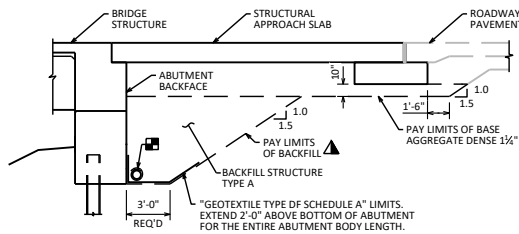


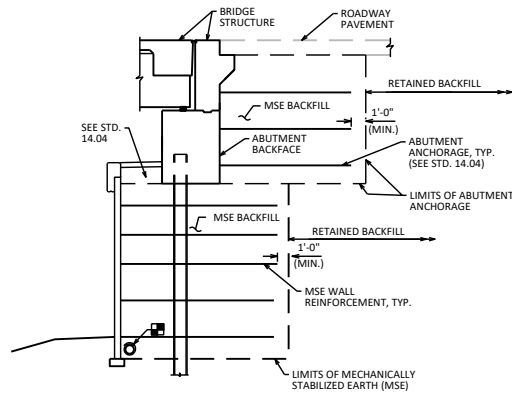
**TYPICAL SECTION
THRU ABUTMENT**

(A3 ABUTMENT WITHOUT STRUCTURAL APPROACH)



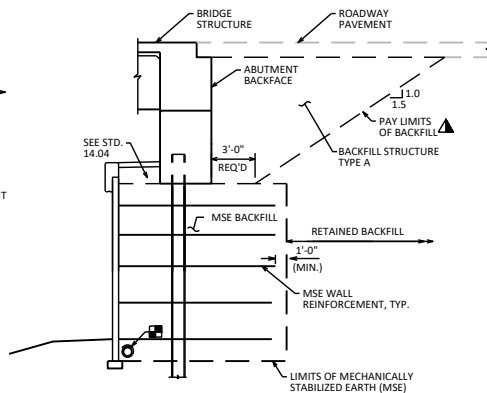
**TYPICAL SECTION
THRU ABUTMENT**

(A1 ABUTMENT WITH STRUCTURAL APPROACH)



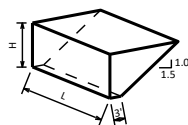
**TYPICAL SECTION
THRU ABUTMENT AT MSE WALL**

(A3 ABUTMENT WITH ABUTMENT ANCHORAGE)



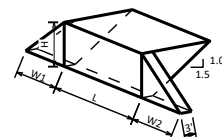
**TYPICAL SECTION
THRU ABUTMENT AT MSE WALL**

(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.

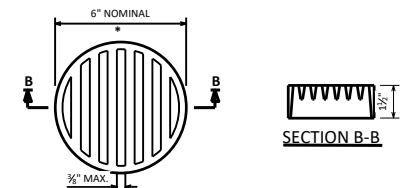
SEE STANDARD 9.02 FOR RETAINING WALL AND BOX CULVERT DETAILS.

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.

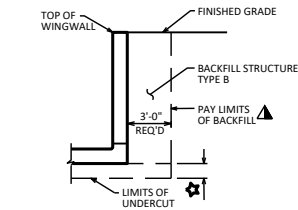
STRUCTURE BACKFILL LIMITS AND NOTES 1



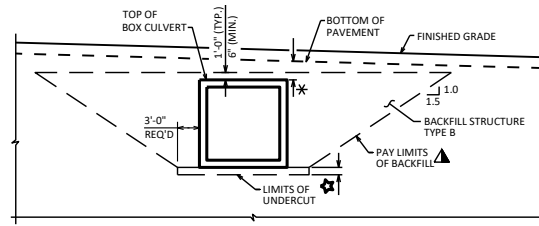
**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

DATE:
7-24



**TYPICAL SECTION
THRU BOX CULVERT WINGWALL**



**TYPICAL SECTION
THRU BOX CULVERT**
(CIP BOX CULVERT WITH SHALLOW FILLS)

★ 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 COARSE AGGREGATE AASHTO NO. 67 OR AASHTO NO. 4 IN ACCORDANCE WITH STANDARD SPEC 310 AND 604, RESPECTIVELY, 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.

PRECAST ELEMENTS SHALL BE PLACED ON A BEDDING OF "BACKFILL STRUCTURE TYPE B" OF 6" MINIMUM DEPTH AND AS APPROVED BY THE ENGINEER. (NOTE APPLICABLE WHEN PRECAST ELEMENTS ARE ALLOWED PER STANDARD 36.02)

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.

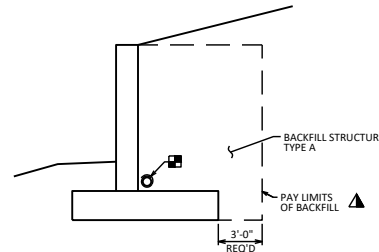
FOR CULVERTS, THE ABOVE NOTE REGARDING POTENTIAL SUBSTITUTION OF BREAKER RUN SHOULD ONLY BE INCLUDED ON THE PLANS IF ALLOWED BY THE REGION GEOTECHNICAL ENGINEER.

* 6" MINIMUM OF "BACKFILL STRUCTURE TYPE B" REQUIRED BETWEEN BOTTOM OF ROADWAY SURFACE AND TOP OF CULVERT.

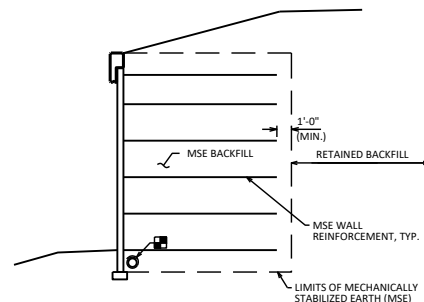
LEGEND

▲ 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)



**TYPICAL SECTION
THRU RETAINING WALL**



**TYPICAL SECTION
THRU MSE RETAINING WALL**

STRUCTURE BACKFILL LIMITS AND NOTES 2



**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

DATE:
7-24

WINGS PARALLEL TO ROADWAY				WINGS PARALLEL TO ABUTMENT
	STANDARD WING	WITH STRUCTURAL APPROACH SLAB	WITH RAILING OR FENCE ONLY	STANDARD WING
STANDARD FILL	<p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>TYPICAL FILL SECTION AT WING</p>
RIP RAP	<p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>TYPICAL FILL SECTION AT WING</p>
STANDARD FILL WITH SIDEWALK	<p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>TYPICAL FILL SECTION AT WING TIPS</p>	<p>TYPICAL FILL SECTION AT WING TIPS</p>	

WING FILL SECTIONS AT WING TIPS



**BUREAU OF
STRUCTURES**

APPROVED: *Laura Shadewald*

DATE:
1-18