

# DESIGN SCENE



OFFICE OF PROJECT MANAGEMENT & TECHNICAL SUPPORT

PROJECT DESIGN SERVICES UNIT

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## **Chapter 2 – Bridges & Box Culverts**

By: Val Svensson with assistance from Y. Crocker

There has been some confusion this season in how Bridge items are documented in project plans and financial information. There is also a need to reinforce how these items are tracked for financial purposes.

The following guidance is related to Bridge replacements, new Bridges and Box Culverts with or without Bridge numbers.

### **Bridge Replacements:**

#### ***Bridge/Box Culvert Replaced with Bridge***

If you have an existing bridge/culvert with a Bridge number that is replaced with a new bridge, the new bridge has a Bridge plan completed that is attached as a separate plan. Bridge plans are not embedded in the grading plans but rather attached at the end.

The existing and new bridge numbers are identified on the Grading plan title sheet index map (e.g. Remove Br. No XXX, Proposed Br. No. XXX) and the new bridge is included in the project description. The Bridge pay items (in the bridge plan only) and quantities are in a separate cost/funding group or groups. The Bridge numbers (new and existing) should also be identified in the appropriate sections of the plan such as the general layout, construction plans and profiles.

#### ***Bridge/ Box Culvert Replace with Box Culvert over 10' Wide***

If you have an existing bridge/culvert with Bridge number that is replaced with a Box culvert that is over 10' wide and has a Bridge number, the new box culvert has plan sheets that are incorporated INTO the Grading Plan.

The existing bridge and new box culvert bridge numbers are identified on the Grading plan title sheet index map (e.g. Remove Br. No XXX, Proposed Box Culvert. No. XXX) and the new bridge is included in the project description. The pay items and quantities for each individual box culvert and end sections are in separate cost/funding group or groups. Since these items are included in the grading plan quantities, the items must have footnotes on the SEQ referencing the culvert and end sections that are for the specific Bridge number noted on the Box culvert. When the project includes multiple box culverts of the same size with different bridge numbers, the footnotes need to identify the quantities for each bridge number. The Bridge numbers (new and existing) should also be identified in the appropriate sections of the plan such as the general layout, construction plans and profiles.

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## Example of Single Bridge/Box Culvert

NOTES	ITEM	DESCRIPTION	UNIT	QUANTITY
①	2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	1
②	2412.511	12x11 PRECAST CONCRETE BOX CULVERT	LIN FT	150
②	2412.512	12x11 PRECAST CONCRETE BOX CULV END SECT	EACH	2

- ① Bridge No 1234 consists of 25' x 25' concrete beam structure.
- ② Box Culvert No. 23X10, Replaces Br. No. 1234

## Example of Multiple Bridges/Box Culverts

NOTES	ITEM	DESCRIPTION	UNIT	QUANTITY
①	2442.501	REMOVE EXISTING BRIDGE A	LUMP SUM	1
②	2442.501	REMOVE EXISTING BRIDGE B	LUMP SUM	1
③	2442.501	REMOVE EXISTING BRIDGE C	LUMP SUM	1
④	2412.511	12x11 PRECAST CONCRETE BOX CULVERT	LIN FT	350
④	2412.512	12x11 PRECAST CONCRETE BOX CULV END SECT	EACH	6

- ① Bridge No. 1234 consists of 25' x 25' concrete beam structure.
- ② Bridge No. 5678 consists of 20' timber structure.
- ③ Bridge No. 9123 consists of 35' x 35' concrete beam structure.
- ④ Box Culvert No. 23X10 = 100' with 2 end sections, Replaces Br. No. 1234  
Box Culvert No. 23X11 = 150' with 2 end sections, Replaces Br. No. 5678  
Box Culvert No. 23X12 = 100' with 2 end sections, Replaces Br. No. 9123

### ***Bridge/ Box Culvert Replace with Box Culvert under 10' Wide***

If you have an existing bridge/culvert with Bridge number that is replaced with a Box culvert that is less than 10' wide, it will not have a bridge number but will have box culvert plan sheets that are incorporated into the Grading Plan.

The existing bridge number being replaced is identified on the Grading plan title sheet index map (e.g. Remove Br. No. XXX) and included in the project description. The pay items and quantities for each individual box culvert and end sections are in separate cost/funding group or groups. Since these items are included in the grading plan quantities, the items must have footnotes on the SEQ referencing each individual culvert and end sections that are for the specific Bridge number being replaced. When the project includes multiple box culverts of the same size replacing existing structures (with bridge numbers), the footnotes need to identify the quantities for each existing bridge number. The Bridge numbers (existing) should also be identified in the appropriate sections of the plan such as the general layout, construction plans and profiles.

## Example of Single Bridge/Box Culvert

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NOTES	ITEM	DESCRIPTION	UNIT	QUANTITY
①	2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	1
②	2412.511	12x11 PRECAST CONCRETE BOX CULVERT	LIN FT	150
②	2412.512	12x11 PRECAST CONCRETE BOX CULV END SECT	EACH	2

- ① Bridge No 1234 consists of 25' x 25' concrete beam structure.
- ② Replaces Bridge No. 1234 (existing Br. No. 1234)

### Example of Multiple Bridges/Box Culverts

NOTES	ITEM	DESCRIPTION	UNIT	QUANTITY
①	2442.501	REMOVE EXISTING BRIDGE A	LUMP SUM	1
②	2442.501	REMOVE EXISTING BRIDGE B	LUMP SUM	1
③	2442.501	REMOVE EXISTING BRIDGE C	LUMP SUM	1
④	2412.511	12x11 PRECAST CONCRETE BOX CULVERT	LIN FT	350
④	2412.512	12x11 PRECAST CONCRETE BOX CULV END SECT	EACH	6

- ① Bridge No. 1234 consists of 25' x 25' concrete beam structure.
- ② Bridge No. 5678 consists of 20' timber structure.
- ③ Bridge No. 9123 consists of 35' x 35' concrete beam structure.
- ④ Box Culvert at Station 101+00 = 100' with 2 end sections, Replaces Br. No. 1234  
Box Culvert at Station 105+70 = 150' with 2 end sections, Replaces Br. No. 5678  
Box Culvert at Station 120+35 = 100' with 2 end sections, Replaces Br. No. 9123

### ***Bridge/ Box Culvert Replace with Pipe***

If you have an existing bridge/culvert with Bridge number that is replaced with a pipe, it will not have a new bridge number but will have plan sheets that are incorporated into the Grading Plan.

The existing bridge number being replaced is identified on the Grading plan title sheet index map (e.g. Remove Br. No. XXX) and included in the project description. The pay items and quantities for the pipe and end sections are in a separate cost/funding group or groups. Since these items are included in the grading plan quantities, the items must have footnotes on the SEQ referencing the pipe and end sections that are for each individual Bridge number being replaced. When the project includes multiple pipes of the same size replacing existing structures (with bridge numbers), the footnotes need to identify the quantities for each existing bridge number. The Bridge numbers (existing) should also be identified in the appropriate sections of the plan such as the general layout, construction plans and profiles.

### Example of Single Bridge/Pipe

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NOTES	ITEM	DESCRIPTION	UNIT	QUANTITY
①	2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	1
②	2501.511	72" RC PIPE CULVERT CLASS IV	LIN FT	150
②	2501.569	72" RC SAFETY APRON	EACH	2

- ① Bridge No 1234 consists of 25' x 25' concrete beam structure.
- ② Replaces Bridge No. 1234

## Example of Multiple Bridges/Pipes

NOTES	ITEM	DESCRIPTION	UNIT	QUANTITY
①	2442.501	REMOVE EXISTING BRIDGE A	LUMP SUM	1
②	2442.501	REMOVE EXISTING BRIDGE B	LUMP SUM	1
③	2442.501	REMOVE EXISTING BRIDGE C	LUMP SUM	1
④	2501.511	72" RC PIPE CULVERT CLASS IV	LIN FT	350
④	2501.569	72" RC SAFETY APRON	EACH	6

- ① Bridge No. 1234 consists of 25' x 25' concrete beam structure.
- ② Bridge No. 5678 consists of 20' timber structure.
- ③ Bridge No. 9123 consists of 35' x 35' concrete beam structure.
- ④ Culvert at Station 101+00 = 100' with 2 end sections, Replaces Br. No. 1234  
Culvert at Station 105+70 = 150' with 2 end sections, Replaces Br. No. 5678  
Culvert at Station 120+35 = 100' with 2 end sections, Replaces Br. No. 9123

## New Bridges:

### *New Bridge*

If you have a new bridge, the new bridge has a Bridge plan completed that is attached to the Grading Plan. The new bridge number is identified on the Grading plan title sheet index map and included in the project description. The Bridge pay items and quantities are in a separate cost/funding group or groups. Bridge plans are not embedded in the grading plans but rather attached at the end. The Bridge numbers (new) should also be identified in the appropriate sections of the plan such as the general layout, construction plans and profiles.

### *New Box Culvert over 10' Wide*

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If you have a new Box culvert that is over 10' wide and has a Bridge number, the new box culvert has plan sheets that are incorporated into the Grading Plan. The new box culvert bridge numbers are identified on the Grading plan title sheet index map (Proposed Box Culvert No. XXXX) and included in the project description. The pay items and quantities for each individual box culvert and end sections are in a separate cost/funding group or groups. Since these items are included in the grading plan quantities, the items must have footnotes on the SEQ referencing the culvert and end sections that are for the specific Bridge number noted on the Box culvert. When the project includes multiple box culverts of the same size with different bridge numbers, the footnotes need to identify the quantities for each bridge number. The Bridge numbers (new) should also be identified in the appropriate sections of the plan such as the general layout, construction plans and profiles.

Example of Single Bridge/Box Culvert

NOTES	ITEM	DESCRIPTION	UNIT	QUANTITY
①	2412.511	12x11 PRECAST CONCRETE BOX CULVERT	LIN FT	150
①	2412.512	12x11 PRECAST CONCRETE BOX CULV END SECT	EACH	2

① Box Culvert No. 23X10

Example of Multiple Bridges/Box Culverts

NOTES	ITEM	DESCRIPTION	UNIT	QUANTITY
①	2412.511	12x11 PRECAST CONCRETE BOX CULVERT	LIN FT	350
①	2412.512	12x11 PRECAST CONCRETE BOX CULV END SECT	EACH	6

① Box Culvert No. 23X10 = 100' with 2 end sections  
Box Culvert No. 23X11 = 150' with 2 end sections  
Box Culvert No. 23X12 = 100' with 2 end sections

### ***New Box Culvert under 10' Wide***

If you have a new Box culvert that is less than 10' wide, it will not have a bridge number but will have box culvert plan sheets that are incorporated into the Grading Plan. The box culverts are not identified on the Grading plan title sheet or included in the project description. The pay items and quantities for box culverts and end sections without bridge numbers are incorporated into the grading cost/funding group.

Items such as grading, pavement, guardrail, riprap, erosion control, and turf are not required or recommended for inclusion in the box culvert cost groups (unless it is shown in the items on separate Bridge SEQ's/Plans) to aid in more efficient contract management in the field.

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