscow, Idaho in cooperation with The Idaho Water Resources Research Institute and Federal and State Agencies.
DEPARTMENT of TRANSPORTATION
UNIVERSITY of IDAHO
LEGEND
0 – 10 Inches or 0 – 250 mm
10 – 15 Inches or 250 – 380 mm
15 – 20 Inches or 380 – 510 mm
20 – 40 Inches or 510 – 1020 mm
40+Inches or 1020+mm
SCALE
0 25 50 100 Miles

The region specified may also be used to determine the season of work as well as to select the seed mix. Dry-land roadside seedings, for Idaho regions can be categorized into three (3) seeding seasons (South-Fall, North-Fall, and North-Spring) as follows:

South Region Seeding Season

South Region Seeding Season	
MAP	**Fall Seeding Season**
<10”	Oct 1 to Nov 30
10”-15”	Oct 1 to Nov 15
North Region Seeding Season	
MAP	**Fall Seeding Season**
15”-20”	Sept 15 to Nov 30
>20”	Sept 15 to Nov 15
For sites with 15” or higher precipitation, where chances of early fall moisture are good, two possibilities can be used — seed early to take advantage of early fall moisture with time for establishment before freezing weather arrives; or delay with enough time to finish before bad weather begins to avoid losing newly germinated seedings.	
MAP	**Spring Seeding Season** *(Use primarily for completion of jobs already started.)*
15”-20”	Feb 15 to May 15
>20”	March 1 to May 30

Generally, the greatest risk of fall seeding is the seeding may be performed during a time when there is sufficient moisture for germination; however there may not be sufficient time for establishment before freezing temperatures set in. The new seedings is likely to die due to winter desiccation and frost heave. The greatest risk of seeding in the spring is the seeding may be completed too late in the season, even though there may be sufficient moisture for germination, there may not be sufficient time for plant establishment before dry, hot weather arrives. The new seedings are likely to die due to summer drought conditions.

For both fall and spring seeding, a minimum of 45 days growth is needed to assure seeding survival.

Be sure to allow sufficient time for work to be completed prior to the seeding begin date. Mulches, erosion blankets, mulch anchoring, benching, and an effort to maintain flatter slopes allows for better erosion control and makes it more feasible to plan fall seedings for most locations.

Seeding grass species only is generally performed in the fall or during seed dormancy, which is more successful in “south region”. For “north region”, successful seeding may be preformed either during the fall or in the spring. Seeding in the north regions may be completed the

following spring if it is impossible to finish the job in the fall, as planned. In the south region, if the seeding is not finished in the fall as planned, completion may be delayed until the following fall, unless establishment water can be used. In special situations, seeding may be performed outside the season of seeding when fall seeding would be difficult or impossible or temporary seeding is required for compliance with the Pollution and Storm Water requirements. Establishment watering may be required if seeding must be performed outside the normal or desired season of seeding.

E.40.05 Topsoil Application & Fertilizer Selection.

Topsoil Application

One consideration for determining whether fertilizers or other soil amendments are needed is to determine whether topsoil is to be used. Topsoil is that uppermost layer of soil capable of growing and supporting vegetation. Topsoil contains essential nutrients, organic matter and soil micro-organisms, and physical characteristics necessary for proper plant growth and establishment. The topsoil layer can vary from a depth of 3 inches to 24 inches or more, depending on the characteristics. If the pH level is above 7.8, the value of the material as topsoil is questionable. Native grass and shrub species that are not to be disturbed shall be identified and flagged prior to topsoil excavation or salvage operations. All large vegetative debris including trunks and stems of shrubs shall be stripped and removed from the topsoil prior to mass grading activities. **In most instances topsoil should be stockpiled and reused on the project to provide a better growing medium for new seedings.** Topsoil shall be placed in separate stockpiles or in composite stockpiles that shall not exceed 4 feet in height. Topsoil stockpiles should be stabilized for protection against wind and water erosion hazards and future reapplication during final grading activities. Stockpiles should be treated with soil binders or tackifiers in order to prevent erosion and minimize weak production. (Topsoil referred to in Section 213 should not to be confused with "select topsoil" as described under Subsection 711.09 for use in planting beds. Select topsoil specifications should be used as a guide in determining what good topsoil is.)

Topsoil is recommended on all disturbed sites and slopes 2:1 or flatter that will be permanently seeded, or an a planting medium for plantings or nursery stock. Topsoil may be added to a rock mulch to enhance slope protection and provide soil for seed germination and plant growth. Topsoil can be mixed with organic material such as compost or manufactured soil amendments to improve the growing capability of vegetation.

Generally, topsoil should not be used on slopes steeper than 2:1 or on sandy or silty slopes steeper than 3:1. Topsoil should not be placed on frozen, extremely wet, or smooth slopes.

When planning to reuse topsoil for roadside seeding, use the "best" soil obtained from the top few inches of soil surface within the construction area. Many areas to be seeded (especially cut slopes) are sterile and deficient in nutrients and micro-organisms because they are primarily obtained from subgrade soil. Most topsoil is better than any subgrade soil. Use the best material available.

For most applications, the desired topsoil depth is 6 inches. Unfortunately, there is usually a shortage of sufficient topsoil to cover all areas. Where quantities of topsoil are limited, it is more practical to redistribute available topsoil to site specific or critically disturbed areas to be the proper depth first, and then distribute any excess topsoil to other areas to be seeded if available. If necessary, the more favorable sites may be left without topsoil. Even 1-2 inches will aid considerably. However, for planning purposes, try to cover all exposed subsoils with available topsoil and make every effort to obtain the desired 6 inch coverage.

Medium-textured soils are preferred; however, this may be difficult to obtain in some areas. When reusing excavated topsoil, special care shall be given to exclude rocks and debris that interfere with seedbed preparation and seeding operations, as well as leaving the surface in a roughened condition before applying the topsoil to ensure it is not eroded away by wind or rain. The desired roughness shall be a series of horizontal serrations of 8 inches which shall cover the entire area where topsoil will be placed. Where embankments are constructed, offsetting lifts of material to create an uneven surface prior to topsoil placement should be considered. Smooth slopes are not acceptable.

Topsoil can be placed on benched slopes to assist in vegetation establishment. A thin layer of topsoil (1-2 inches) is especially valuable on rocky benches and particularly south-and west-facing exposure slopes, however, special care should be taken to not apply too much topsoil that the value of the benches is destroyed.

Fertilizer Selection Determination

Application of fertilizer ingredients on disturbed areas to be seeded is beneficial to new seedlings if the proper kinds and qualities of fertilizer are specified. Failure to apply necessary nutrients may result in poor vegetation establishment or complete failure of the seeding.

Organic-or compost-based products and/or biological soil stimulants or amendments that provide additional assistance or substitute for commercial fertilizer are now available and may be specified as special provisions. These products have proven to be very effective in establishing vegetation under adverse environmental conditions and can be hydro-applied in most instances. Seeding and organic or compost based products, biological soil stimulant, and/or tackifier(s) shall be applied in separate applications. Fertilizer, organic-based compost, biological soil stimulant and or tackiifier(s) shall not be mixed with the seed. The organic-or compost-based products can also replace mulching requirements.

Nitrogen needs or other soil components must be determined by taking a soil sample from the area(s) to be seeded and submitting the sample to an accredited laboratory for an accurate soil evaluation and determination of available nutrients or lack of nutrients critical for plan establishment. The following list illustrates an estimation of the nitrogen level needed as indicated from the available moisture:

This list is not to be used as the determining factor or in place of a soil analysis report.

Mean Annual Precipitation	<10 inches	7 lbs per acre
	10-15 inches	12 lbs per acre
	15-20 inches	18 lbs per acre
	>20 inches	20 lbs per acres

Some commercial fertilizers, especially nitrogen, leach out quite rapidly after application, so it is recommended that nitrogen fertilizer be specified as time, slow, or controlled release. The same nutrient requirements would apply.

After determining the moisture zone of the site(s) to be fertilized, consider additional factors that may affect moisture availability and fertilizer application:

- other sources of water (ground, surface, establishment water, natural springs etc.),
- soil type (sand, clay, silt, loam, etc.),
- quality and/or quantity of organic matter (high or low),

- slope aspect (south or north facing, etc.)
- other soil problems as indicated by the pH (soil test), the presence of indicator plants, sterile subsoils, or parent material (where top soil is not re-used).
- high salt, calcium or other mineral content
- type of vegetation seeded(Native Wild Flowers)

Soil tests shall be conducted from topsoil samples to determine nutrient levels and needs so fertilizer specifications can be based on those nutrient requirements and recommendations. Soil test results and nutrient requirements shall be included in the Materials Phase II report and used to make determinations for appropriate nutrient requirements. The General Soil Map for Idaho (Figure E-03) provides available soil data that may be used to help determine nutrient deficiencies as shown in the recommended nutrient list of the General Soil Legend (Figure E-04). The suggested nutrient quantities are provided in the General Soil Legend (Figure E-04) is in elemental form and should only be used as a guideline in determining appropriate nutrient requirements and should not substitute for soil analysis or test results. However, for ITD's planning and design work, always use the elemental quantities. Contact the Roadside Programs Administrator in headquarters Maintenance section for assistance in determining required nutrients.

E.40.06 Standard Seeding Mixes.

Seeding native dry-land grasses, forbs, and shrubs is the most effective and desirable revegetative practice; however, several years are usually required to meet satisfactory levels of vegetative growth and establishment, thus a combination of adaptable introduced species and native species shall be included in all seed mixes. Seeding shall commence after all seed bed construction requirements are completed. The preferred method of seeding shall be drill seeding for slopes 3:1 or flatter, either dry broadcast seeding or hydro-seeding methods for slopes 2.5:1 or steeper.

Each standard mix shall include a minimum of three native and introduced grass species, two legume species (including one native), and possibly two to five natives (forbs and/or shrub species) for each seeding project. The standard mixes shall be used for most situations. Legume and shrub species shall be specified for slopes and areas some distance away from the edge of pavement (or outside the mow zones.) Legume and/or shrub species may be omitted from the seed mix if it causes a maintenance or vegetation management problem, such as applying herbicide treatment to control invasive or noxious weed species. **Sometimes there are special situation, where natives, wild flowers or legumes are not included in the seed mix. Under these conditions, the "primary" grass species in each seed mix shall be increased by 2lb/A.** A cover crop or "nurse crop" may be included for situations requiring quick establishment, germination, green-up, or growth for erosion control and soil stability during vegetation establishment periods. The cover or nurse crop seed should be obtained from a local source and shall be certified under provisions as established by the Idaho Crop Improvement Association.

The Department shall furnish the seed mix for all projects, unless otherwise specified, and is not required to provide seed quality or certification documents. Seed rates shall be adjusted in the mixes supplied by the department to reflect "bulk seed" and should not specify Pure Live Seed (PLS) amounts. PLS has already been factored into the department's recommended seeding rates. The designer also has the option to require the contractor to furnish all or part of the

seed on construction projects where very little seed is required for projects where large quantities are required, or when the seed specified is not available through Headquarters' Supply Services. For Contractor-furnished seed, weed seed and inert matter content shall not exceed the minimum permitted by law and viability (TZ) test shall be no more than six months old. Contractors shall provide verification or letter of certification, original Association of Official Seed (AOSA) seed test results, and calculations of PLS content. Contractor shall also provide documentation of the seed source, vendor verification of the seed mix ordered including species, varieties, pounds of PLS to be delivered; and the estimated delivery date for all seed at least 30 days prior to the commencement of revegetation activities.

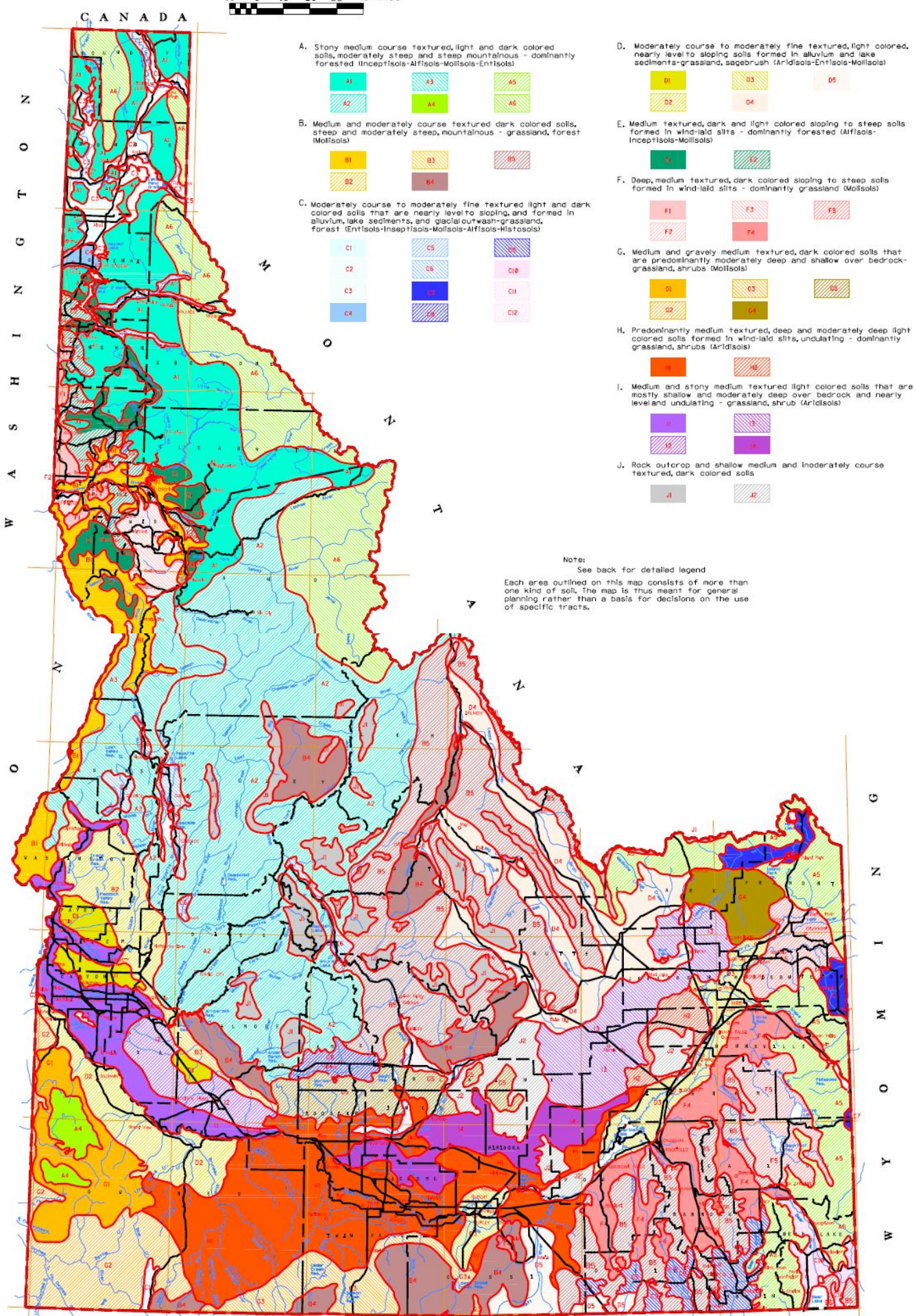
March, 2005

GENERAL SOIL MAP

IDAHO

APRIL 1973

10 0 10 20 30 40 Miles



A. Stony medium course textured, light and dark colored soils, moderately steep and steep mountainous - dominantly forested (Inceptisols-Alfisols-Mollisols-Entisols)

A1 A2 A3 A4 A5 A6

B. Medium and moderately course textured dark colored soils, steep and moderately steep, mountainous - grassland, forest (Mollisols)

B1 B2 B3 B4 B5

C. Moderately course to moderately fine textured light and dark colored soils that are nearly level to sloping, and formed in alluvium, lake sediments, and glacial outwash-grassland, forest (Entisols-Inseptisols-Mollsols-Alfisols-Histosols)

C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12

D. Moderately course to moderately fine textured, light colored, nearly level to sloping soils formed in alluvium and lake sediments-grassland, sagebrush (Aridsols-Entisols-Mollsols)

D1 D2 D3 D4 D5

E. Medium textured, dark and light colored sloping to steep soils formed in wind-laid silts - dominantly forested (Alfisols-Inceptisols-Mollsols)

E1 E2

F. Deep, medium textured, dark colored sloping to steep soils formed in wind-laid silts - dominantly grassland (Mollsols)

F1 F2 F3 F4 F5

G. Medium and gravely medium textured, dark colored soils that are predominantly moderately deep and shallow over bedrock-grassland, shrubs (Mollsols)

G1 G2 G3 G4 G5

H. Predominantly medium textured, deep and moderately deep light colored soils formed in wind-laid silts, undulating - dominantly grassland, shrubs (Aridsols)

H1 H2

I. Medium and stony medium textured light colored soils that are mostly shallow and moderately deep over bedrock and nearly level and undulating - grassland, shrub (Aridsols)

I1 I2 I3 I4

J. Rock outcrop and shallow medium and inoderately course textured, dark colored soils

J1 J2

Note:
See back for detailed legend

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

Figure E-04

GENERAL SOIL LEGEND		
N (nitrogen), **P** (phosphorous), **K** (Potassium), **S** (sulfur), **B** (boron), and **Zn** (Zinc).		
Legend Symbol	**pH Range**	**Recommended Nutrient**
A	4.5-7.0	N - based on available moisture P – 35 lb/A S – 10-15 lb/A B – 1-2 lb/A
B	6.0-7.5	N - based on available moisture P - 35 lb/A K - 35 lb/A S - 1-2 lb/A
C_1-C_7	5.0-7.6	N - based on available moisture P - 35 lb/A K – 40 lb/A S - 1-2 lb/A
C_8-C_{12}	6.5-8.5	N - based on available moisture P - 35 lb /A K - 35 lb /A S - 1-2 lb /A
D	6.5-8.0	N - based on available moisture P - 35 lb A Salt - can be excessive
E	4.5-7.0	N - based on available moisture P – 25 lb /A S - 1-2 lb/A B - 1-2 lb/A
F	7.0-8.0	N - based on available moisture P - 1-2 lb/A
G	6.5-8.5	N - based on available moisture P - 1-2 lb/A Salts - can be excessive
H	6.5-8.5	N - based on available moisture P - 1-2 lb/A Zn – 10 lb/A Salts - can be excessive
I	6.5-8.5	N - based on available moisture P - 1-2 lb/A Salts - can be excessive
J	6.0-8.5	Very Little Soil - primarily rock

Symbols for vegetation identification were taken from: USDA and NRCS. "Plant's Database ," 2003.

South Region (0" – 10" precip.)	**Lbs. Bulk Seed Per Acre**
PrimaryGrasses	
"Covar" Sheep Fescue (FEOVO)	4
Thickspike W.G. (ELMA7)	6
Sandberg Bluegrass (POSE)	2
Bottlebrush Squirreltail (SIHY)	8
Optional (Alternative Grasses)	
"Ephraim" Crested W.G. (AGCR)	5
Siberian W.G. (AGFR)	5
Basin Wildrye (LECI4)	8
Streambank W.G. (ELLA3)	6
Idaho Fescue (FEID)	6
Indian Ricegrass (ORHY)	6
Legume	
Ranger Alfalfa (MESA)	1
SilkyLupin (LUSE)	2
Cover Crop(Optional)	
Spring Wheat, Barley or Oats	2
Hairy Milkvetch	2
Triticale	3
Natives	
To be determined	1-5
TOTALS	33-37

South Region (10" – 15" precip.)	**Lbs. Bulk Seed Per Acre**
Primary Grasses	
"Sodar" Streambank W.G. (ELLAL)	6
Intermediate W.G. (THIN6)	6
Hard Fescue (FETR3)	8
Sandberg Bluegrass (POSE)	2
Bottlebrush Squirreltail (SIHY)	8
Optional (Alternative) Grasses	
Streambank W.G. (ELLA3)	6
Thickspike W.G. (ELLA7)	6
Western W.G. (PASM)	9
Bluebunch W.G. (PSSPS)	6
Slender W.G.(ELTR7)	5
Mountain Brome (BRMA4)	8
Basin Wildrye (LECI4)	8
Blue Wildrye (ELGL)	8
Idaho Fescue (FEID)	6
Legumes	
Ladak Alfalfa (MESAL)	1
Silky Lupine (LUSE)	2
Cover Crop (Optional)	
Spring Wheat, Barley or Oats	4
Hairy Milkvetch	2
Tritical	3
Natives	
To be determined	1-5
TOTALS	33-37

North Region (15"-20" precip)	**Lbs Bulk Seed Per Acre**
Primary Grasses	
"Durar" Hard Fescue (FEOVD)	7
Intermediate W.G. (THIN6)	7
Canada Bluegrass (POCO)	2
Bluebunch W.G. (PSSPS)	8
Idaho Fescue (FEID)	6
Option (Alternative Grasses	
Thickspike W.G. (ELMA7)	6
Streambank W.G. (ELLA3)	6
Slender W.G. (ELTR7)	5
Smooth Brome (BRIN)	6
Columbia Brome (BRVU)	6
Basin Wildrye (LECI4)	8
Blue Wildrye (ELGL)	8
Tall Fescue (FEAR)	6
Western Needlegrass (ACOC3)	3
Prairie Junegrass (KOCI)	2
Legumes	
Ladak Alfalfa (MESAL)	1
White Dutch Clover (TRRE)	1
Silky Lupine (LUSE)	2
Cover Crop	
Spring Wheat, Barley or Oats	1
Hairy Milkvetch	2
Triticale	3
Natives	
To be determined	1-5
TOTALS	38-42

North Region (20+" precip)	**Lbs Bulk Seed Per Acre**
Primary Grasses	
"Durar" Hard Fescue (FEOVD)	7
"Fortress" Red Fescue (FERUR)	7
Canada Bluegrass (POCO)	2
Bluebunch Wheatgrass (PSSPS)	8
Idaho Fescue (FEID)	6
Optional (Alternative) Grasses	
Pinegrass (CARU)	2
Tufted Hairgrass (DECA)	2
Streambank W.G. (ELLA3)	6
Slender W.G. (ELTR7)	5
Blue Wildrye (ELGL)	8
Tall Fescue (FEAR)	6
Legume	
White Dutch Clover (TRRE)	1
Silky Lupine (LUSE)	2
Cover Crop (Optional)	
Spring Wheat, Barley or Oats	1
Hairy Milkvetch	2
Natives	
To be determined	1-5
TOTALS	37-41

E.40.07 Native Seed List The rates per acre for pure wildflower seeding are not specified and will need to be determined on a case-by-case basis. As shown on the Native Seed Lists, the wildflower seeds consist of native and adaptable species suitable for roadside revegetation and landscaping practices and are classed as very small (VS), small (S), medium (M), and large (L) sizes. Additionally, annual wildflower seeds should not make up more than 25% of the total wildflower mix.

Native wildflower seed vary in size, characteristics, reproductive and germination ability and therefore seed rates will vary and should be determined on a case-by-case basis. When wildflower varieties are combined a pro rata calculation would be required to provide approximately 70 to 80 seeds cu. ft. Adjustment of rates may also be needed when methods

other than drill seeding are used. Contact the Roadside Programs Administrator in Headquarters Maintenance Section for assistance.

NATIVE SEED LIST		
* VS = Very Small; S = Small; M = Medium; L = Large		
South Region	**Seed Size***	**Seed**
Perennial Wildflowers	S	Palmer Penstemon (PEPA)
	S	Western Yarrow (ACMIL)
	S	Eaton Penstemon (PEEA)
	M	Small Burnet (SAMI)
	S	Globe Mallow (SPMU)
	S	Purple Prairie Clover
	M	Lewis Flax (LILE)
	M	Arrowleaf Balsamroot (BASA)
	S	Yellow Buckwheat (ERFL4)
	S	Sulfurflower Buckwhear (EFUM)
	S	Western Goundsel (SEIN2)
	S	Louisiana Sagewort (ARLUM2)
	L	Silvery Lupine (LUAR3)
	S	
Annual Wildflowers	S	Farewell to Spring (CLARK)
	M	California Poppy (ESCA)
	S	Blazing Star (MELA2)
Shrubs	VS	Basin Big Sage (ARTRT)
	VS	Wyoming Big Sage (ARTRW)
	VS	Wyoming Big Sage (ARTRV)
	S	Purple Sage (SADO4)
	L	Curleaf Mtn. Mahogany (CELEL)
	L	Fourwing Saltbrush (ATCA)
	L	Shadscale (ATCO)
	S	Yellow Rabbitbrush (CHRY8)
	S	Rubber Rabbitbrush (ERNA10)
	S	Ceanothus (CEVE)
	M	Winterfat (CELAL)
	S	Antelope Bitterbrush (PUTR)
Trees	M	Rocky Mtn. Juniper (JUSC)
	L	Ponderosa Pine (PIPO)

	M	American Plum (PRAM)
	M	Siberian Pea Tree (CAAR)
	M	Lodgepole Pine (LUPAS)

North Region	**Seed Size***	**Seed**
Perennial Wildflowers	S	Rocky Mtn. Penstemon (PEST)
	S	Lance-Leaved Coreopsis (COLAZ)
	S	Alpine Penstemon (PEVE2)
	M	Blueleaf Aster (ASGL)
	S	Showey Goldeneye (VIMUM)
	M	Blanketflower (GAAR)
	M	Sticky Purple Geranium (GEVI)
	M	Arrowleaf Balsamroot (BASA)
	S	Silky Lupine (LUSE4)
	S	Yellow Buckwheat (ERFL4)
	L	Sulfurflower Buckwheat (ERUM)
	S	Fernleaf Biscuitroot (LODI)
	S	Canada Goldenrod (SOCA6)
	S	Gray Aster (EUGL19)
Annual Wildflowers	S	Plains Coreopsis (COTI2)
	M	Corn Poppy (PARH)
	M	Blanketflower (GAPU)
Shrubs	M	Dogwood (COSTS)
	M	Rodosier Dogwood (COSES)
	L	Chokecherry (PRVIM)
	L	True Mahogany (CEMON)
	S	Blueberry Elder (SACE)
	L	Rocky Mtn. Maple (ACGLG)
	S	Kinikinik (ARUV)
	S	Oregon Grape (MARE)
	S	Snowberry (SYAL)
	L	Wood Rode (ROSE sp.)
	M	Mtn. Ash (SOSCS)
	M	Shiny-leaf Spirea (SPBE)
	S	Syringa (Mock Orange) (PHILA)
Trees	S	Willow (SALIX sp.)
	M	Hawthorn (CRDO2)
	M	Red Alder (ALRUS)
	M	Water Birch (BEOC2)
	M	Dwarf Birch (BENA)
	S	Lodgepole Pine (PICO)
	M	Grand Fir (ABGR)
	L	Douglas Fir (PSMEM)

E.40.08 Shoulder-Foreslope Mixes. Most projects require two seed mixes; one seed mix for the shoulder (mow zone) and the foreslope area (usually up to 20 feet from the edge of pavement); and another seed mix for all other areas to be seeded including slopes. Shoulder-foreslope mix shall normally be the two most suitable grasses from the appropriate "shoulder-foreslope grass" list. Usually this will be the foreslope area to near ditch bottom. No legumes or natives are to be included in these shoulder-foreslope mixes.

Shoulder-Foreslope Grasses	
Grass	**Precipitation Range**
Red Fescue (FERUR)	>20”
Hard Fescue (FEOVD)	12”+
Sheep Fescue (FEOVO)	10”+
Idaho Fescue (FEID)	10”+
Canada Bluegrass (POCO)	15”-20”
Sandberg Bluegrass (POSE)	8”+
Bottlebrush Squirreltail (SIHY)	6”-16”
Western Wheat Grass (PASM)	10”-15”
Thickspike Wheatgrass (ELMA7)	8”-20”
Intermediate Wheatgrass (THIN6)	14”+
Streambank Wheatgrass (ELLA3)	10”-25”
Bluebunch Wheatgrass (PSSPS)	10”+
Slender Wheatgrass (ELTR7)	12”+
Sand Dropseed (SPCR)	<8”
Inland Saltgrass (DISP)	5”+

E.40.09 Special Use Grasses and Legumes. If the sites to be seeded fall between regions or precipitation zones; or special conditions exist such as alkali, sand, or drought conditions, contact the Roadside Programs Administrator in Headquarters Maintenance Section for assistance in the use of "Special Use Grasses and Legumes" and combining mixes.

*Special Use Grasses and Legumes	
Alkali or Salt Tolerant "Alkar" Tall Wheatgrass (AGEL3) Alkali Sacaton (SPAIA) "Lemons" Alkaligrass (PULE) Inland Saltgrass (DISP) Fourwing Saltbush (ALCA2)	**Other** Small Burnett (SAMI) "Fults" Alkaligrass (PUDI) "Whitmar" Beardgrass W.G. (AGSPI) "Alta" Tall Fescue (FEAR3) "Secar" Bluebunch W.G. (AGSP3) "Paiute" Orchard Grass (DAGL) **High pH** Tufted Hairgrass (DECA)
Rocky or Steep Slopes Bluebunch W.G. (PSSPS) Idaho Fescue (FEID) Canby Bluegrass (POCA) Thurber's Needlegrass (ACTH7)	
Sand or Silty Soils "Volga" Mammoth Wildrye (ELGI) Indian Ricegrass (ORHYH) Sand Dropseed (SPCR) Thickspike W.G. (ELMA7) Basin Wildrye (LECI4) Prairie Junegrass (KOCI) Needle & Thread (HEOC26)	
*Seeding rates on these special use species to be determined according to conditions on each project where they may be needed.	

E.40.10 Mulch – Mulch Anchoring – Erosion Blankets.

Obtaining a good stand of vegetation may require the use of mulch, mulch mixtures, soil amendments or an erosion blanket on disturbed areas in order to protect and enhance the establishment of permanent vegetation.

Mulch, mulch mixtures, soil amendments or erosion blankets are essentially applied and used:

1. to protect the seed and seedlings, from harsh weather conditions, variable temperatures and wildlife

to conserve and retain moisture,

to reduce and control erosion, surface run-off, and

to provide additional nutrients and organic materials.

The designer has several primary questions to address when planning for mulch.

- What areas should be mulched and with what?
- What areas should receive erosion blankets and what?
- How should the mulch be anchored?
- Will it need to be removed?

E.40.11 Mulch For seeding purposes, the decision on whether to use mulch, mulch mixtures, and/or soil amendments must be take into consideration along with the conditions such as amount of soil texture, slope, aspect, annual moisture or the potential for erosion or surface run-off. The site or soil variation may not always be reasonably isolated for different applications of mulch products; however, consideration of these factors may assist in making appropriate decisions as to various methods and mulches available.

In general, mulch or compost products should be applied to slopes 3:1 or flatter; while mulch, mulch mixtures, compost, soil amendments or an erosion blanket or a combination of these should be applied to slopes 3:1 or steeper.

There are numerous types of mulch products that are being promoted and used for mulching and mulch anchoring. A brief and general description of mulches that may be used follows:

Mulch Alternative. Gravel or crushed rock mulch with aggregate diameters from ½ inch to 2 inches applied to a depth of 2" does a good job of conserving moisture and may be used where risk of erosion is high either due to wind or storm water runoff. Unwashed material is acceptable and enhances vegetation establishment. ***Seed should be applied after the gravel is in place instead of before.***

Noxious weed free Grass hay or grain straw is sometimes desirable for slopes 3:1 or flatter and generally anchored by mechanically crimping the material to the soil surface. Grass hay or straw is not as effective as compost or other organic mulches which maybe cost prohibited. If conditions warrant it, a combination of crimping and tackifers may be used to anchor the mulch. If grass hay or straw is applied on slopes 3:1 or steeper, the mulch shall be anchored with a tackifier or a jute matting or comparable material. Both grass hay and straw provide nutrients to the soil as they break down, usually within two to three years.

Organic- or Compost-based products are very effective and should be to be considered on projects where the application can be accomplished without disturbing or damaging the seedbed preparation. Application methods include spinner trucks, manure spreaders, blowers, and hydro applicators. The advantage to using compost, which maybe derived from almost any organic matter, is that compost retains and conserves moisture, increases the temperature of the soil, promotes desirable soil micro-organisms, provides additional slow release minerals and nutrients, as well as provides erosion control at higher rates. The primary concern is the availability of compost and transport of the product to the site. New seed-meal/organic-based compost products are now available that can be hydro-applied at rates comparable to wood fiber mulch, rates.

Wood fiber, organic or natural fiber, or recycled paper (newsprint or cardboard) in many cases is convenient and the preferred mulch and is generally mixed in water slurry and applied with a hydro applicator. . These products and methods of application can place wood fibers, organic fiber, or recycled paper in either a mulch or erosion blanket classification and can be used effectively for erosion control. Wood fiber, organic fiber, or recycled paper in most instances can be applied on slopes 3:1 or steeper and should generally be the mulch of choice when other equipment cannot be transported into the areas to be seeded or mulched. This water slurry method of application also applies to seeding and fertilizing. In almost all instances tackifiers or soil binders should be used to anchor the mulch. Tackifiers or soil binders may be applied separately over the mulch or may be combined with the mulch in a thick slurry application and then applied to the site.

Under no circumstances should fertilizer or seed be applied in combination with wood fiber or cellulose mulch.

Mulch mixtures may also be used and generally consist of mulch or compost, soil amendments, soil biological stimulants, soil micro-organism inoculants, bonding fibers, tackfiers, natural plant materials or nutrients and/or combinations, which are usually specified as a complete package. The mulch mixture is usually combined into water slurry and applied with a hydro applicator in one application.

Wood chips or shredded bark, or wood bi-products are the least desirable mulches for several reasons, but can be used if the need arises. One of the primary concerns is that wood chips or shredded bark, or wood bi-products can tie up available nutrients or minerials in the soils or use nitrogen that should be readily available to the vegetation thus slowing or reducing germination and establishment. Wood chips or shredded bark are good landscaping mulches, are cheap, and more plentiful in some areas; but difficulty in hauling and applying it to construction sites is a major draw back.

E.40.12 Mulch Anchoring.

There are generally two types of anchoring methods used to hold the mulch in place and bind it to the soil surface. This is done to reduce movement and displacement of the mulch.

Mechanical Anchoring is accomplished by using a crimper disc or other mechanical devise to incorporate grass hay or straw into the soil. Mechanical anchoring should be used on slopes 3:1 or flatter and shall be performed only along cross slopes only in order to create small furrows. Mechanical anchoring using a crimper disc may be performed on slopes 2:1 or flatter using appropriate equipment. On slopes 3:1 or steeper cat walking or yo-yo crimping are the preferred methods of mechanically anchoring grass hay or straw.

Tackifier is used to bind the fibers in various mulches together to prevent loss of mulch due to wind or storm water runoff. This procedure must allow for the penetration and retention of moisture, cannot interfere with or be harmful (toxic) to plant or animal life, and be non-staining to concrete or painted surfaces. On critical erosion prone areas, mechanical anchoring and tackifier may be used in combination with each other. In this case, the tackifier is applied as an overspray after the mulch has been mechanically anchored.

E.40.13 Erosion Blankets.

Erosion Blankets may be applies as a solid or in liquid applied form and should be used on slopes 2:1 or steeper and especially in areas where highly erodible soils are present. Other critical areas may be water ways, wetlands or areas where blow sand is present on slopes 3:1 or steeper.

There are many different types of erosion blankets on the market. The following is a brief description of some types of erosion blanket and their use.

Straw and/or Coir(coconut) Blankets are generally in solid form and in some cases straw/coconut blankets do an excellent job of conserving moisture and controlling erosion. However, heavy or thick straw blankets may not be effective in helping establish satisfactory stands of vegetation.

Jute Matting or Jute Mesh or Burlap is a solid blanket made from natural fibers and primarily used in areas or situations where there is a need to anchor or hold down a grass hay or straw mulch and can be used on very steep slopes or embankments. The jute matting is often used in place of a tackifier on sites where a tackifier may not be enough to anchor or hold the mulch. Jute matting conforms to the soil surface and does not “tent up” like other rigid netting and can be left in place and seeded over.

Excelsior (wood fiber) Blankets are generally in solid form and performs better as an erosion control under high-intensity rain storm events or winds, but is not as effective as straw and/or coir blankets for establishing vegetation. Excelsior has a tendency to wick the moisture out of the soil, and may tent up or not adhere to the ground.

Hydro Blankets are made from natural and/or synthetic materials and come in many forms and packages including Bonded Fiber Matrix, wood fiber mulch, compost and/or combinations of materials that are sprayed on and adhere to the soil surface. Mixtures are nontoxic to animals, mico-organisms, aquatic plant and animals, and generally do not impede seed germination or establishment. However, some liquid blanket products can create impervious surfaces that can increase the amount and velocity of surface water runoff.

E.40.14 Establishment Water.

Establishment water may be used to supplement normal precipitation and enhance establishment for seeding dryland grasses on roadways. It has proven to be a valuable technique; but is not a remedy for all seeding problems and the watering systems remain very costly. However, this method of stand establishment "insurance" can be a cheaper in the long term and more successful in combating weed problems and promoting desired establishment than even reseeding. Good seeding practices should not be altered or shorted, nor should seeding seasons be improperly stretched beyond the recommended duration even where water is available.

The decision to use water should be based on careful analysis of all the conditions. Probability of adequate precipitation is a key factor in considering water application. The publication *Probability of Selected Precipitation Amounts in the Western Region of the United States* is the best guide for determining desired suitable and practical dates for applications and frequency and quantity of water available for any location under consideration as well as the nearest comparable local weather reports for sites in the vicinity under consideration as well as the nearest comparable local weather reports..

Reasons for considering adding extra water include:

1. Soil or site problems indicating seeding difficulty (blow sand or coarse droughty dry material, hardpan soils, south and west facing slopes aspects, or additional site factors);

Low or expected low MAP precipitation regions approaching the 10 inches level or less annual precipitation level or a probable seasonal low including long term droughts. (In these areas seedings are expected to fail unless above-normal moisture is received during the establishment period or establishment water is applied);

Conditions requiring the stretching of the normal seeding season beyond the recommended duration; and

Beautification requirements or the need for rapid growth. Rapid vegetation establishment may be required to reduce erosion and sediment loss and increase vegetative quality, thicker, healthier stand is desired. Some species used for beautification require establishment water in certain locations.

Should one or more of the above conditions exist, determine whether there is an adequate source of quality water available during the period needed and determine delivery feasibility and probable costs.

The most feasible and lowest cost method of delivering water to the area should be determined. Water may be applied by either a sprinkler system or water trucks or a combination of both.

The application period should be planned to supplement existing precipitation levels expected during normal seeding seasons. To be of greatest benefit and to extend the establishment seasons, water should be scheduled just before early fall rains or just after late spring rains. Consider climate, weed, germination and competition, species seeded and construction needs to determine whether to use spring or fall application.

Each water application provided for in the watering schedule should usually be an application of 1Ac. Unit/Acre. The following watering schedule will give the seeding 6 acre unit applications of water and should be adjusted for local conditions. For example, water applications for a water schedule beginning on or after August 15th would be as follows:

- 1st application — ¬1 Ac. Unit/Acre — 4-day interval
- 2nd application — 1 Ac. Unit/Acre — 6-day interval
- 3rd application — 1 Ac. Unit/Acre — 8-day interval
- 4th application — 1 Ac. Unit/Acre — 10-day interval
- 5th application — 1 Ac. Unit/Acre
- Additional applications applied as directed.

E.40.15 Preparing an Establishment Water Plan. The plan can be simple or detailed, depending on the needs and site condition. The plan generally will include:

A Layout Map that contains:

- Source of water.
- Areas to be watered by sprinkler including acreage and volume of water required.
- Areas to be watered by trucks including acreage and volume of water required.
- Proposed layouts for sprinkler lines.
- Proposed layouts for haul roads.
- Pump locations.
- Dimensions of areas to be watered.

The Written Explanation may include:

- Estimated length and size of mainline.
- Estimated length and size of laterals.

- Estimated number and horsepower of pumps to be used.
- Estimated number of and pressure required for each sprinkler heads.
- Spacing of heads, diameter of circle, and overlap required. (Normally, the water plan is based on a 50% of diameter overlap on the full and half-circle impact heads. Except in very unusual circumstances, impact heads should be the only type considered for use even though this may leave certain odd areas to be watered by truck.)
- Other (sump facilities, valves, etc.)

A detailed design is not needed in most cases; however, plans and specifications shall provide sufficient information for the general layout and provide quantities satisfactory for bidding purposes. For assistance, call the headquarters Maintenance section.

E.40.16 Special Areas. Where there is a desire for beautification, but resources are limited, the following guidelines should be used to assist in developing suitable seeding and planting alternatives and their related costs. The use of these guidelines provides a "safe" level and with some flexibility, either up or down, should desires change in future years.

Generally, there are only two alternatives for quality turf development:

- Standard dry-land seed mix which may not be very successful and/or result in a poor-quality turf with related undesirable weeds, or
- Turf seed or sod with complete irrigation system provides good quality turf but is costly to establish and requires a high degree of maintenance.

The following alternatives, if understood and used properly, will satisfy most needs, as well as construction, and maintenance resources. The alternatives are listed in the order of decreasing cost.

- High-Level Maintenance

High-level normally involves the seeding of a good lawn grass species (usually a combination of bluegrass and perennial rye mix or 100% perennial rye); installation of a complete, and permanent irrigation system (with irrigation interval at one to two weeks); very frequent mowing (one- to two-week intervals); and planting suitable shrubs, ground cover and trees as desired. This level provides the designer the greatest flexibility in formal planning and choice of planting materials; however, construction costs are much higher and maintenance costs remain high with little flexibility over the years.

- Medium-Level Maintenance

Medium-level is based on the seeding of appropriate primary grass species; installation of a permanent, irrigation system for minimal waterings (irrigation intervals set at two weeks to one month); and

planting less frequent mowing (two-week to one-month intervals) and planting native dry-land shrubs and trees as desired. This level provides the widest range of flexibility in maintenance costs.

A wider selection of shrubs and/or trees is permitted and mowing requirements would be related to irrigation. Should the irrigation water become unavailable, the turf will not be completely lost, but will survive and respond when water becomes available again. Should over-irrigation of the primary grass turf occur more often than two-week intervals, bluegrass would be expected to invade.

- Low-Level Maintenance

Low-level is based on the seeding of appropriate primary grass species as described earlier, along with the optional use of adequate amounts and combinations of establishment water, some or minimal mowing, and planting native (dry-land) shrub, tree seedlings, container plants. Low-level with no establishment water may consider broadcast seeding or a combination of drill seeding and broadcast seeding.

Summary of Relative Cost Estimates

Beautification Level	No. Yrs. for Mtce. Costs Equal to Constr. Costs	Yearly Mtce. Costs/ $100,000 Constr. Costs
High	6-10	$10,000-$17,000
Medium	10-15	$7,000-$10,000
Low	20-35	$3,000-$5,000

The district should determine the level of turf quality that is appropriate for the area and that can be adequately maintained. Thorough discussions with the city, county or other agency personnel who may have the maintenance responsibilities are required so they will fully understand the alternatives and agree to the proposal.

Careful seedbed preparation and proper sowing techniques of desirable seed techniques of desirable and will greatly improve results. Fertilizer should be specified at seeding time for high medium and low (with water) levels as needed. Low-level (without water) should be fertilized the year following establishment.

The use of establishment irrigation water wherever feasible is very desirable to obtain a thicker turf in a much shorter time frame. A variation that might be used on the two lower levels is installation of a partial or drip irrigation system providing water to certain selected shrubs or trees to allow a wider choice of shrubs and/or trees and yet leave the larger turf area in the lower cost level. Native shrub seed may be necessary to achieve desirable results (particularly on the steep slopes), may be seeded two or three years later by planting native shrub and tree seedlings to supplement the direct seeding.

If mowing is necessary or planned, then, no shrubs should be included in the plan, or mowing should be limited to a specific area or part of the area.

Supplemetal seeding of irrigated areas. Three primary grasses including "Sodar" wheatgrass, "Durar" hard fescue, and/or “Covar” sheeps fescue may be supplemented or specified when planted on the appropriate sites (as shown in the seeding guide) when including irrigation provide additional levels of turf quality. They respond to irrigation water and provide a more dense cover as the amount of desired water is increased. Care should be taken to not over-irrigate, since over-irrigation will cause bluegrass to invade the Sodar and Fescue seedings. The bulk seeding rates for primary grasses at all levels are:

- "Sodar" Wheatgrass (AGRI) 30 lbs. /Ac.
- "Durar" Hard Fescue (FEOVD) 20lbs. /Ac.
- (It is desirable to include of White Dutch Clover at a rate 1 lb./Ac. with the "Durar.")
- “Covar” Sheep Fescue (FEOVO) 20 lbs. /Ac.
- Natives 3 lbs. /Ac.