Chapter 4
Bridge Program Drawings

Section 4.02-General Notes

Introduction

The purpose of the Title Sheet and General Notes sheet is to provide information important to the design, detailing, and construction of Bridge Program projects not covered in the Special Provisions, Supplementary Specifications, Standard Plans, or Standard Specifications.

The Title Sheet and General Notes sheets include General Notes, Estimated Quantities, Index of Drawings, Stream Data, Design Data, and References.

Title Sheet and General Notes Sheet Layout

Many projects require both a Title Sheet and a General Notes sheet. The **TITLE SHEET** is the cover sheet for the complete set of Bridge Plans and, if applicable, shall include the following.

1. Structure title and location as shown on the Project Development Plans (Stationing); or Structure title and location as shown in the current Wyoming Reference Marker System booklet (Reference Marker). For counties and their abbreviations see the following.

County	**Abbreviation**
Albany	Al
Big Horn	Bh
Campbell	C1
Carbon	Cb
Converse	Co
Crook	Cr
Fremont	Fr
Goshen	Go
Hot Springs	Hs
Johnson	Jo
Laramie	La
Lincoln	Ln
Natrona	Na
Niobrara	Ni
Park	Pa
Platte	Pl
Sheridan	Sh

Sublette ----------Sb
Sweetwater ----------Sw
Teton ----------Te
Uinta ----------Ui
Washakie----------Wa
Weston ----------We

2. The Construction Number, without a prefix, is shown under the title and in the upper-right project block. ARS and other minor project numbers are not shown in the project block.
3. County, counties, or district where project is located.
4. Design Data
5. Table of Estimated Quantities
6. Index of Drawings
7. Professional Engineer's stamp, signature, and date
8. Section, Township, and Range for new structures. Place above the title block in the bottom-right comer.
9. 3-letter Structure Number and reference marker (RM) above the title block for all structures. For minor structures, a “M” is placed in front of the 3-letter Structure Number, followed by the structure type. For multiple structures see the following example.

Index of Structures					
Structure Name	Station	Route	RM	Structure Number	Lane
Separation	2036+00	ML80I	400.58	BAH	EBL
		ML80D		BAI	WBL
Bridge Over Muddy Creek	2066+00	ML80I	401.16	BAJ	EBL
		ML80D		BAK	WBL
West Interchange	2082+26.80	ML80I	401.46	BAM	EBL
		ML80D		BAN	WBL
Beech Street Overpass	2118+22.70	ML80I	402.14	BAO	EBL
		ML80D		BAP	WBL

Index of Structures				
Structure Name	Route	RM	Structure Number	Lane
Spring Creek	ML23B	275.69	DDD	
Herrick Lane Separation	ML80D	302.91	AFH	WBL
Lake Hattie Canal	ML103B	19.95	CGJ	

10. Table of Soil Properties. Use only with retaining wall projects.

Use the following table on MSE Retaining Walls

Retaining Wall Design Data											
Wall No.	Foundation Material							Reinforced Backfill Material		Retained Soil	
				Service		Strength					
	ϕ	μ	γ	q_o	q_s	q_r	q_u	ϕ	γ	ϕ	γ
1	36°	0.72	0.125 pcf	0.00 tsf	0.00 tsf	0.00 tsf	0.00 tsf	36°	0.125 pcf	15"	0.124 pcf
2	36°	0.72	0.125 pcf	0.00 tsf	0.00 tsf	0.00 tsf	0.00 tsf	36°	0.125 pcf	15"	0.124 pcf
3	36°	0.72	0.125 pcf	0.00 tsf	0.00 tsf	0.00 tsf	0.00 tsf	36°	0.125 pcf	15"	0.130 pcf

Use the following table on other retaining walls

Retaining Wall Design Data													
Structure	Station	Foundation Material							Backfill Material		Retained Soil		
					Service		Strength						
		ϕ	μ	γ	q_o	q_s	q_r	q_u	ϕ	γ	ϕ	γ	c
Wall No. 1	66+59.95 - 66+80.61	32°	0.42	125 pcf	0.00 tsf	0.00 tsf	0.00 tsf	0.00 tsf	25°	125 pcf	32°	125 pcf	0
	66+80.61 - 68+69.52	32°	0.42	125 pcf	0.00 tsf	0.00 tsf	0.00 tsf	0.00 tsf	25°	125 pcf	32°	125 pcf	0
	68+69.52 - 69+74.31	32°	0.42	125 pcf	0.00 tsf	0.00 tsf	0.00 tsf	0.00 tsf	25°	125 pcf	32°	125 pcf	0
Wall No.2	76+09.20 - 82+67.43	32°	0.42	125 pcf	0.00 tsf	0.00 tsf	0.00 tsf	0.00 tsf	28°	120 pcf	32°	125 pcf	0

If applicable, the **GENERAL NOTES** sheet shall include the following.

1. General Notes
2. Stream Data
3. References
4. Additional information as required

Small projects can accommodate all the project information on the Title Sheet, thus eliminating the General Notes sheet. For larger projects additional General Notes sheets may be required.

General Notes

A list of the common General Notes are included in Appendix A at the conclusion of this chapter. The notes shown are based on the latest version of the WYDOT Standard Specifications for Road and Bridge Construction. These notes will be routinely updated as necessary and can be found on the server or on the Bridge Program web page. The notes provided are complete or require minor editing. The list below provides guidance in using each note. The items preceded by an asterisk in parentheses (*) indicate placement in conjunction with a pay item of the same name in the Table of Estimated Quantities. Notes are not required if the content of the note is covered on the plans, in WYDOT Standard Specifications, or in a job specific Special Provision. Notes shall be placed in a logical order following the sequence of construction.

Custom Notes

Custom notes are notes not found in the list of common notes. These notes may be supplied by the Resident Engineer, other programs, or by the design squad to be included in the Bridge Plans. Often the common notes can be edited to create the custom notes. Custom notes need to be written in active voice and imperative mood as noted in Section 101 of the WYDOT Standard Specifications for Road and Bridge Construction.

Estimated Quantities

The **TABLE OF ESTIMATED QUANTITIES** is a list of pay items for all materials used for a construction project. Each item includes labor, equipment, tools, and incidentals necessary to complete the work as established by the Special Provisions, Project Plans, Supplementary Specifications, Standard Plans, and Standard Specifications. Most items are measured according to the United States Standard Measure. Some items are termed "Lump Sum." These items require complete payment for the work described in the contract. For information on calculating quantities, see Chapter 5 – Quantities Calculations.

Pay items for Bridge Program projects are listed in the "Bid Item Listing." This listing is provided and kept current by the Engineering Services Section of the Project Development Program. Each item listed has a unique item number, item name, unit of measure, and possibly an "S" or "D". "S" indicates that a Special Provision or a Supplementary Specification is required. "D" indicates a detail must be shown on the plans.

Occasionally, pay items not listed in the "Bid Item Listing" are required on a project. These items require a Special Provision and often a detail on the plans. An item number must be obtained from Engineering Services for inclusion of this pay item on the plans.

Often it is necessary to explain the pay item further. This may be accomplished using an explanation on the General Notes sheet. Additional notes with appropriate note symbols may be placed under the table to help explain the calculated quantities. Projects with combined project numbers require a table for each project number.

CONSTRUCTION CODES are required by the Federal Highway Administration to appear in the Table of Estimated Quantities. The codes for bridge improvement are only used for structures carrying highway loads that have an opening of more than 20'-0" between front face of abutments, spring line of arches, or the inside of the exterior walls of box culverts measured along the center line survey. This will also include multiple pipes, providing the clear distance between the opening is less than half of the smaller contiguous opening. The appropriate code is determined by using the following.

Code	Description
08	Bridge, New Construction Use this code when a new bridge is constructed that does not replace or relocate an existing bridge.
10-XXX	Bridge Replacement, Added Capacity Use this code when a structure is replaced with a new structure having additional thru traffic lanes. The structure number of the bridge being replaced should be shown in place of the XXX.
11-XXX	Bridge Replacement, No Added Capacity Use this code when a structure is replaced with a new structure that does not incorporate additional thru traffic lanes in the design. The structure number of the bridge being replaced should be shown in place of the XXX.

13-XXX Bridge Rehabilitation, Added Capacity

Use this code when rehabilitating a structure that includes the addition of thru traffic lanes. If the bridge qualifies for rehabilitation utilizing HBRRP funds (BR Projects), the structure number should be shown in place of the XXX. Otherwise, leave the suffix blank.

14-XXX Bridge Rehabilitation, No Added Capacity

Use this code when rehabilitating a structure that does not incorporate the addition of thru traffic lanes in the design. If the bridge qualifies for rehabilitation utilizing HBRRP funds (BR projects), the structure number should be shown in place of the XXX. Otherwise, leave the suffix blank.

The following are examples of Tables of Estimated Quantities.

ESTIMATED QUANTITIES - CODE 10-ABX				
ITEM NO.	ITEM	UNIT	TOTAL QUANTITY	ESTIMATE
202.03210	REMOVAL OF STEEL BRIDGES	EA		
212.02100	DRY EXCAVATION	CY		
217.01030	GEOTEXTILE, EMB AND RETAINING WALL	SY		
501.01000	STRUCTURAL STEEL	LS	LUMP SUM	LB
503.01000	BRIDGE RAILING	FT		
504.04010	PILE SPLICES	EA		
504.11253	STEEL PILING HP 12 X 53	FT		
507.01000	REINFORCED CONC APPROACH SLABS	SY		
507.01100	BRIDGE APPROACH BACKFILL	CY		
511.02000	GABIONS	SY		
512.01040	COMPRESSED JOINT MATERIAL	FT		
513.00005	CLASS A CONCRETE	LS	LUMP SUM	CY
513.00015	CLASS B CONCRETE	LS	LUMP SUM	CY
514.00015	REINFORCING STEEL	LS	LUMP SUM	LB
514.00025	REINFORCING STEEL (COATED)	LS	LUMP SUM	LB
605.10006	UNDERDRAIN PIPE (PERF) 6 in	FT		
605.20006	UNDERDRAIN PIPE (NON-PERF) 6 in	FT		

ESTIMATED QUANTITIES								
ITEM NO.	ITEM	UNIT	TOTAL QUANTITY	ESTIMATE				
				RM 10.00 CODE 14		RM 20.00 CODE 14		TOTAL
				NBL	SBL	NBL	SBL	
212.02100	DRY EXCAVATION	CY						
217.01030	GEOTEXTILE, EMB AND RETAINING WALL	SY						
503.01200	BRIDGE RAILING MODIFICATION	LS	LUMP SUM					EA
507.01000	REINFORCED CONC APPROACH SLABS	SY						
507.01100	BRIDGE APPROACH BACKFILL	CY						
512.01040	COMPRESSED JOINT MATERIAL	FT						
513.00015	CLASS B CONCRETE	LS	LUMP SUM					CY
605.10006	UNDERDRAIN PIPE (PERF) 6 in	FT						
605.20006	UNDERDRAIN PIPE (NON-PERF) 6 in	FT						

ESTIMATED QUANTITIES				
ITEM NO.	ITEM	UNIT	TOTAL QUANTITY	ESTIMATE
202.03250	REMOVAL OF RC BOX CULVERTS	LS	LUMP SUM	EA
206.03300	CULVERT SUBEXCAVATION	CY		
511.06000	MACHINE-PLACED RIPRAP	CY		
513.00015	CLASS B CONCRETE	LS	LUMP SUM	CY
514.00015	REINFORCING STEEL	LS	LUMP SUM	LB

Index of Drawings

The **INDEX OF DRAWINGS** is a list of detail sheets, in numerical order, for all documents comprising a complete set of Bridge Program Plans. These documents include, but are not limited to, Bridge Program Plans (new structures, widenings, repairs, etc.) and Reference Plans (existing structures to be removed or revised).

A complete list of all sheets shall be shown for Bridge Program Plans having **TEN OR MORE SHEETS** (not including reference sheets). For Bridge Program Plans having less than ten, this list is not required unless directed by the Squad Team Leader. The common sheet titles are listed in the following examples for a new bridge and a bridge rehabilitation project.

INDEX OF DRAWINGS

Drawing: Sheet No.

Title Sheet ----------
General Notes ----------
General Plan and Elevation ----------
Substructure Layout ----------
Gabion Details ----------
Log Boring Sheet ----------
Abutment Details ----------
Abutment No. X Details ----------
Bent Details ----------
Bent No. X Details ----------
Pier Details ----------
Pier No. X Details ----------
Superstructure Details ----------
Bridge Railing Details ----------
Pedestrian Railing Details ----------
Slab Details ----------
Lighting Details ----------
Approach Slab Details ----------
RC Slope Paving Details ----------
Reference Sheets ----------

INDEX OF DRAWINGS

Drawing: Sheet No.

Title Sheet ----------
General Notes ----------
Bridge Railing Modification Details -------
Expansion Device Modification Details ---
Miscellaneous Details ----------
Repair Details ----------
Resurfacing Details ----------
Reference Sheets ----------

Many rehabilitation projects require repairs to more than one structure under the same construction number. To eliminate confusion by the contractor and field personnel, a list of references for each structure is included (see the following).

INDEX OF DRAWINGS

Stream Data

STREAM DATA is required when any structure is traversing a waterway such as a river, creek, canal, ditch, or slough. Information is provided by the Hydraulic Section.

DRAINAGE AREA
Total square miles of all drainages feeding the feature spanned by a bridge, box culvert, or pipe structure.

WATER RIGHT
Controlled use of water by ranchers, industry, etc. This is measured as a maximum volume of water per second.

CHANNEL SLOPE
Natural or proposed grade of the channel bottom at the structure location.

DESCRIPTION OF CHANNEL MATERIAL
Identification of materials comprising the channel bottom. The Log Boring sheet will give an accurate description of the channel material in addition to the information supplied by the Hydraulic Section.

DRIFT POTENTIAL
Identified in one of three ways: large trees and logs, brush and debris, or insignificant.

ORDINARY HIGHWATER ELEVATION
Elevation of water surface based on ordinary highwater. Approximately the 2 year discharge.

HEADWATER ELEVATION
Elevation of the water surface immediately upstream of the structure. The elevations shown shall be based on the design discharge for canals and ditches and the design and review discharges for all other waterways.

HIGH WATER ELEVATION
Elevation of water surface inside or underneath the structure. The elevation shown is based on the design discharge for canals and ditches and the design and review discharges for all other waterways.

DESIGN SCOUR ELEVATION
Elevation of scour based on the 100 year discharge.

CONSTRICTED VELOCITY
Velocity of the water through the channel opening at the structure location based on design and review discharge.

DESIGN FREQUENCY
Design frequency associated with the discharge used to design a drainage structure.

DESIGN DISCHARGE (for rivers, creeks, and sloughs)
Volume of water per second carried by the channel based on the design flood and/or maximum channel capacity.

DESIGN DISCHARGE or **DOUBLE WATER RIGHT** (for canals and ditches)Volume of water per second carried by the channel based on the maximum of the double water right; water right, flood right, and natural drainage intercepted by the channel; or maximum channel capacity.

REVIEW DISCHARGE (for rivers, creeks, and sloughs)
Volume of water per second carried by the channel based on the review flood.

SOURCE OF DISCHARGE (for rivers, creeks, and sloughs)
Normally one of two types of analysis:

1. Log Pearson Type III analysis of gauge data. This type of analysis is conducted when the crossing is on a gauged stream and the gauge has a sufficiently long period of record.

2. "Floodflow Characteristics of Wyoming Streams" regional analysis. This study divides the state into three geographical regions.

SOURCE OF DISCHARGE (for canals and ditches)
Defined as either:

1. Tabulation of Adjudicated Water Rights, which is a manual supplied to the Hydraulic Section by the State Engineer's Office.
2. Maximum channel capacity, which is used when the volume of the flood right and drainage area runoff (or any combination thereof) exceeds the channel capacity at or above the structure location.

METHOD OF ANALYSIS - One of three types:

1. CDS (Culvert Design System). Used when the structure is a culvert or pipe, the Hydraulic Section uses the computer program CDS to analyze the structure.
2. WSPRO (Water Surface Profile and Constricted Bridge Analysis Program). Used when the structure is a bridge, the computer program WSPRO is used to analyze the structure.
3. HEC-RAS (Hydraulic Engineering Center-River Analysis System) is also used, primarily for bridges.

FLOOD HISTORY
Largest volume of water per second measured as indicated historically by file gauge records or indirect measurements.

The following Stream Data information is required for rivers, creeks, and sloughs.

STREAM DATA

Drainage Area ---------- X Sq Mi
Channel Slope ---------- X%
Description of Channel Material ---------- X
Drift Potential ---------- X
Ordinary Highwater Elevation ---------- X ft
Headwater Elevation Q_x ---------- X ft
Q_x ---------- X ft
High Water Elevation Q_x ---------- X ft
Q_x ---------- X ft
Design Scour Elevation ---------- X ft
Constricted Velocity Q_x ---------- X fps
Q_x ---------- X fps
Design Frequency ---------- X Year
Design Discharge Q_x ---------- X cfs
Review Discharge Q_x ---------- X cfs
Source of Discharge ---------- X
Method of Analysis ---------- X
Flood History ---------- X

The following Stream Data information is required for canals and ditches.

STREAM DATA

Water Right (WR) ---------- X cfs
Water Right Plus Flood Right (WR + FR) ---------- X cfs
Headwater Elevation (WR) ---------- X ft
Headwater Elevation (WR + FR) ---------- X ft
Highwater Elevation (WR) ---------- X ft
Highwater Elevation (WR + FR) ---------- X ft
Channel Slope ---------- X %
Drift Potential---------- X
Description of Channel Material ---------- X
Method of Analysis ---------- X

Design Data

DESIGN DATA is an overview of job specific Federal, State, County, and/or City guidelines, design methodology, and loadings used for the design of all structures and should be given on the Title Sheet of the design. A list of the common Design Data notes is included in Appendix B at the conclusion of this chapter. These notes will be routinely updated as necessary and can be found on the server or on the Bridge Program web page. The notes provided are complete or require minor editing. The list below provides guidance in using each note.

ADT
Required on all new, widened, or extended structures.

APPROACH ROADWAY WIDTH
Required on all bridges and culverts. The width to be shown is the approach roadway width, including the shoulder, shown on the Project Development Plans.

DRILLED SHAFTS
Required when drilled shafts are used for the substructure.

FOOTING PRESSURES
Required when footings are used for the substructure.

LOADING (1), (2), or (3)
Required on all bridge replacement, bridge widening, and box culvert projects. Use note (1) for bridge projects. Notes (2) and (3) are for non-rigid (flexible) and rigid box culverts respectively. The alternate loading should be used only for Standard Specification designs on Interstate structures. The live load surcharge is based on the design fill height.

PILE LOADS
Required when piles are used for the substructure.

PRECAST CONCRETE
Required on all precast culverts.

PRESTRESSED CONCRETE
Required on all bridges utilizing prestressed concrete girders.

REINFORCED CONCRETE
Used to specify the class of concrete, type of cement, concrete strength, early strength requirements, and special mix designs. The class of concrete is determined by the Corrosion Resistance Table shown below. Use of early strength concrete may be necessary to re-open the roadway to traffic as soon as possible or in case of emergency repairs. Class A Concrete is always used in the deck. Add the Addendum note if early strength concrete is required.

SPECIFICATIONS (1), (2), or (3)
Use note (1) on bridge widening projects. Use note (2) on all new bridges and box culvert projects. Use note (3) for sign structure and luminaire support projects.

STRUCTURAL STEEL (1) or (2)
Required on all projects with structural steel. Note (1) is required for all bridges. Use note (2) for sign structures. Show only the grade of steel used in the design.

SIESMIC CRITERIA
Required on all new construction bridges or as recommended by the engineer.

Corrosion Resistance Table

				Soil			Water		
Class & type of Concrete	Concrete Attack	Corrosion Resistance Number	Minimum Resistivity (ohm-cm)	Soluble Salts % max	SO_4 % max (Sulphates)	pH	Soluble Salts ppm max	SO_4 ppm max	pH
Class B Type II	Negligible	CR1	1000	0.05	0.05	6.0-9.0	250	250	6.0-9.0
Class B Type II	Negligible	CR2	750	0.075	0.075	5.0-9.0	375	375	5.0-9.0
Class B Type II	Negligible	CR3	550	0.10	0.10	5.0-9.0	500	500	5.0-9.0
Class B Type II	Negligible	CR4	500	0.125	0.125	5.0-9.0	625	625	5.0-9.0
Class B Type II	Negligible	CR5	275	0.20	0.20	5.0-12.0	1000	1000	5.0-12.0
Class B Type V	Considerable	CR6	120	0.50	0.50	5.0-12.0	2000	2000	5.0-12.0
Class B Type V	Severe	CR7	-	>0.50	>0.50	>5.0->12.0	>2000	>2000	>5.0->12.0

Metallic Pipe - Use Resistivity & pH. Should not use concrete where pH is less than 5.0, check aluminum pipe

Non-metallic Pipe - Use Sulphates & pH. For structural concrete, use Sulphates & pH

Note: It is possible to have very low sulphates (SO_4 %) and a pH less than 5.0. In this case, the low pH would cause an acidic attack to the surface of the concrete, but the sulphate attack would be negligible. The Laboratory would show "severe" concrete attack in the Alkali Report, although Class A Concrete, Type V Cement, is not really required. Specific Laboratory recommendations for coating the concrete exposed to acidic soils should be requested for these situations.

Concrete pipe should not be selected for environments having a pH less than 5.0 unless special coating recommendations are provided.

References

The Standard Specifications for Road and Bridge Construction (Standard Specifications), Supplementary Specifications, Project Plans, Standard Plans, Special Provisions, and all supplementary documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. The documents are intended to be complementary and to describe and provide for a complete work. In case of a discrepancy between these contract documents, the governing ranking will be as follows.

1. Special Provisions will govern over
2. Supplementary documents, which will govern over
3. Project Plans, which will govern over
4. Supplementary Specifications, which will govern over
5. Standard Plans, which will govern over
6. The Standard Specifications.

REFERENCES include a list of job-specific Special Provisions, Supplementary Specifications, Reference Plans, Standard Plans, and occasionally Traffic Control Diagrams (as required by the Traffic Design Program).

SPECIAL PROVISIONS are written to clarify and complement aspects of the project not fully identified in the Standard Specifications, Project Plans, Standard Plans, and/or Supplementary Specifications. All Special Provisions are unique and therefore must be customized for each project.

SUPPLEMENTARY SPECIFICATIONS must be included when applicable under **REFERENCES** on the General Notes sheet. Supplementary Specifications are specifications not included in the Standard Specifications due to frequent revisions brought about by new technology, policies, or construction practices. These may be incorporated into an updated Standard Specification. The following Supplementary Specifications (SS) should be included project plans.

SS No.	Title	Use
SS-100K	Adjustment for Structural Steel	Used on all projects with structural steel and reinforcing steel
SS-500A	Amendments to the Division 500 of the Standard Specifications for Road and Bridge Construction	For all projects, typically shown on PD Title Sheet
SS-500B	Welder Qualification	Required for projects with structural steel and any project with field welding
SS-500C	Bridge Deck Membrane	Used when a membrane is placed over a deck and covered with asphalt
SS-500D	Certification for Ultrasonic Quality Field Welding	Used on projects requiring field welding
SS-500E	Bridge Bearing Correction	Used on projects with elastomeric bearing pads or masonry plates
SS-500F	Automatically End-Welded Studs	For projects using composite steel girders
SS-500G	Structural Concrete with Quality Control and Quality Acceptance	Used on all projects with cast-inplace concrete. Do not use for small amount of concrete, such as diversion boxes, drilled shafts for sign structures, etc.
SS-500H	Expansion Joint (Gland)	For projects using a strip seal expansion device

WYDOT OR OTHER AGENCY PLANS are the applicable reference sheets included in the complete set of Project Plans. These may include complete existing structure plans for structures to be removed, or portions of the existing structure plans which are effected by the rehabilitation or widening. Every set of reference sheets include the General Plan and Elevation sheet of each structure to be removed or repaired. These reference sheets assist the contractor in removal operations and in accomplishing the necessary repairs. Traffic Design Program details are included with the plans when specified by the Traffic Design Program.

STANDARD PLANS are standard details that are not unique to any one project and are included in the Project Plans. Hard copies for viewing of the Standard Plans are available in the “Standard Plans" notebook located in each squad.

When assigning **B NUMBERS** to projects having one Construction Number and multiple drawing numbers, place reference sheets pertaining to each structure after the last new detail sheet for that structure. Reference sheets applicable to all structures shall be placed at the end of the Project Plans.

APPENDIX A – GENERAL NOTES

Comments:

ADHESIVE ANCHORAGE SYSTEM: Use one of the following products:

CIA-GEL 6000-GP as manufactured by MiTek USA, Inc.
Red Head C6+ as manufactured by ITW Commercial Construction
Sure Anchor I J51 as manufactured by Dayton Superior
HIT-RE 500 V3 as manufactured by Hilti, Inc.

Drill and prepare holes and install the [threaded rods / reinforcing steel] in accordance with the adhesive system manufacturer's recommendations to provide a pullout strength of equal or greater capacity to the [threaded rod / reinforcing steel]. Work necessary for the adhesive anchorage system is incidental to the contract pay item X.

ARMOR ANGLES: Ensure armor angles conform to ASTM A 709 (Grade 50W). Work necessary for the armor angles is incidental to the contract pay item Class A Concrete.

For armor angles on end diaphragms with no approach slabs.

BACKER ROD: Use a closed cell polyethylene backer rod with a diameter 1/8" larger than the gap width.

BACKFILLING: Do not backfill abutments until abutment diaphragms are in place and concrete has attained 80% of ultimate design strength (f'c) by cylinder tests. Backfill rear face of both abutments simultaneously, keeping the level of fill approximately the same at each abutment.

May be required when abutments retain large amounts of fill.

BEDDING MATERIAL: Work necessary for the bedding material is incidental to the contract pay item Precast Wall Component System.

BEVEL SOLE PLATES: Ensure bevel sole plates at girder ends conform to ASTM A 709 (Grade XX). Work necessary for the bevel sole plates is incidental to the contract pay item Prestressed Precast Conc Girders X in.

Use on prestressed precast concrete bridges without the Structural Steel pay item.

BOLTED CONNECTIONS: Use galvanized hardware at bolted connections, including fabricated U-Bolts. After installation, paint exposed bolt threads, except anchor bolts, with two coats of zinc-rich paint conforming to ASTM A 780.

Use on galvanized or epoxy-mastic painted sign structures.

BRIDGE BEARING ANCHOR BOLTS: Anchor bolts may be swedge bolts or threaded rods. Ensure swedge bolts conform to ASTM A 709 (Grade 36) and swedges are produced by deforming the steel through application of pressure and not by any method that removes material, such as grinding or cutting. Ensure threaded rods conform to ASTM F 1554 (Grade 36) minimum. Ensure anchor bolts or threaded rods and nuts are galvanized. Use anchor bolts compatible with the adhesive anchorage system.

Use one of the following adhesive anchorage systems to set anchor bolts in drilled holes:

CIA-GEL 6000-GP as manufactured by MiTek USA, Inc.
Red Head C6+ as manufactured by ITW Commercial Construction
Sure Anchor I J51 as manufactured by Dayton Superior
HIT-RE 500 V3 as manufactured by Hilti, Inc.

Drill and prepare holes and install the anchor bolts in accordance with the adhesive system manufacturer's recommendations. Work necessary for the adhesive anchorage system is incidental to the contract pay item Structural Steel.

BRIDGE DECK MEMBRANE: After removal of the existing asphalt overlay, install a bridge deck membrane on the bridge deck. See road plans for pay item and quantity. [Remove last sentence referencing road plans if the bridge deck membrane is paid for under the bridge plans.]

BRIDGE OFFICE NOTIFICATION: The engineer will notify the State Bridge Engineer in writing within 14 calendar days after the existing structure has been removed and again within 14 calendar days after the new bridge has been opened to traffic.

Use on bridge replacements

BRIDGE OFFICE NOTIFICATION: The engineer will notify the State Bridge Engineer in writing within 14 calendar days after the bridge has been opened to traffic.

Use on bridge widening or where a structure is not being removed.

BRIDGE OFFICE NOTIFICATION: The engineer will notify the State Bridge Engineer in writing within 14 calendar days after work has been completed at each structure.
[at this structure. (for box culverts or single rehabilitations)]

Use on box culverts and bridge rehabilitations

BRIDGE OFFICE NOTIFICATION: The engineer will notify the State Bridge Engineer in writing within 14 calendar days after the structure has been erected.

Use on overhead sign structures

BRIDGE RAILING: Ensure all bridge railing components are weathering steel conforming to the following requirements:

Rail Tubing	ASTM A 847
Sleeves	ASTM A 242 or ASTM A 709 (Grade 50W)
Posts, Anchor Bars, Rail Bolts, and Terminal Components	ASTM A 709 (Grade 50W)
Anchor Bolts	ASTM A 449, type 3

After fabrication is complete, ensure the rail tubing, posts, and terminal components are prepared in accordance with Steel Structures painting Council Surface preparation Specification No. 6, Commercial Blast Cleaning (SSPC-SP6).

Use with weathering steel bridge railing.

COMPRESSED JOINT MATERIAL: Use one of the following products:
FS-xxx as manufactured by Watson Bowman Acme Corp.
BOR-xxxx as manufactured by Emseal Joint Systems, Ltd.

CONCRETE: Use class S concrete in the drilled shaft foundations. Use class A concrete at all other locations, including [approach slabs, bridge barriers, and reinforced concrete slope paving].

Use on new structures with drilled shaft foundations

CONCRETE: Use class S concrete made with type V cement in the drilled shaft foundations. Use class A concrete made with type V cement at all other locations, including [approach slabs, bridge barriers, and reinforced concrete slope paving].

Use when recommended by alkali report

CONCRETE: Use modified concrete for resurfacing and bridge deck repairs, except at epoxy overlay locations. Use class A concrete at all other locations, including [approach slabs, bridge barriers, and reinforced concrete slope paving], except where designated as bridge concrete repair.

Use on rehabilitations. Modify as necessary for specific work on the project.

CONCRETE AGGREGATE: Ensure all concrete mix designs employed in the project meet the following alkali-silica reactivity (ASR) screening.

Use on projects per the Squad Leader when the supplementary specification for contractor quality control (concrete) is not used.

Conduct the AASHTO T 303 (ASTM C 1260) test using a combined sample of fine aggregate and coarse aggregate, in the same proportions that will be used in the concrete mix design. If the test results indicate an expansion at 16 days from casting of 0.10 percent or less, the aggregate is considered non-reactive and mitigation measures are not required.

If the test results indicate an expansion at 16 days from casting of greater than 0.10 percent, mitigate the aggregate reactivity through the use of class F fly ash as approved for ASR mitigation in accordance with the Materials Testing Manual, silica fume, and/or lithium nitrate additive. Demonstrate adequate mitigation by conducting the ASTM C 1567 test and ensuring the test results indicate an expansion at 16 days from casting of 0.10 percent or less. When conducting the ASTM C 1567 test, use a combined sample of fine aggregate and coarse aggregate, in the same proportions that will be used in the concrete mix design and use the cementitious material that is to be used in the mix design.

Ensure the AASHTO T 303 (ASTM C 1260), and ASTM C 1567 tests have been performed within 12 months of the submittal date.

Submit qualifying AASHTO T 303 (ASTM C 1260) and ASTM C 1567 test results to the engineer a minimum of 14 calendar days before concrete production. Submit test results to the Materials Program along with each mix design request.

CONSTRUCTION SAFETY REQUIREMENTS: To ensure safety of the users below, employ removal and reconstruction methods to prevent debris from falling below the structures. Use warning signs and a debris containment system. Work necessary for these requirements is incidental to applicable contract pay items.

Use on structures over other roadways, railroads, and recreational waterways.

CONSTRUCTION SEQUENCE: Work on the structure in multiple stages. Submit a detailed schedule of operations to the engineer before beginning any work.

Use on precast box culverts without detours.

CONSTRUCTION SEQUENCE: At each location, work on one half of the structure at a time with traffic carried on the other half during construction.

Use on rehabilitations requiring traffic on the structure during construction.

CRUSHED BASE: Use crushed base conforming to grading L from a contractor furnished source. Compact the crushed base in accordance with Subsection 301.4.2.3, Placing.

CULVERT BOTTOM BACKFILL: Backfill the bottom of the culvert with X'-0"+- of excavated material from the adjacent highway embankment. Work necessary for backfilling is incidental to the contract pay item Class A Concrete.

CULVERT EXCAVATION: The estimated quantity of culvert excavation [,including removal of the existing X and excavation for the new culvert,] is X CY and is incidental to the contract pay item X.

CULVERT SUBEXCAVATION: The bottom limits of culvert subexcavation is X' below the bottom of the bottom slab. Line the bottom of the culvert subexcavation with X. Backfill with X conforming to grading X. The estimated quantity of culvert subexcavation is calculated in accordance with Standard Plan 206-1A, Culvert and Trench Excavation.

CUTWATER ANGLE: Ensure steel for the cutwater angle conforms to ASTM A 709 (Grade 36) minimum and is galvanized after fabrication. Work necessary for the cutwater angle is incidental to the contract pay item Class A Concrete.

Use on box culverts with cutwater angles.

DECK DRAINS: Ensure steel components of the deck drain system conform to ASTM A 709 (Grade 50W) and ASTM A 53 (Grade A or B). Ensure threaded rods conform to ASTM F 1554 (Grade 36). After fabrication is complete, ensure the steel components are prepared in accordance with Steel Structures Painting Council Surface Preparation Specification No. 6, Commercial Blast Cleaning (SSPC-SP 6). Work necessary for steel components of the deck drain system will be paid for under the contract pay item Structural Steel. Use schedule 40 polyvinyl chloride pipe for PVC portions of the drain system. Work necessary for the PVC pipe will be paid for under the contract pay item Pipe 6 in. Work necessary for the rubber expansion couplings is incidental to the contract pay item Pipe 6 in.	Use on bridges with a drain collection system piping flow to the ends of the bridge.
DETOUR: A detour is required for construction of this structure. The two-year frequency discharge of XX cfs requires a waterway opening of XX SF. The five-year frequency discharge of XX cfs would require a waterway opening of XX SF. Select the appropriate detour structure in accordance with Subsection 107.11.2, Drainage Structures for Detours.	
DIMENSIONS: Longitudinal dimensions are along flow line. Slopes are vertical : horizontal.	Use on box culverts.
DIMENSIONS: Longitudinal dimensions are horizontal and include no correction for grade. Slopes are vertical : horizontal.	Use on rehabilitations.
DIMENSIONS: Longitudinal dimensions for the substructure are horizontal and include no correction for grade. Longitudinal dimensions for the superstructure are along grade unless noted. Slopes are vertical : horizontal.	Use on new bridges and bridge widenings.
DRAIN BOX BACKFILL: Place backfill to the top of the drain box and slope to form a smooth transition with the roadway embankment.	Use on siphons.
DRY EXCAVATION: The estimated quantity of dry excavation is calculated below existing [ground line / finished grade] at abutments [and piers] and below existing [ground line / finished grade] to the limits shown at approach slabs.	Use on new bridges.

DRY EXCAVATION: The estimated quantity of dry excavation is calculated below existing [ground line / finished grade] at abutments, below existing [ground line / finished grade] to the limits shown at approach slabs, and below existing ground line to Elev xxxx.x at piers. Dry excavation at piers will be paid to actual ground water elevation.

Use on new bridges requiring wet excavation.

DRY EXCAVATION: The estimated quantity of dry excavation is calculated below existing finished grade to the limits shown at approach slabs and includes removal of the existing approach slabs.

Use on bridge rehabilitations.

DYNAMIC LOAD TESTING: Before full production pile driving, the department will take dynamic load measurements on [pile location description]. Notify the engineer 14 calendar days before and again 2 calendar days before driving piles. The department will schedule a testing consultant to instrument and test piles during driving using the pile dynamic analyzer with the Case Pile Wave Analysis Program.

Allow sufficient time for required instrumentation and testing. A re-strike 24 hours after each test pile has been driven will be required. Delay or standby time resulting from non-adherence of the contractor to the pile testing schedule will be at no additional cost to the department.

Provide an additional 10 feet of piling at each test pile. Work necessary for the dynamic load testing is incidental to the contract pay item Steel Piling HP xx X xx.

Use when recommended in the Geology Report.

ELASTOMERIC COMP JOINT SEAL: Use one of the following products:
X-X as manufactured by Watson Bowman Acme Corp.
X-X as manufactured by D.S. Brown.

ELECTRICAL CONDUIT: Work necessary for the electrical conduit in the drilled shafts is incidental to the contract pay item Drilled Shaft Foundations XX in.

Use watertight flexible electrical conduit and fittings between the horizontal tube and message sign. Work necessary for the flexible electrical conduit is incidental to the contract pay item Stl Overhead Sign Support.

Use on overhead sign structures.

ENVIRONMENTAL RESTRICTIONS: In-stream construction activity is prohibited during the months of X.	Use when recommended in the Hydaulic Report.
EPOXY RESIN BONDING COMPOUND: At reconstruction locations using class A concrete, clean the roughened surfaces of the existing concrete and coat with epoxy-resin bonding compound. If the bonding compound gels before concrete placement, remove by sandblasting and reapply. Use bonding compound conforming to Subsection 810.6, Epoxy Resin. Mix and apply in accordance with the manufacturer's recommendations. Work necessary for the epoxy resin bonding compound is incidental to the contract pay item Class A Concrete.	Use on bridge rehabilitations.
EPOXY RESIN BONDING COMPOUND: Clean the exposed ends of the precast culvert end sections and coat with epoxy-resin bonding compound. If the bonding compound gels before concrete placement, remove by sandblasting and reapply. Use bonding compound conforming to Subsection 810.6, Epoxy Resin. Mix and apply in accordance with the manufacturer's recommendations. Work necessary for the epoxy resin bonding compound is incidental to the contract pay item Class A Concrete.	Use on precast box culverts with cast-in-place end sections or wingwalls.
EXPANDED METAL SCREEN: Enclose the opening between column base plate and top of drilled shaft with an expanded metal screen made of stainless steel with diamond shaped mesh openings of 3/8" x 1" or less. Do not extend mesh above top of column base plate. Remove sharp edges. Use a ratchet type device to attach the screen. Work necessary for the expanded metal screen is incidental to the contract pay item Stl Overhead Sign Support.	Use on overhead sign structures.
EXPANDING FOAM: Place a two component rapid curing expanding foam, or a pre-approved equal, between the column base plate and top of drilled shaft. Ensure expanding foam seals the entire bottom of the base plate with a 4" minimum width and does not come in contact with the anchor bolt nuts. Include a ¾" diameter non-corroding drain pipe through expanding foam. Work necessary for the expanding foam and drain is incidental to the contract pay item Stl Overhead Sign Support.	Use on overhead sign structures.

EXPANSION JOINT (GLAND): Use one of the following products:

Wabo StripSeal system with type "R" steel rails and xx-xxx gland as manufactured by Watson Bowman Acme Corp.

Steelflex Strip Seal Expansion Joint System with SSCM2 steel rails and xxx-xxx gland as manufactured by D.S. Brown.

EYEBOLTS: Use galvanized bar conforming to ASTM A 709 (Grade 36). Work necessary for the eyebolts is incidental to the contract pay item Class A Concrete.

FABRICATION AND ERECTION: Work necessary for fabrication and erection of the tri-deck sections; including cast-in steel components, reinforcing steel, bridge railing anchorages, precast curbs, bearing pads, field welding, backer rods, and nonshrink grout is incidental to the contract pay item Prestressed Precast Conc Tri-Deck X in.

Use on prestressed precast concrete bridges. Modify for Bulb-T sections.

FALSEWORK AND SHORING: Provide continuous support of the existing superstructure so there is no deflection of the girders during removal of the existing slab and placement of the new slab.

Use on slab replacements on existing bridges.

Allowable bearing pressure on the ground is X.Y Tsf.

Submit design computations and plans for falsework and shoring to the engineer a minimum of 14 calendar days before erection. Ensure the title pages of the design computations and plans bear the seal and signature of a professional engineer.

Ensure the professional engineer inspects the completed falsework and shoring and provides the engineer with written certification of compliance with the design and plans before removal of the existing slab.

Ensure new slab concrete attains 100% of ultimate design strength (f'c) by cylinder tests before removing falsework and shoring.

Work necessary for the falsework and shoring is incidental to the contract pay items Removal of Concrete.

FELT PAPER: Use 30-pound asphalt felt paper. Work necessary for the felt paper is incidental to the contract pay item Reinforced Conc Approach Slabs.	
FIELD MEASUREMENTS: Field verify dimensions before ordering materials.	Use on bridge rehabilitations.
FLANGE: Work necessary for the flange is incidental to the contract pay item Welded Stl Siphon Pipe X in.	Use on siphons.
FOUNDATIONS: X are on steel piles driven to the nominal soil resistance in X. The total factored load is X tons for HP XX x XX piles. Pile lengths are estimated, the actual lengths will be determined by dynamic load testing.	Use in conjunction with Dynamic Load Testing, per the Geology Report.
FOUNDATIONS: X are on steel piles driven to refusal in X. X are on spread footings founded in X.	
FOUNDATIONS: X are on steel piles driven to refusal in X. X are on spread footings founded in X bedrock. Key footings a minimum of x'-0" into bedrock. Keying consists of placing concrete directly against vertical sides of the footing excavation.	Use when footings are to be keyed into bedrock per the design or Geology Report.
FOUNDATIONS: X are on steel piles driven to refusal in X. X are on drilled shafts founded in X. Casing will be required to control ground water and prevent caving of loose material. Pouring concrete underwater is anticipated. or X are on drilled shafts founded in X. Casing will be required to control ground water and prevent caving of loose material. A good seal is anticipated in X.	
GEOTEXTILE, DRAINAGE AND FILTRATION: Work necessary for the geotextile drainage and filtration is incidental to the contract pay item Underdrain Pipe (Perf) 4 in.	Use on retaining walls.
GRAVEL FOR DRAINS: Work necessary for the gravel for drains is incidental to the contract pay item Underdrain Pipe (Perf) 4 in.	Use on retaining walls.

HAZARDOUS MATERIALS: The paint system on the steel components of the existing structures may contain materials including lead and chromium that are hazardous if ingested, inhaled, or otherwise absorbed.

Use on bridge rehabilitations when existing paint may be disturbed.

HOT PLANT MIX OVERLAY: After installation of the bridge deck membrane, overlay the [approach slabs and] bridge deck with X" of hot plant mix with a ¾" wearing course. See road plans for pay items and quantities.
[Replace ¾" wearing course with cover coat per road plans.]

Use on bridge rehabilitations. Not required for standard approach slab installations.

INSTALLATION REQUIREMENTS FOR SPLICE BOLTS: Install splice bolts, utilizing load indicator washers to ensure proper bolt tension, in accordance with Subsection 501.4.2.3, Connections Using High Strength Bolts.

Use on overhead sign structures.

INSTALLATION REQUIREMENTS FOR ANCHOR BOLT NUTS:

Use on overhead sign structures.

Ensure top nuts have full thread engagement and the distance from the bottom of the leveling nuts and the top of the drilled shaft does not exceed 1".
Field lubricate the anchor bolt threads and the top nut's bearing face and threads with a stick wax or beeswax.
Wrench tighten leveling nuts firmly against base plate before tightening top nuts.
Consecutively tighten opposite side nuts during all top nut tightening sequences.
Initially tighten the top nuts in two rounds of tightening with a torque wrench. Achieve 250 LB-FT of torque in second round of tightening.
Retighten leveling nuts to ensure firm contact is maintained against the base plate.
Tighten the top nuts an additional 1/6 turn (60°) in two rounds of 1/12 turn (30°) each.

JOINT SEALANT: Use joint sealant conforming to AASHTO M 198. Work necessary for the joint sealant is incidental to the contract pay item Precast Box Culverts X.

LINE STYLE DESIGNATION: Phantom lines indicate existing structure, solid lines indicate new construction, hatched areas indicate removal.

Use on bridge rehabilitations.

MACHINE-PLACED RIPRAP: Use stones conforming to class X gradation requirements from a contractor furnished source.

MOISTURE AND DENSITY CONTROL: Compact the bottom limits of dry excavation in accordance with Subsection 203.4.3, Embankment and Cut Areas with Moisture and Density Control.

Use on MSE retaining walls.

OPTIONAL CONSTRUCTION JOINT BASE: If the optional construction joint in the bottom slab is used, work necessary for the base is incidental to the contract pay item Class A Concrete.

Use on cast-in-place concrete box culverts with the optional construction joint.

PAINT: Use a X top coat color for X.

Use on painted steel bridges

PAINT: Use a X top coat color for the sign structure. Paint field splice bolts and hardware after tightening. Do not paint anchor bolts and hardware.

PAINT REPAIR: Paint the exposed steel surfaces at X:

X

X

Collect and contain rags and rinse water used for surface preparation as specified for "Other Debris" in accordance with Supplementary Specification SS-100G, Worker and Environmental Controls for Lead Paint Removal.

POLYETHELYNE SHEETING: Use 4 mil polyethylene sheeting. Lap sheeting 6 inches minimum at joints. Work necessary for polyethylene sheeting is incidental to the contract pay item Reinforced Conc Approach Slabs.

PRECAST BOX CULVERTS: Design precast boxes for the loading specified. Ensure the title pages of the design computations and shop plans bear the seal and signature of a professional engineer.

The minimum concrete cover to the face of the main reinforcing steel is 1½" and 1" to other reinforcing steel unless noted.

PRECAST BOX CULVERTS: The estimated quantity of precast box culverts is based on the precast culvert length for each barrel.

Two single barrel culvert sections may be used instead of the double barrel culvert section. If two single barrel culvert sections are used, maintain a 1" minimum gap between the two culvert sections. Place a sand slurry, as approved by the engineer, to completely fill the gap. Use of two single barrel culvert sections is considered an alternate design.

Design precast boxes for the loading specified. Ensure the title pages of the design computations and shop plans bear the seal and signature of a professional engineer.

The minimum concrete cover to the face of the main reinforcing steel is 1½" and 1" to other reinforcing steel unless noted.

PREDRILLED HOLES: If any pile fails to achieve the bottom of pile elevations shown, predrill the remaining piles to bedrock contact and drive to refusal. The estimated quantity of predrilled holes is calculated from the bottom of the X to bedrock contact at each pile.

PREFORMED EXPANSION JOINT FILLER: Work necessary for the preformed expansion joint filler is incidental to the contract pay item Reinforced Conc Slope Paving.
[or Class A Concrete]

PRESTRESSED PRECAST CONCRETE GIRDERS: Low-relaxation strands conforming to ASTM A 416 (Grade 270) may be used, provided that design computations are submitted along with data regarding the properties and effects of the low-relaxation strands used.

Use on AASHTO or I-Girder sections with a cast-in-place deck.

Ensure the title pages of the design computations and shop plans bear the seal and signature of a professional engineer.

Addendum:
End blocks are required for prestressed precast concrete girders with web thickness less than 8".

PRESTRESSED PRECAST CONCRETE TRI-DECK SECTIONS: Ensure reinforcing steel in the flange portion of the tri-deck is coated.

Modify for Bulb-T sections.

Low relaxation strands conforming to ASTM A 416 (Grade 270) may be used, provided that the design computations are submitted along with data regarding the properties and effects of the low relaxation strands used.

Ensure the title pages of the design computations and shop plans bear the seal and signature of a professional engineer.

REINFORCING STEEL: Ensure reinforcing steel conforms to ATSM A 615 (Grade 60) for all bars, including ties and stirrups. Concrete cover to face of reinforcing steel is 2" unless noted. Dimensions for bent bars are out to out. Ensure bars marked with an asterisk (*) are coated.

[see examples and Bridge Cell Library for diagram to be included]

REMOVAL OF CONCRETE: Remove portions of the existing culvert to the limits shown. Work necessary for removal of concrete, including any reinforcing steel, is incidental to the contract pay item Class A Concrete.

Use on concrete box culvert extensions.

REMOVAL OF CONCRETE: Remove portions of the existing structure to the limits shown. Do not damage existing concrete to remain in place. Use a 30 LB pneumatic hammer for general removal and a 15 LB pneumatic hammer within 1’-0” of removal limits. Do not use larger removal equipment unless approved by the State Bridge Engineer.

Use on bridge rehabilitations and widenings.

Thoroughly clean concrete from reinforcing steel to remain in place and straighten as required. Remove and replace damaged reinforcing steel with the same size bar and weld-splice or mechanically splice where necessary at no additional cost to the department.

REMOVAL OF CONCRETE BRIDGES: Remove the existing X'-X" x X'-X" X span [concrete slab / concrete girder] bridges, Structure No. XXX (xBL) and Structure No. XXX (xBL). [, including the existing concrete slope paving.]

REMOVAL OF JOINT MATERIAL: Remove existing joint material at the locations shown and prepare the concrete surfaces in accordance with the new joint material manufacturer's recommendations. Work necessary for clearing the gap and surface preparation is incidental to the contract pay item X.

Use on rehabilitations where existing joint material is being replaced.

REMOVAL OF RC BOX CULVERTS: Remove the existing X barrel X'-X" x X'-X" x X'-X" concrete box culvert, Structure No. XXX.

REMOVAL OF STEEL BRIDGES: Remove the existing X span X'-X" x X'-X" steel girder bridge, Structure No. XXX. [, including the existing concrete slope paving.]

REMOVAL OF SURFACING: Remove the existing asphalt overlay from the [approach slabs and] bridge deck by cold milling to approximately ½" above the original concrete surface. Do not damage the [approach slabs and] bridge deck while removing the remaining ½" of asphalt. The approximate depth of existing asphalt is X". See road plans for pay item and quantity.
[Remove last sentence referencing road plans if removal of surfacing is paid for under the bridge plans.]

RESURFACING: Complete modified concrete resurfacing operations within two working days after flush cleaning activities for each stage of construction. Only equipment required for the resurfacing operations will be allowed on the bridge after flush cleaning.

SHOP SPLICES: Shop splices in structural tubing and columns will be allowed with approval of the State Bridge Engineer. Ensure shop splices are located as far as possible from handholes, welded fittings, and field splices. Ensure the fabricator's shop drawings show locations and complete details of the proposed shop splices.

Use on overhead sign structures.

SLIDE GATE: Use a X [manufacturer name and model number] slide gate, or an approved equivalent, for a X" diameter PVC pipe. Attach the slide gate to the diversion box in accordance with the manufacturer's recommendations.

SLOPED END SECTIONS, PARAPETS, AND CUTOFF WALLS: The length of precast sloped end sections is included in the estimated quantity for the contract pay item Precast Box Culverts X x X ft.

Work necessary for the precast parapets and cutoff walls is incidental to the contract pay item Precast Box Culverts X x X ft.

SPECIFICATIONS: WYDOT Standard Specifications for Road and Bridge Construction, 2010 Edition.

STAY-IN-PLACE FORMS: Stay-in-place forms may be used for construction of the deck. Do not exceed 15 psf for the weight of the forms and additional concrete, including form deflection. Do not extend vertical legs of support angles past the bottom of the bottom reinforcing steel mat or use these legs to support the reinforcing steel.

STAY-IN-PLACE FORMS: Do not use stay-in-place forms for construction of the deck.

Use when recommended by the Squad Leader.

STEEL PILING: Use steel piles conforming to ASTM A 709 (Grade XX).

The engineer's design will indicate the grade to be used.

STEPS: Use steps conforming to the requirements shown in Standard Plan 625-3, Manholes. Work necessary for the steps is incidental to the contract pay item Class A Concrete.

STOP LOGS: Ensure stop logs are redwood conforming to Subsection 817.1, Structural Timber and Lumber, with a nominal thickness of 2". Work necessary for the stop logs is incidental to the contract pay item Class A Concrete.

STRUCTURAL STEEL: Ensure structural steel conforms to ASTM A 709 (Grade XX) unless noted. Ensure steel fabricators supplying structural components are certified under the AISC Certification Program Requirements for Steel Bridge Fabricators - 2011, Category Intermediate Bridges (IBR). [or Simple Steel Bridges (SBR)]

Use on welded plate and W-Girder bridges. The engineer's design will indicate the grade to be used.

Addendum for pile bents (painted steel bridges):
Ensure cutwater angles and pile bracing at bents conform to ASTM A 709 (Grade 36) minimum.

Include addendum paragraphs as necessary.

Addendum for pile bents (weathering steel bridges):
Ensure cutwater angles and pile bracing at bents conform to ASTM A 709 (Grade 50W).

Addendum for deck drains w/o drain collection system (painted steel bridges):
Ensure deck drains conform to ASTM A 709 (Grade 36) and ASTM A 53 (Grade A or B).

Addendum for deck drains w/o drain collection system (weathering steel bridges):
Ensure deck drains conform to ASTM A 709 (Grade 50W) and ASTM A 53 (Grade A or B). After fabrication is complete, ensure the steel components are prepared in accordance with Steel Structures Painting Council Surface Preparation Specification No. 6, Commercial Blast Cleaning (SSPC-SP 6).

STRUCTURAL STEEL: Ensure structural steel conforms to ASTM A 709 (Grade 50) with the exception of the following:

1) Ensure flanges and webs designated as HPS70W conform to ASTM A 709 (Grade HPS70W).
2) Ensure transverse stiffeners welded to the HPS70W section conform to ASTM A 709 (Grade 50W).

Non-quenched and tempered thermo-quenched control processed (TMCP) HPS70W steel may be substituted for Q & T ASTM A 709 (Grade HPS70W) steel.

Ensure steel fabricators supplying structural components are certified under the AISC Certification Program Requirements for Steel Bridge Fabricators - 2011, Category Intermediate Bridges (IBR).

Use on hybrid girder welded plate bridges with high performance steel.

Addendum for pile bents (painted steel bridges):
Ensure cutwater angles and pile bracing at bents conform to ASTM A 709 (Grade 36) minimum.

Addendum for pile bents (weathering steel bridges):
Ensure cutwater angles and pile bracing at bents conform to ASTM A 709 (Grade 50W).

Addendum for deck drains w/o drain collection system (painted steel bridges):
Ensure deck drains conform to ASTM A 709 (Grade 36) and ASTM A 53 (Grade A or B).

Addendum for deck drains w/o drain collection system (weathering steel bridges):
Ensure deck drains conform to ASTM A 709 (Grade 50W) and ASTM A 53 (Grade A or B). After fabrication is complete, ensure the steel components are prepared in accordance with Steel Structures Painting Council Surface Preparation Specification No. 6, Commercial Blast Cleaning (SSPC-SP 6).

Include addendum paragraphs as necessary.

STRUCTURAL STEEL: Ensure structural steel conforms to the following:

Structural Tubing & Columns [or Pipe]	ASTM A 53 (Grade B), API-5L, ASTM A 252 (Grade 2), ASTM A 500 (Grade B), or ASTM A 501 (Grade A)
Weld Tee	ASTM A 105 or ASTM 234 (Grade WPB)
Flattened Expanded Metal	ASTM F 1267, type II, class 2, grade A
Fabricated U-Bolts	ASTM A 307
Anchor Bolts	ASTM A 449 or threaded rods conforming to ASTM F 1554 (Grade 105)
All other Bolts	ASTM F 3125
All other Structural Steel	ASTM A 709 (Grade 36)

Ensure steel fabricators supplying structural components are certified under the AISC Certification Program Requirements for Steel Bridge Fabricators - 2011, Category Simple Bridges (SBR). Ensure all rough edges are ground smooth after fabrication. [and structural steel is galvanized. (if not painted)]

Use on overhead sign structures. (Overhead DMS structure shown)

Some structures may not contain all elements listed, such as the weld tee or flattened expanded metal. Unnecessary elements may be removed.

STRUCTURAL STEEL: Ensure drain box lid and trash guards conform to ASTM A 709 (Grade 36) and are galvanized after fabrication.

Use on siphons.

STRUCTURE COATING: Ensure sign structure is painted in accordance with Subsection 809.9 – Epoxy Mastic Paint. Do not paint anchor bolts and hardware.

Fabricated components such as the catwalk and handrails may be galvanized instead of painted, at no additional cost to the department.

Use on overhead sign structures where fabricated sections are too large to be hot dip galvanized.

TEMPORARY SHORING: Use a temporary excavation or shoring system located outside the neat lines of excavation shown to prevent sloughing or sliding of material. Submit excavation and shoring details to the engineer before beginning excavation. Work necessary for temporary shoring is incidental to the contract pay item X.

Use temporary shoring is required on retaining walls.

THREADED RODS: Ensure threaded rods conform to ASTM F 1554 (Grade X).
[Use (Grade 105) for bridge railing anchorages. Use (Grade 36) for other installations.]

TRENCH EXCAVATION: The estimated quantity of trench excavation is X CY and is incidental to the contract pay item Welded Stl Siphon Pipe X in.

WATER: The estimated quantity of water for compaction of crushed base is 0.XXX MG per cubic yard. The estimated quantity of water for hydro-demolition is 0.XXX MG per square yard.
[0.040 MG for crushed base and 0.100 MG for hydro-demolition are common values, but should be verified for each project]

WATERSTOP: Work necessary for the waterstop is incidental to the contract pay item Class A Concrete.

WEEP HOLE ASSEMBLIES: Work necessary for the weep hole assemblies is incidental to the contract pay item Class A Concrete.

WELDED STEEL DRAIN PIPE: Use welded steel drain pipe in accordance with Subsection 808.11, Welded Steel Siphon Pipe. Work necessary for the drain pipe is incidental to the contract pay item Welded Stl Siphon Pipe X in.

Use on siphons.

WELDED-WIRE FABRIC: Place welded-wire fabric centered in walls and slab unless noted. Provide 2” minimum concrete cover at ends of fabric and around pipes. Lap fabric 12” as required and cut excess fabric where two or more sheets intersect. Do not place laps through construction joints. The estimated quantity of welded-wire fabric, not including laps, is X SF. Work necessary for the welded-wire fabric is incidental to the contract pay item Class A Concrete.

Use on drainage structures reinforced with welded-wire fabric. Not required for reinforced concrete slope paving.

WET EXCAVATION: The estimated quantity of wet excavation is calculated below Elev xxxx.x at piers. Wet excavation will be paid below actual ground water elevation.

APPENDIX B - DESIGN DATA NOTES

ADT: X (Year X)

APPROACH ROADWAY WIDTH: X'-X"

DRILLED SHAFTS: Allowable Stress / Load and Resistance Factor Design -
Abutments (per drilled shaft) -
Total load = X T
Bearing = X T, X Tsf
Friction = X T

Bents/Piers (per drilled shaft) -
Total load = X T
Bearing = X T, X Tsf
Friction = X T

FOOTING PRESSURES: Allowable Stress / Load and Resistance Factor Design -
Abutments, X Tsf
Bents, X Tsf
Piers, X Tsf

LOADING: HS20 / HS25 and alternative [For Standard Specification designs]
HL93 [For LRFD designs]
Future wearing surface 25 psf. Stay-in-place forms 15 psf.

LOADING:
Live Load: HS20 / HS25 and alternative [For Standard Specification designs]
HL93 [For LRFD designs]
Lateral live load surcharge: 2 ft earth or 72 psf [Fill heights > 10']
Lateral live load surcharge: 3 ft earth or 108 psf [Fill heights ≤ 10']
Lateral live load surcharge: 4 ft earth or 144 psf [Fill heights ≤ 5']
Dead Load: Design Fill: X ft
Vertical earth pressure: 120 pcf
Lateral earth pressure: 72 pcf

LOADING:
Live Load: HS20 / HS25 and alternative [For Standard Specification designs]
HL93 [For LRFD designs]
Lateral live load surcharge: 2 ft earth or 72 psf [Fill heights > 10']
Lateral live load surcharge: 3 ft earth or 108 psf [Fill heights ≤ 10']
Lateral live load surcharge: 4 ft earth or 144 psf [Fill heights ≤ 5']

Dead load: Design Fill: X ft
(1) Vertical earth pressure: 120 pcf
Lateral earth pressure: 36 pcf
(2) Vertical earth pressure: 120 pcf
Lateral earth pressure: 72 pcf

PILE LOADS: Allowable Stress / Load and Resistance Factor Design –
Abutments, X T per pile
Bents, X T per pile
Piers, X T per pile

ELASTOMERIC BEARING LOADS: Allowable Stress / Load and Resistance Factor Design –
Bents – or Piers –
Service Dead Load = X kips
Service Live Load = X kips

PRECAST CONCRETE: Load Factor Design / Load and Resistance Factor Design -
Concrete f'c = 5000 psi
Reinforcing Steel fy = 60,000 psi (Grade 60)

PRESTRESSED CONCRETE: Load Factor Design / Load and Resistance Factor Design -
Concrete f'c = 5000 psi
f'ci = 4000 psi
Reinforcing Steel fy = 60,000 psi (Grade 60)
Prestressing Steel f's =270,000 psi (Grade 270)

REINFORCED CONCRETE: Load Factor Design / Load and Resistance Factor Design -
Class A Concrete f'c = 4000 psi
Reinforcing Steel fy = 60,000 psi (Grade 60)

SEISMIC CRITERIA: Seismic Design Category X
Effective Peak Ground Acceleration Coefficient, A_S = X.XXX
Design Earthquake Response Spectral Acceleration Coefficient for 1.0 Second Period, S_{D1} = X.XXX
Design Earthquake Response Spectral Acceleration Coefficient for 0.2 Second Period, S_{DS} = X.XXX
Site Class X
5% Damping

SPECIFICATIONS:

AASHTO Standard Specification for Highway Bridges, 17th Edition.

SPECIFICATIONS:

AASHTO LRFD Bridge Design Specifications, 8th Edition.
AASHTO Guide Specifications for LRFD Seismic Bridge Design, 2nd Edition.

SPECIFICATIONS:

AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 5th Edition with 2010 and 2011 Interims.

STRUCTURAL STEEL: Load Factor Design / Load and Resistance Factor Design -
Fy = 36,000 psi (Grade 36)
Fy = 50,000 psi (Grade 50)
Fy = 50,000 psi (Grade 50W)
Fy = 70,000 psi (Grade 70W)

STRUCTURAL STEEL: Service Load Design - ASTM A 53 (Grade B) Fy = 35,000 psi
ASTM A 53 (Type F) Fy = 25,000 psi
ASTM A 181 (Class 70) Fy = 36,000 psi
ASTM A 709 (Grade 36) Fy = 36,000 psi