

# DESIGN SCENE



OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

April 2019 - Page 1

PROJECT DESIGN SERVICES UNIT

## **Chapter 2 – AS BUILT (Revised)**

The list in this section needed to include Rumble Strips.

## **Chapter 2 – FUNDING (Revised)**

The table in this section is revised to fix a math error.

ITEM	DESCRIPTION	UNITS	TOTAL ESTIMATED QUANTITY	ESTIMATED QUANTITY SP 1111-11 (A)	ESTIMATED QUANTITY SAP 111-112-121 (B)	100% CITY OF CROCKER FUNDS ( C)
2021.501	MOBILIZATION	LUMP SUM	1	0.5	0.3	0.2
2104.502	REMOVE CONCRETE APRON	EACH	10	5	3	2
2105.504	GEOTEXTILE FABRIC TYPE 3	SQ YD	200	100	50	50

## **Chapter 2 – WEED SPRAYING**

When using weed spraying the plan should contain both...

- 2575.505 WEED SPRAYING by ACRE and
- 2575.506 WEED SPRAY MIXTURE by GALLON.

The weed spraying covers the process of applying the mixture. This needs to include a note either in the SEQ or Tabulation of the application rate.

The weed spray mixture is the cost of the product being applied. This needs to include a note either in the SEQ or Tabulation of the weed spray mixture to be used. Since there are many types of weed sprays and certain ones are used for certain types of weeds there may be more than one needed. For further information contact the Office of Environmental Stewardship.

## **Chapter 3 – SURCHARGE**

There has been some confusion by contractors on when to include or not include surcharge on projects with bridge abutments. This is because on Standard Plan sheets 5-297.233 and 5-297.234 sheet 1 there is a note ③ which states...

“PLACE ABUTMENT APPROACH SURCHARGE MATERIAL PRIOR TO ABUTMENT CONSTRUCTION. AFTER COMPLETION OF SURCHARGE WAITING PERIOD, REMOVE SURCHARGE AND EXISTING MATERIAL OR SELCT GRADING MATERIAL TO THE LIMITS SHOWN IN “ROUGH GRADING SECTION” ABOVE, PRIOR TO ABUTMENT CONSTRUCTION. SEE BRIDGE PLANS AND SPECIAL PROVSIONS FOR ABUTMENT APPROACH SURCHARGE REQUIREMENT AND PAYMENTS.”

If either of these standard plan sheets are needed in the plan then the designer will need to coordinate with the Bridge office to determine if the surcharge is required.

If the surcharge is NOT required then the standard plan sheets should be modified to cross out note ③.

## **Chapter 7 – QUALITY MANAGEMENT (Replaced)**

*This chapter is replaced with the following.....*

Creation of an **additional design and alignment file** and a summary of the **total lane miles per lift** (rounded to the nearest hundredth) for the given material type requiring compaction and/or paving efforts is required for jobs using:

- (2016) “Quality Management – Paver Mounted Thermal Profile (PMTP) Method” and
- (2016) “Quality Management Special – Intelligent Compaction (IC) Method”.

Table 7.1 details when these technologies are required on a given project.

<b>Table 7.1 IC and PMTP Project Requirements</b>			
<b>Specification</b>	<b>Intelligent Construction Technologies (ICT) Method</b>		<b>Net Lane Miles*</b>
	<b>(2016) Quality Management - Paver Mounted Thermal Profile Method</b>	<b>(2016) Quality Management Special - Intelligent Compaction</b>	
2215 (SFDR) 2390 (CIR & CCPR)	...	√	≥ 4 lane miles
2353	...	√	≥ 4 lane miles
2360 & 2365	√	√	≥ 4 lane miles

\* Net lane miles for the given specification and route. The IC and PMTP methods are also required on associated routes within the plan set, with a minimum, continuous length of 2-lane miles, unless waived by the Engineer.

Details describing how to create the additional design and alignment files are outlined in Chapter 3, **Section 3.3** of the Advanced Materials and Technology (AMT) Manual. The AMT manual can be found at: MnDOT A to Z ...go to “Advanced Materials & Technology” ...go to “Manuals, Guides & Videos”.

## **Chapter 12 – CASTING ASSEMBLY**

There has been some confusion on when a casting assembly is paid for separately and when it is part of the structure.

Statewide when the removal of a structure is by the EACH it includes the removal of the casting. If the casting is to be salvaged then a pay item for the salvaging of the casting should be added.

# DESIGN SCENE



When the removal is by the lin fit then follow the intent of the 2506 spec and pay for the casting separately. The tabs would show a remove structure and remove casting.

## **Chapter 12 – CULVERT WORK (Replaced)**

*This section is replaced with the following....*

Whenever there is work to be done on a portion of a culvert, such as a lining or a salvage/install aprons, every effort should be made to bring the aprons up to current standards. A safety apron and/or grate may be needed to accomplish this. However the District does have the option of not bringing the aprons up to current standards. When deciding on whether to add safety features or not the District should investigate the risk, run off the road data, grading, right of way, safety concerns, etc.. If it is decided that the aprons are not going to have safety features a full explanation should be given and placed in the design file. There are a few locations that would still require safety features to be added. One such location would be a median culvert. If you have questions on a particular situations please contact the Project Design Services office.

## **Chapter 12 – DEWATERING**

When DEWATERING is paid for in the plan a location should be referenced either as a note in the SEQ or in a TABULATION where this is needed and at least one of the following should be included...

- A detail/schematic of the dewatering.
- The flow/infiltration rates for each of the locations.
- Information included in the Special Provisions.

A good example of a table is as follows....

DEWATERING TABULATION						
STATION	INPLACE	EXISTING	NORMAL WATER	2-YEAR EVENT	2-YEAR EVENT	DRAINAGE AREA
TH 1	CULVERT	RESOURCE	DEPTH FEET	DEPTH FEET	FLOW CFS	ACRES
272+00	24" RCP	WETLAND	1.5	2.2	12	29
645+06	24" RCP	TRIBUTARY-DNR PROTECTED WATER	0.5	3.1	35	323
900+50	30" RCP	WETLAND	0.5	2	14	41
TH 2	CULVERT	RESOURCE	DEPTH FEET	DEPTH FEET	FLOW CFS	ACRES
174+81	48" RCP	TRIBUTARY	0.3	3.2	64	250
182-83	60" RCP	TRIBUTARY	1	2.1	40	186
47+96	60" RCP	TRIBUTARY	1	2	16	164

## **Chapter 12 – PLASTIC PIPE OPTION FOR STORM SEWER AND CULVERTS (Revised)**

*This section is revised as follows....*

There has been some confusion with this article given the latest Technical Memorandum 17-5- B-02 issued 4-25-2017.

How plastic pipe options are included in the plan has not changed as a result of this Technical Memorandum. Pay for them as the existing/previous article states. The major change for this is that when listing options the designer CAN now also include PP (polypropylene pipe), that qualified vendors and products are listed on the Approved/Qualified Products list and that FHWA allows MnDOT autonomy on determining pipe materials use. While MnDOT continues to recommend consideration of alternative pipe material options where appropriate as a way to increase competition, designers may continue to specify a particular product to be used when professional engineering judgment determines that circumstances warrant. When this is the case the designer should keep written documentation on pipe material selection in the project file.

When giving plastic pipe as an option the plan should include the appropriate bedding detail.

- If using flexible pipe for storm sewer include Standard Plan sheet for *Standard Storm Sewer Bedding for Rigid and Flexible Pipe (5-297.442)*,
- If giving flexible pipe as an option for centerline culvert where treatments are not used include Standard Plan sheet for *Standard Culvert Bedding for Flexible Pipe (without Treatments) (5-297.440)*.
- Where flexible pipe is an option for centerline culverts where treatments are needed include Design Detail for *Culvert Bedding Flexible Pipe*. The designer should use these details not ones they created.

Plastic pipe should be used in accordance with Technical memorandum No. 17-05-B-02.

### ***Storm Sewer***

Storm Sewer (2503 items) Plastic pipe may be used as an option for pipes less than or equal to 48”.

### **Chapter 12 – PIPE BEDDING (Revised)**

*This section is revised as follows...*

There are now standard plan sheets available for Standard Culvert Bedding for Flexible Pipe (5-297.440), Standard Culvert Bedding for Rigid Pipe (5-297.441), and Standard Storm Sewer Bedding for Rigid and Flexible Pipe (5-297.442). These will be required to be used for plan let on or after June 28, 2019.

The design details will still need to be used for culverts with treatments and Box Culverts as these are not covered by the standard plan sheets.

When there are Storm Sewer Pipes items (2503) in the plan...

- Bedding, excavation and backfill do NOT need to be tabulated separately but are considered to be included in the cost of the storm sewer items.
- Include the Standard Plan sheet for Standard Storm Sewer Bedding for Rigid and Flexible Pipe (5-297.442) in the plan. These details should NOT need to be edited.

When there are Culvert items in the plan (2501) that...

# DESIGN SCENE



OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

PROJECT DESIGN SERVICES UNIT

April 2019 - Page 5

- Require treatments, typically centerline culverts in areas prone to frost heave...
  - ❖ Payment for excavation, bedding, and special backfill quantities should be included in the SEQ and Tabulations (preferable the drainage tabulation).
  - ❖ Identify the treatment type in the Tabulations.
  - ❖ Include the detail in the plan from...MnDOT A to Z...go to “Design Details”...go to
    - ✦ “CULV BEDDING RIGID” if using concrete pipes.
    - ✦ “CULV BEDDING FLEX” if using metal and/or plastic pipes.
      - These details can be editing according to the District materials Engineers recommendations.
- Do NOT require treatments, typically centerline and side culverts for local roadways but do not typically apply to entrance culverts....
  - ❖ Payment for the bedding quantities should be included in the SEQ and Tabulations.
  - ❖ Excavation and backfill do NOT need to be tabulated separately but are considered to be included in the cost of the storm sewer items unless a special backfill is required. When special backfill is required backfill should be included in the SEQ and Tabulations.
  - ❖ Include the Standard Plan for
    - ✦ “STANDARD CULVERT BEDDING FOR RIGID PIPE (5-297.441)” if using concrete pipes.
    - ✦ “STANDARD CULVERT BEDDING FOR FLEXIBLE PIPE (5-297.440)” if using metal and/or plastic pipes.
      - Details are NOT modified unless an alternate bedding design is used.
- Are Entrance Culverts for agricultural, residential, or commercial entrances.
  - ❖ If placed with “Select grading material” as backfill then...
    - ✦ No detail is needed
    - ✦ No quantities need to be in the tabulations.
  - ❖ If specific bedding is required then...
    - ✦ Payment for the bedding quantities should be included in the SEQ and Tabulations.
    - ✦ Excavation and backfill do NOT need to be tabulated separately but are considered to be included in the cost of the culvert items.
  - ❖ Include the detail in the plan from...MnDOT A to Z...go to “Design Details”...go to
    - ❖ “STANDARD CULVERT BEDDING FOR RIGID PIPE (5-297.441)” if using concrete pipes.
    - ❖ “STANDARD CULVERT BEDDING FOR FLEXIBLE PIPE (5-297.440)” if using metal and/or plastic pipes.
      - Details are NOT modified unless an alternate bedding design is used.\

When there are Box Culvert items (2412) in the plan...

- Payment for excavation, bedding, and special backfill quantities should be included in the SEQ and Tabulations.
- Include the detail in the plan from... MnDOT A to Z...go to “Design Details”...go to “BOX CULV BEDDING”
  - ❖ Details are NOT modified unless an alternate bedding design is used.

## **Chapter 12 – WHAT IS IT?**

There has been confusion for the situation when there is a culvert with a drainage structure (catch basin) as part of it.

The Road Design Manual Chapter 8(3) defines a

- Culvert as “*a conduit with open ends through which surface water flows transversely under one or more roadways. It may include intermediate median drains or junctioning conduits, but such junctioning conduits shall be classified as pipe culverts only if they consist of a single conduit with an open end.*”
- Storm Sewer as “*a conduit or interconnected complex of conduits that conveys storm water runoff. Water is admitted to the system primarily through drains and catch basins. An open-end conduit is classified as a storm drain if it connects to a system of conduits.*”

In other words...if it drains primarily from the roadway it is a storm sewer, if it drains primarily from the ditch it is a culvert.

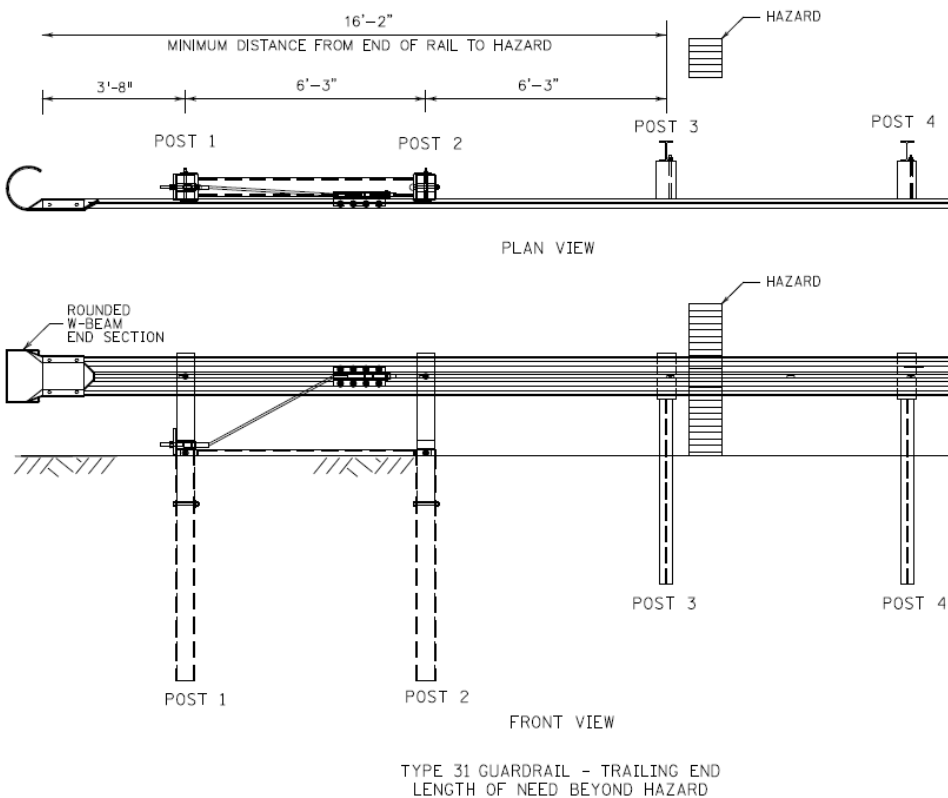
## **Chapter 14 – STIFFENED GUARDRAIL (Revised)**

*The last paragraph of this section is revised as follows to add clarification....*

*Ending Guardrail* - How far to take the guardrail beyond the hazard when shielding is not required in the opposite traffic direction? There is currently no statewide consensus on this. The guidance is different for 8338 vs. Type 31. For the interim we would recommend that 12’-6” be used as a minimum for type 8338, and that 16’-2” be used for Type 31 (12’-6” + 3’-8”).

This will take you to the end of the guardrail but not the rounded end of the anchorage as shown below...

# DESIGN SCENE



## **Chapter 16 – TRAFFIC DETAILS**

There has been some confusion on when certain traffic details need to be signed or not signed. Hopefully this will clear that up.

There are several different areas of details managed by the Office of Traffic Engineering. The most current version should always be used for each of the following situations.

The following is how each areas details should be handled in the plans.

### ➤ **Pavement Markings Typicals Details**

The Pavement Marking Typical Details have been created with the intent of reducing the number of plan sheets needed for the Pavement Marking Plan. They are also referenced by the MnDOT Traffic Engineering Manual to convey the MnDOT Traffic Engineering Organization's (TEO) convention for pavement markings. Designers may make modifications to the Typical Details as long as the design is allowed by the Minnesota Manual on Uniform Traffic Control Devices; however, modifications to the TEO convention needs to be indicated on the typical and the Designer needs to sign off on the modification.

The PM Typical Details are to be placed onto the Pavement Marking Typical blank plan sheets and, if modified, the modified box in the typical detail needs to be filled out with both a date and initials. If a PM Typical Detail includes elements that are not used, cross out the elements not used. *Changes made to the typical detail allowed by the Designer Notes do not*

*require the modified box to be filled out.* The signature for the Pavement Marking Typical *plan sheet* indicates the selection of the PM Typical Details to be used and for any modifications made to the typicals. The plan sheet must be signed whether or not any modifications were made to the PM Typical Details.

➤ **Temporary Traffic Control Templates**

The Traffic Control Templates are meant to be a guidance about the MnDOT best practice for Traffic Control Plan designers. They are essentially upgraded from Field Manual Layouts (which are a standard to be used on all roads open to the public in the state of MN) to be used for long term use (greater than 3 days). **They are not specifically intended to be placed into a plan.** If a designer does put them in the plan then they may copy the design elements from the Templates and modify appropriately for their project. It is possible that not all information from the template will be on the detail sheet. When these templates are used the Engineer is taking responsibility for that sheet, thus the Engineer will need to include a plan sheet border and sign the signature block on this page.

➤ **Signing Details**

The Signing Details have been created with the intent of specifically adding these sheets into plans. These sheets can be inserted into the plan and do not require a signature. However, if modified then the Engineer is taking responsibility for that sheet, thus the Engineer will need to sign the signature block on this page.

➤ **Lighting Details**

The Lighting Details have been created with the intent of specifically adding these sheets into plans. These sheets can be inserted into the plan and do not require a signature. However, if modified then the Engineer is taking responsibility for that sheet, thus the Engineer will need to sign the signature block on this page.

➤ **Signal Details**

The Signal Details have been created with the intent of specifically adding these sheets into plans. These sheets can be inserted into the plan and do not require a signature. However, if modified then the Engineer is taking responsibility for that sheet, thus the Engineer will need to sign the signature block on this page.

➤ **TMS Details**

The Traffic Management System Details have been created with the intent of specifically adding these sheets into plans. These sheets can be inserted into the plan. These plan sheets must be signed. The signature for the overall plan sheet indicates the selection of the details to be used and for any modifications made to the details.

*The easiest way to tell if it needs to be signed is that when you open the detail from the various websites if it contains a signature block it needs to be signed.*



## **Chapter 18 - ADDENDUM SIGNATURE BLOCK (Revised)**

*This section revised to add the last sentence....*

A signature block is required on a plan sheet that is added or revised by an addendum. When a new plan sheet is added to the plan by addendum, the sheet shall be numbered with “A”, “B”, “C” etc. (e.g. Sheet No. 63A of 63). Revised plan sheets: When a plan sheet is deleted and a revised plan sheet substituted by an addendum, the revised sheet shall be numbered with a “R” (e.g. Sheet No. 62R of 62). If an “R” sheet is revised by a second addendum it should be labelled as “RR”.