

# HAZEL DELL ROAD RETAINING WALL

M.P. 1.76

Section 33, Township 9N, Range 2W

March 2024

CRP NO. 795

SYMBOL LEGEND	
SYMBOL	DESCRIPTION
	FENCE GATE POST - EXISTING
	MAIL BOX
	CONIFER TREE*
	DECIDUOUS TREE*
	SIGN
	GUY ANCHOR
	LIGHT STANDARD
	UTILITY POLE

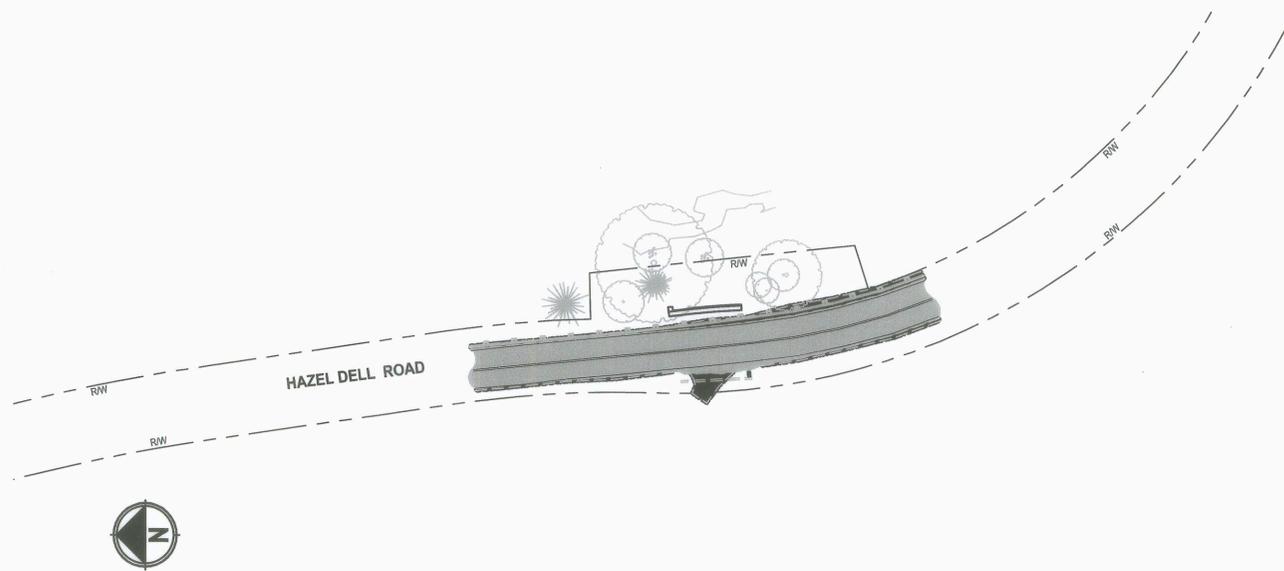
\* NOTE THAT APPROXIMATE TREE DIAMETERS WERE COLLECTED, BUT NOT SHOWN HEREON DUE TO CLARITY ISSUES. PLEASE REQUEST THIS INFORMATION IF NECESSARY.

ABBREVIATIONS	
ABBREV	DESCRIPTION
A	DELTA
BRG	BEARING
BTW	BETWEEN
BVCS	POINT OF VERTICAL CURVATURE - STATION
BVCE	POINT OF VERTICAL CURVATURE - ELEVATION
CLR	CLEAR
CONC	CONCRETE
CPE	CORRUGATED POLYETHYLENE PIPE
DIA	DIAMETER
E	EAST
E.F.	EACH FACE
EG	EXISTING GROUND
EL	ELEVATION
ELEV	ELEVATION
EOP	EDGE OF PAVEMENT
EVCS	POINT OF VERTICAL TANGENCY - STATION
EVCE	POINT OF VERTICAL TANGENCY - ELEVATION
EXIST	EXISTING
FG	FINISH GRADE
HMA	HOT MIX ASPHALT
HP	HIGH POINT
I.E.	INVERT ELEVATION
INV	INVERT
JT	JOINT
L	LENGTH

ABBREVIATIONS	
ABBREV	DESCRIPTION
LF	LINEAR FEET
LT	LEFT
M.P.	MILE POST
MAX	MAXIMUM
MIN	MINIMUM
N	NORTH
PC	POINT OF HORIZONTAL CURVATURE
PGA	PERMANENT GROUND ANCHOR
PI	POINT OF HORIZONTAL INTERSECTION
PT	POINT OF HORIZONTAL TANGENCY
PVI	POINT OF VERTICAL INTERSECTION
R	RADIUS
R/W	RIGHT OF WAY
RD	ROAD
RT	RIGHT
S	SOUTH
SHT	SHEET
STA	STATION
STD	STANDARD
TYP	TYPICAL
VC	VERTICAL CURVE
W	WEST
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
WV	WITH

INDEX OF DRAWINGS	
SHEET NO.	TITLE
1	COVER SHEET
2	TYPICAL ROADWAY SECTIONS
3	REMOVAL AND TESC PLAN
4	TRAFFIC CONTROL PLAN
5	ROADWAY AND WALL PLAN
6	ROADWAY PROFILE
7	WALL PROFILE
8	GUARDRAIL AND WALL CROSS SECTIONS (1 OF 2)
9	GUARDRAIL AND WALL CROSS SECTIONS (2 OF 2)
10	TYPICAL WALL SECTION
11	PILE DETAILS
12	PERMANENT GROUND ANCHOR DETAILS
13	LAGGING DETAILS

LINETYPE LEGEND			
EXISTING		DESIGN	
LINETYPE	DESCRIPTION	LINETYPE	DESCRIPTION
	DRAINAGE CULVERT		ALIGNMENT CENTERLINE
	DRAINAGE / ROAD DITCH		EDGE OF PAVEMENT
	FENCE, TYPE AS NOTED		SHOULDER
	EDGE OF WATER		SILT FENCE
	EDGE OF PAVEMENT		GUARD RAIL
	EDGE OF GRAVEL		CUT
	OVERHEAD WIRE		FILL
	TELEPHONE LINE		DAYLIGHT - CUT
	ELECTRIC LINE		DAYLIGHT - FILL
	UTILITY LINE PAINT ENDS HERE, CONNECTION NOT LOCATED OR UNKNOWN		DESIGN PROFILE AT CENTERLINE
	GUARD RAIL		CONTOUR - INDEX
	BUILDING LINE		CONTOUR - INTERMEDIATE
	MAJOR CONTOUR - SPACED AT 5' INTERVALS		
	MINOR CONTOUR - SPACED AT 1' INTERVALS		
	RIGHT-OF-WAY LINE		
	EXISTING GROUND PROFILE AT CENTERLINE		



STANDARD DRAWINGS	
DRAWING	DESCRIPTION
WSDOT:	
G-20.10	GROUND MOUNTED SIGN PLACEMENT
H-70.10	MAILBOX SUPPORT TYPE 1
I-30.17	HIGH VISIBILITY SILT FENCE
I-30.40	COMPOST SOCK
I-50.20	CHECK DAMS ON CHANNELS
I-60.10	BIODEGRADABLE EROSION CONTROL BLANKET PLACEMENT FOR SLOPES
I-80.10	MISCELLANEOUS EROSION CONTROL DETAILS
K-80.10	CLASS A CONSTRUCTION SIGNING INSTALLATION
K-80.32	CONCRETE BARRIER TYPE 2
K.80.35	TEMPORARY CONCRETE BARRIER ANCHORING
M-20.10	LONGITUDINAL MARKING PATTERNS
M-40.10	GUIDEPOSTS AND BARRIER DELINEATORS
COUNTY:	
CC-1202	GUARDRAIL LOCATION
CC-1317	APPROACH - ASPHALT OR CONCRETE APRON

**PURPOSE OF SURVEY:**

THE PURPOSE OF THIS SURVEY WAS TO PROVIDE TOPOGRAPHIC SURVEY AND RIGHT OF WAY RESOLUTION FOR A PORTION OF HAZEL DELL ROAD, FOR PURPOSES OF DESIGN.

COUNTY PROJECT NUMBER: 1772

**BASIS OF BEARINGS / HORIZONTAL COORDINATES / CONTROL SCHEME:**

WASHINGTON STATE PLANE, SOUTH ZONE (SPC 4602 WA S), UTILIZING GRID DISTANCES- SEE BELOW:

HORIZONTAL COORDINATES AND BASIS OF BEARINGS ARE BASED ON WASHINGTON STATE PLANE (SOUTH ZONE) - REFERENCE FRAME: NAD83 (2011) (EPOCH:2010.0000), US SURVEY FEET. ALL DISTANCES ARE GRID AND WERE DETERMINED FROM NGS OPUS SOLUTIONS, WHICH WERE DERIVED FROM 2 HOUR MINIMUM GPS OBSERVATIONS ON CONTROL POINTS 1,7,8,13,65,85, AND 214 (NOT ALL SHOWN HEREON), UTILIZING THE FOLLOWING EXISTING BASE STATIONS:

PID	DESIGNATION	LATITUDE(°)	LONGITUDE(°)
DH4122	P690 MSH_SRIDGEWA2005 CORS GRP	N46°10'47.944"	W122°11'23.470"
DK4153	P446 KELSO_AIR_WA2007 CORS GRP	N46°06'56.369"	W122°53'33.975"
DG8346	P420 FANTASYFD_WA2004 CORS GRP	N46°35'18.952"	W122°51'58.733"
DH5821	P693 MSH_NWDOMEWA2004 CORS GRP	N46°12'37.142"	W122°12'08.394"
DN6068	GRMD GRAND MOUND CORS GRP	N46°47'43.735"	W123°01'21.288"
DH5824	P702 MSH_ELKRCCKWA2004 CORS GRP	N46°18'00.565"	W122°20'44.271"
DH4131	P698 MSH_SESLPEWA2004 CORS GRP	N46°10'24.461"	W122°09'38.141"

CONTROL POINTS 1 AND 7 WERE THEN TIED TOGETHER USING STANDARD TRAVERSE TECHNIQUES, THE RESULTS OF WHICH WERE ADJUSTED TOGETHER IN A WEIGHTED LEAST SQUARES ADJUSTMENT, UTILIZING STARNET SOFTWARE. AN AVERAGE PROJECT COMBINED SCALE FACTOR (0.9999288985) WAS CALCULATED FOR THE PURPOSES OF COMPARING GRID DISTANCES TO GROUND DISTANCES. GRID DISTANCE OF 1000.00' = GROUND DISTANCE OF 1000.07'

THE CONVERGENCE ANGLE IS -1°45'37" AT CONTROL POINT NUMBER 11.

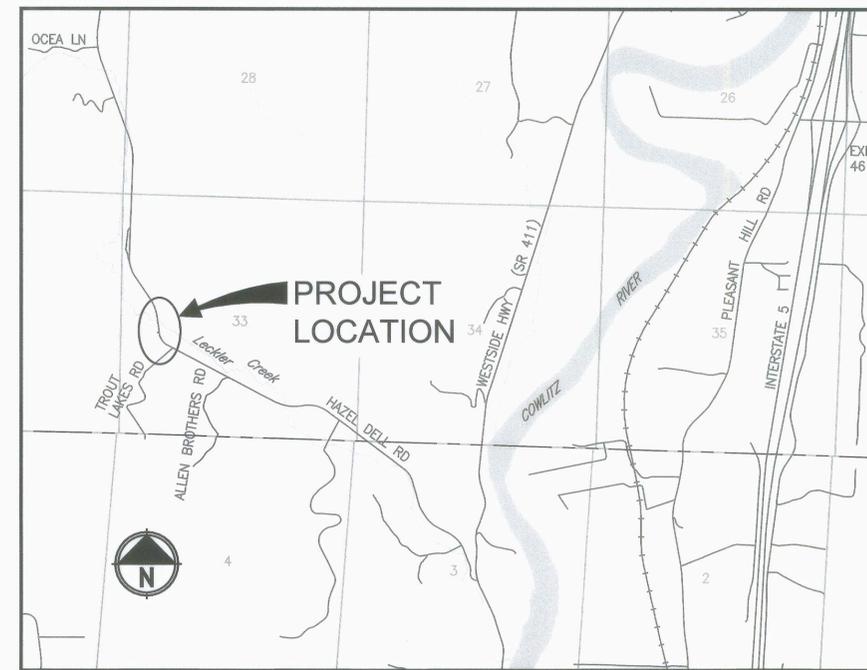
**VERTICAL DATUM:**

ELEVATION DATUM: NAVD 88  
BENCHMARK: CONTROL POINT #11  
LOCATION: AS SHOWN HEREON  
ELEVATION: 128.23 FEET

SEE APPENDIX B FOR PROJECT TOPOGRAPHIC SURVEY.

**SURVEY CONTROL TABLE**

NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
9	332,568.833	1,021,942.876		SET MAG NAIL
10	332,729.886	1,021,727.790		SET 5/8" REBAR
11	332,970.122	1,021,685.166	128.23	SET 5/8" REBAR
12	333,356.629	1,021,593.703		SET 5/8" REBAR
111	332,842.722	1,021,665.867		1-1/2" IRON PIPE
206	333,021.340	1,021,683.198		1-1/2" IRON PIPE



VICINITY MAP

NOTE: SCALES SHOWN ARE FOR FULL SIZE (22" x 34") PLAN SHEETS ONLY. SCALES FOR PLANS PRINTED ON 11" x 17" (HALF SIZE) ARE APPROXIMATELY ONE HALF SCALE.

CALL 48 HOURS BEFORE YOU DIG  
1-800-424-5555  
"It's the Law"

Parametrix

BRIAN BIERWAGEN  
PROJECT MANAGER  
2/27/2024  
DATE

NILS HOVLAND  
DRAWN BY  
2/27/2024  
DATE

BRIAN BIERWAGEN  
CHECKED BY  
2/27/2024  
DATE

HORIZ. SCALE: AS SHOWN  
VERT. SCALE: AS SHOWN

PROJECT ID: 1772  
ROAD NO. : 21300 (HAZEL DELL RD)

COMPUTER FILE:  
PO2415022A01-Cover Sheet.dwg

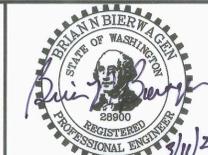


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APPROVED BY:  
*Lusan Eugenio*  
COUNTY ENGINEER

DATE: 3/21/2024

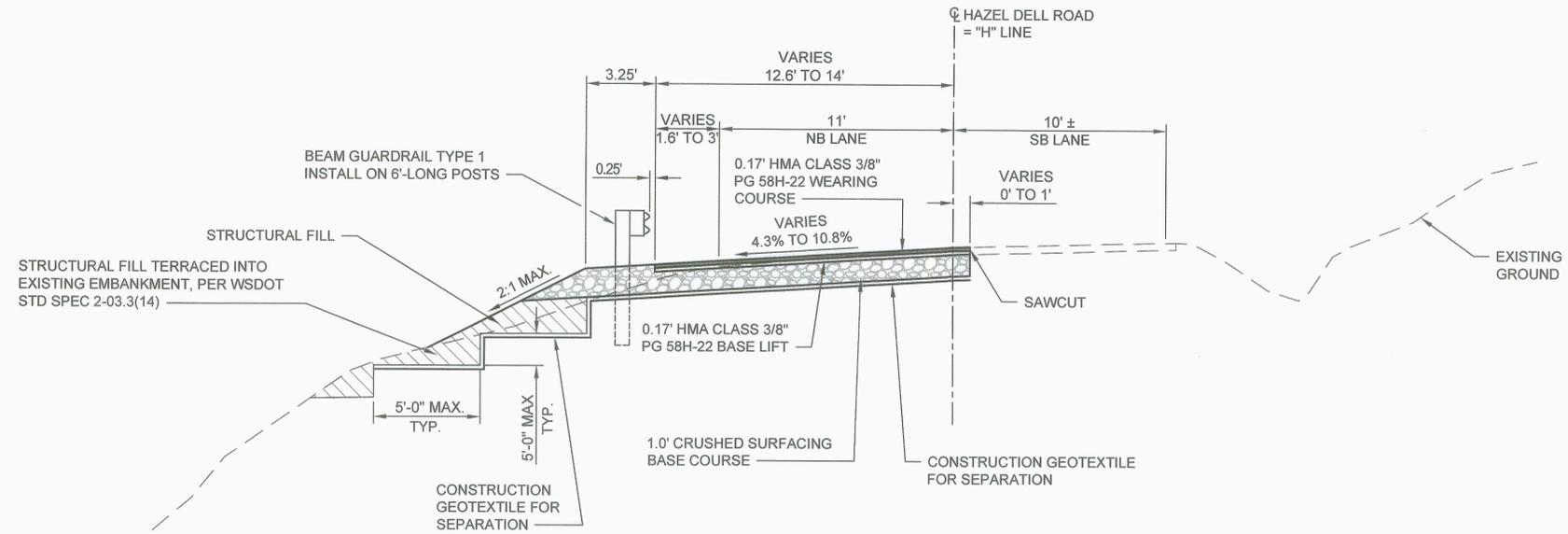


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CRP NO. 795

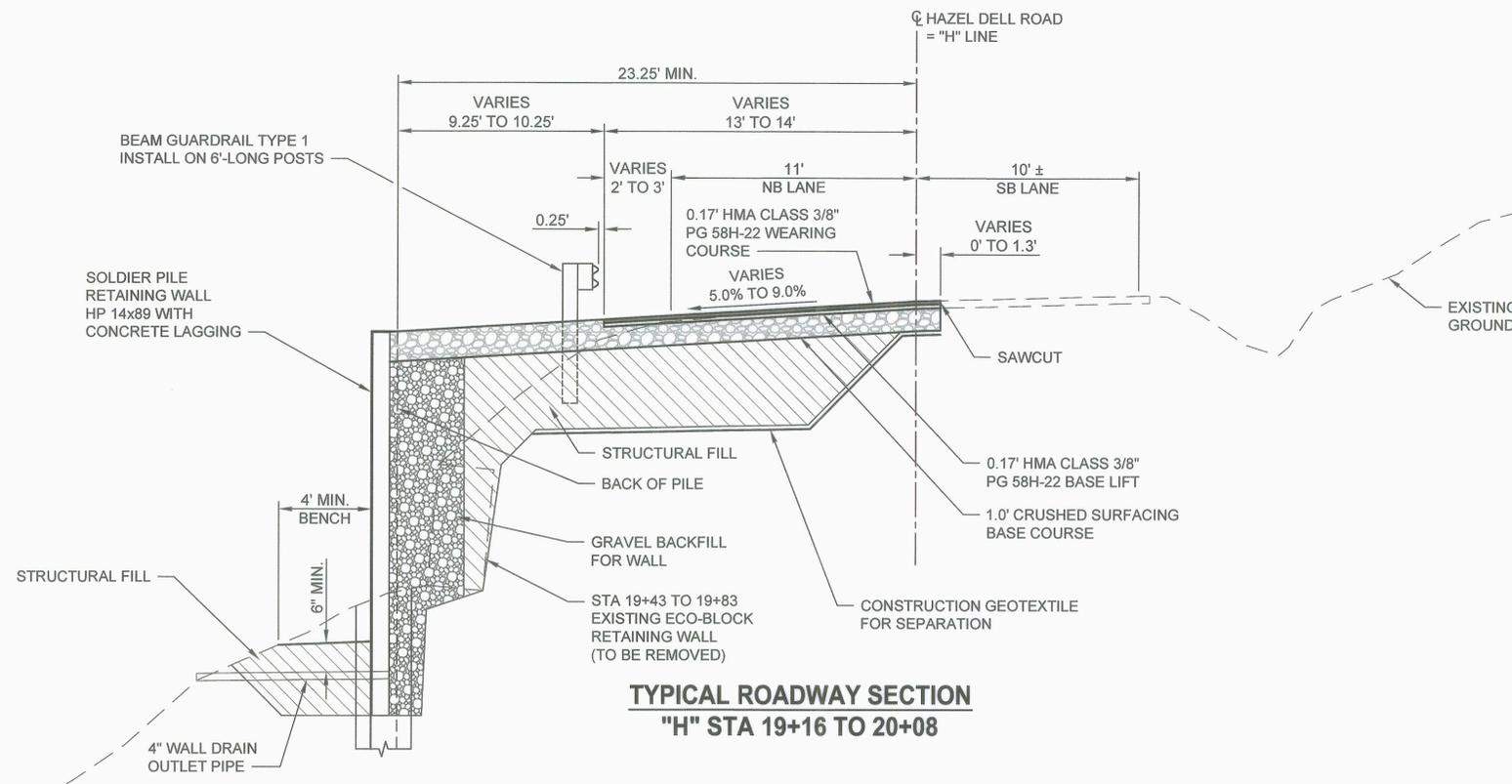
HAZEL DELL ROAD MP 1.76  
RETAINING WALL

COVER SHEET

SHEET  
1  
OF  
13



**TYPICAL ROADWAY SECTION**  
**"H" STA 18+80 TO 19+16**  
**"H" STA 20+08 TO 20+50**



**TYPICAL ROADWAY SECTION**  
**"H" STA 19+16 TO 20+08**

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2/27/2024  
DATE

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2/27/2024  
DATE

BRIAN BIERWAGEN  
CHECKED BY  
2/27/2024  
DATE

HORIZ. SCALE: NOT TO SCALE  
 VERT. SCALE: NOT TO SCALE  
 PROJECT ID: 1772  
 ROAD NO. : 21300 (HAZEL DELL RD)  
 COMPUTER FILE:  
 PO2415022C01-Typical Roadway Sections.dwg



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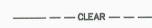
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**HAZEL DELL ROAD MP 1.76**  
**RETAINING WALL**

**TYPICAL ROADWAY SECTIONS**

SHEET  
**2**  
OF  
**13**

**LEGEND**

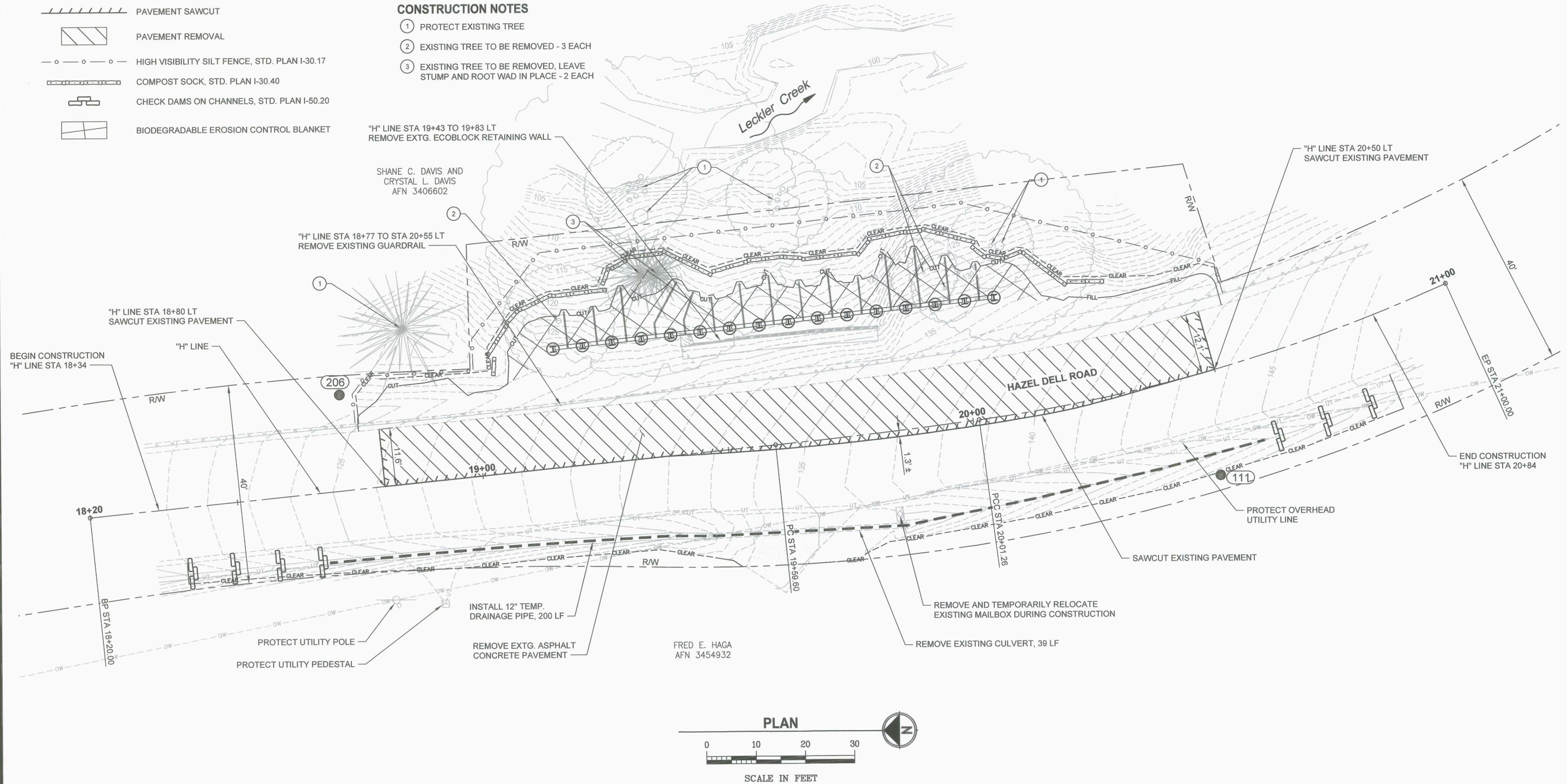
-  CLEAR --- LIMITS OF SITE CLEARING
-  CUT --- LIMITS OF EXCAVATION
-  FILL --- LIMITS OF EMBANKMENT
-  PAVEMENT SAWCUT
-  PAVEMENT REMOVAL
-  HIGH VISIBILITY SILT FENCE, STD. PLAN I-30.17
-  COMPOST SOCK, STD. PLAN I-30.40
-  CHECK DAMS ON CHANNELS, STD. PLAN I-50.20
-  BIODEGRADABLE EROSION CONTROL BLANKET

**NOTES**

1. REMOVAL OF CONCRETE WALL BLOCKS PAID AS REMOVAL OF STRUCTURES AND OBSTRUCTIONS.
2. REMOVAL AND TEMPORARY RELOCATION OF MAILBOX PAID AS REMOVAL OF STRUCTURES AND OBSTRUCTIONS.

**CONSTRUCTION NOTES**

- ① PROTECT EXISTING TREE
- ② EXISTING TREE TO BE REMOVED - 3 EACH
- ③ EXISTING TREE TO BE REMOVED, LEAVE STUMP AND ROOT WAD IN PLACE - 2 EACH



BRIAN BIERWAGEN  
PROJECT MANAGER  
DATE 2/27/2024

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CHECKED BY  
DATE 2/27/2024

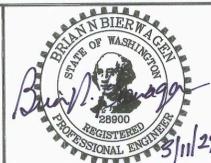
HORIZ. SCALE: 1" = 10'  
VERT. SCALE:  
PROJECT ID: 1772  
ROAD NO. : 21300 (HAZEL DELL RD)  
COMPUTER FILE:  
PO2415022C02-Removal and TESC Plan.dwg



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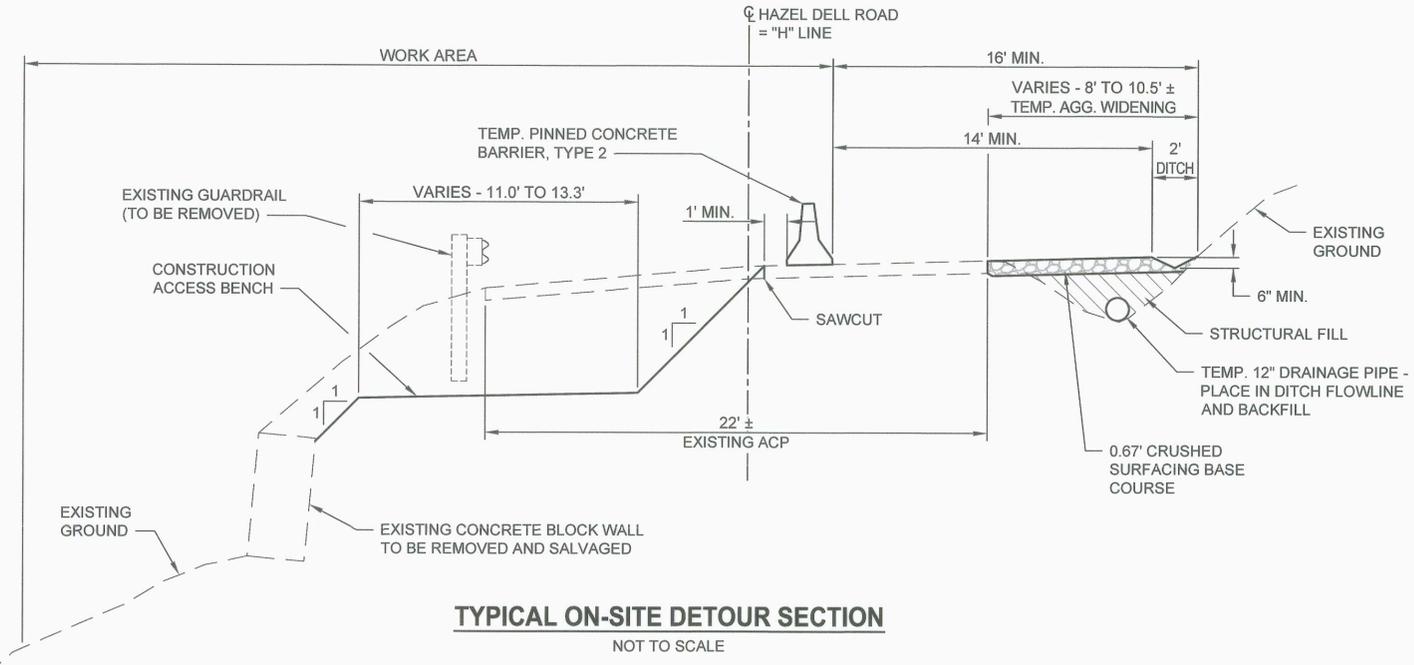
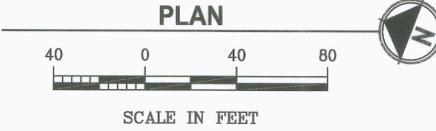
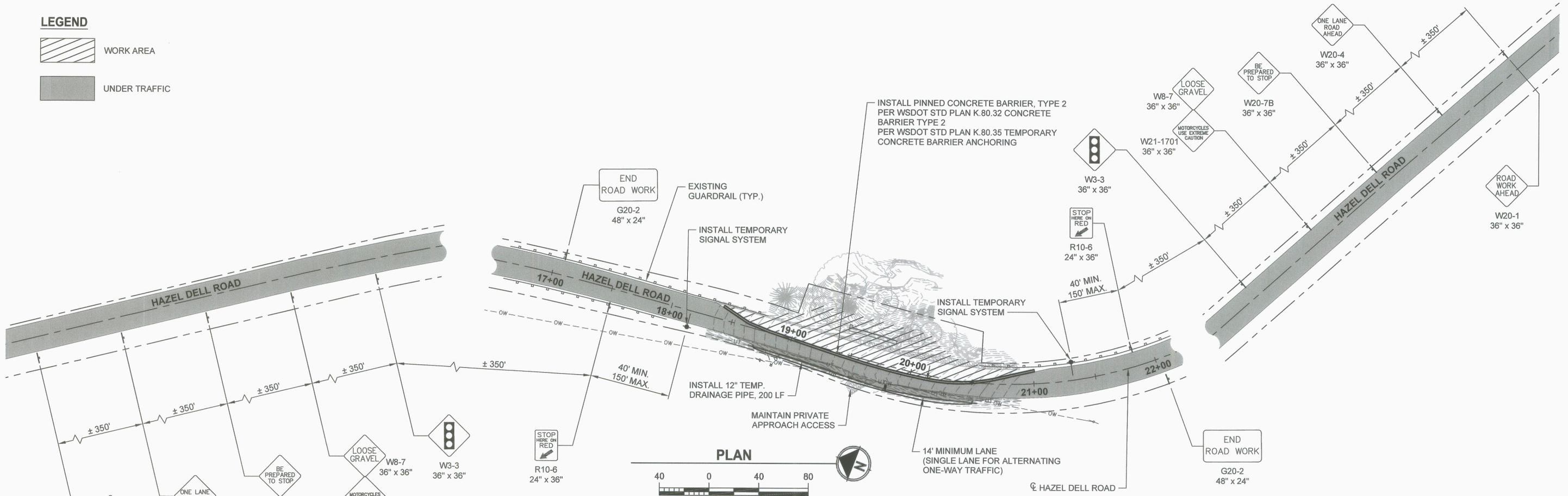
**HAZEL DELL ROAD MP 1.76  
RETAINING WALL**

**REMOVAL AND TESC PLAN**

SHEET  
**3**  
OF  
**13**

**LEGEND**

-  WORK AREA
-  UNDER TRAFFIC



**TYPICAL ON-SITE DETOUR SECTION**  
NOT TO SCALE

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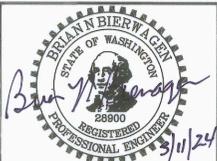
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DATE: 2/27/2024

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VERT. SCALE:  
PROJECT ID: 1772  
ROAD NO.: 21300 (HAZEL DELL RD)  
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PO2415022C03-Traffic Control Plan.dwg



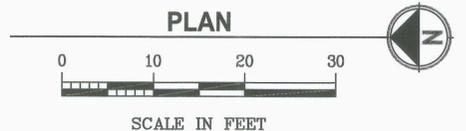
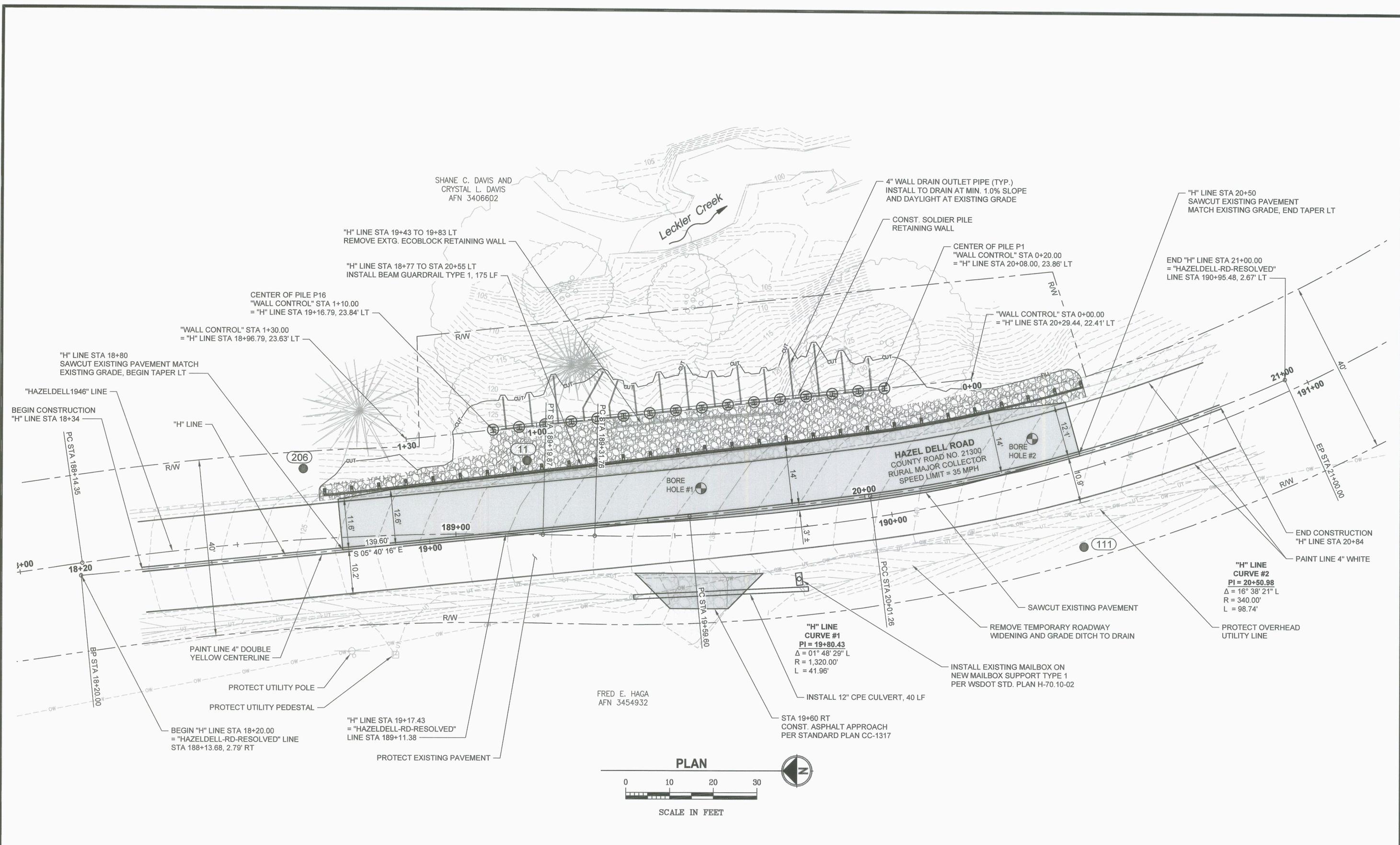
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**HAZEL DELL ROAD MP 1.76  
RETAINING WALL  
TRAFFIC CONTROL PLAN**

SHEET  
**4**  
OF  
**13**



BRIAN BIERWAGEN  
PROJECT MANAGER  
DATE: 2/27/2024

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DRAWN BY  
DATE: 2/27/2024

BRIAN BIERWAGEN  
CHECKED BY  
DATE: 2/27/2024

HORIZ. SCALE: 1" = 10'  
VERT. SCALE:

PROJECT ID: 1772  
ROAD NO.: 21300 (HAZEL DELL RD)

COMPUTER FILE:  
PO2415022C04-Roadway Plan and Profile-Wall  
Plan.dwg

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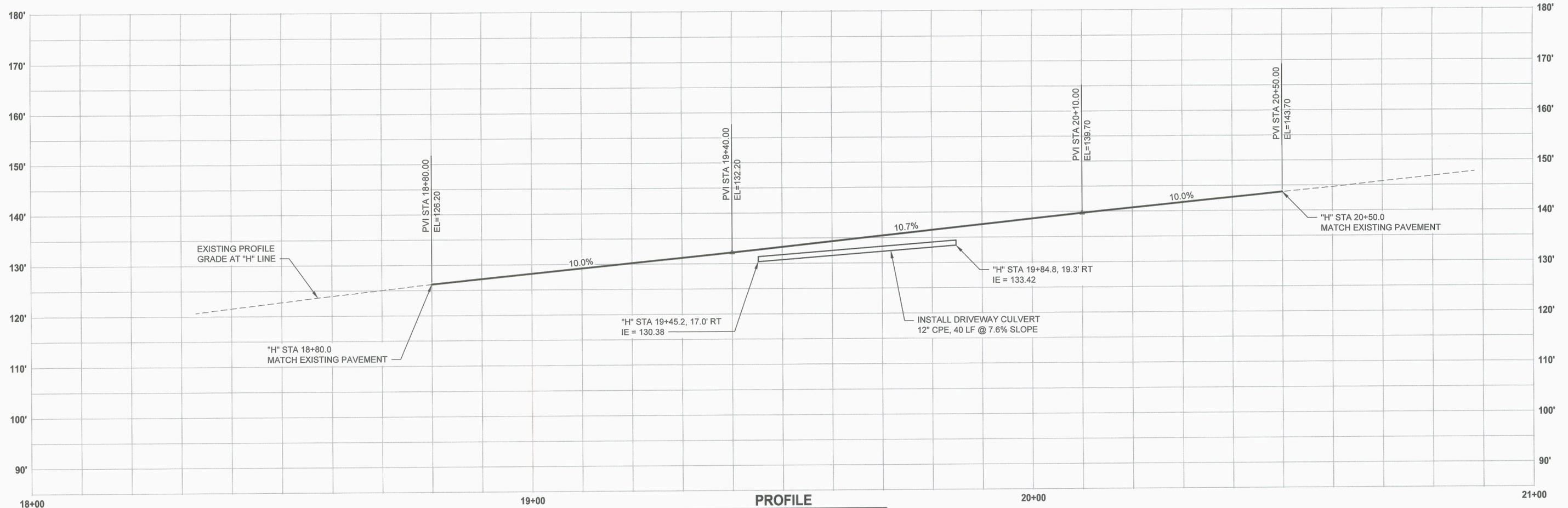
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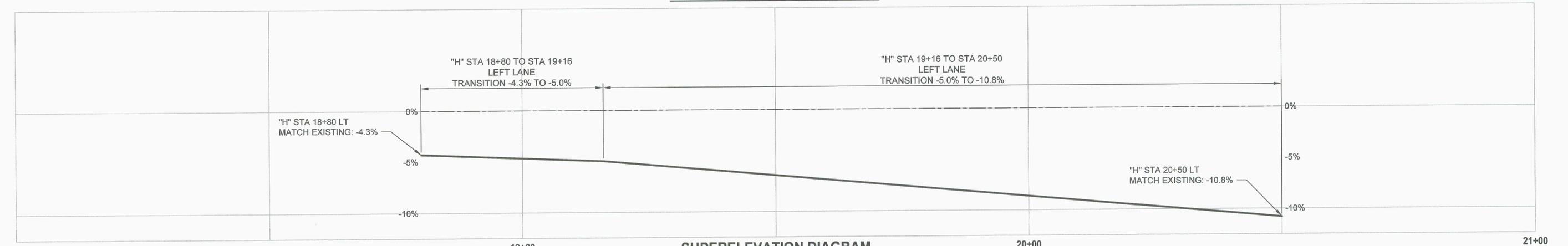
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CRP NO. 795

**HAZEL DELL ROAD MP 1.76  
RETAINING WALL  
ROADWAY AND WALL PLAN**

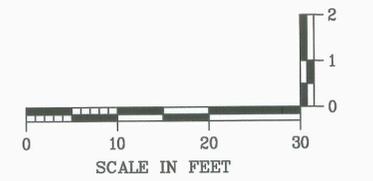
SHEET  
**5**  
OF  
**13**



PROFILE



SUPERELEVATION DIAGRAM



BRIAN BIERWAGEN  
PROJECT MANAGER  
2/27/2024  
DATE

NILS HOVLAND  
DRAWN BY  
2/27/2024  
DATE

BRIAN BIERWAGEN  
CHECKED BY  
2/27/2024  
DATE

HORIZ. SCALE: 1" = 10'  
VERT. SCALE: 1" = 2'

PROJECT ID: 1772  
ROAD NO. : 21300 (HAZEL DELL RD)

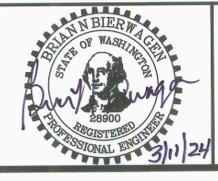
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Plan.dwg



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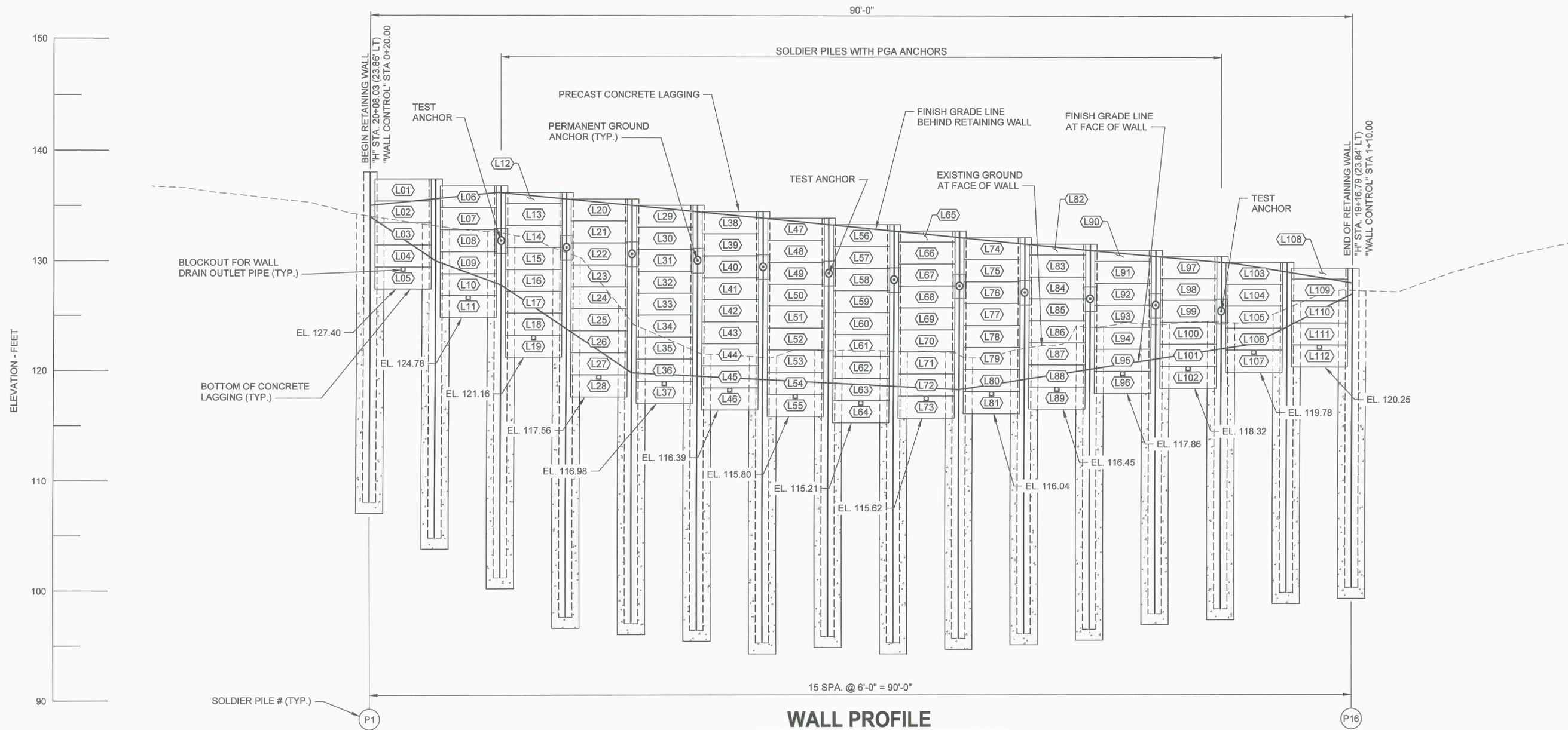


SECTION 33, T9N, R2W  
CRP NO. 795

**HAZEL DELL ROAD MP 1.76  
RETAINING WALL**

**ROADWAY PROFILE**

SHEET  
**6**  
OF  
**13**



**WALL PROFILE**

HORIZ: 1" = 5'-0"  
VERT: 1" = 5'-0"

**SOLDIER PILE SCHEDULE**

PILE #	"H" LINE STATION	OFFSET	SOLDIER PILE SIZE	TOP OF PILE ELEVATION	EST. PILE TIP ELEVATION	TOTAL LENGTH OF SOLDIER PILE	TOP OF LAGGING ELEVATION	SHAFT DIAMETER	P.G.A. FACTORED DESIGN LOAD (KIPS)
P1	20+08.03	23.86' LT	HP 14x89	138.02'	108.02'	30.00'	137.40'	2'-6"	-
P2	20+01.58	24.05' LT	HP 14x89	137.40'	104.78'	32.62'	136.78'	2'-6"	-
P3	19+95.45	24.16' LT	HP 14x89	136.78'	101.16'	35.62'	136.16'	2'-6"	37
P4	19+89.34	24.25' LT	HP 14x89	136.16'	97.56'	38.60'	135.56'	2'-6"	57
P5	19+83.23	24.31' LT	HP 14x89	135.56'	96.98'	38.58'	134.98'	2'-6"	63
P6	19+77.11	24.34' LT	HP 14x89	134.98'	96.39'	38.59'	134.39'	2'-6"	60
P7	19+71.00	24.35' LT	HP 14x89	134.39'	95.21'	39.18'	133.80'	2'-6"	55
P8	19+64.89	24.32' LT	HP 14x89	133.80'	95.80'	38.00'	133.21'	2'-6"	52
P9	19+58.79	24.27' LT	HP 14x89	133.21'	95.21'	38.00'	132.62'	2'-6"	49
P10	19+52.79	24.21' LT	HP 14x89	132.62'	95.62'	37.00'	132.04'	2'-6"	47
P11	19+46.79	24.15' LT	HP 14x89	132.04'	96.04'	36.00'	131.45'	2'-6"	44
P12	19+40.79	24.09' LT	HP 14x89	131.45'	96.45'	35.00'	130.86'	2'-6"	37
P13	19+34.79	24.02' LT	HP 14x89	130.86'	97.86'	33.00'	130.32'	2'-6"	33
P14	19+28.79	23.96' LT	HP 14x89	130.32'	98.32'	32.00'	129.78'	2'-6"	27
P15	19+22.79	23.90' LT	HP 14x89	129.78'	99.78'	30.00'	129.25'	2'-6"	-
P16	19+16.79	23.84' LT	HP 14x89	129.25'	100.25'	29.00'	129.00'	2'-6"	-

**NOTES:**

1. DRILLING AND INSTALLATION OF THE SOLDIER PILES AND PERMANENT GROUND ANCHORS SHOULD BE MONITORED THROUGHOUT CONSTRUCTION BY A GEOTECHNICAL DESIGN TEAM REPRESENTATIVE.
2. GEOTECHNICAL ENGINEER SHALL DETERMINE FINAL TIP ELEVATIONS BASED ON PREBORING MATERIALS ENCOUNTERED.
3. FOLLOWING INSTALLATION, EACH PERMANENT GROUND ANCHOR SHALL BE TESTED FOLLOWING THE PROCEDURES IN THE 2024 WSDOT STANDARD SPECIFICATIONS SECTION 6-17.3(8) AND SPECIAL PROVISIONS TO CONFIRM THE REQUIRED AXIAL RESISTANCE.
4. PERFORMANCE TESTING SHALL BE PERFORMED ON (3) THREE PERMANENT GROUND ANCHORS.
5. SEE GEOTECHNICAL REPORT DATED APRIL 23RD, 2023 FOR RECOMMENDATIONS ON CAVING AND OBSTRUCTIONS.

BRIAN BIERWAGEN  
PROJECT MANAGER  
DATE: 2/27/2024

CHELSEA HORCHY  
DRAWN BY  
DATE: 2/27/2024

DAN MCINTIER  
CHECKED BY  
DATE: 2/27/2024

HORIZ. SCALE: 1" = 5'-0"  
VERT. SCALE: 1" = 5'-0"

PROJECT ID: 1772  
ROAD NO.: 21300 (HAZEL DELL RD)

COMPUTER FILE:  
PO2415022S01-Wall Profile.dwg



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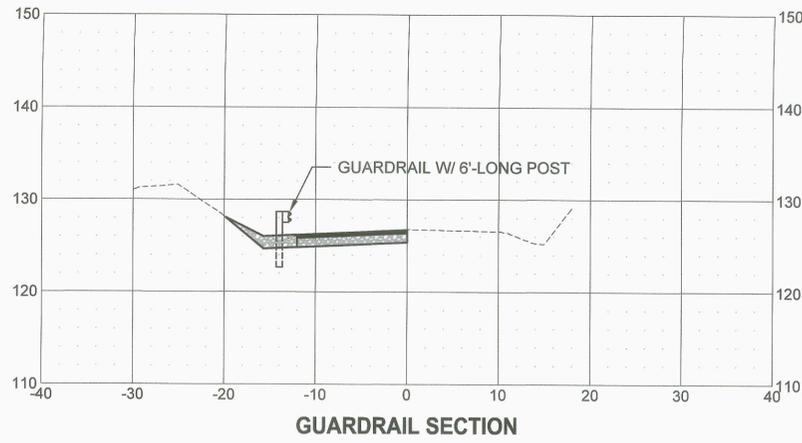
SECTION 33, T9N, R2W  
CRP NO. 795

**HAZEL DELL ROAD MP 1.76  
RETAINING WALL**

**WALL PROFILE**

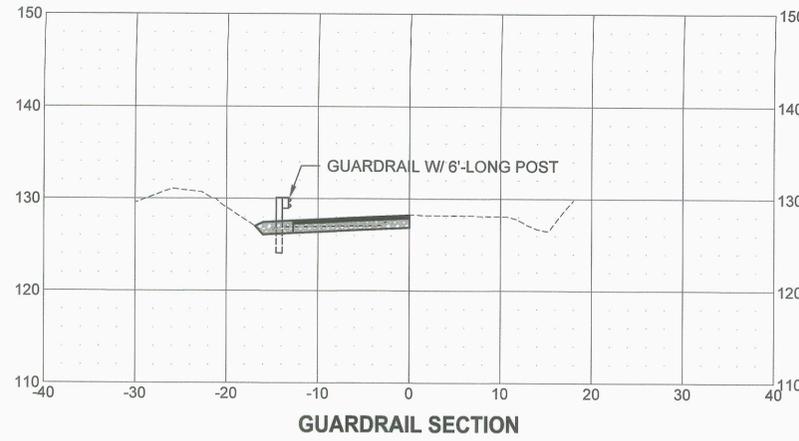
SHEET  
**7**  
OF  
**13**

"H" LINE  
18+85



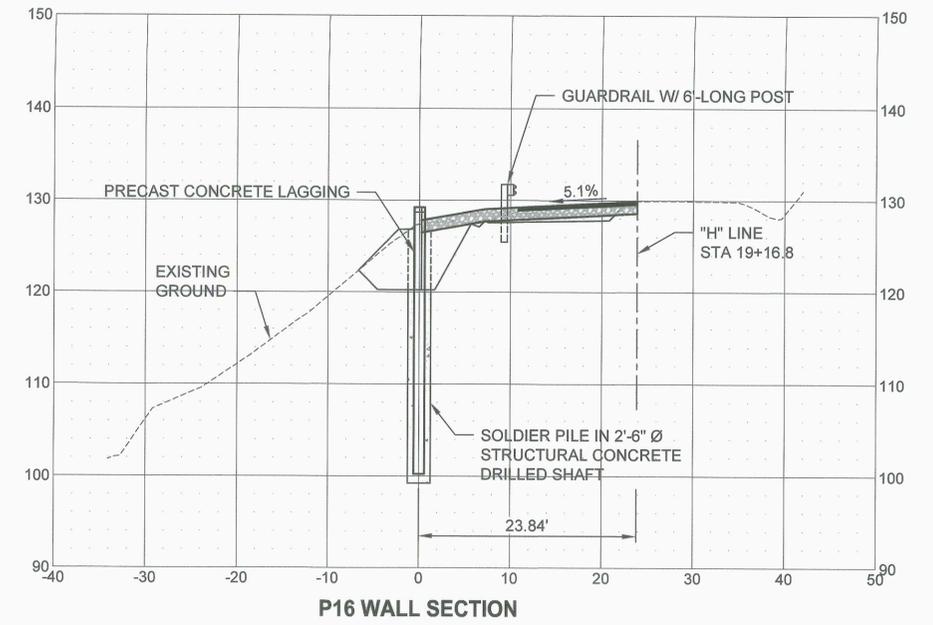
GUARDRAIL SECTION

"H" LINE  
19+00



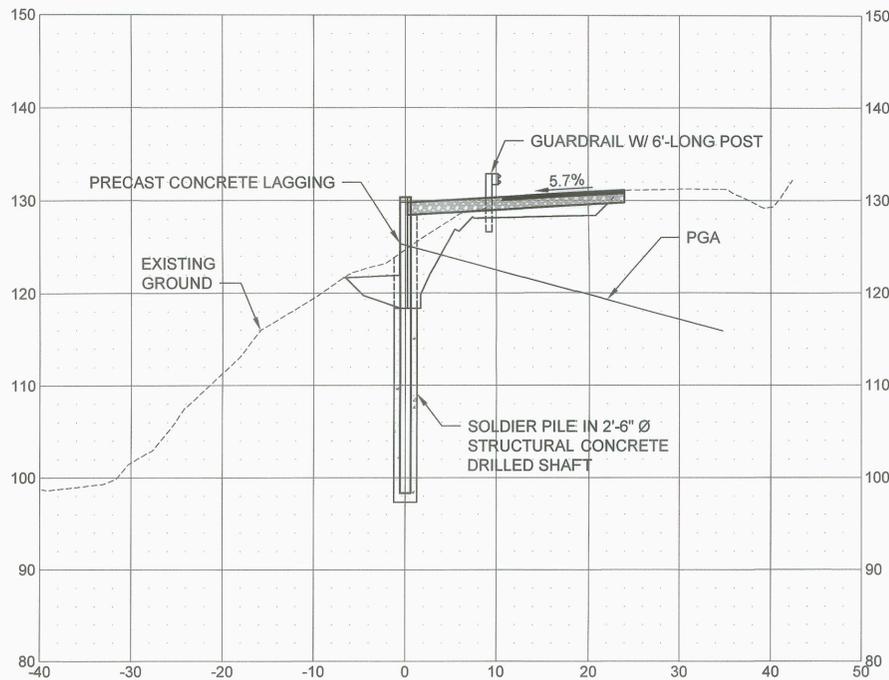
GUARDRAIL SECTION

WALL  
1+10



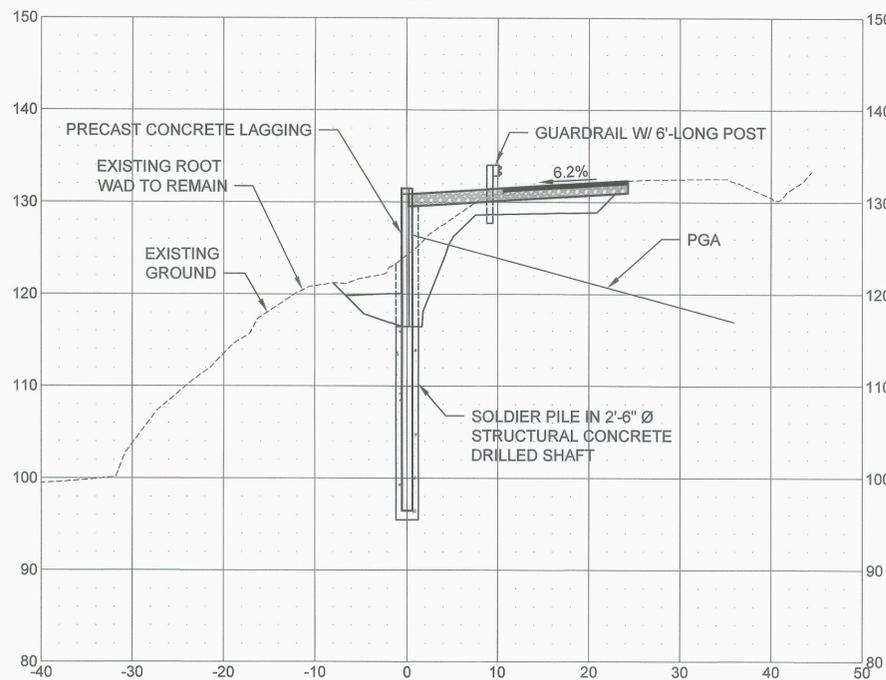
P16 WALL SECTION

WALL  
0+98



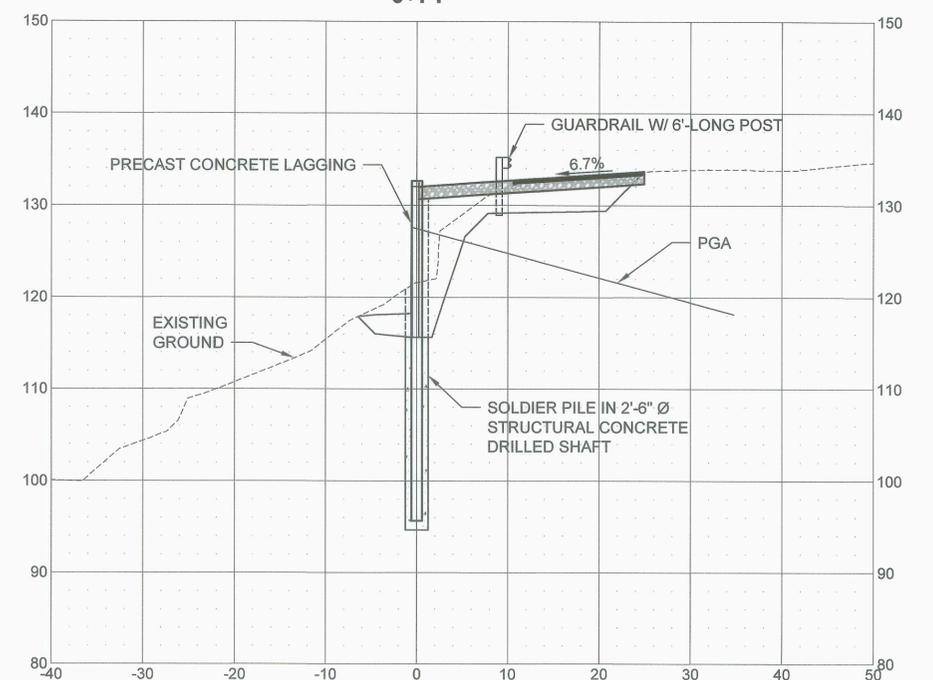
P14 WALL SECTION

WALL  
0+86



P12 WALL SECTION

WALL  
0+74



P10 WALL SECTION

BRIAN BIERWAGEN  
PROJECT MANAGER  
DATE 2/27/2024

NILS HOVLAND  
DRAWN BY  
DATE 2/27/2024

BRIAN BIERWAGEN  
CHECKED BY  
DATE 2/27/2024

HORIZ. SCALE: 1" = 10'  
VERT. SCALE: 1" = 10'

PROJECT ID: 1772  
ROAD NO.: 21300 (HAZEL DELL RD)

COMPUTER FILE:  
PO2415022S02-Cross Sections.dwg



DEPARTMENT  
OF  
PUBLIC WORKS

1600 13TH AVENUE SOUTH  
KELSO, WASHINGTON 98626

**Parametrix**

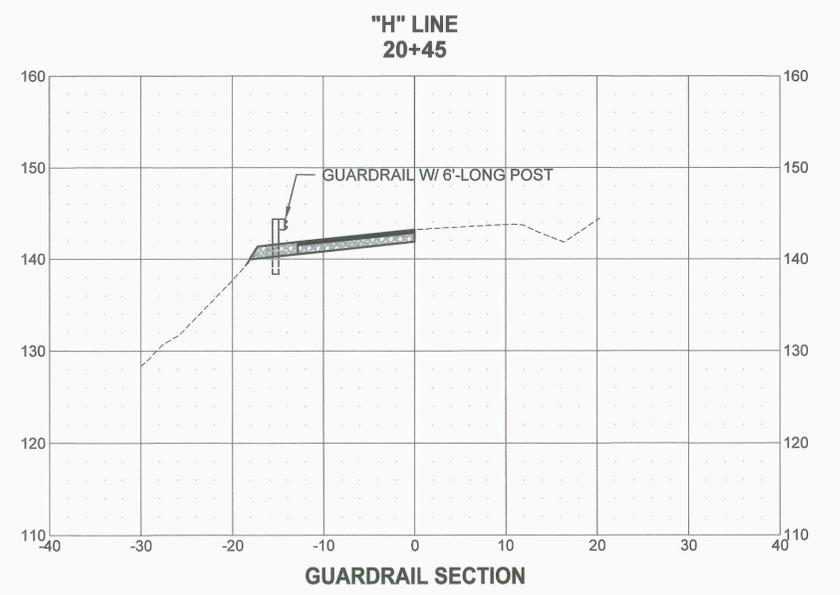
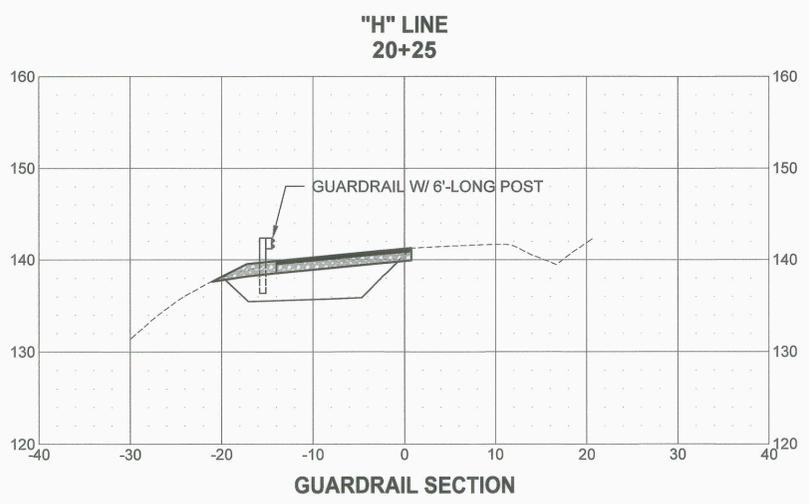
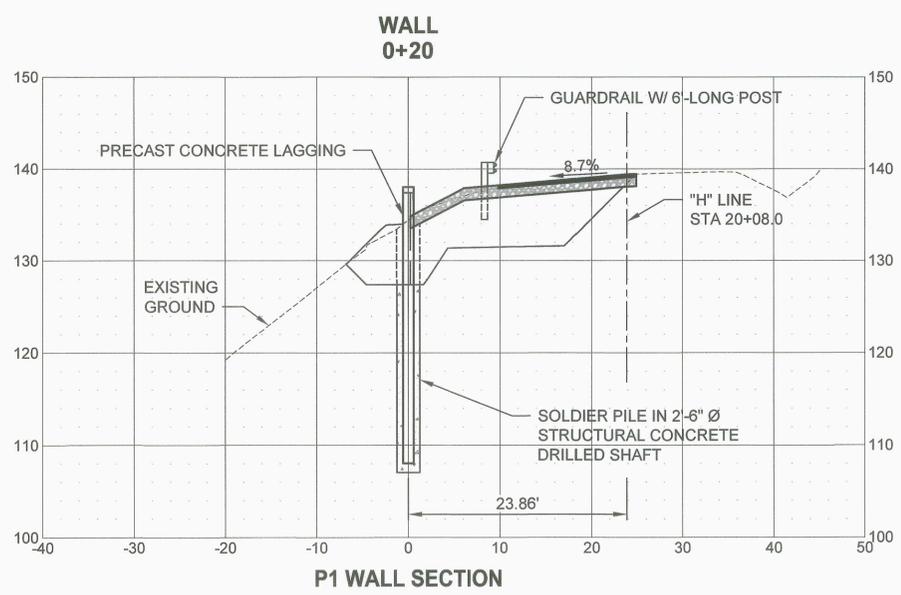
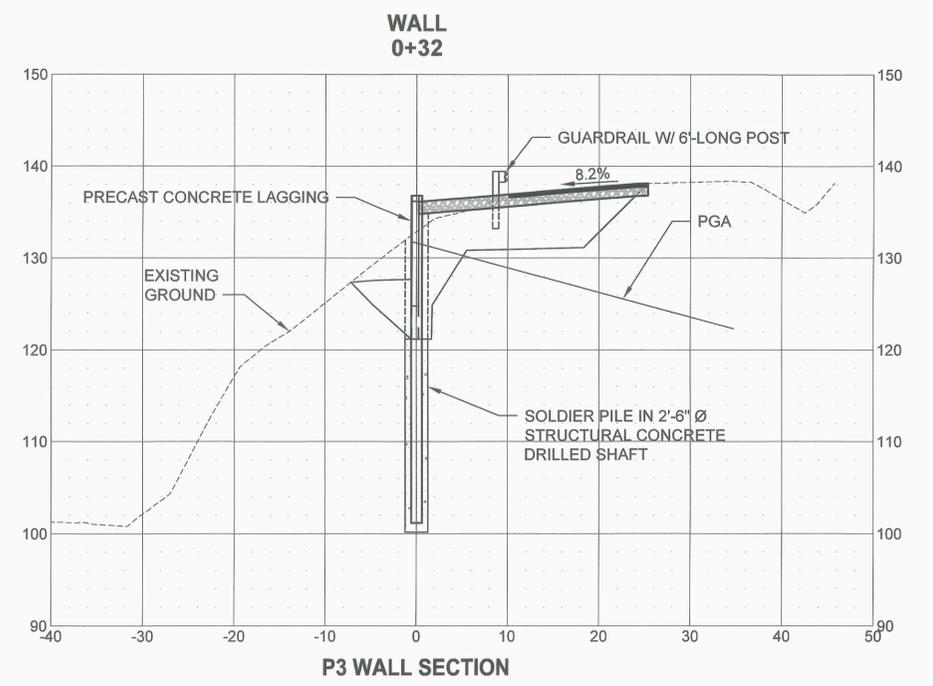
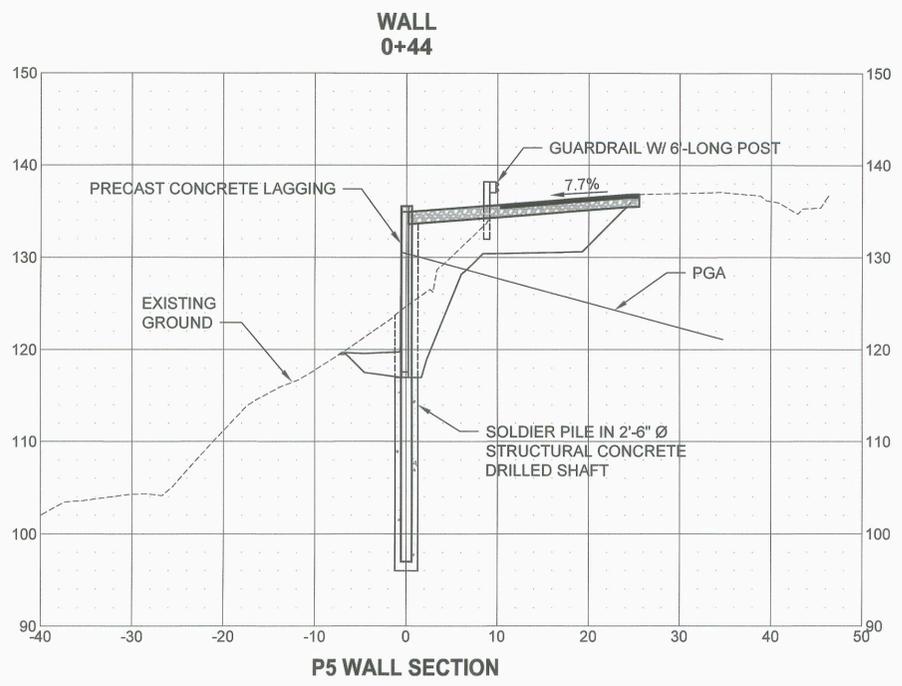
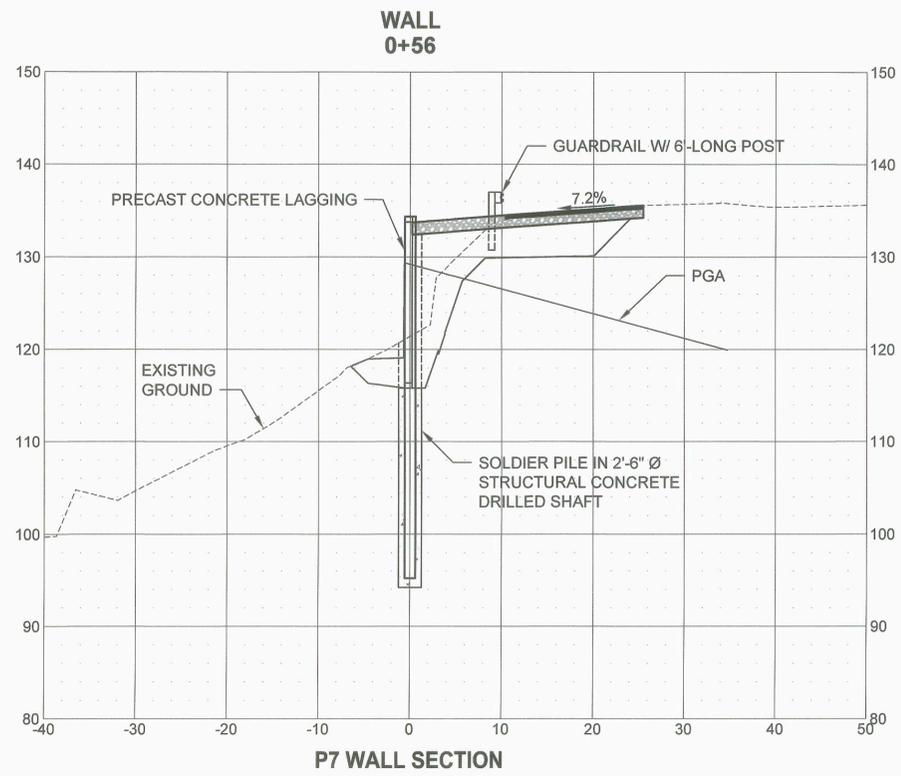
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SECTION 33, T9N, R2W  
CRP NO. 795

**HAZEL DELL ROAD MP 1.76  
RETAINING WALL  
GUARDRAIL AND WALL CROSS SECTIONS  
(1 OF 2)**

SHEET  
**8**  
OF  
**13**



BRIAN BIERWAGEN 2/27/2024  
PROJECT MANAGER DATE

NILS HOVLAND 2/27/2024  
DRAWN BY DATE

BRIAN BIERWAGEN 2/27/2024  
CHECKED BY DATE

HORIZ. SCALE: 1" = 10'  
VERT. SCALE: 1" = 10'

PROJECT ID: 1772  
ROAD NO. : 21300 (HAZEL DELL RD)

COMPUTER FILE:  
PO2415022S02-Cross Sections.dwg



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1600 13TH AVENUE SOUTH  
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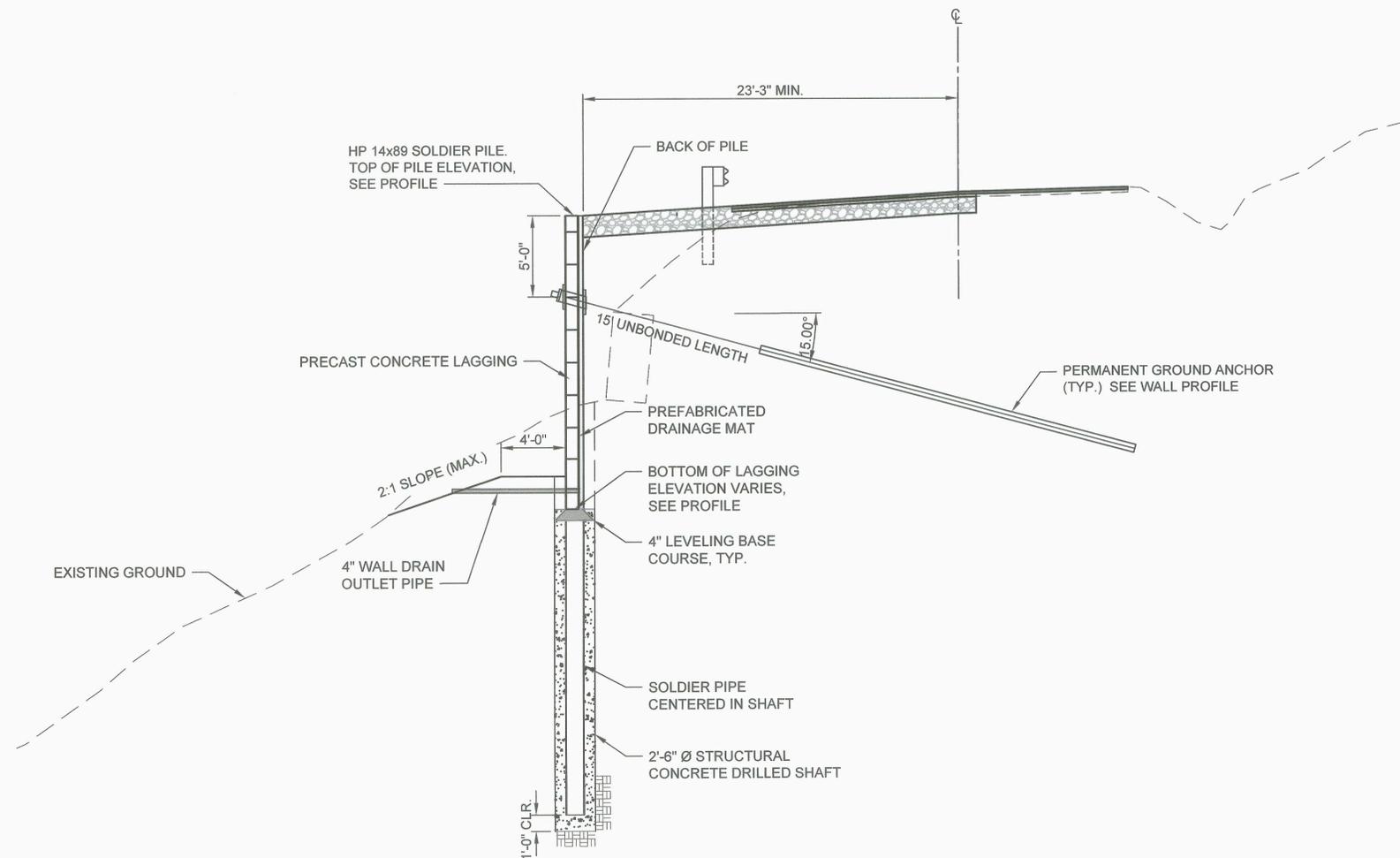


DANIEL J. MCNEILL  
1988  
REGISTERED PROFESSIONAL ENGINEER  
3/1/24

SECTION 33, T9N, R2W  
CRP NO. 795

HAZEL DELL ROAD MP 1.76  
RETAINING WALL  
GUARDRAIL AND WALL CROSS SECTIONS  
(2 OF 2)

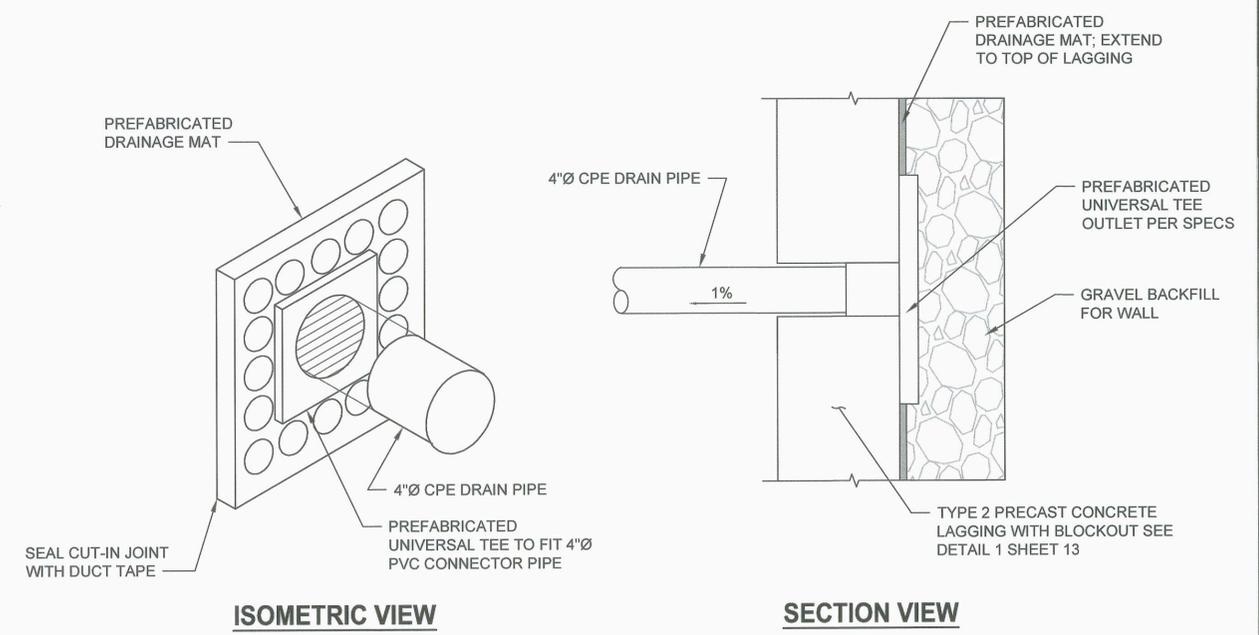
SHEET 9 OF 13



**TYPICAL WALL SECTION**  
NOT TO SCALE

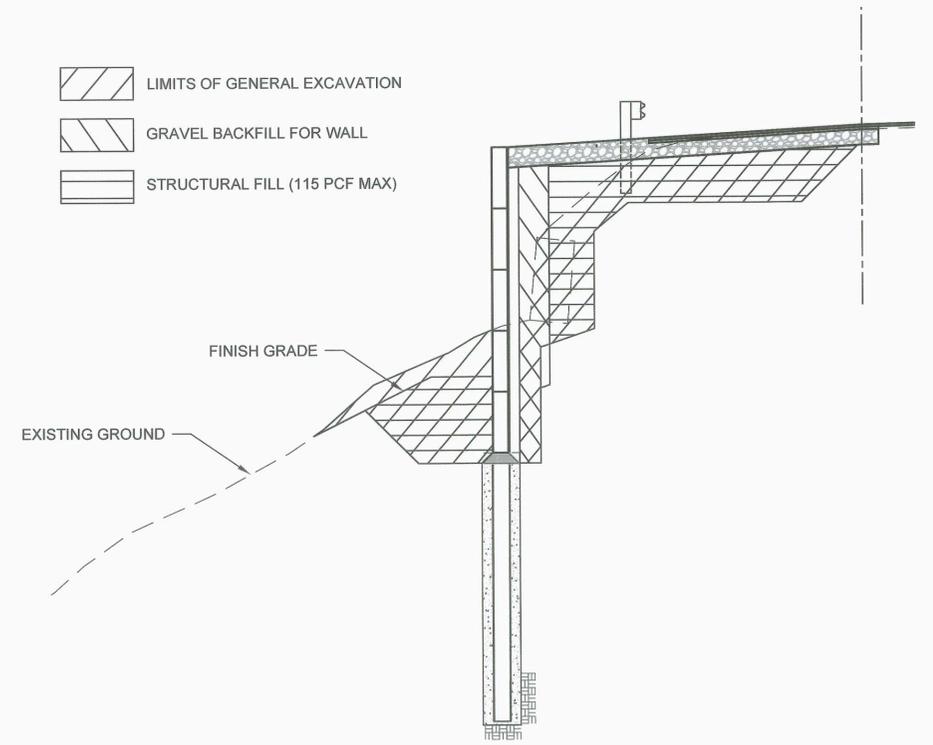
**STRUCTURAL NOTES:**

1. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE REQUIREMENTS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION DATED 2024 AND SPECIAL PROVISIONS. WALL IS DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION.
2. PROVIDE ALL REINFORCING STEEL ACCORDING TO ASTM SPECIFICATION A706, OR AASHTO M31 (ASTM A615) GRADE 60.
3. PROVIDE STEEL SOLDIER PILES ACCORDING TO ASTM SPECIFICATIONS A572 GRADE 50.
4. PROVIDE CLASS 4000P - 3/8" CONCRETE FOR ALL SOLDIER PILE SHAFTS.
5. PROVIDE CLASS 4000 CONCRETE FOR PRECAST CONCRETE LAGGING.
6. PRODUCE WELDS ACCORDING TO THE LATEST EDITION OF AWS D 1.1 STRUCTURAL WELDING CODE - STEEL.
7. CONTRACTOR SHALL SECURE UPPER COURSES OF LAGGING IN PLACE WHERE LAGGING EXTENDS ABOVE THE GROUND LINE BEHIND THE WALL BY MORE THAN 1'-0". IF REQUIRED, THE CONTRACTOR SHALL SUBMIT PROPOSED DETAILS TO THE ENGINEER FOR APPROVAL.
8. THE LIFTING ANCHORS SHALL BE DESIGNED BY THE FABRICATOR / CONTRACTOR AND BE APPROVED BY THE ENGINEER.



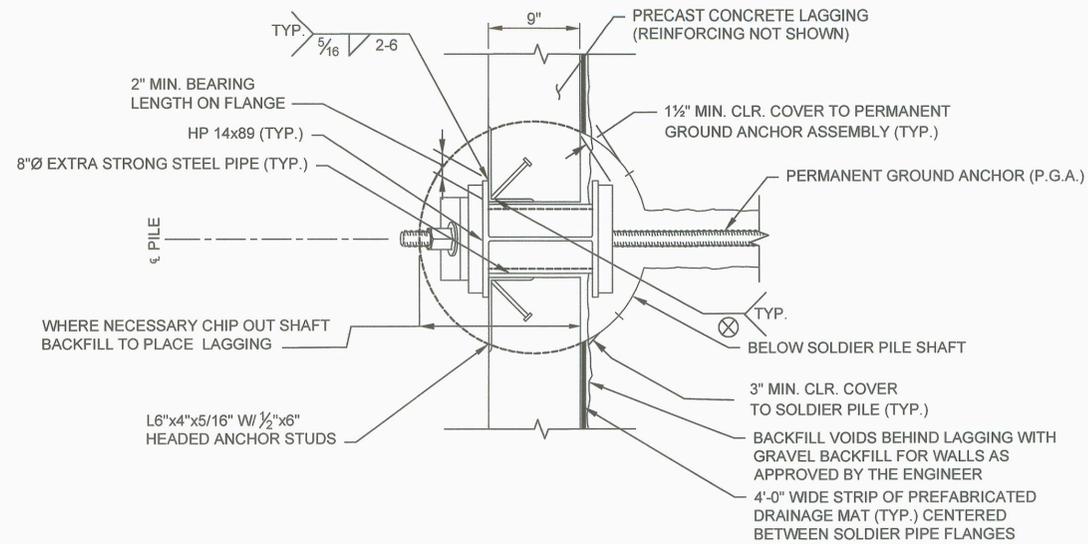
**WALL DRAIN PIPE CONNECTION  
DETAIL**  
NOT TO SCALE

- LIMITS OF GENERAL EXCAVATION
- GRAVEL BACKFILL FOR WALL
- STRUCTURAL FILL (115 PCF MAX)



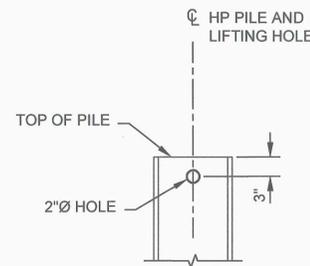
**EXCAVATION AND BACKFILL LIMITS**  
NOT TO SCALE

BRIAN BIERWAGEN PROJECT MANAGER 2/27/2024 DATE  EMMA SUN DRAWN BY 2/27/2024 DATE  DAN MCINTIER CHECKED BY 2/27/2024 DATE	HORIZ. SCALE: NOT TO SCALE VERT. SCALE: PROJECT ID: 1772 ROAD NO. : 21300 (HAZEL DELL RD)  COMPUTER FILE: PO2415022S03-Section Details.dwg	DEPARTMENT OF PUBLIC WORKS  1600 13TH AVENUE SOUTH KELSO, WASHINGTON 98626	5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214 Ph: 503.233.2400		SECTION 33, T9N, R2W CRP NO. 795	<b>HAZEL DELL ROAD MP 1.76 RETAINING WALL</b>	SHEET <b>10</b> OF <b>13</b>
						<b>TYPICAL WALL SECTION</b>	



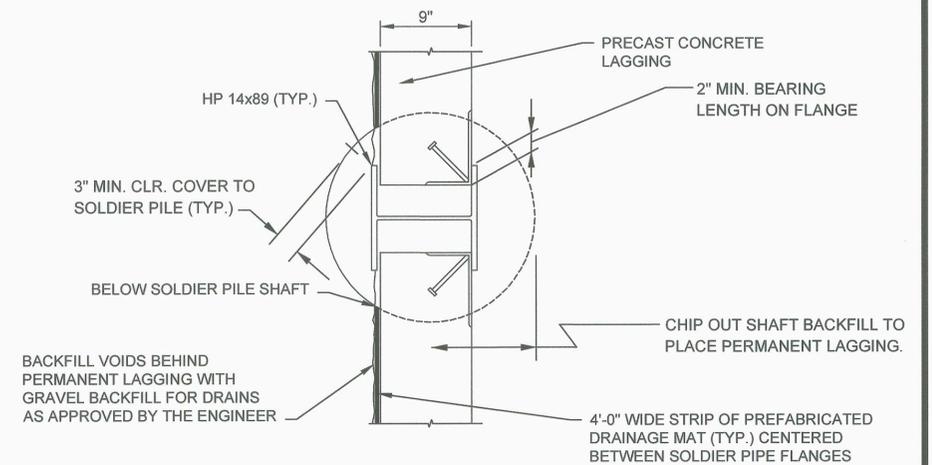
**SOLDIER PILE WITH PERMANENT GROUND ANCHOR PLAN**

NOT TO SCALE



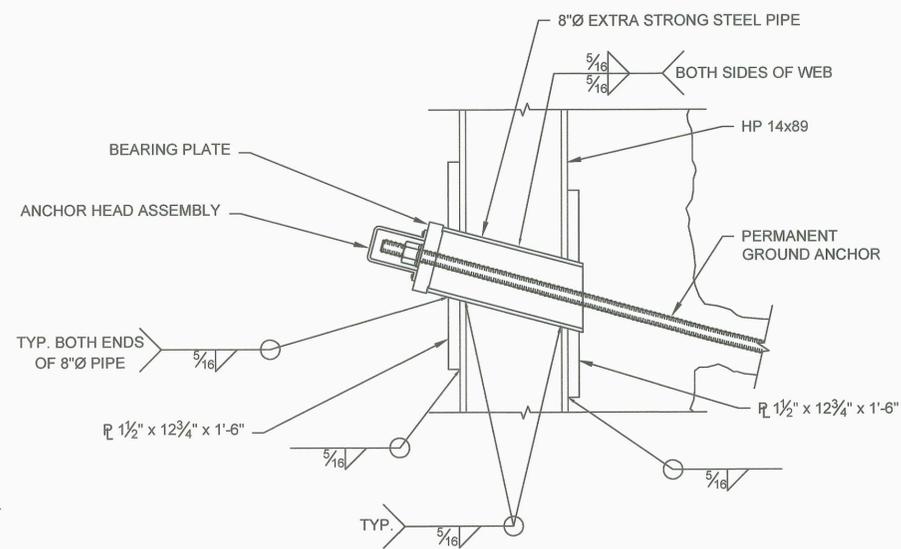
**SOLDIER PILE LIFTING HOLE**

NOT TO SCALE



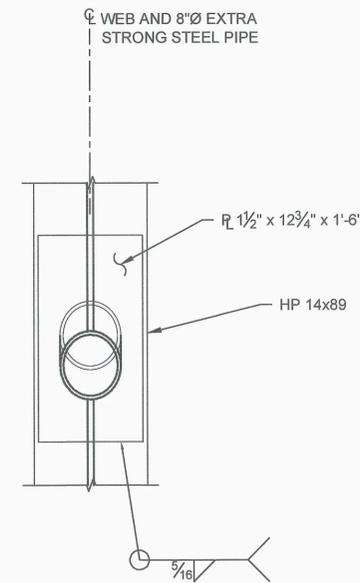
**SOLDIER PILE WALL WITHOUT P.G.A. PLAN**

NOT TO SCALE



**SOLDIER PILE WITH PERMANENT GROUND ANCHOR THROUGH WEB ELEVATION**

1" = 1'-0"



**VIEW**

1" = 1'-0"



BRIAN BIERWAGEN  
PROJECT MANAGER  
DATE: 2/27/2024

EMMA SUN  
DRAWN BY  
DATE: 2/27/2024

DAN MCINTIER  
CHECKED BY  
DATE: 2/27/2024

HORIZ. SCALE: AS NOTED  
VERT. SCALE: AS NOTED  
PROJECT ID: 1772  
ROAD NO.: 21300 (HAZEL DELL RD)  
COMPUTER FILE:  
PO2415022S03-Section Details.dwg



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KELSO, WASHINGTON 98626

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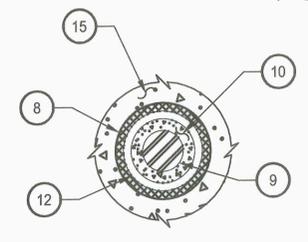
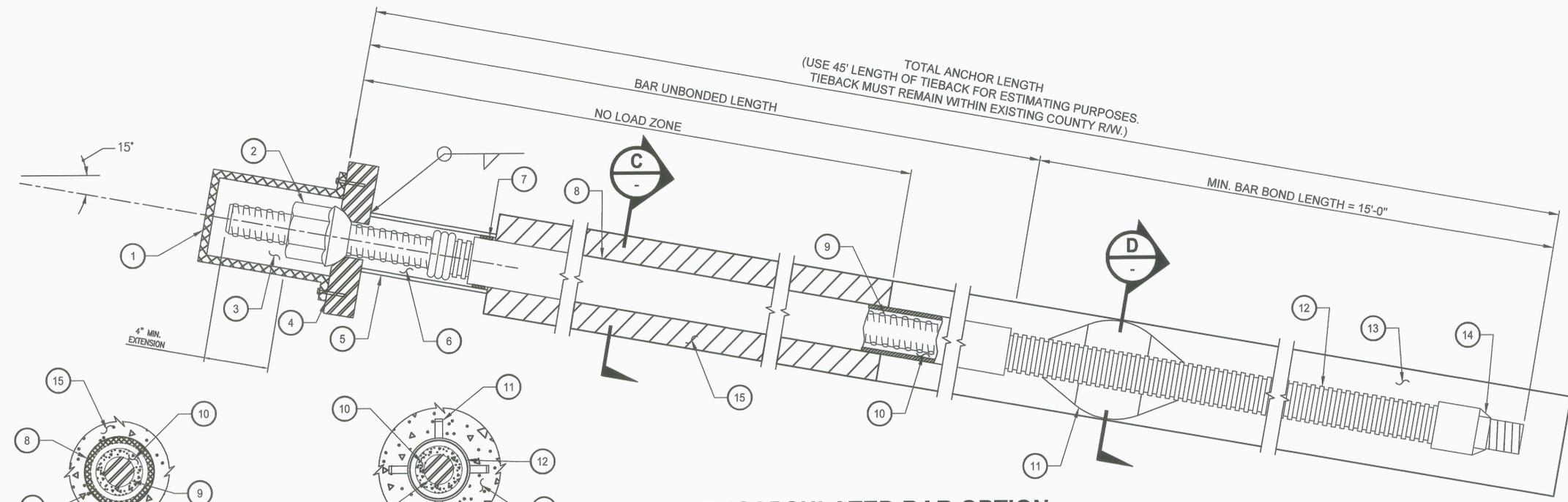


SECTION 33, T9N, R2W  
CRP NO. 795

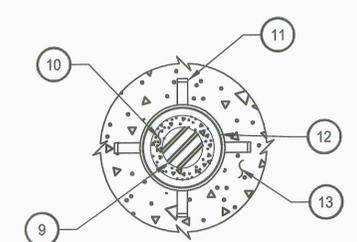
**HAZEL DELL ROAD MP 1.76  
RETAINING WALL**

**PILE DETAILS**

SHEET  
**11**  
OF  
**13**



**SECTION C**  
NOT TO SCALE



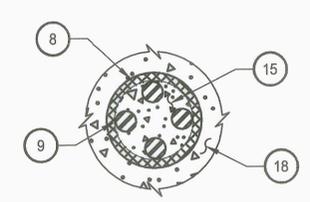
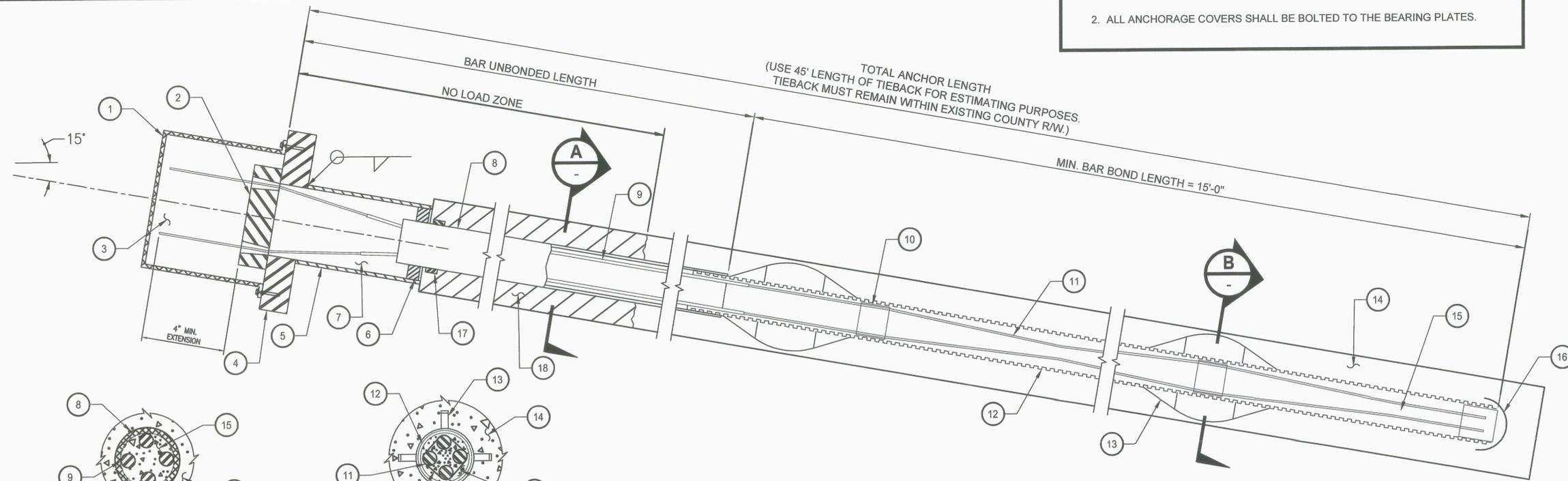
**SECTION D**  
NOT TO SCALE

**ENCAPSULATED BAR OPTION**

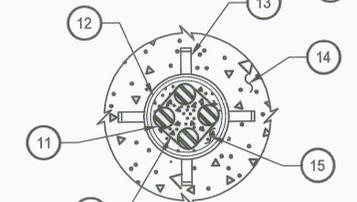
NOT TO SCALE

**NOTES:**  
 1. THE DOUBLE CORROSION PROTECTION SYSTEM AT THE ANCHOR HEAD SHALL BE DETAILED TO ALLOW A MINIMUM OF  $\pm 2^\circ$  VARIATION IN THE SLOPE OF THE SOIL ANCHOR FOR PLACEMENT TOLERANCE.  
 2. ALL ANCHORAGE COVERS SHALL BE BOLTED TO THE BEARING PLATES.

1. ANCHORAGE COVER
  2. NUT
  3. ANTICORROSION GREASE\*
  4. BEARING PLATE
  5. TRUMPET
  6. ANTICORROSION GREASE SEAL
  7. SEAL
  8. SMOOTH PVC BOND BREAKER BAR
  9. BAR
  10. ENCAPSULATION GROUT
  11. CENTRALIZERS
  12. CORRUGATED PVC
  13. ANCHOR GROUT
  14. END CAP
  15. NONSTRUCTURAL FILLER
- \* USE GROUT IF ANCHORAGE COVER IS EXPOSED.



**SECTION A**  
NOT TO SCALE



**SECTION B**  
NOT TO SCALE

**ENCAPSULATED STRAND OPTION**

NOT TO SCALE

1. ANCHORAGE COVER
2. ANCHOR HEAD AND WEDGES
3. ANTICORROSION GREASE
4. BEARING PLATE
5. TRUMPET
6. SEAL
7. ANTICORROSION GREASE
8. PVC OR POLYETHYLENE TUBE
9. INDIVIDUALLY GREASED AND SHEATHED STRAND
10. SPACER
11. STRAND
12. CORRUGATED PVC
13. CENTRALIZER
14. ANCHOR GROUT
15. ENCAPSULATION GROUT
16. END CAP
17. TENSION RING TO RESIST SPLITTING FORCE OF DEFLECTED STRANDS.
18. NON-STRUCTURAL FILLER

BRIAN BIERWAGEN  
PROJECT MANAGER  
2/27/2024  
DATE

EMMA SUN  
DRAWN BY  
2/27/2024  
DATE

DAN MCINTIER  
CHECKED BY  
2/27/2024  
DATE

HORIZ. SCALE: NOT TO SCALE  
VERT. SCALE:  
PROJECT ID: 1772  
ROAD NO. : 21300 (HAZEL DELL RD)  
COMPUTER FILE:  
PO2415022S03-Section Details.dwg

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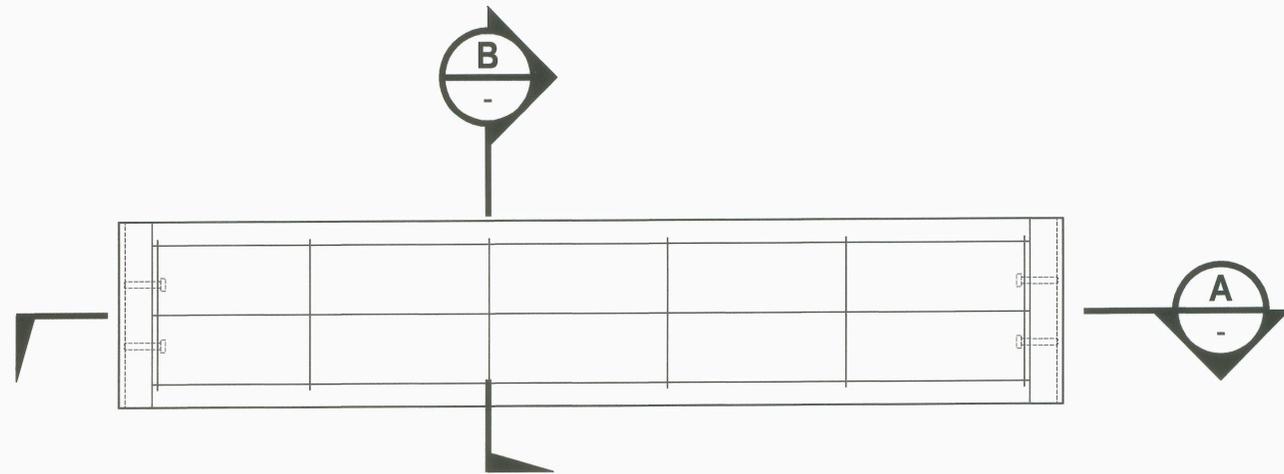
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SECTION 33, T9N, R2W  
CRP NO. 795

**HAZEL DELL ROAD MP 1.76  
RETAINING WALL**

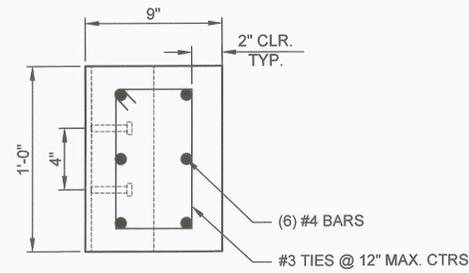
**PERMANENT GROUND ANCHOR DETAILS**

SHEET  
**12**  
OF  
**13**

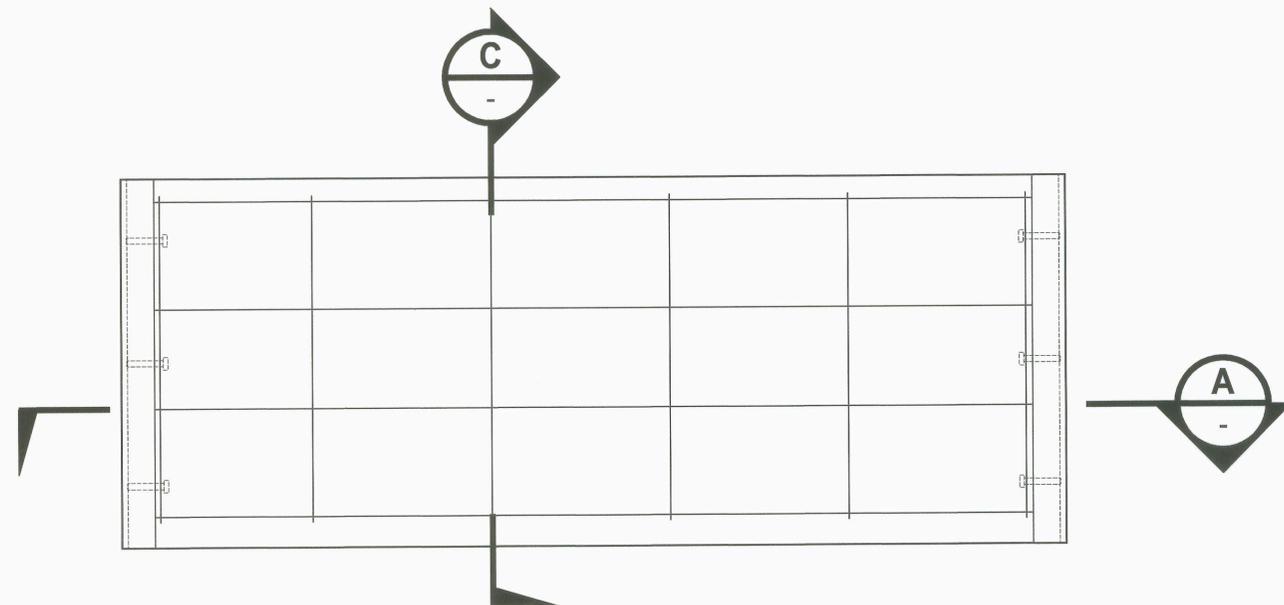


**PRECAST CONCRETE LAGGING TYPE 1**

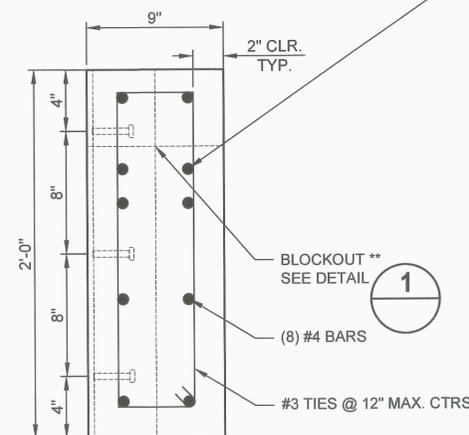
NOTE: L12, L65, L82, L90, & L108 ONLY



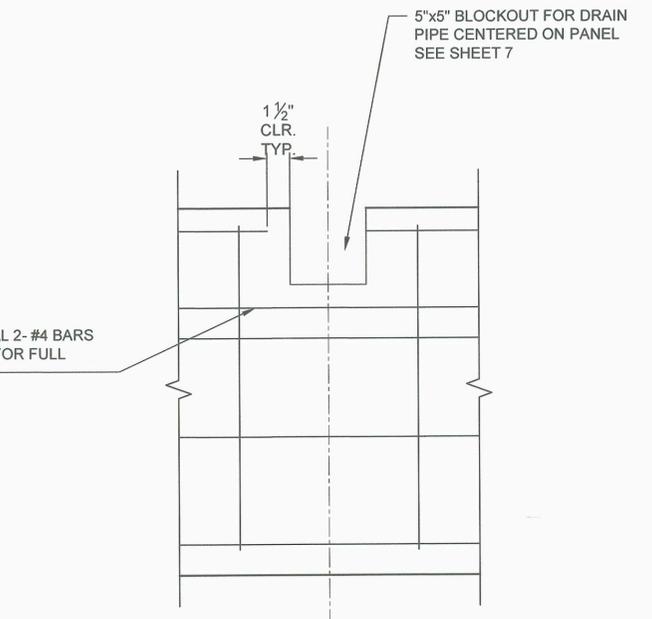
**SECTION B**  
2" = 1'-0"



**PRECAST CONCRETE LAGGING TYPE 2**

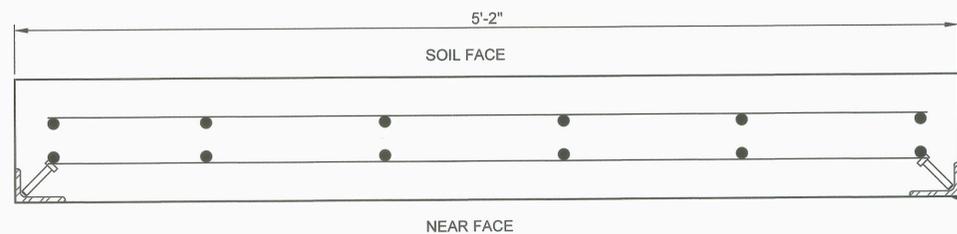


**SECTION C**  
2" = 1'-0"



**DRAIN PIPE BLOCK OUT DETAIL \*\***  
2" = 1'-0"

\*\* DRAIN PIPE BLOCK OUT DETAIL APPLIES TO PANELS L05, L11, L19, L28, L37, L46, L55, L64, L73, L81, L89, L96, L102, L107, L112



**SECTION A**  
2" = 1'-0"

L6"x4"x5/16" STEEL ANGLES EMBEDDED IN VERTICAL LEADING EDGES W/1/2" DIA x 6" HEADED ANCHOR STUDS

BRIAN BIERWAGEN PROJECT MANAGER DATE: 2/27/2024  EMMA SUN DRAWN BY DATE: 2/27/2024  DAN MCINTIER CHECKED BY DATE: 2/27/2024	HORIZ. SCALE: AS NOTED VERT. SCALE: AS NOTED PROJECT ID: 1772 ROAD NO.: 21300 (HAZEL DELL RD) COMPUTER FILE: PO2415022S03-Section Details.dwg	DEPARTMENT OF PUBLIC WORKS 1600 13TH AVENUE SOUTH KELSO, WASHINGTON 98626	5 SE Martin Luther King Jr. Blvd, Suite 400 • Portland, OR 97214 Ph: 503.233.2400	DANIEL J. MCINTIER REGISTERED PROFESSIONAL ENGINEER 49898	SECTION 33, T9N, R2W CRP NO. 795	HAZEL DELL ROAD MP 1.76 RETAINING WALL	SHEET 13
						LAGGING DETAILS	OF 13