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.

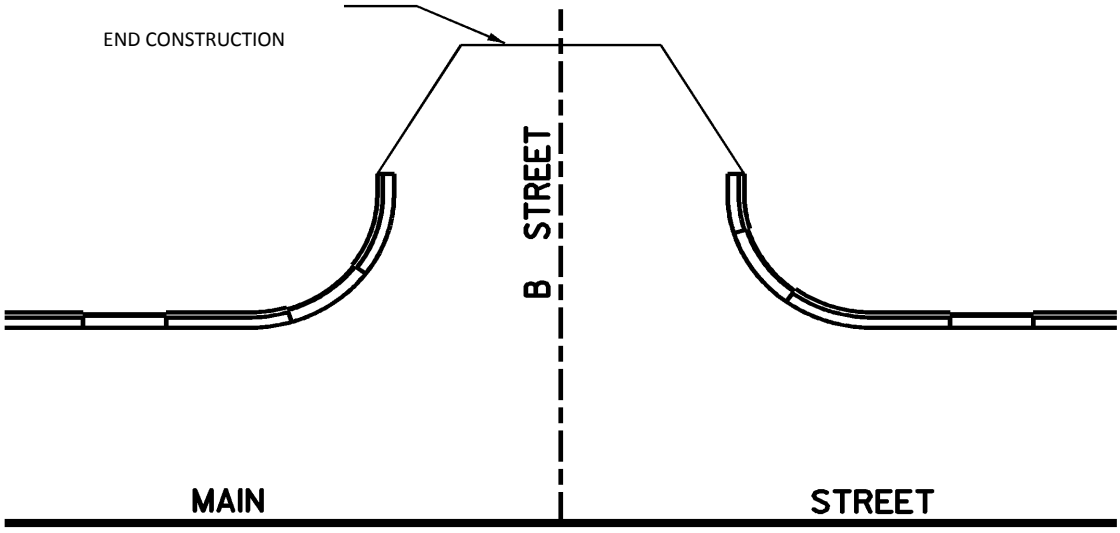
810.05 Angles. Angles will be shown in degrees, minutes, and seconds.

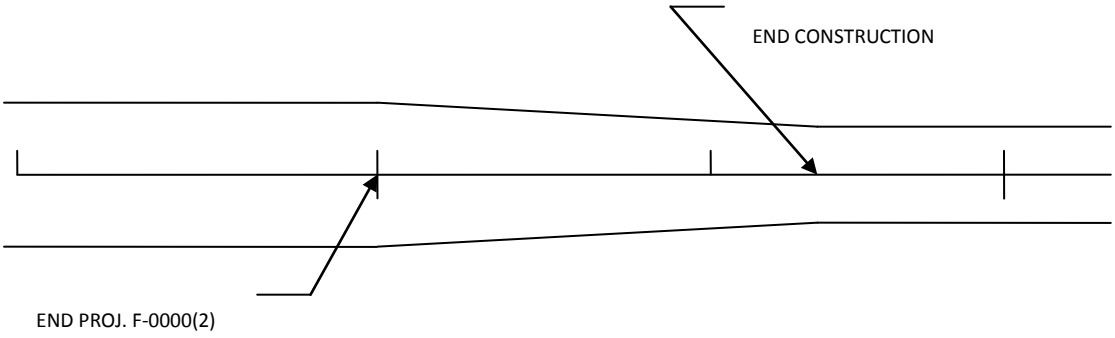
810.06 Culverts. Culvert diameters will be shown in inches according to the sizes available from suppliers. Culvert lengths will be to the nearest foot.

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:



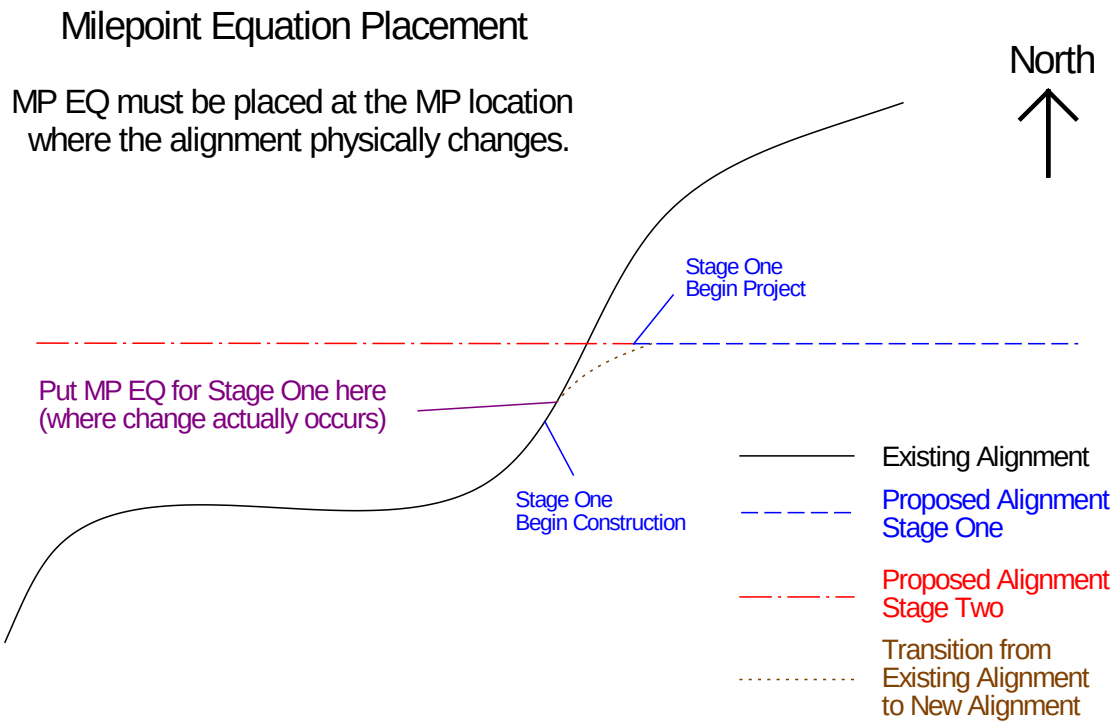


825.00 – MILE POSTS & MILEPOINT EQUATIONS

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

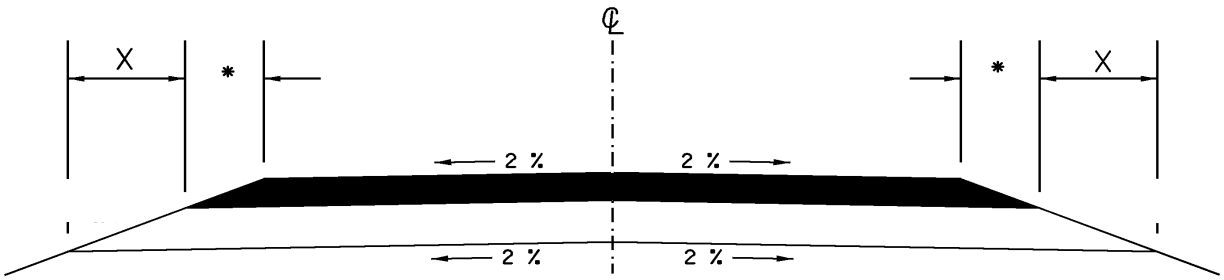
- Add title block information.
- Show drafter's or designer's name and the date in the title block.

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.

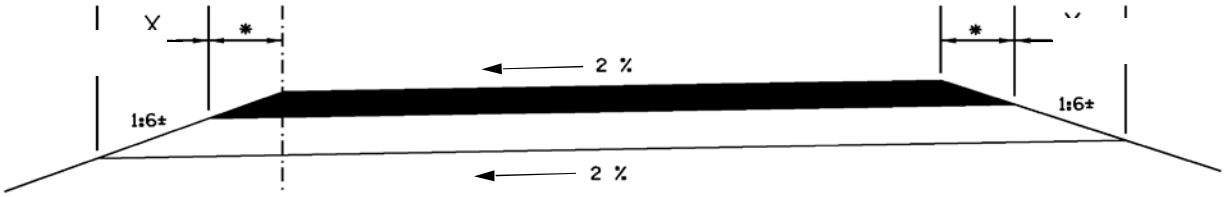
0.50’ Comp. ¾” Aggr. for Base

(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.

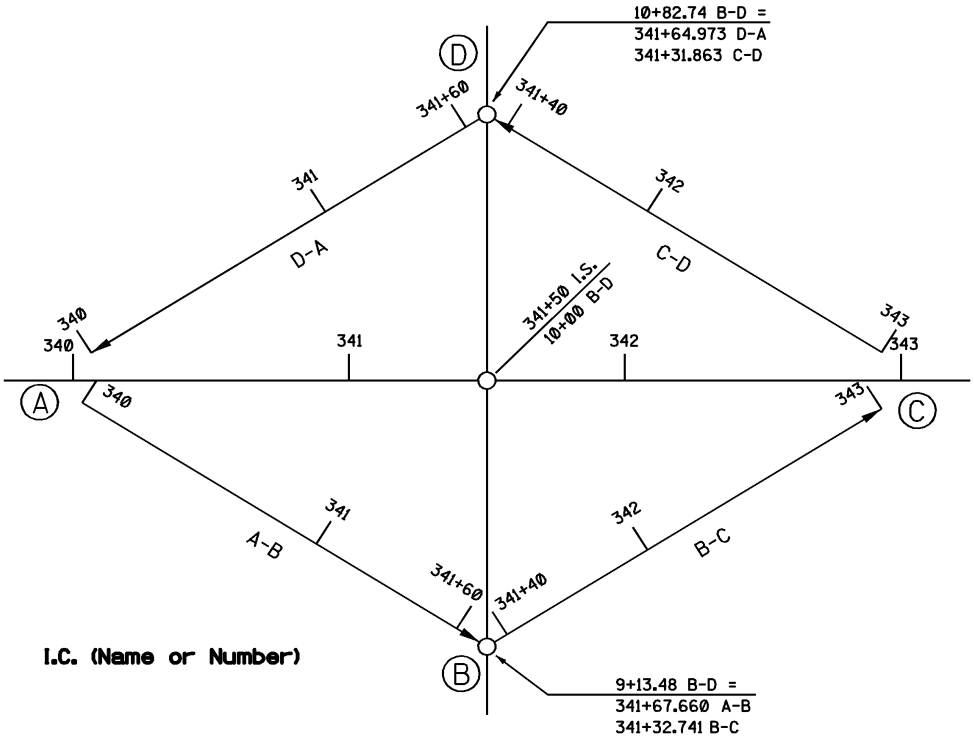
Non-pay items such as pipe removal shall be shown on the top portion of the plan sheet, but shall not be assigned a number.

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 ..... _____