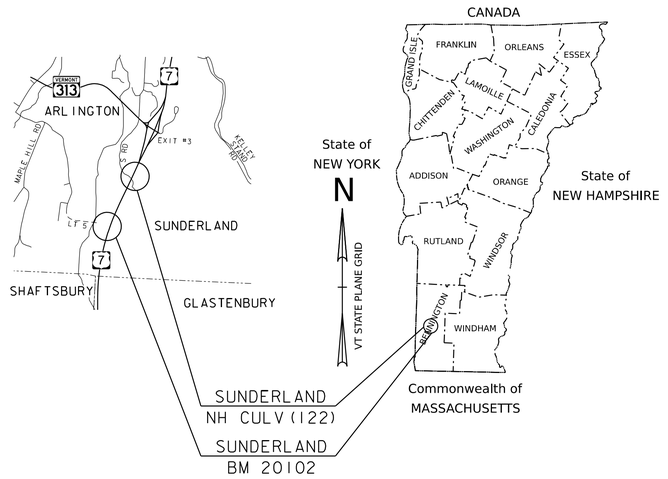
STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
BRIDGE PROJECT

TOWN OF SUNDERLAND
COUNTY OF BENNINGTON



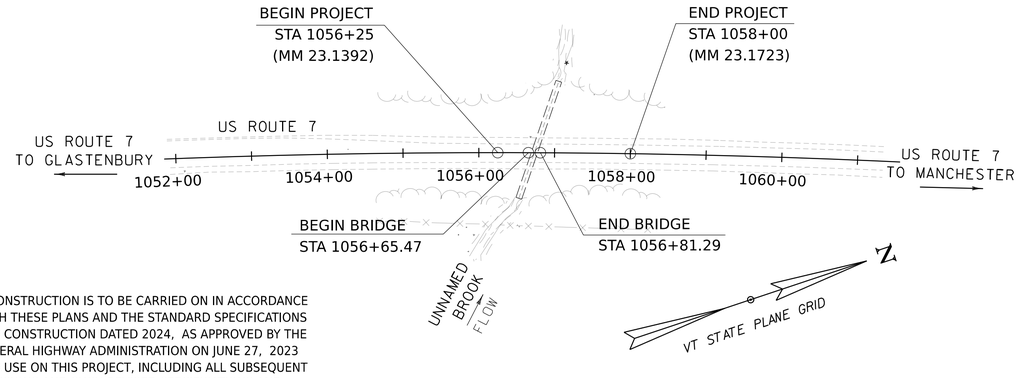
SUNDERLAND BM 20102

ROUTE NO : US ROUTE 7 PRINCIPAL ARTERIAL
BRIDGE NO : 19-5

PROJECT LOCATION: 1.10 MILE SOUTH OF VT ROUTE 313, AT UNNAMED BROOK.

PROJECT DESCRIPTION: REPLACEMENT OF EXISTING BRIDGE STRUCTURE (BRIDGE 19-5) WITH A NEW STRUCTURE WITH RELATED APPROACH ROADWAY AND CHANNEL WORK.

PROJECT LENGTH:
LENGTH OF ROADWAY: 375 FT
LENGTH OF STRUCTURE: 15.82 FT
LENGTH OF PROJECT: 175 FT



CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2024, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JUNE 27, 2023 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL 1

SURVEYED BY : R. GILMAN
SURVEYED DATE : 6-20-2022

DATUM
VERTICAL NAVD 88
HORIZONTAL NAD 83 (2011)

SCALE: 1" = 100'-0"
0 100 200
SCALE

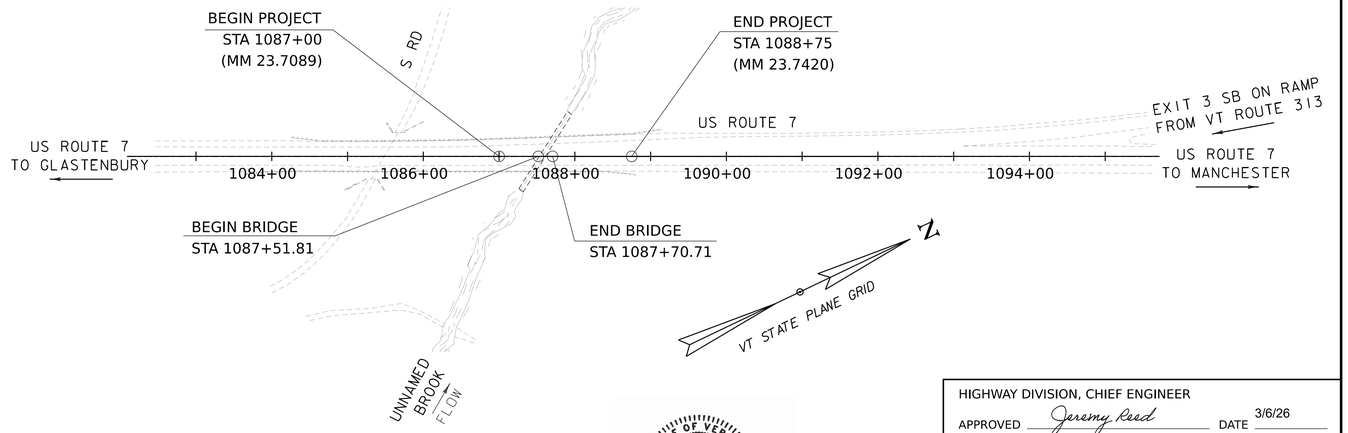
SUNDERLAND NH CULV(122)

ROUTE NO : US ROUTE 7 PRINCIPAL ARTERIAL
BRIDGE NO : 19-7

PROJECT LOCATION: 0.52 MILE SOUTH OF VT ROUTE 313 AT UNNAMED BROOK

PROJECT DESCRIPTION: REPLACEMENT OF EXISTING BRIDGE STRUCTURE (BRIDGE 19-7) WITH A NEW STRUCTURE WITH RELATED APPROACH ROADWAY AND CHANNEL WORK.

PROJECT LENGTH:
LENGTH OF ROADWAY: 375 FT
LENGTH OF STRUCTURE: 18.90 FT
LENGTH OF PROJECT: 175 FT



STATE OF VERMONT
TIMOTHY C. HIGGINSON
NO. 8965
Civil
LICENSED
PROFESSIONAL ENGINEER
3/5/26

HIGHWAY DIVISION, CHIEF ENGINEER
APPROVED Jeremy Reed DATE 3/6/26

PROJECT MANAGER : G. LAROCHE P.E.

PROJECT NAME : SUNDERLAND & SUNDERLAND
PROJECT NUMBER : BM 20102 & NH CULV(122)

SHEET 1 OF 66 SHEETS

COMPOSITE SHEETS

1	COMBINED TITLE SHEET
2	INDEX OF SHEETS
3	COMBINED PROJECT NOTES SHEET
4	CONVENTIONAL SYMBOLOGY LEGEND SHEET

BM 20102 BRIDGE 19-5

5	TITLE SHEET
6	PRELIMINARY INFORMATION SHEET
7	TYPICAL SECTIONS (ROADWAY AND CHANNEL)
8	PROJECT NOTES
9-10	QUANTITY SHEET (1-2)
11	TIE SHEET
12	ALIGNMENT SHEET
13	LAYOUT PLAN
14	TRAFFIC SIGN AND LINE LAYOUT
15	US7 PROFILE - BANKING DIAGRAM
16	MATERIAL TRANSITION
17	BORING INFORMATION SHEET
18-19	BORING LOGS SHEET (1-2)
20	PLAN AND ELEVATION SHEET
21	CULVERT LAYOUT PLAN
22	SUBSTRUCTURE DETAILS
23-26	MAINLINE CROSS SECTIONS (1-4)
27-31	CULVERT CROSS SECTIONS (1-5)
32	EXISTING EPSC SITE PLAN
33	LANDSCAPE PLAN

NH CULV(122) BRIDGE 19-7

34	TITLE SHEET
35	PRELIMINARY INFORMATION SHEET
36	TYPICAL SECTIONS (ROADWAY AND CHANNEL)
37	PROJECT NOTES
38-39	QUANTITY SHEET (1-2)
40	TIE SHEET
41	ALIGNMENT SHEET
42	LAYOUT PLAN
43	TRAFFIC SIGN AND LINE LAYOUT
44	US7 PROFILE - BANKING DIAGRAM
45	MATERIAL TRANSITION
46	BORING INFORMATION SHEET
47	BORING LOGS SHEET 1
48	PLAN AND ELEVATION SHEET
49	CULVERT LAYOUT PLAN
50	SUBSTRUCTURE DETAILS
51-55	MAINLINE CROSS SECTIONS (1-5)
56-60	CULVERT CROSS SECTIONS (1-5)
61	EXISTING EPSC SITE PLAN
62	LANDSCAPE PLAN

COMPOSITE SHEETS

63-65	DETOUR SHEET (1-3)
66	EPSC DETAILS

COMPOSITE DETAILS

HSD-213.01	MILLED RUMBLE STRIPS (SHOULDER)	2/27/2017
HSD-400.01	SAFETY EDGE DETAILS	1/5/2018
HSD-621.01	POST AND BLOCKOUT DETAILS FOR STEEL BEAM GUARDAIL, GALVANIZED	6/9/2015
HSD-621.07A	MIDWEST GUARDRAIL SYSTEM (MGS)	1/4/2021
HSD-621.07B	W-BEAM GUARDRAIL COMPONENTS	4/17/2019
HSD-621.07C	MIDWEST GUARDRAIL SYSTEM (MGS) ANCHOR	4/17/2019
HSD-621.07D	MIDWEST GUARDRAIL SYSTEM (MGS) ANCHOR COMPONENTS	4/17/2019
HSD-621.07E	MIDWEST GUARDRAIL SYSTEM (MGS) ANCHOR COMPONENTS 2	4/17/2019
HSD-621.07F	MIDWEST GUARDRAIL SYSTEM TRANSITION SECTION	1/4/2021

STANDARDS LIST

B5	SLOPE GRADING, EMBANKMENTS, MUCK	06-01-1994
E-1	TREE PLANTING DETAILS	01-31-2025
E-2	SHRUB PLANTING DETAILS	06-25-2024
E-10	ROLLED EROSION CONTROL PRODUCT, TYPE I	04-07-2020
E-12	STABILIZED CONSTRUCTION ENTRANCE	04-07-2020
E-15	SILT FENCE	04-07-2020
G-1	STEEL BEAM GUARDRAIL DETAILS (POST, DELINEATOR, TYPICALS)	06-24-2025
G-1D	STEEL BEAM GUARDRAIL DETAILS (END TERMINAL, ANCHOR, MEDIAN)	06-24-2025
G-19	GENERIC GRADING PLANS FOR GUARDRAIL END TERMINALS	10-02-2018
S-500	CONCRETE DETAILS AND NOTES	02-15-2023
S-501	CONCRETE DETAILS AND NOTES	02-15-2023
T-1	TRAFFIC CONTROL GENERAL NOTES	06-24-2025
T-2	TRAFFIC SIGN GENERAL NOTES	06-24-2025
T-10	CONVENTIONAL ROADS CONSTRUCTION APPROACH SIGNING	06-24-2025
T-11	CONSTRUCTION APPROACH SIGNING DIVIDED HIGHWAY ONE LANE CLOSED	06-24-2025
T-12	TRAFFIC CONTROL DIVIDED HIGHWAY ONE LANE CLOSED	06-24-2025
T-13	TRAFFIC CONTROL DIVIDED HIGHWAY ONE LANE CLOSED	06-24-2025
T-17	TRAFFIC CONTROL MISCELLANEOUS DETAILS	06-24-2025
T-20	TEMPORARY TERMINATION OF EXPRESSWAY AND FREEWAY FACILITIES	06-24-2025
T-28	CONSTRUCTION SIGN DETAILS	06-24-2025
T-29	CONSTRUCTION SIGN DETAILS	06-24-2025
T-30	CONSTRUCTION SIGN DETAILS	02-17-2022
T-31	CONSTRUCTION SIGN DETAILS	06-24-2025
T-35	CONSTRUCTION ZONE LONGITUDINAL DROP-OFFS	06-24-2025
T-36	CONSTRUCTION ZONE LONGITUDINAL DROP-OFFS FOR PAVING	06-24-2025
T-40	DELINEATORS AND MILEPOSTS	06-24-2025
T-42	BRIDGE NUMBER PLAQUE	06-24-2025
T-45	SQUARE TUBE SIGN POST AND ANCHOR	06-24-2025

PROJECT NAME: SUNDERLAND & SUNDERLAND
PROJECT NUMBER: BM 20102 & NH CULV(122)

FILE NAME: z20bl55ind.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
INDEX OF SHEETS

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON

GENERAL NOTES:

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION 2024, AND ITS LATEST REVISIONS, AND THE AASHTO LRFD BRIDGE DESIGN SPECIFICATION 9TH EDITION, DATED 2020, AND ITS LATEST REVISIONS.

2. THE MANUFACTURE OF THE PRECAST UNITS AND ALL DIMENSIONAL TOLERANCES SHALL BE IN ACCORDANCE WITH PCI MNL-116 AND PCI MNL-135, OR WITH THE NPCA QUALITY CONTROL MANUAL FOR PRECAST CONCRETE/PLANTS, UNLESS OTHERWISE NOTED IN THE CONTRACT OR AS APPROVED BY THE ENGINEER.

3. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING CONSISTENCY BETWEEN THE FABRICATOR'S SHOP DRAWINGS AND ENSURING THAT ALL PRECAST COMPONENTS FIT TOGETHER.

4. ALL DIMENSIONS ARE GIVEN AT 68 DEGREES FAHRENHEIT UNLESS NOTED OTHERWISE.

EARTHWORK NOTES:

5. THE REMOVAL OF THE EXISTING STRUCTURE WILL BE PAID UNDER ITEM 529.1500 "REMOVAL OF STRUCTURE". THIS WORK INCLUDES REMOVAL OF THE ENTIRE PIPE AND ANY PORTIONS OF THE EXISTING HEADWALLS AND ALL PARTS OF THE EXISTING STRUCTURE THAT MAY FALL OUTSIDE THE LIMITS OF STRUCTURE EXCAVATION OR UNCLASSIFIED CHANNEL EXCAVATION.

6. THE USE OF EQUIPMENT AND THE METHOD OF BACKFILLING AROUND THE BURIED STRUCTURE SHALL BE IN ACCORDANCE WITH THE FABRICATOR'S RECOMMENDATIONS. CARE SHALL BE TAKEN WHEN BACKFILLING AGAINST JOINT SEALING MATERIALS.

7. ALL STONE FILL SHALL BE KEYED IN AS SHOWN IN THE PLANS. IF BEDROCK IS ENCOUNTERED IN LOCATIONS THAT PROHIBIT THE INSTALLATION OF THE KEY, THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO ANY PLACEMENT. NO PERMANENT STONE FILL SHALL BE PLACED DIRECTLY ON BEDROCK WITHOUT APPROVAL FROM THE ENGINEER.

CONCRETE NOTES:

8. ALL CORNERS OF CONCRETE SHALL BE CHAMFERED 1" PER S-500, UNLESS NOTED OTHERWISE.

9. ALL LIFTING POINTS SHALL BE REMOVABLE OR COVERABLE TO THE MINIMUM CLEAR COVER FOR REINFORCING STEEL SPECIFIED IN THE PLANS. THE LIFTING POINTS SHALL BE DETAILED IN THE APPROPRIATE FABRICATION DRAWING. PAYMENT FOR THIS WORK WILL BE CONSIDERED INCIDENTAL TO THE PRECAST ITEM.

10. ALL RECESSED LIFTING POINTS AND BLOCK OUTS SHALL BE FILLED WITH A TYPE IV MORTAR PER SUBSECTION 540.11 AND 707.01(e). PAYMENT WILL BE CONSIDERED INCIDENTAL TO THE APPROPRIATE PRECAST ITEM.

11. WATER REPELLENT, SILANE SHALL BE FURNISHED IN ACCORDANCE WITH SECTION 514 AND SHALL BE FIELD APPLIED TO ALL EXPOSED EXTERIOR SURFACES OF THE PRECAST CONCRETE STRUCTURE. SILANE WILL BE PAID UNDER ITEM 514.1000 "WATER REPELLENT, SILANE".

REINFORCING STEEL NOTES:

12. CUTTING AND REPAIRING DAMAGED AREAS OF COATED REINFORCING STEEL SHALL BE PERFORMED IN ACCORDANCE WITH SUBSECTION 507.04.

13. REINFORCING STEEL CLEAR COVER REQUIREMENTS ARE STATED ACCORDING TO THE FOLLOWING, UNLESS OTHERWISE NOTED IN THE PLANS:

A.	INSIDE FACES OF BOX	1.5 INCHES
B.	EXPOSED TO EARTH OR WEATHER	2.0 INCHES
C.	TOP OF OUTSIDE FACES OF BOX	2.5 INCHES
D.	DIRECT EXPOSURE TO DEICING SALTS (FRAME FASCIA OR CURB)	3.0 INCHES
E.	CAST AGAINST EARTH	3.0 INCHES

14. TEST BARS SHALL BE PROVIDED IN ACCORDANCE WITH THE "VERMONT AGENCY OF TRANSPORTATION MATERIAL SAMPLING MANUAL" AVAILABLE ON THE AGENCY WEBSITE. ALL COSTS ASSOCIATED WITH PROVIDING BARS FOR TESTING WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE APPROPRIATE PRECAST ITEM.

15. ALL REINFORCING IN THE BOX CULVERT, HEADWALLS, CUTOFF WALLS, RETENTION SILLS AND WINGWALLS SHALL BE CORROSION PROTECTION LEVEL I, PER SECTION 507. PAYMENT WILL BE INCIDENTAL TO PRECAST ITEM.

PRECAST BOX CULVERT / RETAINING WALLS - DESIGN CRITERIA

16. THE PRECAST BOX CULVERT DETAILS ARE SHOWN FOR REFERENCE ONLY. THE ACTUAL DIMENSIONS AND CONFIGURATION WILL BE DEPENDENT ON THE FABRICATOR. THE INSIDE CLEAR DIMENSION, INSIDE HEIGHT, AND LENGTH OF THE BOX CULVERT MAY BE NO LESS THAN SHOWN IN THE TYPICAL SECTIONS AND STRUCTURE DETAILS.

17. THE FABRICATOR SHALL SUPPLY THE STATE WITH THE LRFD LOAD RATING FACTORS FOR THE BOX CULVERT TO COMPLETE THE LOAD RATING TABLE ON THE PRELIMINARY INFORMATION SHEET.

18. BOX CULVERT INLET AND OUTLET FACES SHALL BE PLUMB IN THEIR FINAL POSITION.

19. WATER PROOFING MEMBRANE SYSTEM, TYPE III - MEETING THE REQUIREMENTS OF SUBSECTION 726.08(c) - SHALL BE APPLIED IN TWO-FOOT STRIPS OVER JOINTS IN THE BOX CULVERT. EXTEND THE SHEET MEMBRANE DOWN THE ENTIRE SIDE AND ACROSS THE TOP OF EACH STRUCTURE. COVER THE SIDES OF THE STRUCTURES PRIOR TO THE TOPS. ANY OVERLAPPING OF MEMBRANE SHALL BE DONE IN A SHINGLED STYLE WITH A MINIMUM OVERLAP OF ONE FOOT. A 1" THICK POLYSTYRENE INSULATION BOARD - MEETING THE REQUIREMENTS OF SUBSECTION 735.01 - SHALL BE PLACED OVER THE MEMBRANE PRIOR TO BACKFILLING. PAYMENT FOR THIS WORK AND MATERIALS IS INCIDENTAL TO ITEM 540.1000 "PRECAST CONCRETE STRUCTURE".

TRAFFIC CONTROL NOTES:

20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF A SITE-SPECIFIC TRAFFIC CONTROL PLAN FOR ALL STAGES OF CONSTRUCTION. CLEARLY DETAIL HOW TRAFFIC WILL BE MAINTAINED. SPECIFY ALL CONSTRUCTION ACTIVITIES REQUIRING LANE SHIFTS AND SHOULDER AND ROAD CLOSURES, WITH ENTRY AND EXIT POINTS IDENTIFIED. RELATE THOSE ACTIVITIES TO THE CONSTRUCTION SCHEDULE AND SHOW APPROPRIATE TEMPORARY TRAFFIC CONTROL. FOR LANE SHIFTS AND NIGHT-TIME CLOSURES, A 15 MPH SPEED REDUCTION (DOWN TO 40 MPH) SHALL BE INCLUDED THROUGH THE WORK ZONE. PAYMENT FOR ALL ACTIVITIES AND MATERIALS ASSOCIATED WITH THIS WORK WILL BE INCLUDED IN ITEM 641.1100, "TRAFFIC CONTROL, ALL INCLUSIVE".

21. US ROUTE 7 WILL BE CLOSED AT THE PROJECT BRIDGES FOR THE DURATION OF THE INCENTIVE/DISINCENTIVE (I/D) PERIOD. SIGNED REGIONAL AND LOCAL DETOURS SHALL BE PROVIDED AS SHOWN IN THE PLANS. PAYMENT FOR ALL DETOUR SIGNS SHALL BE INCLUDED IN ITEM 641.1100 "TRAFFIC CONTROL, ALL-INCLUSIVE".

22. FOR GENERAL TRAFFIC CONTROL NOTES SEE VTRANS STANDARD T-1.

23. PAYMENT FOR SIGNAGE, TEMPORARY PAVEMENT MARKINGS, TRAFFIC BARRELS, AND TEMPORARY IMPACT ATTENUATORS WILL BE PAID UNDER ITEM 641.1100. TEMPORARY IMPACT ATTENUATORS SHALL MEET THE REQUIREMENTS OF SUBSECTION 627.06. IF TRUCK MOUNTED ATTENUATORS ARE TO BE USED, THEN THEY SHALL MEET THE REQUIREMENTS OF SUBSECTION 608.02

24. TRAFFIC CONTROL FOR UNIFORMED OFFICERS AND ROADWAY FLAGGERS ARE TO BE PAID FOR UNDER ITEM 630.1000, "UNIFORMED TRAFFIC OFFICERS", AND ITEM 630.1500, "FLAGGERS".

25. SIGNS SHALL BE INSTALLED SO AS NOT TO OBSTRUCT EXISTING SIGNS.

26. ALL VEGETATION THAT INTERFERES WITH VISIBILITY OF SIGNS SHALL BE REMOVED AND PAID FOR UNDER ITEM 201.1000 "CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS".

27. THE CONTRACTOR SHALL PROVIDE ACCESS THROUGH THE WORK ZONE FOR EMERGENCY VEHICLES AT ALL TIMES OR COORDINATE EMERGENCY ROUTES VIA PROJECT DETOUR PRIOR TO THE START OF CONSTRUCTION.

28. PROJECT APPROACH SIGNING AND TEMPORARY TRAFFIC CONTROL SHALL BE IN PLACE BEFORE ANY WORK BEGINS.

29. PORTABLE CHANGEABLE MESSAGE SIGNS WILL BE PAID FOR SEPARATELY UNDER ITEM 641.1500 AND SHALL BE INSTALLED A MINIMUM OF 2 WEEKS PRIOR TO THE START OF THE I/D PERIOD. MESSAGES SHALL BE REVISED AS NECESSARY AS CHANGES IN ACTIVITIES WARRANT. ANY CHANGES TO THE MESSAGE TO BE DISPLAYED, AND THEIR PROPOSED LOCATIONS, SHALL BE SUBMITTED TO THE RESIDENT ENGINEER IN ADVANCE FOR APPROVAL. TURN OFF OR REMOVE PCMS IF MESSAGES DO NOT CONVEY ANY MORE INFORMATION THAN STATIC SIGNS - COORDINATE WITH RESIDENT ENGINEER PRIOR TO TURNING OFF. WHEN IN OPERATING MODE, THE BOTTOM OF THE PCMS MESSAGE PANEL SHALL BE FULLY EXTENDED TO 7 FEET ABOVE THE ROADWAY.

30. TEMPORARY TRAFFIC BARRIER SHALL MEET THE REQUIREMENTS OF SUBSECTION 621.07. PAYMENT FOR FURNISHING, MAINTAINING, INSTALLATION, REMOVAL, AND RESETTING WILL BE INCLUDED UNDER ITEM 641.1100, "TRAFFIC CONTROL, ALL-INCLUSIVE".

MISCELLANEOUS NOTES:

31. THE CONTRACTOR SHALL PROVIDE A SITE-SPECIFIC EROSION PREVENTION AND SEDIMENT CONTROL PLAN IN ACCORDANCE WITH SECTION 653 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION. ESTIMATED QUANTITIES FOR EPSC WORK HAVE BEEN INCLUDED IN THE CONTRACT FOR BIDDING PURPOSES. IF THE CONTRACTOR'S EPSC PLAN REQUIRES ITEMS OF WORK THAT ARE NOT INCLUDED IN THE PLANS IT SHALL BE PAID FOR AS PART OF ITEM 653.0300 "MAINTENANCE OF EPSC PLAN".

32. ALL EXISTING MATERIAL REMOVED AND NOT REUSED OR RESET AS PART OF THIS PROJECT AND ALL WASTE MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF ONLY AT AN APPROVED FACILITY.

33. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE STATUTES AND REGULATIONS RELATING TO THE PREVENTION AND ABATEMENT OF ALL POLLUTION.

34. THE CLEARING OF TREES 3" DBH AND GREATER WITHIN THE PROJECT LIMITS HAS BEEN COMPLETED BY VTRANS. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THE FELLED TREES, AS WELL AS COMPLETE ALL REMAINING CLEARING AND GRUBBING WITHIN THE PROJECT LIMITS. THIS WORK WILL BE PAID FOR UNDER ITEM 201.1000 "CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS".

TEMPORARY TRAFFIC SIGNAL NOTES:

35. SIGNAL TIMING/TIMING ADJUSTMENTS SHALL BE ACCOMPLISHED WITHIN A 48 HOUR PERIOD AND PAYMENT WILL BE INCIDENTAL TO ITEM 641.2200 "TEMPORARY TRAFFIC CONTROL SIGNAL SYSTEM, PORTABLE". SIGNAL FACES SHALL BE LED AND CONSIST OF 12 INCH LENSES (RED, YELLOW AND GREEN).

36. THE BOTTOM OF THE HOUSING OF A SIGNAL FACE SUSPENDED OVER A ROADWAY SHALL NOT BE LESS THAN 16.5 FEET NOR MORE THAN 19.0 FEET ABOVE THE PAVEMENT GRADE AT THE CENTER OF THE ROADWAY. THE BOTTOM OF A SIGNAL FACE NOT MOUNTED OVER A ROADWAY SHALL NOT BE LESS THAN 8.0 FEET NOR MORE THAN 15.0 FEET ABOVE THE GROUND. CAUTION SHOULD BE USED TO ENSURE COMPLIANCE WITH THE HEIGHT REQUIREMENT IN THE EVENT THE NEW APPROACH GRADE DIFFER SIGNIFICANTLY FROM THE FULL ROADWAY GRADE.

37. SIGNAL FACES FOR ANY ONE APPROACH SHALL NOT BE LESS THAN 8 FEET APART MEASURED HORIZONTALLY BETWEEN CENTER FACES.

38. THE CONTRACTOR SHALL HAVE THE OPTION OF INSTALLING SPAN WIRE OR CANTILEVER MAST ARM TRAFFIC SIGNALS IN PLACE OF A PORTABLE SIGNAL SYSTEM. DESIGN OF SUCH SYSTEM, INCLUDING REQUIRED POLE LOCATIONS, ANY REQUIRED GUYING, AND POWER CONNECTION SHALL BE THE RESPONSIBLITY OF THE CONTRACTOR. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 641.2200 "TEMPORARY TRAFFIC CONTROL SIGNAL SYSTEM, PORTABLE".

39. SIGNAL HEAD PLACEMENT IS CRITICAL. HEADS SHALL BE ADJUSTED TO REFLECT LANE LOCATION CHANGES AS REQUIRED.

40. POLES SUPPORTING SPAN WIRES AND/OR MAST ARMS SHALL BE ADEQUATELY BRACED OR GUYED AND SHALL BE PLACED SO AS NOT TO CREATE A HAZARD TO THE TRAVELLING PUBLIC.

41. LUMINAIRES SHALL BE INSTALLED AT EACH OF THE APPROACHES TO ADEQUATELY LIGHT THE STOP BAR AREAS. HIGH PRESSURE SODIUM OR LED LUMINAIRES ARE ACCEPTABLE FORMS OF LAMPS. THE MOUNTING HEIGHT FOR LUMINAIRES SHALL BE DETERMINED BY THE CONTRACTOR. ILLUMINANCE SHALL BE MEASURED AT NIGHTTIME AFTER INSTALLATION AT EACH STOP BAR. ILLUMINANCE SHALL BE NO LESS THAN 1.0 FOOT-CANDLES AND NOT TO EXCEED 2.0 FOOT-CANDLES. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 641.2200 "TEMPORARY TRAFFIC CONTROL SIGNAL SYSTEM, PORTABLE".

42. ALL TEMPORARY SIGNAL EQUIPMENT, SIGNS, ETC. SHALL BELONG TO THE CONTRACTOR AT THE END OF THE PROJECT AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR REMOVAL INCLUDING UTILITY POLES, WIRES, ETC. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 641.2200 "TEMPORARY TRAFFIC CONTROL SIGNAL SYSTEM, PORTABLE".

43. TEMPORARY SIGNALS ALONG THE DETOUR ROUTE SHALL BE INSTALLED PRIOR TO THE START OF THE I/D PERIOD. SIGNALS SHALL BE MAINTAINED THROUGHOUT THE CLOSURE AND REMOVED ONCE CONSTRUCTION OF BOTH CULVERTS IS COMPLETE AND ROUTE 7 IS OPEN TO TRAFFIC. PAYMENT FOR TEMPORARY SIGNALS FOR THE NH CULV(122) CULVERT WILL BE CONSIDERED INCIDENTAL TO THE BM 20102 CULVERT CONTRACT ITEM 641.2200 "TEMPORARY TRAFFIC CONTROL SIGNAL SYSTEM, PORTABLE".

44. APPROVED IN-STREAM WORKING DATES ON SUNDERLAND BM 20102 AND SUNDERLAND NH CULV(122) ARE FROM JULY 1ST TO OCTOBER 1ST (UNLESS OTHERWISE SPECIFIED BY THE RIVER MANAGEMENT ENGINEER). CONTRACTOR PROPOSALS FOR CONSTRUCTION ACTIVITIES IN OR ADJACENT TO FLOWING WATER DURING THE RESTRICTED PERIOD MUST BE ISOLATED FROM STREAM FLOW AND MUST RECEIVE PRIOR APPROVAL FROM THE RIVER MANAGEMENT ENGINEER. PAYMENT FOR THIS WORK WILL BE PAID UNDER ITEM 614.1000 "TEMPORARY RELOCATION OF STREAM", ITEM 653.4500 "FILTER BAG", AND "EPSC PLAN" ITEMS.

PROJECT NAME: SUNDERLAND & SUNDERLAND
PROJECT NUMBER: BM 20102 & NH CULV(122)

FILE NAME: z20bl55gen.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
COMBINED PROJECT NOTES SHEET

PLOT DATE: 3/2/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON

GENERAL INFORMATION

SYMBOLOGY LEGEND NOTE

THE SYMBOLOGY ON THIS SHEET IS INTENDED TO COVER STANDARD CONVENTIONAL SYMBOLOGY. THE SYMBOLOGY IS USED FOR EXISTING & PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROJECT ANNOTATION, AS NOTED ON PROJECT PLAN SHEETS. THIS LEGEND SHEET COVERS THE BASICS. SYMBOLOGY ON PLANS MAY VARY, PLAN ANNOTATIONS AND NOTES SHOULD BE USED TO CLARIFY AS NEEDED.

R.O.W. ABBREVIATIONS (CODES) & SYMBOLS

POINT	CODE	DESCRIPTION
	CH	CHANNEL EASEMENT
	CONST	CONSTRUCTION EASEMENT
	CUL	CULVERT EASEMENT
	D&C	DISCONNECT & CONNECT
	DIT	DITCH EASEMENT
	DR	DRAINAGE EASEMENT
	DRIVE	DRIVEWAY EASEMENT
	EC	EROSION CONTROL
	HWY	HIGHWAY EASEMENT
	I&M	INSTALL & MAINTAIN EASEMENT
	LAND	LANDSCAPE EASEMENT
	R&RES	REMOVE & RESET
	R&REP	REMOVE & REPLACE
	SR	SLOPE RIGHT
	UE	UTILITY EASEMENT
	(P)	PERMANENT EASEMENT
	(T)	TEMPORARY EASEMENT
■	BNDNS	BOUND SET
⧈	BNDNS	BOUND TO BE SET
●	IPNS	IRON PIN SET
◎	IPNS	IRON PIN TO BE SET
⊠	CALC	EXISTING ROW POINT
○	PROW	PROPOSED ROW POINT
[LENGTH]		LENGTH CARRIED ON NEXT SHEET

COMMON TOPOGRAPHIC POINT SYMBOLS

POINT	CODE	DESCRIPTION
	APL	BOUND APPARENT LOCATION
	BM	BENCHMARK
	BND	BOUND
	CB	CATCH BASIN
	COMB	COMBINATION POLE
	DITHR	DROP INLET THROATED DNC
	EL	ELECTRIC POWER POLE
	FPOLE	FLAGPOLE
	GASFIL	GAS FILLER
	GP	GUIDE POST
	GSO	GAS SHUT OFF
	GUY	GUY POLE
	GUYW	GUY WIRE
	GV	GATE VALVE
	H	TREE HARDWOOD
	HCTRL	CONTROL HORIZONTAL
	HVCTRL	CONTROL HORIZ. & VERTICAL
	HYD	HYDRANT
	IP	IRON PIN
	IPIPE	IRON PIPE
	LI	LIGHT - STREET OR YARD
	MB	MAILBOX
	MH	MANHOLE (MH)
	MM	MILE MARKER
	PM	PARKING METER
	PMK	PROJECT MARKER
	POST	POST STONE/WOOD
	RRSIG	RAILROAD SIGNAL
	RRSL	RAILROAD SWITCH LEVER
	S	TREE SOFTWOOD
	SAT	SATELLITE DISH
	SHRUB	SHRUB
	SIGN	SIGN
	STUMP	STUMP
	TEL	TELEPHONE POLE
	TIE	TIE
	TSIGN	SIGN W/DOUBLE POST
	VCTRL	CONTROL VERTICAL
	WELL	WELL
	WSO	WATER SHUT OFF

THESE ARE COMMON VAOT SURVEY POINT SYMBOLS FOR EXISTING FEATURES, ALSO USED FOR PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROPOSED ANNOTATION.

PROPOSED GEOMETRY CODES

CODE	DESCRIPTION
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
CC	CENTER OF CURVE
PT	POINT OF TANGENCY
PCC	POINT OF COMPOUND CURVE
PRC	POINT OF REVERSE CURVE
POB	POINT OF BEGINNING
POE	POINT OF ENDING
STA	STATION PREFIX
AH	AHEAD STATION SUFFIX
BK	BACK STATION SUFFIX
D	CURVE DEGREE OF (100FT)
R	CURVE RADUIS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE

UTILITY SYMBOLOGY

UNDERGROUND UTILITIES

- UGU — UTILITY (GENERIC-UNKNOWN)
- UT — TELEPHONE
- UE — ELECTRIC
- UC — CABLE (TV)
- UEC — ELECTRIC+CABLE
- UET — ELECTRIC+TELEPHONE
- UCT — CABLE+TELEPHONE
- UECT — ELECTRIC+CABLE+TELEP.
- G — GAS LINE
- W — WATER LINE
- S — SANITARY SEWER (SEPTIC)

ABOVE GROUND UTILITIES (AERIAL)

- AGU — UTILITY (GENERIC-UNKNOWN)
- T — TELEPHONE
- E — ELECTRIC
- C — CABLE (TV)
- EC — ELECTRIC+CABLE
- ET — ELECTRIC+TELEPHONE
- AER E&T — ELECTRIC+TELEPHONE
- CT — CABLE+TELEPHONE
- ECT — ELECTRIC+CABLE+TELEP.
- UTILITY POLE GUY WIRE

PROJECT CONSTRUCTION SYMBOLOGY

PROJECT DESIGN & LAYOUT SYMBOLOGY

- CZ — CLEAR ZONE
- PLAN LAYOUT MATCH LINE

PROJECT CONSTRUCTION FEATURES

- TOP OF CUT SLOPE
- TOE OF FILL SLOPE
- STONE FILL
- BOTTOM OF DITCH ℄
- CULVERT PROPOSED
- STRUCTURE SUBSURFACE
- PDF — PDF — PROJECT DEMARCATION FENCE
- BF — BF — BARRIER FENCE
- TREE PROTECTION ZONE (TPZ)
- STRIPING LINE REMOVAL
- SHEET PILES

CONVENTIONAL BOUNDARY SYMBOLOGY

BOUNDARY LINES

- TOWN LINE — TOWN BOUNDARY LINE
- COUNTY LINE — COUNTY BOUNDARY LINE
- STATE LINE — STATE BOUNDARY LINE
- PROPOSED STATE R.O.W. (LIMITED ACCESS)
- PROPOSED STATE R.O.W.
- STATE ROW (LIMITED ACCESS)
- STATE ROW
- TOWN ROW
- PERMANENT EASEMENT LINE (P)
- TEMPORARY EASEMENT LINE (T)
- SURVEY LINE
- P L P L — PROPERTY LINE (P/L)
- SR SR SR — SLOPE RIGHTS
- 6f — 6f — 6F PROPERTY BOUNDARY
- 4f — 4f — 4F PROPERTY BOUNDARY
- HAZ — HAZ — HAZARDOUS WASTE

EPSC LAYOUT PLAN SYMBOLOGY

EPSC MEASURES

- FILTER CURTAIN
- SILT FENCE
- SILT FENCE WOVEN WIRE
- CHECK DAM
- DISTURBED AREAS REQUIRING RE-VEGETATION
- EROSION MATTING

SEE EPSC DETAIL SHEETS FOR ADDITIONAL SYMBOLOGY

ENVIRONMENTAL RESOURCES

- WETLAND BOUNDARY
- RIPARIAN BUFFER ZONE
- WETLAND BUFFER ZONE
- SOIL TYPE BOUNDARY
- T&E — THREATENED & ENDANGERED SPECIES
- HAZ — HAZ — HAZARDOUS WASTE AREA
- AG — AGRICULTURAL LAND
- HABITAT — FISH & WILDLIFE HABITAT
- FLOOD PLAIN — FLOOD PLAIN
- OHW — ORDINARY HIGH WATER (OHW)
- STORM WATER
- USDA FOREST SERVICE LANDS
- WILDLIFE HABITAT SUIT/CONN
- BAT — BAT HABITAT

ARCHEOLOGICAL & HISTORIC

- ARCH — ARCHEOLOGICAL BOUNDARY
- HISTORIC DIST — HISTORIC DISTRICT BOUNDARY
- HISTORIC — HISTORIC AREA
- (H) HISTORIC STRUCTURE

CONVENTIONAL TOPOGRAPHIC SYMBOLOGY

EXISTING FEATURES

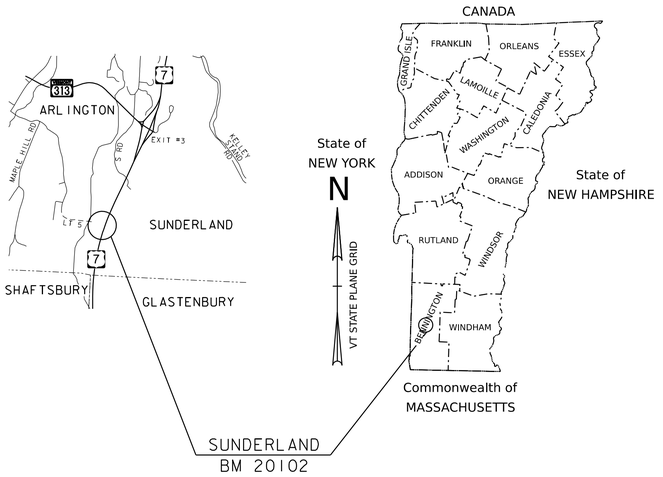
- ROAD EDGE PAVEMENT
- ROAD EDGE GRAVEL
- DRIVEWAY EDGE
- DITCH
- FOUNDATION
- FENCE (EXISTING)
- FENCE WOOD POST
- FENCE STEEL POST
- GARDEN
- ROAD GUARDRAIL
- RAILROAD TRACKS
- CULVERT (EXISTING)
- STONE WALL
- WALL
- WOOD LINE
- BRUSH LINE
- HEDGE
- BODY OF WATER EDGE
- LEDGE EXPOSED

PROJECT NAME: SUNDERLAND & SUNDERLAND
PROJECT NUMBER: BM 20102 & NH CULV(122)

FILE NAME: z20bl55legend.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
CONVENTIONAL SYMBOLOGY LEGEND SHEET

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 4 OF 66

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
BRIDGE PROJECT

TOWN OF SUNDERLAND

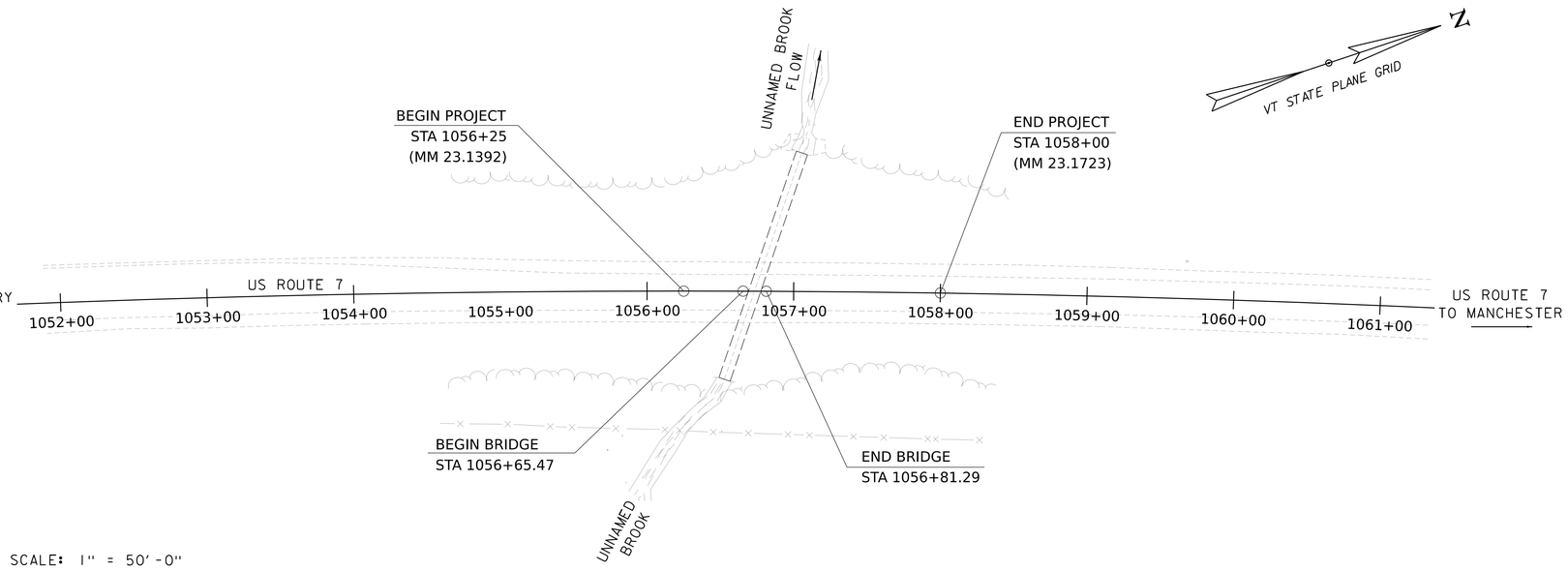
COUNTY OF BENNINGTON

ROUTE NO : US ROUTE 7 PRINCIPAL ARTERIAL BRIDGE NO : 19-5

PROJECT LOCATION: 1.10 MILE SOUTH OF VT ROUTE 313, AT UNNAMED BROOK.

PROJECT DESCRIPTION: REPLACEMENT OF EXISTING BRIDGE STRUCTURE (BRIDGE 19-5) WITH A NEW STRUCTURE WITH RELATED APPROACH ROADWAY AND CHANNEL WORK.

PROJECT LENGTH:
- LENGTH OF ROADWAY: 375 FT
- LENGTH OF STRUCTURE: 15.82 FT
- LENGTH OF PROJECT: 175 FT



CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2024, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JUNE 27, 2023 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL 1

SURVEYED BY : R. GILMAN

SURVEYED DATE : 6-20-2022

DATUM

VERTICAL NAVD 88

HORIZONTAL NAD 83 (2011)

SCALE: 1" = 50'-0"

0 50 100

SCALE

PROJECT MANAGER : G. LAROCHE, P.E.

PROJECT NAME : SUNDERLAND

PROJECT NUMBER : BM 20102

SHEET 5 OF 66 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (CULVERT)

Version
LRFD

INDEX OF SHEETS

PLAN SHEETS

SEE INDEX OF SHEETS FOR SUNDERLAND BM 20102 INDEX

STANDARDS LIST

DETAIL SHEETS

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: 12/05/2024

DRAINAGE AREA : 0.36 Sq.mi
CHARACTER OF TERRAIN :
STREAM CHARACTERISTICS :
NATURE OF STREAMBED :

PEAK FLOW DATA

Q 2.33 =	32 cfs	Q 50 =	140 cfs
Q 10 =	76 cfs	Q 100 =	180 cfs
Q 25 =	110 cfs	Q 500 =	

DATE OF FLOOD OF RECORD : Unknown
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY :
ICE CONDITIONS :
DEBRIS:
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY?
IS ORDINARY RISE RAPID?
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS?
IF YES, DESCRIBE:

WATERSHED STORAGE: 0.0%
HEADWATERS:
UNIFORM:
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Corrugated Metal Pipe Plate Arch
YEAR BUILT: 1978
CLEAR SPAN(NORMAL TO STREAM): 8.2 ft
VERTICAL CLEARANCE ABOVE STREAMBED: 5.8 ft
WATERWAY OF FULL OPENING: 162 ft
DISPOSITION OF STRUCTURE: Replacement
TYPE OF MATERIAL UNDER SUBSTRUCTURE: See Borings

WATER SURFACE ELEVATIONS AT:

Q2.33 =		VELOCITY =	
Q10 =		"	
Q25 =		"	
Q50 =		"	
Q100 =		"	

LONG TERM STREAMBED CHANGES:

IS THE ROADWAY OVERTOPPED BELOW Q100: N/A
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @Q100: N/A

UPSTREAM STRUCTURE

TOWN: DISTANCE:
HIGHWAY # : STRUCTURE #:
CLEAR SPAN: CLEAR HEIGHT:
YEAR BUILT: FULL WATERWAY:
STRUCTURE TYPE:

DOWNSTREAM STRUCTURE

TOWN: DISTANCE:
HIGHWAY # : STRUCTURE #:
CLEAR SPAN: CLEAR HEIGHT:
YEAR BUILT: FULL WATERWAY:
STRUCTURE TYPE:

PROPOSED STRUCTURE

STRUCTURE TYPE: Concrete Box Culvert

CLEAR SPAN(NORMAL TO STREAM): 14.0 ft
VERTICAL CLEARANCE ABOVE STREAMBED: 6.0 ft
WATERWAY OF FULL OPENING: 923.84 ft

WATER SURFACE ELEVATIONS AT:

Q2.33 =	930.16 ft	VELOCITY=	4.11 fps
Q10 =	930.79 ft	"	5.76 fps
Q25 =	931.24 ft	"	6.67 fps
Q50 =	931.59 ft	"	7.33 fps
Q100 =	932.02 ft	"	8.10 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: N/A
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @Q100: N/A

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE:
VERTICAL CLEARANCE: @ Q =

SCOUR: N/A

REQUIRED CHANNEL PROTECTION: Stone Fill, Type II

PERMIT INFORMATION

AVERAGE DAILY FLOW:		DEPTH OR ELEVATION:
ORDINARY LOW WATER:		
ORDINARY HIGH WATER:		

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: N/A
CLEAR SPAN (NORMAL TO STREAM): N/A
VERTICAL CLEARANCE ABOVE STREAMBED: N/A
WATERWAY AREA OF FULL OPENING: N/A

ADDITIONAL INFORMATION

E-Stone Fill, Type II to be used for all in-channel work

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TRAFFIC ON AN OFF SITE DETOUR DURING THE TIME THE EXISTING ROADWAY WILL BE CLOSED.
2. SIDEWALKS ARE NOT NECESSARY.

DESIGN VALUES

1.	DESIGN LIVE LOAD		HL-93
2.	FUTURE PAVEMENT	d_p:	0.0 INCH
3.	CULVERT OPENING	D:	14.00 FT
4.	MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	---
5.	PRESTRESSING STRAND	f_y:	---
6.	PRESTRESSED CONCRETE STRENGTH	f'_c:	---
7.	PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	---
8.	HIGH PERFORMANCE CONCRETE, CLASS PCD	f'_c:	---
9.	HIGH PERFORMANCE CONCRETE, CLASS PCS	f'_c:	---
10.	CONCRETE HIGH PERFORMANCE, CLASS SCC	f'_c:	---
11.	CONCRETE, CLASS C	f'_c:	---
12.	REINFORCING STEEL	f_y:	60 KSI
13.	STRUCTURAL STEEL AASHTO M270	f_y:	---
14.	NOMINAL BEARING RESISTANCE OF SOIL	q_n:	---
15.	SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
16.	NOMINAL BEARING RESISTANCE OF ROCK	q_n:	---
17.	ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
18.	PILE RESISTANCE FACTOR	ϕ:	---
19.	LATERAL PILE DEFLECTION	Δ:	---
20.	BASIC WIND SPEED	V_{3s}:	---
21.	MINIMUM GROUND SNOW LOAD	p_g:	---
22.	SEISMIC DATA	S_s:	---
	PGA: ---	S_1:	---
23.			---
24.			---
25.			---
26.			---

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY							
POSTING							
OPERATING							
COMMENTS:	TABLE TO BE COMPLETED BY CONTRACTOR'S DESIGNER						

CULVERT DESIGN CRITERIA

1. PROPOSED CULVERT IS A PRECAST CONCRETE BOX (14'-0" X 8'-0" X 125'-0" BOX).
2. CULVERT WILL REQUIRE AQUATIC ORGANISM PASSAGE (AOP).

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2027	7760	950	51	5.3	470
2047	8520	1050	51	6.3	615

20 year ESAL for flexible pavement from 2027 to 2047 : 3341500
40 year ESAL for flexible pavement from 2027 to 2067 : 7072000
Design Speed : 55 mph

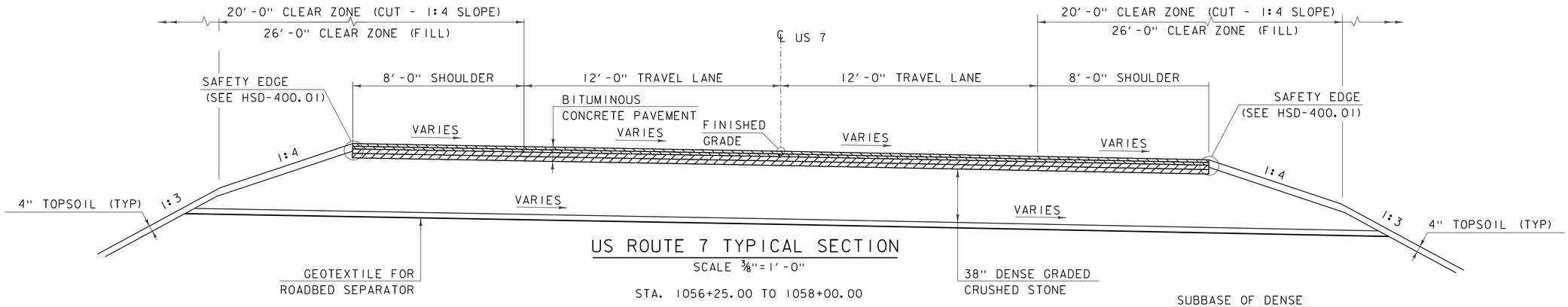
AS BUILT "REBAR" DETAIL

LEVEL I	LEVEL II	LEVEL III
TYPE:	TYPE:	TYPE:
GRADE:	GRADE:	GRADE:

PROJECT NAME: **SUNDERLAND**
PROJECT NUMBER: **BM 20102**

FILE NAME: **X20B155FORMS.DGN**
PROJECT LEADER: **A. STOCKIN**
DESIGNED BY: **M. GROTE**
PRELIMINARY INFORMATION SHEET 1

PLOT DATE: **6/12/2025**
DRAWN BY: **M. HERMIS**
CHECKED BY: **T. HIGGINSON**



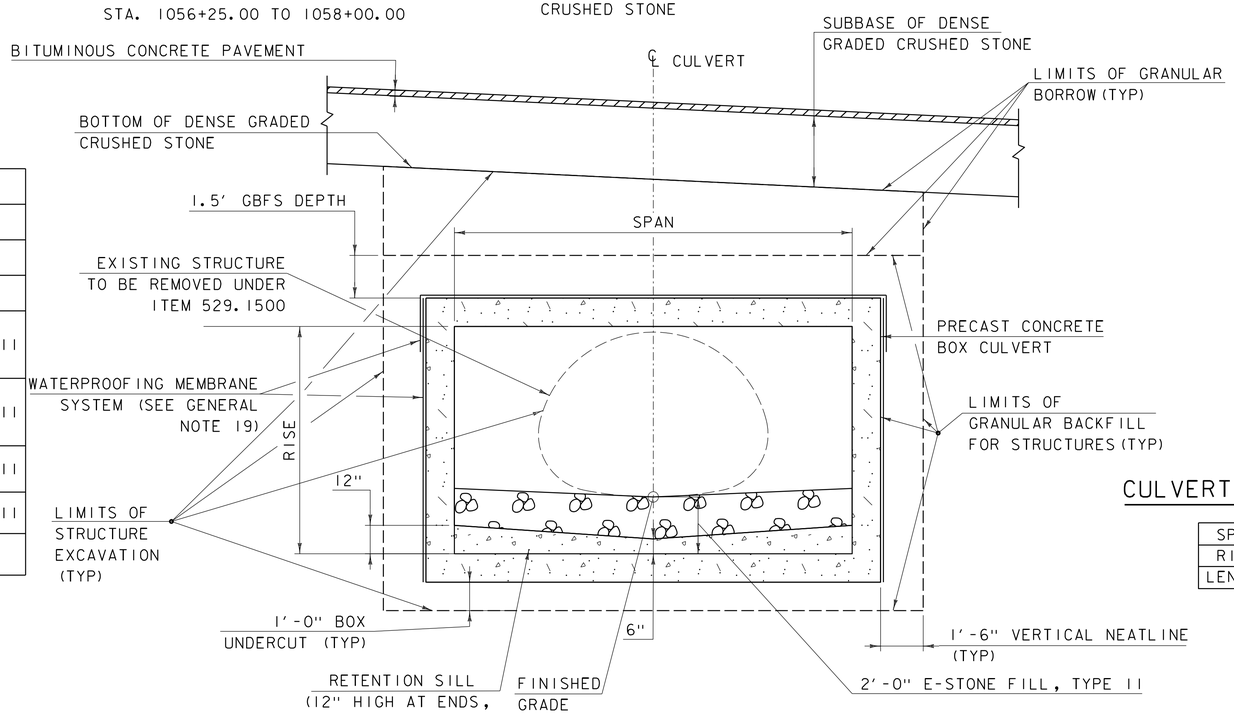
US ROUTE 7 TYPICAL SECTION

SCALE 3/8"=1'-0"

STA. 1056+25.00 TO 1058+00.00

BITUMINOUS CONCRETE PAVEMENT MATERIAL REQUIREMENTS

	THICKNESS	DESCRIPTION
ESAL	1,704,165	DESIGN LANE/DESIGN LIFE ESAL
BINDER	58E-28	PERFORMANCE GRADE ASPHALT BINDER
GYRATION	65	DESIGN NUMBER OF GYRATIONS
WEARING COURSE	1½"	BITUMINOUS CONCRETE PAVEMENT, TYPE IVS, QA TIER III
INTERMEDIATE COURSE	1½"	BITUMINOUS CONCRETE PAVEMENT, TYPE IVS, QA TIER III
BASE COURSE #2	2½"	BITUMINOUS CONCRETE PAVEMENT, TYPE IIS, QA TIER III
BASE COURSE #1	2½"	BITUMINOUS CONCRETE PAVEMENT, TYPE IIS, QA TIER III
BASE	38"	DENSE GRADED CRUSHED STONE

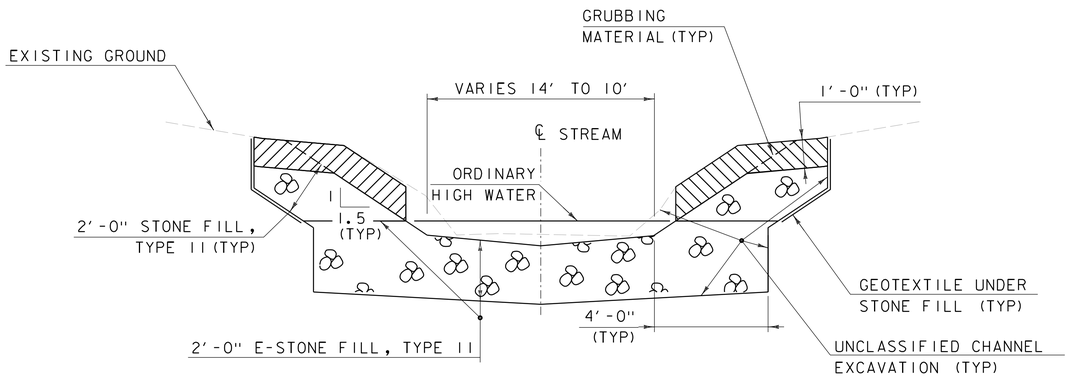


CULVERT REQUIREMENTS

SPAN	14'-0"
RISE	8'-0"
LENGTH	125'-0"

CULVERT TYPICAL SECTION

(NOT TO SCALE)



TYPICAL CHANNEL SECTION

(NOT TO SCALE)

NOTE:

1) WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF THE ROADWAY SUBBASE.

2) THE CONTRACTOR SHALL CREATE A LOW FLOW CHANNEL IN THE STREAM BED MATERIAL AS DIRECTED BY THE ENGINEER.

3) WHENEVER BEDROCK IS ENCOUNTERED DURING EXCAVATION OF THE CHANNEL KEY OR FILL SLOPES, THE ENGINEER WILL COORDINATE WITH THE RIVER MANAGEMENT ENGINEER FOR APPROVAL OF HOW TO CONSTRUCT THE CHANNEL.

4) REUSE OF NATIVE MATERIAL MEETING THE SPECIFICATION OF GRANULAR BORROW IS PERMITTED.

MATERIAL TOLERANCES

(IF USED ON PROJECT)

SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- ¼"
- AGGREGATE SURFACE COURSE	+/- ½"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BM 20102

FILE NAME: z20bl55typ.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
TYPICAL SECTIONS

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 7 OF 66

PRECAST BOX CULVERT / RETAINING WALLS - DESIGN CRITERIA

1. THE PRECAST CONCRETE BOX CULVERT, HEADWALLS, WINGWALLS, CUTOFF WALLS, AND RETENTION SILLS SHALL BE DESIGNED BY THE FABRICATOR IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS REFERENCED IN COMBINED PROJECT NOTES 1. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS AND CALCULATIONS TO THE ENGINEER IN ACCORDANCE WITH SECTION 105 AND SUBSECTION 540.04. USE THE FOLLOWING DESIGN CRITERIA AND GEOMETRIC REQUIREMENTS DEFINED IN THE PLANS:

    A. SOIL UNIT WEIGHT = 140 PCF (GRANULAR BACKFILL FOR STRUCTURES)
    B. AT-REST EARTH PRESSURE (K0) = 0.44
    C. DESIGN CODE = AASHTO LRFD LATEST EDITION/HL93
    D. DESIGN FILL OVER BOX CULVERT (MAX) = 12.5 FEET
    E. FACTORED BEARING RESISTANCE = 9.8 (FOR STRENGTH LIMIT STATE, USING FACTOR OF 0.45)
    F. FACTORED BEARING RESISTANCE = 6.8 (FOR SERVICE LIMIT STATE, USING FACTOR OF 1.0)
    G. REQUIRED DESIGN LIFE = 75 YEARS

2. A BRIDGE PLAQUE FURNISHED BY THE AGENCY SHALL BE CAST INTO WING WALL NO. 2. SEE S-501 FOR FURTHER DETAILS.

3. THE BOX CULVERT HEADWALLS, CUTOFF WALLS, RETENTION SILLS AND WINGWALLS SHALL BE CONSIDERED INCIDENTAL TO ITEM 540.1000 "PRECAST CONCRETE STRUCTURE (14 FT x 8 FT x 125 FT BOX CULVERT)".

wsp

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BM 20102

FILE NAME: z20bl55gen.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
PROJECT NOTES SHEET

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 8 OF 66

STATE OF VERMONT

AGENCY OF TRANSPORTATION

QUANTITY SHEET

SUMMARY OF ESTIMATED QUANTITIES

1011 - ROADWAY	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND
		157,920.00			157,920.00		DL	INCENTIVE OR DISINCENTIVE (N.A. B.I.)	199.8101	
1.00					1.00		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS (BRIDGE 19-5)	201.1000	
1,625.00					1,625.00		CY	COMMON EXCAVATION	203.1500	
		350.00			350.00		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.2700	
380.00					380.00		CY	GRANULAR BORROW	203.3200	
1.00					1.00		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.2200	
		1,300.00			1,300.00		CY	STRUCTURE EXCAVATION	204.2500	
		400.00			400.00		CY	GRANULAR BACKFILL FOR STRUCTURES	204.3000	
675.00					675.00		SY	COARSE-MILLING, BITUMINOUS PAVEMENT	210.1000	
1,450.00					1,450.00		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.3500	
21.00					21.00		GWT	TACK COAT, EMULSIFIED ASPHALT	404.1100	
315.00					315.00		TON	BITUMINOUS CONCRETE PAVEMENT, TY PE IIS, QA TIER III	406.0230	
270.00					270.00		TON	BITUMINOUS CONCRETE PAVEMENT, TY PE IVS, QA TIER III	406.0430	
1.00					1.00		DL	PAY ADJUSTMENT, BCP, MIXTURE PROPERTIES (N.A.B.I.)	406.9100	
1.00					1.00		DL	PAY ADJUSTMENT, BCP, MAT DENSITY (N.A.B.I.)	406.9200	
		4.00			4.00		GAL	WATER REPELLENT, SILANE	514.1000	
		1.00			1.00		EACH	REMOVAL OF STRUCTURE (8.2 FT X 5.8 FT X 162 FT CGMPPA)	529.1500	
		1.00			1.00		LS	PRECAST CONCRETE STRUCTURE (14 FT X 8 FT X 125 FT BOX CULVERT)	540.1000	
		250.00			250.00		CY	E-STONE FILL, TY PE II	613.0602	
		10.00			10.00		CY	STONE FILL, TY PE I	613.1001	
		120.00			120.00		CY	STONE FILL, TY PE II	613.1002	
		1.00			1.00		EACH	TEMPORARY RELOCATION OF STREAM (BRIDGE 19-5)	614.1000	
104.00					104.00		HR	UNIFORMED TRAFFIC OFFICERS	630.1000	
152.00					152.00		HR	FLAGGERS	630.1500	
			1.00		1.00		LS	FIELD OFFICE, ENGINEER'S (BRIDGE 19-5)	631.1000	
			1.00		1.00		LS	TESTING EQUIPMENT, BITUMINOUS (BRIDGE 19-5)	631.1700	
			1.00		1.00		LS	TESTING EQUIPMENT, GROUT (BRIDGE 19-5)	631.1900	
			1,500.00		1,500.00		DL	FIELD OFFICE COMMUNICATIONS (N.A. B.I.)	631.2600	
1.00					1.00		LS	MOBILIZATION/DEMOBILIZATION (BRIDGE 19-5)	635.1100	
1.00					1.00		LS	TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 19-5)	641.1100	
6.00					6.00		EACH	PORTABLE CHANGEABLE MESSAGE SIGN	641.1500	
2.00					2.00		EACH	TEMPORARY TRAFFIC CONTROL SIGNAL SYSTEM, PORTABLE	641.2200	
750.00					750.00		LF	6 INCH WHITE LINE, WATERBORNE PAINT	646.2141	
750.00					750.00		LF	6 INCH YELLOW LINE, WATERBORNE PAINT	646.2151	
400.00					400.00		SF	PAVEMENT MARKING MASK	646.8600	
2,000.00					2,000.00		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.1100	
		360.00			360.00		SY	GEOTEXTILE UNDER STONE FILL	649.3100	
	2,100.00				2,100.00		SY	TURF ESTABLISHMENT, SPECIALTY SEED (POLLINATOR DRY MIX)	651.1600	
	230.00				230.00		CY	TOPSOIL	651.3500	
	50.00				50.00		SY	GRUBBING MATERIAL, 12 INCH	651.4012	
	1.00				1.00		LS	EPSC PLAN (BRIDGE 19-5)	653.0100	

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS
		EARTHWORK SUMMARY
		FILL AVAILABLE
1,625.0	CY	COMMON EXCAVATION(1625 X 1.0)
105.0	CY	UNCLASSIFIED CHANNEL EXCAVATION(350 X 0.3)
390.0	CY	STRUCTURE EXCAVATION(1300 X 0.3)
80.0	CY	ROUNDING
2,200.0	CY	TOTAL FILL AVAILABLE
		FILL REQUIRED
69.0	CY	FACTORED FILL REQUIRED (60 X 1.15)
1.0	CY	ROUNDING
70.0	CY	TOTAL FILL REQUIRED
		BORROW OR WASTE
2,130.0	CY	WASTE

PROJECT NAME: SUNDERLAND

PROJECT NUMBER: BM 20102

FILE NAME: z20bl55qs.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
QUANTITY SHEET I

PLOT DATE: 3/9/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON

STATE OF VERMONT

AGENCY OF TRANSPORTATION

QUANTITY SHEET

| SUMMARY OF ESTIMATED QUANTITIES | | |

PRIMARY CONTROL

HVCTRL #1
NORTH = 201276.5510
EAST = 1472675.7500
ELEV. = 871.7600

LOCATED AT-THE ROUTE 7 SOUTH BOUND EXIT #3 FOR ARLINGTON AND SUNDERLAND. IN THE GRASS ISLAND FORMED BY ROUTE 7 AND THE SOUTH BOUND OFF RAMP.

THE MARK IS A 3/4 INCH REBAR WITH RED CAP SET FLUSH WITH GROUND SURFACE.

IT IS 22.5' WEST OF AND 2' BELOW THE WEST EDGE OF US7, 25.7' EAST OF AND 1' BELOW THE EAST EDGE OF THE OFF RAMP, 30.5' SE OF A DROP INLET, 81.0' W OF AND DIRECTLY OPPOSITE A NORTH US 7 SIGN AND 129' NW OF MILE MARKER 0070/0215/0180.

HVCTRL #2
NORTH = 194779.8680
EAST = 1469822.5340
ELEV. = 943.8400

TO REACH FROM THE ROUTE 7 BRIDGE OVER ROUTE 313/ORVIS RD, IN SUNDERLAND, GO SOUTH ALONG ROUTE 7 FOR 1.1 MILES TO THE SITE OF THE MARK ON THE RIGHT.

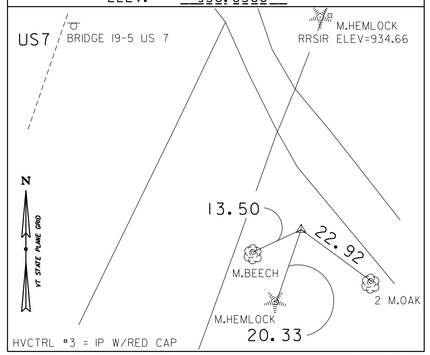
THE MARK IS A 3/4 INCH REBAR WITH RED CAP SET 0.2 FEET BELOW GROUND SURFACE.

IT IS 1.0' WEST OF THE WEST EDGE OF US7, 11.5' SOUTH OF THE CENTERLINE OF A 72" CULVERT, 300' SW OF MILE MARKER 23.2 AND 167' SW OF A BRIDGE SIGN.

SECONDARY CONTROL

HVCTRL #3

NORTH = 194667.9673
EAST = 1469921.5979
ELEV. = 936.8560



*TRAVERSE COMPLETED ON 9/10/2020 BY R.GILMAN H.MCGOWAN

HVCTRL

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

ALIGNMENT TIES

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

DATUM
VERTICAL NAVD 88
HORIZONTAL NAD83 (2011)
ADJUSTMENT COMPASS

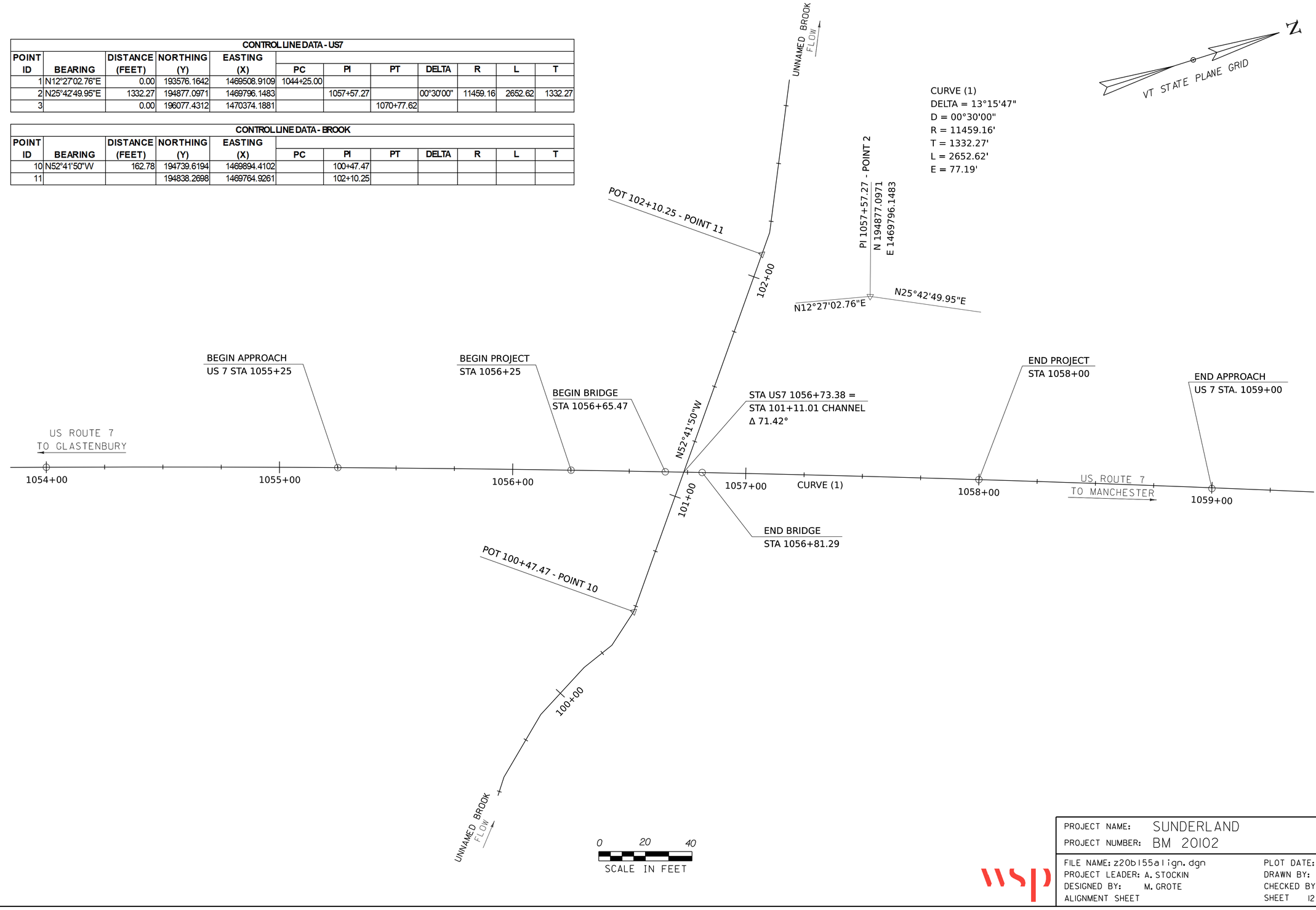
PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BM 20102

FILE NAME: X20BI55TI.DGN
PROJECT LEADER: J.SALVATORI
DESIGNED BY: VTRANS
TIE SHEET

PLOT DATE: 2/25/2026
DRAWN BY: H.MCGOWAN
CHECKED BY: R. GILMAN
SHEET II OF 66

CONTROL LINE DATA - US7											
POINT ID	BEARING	DISTANCE (FEET)	NORTHING (Y)	EASTING (X)	PC	PI	PT	DELTA	R	L	T
1	N12°27'02.76"E	0.00	193576.1642	1469508.9109	1044+25.00						
2	N25°42'49.95"E	1332.27	194877.0971	1469796.1483		1057+57.27		00°30'00"	11459.16	2652.62	1332.27
3		0.00	196077.4312	1470374.1881			1070+77.62				

CONTROL LINE DATA - BROOK											
POINT ID	BEARING	DISTANCE (FEET)	NORTHING (Y)	EASTING (X)	PC	PI	PT	DELTA	R	L	T
10	N52°41'50"W	162.78	194739.6194	1469894.4102		100+47.47					
11			194838.2698	1469764.9261		102+10.25					



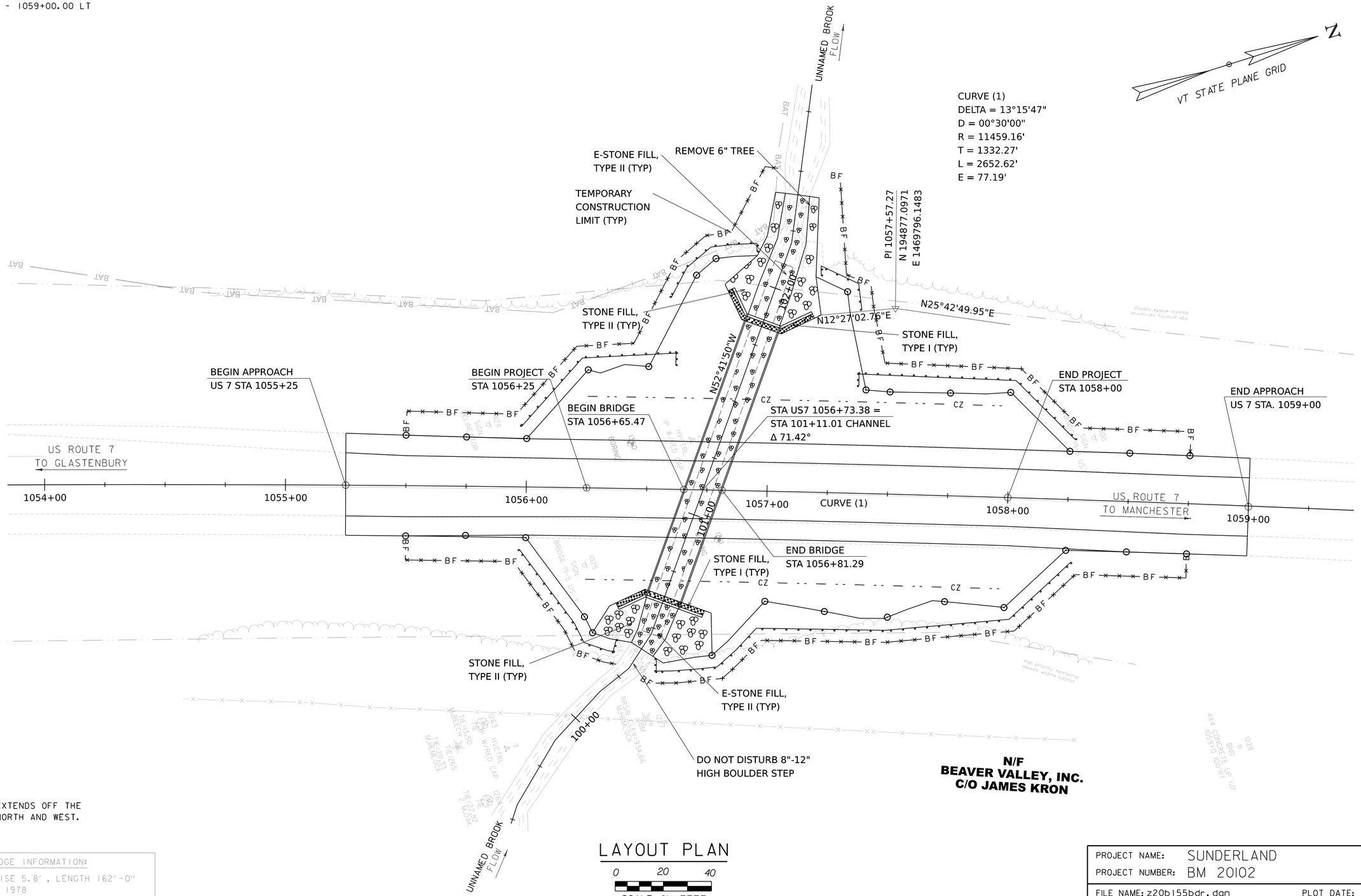
PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BM 20102

FILE NAME: z20b155align.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
ALIGNMENT SHEET

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 12 OF 66

COARSE-MILLING, BITUMINOUS PAVEMENT
STA. 1055+25.00 - 1056+00.00
STA. 1058+25.00 - 1059+00.00

MILLED RUMBLE STRIPS, SHOULDER
STA. 1055+25.00 - 1059+00.00 RT
STA. 1055+25.00 - 1059+00.00 LT



LAYOUT PLAN

0 20 40

SCALE IN FEET

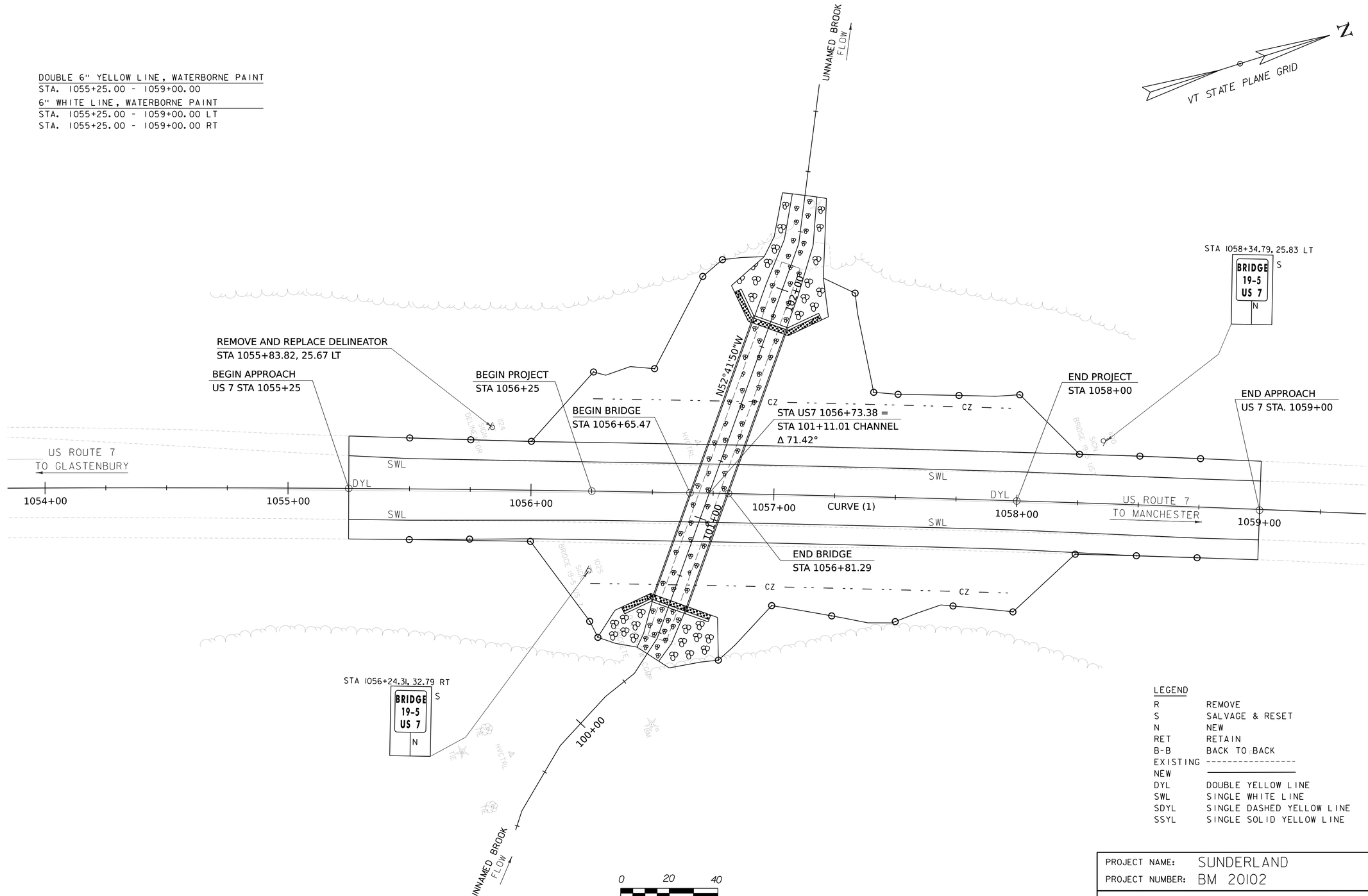
NOTE:
EXISTING ROW EXTENDS OFF THE SHEET TO THE NORTH AND WEST.

EXISTING BRIDGE INFORMATION:
SPAN 8.2', RISE 5.8', LENGTH 162'-0"
CGMPPA BUILT 1978
13' AVERAGE COVER
48 SF WATERWAY AREA

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	BM 20102
FILE NAME: z20b155bdr.dgn	PLOT DATE: 2/25/2026
PROJECT LEADER: A. STOCKIN	DRAWN BY: M. HERMIS
DESIGNED BY: M. GROTE	CHECKED BY: T. HIGGINSON
LAYOUT PLAN	SHEET 13 OF 66

DOUBLE 6" YELLOW LINE, WATERBORNE PAINT
STA. 1055+25.00 - 1059+00.00

6" WHITE LINE, WATERBORNE PAINT
STA. 1055+25.00 - 1059+00.00 LT
STA. 1055+25.00 - 1059+00.00 RT



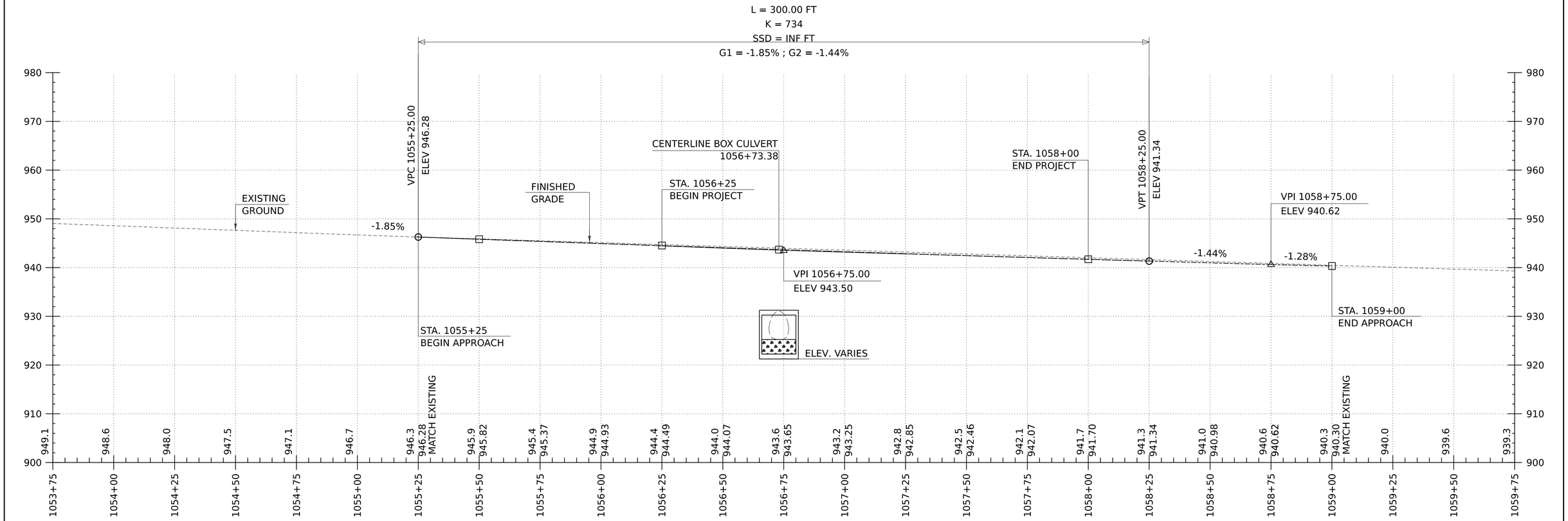
LEGEND

R	REMOVE
S	SALVAGE & RESET
N	NEW
RET	RETAIN
B-B	BACK TO BACK
EXISTING	----------
NEW	————
DYL	DOUBLE YELLOW LINE
SWL	SINGLE WHITE LINE
SDYL	SINGLE DASHED YELLOW LINE
SSYL	SINGLE SOLID YELLOW LINE

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BM 20102

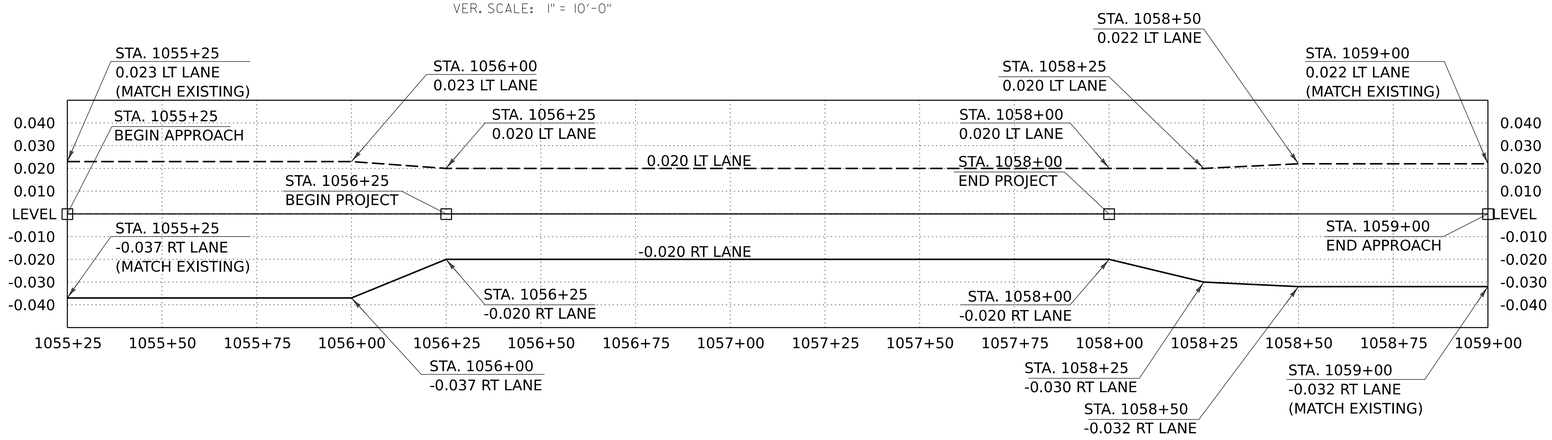
FILE NAME: z20b155bdr_trf-sign.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
TRAFFIC SIGN AND LINE LAYOUT

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON



US ROUTE 7 PROFILE

HOR. SCALE: 1" = 20'-0"
VER. SCALE: 1" = 10'-0"

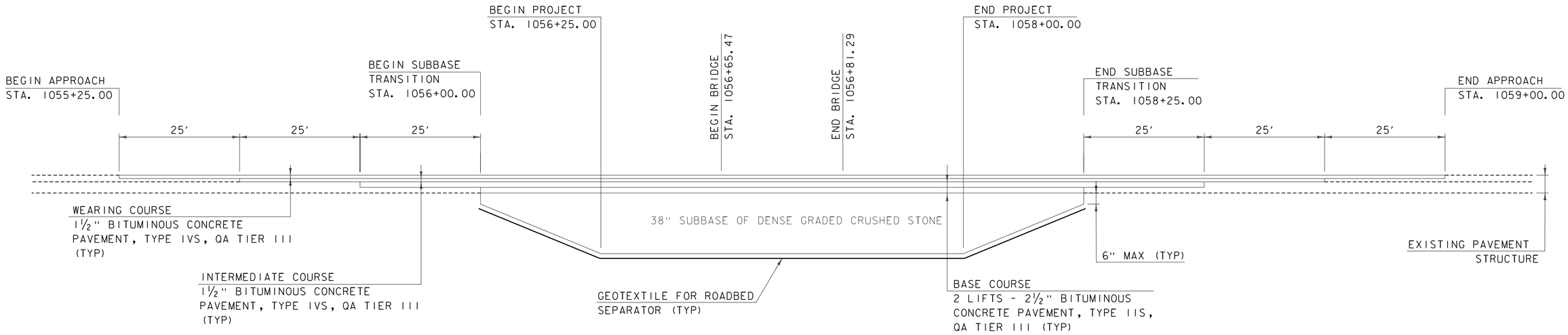


BANKING DIAGRAM - US ROUTE 7

(NOT TO SCALE)

NOTES:
1. ELEVATIONS SHOWN TO THE NEAREST TENTH DEPICT THE EXISTING GROUND ELEVATION.
2. ELEVATIONS SHOWN TO THE NEAREST HUNDRETH DEPICT THE PROPOSED PROFILE GRADE ELEVATION.

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	BM 20102
FILE NAME: z20b155pro1.dgn	PLOT DATE: 2/25/2026
PROJECT LEADER: A. STOCKIN	DRAWN BY: M. HERMIS
DESIGNED BY: M. GROTE	CHECKED BY: T. HIGGINSON
US 7 PROFILE - BANKING DIAGRAM	SHEET 15 OF 66



US ROUTE 7 MATERIAL TRANSITION

(NOT TO SCALE)

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	BM 20102
FILE NAME: z20bl55dtl.dgn	PLOT DATE: 2/25/2026
PROJECT LEADER: A. STOCKIN	DRAWN BY: M. HERMIS
DESIGNED BY: M. GROTE	CHECKED BY: T. HIGGINSON
MATERIAL TRANSITION	SHEET 16 OF 66

SOIL CLASSIFICATION

AASHTO	
A1	Gravel and Sand
A3	Fine Sand
A2	Silty or Clayey Gravel and Sand
A4	Silty Soil - Low Compressibility
A5	Silty Soil - Highly Compressible
A6	Clayey Soil - Low Compressibility
A7	Clayey Soil - Highly Compressible

ROCK QUALITY DESIGNATION

R.Q.D. (%)	ROCK DESCRIPTION
<25	Very Poor
25 to 50	Poor
51 to 75	Fair
76 to 90	Good
>90	Excellent

SHEAR STRENGTH

UNDRAINED SHEAR STRENGTH IN P.S.F.	CONSISTENCY
<250	Very Soft
250-500	Soft
500-1000	Med. Stiff
1000-2000	Stiff
2000-4000	Very Stiff
>4000	Hard

CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

COMMONLY USED SYMBOLS

▼	Water Elevation
⊛	Standard Penetration Boring
⊕	Auger Boring
⊙	Rod Sounding
S	Sample
N	Standard Penetration Test Blow Count Per Foot For: 2" O. D. Sampler 1 3/8" I. D. Sampler Hammer Weight Of 140 Lbs. Hammer Fall Of 30"
VS	Field Vane Shear Test
US	Undisturbed Soil Sample
B	Blast
DC	Diamond Core
MD	Mud Drill
WA	Wash Ahead
HSA	Hollow Stem Auger
AX	Core Size 1 1/8"
BX	Core Size 1 5/8"
NX	Core Size 2 1/8"
M	Double Tube Core Barrel Used
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
w	Non Plastic
D	Moisture Content (Dry Wgt. Basis)
NP	Dry
M	Moist
MTW	Moist To Wet
W	Wet
SAT	Saturated
BO	Boulder
Gr	Gravel
Sa	Sand
Si	Silt
Cl	Clay
HP	Hardpan
Le	Ledge
NLTD	No Ledge To Depth
CNPF	Can Not Penetrate Further
TLOB	Top of Ledge Or Boulder
NR	No Recovery
Rec.	Recovery
%Rec.	Percent Recovery
RQD	Rock Quality Designation
CBR	California Bearing Ratio
<	Less Than
>	Greater Than
R	Refusal (N > 100)
VTSPG	NAD83 - See Note 7

COLOR			
blk	Black	pnk	Pink
bl	Blue	pu	Purple
brn	Brown	rd	Red
dk	Dark	tn	Tan
gry	Gray	wh	White
gn	Green	yel	Yellow
lt	Light	mltc	Multicolored
or	Orange		

DEFINITIONS (AASHTO)

BEDROCK (LEDGE) - Rock in its native location of indefinite thickness.

BOULDER - A rock fragment with an average dimension > 12 inches.

COBBLE - Rock fragments with an average dimension between 3 and 12 inches.

GRAVEL - Rounded particles of rock < 3" and > 0.0787" (#10 sieve).

SAND - Particles of rock < 0.0787" (#10 sieve) and > 0.0029" (#200 sieve).

SILT - Soil < 0.0029" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.

CLAY - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.

VARVED - Alternate layers of silt and clay.

HARDPAN - Extremely dense soil, cemented layer, not softened when wet.

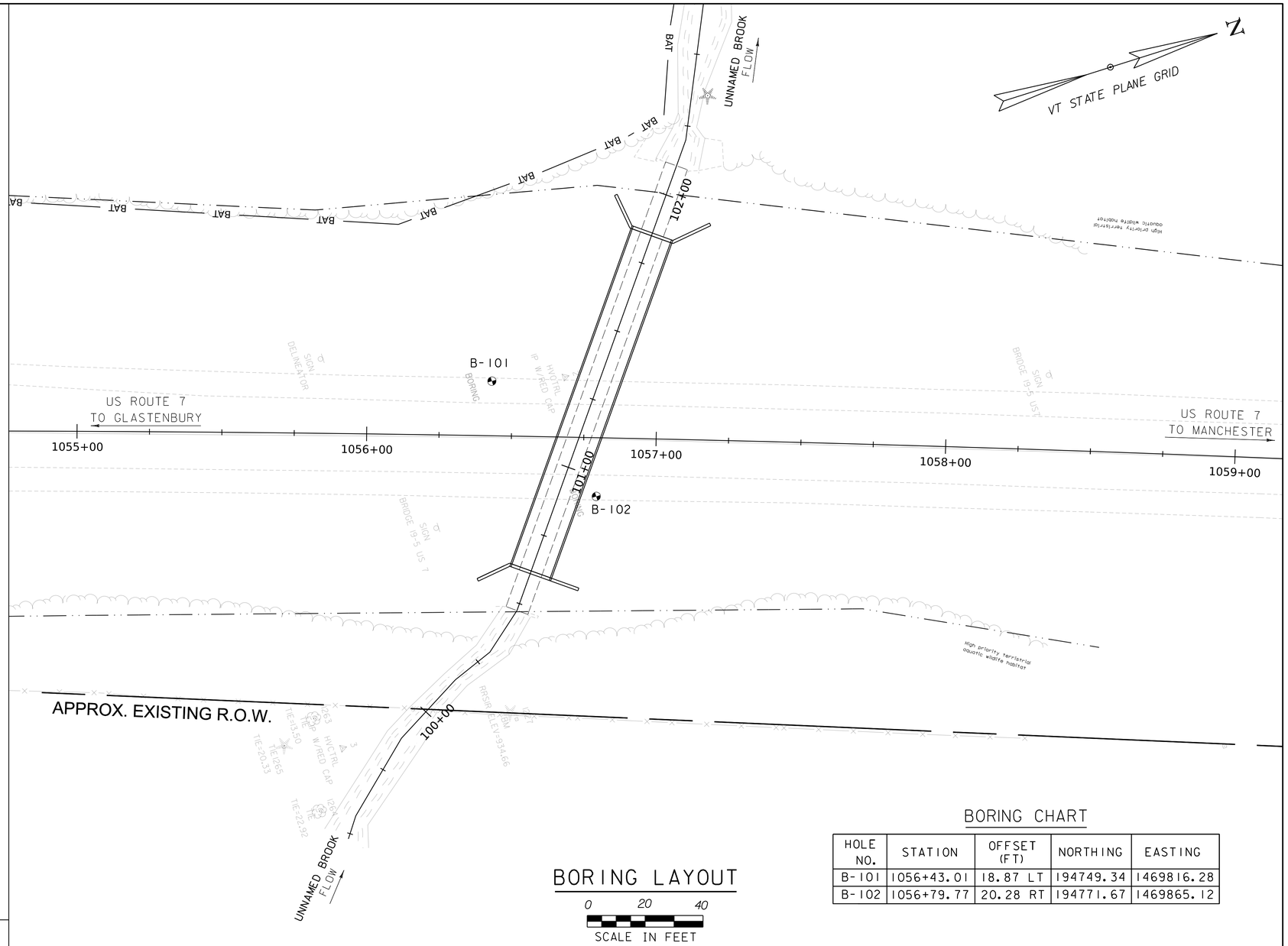
MUCK - Soft organic soil (containing > 10% organic material.

MOISTURE CONTENT - Weight of water divided by dry weight of soil.

FLOWING SAND - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.

STRIKE - Angle from magnetic north to line of intersection of bed with a horizontal plane.

DIP - Inclination of bed with a horizontal plane.



BORING LAYOUT

0 20 40

SCALE IN FEET

BORING CHART

HOLE NO.	STATION	OFFSET (FT)	NORTHING	EASTING
B-101	1056+43.01	18.87 LT	194749.34	1469816.28
B-102	1056+79.77	20.28 RT	194771.67	1469865.12

GENERAL NOTES

1. The subsurface explorations shown herein were made between 4/10/23 and 4/12/23 by WSP.

2. Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.

3. Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.

4. Engineering judgment was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgment by the Contractor.

5. Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.

6. Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.

7. Northing and Easting coordinates are shown in Vermont State Plane Grid North American Datum 1983 in meters and survey feet.

wsp

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BM 20102

FILE NAME: z20b155bor1.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
BORING INFORMATION SHEET

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 17 OF 66

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Sunderland
BM 20102
Bridge 19-5 Culvert US Route 7

Boring No.: **B-101**
Page No.: 1 of 2
Pin No.: 20b155
Checked By: MA

Boring Crew: Michael Jordan (Platform), Kaitlin Berube (WSP)
Date Started: 4/10/23 Date Finished: 4/11/23
VTSPG NAD83: N 194749.34 ft E 1469816.28 ft
Station: 1056+43.01 Offset: 18.87 ft L
Ground Elevation: 944.54 ft

	Casing	Sampler
Type:	HSA & WB	SS
I.D.:	4 in	1.5 in
Hammer Wt:	140 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:	Auto/NWJ	
Rig:	Geoprobe 7822DT	C_E = 1.68

Groundwater Observations

Date	Depth (ft)	Notes
04/11/23	13.6	8:45 AM (AD 16hrs)

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		0.0 ft - 0.5 ft, Asphalt					
		0.5 ft - 2.5 ft, Nested cobble zone					
5		5.0 ft - 7.0 ft, A-1-b, SM, reddish-brown, dry, medium dense gravelly fine to coarse SAND, some silt, well-graded., Rec. = 1.1 ft	1-7-8-6 (15)				
10		10.0 ft - 12.0 ft, A-1-b, SM, reddish-brown, dry, very dense gravelly fine to coarse SAND, some silt, well-graded., Rec. = 1.0 ft	70-44-30-20 (74)	10.6	38.8	41.0	20.2
15		15.0 ft - 17.0 ft, A-1-b, SM, reddish-brown, moist, dense gravelly fine to coarse SAND, some silt, well-graded., Rec. = 0.5 ft	8-11-35-39 (46)				
20		20.0 ft - 22.0 ft, A-1-b, SM, reddish-brown, moist, medium dense GRAVEL, some sand, some silt, well-graded., Rec. = 0.8 ft	17-13-9-7 (22)	10.7	41.3	33.8	24.9
25		25.0 ft - 27.0 ft, A-1-b, SM, reddish-brown, moist, medium dense GRAVEL, some sand, some silt, well-graded., Rec. = 0.8 ft	15-11-10-10 (21)				
		27.0 ft - 28.0 ft, During boring advancement driller used a roller bit to advance through a boulder from approximately 27 feet to 28 feet bgs.					
30		30.0 ft - 32.0 ft, A-2-4, SM, reddish-brown, moist to wet, medium dense GRAVEL, some sand, some silt., Rec. = 0.85 ft	16-10-17-28 (27)	10.1	38.4	30.4	31.2

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 31405712.002 VTRANS SUNDERLAND (1).GPJ VERMONT AOT GDT 6/2/23

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Sunderland
BM 20102
Bridge 19-5 Culvert US Route 7

Boring No.: **B-101**
Page No.: 2 of 2
Pin No.: 20b155
Checked By: MA

Boring Crew: Michael Jordan (Platform), Kaitlin Berube (WSP)
Date Started: 4/10/23 Date Finished: 4/11/23
VTSPG NAD83: N 194749.34 ft E 1469816.28 ft
Station: 1056+43.01 Offset: 18.87 ft L
Ground Elevation: 944.54 ft

Type: HSA & WB / SS
I.D.: 4 in / 1.5 in
Hammer Wt: 140 lb. / 140 lb.
Hammer Fall: 30 in. / 30 in.
Hammer/Rod Type: Auto/NWJ
Rig: Geoprobe 7822DT C_E = 1.68

Groundwater Observations

Date	Depth (ft)	Notes
04/11/23	13.6	8:45 AM (AD 16hrs)

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
35		35.0 ft - 37.0 ft, A-1-b, GM, reddish-brown, moist to wet, very dense, GRAVEL, some sand, some silt., Rec. = 0.55 ft	46-47-43-44 (90)	8.4	51.8	27.7	20.5
40		40.0 ft - 41.75 ft, A-4, SM, reddish-brown, dry, very dense, GRAVEL, some sand, some silt., Rec. = 0.8 ft	114-48-76-50/3" (124)	11.2	37.1	27.8	35.1
		42.0 ft - 45.0 ft, Roller bit and casing refusal at 42 ft bgs. Advanced core barrel through cobbles and boulders 42 to 45 ft bgs.					
45		Hole stopped @ 45.0 ft Boring backfilled with drill cuttings.					

Remarks:
- Groundwater level recorded 16 hours after drilling (AD), at the time the groundwater level was recorded the steel casing was advanced 25 feet below the ground surface (bgs).
- AASHTO and USCS classifications are based on visual description of sample recovery at depths where lab testing not performed.
- Boring was backfilled with drill cuttings and capped with cold-patch asphalt to the existing ground surface by Platform.
- Boring coordinates and elevation were provided to WSP by VTrans on 5/18/2023.

50
55
60

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 31405712.002 VTRANS SUNDERLAND (1).GPJ VERMONT AOT GDT 6/2/23

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BM 20102

FILE NAME: z20b155bor1.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
BORING LOGS SHEET 1

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 18 OF 66

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Sunderland
BM 20102
Bridge 19-5 Culvert US Route 7

Boring No.: **B-102**
Page No.: 1 of 2
Pin No.: 20b155
Checked By: MA

Boring Crew: Michael Jordan (Platform), Kaitlin Berube (WSP)
Date Started: 4/12/23 Date Finished: 4/12/23
VTSPG NAD83: N 194771.67 ft E 1469865.12 ft
Station: 1056+79.77 Offset: 20.28 ft R
Ground Elevation: 942.45 ft

	Casing	Sampler
Type:	HSA & WB	SS
I.D.:	4 in	1.5 in
Hammer Wt:	140 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:	Auto/NWJ	
Rig:	Geoprobe 7822DT	C_E = 1.68

Groundwater Observations

Date	Depth (ft)	Notes
04/12/23	10.8	4:40 PM (ATD 3 min)

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		0.0 ft - 0.5 ft, Asphalt					
		0.5 ft - 2.5 ft, Nested cobble zone					
5		5.0 ft - 7.0 ft, A-4, SM, reddish-brown, moist, medium dense, SILT, some gravel, some sand, Rec. = 1.0 ft	5-8-7-10 (15)	12.6	30.9	32.2	36.9
10		10.0 ft - 12.0 ft, A-4, SM, reddish-brown, dry to moist, dense, SILT, some gravel, some sand, Rec. = 1.5 ft	39-15-18-25 (33)				
		14.0 ft, Driller switched from hollow stem augers to drive and wash.					
15		15.0 ft - 17.0 ft, A-2-4, SM, brownish-grey, moist, loose, SAND, little silt, trace gravel, Rec. = 0.3 ft	5-3-2-5 (5)	17.2	8.9	72.1	19.0
20		20.0 ft - 22.0 ft, A-2-4, GP-GM, reddish-brown, moist, very dense,SAND, some gravel, some silt, Rec. = 0.45 ft	19-34-29-18 (63)				
25		25.0 ft - 27.0 ft, A-2-4, SM, reddish-brown, moist, dense, SAND, some gravel, some silt, Rec. = 0.65 ft	36-16-15-13 (31)	10.8	34.4	39.5	26.1
		29.0 ft, During boring advancement driller noted gravel in the wash water from approximately 29 feet to 30 feet below ground surface (bgs).					
30		30.0 ft - 31.25 ft, A-2-4, GP-GM, reddish-brown, wet, very dense, GRAVEL, trace sand, trace silt, trace quartzite pieces, Rec. = 0.5 ft	30-45-50/3" (R)				

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 31405712.002 VTRANS SUNDERLAND (1).GPJ VERMONT AOT.GDT 6/2/23

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Sunderland
BM 20102
Bridge 19-5 Culvert US Route 7

Boring No.: **B-102**
Page No.: 2 of 2
Pin No.: 20b155
Checked By: MA

Boring Crew: Michael Jordan (Platform), Kaitlin Berube (WSP)
Date Started: 4/12/23 Date Finished: 4/12/23
VTSPG NAD83: N 194771.67 ft E 1469865.12 ft
Station: 1056+79.77 Offset: 20.28 ft R
Ground Elevation: 942.45 ft

	Casing	Sampler
Type:	HSA & WB	SS
I.D.:	4 in	1.5 in
Hammer Wt:	140 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:	Auto/NWJ	
Rig:	Geoprobe 7822DT	C_E = 1.68

Groundwater Observations

Date	Depth (ft)	Notes
04/12/23	10.8	4:40 PM (ATD 3 min)

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
35		35.0 ft - 37.0 ft, A-2-4, GM, reddish-brown, moist, very dense, GRAVEL, some sand, some silt, well-graded, Rec. = 0.9 ft	21-64-49-20 (113)	9.3	39.8	27.9	32.3
40		38.0 ft - 40.0 ft, During boring advancement driller used a roller bit to advance through a cobble zone from approximately 38 feet to 40 feet bgs.					
45		43.0 ft - 45.0 ft, A-2-4, SM, reddish-brown, dry, very dense, GRAVEL, some sand, some silt, well-graded, Rec. = 1.0 ft	12-86-42-37 (128)	10.6	35.1	32.3	32.6
		Hole stopped @ 45.0 ft Boring backfilled with drill cuttings.					
50							
55							
60							

Remarks:
- Groundwater level recorded 3 minutes after drilling (AD), at the time the groundwater level was recorded the steel casing was advanced 43 feet below the ground surface (bgs).
- AASHTO and USCS classifications are based on visual description of sample recovery at depths where lab testing not performed.
- Boring was backfilled with drill cuttings and capped with cold-patch asphalt to the existing ground surface by Platform.
- Boring coordinates and elevation were provided to WSP by VTrans on 5/18/2023.

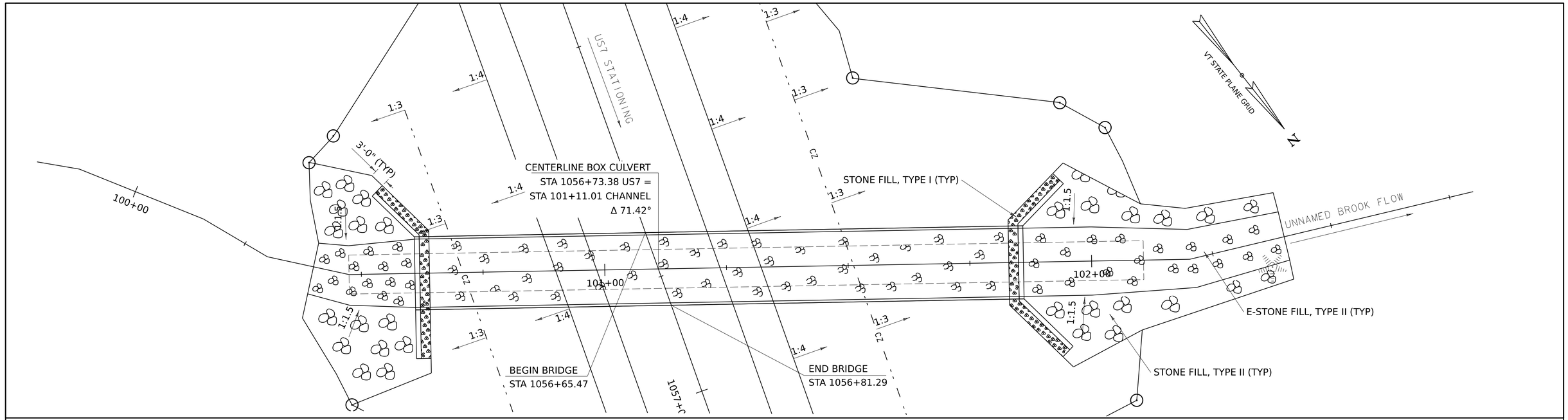
Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

BORING LOG 31405712.002 VTRANS SUNDERLAND (1).GPJ VERMONT AOT.GDT 6/2/23

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BM 20102

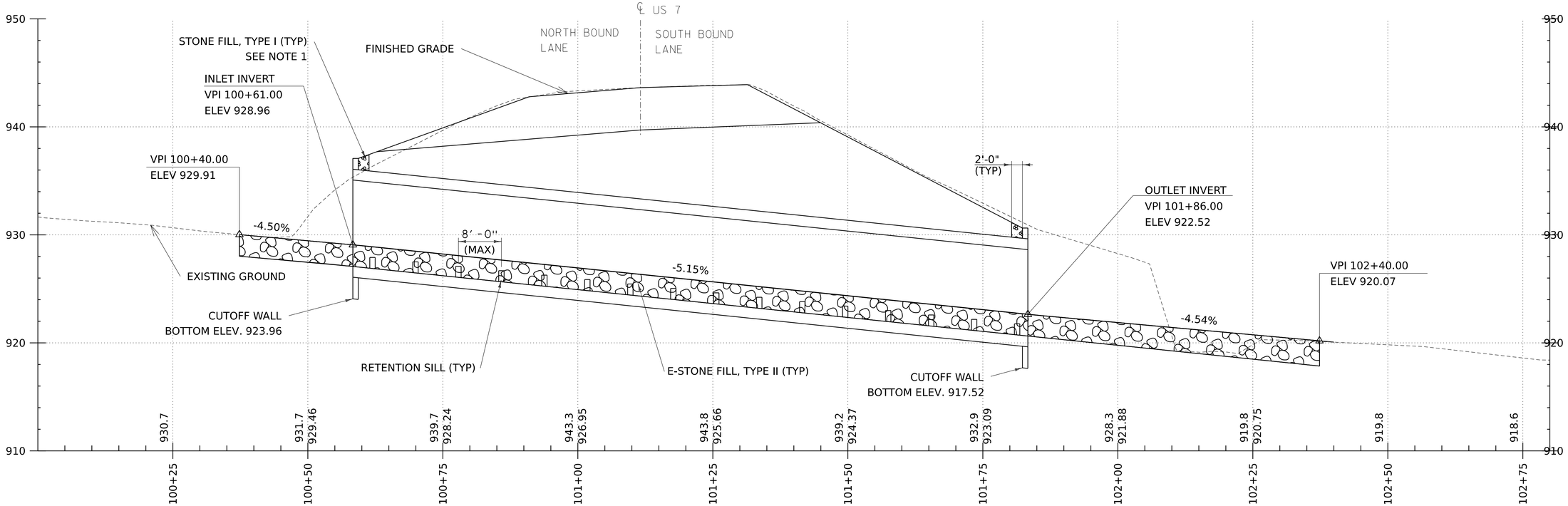
FILE NAME: z20b155bor1.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
BORING LOGS SHEET 2

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 19 OF 66



STRUCTURE PLAN

SCALE: 1" = 10'-0"

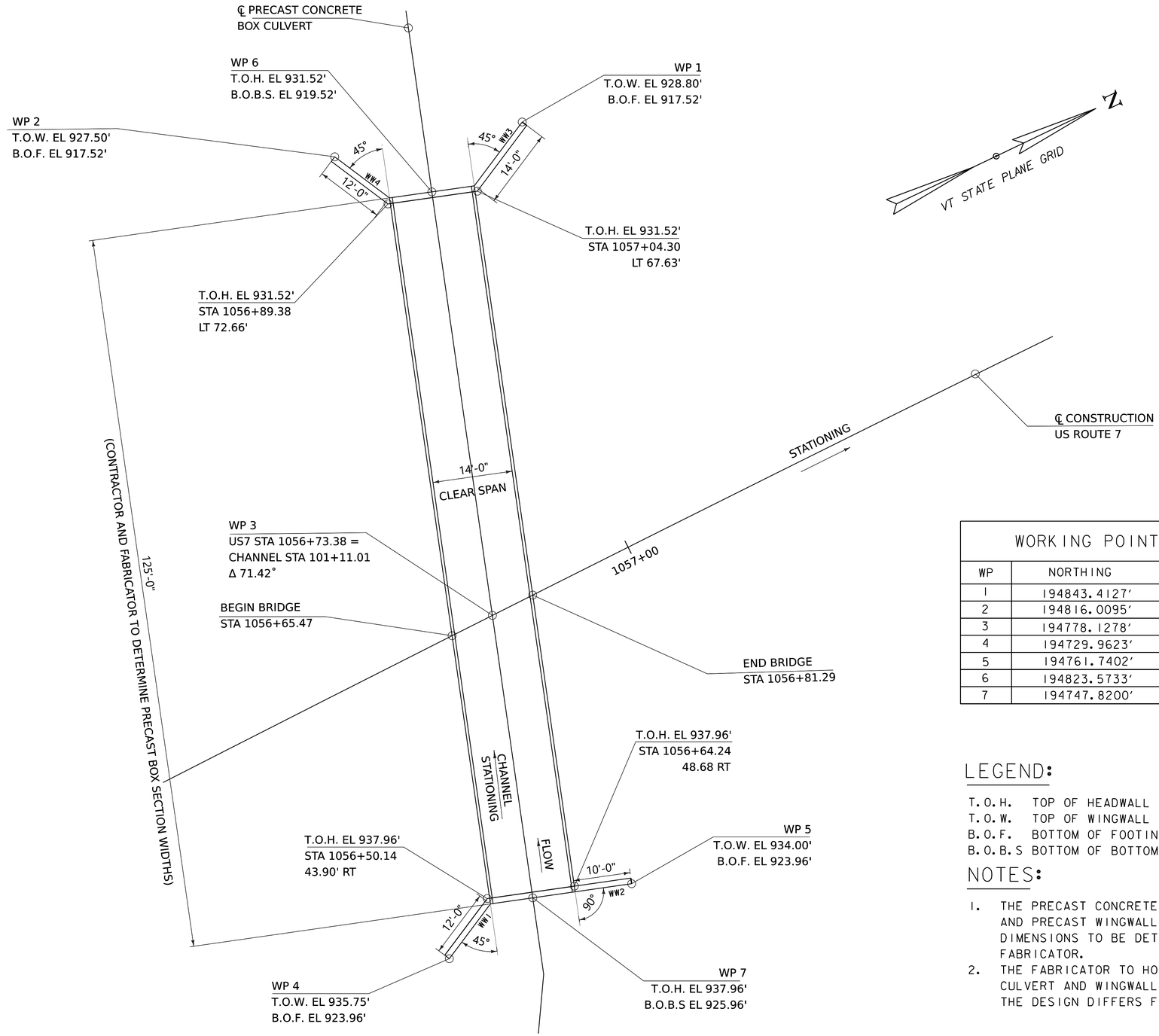


NOTE:
1) STONE FILL TYPE I SHALL BE WRAPPED UP IN GEOTEXTILE, ITEM #649.3100 "GEOTEXTILE UNDER STONE FILL"

STRUCTURE CHANNEL PROFILE

SCALE: 1" = 10'-0"

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	BM 20102
FILE NAME: z20b155pro2.dgn	PLOT DATE: 2/26/2026
PROJECT LEADER: A. STOCKIN	DRAWN BY: M. HERMIS
DESIGNED BY: M. GROTE	CHECKED BY: T. HIGGINSON
PLAN AND ELEVATION SHEET	SHEET 20 OF 66



PLAN

0 10 20

SCALE IN FEET

WORKING POINT COORDINATES		
WP	NORTHING	EASTING
1	194843.4127'	1469786.8971'
2	194816.0095'	1469767.7759'
3	194778.1278'	1469843.8657'
4	194729.9623'	1469880.7086'
5	194761.7402'	1469894.2520'
6	194823.5733'	1469784.2160'
7	194747.8200'	1469883.6465'

LEGEND:

T.O.H. TOP OF HEADWALL
T.O.W. TOP OF WINGWALL
B.O.F. BOTTOM OF FOOTING
B.O.B.S BOTTOM OF BOTTOM SLAB

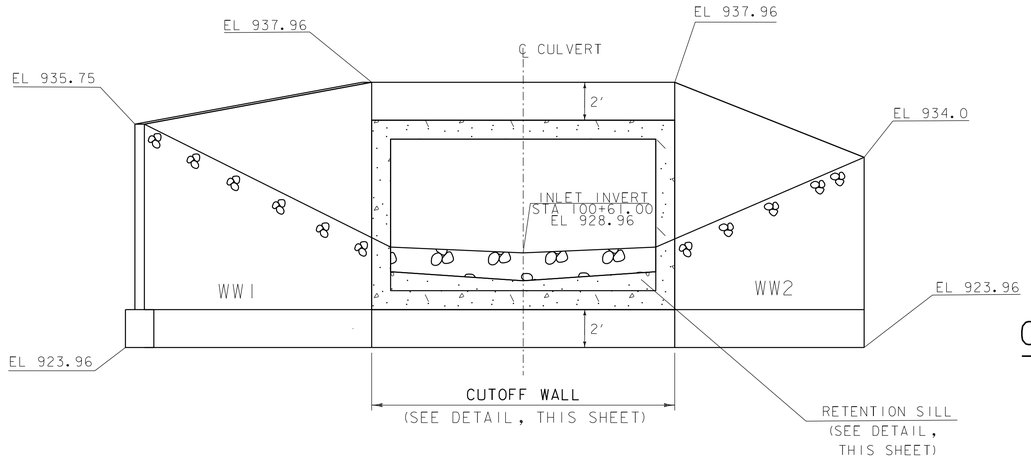
NOTES:

1. THE PRECAST CONCRETE BOX CULVERT WALLS AND SLABS, AND PRECAST WINGWALL THICKNESS ARE ASSUMED. ACTUAL DIMENSIONS TO BE DETERMINED BY CONTRACTOR'S FABRICATOR.
2. THE FABRICATOR TO HOLD THE FRONT FACE OF THE BOX CULVERT AND WINGWALLS AND ADJUST THE BACK FACE IF THE DESIGN DIFFERS FROM WHAT IS SHOWN.

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BM 20102

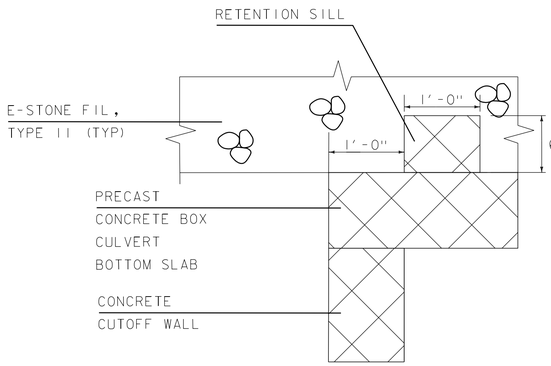
FILE NAME: z20b155sub.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
CULVERT LAYOUT PLAN

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 21 OF 66



INLET ELEVATION

SCALE 1/4 "= 1'-0"



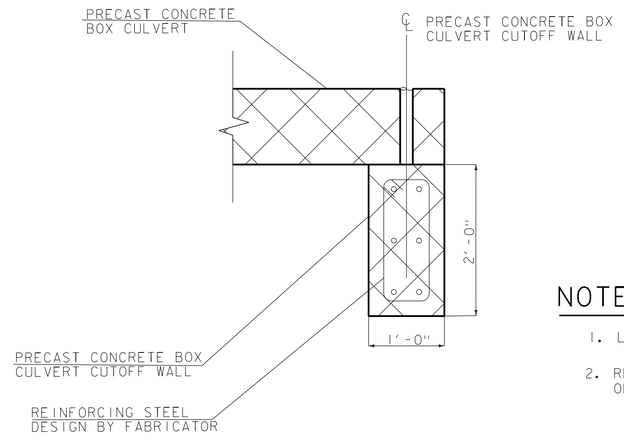
RETENTION SILL REQUIREMENTS	
	DIMENSION
HEIGHT AT ENDS	12"
HEIGHT AT CENTER	6"
MAX SPACING (O.C.)	8'-0"

NOTES:

1. PLACE A RETENTION SILL AT THE INLET AND OUTLET OF THE STRUCTURE, AS SHOWN, AS WELL AS CONTINUOUSLY THROUGHOUT THE STRUCTURE AT NO MORE THAN THE MAX SPACING SPECIFIED.
2. BOX CULVERT FABRICATOR SHALL DESIGN AND DETAIL THE PRECAST RETENTION SILL TO BE CAST INTEGRAL WITH THE BOX CULVERT.

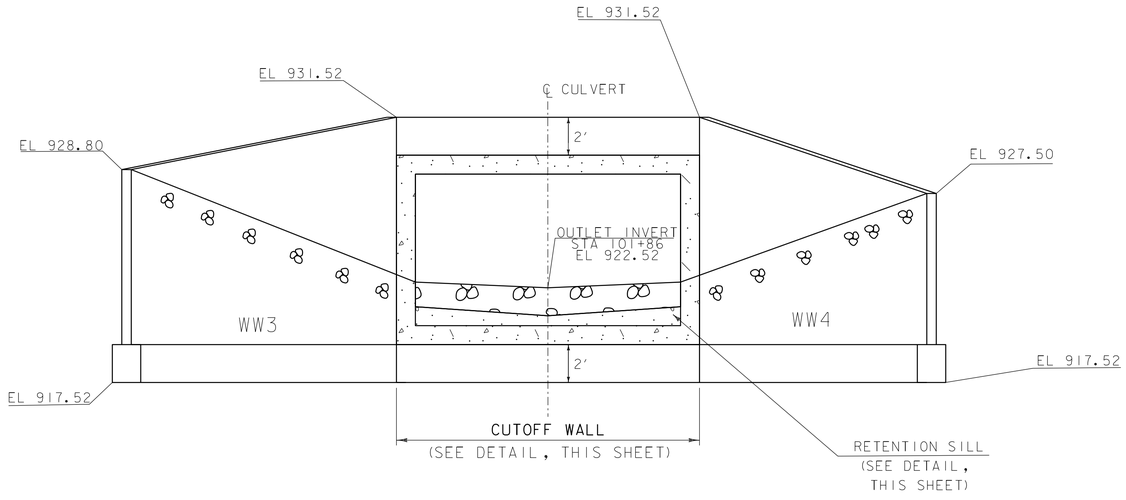
CULVERT RETENTION SILL DETAIL

NOT TO SCALE



NOTES:

1. LENGTH OF CUTOFF WALL TO MATCH TOTAL WIDTH OF CULVERT.
2. REFERENCE ELEVATION VIEWS THIS SHEET FOR BOTTOM OF CUTOFF WALL ELEVATIONS.



OUTLET ELEVATION

SCALE 1/4 "= 1'-0"

PRECAST CONCRETE CUTOFF WALL DETAIL

NOT TO SCALE

NOTES:

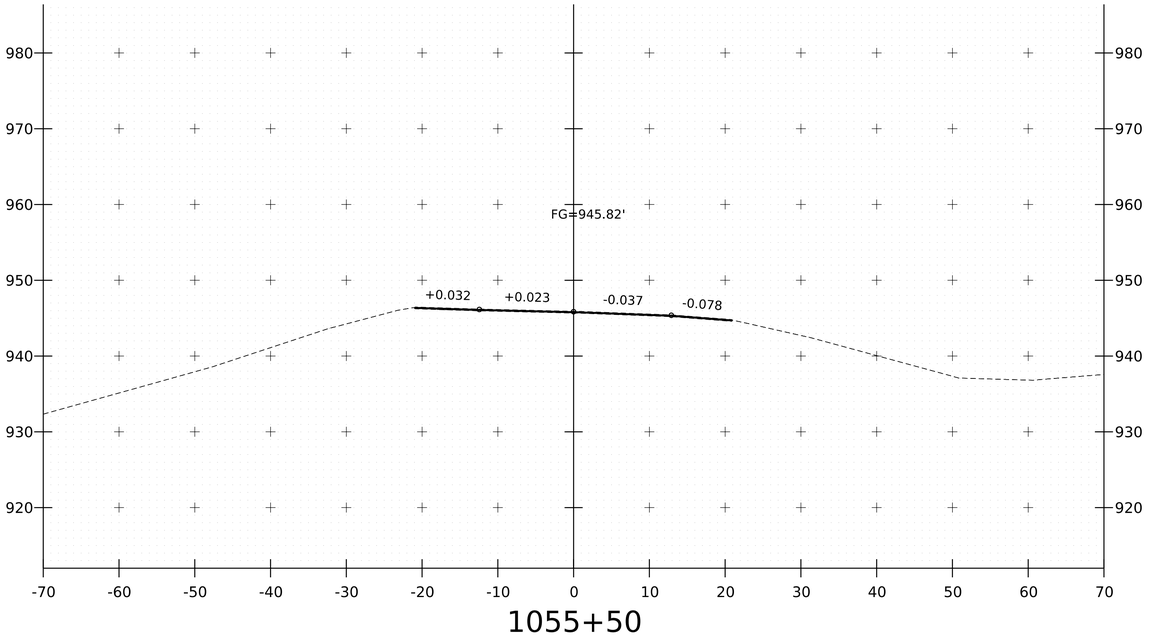
1. THE PRECAST SECTIONS ARE SHOWN FOR REFERENCE ONLY. THE ACTUAL DIMENSIONS AND SHAPE WILL BE DEPENDENT ON THE FABRICATOR.
2. FOR BOX PROFILE SEE CULVERT PLAN AND PROFILE SHEET.
3. THE CONTRACTOR/FABRICATOR TEAM IS RESPONSIBLE FOR THE DESIGN OF THE BOX CULVERT, HEADWALLS, WINGWALLS, CUTOFF WALLS, RETENTION SILLS AND ALL CONNECTIONS BETWEEN PRECAST ELEMENTS.
4. THE CONNECTIONS BETWEEN PRECAST ELEMENTS ARE NOT SHOWN ON THESE DETAILS.

wsp

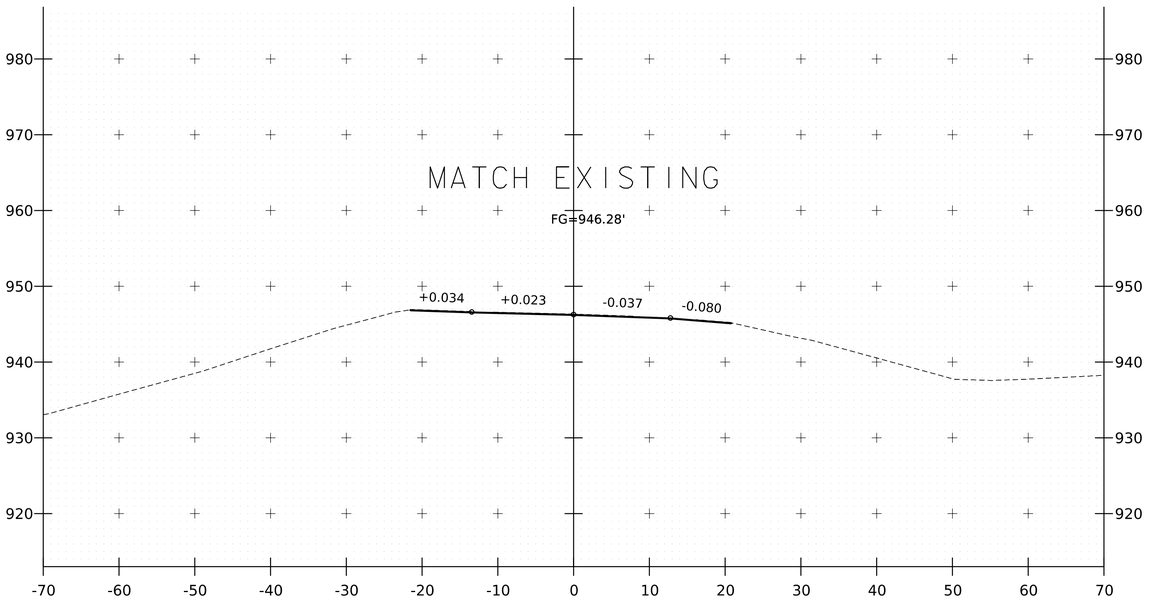
PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BM 20102

FILE NAME: z20bl55subl.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
SUBSTRUCTURE DETAILS I

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 22 OF 66

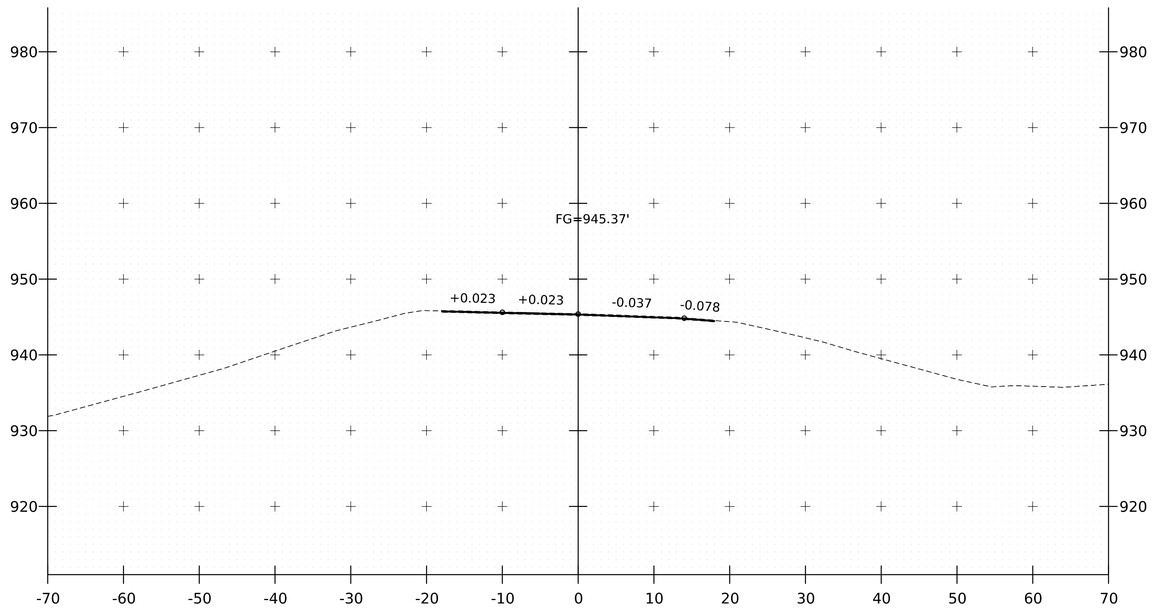


1055+50



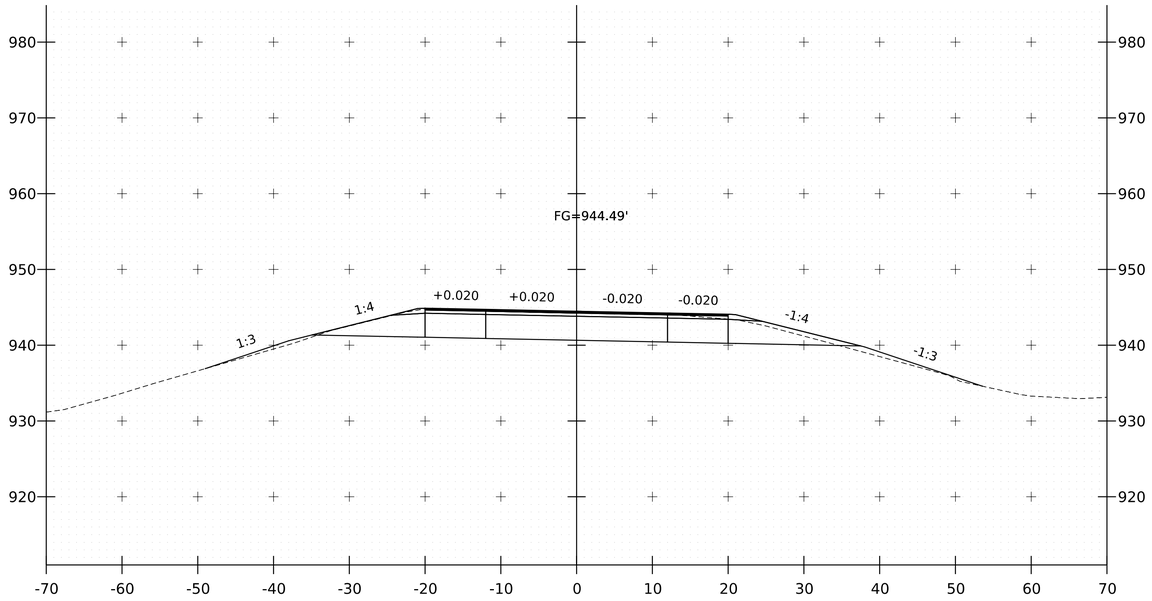
1055+25

BEGIN APPROACH



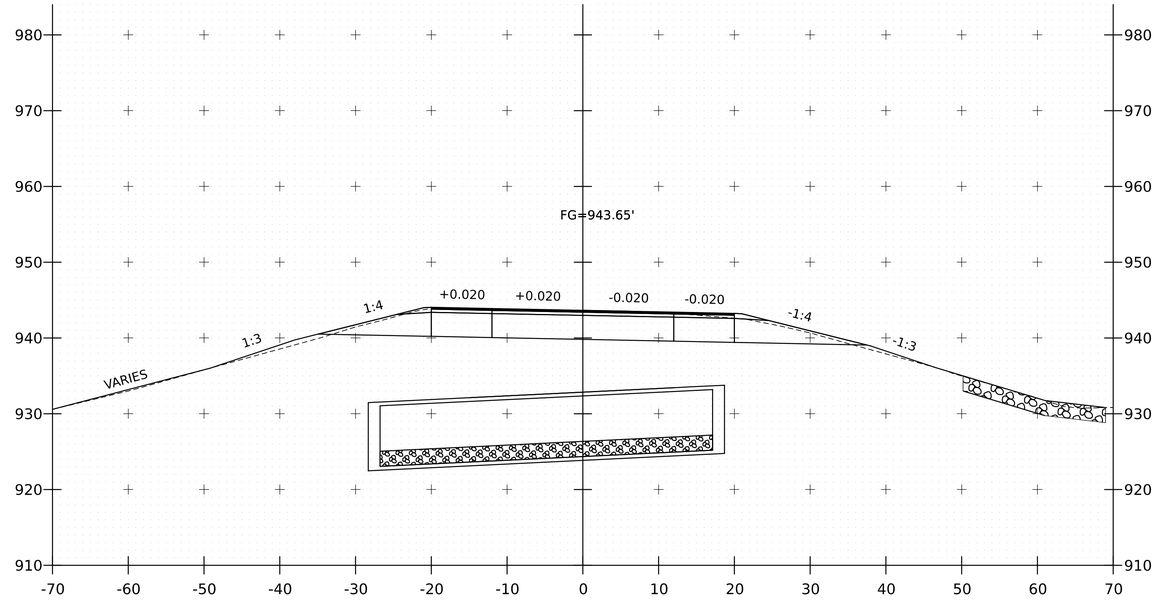
1055+75

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	BM 20102
FILE NAME: z20b155xs1.dgn	PLOT DATE: 2/25/2026
PROJECT LEADER: A. STOCKIN	DRAWN BY: M. HERMIS
DESIGNED BY: M. GROTE	CHECKED BY: T. HIGGINSON
MAINLINE CROSS SECTIONS 1	SHEET 23 OF 66



1056+25

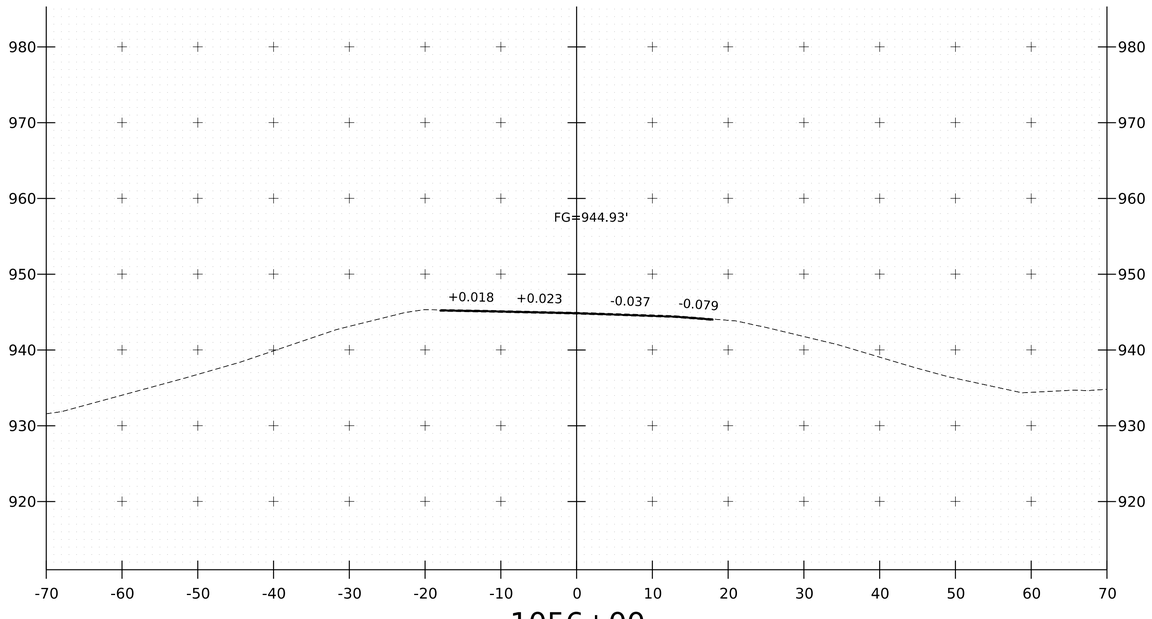
BEGIN PROJECT



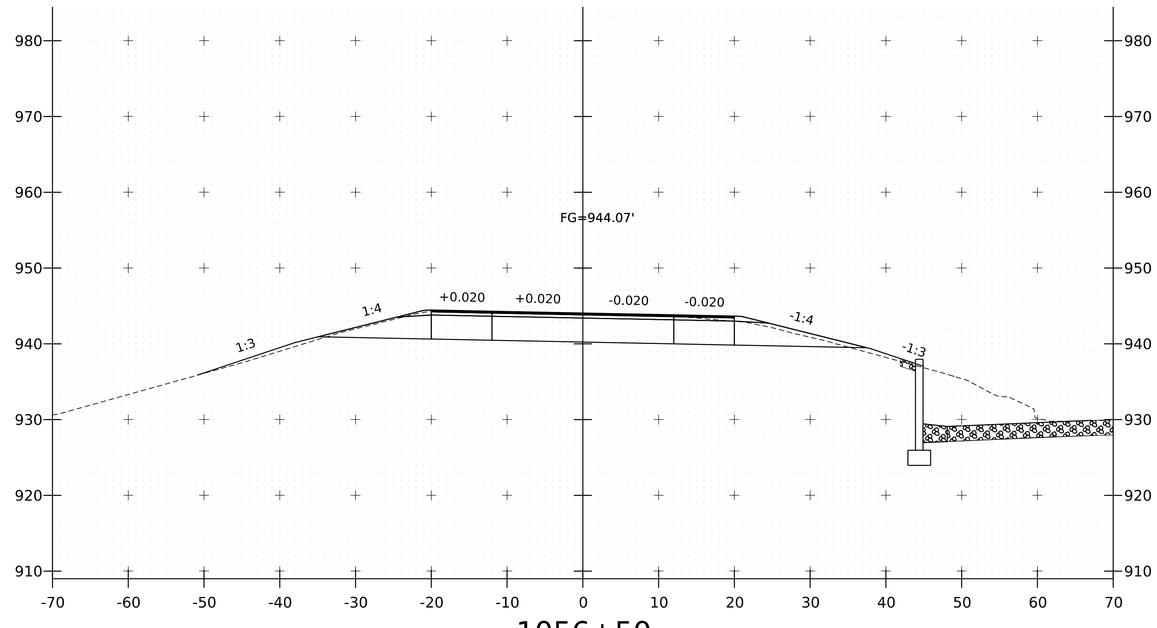
1056+75

STA. 1056+65.47 BEGIN BRIDGE

STA. 1056+81.29 END BRIDGE



1056+00



1056+50

PROJECT NAME: SUNDERLAND

PROJECT NUMBER: BM 20102

FILE NAME: z20b155xs1.dgn

PROJECT LEADER: A. STOCKIN

DESIGNED BY: M. GROTE

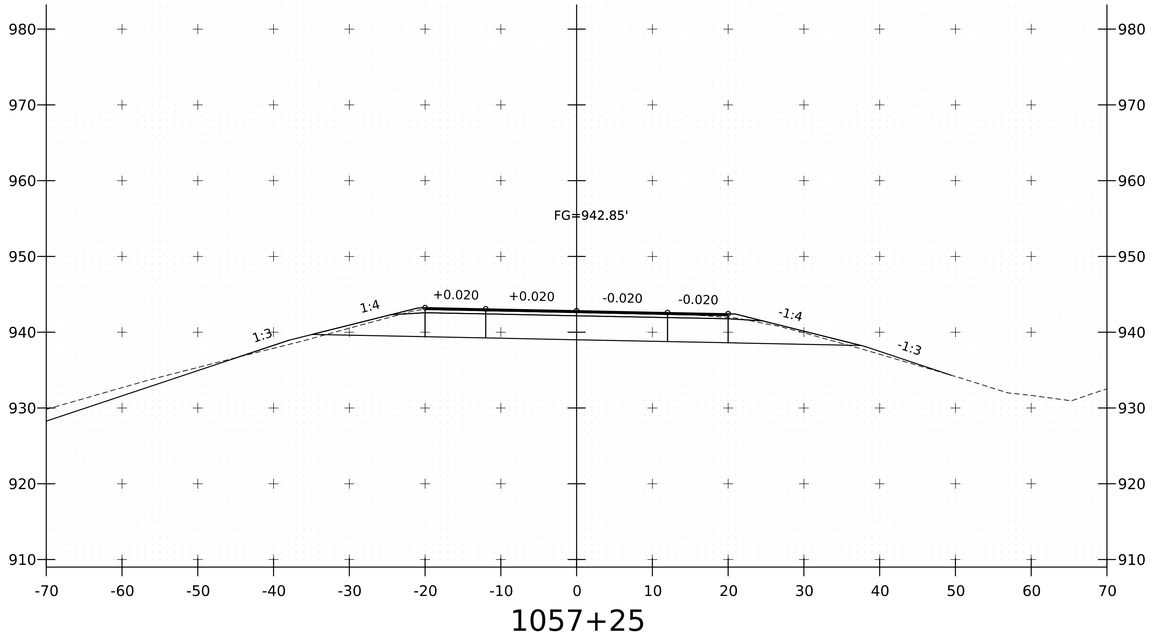
MAINLINE CROSS SECTIONS 2

PLOT DATE: 2/25/2026

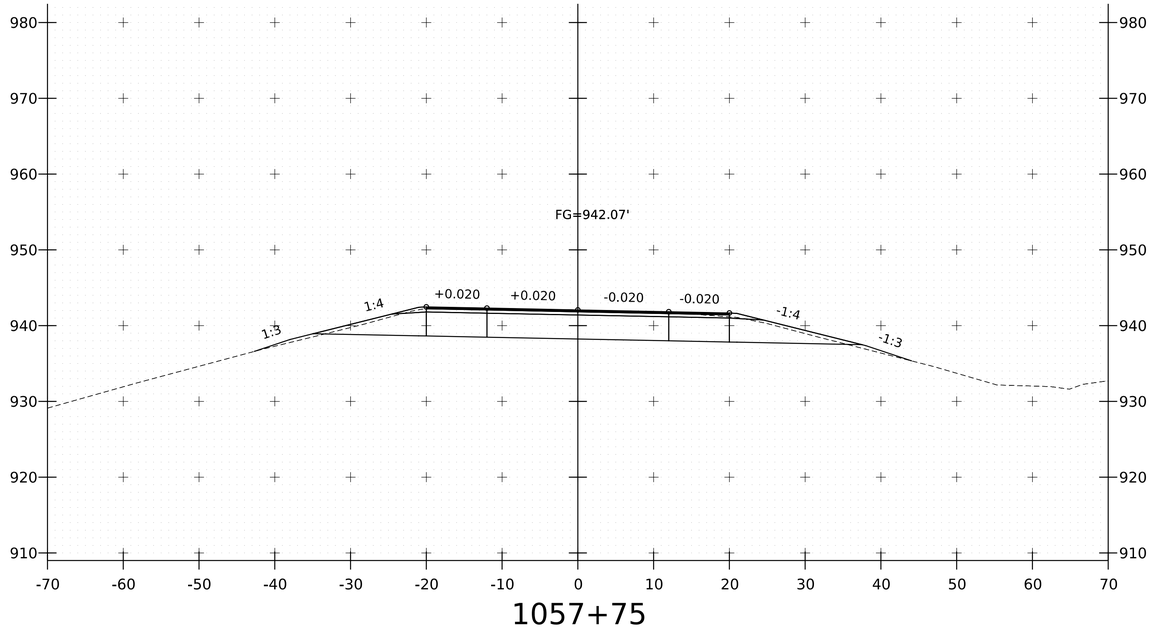
DRAWN BY: M. HERMIS

CHECKED BY: T. HIGGINSON

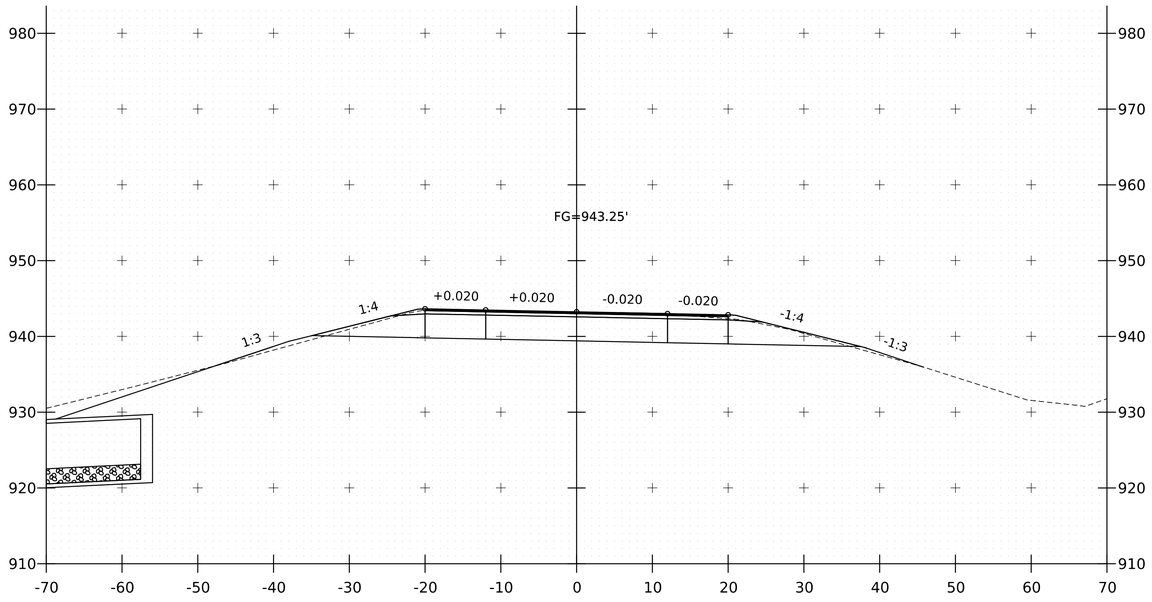
SHEET 24 OF 66



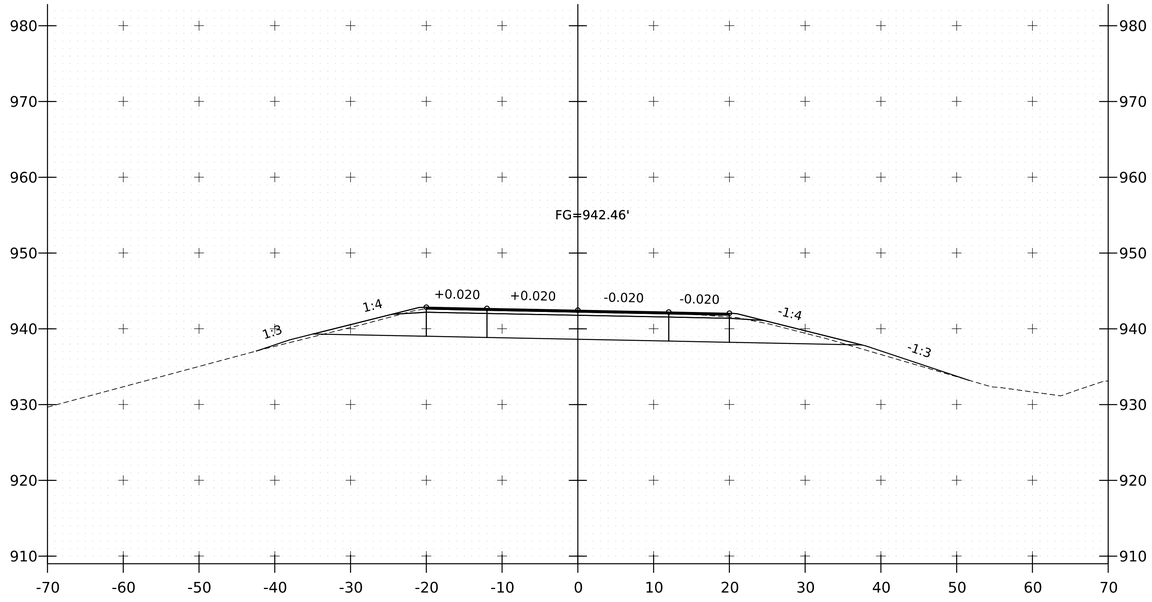
1057+25



1057+75



1057+00

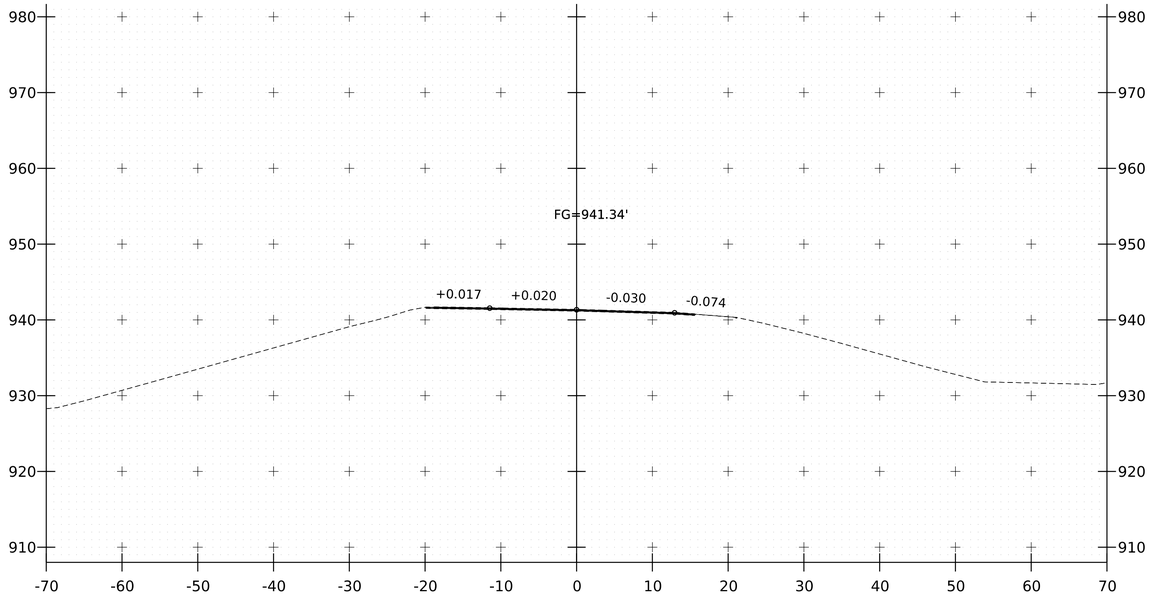


1057+50

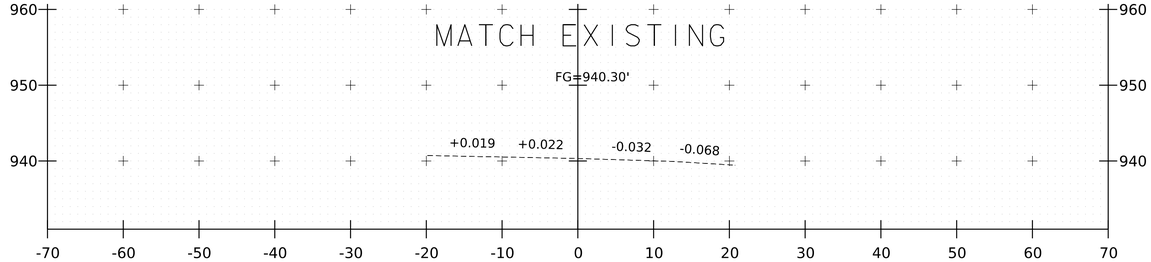
PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BM 20102

FILE NAME: z20b155xs1.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
MAINLINE CROSS SECTIONS 3

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 25 OF 66

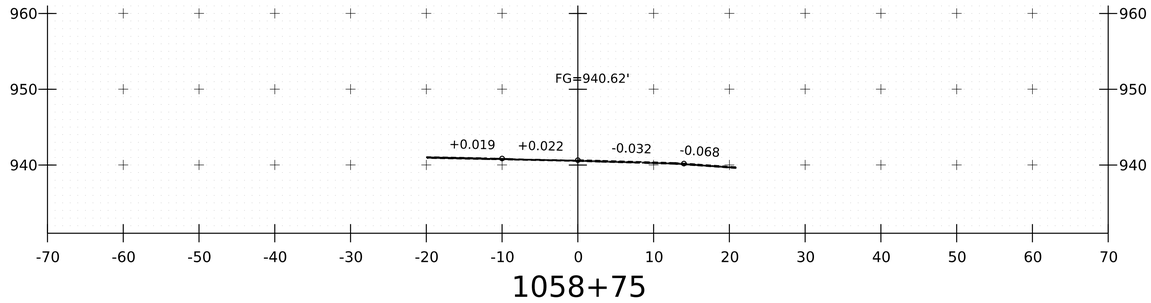


1058+25

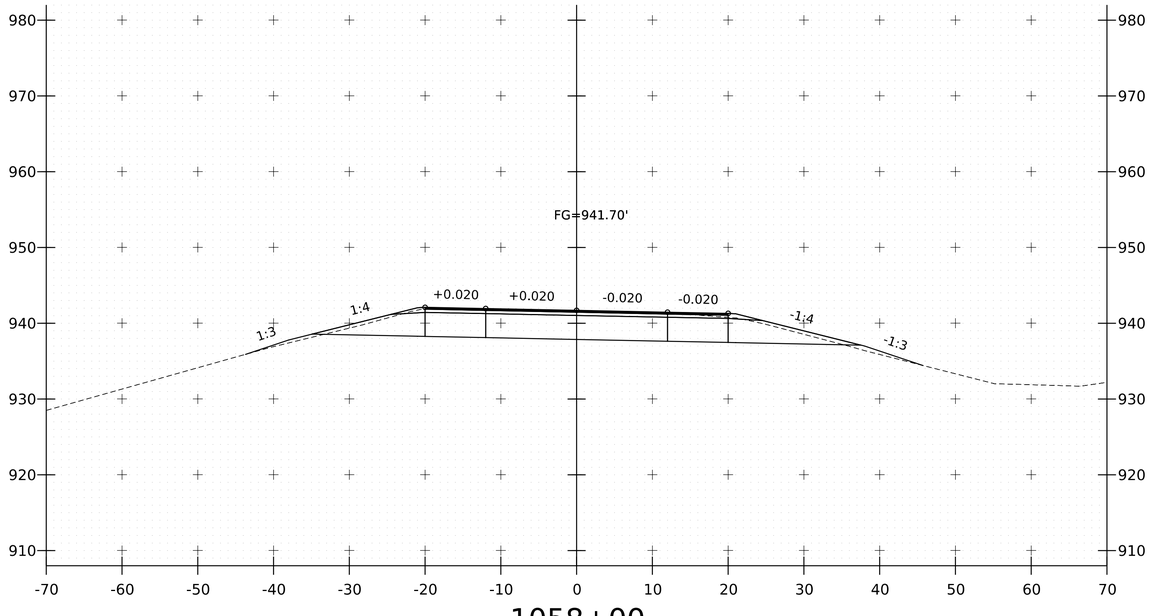


1059+00

END APPROACH

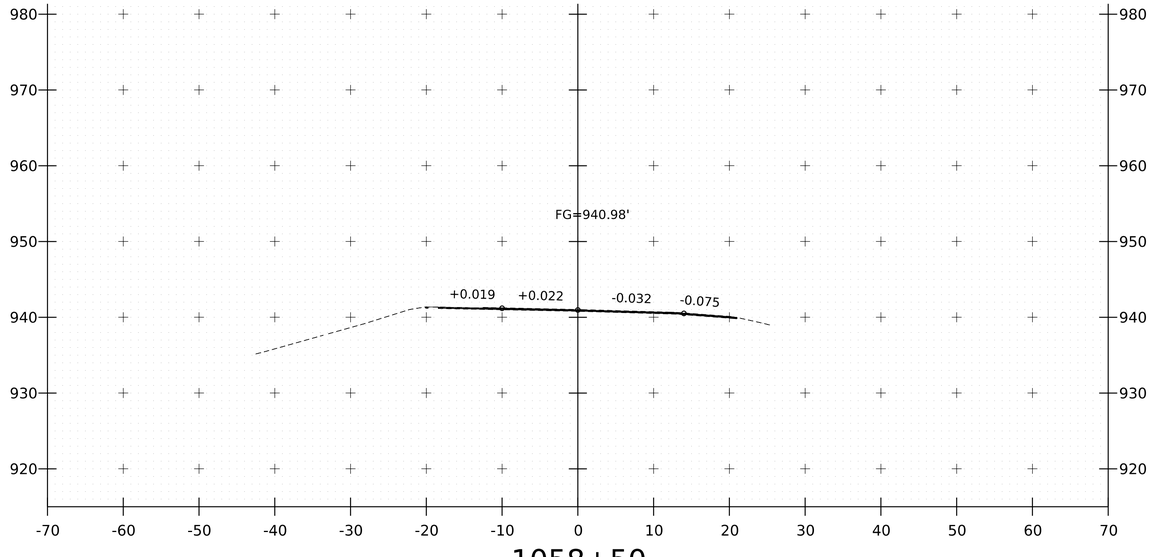


1058+75



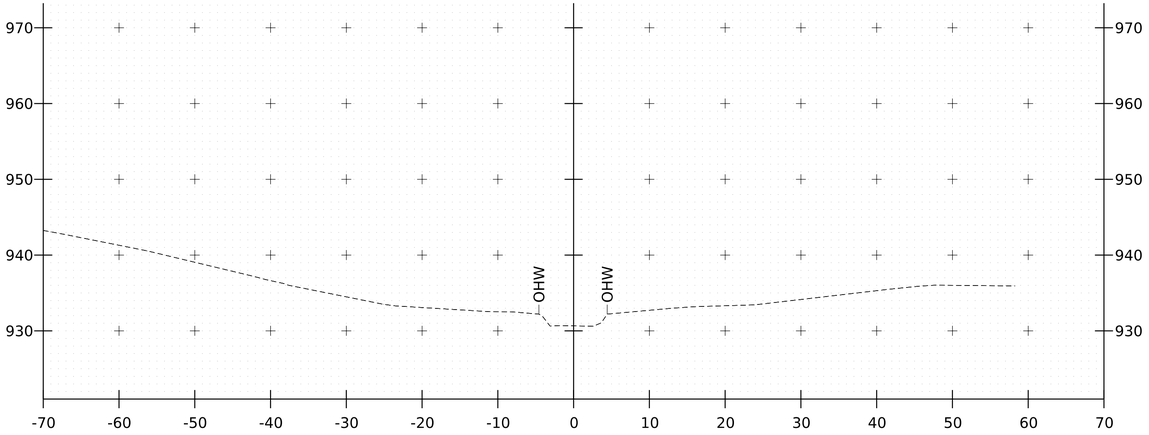
1058+00

END PROJECT

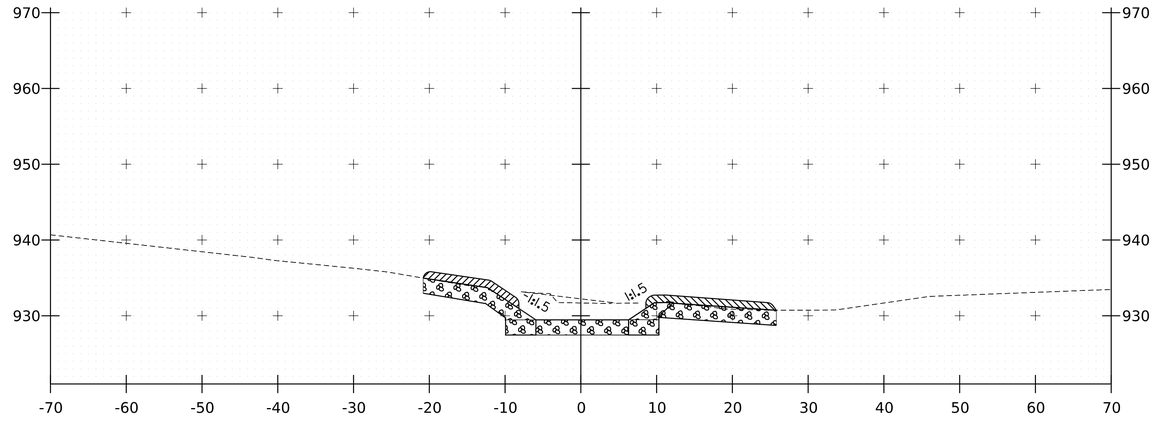


1058+50

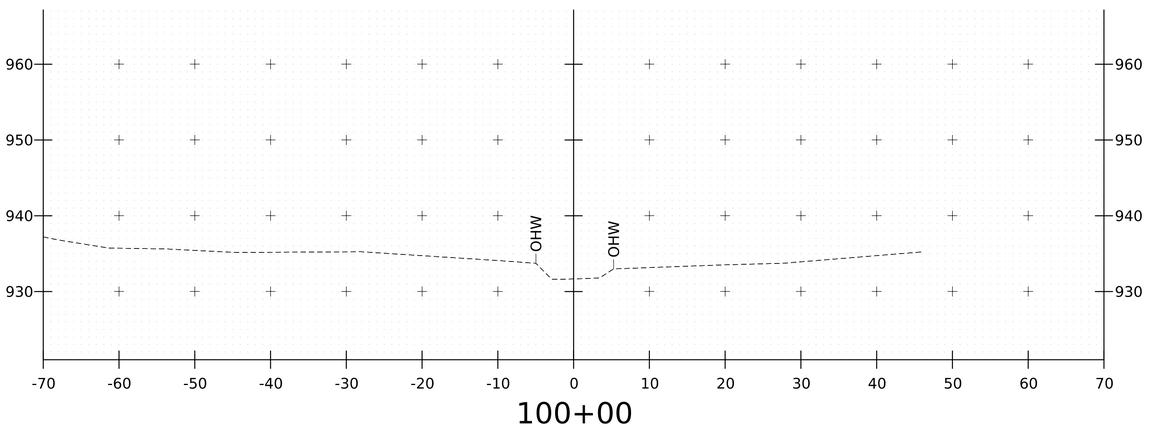
PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	BM 20102
FILE NAME: z20b155xs1.dgn	PLOT DATE: 2/25/2026
PROJECT LEADER: A. STOCKIN	DRAWN BY: M. HERMIS
DESIGNED BY: M. GROTE	CHECKED BY: T. HIGGINSON
MAINLINE CROSS SECTIONS 4	SHEET 26 OF 66



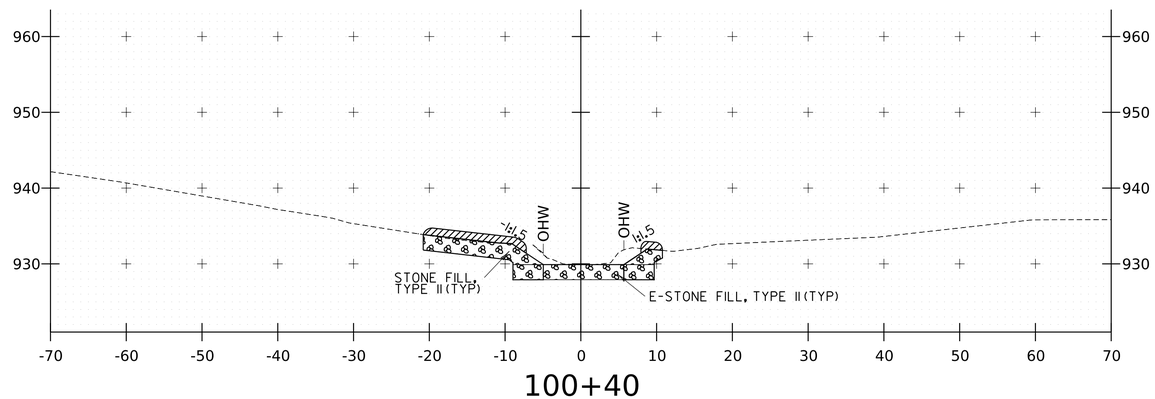
100+25



100+50



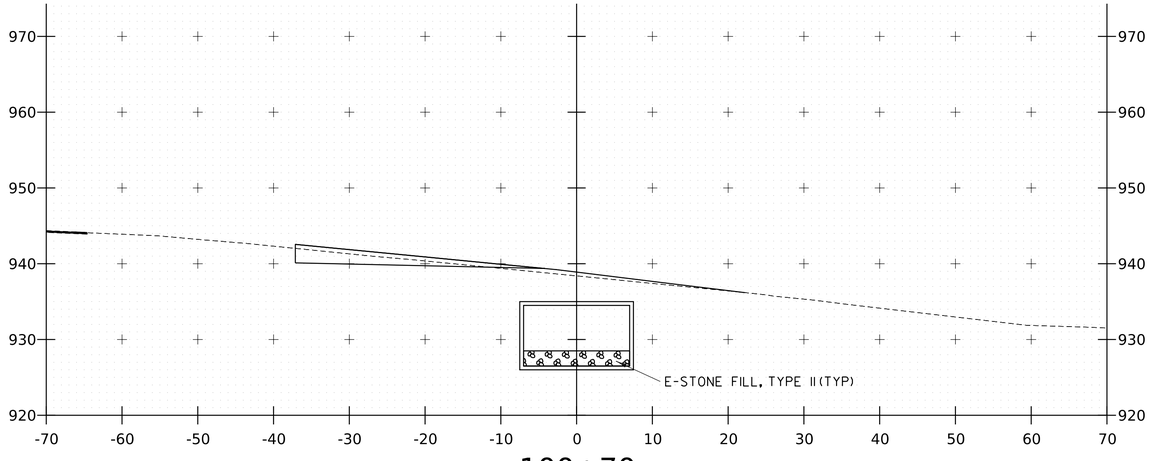
100+00



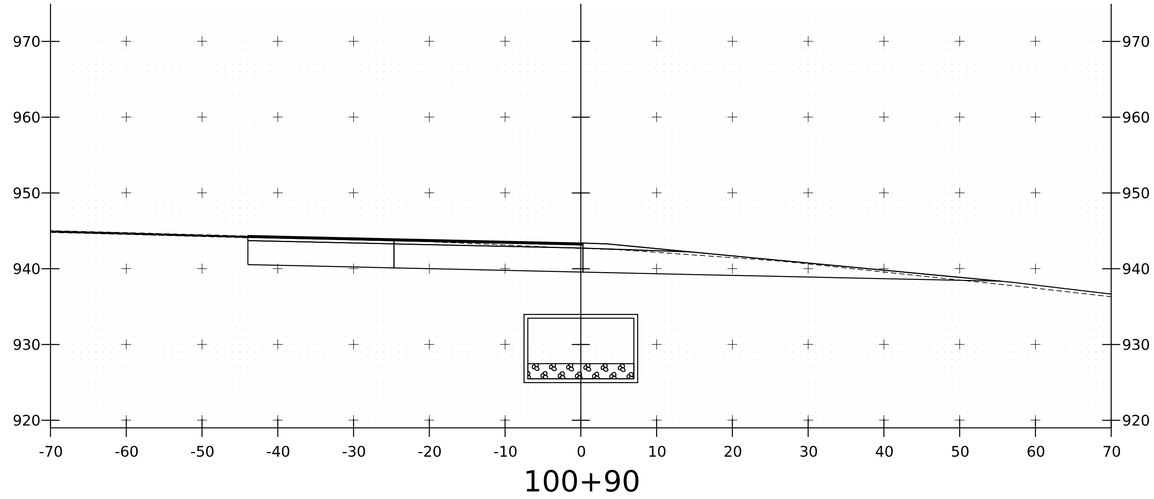
100+40

CHANNEL STA. 100+40.00
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
BEGIN STONE FILL, TYPE II
BEGIN E-STONE FILL, TYPE II (SEE NOTE 2 ON TYPICAL SECTIONS FOR LOW-FLOW CHANNEL)
BEGIN GRUBBING MATERIAL (SEE TYPICAL CHANNEL SECTION FOR MORE INFORMATION)
BEGIN GEOTEXTILE UNDER STONE FILL

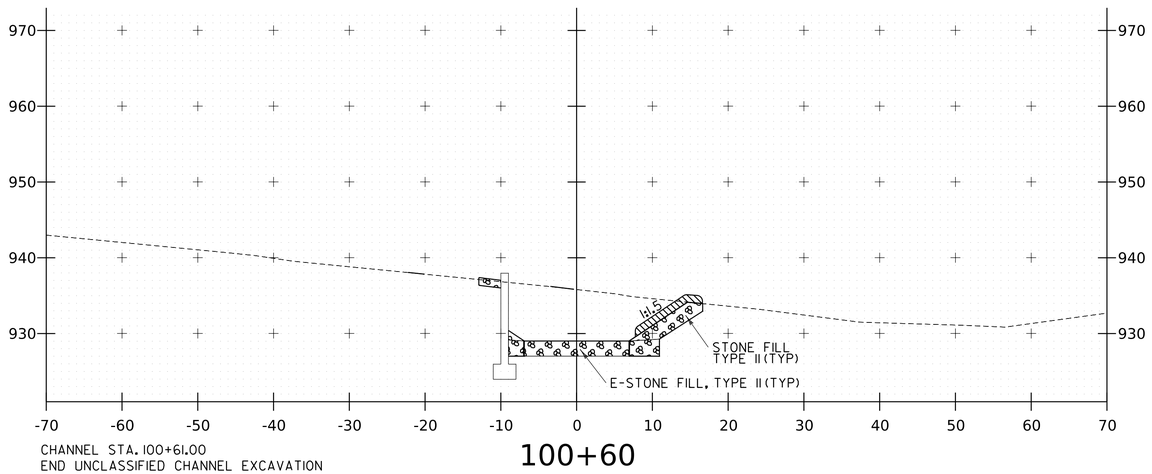
PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	BM 20102
FILE NAME: z20b155xs2.dgn	PLOT DATE: 2/25/2026
PROJECT LEADER: A. STOCKIN	DRAWN BY: M. HERMIS
DESIGNED BY: M. GROTE	CHECKED BY: T. HIGGINSON
CULVERT CROSS SECTIONS 1	SHEET 27 OF 66



100+70



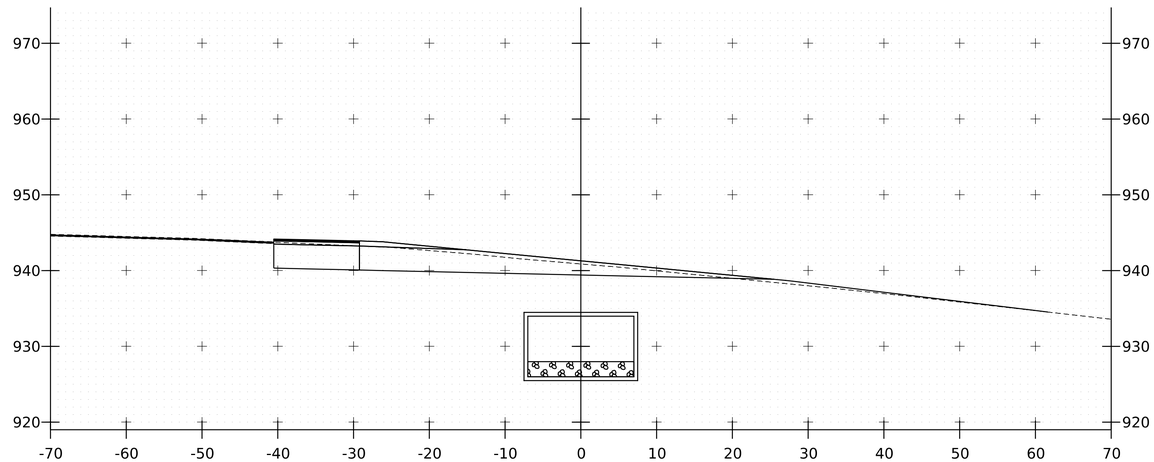
100+90



100+60

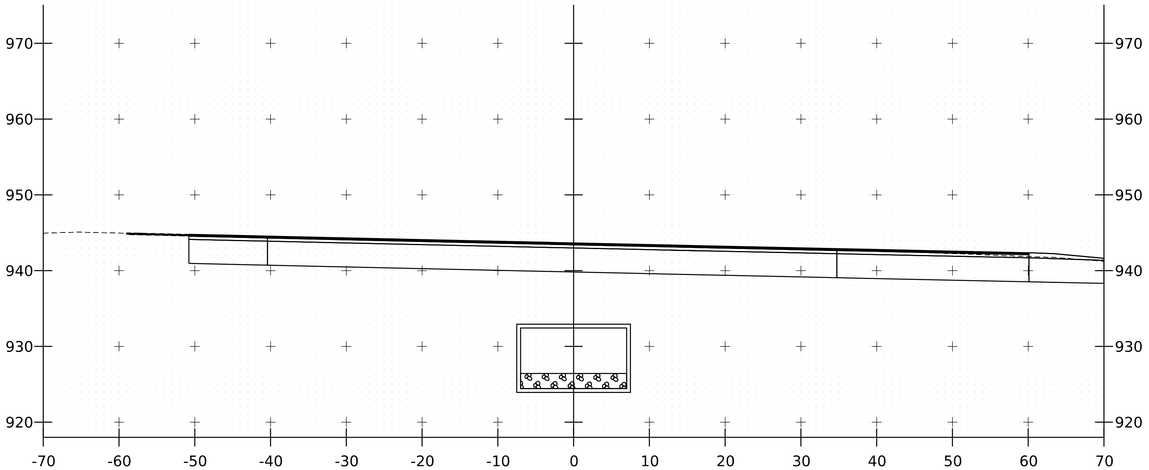
CHANNEL STA. 100+61.00
END UNCLASSIFIED CHANNEL EXCAVATION
END STONE FILL, TYPE II
END E-STONE FILL, TYPE II
END GRUBBING MATERIAL
END GEOTEXTILE UNDER STONE FILL
BEGIN STRUCTURE EXCAVATION

STA. 100+61 BEGIN BOX

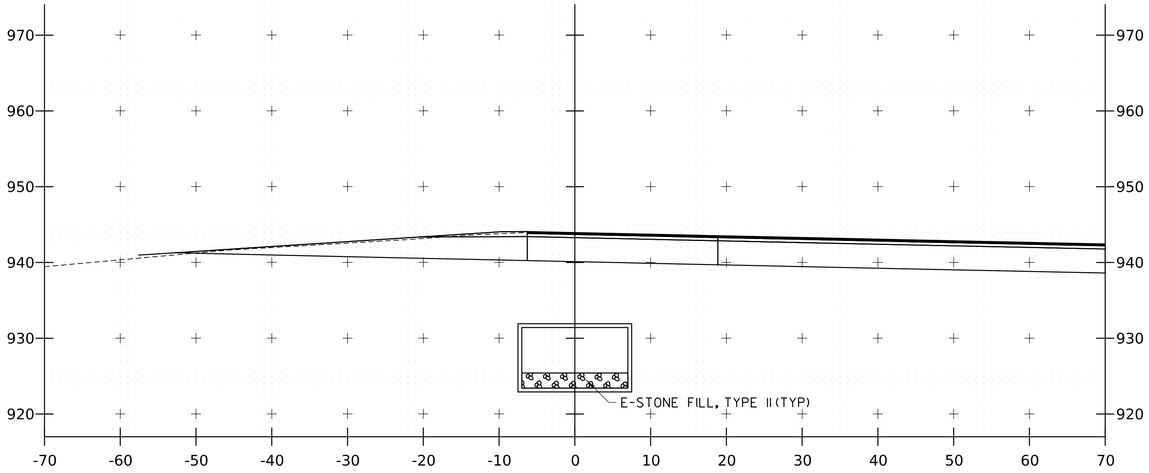


100+80

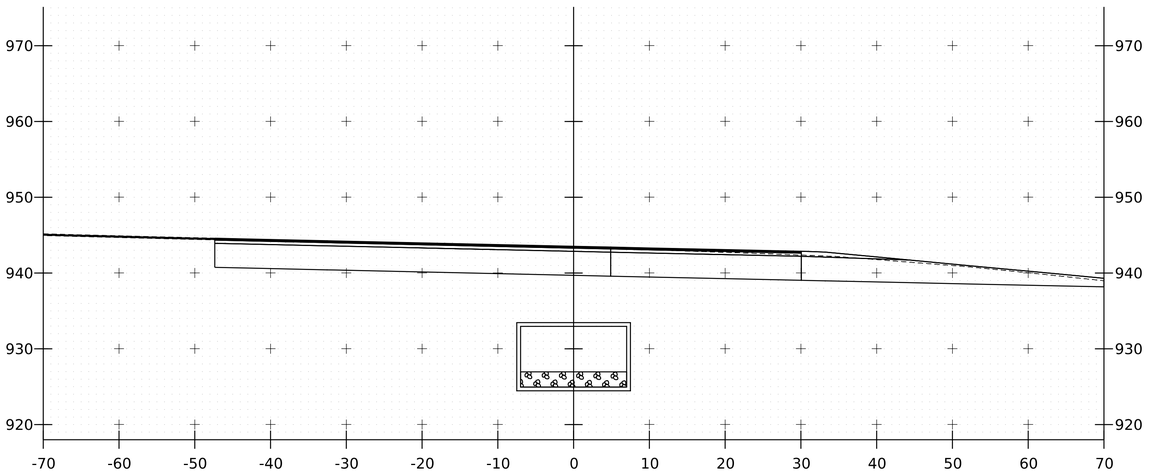
PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	BM 20102
FILE NAME: z20b155xs2.dgn	PLOT DATE: 2/25/2026
PROJECT LEADER: A. STOCKIN	DRAWN BY: M. HERMIS
DESIGNED BY: M. GROTE	CHECKED BY: T. HIGGINSON
CULVERT CROSS SECTIONS 2	SHEET 28 OF 66



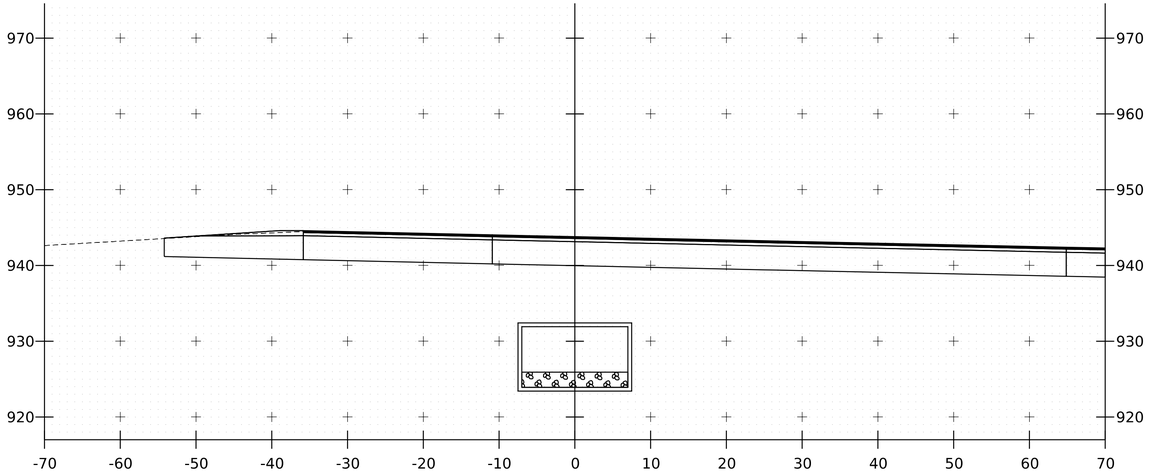
101+10



101+30



101+00

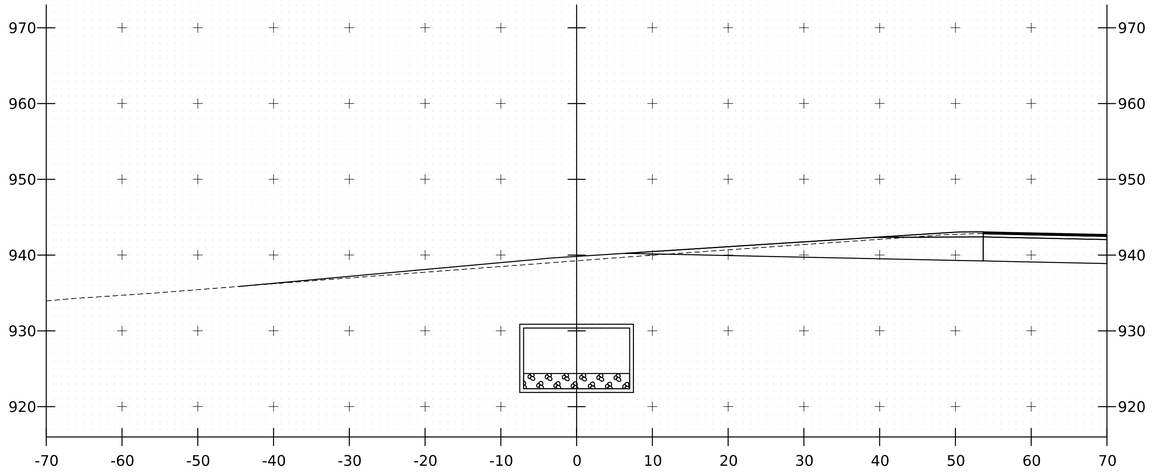


101+20

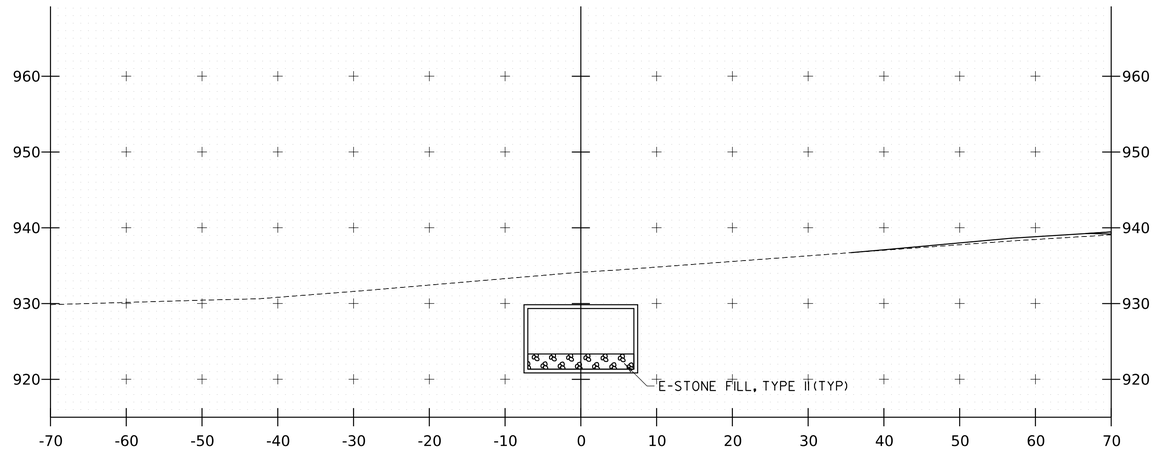
PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BM 20102

FILE NAME: z20b155xs2.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
CULVERT CROSS SECTIONS 3

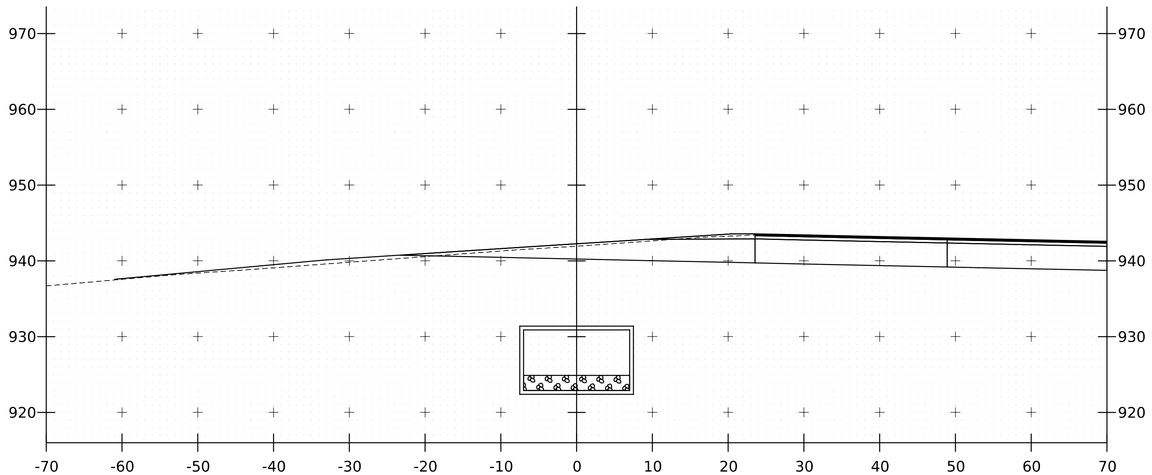
PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 29 OF 66



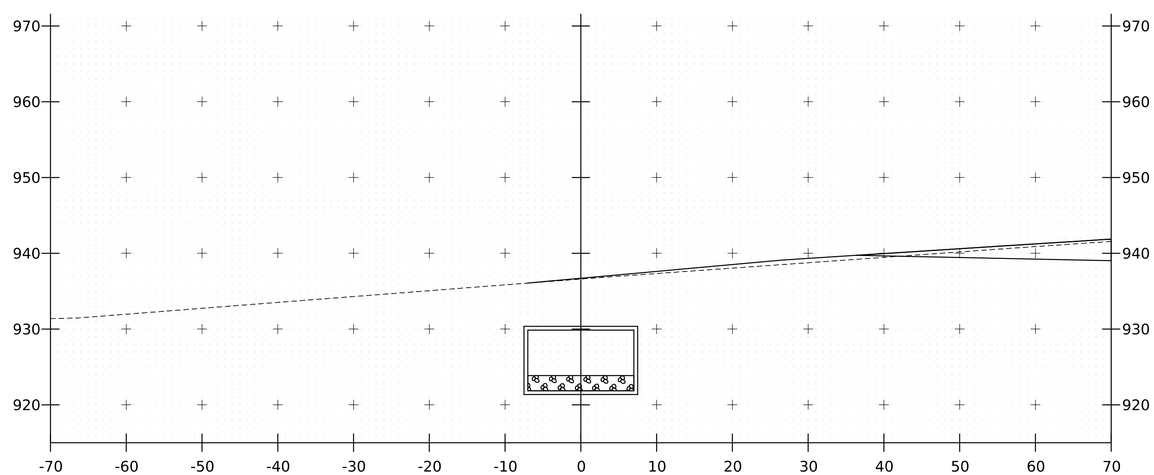
101+50



101+70



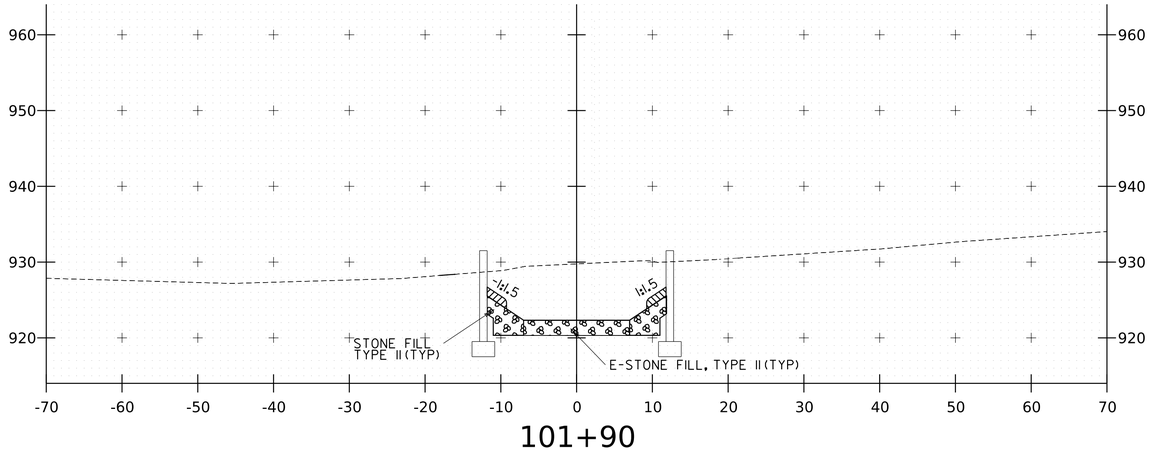
101+40



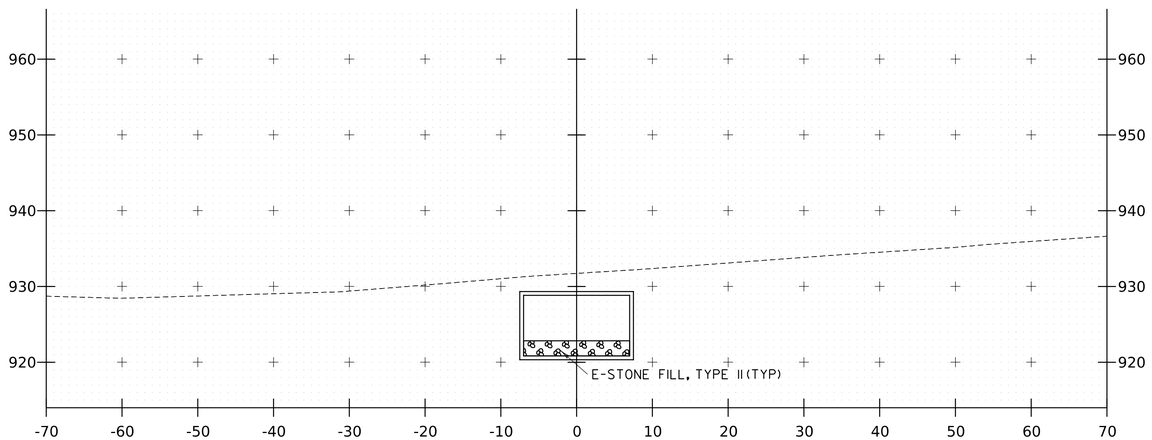
101+60

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	BM 20102

FILE NAME:	z20b155xs2.dgn	PLOT DATE:	2/25/2026
PROJECT LEADER:	A. STOCKIN	DRAWN BY:	M. HERMIS
DESIGNED BY:	M. GROTE	CHECKED BY:	T. HIGGINSON
CULVERT CROSS SECTIONS 4		SHEET	30 OF 66



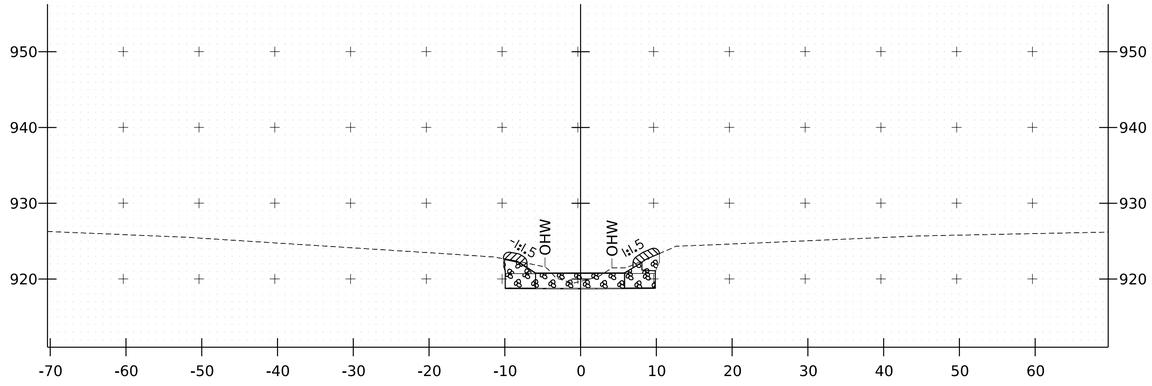
101+90



101+80

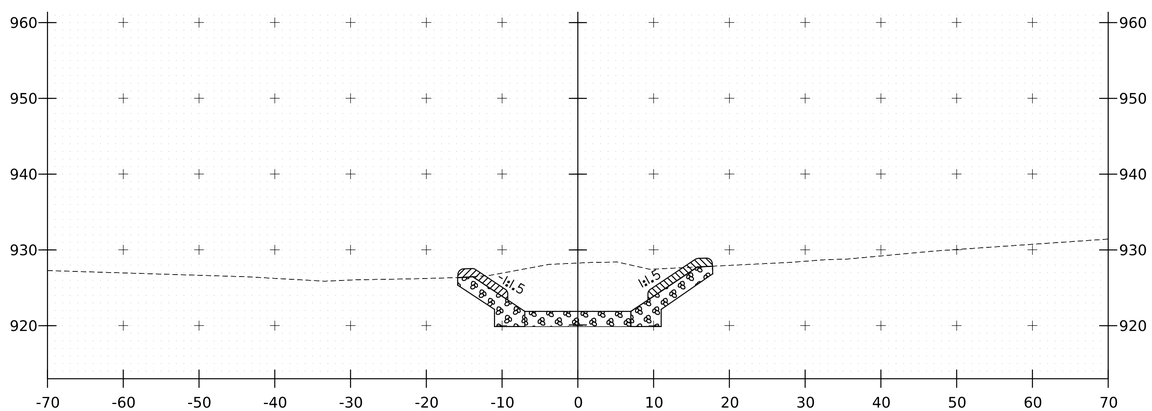
CHANNEL STA. 101+86
END STRUCTURE EXCAVATION
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
BEGIN STONE FILL, TYPE II
BEGIN E-STONE FILL, TYPE II (SEE NOTE 2 ON TYPICAL SECTIONS FOR LOW-FLOW CHANNEL)
BEGIN GRUBBING MATERIAL (SEE TYPICAL CHANNEL SECTION FOR MORE INFORMATION)
BEGIN GEOTEXTILE UNDER STONE FILL

STA. 101+86 END BOX



102+25

CHANNEL STA. 102+40.00
END UNCLASSIFIED CHANNEL EXCAVATION
END STONE FILL, TYPE II
END E-STONE FILL, TYPE II
END GRUBBING MATERIAL
END GEOTEXTILE UNDER STONE FILL



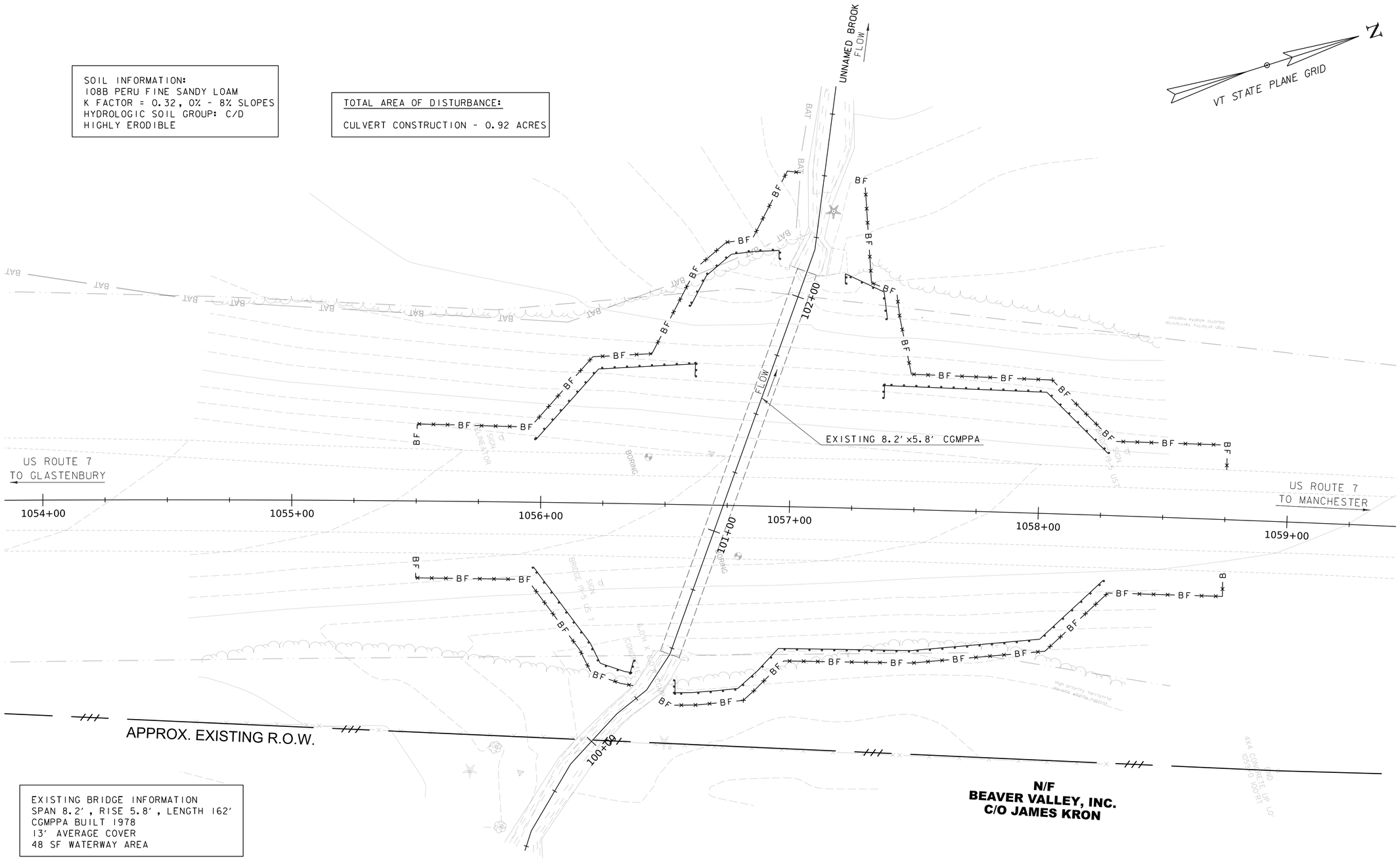
102+00

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	BM 20102
FILE NAME: z20b155xs2.dgn	PLOT DATE: 2/25/2026
PROJECT LEADER: A. STOCKIN	DRAWN BY: M. HERMIS
DESIGNED BY: M. GROTE	CHECKED BY: T. HIGGINSON
CULVERT CROSS SECTIONS 5	SHEET 31 OF 66

SOIL INFORMATION:
108B PERU FINE SANDY LOAM
K FACTOR = 0.32, 0% - 8% SLOPES
HYDROLOGIC SOIL GROUP: C/D
HIGHLY ERODIBLE

TOTAL AREA OF DISTURBANCE:

CULVERT CONSTRUCTION - 0.92 ACRES



EXISTING BRIDGE INFORMATION
SPAN 8.2', RISE 5.8', LENGTH 162'
CGMPPA BUILT 1978
13' AVERAGE COVER
48 SF WATERWAY AREA

EXISTING EPSC SITE PLAN

0 20 40
SCALE IN FEET

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	BM 20102
FILE NAME: z20b155rs.dgn	PLOT DATE: 2/25/2026
PROJECT LEADER: A. STOCKIN	DRAWN BY: M. HERMIS
DESIGNED BY: M. GROTE	CHECKED BY: T. HIGGINSON
EXISTING EPSC SITE PLAN	SHEET 32 OF 66

LEGEND:

VAOT POLLINATOR DRY SEED MIX

TREES & SHRUBS W/ VAOT POLLINATOR DRY SEED MIX

KEY	QUANTITY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONTAINER	SPACING (ON CENTER)	NOTES
TREES - DECIDUOUS							
AR	6	*Acer rubrum*	Red Maple	5-6' height	CONT.	4' O.C.	Straight species only. No cultivars.
AS	6	*Acer saccharum*	Sugar Maple	5-6' height	CONT.	4' O.C.	Straight species only. No cultivars.
TA	6	*Tilia americana*	Basswood	5-6' height	CONT.	4' O.C.	Straight species only. No cultivars.
SHRUBS - DECIDUOUS							
CS	6	*Cornus sericea*	Red twig dogwood	2 GAL	CONT.	4' O.C.	Straight species only. No cultivars.
RT	6	*Rhus typhina*	Staghorn sumac	2 GAL	CONT.	4' O.C.	Straight species only. No cultivars.
SD	6	*Salix discolor*	Common pussy willow	2 GAL	CONT.	4' O.C.	Straight species only. No cultivars.
SE	6	*Salix eriocephala*	Wooly headed willow	2 GAL	CONT.	4' O.C.	Straight species only. No cultivars.

N

VT STATE PLANE GRID

NOTES:

1. A LANDSCAPE-SPECIFIC COORDINATION MEETING WILL BE HELD AT LEAST 30 CALENDAR DAYS PRIOR TO LANDSCAPE INSTALLATION WITH THE LANDSCAPE SUBCONTRACTOR, PRIME CONTRACTOR, ENGINEER, AOT CONSTRUCTION ENVIRONMENTAL ENGINEER, AND EITHER THE AOT LANDSCAPE ARCHITECT OR THE CONSTRUCTION LANDSCAPE INSPECTOR

2. THE AOT LANDSCAPE ARCHITECT OR CONSTRUCTION LANDSCAPE INSPECTOR SHALL BE ON SITE TO CONFIRM PLANT SPECIES AND HEALTH, APPROVE PLANT LAYOUT, AND OBSERVE INSTALLATION. NOTIFY THE AOT LANDSCAPE ARCHITECT OR CONSTRUCTION LANDSCAPE INSPECTOR AT LEAST 7 CALENDAR DAYS PRIOR TO INSTALLATION. FAILURE TO INCLUDE THE AOT LANDSCAPE ARCHITECT OR CONSTRUCTION LANDSCAPE INSPECTOR MAY RESULT IN THE REJECTION OF PLANT MATERIAL AFTER INSTALLATION. NOTE: THE ENGINEER MAY EXERCISE THEIR AUTHORITY TO SUSPEND PLANT INSTALLATION UNTIL THE AOT LANDSCAPE ARCHITECT OR CONSTRUCTION LANDSCAPE INSPECTOR IS PRESENT, PER SUBSECTION 105.01(B).

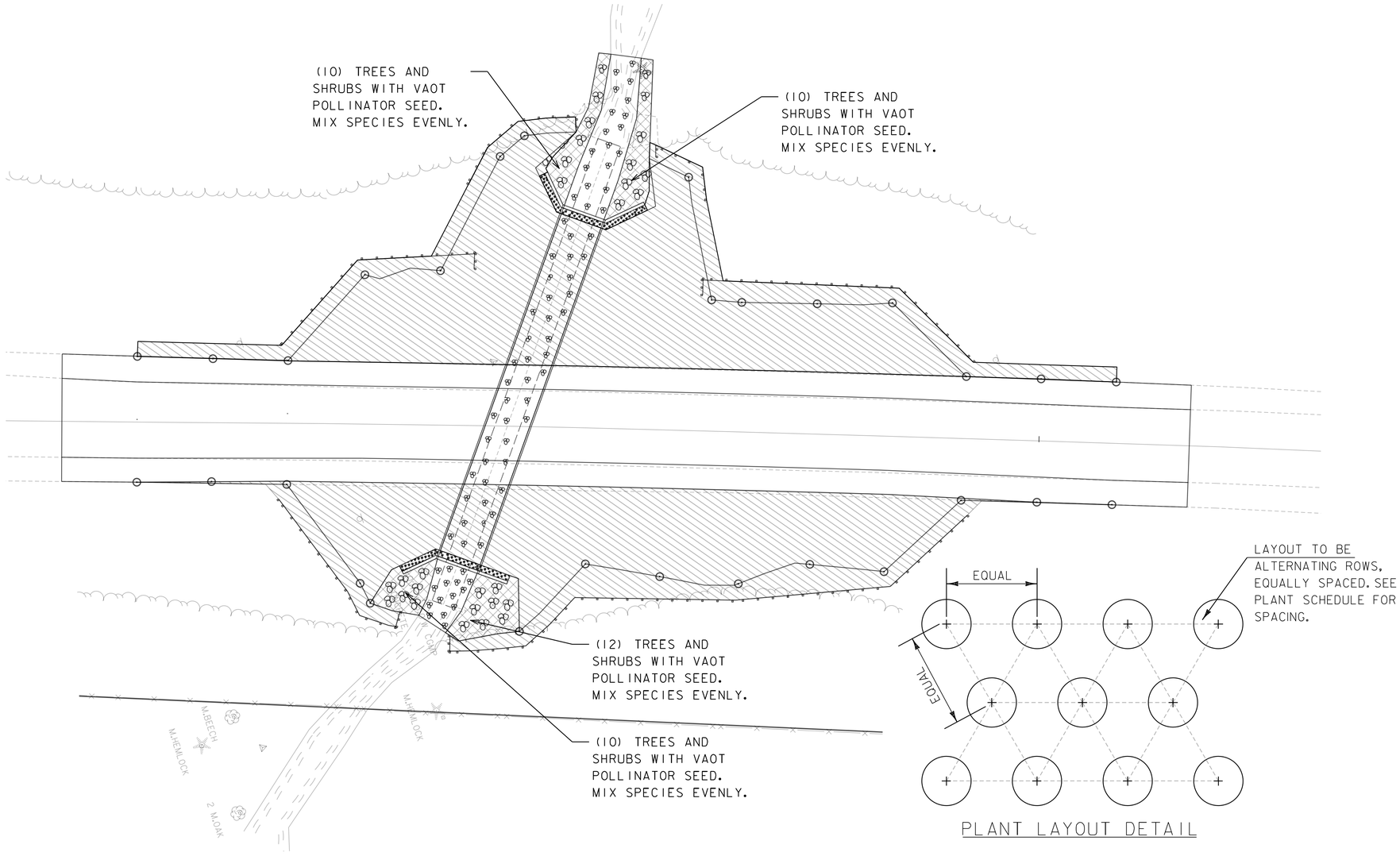
3. SEEDED AREAS SHALL BE PROTECTED IN ACCORDANCE WITH SPECIFICATION SUBSECTION 651.07 PROTECTION. WHERE WETLANDS OR WETLAND BUFFERS ARE PRESENT, STRAW MULCH SHALL BE USE INSTEAD OF HAY MULCH.

4. IF AREAS WITHIN PDF OR BARRIER FENCE ARE NOT DISTURBED, THEY SHOULD REMAIN VEGETATED, AND ADDITIONAL REVEGETATION IS NOT REQUIRED.

5. PROVIDING SUFFICIENT MOISTURE IS CRITICAL DURING THE ENTIRE PLANT ESTABLISHMENT PERIOD. WATERING TO BE PAID FOR UNDER 656.6500 LANDSCAPE WATERING.

6. IN AREAS RECEIVING PLANTINGS ON STONE FILL, THE CONTRACTOR SHALL VERIFY THAT THE GRUBBING LAYER, AFTER PLACEMENT, STILL MEETS THE SPECIFIED DEPTH AND HAS NOT DISAPPEARED INTO GAPS. TOP LAYER OF STONE FILL MAY BE BROKEN DOWN INTO SMALLER PIECES TO PREVENT SOIL LOSS AS DIRECTED BY THE ENGINEER.

7. APPLY MYCORRHIZAL FUNGI PER MANUFACTURERS RECOMMENDATIONS TO TREES AND SHRUBS.



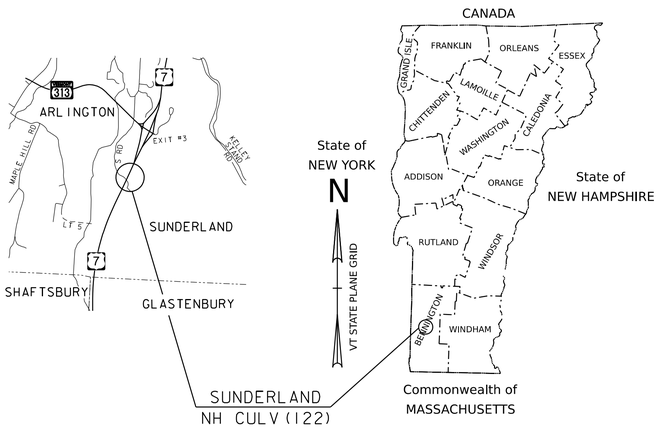
PLANT LAYOUT DETAIL

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: BM 20102

FILE NAME: w20b155bds_lds
PROJECT LEADER: GARY LAROCHE
DESIGNED BY: B. DONAHUE
LANDSCAPE PLAN

PLOT DATE: 5-FEB-2026
DRAWN BY: B. DONAHUE
CHECKED BY: G. LAROCHE
SHEET 33 OF 66

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
BRIDGE PROJECT

TOWN OF SUNDERLAND

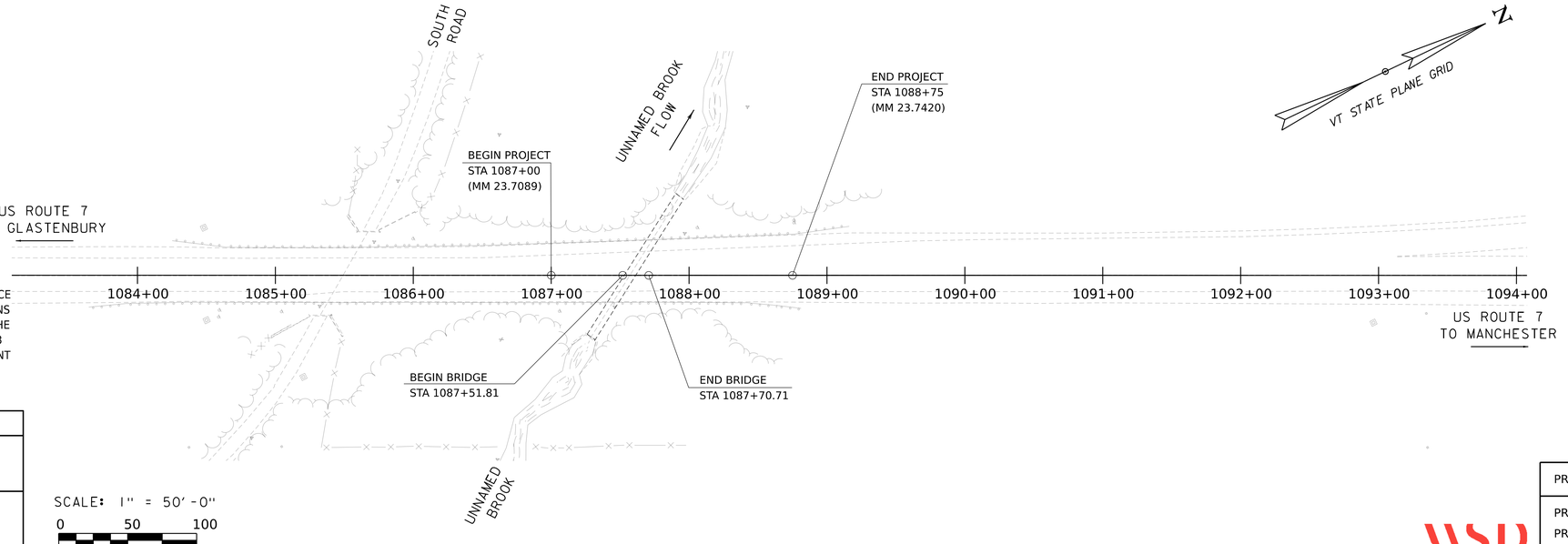
COUNTY OF BENNINGTON

ROUTE NO : US ROUTE 7 PRINCIPAL ARTERIAL BRIDGE NO : 19-7

PROJECT LOCATION: 0.52 MILE SOUTH OF VT ROUTE 313 AT UNNAMED BROOK

PROJECT DESCRIPTION: REPLACEMENT OF EXISTING BRIDGE STRUCTURE (BRIDGE 19-7) WITH A NEW STRUCTURE WITH RELATED APPROACH ROADWAY AND CHANNEL WORK.

PROJECT LENGTH:
- LENGTH OF ROADWAY: 375 FT
- LENGTH OF STRUCTURE: 18.90 FT
- LENGTH OF PROJECT: 175 FT



SCALE: 1" = 50'-0"

0 50 100

SCALE

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2024, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JUNE 27, 2023 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL 1

SURVEYED BY : R. GILMAN

SURVEYED DATE : 6-20-2022

DATUM

VERTICAL NAVD 88

HORIZONTAL NAD 83 (2011)

PROJECT MANAGER : G. LAROCHE, P.E.

PROJECT NAME : SUNDERLAND

PROJECT NUMBER : NH CULV(122)

SHEET 34 OF 66 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (CULVERT)

Version
LRFD

INDEX OF SHEETS

PLAN SHEETS

SEE INDEX OF SHEETS FOR SUNDERLAND NH CULV(122) INDEX

DETAIL SHEETS

STANDARDS LIST

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: 12/05/2024

DRAINAGE AREA : 1.28 sq.mi
CHARACTER OF TERRAIN :
STREAM CHARACTERISTICS :
NATURE OF STREAMBED :

PEAK FLOW DATA

Q 2.33 =	100 cfs	Q 50 =	390 cfs
Q 10 =	220 cfs	Q 100 =	480 cfs
Q 25 =	310 cfs	Q 500 =	

DATE OF FLOOD OF RECORD : Unknown
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY :
ICE CONDITIONS :
DEBRIS:
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY?
IS ORDINARY RISE RAPID?
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS?
IF YES, DESCRIBE:

WATERSHED STORAGE: 0.0% HEADWATERS:
UNIFORM:
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Corrugated Metal Pipe Plate
YEAR BUILT: 1979
CLEAR SPAN(NORMAL TO STREAM): 7 ft
VERTICAL CLEARANCE ABOVE STREAMBED:
WATERWAY OF FULL OPENING: 120 ft
DISPOSITION OF STRUCTURE: Replacement
TYPE OF MATERIAL UNDER SUBSTRUCTURE: See Borings

WATER SURFACE ELEVATIONS AT:

Q2.33 =		VELOCITY =	
Q10 =		"	
Q25 =		"	
Q50 =		"	
Q100 =		"	

LONG TERM STREAMBED CHANGES:

IS THE ROADWAY OVERTOPPED BELOW Q100: N/A
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @Q100: N/A

UPSTREAM STRUCTURE

TOWN: DISTANCE:
HIGHWAY # : STRUCTURE #:
CLEAR SPAN: CLEAR HEIGHT:
YEAR BUILT: FULL WATERWAY:
STRUCTURE TYPE:

DOWNSTREAM STRUCTURE

TOWN: DISTANCE:
HIGHWAY # : STRUCTURE #:
CLEAR SPAN: CLEAR HEIGHT:
YEAR BUILT: FULL WATERWAY:
STRUCTURE TYPE:

PROPOSED STRUCTURE

STRUCTURE TYPE: Concrete Culvert Box

CLEAR SPAN(NORMAL TO STREAM): 14 ft
VERTICAL CLEARANCE ABOVE STREAMBED: 6 ft
WATERWAY OF FULL OPENING: 884.25 ft

WATER SURFACE ELEVATIONS AT:

Q2.33 =	100 cfs	VELOCITY=	6.14 fps
Q10 =	220 cfs	"	8.37 fps
Q25 =	310 cfs	"	9.57 fps
Q50 =	390 cfs	"	10.46 fps
Q100 =	480 cfs	"	11.34 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: N/A
FREQUENCY: N/A
RELIEF ELEVATION: N/A
DISCHARGE OVER ROAD @Q100: N/A

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE:
VERTICAL CLEARANCE: @ Q =

SCOUR: N/A

REQUIRED CHANNEL PROTECTION: Stone Fill, Type III

PERMIT INFORMATION

AVERAGE DAILY FLOW:		DEPTH OR ELEVATION:
ORDINARY LOW WATER:		
ORDINARY HIGH WATER:		

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: N/A
CLEAR SPAN (NORMAL TO STREAM): N/A
VERTICAL CLEARANCE ABOVE STREAMBED: N/A
WATERWAY AREA OF FULL OPENING: N/A

ADDITIONAL INFORMATION

E-Stone Fill, Type II to be used for all in-channel work.

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN TRAFFIC ON AN OFF SITE DETOUR DURING THE TIME THE EXISTING ROADWAY WILL BE CLOSED.
2. SIDEWALKS ARE NOT NECESSARY.

DESIGN VALUES

1. DESIGN LIVE LOAD		HL-93
2. FUTURE PAVEMENT	d_p:	0.0 INCH
3. CULVERT OPENING	D:	14.00 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	- - -
5. PRESTRESSING STRAND	f_y:	- - -
6. PRESTRESSED CONCRETE STRENGTH	f'_c:	- - -
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	- - -
8. HIGH PERFORMANCE CONCRETE, CLASS PCD	f'_c:	- - -
9. HIGH PERFORMANCE CONCRETE, CLASS PCS	f'_c:	- - -
10. CONCRETE HIGH PERFORMANCE, CLASS SCC	f'_c:	- - -
11. CONCRETE, CLASS C	f'_c:	- - -
12. REINFORCING STEEL	f_y:	60 KSI
13. STRUCTURAL STEEL AASHTO M270	f_y:	- - -
14. NOMINAL BEARING RESISTANCE OF SOIL	q_n:	- - -
15. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	- - -
16. NOMINAL BEARING RESISTANCE OF ROCK	q_n:	- - -
17. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	- - -
18. PILE RESISTANCE FACTOR	ϕ:	- - -
19. LATERAL PILE DEFLECTION	Δ:	- - -
20. BASIC WIND SPEED	V_{3s}:	- - -
21. MINIMUM GROUND SNOW LOAD	p_g:	- - -
22. SEISMIC DATA PGA: - - -	S_s:	- - -
	S_1:	- - -
23.		- - -
24.		- - -
25.		- - -
26.		- - -

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
TONNAGE	20	36	36	66	30	34.5	38
INVENTORY							
POSTING							
OPERATING							
COMMENTS:	TABLE TO BE COMPLETED BY CONTRACTOR'S DESIGNER						

CULVERT DESIGN CRITERIA

1. PROPOSED CULVERT IS A PRECAST CONCRETE BOX (14'-0" X 8'-0" X 125'-0" BOX).
2. CULVERT WILL REQUIRE AQUATIC ORGANISM PASSAGE (AOP).

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2027	7760	950	51	5.3	470
2047	8520	1050	51	6.3	615

20 year ESAL for flexible pavement from 2027 to 2047 : 3341500
40 year ESAL for flexible pavement from 2027 to 2067 : 7072000
Design Speed : 55 mph

AS BUILT "REBAR" DETAIL

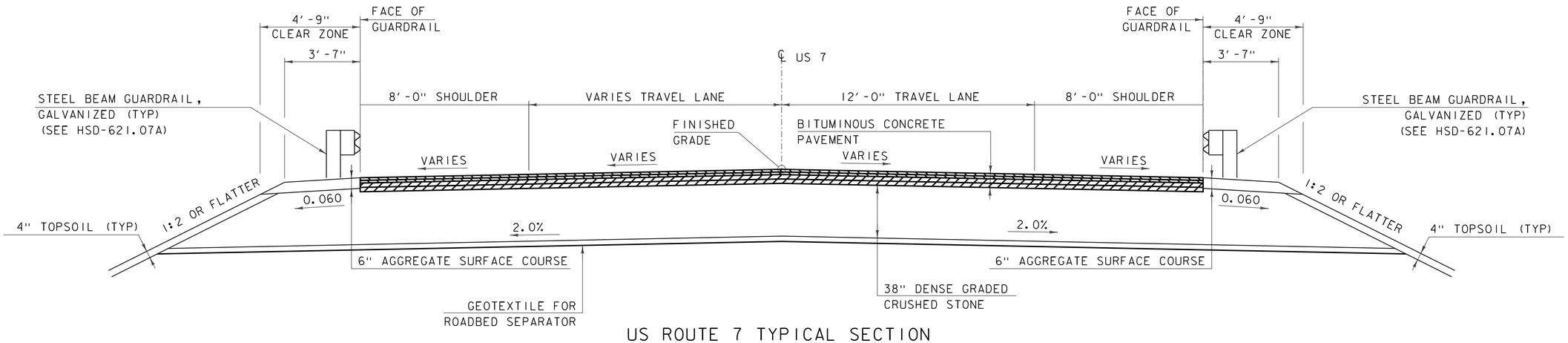
LEVEL I	LEVEL II	LEVEL III
TYPE:	TYPE:	TYPE:
GRADE:	GRADE:	GRADE:

PROJECT NAME: **SUNDERLAND**
PROJECT NUMBER: **NH CULV(122)**

FILE NAME: **X23B027FORMS.DGN**
PROJECT LEADER: **A. STOCKIN**
DESIGNED BY: **M. GROTE**
PRELIMINARY INFORMATION SHEET 1

PLOT DATE: **6/12/2025**
DRAWN BY: **M. HERMIS**
CHECKED BY: **T. HIGGINSON**

SHEET **35** OF **66**

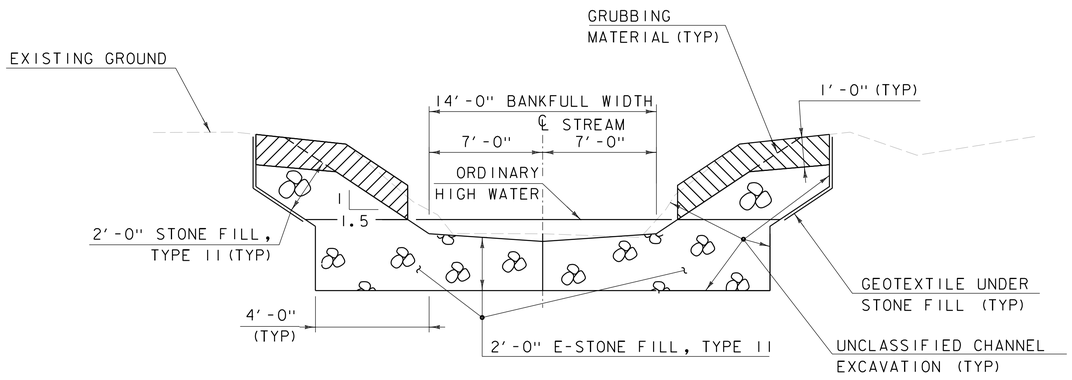


US ROUTE 7 TYPICAL SECTION

SCALE 3/8"=1'
STA. 1087+00.00 TO 1088+75.00

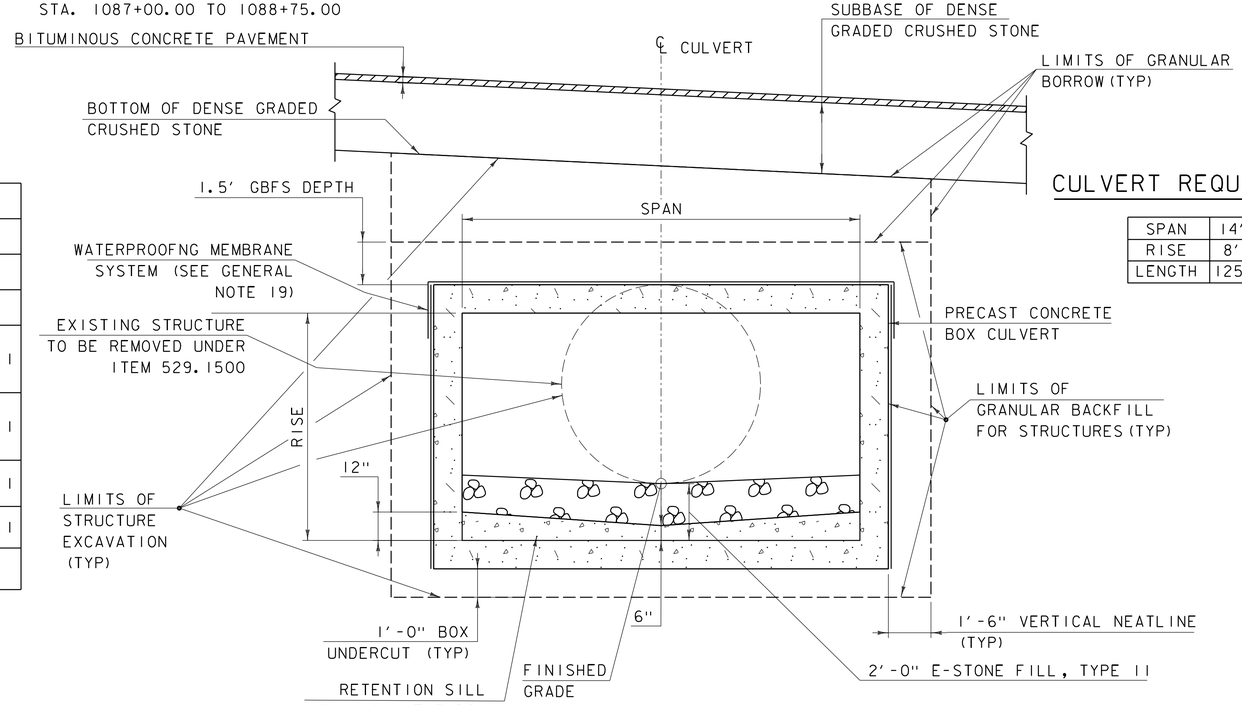
BITUMINOUS CONCRETE PAVEMENT MATERIAL REQUIREMENTS

	THICKNESS	DESCRIPTION
ESAL	1,704,165	DESIGN LANE/ DESIGN LIFE ESAL
BINDER	58E-28	PERFORMANCE GRADE ASPHALT BINDER
GYRATION	65	DESIGN NUMBER OF GYRATIONS
WEARING COURSE	1½"	BITUMINOUS CONCRETE PAVEMENT, TYPE IVS, QA TIER III
INTERMEDIATE COURSE	1½"	BITUMINOUS CONCRETE PAVEMENT, TYPE IVS, QA TIER III
BASE COURSE #2	2½"	BITUMINOUS CONCRETE PAVEMENT, TYPE IIS, QA TIER III
BASE COURSE #1	2½"	BITUMINOUS CONCRETE PAVEMENT, TYPE IIS, QA TIER III
BASE	38"	DENSE GRADED CRUSHED STONE



TYPICAL CHANNEL SECTION

(NOT TO SCALE)



CULVERT TYPICAL SECTION

(NOT TO SCALE)

CULVERT REQUIREMENTS

SPAN	14'-0"
RISE	8'-0"
LENGTH	125'-0"

NOTE:

1) WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF ROADWAY SUBBASE.

2) THE CONTRACTOR SHALL CREATE A LOW FLOW CHANNEL IN THE STREAM BED MATERIAL AS DIRECTED BY THE ENGINEER.

3) WHENEVER BEDROCK IS ENCOUNTERED DURING EXCAVATION OF THE CHANNEL KEY OR FILL SLOPES, THE ENGINEER WILL COORDINATE WITH THE RIVER MANAGEMENT ENGINEER FOR APPROVAL OF HOW TO CONSTRUCT THE CHANNEL.

4) REUSE OF NATIVE MATERIAL MEETING THE SPECIFICATION OF GRANULAR BORROW IS PERMITTED.

MATERIAL TOLERANCES

(IF USED ON PROJECT)

SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- ¼"
- AGGREGATE SURFACE COURSE	+/- ½"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

FILE NAME: z23b027typ.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
TYPICAL SECTIONS

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON

PRECAST BOX CULVERT / RETAINING WALLS - DESIGN CRITERIA

1. THE PRECAST CONCRETE BOX CULVERT, HEADWALLS, WINGWALLS, CUT OFF WALLS, AND RETENTION SILLS SHALL BE DESIGNED BY THE FABRICATOR IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS REFERENCED IN COMBINED PROJECT NOTES 1. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS AND CALCULATIONS TO THE ENGINEER IN ACCORDANCE WITH SECTION 105 AND SUBSECTION 540.04. USE THE FOLLOWING DESIGN CRITERIA AND GEOMETRIC REQUIREMENTS DEFINED IN THE PLANS:

    A. SOIL UNIT WEIGHT = 140 PCF (GRANULAR BACKFILL FOR STRUCTURES)
    B. AT-REST EARTH PRESSURE (Ko) = 0.44
    C. DESIGN CODE = AASHTO LRFD LATEST EDITION/HL93
    D. DESIGN FILL OVER BOX CULVERT (MAX) = 13.5 FEET
    E. FACTORED BEARING RESISTANCE = 9.0 (FOR STRENGTH LIMIT STATE, USING FACTOR OF 0.45)
    F. FACTORED BEARING RESISTANCE = 4.0 (FOR SERVICE LIMIT STATE, USING FACTOR OF 1.0)
    G. REQUIRED DESIGN LIFE = 75 YEARS

2. A BRIDGE PLAQUE FURNISHED BY THE AGENCY SHALL BE CAST INTO WING WALL NO. 2. SEE S- 501 FOR FURTHER DETAILS.

3. THE BOX CULVERT HEADWALLS, CUTOFF WALLS, RETENTION SILLS AND WINGWALLS SHALL BE CONSIDERED INCIDENTAL TO ITEM 540.1000 "PRECAST CONCRETE STRUCTURE (14 FT x 8 FT x 125 FT BOX CULVERT)".

wsp

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

FILE NAME: z23b027gen.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
PROJECT NOTES

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 37 OF 66

STATE OF VERMONT

AGENCY OF TRANSPORTATION

QUANTITY SHEET

SUMMARY OF ESTIMATED QUANTITIES

1011 - ROADWAY	1051 - EROSION CONTROL	1211 - BRIDGE NO. 1	1999 - FULL C.E. ITEMS	3041 - LANDSCAPING	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND
1.00					1.00		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS (BRIDGE 19-7)	201.1000	
1,850.00					1,850.00		CY	COMMON EXCAVATION	203.1500	
		450.00			450.00		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.2700	
500.00					500.00		CY	GRANULAR BORROW	203.3200	
1.00					1.00		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.2200	
		1,450.00			1,450.00		CY	STRUCTURE EXCAVATION	204.2500	
		400.00			400.00		CY	GRANULAR BACKFILL FOR STRUCTURES	204.3000	
775.00					775.00		SY	COARSE-MILLING, BITUMINOUS PAVEMENT	210.1000	
1,600.00					1,600.00		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.3500	
55.00					55.00		CY	AGGREGATE SURFACE COURSE	401.1000	
23.00					23.00		GWT	TACK COAT, EMULSIFIED ASPHALT	404.1100	
361.00					361.00		TON	BITUMINOUS CONCRETE PAVEMENT, TY PE IIS, QA TIER III	406.0230	
302.00					302.00		TON	BITUMINOUS CONCRETE PAVEMENT, TY PE IVS, QA TIER III	406.0430	
1.00					1.00		DL	PAY ADJUSTMENT, BCP, MIXTURE PROPERTIES (N.A.B.I.)	406.9100	
1.00					1.00		DL	PAY ADJUSTMENT, BCP, MAT DENSITY (N.A.B.I.)	406.9200	
		4.00			4.00		GAL	WATER REPELLENT, SILANE	514.1000	
		1.00			1.00		EACH	REMOVAL OF STRUCTURE (7 FT DIA. X 120 FT CGMPP)	529.1500	
		1.00			1.00		LS	PRECAST CONCRETE STRUCTURE (14 FT X 8 FT X 125 FT BOX CULVERT)	540.1000	
		270.00			270.00		CY	E-STONE FILL, TY PE II	613.0602	
		10.00			10.00		CY	STONE FILL, TY PE I	613.1001	
		225.00			225.00		CY	STONE FILL, TY PE II	613.1002	
		1.00			1.00		EACH	TEMPORARY RELOCATION OF STREAM (BRIDGE 19-7)	614.1000	
560.00					560.00		LF	REMOVAL OF GUARDRAIL	621.0100	
575.00					575.00		LF	STEEL BEAM GUARDRAIL	621.1060	
2.00					2.00		EACH	MTS, MGS, TANGENT, TL-3	621.3030	
104.00					104.00		HR	UNIFORMED TRAFFIC OFFICERS	630.1000	
152.00					152.00		HR	FLAGGERS	630.1500	
			1.00		1.00		LS	FIELD OFFICE, ENGINEER'S (BRIDGE 19-7)	631.1000	
			1.00		1.00		LS	TESTING EQUIPMENT, BITUMINOUS (BRIDGE 19-7)	631.1700	
			1.00		1.00		LS	TESTING EQUIPMENT, GROUT (BRIDGE 19-7)	631.1900	
			1,500.00		1,500.00		DL	FIELD OFFICE COMMUNICATIONS (N.A.B.I.)	631.2600	
1.00					1.00		LS	MOBILIZATION/DEMOBILIZATION (BRIDGE 19-7)	635.1100	
1.00					1.00		LS	TRAFFIC CONTROL, ALL-INCLUSIVE (BRIDGE 19-7)	641.1100	
750.00					750.00		LF	6 INCH WHITE LINE, WATERBORNE PAINT	646.2141	
750.00					750.00		LF	6 INCH YELLOW LINE, WATERBORNE PAINT	646.2151	
2,100.00					2,100.00		SY	GEOTEXTILE FOR ROADBED SEPARATOR	649.1100	
		510.00			510.00		SY	GEOTEXTILE UNDER STONE FILL	649.3100	
	1,700.00				1,700.00		SY	TURF ESTABLISHMENT, SPECIALTY SEED (POLLINATOR DRY MIX)	651.1600	
	190.00				190.00		CY	TOPSOIL	651.3500	
	100.00				100.00		SY	GRUBBING MATERIAL, 12 INCH	651.4012	
	1.00				1.00		LS	EPSC PLAN (BRIDGE 19-7)	653.0100	

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS
		EARTHWORK SUMMARY
		FILL AVAILABLE
555.0	CY	COMMON EXCAVATION(1850 X 0.3)
135.0	CY	UNCLASSIFIED CHANNEL EXCAVATION(450 X 0.3)
435.0	CY	STRUCTURE EXCAVATION(1450 X 0.3)
75.0	CY	ROUNDING
1200.0	CY	TOTAL FILL AVAILABLE
		FILL REQUIRED
138.0	CY	FACTORED FILL REQUIRED (120 X 1.15)
2.0	CY	ROUNDING
140.0	CY	TOTAL FILL REQUIRED
		BORROW OR WASTE
1060.0	CY	WASTE

PROJECT NAME: SUNDERLAND

PROJECT NUMBER: NH CULV(122)

FILE NAME: z23b027qs.dgn

PROJECT LEADER: A. STOCKIN

DESIGNED BY: M. GROTE

QUANTITY SHEET I

PLOT DATE: 3/9/2026

DRAWN BY: M. HERMIS

CHECKED BY: T. HIGGINSON

STATE OF VERMONT

AGENCY OF TRANSPORTATION

QUANTITY SHEET

| SUMMARY OF ESTIMATED QUANTITIES | | |

PRIMARY CONTROL

HVCTRL #1
NORTH = 201276.5510
EAST = 1472675.7500
ELEV. = 871.7600

LOCATED AT THE ROUTE 7 SOUTH BOUND EXIT #3 FOR ARLINGTON AND SUNDERLAND. IN THE GRASS ISLAND FORMED BY ROUTE 7 AND THE SOUTH BOUND OFF RAMP.

THE MARK IS A 3/4 INCH REBAR WITH RED CAP SET FLUSH WITH GROUND SURFACE.

IT IS 22.5' WEST OF AND 2' BELOW THE WEST EDGE OF US7, 25.7' EAST OF AND 1' BELOW THE EAST EDGE OF THE OFF RAMP, 30.5' SE OF A DROP INLET, 81.0' W OF AND DIRECTLY OPPOSITE A NORTH US 7 SIGN AND 129' NW OF MILE MARKER 0070/0215/0180.

HVCTRL #2
NORTH = 194779.8680
EAST = 1469822.5340
ELEV. = 943.8400

TO REACH FROM THE ROUTE 7 BRIDGE OVER ROUTE 313/ORVIS RD, IN SUNDERLAND, GO SOUTH ALONG ROUTE 7 FOR 1.1 MILES TO THE SITE OF THE MARK ON THE RIGHT.

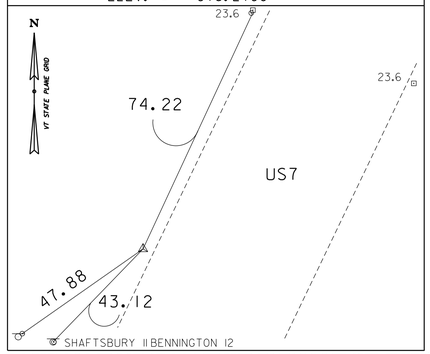
THE MARK IS A 3/4 INCH REBAR WITH RED CAP SET 0.2 FEET BELOW GROUND SURFACE.

IT IS 1.0' WEST OF THE WEST EDGE OF US7, 11.5' SOUTH OF THE CENTERLINE OF A 72" CULVERT, 300' SW OF MILE MARKER 23.2 AND 167' SW OF A BRIDGE SIGN.

SECONDARY CONTROL

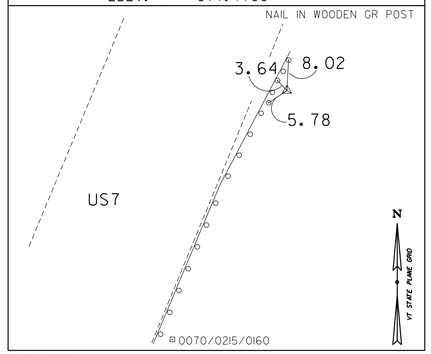
HVCTRL #3

NORTH = 196942.3144
EAST = 1470763.6363
ELEV. = 916.2190



HVCTRL #4

NORTH = 200220.1403
EAST = 1472366.1968
ELEV. = 871.1790



NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

*TRAVERSE COMPLETED ON 6/6/2022 BY R.GILMAN R.GAUVIN

ALIGNMENT TIES

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

NORTH =
EAST =
ELEV. =

DATUM

VERTICAL NAVD 88
HORIZONTAL NAD83 (2011)
ADJUSTMENT COMPASS

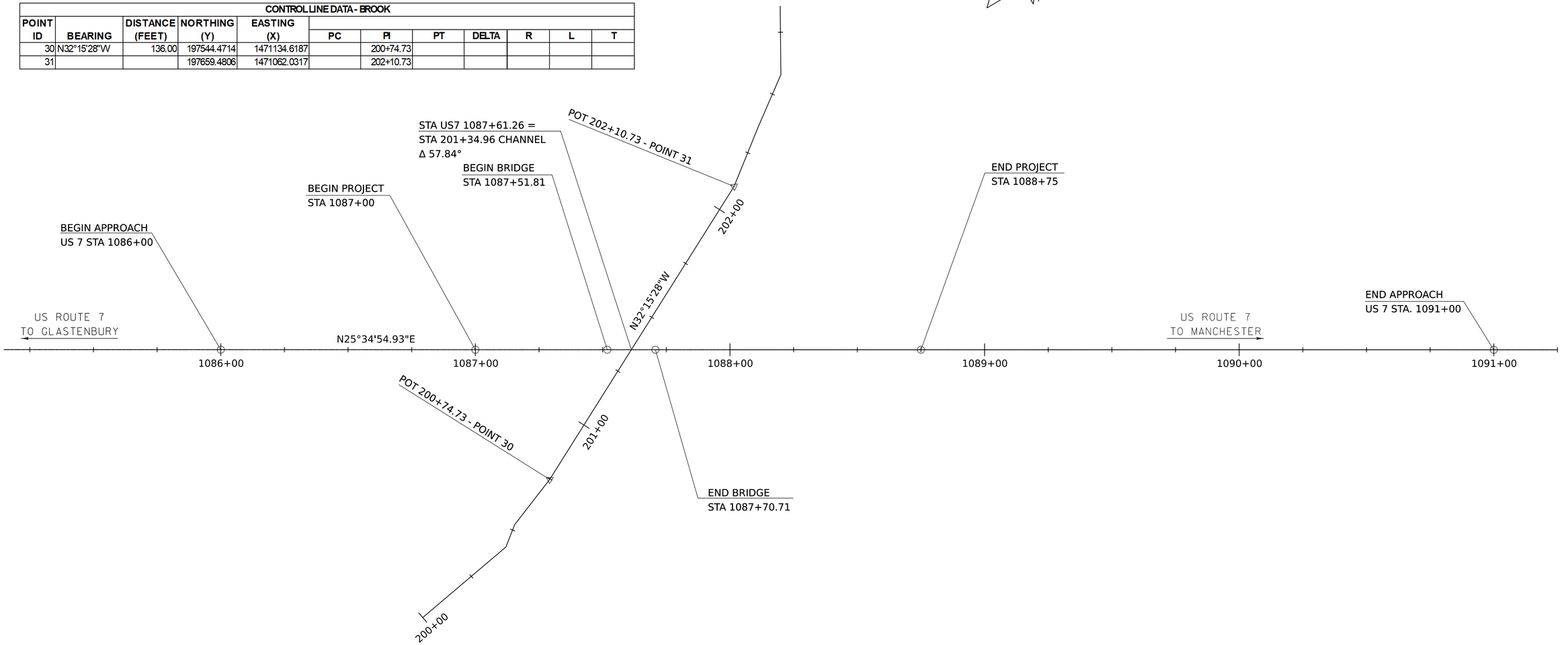
PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

FILE NAME: X23B027TI.DGN
PROJECT LEADER: C. COTA
DESIGNED BY: VTRANS
TIE SHEET

PLOT DATE: 9/22/2025
DRAWN BY: H.MCGOWAN
CHECKED BY: R. GILMAN

CONTROL LINE DATA - US7											
POINT ID	BEARING	DISTANCE (FEET)	NORTHING (Y)	EASTING (X)	PC	PI	PT	DELTA	R	L	T
20	N25°34'54.93"E	1921.64	196638.1764	1470644.2238		1077+00.00					
21			198371.4370	1471473.9909		1096+21.64					

CONTROL LINE DATA - BROOK											
POINT ID	BEARING	DISTANCE (FEET)	NORTHING (Y)	EASTING (X)	PC	PI	PT	DELTA	R	L	T
30	N32°15'28"W	136.00	197544.4714	1471134.6187		200+74.73					
31			197659.4806	1471062.0317		202+10.73					



0 20 40
SCALE IN FEET

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	NH CULV(122)
FILE NAME: z23b027align.dgn	PLOT DATE: 2/25/2026
PROJECT LEADER: A. STOCKIN	DRAWN BY: M. HERMIS
DESIGNED BY: M. GROTE	CHECKED BY: T. HIGGINSON
ALIGNMENT SHEET	SHEET 41 OF 66

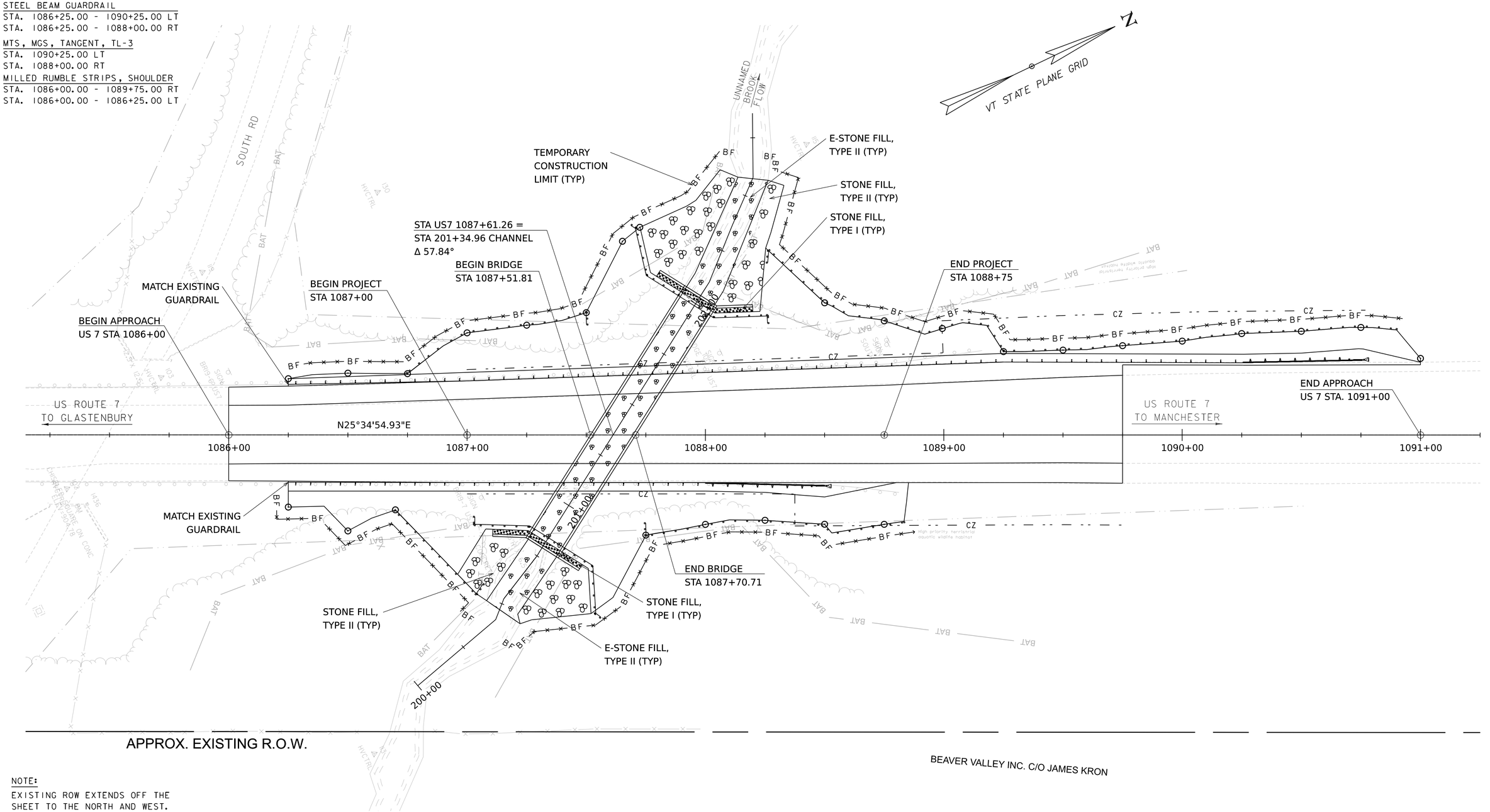
COARSE-MILLING, BITUMINOUS PAVEMENT
STA. 1086+00.00 - 1086+75.00
STA. 1089+00.00 - 1089+75.00

REMOVAL OF GUARDRAIL
STA. 1086+25.00 - 1089+16.00 LT
STA. 1086+25.00 - 1088+81.00 RT

STEEL BEAM GUARDRAIL
STA. 1086+25.00 - 1090+25.00 LT
STA. 1086+25.00 - 1088+00.00 RT

MTS, MGS, TANGENT, TL-3
STA. 1090+25.00 LT
STA. 1088+00.00 RT

MILLED RUMBLE STRIPS, SHOULDER
STA. 1086+00.00 - 1089+75.00 RT
STA. 1086+00.00 - 1086+25.00 LT



NOTE:
EXISTING ROW EXTENDS OFF THE SHEET TO THE NORTH AND WEST.

EXISTING BRIDGE INFORMATION:
SPAN 7' DIAMETER, LENGTH 120'-0"
CGMPP BUILT 1979
10' AVERAGE COVER
38 SF WATERWAY AREA

LAYOUT PLAN

0 20 40
SCALE IN FEET

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

FILE NAME: z23b027bdr.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
LAYOUT PLAN

PLOT DATE: 2/26/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 42 OF 66

DOUBLE 6" YELLOW LINE, WATERBORNE PAINT
STA. 1086+00.00 - 1089+75.00
6" WHITE LINE, WATERBORNE PAINT
STA. 1086+00.00 - 1089+75.00 LT
STA. 1086+00.00 - 1089+75.00 RT

SOUTH RD

UNNAMED BROOK FLOW

VT STATE PLANE GRID

STA 1088+76.36 39.83 LT

STA 1088+05.81 34.35 LT

BRIDGE 19-7 US 7

SOUTH 7

STA US7 1087+61.26 =
STA 201+34.96 CHANNEL
Δ 57.84°

BEGIN BRIDGE
STA 1087+51.81

BEGIN PROJECT
STA 1087+00

END PROJECT
STA 1088+75

DELINEATOR WITH STEEL POST
STA 1090+75.50, 31.69 LT (BLUE)

MATCH EXISTING GUARDRAIL

BEGIN APPROACH
US 7 STA 1086+00

N32°15'28"W

CZ

US ROUTE 7
TO GLASTENBURY

US ROUTE 7
TO MANCHESTER

END APPROACH
US 7 STA. 1091+00

SWL

DYL

N25°34'54.93"E

1086+00 1087+00 1088+00 1089+00 1090+00 1091+00

200+00

STA 1087+06.68 25.89 RT

END BRIDGE
STA 1087+70.71

DELINEATOR WITH STEEL POST
STA 1088+51.02, 21.67RT (GREEN)

APPROX. EXISTING R.O.W.

BEAVER VALLEY INC. C/O JAMES KRON

LEGEND

R	REMOVE
S	SALVAGE & RESET
N	NEW
RET	RETAIN
B-B	BACK TO BACK
EXISTING	----------
NEW	————
DYL	DOUBLE YELLOW LINE
SWL	SINGLE WHITE LINE
SDYL	SINGLE DASHED YELLOW LINE
SSYL	SINGLE SOLID YELLOW LINE

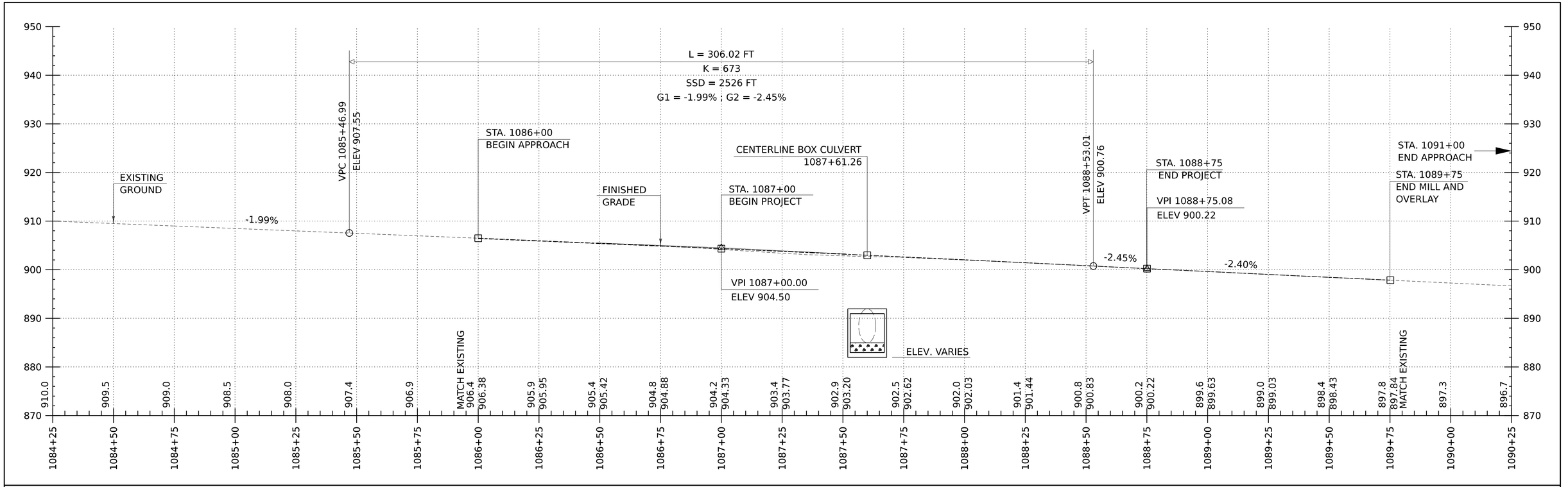
LAYOUT PLAN

0 20 40
SCALE IN FEET

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

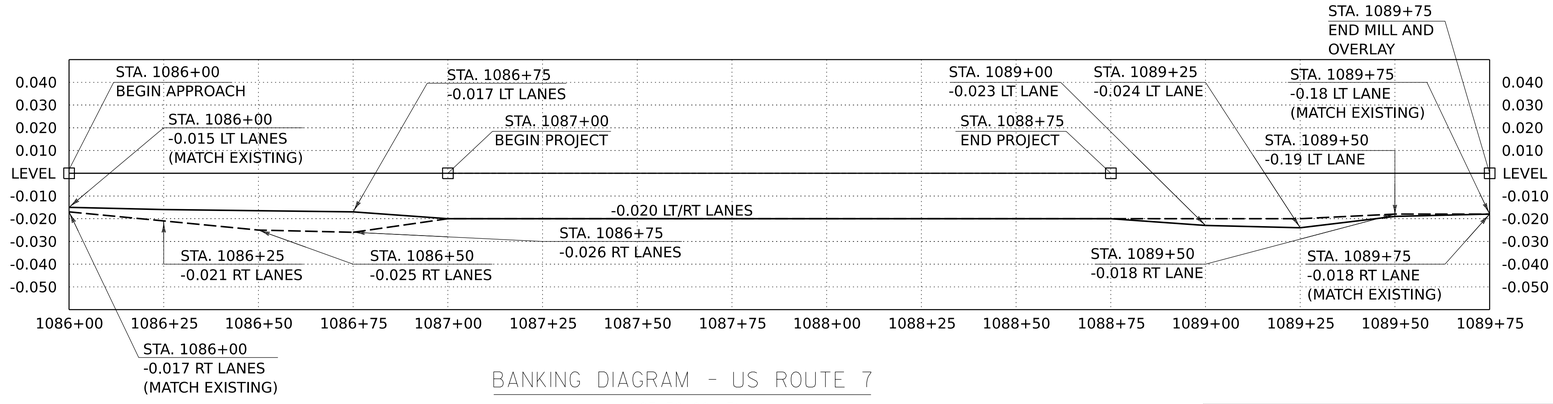
FILE NAME: z23b027bdr_trf-sign.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
TRAFFIC SIGN AND LINE LAYOUT

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 43 OF 66



US ROUTE 7 PROFILE

HOR. SCALE: 1" = 20'-0"
VERT. SCALE: 1" = 10'-0"



BANKING DIAGRAM - US ROUTE 7

(NOT TO SCALE)

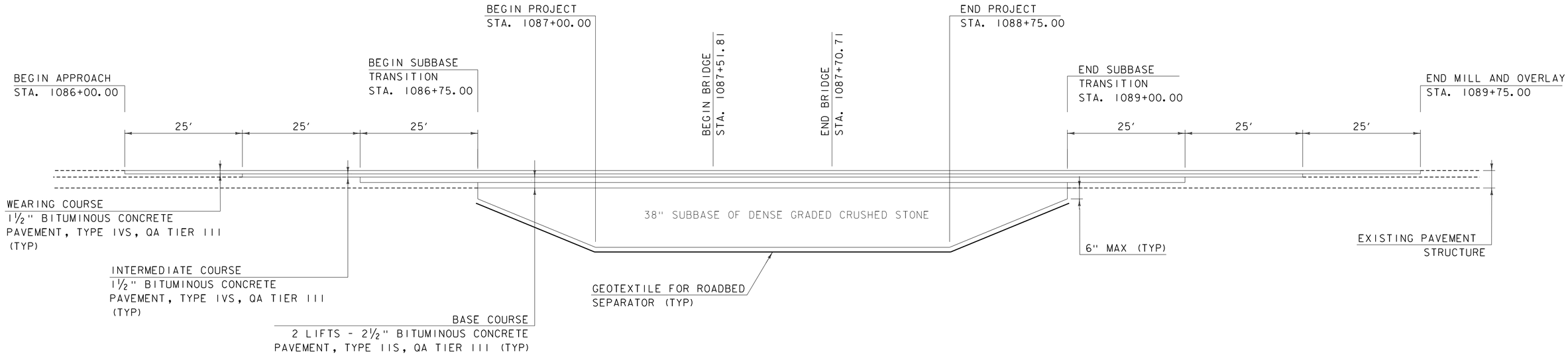
NOTES:

1. ELEVATIONS SHOWN TO THE NEAREST TENTH DEPICT THE EXISTING GROUND ELEVATION.
2. ELEVATIONS SHOWN TO THE NEAREST HUNDRETH DEPICT THE PROPOSED PROFILE GRADE ELEVATION.

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

FILE NAME: z23b027pro1.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
US7 PROFILE - BANKING DIAGRAM

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON



US ROUTE 7 MATERIAL TRANSITION

(NOT TO SCALE)

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	NH CULV(122)
FILE NAME: z23b027dtl.dgn	PLOT DATE: 2/25/2026
PROJECT LEADER: A. STOCKIN	DRAWN BY: M. HERMIS
DESIGNED BY: M. GROTE	CHECKED BY: T. HIGGINSON
MATERIAL TRANSITION	SHEET 45 OF 66

SOIL CLASSIFICATION

	AASHTO
A1	Gravel and Sand
A3	Fine Sand
A2	Silty or Clayey Gravel and Sand
A4	Silty Soil - Low Compressibility
A5	Silty Soil - Highly Compressible
A6	Clayey Soil - Low Compressibility
A7	Clayey Soil - Highly Compressible

ROCK QUALITY DESIGNATION

R.Q.D. (%)	ROCK DESCRIPTION
<25	Very Poor
25 to 50	Poor
51 to 75	Fair
76 to 90	Good
>90	Excellent

SHEAR STRENGTH

UNDRAINED SHEAR STRENGTH IN P.S.F.	CONSISTENCY
<250	Very Soft
250-500	Soft
500-1000	Med. Stiff
1000-2000	Stiff
2000-4000	Very Stiff
>4000	Hard

CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

COMMONLY USED SYMBOLS

▼	Water Elevation
⊕	Standard Penetration Boring
⊕	Auger Boring
⊙	Rod Sounding
S	Sample
N	Standard Penetration Test Blow Count Per Foot For: 2" O. D. Sampler 1 ⅜" I. D. Sampler Hammer Weight Of 140 Lbs. Hammer Fall Of 30"
VS	Field Vane Shear Test
US	Undisturbed Soil Sample
B	Blast
DC	Diamond Core
MD	Mud Drill
WA	Wash Ahead
HSA	Hollow Stem Auger
AX	Core Size 1 ⅛"
BX	Core Size 1 ⅝"
NX	Core Size 2 ⅛"
M	Double Tube Core Barrel Used
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
w	Non Plastic
D	Moisture Content (Dry Wgt. Basis)
NP	Dry
M	Moist
MTW	Moist To Wet
W	Wet
SAT	Saturated
BO	Boulder
Gr	Gravel
Sa	Sand
Si	Silt
Cl	Clay
HP	Hardpan
Le	Ledge
NLTD	No Ledge To Depth
CNPF	Can Not Penetrate Further
TLOB	Top of Ledge Or Boulder
NR	No Recovery
Rec.	Recovery
%Rec.	Percent Recovery
RQD	Rock Quality Designation
CBR	California Bearing Ratio
<	Less Than
>	Greater Than
R	Refusal (N > 100)
VTSPG	NAD83 - See Note 7

COLOR			
blk	Black	pnk	Pink
bl	Blue	pu	Purple
brn	Brown	rd	Red
dk	Dark	tn	Tan
gry	Gray	wh	White
gn	Green	yel	Yellow
lt	Light	mltc	Multicolored
or	Orange		

DEFINITIONS (AASHTO)

BEDROCK (LEDGE) - Rock in its native location of indefinite thickness.

BOULDER - A rock fragment with an average dimension > 12 inches.

COBBLE - Rock fragments with an average dimension between 3 and 12 inches.

GRAVEL - Rounded particles of rock < 3" and > 0.0787" (#10 sieve).

SAND - Particles of rock < 0.0787" (#10 sieve) and > 0.0029" (#200 sieve).

SILT - Soil < 0.0029" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.

CLAY - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.

VARVED - Alternate layers of silt and clay.

HARDPAN - Extremely dense soil, cemented layer, not softened when wet.

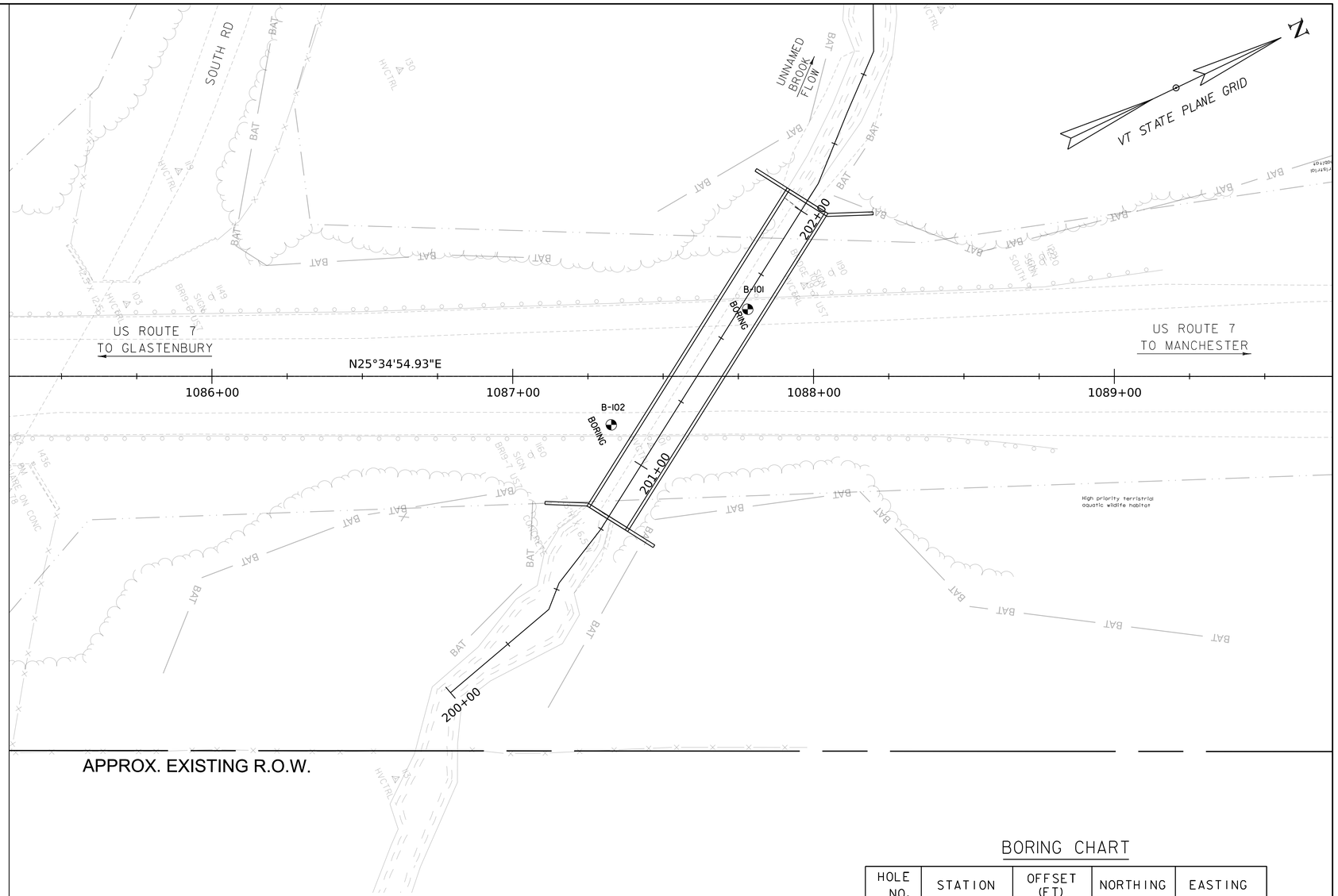
MUCK - Soft organic soil (containing > 10% organic material.

MOISTURE CONTENT - Weight of water divided by dry weight of soil.

FLOWING SAND - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.

STRIKE - Angle from magnetic north to line of intersection of bed with a horizontal plane.

DIP - Inclination of bed with a horizontal plane.



BORING LAYOUT

0 20 40

SCALE IN FEET

BORING CHART

HOLE NO.	STATION	OFFSET (FT)	NORTHING	EASTING
B-101	1087+78.12	22.33 LT	197620.80	1471089.30
B-102	1087+32.75	16.13 RT	197562.70	1471104.70

GENERAL NOTES

1. The subsurface explorations shown herein were made between 8/17/22 and 8/31/22 by VTrans.

2. Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.

3. Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.

4. Engineering judgment was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgment by the Contractor.

5. Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.

6. Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.

7. Northing and Easting coordinates are shown in Vermont State Plane Grid North American Datum 1983 in meters and survey feet.

wsp

PROJECT NAME: SUNDERLAND

PROJECT NUMBER: NH CULV(122)

FILE NAME: z23b027bor1.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
BORING INFORMATION SHEET

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 46 OF 66

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Statewide-Southwest
NH CULV(122)
Sunderland, US 7 BR 19-7

Boring No.: **B-101 (Br. 19-7)**
Page No.: 1 of 1
Pin No.: 23b027
Checked By: END

Boring Crew: McGinley, Aubut, Arles
Date Started: 8/17/22 Date Finished: 8/17/22
VTSPG NAD83: N 197620.80 ft E 1471089.30 ft
Station: 1087+78.12 Offset: 22.33 ft LT
Ground Elevation: 902.1 ft

	Casing	Sampler
Type:	WB	SS
I.D.:	3 in	1.5 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/AWJ	
Rig:	CME 55 TRACK	C_E = 1.52

Groundwater Observations

Date	Depth (ft)	Notes
08/17/22	10.6	WT After Drilling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Field Note:, Asphalt 0.0'-1.0'					
		Visual Description:, Poorly graded Gravel, white, Dry, Rec. = 1.5 ft, Split sample	10-7-7-12 (14)				
		Visual Description:, Sand with Silt and Gravel, Lt brn, Dry, Split sample					
		A-2-4, SiSa, Lt brn, MTD, Rec. = 1.7 ft	16-15-19-21 (34)	8.7	10.8	58.7	30.5
5		Visual Description:, Poorly graded Sand with Silt, Lt brn, Dry, Rec. = 1.3 ft	13-22-22-22 (44)				
		Visual Description:, Poorly graded Sand with Silt and trace Gravel, Lt brn, Dry, Rec. = 1.2 ft, Gravel in end of sampler	15-14-20-26 (34)				
10		A-1-b, SaGr, brn, Dry, Rec. = 0.7 ft	13-19-16-14 (35)	5.2	46.3	41.5	12.2
15		Visual Description:, Poorly graded Sand trace Gravel, brn, Wet, Rec. = 0.4 ft	9-6-4-8 (10)				
20		Field Note:, Attempted NX core. Appears to be nested cobbles 19.6'-22.0', NX cleanout 18.5'-19.6'					
25		Field Note:, No recovery	15-14-21-26 (35)				
30		A-4, SaSi, Rec. = 1.0 ft, Gravel in end of sampler	9-15-19-27 (34)	21.0	18.8	20.1	61.1
35		Visual Description:, Poorly graded Gravel with Silt, Lt brn, Wet, Rec. = 0.2 ft, Refusal at 35.8' 50 blows per 6"	16-R@3" (R)				
		Hole stopped @ 35.8 ft					
40		Remarks: Hole collapsed @ 11.0'.					

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

2010 COPY SUNDERLAND.GPJ VERMONT AOT.GDT 10/28/22

STATE OF VERMONT
AGENCY OF TRANSPORTATION
CONSTRUCTION AND
MATERIALS BUREAU
CENTRAL LABORATORY

BORING LOG

Statewide-Southwest
NH CULV(122)
Sunderland, US 7 BR 19-7

Boring No.: **B-102 (Br. 19-7)**
Page No.: 1 of 1
Pin No.: 23b027
Checked By: END

Boring Crew: McGinley, Aubut, Arles
Date Started: 8/18/22 Date Finished: 8/31/22
VTSPG NAD83: N 197562.70 ft E 1471104.70 ft
Station: 1087+32.75 Offset: 16.13 ft RT
Ground Elevation: 902.6 ft

	Casing	Sampler
Type:	WB	SS
I.D.:	3 in	1.5 in
Hammer Wt:	N.A.	140 lb.
Hammer Fall:	N.A.	30 in.
Hammer/Rod Type:	Auto/AWJ	
Rig:	CME 55 TRACK	C_E = 1.52

Groundwater Observations

Date	Depth (ft)	Notes
08/09/22		No water to depth

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		Field Note:, Asphalt 0.0'-0.8'					
		Visual Description:, Poorly graded Gravel with trace Sand, white, Dry, Rec. = 1.0 ft	12-13-15-16 (28)				
		A-4, SaSi, Lt brn, Dry, Rec. = 1.6 ft	16-18-23-26 (41)	7.7	19.3	43.4	37.3
5		Field Note:, No recovery, Gravel in end of sampler. Rollercone cleanout 5.9'-6.0'	33-R@3" (R)				
		Field Note:, Attempted core at 6' appears to be cobbles/boulders					
		Visual Description:, Silt and Sand with little Gravel, Lt brn, Dry, Rec. = 0.6 ft	8-7-5-9 (12)				
10		Visual Description:, Coarse to medium Sand and Gravel with trace Silt, Lt brn, Wet, Rec. = 0.7 ft	8-7-11-12 (18)				
		A-2-4, SiGrSa, Lt brn, Wet, Rec. = 0.6 ft	12-13-13-13 (26)	12.0	31.5	41.7	26.8
15		Visual Description:, Coarse to medium Gravel with little coarse Sand, Lt brn, Wet, Rec. = 0.3 ft	5-28-17-7 (45)				
20		Field Note:, No recovery, Refusal @ 5", 50 blows per 6". Rollercone cleanout 20.5'-25.0'	R@5" (R)				
25		A-4, SaSi, Lt brn, MTW, Rec. = 0.6 ft	17-16-20-24 (36)	18.2	17.0	30.9	52.1
30		A-4, SaSi, Lt brn/white, MTD, Rec. = 1.5 ft	10-12-9-16 (21)	26.2	1.9	26.5	71.6
35		Visual Description:, Clay with Gravel, Lt brn, MTW, Rec. = 2.0 ft	6-8-11-14 (19)				
		Hole stopped @ 37.0 ft					
40		Remarks: Hole collapsed @ 12.7'.					

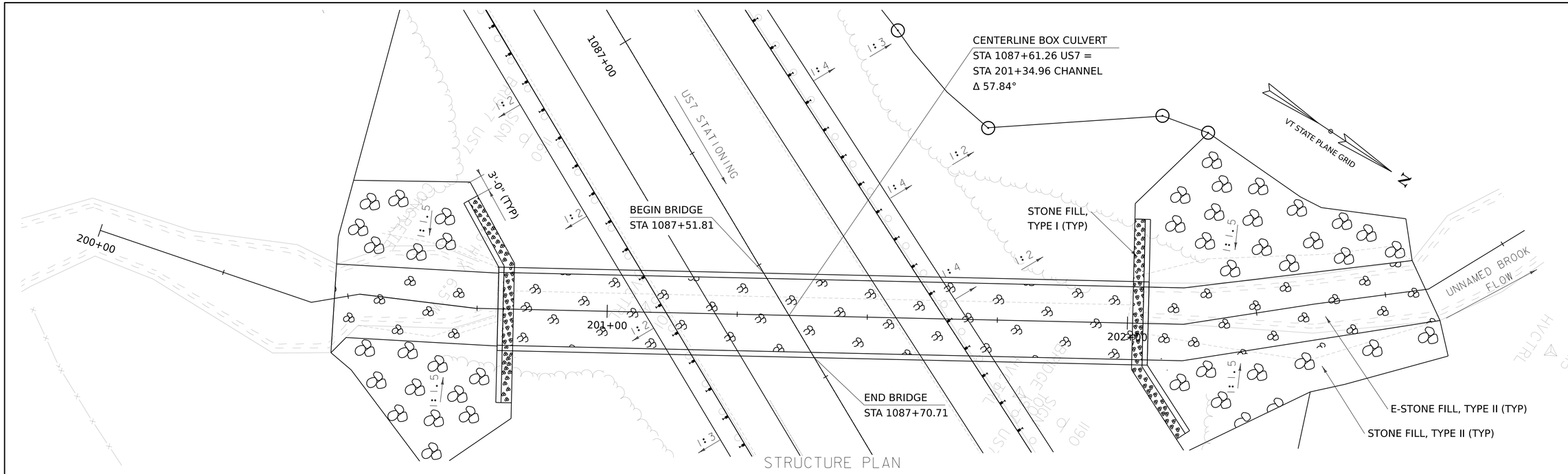
Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor.
3. Water level readings have been made at times and under conditions stated. Fluctuations may occur due to other factors than those present at the time measurements were made.

2010 COPY SUNDERLAND.GPJ VERMONT AOT.GDT 10/28/22

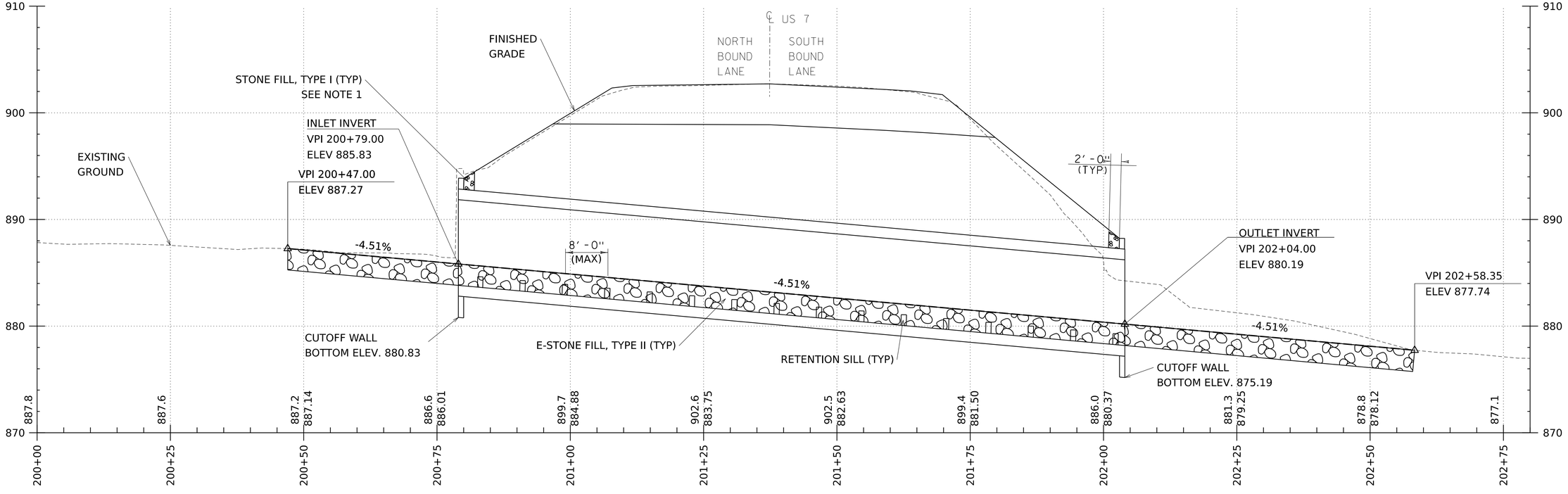
PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

FILE NAME: z23b027bor1.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
BORING LOGS SHEET 1

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 47 OF 66



STRUCTURE PLAN



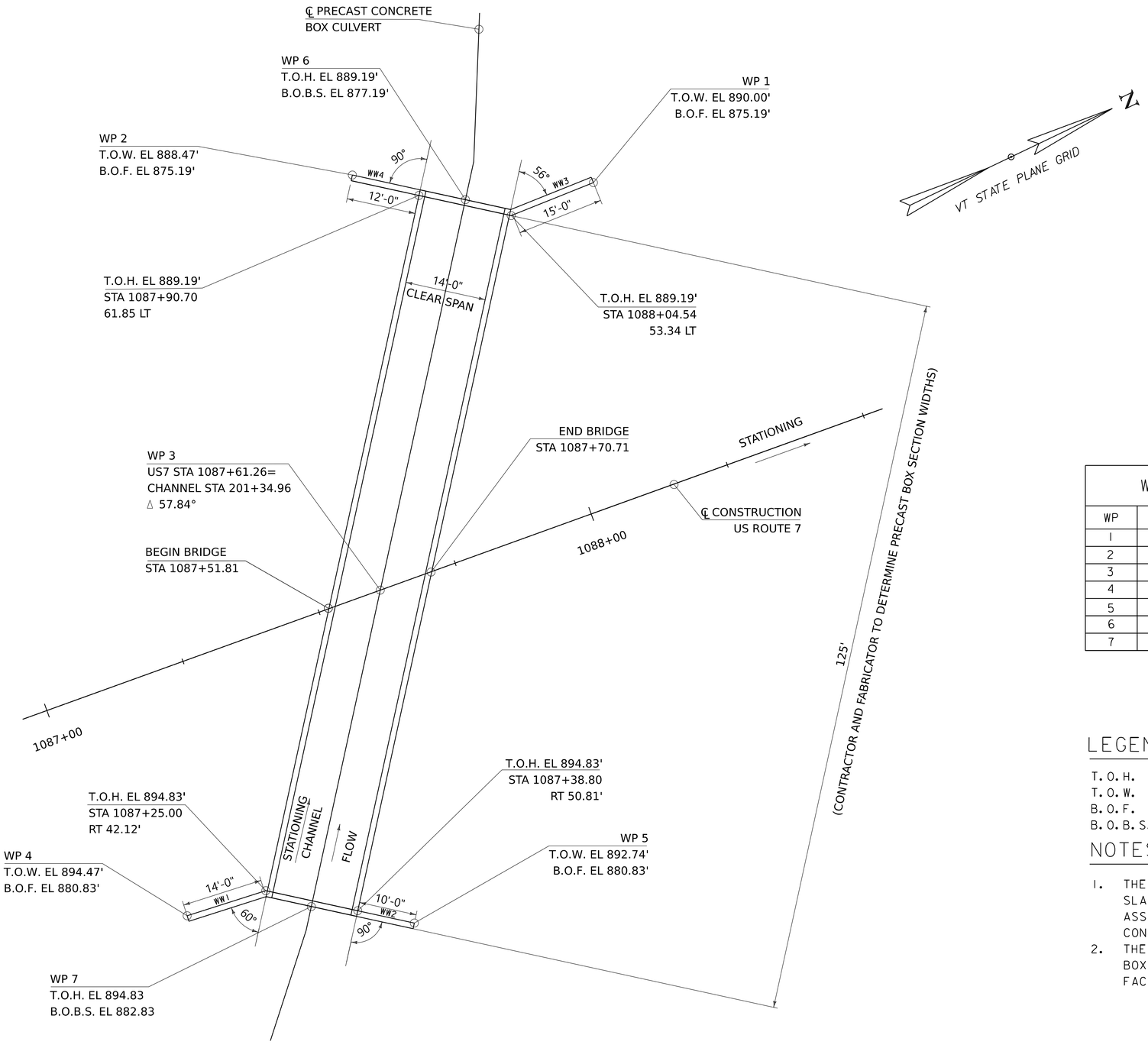
STRUCTURE CHANNEL PROFILE

SCALE: 1" = 10'-0"

NOTE:

1) STONE FILL TYPE I SHALL BE WRAPPED UP IN GEOTEXTILE, ITEM #649.3100 "GEOTEXTILE UNDER STONE FILL"

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	NH CULV(122)
FILE NAME:	z23b027pro2.dgn
PROJECT LEADER:	A. STOCKIN
DESIGNED BY:	M. GROTE
PLAN AND ELEVATION SHEET	
PLOT DATE:	2/25/2026
DRAWN BY:	M. HERMIS
CHECKED BY:	T. HIGGINSON
SHEET	48 OF 66



PLAN

0 10 20

SCALE IN FEET

WORKING POINT COORDINATES

WP	NORTHING	EASTING
1	197671.4008'	1471079.3126'
2	197643.1075'	1471048.7151'
3	197595.3854'	1471102.4857'
4	197531.8845'	1471118.1741'
5	197558.5325'	1471147.0295'
6	197652.9327'	1471066.1637'
7	197548.0794'	1471132.3425'

LEGEND:

T.O.H. TOP OF HEADWALL
T.O.W. TOP OF WINGWALL
B.O.F. BOTTOM OF FOOTING
B.O.B.S. BOTTOM OF BOTTOM SLAB

NOTES:

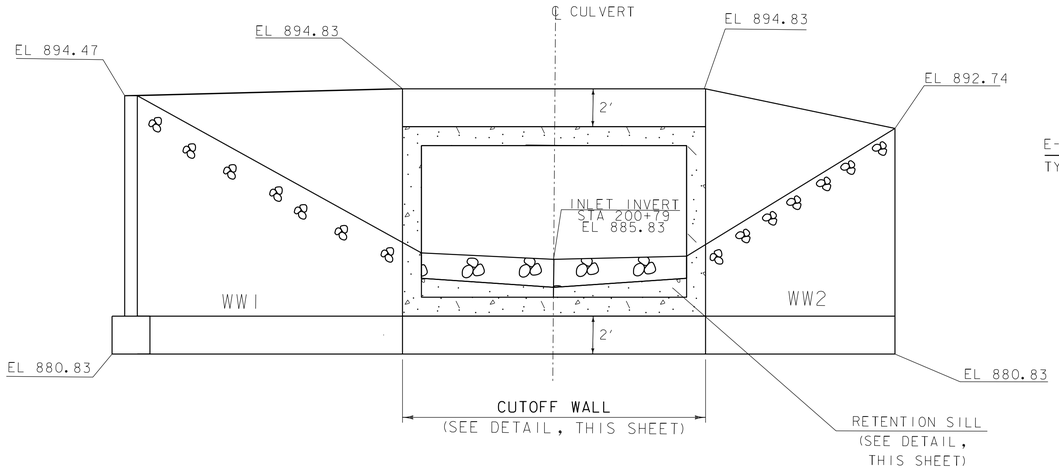
1. THE PRECAST CONCRETE BOX CULVERT WALLS AND SLABS, AND PRECAST WINGWALL THICKNESS ARE ASSUMED. ACTUAL DIMENSIONS TO BE DETERMINED BY CONTRACTOR'S FABRICATOR.
2. THE FABRICATOR TO HOLD THE FRONT FACE OF THE BOX CULVERT AND WINGWALLS AND ADJUST THE BACK FACE IF THE DESIGN DIFFERS FROM WHAT IS SHOWN.

wsp

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

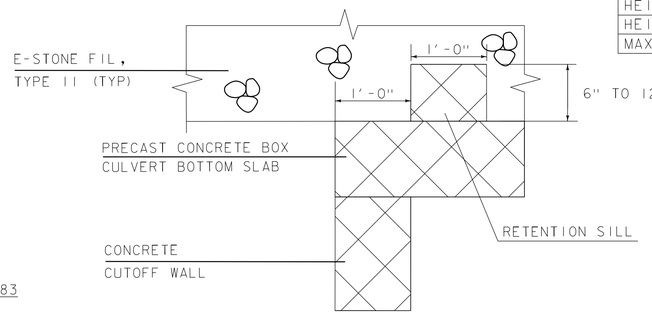
FILE NAME: z23b027sub.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
CULVERT LAYOUT PLAN

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 49 OF 66



INLET ELEVATION

SCALE ¼"=1'-0"



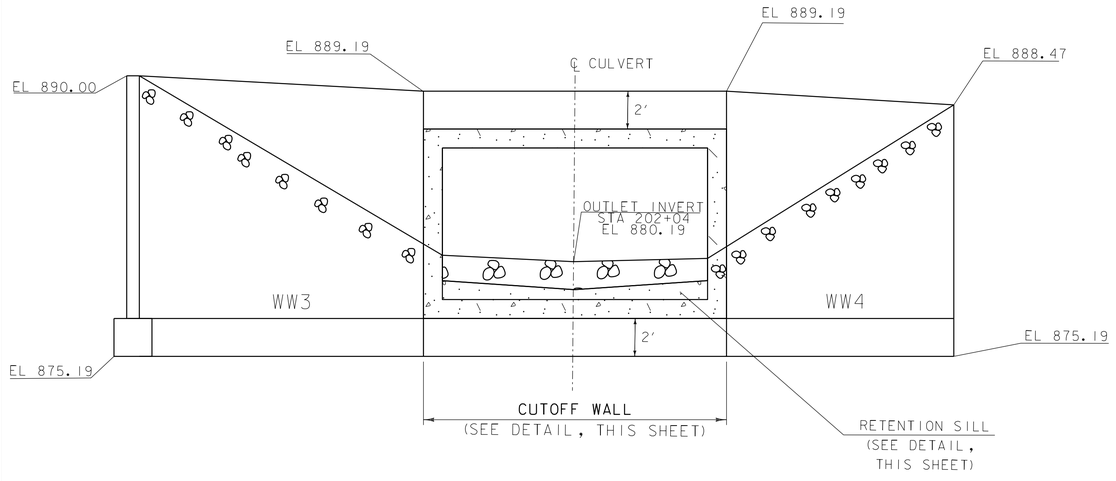
RETENTION SILL REQUIREMENTS	
	DIMENSION
HEIGHT AT ENDS	12"
HEIGHT AT CENTER	6"
MAX SPACING (O.C.)	8'-0"

NOTES:

1. PLACE A RETENTION SILL AT THE INLET AND OUTLET OF THE STRUCTURE, AS SHOWN, AS WELL AS CONTINUOUSLY THROUGHOUT THE STRUCTURE AT NO MORE THAN THE MAX SPACING SPECIFIED.
2. BOX CULVERT FABRICATOR SHALL DESIGN AND DETAIL THE PRECAST RETENTION SILL TO BE CAST INTEGRAL WITH THE BOX CULVERT.

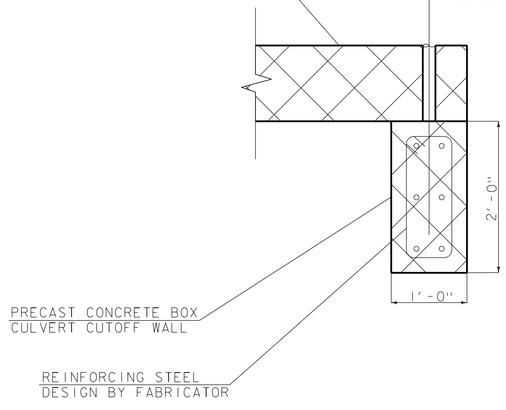
CULVERT RETENTION SILL DETAIL

NOT TO SCALE



OUTLET ELEVATION

SCALE ¼"=1'-0"



NOTES:

1. LENGTH OF CUTOFF WALL TO MATCH TOTAL WIDTH OF CULVERT.
2. REFERENCE ELEVATION VIEWS THIS SHEET FOR BOTTOM OF CUTOFF WALL ELEVATIONS.

PRECAST CONCRETE CUTOFF WALL DETAIL

NOT TO SCALE

NOTES:

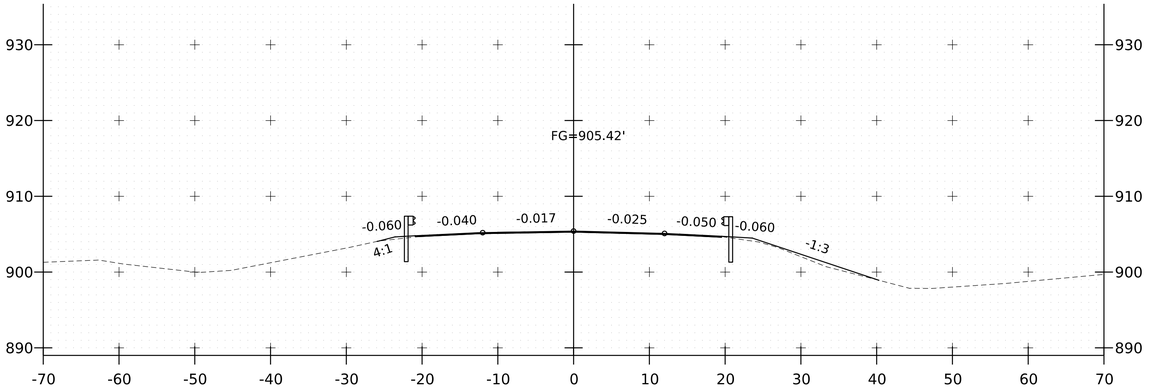
1. THE PRECAST SECTIONS ARE SHOWN FOR REFERENCE ONLY. THE ACTUAL DIMENSIONS AND SHAPE WILL BE DEPENDENT ON THE FABRICATOR.
2. FOR BOX PROFILE SEE CULVERT PLAN AND PROFILE SHEET.
3. THE CONTRACTOR/FABRICATOR TEAM IS RESPONSIBLE FOR THE DESIGN OF THE BOX CULVERT, HEADWALLS, WINGWALLS, CUTOFF WALLS, RETENTION SILLS AND ALL CONNECTIONS BETWEEN PRECAST ELEMENTS.
4. THE CONNECTIONS BETWEEN PRECAST ELEMENTS ARE NOT SHOWN ON THESE DETAILS.

wsp

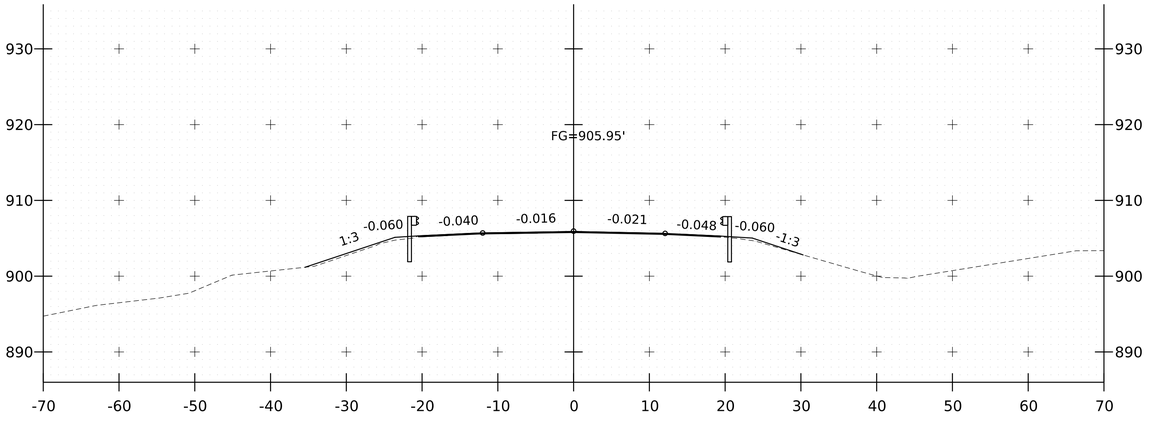
PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

FILE NAME: z23b072ubl.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
SUBSTRUCTURE DETAILS I

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON

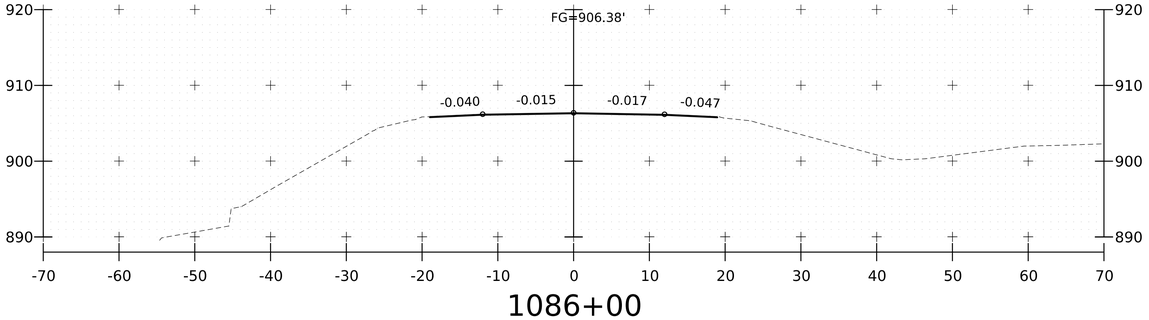


1086+50



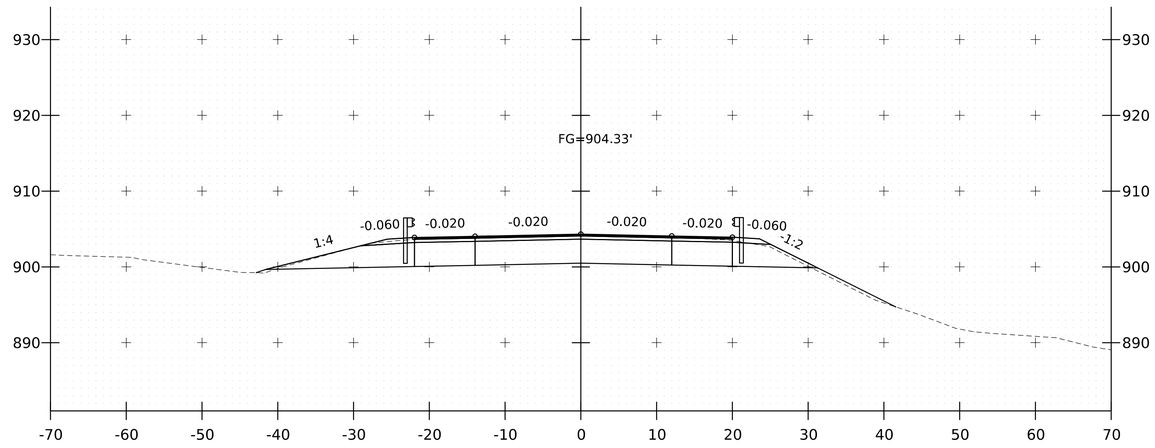
1086+25

MATCH EXISTING



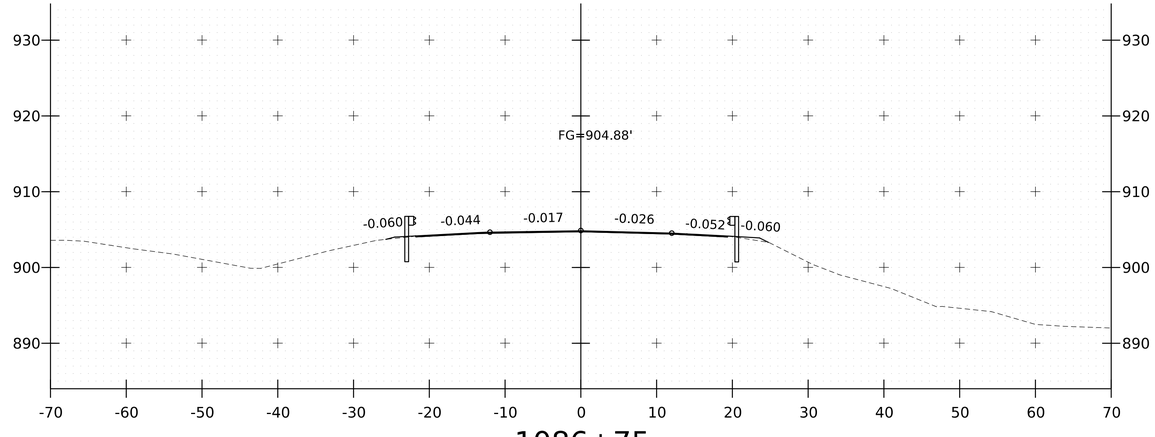
1086+00

BEGIN APPROACH



1087+00

BEGIN PROJECT

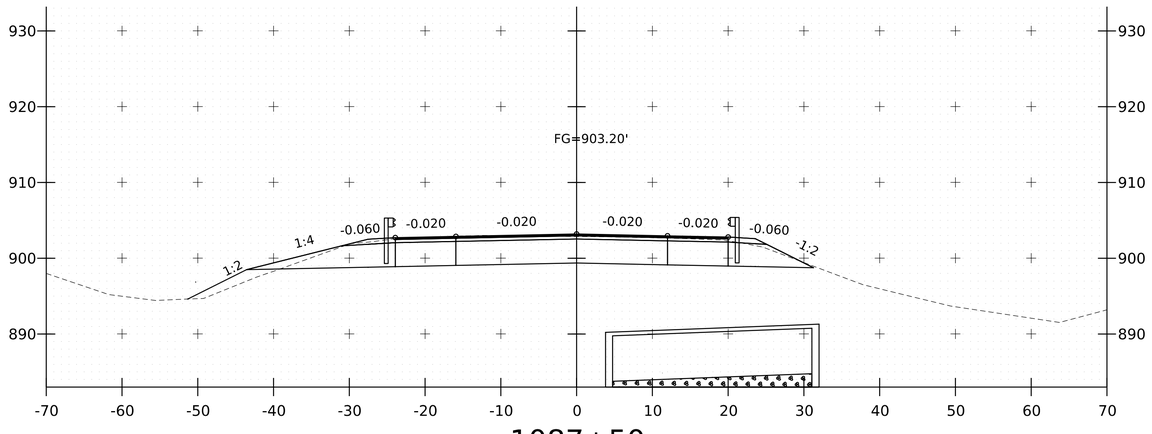


1086+75

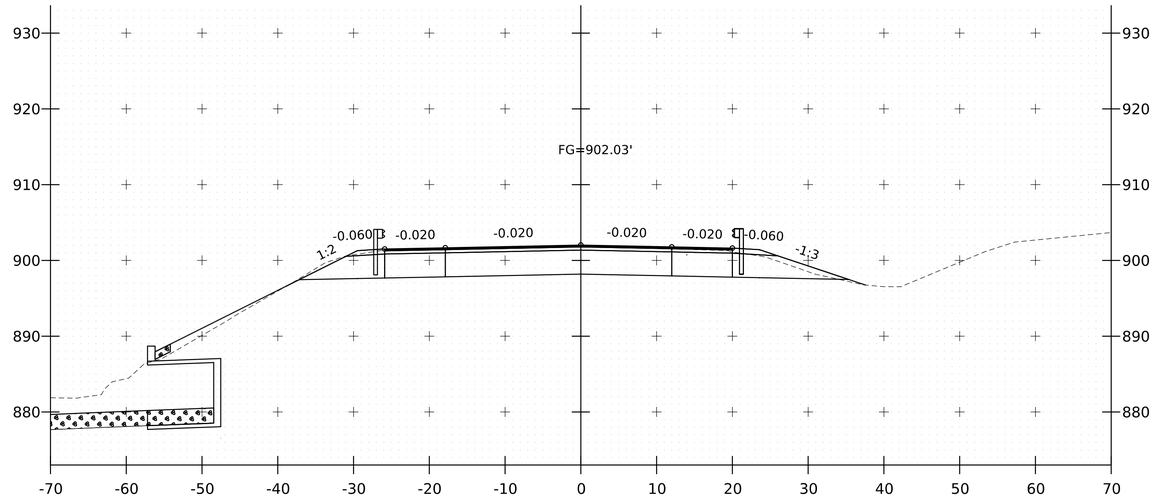
PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

FILE NAME: z23b027xs1.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
MAINLINE CROSS SECTIONS 1

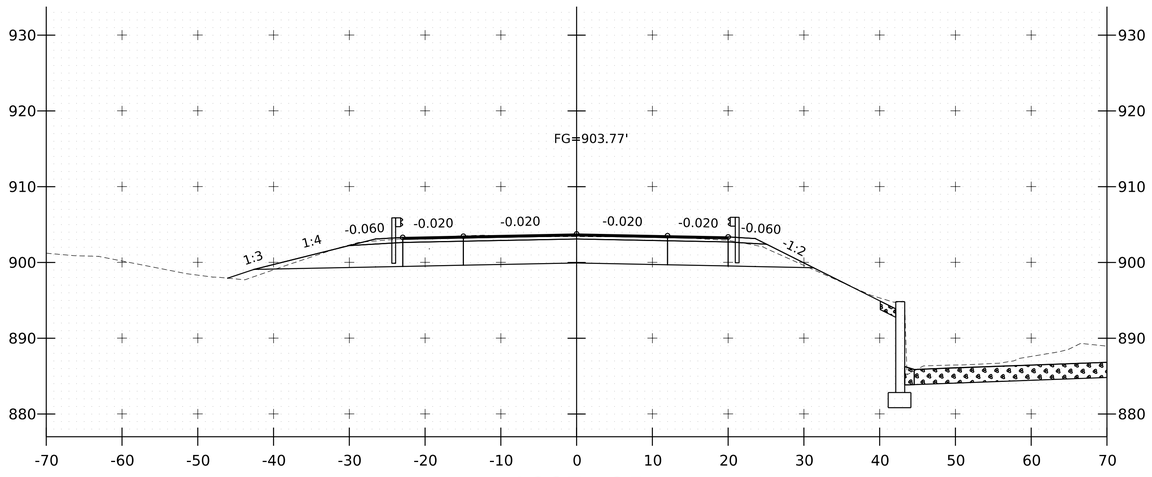
PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 51 OF 66



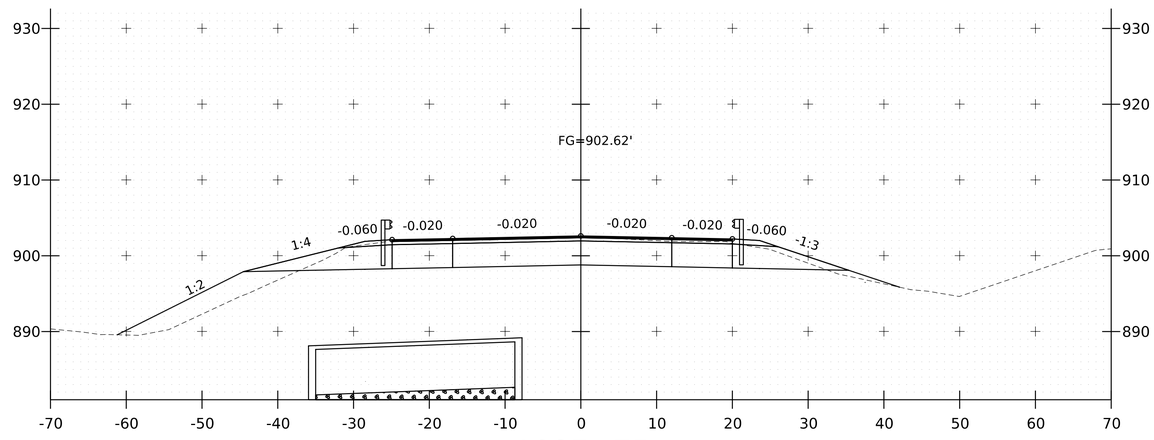
1087+50



1088+00



1087+25

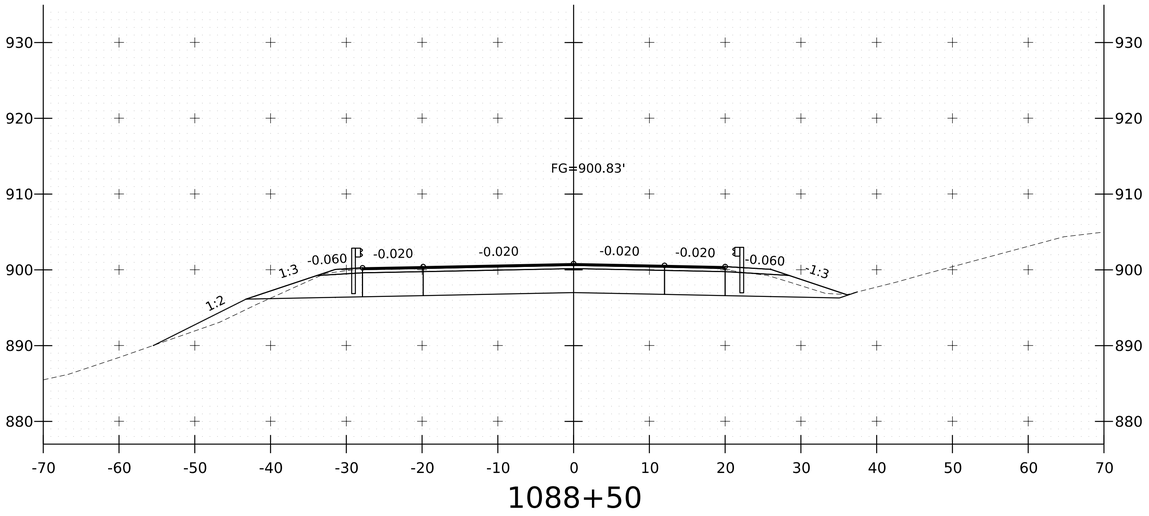


1087+75

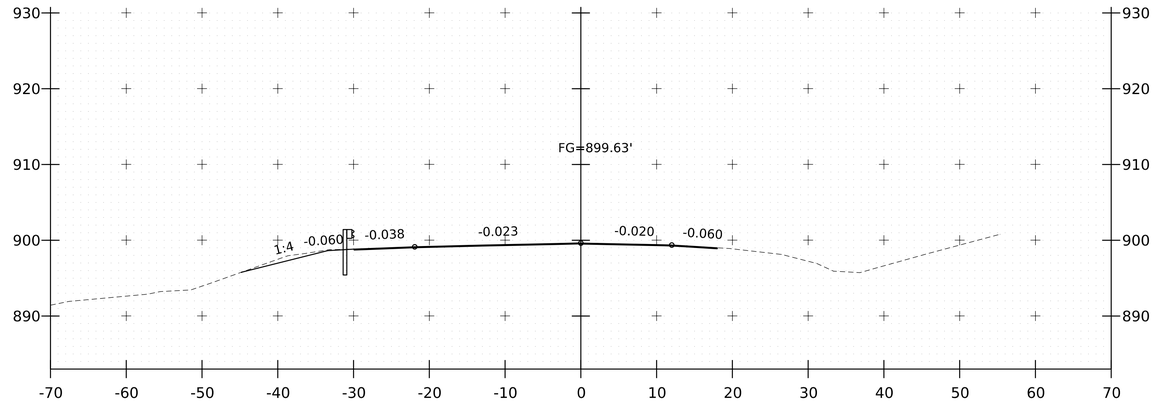
STA. 1087+51.81 BEGIN BRIDGE
STA. 1087+70.71 END BRIDGE

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	NH CULV(122)

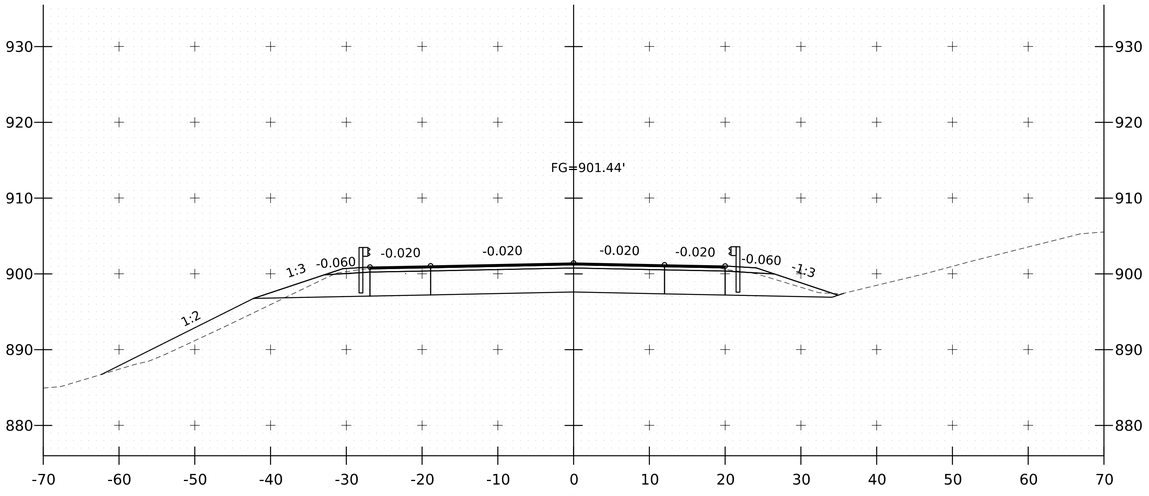
FILE NAME:	z23b027xs1.dgn	PLOT DATE:	2/25/2026
PROJECT LEADER:	A. STOCKIN	DRAWN BY:	M. HERMIS
DESIGNED BY:	M. GROTE	CHECKED BY:	T. HIGGINSON
MAINLINE CROSS SECTIONS 2		SHEET	52 OF 66



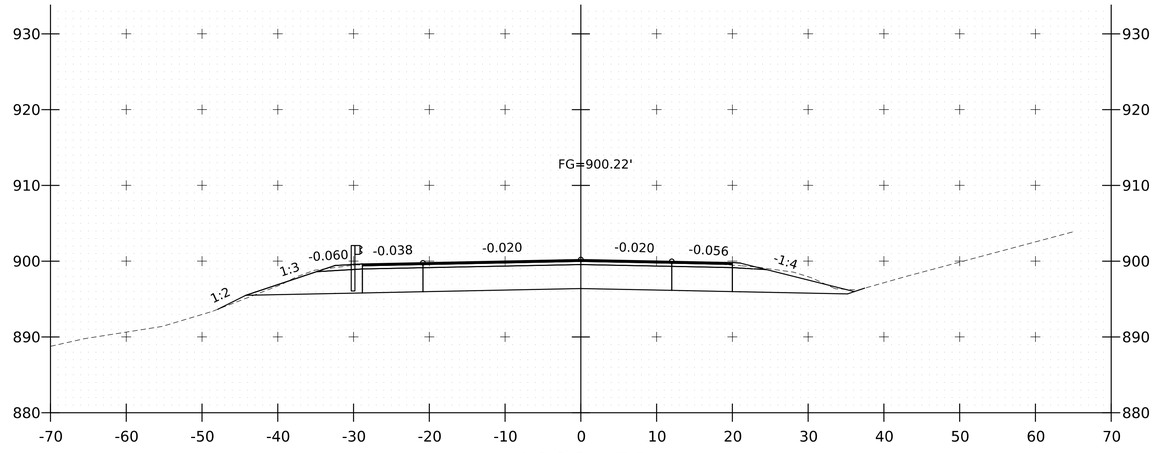
1088+50



1089+00



1088+25

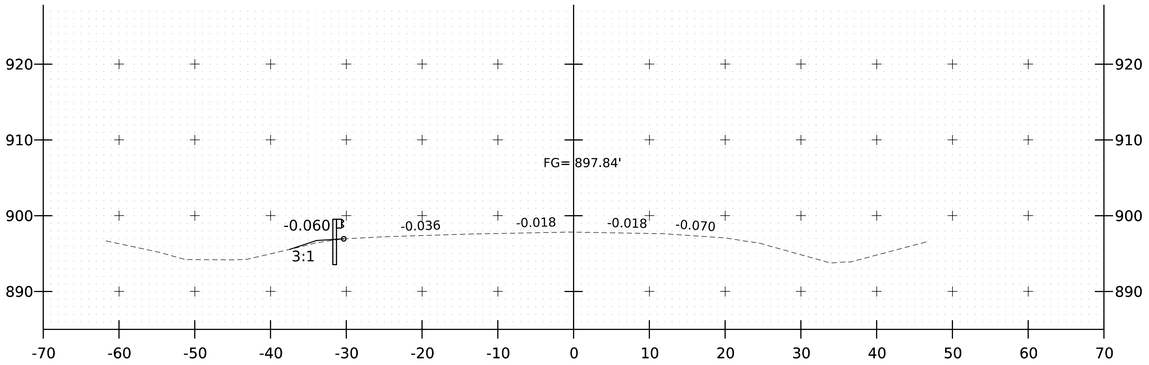


1088+75

END PROJECT

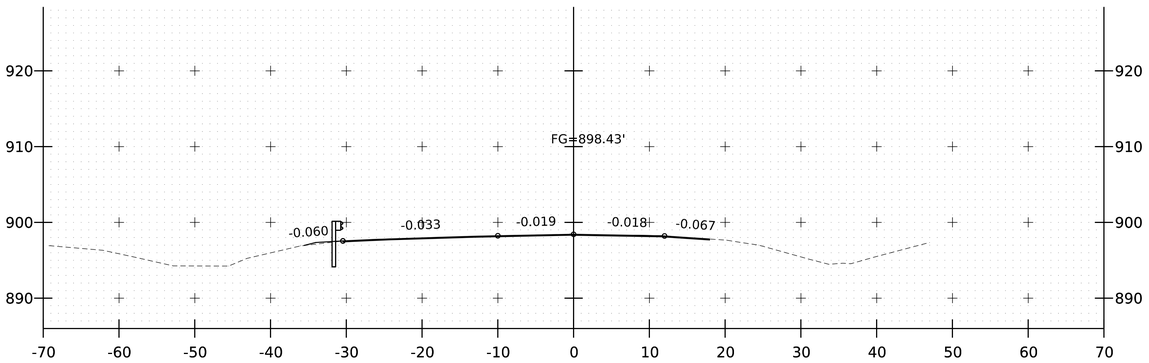
PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	NH CULV(122)

FILE NAME:	z23b027xs1.dgn	PLOT DATE:	2/25/2026
PROJECT LEADER:	A. STOCKIN	DRAWN BY:	M. HERMIS
DESIGNED BY:	M. GROTE	CHECKED BY:	T. HIGGINSON
MAINLINE CROSS SECTIONS 3		SHEET	53 OF 66

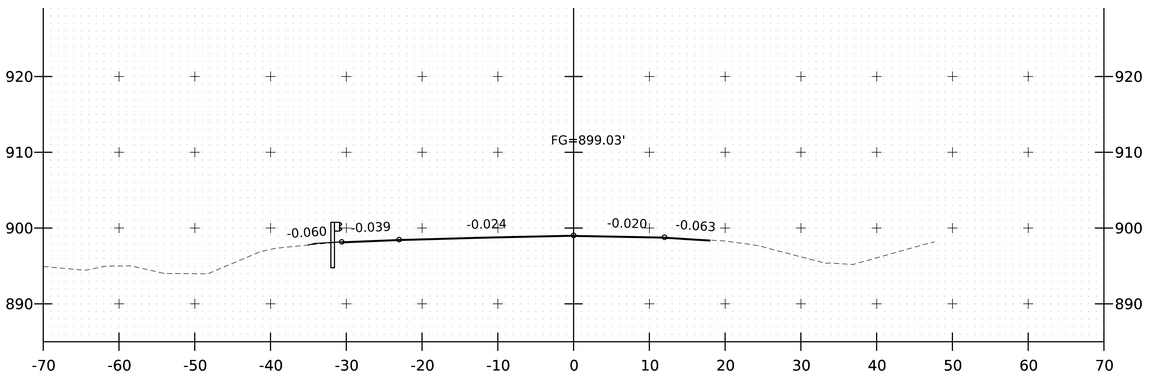


1089+75

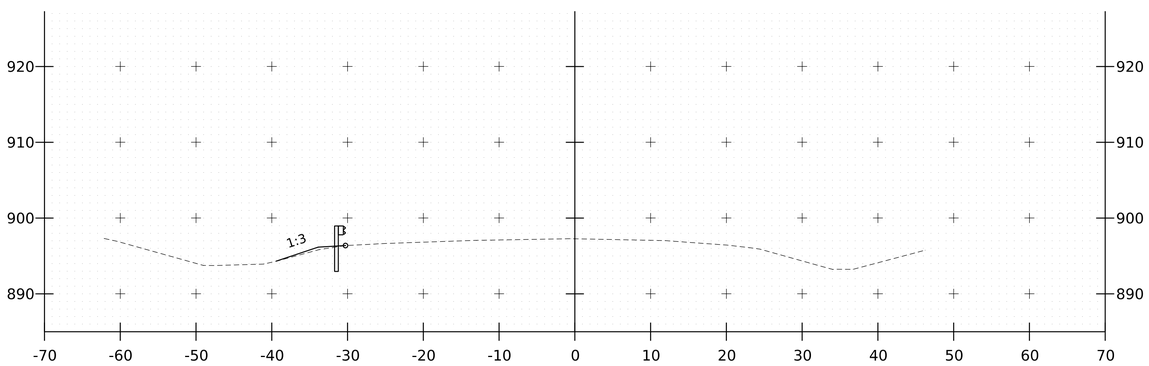
END MILL AND OVERLAY



1089+50



1089+25

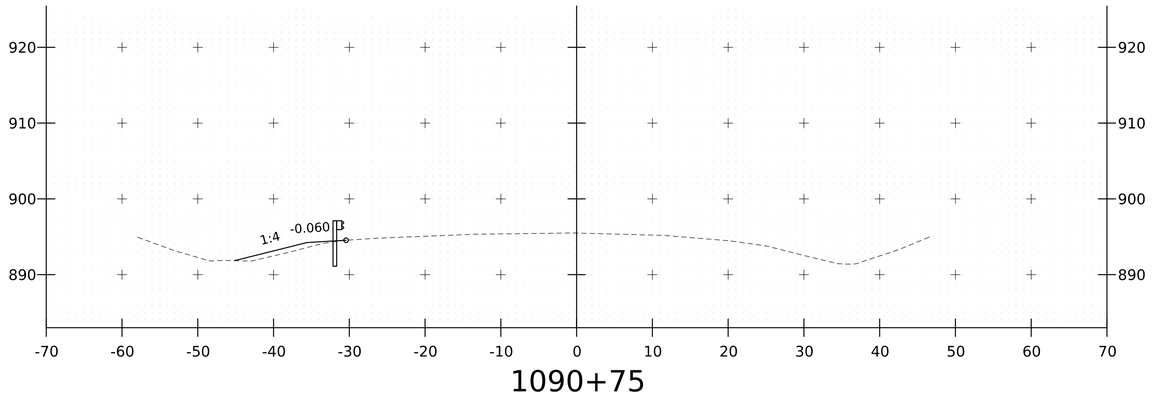


1090+00

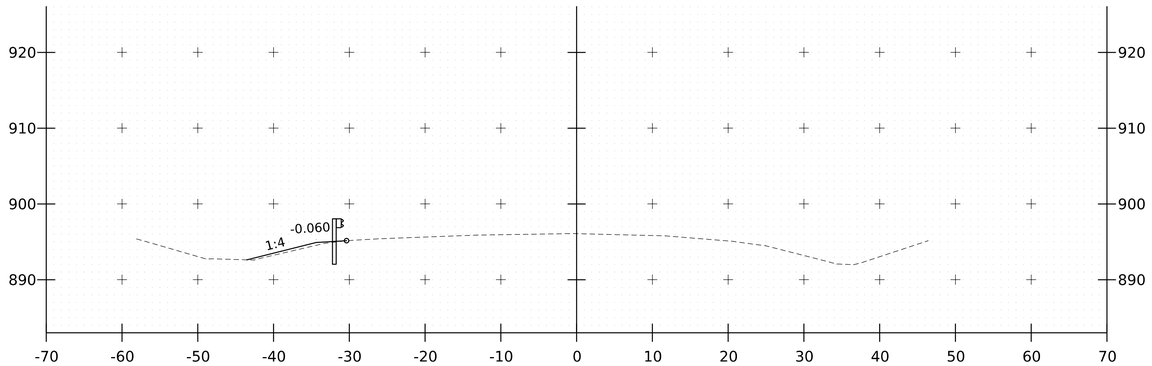
PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

FILE NAME: z23b027xs1.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
MAINLINE CROSS SECTIONS 4

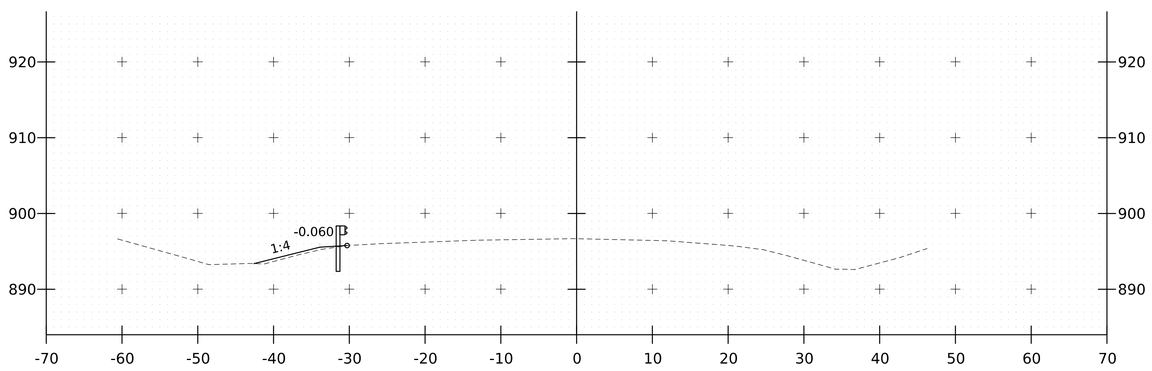
PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 54 OF 66



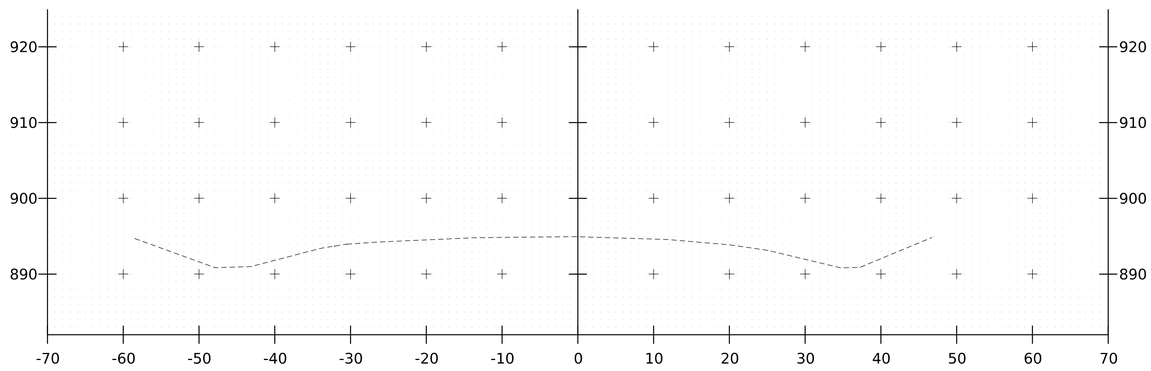
1090+75



1090+50



1090+25

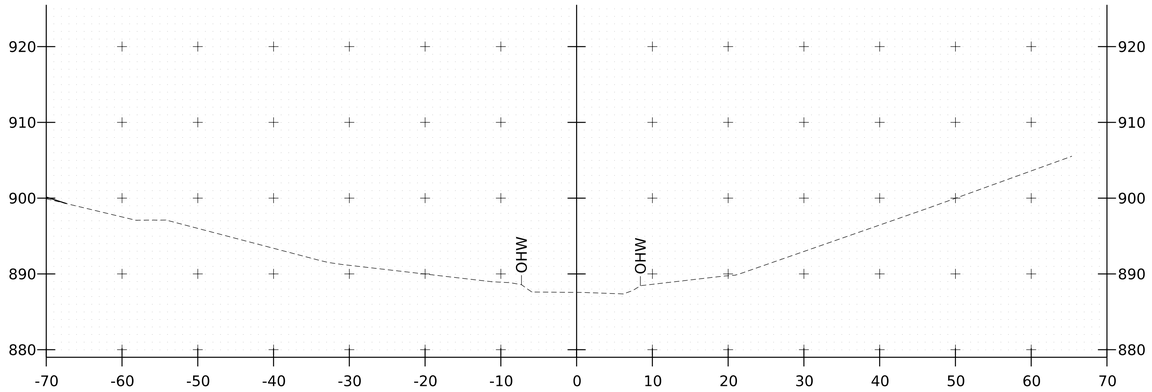


1091+00

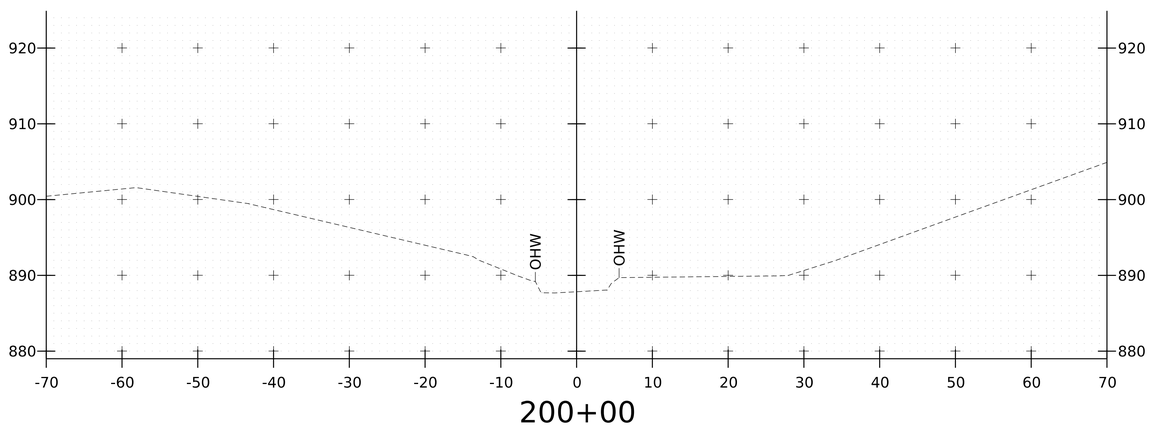
END APPROACH

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	NH CULV(122)

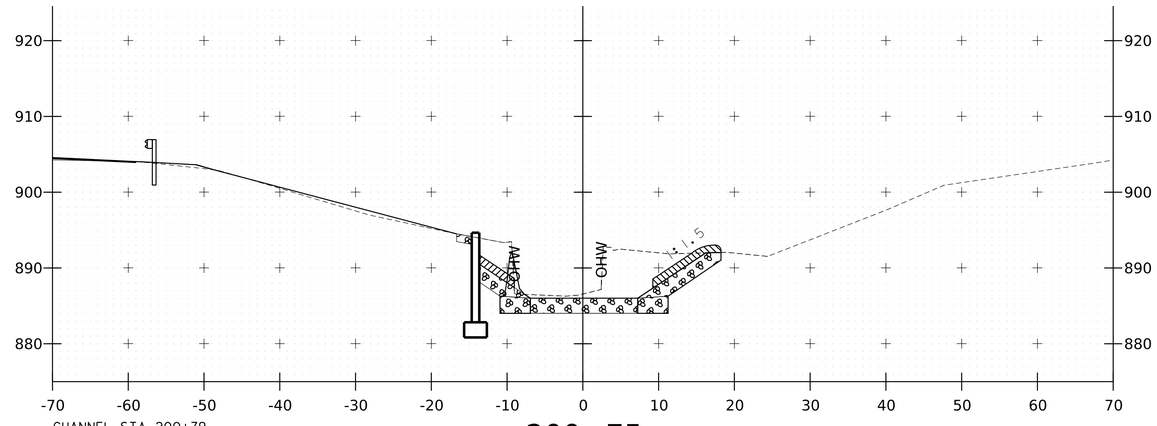
FILE NAME:	z23b027xs1.dgn	PLOT DATE:	2/25/2026
PROJECT LEADER:	A. STOCKIN	DRAWN BY:	M. HERMIS
DESIGNED BY:	M. GROTE	CHECKED BY:	T. HIGGINSON
MAINLINE CROSS SECTIONS 5		SHEET	55 OF 66



200+25



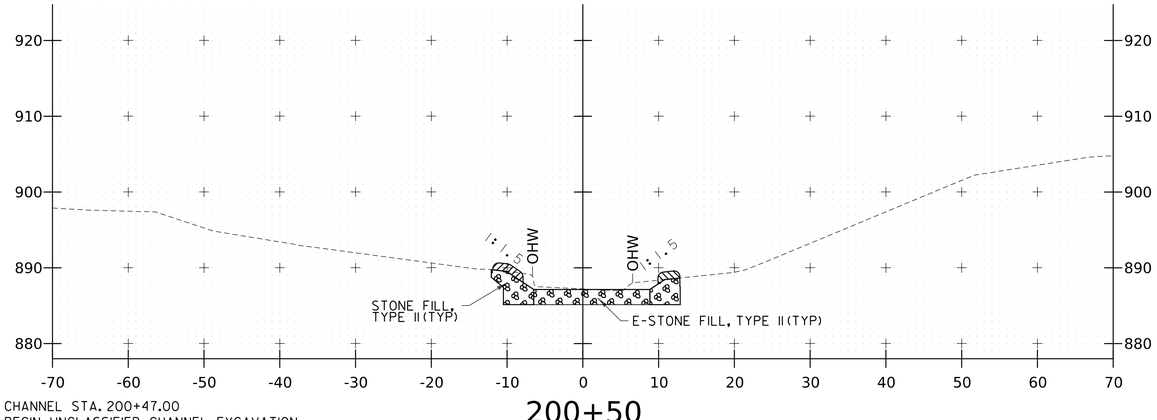
200+00



200+75

CHANNEL STA. 200+79
END UNCLASSIFIED CHANNEL EXCAVATION
END STONE FILL, TYPE II
END E-STONE FILL, TYPE II
END GRUBBING MATERIAL
END GEOTEXTILE UNDER STONE FILL
BEGIN STRUCTURE EXCAVATION

STA. 200+79 BEGIN BOX



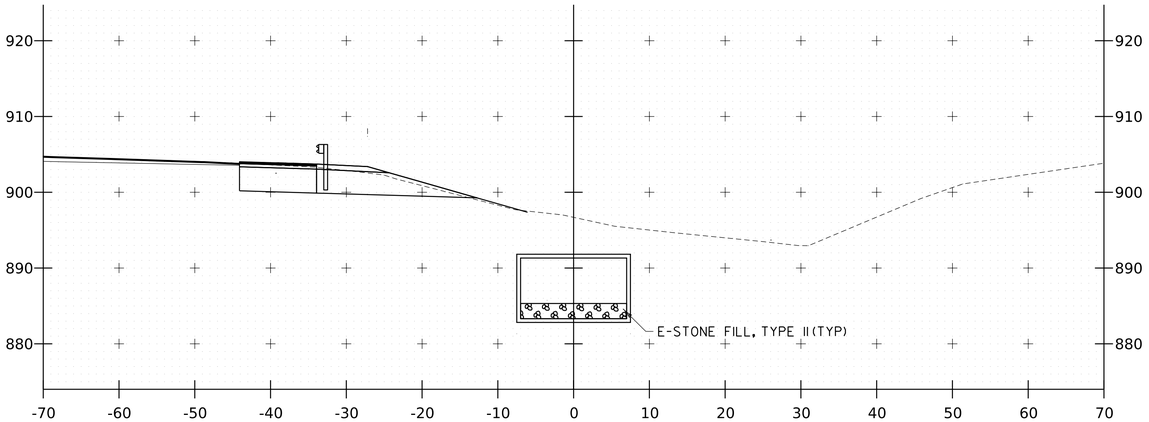
200+50

CHANNEL STA. 200+47.00
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
BEGIN STONE FILL, TYPE II
BEGIN E-STONE FILL, TYPE II (SEE NOTE 2 ON TYPICAL SECTIONS FOR LOW-FLOW CHANNEL)
BEGIN GRUBBING MATERIAL (SEE TYPICAL SECTION FOR MORE INFORMATION)
BEGIN GEOTEXTILE UNDER STONE FILL

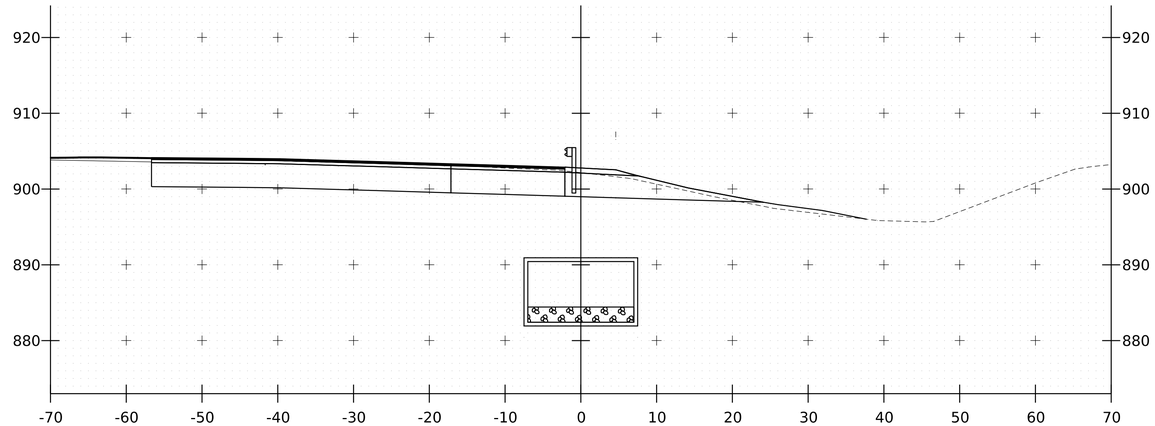
PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

FILE NAME: z23b027xs2.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
CULVERT CROSS SECTIONS 1

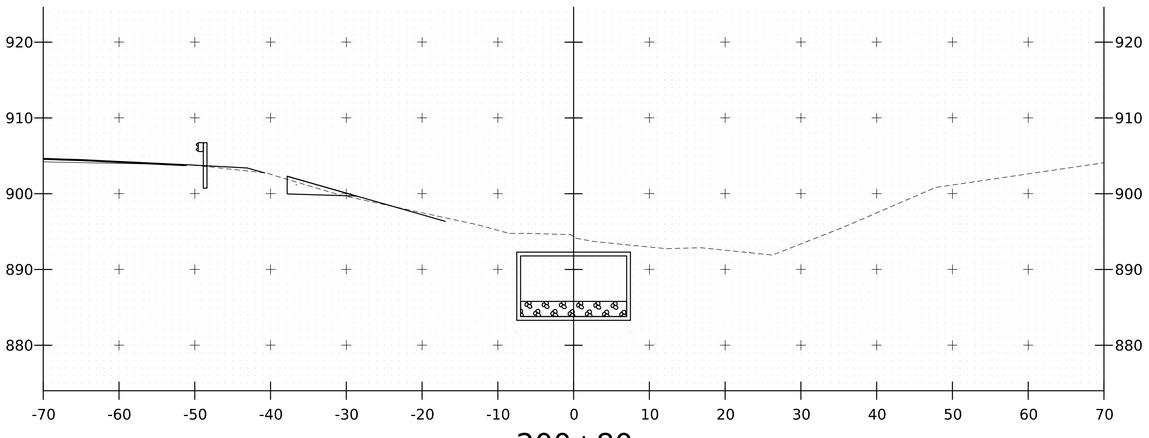
PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 56 OF 66



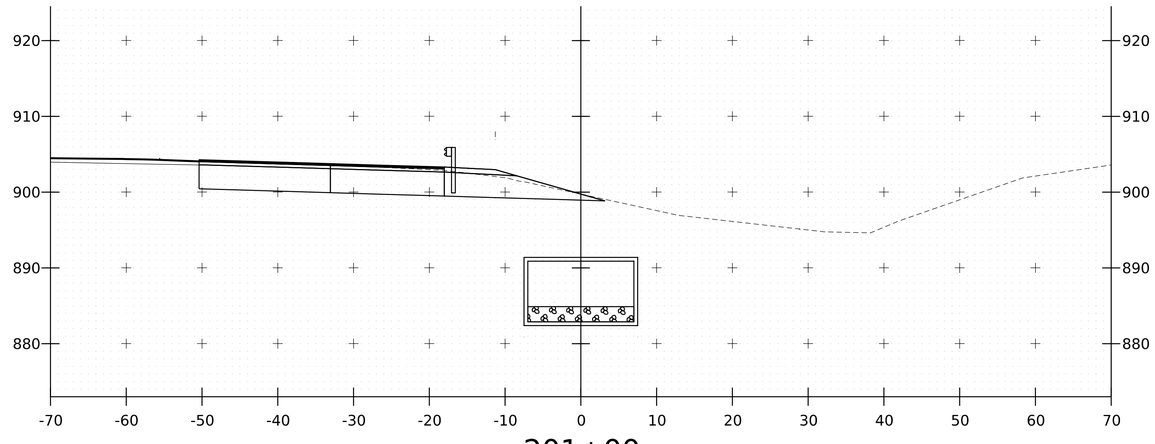
200+90



201+10



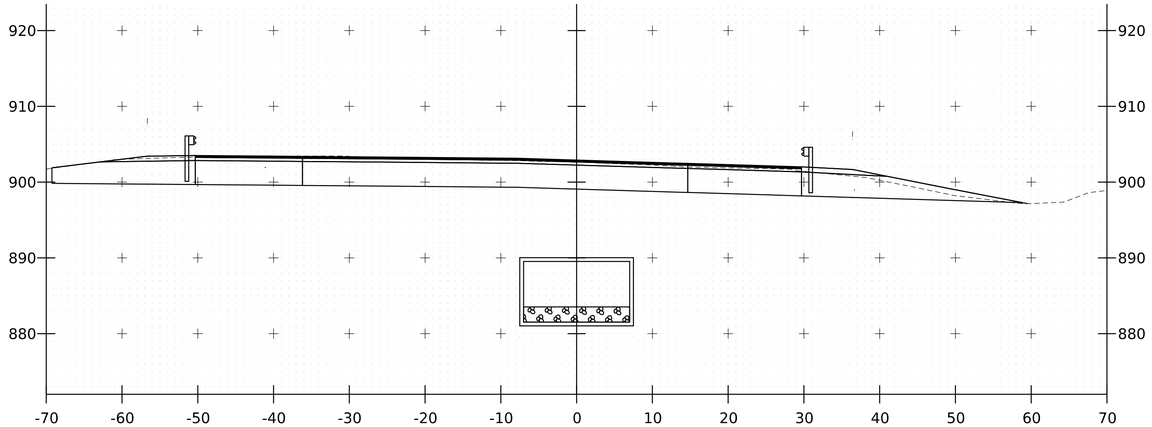
200+80



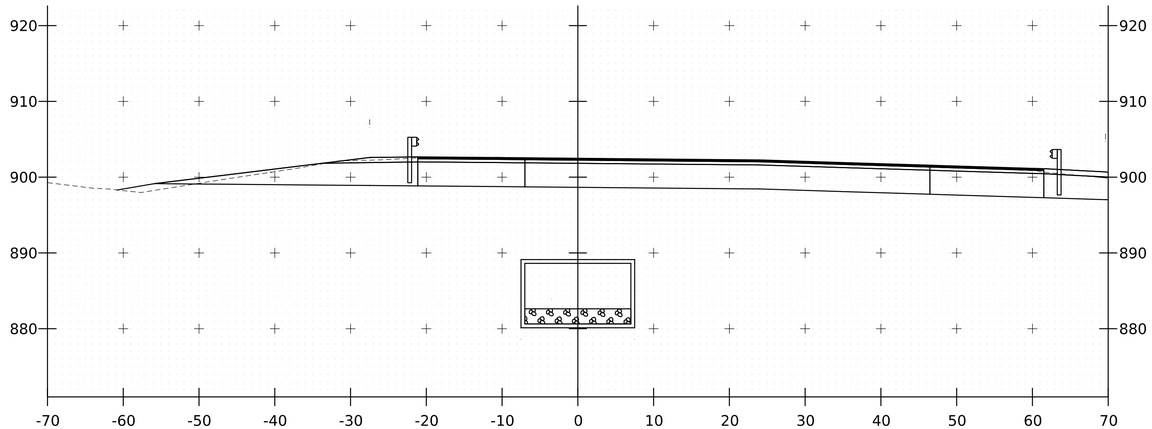
201+00

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	NH CULV(122)

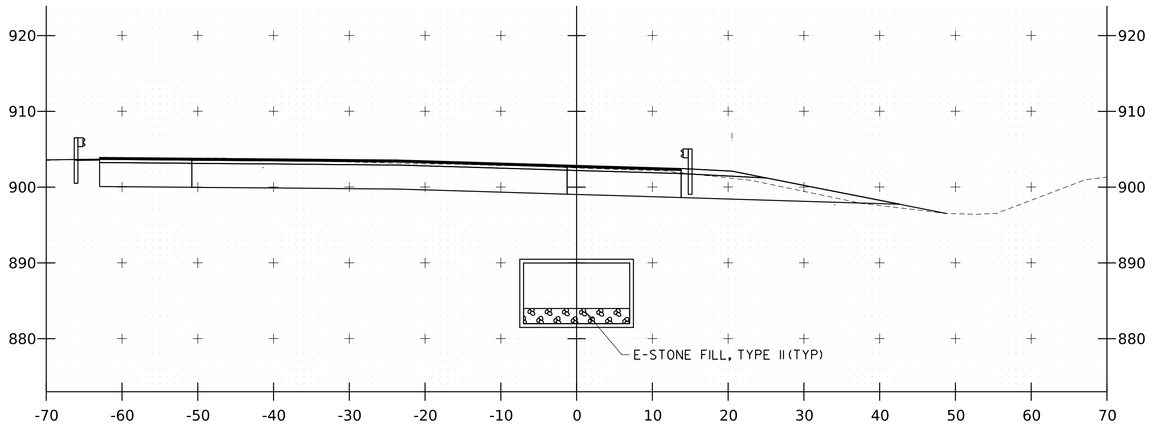
FILE NAME: z23b027xs2.dgn		PLOT DATE:	2/25/2026
PROJECT LEADER:	A. STOCKIN	DRAWN BY:	M. HERMIS
DESIGNED BY:	M. GROTE	CHECKED BY:	T. HIGGINSON
CULVERT CROSS SECTIONS 2		SHEET	57 OF 66



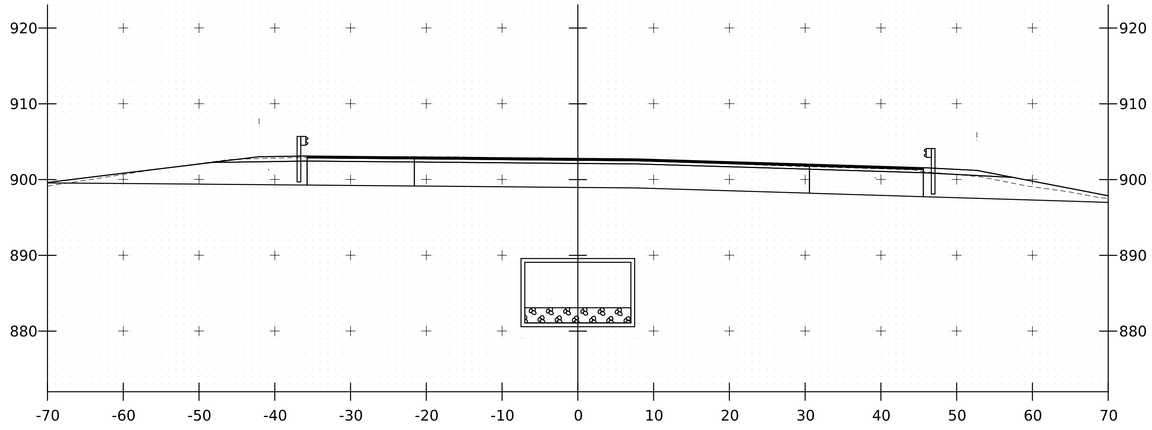
201+30



201+50



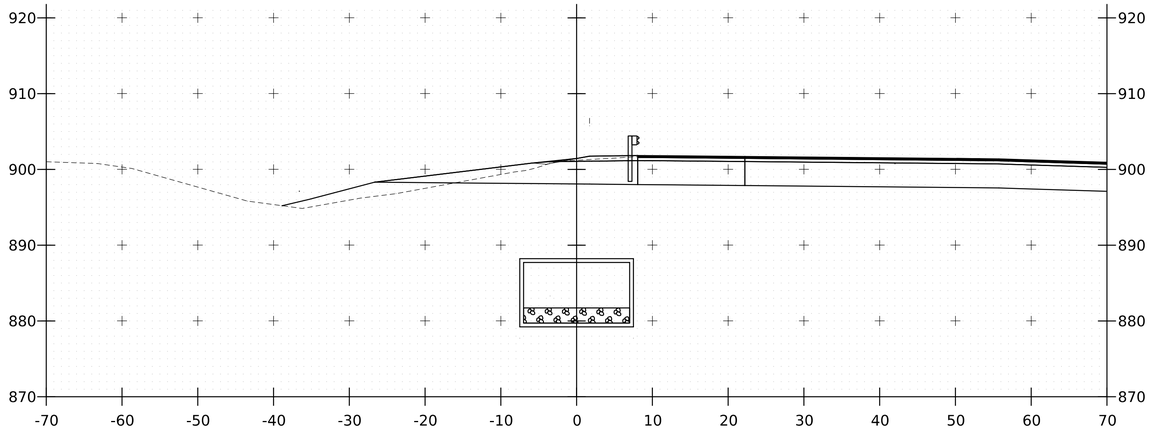
201+20



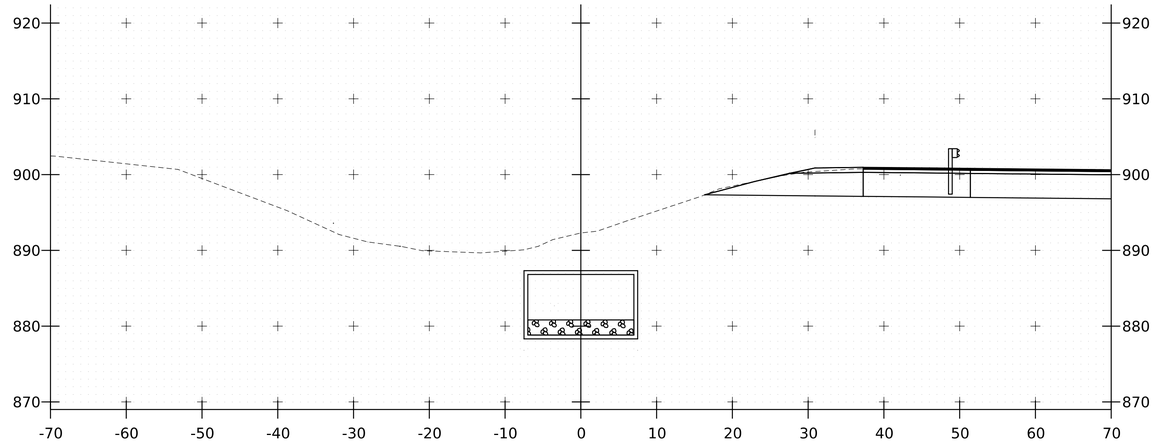
201+40

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	NH CULV(122)

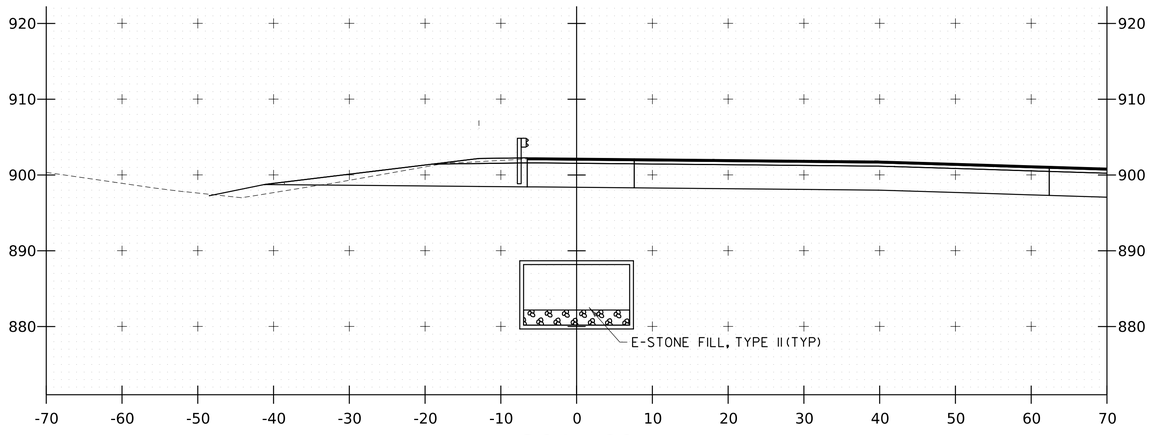
FILE NAME:	z23b027xs2.dgn	PLOT DATE:	2/25/2026
PROJECT LEADER:	A. STOCKIN	DRAWN BY:	M. HERMIS
DESIGNED BY:	M. GROTE	CHECKED BY:	T. HIGGINSON
CULVERT CROSS SECTIONS 3		SHEET	58 OF 66



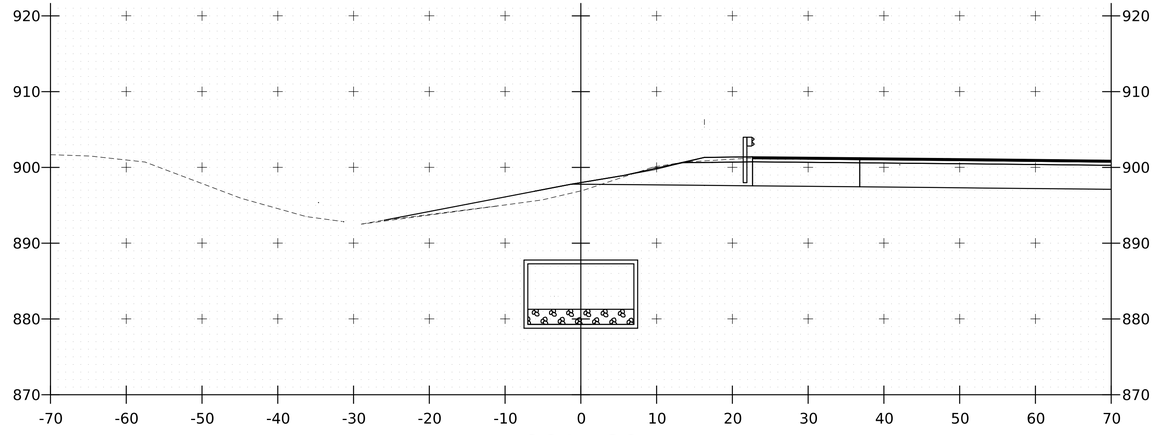
201+70



201+90



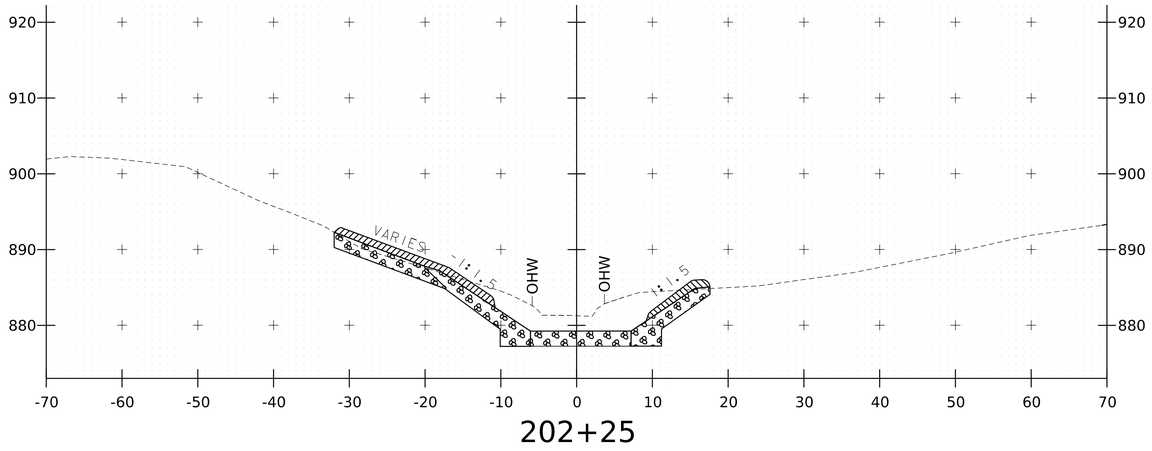
201+60



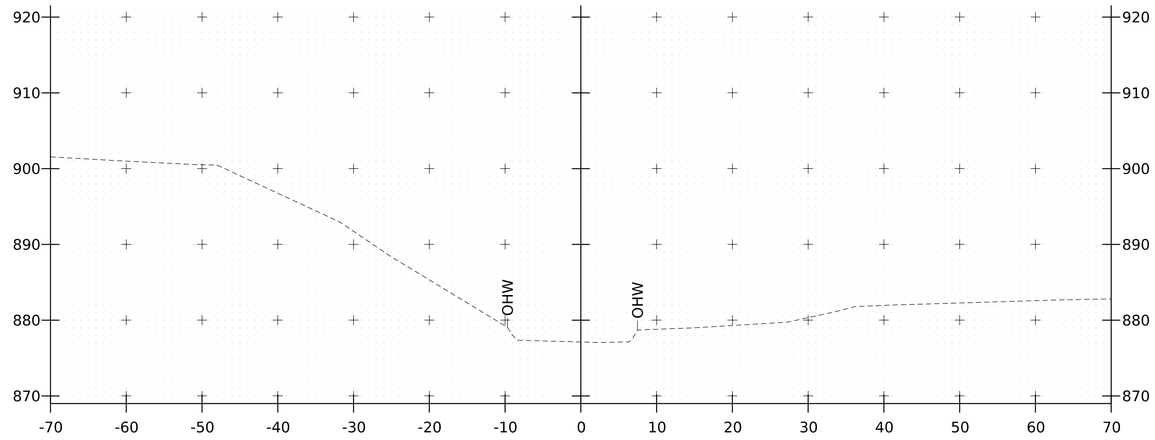
201+80

PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	NH CULV(122)

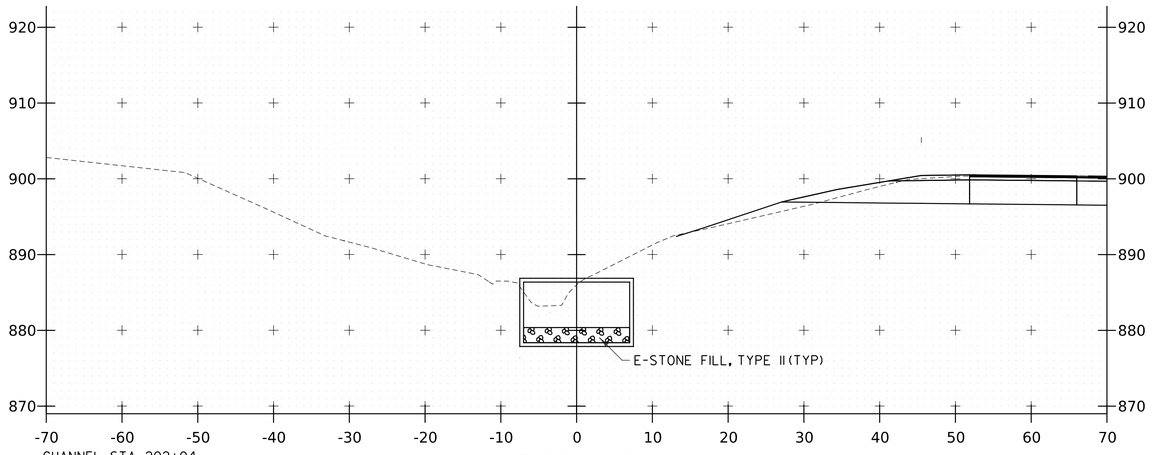
FILE NAME:	z23b027xs2.dgn	PLOT DATE:	2/25/2026
PROJECT LEADER:	A. STOCKIN	DRAWN BY:	M. HERMIS
DESIGNED BY:	M. GROTE	CHECKED BY:	T. HIGGINSON
CULVERT CROSS SECTIONS 4		SHEET	59 OF 66



202+25



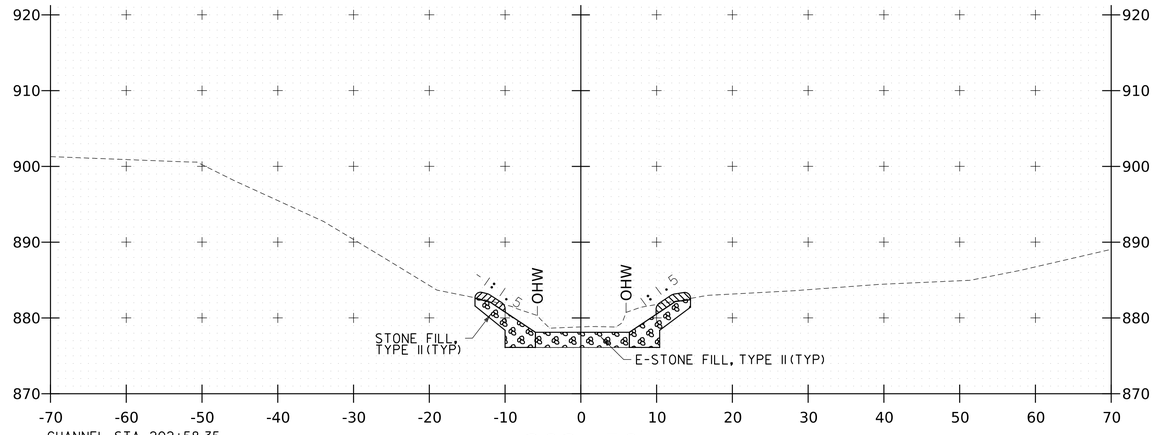
202+75



202+00

CHANNEL STA. 202+04
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
BEGIN STONE FILL, TYPE II
BEGIN E-STONE FILL, TYPE II (SEE NOTE 2 ON TYPICAL SECTIONS FOR LOW-FLOW CHANNEL)
BEGIN GRUBBING MATERIAL (SEE TYPICAL SECTION FOR MORE INFORMATION)
BEGIN GEOTEXTILE UNDER STONE FILL
END STRUCTURE EXCAVATION

STA. 202+04 END BOX



202+50

CHANNEL STA. 202+58.35
END UNCLASSIFIED CHANNEL EXCAVATION
END STONE FILL, TYPE II
END E-STONE FILL, TYPE II
END GRUBBING MATERIAL
END GEOTEXTILE UNDER STONE FILL

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

FILE NAME: z23b027xs2.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
CULVERT CROSS SECTIONS 5

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 60 OF 66

SOIL INFORMATION:
108B PERU FINE SANDY LOAM
K-FACTOR = 0.32, 0% - 8% SLOPES
HYDROLOGIC SOIL GROUP: C/D
HIGHLY ERODIBLE

SOIL INFORMATION:
105C MONADNOCK FINE SANDY LOAM
K-FACTOR = 0.37, 8% - 15% SLOPES
HYDROLOGIC SOIL GROUP: B
HIGHLY ERODIBLE

N

VT STATE PLANE GRID

TOTAL AREA OF DISTURBANCE:

CULVERT CONSTRUCTION - 0.91 ACRES

UNNAMED BROOK
FLOW

EXISTING 7' DIA. CGMPP

FLOW

UNNAMED BROOK
FLOW

EXISTING BRIDGE INFORMATION
SPAN 7' DIA., LENGTH 120'
CGMPP BUILT 1979
10' AVERAGE COVER
38 SF WATERWAY AREA

SOIL INFORMATION:
113B CABOT SILT LOAM
K-FACTOR = 0.49, 8% - 15% SLOPES
HYDROLOGIC SOIL GROUP: D
HIGHLY ERODIBLE

APPROX. EXISTING R.O.W.

BEAVER VALLEY INC. C/O JAMES KRON

EXISTING EPSC SITE PLAN

0 20 40
SCALE IN FEET

PROJECT NAME: SUNDERLAND
PROJECT NUMBER: NH CULV(122)

FILE NAME: z23b027rs.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
EXISTING EPSC SITE PLAN

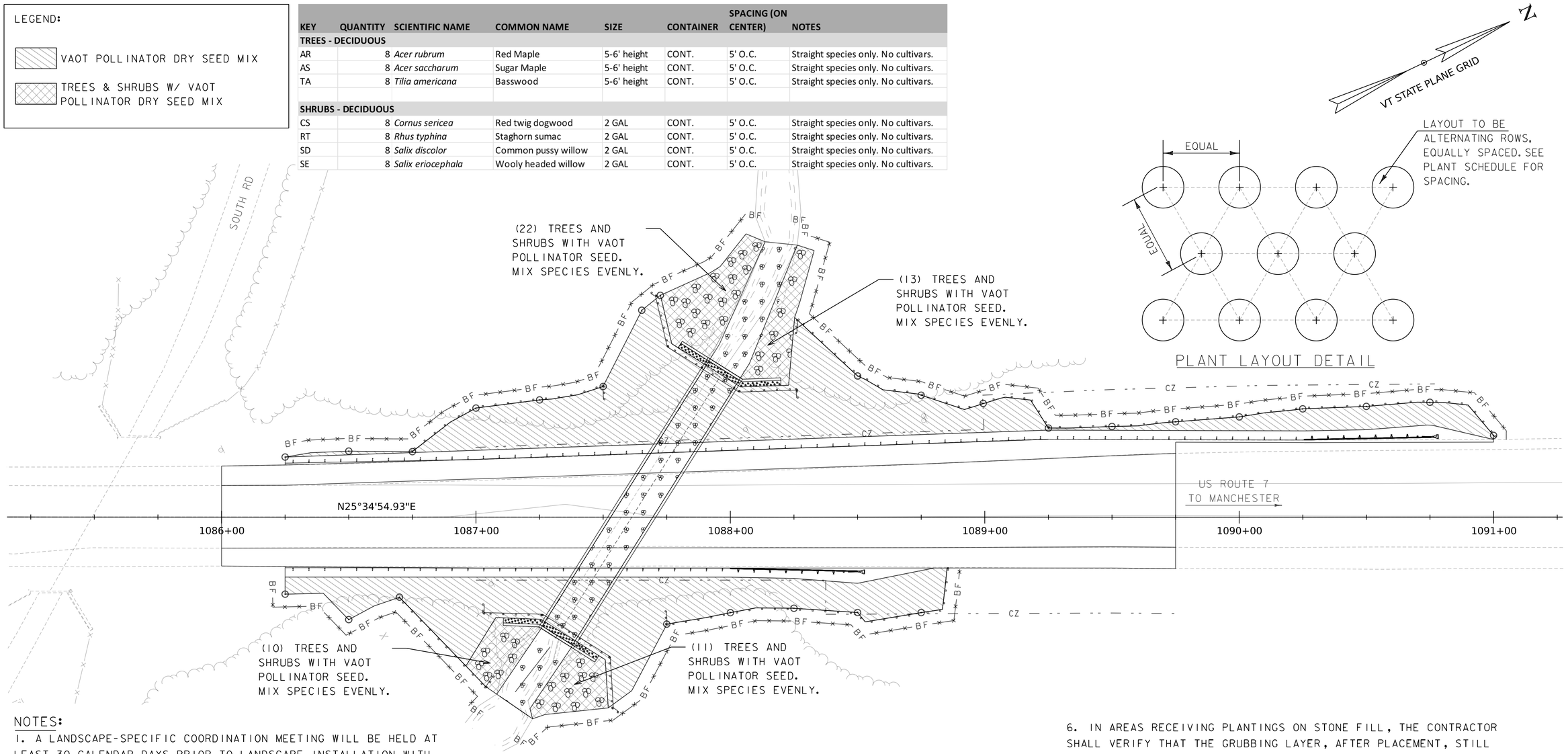
PLOT DATE: 2/27/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 61 OF 66

LEGEND:

VAOT POLLINATOR DRY SEED MIX

TREES & SHRUBS W/ VAOT POLLINATOR DRY SEED MIX

KEY	QUANTITY	SCIENTIFIC NAME	COMMON NAME	SIZE	CONTAINER	SPACING (ON CENTER)	NOTES
TREES - DECIDUOUS							
AR	8	*Acer rubrum*	Red Maple	5-6' height	CONT.	5' O.C.	Straight species only. No cultivars.
AS	8	*Acer saccharum*	Sugar Maple	5-6' height	CONT.	5' O.C.	Straight species only. No cultivars.
TA	8	*Tilia americana*	Basswood	5-6' height	CONT.	5' O.C.	Straight species only. No cultivars.
SHRUBS - DECIDUOUS							
CS	8	*Cornus sericea*	Red twig dogwood	2 GAL	CONT.	5' O.C.	Straight species only. No cultivars.
RT	8	*Rhus typhina*	Staghorn sumac	2 GAL	CONT.	5' O.C.	Straight species only. No cultivars.
SD	8	*Salix discolor*	Common pussy willow	2 GAL	CONT.	5' O.C.	Straight species only. No cultivars.
SE	8	*Salix eriocephala*	Wooly headed willow	2 GAL	CONT.	5' O.C.	Straight species only. No cultivars.



PLANT LAYOUT DETAIL

NOTES:

1. A LANDSCAPE-SPECIFIC COORDINATION MEETING WILL BE HELD AT LEAST 30 CALENDAR DAYS PRIOR TO LANDSCAPE INSTALLATION WITH THE LANDSCAPE SUBCONTRACTOR, PRIME CONTRACTOR, ENGINEER, AOT CONSTRUCTION ENVIRONMENTAL ENGINEER, AND EITHER THE AOT LANDSCAPE ARCHITECT OR THE CONSTRUCTION LANDSCAPE INSPECTOR

2. THE AOT LANDSCAPE ARCHITECT OR CONSTRUCTION LANDSCAPE INSPECTOR SHALL BE ON SITE TO CONFIRM PLANT SPECIES AND HEALTH, APPROVE PLANT LAYOUT, AND OBSERVE INSTALLATION. NOTIFY THE AOT LANDSCAPE ARCHITECT OR CONSTRUCTION LANDSCAPE INSPECTOR AT LEAST 7 CALENDAR DAYS PRIOR TO INSTALLATION. FAILURE TO INCLUDE THE AOT LANDSCAPE ARCHITECT OR CONSTRUCTION LANDSCAPE INSPECTOR MAY RESULT IN THE REJECTION OF PLANT MATERIAL AFTER INSTALLATION. NOTE: THE ENGINEER MAY EXERCISE THEIR AUTHORITY TO SUSPEND PLANT INSTALLATION UNTIL THE AOT LANDSCAPE ARCHITECT OR CONSTRUCTION LANDSCAPE INSPECTOR IS PRESENT, PER SUBSECTION 105.01(B).

3. SEEDED AREAS SHALL BE PROTECTED IN ACCORDANCE WITH SPECIFICATION SUBSECTION 651.07 PROTECTION. WHERE WETLANDS OR WETLAND BUFFERS ARE PRESENT, STRAW MULCH SHALL BE USE INSTEAD OF HAY MULCH.

4. IF AREAS WITHIN PDF OR BARRIER FENCE ARE NOT DISTURBED, THEY SHOULD REMAIN VEGETATED, AND ADDITIONAL REVEGETATION IS NOT REQUIRED.

5. PROVIDING SUFFICIENT MOISTURE IS CRITICAL DURING THE ENTIRE PLANT ESTABLISHMENT PERIOD. WATERING TO BE PAID FOR UNDER 656.6500 LANDSCAPE WATERING.

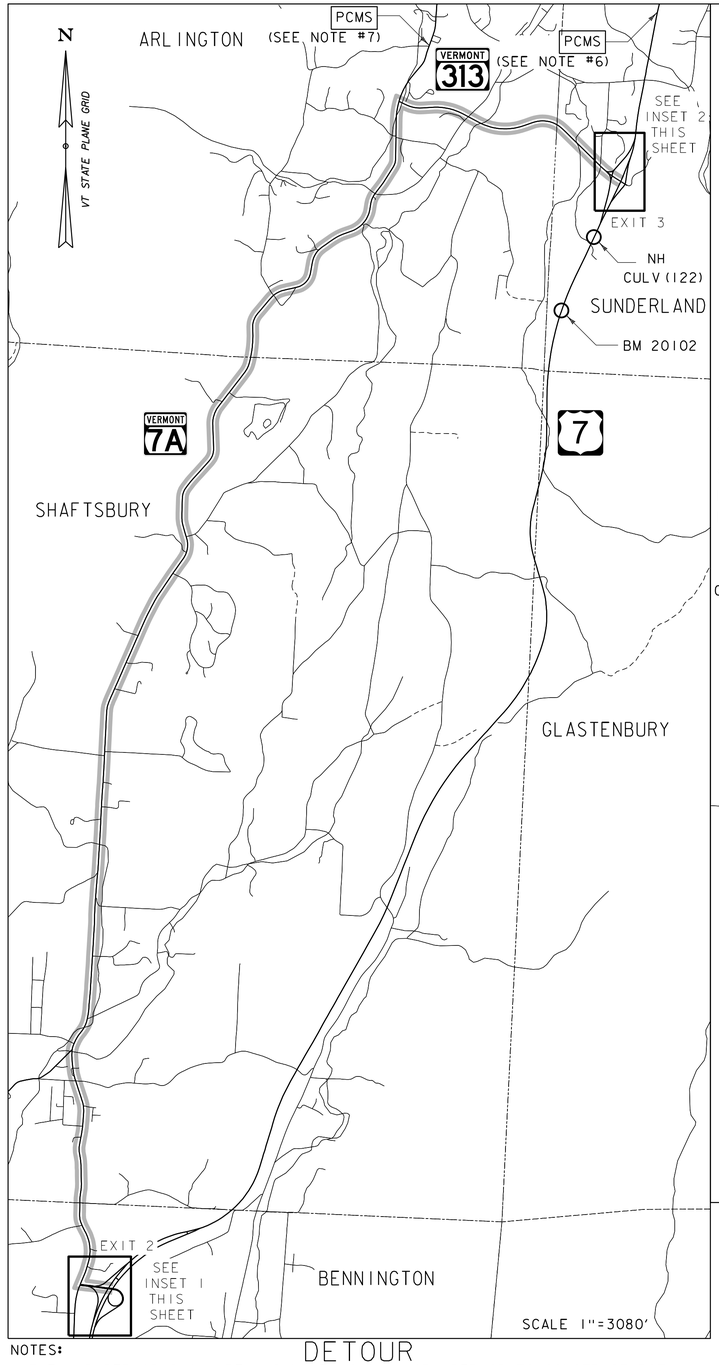
6. IN AREAS RECEIVING PLANTINGS ON STONE FILL, THE CONTRACTOR SHALL VERIFY THAT THE GRUBBING LAYER, AFTER PLACEMENT, STILL MEETS THE SPECIFIED DEPTH AND HAS NOT DISAPPEARED INTO GAPS. TOP LAYER OF STONE FILL MAY BE BROKEN DOWN INTO SMALLER PIECES TO PREVENT SOIL LOSS AS DIRECTED BY THE ENGINEER.

7. TREES SHALL NOT BE PLANTED WITHIN 15' OF OVERHEAD POWER LINES.

8. APPLY MYCORRHIZAL FUNGI PER MANUFACTURERS RECOMMENDATIONS TO TREES AND SHRUBS.

0 20 40
SCALE IN FEET

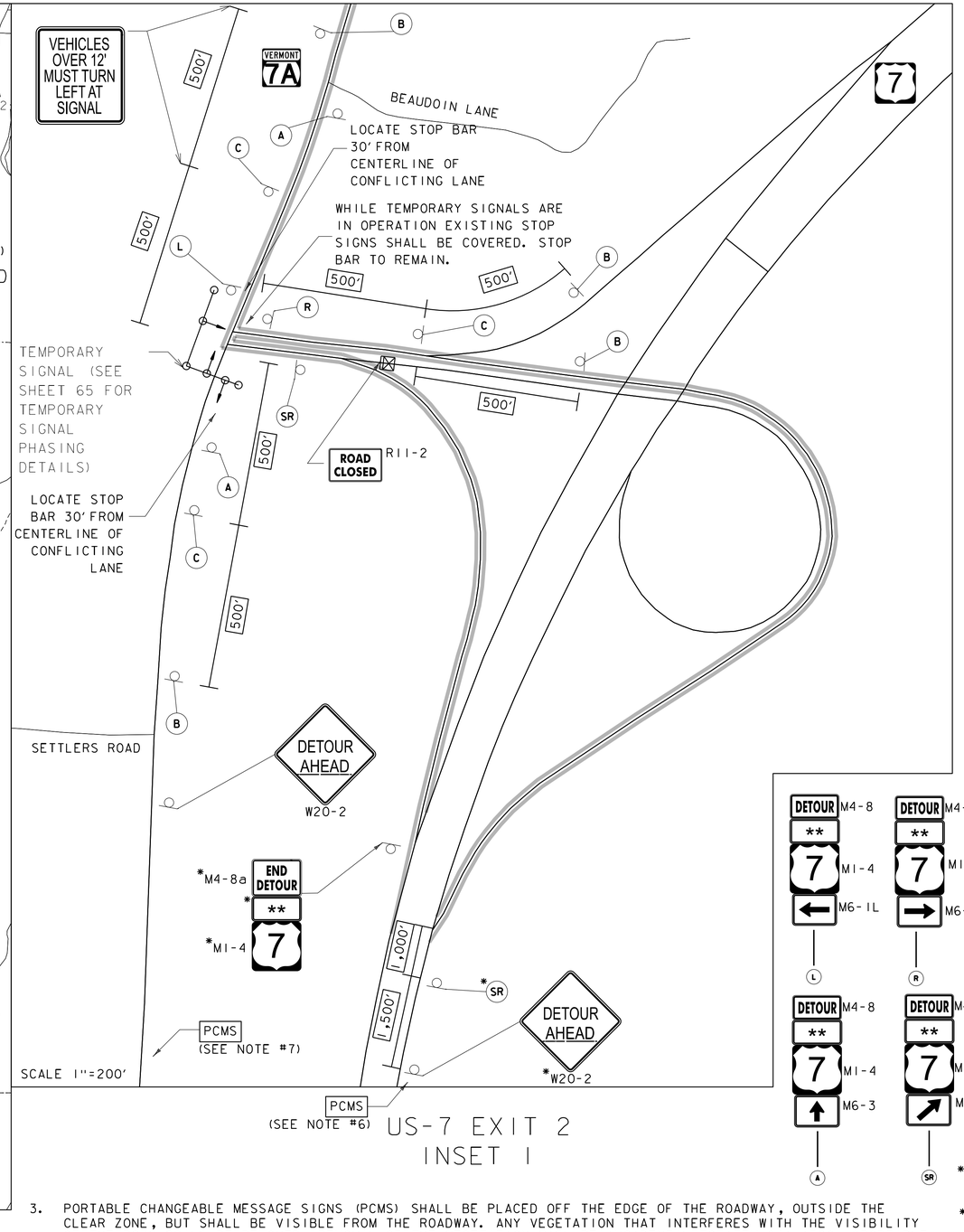
PROJECT NAME:	SUNDERLAND
PROJECT NUMBER:	NH CULV(122)
FILE NAME: w23b027lds_bdr	PLOT DATE: 5-FEB-2026
PROJECT LEADER: G. LAROCHE	DRAWN BY: B. DONAHUE
DESIGNED BY: B. DONAHUE	CHECKED BY: G. LAROCHE
LANDSCAPE SHEET	SHEET 62 OF 66



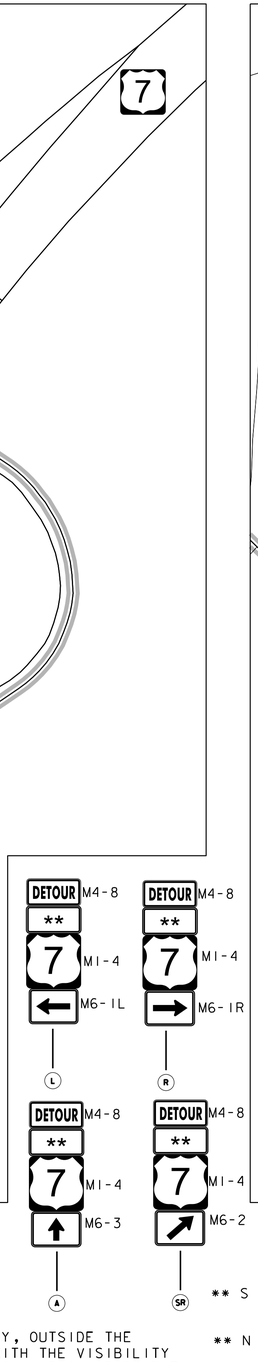
DETOUR

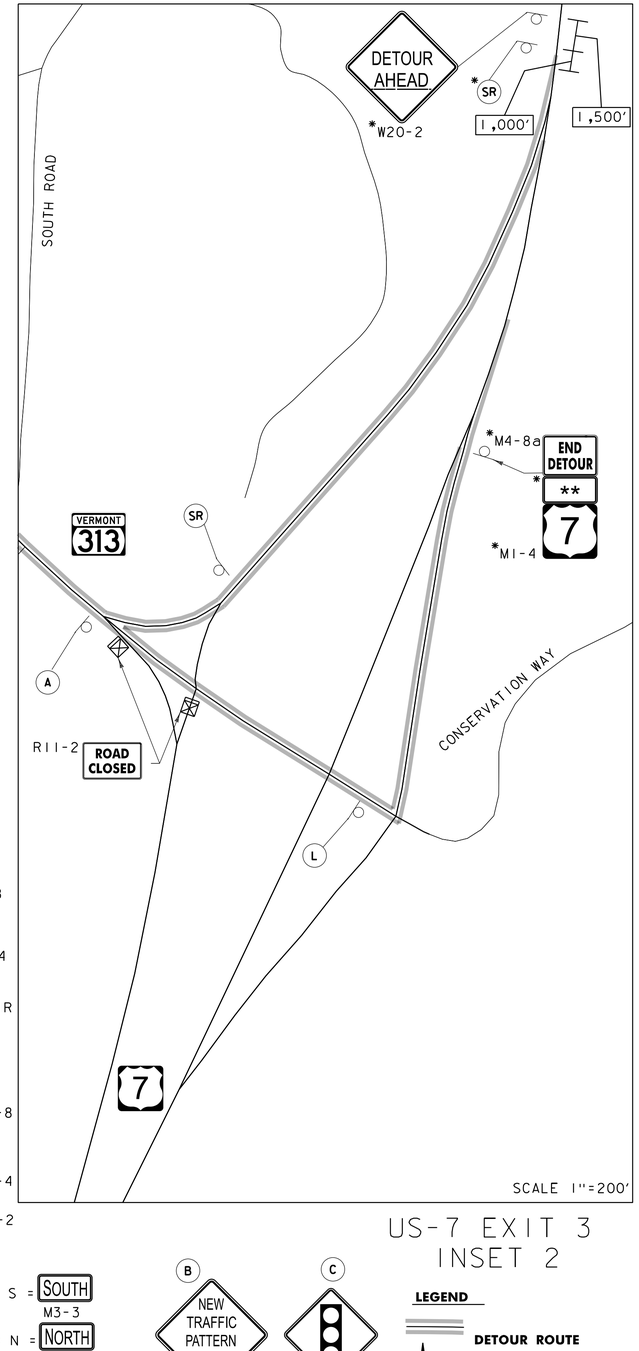
NOTES:

1. THE I/D PERIOD SHALL BE A SINGLE 14-DAY WORK PERIOD TO CONSTRUCT BOTH SUNDERLAND BM 20102 AND SUNDERLAND NH CULV(122).
2. VT ROUTE 313 IN ARLINGTON HAS A LOW CLEARANCE BRIDGE (RR OVERPASS) WHICH IS POSTED FOR 14-FEET. AS SUCH, SUPER LOADS CAN'T COME UP THE VT ROUTE 7A DETOUR THROUGH BENNINGTON. THESE LARGER VEHICLES WILL NEED TO GO UP THROUGH MANCHESTER OR UTILIZE US ROUTE 4 THROUGH NY. VT DMV WILL NEED TO BE NOTIFIED EARLY TO REROUTE THESE LOADS AND ANY ANNUAL HAULER PERMITS THAT MAY USE US-7 DURING THE I/D PERIOD. THE RESIDENT ENGINEER TO SEND OUT THE NOTIFICATION OF ROADWAY RESTRICTION FORM TO THE DMV A MINIMUM OF 14 WORKING DAYS AHEAD OF THE I/D PERIOD. PROJECT PUBLIC INFORMATION CONSULTANT WILL NOTIFY NY DMV AND LOCAL MUNICIPALITIES A MINIMUM OF FOUR WEEKS AHEAD OF THE I/D PERIOD.
3. PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE PLACED OFF THE EDGE OF THE ROADWAY, OUTSIDE THE CLEAR ZONE, BUT SHALL BE VISIBLE FROM THE ROADWAY. ANY VEGETATION THAT INTERFERES WITH THE VISIBILITY OF THE PCMS SHALL BE REMOVED, REMOVAL OF THE VEGETATION WILL BE INCIDENTAL TO ITEM 641.1500, "PORTABLE CHANGEABLE MESSAGE SIGN".
4. PCMS SIGN TO READ "ROUTE 7 CLOSED 9/9-9/23" TWO WEEKS PRIOR TO I/D PERIOD.
5. PCMS SIGN TO READ "ROUTE 7 BRIDGE CLOSED" DURING I/D PERIOD.
6. PCMS SIGNS ALONG ROUTE 7 TO BE LOCATED APPROXIMATELY 1 MILE UPSTREAM OF THE DECISION POINT.
7. PCMS SIGNS ALONG BOTH NORTHBOUND AND SOUTHBOUND VT ROUTE 7A TO READ "SIGNAL AHEAD" DURING I/D PERIOD. PCMS TO BE LOCATED APPROXIMATELY ½ MILE PRIOR TO TEMPORARY SIGNAL LOCATIONS.
8. FOLLOW VERMONT AGENCY OF TRANSPORTATION STANDARD T-20 FOR TEMPORARY CLOSURE OF ROUTE 7 NORTHBOUND AND SOUTHBOUND.
9. PLACE DETOUR ROUTE CONFIRMATION SIGN ASSEMBLY (A) EVERY 1-2 MILES ALONG ROUTE 7A DETOUR AND AFTER EVERY MAJOR INTERSECTION.
10. FOLLOW VERMONT AGENCY OF TRANSPORTATION STANDARD T-1 FOR TEMPORARY TRAFFIC CONTROL GENERAL NOTES.
11. SIGNS ON FREEWAYS/EXPRESSWAYS (US7 NB/SB MAINLINE) ARE TO BE UP SIZED FROM CONVENTIONAL ROAD SIGN SIZES.



US-7 EXIT 2 INSET 1





US-7 EXIT 3 INSET 2

** S = SOUTH M3-3

** N = NORTH M3-1

* = FREEWAY SIGN (UP SIZED)

B NEW TRAFFIC PATTERN AHEAD W23-2

C W3-3

LEGEND

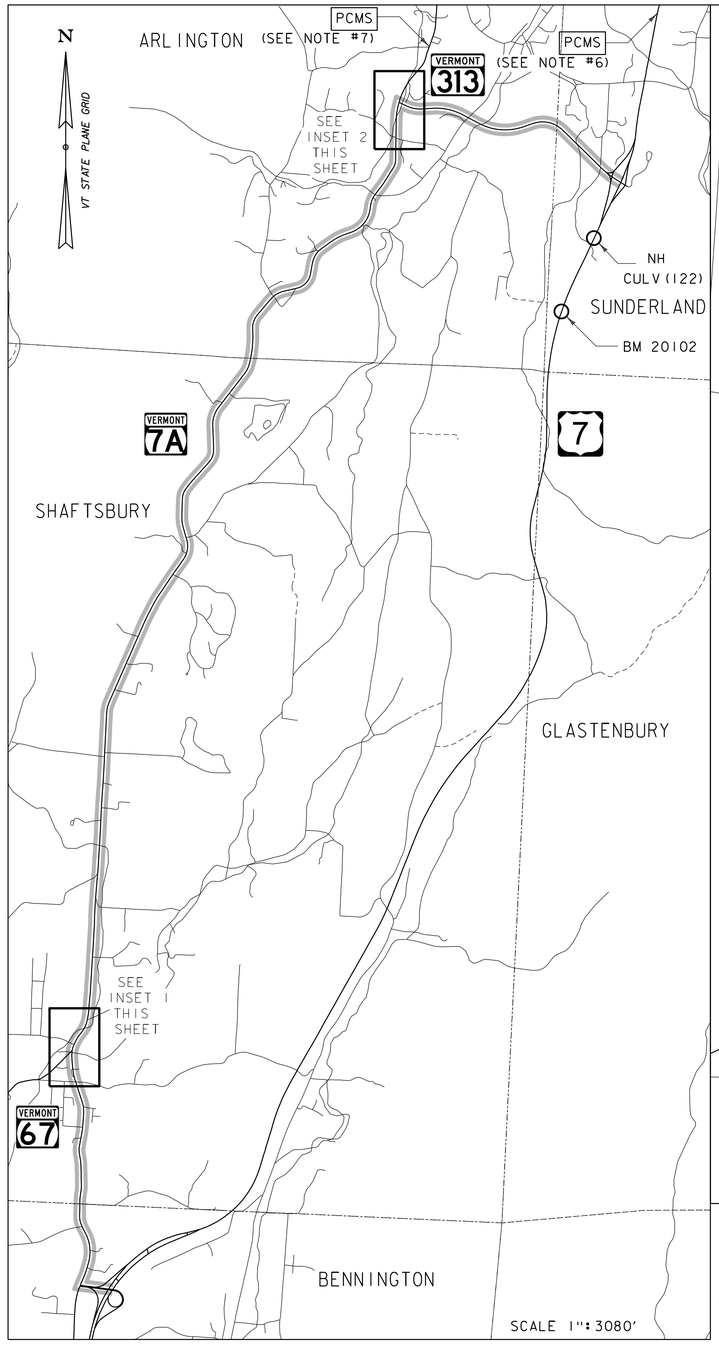
- DETOUR ROUTE
- TEMPORARY SIGNAL SYSTEM
- TYPE III BARRICADE WITH SIGN

PROJECT NAME: SUNDERLAND & SUNDERLAND

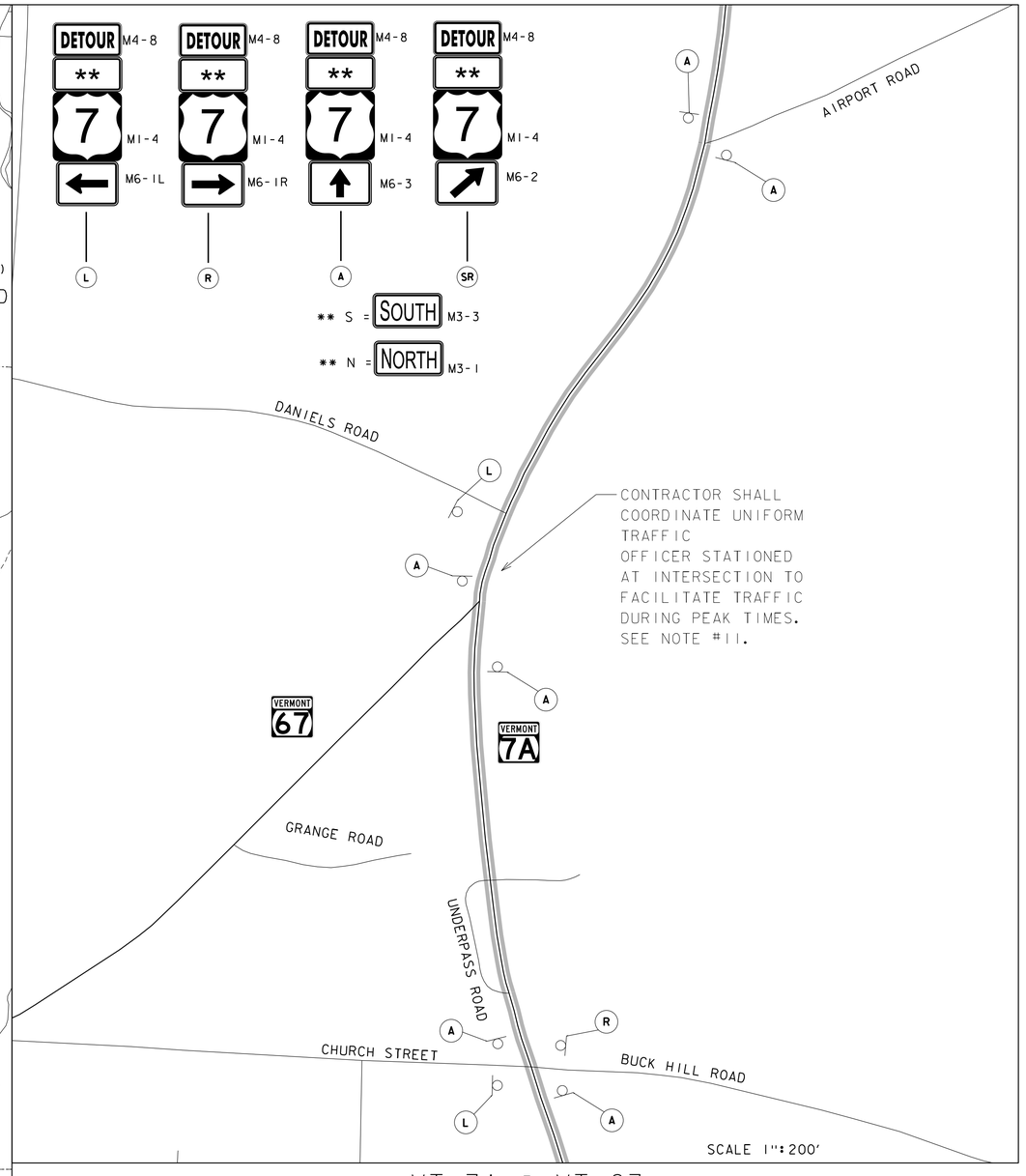
PROJECT NUMBER: BM 20102 & NH CULV(122)

FILE NAME: z20b155traf.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
DETOUR SHEET 1

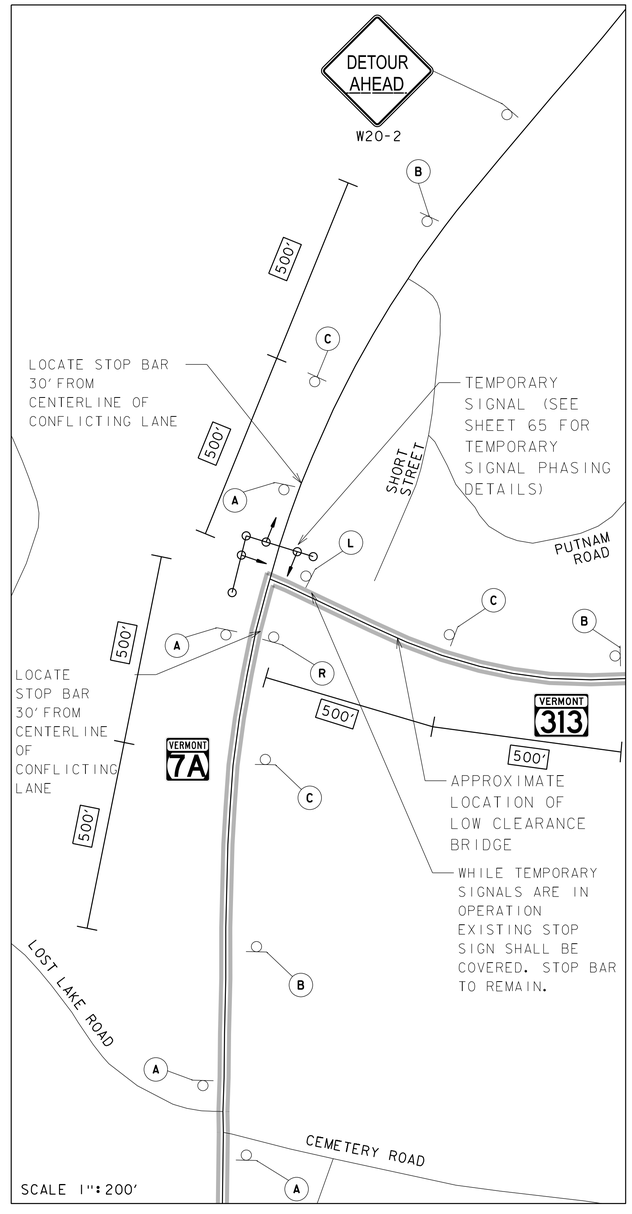
PLOT DATE: 3/2/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 63 OF 66



DETOUR



VT-7A @ VT-67
INSET 1



VT-7A @ VT-313
INSET 2

LEGEND

DETOUR ROUTE

TEMPORARY SIGNAL SYSTEM

NOTES:

1. THE I/D PERIOD SHALL BE A SINGLE 14-DAY WORK PERIOD TO CONSTRUCT BOTH SUNDERLAND BM 20102 AND SUNDERLAND NH CULV(122).
2. VT ROUTE 313 IN ARLINGTON HAS A LOW CLEARANCE BRIDGE (RR OVERPASS) WHICH IS POSTED FOR 14-FEET. AS SUCH, SUPER LOADS CAN'T COME UP THE VT ROUTE 7A DETOUR THROUGH BENNINGTON. THESE LARGER VEHICLES WILL NEED TO GO UP THROUGH MANCHESTER OR UTILIZE US ROUTE 4 THROUGH NY. VT DMV WILL NEED TO BE NOTIFIED EARLY TO REROUTE THESE LOADS AND ANY ANNUAL HAULER PERMITS THAT MAY USE US-7 DURING THE I/D PERIOD. THE RESIDENT ENGINEER TO SEND OUT THE NOTIFICATION OF ROADWAY RESTRICTION FORM TO THE DMV A MINIMUM OF 14 WORKING DAYS AHEAD OF THE I/D PERIOD. PROJECT PUBLIC INFORMATION CONSULTANT WILL NOTIFY NY DMV AND LOCAL MUNICIPALITIES A MINIMUM OF FOUR WEEKS AHEAD OF I/D PERIOD.
3. PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE PLACED OFF THE EDGE OF THE ROADWAY, OUTSIDE THE CLEAR ZONE, BUT SHALL BE VISIBLE FROM THE ROADWAY. ANY VEGETATION THAT INTERFERES WITH THE VISIBILITY OF THE PCMS SHALL BE REMOVED, REMOVAL OF THE VEGETATION WILL BE INCIDENTAL TO ITEM 641.1500, "PORTABLE CHANGEABLE MESSAGE SIGN".
4. PCMS SIGN TO READ "ROUTE 7 CLOSED 9/9-9/23" TWO WEEKS PRIOR TO I/D PERIOD.
5. PCMS SIGN TO READ "ROUTE 7 BRIDGE CLOSED" DURING BRIDGE I/D PERIOD.
6. PCMS SIGNS ALONG ROUTE 7 TO BE LOCATED APPROXIMATELY 1 MILE UPSTREAM OF THE DECISION POINT.
7. PCMS SIGNS ALONG BOTH NORTHBOUND AND SOUTHBOUND VT ROUTE 7A TO READ "SIGNAL AHEAD" DURING I/D PERIOD. PCMS TO BE LOCATED APPROXIMATELY ½ MILE PRIOR TO TEMPORARY SIGNAL LOCATIONS.
8. FOLLOW VERMONT AGENCY OF TRANSPORTATION STANDARD T-20 FOR TEMPORARY CLOSURE OF ROUTE 7 NORTHBOUND AND SOUTHBOUND.
9. PLACE DETOUR ROUTE CONFIRMATION SIGN ASSEMBLY (A) EVERY 1-2 MILES ALONG ROUTE 7A DETOUR AND AFTER EVERY MAJOR INTERSECTION.
10. FOLLOW VERMONT AGENCY OF TRANSPORTATION STANDARD T-1 FOR TEMPORARY TRAFFIC CONTROL GENERAL NOTES.
11. PEAK TRAFFIC PERIODS ARE AS FOLLOWS: WEEKDAY - AM PEAK = 7-9AM, PM PEAK = 3-5PM; WEEKEND - SAT 11AM-1PM, SUN 2-4PM.

B
NEW
TRAFFIC
PATTERN
AHEAD
W23-2

C
W3-3

PROJECT NAME:	SUNDERLAND & SUNDERLAND
PROJECT NUMBER:	BM 20102 & NH CULV(122)
FILE NAME: z20b155traf2.dgn	PLOT DATE: 3/2/2026
PROJECT LEADER: A. STOCKIN	DRAWN BY: M. HERMIS
DESIGNED BY: M. GROTE	CHECKED BY: T. HIGGINSON
DETOUR SHEET 2	SHEET 64 OF 66

VT 7A & VT 313

SIGNAL PHASING			
TIMING IN SECONDS	Ø 2 ↑	Ø 4 ←	Ø 6 ↓
INITIAL INTERVAL	5	5	5
VEHICLE EXTENSION	3	3	3
MAX 1	30	35	30
YELLOW	5.0	5.0	5.0
ALL RED	2.0	2.0	2.0
RECALL	MIN	OFF	MIN
DETECTOR MEMORY	LOCK	NON-LOCK	LOCK
FLASH	YELLOW	RED	YELLOW

MAX 1: ALL TIME PERIODS
ø2 IS NORTHBOUND TRAFFIC ON VT 7A
ø4 IS WESTBOUND TRAFFIC ON VT 313
ø6 IS SOUTHBOUND TRAFFIC ON VT 7A

NEMA STD 8ø CONTROLLER

VT 7A & US 7 RAMPS

SIGNAL PHASING				
TIMING IN SECONDS	Ø 1 ↘	Ø 2 ↑	Ø 4 ←	Ø 6 ↓
INITIAL INTERVAL	5	5	5	5
VEHICLE EXTENSION	3	3	3	3
MAX 1	20	10	15	35
YELLOW	5.0	5.0	5.0	5.0
ALL RED	2.0	2.0	2.0	2.0
RECALL	MIN	MIN	OFF	MIN
DETECTOR MEMORY	LOCK	LOCK	NON-LOCK	LOCK
FLASH	YELLOW	YELLOW	RED	YELLOW

MAX 1: ALL TIME PERIODS
ø1 SHALL BE PROTECTED+PERMISSIVE
ø1 IS SOUTHBOUND LEFT TURN TRAFFIC ON VT 7A
ø2 IS NORTHBOUND TRAFFIC ON VT 7A
ø4 IS WESTBOUND TRAFFIC ON US 7 RAMPS
ø6 IS SOUTHBOUND TRAFFIC ON VT 7A

NEMA STD 8ø CONTROLLER

TEMPORARY TRAFFIC SIGNAL NOTES:

1. CONTRACTOR SHALL IMPLEMENT SIGNAL TIMINGS SHOWN IN THIS PLAN DURING THE DETOUR. SIGNALS SHALL BE MONITORED AND FURTHER ADJUSTED IF NECESSARY WITH VTRANS APPROVAL.

2. SIGNALS SHALL OPERATE IN ACTUATED MODE. MANUAL OR PRETIMED MODES MAY BE USED AT THE DIRECTION OF THE ENGINEER.

3. TEMPORARY TRAFFIC SIGNALS TO BE LOCATED SO THAT AT LEAST 425 FEET OF SIGHT DISTANCE IS PROVIDED TO APPROACHING TRAFFIC ON VT 7A PER POSTED SPEED LIMIT OF 50 MPH.

PROJECT NAME: SUNDERLAND & SUNDERLAND
PROJECT NUMBER: BM 20102 & NH CULV(122)

FILE NAME: z20bl55traf3.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
DETOUR SHEET 3

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 65 OF 66

VAOT POLLINATOR DRY			
% OF MIX	LATIN NAME	COMMON NAME	CULTIVAR/ ECOTYPE
6	AGROSTIS PERENNANS	AUTUMN BENTGRASS,	APB (NY)
25.2	ANDROPOGON GERARDII	BIG BLUESTEM	APB (NY)
0.5	ASCLEPIAS SYRIACA	COMMON MILKWEED	ANY
0.8	ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	PA
25	ELYMUS VIRGINICUS	VIRGINIA WILDRYE	MADISON OR PA
0.6	MONARDA FISTULOSA	WILD BERGAMOT	FIG (PA)
20	PANICUM CLANDESTINUM	DEERTONGUE	TIOGA
1.5	RUDBECKIA HIRTA	BLACK EYED SUSAN	ANY
20	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	ANY
0.2	SOLIDAGO JUNCEA	EARLY GOLDENROD	PA
0.2	SOLIDAGO RUGOSA	WRINKLE LEAF GOLDENROD	PA
100%			

SEED RATE: 60 LBS/ACRE PURE LIVE SEED (PLS)
30 LBS/ACRE OF NURSE CROP
30 LBS/ACRE OF BULKING AGENT

*PREFERRED SEEDING PERIOD FOR POLLINATOR SEED MIX IS BEFORE MAY 1 (AFTER SNOWMELT) AND AFTER SEPTEMBER 15 (BEFORE SNOWPACK). IF SEEDING OCCURS DURING THE PREFERRED PERIOD, SEEDING RATE SHALL BE REDUCED BY 30%. NO ADJUSTMENT IS REQUIRED FOR NURSE CROPS OR BULKING AGENTS).

DESIGN GUIDANCE

1. THIS SEED MIX SHALL BE USED IN AREAS THAT WILL NATURALIZE, RECEIVING MOWING ONCE EVERY 3 YEARS OR LESS.
2. USE SEED MIX FOR AREAS THAT ARE SLOPED OR FLAT, WITH NORMAL TO DRY CONDITIONS, OR AS INDICATED IN THE PLANS.

CONSTRUCTION GUIDANCE

1. SEE VAOT POLLINATOR SEED CONSTRUCTION GUIDANCE DETAIL FOR MORE INFORMATION ON INSTALLATION AND BULKING AGENT.

TURF ESTABLISHMENT

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 651 FOR SEED (PAY ITEM 651.1600 TURF ESTABLISHMENT, SPECIALTY SEED)

REVISIONS	
JUNE 21, 2023	BKD

VAOT POLLINATOR SEED CONSTRUCTION GUIDANCE

1. PREPARE SOIL FOR POLLINATOR SEED MIX APPLICATION SITES IN ACCORDANCE WITH VTRANS SUBSECTION 651.04 & 651.05 FOR TURF ESTABLISHMENT.
2. APPLY SOIL AMENDMENTS PER SOIL TEST RESULTS.
3. MIX POLLINATOR SEED, NURSE CROP SEEDS, AND BULKING AGENT PRIOR TO APPLICATION. ENSURE THAT THE MATERIALS ARE EVENLY DISTRIBUTED THROUGHOUT THE MIX.
   A. NURSE CROP: USE GRAIN OATS (AVENA SATIVA) AS A NURSE CROP IF PLANTING BETWEEN JANUARY 1 AND JULY 31 OR USE WINTER RYE (SECALE CEREALE) IF PLANTING BETWEEN AUGUST 1 AND DECEMBER 31.
   B. BULKING AGENT: ADD AN INERT CARRIER AND BULKING AGENT SUCH AS GRANULAR SODIUM BENTONITE CLAY, NON-CLUMPING & NON-SCENTED KITTY LITTER, OR APPROVED EQUIVALENT TO ALLOW FOR EVEN SEED DISTRIBUTION AND AS A VISUAL AID OF COVERAGE DURING THE SEED INSTALLATION. BULKING AGENTS SHALL BE MIXED WITH THE SEED MIX AND NURSE CROP AT THE RATES SPECIFIED ON THE POLLINATOR SEED MIX DETAILS. PAYMENT FOR BULKING AGENT AND NURSE CROP SHALL BE INCIDENTAL TO THE CORRESPONDING SEED PAY ITEMS.
4. APPLY POLLINATOR SEED MIXES, NURSE CROP SEEDS, AND BULKING AGENT CONCURRENTLY IN ACCORDANCE WITH THE RATES SHOWN ON THE POLLINATOR SEED MIX TABLES. DO NOT EXCEED THE RECOMMENDED NURSE CROP SEEDING RATES TO AVOID SMOTHERING THE POLLINATOR SEED MIX AND PREVENTING GERMINATION.
5. SPREAD SEED BY HAND OR USE BROADCAST SEEDING EQUIPMENT WITH AN INTERNAL AGITATOR AND AN ADJUSTABLE FLOW GATE TO CREATE A SLOW, STEADY SEED FLOW, ALLOWING FOR EVEN DISTRIBUTION OF THE SMALLER SEEDS.
6. USE A LANDSCAPE-TYPE ROLLER, CULTIPACKER, OR LEAF RAKE TO LIGHTLY PRESS SEED INTO SOIL BED AFTER BROADCAST SPREADING. THIS PROMOTES ADEQUATE SEED TO SOIL CONTACT. DO NOT TILL OR COVER SEED WITH SOIL.
7. MULCH WITH A LIGHT COVER OF WEED-FREE OAT STRAW AT A RATE OF 3,000 LB./ACRE.
8. IF HYDROSEEDING, A TWO-STEP PROCESS SHALL BE USED. FIRST PASS: APPLY SEED WITH 1/3 THE NORMAL RATE OF HYDRAULIC MULCH. SECOND PASS: APPLY REMAINDER OF HYDRAULIC MULCH. RATE OF HYDROSEED SHALL BE PER MANUFACTURERS RECOMMENDATIONS. NO BULKING AGENT SHALL BE USED.

TURF ESTABLISHMENT

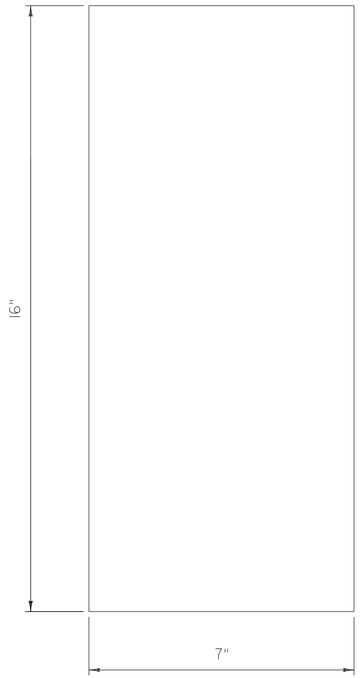
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 651 FOR SEED (PAY ITEM 651.1600 TURF ESTABLISHMENT, SPECIALTY SEED)

REVISIONS	
JUNE 21, 2023	BKD

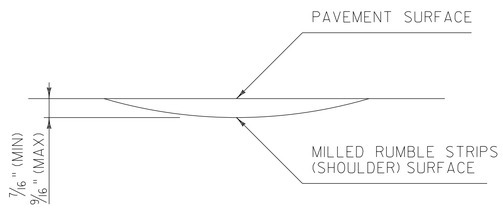
PROJECT NAME: SUNDERLAND & SUNDERLAND
PROJECT NUMBER: BM 20102 & NH CULV(122)

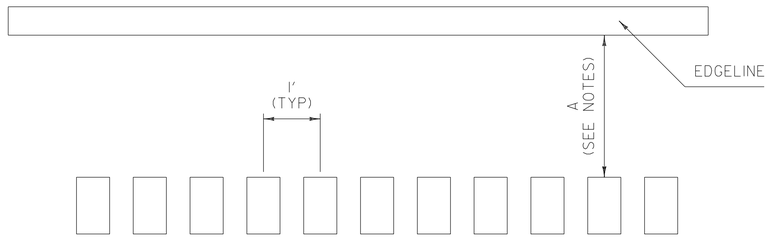
FILE NAME: z20bl55epsc_det.dgn
PROJECT LEADER: A. STOCKIN
DESIGNED BY: M. GROTE
EPSC DETAILS

PLOT DATE: 2/25/2026
DRAWN BY: M. HERMIS
CHECKED BY: T. HIGGINSON
SHEET 66 OF 66



RUMBLE STRIP DETAIL

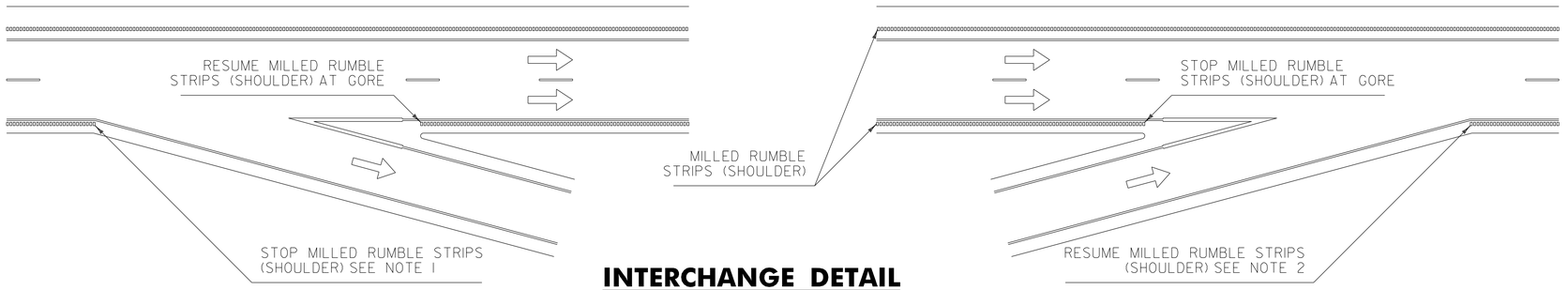




RUMBLE STRIP LAYOUT DETAIL

NOTES:

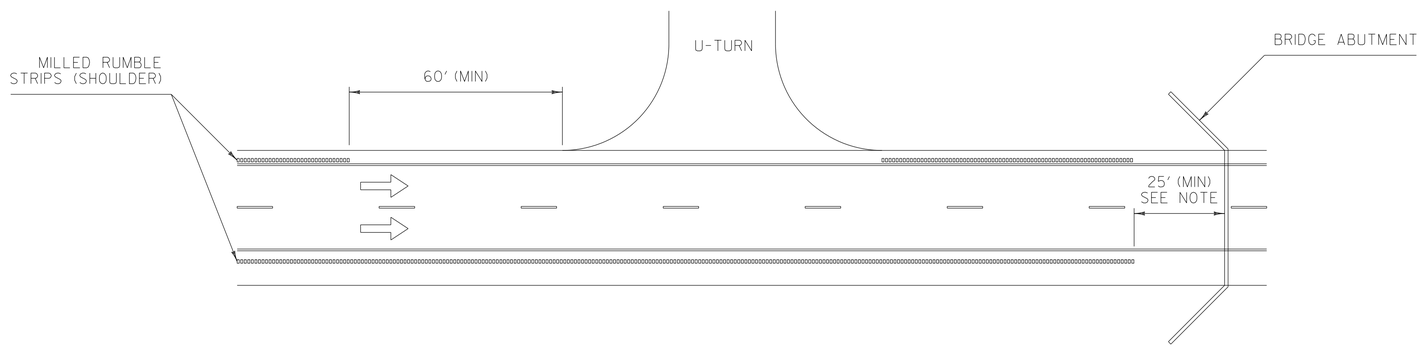
1. DIMENSION "A" SHALL BE 30 INCHES FOR SHOULDERS WITH A WIDTH OF SIX FEET OR GREATER.
2. DIMENSION "A" SHALL BE SIX INCHES FOR SHOULDERS WITH A WIDTH OF LESS THAN SIX FEET, WITHOUT GUARDRAIL.
3. MILLED RUMBLE STRIPS (SHOULDER) SHALL BE INSTALLED WITH A LATERAL TOLERANCE OF +/- TWO INCHES.
4. MILLED RUMBLE STRIPS (SHOULDER) SHALL BE STOPPED WHEN THE FACE OF GUARDRAIL IS PRESENT WITHIN FOUR FEET OF THE EDGE OF TRAVELLED WAY.



INTERCHANGE DETAIL

NOTES:

1. DETAIL IS SHOWN FOR A TAPERED DECELERATION LANE, FOR PARALLEL DECELERATION LANES MILLED RUMBLE STRIPS (SHOULDER) SHALL STOP AT THE BEGINNING OF THE DECELERATION LANE TAPER.
2. DETAIL IS SHOWN FOR A TAPERED ACCELERATOIN LANE, FOR PARALLEL ACCELERATION LANES MILLED RUMBLE STRIPS (SHOULDER) SHALL STOP AT THE END OF THE ACCELERATION LANE TAPER.



NOTE:

1. MILLED RUMBLE STRIPS (SHOULDER) SHALL STOP A MINIMUM OF 25 FEET PRIOR TO BRIDGE ABUTMENT AND RESUME A MINIMUM OF 25 FEET AFTER THE TRAILING ABUTMENT. THIS DISTANCE MAY BE INCREASED TO MEET THE REQUIREMENTS OF THE RUMBLE STRIP LAYOUT DETAIL NOTE 4 ON THIS SHEET. MILLED RUMBLE STRIPS (SHOULDER) SHALL ALSO STOP PRIOR TO AND RESUME AFTER ALL APPROACH SLABS.

MISCELLANEOUS DETAILS

REV.	DATE	DESCRIPTION
0	NOV. 3, 2015	ORIGINAL APPROVAL
1	FEB. 4, 2016	ADDED LATERAL TOLERANCE NOTE
2	FEB. 27, 2017	UPDATED LATERAL TOLERANCE NOTE

OTHER DETAILS REQUIRED: NONE

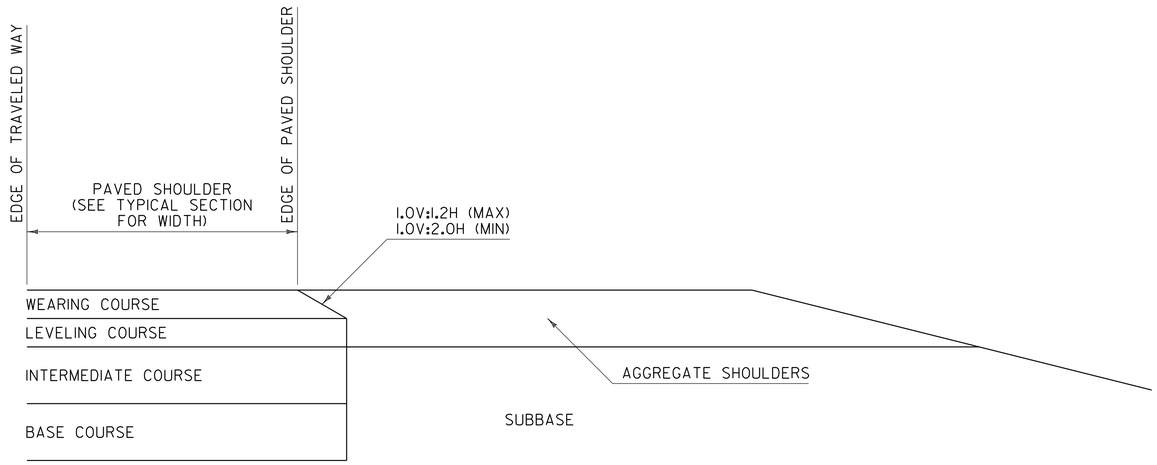
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

MILLED RUMBLE STRIPS (SHOULDER)

VTrans Working to Get You There
VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL

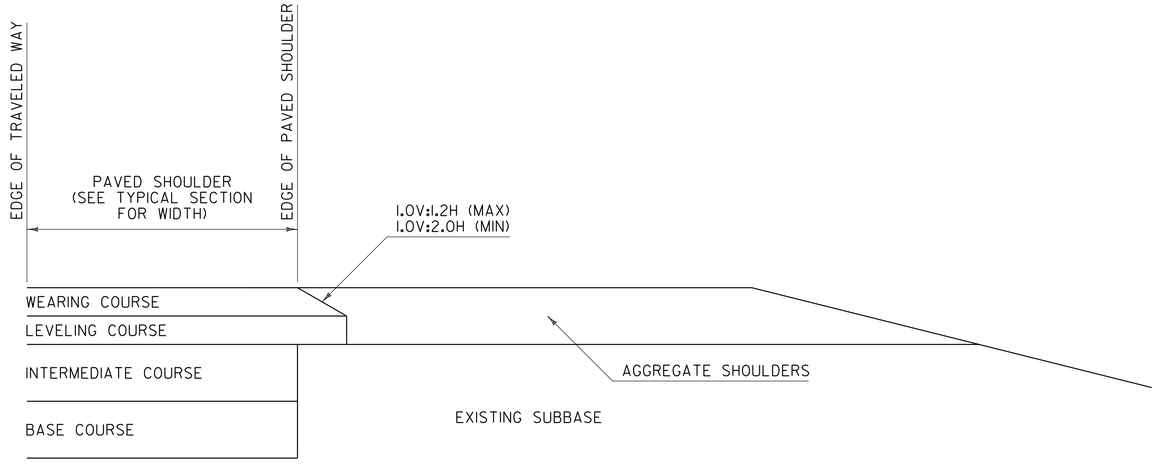
HSD-213.01



SAFETY EDGE DETAIL
FOR PAVING BELOW WEARING COURSE

NOTES:

1. THIS DETAIL IS INTENDED FOR WHEN PAVING EXTENDS BELOW THE WEARING COURSE.
2. PRIOR TO PLACEMENT OF THE LEVELING AND/OR WEARING COURSE, THE SUBBASE LOCATED BENEATH THE AGGREGATE SHOULDERS SHALL BE PREPARED FLUSH WITH THE BOTTOM OF THE LEVELING COURSE.
3. BASE COURSE LIMITS MAY VARY, SEE TYPICAL SECTIONS FOR WIDTH.



SAFETY EDGE DETAIL
FOR PAVING WEARING COURSE ONLY

NOTES:

1. THIS DETAIL IS INTENDED FOR WHEN ONLY THE LEVELING AND/OR WEARING COURSE IS TO BE PLACED.
2. PAVEMENT COURSES MAY VARY, SEE TYPICAL SECTIONS FOR ACTUAL PAVEMENT COURSES REQUIRED.

SAFETY EDGE WIDTH BASED ON WEARING COURSE THICKNESS AND A 1V:1.6H SLOPE	
WEARING COURSE THICKNESS (INCHES)	NOMINAL SAFETY EDGE WIDTH (INCHES)
1.25	2.000
1.50	2.375
1.75	2.750
2.00	3.125
2.25	3.500
2.50	4.000

GENERAL NOTES:

1. PLACEMENT OF THE WEARING COURSE SHALL INCLUDE THE SAFETY EDGE, UNLESS THE FOLLOWING APPLIES:
   - A. THE ADJACENT SLOPE IS STEEPER THAN THE SAFETY EDGE.
   - B. THE EDGE OF PAVEMENT BEING PLACED ABUTS BOUND MATERIAL.
   - C. VEHICLES ARE RESTRICTED FROM LEAVING THE PAVED SURFACE (EXAMPLE: GUARDRAIL).
2. THE SAFETY EDGE SHALL BE FORMED IN SUCH A WAY THAT THE BITUMINOUS CONCRETE PAVEMENT IS EXTRUDED OR COMPRESSED TO FORM THE SLOPE. DEVICES THAT SIMPLY STRIKE-OFF THE MIX WITHOUT PROVIDING ANY COMPACTIVE EFFORT WILL NOT BE ALLOWED.
3. THE SAFETY EDGE SHALL NOT BE CONSIDERED PART OF THE PAVED SHOULDER.
4. THIS WORK SHALL BE INCIDENTAL TO THE RESPECTIVE BITUMINOUS CONCRETE PAVEMENT ITEM.

REV.	DATE	DESCRIPTION
0	MAR. 29, 2016	ORIGINAL APPROVAL
1	JAN. 5, 2018	ANNOTATION CORRECTIONS

OTHER DETAILS REQUIRED: NONE

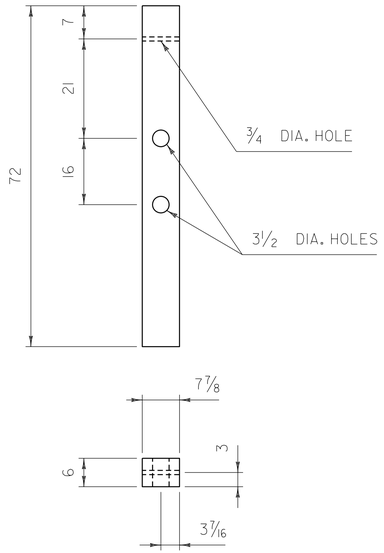
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

SAFETY EDGE DETAILS

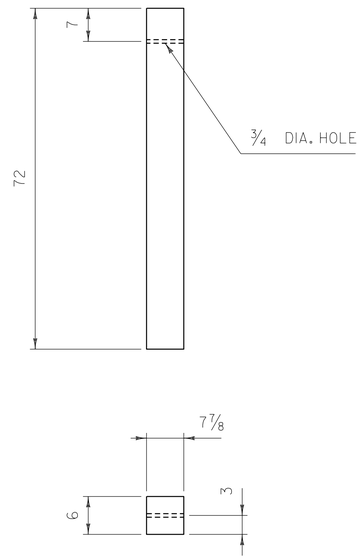
VTrans Working to Get You There
VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL

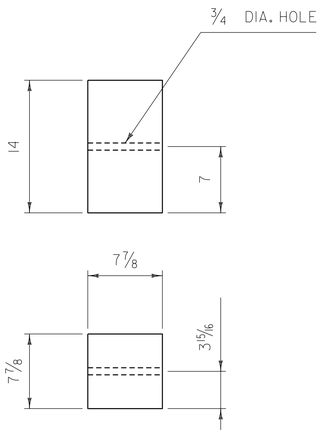
HSD-400.01



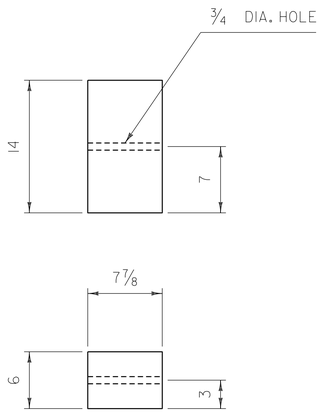
CONTROLLED RELEASING TERMINAL (CRT) TIMBER POST (PDE09)



TIMBER GUARDRAIL POST (PDE07)



TRANSITION SPACER BLOCKOUTS (PDB07)



W-BEAM TIMBER BLOCKOUT (PDB01)

GENERAL NOTES:

1. ALL MATERIAL DESIGNATIONS ARE AS IDENTIFIED IN ''A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE'' AS PUBLISHED BY THE ''AMERICAN ASSOCIATION OF STATE AND HIGHWAY TRANSPORTATION OFFICIALS'' (AASHTO), ASSOCIATED GENERAL CONTRACTORS OF AMERICA (AGC) AND THE AMERICAN ROAD AND TRANSPORTATION BUILDERS ASSOCIATION (ARTBA).
2. CRT TIMBER POSTS SHALL BE INSTALLED SO THAT THE CENTER OF THE TOP 3 1/2 INCH HOLE IS AT GROUND LEVEL.
3. ALL TIMBER SHALL RECEIVE A PRESERVATION TREATMENT IN ACCORDANCE WITH AASHTO M133 AFTER ALL HOLES ARE DRILLED AND END CUTS ARE MADE.
4. ALL DIMENSIONS IN INCHES.

REV.	DATE	DESCRIPTION
0	JUN. 9, 2015	ORIGINAL APPROVAL

OTHER DETAILS REQUIRED: NONE

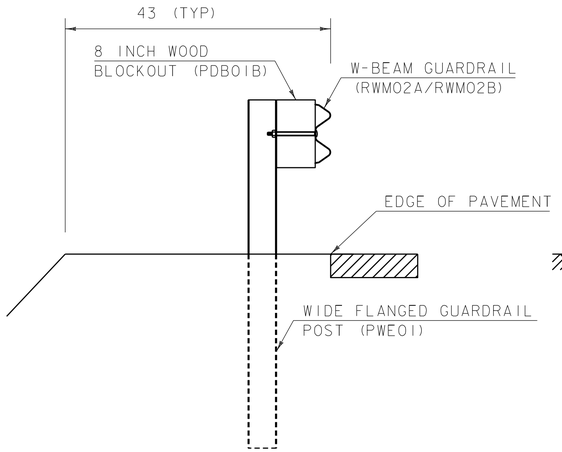
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

POST AND BLOCKOUT DETAILS FOR STEEL BEAM GUARDRAIL, GALVANIZED

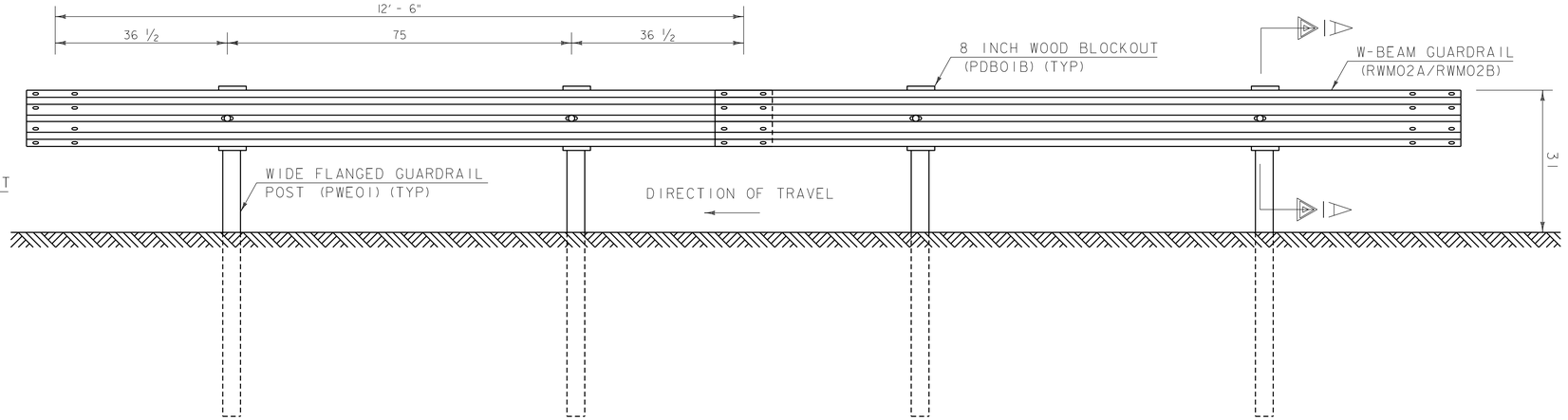
VTrans Working to Get You There
VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL

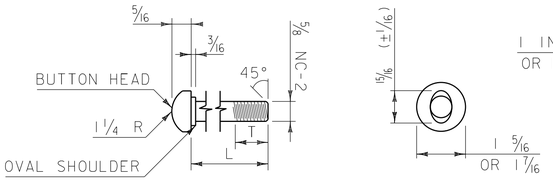
HSD-621.01



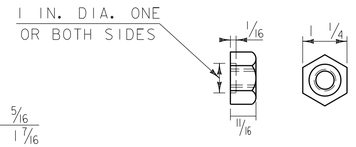
TYPICAL GUARDRAIL DETAIL
SECTION A-A



GUARDRAIL ELEVATION

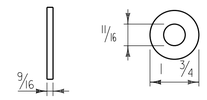


GUARDRAIL BOLT



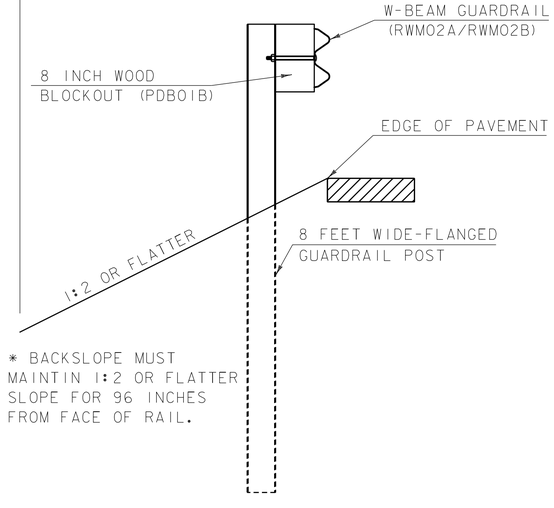
RECESSED NUT FOR GUARDRAIL BOLT

NOTE: WASHER IS USED UNDER RECESSED NUT WHERE GUARDRAIL BOLT IS USED WITH WOOD POSTS.

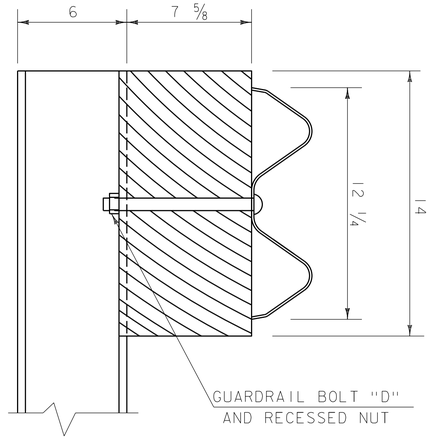


WASHER FOR 5/8" BOLTS
ARTBA F-13-73

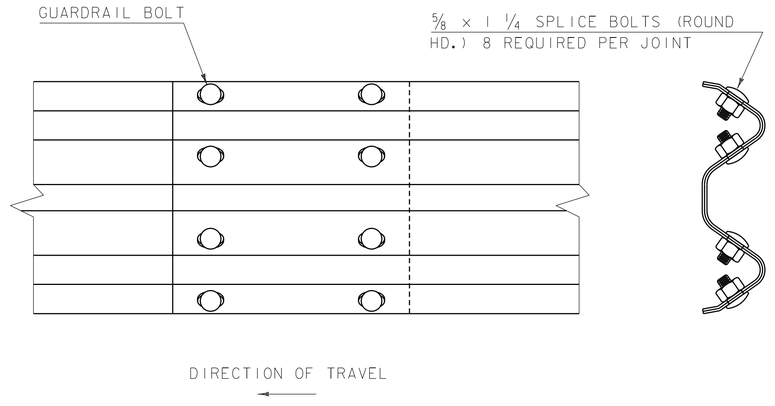
GUARDRAIL BOLTS				FASTENER USED IN	
BOLT DES.	ARTBA REF. NO.	L	T (MIN.)	STEEL POSTS	WOOD POSTS
"A"	F-3[1 1/4]-76	1 1/4"	1"	X	X
"C"	F-3[9 1/2]-76	9 1/2"	1 3/4"	X	
"D"	F-3[18]-76	18"	2 1/2"		X
"F"	F-3[25]-76	25"	2"		X



8 FEET POSTS GUARDRAIL DETAIL
SECTION A-A



POST ATTATCHMENT DETAIL



SPLICE DETAIL

GENERAL NOTES

1. DESIGNATIONS ARE AS IDENTIFIED IN "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE" AS PUBLISHED BY THE "AMERICAN ASSOCIATION OF STATE AND HIGHWAY TRANSPORTATION OFFICIALS" (AASHTO), "ASSOCIATED GENERAL CONTRACTORS OF AMERICA" (AGC) AND THE "AMERICAN ROAD AND TRANSPORTATION BUILDERS ASSOCIATION" (ARTBA).
2. MATERIALS SHALL BE IN ACCORDANCE WITH SECTION 728 OF THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION, AND ITS LATEST REVISIONS, AS APPLICABLE.
3. WHEN W-BEAM GUARDRAIL, 8 FEET POSTS IS SPECIFIED ON THE PLANS, WIDE FLANGED GUARDRAIL POST (PWE01) SHALL BE INCREASED FROM 72 INCHES TO 96 INCHES, SEE DETAIL HSD-621.07B.
4. THE DYNAMIC DEFLECTION DISTANCE OF 57 INCHES FOR W BEAM GUARDRAIL SHALL BE MAINTAINED CLEAR OF OBSTACLES, TO BE MEASURED FROM THE BACK OF POST.
5. FOR TEST LEVEL 3 APPLICATIONS, AS APPROVED IN THE FEDERAL HIGHWAY ADMINISTRATION'S ELIGIBILITY LETTER, HSST/B-240, DATED NOVEMBER 8, 2012.
6. ALL DIMENSION IN INCHES, UNLESS OTHERWISE NOTED.

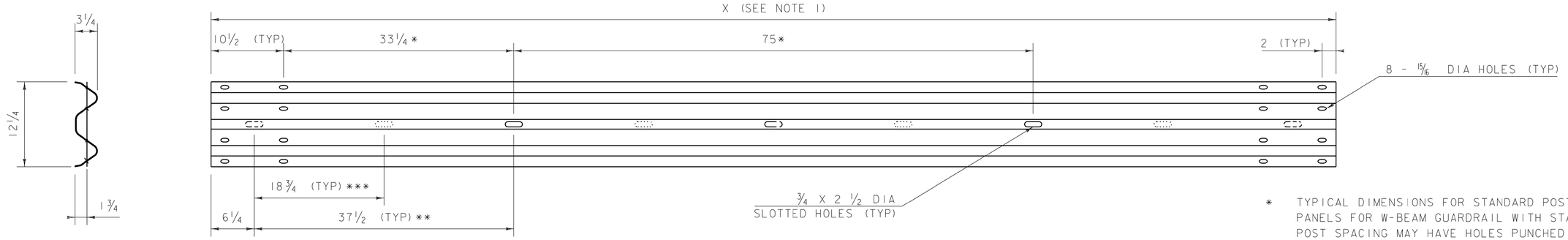
REV.	DATE	DESCRIPTION
--	APR. 17, 2019	ORIGINAL APPROVAL
1	JAN. 4, 2021	CORRECTED REFERENCE IN NOTE 3

OTHER DETAILS REQUIRED: 621.07B
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

MIDWEST GUARDRAIL SYSTEM (MGS)

VTrans Working to Get You There
VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL
HSD-621.07A



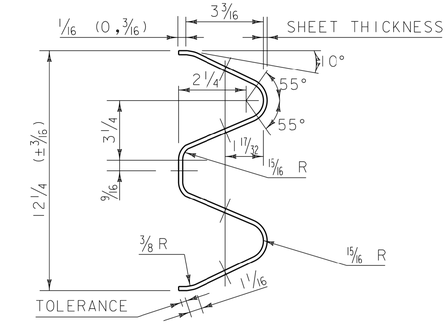
1. TANGENT W-BEAM RAIL LENGTHS SHALL BE 13'-6 1/2" OR 26'-1/2", UNLESS OTHERWISE SPECIFIED.
2. W-BEAM THICKNESS SHALL BE 1/8" FOR STANDARD W-BEAM GUARDRAIL (RWM02A) AND 5/64" FOR HEAVY DUTY GUARDRAIL (RWM02B).

* TYPICAL DIMENSIONS FOR STANDARD POST SPACING. PANELS FOR W-BEAM GUARDRAIL WITH STANDARD POST SPACING MAY HAVE HOLES PUNCHED AT ONE-HALF POST SPACING FOR INVENTORY PURPOSES.
** TYPICAL DIMENSION FOR ONE-HALF POST SPACING.
*** TYPICAL DIMENSION FOR ONE-QUARTER POST SPACING.

W-BEAM GUARDRAIL (RWM02A/ RWM02B)

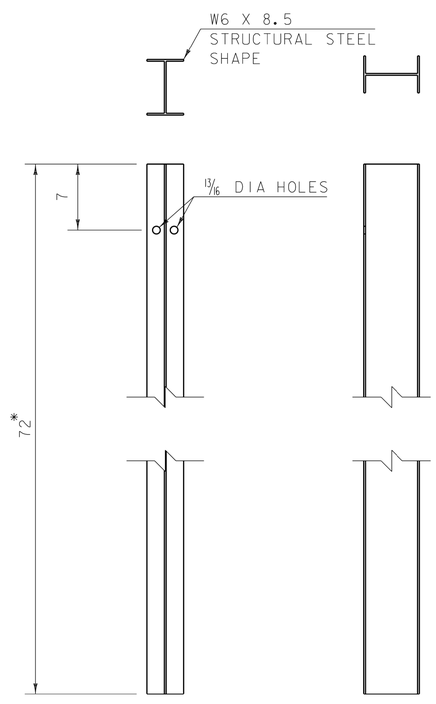
NOTES:

1. BLOCKS SHALL BE MADE OF TIMBER WITH A STRESS GRADE OF 1200 PSI OR MORE. TESTING SHALL BE IN ACCORDANCE WITH WEST COAST LUMBER INSPECTION BUREAU, SOUTHERN PINE INSPECTION BUREAU OR OTHER APPROPRIATE ASSOCIATION. TIMBER FOR BLOCKS SHALL BE ROUGH SAWN (UNPLANED) WITH DIMENSIONS INDICATED. THE SIZE TOLERANCE OF ROUGH SAWN BLOCKS IN THE DIRECTION OF THE BOLT HOLES SHALL BE NOT MORE THAN +/- 1/4".
2. SUPPLY WOOD BLOCKS PER AASHTO M 168.
3. TREAT WITH PRESERVATIVE PER AASHTO M 133.
4. BLOCKOUTS MAY ALSO BE MADE OF APPROVED ALTERNATIVE MATERIAL.



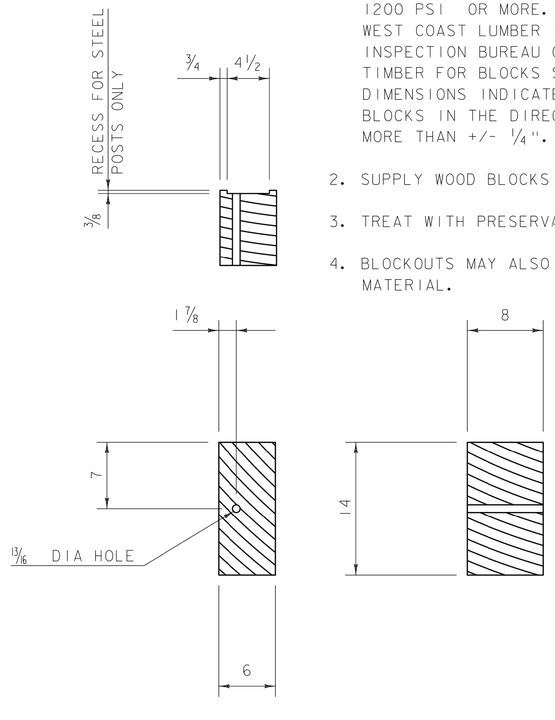
ARTBA RE-3(2@6'-3"=12'-6" CLASS A, TYPE 1)-73

TYPICAL GUARDRAIL SECTION



WIDE FLANGED GUARDRAIL POST (PWE01)

* POST LENGTH SHALL BE INCREASED TO 96 INCHES WHEN W BEAM GUARDRAIL, 8 FEET POSTS IS SPECIFIED.



8 INCH WOOD BLOCKOUT (PDB01B)

GENERAL NOTES

1. DESIGNATIONS ARE AS IDENTIFIED IN "A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE" AS PUBLISHED BY THE "AMERICAN ASSOCIATION OF STATE AND HIGHWAY TRANSPORTATION OFFICIALS" (AASHTO), "ASSOCIATED GENERAL CONTRACTORS OF AMERICA" (AGC) AND THE "AMERICAN ROAD AND TRANSPORTATION BUILDERS ASSOCIATION" (ARTBA).
2. MATERIALS SHALL BE IN ACCORDANCE WITH SECTION 728 OF THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION, AND ITS LATEST REVISIONS, AS APPLICABLE.
3. ALL DIMENSION IN INCHES, UNLESS OTHERWISE NOTED.

REV.	DATE	DESCRIPTION
--	APR. 17, 2019	ORIGINAL APPROVAL

OTHER DETAILS REQUIRED: NONE

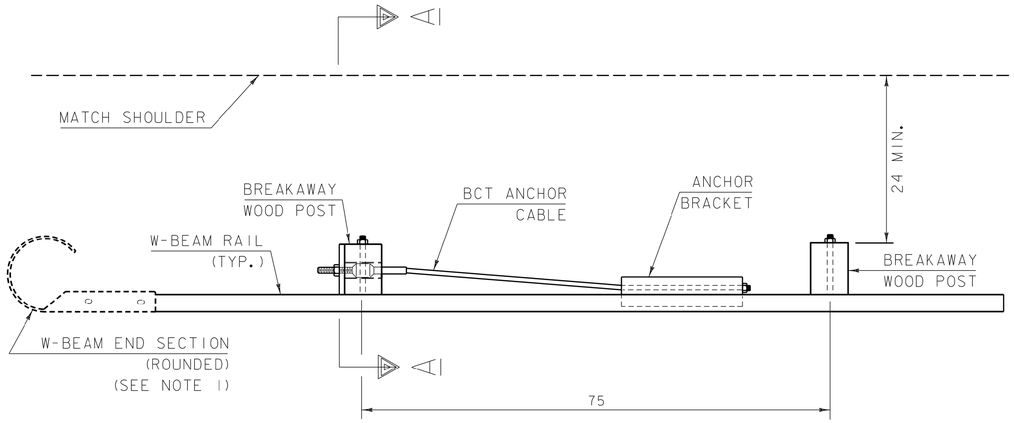
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

W-BEAM GUARDRAIL COMPONENTS

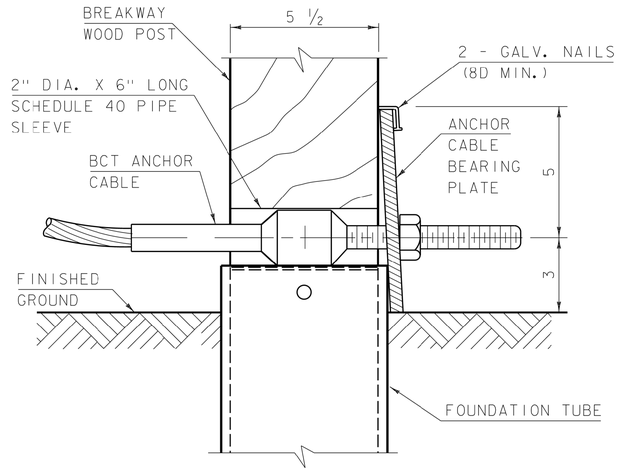
VTrans Working to Get You There — VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL

HSD-621.07B

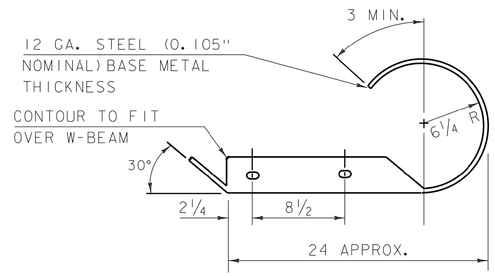


PLAN VIEW

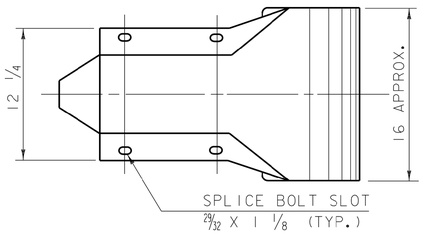


DETAIL A

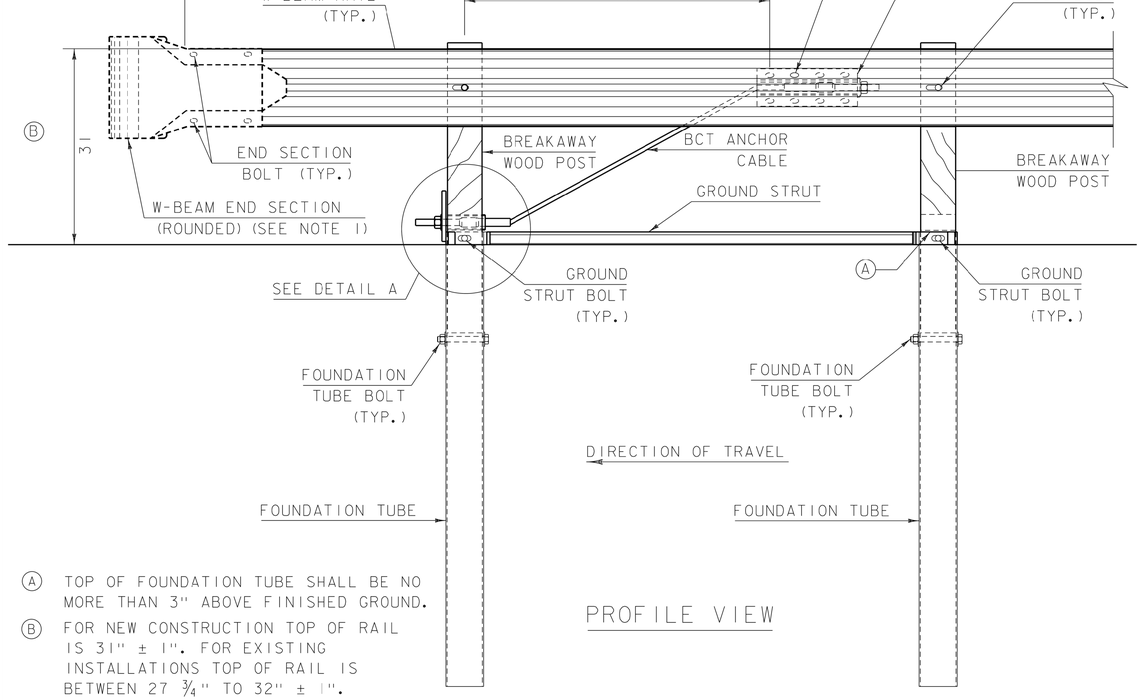
POST NO. 1
GROUND STRUT NOT SHOWN FOR CLARITY.



PLAN VIEW



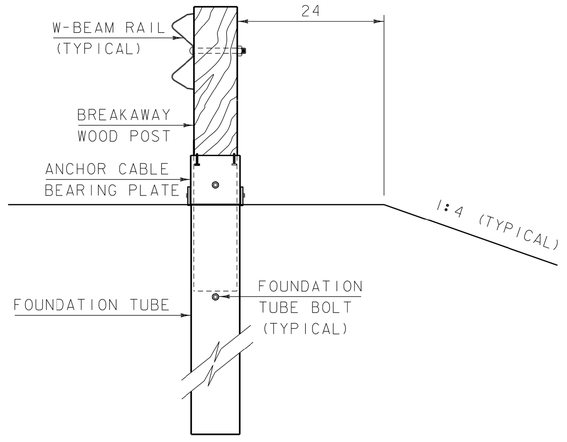
PROFILE VIEW
W-BEAM END SECTION (ROUNDED)



Ⓐ TOP OF FOUNDATION TUBE SHALL BE NO MORE THAN 3" ABOVE FINISHED GROUND.

Ⓑ FOR NEW CONSTRUCTION TOP OF RAIL IS 31" ± 1". FOR EXISTING INSTALLATIONS TOP OF RAIL IS BETWEEN 27 ¾" TO 32" ± 1".

PROFILE VIEW



SECTION A-A

GENERAL NOTES

1. WHEN AN ANCHOR IS USED IN THE MIDDLE OF A GUARDRAIL RUN A STANDARD W-BEAM MID-SPLICE CONNECTION SHALL BE UTILIZED.
2. END SECTION SHALL ONLY BE INSTALLED AS TRAILING END ON ONE-WAY TRAFFIC ROADS.
3. W-BEAM END SECTION ROUNDED HAS THE SAME MATERIAL PROPERTIES AS STANDARD STEEL RAIL.
4. END SECTION BOLTS AND NUTS HAVE THE SAME MATERIAL REQUIREMENTS AS SPLICE BOLTS.
5. FOUNDATION TUBE BOLTS ARE ⅞" DIAMETER ASTM A307 HEX HEAD BOLT. FOUNDATION TUBE BOLTS REQUIRE ASTM A563 A NUT AND TWO ASTM F844 ⅞" DIAMETER FLAT WASHERS. INSTALL ONE WASHER UNDER BOLT HEAD AND ONE WASHER UNDER NUT.
6. ANCHOR BRACKET AND GROUND STRUT BOLTS ARE A ⅝" DIAMETER ASTM A307 HEX HEAD BOLT. ANCHOR BRACKET BOLTS REQUIRE ASTM A563 A NUT AND TWO ASTM F844 ⅝" DIAMETER FLAT WASHERS. INSTALL ONE WASHER UNDER BOLT HEAD AND ONE WASHER UNDER NUT.
7. W-BEAM END SECTION (ROUNDED) AND W-BEAM RAIL SHALL BE PAID FOR UNDER ITEM 621.20 STEEL BEAM GUARDRAIL GALVANIZED. ALL OTHER COMPONENTS SHALL BE PAID FOR UNDER ITEM 621.60 ANCHOR FOR STEEL BEAM RAIL.
8. ALL MEASUREMENTS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

REV.	DATE	DESCRIPTION
--	APR. 17, 2019	ORIGINAL APPROVAL

OTHER DETAILS REQUIRED: HSD-621.07D, HSD-621.07E

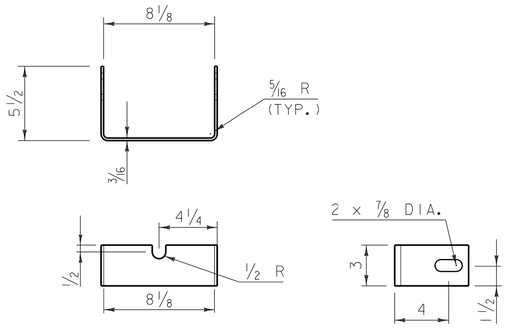
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

MIDWEST GUARDRAIL SYSTEM (MGS) ANCHOR

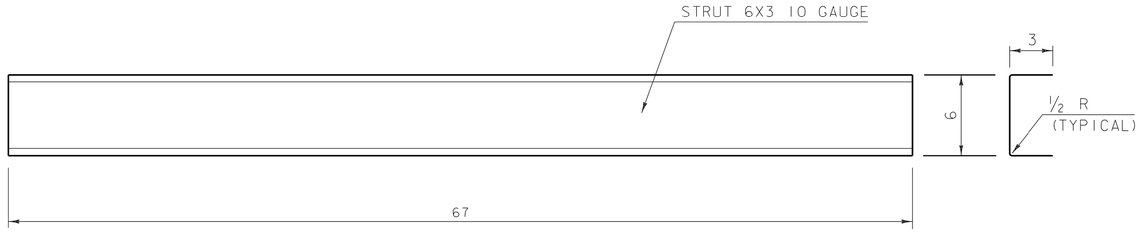
VTrans Working to Get You There — VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL

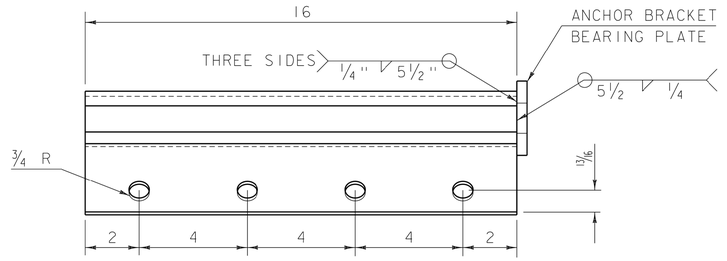
HSD-621.07C

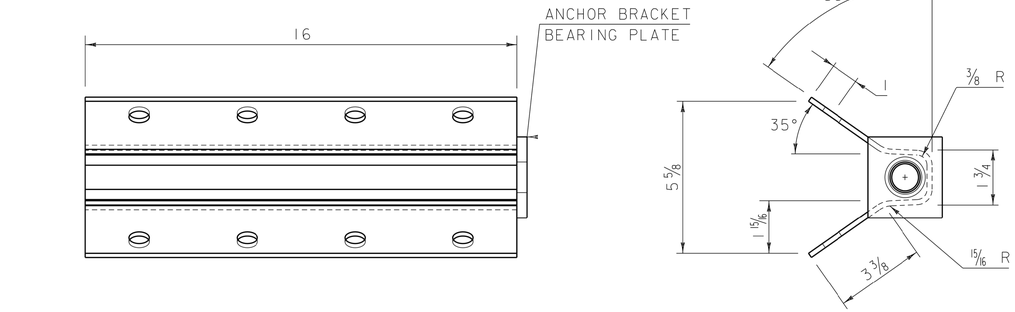


YOKE DETAIL

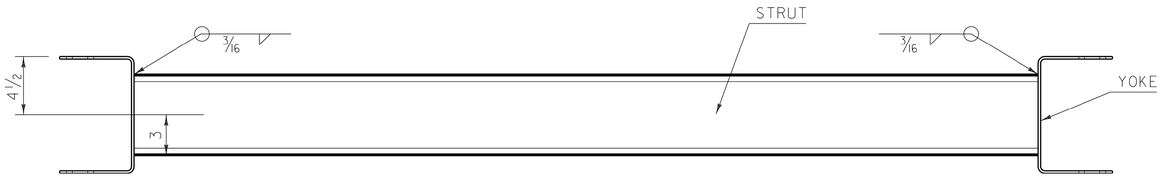


STRUT DETAIL

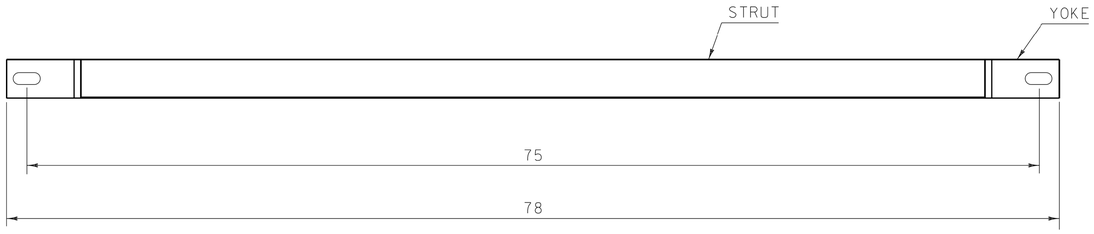




ANCHOR BRACKET

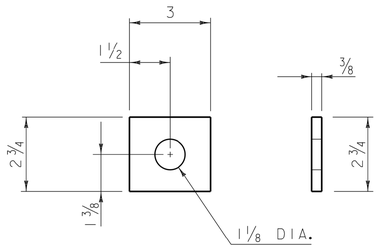


PLAN VIEW



PROFILE VIEW

GROUND STRUT DETAIL



ANCHOR BRACKET
BEARING PLATE

GENERAL NOTES

1. ALL MEASUREMENTS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

REV.	DATE	DESCRIPTION
--	APR. 17, 2019	ORIGINAL APPROVAL

OTHER DETAILS REQUIRED: HSD-621.07C, HSD-621.07E

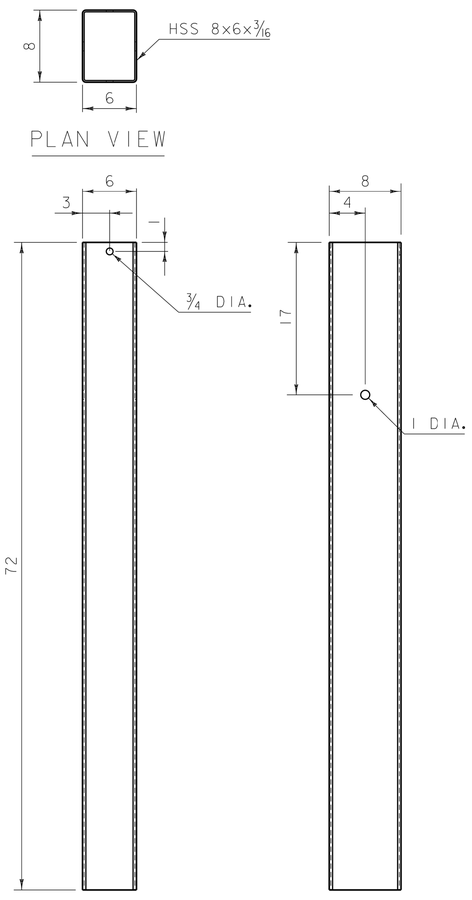
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

MIDWEST GUARDRAIL SYSTEM (MGS) ANCHOR COMPONENTS

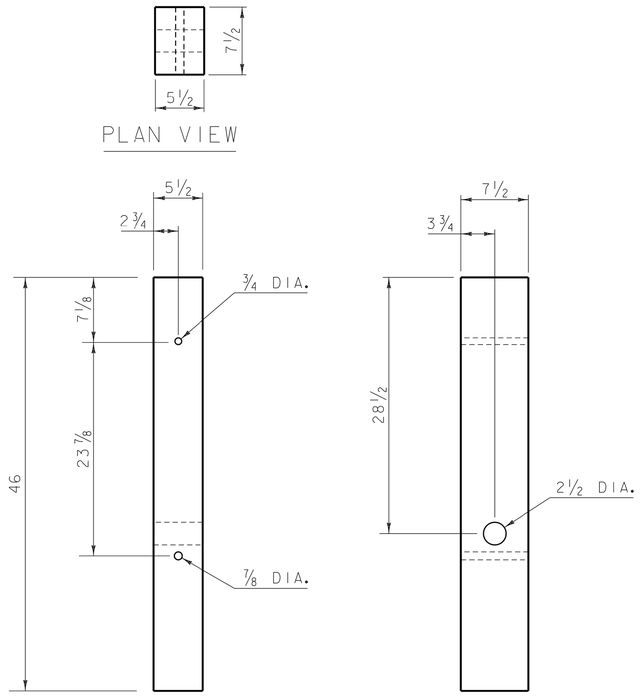
VTrans Working to Get You There VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL

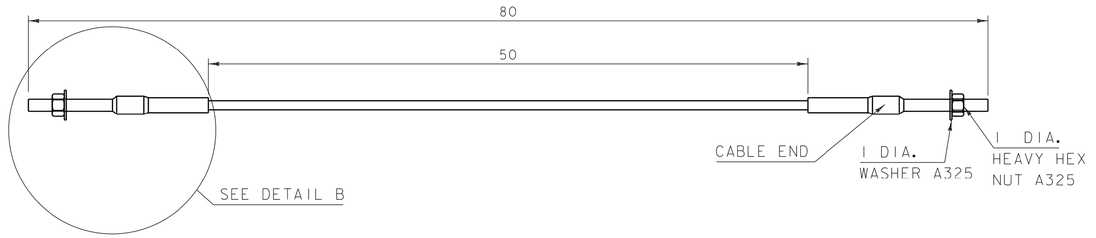
HSD-621.07D



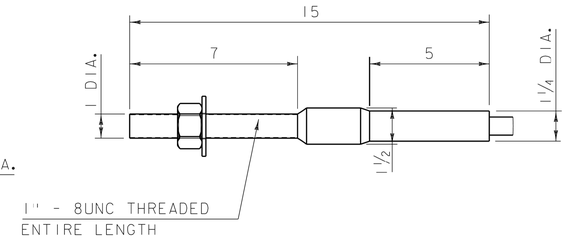
FOUNDATION TUBE



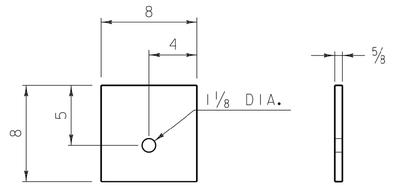
BREAKAWAY WOOD POST



BCT ANCHOR CABLE



DETAIL B



ANCHOR CABLE
BEARING PLATE

GENERAL NOTES

1. BCT ANCHOR CABLE IS A 3/4" DIAMETER 6X19 IWRC IPS GALVANIZED WIRE ROPE. THE SWAGED FITTINGS AND STUD ARE REQUIRED.
2. END FITTING SHALL BE MACHINED FROM HOT-ROLLED CARBON STEEL CONFORMING TO ASTM A576 GRADE 1035 AND GALVANIZED ACCORDING TO ASTM A123.
3. TREADED STUD SHALL CONFORM TO ASTM A325 OR SAE GRADE 5.
4. MINIMUM BREAKING STRENGTH OF WIRE ROPE IS 43,000 LB.
5. WIRE ROPE IS TO BE TAUT.
6. ALL MEASUREMENTS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

REV.	DATE	DESCRIPTION
--	APR. 17, 2019	ORIGINAL APPROVAL

OTHER DETAILS REQUIRED: HSD-621.07C, HSD-621.07D

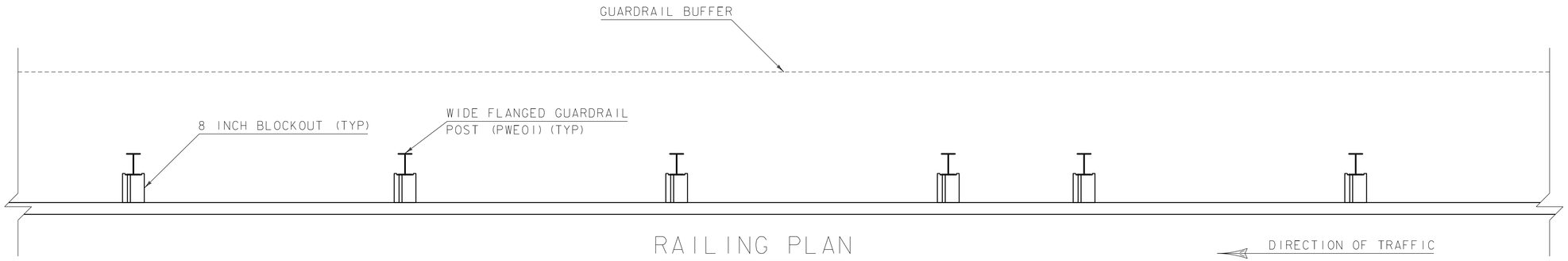
DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

MIDWEST GUARDRAIL SYSTEM (MGS) ANCHOR COMPONENTS

VTrans Working to Get You There
VERMONT AGENCY OF TRANSPORTATION

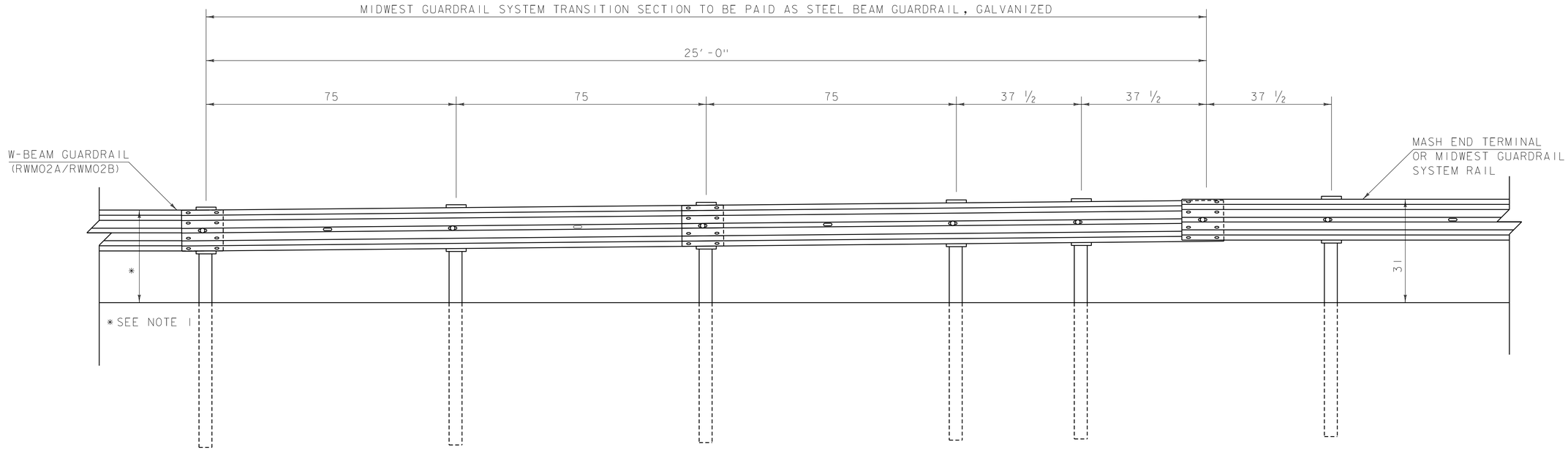
HIGHWAY SAFETY & DESIGN DETAIL

HSD-621.07E



RAILING PLAN

DIRECTION OF TRAFFIC



RAILING ELEVATION

GENERAL NOTES

1. THE HEIGHT OF RAIL AT THE END OF THIS TRANSITION SHALL MATCH THE DESIGN FOR THE APPLICABLE GUARDRAIL SYSTEM.
2. TRANSITIONS FROM 31 INCH HIGH MIDWEST GUARDRAIL SYSTEM TO OTHER RAIL SYSTEMS SHALL BE ACCOMPLISHED WITH 2 STANDARD 12½ FOOT SECTIONS OF W-BEAM RAIL.
3. POSTS, BLOCKOUTS AND SPLICES SHALL BE IN ACCORDANCE WITH DETAILS HSD-621.07A AND HSD-621.07B AND LOCATED AS SHOWN IN THE DETAILS ABOVE.
4. STANDARD 6 FOOT POSTS SHALL BE USED UNLESS OTHERWISE NOTED ON PLANS.
5. END TERMINAL SHALL BE A VTRANS APPROVED PRODUCT MEETING MASH TESTING CRITERIA. ANY TERMINAL USED SHALL BE FROM THE VTRANS APPROVED PRODUCTS LIST.
6. ALL MEASURMENTS ARE IN INCHES UNLESS OTHERWISE NOTED.

REV.	DATE	DESCRIPTION
--	APR. 17, 2019	ORIGINAL APPROVAL
1	JAN. 4, 2021	CORRECTED NOTE 3 REFERENCES

OTHER DETAILS REQUIRED: HSD-621.07A, HSD-621.07B

DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN

MIDWEST GUARDRAIL SYSTEM TRANSITION SECTION

VTrans Working to Get You There
VERMONT AGENCY OF TRANSPORTATION

HIGHWAY SAFETY & DESIGN DETAIL

HSD-621.07F