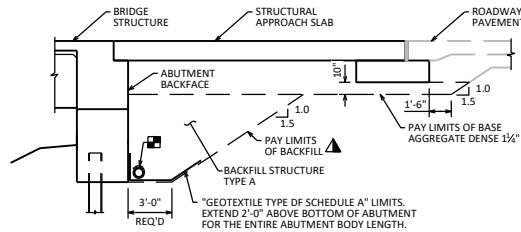


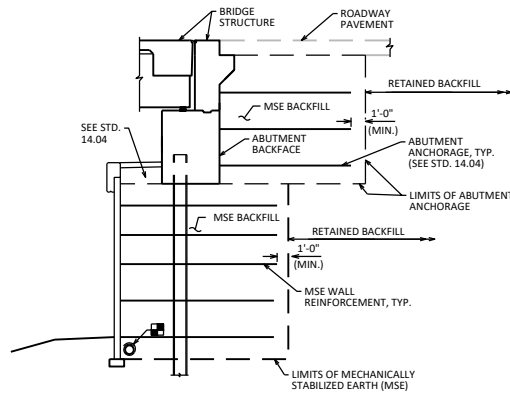
TYPICAL SECTION THRU ABUTMENT

(A3 ABUTMENT WITHOUT STRUCTURAL APPROACH)



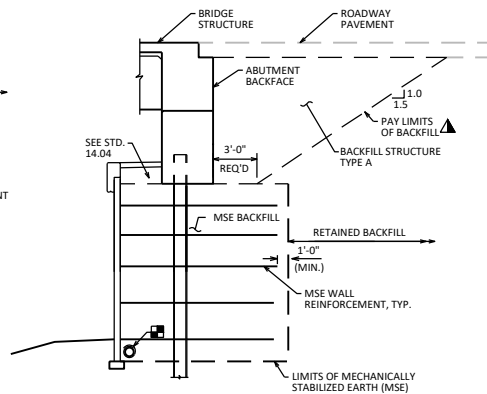
TYPICAL SECTION THRU ABUTMENT

(A1 ABUTMENT WITH STRUCTURAL APPROACH)



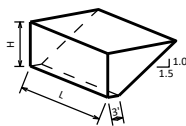
TYPICAL SECTION THRU ABUTMENT AT MSE WALL

(A3 ABUTMENT WITH ABUTMENT ANCHORAGE)



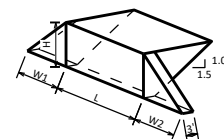
TYPICAL SECTION THRU ABUTMENT AT MSE WALL

(A1 ABUTMENT WITHOUT STRUCTURAL APPROACH)



ABUTMENT BACKFILL DIAGRAM FOR WINGS PARALLEL TO ROADWAY

- L = OUT TO OUT OF ABUTMENT, INCLUDING WINGS (FT)
- H = AVERAGE ABUTMENT FILL HEIGHT (FT)
- EF = EXPANSION FACTOR (1.20 FOR CY BID ITEMS AND 1.00 FOR TON BID ITEMS)
- $V_{CF} = (L)(3.0')(H) + (L)(0.5)(1.5H)(H)$
- $V_{CY} = V_{CF}(EF)/27$
- $V_{TON} = V_{CY}(2.0)$



ABUTMENT BACKFILL DIAGRAM FOR WINGS PARALLEL TO ABUTMENT

- L = OUT TO OUT OF ABUTMENT BODY (FT)
- H = AVERAGE ABUTMENT FILL HEIGHT (FT)
- W1 = WING 1 LENGTH (FT)
- W2 = WING 2 LENGTH (FT)
- EF = EXPANSION FACTOR (1.20 FOR CY BID ITEMS AND 1.00 FOR TON BID ITEMS)
- $V_{CF} = (L)(3.0')(H) + (L)(0.5)(1.5H)(H) + (3.0')(0.5)(W1+W2)(H)$
- $V_{CY} = V_{CF}(EF)/27$
- $V_{TON} = V_{CY}(2.0)$

NOTES

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES BRIDGES B-..." SHALL BE THE EXISTING GROUNDLINE.

THE BACKFILL QUANTITIES ARE BASED ON THE PAY LIMITS SHOWN ON THE PLANS AND MAY NOT REFLECT ACTUAL PLACED QUANTITIES. "BACKFILL STRUCTURE TYPE A" REQUIRED DIRECTLY BEHIND ABUTMENTS AND ABUTMENT WINGS FOR 3 FEET. BACKFILL PLACED BEYOND PAY LIMITS OR EXCEEDING PLAN QUANTITIES SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES.

EXCAVATION BELOW THE ABUTMENT AND ABUTMENT BEDDING MATERIALS REQUIRES ENGINEER APPROVAL. GEOTEXTILE SHALL BE SET AT THE BOTTOM OF EXCAVATION AND EXTEND 2'-0" ABOVE BOTTOM OF ABUTMENT. (NOTE INTENDED FOR PILE SUPPORTED ABUTMENTS. SEE DESIGNER NOTES FOR MORE INFORMATION.)

DESIGNER NOTES

THE DESIGN ENGINEER SHOULD PROVIDE ALL NECESSARY BACKFILL PAY LIMITS AND NOTES IN ORDER TO DETERMINE QUANTITIES. FOR ABUTMENTS, PROVIDE AN ABUTMENT BACKFILL DIAGRAM AS SHOWN ON THIS SHEET. SEE BRIDGE MANUAL SECTIONS 6.4.2 AND 9.10 FOR ADDITIONAL INFORMATION.

- ▲ SUBSURFACE DRAINAGE DETAILS AND NOTES SHOULD DIRECT DRAINAGE AROUND THE ABUTMENT RATHER THAN BELOW THE ABUTMENT. DRAINAGE UNDER THE ABUTMENT MAY CAUSE SLOPE PAVING DAMAGE OR FAILURE. GEOTEXTILE SHALL EXTEND THE ENTIRE LENGTH OF THE ABUTMENT BODY.
- SEE STANDARD 12.08 FOR GUIDANCE ON UNDERDRAIN PLACED ABOVE NORMAL WATER. FOR UNDERDRAIN EXPOSED TO HIGH WATER, CONSIDER CAPPING THE UPSTREAM END TO PREVENT CLOGGING.

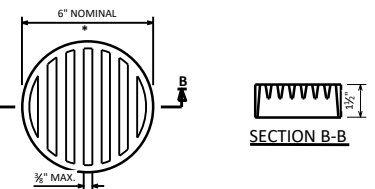
FOR ABUTMENTS WITH MSE BACKFILL BELOW THE REQUIRED "BACKFILL STRUCTURE TYPE A" WIDTH, PIPE UNDERDRAIN AND GEOTEXTILE ARE NOT REQUIRED BEHIND ABUTMENTS. PIPE UNDERDRAIN IS REQUIRED AT THE BOTTOM OF THE MSE WALL.

SEE STANDARD 9.02 FOR RETAINING WALL AND BOX CULVERT DETAILS.

SEE STANDARD 9.03 FOR WING FILL SECTIONS AT WING TIPS.

LEGEND

- ▲ BACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.
- PIPE UNDERDRAIN WRAPPED (6-INCH). SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. (SHOW DETAIL ON PLANS)



RODENT SHIELD DETAIL

* DIMENSIONS ARE APPROXIMATE. THE GRATE IS SIZED TO FIT INTO A PIPE COUPLING. ORIENT SO SLOTS ARE VERTICAL.

THE RODENT SHIELD, PIPE COUPLING AND SCREWS SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEM "PIPE UNDERDRAIN WRAPPED 6-INCH".

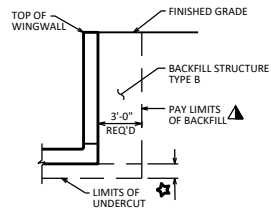
THE RODENT SHIELD SHALL BE A PVC GRATE SIMILAR TO THIS DETAIL. THE GRATE IS COMMERCIALY AVAILABLE AS A FLOOR STRAINER. A PIPE COUPLING IS REQUIRED FOR THE ATTACHMENT OF THIS SHIELD TO THE EXPOSED END OF THE PIPE UNDERDRAIN. THE SHIELD SHALL BE FASTENED TO THE PIPE COUPLING WITH TWO OR MORE NO. 10 X 1-INCH STAINLESS STEEL SHEET METAL SCREWS.

STRUCTURE BACKFILL LIMITS AND NOTES 1

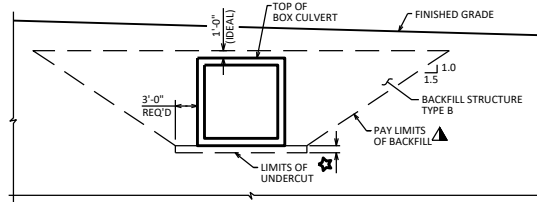


APPROVED: *Laura Shadewald*

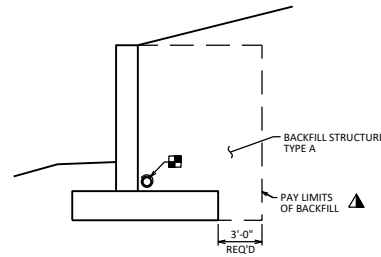
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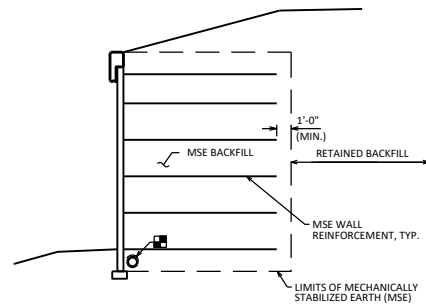
**TYPICAL SECTION
THRU BOX CULVERT WINGWALL**



**TYPICAL SECTION
THRU BOX CULVERT**



**TYPICAL SECTION
THRU RETAINING WALL**



**TYPICAL SECTION
THRU MSE RETAINING WALL**

★ CULVERT UNDERCUT AND BEDDING BACKFILL TO BE DETERMINED BY GEOTECHNICAL ENGINEER. (CHOOSE APPLICABLE NOTE, MODIFY AS NEEDED)

NOTES (BOX CULVERTS)

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES CULVERTS C-..." SHALL BE THE EXISTING GROUNDLINE.

THE BACKFILL QUANTITIES ARE BASED ON THE PAY LIMITS SHOWN ON THE PLANS AND MAY NOT REFLECT ACTUAL PLACED QUANTITIES. "BACKFILL STRUCTURE TYPE B" REQUIRED ON THE BOX CULVERT SIDES AND BEHIND APRON WINGS FOR 3 FEET. BACKFILL PLACED BEYOND PAY LIMITS OR EXCEEDING PLAN QUANTITIES SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES.

NOTE AND DIMENSION NOT REQUIRED. (UNDERCUT NOT REQUIRED PER GEOTECHNICAL ENGINEER OR WHEN CONSTRUCTED ON FILLS)

UNDER CUT "X"-X". EXCAVATION FOR UNDER CUT TO BE INCLUDED IN EXCAVATION FOR STRUCTURES. BACKFILL WITH "BACKFILL STRUCTURE TYPE B".

UNDER CUT "X"-X". EXCAVATION FOR UNDER CUT TO BE INCLUDED IN EXCAVATION FOR STRUCTURES. PLACE "GEOTEXTILE TYPE C" AND BACKFILL WITH "BREAKER RUN".

IN LIEU OF USING BREAKER RUN FOR THE BOX CONSTRUCTION PLATFORM, THE CONTRACTOR MAY ELECT TO SUBSTITUTE #1 OR #2 CONCRETE COARSE AGGREGATE, SELECT CRUSHED MATERIAL OR OTHER GRANULAR MATERIAL AS APPROVED BY THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR BASE STABILITY WITH ANY SUBSTITUTED MATERIAL. THE REGION GEOTECHNICAL ENGINEER MAY BE CONTACTED TO DETERMINE IF "OTHER GRANULAR MATERIAL" IS ACCEPTABLE.

ALL PRECAST BOX SECTIONS SHALL BE PLACED ON A BEDDING OF "BACKFILL STRUCTURE TYPE B" OF 6" MINIMUM DEPTH. (NOTE APPLICABLE WHEN PRECAST NOTE IS SHOWN ON THE PLANS)

NOTES (RETAINING WALLS)

THE UPPER LIMITS OF "EXCAVATION FOR STRUCTURES RETAINING WALLS R-..." SHALL BE THE EXISTING GROUNDLINE.

THE BACKFILL QUANTITIES ARE BASED ON THE PAY LIMITS SHOWN ON THE PLANS AND MAY NOT REFLECT ACTUAL PLACED QUANTITIES. "BACKFILL STRUCTURE TYPE A" REQUIRED FOR THE ENTIRE WALL LENGTH. BACKFILL PLACED BEYOND PAY LIMITS OR EXCEEDING PLAN QUANTITIES SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES.

DESIGNER NOTES

▲ THE DESIGN ENGINEER SHOULD PROVIDE ALL NECESSARY BACKFILL PAY LIMITS AND NOTES IN ORDER TO DETERMINE QUANTITIES. SEE BRIDGE MANUAL SECTIONS 6.4.2 AND 9.10 FOR ADDITIONAL INFORMATION.

FOR CULVERTS, THE ABOVE NOTE REGARDING POTENTIAL SUBSTITUTION OF BREAKER RUN SHOULD ONLY BE INCLUDED ON THE PLANS IF ALLOWED BY THE REGION GEOTECHNICAL ENGINEER.

LEGEND

▲ BACKFILL PAY LIMITS. BACKFILL BEYOND BACKFILL PAY LIMITS SHALL BE INCIDENTAL TO EXCAVATION FOR STRUCTURES. LIMITS OF EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR.

■ PIPE UNDERDRAIN WRAPPED (6-INCH). SLOPE 0.5% MIN. TO SUITABLE DRAINAGE. ATTACH RODENT SHIELD AT ENDS OF PIPE UNDERDRAIN. (SHOW DETAIL ON PLANS)

**STRUCTURE BACKFILL
LIMITS AND NOTES 2**



**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

DATE:
7-22

		WINGS PARALLEL TO ROADWAY			WINGS PARALLEL TO ABUTMENT
		STANDARD WING	WITH STRUCTURAL APPROACH SLAB	WITH RAILING OR FENCE ONLY	STANDARD WING
STANDARD FILL RIP RAP STANDARD FILL WITH SIDEWALK	STANDARD FILL	<p>PARAPET PLACE FILL EVEN WITH TOP OF WING, 2 FEET FROM WING TIP. TRANSITION FILL TO TOP OF CURB, IF PRESENT. 2'-0" TOP OF WING 2.5 MIN 1 WING WALL END OF ABUTMENT WING</p> <p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>PARAPET PLACE FILL EVEN WITH TOP OF WING, 2 FEET FROM WING TIP. TRANSITION FILL TO TOP OF CURB, IF PRESENT. 2'-0" TOP OF STRUCTURAL APPROACH SLAB 2.5 MIN 1 WING WALL BASE AGGREGATE DENSE 1 1/2" OR FOOTING END OF ABUTMENT WING</p> <p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>RAILING OR FENCE PLACE FILL EVEN WITH TOP OF WING, 2 FEET FROM WING TIP. 2'-0" TOP OF WING 2.5 MIN 1 WING WALL END OF ABUTMENT WING</p> <p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>NOTE: PLACE FILL AS SHOWN IN WING ELEVATION DETAIL</p> <p>TOP OF WING 2'-6" WING WALL ABUTMENT WING 2.0 MIN 1</p> <p>TYPICAL FILL SECTION AT WING</p>
	RIP RAP	<p>PARAPET PLACE HEAVY RIPRAP EVEN WITH TOP OF WING, 2 FEET FROM WING TIP. 2'-0" TOP OF WING HEAVY RIPRAP 2.5 MIN 1 WING WALL GEOTEXTILE, TYPE HR (TYP.) END OF ABUTMENT WING</p> <p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>PARAPET PLACE HEAVY RIPRAP EVEN WITH TOP OF WING, 2 FEET FROM WING TIP. 2'-0" TOP OF STRUCTURAL APPROACH SLAB HEAVY RIPRAP 2.5 MIN 1 WING WALL BASE AGGREGATE DENSE 1 1/2" OR FOOTING GEOTEXTILE, TYPE HR (TYP.) END OF ABUTMENT WING</p> <p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>RAILING OR FENCE PLACE HEAVY RIPRAP EVEN WITH TOP OF WING, 2 FEET FROM WING TIP. 2'-0" TOP OF WING HEAVY RIPRAP 2.5 MIN 1 WING WALL GEOTEXTILE, TYPE HR (TYP.) END OF ABUTMENT WING</p> <p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>NOTE: PLACE HEAVY RIPRAP AS SHOWN IN WING ELEVATION DETAIL</p> <p>TOP OF WING 2'-6" WING WALL ABUTMENT WING HEAVY RIPRAP 1.5 MIN 1 GEOTEXTILE, TYPE HR (TYP.) 2'-0"</p> <p>TYPICAL FILL SECTION AT WING</p>
	STANDARD FILL WITH SIDEWALK	<p>PARAPET PLACE FILL EVEN WITH TOP OF WING, 2 FEET FROM WING TIP. TRANSITION FILL TO TOP OF SIDEWALK, 2 FEET FROM WING TIP. 2'-0" TOP OF SIDEWALK/ TOP OF WING 2.5 MIN 1 WING WALL END OF ABUTMENT WING</p> <p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>PARAPET PLACE FILL EVEN WITH TOP OF WING, 2 FEET FROM WING TIP. TRANSITION FILL TO TOP OF SIDEWALK. 2'-0" TOP OF SIDEWALK 2.5 MIN 1 WING WALL STRUCTURAL APPROACH SLAB END OF ABUTMENT WING</p> <p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>RAILING OR FENCE PLACE FILL EVEN WITH TOP OF SIDEWALK, 2 FEET FROM WING TIP. 2'-0" TOP OF SIDEWALK/ TOP OF WING 2.5 MIN 1 WING WALL END OF ABUTMENT WING</p> <p>TYPICAL FILL SECTION AT WING TIPS</p>	

**WING FILL SECTIONS
AT WING TIPS**

**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald* DATE: 1-18