Section 1300 Plan Components

Section 1300 Plan Components

1301 Introduction

Plan development relies on standards and guidelines to provide clear, concise, and accurate construction documents. Detailed construction plans include illustrations of proposed work, plan notes, specifications, and quantities enabling contractors to bid and execute an ODOT project. Section 1300 has been developed to provide general guidelines under which to develop ODOT construction plans.

Section 1300 combines many components of final plan development and outlines the content required in each plan set. The subsections listed within this document are intended to provide details related to plan format and **not** design standards. ODOT maintains specific manuals related to design standards (i.e. Bridge Design Manual, Location and Design Manual, Volume 1, Traffic Engineering Manual, etc.) which establish design criteria required for the facility.

Section 1300 includes references to figures and Sample Plans. The figures are tables, and diagrams, presenting plan sheet requirements and are referenced with bold text. The following is an example: **Figure 1302-1**.

The Sample Plans are examples of ODOT plan sheets (i.e. Title Sheet, Schematic, Typical Sections, etc.) and are intended to be used as a "guide" to assist the designer with plan development. The Sample Plans are not all-inclusive. Final plan development, in accordance with ODOT standards, is the responsibility of the designer. Structural plans (**Bridge Design Manual**) and Right-of-Way plans (Right-of-Way Manual) shall be developed according to their respective manuals. References to the Sample Plans are shown with brackets and bold text. The following is an example: **[**SP 1302-1**]**.

1301.1 Standard Plans

Standard highway plans are made up of several components. Most of these components are discussed in detail in this section. Except for very complex projects, seldom will all components be required in a plan. However, when they are required, they should be placed in the order indicated below:

- Title Sheet
- Schematic Plan
- Typical Sections
- General Notes
- Maintenance of Traffic (Notes and Plan Details)
- General Summary
- Subsummaries
- Calculations
- Project Site Plan
- Plan & Profile (Mainline)
- Plan & Profile (Side Roads, ramps, etc.)
- Cross-Sections (Mainline)
- Cross-Sections (Side Roads, ramps, etc.)
- Superelevation Tables

- Interchange Details
- Intersection Details
- Drive Details
- Storm Sewer Profiles
- Culvert Details
- Channel Details
- Channel Cross-Sections
- Drainage Details
- Retaining Walls (not associated with Structures)
- Sanitary Sewer
- Water Work
- Miscellaneous Details
- Traffic Control
  - Pavement Marking
  - Signing
  - Signals
- Lighting
- Landscaping
- Structure (20 Foot Span and Under)
- Structure (Over 20 Foot Span)
  - Site Plan
  - General Plan
  - General Notes
  - Estimated Quantities
  - Stage Construction Details
  - Foundation Plan
  - Abutment Details
  - Retaining Wall Details
  - Pier Details
  - Superstructure Details
  - Reinforcing Steel List
- Fence Plan
- Right-of-Way
  - Right-of-Way Legend Sheet
  - Centerline Plat
  - Property Map
  - Summary of Additional Right-of-Way
  - Detailed Right-of-Way
- Soil Profile

  On the Title Sheet, state the type of Geotechnical Explorations performed (i.e., Soil Profile – Roadway, Soil Profile – Bridge, etc.) in accordance with Section 700 and Appendix D of the

Specifications for Geotechnical Explorations. Include those sheets in the sequential numbering of the construction plan sheets.

- Railroad or Government Land Plats. These sheets are not included in the sequential numbering of the construction plan and should be numbered separately.

1301.2 Simplified Plans

Simplified Plans are appropriate when the proposed work is simple and straightforward. Some examples include: guardrail upgrading, pavement marking, herbicidal spraying, mowing, fencing, and resurfacing projects.

Simplified plans contain only the information necessary to minimally describe the type and location of the work. Typically, such plans consist of the following components:

- Title Sheet **[**SP 1302-7**]**
- Typical Sections
- General Notes
- General Summary, Subsummaries, Calculations
- General plan, sketch, line drawing, or plan and profile
- Special Details

Simplified plans may be used provided they give sufficient information to adequately describe the work so that a contractor can properly bid and construct the project. In some cases, this information can be presented entirely in written format, without the use of drawings. See Section 1315 for additional information regarding simplified plan content.

1301.3 Order of Precedence

As defined in the Construction and Materials Specifications, the order of precedence for all contract documents is:

1. Addenda
2. Proposal and Special Provisions
3. Plans
4. Supplemental Specifications
5. Standard Construction Drawings
6. Standard Specifications

1302 Title Sheet

1302.1 General

The title sheet serves as a preface for the remainder of the construction plan. It gives a brief description and the length of the project, shows the general location of the project, sets up the specifications under which the project is to be built, states whether traffic is to be maintained or detoured, lists earth disturbed areas, gives an index of all sheets in the plan, lists standard construction drawings, railroad

involvement, construction project number, federal project number, supplemental specifications, and special provisions, and contains the signature of approval by the proper officials.
The information to be included on the Title Sheet is discussed in the following sections.

1302.2 Plan Title

1302.2.1 Heading

All construction plans processed by the Ohio Department of Transportation must show in bold letters at the top of the Title Sheet, "**STATE OF OHIO, DEPARTMENT OF TRANSPORTATION**".

1302.2.2 Project Designation

1302.2.2.1 Projects in One or Two Counties

A. On-System Projects - Projects on the State system are identified by county code, route number, and section number to the nearest hundredth of a mile (straight-line mileage). Following is an example **[**SP 1302-4**]** for a project in Wyandot County, on Route 30, beginning at straight-line mileage 9.11.

WYA-30-9.11

The county code consists of the first three letters of the county name with the following exceptions:

County	Code
Ashland	ASD
Ashtabula	ATB
Champaign	CHP
Harrison	HAS
Meigs	MEG
Monroe	MOE
Montgomery	MOT
Morgan	MRG
Morrow	MRW

The route number is identical to the actual route number assigned to the highway on which the improvement is located. The section number is the straight-line mileage (SLM) at the point where the project begins, measured from the county line in miles from west to east for east-west routes or from south to north for north-south routes, as the route is viewed across the entire state.

Listed below are several special conditions which may be encountered in determining a project designation for a project on the State system.

County Line Located on Project Centerline
The county code letters should be in accordance with the predetermined straight-line mileage assignment as listed in the Straight-Line Diagrams.

Project Limits Extend into Adjacent County
A project designation must be shown for each county.

FRA-3-26.18, DEL-3-0.00

or

FRA/DEL-3-26.18/0.00

Work Limits Extend into Adjacent County
The adjoining county code letters are shown in parentheses.

TUS-77-10.64(STA)

More than One Route (Not Overlapping)
A separate project designation is used for each.

UNI-31-8.19, UNI-37-2.04

or

UNI-31/37-8.19/2.04

For projects with various work types on three or more routes and/or ramps that are all included in the work, the primary route number, and reference to the various routes, should be shown followed by the primary route SLM and reference to the secondary route(s) various SLMs, as shown:

MAH-224/VAR-13.62/VAR

Overlapping Routes - For projects on overlapping highways of different systems (Interstate, U.S. or State), only the project designation for the highest-classed system should be used. For overlapping routes on the same system, the project designation for the lowest route number is used.

Intersecting Routes - A separate project designation is not required when other routes intersect the proposed improvement (junction or grade separation) unless it is determined that the intersecting route will have different funding than the principal route.

Suspended Projects - A separate straight-line mileage section number is used at the point where the project limit is resumed. The example below and **[**SP 1302-2**]** shows a project limit that begins at SLM 21.73, is suspended for a distance, and then is resumed at SLM 22.83. For additional information on how to determine project limits, see Section 1303.6

DAR-121-(21.73) (22.33)

For instances where a project has numerous suspend/resume sections, the words "and various" may be used within the project designation, as shown as follows and in **[**SP 1302-5**]**.

ERI-2-30.51 and various

B. Off System Projects - The project designation for improvements on county or township road systems include the county code, county or township route number, and local name (if any). A section number may also be included, if appropriate. **[**SP 1302-6(a)**]**

CRA-C.R. 6-1.61 (Boundary Rd.)

POR-T.R. 233D (Asbury Road)

If a route number is not available, city street improvements simply use the county code letters and the street name as the project designation. **[**SP 1302-1**]**

JEF-FERNWOOD RD.

1302.2.2.2 District-Wide Projects

District-wide projects are defined as projects which involve work in three or more counties within the District. The project designation for a District-Wide project is as follows: District Identifier - Project Type - Fiscal Year. Following is an example project designation for a district-wide pavement marking plan, in District 4, that is scheduled to be awarded in the fiscal year 2016.

D04-PM-FY2016

There may be a need to have multiple projects of the same project type, in the same district, in one fiscal year. If this is the case, the project designation is as follows:

D04-PM-FY2016(A)

and

D04-PM-FY2016(B)

The following is a list of project types. Contact the Office of CADD and Mapping Services if another project type is needed.

ACPV	Asphalt Concrete Paving
BC	Bridge Cleaning
BH	Bridge Repair
BI	Bridge Inspection
BK	Generic PIDs (Block)
BP	Bridge Painting
CB	Catch Basins
CH	Cleaning/Sweeping highways
CHIP	Chip Seal

CR	Small Culvert Repair/Replacement (Rise<60", round or elliptical conduit only)
CS	Crack Sealing
FEN	Fence
ENV	Environmental
GT	Geotechnical
GES	General Engineering Services Contract
GR	Guardrail
HS	Herbicidal Spraying
IMC	Interstate Maintenance Contract
ITS	Intelligent Transportation Systems
LG	Lighting
LOOP	Loop Detector Repair
MCRO	Microsurface
MOW	Mowing
NW	Noise Walls
PM	Pavement Marking
PR	Pruning, Tree/Brush removal
PS	Pavement/Shoulder Sealing
RPM	Raised Pavement Markers
RS	Ride Share
RUM	Rumble Strips
SIGN	Signing
SP	Spot Paving (less than 1000' in length)
ST	Surface Treatment (spot locations)
TSG	Traffic Signals
WIM	Weigh-In-Motion

1302.2.2.3 Statewide Projects

Statewide projects should use the same project designation as District-Wide projects, except the District Identifier is replaced with STW (Statewide). For example: STW-ITS-FY2017.

1302.2.3 Political Subdivisions

Whenever any work is located within a political subdivision, it is necessary to include the name of the subdivision. If the improvement is located entirely within the corporate limits of a city or village, the township name is omitted. The order of political subdivisions, from top to bottom is: city, village, township, and county. If the work limits extend into an adjoining county, the county is shown in parentheses. The following example shows how a title would read when portions of the improvement are located within several political subdivisions and the work limits extend into the adjoining county.

TUS-77-0.00 (STA)

CITY OF TROY

VILLAGE OF SPARTAN

OXFORD TOWNSHIP

TUSCARAWAS COUNTY

(STARK COUNTY)

1302.2.4 Railroads

When the improvement involves a railroad separation, the involvement must be indicated by a subtitle under the project designation **[**SP 1302-3**]**.

Grade Crossing Elimination - When an existing railroad grade crossing is to be eliminated by constructing a separation or relocating the highway, the following subtitle should be used:
GRADE CROSSING ELIMINATION WITH THE _____ RAILROAD

Separation Constructed Without Elimination - When the highway is to be separated from a railroad and the existing railroad grade crossing is not eliminated, use the following subtitle:

GRADE SEPARATION WITH THE _____ RAILROAD

Existing Separation Rebuilt - When an existing separated crossing is to be rebuilt, the subtitle should read:

RECONSTRUCTION OF EXISTING SEPARATED CROSSING WITH THE _____ RAILROAD

Projects which include grade separations or any other railroad involvement, should list the railroad company's name in the Railroad Involvement portion of the title block.

It should be noted that some companies are incorporated as railroads and some as railways. Verify the proper name is placed on the title sheet.

1302.3 Design Designation

The Design Designation is an expression of the basic factors that control the design of the highway. It may be included in the plan for any type of construction project, but it is required on any improvement having pavement work or geometric changes.

Normally, only one representative Design Designation is necessary. On improvements involving interchanges, major intersections, or other major traffic generators that materially affect traffic volumes, additional Design Designations are required. Design designations are necessary for side roads if relocation, or significant improvements, equal to or greater than three-hundred feet (300') are involved. If only one Design Designation is used, it should be shown on the Title Sheet. For improvements with multiple design designations (e.g., more than one route), this information may be shown on a sheet other than the Title Sheet (i.e., Schematic Plan, specially designated sheet). However, the location of these sheet(s) must be noted in the Title Sheet's Index of Sheets **[**SP 1302-5**]**.

The following is an example of the Design Designation format **[**SP 1302-1 through 1302-6(b)**]**:

DESIGN DESIGNATION (ENGLISH UNITS)

Current ADT (2012)	10,390
Design Year ADT (2032)	25,200
Design Hourly Volume (2032)	2,520
Directional Distribution	55%
Trucks (24 hour B&C)	2.6%
T_d	4%
Design Speed	50 MPH
Legal Speed	40 MPH
Design Functional Classification	03 Principal Arterial (Urban)
NHS Project	Yes

Current ADT is the Average Daily Traffic for the anticipated opening year of the project.

Design year is defined in Location and Design Manual, Volume 1, Section 102.2.

T_d is the percentage of trucks during the design hour in the design year, and is required for interstates, other freeways and expressways only.

Legal speeds are defined by the Ohio Revised Code in miles per hour.

If the project design is based on 3R **[SP 1302-1]** values the phrase "3R Project" should be used in lieu of the design speed. If a project mixes 3R work with other work that does not qualify as 3R, it is necessary to delineate or tabulate the non-3R portions and indicate the applicable design speeds.

Per the Ohio Department of Transportation Highway System Highway Functional Classification System – Concepts, Procedures, and Instructions, in addition to being classified as urban or rural, roadways are categorized as Principal Arterials, Minor Arterials, Collectors and Local Roads. Additionally, Principal Arterials and Collectors are further subcategorized, creating a total of seven (7) classifications or sub-classifications as shown in the table below:

#	Description
	Principal Arterial Roads
01	Interstates
02	Other Freeways or Expressways
03	Other Principal Arterial Roads
	Minor Arterial Roads
04	Minor Arterial Roads
	Collector Roads
05	Major Collector Roads
06	Minor Collector Roads
	Local Roads
07	Local Roads

For more information on the Design Functional Classification please refer to the Location and Design Manual, Volume 1, Section 101, the Ohio Department of Transportation Highway Functional Classification System – Concepts, Procedures and Instructions Manual, or contact the Office of Roadway Engineering.

1302.4 Design Exceptions

Design Exceptions are required as specified in Location and Design Manual, Volume 1, Section 105. The difference between the actual design and the normal design criteria must be clearly denoted on the appropriate plan sheet in the construction plans.

Design exceptions should be shown on the plan sheets in accordance with the guidelines on **Figure 1302-3, Guide For Showing Design Exceptions in Plan,** and on the Title Sheet **[**SP 1302-1**]** utilizing the following format:

DESIGN EXCEPTIONS

Design Feature	Approval Dates	Sheet Numbers
Lane Width	7/7/18	24
Bridge Width	7/7/18	46

If there are no design exceptions, indicate this by adding the words "None Required". Contact the Office of Roadway Engineering with questions.

1302.5 Index of Sheets

The Index of Sheets serves as the table of contents for the entire set of plans. Soil Profile sheets should appear in the index, sequentially numbered with the rest of the construction plan sheets. Geotechnical data from geotechnical reports may be included as Special Provisions on 8 ½ "x 11" sheets.

Since sheets are often added, deleted or rearranged during plan development, the final sheet numbering is usually deferred until the Stage 3 Review. To assist the reviewer in describing the location of review comments, sheets should be designated with numerical or alphabetical characters for each review submission.

As a last resort, sheets may be inserted into the plan by alphabetizing (Example: 88A, 88B, 88C, etc.). All alphabetized sheets must be shown in the Index of Sheets. The last actual sheet number in the plan is never alphabetized. **[**SP 1302-4**]**

Sheet numbers that are not used must be noted as "Not Used". **[**SP 1302-4**]**

It is extremely important that the Index of Sheets agrees exactly with the plan sheet numbering system, to ensure that the plan is complete.

1302.6 Plan Preparer Identification

1302.6.1 Engineer's Seal

All construction plans, including those prepared by ODOT staff, must be sealed by a Registered Professional Engineer [SP 1302-1] in accordance with Ohio Revised Code. More than one Engineer may seal the title sheet, or different Engineers may seal different portions of a plan (e.g., seal on bridge site plan to cover all bridge work). It must be clear what design elements each seal covers. [SP 1302-2] A single Engineer's seal on the Title Sheet is assumed to cover the entire plan; unless otherwise noted.

Any design changes after the plans have been sealed should be performed by the Engineer who sealed the plans. If this is not possible, all design changes shall be clearly noted and sealed somewhere within the plans. This may be accomplished by a general note listing all changes, or by a revision block on each sheet that is affected. **[SP 1302-6(a)]**

Sample Plan sheets [SP 1302-1 through 1302-8] show the normal placement of the Engineer's seal. The Engineer must sign and date the plans immediately below the seal.

Requirements for sealing plans by Professional Surveyors (e.g., Right-of-Way plans) are covered in the **Right-of-Way Manual**.

1302.6.2 Design Firm Information

The name and address of the firm preparing the plan shall be shown [SP 1302-1 through 1302-8].

1302.7 Underground Utilities Note

The "Before You Dig" warning note must be shown on the Title Sheet for all plans. The note is shown below and on the Sample Plan sheets **[SP 1302-1 through 1302-8]**.

1302.8 Location Map

The Location Map [SP 1302-1 through 1302-8] shows the general area in which the project is located and the project limits. The map should be approximately 7" x 7", for a full-size plan, and 3 ¼ " x 3 ¼ ", for a simplified plan, with North pointing toward the top of the sheet. A scale of 1" = 1 mile is often used; however, the map scale shall be such that the limits of the project are clearly identified and the lettering clearly legible on an 11"x17" reduced set of plans.

The Location Map shall contain sufficient information to clearly show the location of the improvement with respect to: federal, state, county and township roads; identifiable streets in urban areas; villages, cities, townships and counties; and rivers and creeks. ODOT maintains an application for use when

placing location maps. The application is available for download from the ODOT CADD Services web site.

Detour routes should be shown on the Location Map **[**SP 1302-2**]**, if possible. If not, the detour shall be shown on the Schematic Plan, or Maintenance of Traffic Sheets **[**SP 1302-6(a)**]**, and so noted in the Index of Sheets.

The latitude and longitude shall be provided for all projects, shall be measured to the center of the project, and shall be accurate to the nearest 5 seconds of a degree. These geographic references are not only used to locate a project but are also used in the computer analysis of bid data, and in estimating software. Therefore, the latitude and longitude values must be presented accurately, because this information will affect the reliability of the results obtained by these applications.

On multiple segment contracts, the latitude and longitude used shall be the approximate center of the segments of work. The approximate center can be established by visual inspection.

On district-wide contracts, the latitude and longitude used shall be the locations in the following table:

DISTRICT	LATITUDE	LONGITUDE
1	40°46'18"	84°05'34"
2	41°23'07"	83°38'48"
3	40°52'38"	82°17'41"
4	41°00'57"	81°29'30"
5	39°57'06"	82°24'41"
6	40°17'52"	83°02'58"
7	40°17'49"	84°09'40"
8	39°25'52"	84°17'03"
9	39°19'28"	82°57'47"
10	39°26'28"	81°27'36"
11	40°27'19"	81°24'29"
12	41°24'54"	81°36'54"
Statewide	39°57'21"	83°03'13"

1302.9 Supplemental Specifications

A list of the Supplemental Specifications (including the current revision date) applicable to the project shall be included on the Title Sheet **[**SP 1302-1**]**. Supplements, 1000 series and above, are not to be listed on the Title Sheet.

Supplemental Specification 800 is used as a boiler plate specification. That is, it is updated quarterly to include errata and other corrections to the Construction and Materials Specifications (CMS). It must be specified on all projects. In order to ensure that the most recent version of Supplemental Specification 800 is specified, the current revision date used on the Title Sheet should match the revision date that will be in effect when the Engineer's Estimate is completed by the Office of Estimating.

The date when the Engineer's Estimate is completed by the **Office of Estimating** is approximately 8 weeks prior to the Sale Date for the project. The Letting Schedule, including Sale Dates, is established by the **Office of Estimating** and published on the Office of Contracts website.

A suffix indicating the applicable year of the specification book should be provided on the title sheet (i.e., when using the 2016 Construction and Material Specifications, Supplemental Specification 800-2016 should be used). The suffix is required because Supplemental Specification 800 will vary with each edition of the CMS.

1302.9.1 Special Provisions

When a special provision is needed for a project, the title and date of the special provision shall be listed on the Title Sheet **[**SP 1302-1**]**. See Section 1305.3 – Special Provisions.

1302.10 Standard Construction Drawings

A list of current Standard Construction Drawings (including the current revision date) applicable to the project shall be included on the Title Sheet. Standard Construction Drawings are published in three sets. The sets include Roadway Drawings, Bridge Drawings, and Traffic Drawings and are maintained by the following offices:

1. **Roadway Drawings**

Drawing Series:	Office:
BP (Base Pavement)	Office of Pavement Engineering
BP (Base Pavement)	Office of Roadway Engineering
CB (Catch Basins)	Office of Hydraulic Engineering
DM (Drainage Miscellaneous)	**Office of Hydraulic Engineering**
F (Fence)	**Office of Roadway Engineering**
MGS (Guardrail)	**Office of Roadway Engineering**
HW (Headwalls)	**Office of Hydraulic Engineering**
I (Inlets)	**Office of Hydraulic Engineering**
LA (Landscaping)	**Office of Roadway Engineering**
MH (Manholes)	**Office of Hydraulic Engineering**
RM (Roadway Miscellaneous)	**Office of Roadway Engineering**
WQ (Water Quality)	**Office of Hydraulic Engineering**

2. **Bridge Drawings**

Drawing Series:	Office:
A (Abutments)	Office of Structural Engineering
AS (Approach Slabs)	**Office of Structural Engineering**
BD (Bearing Details)	**Office of Structural Engineering**
BR (Bridge Railing)	**Office of Structural Engineering**
CPA (Capped Pile Abutments)	**Office of Structural Engineering**
CPP (Capped Pile Piers)	**Office of Structural Engineering**
CS (Continuous Slabs)	**Office of Structural Engineering**
DBR (Deep Beam Railings)	**Office of Structural Engineering**
DS (Drip Strips)	**Office of Structural Engineering**
EXJ (Expansion Joints)	**Office of Structural Engineering**

FB (Fixed Bearings)	**Office of Structural Engineering**
GSD (General Steel Details)	**Office of Structural Engineering**
HW (Headwalls)	**Office of Structural Engineering**
ICD (Integral Construction Details)	**Office of Structural Engineering**
NBS (Noise Barrier Specifications)	**Office of Structural Engineering**
PCB (Portable Concrete Barrier)	**Office of Structural Engineering**
PSBD (Prestressed Concrete Box Beam Details)	**Office of Structural Engineering**
PSID (Prestressed Concrete I-Beam Details)	**Office of Structural Engineering**
RB (Rockers and Bolsters)	**Office of Structural Engineering**
SB (Single Span Slab Bridge)	**Office of Structural Engineering**
SBR (Single Slope Bridge Railing)	**Office of Structural Engineering**
SICD (Semi-Integral Construction Details)	**Office of Structural Engineering**
TBR (Thrie Beam Retrofit)	**Office of Structural Engineering**
TST (Twin Steel Tube)	**Office of Structural Engineering**
VPF (Vandal Protection Fence)	**Office of Structural Engineering**

3. **Traffic Drawings**

Drawing Series:	**Office:**
HL (Highway Lighting)	**Office of Roadway Engineering**
ITS (Intelligent Transportation Systems)	**Office of Roadway Engineering**
MT (Maintenance of Traffic)	**Office of Roadway Engineering**
TC (Traffic Control)	**Office of Roadway Engineering**

The Title Sheet includes a table listing the Standard Drawings that apply to the project. During plan preparation, the drawings should be grouped by set, listed in alpha-numeric order within that set, and added to the Title Sheet **[**SP 1302-1**]**.

1302.11 Project Description and Earth Disturbed Areas

1302.11.1 Project Description

The Project Description consists of a brief note describing the primary purpose of the improvement and the project's length.

The project's length is the total distance between the Begin and End project points, adjusted for suspensions and station equations, and measured along the centerline of construction. It is calculated to the nearest hundredth of a mile. In addition, the Project Description should describe other incidental construction. Incidental construction may include the following items (unless they are included in the primary construction): bridge work, interchanges, major connecting roads, lighting, traffic control, etc. The descriptions should use words and phrases such as: resurfacing of, widening and resurfacing of, reconstruction of, relocation of, construction of, rehabilitation of, replacement of, etc.

1302.11.2 Earth Disturbed Areas

For all projects, list the Project Earth Disturbed Area and the Estimated Contractor Earth Disturbed Area in acres to the tenth of an acre. For projects that require the submittal of a Notice of Intent

(NOI), as explained in the Location and Design Manual, Volume 2, Section 1112, list the Notice of Intent (NOI) Earth Disturbed Area to the tenth of an acre. For projects with non-contiguous portions of earth disturbance located ¼ mile or more apart, list the separate non-contiguous earth disturbance area values in separate tables.

For projects involving no disturbed area, such as pavement marking, provide the estimated Project and Contractor EDA, but indicate that a Notice of Intent (NOI) is not required. Use the approach shown in the following example description: [SP 1302-8]

Project Earth Disturbed Area = 0.0 Acres
Estimated Contractor Earth Disturbed Area = 0.0 Acres
Notice of Intent Earth Disturbed Area = N/A (NOI not required)

For projects involving some earthwork, but less than one acre of total earth disturbed area (EDA) (e.g., small bridge replacement), provide the estimated Project and Contractor EDA, to the tenth of an acre, but indicate that a Notice of Intent (NOI) is not required. Use the approach shown in the following example description:

Project Earth Disturbed Area = 0.5 Acres
Estimated Contractor Earth Disturbed Area = 0.2 Acres
Notice of Intent Earth Disturbed Area = N/A (NOI not required)

For projects that require a Notice of Intent (NOI), provide the estimated Project and Contractor EDA, as well as the Total EDA, called the Notice of Intent EDA to the tenth of an acre. Use the approach shown in the following example description: [SP 1302-1]

Project Earth Disturbed Area = 3.1 Acres
Estimated Contractor Earth Disturbed Area = 0.5 Acres
Notice of Intent Earth Disturbed Area = 3.6 Acres

For routine maintenance projects, per the **Location and Design Manual, Volume 2, Section 1112.2**, provide the estimated Project and Contractor EDA to the tenth of an acre, but indicate that a Notice of Intent (NOI) is not required. Use the approach shown in the following example description: [SP 1302-7]

Project Earth Disturbed Area = 4.0 Acres
Estimated Contractor Earth Disturbed Area = 0.1 Acres
Notice of Intent Earth Disturbed Area = N/A (NOI not required) *
* Routine Maintenance Project

1302.12 Notes

1302.12.1 Limited Access

The following note shall be used on the Title Sheet when any portion of the existing, or proposed, right-of-way is designated as Limited Access (includes cases where bridges span a limited access facility): [SP 1302-4]

LIMITED ACCESS

THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY, OR FREEWAY, BY ACTION OF THE DIRECTOR IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02 OF THE OHIO REVISED CODE.

1302.12.2 Specifications

The following note shall be used to indicate the publication date of the Construction and Material Specifications used on the project. The current specification revision year shall be used. Plan details and pay items must be modified to reflect the specification year used.

SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PLANS AND CHANGES LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

1302.12.3 Maintenance of Traffic Endorsement

All contract plans are to be endorsed. One of the notes below shall be used on the Title Sheet, as appropriate. It may be necessary to alter these notes to some degree so that the intent clearly and accurately reflects the project conditions. [SP 1302-5]

Traffic Not Rerouted

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

Traffic Rerouted

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT DETOURS WILL BE PROVIDED AS INDICATED ON SHEET _____.

Traffic Rerouted for Brief Time Periods

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY EXCEPT AS NOTED ON SHEET _____ , AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

Traffic Rerouted Majority of Time

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY EXCEPT AS NOTED ON SHEET ___ , AND THAT DETOURS WILL BE PROVIDED AS INDICATED ON THE PLANS.

Traffic Rerouted Approximately Half Time

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL REQUIRE THE PART-TIME CLOSING OF THE HIGHWAY TO TRAFFIC, AS

NOTED ON SHEET ___. DURING WHICH TIME DETOURS WILL BE PROVIDED AS SHOWN HEREIN. PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

Traffic Rerouted for Side Road Closure

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY EXCEPT FOR THE SIDE ROADS AS DESCRIBED ON SHEETS ___ AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

1302.13 Plan Signatures

Approval spaces shall be provided for the following:

- District Deputy Director
- Director, Department of Transportation

When additional signatures are desired, such as those for city or county officials, they shall appear directly above the District Deputy Director **[**SP 1302-1, SP 1302-6(a)**]**. Local officials should sign the Title Sheet prior to submission of final tracings to the district office.

1302.14 Combined Plans

When construction plans for two or more projects are combined to be sold as one construction project, the following Title Sheet **[**SP 1302-6(a), SP 1302-6(b)**]** changes should be made:

- Add "Part 1" after the project designation on the first title sheet. Add "Part 2", "Part 3", etc. to each succeeding plan title sheet.
- Cross reference all parts on all title sheets. For example, on the first title sheet for a three part project, add "For Part 2 see _____" and "For Part 3 see _____."
- Expand the Standard Construction Drawings, Supplemental Specification and Special Provisions lists on the Part 1 title sheet to include those required for all parts. Remove Standard Construction Drawing, Supplemental Specification and Special Provisions lists from all subsequent title sheets and add a cross-reference to Part 1.

In addition to the above title sheet changes, the type of Field Office specified in each plan should be adjusted to provide for the combined construction costs; and, the maintenance of traffic should be coordinated for all parts.

During the design phase of a project that will use Combined Plans, two or more separate PIDs may be established to reference each Part of the project. However, the construction contract must utilize only one PID. Update Ellis to provide cross-references that correlate the design phase and construction PIDs.

Items 614, 619, 623, and 624 should be provided on all parts where they are applicable.

1302.15 Americans with Disabilities Act (ADA) Design Waivers

ADA Design Waivers are required as specified in the **Location and Design Manual, Volume 1, Section 306.1.2**. ADA Design Waivers shall be shown on the Title Sheet utilizing the following format [SP 1302-1]:

ADA DESIGN WAIVER: None Required
ADA DESIGN WAIVER: Required

Additional information will be provided in the General Notes for ADA features requiring a waiver. See the **Location and Design Manual, Volume 1**, Sample Plan Notes for details. Contact the **Office of Roadway Engineering** with questions.

1302.16 Railroad Involvement

The names of all railroads involved in the project must be entered in the space provided on the title sheet. If there is no railroad involvement, this should be indicated by entering the word "NONE" in this space.

1302.17 Construction Project Number

The construction project number is added to the title sheet by the Office of Contracts prior to the letting date.

1302.18 Federal Project Number

The Federal Project Number should be entered in the appropriate **space** on the title sheet. If the project has no federal participation, the words "Non-Federal" should be entered in this space.

1303 Schematic Plan

1303.1 General

The purpose of a Schematic Plan **[**SP 1303-1**]** is to show the geometric location of proposed roadway segments in relation to existing roadway segments and other features. All projects shall include a Schematic Plan unless the project is short enough to be shown entirely on less than four Plan & Profile sheets.

Schematic Plans are normally prepared to a scale of 1"=100', 1"=200', or 1"=400'. It is preferable to limit the Schematic Plan to one sheet. The scale shall be shown in bar format.

Many of the features included on a Schematic Plan are discussed in the following sections. Other features may be added, as necessary, to provide a clearer picture of the proposed improvement and its relationship to existing facilities.

1303.2 Reference Lines

All reference lines should be clearly shown on the Schematic Plan **[**SP 1303-1**]**. These include the centerline of construction, baselines of ramps, directional roadways and other similar facilities. The centerline of construction and centerline of Right-of-Way should normally be the same. When they differ, their relationship to each other must be shown in the plan. Typically, the relationship is only shown on the Right-of-Way plan sheets.

With modern survey technology, topographic surveys are no longer completed based on a centerline of survey. Consequently, survey centerlines are a misnomer and should not be shown.

The intersection angle, as well as the intersecting stations, should be shown for all intersecting roadways. It may be more convenient to show this information on an intersection detail.

1303.3 Stationing

In general, tick marks shall be shown at full stations (100 ft. intervals) along the center and base reference lines. The centerline stationing on a project should reflect the straight-line mileage shown on the "section" (County-Route-Section). Centerline stationing may also be established based on existing monumentation, bridges and prior projects. Stationing shall increase in the direction of the straight-line mileage.

The Schematic Plan should generally be oriented in such a manner that the stationing on the mainline will increase from left to right, regardless of the north direction **[**SP 1303-2**]**.

Ramp stationing should be a continuation of mainline stationing from the exit or entrance nose and should increase or decrease along the ramp as it does along the mainline. In general, it is not desirable to use

ramp stations in the terminal area, as the required pavement slopes and transitions can be laid out using the mainline stations.

Station equations, if necessary, are to be indicated on the reference line by stating the station back and station ahead **[**SP 1303-3**]**.

If the basis for centerline stationing is unclear or there is a lack of monumentation, structures or prior project stationing documentation, the designer establishing the centerline stationing shall coordinate with the District Survey Section and/or District Real Estate Section to determine the appropriate basis for centerline stationing.

1303.4 Bearings

Bearings shall be shown for the tangent sections of all reference lines.

1303.5 Horizontal Curve Data

Horizontal curve data, and deflections without curves, for all existing and proposed alignments must be shown on the Schematic Plan. **Figures 1303-1 through 1303-3** show elements and data for simple curves, spiral curves, and for when combining spirals between two simple curves. Curve data (except angles) should be shown to two decimal place accuracy. Deflections without curves are identified as follows:

P.I. = Sta. _____

Deflection = _____

NO CURVE

Use "e_{max} = NC" to indicate that normal crown is provided.

1303.6 Project Limits

Project limits are points on the mainline centerline of construction where the proposed improvement, as described in the project description on the Title Sheet (excluding incidental construction), begins and ends. Project limits are generally defined as the beginning/ending of proposed full-depth, full-width pavement. Incidental construction includes all work required to complete a project in addition to the primary purpose for the improvement. Work such as pavement feathering and tapering, traffic control devices, drainage, guardrail, drives, side roads, service roads, etc. may be considered as incidental construction and not be included in the project limits.

Where the primary work on the mainline is suspended for a substantial distance, suspend and resume project points must also be shown.

Begin Project, *End Project*, *Suspend Project*, and *Resume Project* points shall be shown on the Schematic Plan and the Plan & Profile sheets and include both stationing and straight-line mileage (SLM).

1303.7 Work Limits

Work Limits are the extreme limits of the contractor's responsibility on a project, including all temporary and incidental construction, with the exception of work zone traffic control devices required for maintenance of traffic. Work Limit stations are shown along the centerline of construction of the

mainline facility and along the centerline of all side roads, crossroads, and other construction generally running perpendicular to the project or separated from the project.

1303.8 Federal Project Flags

Federal Project Flags, including Federal Project numbers, should be placed at the project limits **[**SP 1303-2**]**. The flags should always point toward the project. If more than one Federal number is used, the limits of each Federal number should be shown, again pointing to the portion of the project to which it applies.

1303.9 Political Boundaries

All county, township, corporation limits, and other political boundaries shall be labeled. The station where these boundaries intersect the centerline of construction shall be shown. When the political boundary is located along the centerline, stationing shall be shown at the points where the political boundary meets and leaves the centerline.

1303.10 Waterways

All waterways (lakes, rivers, streams, jurisdictional ditches, creeks, ponds, etc.), crossing or adjacent to the proposed improvement, shall be shown, labeled, and the direction of flow shall be indicated. This includes any relocated waterways. See **Office of Environmental Services'** Waterway Permits Manual for more information on waterways.

1303.11 Bridges

All bridges, existing and proposed, shall be shown at their appropriate location and identified by their structure number, including left and right notation.

1303.12 Roads for Maintaining Traffic

The location of all roads for maintaining traffic located on an independent alignment shall be shown. Roads for maintaining traffic may be shown using centerline only.

1303.13 Railroads

All railroads in the vicinity of the proposed improvement shall be shown. If a railroad intersects the highway, the station shall be indicated.

1303.14 Utility Lines

High voltage power lines and other major overhead utilities shall be shown. High pressure underground utility lines shall also be shown. Include size/voltage and ownership for these lines **[**SP 1303-3**]**.

1303.15 Pipelines

All major pipelines shall be located and shown.

1303.16 Service/Public Roads

All existing and proposed service roads and other public roads shall be shown and identified by the name and number.

1303.17 Culverts and Sewers

All existing and proposed culverts shall be shown at their appropriate location and the size indicated. Include flow arrows showing direction of flow in the culvert. List the structure number for any structure on the State/Federal system having a span greater than or equal to 10 feet.

Outfall sewers shall be shown.

Drive pipes do not need to be shown.

1303.18 Landscaped Areas

All existing and proposed landscaped areas should be shown. If no landscaped areas exist, then include the phrase "There are no existing landscaped areas within the work limits."

1303.19 Participation Splits

All participation split locations shall be shown. Participation splits are necessary when portions of the project are financed under different Federal Project Numbers, are split by municipal corporation lines, or there are areas to be paid for by only one agency.

1303.20 Contractor's Use of ODOT Right-of-Way

On large projects it may be economical for the Department to permit the contractor to use ODOT property to dispose of waste material and construction debris, excavate borrow material or place a portable plant.

These areas should be checked to ensure that their use is in keeping with all design criteria, environmental regulations and public involvement commitments. When evaluating an area for waste material, the designer should consider future widening and the location of underground utilities.

Areas where the above activities are permissible should be identified in the plans (i.e., on the schematic plan, on the plan and profile sheets, on the cross-sections, in a plan note). Grading restrictions should be identified on the cross sections or specified in the General Notes. Unless additional requirements are provided in the plans, there are no limits on the type of waste material that can be used (e.g., plant material, stumps, etc.). The plan should show whether environmental and/or FEMA permits have been obtained or if the contractor is required to obtain them.

1303.21 Wetlands

All existing wetlands within 100 feet of the proposed construction limits shall be shown and labeled. Wetlands are located and delineated as per the Office of Environmental Services Ecological Manual.

1303.22 Project Control and Reference Points

All necessary survey/mapping parameters should be conveyed in the General Notes as established in Sample Plan Note G105, in Appendix B. Points used to establish project control and reference points should be shown in the Schematic Plan **[**SP 1303-1**]** or listed in the General Notes **[**SP 1305-1**]**.

The survey/mapping for all projects should be developed utilizing the ODOT Survey and Mapping Specifications which are available through the ODOT Design Reference Resource Center (DRRC) website, and the **Office of CADD and Mapping Services** website.

A table listing project control and reference information such as; the primary project control monuments, azimuth marks and/or temporary benchmarks (see the **Survey and Mapping Specification** for descriptions of these items) should be provided. The following information should be included:

- Point number
- Grid and scaled coordinates in U.S. Survey feet (northing/easting)
- Orthometric Height (Elevation)
- Description (i.e. Primary Project Control - steel rod set in concrete)

See **SP 1305-1** for an example of the project control table.

1304 Typical Sections

1304.1 General

The Typical Section is a portrayal, with dimensions, of how a cross-sectional view of the roadway would appear after construction is completed. Except in the case of some ramps, typical sections should be shown relative to the direction of increasing stationing regardless of the direction of travel. Sections should generally be drawn to the same scale horizontally and vertically, although the vertical scale of the pavement thickness may be exaggerated to show the thickness of the various layers. The scale should be large enough to clearly show the proposed section, as well as existing features. No scale should be shown on the typical section. Although sections on the same sheet are usually drawn to the same scale, enlarged details may be used to show items such as pavement edge treatment. Ground lines, existing pavement and all other existing features should be shown (if relevant) using dashed lines.

Mainline, ramp and other roadway typical sections should be grouped together.

Most of the features included in the Typical Sections are discussed in the following sections. Other features may be necessary to cover special circumstances. Examples are included in the Sample Plan Sheets.

1304.2 Typical Section Type and Limits

Unless they have identical typical sections, separate sections must be shown for the mainline, side roads, crossroads, ramps, and other roadways involving paving or earthwork. The typical section of the adjoining pavement including type, thickness, and cross slopes of all pavement courses should be provided.

Sections should be shown for each roadway when: the pavement build-up changes, the type of median changes, guardrail and concrete barriers begin or end, lanes are added or dropped (minimum and

maximum limits are sufficient), and in superelevated areas. Separate sections and lane widths are not required for intersections.
Varying pavement widths in intersection return areas should also be disregarded. A reference to the sheet containing the intersection detail may be added, if necessary. Each section must be adequately labeled to indicate if it is a normal or superelevated section and the roadway and station limits where it applies. Partial sections may be applicable for: changes in treated shoulder build-up; shoulder slope changes in superelevated sections; cut and fill slopes; and other similar situations.

Special sections may be required for speed change lanes, approach slabs, linear grading, etc. Typical sections should also be shown where pavement composition is adjusted over culverts with shallow fill.

Under each section, the station limits where the typical section is applicable shall be indicated. Calculation of the lengths where these typicals apply is not necessary.

Limiting stations for side road typical sections shall break at the side road stations of the extended mainline edges of pavement.

1304.3 Reference Line Location

The location of the centerline or baseline of construction must be shown on each typical section.

1304.4 Rounding

Rounding of slopes shall be shown on each typical section where applicable.

1304.5 Profile Grade Point

The location of the profile grade elevation (normally the crown point) shall be noted on each typical section. Its location should be clearly identified. On a divided highway the profile grade for both sides shall be shown. When the crown-line and profile-grade line are not the same **[SP 1304-5]**, their relationship to each other must be shown.

1304.6 Dimensions

Items on each typical section shall be dimensioned. All dimensions must be shown either in a vertical or horizontal plane. None are to be measured along slope lines. When referring to items detailed in the Standard Construction Drawings, dimensions may be omitted.

If a dimension varies within the limits of a typical section, it should be noted as “varies”, the maximum and minimum dimensions within the limits shall be identified. The limits shall be clearly shown; either on the Typical Section, the Plan and Profile Sheet, or other appropriate detail sheet.

Vertical dimensions include pavement course thicknesses, edge thicknesses, underdrain depths, ditch depths, etc. Where variations in a pavement course thickness are proposed, the typical section should show the thickness as “varies” and the variations shown in tabular form. Vertical dimensions shall normally be in inches.

Horizontal dimensions include widths of pavement, graded shoulders, treated shoulders, steps at edges of pavements, ditches, sidewalks, approach slabs, rounding, pavement widening, medians, barrier offsets, etc. On projects with multilane configurations or curbed shoulders, the lane locations and widths should be shown. Variations in horizontal dimensions due to intersections, etc. should not be included in the typical section. They should be clearly shown on the pertinent plan detail sheets. Horizontal dimensions shall normally be in tenths of a foot.

1304.7 Pavement and Shoulder Cross-Slopes

The shape of the finished surface of the pavement and shoulders should be shown on each typical section by indicating the direction (by an arrow pointing downslope) and the rate of slope. Cross-slopes on pavements and shoulders are to be expressed in dimensionless, vertical-to-horizontal ratios, in decimal form (e.g. 0.01, 0.016, 0.08, etc.).

1304.8 Subsurface Drainage

The location of pipe underdrains, aggregate drains, etc. should be shown on each typical section. Include slopes for aggregate drains. See the Pavement Design Manual, Section 205 - Subsurface Pavement Drainage for guidance.

1304.9 Pavement Build-up

Pavement and treated shoulder build-ups and course steps shall be clearly indicated on each typical section. This includes such items as: surface, base and subbase courses; curb, curb and gutter; saw cuts; depth of planning; pavement for maintaining traffic to remain, etc.

Step details may be needed to adequately show pavement "steps" as per the Pavement Design Manual.

1304.10 Foreslopes and Backslopes

If the limiting stations of a typical section include both cuts and fills, examples of each should be shown. Cut and fill foreslope and backslope rates shall be indicated as 2:1, 3:1, 4:1, (horizontal: vertical) etc. Percentages should not be used. Guardrail offset locations shall also be shown, where applicable.

1304.11 Legend

The legend is required to describe the pay items used in the Typical Sections and the build-up of the existing pavement. It may be shown on only the first Typical Section sheet with a cross-reference shown on each succeeding sheet.

Numbered or lettered balloons are used to tie the legend to the drawings. Proposed items are to be differentiated from existing by using numbers for proposed and letters for existing. In addition, dashed balloons may be used to show existing items. Balloon references should be consistent throughout the typical section sheets.

The legend for proposed items shall include the specification number and the exact pay item description, as listed in the ODOT Item Master. The legend for existing items should never include a specification number but should describe the item in more generic terms such as: Asphalt Concrete, Reinforced Concrete, or Subbase. The approximate existing depth (+/-) should be listed.

1304.12 Longitudinal Joints

For rigid pavements, the location and type of all longitudinal joints should be indicated on each typical section **[**SP 1304-3**]**.

1304.13 Approach Slabs

Although approach slabs are paid for as structure items, base pavement, cross slopes, etc. must be shown on the typical sections.

1304.14 Warranty Pavement

When warranty pavement is included in a project, show the total thickness of the pavement along with an assumed configuration.

1304.15 Subgrade Treatment

Subgrade treatments such as lime stabilization, cement stabilization or undercuts are to be shown on the typical sections and the cross sections.

1305 General Notes and Special Provisions

1305.1 General

The General Notes contain those plan notes required to clarify construction items that are not satisfactorily covered by the specifications or plan details. They are also used to modify the Standard Construction Drawings. All pay items that are "*As Per Plan*" or "*Item Special*" require a plan note, a special detail, or both.

On small projects, the General Note Sheets will include the majority of all plan notes for the project. For large projects, components such as: Maintenance of Traffic, Sanitary Sewers, Water Work, Traffic Control, Lighting, Landscaping or Structures should be accompanied by their own plan notes.

Plan notes are to be consistent with the intent and requirements of the plans. Notes that repeat provisions clearly covered by the Construction and Material Specifications, Supplemental Specifications or Standard Construction Drawings should be avoided. For unusual or potentially controversial plan notes, contact the involved specification committee chair for advice on the content of the note.

Sample Plan Sheet SP 1305-1 shows an example General Note format. Specific notes must be selected by the project designer. Notes may be right and left justified as shown in SP 1305-1; or left justified as shown in SP 1306-1.

1305.2 Sample Plan Notes

Sample Plan Notes for environmental, pavements and general project information are found in Appendix B. Sample Plan Notes for other project issues such as bridges, guardrail, traffic control and maintenance of traffic are available from the responsible ODOT unit (**Offices of Structural Engineering**, **Roadway Engineering**, Traffic Operations, etc.). Each general note is accompanied by a designer note which provides guidance on when to specify the note, as well as details on how the note may need to be customized to address project specific issues.

The ODOT **Office of CADD and Mapping Services,** CADD Services Section maintains a plan note application available for download from the CADD web page. The application assists with plan note placement in MicroStation files.

1305.3 Special Provisions

Special Provisions are notes and/or specifications developed for a project that are not related to standard ODOT Construction and Material Specifications. Ordinarily, these notes should be included in the General Notes. However, when these notes would take up a significant number of plan sheets, the designer may opt to include them with the plan as Special Provisions produced on 8-1/2" x 11" sheets.

In the case of Waterway Special Provisions, the **Office of Environmental Services (OES)** provides Special Provisions in the form of Waterway Permit conditions, which includes the conditions of the Section 404 permits and the OEPA Section 401 Water Quality Certifications. The actual 404/401 permits are sent by OES to the district office to be displayed on the project site.

The title and date of all Special Provisions are listed on the Title Sheet. A reproducible letter size copy of all Special Provisions is to be included in the Final Plan Package submitted to the **Office of Estimating**.

1306 Maintenance of Traffic

1306.1 General

Maintenance of Traffic sheets normally follow the General Notes. On projects where traffic maintenance is uncomplicated or traffic is detoured, a separate Maintenance of Traffic section of the plan is not required, and the notes may be included with the General Notes. When bridge plans include staged construction details, a cross-reference to these details should be added to the Maintenance of Traffic notes.

Examples of Maintenance of Traffic sheets are included in the Sample Plan Sheets **[**SP 1306-1 through SP 1306-8**]**.

1306.2 Maintenance of Traffic Plan Contents

Probably the least complicated plans for maintaining traffic result when through traffic is detoured during the entire construction period. In such cases, the detour route is shown on the Title Sheet Location Map **[SP 1302-2]**, Schematic Plan, General Notes or on a separate detour sheet **[SP 1306-3]**. If the detour is shown somewhere other than on the Title Sheet Location Map, it should be referenced in the Index of Sheets.

When traffic is maintained during construction, the plan will normally require a number of notes along with several details. The following is a list of some of the details that may be required:

- Sequence of operations **[**SP 1306-1 and SP 1306-2**]**.
- Phase drawings showing construction by phase **[**SP 1306-4(a) through 1306-8**]**, method of maintaining traffic for each phase, barriers, drums, maintenance of traffic signing, existing signing, and pavement marking. Phasing plans may be drawn at 1"=20', 1"=30', 1"=40', 1"=50', 1"=100' or 1"=200'.

- Section details for maintaining traffic, showing: existing pavement widths, pavement for maintaining traffic widths (including guardrail offset and grading), lateral construction limits, placement of channeling devices (barriers, drums, etc.) and work zone lane widths.
- Supplemental details for work zone traffic control devices.
- Plan insert sheets Crossover details
- Roads / Pavement for maintaining traffic details
- Miscellaneous MOT details

The Traffic Engineering Manual provides guidance on how to maintain traffic during construction and gives specific details on what is required on maintenance of traffic sheets.

For additional information regarding Maintenance of Traffic, contact the Office of Roadway Engineering.

1306.3 Roads and Pavements for Maintaining Traffic

A temporary road is a road whose sole purpose is to temporarily maintain traffic during construction, after which it is normally removed. Temporary roads are constructed using Item 615, Roads for Maintaining Traffic and Item 615, Pavement for Maintaining Traffic.

Item 615, Roads for Maintaining Traffic is a lump sum quantity that includes all embankment and excavation necessary to construct and remove the temporary road. When undercuts are necessary for permanent mainline pavement or embankment construction, the proposed temporary road should be evaluated for undercuts. A geotechnical evaluation should be considered to determine if the existing soil conditions are adequate to support the temporary road. Additional soil borings along the temporary road are not normally required to make the geotechnical evaluation.

Item 615, Pavement for Maintaining Traffic is paid for by the square yard and includes the necessary pavement for the temporary road as per CMS 615.05. When the pavement build-up differs from that shown in CMS 615.05, Item 615, Pavement for Maintaining Traffic, As Per Plan, shall be used with the pavement build-up as shown in the plans.

Sample Plan Sheets SP 1306-6 and 1306-7 show details such as alignment, grade, typical sections, cross-sections, and superelevation that are typically required for a temporary road on independent alignment. Independent alignments should be drawn at 20'=1" [20:1] or 50'=1" [50:1].

When the earthwork required to maintain traffic is relatively small, a plan note can be used to indicate that the earthwork required to construct the temporary road will be included as part of Item 615, Pavement for Maintaining Traffic, As Per Plan and not paid for separately under Item 615, Roads for Maintaining Traffic. **SP 1306-4(a)** shows an example of when it may be beneficial to combine the two quantities.

Item 615, Pavement for Maintaining Traffic should not be confused with items such as 410, 441, and 616 which may also be included in the plans to be used for maintenance of traffic. Nor should it be confused with the pavement quantities listed in the Local Alternate Detour note.

1307 Estimated Quantities

1307.1 General

Quantities shall be calculated and presented in the plan in such a manner that they may be traced from the General Summary sheet to their origin through a system of cross-referencing. Sample Plan sheets SP1307-1 through 1307-6 provide examples of Subsummary and General Summary formats.

The General Summary for all projects is required to be in an Excel format using the standard spreadsheet, CTY-PID-GENSUM.xlsm, available on the **CADD Services'** external webpage and on the **Office of Estimating's** website. This excel spreadsheet is used to transfer all plan quantities directly into the **Office of Estimating's** AASHTOWare software. More information on the use of the spreadsheet can be found on the **Office of Estimating's** website, and in Section 502.1 of the ODOT CADD Engineering Standards Manual.

The spreadsheet can be copied, or linked, to a CADD file containing a standard sheet border for inclusion in the plan images set, or for printing purposes.

1307.2 General Summary Sheet

1307.2.1 Sheet Number Columns

The sheet number columns are used to show a cross-reference to the sheet from which the quantities are carried. Extra columns should be provided to allow for possible additions. Quantities may originate from many sources, and these sources may often exceed the number of columns available on the General Summary. For this reason, subsummaries are often used. Subsummaries are described in more detail in Section 1307.3.

1307.2.2 Participation and Funding Splits

To facilitate project accounting, pay quantities should be separated in the General Summary and throughout the plans according to participation by the involved agencies [SP 1307-4 and 1307-5]. This usually applies to situations where portions of the project are financed under different federal project numbers, are split by municipal corporation lines, or contain items that are to be paid for by only one agency. The General Summary should show a separate subtotal for each unique combination of Local, State and Federal fund participation, including subtotals for all incidental pay items, in addition to the grand total. Funding splits for projects using combined funds (e.g. Bridge and Safety) shall also show separate subtotals for each unique combination of funding, in addition to the grand total in the General Summary. When participation or funding splits are needed for a project, the participation or funding split columns are to be included on all sheets of the General Summary.

In lieu of creating separate columns in the General Summary, the use of an asterisk to identify items with participation or funding splits is allowable for projects with one or two affected items. A note associated with the asterisk shall provide details regarding the participation or funding split.

Pavement Quantities listed under the "Office Calcs" column on the General Summary should reflect participation or funding splits when needed.

If space permits, extra columns should be provided on the General Summary to permit additional participation or funding splits.

1307.2.3 Item Code, Unit of Measure, and Description

The ODOT Item Master is a listing of construction item codes, their corresponding pay item descriptions, and units of measure. This list is continually updated and posted on the Office of Estimating's website. Questions regarding the ODOT Item Master should be directed to the **Office of Estimating**.

The item code is a nine-character identifier used to catalogue pay item descriptions into a computerized database. All item codes and descriptions must be written exactly as listed in the Item Master. The first three digits of the item code generally refer to the specification number of the pay item and are entered in the "Item" column on the General Summary. The last five digits of the item code (referred to as the "Item Extension") are used to catalogue the pay items within the specification number. The item extension is entered in the "Item Extension" column. The fourth character refers to the type of measurement being used ("E" for English), and should not be included in the item code on the General Summary. It will be added at the time the information is entered into the computer during final plan processing.

Item Specials are an exception to the above and are discussed in Section 1307.2.6 – "Standard", "As Per Plan", "Miscellaneous", and "Special" Pay Items. Item extensions are to be shown on the General Summary only (not subsummaries, notes, etc.).

Water work items using city specifications are to be Item "Specials" and their descriptions are to be per ODOT's Item Master. Refer to the Item Master page on the Office of Estimating's website for guidance.

Item descriptions are limited to an additional 120 characters beyond those shown in the Item Master.

Lump sum items shall show "LS" in the Grand Total column with the Unit column left blank.

Supplemental descriptions are occasionally required for standard items and are always required for miscellaneous items. Refer to the "Special Instruction" column in ODOT's Item Master for a list of items requiring a supplemental description. Spaces, colons, and/or semicolons are not to be placed before a supplemental description, nor is the supplemental description to be placed within quotation marks.

The various items of work are grouped in order in the General Summary under the following headings:

Roadway

Erosion Control

Environmental / Remediation

Drainage

Pavement

Water Work

Sanitary Sewer

Lighting

Electrical

Other Utilities

Traffic Surveillance

Traffic Control

Traffic Signals

Landscaping

Retaining Walls (Identifying Information)

Building Demolition

Noise Barriers

Structures:

- Structure Repair (Bridge Number and SFN)
- Structure 20 Foot Span and Under (Bridge Number and SFN)
- Structure Over 20 Foot Span (Bridge Number and SFN)
- Miscellaneous Structure

Maintenance of Traffic

Items of Work

Engineering and Surveying Services

Incidentals

Alternate, optional, and additive alternate bid items shall be listed under separate headings that are modified from the headings listed.

Alternate bid items shall be listed in the General Summary under a separate heading selected from the headings listed in this section, followed by the word "ALTERNATES" (e.g., ROADWAY ALTERNATES, DRAINAGE ALTERNATES, etc.), and placed directly after its corresponding heading section. For more information, see Section 1307.2.7 – Alternate, Optional, and Additive Alternate Bid Items and **Sample Plan Sheet** SP1307-4.

ALT (X)	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
					ROADWAY
	202	23000	1000	SY	PAVEMENT REMOVED
	202	58700	12	EACH	MANHOLE ABANDONED
	202	75000	225	FT	FENCE REMOVED
	202	75250	1	EACH	GATE REMOVED
					ROADWAY ALTERNATES
X	606	98000	500	FT	GUARDRAIL, MISC.: TENSIONED CABLE (BRIFEN) (ALTERNATE 1)
X	606	98100	20	EACH	GUARDRAIL, MISC.: TENSIONED CABLE ANCHOR TERMINAL (BRIFEN) (ALTERNATE 1)
X	606	98000	500	FT	GUARDRAIL, MISC.: TENSIONED CABLE (TRINITY) (ALTERNATE 2)
X	606	98100	2	EACH	GUARDRAIL, MISC.: TENSIONED CABLE ANCHOR TERMINAL (TRINITY) (ALTERNATE 2)
X	606	98000	500	FT	GUARDRAIL, MISC.: TENSIONED CABLE (MARION STEEL) (ALTERNATE 3)
X	606	98100	2	EACH	GUARDRAIL, MISC.: TENSIONED CABLE ANCHOR TERMINAL (MARION STEEL) (ALTERNATE 3)

As with alternate bid items, optional bid items shall also be listed in the General Summary under a separate heading selected from the headings listed in this section, with each set of optional bid items grouped together and designated with an alphabetical label (e.g., OPTION A, OPTION B, etc.) added to the heading. The heading shall be followed by a brief description and placed in alphabetical order directly after its corresponding heading section. For more information, see Section 1307.2.7 – Alternate, Optional, and Additive Alternate Bid Items and **Sample Plan Sheet** SP1307-3(c).

ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SP 1307-3(c) DATE: JULY 2020	SEE SHEET NO.
				RETAINING WALLS (WALL 1) OPTION A: BIN WALL		
203	20000	1710	CY	EMBANKMENT		
203	35000	3474	CY	GRANULAR EMBANKMENT		
503	11100	LS		COFFERDAMS AND EXCAVATION BRACING		
503	21101	1124	CY	UNCLASSIFIED EXCAVATION, AS PER PLAN		108
530	50010	4766	SF	RETAINING WALL, MISC.: BIN WALL		190
				RETAINING WALLS (WALL 1) OPTION B: CRIB WALL		
203	20000	1636	CY	EMBANKMENT		
203	35000	3584	CY	GRANULAR EMBANKMENT		
503	11100	LS		COFFERDAMS AND EXCAVATION BRACING		
503	21101	1150	CY	UNCLASSIFIED EXCAVATION, AS PER PLAN		108
530	50010	4738	SF	RETAINING WALL, MISC.: CRIB WALL		190

Additive alternate bid items shall be listed in the General Summary under an "ADDITIVE ALTERNATE" heading followed by a numerical label (e.g. 1, 2, etc.). The heading shall be followed by a brief description and placed in numerical order directly before the incidental pay items. For more information, see Section 1307.2.7 – Alternate, Optional, and Additive Alternate Bid Items and Sample Plan Sheet SP1307-3(d).

FIG. 1307-3(d)
DATE: JANUARY 2019

ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
				ADDITIVE ALTERNATE 1: SIDEWALK
608	10000	5985	SF	4" CONCRETE WALK
608	52000	126	SF	CURB RAMP
616	10000	5	MGAL	WATER
659	00300	105	CY	TOPSOIL
659	10000	940	SY	SEEDING AND MULCHING
				ADDITIVE ALTERNATE 2: PEDESTRIAN CROSSWALK
630	02100	52	FT	GROUND MOUNTED SUPPORT, NO. 2 POST
630	08600	1	EACH	SIGN POST REFLECTOR
630	80100	27.8	SF	SIGN, FLAT SHEET
630	84900	2	EACH	REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL
630	86002	2	EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL
631	92001	2	EACH	SIGN FLASHER ASSEMBLY, AS PER PLAN
644	00500	13	FT	STOP LINE
644	00600	200	FT	CROSSWALK LINE

A Bridge Number is the SLM of the structure, written without the decimal point (i.e., MER-707-1692L&R or HIG-TR607-0168). The SFN is the Structure File Number that uniquely identifies a bridge.

Three-sided culverts must be listed as separate structures. Prefabricated structures with spans greater than or equal to 10 feet should be listed as structure items. Prefabricated structures with spans less than 10 feet should be included with the drainage items. Work that may require a sub-contractor may have a separate summary, or subsummary, unless very few items are involved. Examples are Water Work, Lighting, Traffic Control, Traffic Signals, Landscaping, Retaining Walls and Structures. When a separate summary is used, a cross reference must be shown on the General Summary to the sheet numbers on which the quantities are listed. A separate summary is usually provided for Sanitary Sewer items, although these items may be included under Drainage if the sanitary work involves only minor adjustments.

Building Demolished is often considered a Roadway item when only a few buildings are involved. To facilitate the collection of data for reports required by FHWA, Structures are divided into four categories: Structure Repair, Structure 20 Foot Span and Under, Structure Over 20 Foot Span, and Miscellaneous Structure.

The General Summary shall be required in an Excel format using the standard spreadsheet, CTY-PID-GENSUM.xlsm.

More information on the use of the CTY-PID-GENSUM.xlsm spreadsheet can be found in Section **1307.1** and on the Office of Estimating**'s** website.

The pay items within each of the listed headings must be arranged in ascending numerical order by the item code. For items with the same item code but different supplemental descriptions, the items are placed in alpha-numeric order by supplemental description. As a general rule, at least one blank line should be left between every five pay items to provide for possible additions.

Pay items should be included under each heading as per the following list. Unless otherwise noted, all items under the stated specification number are included.

Roadway - 201, 202 (except Structure Removed, Portions of Structure Removed, Approach Slab Removed, and Building Demolished), 203 (except when used for mechanically stabilized earth walls), 204, 205, 206, 208, 209, 606 (except Noise Barrier), 607, 608, 622 (Concrete Barrier), 623 (except Construction Layout Stakes and Surveying), 625 (Ground Rod for fence), 651, 652, 653, 654, 656, 690 (pertinent pay items), 862, 863, 871, 878.

Erosion Control - 601, 616 (when used for Erosion Control), 659, 660, 670, 671, 690 (pertinent pay items), 832, 836, 838.

The Department will furnish Item 832, Each, Erosion Control/Construction Erosion Control with an amount in the proposal to pay for Temporary Sediment and Erosion Control (TSEC) Best Management Practices (BMP) work. This amount is an estimate by the Department of the total cost of TSEC BMP work. If the TSEC BMP work exceeds this amount, the TSEC BMP work will still be paid at the pre-determined prices. The pre-determined prices are located in Supplemental Specification 832.

A LS pay item for the Storm Water Pollution Prevention Plan (SWPPP) shall be included in the General Summary when a SWPPP is required.

Item 616, Water, must be added to all projects that require a 404/401 waterway permit. This quantity of water is used to comply with permit requirements regarding erosion and dust control near waterways. In addition, projects that include the Dust Control Plan note from the Traffic Engineering Manual should include this Item 616, Water, in the Maintenance of Traffic section of the General Summary.

Environmental / Remediation - 690 (pertinent pay items)

Drainage - 602, 605, 611 (when used for Drainage, except structures requiring a Structure File Number (SFN) and conduit for Pull Boxes), 613, 690 (pertinent pay items), 833, 837, 839, 841, 895, 899.

Pipe Alternates - In the following examples, the figure in parentheses at the end of the corrugated metal pipe descriptions indicates the metal thickness of the pipe; if there are two figures, the first figure indicates the thickness of the top plates and the second figure indicates the thickness of the bottom plates. If there is no figure, the thickness shown for that pipe size in the appropriate 707 Table of the Construction and Material Specifications will suffice and need not be shown on the plan. A figure in parentheses for 707.04 indicates the height of corrugation. A 1-inch corrugation should generally be noted for pipe diameters over 48 inches.

Small Diameter (Less than 36")

611 _____ Ft. 21" Conduit, Type A 706.01, 706.02, 706.08 or 24" 707.01 (0.138), 707.04 (0.109), 707.05 (0.109), 707.21.

611 _____Ft. 24" Conduit, Type A 706.01, 706.02, 706.08, 707.33 with welded bell, SS 938 with welded bell or 30" 707.01 (0.138), 707.04, 707.05, 707.21.

Large Diameter (36" and over)

611 _____ Ft. 60" Conduit, Type A 706.02, 707.33 with welded bell, SS 938 with welded bell or 72" 707.02 (0.138), 707.03, 707.04 (1"), 707.07 (0.109), 707.22.

611 _____ Ft. 66" Conduit, Type A 706.02 or 72" 707.02 (0.138), 707.04 (1") (0.109), 707.07 (0.109), 707.22.

Pavement - 251, 252, 253, 254, 255, 256, 257, 258, 300, 301, 302, 304, 305, 320, 321, 400, 407, 408, 409, 411, 421, 422, 423, 424, 441, 442, 443, 450, 451, 452, 609, 617, 618, 690 (pertinent pay items), 803, 822, 823, 826, 852, 859, 860, 861, 872, 874, 875, 880, 881, 882, 884, 886, 888, 897.

Water Work - 638 (Item Special when local government specification is used), 690 (pertinent pay items).

Sanitary Sewer - 611 (when used for Sanitary Sewer, except structures requiring a Structure File Number (SFN) and conduit for Pull Boxes), 690 (pertinent pay items).

Lighting - 625 (when used for Lighting, except Ground Rod for fence), 690 (pertinent pay items) 812, 818, 820, 893 (when used for Lighting).

Electrical - 625 (when used for Electrical, except Ground rod for fence), 690 (pertinent pay items), 864 (when used for Electrical).

Other Utilities - 611 (when used for Other Utilities, except structures requiring a Structure File Number (SFN) and conduit for Pull Boxes) 625 (when used for Other Utilities, except Ground Rod for fence), 690 (pertinent pay items), 864 (when used for Other Utilities).

Traffic Surveillance - 625 (when used for Traffic Surveillance, except Ground Rod for fence), [630, 631, 632, 633] (when used for Traffic Surveillance), 690 (pertinent pay items), 804 (when used for Traffic Surveillance), 809 (pertinent pay items), 864 (when used for Traffic Surveillance).

Traffic Control - 620, 621, 626, [630, 631] (when used for Traffic Control), 640, 642, 643, 644, 645, 646, 647, 648, 690 (pertinent pay items), 807, 814, 850, 893 (when used for Traffic Control).

Traffic Signals - 611 (conduit for Pull Boxes), 625 (when used for Traffic Signals, except Ground Rod for fence), [632, 633] (when used for Traffic Signals), 690 (pertinent pay items), 804 (when used for Traffic Signals), 805, 809 (pertinent pay items), 810, 815, 816, 819, 824, 828, 898.

Landscaping - 657, 658, 661, 662, 666, 690 (pertinent pay items).

Retaining Walls - 203 (when used for mechanically stabilized earth walls. See the Bridge Design Manual for additional information), [503, 504, 505, 506] (when used for Retaining Walls), 507 (pertinent pay items), [509, 510] (when used for Retaining Walls), [511, 512, 513, 514, 516, 517, 518, 519] (pertinent pay items), [520, 523, 524] (when used for Retaining Walls), 530 (pertinent pay items), 690 (pertinent pay items), 840, [843, 844, 845, 855] (when used for Retaining Walls), 866, 867, 870, 883 (when used for Retaining Walls), 885 (pertinent pay items), [893, 894] (when used for Retaining Walls).

Building Demolition - 202 (Building Demolished), 690 (pertinent pay items).

Noise Barriers - 606 (Noise Barrier), 690 (pertinent pay items), 893 (when used for Noise Barriers).

Structures - 202 (Structure Removed, Portions of Structure Removed, and Approach Slab Removed), [503, 504, 505, 506] (when used for Structures), 507 (pertinent pay items), [509, 510] (when used for Structures), [511, 512, 513, 514] (pertinent pay items), 515, [516, 517, 518, 519] (pertinent pay

items), 520 (when used for Structures), 522, [523, 524] (when used for Structures), 526, 530 (pertinent pay items), 611 (structures requiring a Structure File Number (SFN)), 690 (pertinent pay items), 842, [843, 844, 845] (when used for Structures), 846, 847, 848, 849, 855 (when used for Structures), 856, 858, 869, 883 (when used for Structures), 885 (pertinent pay items), 892, 894 (when used for Structures).

In order to effectively track bridge maintenance costs, quantities must be recorded separately for each bridge structure utilizing its assigned SFN. The following three options are acceptable:

1. Providing a separate general summary for each bridge by SFN within the bridge sheets with a reference from the General Summary to each Structure General Summary.

2. Providing a combined structure general summary that separates quantities for each bridge by SFN; also with a reference from the General Summary for each bridge.

3. Providing quantities for each bridge, broken out separately by SFN, on the General Summary.

Each Structure General Summary shall be combined with the General Summary in an Excel format using the standard spreadsheet, CTY-PID-GENSUM.xlsm. See Section 1307.1 - General for more information.

Maintenance of Traffic - 410, 502, 614 (except Maintaining Traffic), 615, 616 (when used for Maintenance of Traffic), 622 (Portable Barrier), 690 (pertinent pay items), 808, 829, 831, 896, any additional items used specifically for maintenance of traffic.

Items of Work – 680, 690 (pertinent pay items), 691, 692, 893 (when used for Items of Work), 900, 950.

Engineering and Surveying Services – 107, 690 (pertinent pay items).

Incidentals – 108, 614 (Maintaining Traffic), 619, 623 (Construction Layout Stakes and Surveying), 624, 690 (pertinent pay items).

The following incidental pay items shall be provided on the General Summary:

Incidentals -

614	LS, Maintaining Traffic
619	MNTH, Field Office, Type A, B or C
623	LS, Construction Layout Stakes and Surveying
624	LS/Each, Mobilization

Building Demolition is a type of project that would not require Item 614, Maintaining Traffic.

Two-lane resurfacing, mowing, pavement marking, guardrail replacement, bridge painting, and other similar types of projects may not require pay items for Field Office, Construction Layout Stakes and Surveying, or Mobilization.

The District Highway Management Administrator should be consulted when there is a question regarding the need for these incidental pay items.

The following guidelines are recommended when determining the type of Field Office to specify on a project:

Estimated Project Construction Cost	Office Type
Less than $500,000	Type A
$500,000 to $5,000,000	Type B
Over $5,000,000	Type C

The basis of payment for a Field Office should be MNTH, unless otherwise instructed.

1307.2.4 Contingency Quantities

In some cases, it may not be feasible to obtain precise quantities due to uncertainties regarding existing conditions. In these cases, a reasonable estimate (not contingency) of the items necessary, along with the location to where they apply, should be completed and appropriate quantities shown in the plans. Contingency quantities should not be used.

Pavement cores, soil borings and other condition surveys commensurate with the nature of the proposed work should be used to assist with the determination of these quantities.

1307.2.5 Linear Grading

Linear grading pay items are intended for shallow grading and/or filling operations performed from the edge of pavement outward, to prepare, dress and/or reshape the roadside.

Item 209 - Reshaping Under Guardrail and Item 209 - Preparing Subgrade for Shoulder Paving are described in the Construction and Material Specifications. Item 209 - Linear Grading may be used at other locations with minor grading. All three pay items are based on a linear measurement along each side of the pavement.

Sufficient detail must be included in the plans to estimate and construct the work. When two or more different types of Item 209 - Linear Grading are required in the same plan, they should be differentiated by designating them as "Method A", "Method B", etc.

If off-project material is needed for the work, a quantity of Item 209 - Borrow must be specified in the plans. Consideration should be given as to how this item is paid. If Item 209 - Borrow can be measured and calculated, then payment should be by the Cu. Yd. If the borrow cannot be measured due to settlement, or because the area is under water, then payment should be by the Ton.

1307.2.6 "Standard", "As Per Plan", "Miscellaneous", and "Special" Pay Items

There are four types of pay items in a construction plan, "Standard", "As Per Plan", "Miscellaneous", and "Special". A "Standard" pay item is one whose requirements are defined by the Standard Construction Drawings and the **Construction and Material Specifications** or **Supplemental Specifications**. The description of a "Standard" pay item is consistent from plan to plan and is listed under the heading "*Basis of Payment*" in the **Construction and Material Specifications** or **Supplemental Specifications**.

An "As Per Plan" item is a standard pay item whose requirements need to be modified from that which is defined by the Standard Construction Drawings, the **Construction and Material**

Specifications, or **Supplemental Specifications**. Every "As Per Plan" item must have a corresponding plan note, Proposal Note, plan detail, or combination thereof which clearly and completely explains the deviation(s) from the standard item. The "As Per Plan" descriptor should not be included as part of a "Miscellaneous" or "Special" pay item description. The location of "As Per Plan" notes and details shall be cross-referenced in the "See Sheet No." column on the General Summary.

A "Miscellaneous" item code is used for unique or infrequently performed items. These items shall be within the guidelines of the Standard Construction Drawings, the Construction and Material Specifications, Supplemental Specifications, or any other authoritative document. Every "Miscellaneous" item must have a corresponding plan note, proposal note, plan detail, or combination thereof to completely explain the item. The location of "Miscellaneous" notes and details shall be cross-referenced in the "See Sheet No." column on the General Summary sheet. If the item is "Miscellaneous", the word "MISC.:" will be part of the item description.

A "Special" item is an item that does not exist in the Standard Construction Drawings, the **Construction and Material Specifications** or **Supplemental Specifications**. It must be created by means of plan notes, plan details, proposal notes, special provisions or a combination thereof, which clearly and completely define all aspects of the item. The location of "Special" item notes and details shall be cross-referenced in the "See Sheet No." column on the General Summary. "Special" pay items are coded according to the closest related Specification number. If the item is a "Special", the word "Special" must be entered in the "Item" column and all eight digits of the item code are entered in the "Item Extension" column.

1307.2.7 Alternate, Optional, and Additive Alternate Bid Items

Alternate, optional, and additive alternate bid items are included in a plan when so dictated by the sponsoring agency.

Alternate bid items shall be listed in the General Summary under a separate heading selected from the headings listed in Section 1307.2.3 – Item Code, Unit of Measure, and Description. This heading shall be modified by adding the word "ALTERNATES" (e.g., ROADWAY ALTERNATES, DRAINAGE ALTERNATES, etc.), and placed directly after its corresponding heading section. The description of individual alternate bid items shall include "ALTERNATE" followed by an appropriate numerical value, in parentheses, at the end. For each alternate bid item, an "X" shall be placed in the "ALT(X)" column in the General Summary [SP 1307-4].

ALT (X)	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
					ROADWAY
	202	23000	1000	SY	PAVEMENT REMOVED
	202	58700	12	EACH	MANHOLE ABANDONED
	202	75000	225	FT	FENCE REMOVED
	202	75250	1	EACH	GATE REMOVED
					ROADWAY ALTERNATES
X	606	98000	500	FT	GUARDRAIL, MISC.: TENSIONED CABLE (BRIFEN) (ALTERNATE 1)
X	606	98100	20	EACH	GUARDRAIL, MISC.: TENSIONED CABLE ANCHOR TERMINAL (BRIFEN) (ALTERNATE 1)
X	606	98000	500	FT	GUARDRAIL, MISC.: TENSIONED CABLE (TRINITY) (ALTERNATE 2)
X	606	98100	2	EACH	GUARDRAIL, MISC.: TENSIONED CABLE ANCHOR TERMINAL (TRINITY) (ALTERNATE 2)
X	606	98000	500	FT	GUARDRAIL, MISC.: TENSIONED CABLE (MARION STEEL) (ALTERNATE 3)
X	606	98100	2	EACH	GUARDRAIL, MISC.: TENSIONED CABLE ANCHOR TERMINAL (MARION STEEL) (ALTERNATE 3)

The description for alternate bid items should vary to give distinction between items. One group of bid items can be alternated to another group of bid items without there being a one-to-one item match. Plan notes, plan details, proposal notes, special provisions, or a combination thereof shall be provided to clearly and completely define and identify the alternates. The bidder is required to bid on all alternate items.

The sponsoring agency will determine the alternate item, or group of alternate items, selected for the contract to be awarded. When the higher priced alternate item is selected, the additional cost of the alternate will be the responsibility of the sponsoring agency.

Optional bid items shall be listed in the General Summary under a separate heading selected from the headings listed in Section 1307.2.3 – Item Code, Unit of Measure, and Description, with each set of optional bid items grouped together and designated with an alphabetical label (e.g., OPTION A, OPTION B, etc.) added to the heading. The heading shall be followed by a brief description and placed in alphabetical order directly after its corresponding heading section [SP 1307-3(c)].

ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION — SP 1307-3(c) DATE: JULY 2020	SEE SHEET NO.
				RETAINING WALLS (WALL 1) OPTION A: BIN WALL	
203	20000	1710	CY	EMBANKMENT	
203	35000	3474	CY	GRANULAR EMBANKMENT	
503	11100	LS		COFFERDAMS AND EXCAVATION BRACING	
503	21101	1124	CY	UNCLASSIFIED EXCAVATION, AS PER PLAN	108
530	50010	4766	SF	RETAINING WALL, MISC.: BIN WALL	190
				RETAINING WALLS (WALL 1) OPTION B: CRIB WALL	
203	20000	1636	CY	EMBANKMENT	
203	35000	3584	CY	GRANULAR EMBANKMENT	
503	11100	LS		COFFERDAMS AND EXCAVATION BRACING	
503	21101	1150	CY	UNCLASSIFIED EXCAVATION, AS PER PLAN	108
530	50010	4738	SF	RETAINING WALL, MISC.: CRIB WALL	190

When a group of bid items is optional to another group of bid items, each group of items will be given a single label. The bidder is to bid on one option only, with the bidder deciding which option to bid on.

Additive alternate bid items shall be listed in the General Summary under an "ADDITIVE ALTERNATE" heading followed by a numerical label (e.g. 1, 2, etc.). The heading shall be followed by a brief description and placed in numerical order directly before the incidental pay items [SP1307-3(d)].

Incidental pay items that incur additional costs due to the inclusion of the additive alternate shall be included in the bid items for the additive alternate.

FIG. 1307-3(d)
DATE: JANUARY 2019

ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
				ADDITIVE ALTERNATE 1: SIDEWALK
608	10000	5985	SF	4" CONCRETE WALK
608	52000	126	SF	CURB RAMP
616	10000	5	MGAL	WATER
659	00300	105	CY	TOPSOIL
659	10000	940	SY	SEEDING AND MULCHING
				ADDITIVE ALTERNATE 2: PEDESTRIAN CROSSWALK
630	02100	52	FT	GROUND MOUNTED SUPPORT, NO. 2 POST
630	08600	1	EACH	SIGN POST REFLECTOR
630	80100	27.8	SF	SIGN, FLAT SHEET
630	84900	2	EACH	REMOVAL OF GROUND MOUNTED SIGN AND DISPOSAL
630	86002	2	EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL
631	92001	2	EACH	SIGN FLASHER ASSEMBLY, AS PER PLAN
644	00500	13	FT	STOP LINE
644	00600	200	FT	CROSSWALK LINE

Multiple sets of additive alternates are permissible. When multiple sets are used, the additive alternates are to be listed numerically in order of highest to lowest priority. The sponsoring agency will determine the order of priority. The bidder is required to bid on all additive alternate items.

Questions regarding the setup of alternate, optional, and additive alternate bid items on the General Summary should be addressed to the **Office of Estimating**.

1307.2.8 Sheet Cross References

The "See Sheet No." column is used to show a cross-reference to a general note sheet, plan detail sheet or description group general summary. References to a general note or plan detail for items that are not "As Per Plan" or "Special" should be made when the note or detail describes a specific method of performing work. Description groups that have their general summaries cross-referenced should be listed in the order shown in Section 1307.2.3 – Item Code, Unit of Measure, and Description.

Reference to a Proposal Note may be made at the end of a pay item description only if the pay item is new, or rarely used.

1307.2.9 Buildings Demolished

Buildings to be demolished should be paid for under Item 202, Building Demolished. A single lump sum item is used for each parcel. The item description should include the parcel number and a list of the buildings to be removed.

For example:

Item 202, Building Demolished, Parcel 10 WD, 2-Story Framed House, Basement, Shed

Item 202, Building Demolished, Parcel 20 T, 1-Story Brick House, 2-Car Detached Garage

Item 202, Building Demolished, Parcel 102 WL, Remove 20 Trailers, 6 Sheds

For additional information contact the Office of Real Estate.

1307.2.10 Salvage of Utility Items

Existing utility facilities (fire hydrants, valve boxes, etc.) to be removed by the highway contractor shall be disposed of and replaced, adjusted, or removed and reset. These items shall not be removed and stored for retrieval by the utility owner. The rules governing utility relocation and reimbursement differ from other functions of the highway construction process. The removal of existing facilities for storage would require that a salvage credit be given to the project for the value of the removed items, and any contractor charges for handling and/or transportation of the items would be ineligible for project cost.

1307.3 Subsummaries

A limited number of sheet number columns are available on the General Summary. This limits the number of sheets from which quantities can be brought forward. It is therefore necessary on larger plans to summarize quantities in stages. Subsummaries are plan sheets where quantities from several sheets are gathered. The items may or may not have some relationship to each other.

Some of the pavement marking quantities are subdivided and subtotaled by color and/or type. Examples of subsummary sheets are included in the Sample Plan Sheets.

Subsummaries are generally located in a set of plans near (normally in front of) the source of the quantities they summarize. However, when they summarize a number of unrelated items, they may be located either after the General Summary or after the calculation sheets.

1307.4 Quantity Calculations

1307.4.1 General

In order to prepare a valid engineering cost estimate for a project, it is essential that quantities be accurately calculated, accurately carried to the General Summary, and that substantiating data for all calculated items be included in the plan.

1307.4.2 Pavement Calculations

Pavement, subgrade compaction and treated shoulder quantity computations should be completed on 8 1/2" x 11" sheets. These sheets may be handwritten, or computer generated (e.g., spreadsheets). Computations are to clearly show how the quantities were derived. Irregular areas

should be noted as CADD generated or planimetered areas. All sheets must include the project title and be numbered (e.g., 2 of 10). Quantities are to be carried to the General Summary and listed under a column entitled "Office Calcs." [SP 1307-3(a) and 1307-3(b)].

1307.4.3 Rounding of Quantities

Rounding of quantities should be made at the subsummary level. All quantities are whole numbers except as follows:

- Carried to tenths:
  Cubic Yards - Masonry
  Square Feet - Signs
  Feet - Ground Mounted Sign Supports

- Carried to the nearest foot
  Feet - Conduit and Underdrains, Subdrainage piping (Structural)

- Carried to hundredths:
  Miles - Pavement Marking
  Feet - Bridge Deck Joints, Drip Strip, Prestressed Concrete Bridge Members
  Tons - Commercial Fertilizer
  Acres - Lime

- Nearest 100 Pounds
  Pounds - Structural Steel

Guardrail quantities are normally determined in standard 12.5' panel lengths.

1307.4.4 Validation of Quantities

Prior to submission of the completed plans, all plan quantities shall be independently checked by competent personnel other than the person(s) who originally computed the quantities. Each plan sheet that lists quantities or calculations shall be validated by the signed initials or names of persons who computed the quantities, and also those who performed the checking operations. These initials should be shown in the title block. While it is contemplated that spot checks of quantities will be made during review of the plan, the correctness of the quantities is the responsibility of the design unit preparing the plans.

1308 Project Site Plan

1308.1 General

A Project Site Plan is required for all projects that require the submittal of a Notice of Intent (NOI) or post construction BMPs, as explained in the **Location and Design Manual, Volume 2, Section 1112**. The Project Site Plan is prepared by the designer and provided as part of the contract documents. Electronic design files used to create the Project Site Plan are also a part of the contract documents and shall be provided. For more information, see the ODOT Guidelines for Electronic Deliverables document located on the Office of CADD & Mapping Services' website. A sample Project Site Plan is shown in the Sample Plan Sheets [SP 1308-1].

For non-contiguous portions of projects sold under one contract, as described in Location and Design Manual, Volume 2, Section 1112, provide a Project Site Plan for each individual site that exceeds one acre of earth disturbing activity.

A Storm Water Pollution Prevention Plan (SWPPP) is required for all projects that submit a Notice of Intent (NOI) for permit coverage under the Ohio EPA's Construction General Permit. Projects that may have environmental impacts to habitat, or species, may also be required to prepare a SWPPP as determined by the District Environmental Coordinator. The construction contractor is responsible for modifying the Project Site Plan to prepare a SWPPP that meets the Ohio EPA NPDES (National Pollutant Discharge Elimination System) Permit requirements. The contractor shall develop the SWPPP in accordance with Supplemental Specification 832. The contractor's engineer must sign, seal, and submit the proposed plan to ODOT for review. Additional guidance can be found in the **Location and Design Manual, Volume 2, Section 1114.**

1308.2 Requirements

The Project Site Plan shall consist of a schematic plan similar to that required in Section 1303 – Schematic Plan. It will generally have a scale of 1"=200'. This plan shall show all Project Disturbed Areas.

The following items shall be included on the plan and may be listed in tabular form:

- A site description indicating the nature and type of construction activity.
- The total area of project (right-of-way, including permanent easements).
- The total area of "Project Earth Disturbing Activities" that is expected to undergo earth disturbing activities as estimated from **Location and Design Manual, Volume 2, Figure 1112-1**.
- The area of "Contractor Earth Disturbing Activities" as estimated from **Location and Design Manual, Volume 2, Figure 1112-1**.
- The area of "NOI Earth Disturbing Activities" as estimated from **Location and Design Manual, Volume 2, Figure 1112-1**.
- An approximate determination of the Rational Method runoff coefficient for both the pre-construction and post-construction site conditions.
- An estimate of the impervious (paved) area for both the pre-construction and post construction site conditions.
- The name and location of the immediate receiving stream or surface water(s) and the subsequent named receiving water(s) (e.g. Black Run/Sandy Creek).
- Surface water locations including streams, lakes, ponds, wetlands, jurisdictional and regulated ditches, springs, etc. within 200' of the right-of-way.
- The approximate latitude and longitude (± 5 seconds) of the center of the project.
- The name and number of the USGS 7.5 minute quadrangle map(s) on which the project is located.

- Existing contours with enough accuracy to define the existing drainage patterns.
- Flow arrows indicating proposed drainage patterns.
- Existing buildings and current land uses (e.g. residential, commercial, or agricultural).
- Permanent drainage items such as culverts, storm sewers, catch basins, etc.
- The location of permanent storm water Best Management Practices (BMP) through a description, graphically, and in tabular form. Ensure all latitude and longitude positions are in units of decimal degrees and have 6 values after the decimal. Furnish a begin position and end position for the following linear BMPs: Vegetated Filter Strip and Vegetated Biofilter. Furnish just the outlet position of all other BMPs. Include a table that lists each individual BMP, the BMP type, the Begin Latitude/Longitude, the End Latitude/Longitude (if applicable), the BMP Width (strip width for Vegetated Filter Strips and bottom width for Vegetated Biofilters only), and the EDA Treatment Credit. In the same table, provide the summation of EDA Treatment Credit from all BMPs, as well as the EDA Treatment Credit Required for the project.

1309 Plan & Profile Sheets

1309.1 General

Plan & Profile Sheets **[**SP 1309-1(a) through SP 1309-8**]** show what an area looks like before (existing) and after (proposed) construction of the project. In addition, they show quantities, dimensions, and other items required to construct the project. Plan and Profile Sheets are normally drawn to the following scales:

- Rural Projects:

  - Horizontal: 1"=50', or 1"=20'
  - Vertical: 1"= 5', or 1"=10'

- Urban (or Short Rural) Projects:

  - Horizontal: 1"=20'
  - Vertical: 1”=5' (preferred) or 1”=10'

The above scales will result in coverage on a typical sheet of 1500' at 1"=50' and 600' at 1"=20'. For convenience, the scale used for the roadway plan and profile sheets should match the scale used on the right-of-way detail sheets.

The profile should be plotted on a square grid system subdivided in accordance with the examples shown in **Figure 1202-1, Acceptable Grid Systems**.

The plan and profile sheets at the beginning and end of the project should include additional length of existing topographic features beyond the ends of the permanent pavement construction. The minimum additional length is 300 feet for design speeds of 40 mph or less and 500 feet for design speeds over 40 mph. Horizontal and vertical alignments and all topography should be shown in these “extension” areas.

To avoid misinterpretations, the use of abbreviations in the plans, except those defined in the **Construction and Materials Specifications** or generally understood by engineers and contractors, should be minimized. If abbreviations are used, a legend explaining the abbreviations should be included.

1309.2 Format

Plan & Profile Sheets are composed of three distinct parts - plan, profile and quantities. All of these parts may be shown on a single sheet **[**SP 1309-5, 1309-6, and 1309-8**]**. However, because of the complexity of some plans, it may be necessary to vary the format to more clearly show the proposed work. In such cases, the plan, profile and quantities may be shown on separate sheets **[**SP 1309-2**]** or combined in any manner **[**SP 1309-1(a) and 1309-1(b)**]**. When varying from the single-sheet format, the designer should locate the plan, profile and quantity sheets as near to each other as possible and provide cross-references on each sheet.

1309.3 Existing Information

All existing features should be shown and the disposition of all such items within the existing and/or proposed right-of-way should be indicated. Existing features, except buildings, should be shown using dashed lines. The following sections list many of the existing items that should be shown on a Plan & Profile Sheet. This list should not be considered all-inclusive.

1309.3.1 Topography

- Trees and stumps – For projects involving earth disturbing activities or any other construction activity that may require tree removal, the diameter of all trees and stumps 12 inches and over must be shown. Symbols should be used to differentiate between deciduous and coniferous trees. Species names (e.g., Oak, Maple, Pine) do not need to be labeled. In general, labels designating tree size (as defined in the **Construction and Material Specifications**) should be provided for trees located within the construction limits and 25 feet outside the project construction limits. Trees and stumps to be removed should be noted by an "X".
- Shrubs
- Moving water such as creeks, streams, rivers and ditches - The direction of flow should be denoted by flow arrows.
- Ponds and lakes
- Wetland areas

1309.3.2 Buildings and Appurtenances

- Buildings – Identify usage (i.e., residential commercial, etc.), type of construction and number of stories
- Wells, cisterns, sanitary systems (leach fields, septic tanks)
- Underground storage tanks, oil and gas wells with associated piping
- Walks, drives, paved areas

- Walls, fences
- Non-highway signs – Highway signs are not typically shown on the Plan and Profile Sheets but rather in the Traffic Control Plans.
- Railroad facilities shall be shown when they are located within the normal limits of the Plan & Profile Sheet. The location of the tracks with respect to the centerline of construction should be shown together with the rail elevations at intervals not to exceed 500 feet]. This information may be shown on the cross-sections if more convenient.

1309.3.3 Roadway Items

- Pavement, curbs, treated shoulder, drives.
- Guardrails, concrete barrier, fences.
- Profile of the ground line at the centerline of construction, with elevations every 50' and at abrupt changes **[**SP 1309-1(a) through SP 1309-8**]**.
- Storm sewers, inlets, manholes, catch basins, culverts (type, size and elevations) **[**SP 1309-6 and 1309-8**]**.
- Bridges.
- Light poles.

1309.3.4 Boundary Lines

- Property lines, easements.
- Right-of-way lines.
- Governmental boundaries (State, County, City, Village, Township, etc.).
- Railroad right-of-way lines.

1309.3.5 Utilities

- Location and depth of underground utilities (gas, telephone, water, sanitary, etc.)
- Location of overhead utilities (electric, telephone, cable television, etc.). Only poles should be shown unless actual lines are located such that they may impact the contractor's operations. Indicate the rating of major overhead electric transmission lines and the existing clearance.

1309.3.6 Underground Mines

- Location of any field observed or mapped mine features (openings, subsidence features, etc.).
- Limits of mapped mine workings labeled with the **Ohio Department of Natural Resources Division of Geological Survey Mine Code**. A note referencing the

appropriate Mine Map Overlay Sheets should be shown on the Plan & Profile sheets when the extent of the mine workings exceeds the normal limits of the sheet.

1309.4 Proposed Facility Information

Following are many of the proposed facility items that should be shown on a Plan & Profile sheet. This list should not be considered all-inclusive.

1309.4.1 Alignment and Grade

- Centerline of construction and any other construction baselines should be shown along with their relationship to each other. Stations, station equations, and bearings (at each tangent and at least one per sheet) must be shown.

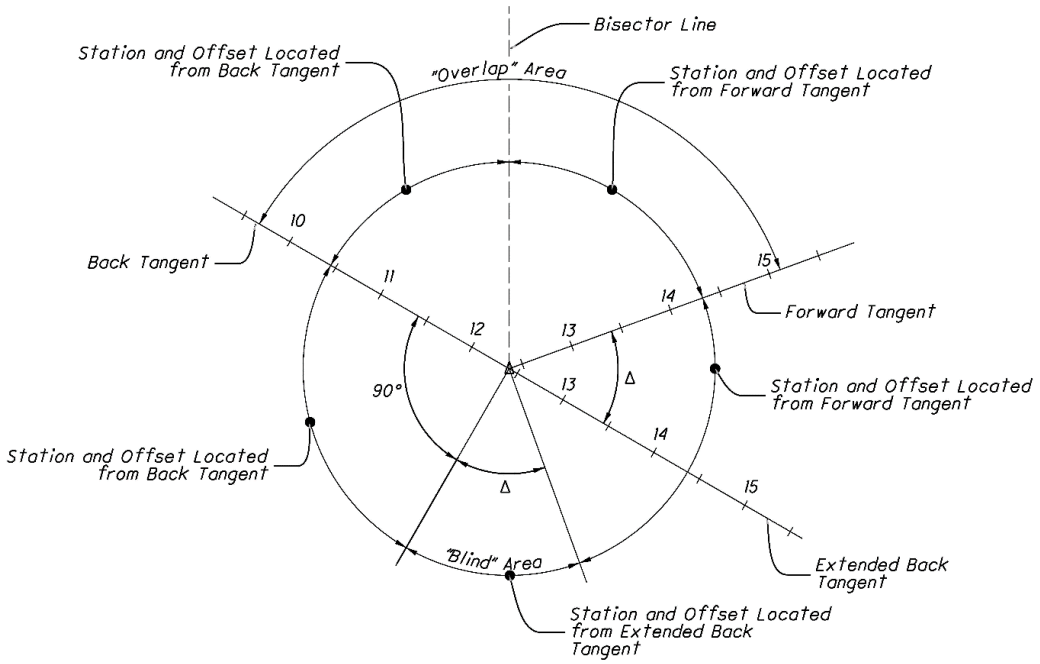
  The centerline of construction should match the centerline of right-of-way. In those instances where it is not possible to match the two centerlines, a constant offset between the two centerlines is preferred. When the two centerlines differ, their relationship must be shown in the right-of-way plans. It is not necessary to show this relationship within the construction plans.

  Stationing shall be designated in feet per the following examples:

  104+59.35, meaning 10,459.35 feet from Sta. 0+00.

  When giving locations of points intermediate of full stations and leaving off the full station designation, all leading zeros should be included. For example: +03.17 would be the abbreviated form of Sta. 2+03.17.

  When a centerline includes a deflection angle (i.e., a P.I. without a horizontal curve), there can be confusion on how to measure stations and offsets from the back and forward tangents. The following figure clarifies which tangent to use depending on a point's location in the "overlap" area.



In addition to the "overlap" area, there is a "blind" area in which a station and offset cannot be measured from either the back or forward tangent. Stations and offsets in the "blind" area should be measured off an extended back tangent as shown in the figure.

Indicate when station and offset are being reported along the extended back tangent in the "blind" area as follows:

Sta. 12+75.00, 30.00' Rt., on Extended Back Tangent

- Grades are to be shown using percentages to the hundredths.
- Profile grade elevations are to be shown every 25'. The location of the profile grade elevation is shown on the Typical Sections.
- Elevations shall be expressed in feet above the specified datum.
- Horizontal alignment data – Show all data for simple curves and spiral curves (See **Figures 1303-1, 1303-2 and 1303-3**). All proposed horizontal alignment data (i.e. curve information, station equations, reference points, etc.) shall be specified to the nearest hundredth of a foot.
- Vertical alignment data – The data includes the station and elevation of the PVI and the limits and length of vertical curve. When there is a grade break without a vertical curve, the words "NO CURVE" should be added adjacent to the PVI station and elevation **[**SP 1309-1(a)].
- Vertical clearance under overhead structures - The existing, proposed and required clearance shall be shown.
- Vertical clearance under major overhead electric transmission lines.

1309.4.2 Roadway Items

- Lane widths – Where lane widths are not obvious, they should be shown on the plan view or on a separate sketch. The location and dimensions of all pavement transitions should be shown, including "tie-ins" to existing pavement.
- Pavement width, treated shoulder width – Label width dimensions left and right of the centerline of construction at transition end points **[**SP 1309-5**]**.
- Curbs – Show and label transitions **[**SP 1309-1(a)**]**.
- Drives – Label the location, type, existing surface type, width, and alignment with mainline (i.e., angle relative to centerline) on plan and profile sheets, drive detail sheets or tables.
- Guardrail – Label anchor assemblies, bridge terminal assemblies, terminal stations, flare and radii **[**SP 1309-2 and 1309-8**]**.
- Concrete barrier – Label terminal stations, end anchorages, transitions, and end treatments like impact attenuators.
- Signs – Identify sign structures (i.e. cantilever and trusses), controllers and signal poles. Smaller traffic control signs (i.e. mounted on yielding posts) are normally shown on a separate traffic control plan sheet.
- Bridge limits, structure number, approach slab limits, and pier locations **[**SP 1309-8**]**.

1309.4.3 Boundary Lines

- Right-of-Way, easement, temporary right-of-way and limited access lines
- Construction limits – These limits must encompass all work. This includes removals, room for construction equipment to complete work, site access, etc. Construction limits are not intended to encompass storage areas for materials or equipment. However, it may be necessary to address storage areas when determining a project's environmental impacts.
- Property Lines – Show property lines when right-of-way is being acquired or when the project includes access management changes for properties along the roadway.

1309.4.4 Drainage Items

- Storm sewers, inlets, manholes, catch basins, culverts - These items shall be shown in both plan and profile **[**SP 1309-1(a), 1309-3, 1309-4, 1309-5, 1309-6**]**. Label the conduit size and type (ex. 36" – Type C) in the plan view. Drainage items are often shown on the cross-sections and drainage details, in addition to the Plan & Profile sheets. Detailed information should be indicated on only one of these sheets. The remaining sheets need only show the type of structure and a reference to the sheet showing additional details. Proposed and existing elevations should be shown on the Plan & Profile sheets for manholes and catch basins which are to be either reconstructed or adjusted to grade.
- Underdrains - Include all bends, branches, outlet offsets and elevations **[**SP 1309-5**]**. In addition, include the profile grade for unclassified underdrains only

- Flow arrows showing direction of flow in ditches, streams, underdrains and culverts.
- Erosion protection - includes dimensions of rock channel protection, sodding, ditch erosion protection, etc.
- Slope lines, where necessary, to better define drainage.
- Design and 100-year water elevations, if not shown elsewhere in the plans (e.g., culvert details, etc.).

1309.5 Quantities

Plan & Profile sheets are used to show many of the plan quantities as described in the following sections.

1309.5.1 Reference Balloons

Reference balloons are used to tie the items on the plan to the pay quantities in the estimated quantities table. The designations within the balloon correspond with the reference designation in the estimated quantities table. Dashed balloons are used to indicate that quantities are picked up on a different sheet.

A separate reference balloon is used for each drainage structure and its outlet run of conduit regardless of whether or not the run of conduit extends onto an adjacent plan and profile sheet. For example, reference balloon D-5 on SP 1309-1(a) and SP 1309-1(b) includes a catch basin and proposed storm sewer conduit that extends to the next sheet.
Reference balloon numbering may be restarted on each plan view or may be carried through the entire plan. A consistent system of reference balloon numbering should be used for each project. SP 1309-1(a) and SP 1309-1(b) provide an example of sequential balloon numbering that is carried through all plan and profile sheets. SP 1309-6 provides an example of balloon numbering that is restarted for each plan and profile sheet.

1309.5.2 Estimated Quantities

Quantities should be shown in tabular form in such a manner as to clearly show the following:

- Reference Designation - This is usually a combination of letters and numbers. The letters indicate the general description of the item (Example - UD or U for underdrain, GR or G for guardrail, D for drainage, S for sanitary sewer, C for curb, DR for driveways, R for removal, WQ for manufactured water quality structure), and numbers differentiate between similar items (D-1, D-2 and D-3 might be used when there were three drainage items on one Plan & Profile Sheet).
- Location - This includes the limiting stations and side (Rt. or Lt.)
- Item Number or Special and item description
- Unit of Measure (ft^2, yd^3, mi., etc.)
- Item quantity and total quantity

Indicate whether the total quantities are carried to the General Summary or to a Subsummary Sheet.

1309.6 Miscellaneous Information

In addition to existing and proposed information and quantities, Plan & Profile sheets include other information pertinent to the project, such as the following:

1309.6.1 Project Control and Reference Points

Points used to establish project control along with the associated reference points are more commonly shown on the Schematic Plan or General Notes. When a Schematic Plan is not provided or for other unique situations where the project control points and reference points cannot be shown in the Schematic Plan or General Notes, these points should be shown on the Plan sheets as described in Section 1303.2.2.

1309.6.2 Cross References to Other Sheets

Where quantities, details, etc. are shown on other sheets, cross-references are required.

1309.6.3 Typical Sections of Adjoining Pavement

When not shown with the Typical Section Sheets, the first and last Plan & Profile Sheet should show a detail of the Typical Section of the Adjoining Pavement, including type, thickness and cross slopes of all pavement courses.

1309.6.4 Project and Work Limits

If the Project and Work Limits are not provided in the Schematic Plan, the limits should be shown on the appropriate Plan & Profile Sheets.

1309.6.5 Match Lines

A match line should be shown, and the station given, wherever the plan view, work or quantities are continued on another sheet. It is recommended that the match lines be made at a location where the stationing is a multiple of 100 feet.

1310 Cross-Sections

1310.1 General

Although the main purpose for cross-sections is to show end areas and surface dimensions for the calculation of earthwork and seeding quantities, they conveniently show a wealth of additional information, which will be discussed in part in the following sections **[**SP 1310-1 through SP 1310-4**]**.

In complicated areas such as interchanges, a cross-section layout sheet may be required. A cross-section layout sheet is a plan sheet showing where each section is located **[**SP 1310-6**]**.

1310.2 Format

Cross-Sections are plotted on a 1" x 1" grid system subdivided in accordance with the examples shown in **Figure 1202-1**. Horizontal and vertical scales are equal - usually 1"=5' or 1"=10'. Elevations are labeled along each side at the major grid lines. When a 1"=10' scale is used, the even elevations are located at the 1" grid lines. The distance, measured from the centerline of construction, is labeled at the top and bottom of the sheet at the vertical major grid lines.

Intervals between regular sections should normally be 50'. Intervals of 25' should be used where greater detail is required. In addition, sections (or partial sections) are plotted at abrupt ground line changes or to show special features such as drives, bridges, or drainage items. Sections must be shown as often as necessary to accurately determine the character and extent of the proposed work. When existing and proposed features are located between two cross-sections, it is preferred that either additional cross-sections be included at the location of the feature, or they be shown on a storm sewer profile sheet.

Cross section sheets shall be laid out such that stationing increases from the bottom to the top of the sheet. The station is shown in bold print under each section at the centerline of construction. The existing ground elevation at the centerline of construction is shown directly below the station number and the elevation of the proposed grade at the profile grade point is shown directly above the station number. A project may require two profile grade points to be shown on the cross-sections.

Exaggerated cross-sections may be included in the plan, or provided on separate sheets, with the Stage 3 submission for review and reference during construction of the project. They are used to calculate variable depth pavement leveling course quantities or to show variable depth pavement planning.

Existing features are shown with dashed lines and proposed features are shown with solid lines. Surface, base and subbase courses of proposed pavement are not shown. Likewise, interpretations of the subsurface investigation, such as top of rock, are not shown. The limits of the existing pavement should be shown.

The ratio for each side-slope and back-slope (2:1, 3:1, etc.) should be labeled at the top and bottom sections on each sheet and at any intermediate sections where there is a change in the slope.

1310.3 Earthwork and Seeding Quantities

1310.3.1 Earthwork Calculations

End areas (calculated to the nearest square foot and earthwork volumes (cubic yards are shown for cuts and fills in the columns on the right side of the cross-section sheet. Separate calculations must be shown when different types of earthwork (e.g., Item 203 and Item 204) are included **[**SP 1310-2 and 1310-4**]**.

Concrete pavement removal must be itemized separately and paid for under Item 202, Pavement Removed. On large projects, asphalt concrete pavement removal should be itemized separately under Item 202, Pavement Removed, Asphalt **[**SP 1310-7**]**. Adjustments must be made for drives, intersections, etc. When pavement is removed and is to be replaced with embankment material, the quantity of embankment must be included in the plans using the applicable 203 or 204 pay item.

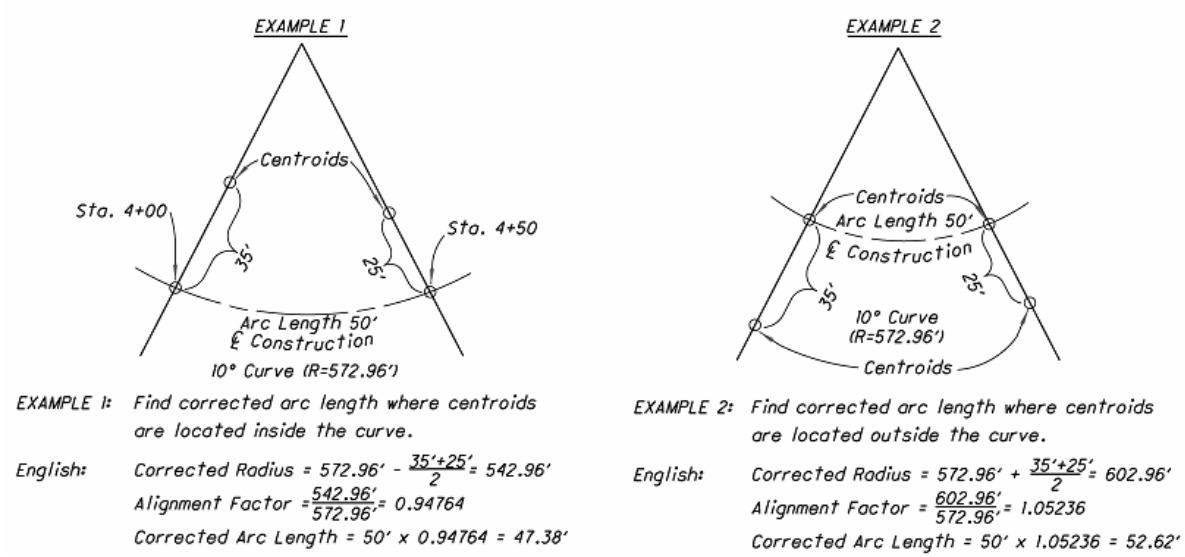
End areas may be determined using computer programs, planimetering, or summation of geometric shapes. Subtotals for earthwork quantities should be shown on each sheet and carried to a subsummary in advance of the cross-sections or directly to the General Summary.

1310.3.2 Earthwork Corrections for Curvature

When computing earthwork for a project, it is important that the designer consider the effect of curvature on the volumes of cut and fill, and adjust the quantities where warranted. Curvature may have a significant effect where there are side-hill cuts and/or fills where the centroid of either area is significantly displaced from the centerline. The magnitude is a function of the curve radius, with shorter radii curves (such as may be used on ramps) having the greater effect. Whenever the true volume of cut or fill, or both combined, based on the centroidal arc length, differs by one cubic yard per yard of distance between adjacent cross-sections from the estimated volumes based on the survey length, a correction shall be shown in the plans.

It is assumed that the actual true volume of a curved prismoid is the product of the average area of end sections times the arch length passing midway between the centroids (centers-of-gravity) of the end sections. If the centroidal arc lies on the inside of a curve, its length is shorter than the centerline distance; if it lies on the outside, its length is longer.

To adjust earthwork volumes for curvature, the corrected-arc-length method should be used. This method is simple and easy to understand and is easily adapted to computer programs for earthwork. An example of this method is shown in the following figure:



The diagram of the example showing the method of correction should be shown on the General Note Sheet. The corrected arc lengths should be shown in the earthwork tabulations on the cross-section sheets.

1310.3.3 Roads for Maintaining Traffic

Roads for Maintaining Traffic, along with their baseline (if any) should be shown on the cross-sections **[**SP 1310-2 and SP 1310-3**]**. Earthwork for Roads for Maintaining Traffic shall be shown by heavy dashed lines. This includes both the portion to be removed under **Item 615, Roads for Maintaining Traffic**, as well as the overlapping areas of earthwork that will remain as part of the permanent facility.

Earthwork cut and fill end areas for Roads for Maintaining Traffic may be shown on the cross-sections with quantities located in separate cut and fill columns or marked with an asterisk. Alternatively, they may be calculated and included for estimating purposes on the Office of Estimating's Estimated

Quantities form which can be found in Appendix D. The totals of the earthwork cut and fill for **Roads for Maintaining Traffic** shall be provided in the General Notes.

1310.3.4 Seeding Calculations

Except on projects where the seeding quantities can otherwise be determined with reasonable accuracy, seeding end widths and areas should be shown on the cross-sections. The limits of seeding shall be all areas of exposed soil between the right-of-way lines and within the construction limits for areas outside the right-of-way lines.

End widths measured to the closest foot and seeding areas (sq. yards) are shown in the columns on the left side of the Cross-Section sheet. Adjustments must be made for drives, intersections, etc. **[**SP 1310-3**]** Subtotals for seeding quantities should be shown on each sheet and carried to a subsummary in advance of the Cross-Sections or directly to the General Summary.

1310.4 Drainage Items

Existing and proposed drainage facilities should be shown on the Cross-Sections. This includes, but is not limited to: ditches, permanent erosion control items, flow arrows, culverts, headwalls (type and elevations), inlets, manholes, drive pipes, and other longitudinal drainage items. Ditch flowline elevations should be shown. Existing facilities to be removed or abandoned should be so noted. Existing normal water level elevations should also be noted for lakes, ponds, rivers and streams. The elevation of the Ordinary High Water Mark (OHWM) should be identified for any waterway feature (i.e., streams, jurisdictional ditches, lakes, reservoirs, and ponds) being addressed through the Waterway Permit.

Drainage items are normally shown on the Plan & Profile Sheets and the Drainage Detail sheets, in addition to the Cross-Sections. Full design information should be indicated on only one of these sheets. The remaining sheets need only show the type of structure and a reference to the sheet where additional details can be found.

1310.5 Drives

Drive profiles should be shown on the cross-sections. Profiles which do not fall at a full cross-section should be shown on a partial section. The drive's station, length and grade should be labeled. Separate drive profile sheets are not typically required, although they may be needed for long drives **[**SP 1310-5**]**.

1310.6 Miscellaneous Items

Some of the other items that should be shown on the Cross-Sections include retaining walls, limits of subgrade stabilization and all underground utilities.

1311 Miscellaneous Details

Miscellaneous Details is a section of the plan that serves as a "catch-all" for items that do not fit under other headings. Some of the items that may fall into this category are included in the following subsections.

1311.1 Drive Details

Drive details [SP 1311-4 and 1311-5] show the geometry and build-up of drives. Typically, this information can be adequately presented in tabular format and separate drive details are not needed.

1311.2 Grading Details

Grading Details [SP 1311-12] are sheets showing the graded shoulder, slope breaks, drainage structures, ditches, and flow arrows. A grading detail should be provided for intersections and interchanges on complicated plans where cross-sections and profiles cannot adequately describe the grading.

1311.3 Intersection Details

Intersection Details [SP 1311-2 and SP 1311-3] show the intersection angle, pavement widths, radius return curve data (location of origin point, radius, interior angle and length of curve), centerline and edge of pavement elevations at 25 ft. intervals, elevations around the radius returns at 10 to 15 ft. intervals, drainage structures including elevations, ditch and conduit flow arrows, and top of curb elevation. An intersection detail should be provided for all intersections.

1311.4 Interchange and Ramp Terminal Details

Addition of new or modification of existing interchanges should be accompanied by Interchange Details showing baseline layout information, profiles, horizontal alignment, ramp intersections, class terminals, tapers in terminal areas, superelevation rates and superelevation transition lengths.

Ramp Terminal Details [SP 1311-13] show pavement elevations and stations for proposed edge of pavement, crown and edge of shoulder. Width dimensions associated with ramp terminals are provided.

1311.5 Pavement Joint Details

A Pavement Joint Detail [SP 1311-7(a) and 1311-7(b)] should be provided for all intersections, ramp terminals and other varying width sections when constructed with concrete pavement. The Pavement Joint Detail shows the locations of all expansion, longitudinal and contraction joints.

1311.6 Pavement/Transition Details

Pavement/Transition Details [SP 1311-6 and 1311-9 through 1311-11] show the pavement build-up within a transition. A Pavement/Transition Detail should be provided for areas at the ends of a project that are not easily depicted by a typical section.

1311.7 Superelevation Tables

Superelevation Tables [SP 1311-1] show edge of pavement elevations, profile grade elevation, pavement cross slopes at 25 ft. intervals and at all P.C., P.T., T.S., S.C., S.T., and C.S. as well as the transition rates.

1311.8 Other Details

Additional details that may be needed include:

- Noise Barriers - Additional information may be obtained by contacting the **Office of Environmental Services**.
- Linear Grading Details
- Median Crossover Details **[**SP 1311-8**]**
- Roundabout Details **[**SP 1311-14(a) and 1311-14(b)**]** show roundabout geometry in addition to what is shown on the Schematic Plan. Additional information may be obtained by contacting the **Office of Roadway Engineering**.

1312 Drainage Details

1312.1 General

Drainage Details include details for prefabricated structures and other drainage related items that cannot be adequately shown on other plan sheets. Several of these are discussed in the following sections.

1312.2 Culvert Details

If larger than minimum pipe sizes are used, a separate culvert detail is required **[**SP 1312-1, 1312-2, 1312-3 and 1312-7**]**. If space permits, two or more details may be placed on one sheet. The horizontal and vertical scales are the same, preferably 1"=10'. Culvert details should include the following:

A. Hydraulic Design Data to be shown on the profile or as an information block for each culvert:

- Drainage area to the nearest acre.
- Design-year and 100-year discharge in cfs.
- Design-year and 100-year velocity in ft/s.
- Design-year and 100-year headwater elevation to the nearest 0.1 ft.
- Elevation of the Ordinary High Water Mark (OHWM) or depth of flow associated with ordinary high water to the nearest 0.1 ft. for crossings that require a Waterway Permit.
- Amount of fill material below the OHWM for crossings that require a Waterway Permit. See the Office of Environmental Services' Waterway Permits Manual for more information.
- All existing structure data - size, type, length, date built.
- Design Service Life: 75 yr.
- Stream pH
- Abrasion Level: 1 - 6

- Conduit File Number (CFN). Required for Type A conduits having an opening, measured along the centerline of the roadway, of 12 inches or greater but less than 120 inches.

B. Plan View Information:

- Station to nearest 0.01 ft. where structure centerline intersects centerline of construction.
- Skew angle to the nearest degree as measured from the centerline of the culvert to the centerline of the roadway.
- Stations and offsets (nearest 0.01 foot at structure ends).
- Channel protection with dimensions.
- Slope treatment.
- Conduit channels and ditches with flow arrows.
- Pavement dimensions.
- Guardrail dimensions and offsets.
- Headwall angle to structure and location with dimensions.
- Right-of-Way limits, easements.
- Construction limits.

C. Profile Information:

- Culvert type, length and grade.
- Culvert grade to nearest hundredth of a percent.
- Inlet and outlet flowline elevations to the nearest 0.1 foot
- Profile grade elevation.
- Edge of pavement elevations.
- Minimum cover elevation to the nearest foot.
- Maximum cover elevation to the nearest foot.
- Type of headwall with elevations.
- Ditch grades to the nearest tenth of a foot.
- Type of channel and/or ditch protection with thickness.
- Guardrail treatment.

- Centerline of construction.
- All offsets (measured along centerline of culvert).

D. Estimated Quantities:

- End treatment (riprap, etc.).
- Item 602, Concrete Masonry for headwalls or Item 511, Concrete if non-standard.
- Conduit. The pay quantity for pipe on slopes 3:1 or steeper is measured along the invert. All other pipe is measured horizontal from station to station.
- Pavement restoration. All items that are required to restore the pavement after the installation of 611 items.

If the quantities are carried to any sheet other than the General Summary, a cross-reference note should be added.

All items that are located such that they would prevent a 611, or 605, item from being constructed require a 202 removal item (headwall removed, pipe removed, catch basin removed, etc.).

Provide the design live load (HL-93) with the future wearing surface load (60 PSF) information on the Culvert Detail Sheet or Site Plan for precast reinforced concrete box culverts (spans 14 feet or greater), precast reinforced concrete three-sided flat-topped culverts, precast reinforced concrete arch culverts, and precast reinforced concrete round sections.

1312.3 Storm Sewer Profiles

Storm sewers are usually shown in detail on the Plan & Profile sheets. However, it is sometimes necessary to show storm sewer profiles on separate sheets if the profile on the Plan & Profile sheets is too congested. Storm sewer profiles should include: pipe type, size, length, direction of flow, existing and proposed cover; grade, flowline elevations, stations and offsets, and all catch basins, manholes and inlets **[**SP 1312-4 and 1312-5**]**.

A Conduit File Number (CFN) is required for Type B conduits having and opening, measured along the centerline of the roadway, of 12 inches or greater but less than 120 inches.

1312.4 Precast Drainage Structures

In addition to the culvert details specified in Section 1312.2 – Culvert Details, precast drainage structures (i.e. C&MS 706.05, 706.051, 706.052 & 706.053) require the Designers to prepare plans using one of the methods listed below. For more information about choosing a Plan Preparation method refer to BDM Section 311.2.2.

A. Cast-in-place full-height headwalls as illustrated in Sample Plan Sheets **[**SP 1312-6(a) through 6(h)**]** with the following minimum Plan Details:
   - Wall and slab thickness of the drainage structure.
   - Fully detailed headwalls including footings, wingwalls, foreslope walls, and cutoff walls.
   - Reinforcing steel list.
   - Structure number with station.
   - Foundation notes.

- Estimated quantities – 503, 509, and 511. The plans should define the limits of work under 503 and 611.

B. Precast full-height headwalls as illustrated in Sample Plan Sheets [SP 1312-6(i) through 6(p)] with the following minimum Plan Details:
   - Wall and slab thicknesses of the drainage structure
   - Fully detailed footings, foreslope walls and cutoff walls
   - Reinforcing steel list (for footings, foreslope walls and cutoff only)
   - Structure number with station.
   - Foundation notes
   - Estimated quantities - 503, 509, 511 (for footing and headwalls only) and 851 (see Designer Notes for quantity information). The plans should define the limits of work under 503 and 611.

For three-sided culvert plans involving optional designs (flat top/arch top), the structure details may be combined or separated, depending on the degree of similarity. Footing and wingwall designs should generally be the same for each option. Quantities for optional designs should use one of the following formats:

- Separate list of estimated quantities for each option.
- A combined list with all common quantities listed together and all quantities not common listed separately under each option (i.e., Option A, Option B, etc.)

1312.5 Underdrain Details

Underdrains are typically shown in detail in the plan view of the Plan & Profile sheets. However, in cases where the Plan & Profile sheets are too congested, it is recommended to show underdrains on a separate sheet. Underdrain details show the size of underdrain, type of underdrain, tees, bends, crosses, and outlets for underdrains.

1313 Sanitary Sewer and Water Work Plans

Normally, sanitary sewer and water work can adequately be shown on the regular Plan & Profile sheets. Occasionally, however, where the project is complex, or the magnitude of this type of work is extensive, special plan sheets may be required [SP 1313-1 and SP 1313-2].

1314 Traffic Control, Lighting, Landscaping, Rest Areas, Structures, Right-of-Way, and Soil Profile

1314.1 Traffic Control Plans

Plans and details involving permanent traffic control items, such as pavement markings, signing, and signalization [SP 1314-1 through 1314-4], shall be prepared in accordance with the **Ohio Manual of Uniform Traffic Control Devices,** Signal Design Reference Packet, and the **Traffic Engineering Manual**

. Additional information may be obtained by contacting the **Office of Roadway Engineering** and the **Office of Traffic Operations**.

1314.2 Lighting Plans

Lighting plans should be prepared in accordance with the **Traffic Engineering Manual [**SP 1314-9 through 1314-11**]**. The **Office of Roadway Engineering** should be contacted for assistance in the preparation of plans involving highway lighting.

1314.3 Landscaping Plans

The **Office of Roadway Engineering** and the **Office of Environmental Services** should be contacted for assistance in the preparation of plans involving highway landscaping **[**SP 1314-12**]**.

1314.4 Rest Area Plans

The **Office of Facilities Management** should be contacted for assistance in the preparation of plans involving rest areas.

1314.5 Structures

Structure plan preparation should be in accordance with the **Bridge Design Manual**. Additional information may be obtained by contacting the **Office of Structural Engineering**.

1314.6 Right-of-Way Plans

The **Real Estate Administration Policies and Procedures Manual** should be used as a guide for preparation of Right-of-Way plans. Right-of-way sample plan sheets are contained within the **Real Estate Manual**. Additional information may be obtained by contacting the **Office of Real Estate**.

1314.7 Soil Profile Sheets

Soil Profile sheets should be prepared using the Specifications for Geotechnical Explorations. Additional geotechnical information, if any, may be obtained by reviewing the ODOT Transportation Information Mapping System (TIMS) and then contacting the **Office of Geotechnical Engineering** and the District Geotechnical Engineer.

Include all available geotechnical information in the contract documents. This is usually accomplished by the use of Soil Profile sheets. Special Provisions or plan notes referencing the location of additional geotechnical information may also be used.

1314.8 Mine Map Overlay Sheets

Mine Map Overlay sheets should be used when a mine exists within 500' of the proposed work. These sheets should show mine maps overlain on the proposed roadway. Additional features located within 500 feet on both sides of the centerline, including but not limited to the following, should be shown on the overlay sheets:

- Location of any field observed or mapped mine features (openings, subsidence features, etc.).

- Limits of the mapped mine. A note should be shown on the Plan & Profile sheets when the extent of the mine workings exceeds the normal limits of the sheet.
- Existing and proposed roadways and centerlines
- Property and Section lines
- Contours
- Construction limits
- Existing and proposed structures (houses, bridges, culverts, etc.)
- Driveways
- Railroads
- Streams, seeps, and springs
- All-terrain vehicle trails, hiking and horse trails, and bike paths

Additional information regarding Mine Map Overlay Sheets may be obtained by contacting the Office of Geotechnical Engineering. High resolution tiff images, and their associated georeferencing files, of abandoned underground maps are available from the Ohio Department of Natural Resources (ODNR), Division of Geological Survey.

1315 Simplified Plans

1315.1 General

Simplified plans **[**SP 1315-1 through SP 1315-4**]** are not required to follow the format requirements described in the previous sections. However, they shall contain enough information to adequately describe the work so that the contractor can properly bid and construct the project.

1315.2 Plan Sheets

As a minimum, all plan sheets shall have a project identifier and sheet number.

1315.2.1 Title Sheet

The following is the minimum information that shall be provided on the title sheet:

- Plan Title - **Section** 1302.2
- Design Designation - **Section** 1302.3
- Design Exceptions - **Section** 1302.4
- Index of Sheets - **Section** 1302.5
- Plan Preparer Identification - **Section** 1302.6
- Underground Utilities Note - **Section** 1302.7
- Location Map - **Section** 1302.8
- Supplemental Specifications - **Section** 1302.9
- Standard Construction Drawings - **Section** 1302.10
- Project Information – **Section** 1302.11
- Notes - **Section** 1302.12
- Plan Signatures - **Section** 1302.13

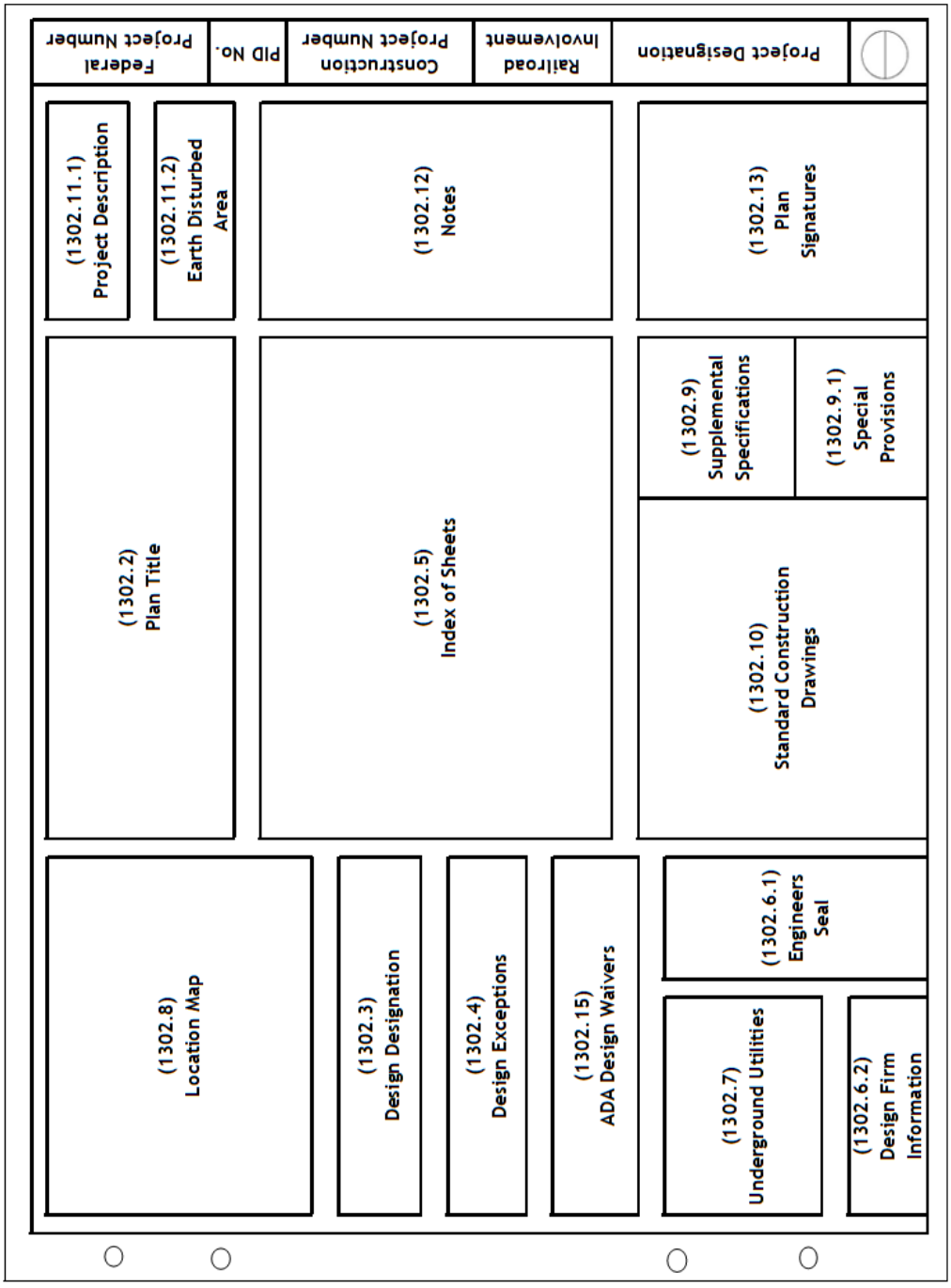
Quarter size sheets should follow the format shown on **Figure 1302-1**.

1315.2.2 General Summary

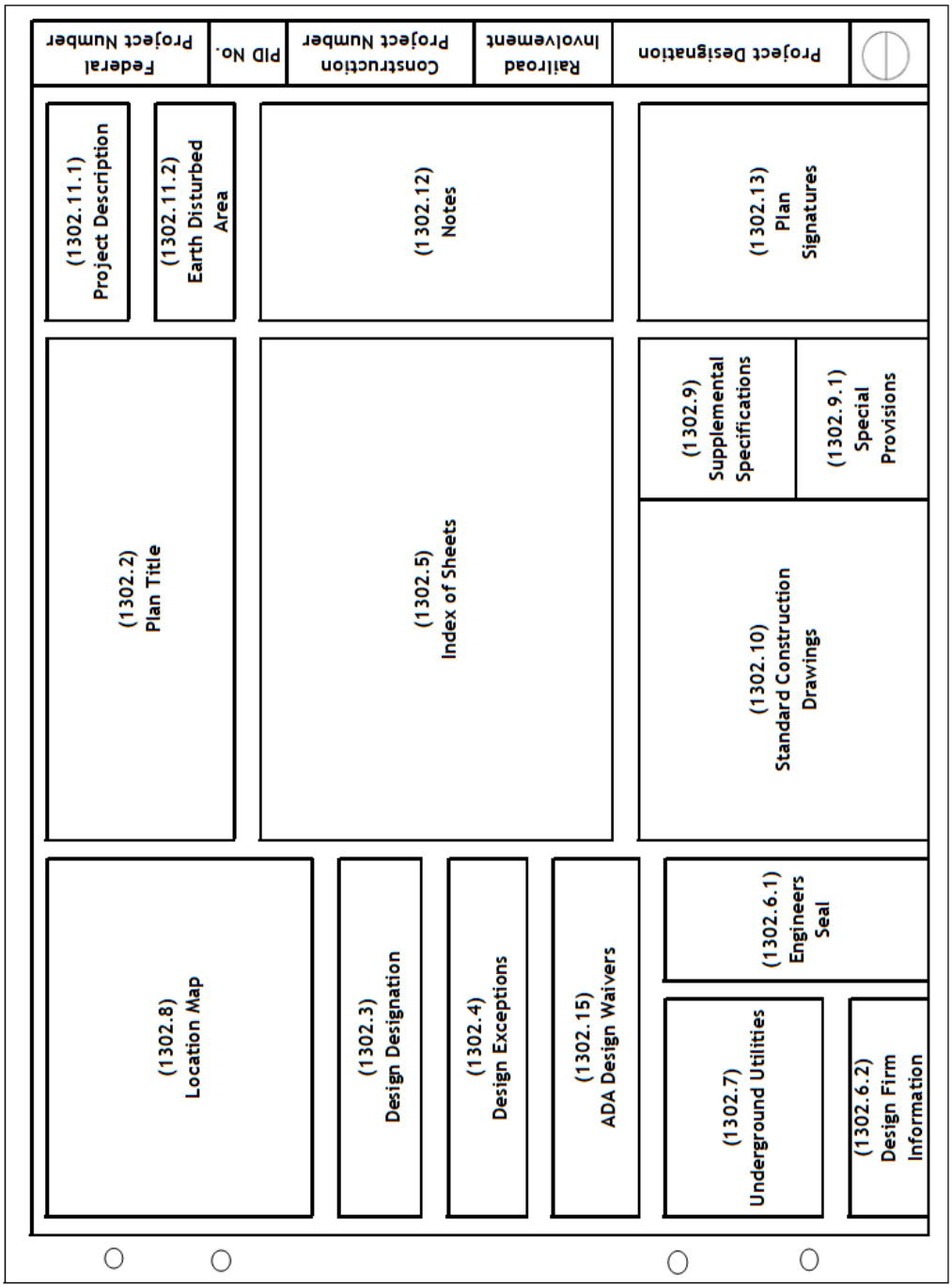
All Simplified Plans must include a General Summary. The format of the General Summary shall be as per **Section 1307.2 – General Summary Sheet**.

Figures

1302-1	Standard Title Sheet Layout
Reference Section 1302	



1302-2	Simplified Plan Title Sheet Layout: 11” x 17” Size
Reference Section 1315.2.1	



1302-3	Guide for Showing Design Exceptions in Plan
Reference Section 1302.4	

NDC = Normal Design Criteria

PLAN SHEET	DESIGN EXCEPTION	DESIGN FEATURE	EXAMPLE
Schematic (A)	Horizontal Curve Radius	Degree of Curve	Dc = 7º00' (NDC Dc = 6º00'MAX)
	Superelevation	Superelevation Rate	e_{max}= 0.075 (NDC 0.08)
Typical Section	Lane Width	Lane Width	11' (NDC 12')
	Shoulder Width	Graded/Curbed Shoulder Width	8' (NDC 10')
	Cross Slope	Pavement Cross Slope	0.0208 (NDC 0.016)
Plan Sheet	Stopping Sight Distance	Horizontal SSD (B)(C)	SSD=381'(450' Min) Actual Design Speed 48 MPH
Profile Sheet	Stopping Sight Distance	Vertical SSD (C)	SSD=381'(450' Min) Actual Design Speed 48 MPH
	Maximum Grade	Grades	4.36% (NDC 4.00% MAX)
	Vertical Clearance	Vertical Clearance	15.5' (NDC 16.5' MIN)
	Horizontal Curve Radius	Degree of Curve	Dc = 7º00' (NDC D_{C} = 6º00'
	Superelevation	Superelevation Rate	e_{max} = 0.077 (NDC 0.08
Bridge Plan Sheets	Design Loading Structural Capacity	Structural Capacity	(D)
Superelevation Sheets	Superelevation	Superelevation Rate	e_{max} = 0.077 (NDC 0.08)

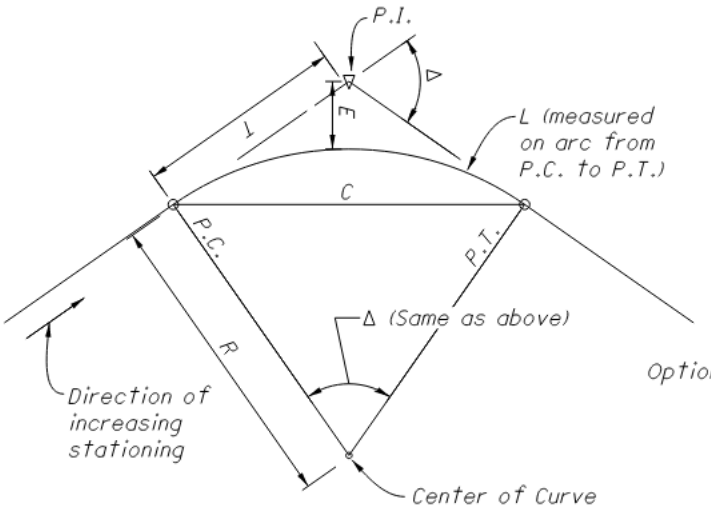
(A) If no Schematic Plan, show on Plan and Profile Sheets.

(B) Show with Curve Data

(C) Stopping Sight Distance (SSD) and Actual Design Speed are shown only when the SSD is less than the normal design criteria. The Vertical SSD applies only to crest vertical curves.

(D) See Bridge Design Manual or contact the Office of Structural Engineering.

1303-1	Simple Curve Elements and Data
Reference Section 1303.5, 1309.4.1	



CURVE DATA

P.I.= Sta.
Δ = ___° ___′ ___″ Lt. or Rt.
* D_C = ___° ___′ ___″
R =
T =
L =
E =
e_{max} =
Optional { C =
C.B. = ___ ___° ___′ ___″___
P.C. = Sta. } (1)
P.T. = Sta. }

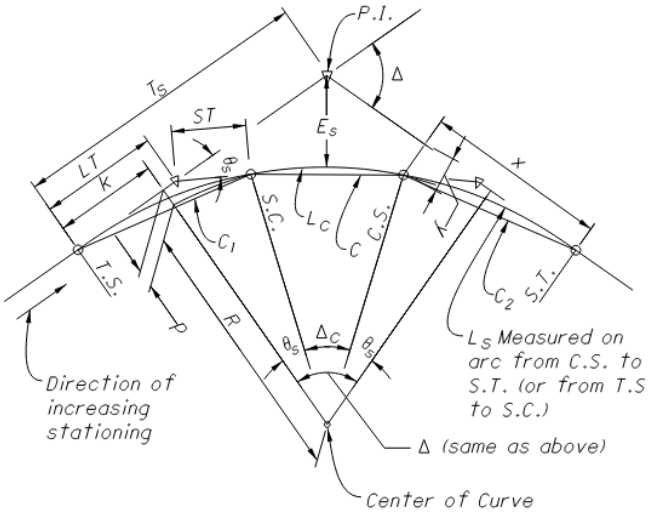
(1) Normally shown on Plan View.

ELEMENTS

P.I.- Point of Intersection
Δ - Angle of Intersection
* D_C - Degree of Curve
R - Radius
T - Tangent Length
L - Length of Curve
E - External Distance
e_{max} - Maximum Superelevation
C - Chord Length
C.B.- Chord Bearing
P.C.- Point of Curve
P.T.- Point of Tangent

* English Units only

1303-2	Spiral Curve Elements and Data
Reference Section 1303.5, 1309.4.1	



CURVE DATA

P.I.= Sta.

Δ = ___ ° ___ ′ ___ ″ Lt. or Rt.

*D_C = ___ ° ___ ′ ___ ″

R =

L_S =

θ_S =

LT =

ST =

Optional { x = ; y = ; k = ; p = ; Δ_C = } ①

L_C =

T_S =

E_S =

e_{max} =

Optional { C_1 = ; C = ; C_2 = }

T.S. = Sta.

S.C. = Sta.

C.S. = Sta.

S.T. = Sta. } ②

Optional { $C.B._1$ = ___ ° ___ ′ ___ ″ ; C.B. = ___ ° ___ ′ ___ ″ ; $C.B._2$ = ___ ° ___ ′ ___ ″ }

Note:
If the spiral is only on one end of a curve, substitute T_1 and T_2 for T_s and either P.C. for T.S. and S.C. or P.T. for C.S. and S.T. . The E_s distance becomes optional.

① For unequal spirals, show two sets of data for these items and substitute T_1 and T_2 for T_s.

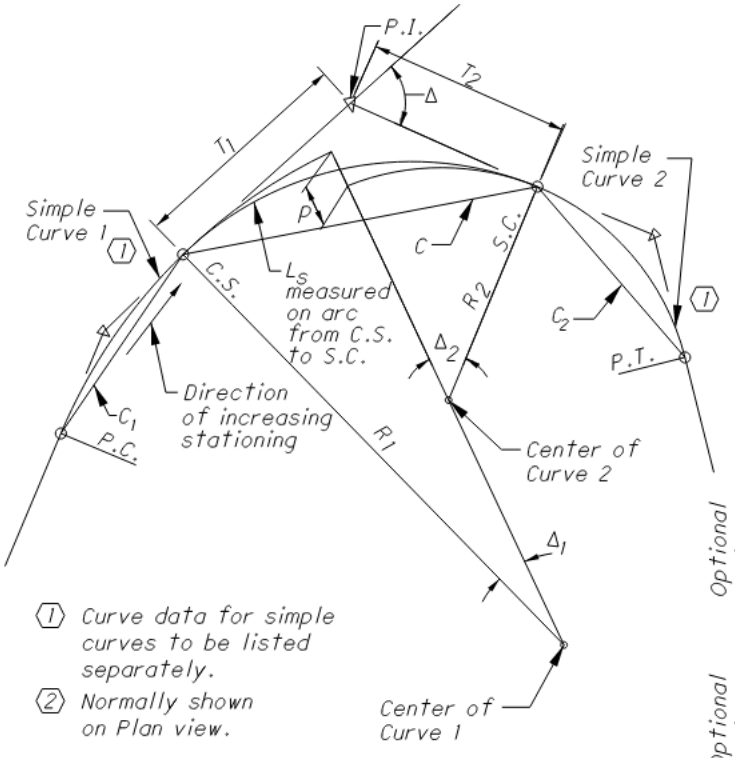
② Normally shown on Plan view.

ELEMENTS

P.I. - Point of Intersection
Δ - Angle of Intersection
*D_c - Degree of Curve
R - Radius of Curve
L_S - Length of Spiral
θ_S - Angle of Intersection of the LT and ST.
LT - Long Tangent
ST - Short Tangent
x - Tangent distance of the C.S. with reference to the S.T. and the T_s.
y - Tangent offset of the C.S. with reference to the S.T. and the T_s.
k - Distance from the T.S. to the perpendicular projection of the center of curve.
p - Offset of Curve to Tangent
Δ_c - Central Angle of Curve
L_C - Length of Curve
T_s - Distance from T.S. or S.T. to P.I.
E_S - Distance from curve to P.I.
e_{max} - Maximum Superelevation
C_1 = Chord Length from T.S. to S.C.
C = Chord Length from S.C. to C.S.
C_2 = Chord Length from C.S. to S.T.
T.S. - Tangent to Spiral
S.C. - Spiral to Curve
C.S. - Curve to Spiral
S.T. - Spiral to Tangent
$C.B._1$ = C_1 Bearing
C.B. = C Bearing
$C.B._2$ = C_2 Bearing

* English Units only

1303-3	Combining Spiral Curve Elements and Data
Reference Section 1303.5, 1309.4.1	



CURVE DATA

P.I. = Sta.

Δ = ___ ° ___ ′ ___ ″ Lt. or Rt.

* D_1 = ___ ° ___ ′ ___ ″

R_1 =

* D_2 = ___ ° ___ ′ ___ ″

R_2 =

L_S =

p =

Δ_1 = ___ ° ___ ′ ___ ″

Δ_2 = ___ ° ___ ′ ___ ″

T_1 =

T_2 =

e_1 =

e_2 =

Optional { C_1 = ; C = ; C_2 = }

C.S. = Sta.

S.C. = Sta. } 2

Optional { $C.B._1$ = ___ ° ___ ′ ___ ″ ; $C.B.$ = ___ ° ___ ′ ___ ″ ; $C.B._2$ = ___ ° ___ ′ ___ ″ }

ELEMENTS

P.I. - Point of Intersection

Δ - Angle of Intersection

* D_1 - Degree of Curve 1

R_1 - Radius of Curve 1

* D_2 - Degree of Curve 2

R_2 - Radius of Curve 2

L_s - Length of Spiral

θ_s - Nominal Spiral Angle (Not Shown on Diagram)

p - Radial Shift (Distance that Curve 1 is offset from Curve 2)

Δ_1 - Central Angle of the extension of Curve 1 into Spiral

Δ_2 - Central Angle of the extension of Curve 2 into Spiral

C_1 = Chord Length from P.C. to C.S.

C = Chord Length from S.C. to C.S.

C_2 = Chord Length from S.C. to P.T.

T_1 - Distance from C.S. to P.I.

T_2 - Distance from P.I. to S.C.

e_1 - Superelevation at C.S.

e_2 - Superelevation at S.C.

C.S. - Curve to Spiral

S.C. - Spiral to Curve

$C.B._1$ = C_1 Bearing

$C.B.$ = C Bearing

$C.B._2$ = C_2 Bearing

* English Units only