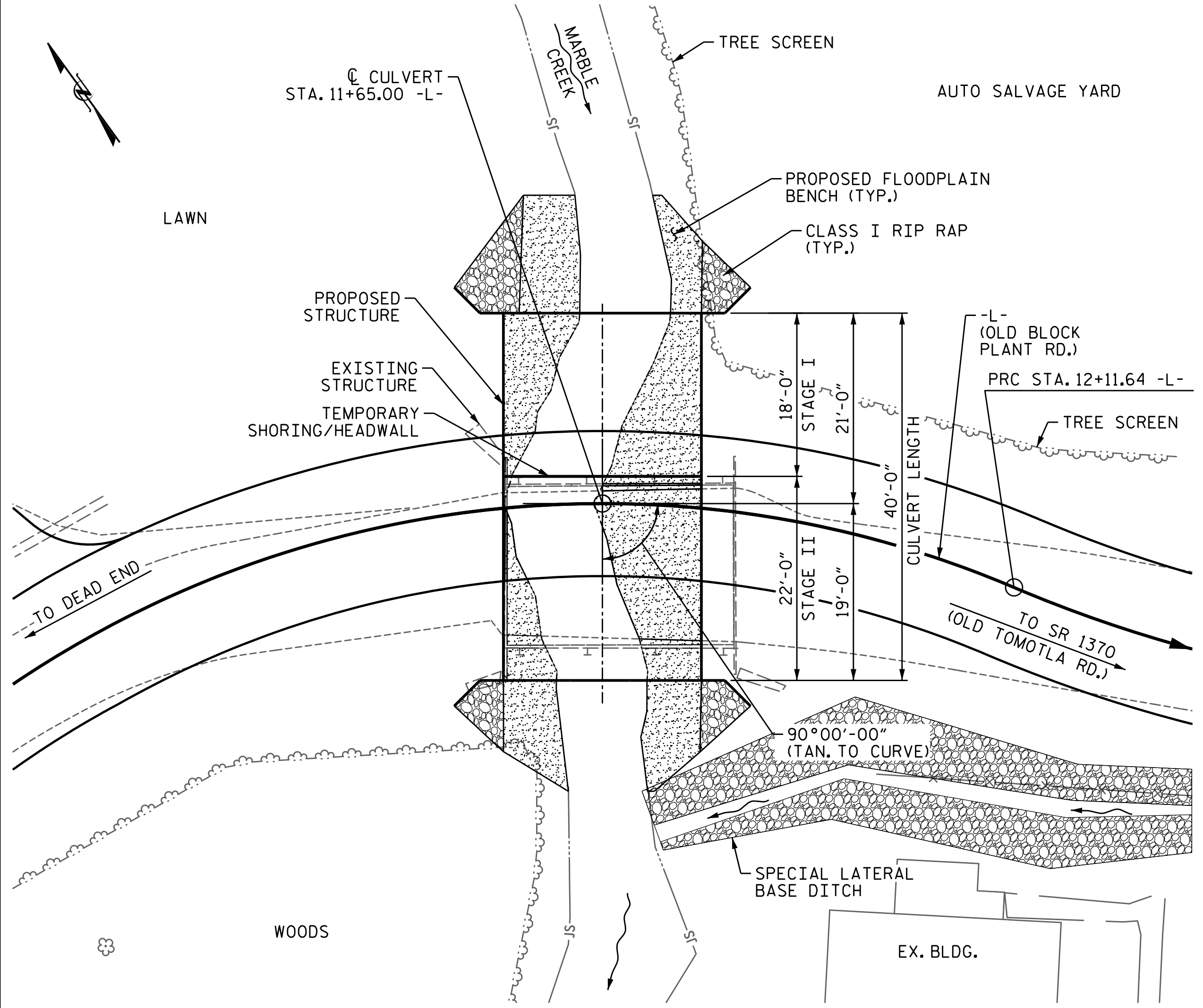


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BM#2 BENCHTIE SET IN 24" SYCAMORE, 10.38' RT, BL STA. 7+38.84, ELEV.= 1590.75'



**LOCATION SKETCH**

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

**NOTES**

- ASSUMED LIVE LOAD.....HL-93 OR ALTERNATE LOADING.
- MAXIMUM DESIGN FILL..... 3.6'
- MINIMUM DESIGN FILL..... 2.6'
- FOR OTHER DESIGN DATA AND NOTES, SEE STANDARD NOTE SHEET.
- FOR CULVERT DIVERSION DETAILS, SEE EROSION CONTROL PLANS.
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES."
- THE EXISTING STRUCTURE CONSISTING OF A SINGLE SPAN, 25'-6" WITH AN ASPHALT WEARING SURFACE ON A TIMBER DECK ON STEEL I-BEAMS AND CHANNELS, HAVING A CLEAR ROADWAY WIDTH OF 17'-1" SUPPORTED ON A SUBSTRUCTURE OF TIMBER CAPS, AND TIMBER POSTS AND SILLS AND LOCATED AT PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AT ACTUAL CONDITIONS AT THE PROJECT SITE.
- FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.
- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF THE CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.
- FOR ALUMINUM BOX CULVERT AND FOUNDATIONS, SEE SPECIAL PROVISIONS FOR ALUMINUM BOX CULVERT.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

- THE DETAILS SHOWN HERE ARE FOR GENERAL LAYOUT ONLY. THE SUPPLIER SHALL SUPPLY DESIGNS AND DETAILS FOR REVIEW AND APPROVAL THAT MEET THE REQUIREMENTS OF AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12, AND ARE SEALED BY A NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER.
- THE CONTRACTOR SHALL SUBMIT SEALED SHOP DRAWING PLANS FOR THE ALUMINUM BOX CULVERT, ALUMINUM HEADWALL AND ANY REQUIRED FOUNDATIONS TO NCDOT FOR APPROVAL PRIOR TO CONSTRUCTION.
- UNLESS OTHERWISE INDICATED, THE SUPPLIER SHALL DESIGN, DETAIL, AND FURNISH ALL STRUCTURAL ELEMENTS AND HARDWARE.
- ALL MATERIALS SHALL MEET THE REQUIREMENTS OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES DATED JANUARY 2018.
- THE MANUFACTURER OF THE 21'-10" X 5'-8" ALUMINUM BOX CULVERT SHALL PROVIDE LOAD RESISTANCE FACTOR RATINGS (LRFR) SUMMARY PER NCDOT REQUIREMENTS.
- THE CORRUGATED ALUMINUM BOX CULVERT AT STATION 11+65.00 -L- IS DESIGNED FOR A FACTORED RESISTANCE OF 2 TSF. CHECK FIELD CONDITIONS FOR THE REQUIRED RESISTANCE OF 5 TSF JUST BEFORE PLACING CULVERT.
- EXCAVATE FOUNDATION A MINIMUM OF 1.0 FOOT BELOW CULVERT BEARING ELEVATION. PLACE 1.0 FOOT OF CLASS VI FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH SECTION 414 OF THE STANDARD SPECIFICATIONS.
- OVER EXCAVATE LOOSE/SOFT MATERIAL IF PRESENT TO SUITABLE BEARING MATERIALS AND REPLACE WITH ADDITIONAL CLASS VI FOUNDATION CONDITIONING MATERIAL.
- BACKFILL WITH SELECT MATERIAL, CLASS II OR III MEETING THE REQUIREMENTS OF SECTION 1016 OF THE STANDARD SPECIFICATIONS.
- FOR BLASTING ADJACENT TO HIGHWAY STRUCTURES, SEE ARTICLE 410-9 OF THE STANDARD SPECIFICATIONS.
- AT THE CONTRACTOR'S OPTION HE MAY SUBMIT TO THE ENGINEER FOR APPROVAL DESIGN AND DETAIL DRAWINGS FOR PRECAST REINFORCED CONCRETE HEADWALL IN LIEU OF THE ALUMINUM HEADWALLS SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND LAYOUT AS USED ON THE ALUMINUM HEADWALL DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE HEADWALLS, SEE SPECIAL PROVISIONS.

TOTAL STRUCTURE QUANTITIES	
REMOVAL OF EXISTING STRUCTURE	LUMP SUM
CULVERT EXCAVATION	LUMP SUM
FOUNDATION COND. MAT'L	62 TONS
CLASS I RIP RAP	11 TONS
ALUMINUM BOX CULVERT	LUMP SUM
ASBESTOS ASSESSMENT	LUMP SUM

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

HYDRAULIC DATA	
DESIGN DISCHARGE	= 200 CFS
FREQUENCY OF DESIGN FLOOD	= 2* YEARS
DESIGN HIGH WATER ELEVATION	= 1588.6
DRAINAGE AREA	= 2.12 SQ.MI.
BASE DISCHARGE (Q100)	= 1000 CFS
BASE HIGH WATER ELEVATION	= 1591.3
* EXISTING LEVEL OF SERVICE IS BEING MAINTAINED	

HORIZONTAL CURVE DATA	
PI STA. 11+48.02 -L-	
Δ = 76°-59'-56.3" (RT)	
D = 49°-23'-34.5"	
L = 155.89'	
T = 92.27'	
R = 116.00'	

OVERTOPPING FLOOD DATA	
OVERTOPPING DISCHARGE	= 500 CFS
FREQUENCY OF OVERTOPPING FLOOD	= 10 YEARS
OVERTOPPING FLOOD ELEVATION	= 1590.3

GRADE DATA	
GRADE POINT ELEV. @ STA. 11+65.00 -L- = 1593.36'	
INVERT ELEVATION @ 11+65.00 -L- = 1584.5'	
ROADWAY SIDE SLOPES = 4:1.	

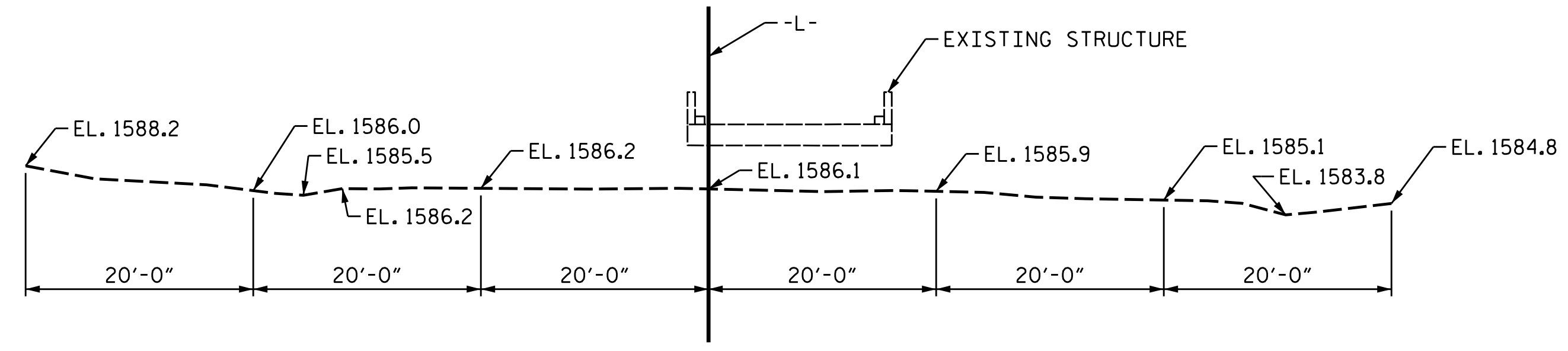
PROJECT NO. 17BP.14.R.167  
CHEROKEE COUNTY  
 STATION: 11+65.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE NO. 170

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SINGLE 21'-10" x 5'-8" ALUMINUM BOX CULVERT  
 90° SKEW**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS 3
2			4			



**PROFILE ALONG C CULVERT**

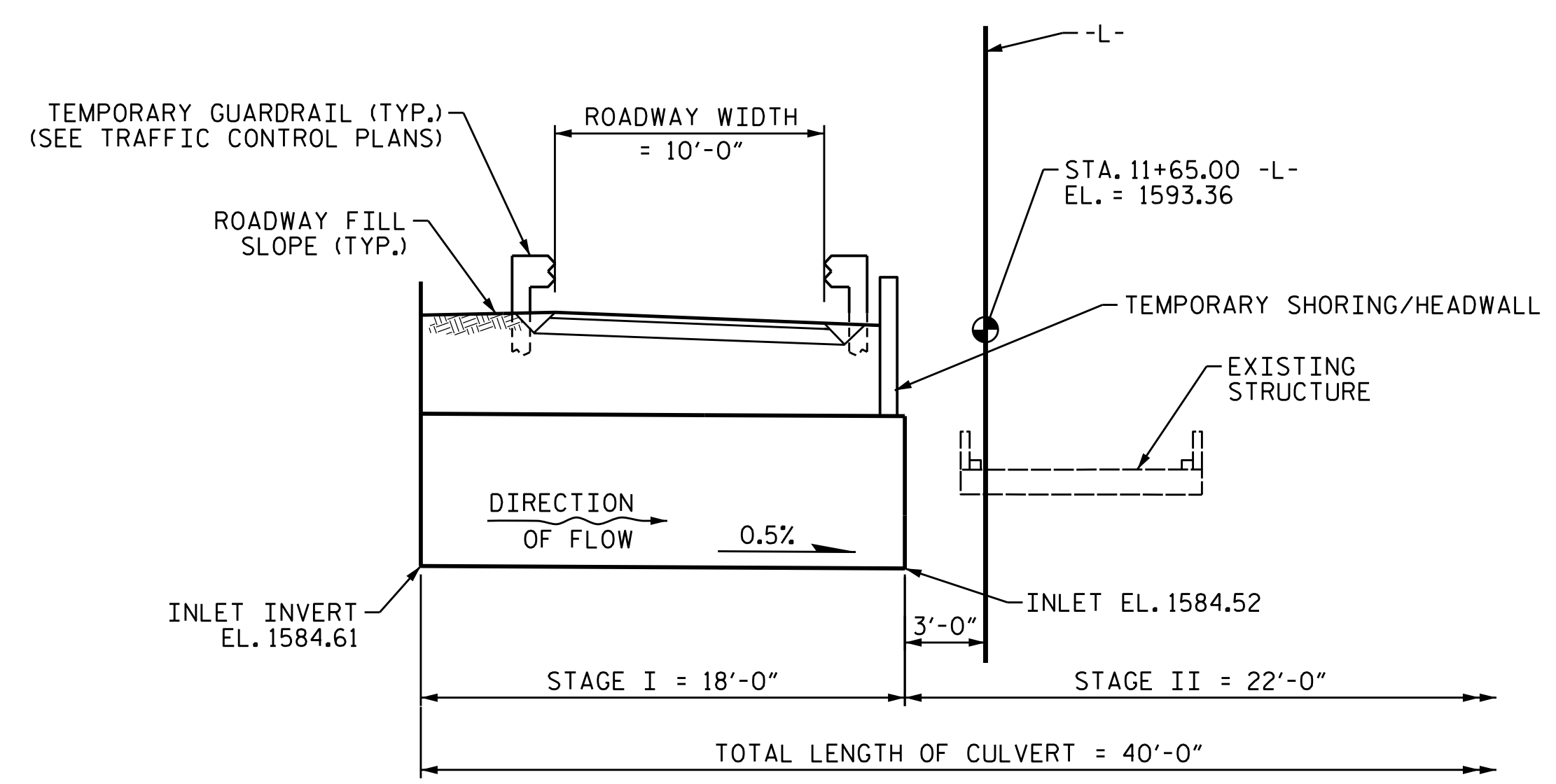
DESIGNED BY:	J. WHEATLEY	DATE :	DEC 2021
DRAWN BY:	M. HOBBS	DATE :	DEC 2021
CHECKED BY:	T. HARRIS	DATE :	DEC 2021
DESIGN ENGINEER OF RECORD:	T. HARRIS	DATE :	DEC 2021

**wsp** WSP USA Inc.  
 434 FAYETTEVILLE STREET  
 SUITE 1500  
 RALEIGH, NC 27601  
 TEL: 1.919.836.4040  
 LICENSE NO. F-0165

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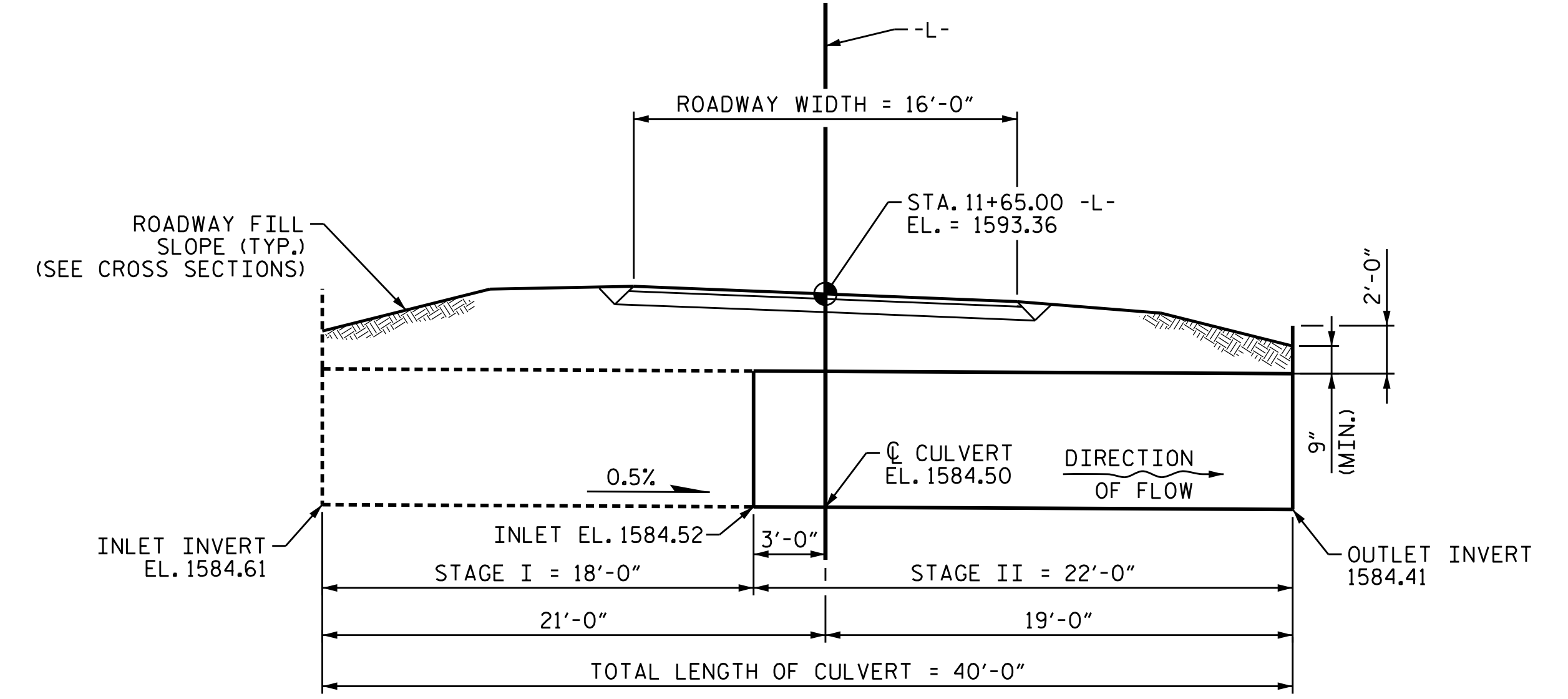
THOMAS M. HARRIS  
 ENGINEER  
 SEAL 19299  
 12/1/2021

12/1/2021 4:10:00 PM 17BP.14.R.170\_SML\_GD01.dgn

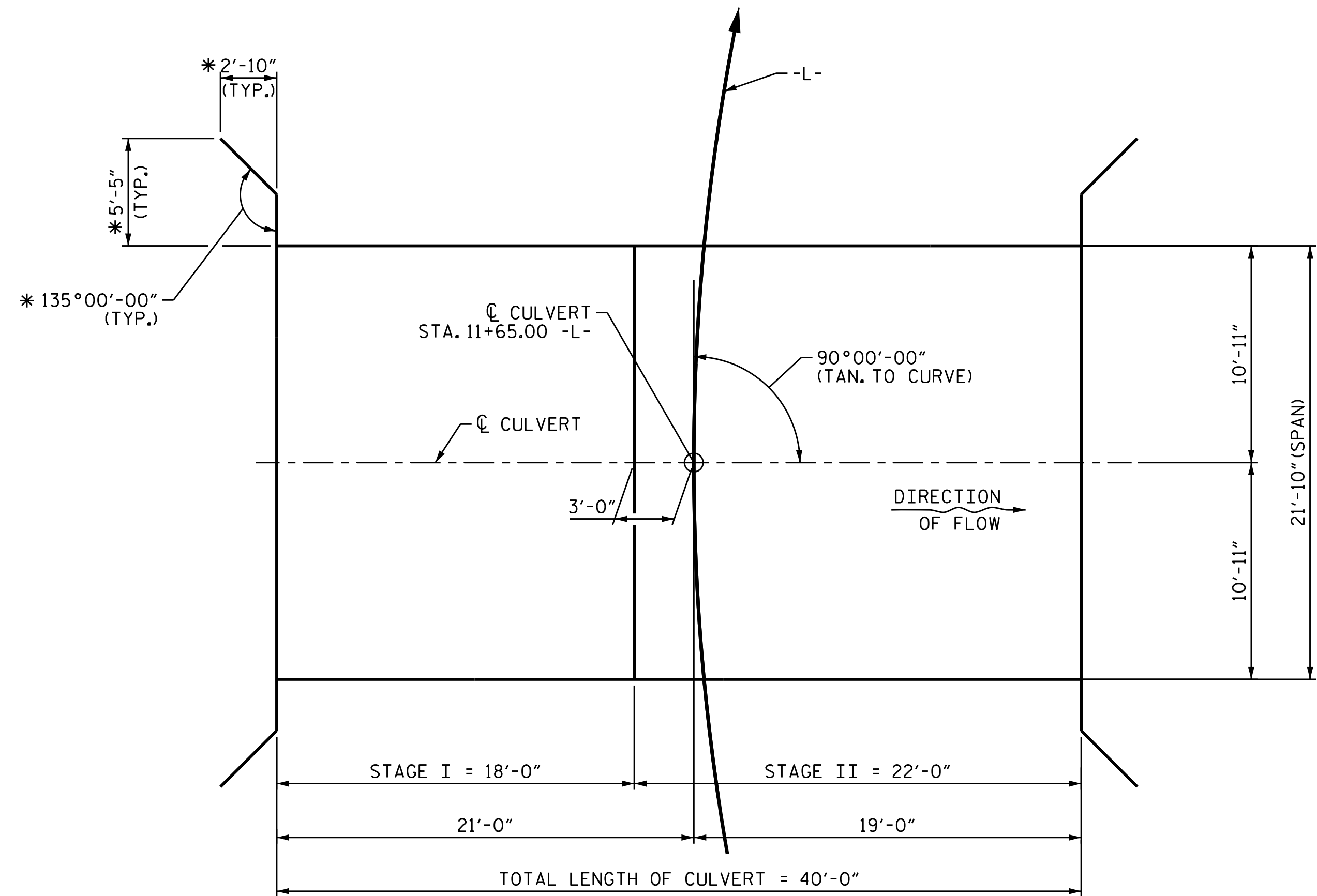


**STAGE I - CULVERT SECTION NORMAL TO ROADWAY**

NOTE: PARTIAL REMOVAL OF EXISTING STRUCTURE WILL BE REQUIRED. SEE TRANSPORTATION MANAGEMENT PLANS.

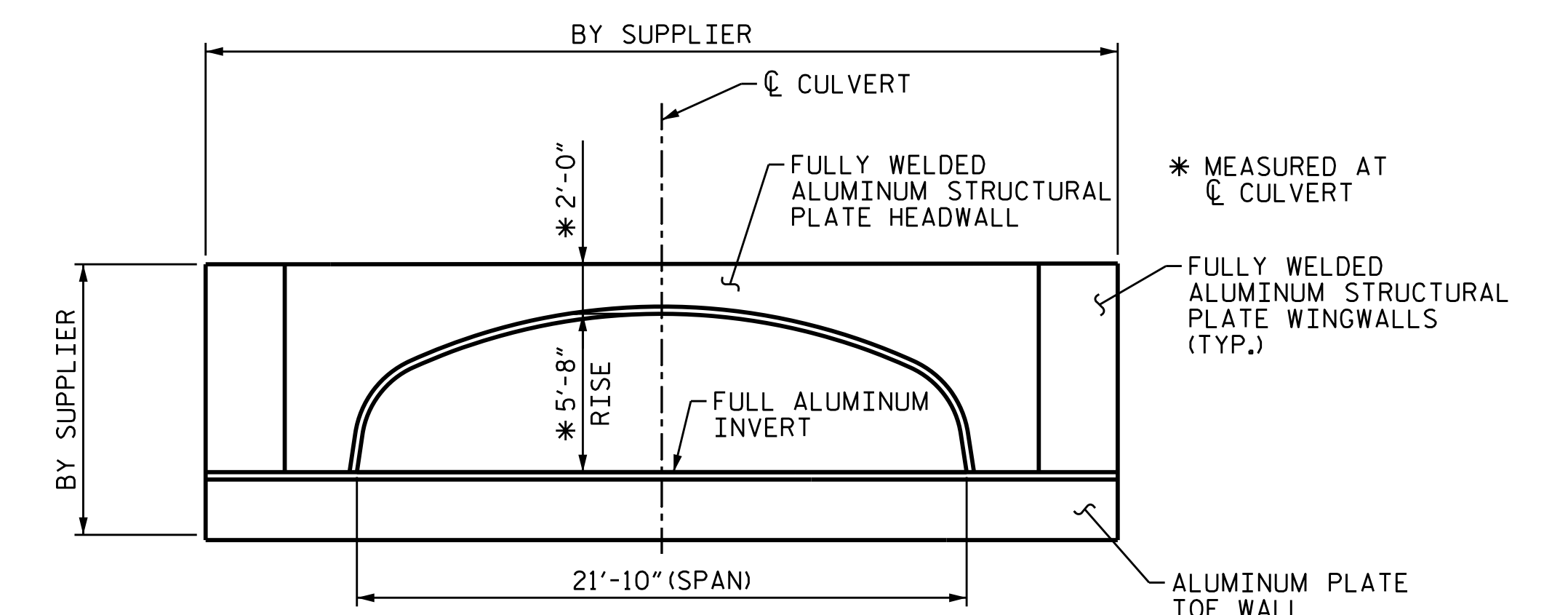


**FINAL CULVERT SECTION NORMAL TO ROADWAY**



**PLAN VIEW**

\* - FIELD VERIFICATION BY SUPPLIER



**OUTLET END ELEVATION**

(INLET END ELEVATION SIMILAR)  
(SILLS NOT SHOWN, SEE SHEET 3 OF 3 FOR SILL LOCATIONS.)

PROJECT NO. 17BP.14.R.167  
CHEROKEE COUNTY  
 STATION: 11+65.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SINGLE 21'-10" x 5'-8" ALUMINUM BOX CULVERT  
 90° SKEW**

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. **S-2**  
 TOTAL SHEETS **3**

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STATE OF NORTH CAROLINA  
 PROFESSIONAL SEAL  
 19299  
 ENGINEER  
 THOMAS M. HARRIS  
 12/1/2021

DocuSigned By:  
 Thomas Harris

**wsp**

WSP USA Inc.  
 434 FAYETTEVILLE STREET  
 SUITE 1500  
 RALEIGH, NC 27601  
 TEL: 1.919.836.4040  
 LICENSE NO. F-0165

12/1/2021 4:10:00 PM 17BP.14.R.170\_SML\_G002.dgn

DESIGNED BY: J. WHEATLEY DATE: DEC 2021  
 DRAWN BY: M. HOBBS DATE: DEC 2021  
 CHECKED BY: T. HARRIS DATE: DEC 2021  
 DESIGN ENGINEER OF RECORD: T. HARRIS DATE: DEC 2021

**NOTES**

NATIVE MATERIAL EXCAVATED FROM THE EXISTING STREAM BED OR FLOOD PLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION SHALL BE STOCKPILED AND LATER PLACED IN THE PROPOSED CHANNEL BETWEEN SILLS TO PROVIDE A CONTINUOUS LOW FLOW CHANNEL. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

THE STOCKPILED NATIVE MATERIAL SHALL BE PLACED AS SHOWN IN THE "FLOOR SILL LAYOUT" SKETCH TO PROVIDE A 1'-0" DEPTH LOW FLOW CHANNEL BETWEEN LOW FLOW SILLS, AND SHALL BE PLACED TO THE DEPTH OF 1'-6" BETWEEN HIGH FLOW SILL.

SUPPLEMENTAL STONE OF SIMILAR CHARACTERISTICS OF THE NATIVE MATERIAL MAY BE USED AS NECESSARY WITH APPROVAL BY ENGINEER.

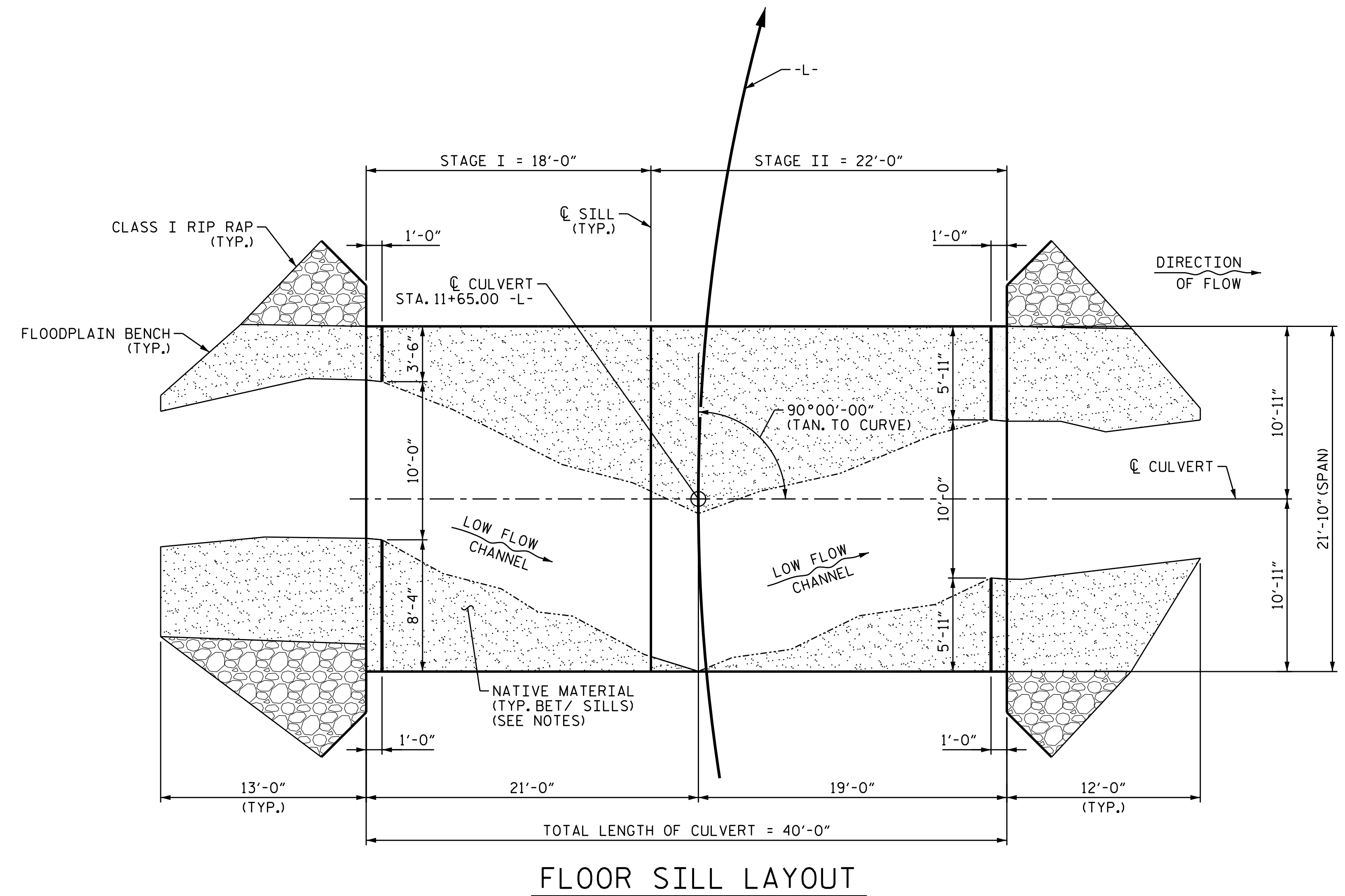
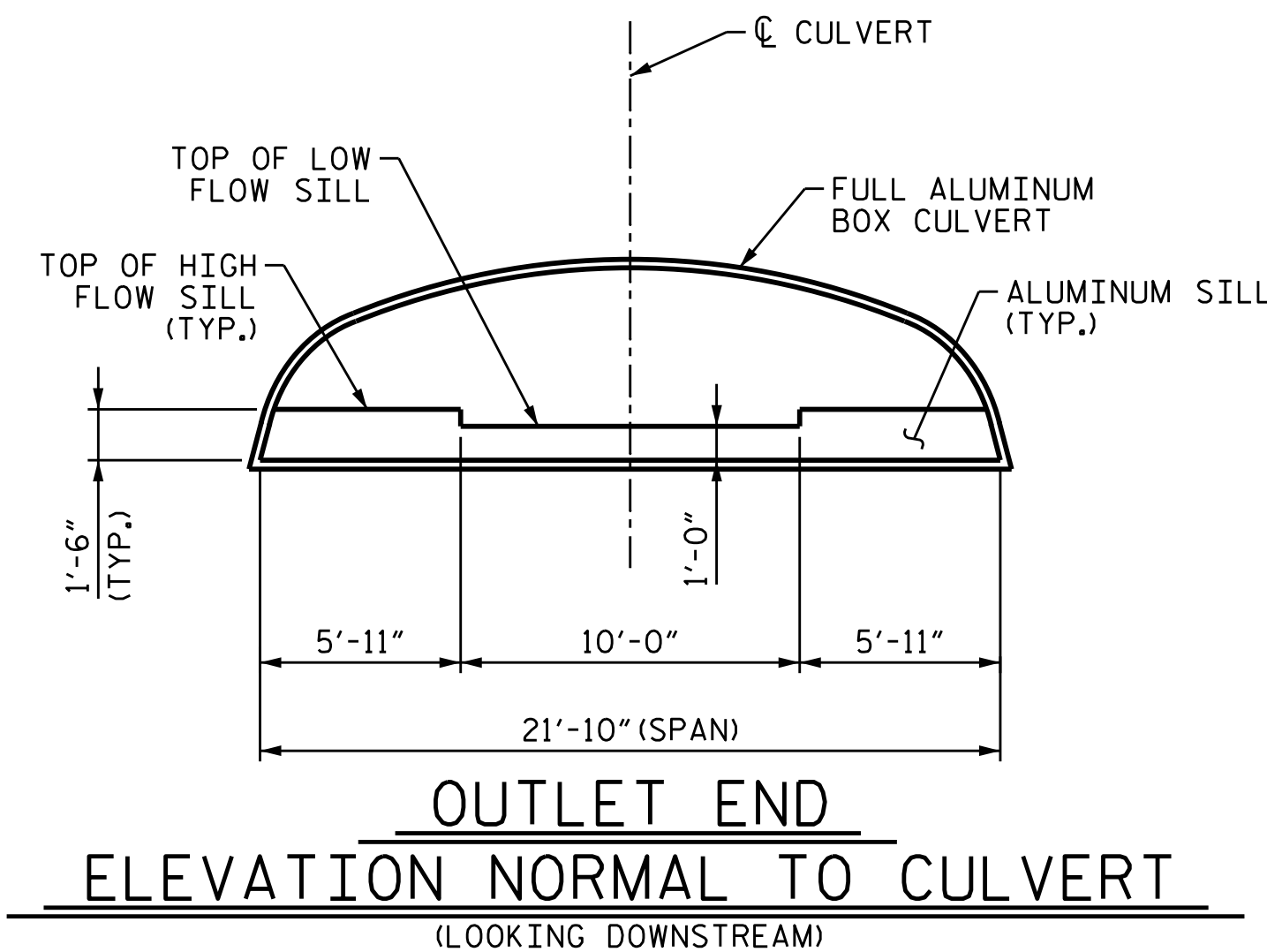
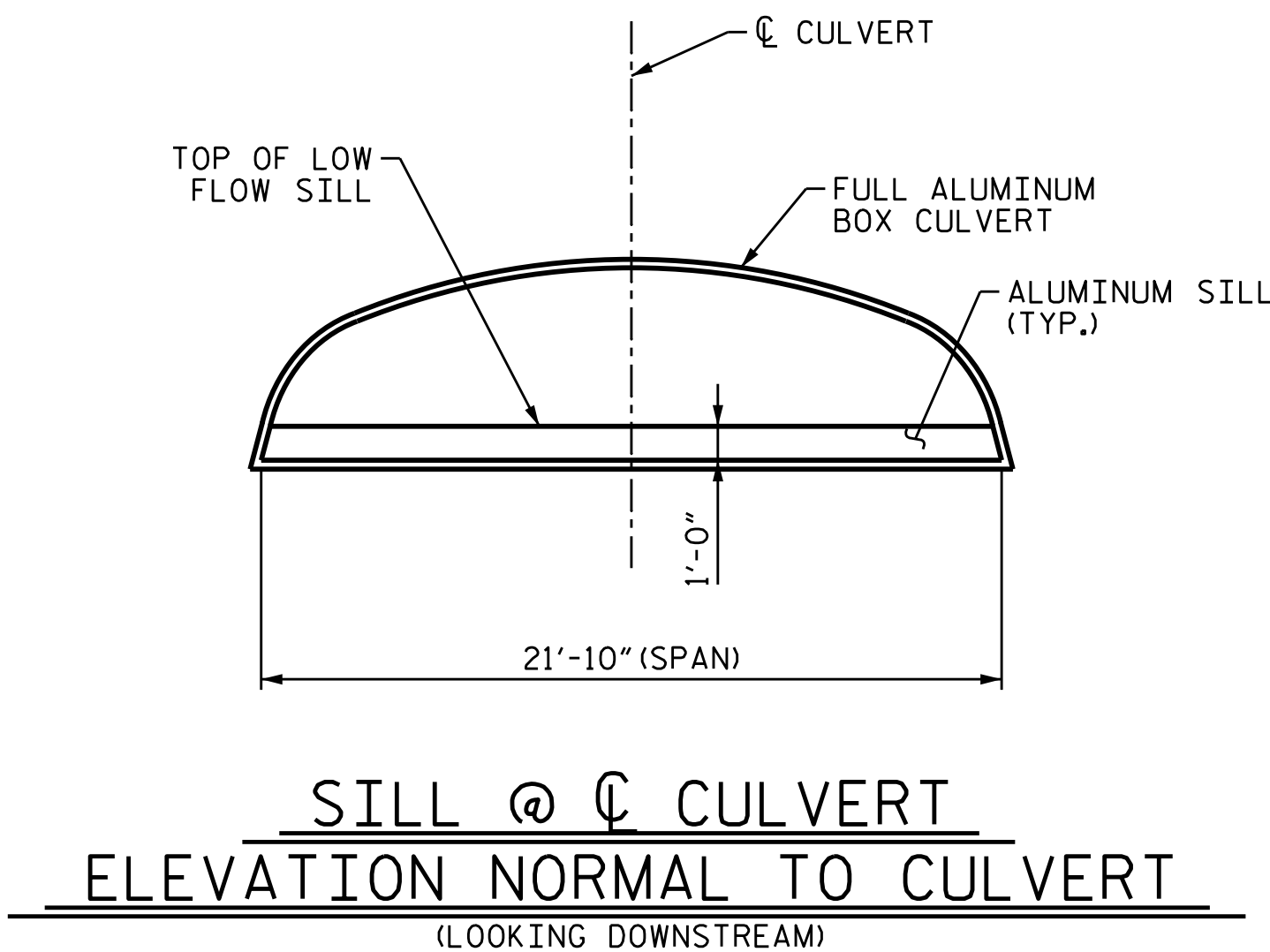
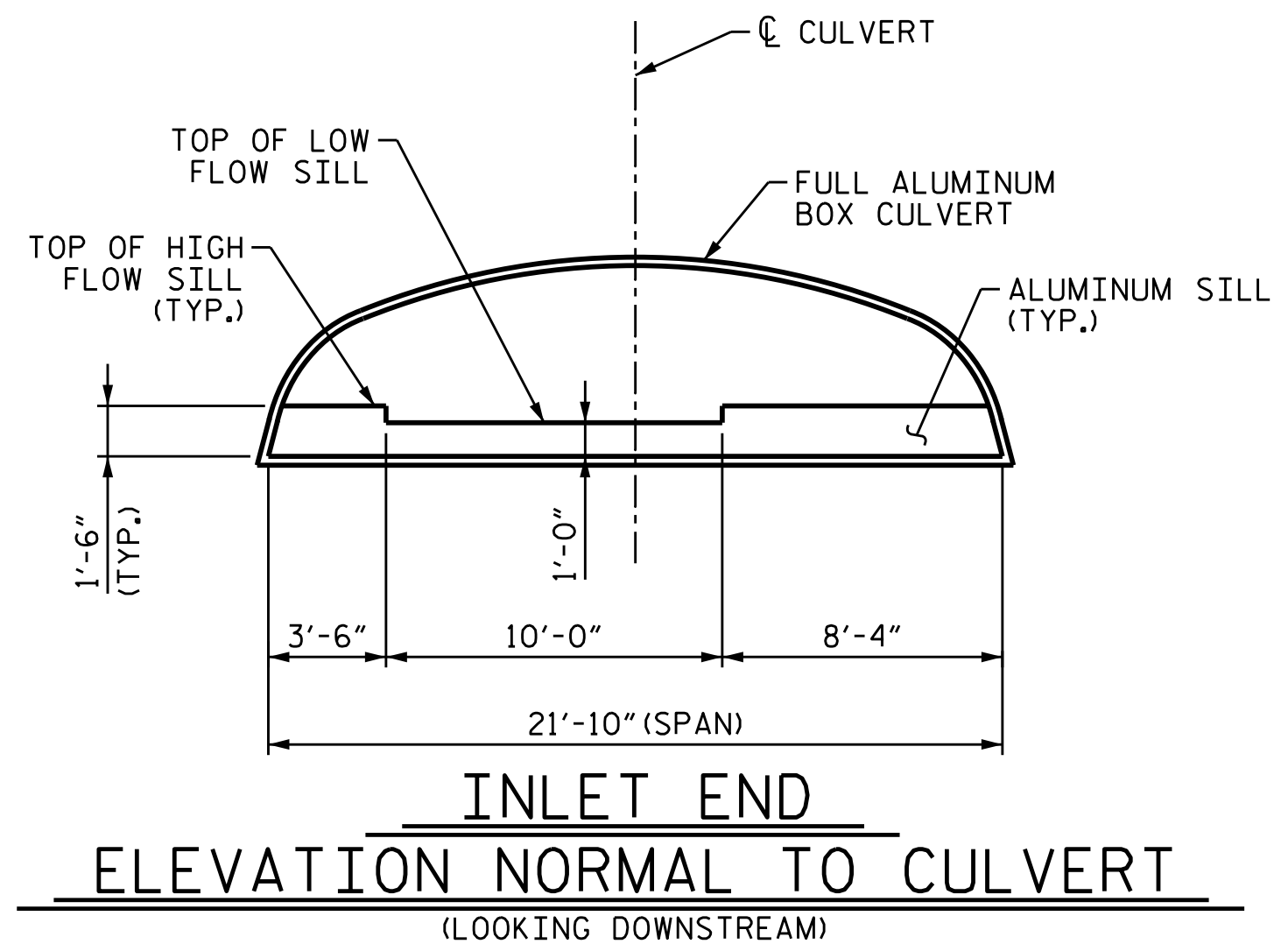
THE ENTIRE COST OF WORK REQUIRED TO PLACE THE EXCAVATED MATERIAL SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR CULVERT EXCAVATION.

THE SILLS ARE ALUMINUM AND BOLTED INTO THE CULVERT.

THE ENTIRE COST OF THE ALUMINUM SILLS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR THE ALUMINUM BOX CULVERT.

TOP OF LOW FLOW SILLS SHOULD MATCH STREAM BED ELEVATION IN LOW FLOW CHANNEL OF STREAM.

DO NOT SET ELEVATION OF HIGH FLOW SILLS ABOVE BANK FILL.



PROJECT NO. 17BP.14.R.167  
CHEROKEE COUNTY  
 STATION: 11+65.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**SINGLE 21'-10" x 5'-8" ALUMINUM BOX CULVERT  
 90° SKEW**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			3

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SEAL 19299  
 ENGINEER  
 THOMAS M. HARRIS  
 12/1/2021

**wsp**

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 DRAWN BY: M. HOBBS DATE: DEC 2021  
 CHECKED BY: T. HARRIS DATE: DEC 2021  
 DESIGN ENGINEER OF RECORD: T. HARRIS DATE: DEC 2021

12/1/2021  
 410\_005\_17BP.14.R.170\_SML\_GD03.dgn

STR. #170

