

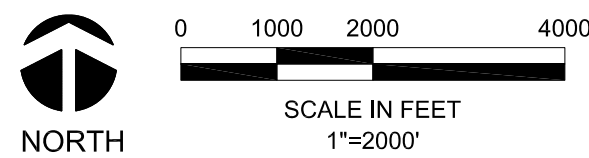
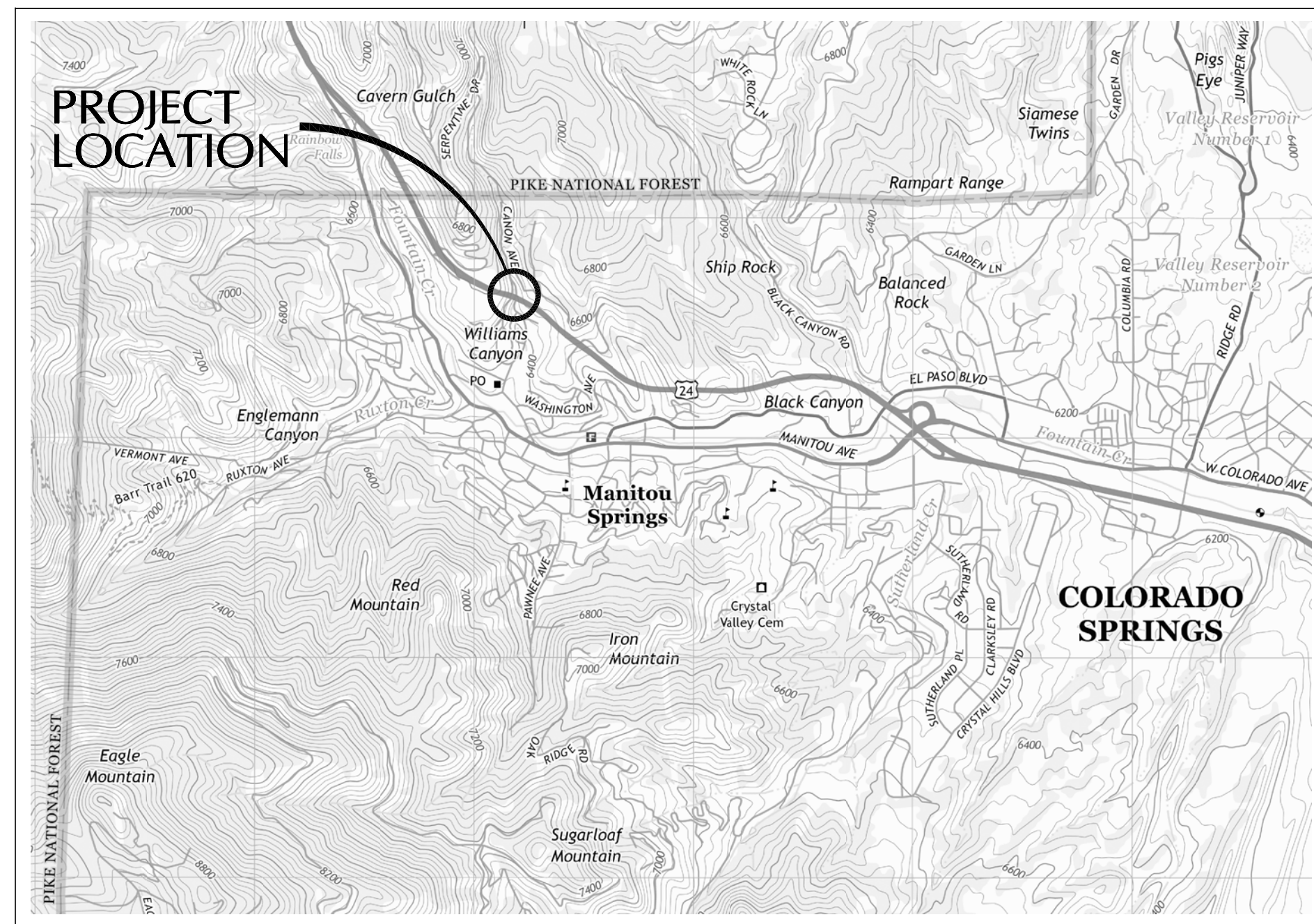
Appendix G:

Manitou Springs Williams Canyon Project Plans

WILLIAMS CANYON DRAINAGE NRCS EMERGENCY WATERSHED PROTECTION PROGRAM DEBRIS CONTROL MEASURES AND CHANNEL REPAIRS PHASE I

MANITOU SPRINGS, EL PASO COUNTY, COLORADO

LOCATION MAP



SOURCE:
USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)
QUADRANGLE OF MANITOU SPRINGS, COLO.
2013

CALL COLORADO
811
OR CALL UTILITY NOTIFICATION
CENTER OF COLORADO
1-800-922-1987
CALL 3-BUSINESS DAYS IN ADVANCE
BEFORE YOU DIG, GRADE, OR EXCAVATE
FOR THE MARKING OF UNDERGROUND
MEMBER UTILITIES

SHEET INDEX

SITE CIVIL

- G1 COVER SHEET AND SHEET INDEX
- G2 GENERAL NOTES AND PLAN INDEX
- C1 DEMOLITION PLAN
- C2 CHANNEL AND UPPER DEBRIS STRUCTURE PLAN & PROFILE STA. 27+50 TO 21+50
- C3 CHANNEL AND SEDIMENTATION BASIN PLAN & PROFILE STA. 21+50 TO 16+50
- C4 UPPER DEBRIS NET AREA
- C5 CHANNEL DETAILS
- C6 DEBRIS NET SECTION STA. 21+81.83
- C7 SEDIMENTATION BASIN AREA
- C8 SEDIMENTATION BASIN AND OUTLET DETAILS
- C9 STORM SEWER PLANS & PROFILES
- C10 ROADWAY PLAN & PROFILE STA. 6+00 TO 10+80 AND SOIL NAIL WALL STATIONING
- C11 ROADWAY PLAN & PROFILE STA. 0+00 TO 6+00 AND SOIL NAIL WALL STATIONING
- C12 ROADWAY AND SITE DETAILS
- C13 CDOT DETAILS

STRUCTURAL

- S1 GENERAL NOTES
- S2 STANDARD DETAILS
- S3 UPPER DEBRIS STRUCTURE
- S4 CHANNEL DETAILS
- S5 CHANNEL DETAILS
- S6 SEDIMENTATION BASIN
- S7 DEBRIS FLOW BARRIER SYSTEM

GEOTECHNICAL

- GT1 GENERAL NOTES
- GT2 SOIL NAIL WALL ELEVATION VIEW
- GT3 SOIL NAIL WALL ELEVATION VIEW
- GT4 SOIL NAIL WALL DETAILS
- GT5 SOIL NAIL WALL DETAILS

EROSION CONTROL

- EC1 COVER SHEET
- EC2 GENERAL NOTES AND PLAN INDEX
- EC3 EROSION CONTROL PLAN
- EC4 EROSION CONTROL DETAILS
- EC5 EROSION CONTROL DETAILS

CONTACTS

<p>OWNER: CITY OF MANITOU SPRINGS 606 MANITOU AVENUE MANITOU SPRINGS, CO 80829</p> <p>ENGINEER: WRIGHT WATER ENGINEERS, INC. 2490 W. 26TH AVENUE SUITE 100A DENVER, CO 80211</p> <p>STRUCTURAL: J.F. SATO AND ASSOCIATES 5898 S. RAPP STREET LITTLETON, CO 80120</p> <p>SURVEYOR: CLARK LAND SURVEYING 1129 N. WAHSATCH AVENUE COLORADO SPRINGS, CO 80903</p> <p>GEOTECHNICAL: KUMAR AND ASSOCIATES, INC. 6735 KUMAR HEIGHTS COLORADO SPRINGS, CO 80918</p> <p>USDA NRCS: STATE CONSERVATION ENGINEER</p>	<p>CONTACT: BRUNO POTHIER PUBLIC WORKS DIRECTOR 719-685-2605 (OFFICE)</p> <p>CONTACT: IAN PATON, P.E. 303-480-1700 (OFFICE) 303-875-5583 (CELL)</p> <p>CONTACT: CRYSTAL BACKHAUS, P.E. 303-797-1200 (OFFICE)</p> <p>CONTACT: RUSS CLARK, PLS 719-633-8533 (OFFICE) 866-450-6303 (TOLL FREE)</p> <p>CONTACT: JONATHAN LOVEKIN, P.G. 719-632-7009 (OFFICE)</p> <p>CONTACT: JOHN ANDREWS, P.E. 720-544-2834</p>
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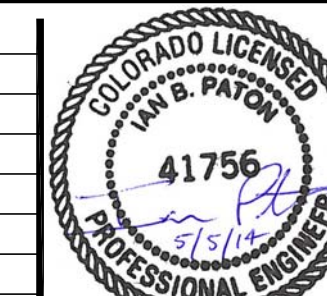
SIGNATURE BLOCKS

I hereby certify that these plans for the construction of the Williams Canyon Drainage NRCS Emergency Watershed Protection Program Debris Control Measures and Channel Repairs - Phase I were prepared by me or under my direct supervision for The City of Manitou Springs.

5/5/14
 Ian B. Paton, P.E. No. 41756 Date

WWE WRIGHT WATER ENGINEERS, INC.
2490 W. 26TH AVE. SUITE 100A
DENVER, CO 80211
(303)480-1700 FAX(303)480-1020

REVISIONS				REVISIONS			
NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION
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△	-	2/27/14	60% DESIGN SUBMITTAL				
△	-	3/11/14	BID SET FOR NRCS REVIEW				
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△	IBP	4/4/14	ADDENDUM 2				



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DETAIL KAL	03/19/14
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APPROVAL	
SCALE	AS NOTED
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Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

COVER SHEET AND SHEET INDEX

JOB NO.
131-080.040
REVISION NO.
3
SHEET NO.
G1

CONSTRUCTION DOCUMENT

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GENERAL NOTES

- ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE OWNER. THE OWNER RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.
- THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER A MINIMUM OF 48 HOURS PRIOR TO STARTING CONSTRUCTION.
- LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO ACTUAL CONSTRUCTION. FOR INFORMATION CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 OR 1-800-922-1987.
- THE CONTRACTOR SHALL HAVE ONE (1) SIGNED COPY OF THE PLANS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES.
- THE CONTRACTOR SHALL PREPARE AND SUBMIT TO THE ENGINEER FOR REVIEW A DEWATERING PLAN PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ANY GROUNDWATER ENCOUNTERED DURING THE CONSTRUCTION OF ANY PORTION OF THIS PROJECT. GROUNDWATER SHALL BE PUMPED, PIPED, REMOVED AND DISPOSED OF IN A MANNER WHICH DOES NOT CAUSE FLOODING, EROSION OR SEDIMENTATION ON ADJACENT PROPERTIES, IN ACCORDANCE TO STATE AND LOCAL STATUTES.
- ALL CONSTRUCTION SHALL CONFORM TO THE DRAWINGS AND SPECIFICATIONS. DRAWINGS AND SPECIFICATIONS SHALL NOT BE CHANGED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER AND ENGINEER.
- THE CONTRACTOR IS RESPONSIBLE FOR CONTROL OF POLLUTION, SURFACE WATER, GROUNDWATER, EROSION, AND SEDIMENT THROUGHOUT THE DURATION OF THE CONTRACT, INCLUDING ALL APPLICABLE PERMITS AND REGULATORY COMPLIANCE.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL INCIDENTAL SURFACE WATER MANAGEMENT AND STORMWATER CONTROL, INCLUDING BUT NOT LIMITED TO A STORMWATER MANAGEMENT PLAN WITH CDPHE.
- THE CONTRACTOR IS RESPONSIBLE FOR, BUT NOT LIMITED TO, THE FOLLOWING:
 - ALL PERMITS AND LICENSES REQUIRED FOR CONSTRUCTION
 - THE EXACT LOCATION OF ALL UTILITY LINES AND COORDINATION OF ANY DISRUPTION IN SERVICES WITH AFFECTED PARTIES.
 - ANY AND ALL DAMAGES AND COSTS TO UTILITIES AND EXISTING STRUCTURES.
- A TESTING AGENCY EMPLOYED BY THE OWNER WILL OBSERVE AND APPROVE PLACEMENT OF ALL EARTHWORK. CONTRACTOR SHALL COORDINATE PLACEMENT WITH TESTING AGENCY.
- THE DESIGN ENGINEER IS TO BE NOTIFIED OF ANY DISCREPANCY OR CONFLICT PRIOR TO CONTINUING CONSTRUCTION.
- ALL LOCATIONS AND ELEVATIONS SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION. NOTIFY THE OWNER'S REPRESENTATIVE OF ANY FEATURES NOT SHOWN ON THESE DRAWINGS WHICH MAY IMPACT CONSTRUCTION.
- CONTRACTOR SHALL ESTABLISH AND MAINTAIN AN UP TO DATE SET OF "RED LINED" AS-BUILT DRAWINGS ON THE PROJECT SITE. THE DRAWINGS SHALL BE FINALIZED AT THE END OF THE PROJECT AND SUBMITTED TO THE ENGINEER.

GENERAL NOTES

- OBSERVATIONS OF WORK IN PROGRESS AND ON-SITE VISITS ARE NOT TO BE CONSTRUED AS A GUARANTEE BY THE OWNER OR OWNER'S REPRESENTATIVE OF THE CONTRACTORS' CONTRACTUAL COMMITMENT.
- EARTHWORK TOLERANCE ±0.2 FT.
- THE CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS, INCLUDING MEMBERS OF THE PUBLIC, AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY, AND NOT BE LIMITED TO NORMAL WORKING HOURS AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OR WORK, ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER, THE ENGINEER, OR THE COUNTY.
- CONTRACTOR SAFETY RESPONSIBILITIES MUST ACCOUNT FOR PERFORMING WORK IN A LOCATION THAT IS SUBJECT TO FLASH FLOODING AND DEBRIS FLOWS, WHICH CAN INCLUDE LARGE QUANTITIES OF SEDIMENT, BOULDERS AND OTHER DEBRIS.
- THE OWNER AND/OR OWNER'S ENGINEER IS NOT RESPONSIBLE FOR SAFETY IN, ON OR ABOUT THE PROJECT SITE, NOR FOR COMPLIANCE BY THE APPROPRIATE PARTY OF ANY REGULATIONS RELATING THERETO.
- CONTRACTOR SHALL DEVELOP A TRAFFIC CONTROL PLAN FOR REVIEW BY THE CITY PRIOR TO COMMENCING WORK. CONTRACTOR SHALL ALSO FURNISH ALL NECESSARY FLAG-PERSONS, WARNING LIGHTS, SIGNS, BARRICADES, TEMPORARY FENCE, AND SUFFICIENT SAFEGUARDS AROUND ALL EXCAVATIONS, EMBANKMENTS, OBSTRUCTIONS AND PERFORM ANY OTHER WORK NECESSARY FOR THE PROTECTION OF ALL WORK BEING PERFORMED, AND FOR THE SAFETY OF THE PUBLIC AND PEDESTRIAN TRAFFIC, AS WELL AS MOTOR VEHICLES. THE TRAFFIC CONTROL PLAN MUST ADDRESS TRAFFIC IN THE PROJECT AREA AND ALSO ADDRESS TRAFFIC CONTROL AND ACCESS TO AND FROM HIGHWAY 24, VIA A GATE LOCATED OFF LUCERNE TRAIL, FOR RESIDENTS ALONG ALPINE DRIVE, LUCERNE TRAIL AND GENEVA TRAIL THAT WILL BE RESTRICTED FROM TRAVELING THROUGH THE PROJECT AREA DURING CONSTRUCTION.
- ALL CONCRETE RUBBLE TO BE DISPOSED OF OFF-SITE BY CONTRACTOR AT APPROVED LOCATION.
- A TESTING AGENCY SHALL BE ON-SITE DURING CONSTRUCTION FOR CONCRETE TESTING.
- PAVEMENT DESIGN SHALL BE ACCORDING TO THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER.
- THE PROJECT OBJECTIVE IS TO PROVIDE DEBRIS CAPTURE FACILITIES AND CHANNEL STABILIZATION MEASURES UNDER THE NRCS EMERGENCY WATERSHED PROTECTION PROGRAM FUNDING. THIS PROJECT DOES NOT PROVIDE DETENTION AND STORAGE OF FLOOD WATERS. IT ALSO DOES NOT PROVIDE FOR NEEDED INCREASED CHANNEL CAPACITY DOWNSTREAM IN THE WILLIAMS CANYON DRAINAGE OR IN FOUNTAIN CREEK; IMPROVEMENTS DOWNSTREAM ARE PLANNED FOR THE WILLIAMS CANYON DRAINAGE IN SUBSEQUENT PHASES AND ARE RECOMMENDED FOR FOUNTAIN CREEK. THESE CHANNEL IMPROVEMENTS DO NOT CONVEY THE 100-YR. FLOOD DUE TO SPACE LIMITATIONS, AND THE 100-YR FLOODPLAIN WILL CONTINUE TO BE OUTSIDE THE CHANNEL.
- THERE ARE THREE (3) INDEPENDENT STATIONING ALIGNMENTS USED FOR THE PROPOSED CHANNEL, PROPOSED ROADWAY AND PROPOSED SOIL NAIL WALL.
- SITE VERTICAL DATUM IS NGVD 29. SEE CONTROL COORDINATES THIS SHEET.
- EXACT LOCATIONS OF GAS AND WATER LINES, IN THE CANYON, ARE UNKNOWN. CONTRACTOR SHALL VERIFY LOCATIONS AND POT HOLE IF NECESSARY PRIOR TO CONSTRUCTION. IF CONFLICTS ARE FOUND WITH ROAD OR STORM SEWER CONSTRUCTION, CONTRACTOR SHALL NOTIFY ENGINEER. CONTRACTOR SHALL ALSO NOTIFY COLORADO SPRINGS UTILITIES IF GAS LINES ARE IN CONFLICT. UPON RESOLUTION OF CONFLICT, CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRS, AND REQUIRED RELOCATIONS, IF ANY.

LEGEND, SYMBOLS AND ABBREVIATIONS

- 6425 EXISTING CONTOUR 5-FOOT
- EXISTING CONTOUR 1-FOOT
- 6425 PROPOSED CONTOUR 5-FOOT
- PROPOSED CONTOUR 1-FOOT
- PARCEL BOUNDARY
- 20+00 PROJECT CENTERLINE STATIONING (SEE NOTES)
- EXISTING GRADE
- FINISHED GRADE
- R** RIGHT SIDE LOOKING DOWN GRADIENT
- L** LEFT SIDE LOOKING DOWN GRADIENT
- EG** EXISTING GRADE ELEVATION
- FG** FINISHED GRADE ELEVATION
- UD INV** UNDERDRAIN INVERT ELEVATION
- S** SLOPE
- GB** GRADE BREAK
- OE** OVERHEAD ELECTRIC
- WL** POTABLE WATER LINE
- OT** OVERHEAD TELEPHONE LINE
- UTILITY CROSSING

CONTROL COORDINATES

CONTROL POINT TABLE			
DESCRIPTION	NORTHING	EASTING	ELEVATION
1050/NGS QUILLENB M 1	1374455	3167575	6434.957
1055/60D NAIL	1376430	3165762	6484.946
1055/60D NAIL	1376205	3165850	6464.824
1055/60D NAIL	1375996	3165899	6449.884
1055/60D NAIL AND TAG	1376386	3165815	6479.870
1055/60D NAIL	1375759	3165975	6435.896
1055/60D NAIL	1375520	3165907	6421.180
29 VERT	1374455	3167575	6434.957
1054/101 RESHOT FROM 102	1376430	3165762	6484.644
1054/106 WITH GPS	1375520	3165907	6421.219
N04 REBAR	1375400	3165975	6421.000
N04 REBAR	1375323	3165934	6402.780

NOTE: ALL SHOWN ELEVATIONS WILL RELATE TO THE NORTHERN GEODETIC VERTICAL DATUM OF 1929 (NGVD 29). THE VERTICAL TRANSFORMATION TO NGVD 1929 WAS CALCULATED AND APPLIED FROM BENCHMARK: NGS QUILLEN.

SOURCE OF SURVEY DATA: CLARK LAND SURVEYING, INC.

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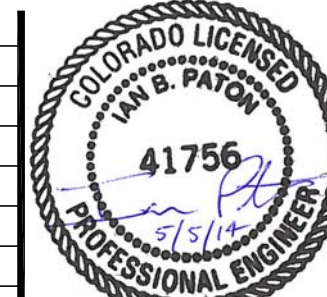
PLAN INDEX - PHASE I



CONSTRUCTION DOCUMENT

WWE WRIGHT WATER ENGINEERS, INC.
2490 W. 26TH AVE. SUITE 100A
DENVER, CO 80211
(303)480-1700 FAX(303)480-1020

REVISIONS				CHANGES			
NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION
1	IBP	1/22/14	30% DESIGN SUBMITTAL	1	IBP	5/1/14	RELEASE FOR CONSTRUCTION
2	IBP	2/27/14	60% DESIGN SUBMITTAL				
3	IBP	3/11/14	BID SET FOR NRCS REVIEW				
4	IBP	3/19/14	RELEASE FOR BID				
5	IBP	4/4/14	ADDENDUM 2				



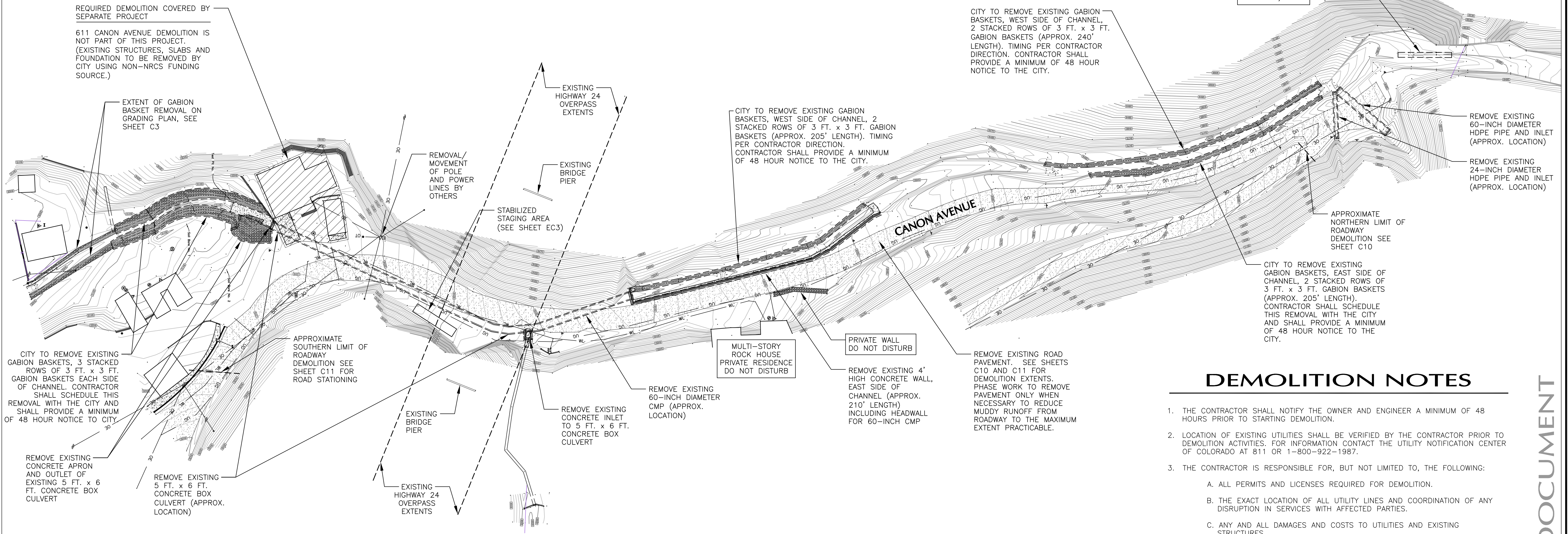
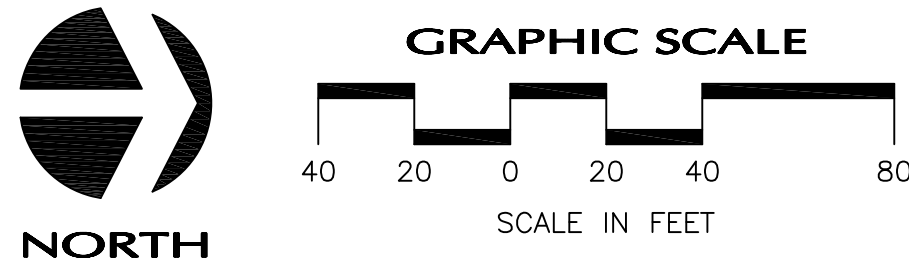
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SCALE	AS NOTED
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Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

GENERAL NOTES AND PLAN INDEX

JOB NO. 131-080.040
REVISION NO. **3**
SHEET NO. **G2**

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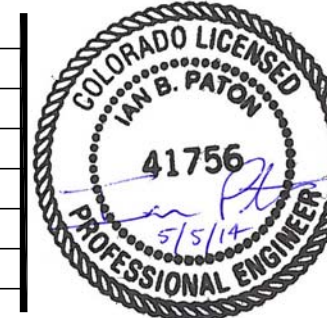
DEMOLITION NOTES

1. THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER A MINIMUM OF 48 HOURS PRIOR TO STARTING DEMOLITION.
2. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO DEMOLITION ACTIVITIES. FOR INFORMATION CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 OR 1-800-922-1987.
3. THE CONTRACTOR IS RESPONSIBLE FOR, BUT NOT LIMITED TO, THE FOLLOWING:
 - A. ALL PERMITS AND LICENSES REQUIRED FOR DEMOLITION.
 - B. THE EXACT LOCATION OF ALL UTILITY LINES AND COORDINATION OF ANY DISRUPTION IN SERVICES WITH AFFECTED PARTIES.
 - C. ANY AND ALL DAMAGES AND COSTS TO UTILITIES AND EXISTING STRUCTURES.
4. THE DESIGN ENGINEER IS TO BE NOTIFIED OF ANY DISCREPANCY OR CONFLICT PRIOR TO CONTINUING DEMOLITION.
5. THE CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF DEMOLITION ACTIVITIES, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY AND THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY, AND NOT BE LIMITED TO NORMAL WORKING HOURS AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OR WORK, ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER, THE ENGINEER, OR THE CITY.
6. THE OWNER AND/OR OWNER'S ENGINEER IS NOT RESPONSIBLE FOR SAFETY IN, ON OR ABOUT THE PROJECT SITE, NOR FOR COMPLIANCE BY THE APPROPRIATE PARTY OF ANY REGULATIONS RELATING THERETO.
7. THE CONTRACTOR IS RESPONSIBLE FOR ALL INCIDENTAL SURFACE WATER MANAGEMENT AND STORMWATER CONTROL, INCLUDING BUT NOT LIMITED TO IMPLEMENTING AND MAINTAINING COMPLIANCE WITH THE STORMWATER MANAGEMENT PLAN FOR THE PROJECT.
8. ALL DEMOLITION DEBRIS WILL BE DISPOSED OF OFFSITE BY THE THE CONTRACTOR AT AN APPROVED LOCATION.
9. DUST CONTROL MEASURES WILL BE IMPLEMENTED DURING DEMOLITION.

DEMOLITION PLAN

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NRCS Emergency Watershed Protection Program
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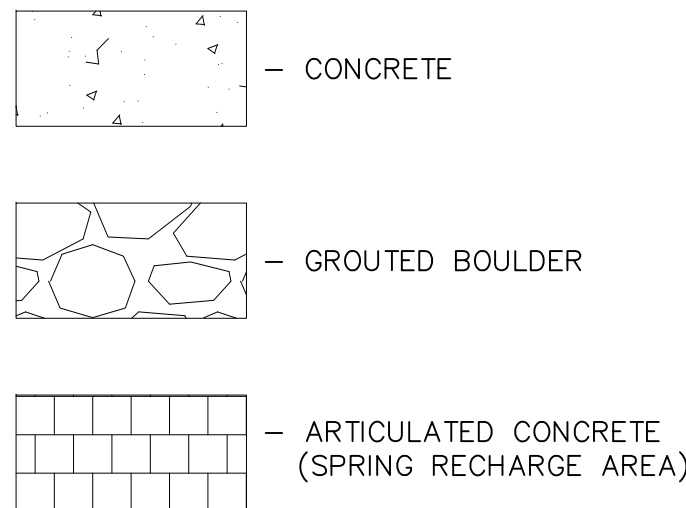
DEMOLITION PLAN

JOB NO.
131-080.040
REVISION NO.
3
SHEET NO.
C1

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CONSTRUCTION DOCUMENT

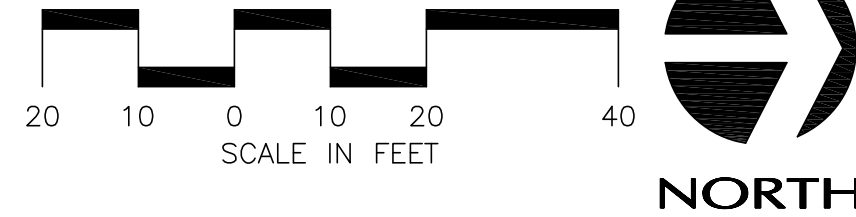
CHANNEL LEGEND



SHEET NOTES:

- CUTOFF WALLS SHALL BE PROVIDED IN THE BOTTOM OF THE CHANNEL AT TRANSITIONS BETWEEN EACH CHANNEL TYPE. SEE STRUCTURAL SHEET S5 FOR CHANNEL CUTOFF WALL DETAIL.
- PROPOSED CHANNEL CENTERLINE ALIGNMENT IS INDEPENDENT OF ROAD AND SOIL NAIL WALL STATIONING. SEE SHEETS C10 AND C11 FOR PROPOSED ROAD STATIONING AND SOIL NAIL WALL STATIONING.

PLAN SCALE



(DO NOT CONSTRUCT - NOT PART OF THIS PROJECT - REMOVED PER OWNER REQUEST) DEER FENCE PER CDOT STANDARD PLAN NO. M-607-4. SET FENCE LINE 3 FEET BACK FROM WEST CHANNEL SOIL NAIL WALL, SEE SHEET C13

(DO NOT CONSTRUCT - NOT PART OF THIS PROJECT - REMOVED PER OWNER REQUEST) DEBRIS NET, SEE DETAIL

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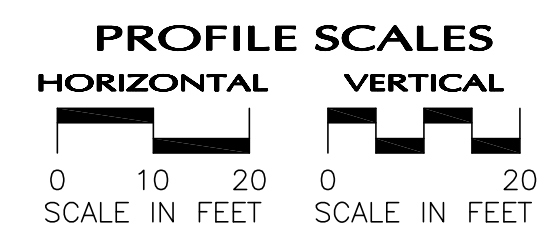
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CHANNEL PLAN

CHANNEL PROFILE STA 21+50 TO 27+50

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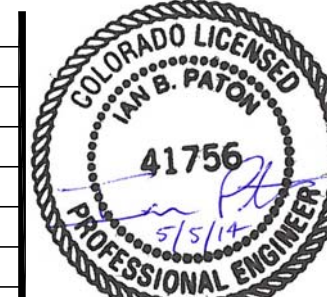


SCHEDULE: 7405200004
 OWNER: 2012 CANAL
CONSTRUCTION DOCUMENT

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WWE WRIGHT WATER ENGINEERS, INC.
 2490 W. 26TH AVE. SUITE 100A
 DENVER, CO 80211
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REVISIONS				CHANGES			
NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION
1	IBP	1/22/14	30% DESIGN SUBMITTAL	1	IBP	5/1/14	RELEASE FOR CONSTRUCTION
2	IBP	2/27/14	60% DESIGN SUBMITTAL				
3	IBP	3/11/14	BID SET FOR NRCS REVIEW				
4	IBP	3/19/14	RELEASE FOR BID				
5	IBP	4/4/14	ADDENDUM 2				

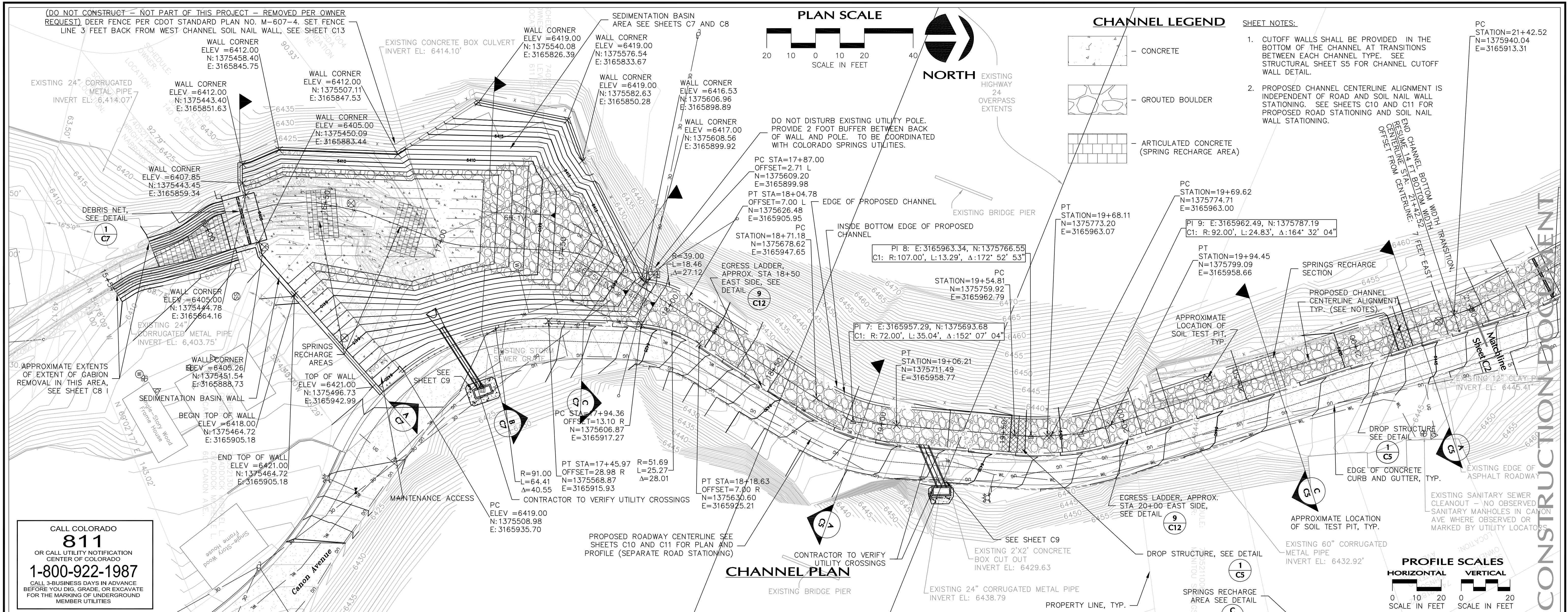


DATE	DESCRIPTION
03/19/14	DESIGN IBP/HAL/DAF/EJW
03/19/14	DETAIL HAL
03/19/14	CHECK JEJ/WFL
AS NOTED	APPROVAL
	SCALE
	Sht C2.dwg

Williams Canyon Drainage
 NRCS Emergency Watershed Protection Program
 Debris Control Measures and Channel Repairs - Phase I
**CHANNEL AND UPPER DEBRIS
 STRUCTURE PLAN AND PROFILE
 STA 27+50 TO 21+50**

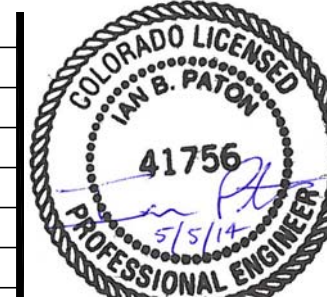
JOB NO.
131-080-040
 REVISION NO.
3
 SHEET NO.
C2

(DO NOT CONSTRUCT - NOT PART OF THIS PROJECT - REMOVED PER OWNER REQUEST) DEER FENCE PER CDOT STANDARD PLAN NO. M-607-4. SET FENCE LINE 3 FEET BACK FROM WEST CHANNEL SOIL NAIL WALL, SEE SHEET C13



CALL COLORADO
811
OR CALL UTILITY NOTIFICATION CENTER OF COLORADO
1-800-922-1987
CALL 3-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS				COMMENTS			
NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION
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4	IBP	3/19/14	RELEASE FOR BID				
5	IBP	4/4/14	ADDENDUM 2				



DESIGN	DATE
IBP/HAL/DAF/EJW	03/19/14
DETAIL	HAL
CHECK	JEJ/WFL
APPROVAL	03/19/14
SCALE	AS NOTED
Sht C3.dwg	

Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

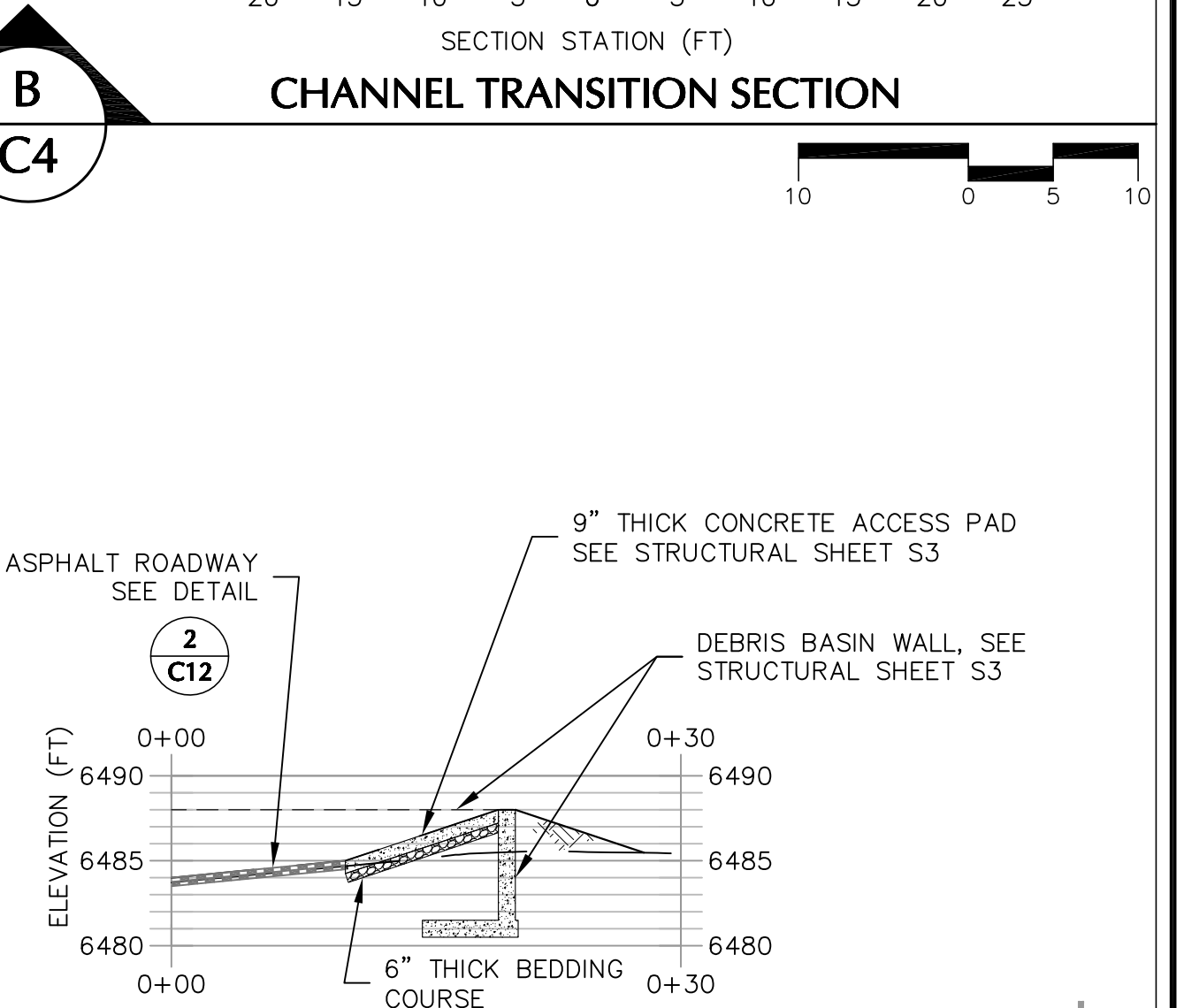
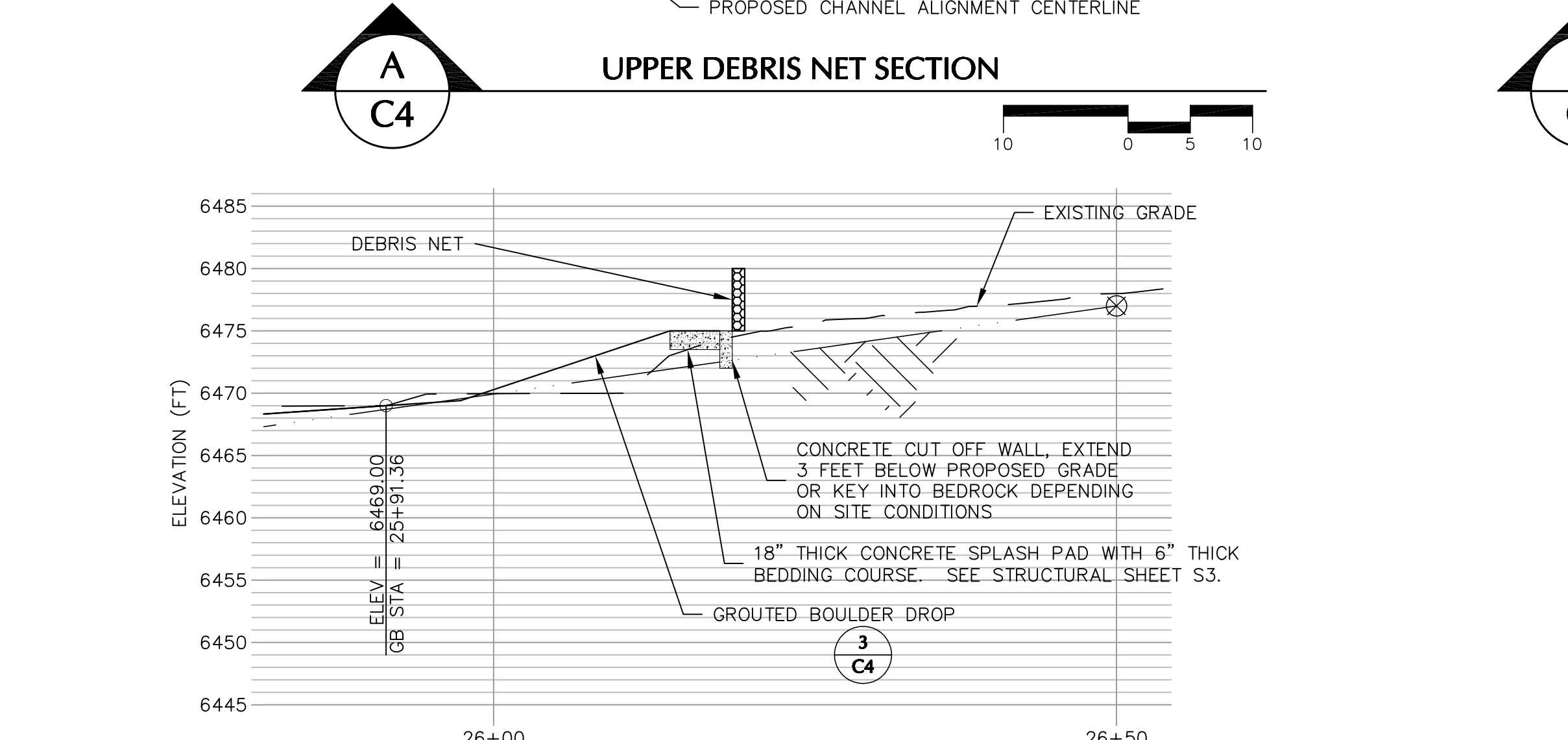
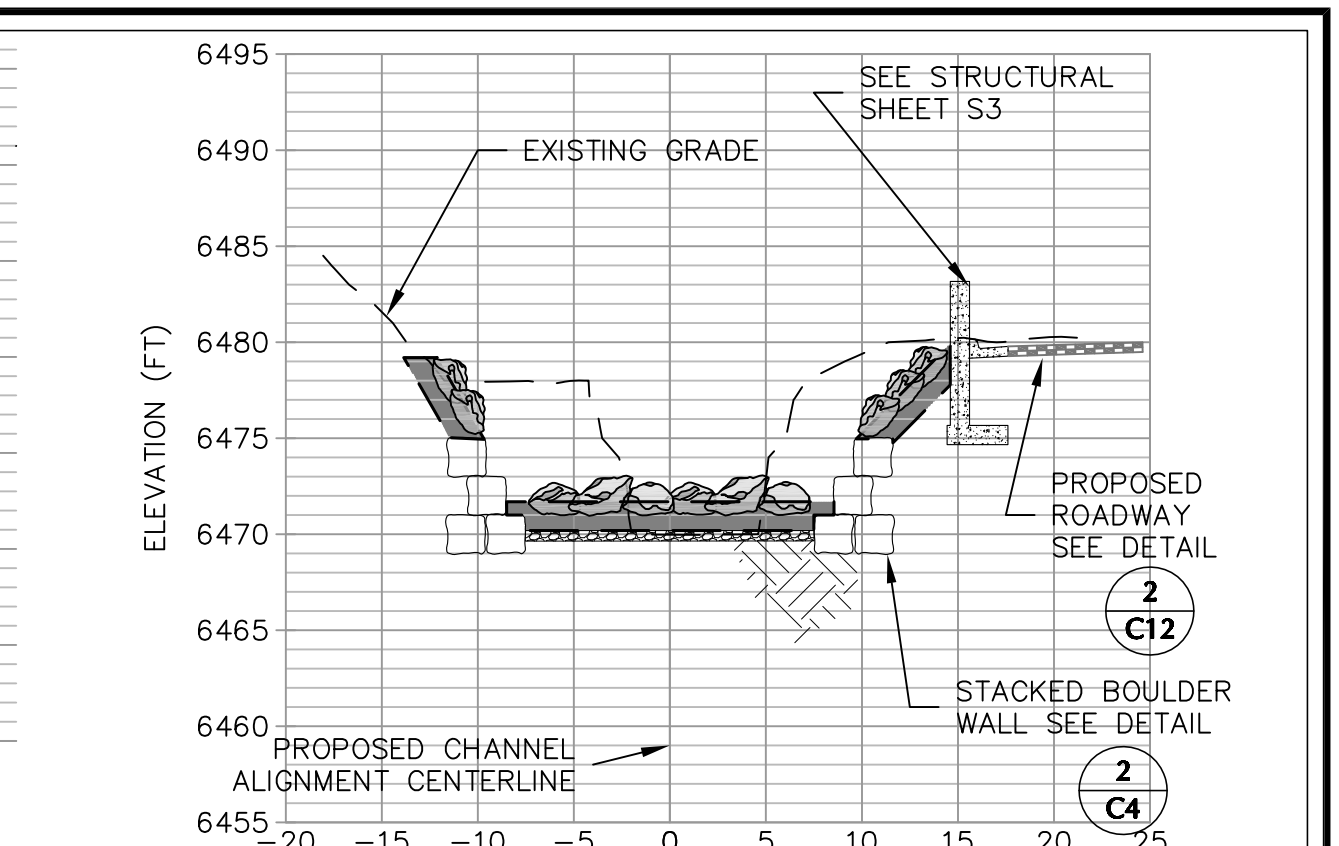
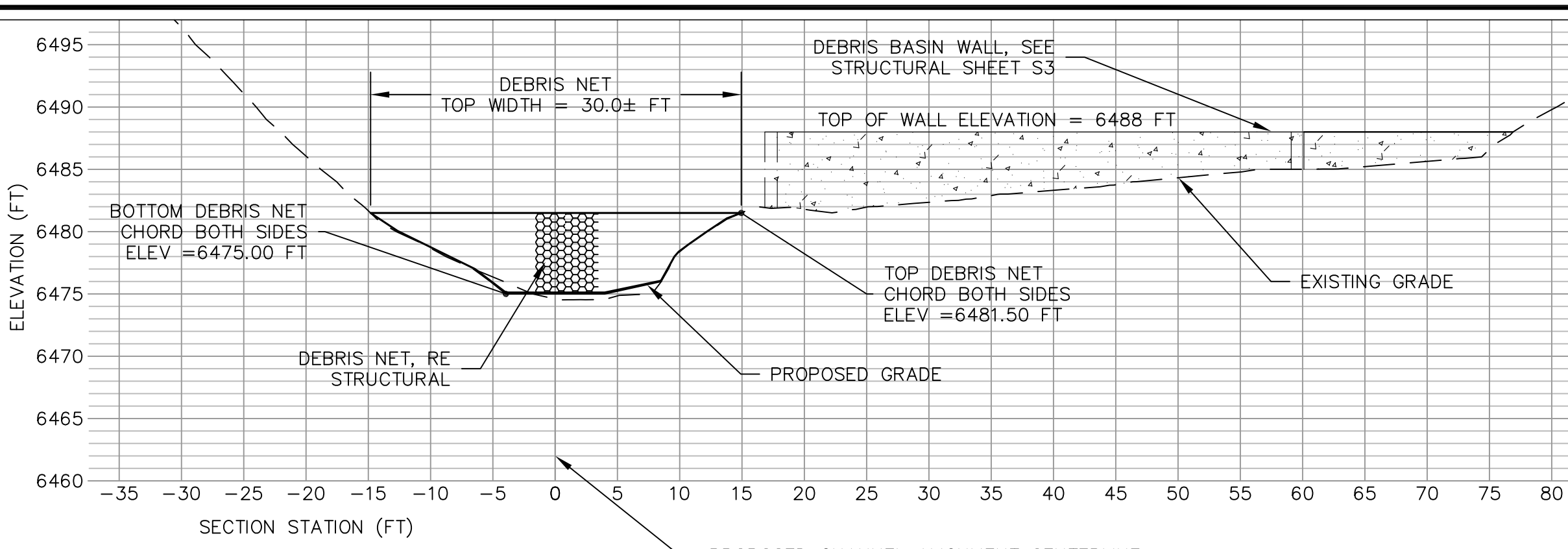
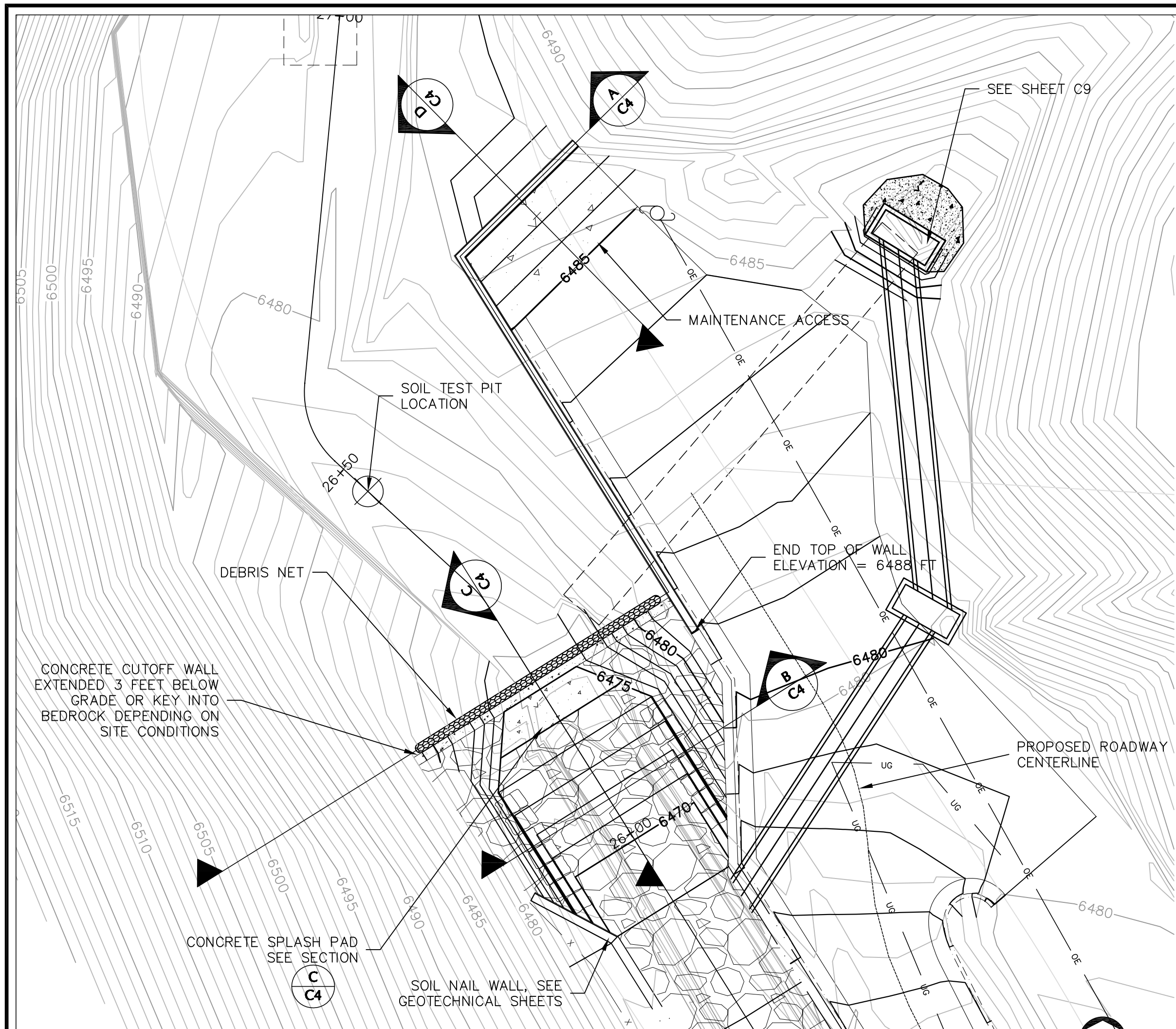
CHANNEL AND SEDIMENTATION BASIN
PLAN AND PROFILE
STA 21+50 TO 16+00

JOB NO.
131-080.040

REVISION NO.
3

SHEET NO.
C3

Plot Date/Time: 05/05/2014, 04:34:38 PM; Z:\PROJECT FILES\131-080\131-080.040\CAD-015\CAD CO BID SET\SH3 C3.DWG-C3



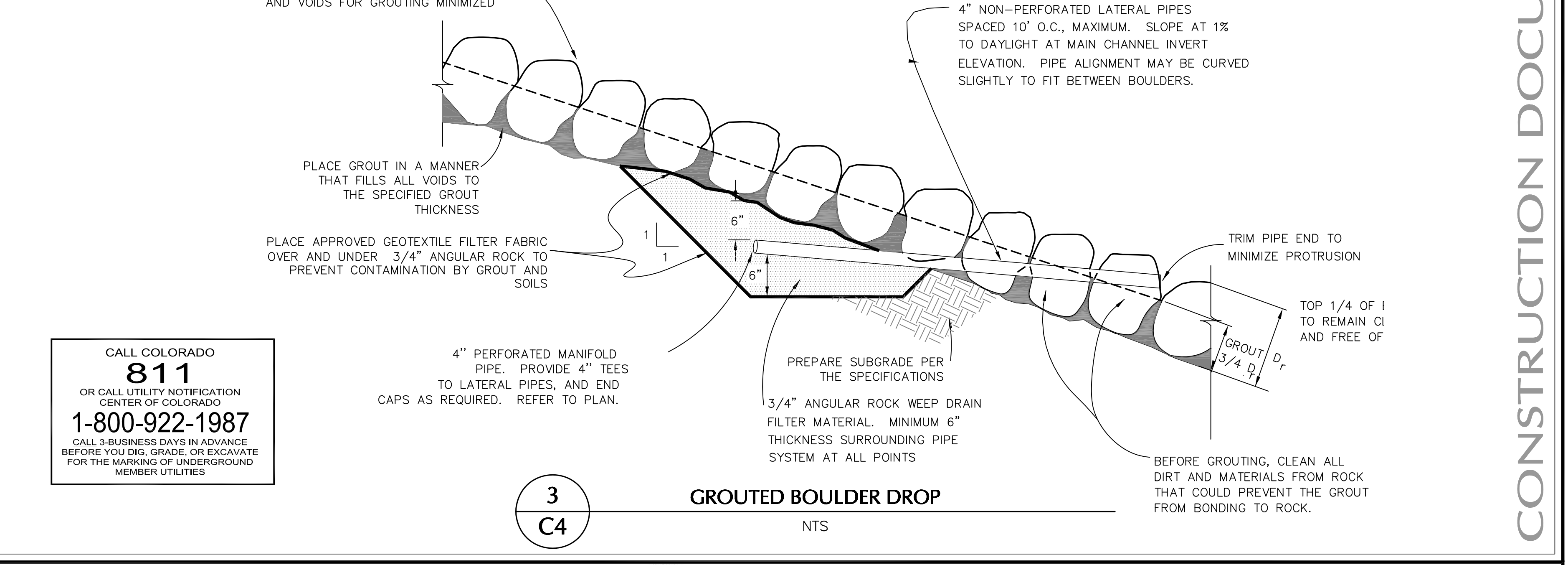
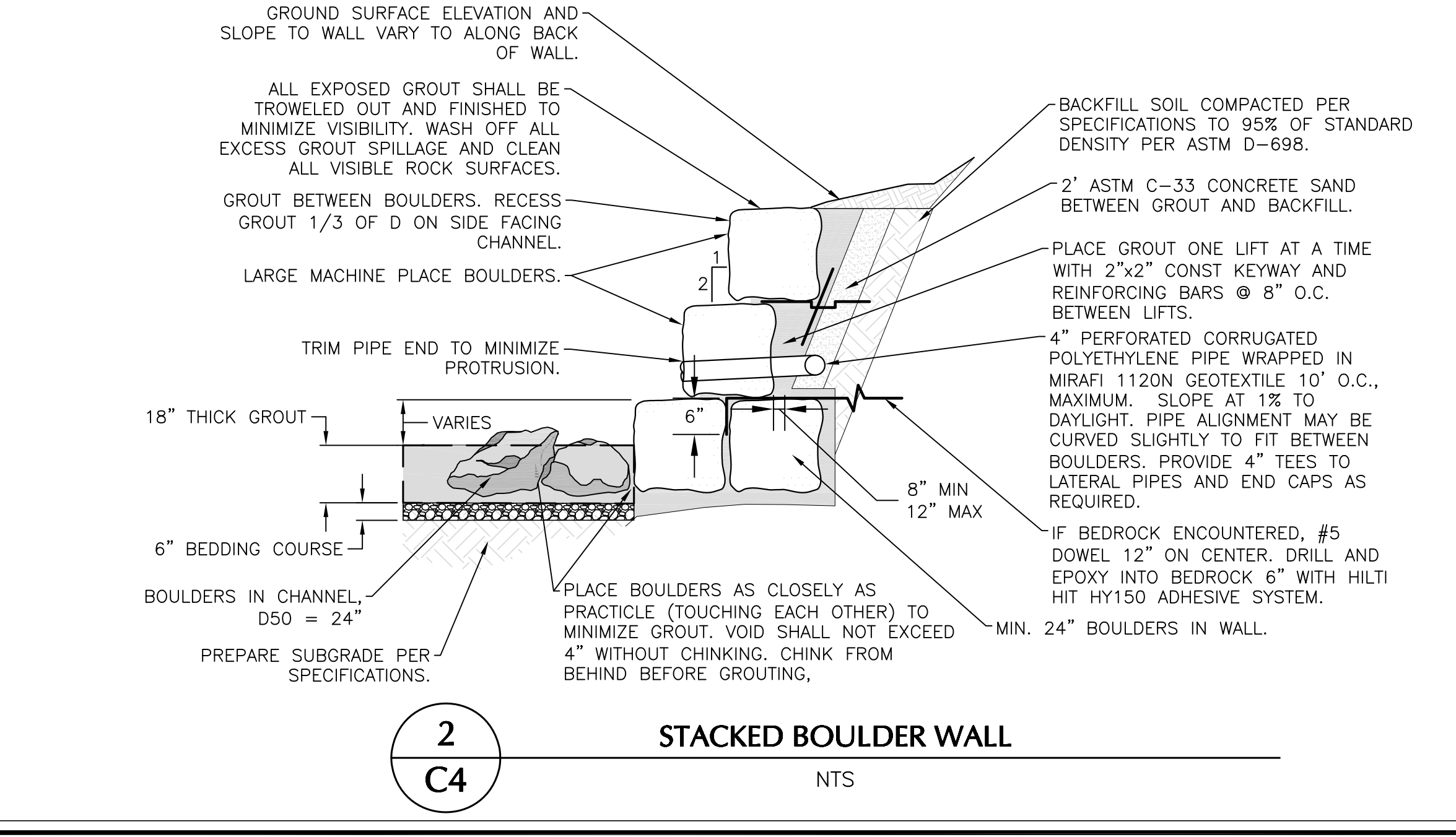
1
C4
UPPER DEBRIS NET PLAN

A
C4
UPPER DEBRIS NET SECTION

C
C4
CHANNEL TRANSITION SECTION

B
C4
CHANNEL TRANSITION SECTION

D
C4
MAINTENANCE ACCESS SECTION



2
C4
STACKED BOULDER WALL
NTS

3
C4
GROUTED BOULDER DROP
NTS

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CENTER OF COLORADO
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FOR THE MARKING OF UNDERGROUND
MEMBER UTILITIES

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REVISIONS				COMMENTS			
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5	IBP	4/4/14	ADDENDUM 2				

COLORADO LICENSED
J.W.B. PATON
41756
PROFESSIONAL ENGINEER

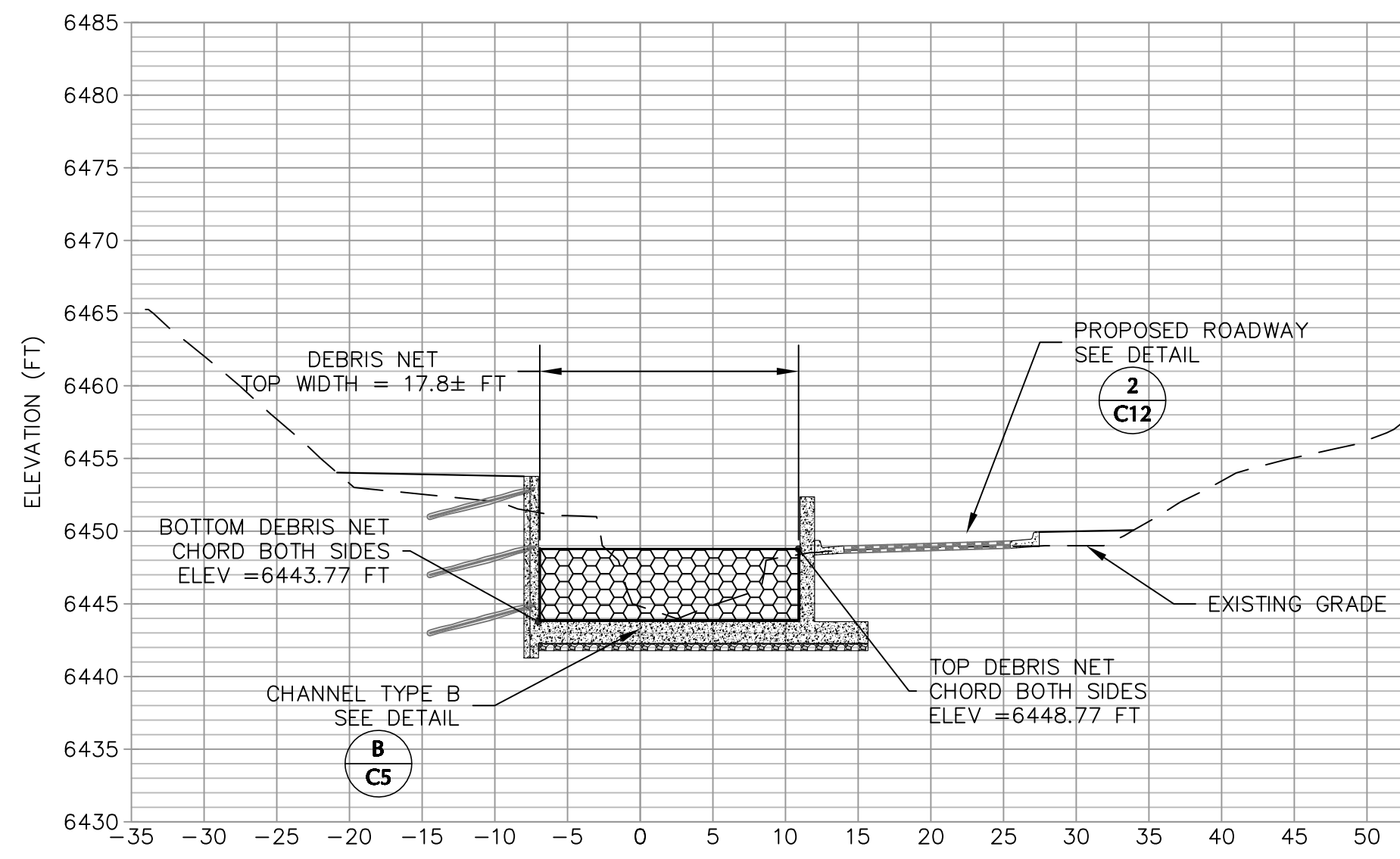
DESIGN IBP/HAL/DAF/EJW 03/19/14
DETAIL HAL 03/19/14
CHECK JEJ/WFL 03/19/14
APPROVAL AS NOTED
SCALE Sht C4.dwg

Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

JOB NO. 131-080.040
REVISION NO. 3
SHEET NO. C4

UPPER DEBRIS NET AREA

CONSTRUCTION DOCUMENT

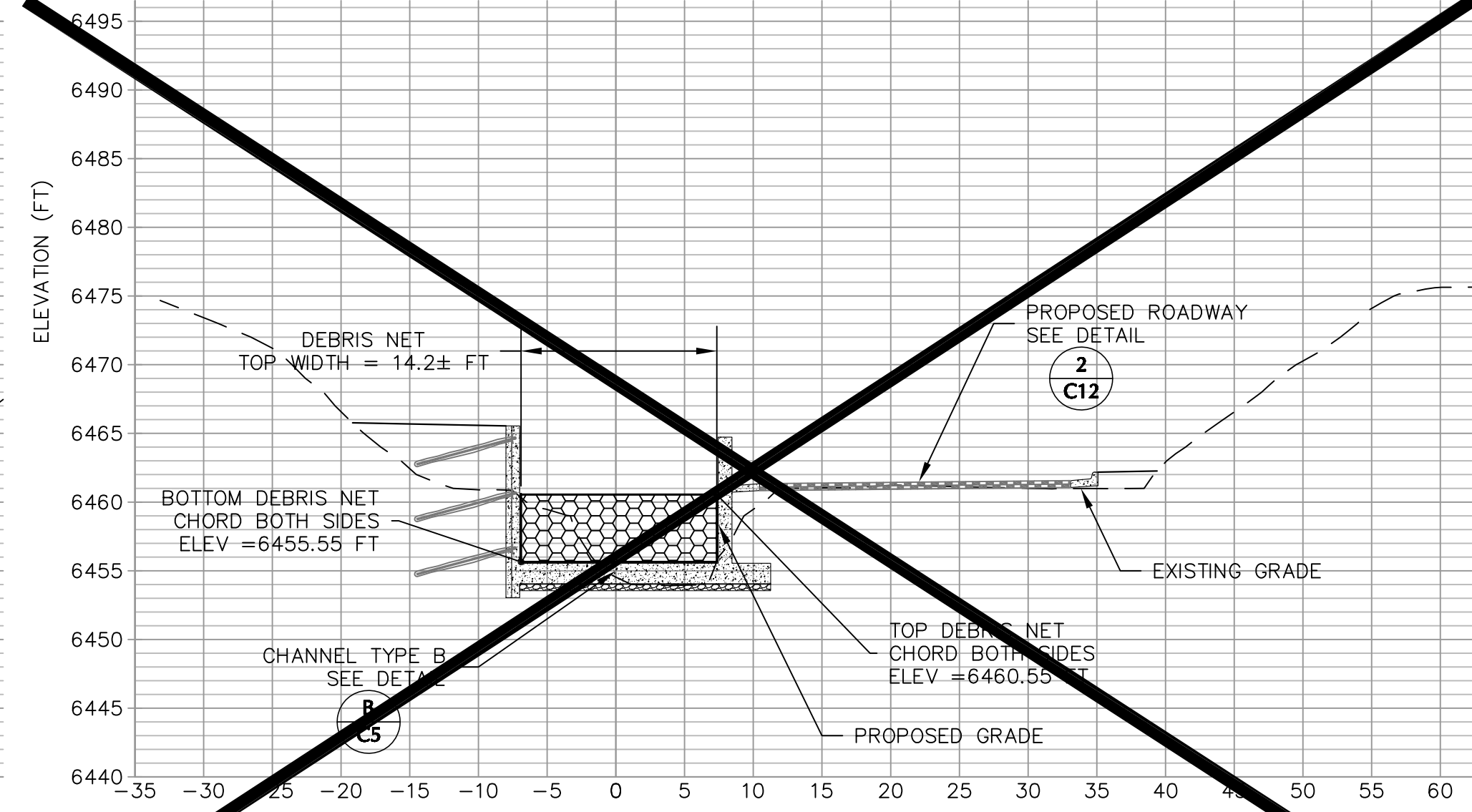


1
C6

DEBRIS NET SECTION: STATION 21+81.83

SCALE: 1"=10'-0"

0 5 10

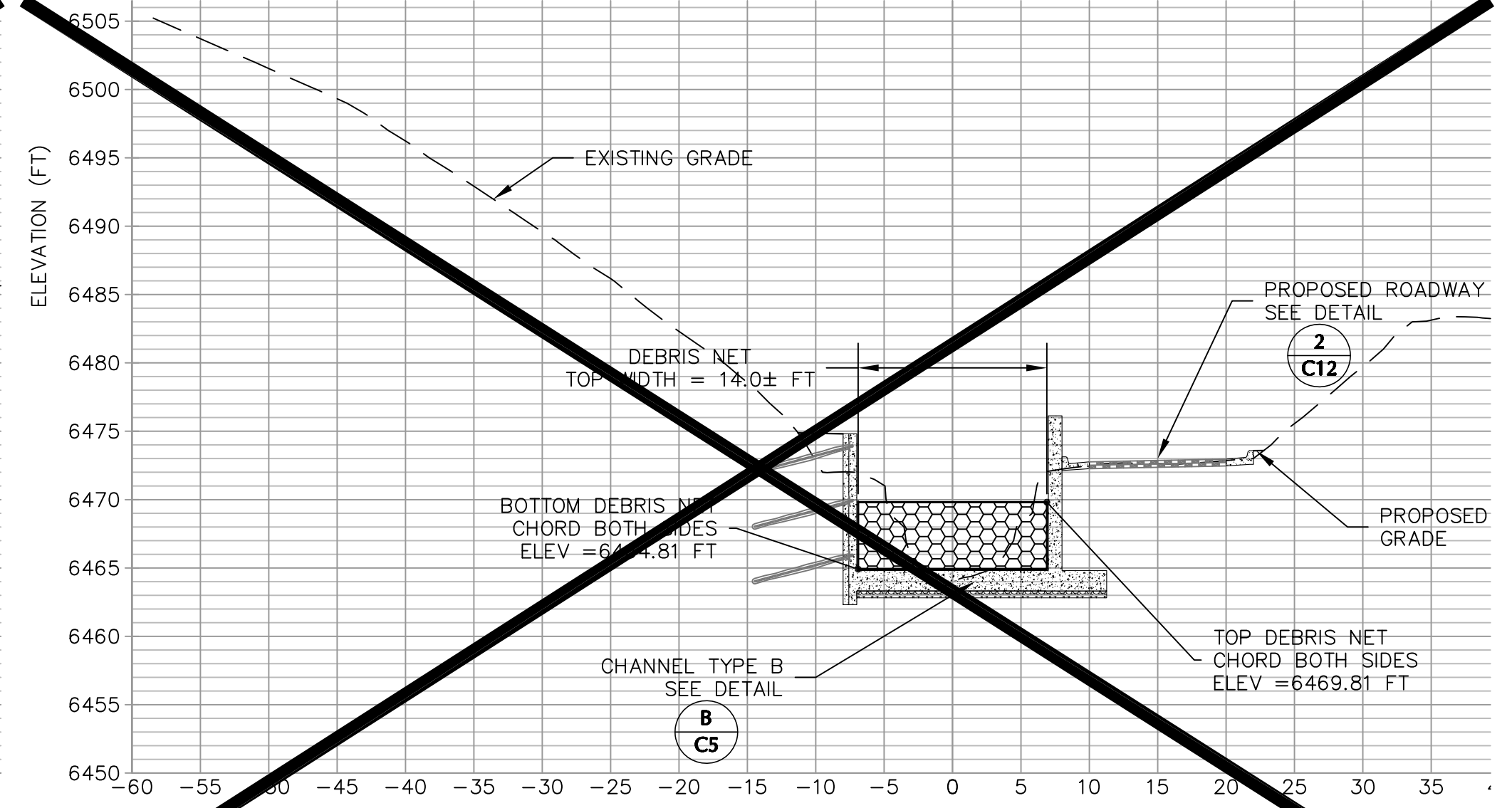


2
C6

DEBRIS NET SECTION: STATION 23+42.31

SCALE: 1"=10'-0"

0 5 10



3
C6

DEBRIS NET SECTION: STATION 25+35.36

SCALE: 1"=10'-0"

0 5 10

DO NOT CONSTRUCT - NOT PART OF THIS PROJECT - REMOVED PER OWNER REQUEST

DO NOT CONSTRUCT - NOT PART OF THIS PROJECT - REMOVED PER OWNER REQUEST

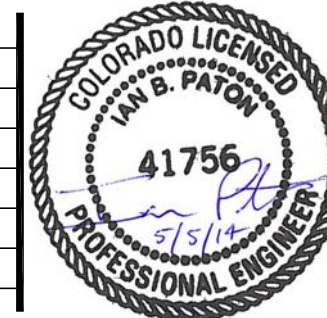
DEBRIS NET NOTES

1. DEBRIS NET CROSS SECTIONS AT UPPER DEBRIS NET AREA AND SEDIMENTATION BASIN AREA ARE SHOWN ON SHEETS C4 AND C7, RESPECTIVELY.
2. SEE STRUCTURAL SHEETS S6 AND S7 FOR DEBRIS NET TYPE AND ANCHORING DETAILS.
3. ALL DETAILS ON SHEET C6 FACING UPSTREAM.

Plot Date/Time: 05/05/2014, 04:42:14 PM; Z: PROJECT FILES\13\131-080\131-080.040\CAD-GIS\CAD_CD BID SET\SH C6.DWG-C6

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REVISIONS				REVISIONS			
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4	IBP	3/19/14	RELEASE FOR BID				
5	IBP	4/4/14	ADDENDUM 2				



	DATE
DESIGN	IBP/HAL/DAF/EJW 03/19/14
DETAIL	HAL 03/19/14
CHECK	JEJ/WFL 03/19/14
APPROVAL	
SCALE	AS NOTED
Sht C6.dwg	

Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

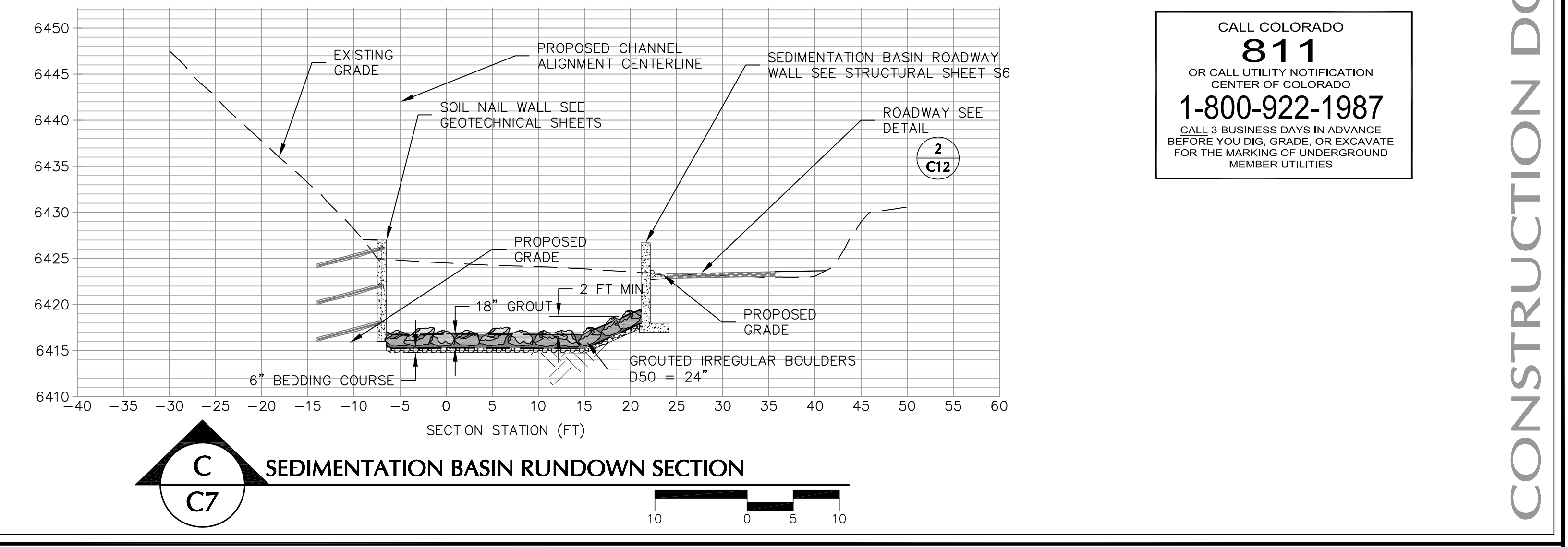
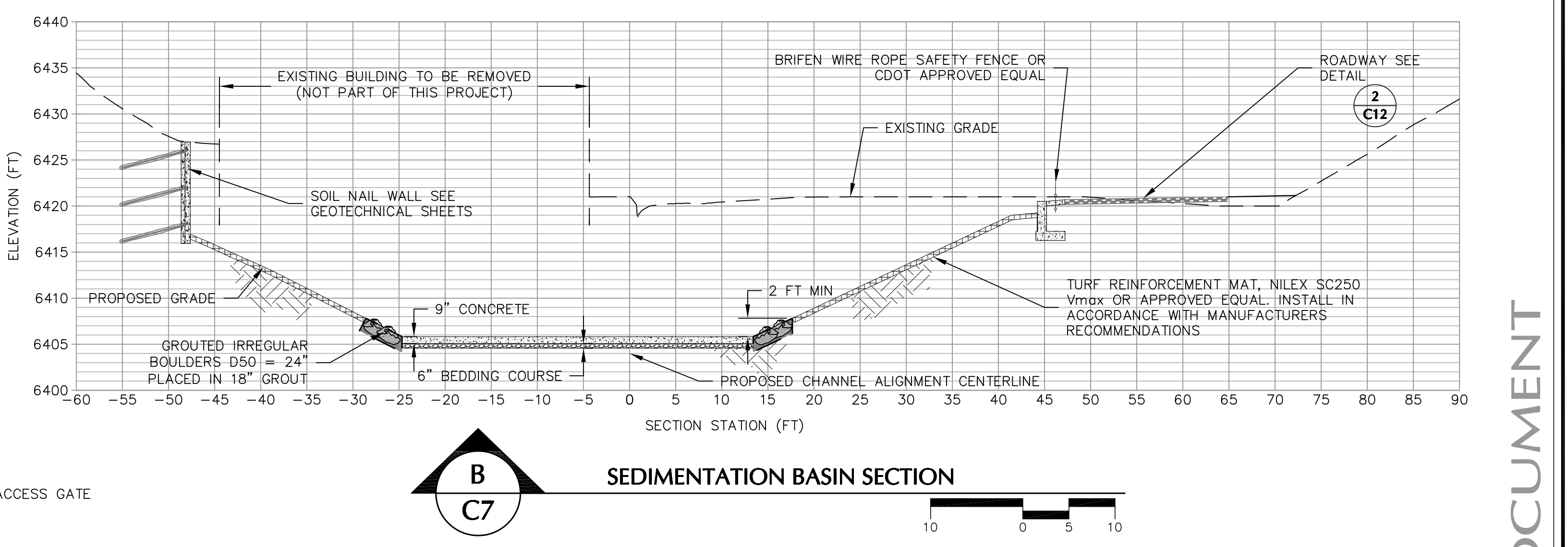
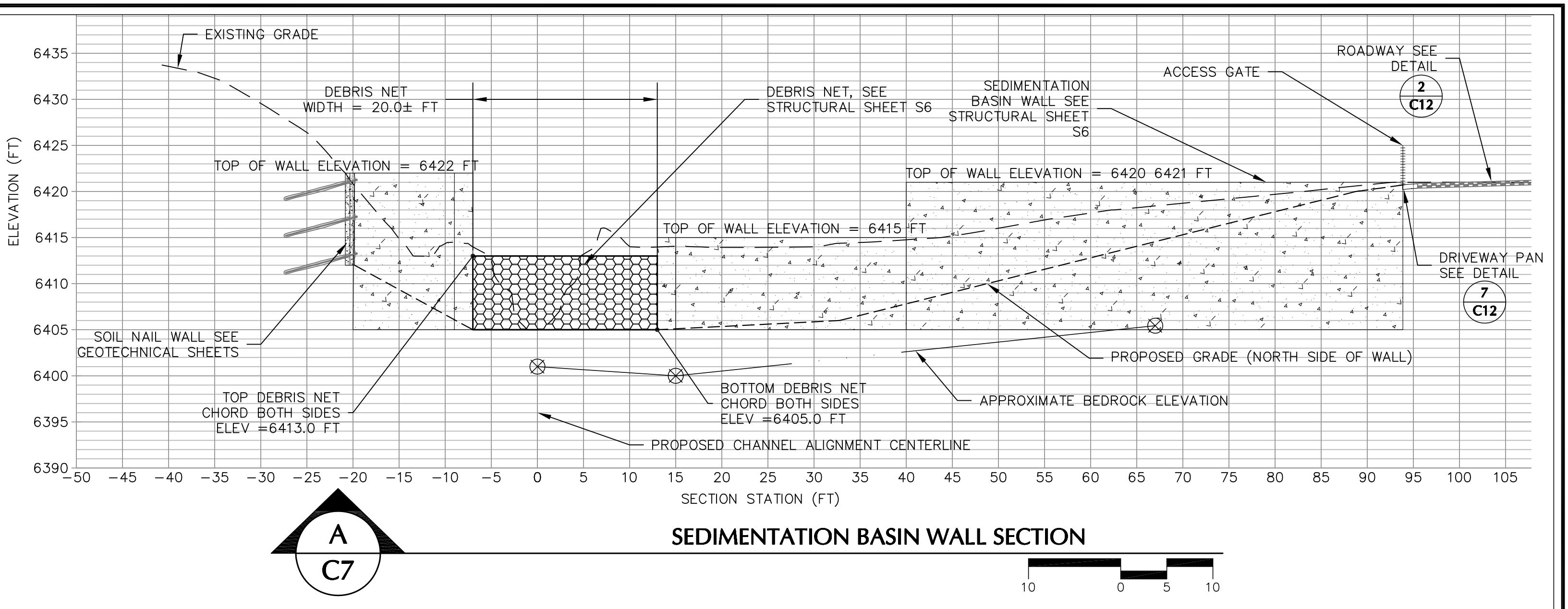
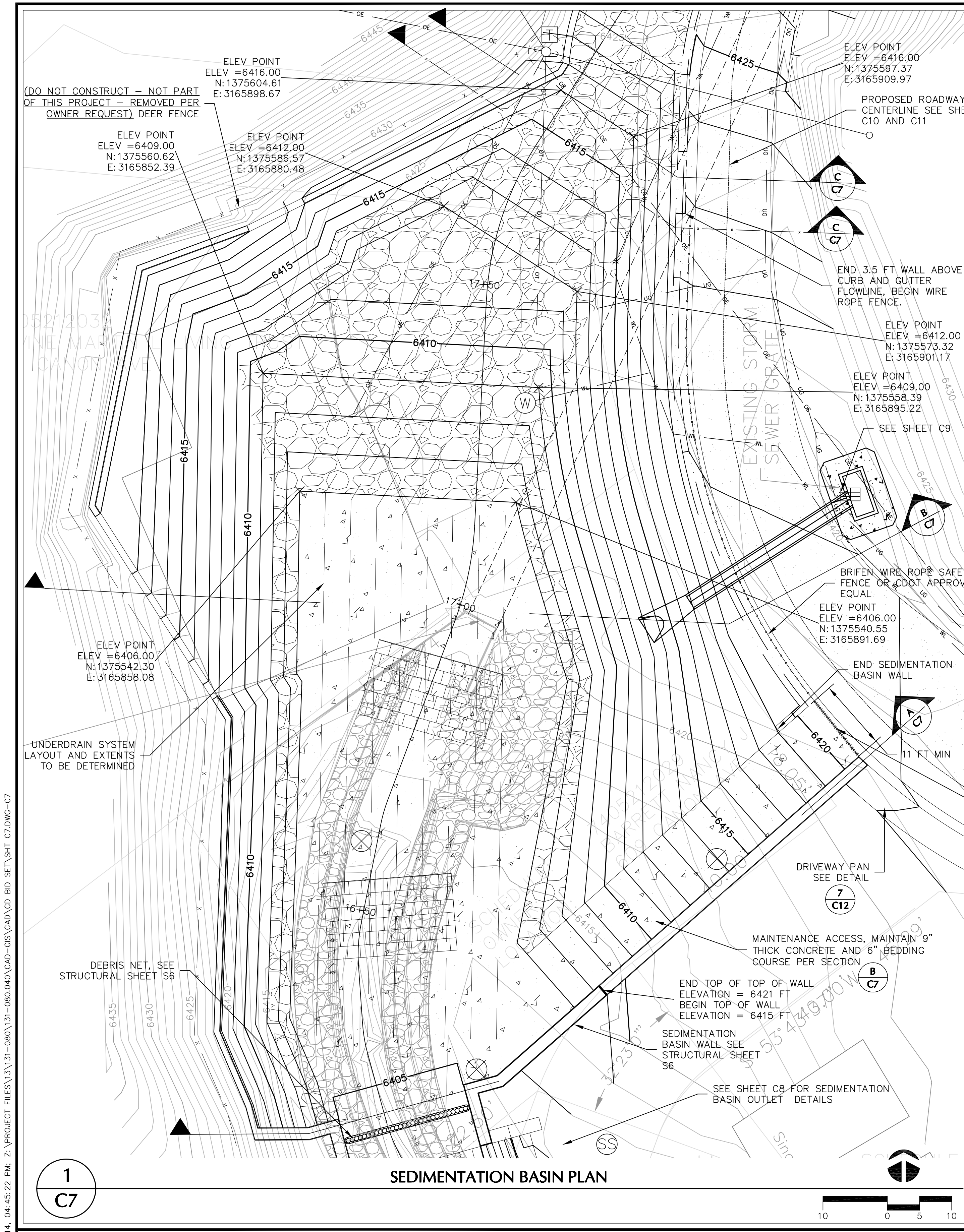
DEBRIS NET SECTION STA. 21+81.83

JOB NO.
131-080.040

REVISION NO.
3

SHEET NO.
C6

CONSTRUCTION DOCUMENT



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4	IBP	3/19/14	RELEASE FOR BID				
5	IBP	4/4/14	ADDENDUM 2				

COLORADO LICENSED
JAN B. PATTON
41756
PROFESSIONAL ENGINEER

DESIGN	DATE
IBP/HAL/DAF/EJW	03/19/14
DETAIL	HAL
CHECK	JEJ/WFL
APPROVAL	
SCALE	AS NOTED

Sht C7.dwg

Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

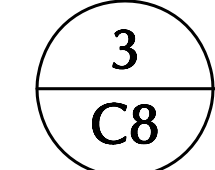
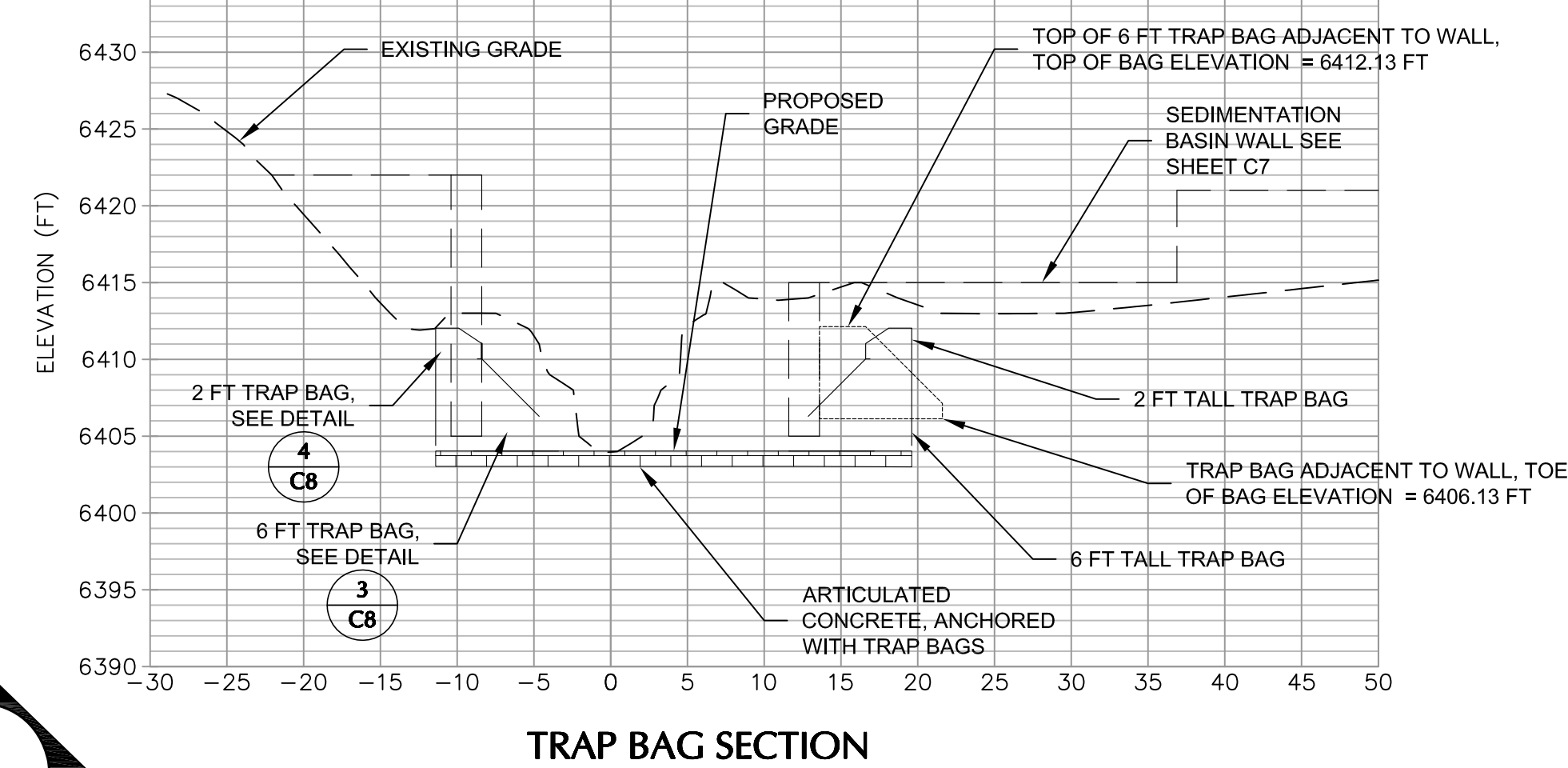
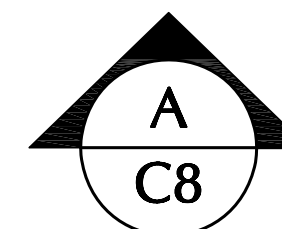
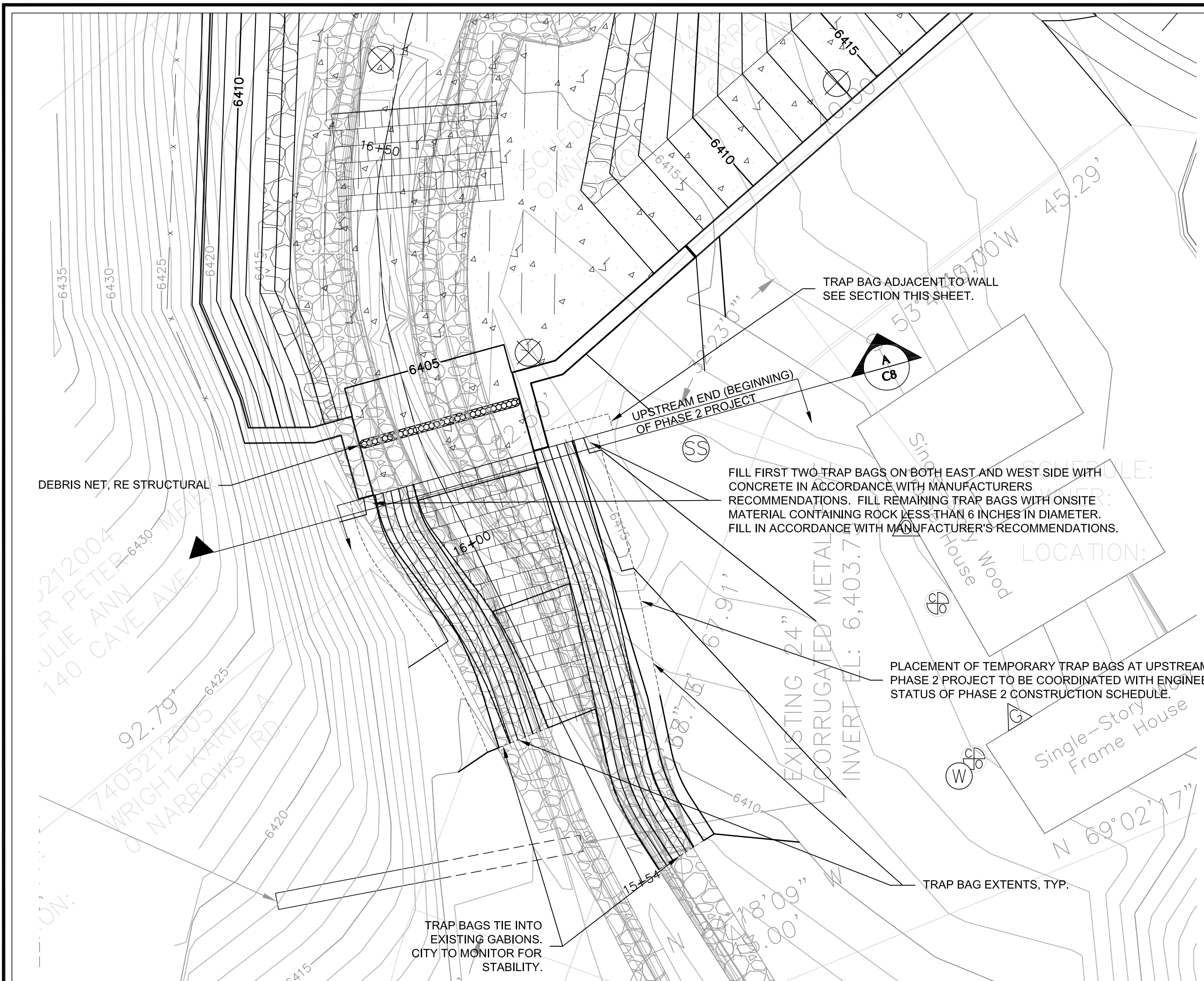
SEDIMENTATION BASIN AREA

JOB NO. 131-080.040
REVISION NO. 3
SHEET NO. C7

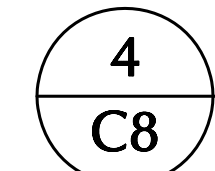
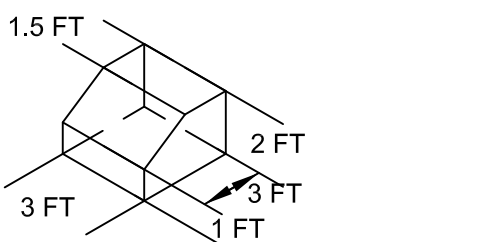
CONSTRUCTION DOCUMENT

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Plot Date/Time: 05/05/2014, 04:51:09 PM; Z: PROJECT FILES\13\131-080\131-080.040\CAD-GIS\CAD_CD BID SET\SH C8.DWG-C8 SEDIMENT

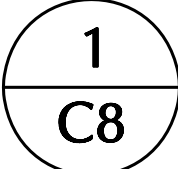


3
C8 6 FT TRAP BAG

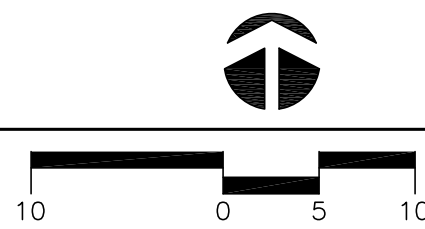


4
C8 2 FT TRAP BAG

CALL COLORADO
811
OR CALL UTILITY NOTIFICATION
CENTER OF COLORADO
1-800-922-1987
CALL 3-BUSINESS DAYS IN ADVANCE
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1
C8 SEDIMENTATION BASIN OUTLET PLAN



CONSTRUCTION DOCUMENT

WWE WRIGHT WATER ENGINEERS, INC.
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(303)480-1700 FAX(303)480-1020

REVISIONS				CHANGES			
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4	IBP	3/19/14	RELEASE FOR BID				
5	IBP	4/4/14	ADDENDUM 2				



	DATE
DESIGN	IBP/HAL/DAF/EJW 03/19/14
DETAIL	HAL 03/19/14
CHECK	JEJ/WFL 03/19/14
APPROVAL	
SCALE	AS NOTED
SH: C8.dwg	

Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

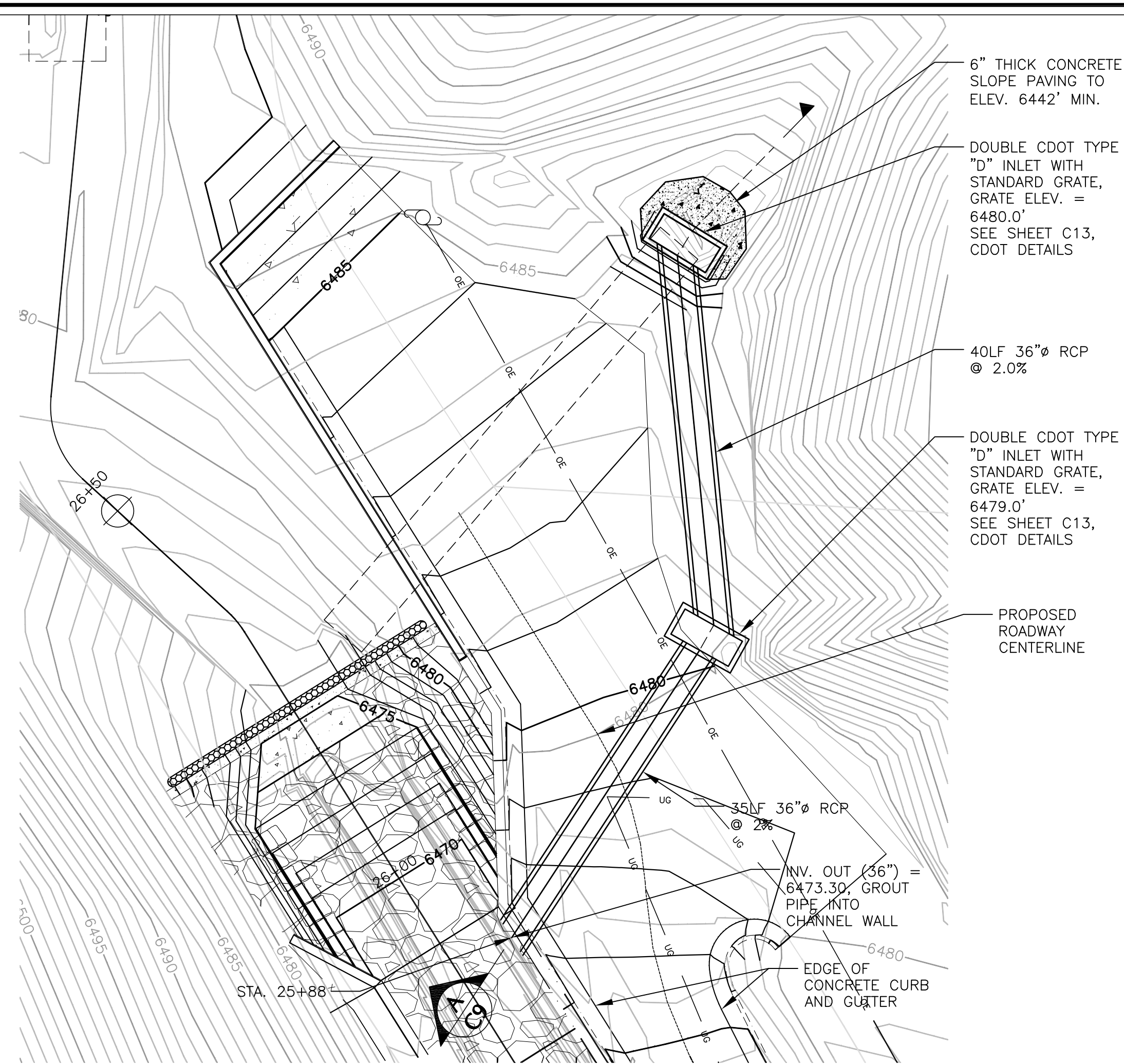
**SEDIMENTATION BASIN
AND OUTLET DETAILS**

JOB NO.
131-080.040

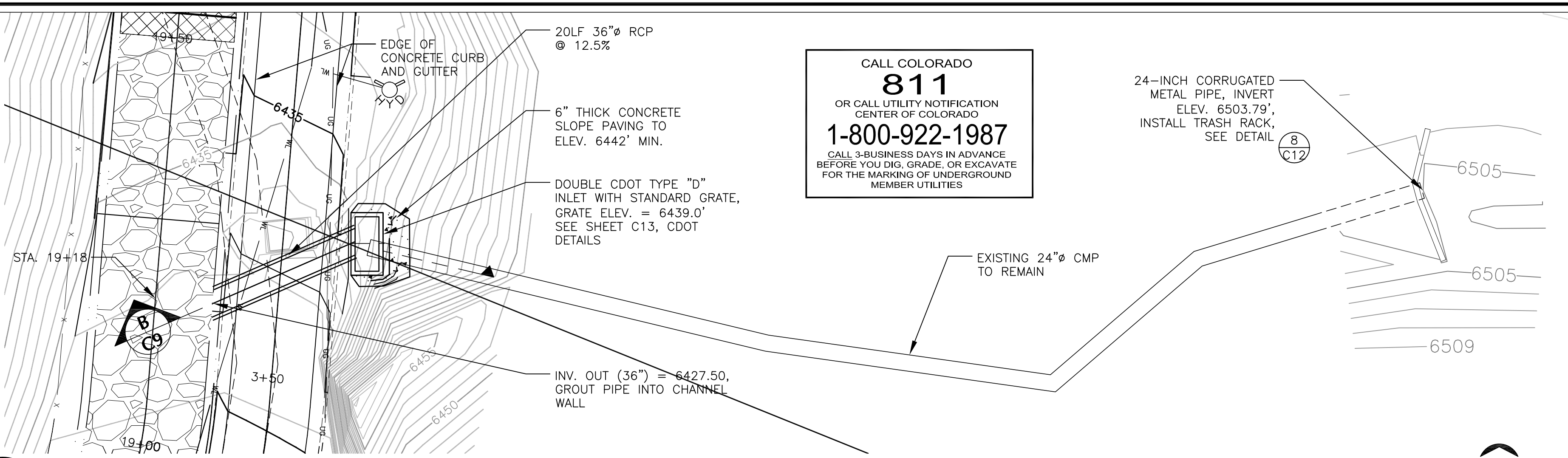
REVISION NO.
3

SHEET NO.
C8

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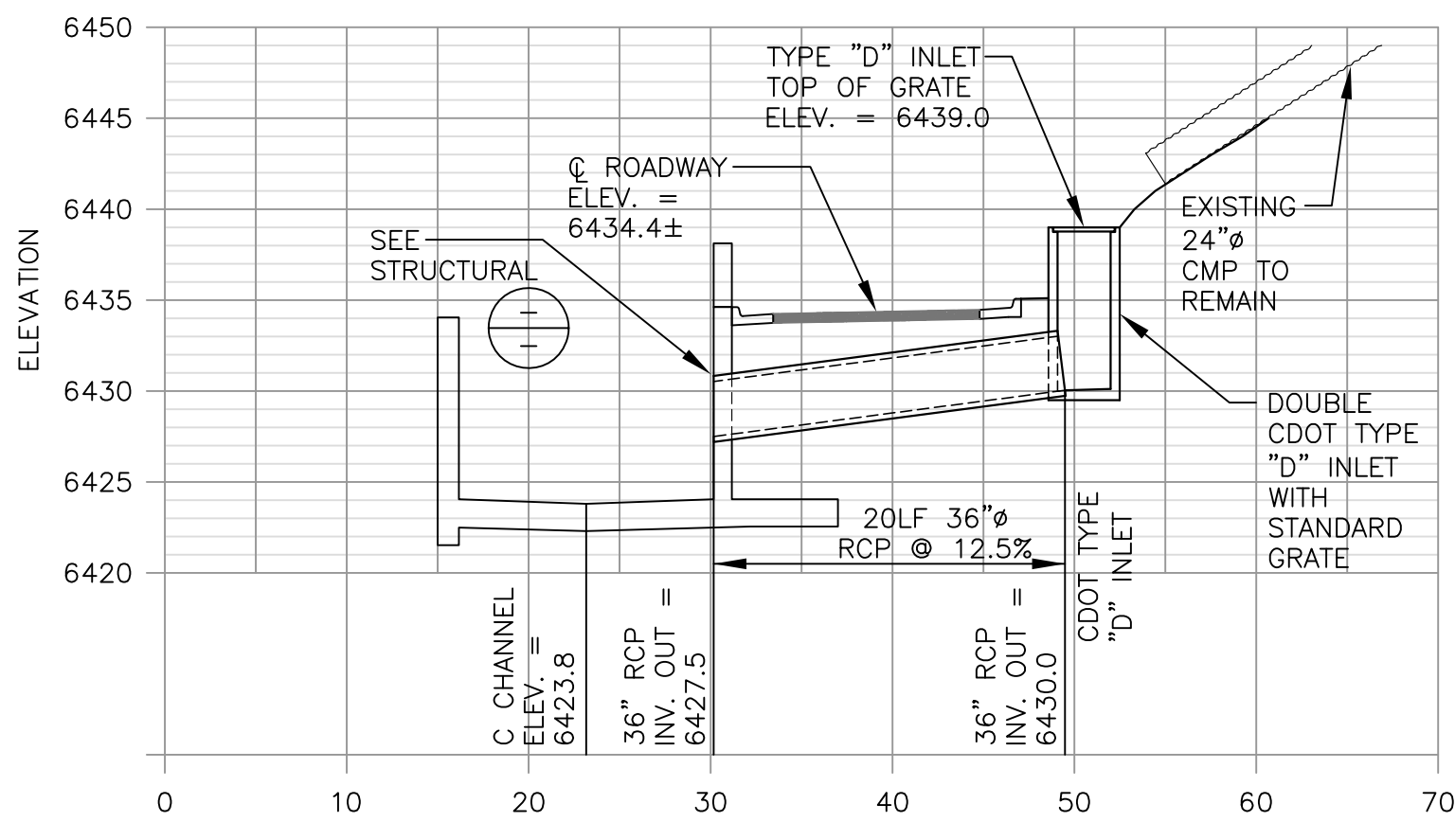
AREA 1 - UPPER CHANNEL STORM SEWER PLAN



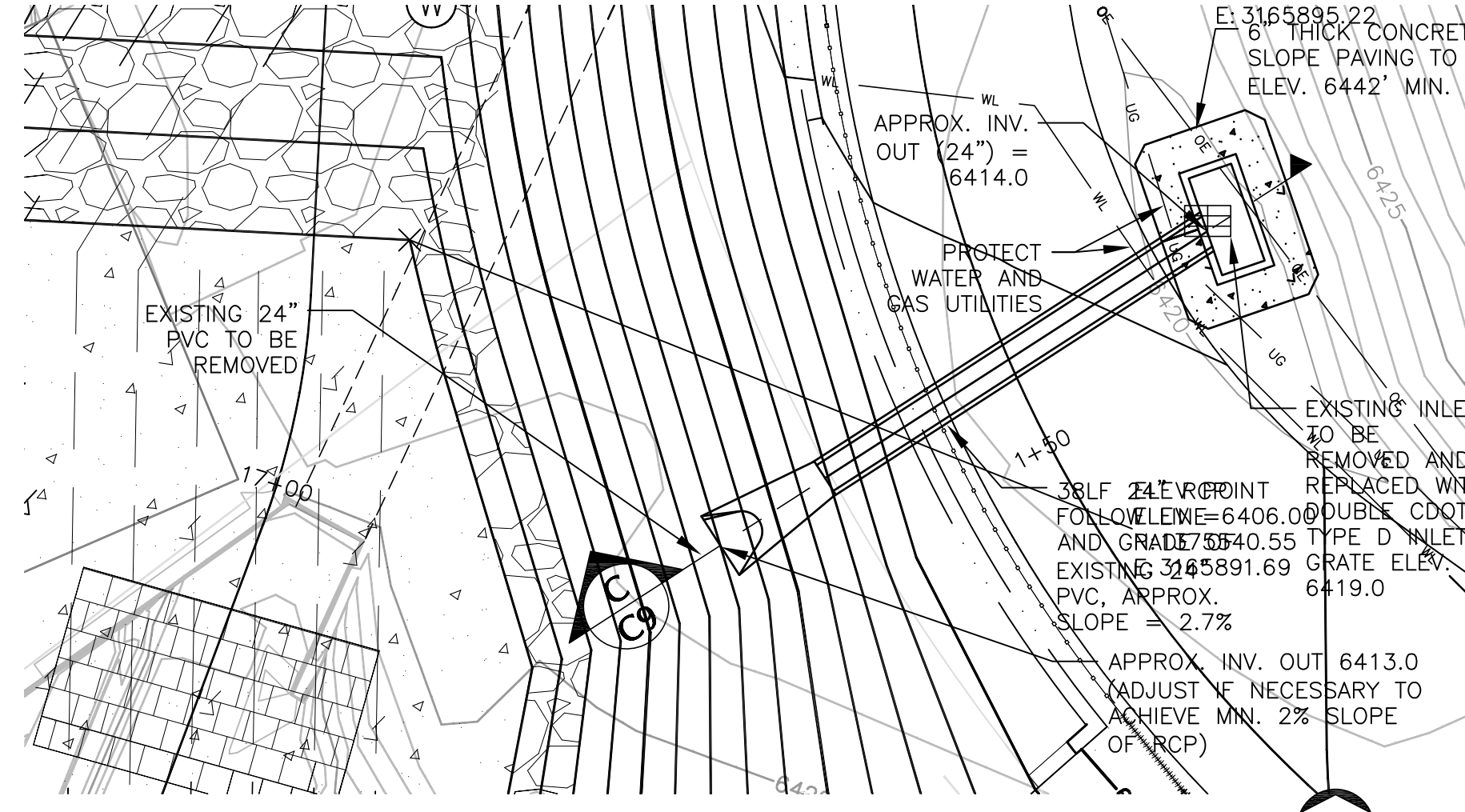
AREA 2 - UNDERPASS STORM SEWER PLAN

CALL COLORADO
811
OR CALL UTILITY NOTIFICATION
CENTER OF COLORADO
1-800-922-1987
CALL 3-BUSINESS DAYS IN ADVANCE
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FOR THE MARKING OF UNDERGROUND
MEMBER UTILITIES

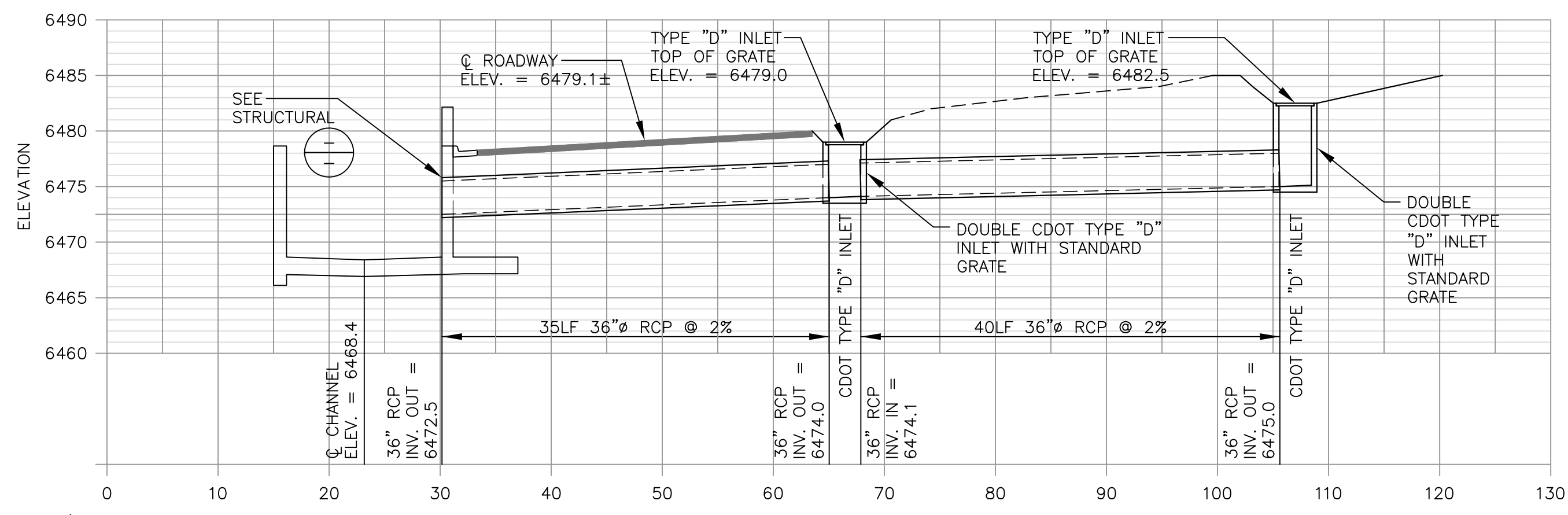
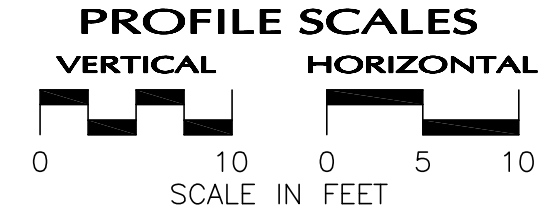
24-INCH CORRUGATED
METAL PIPE, INVERT
ELEV. 6503.79',
INSTALL TRASH RACK,
SEE DETAIL



AREA 2 - UNDERPASS STORM SEWER PROFILE



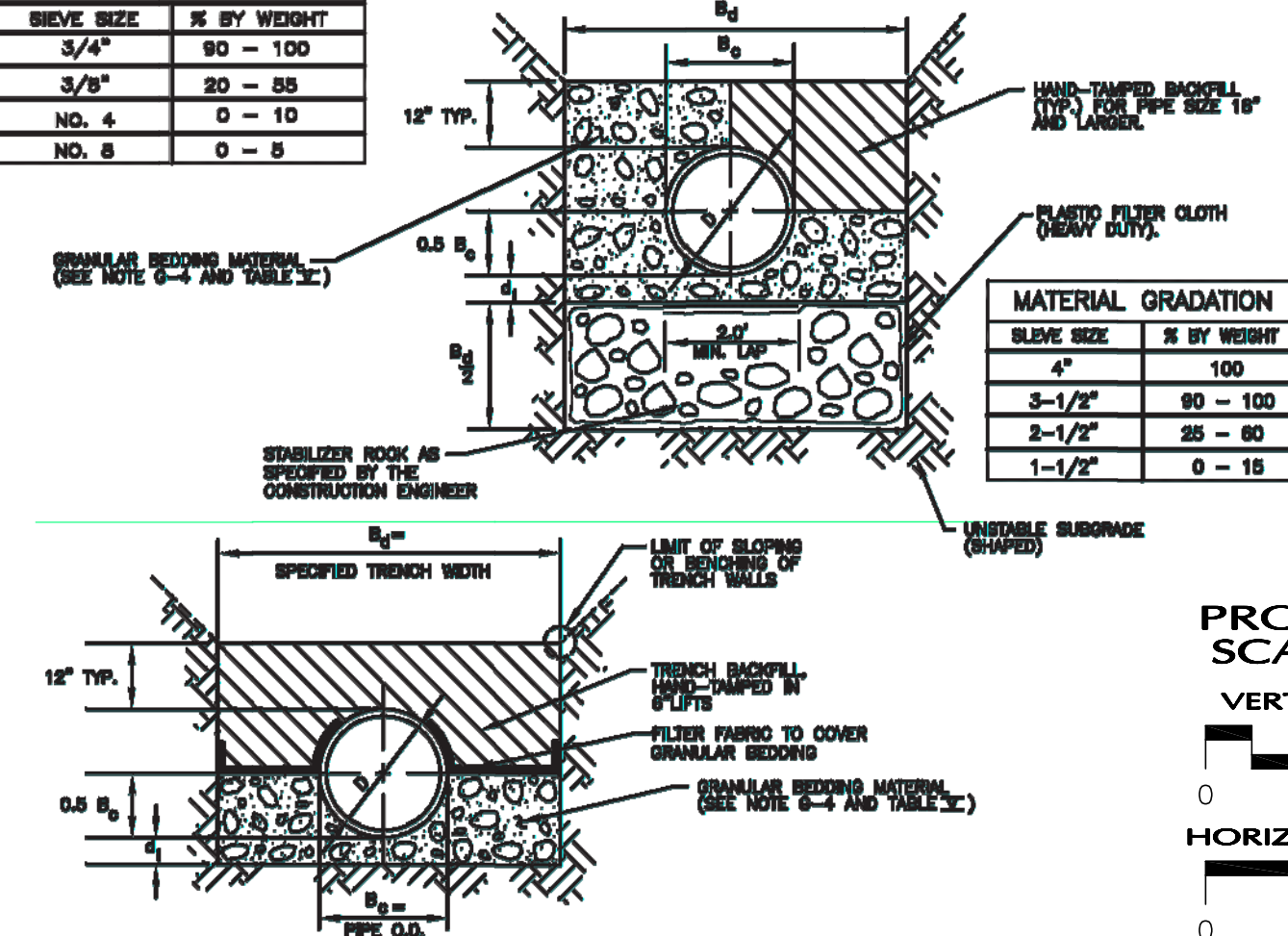
AREA 3 - LOW POINT STORM SEWER PLAN



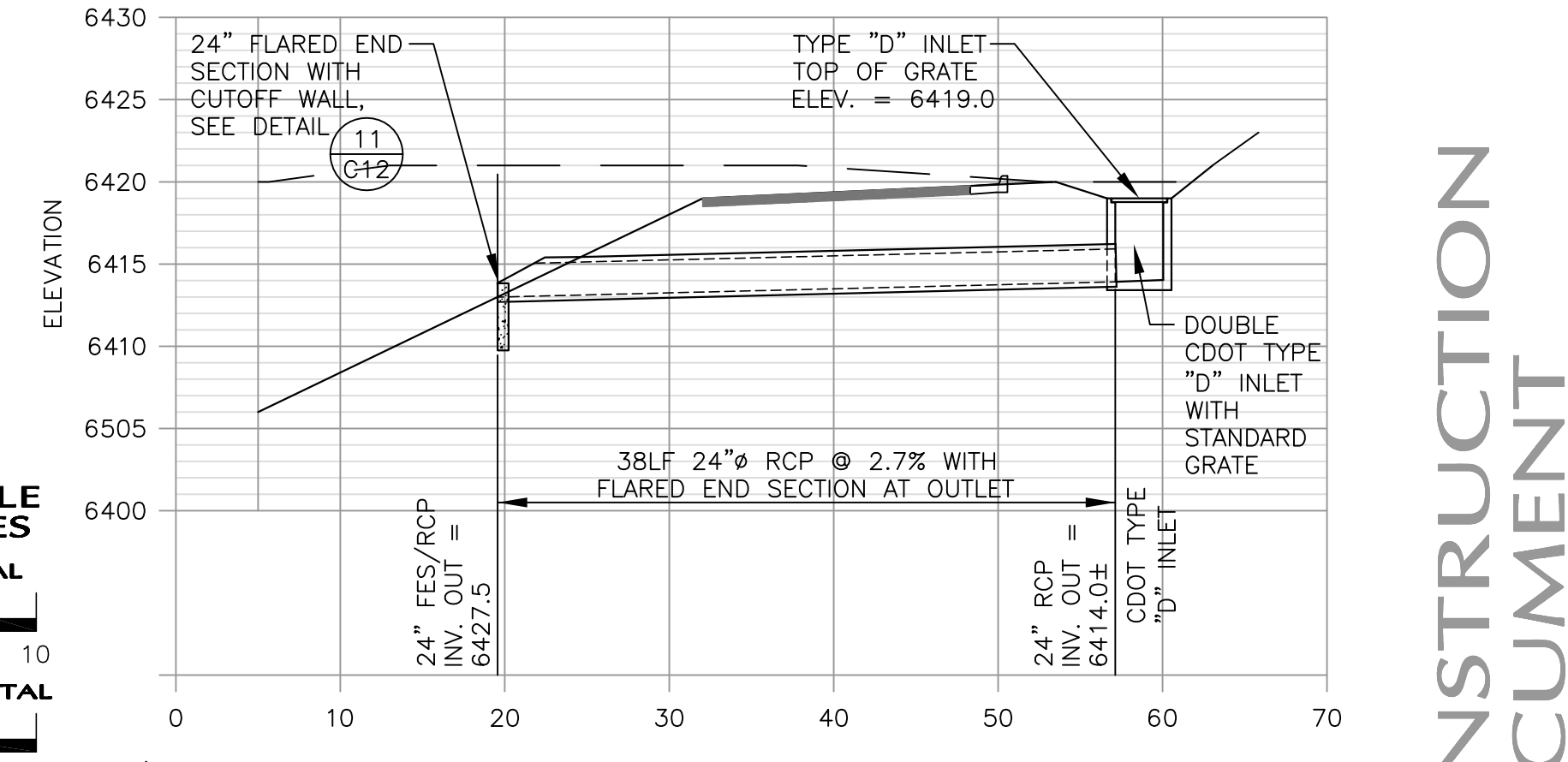
AREA 1 - UPPER CHANNEL STORM SEWER PROFILE

TABLE V
CLASS 67 GRADATION
ASTM D-2939

SIEVE SIZE	% BY WEIGHT
3/4"	90 - 100
3/8"	20 - 55
No. 4	0 - 10
No. 6	0 - 5



TRENCHING AND BEDDING DETAIL



AREA 3 - LOW POINT STORM SEWER PROFILE

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DESIGN	DATE
IBP/HAJ/DAF/EJW	03/19/14
DETAIL	KAL
CHECK	JEJ/WFL
APPROVAL	03/19/14
SCALE	AS NOTED
Sht C9.dwg	

Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

STORM SEWER PLANS & PROFILES

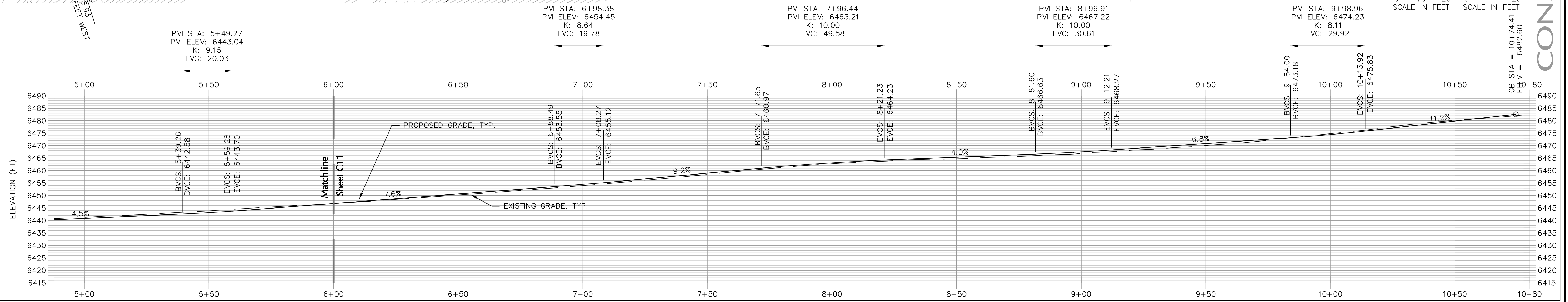
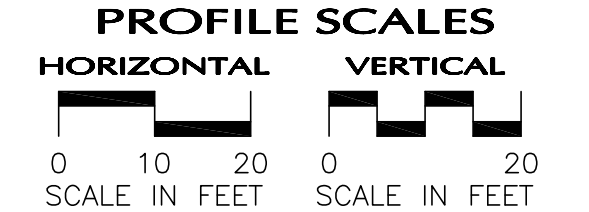
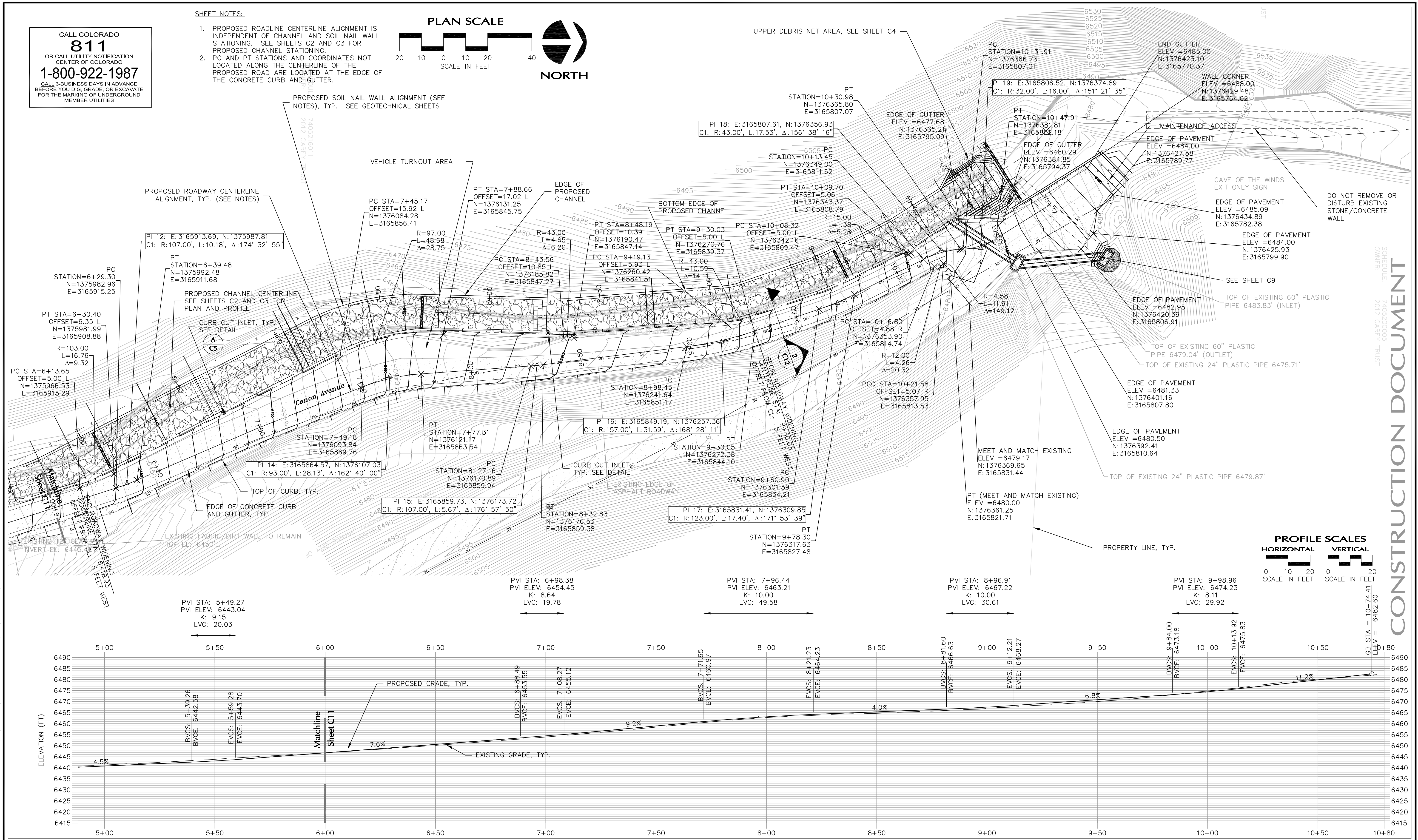
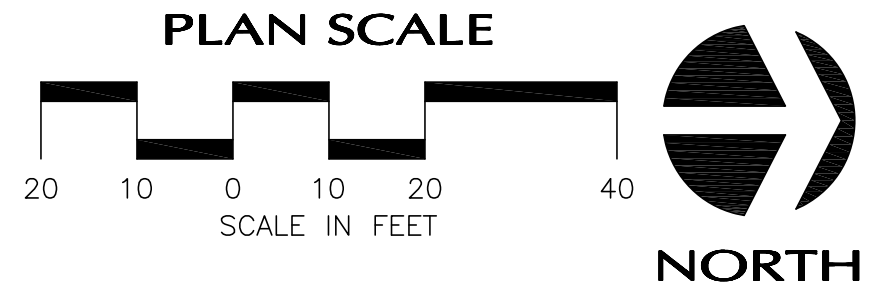
JOB NO. 131-080.040
REVISION NO. 3
SHEET NO. C9

CONSTRUCTION DOCUMENT

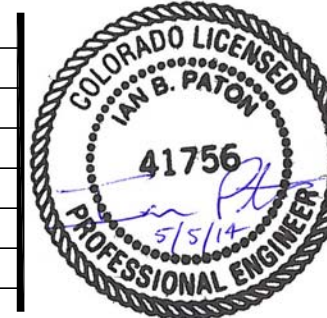
CALL COLORADO
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1-800-922-1987
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FOR THE MARKING OF UNDERGROUND
MEMBER UTILITIES

SHEET NOTES:

1. PROPOSED ROADLINE CENTERLINE ALIGNMENT IS INDEPENDENT OF CHANNEL AND SOIL NAIL WALL STATIONING. SEE SHEETS C2 AND C3 FOR PROPOSED CHANNEL STATIONING.
2. PC AND PT STATIONS AND COORDINATES NOT LOCATED ALONG THE CENTERLINE OF THE PROPOSED ROAD ARE LOCATED AT THE EDGE OF THE CONCRETE CURB AND GUTTER.



REVISIONS				CHANGES			
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5	IBP	4/4/14	ADDENDUM 2				



DESIGN	DATE
IBP/HAL/DAF/EJW	03/19/14
DETAIL	HAL
CHECK	JEJ/WFL
APPROVAL	AS NOTED
SCALE	
Sht C10.dwg	

**Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I**

**ROADWAY PLAN AND PROFILE
STA 6+00 TO 10+80 AND
SOIL NAIL WALL STATIONING**

JOB NO. 131-080.040
REVISION NO. 3
SHEET NO. C10

WWE WRIGHT WATER ENGINEERS, INC.
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DENVER, CO 80211
(303)480-1700 FAX(303)480-1020

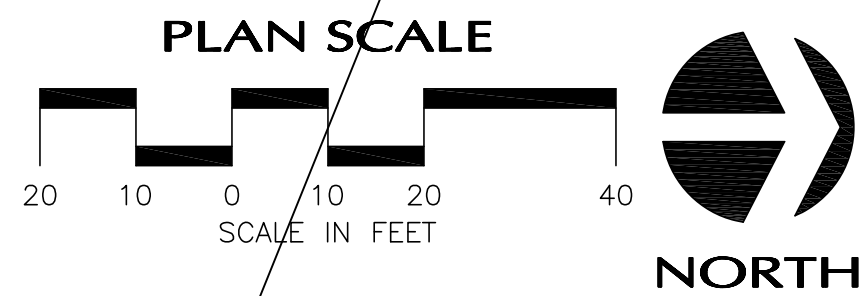
CONSTRUCTION DOCUMENT
SCHEDULE: 7/20/2013
OWNER: 2012 CANEY TRUST

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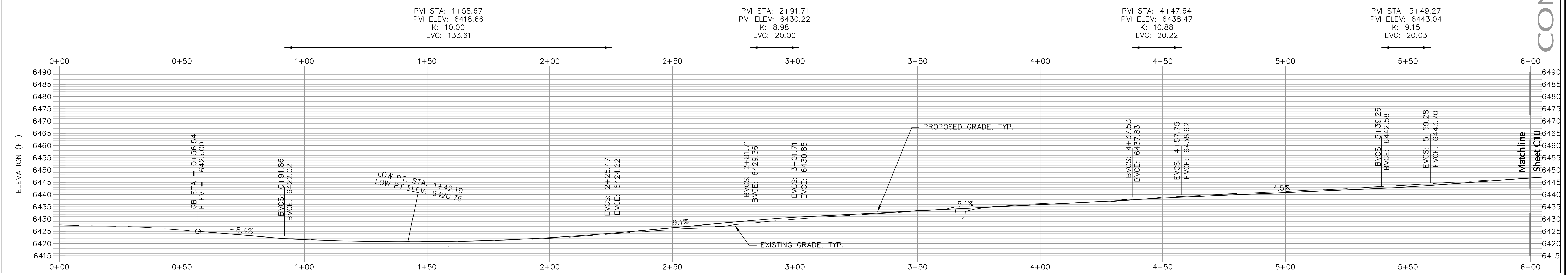
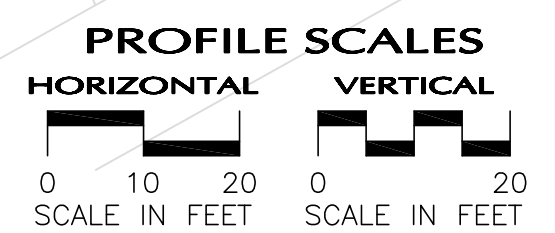
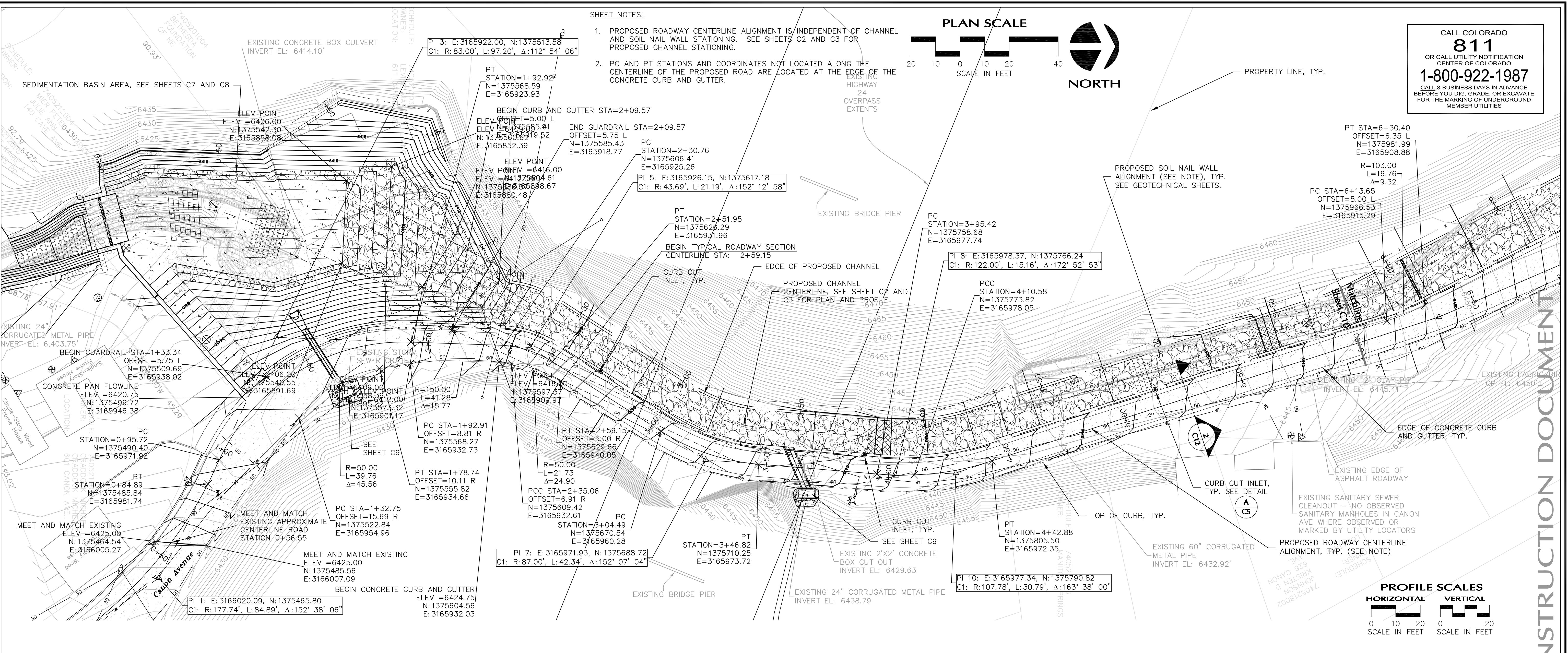
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SHEET NOTES:

1. PROPOSED ROADWAY CENTERLINE ALIGNMENT IS INDEPENDENT OF CHANNEL AND SOIL NAIL WALL STATIONING. SEE SHEETS C2 AND C3 FOR PROPOSED CHANNEL STATIONING.
2. PC AND PT STATIONS AND COORDINATES NOT LOCATED ALONG THE CENTERLINE OF THE PROPOSED ROAD ARE LOCATED AT THE EDGE OF THE CONCRETE CURB AND GUTTER.

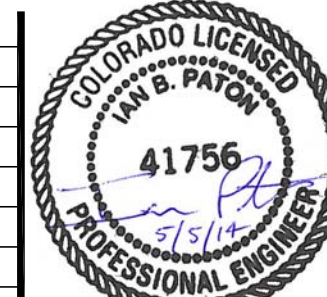


CALL COLORADO
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CENTER OF COLORADO
1-800-922-1987
CALL 3-BUSINESS DAYS IN ADVANCE
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DENVER, CO 80211
(303)480-1700 FAX(303)480-1020

REVISIONS				COMMENTS			
NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION
1	IBP	1/22/14	30% DESIGN SUBMITTAL	1	IBP	5/1/14	RELEASE FOR CONSTRUCTION
2	IBP	2/27/14	60% DESIGN SUBMITTAL				
3	IBP	3/11/14	BID SET FOR NRCS REVIEW				
4	IBP	3/19/14	RELEASE FOR BID				
5	IBP	4/4/14	ADDENDUM 2				

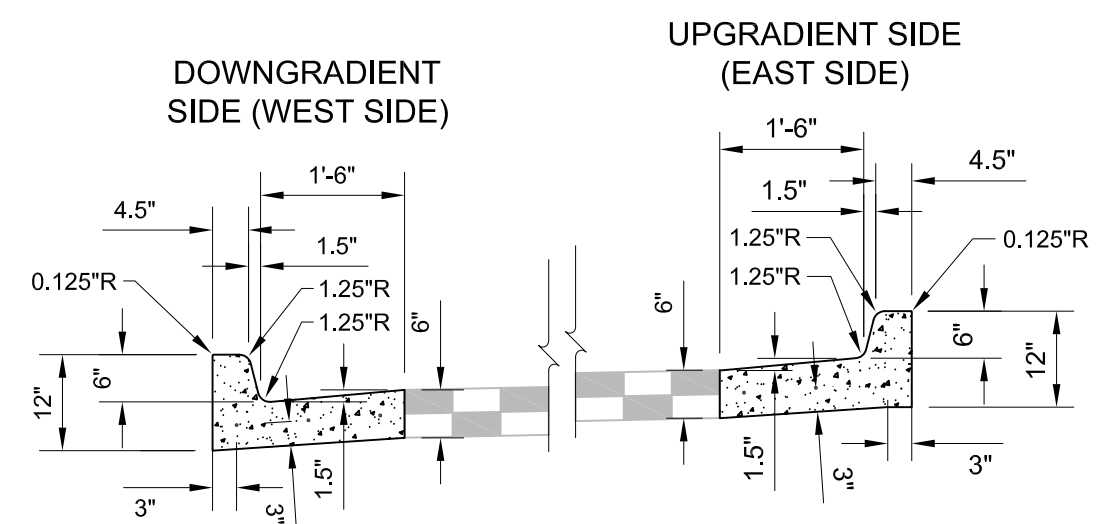


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03/19/14	CHECK JEJ/WFL
	APPROVAL
	SCALE AS NOTED

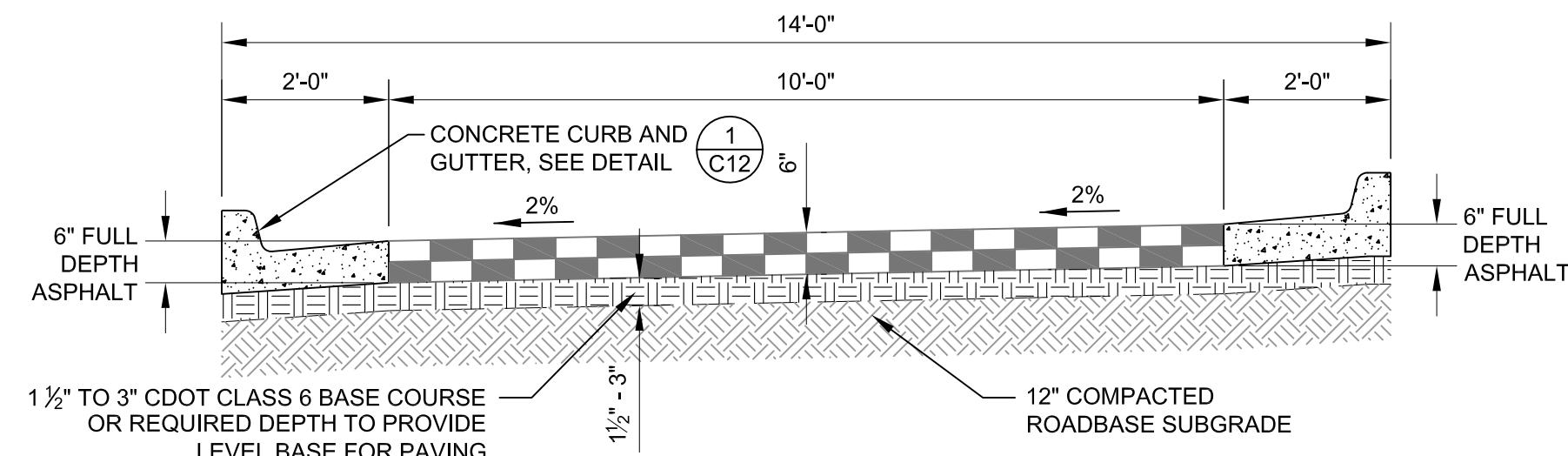
**Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I**

**ROADWAY PLAN AND PROFILE
STA 0+00 to 6+00 AND
SOIL NAIL WALL STATIONING**

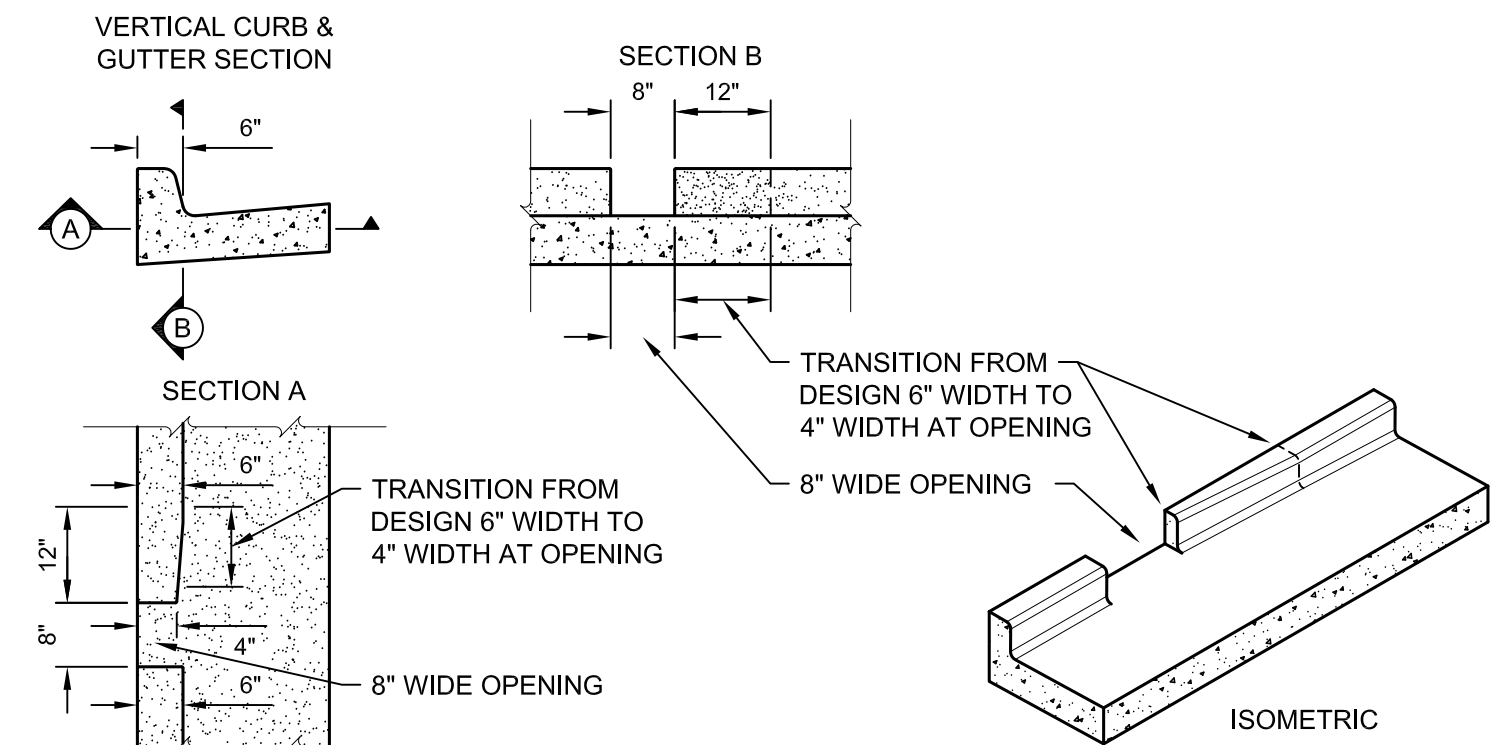
JOB NO. 131-080.040
REVISION NO. 3
SHEET NO. C11



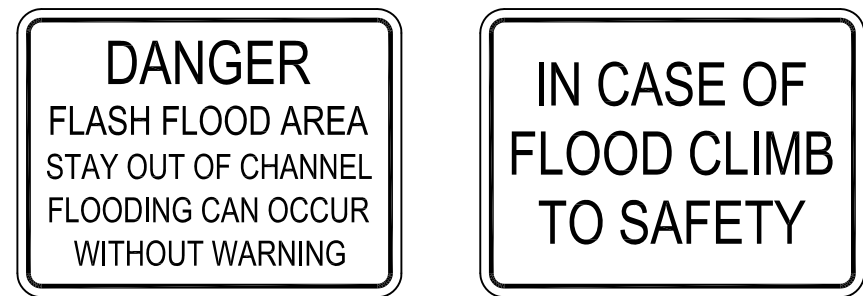
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C12
VERTICAL CURB AND GUTTER DETAIL
NOT TO SCALE



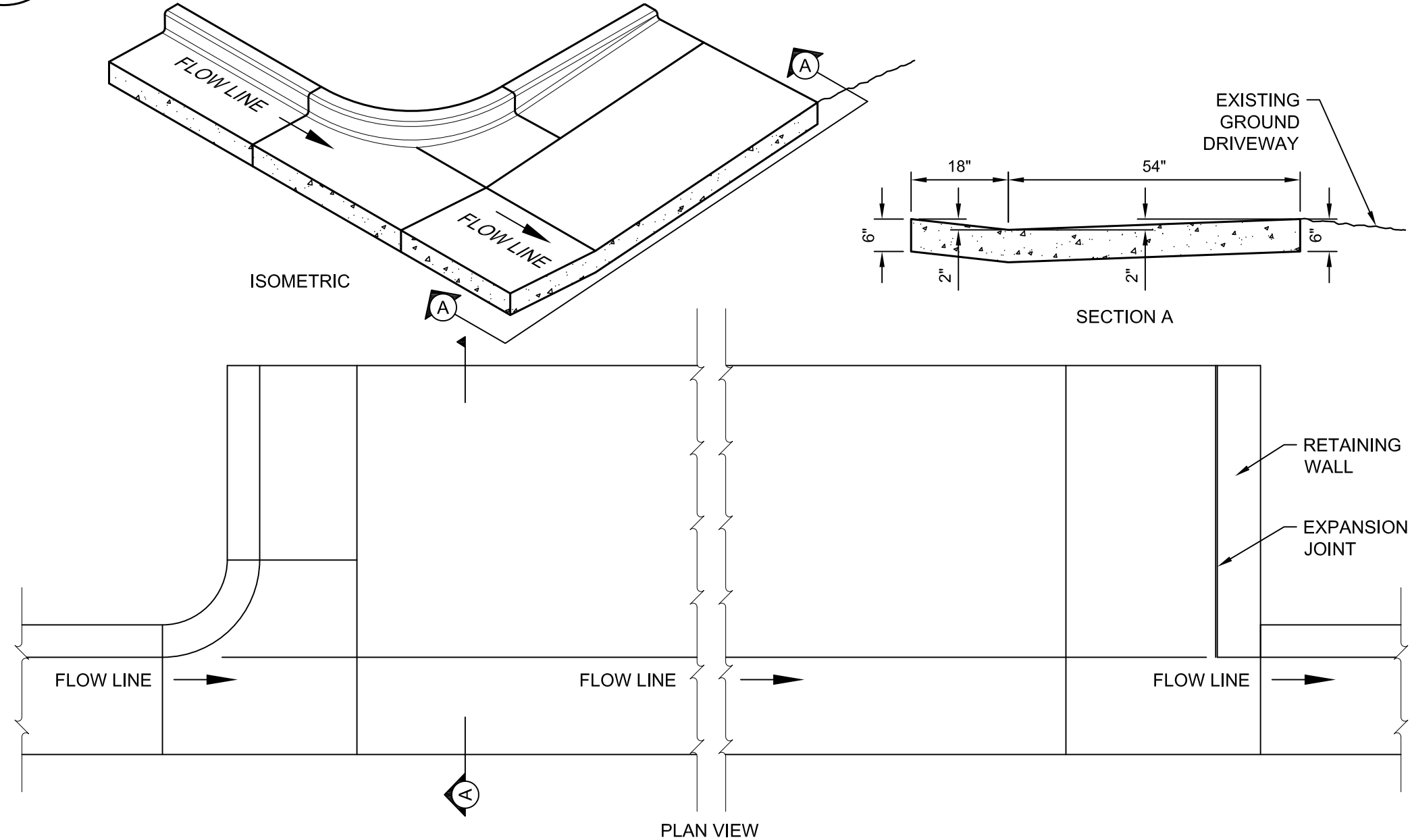
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C12
ROADWAY WITH VERTICAL CURB AND GUTTER DETAIL
NOT TO SCALE



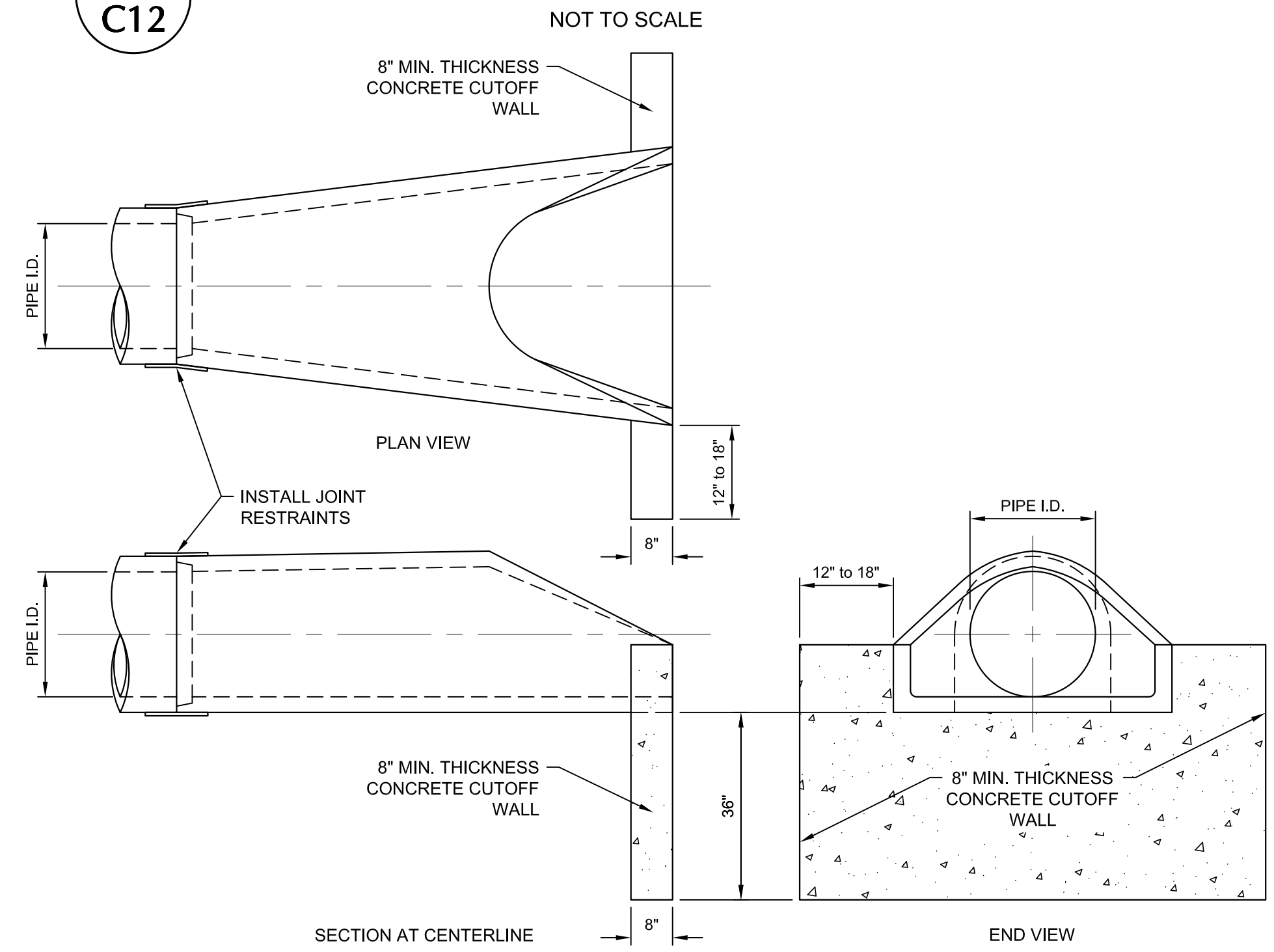
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C12
CURB CUT INLET DETAIL
NOT TO SCALE



4
C12
FLASH FLOOD WARNING SIGNS
NOT TO SCALE



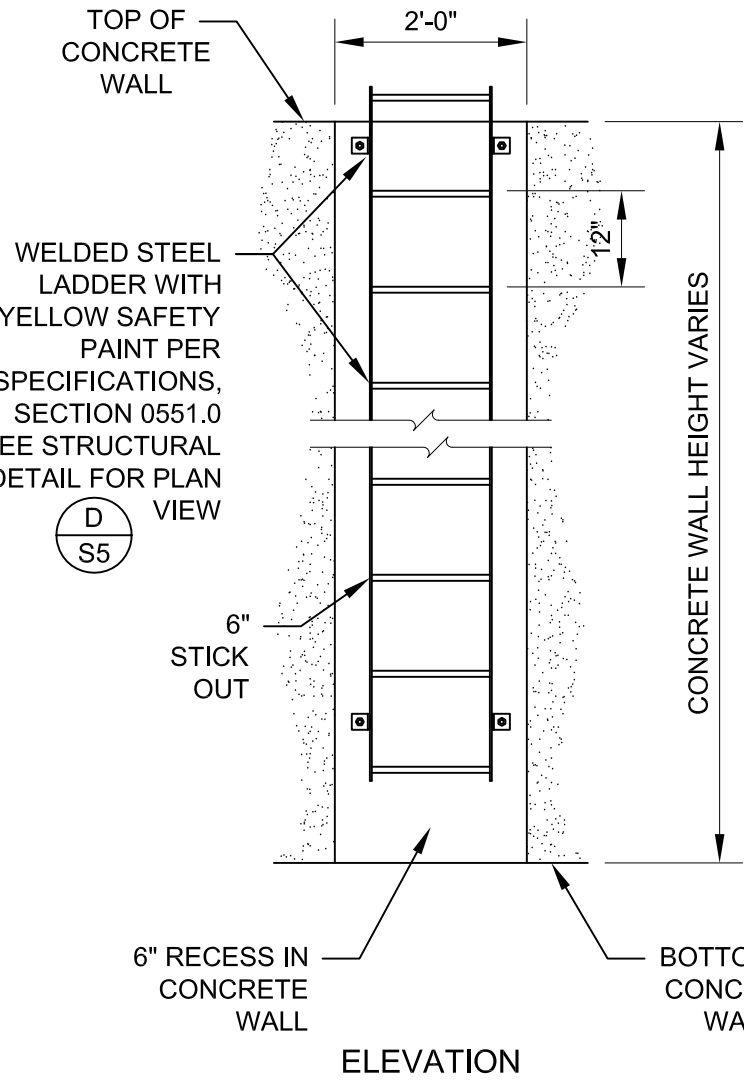
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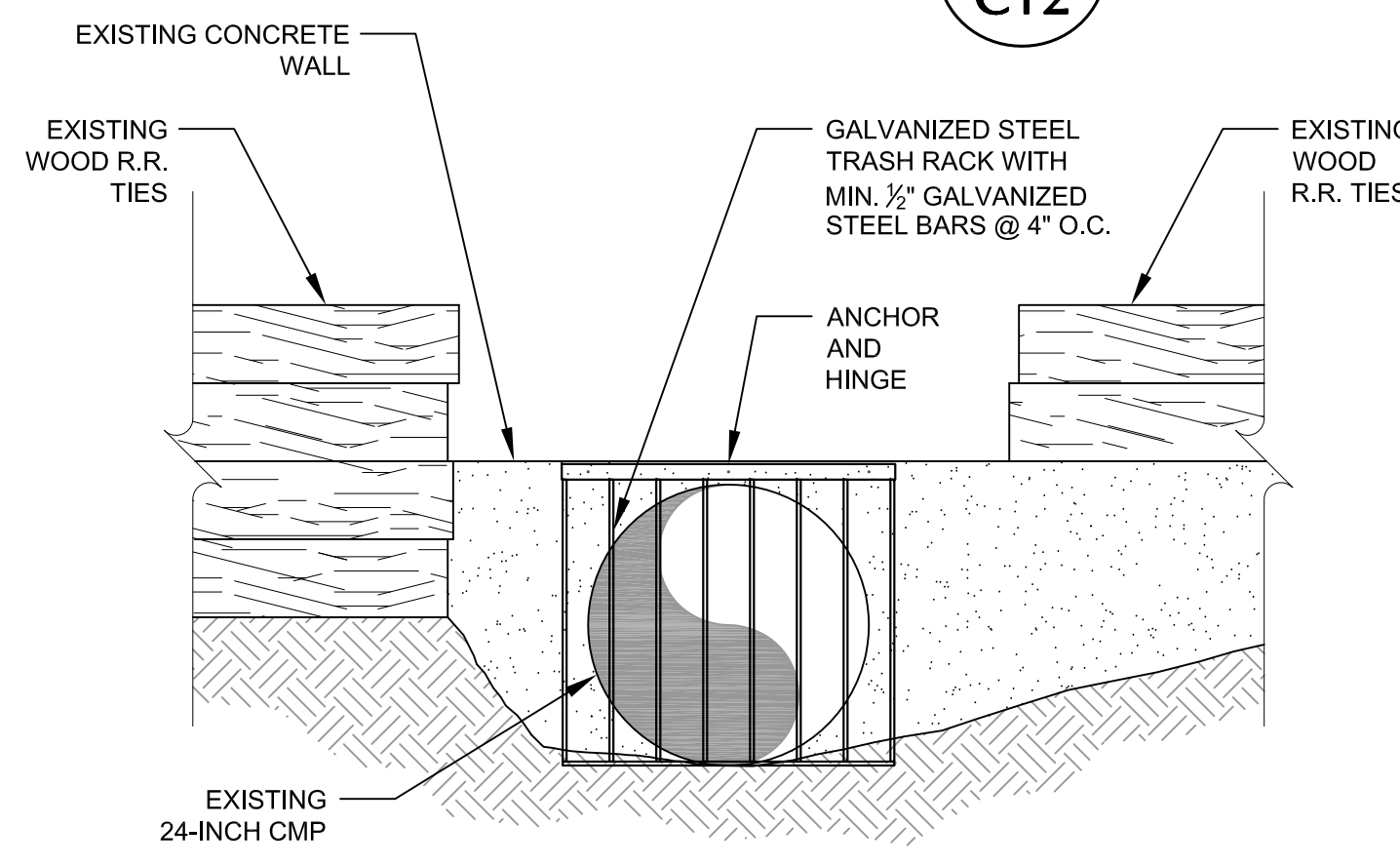
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CONCRETE FLARED END SECTION WITH CUTOFF WALL
NOT TO SCALE



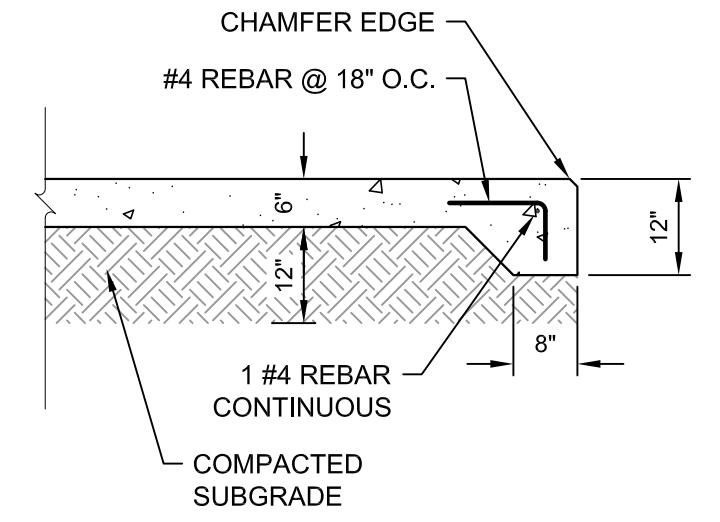
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STANDARD REGULATORY SIGNS
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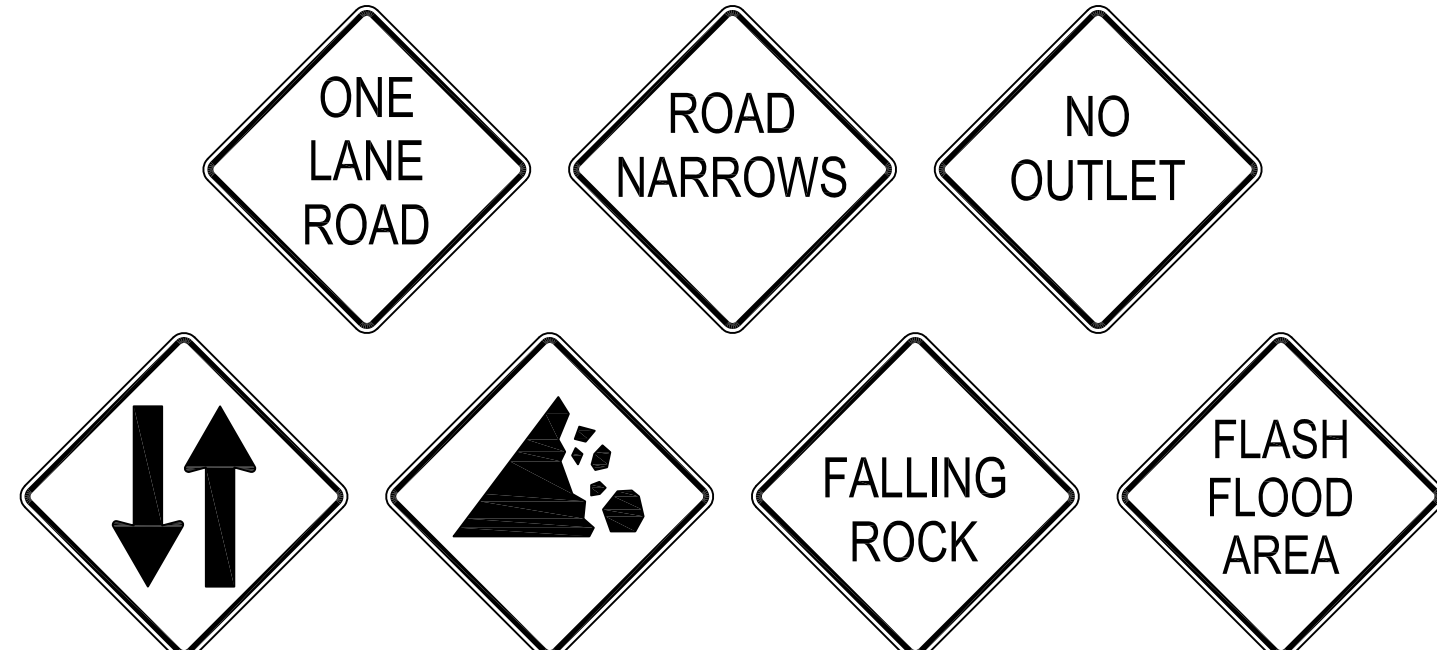
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C12
EMERGENCY EGRESS LADDER
NOT TO SCALE



8
C12
TRASH RACK DETAIL
NOT TO SCALE



11
C12
CONCRETE PAVEMENT THICKENED EDGE
NOT TO SCALE



6
C12
STANDARD WARNING SIGNS
NOT TO SCALE

REVISIONS				CREVISIONS			
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5	IBP	4/4/14	ADDENDUM 2				



DESIGN	DATE
DAF/IBP/HAL/EJW	03/19/14
DETAIL	KAL
CHECK	JEU/WFL
APPROVAL	
SCALE	AS NOTED
Sht C12.dwg	

Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

ROADWAY AND SITE DETAILS

JOB NO.
131-080.040

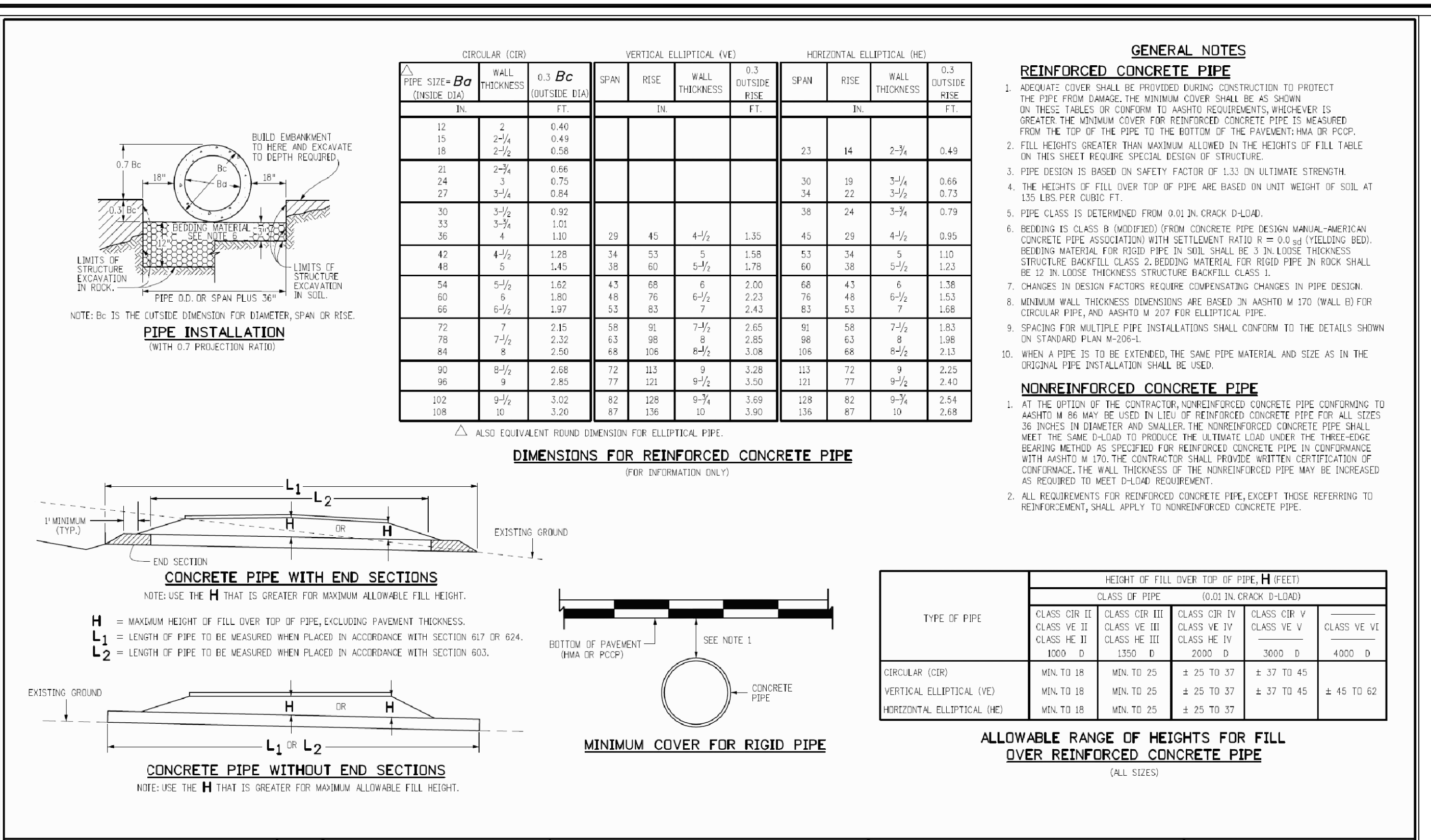
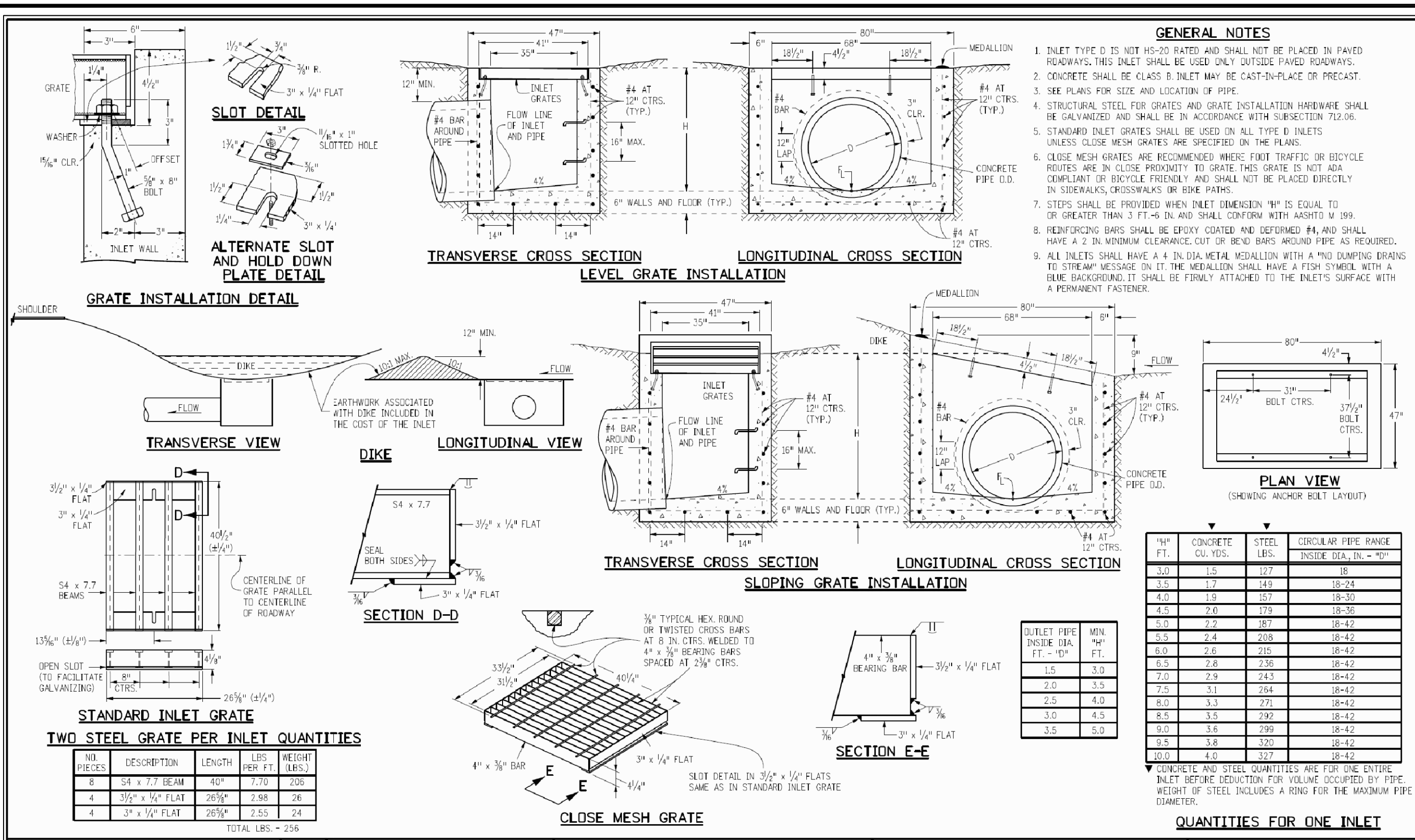
REVISION NO.
3

SHEET NO.
C12

Plot Date/Time: 05/05/2014, 05:01:10 PM; Z: \\PROJECT FILES\131-080\131-080.040\CAD-GIS\CAD-BID SET\SH1 C12.DWG-C12 ROADWAY

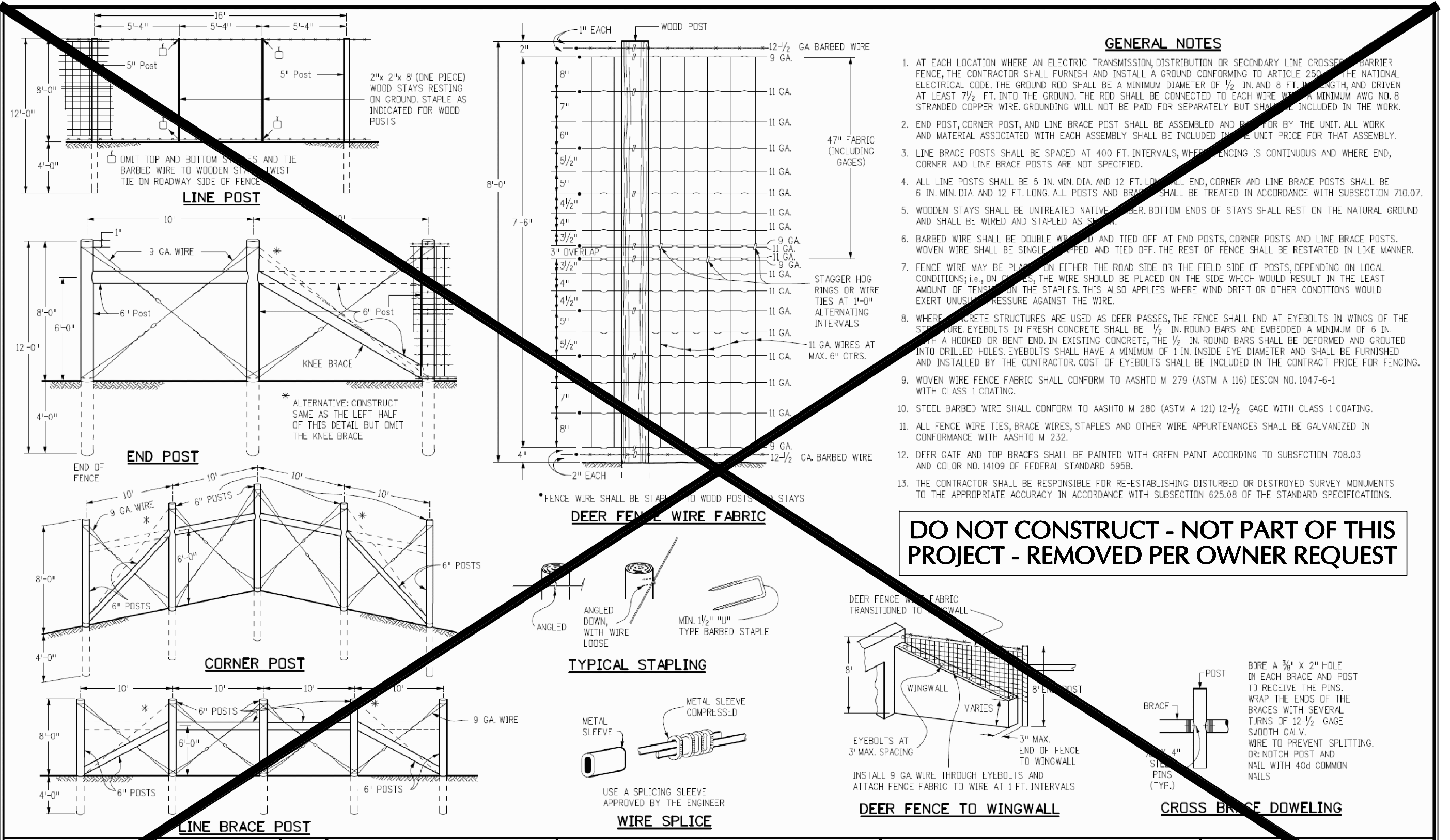
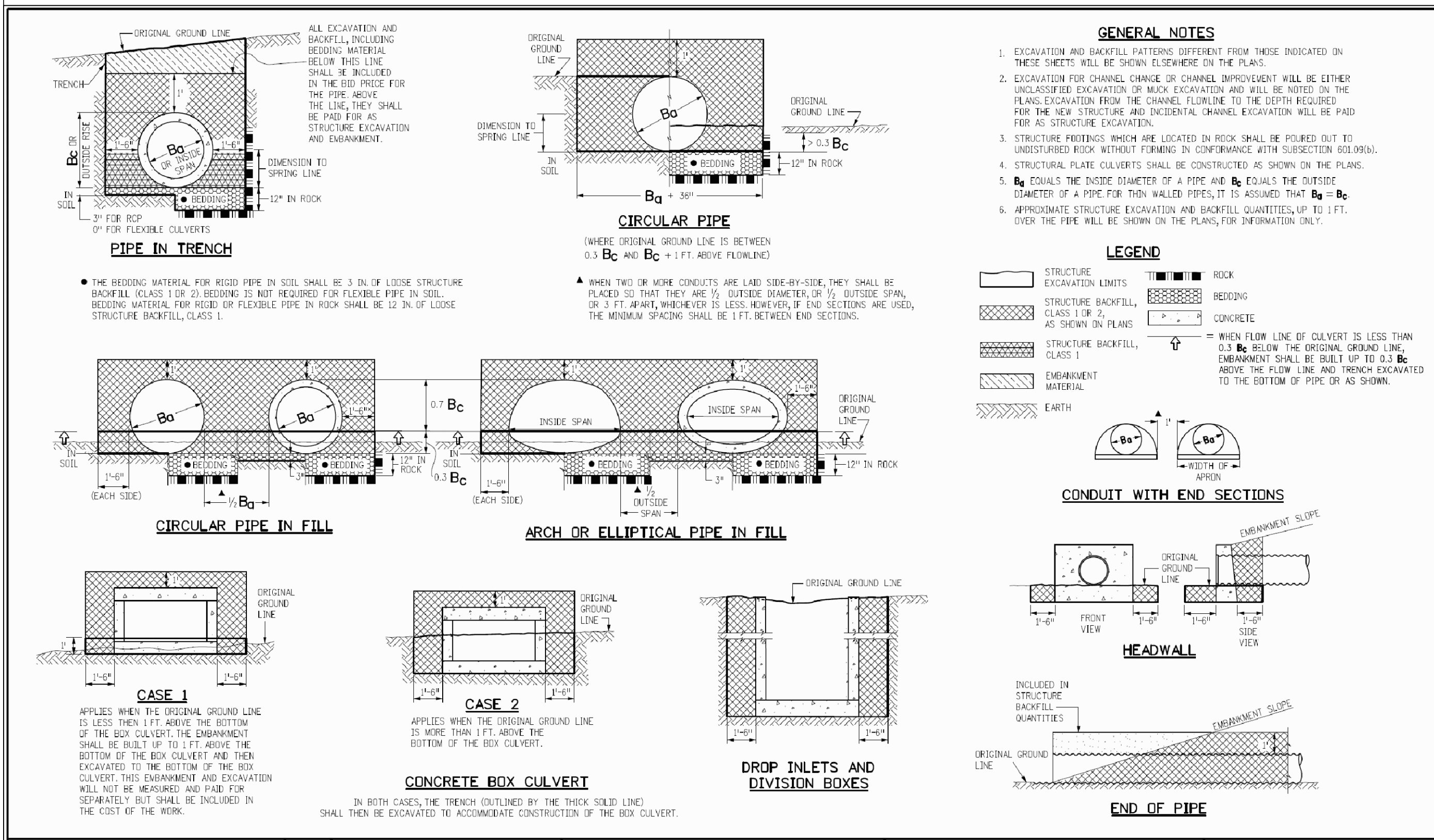
CONSTRUCTION DOCUMENT





Computer File Information Creation Date: 07/04/12 Initials: DD Last Modification Date: 07/04/12 Initials: LTA Full Path: www.coloradodot.info/business/designsupport Drawing File Name: 604010101.dgn CAD Ver: MicroStation V8 Scale: Not to Scale Units: English	Sheet Revisions Date: Comments	Colorado Department of Transportation 4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9083 Fax: (303) 757-9820 Project Development Branch DD/LTA	INLET, TYPE D STANDARD PLAN NO. M-604-11 Sheet No. 1 of 1
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Computer File Information Creation Date: 07/04/12 Initials: DD Last Modification Date: 07/04/12 Initials: LTA Full Path: www.coloradodot.info/business/designsupport Drawing File Name: 603020101.dgn CAD Ver: MicroStation V8 Scale: Not to Scale Units: English	Sheet Revisions Date: Comments	Colorado Department of Transportation 4201 East Arkansas Avenue Denver, Colorado 80222 Phone: (303) 757-9083 Fax: (303) 757-9820 Project Development Branch DD/LTA	REINFORCED CONCRETE PIPE STANDARD PLAN NO. M-603-2 Sheet No. 1 of 1
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WWE WRIGHT WATER ENGINEERS, INC.
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REVISIONS				CHANGES			
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5	IBP	4/4/14	ADDENDUM 2				

Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

DESIGN -- 03/19/14
DETAIL -- 03/19/14
CHECK -- 03/19/14
APPROVAL
SCALE AS NOTED
DATE

CDOT DETAILS

JOB NO. 131-080.040
REVISION NO. 3
SHEET NO. C13

GENERAL NOTES

I. GENERAL REQUIREMENTS:

1. STRUCTURAL DESIGN IS IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, 2012; ASCE 7, 2010; AISC MANUAL, 13TH EDITION AND ACI 318-08.
2. IN CASE OF DISAGREEMENT BETWEEN THE DRAWING AND SPECIFICATIONS OR WITHIN EITHER DOCUMENT ITSELF, THE BETTER QUALITY OR GREATER QUANTITY SHALL BE USED UNLESS A WRITTEN CLARIFICATION IS ISSUED. AS PERTAINING TO STRUCTURAL PLAN SHEETS S1 - S7.
3. THE DRAWINGS REPRESENT THE COMPLETED STRUCTURE IN ITS FINAL CONDITION WITH ALL MEMBERS IN PLACE, CONNECTIONS COMPLETE, AND ALL AT THEIR SPECIFIED STRENGTH. PRIOR TO THIS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY BRACING AND SHORING DURING CONSTRUCTION AND ERECTION FOR ANY AND ALL LOADS TO WHICH THE CONSTRUCTION IS SUBJECTED. JOB SITE SAFETY AND CONSTRUCTION PROCEDURES ARE THE RESPONSIBILITY OF THE CONTRACTOR.
4. CONTRACTOR SHALL COORDINATE WITH CIVIL AND ANY SPECIALTY DRAWINGS FOR SIZE AND LOCATION OF OPENINGS, SLEEVES, INSERTS, SLOPES, DEPRESSIONS, OR OTHER ITEMS THAT INTERFACE WITH THE STRUCTURE.
5. REPRODUCTION OF STRUCTURAL CONTRACT DOCUMENTS FOR RESUBMITTAL AS SHOP DRAWINGS IS PROHIBITED. SHOP DRAWINGS PRODUCED IN SUCH A MANNER WILL BE REJECTED AND RETURNED.

II. DESIGN LOADS:

1. LIVE LOAD:
 - A. VEHICULAR SURCHARGE ----- 220 PSF
 - B. HYDRAULIC LOAD ----- 62.4 PCF
2. SNOW LOAD:
 - A. FLAT ROOF LOAD ----- 30 PSF
 - B. IMPORTANCE FACTOR ----- 1.0
 - C. SNOW EXPOSURE FACTOR ----- 1.0
 - D. THERMAL FACTOR ----- 1.0
3. WIND LOAD:
 - A. BASIC WIND SPEED ----- 115 MPH
 - B. EXPOSURE CATEGORY ----- C
 - C. IMPORTANCE FACTOR ----- 1.0
 - D. WIND ENCLOSURE ----- VARIES
 - E. INTERNAL PRESSURE COEFFICIENT ----- VARIES
4. SEISMIC LOADS:
 - A. OCCUPANCY CATEGORY ----- II
 - B. SITE CLASS ----- C
 - C. SEISMIC DESIGN CATEGORY ----- C
 - D. IMPORTANCE FACTOR ----- 1.0
 - E. SPECTRAL RESPONSE ACCELERATIONS ----- $S_s=0.191$
 $S_1=0.063$
 - F. SPECTRAL RESPONSE COEFFICIENTS ----- $S_{as}=0.203$
 $S_{a1}=0.100$
 - G. BASIC SEISMIC FORCE RESISTING SYSTEM ----- VARIES
 - H. SEISMIC RESPONSE COEFFICIENT ----- VARIES
 - I. RESPONSE MODIFICATION FACTOR ----- VARIES
 - J. ANALYSIS PROCEDURE ----- EQUIVALENT
LATERAL FORCE
 - K. DESIGN BASE SHEAR ----- VARIES

III. FOUNDATIONS:

1. FOUNDATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE RECOMMENDATIONS SET FORTH IN THE GEOTECHNICAL REPORT PREPARED BY KUMAR & ASSOCIATES, INC., PROJECT NUMBER 13-2-211, DATED MARCH 7, 2014 AND TITLED GEOTECHNICAL ENGINEERING STUDY AND GEOLOGICAL RECONNAISSANCE WILLIAMS CANYON DRAINAGE IMPROVEMENTS MANITOU SPRINGS, COLORADO. THE CONTRACTOR SHALL REVIEW THIS REPORT FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. DESIGN CRITERIA:
 - A. ALLOWABLE SOIL BEARING PRESSURE ----- 3000 PSF @ UNDISTURBED NATURAL SOILS OR STRUCTURAL FILL
 - B. ACTIVE LATERAL SOIL PRESSURE ----- 60 PCF (LATERALLY RESTRAINED WALLS)
45 PCF (CANTILEVERED OPEN WALLS)
 - C. PASSIVE LATERAL SOIL PRESSURE ----- 200 PCF (DRAINED)
 - D. FROST PROTECTION DEPTH ----- 3'-0" BELOW GRADE
3. PROVIDE A QUALIFIED GEOTECHNICAL ENGINEER TO PROVIDE FIELD VERIFICATION THAT THE SOIL CONDITIONS ENCOUNTERED, AND SUBGRADE PREPARATION PERFORMED, PROVIDE VALUES EQUAL OR SUPERIOR TO THE DESIGN CRITERIA OUTLINED ABOVE AND THE REQUIREMENTS OF THE SPECIFICATIONS. FIELD VERIFICATION SHALL OCCUR PRIOR TO PLACING FOUNDATIONS.

IV. STRUCTURAL STEEL AND ALUMINUM:

1. ALL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC MANUAL OF STEEL CONSTRUCTION, ASD 9TH EDITION.
2. DESIGN STRESSES:
 - A. ANGLES, CHANNELS, PLATES, BARS (ASTM A36) ----- $F_y = 36,000$ PSI
 - B. STEEL PIPE (ASTM A501) ----- $F_y = 36,000$ PSI
 - C. SQUARE & RECTANGULAR STEEL TUBE (ASTM A500, GRADE B) ----- $F_y = 46,000$ PSI
3. ANCHOR BOLTS ----- A307
4. WELDING ELECTRODES:
 - A. ELECTRODES FOR STEEL ----- E70XX
5. MINIMUM WELDS ACCORDING TO AISC SPECIFICATIONS AND NOT LESS THAN $\frac{3}{8}$ " FILLET CONTINUOUS, UNLESS DETAILED OTHERWISE. ALL WELDS SHALL BE MADE IN ACCORDANCE WITH CURRENT STANDARDS OF THE AMERICAN WELDING SOCIETY AND PERFORMED BY WELDERS QUALIFIED BY AWS STANDARDS.
6. ANCHOR BOLTS SHALL BE HEADED BOLTS OR THREADED ROD WITH NUT. J- OR L-SHAPED ANCHOR BOLTS SHALL NOT BE USED. RE: (3005).
7. STEEL SHALL BE GALVANIZED UNLESS NOTED OTHERWISE.

V. CONCRETE AND REINFORCING

1. ALL CONCRETE SHALL BE PREPARED AND PLACED ACCORDING TO ACI 301, "STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE" AND ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".
2. ALL CONCRETE SHALL BE NORMAL WEIGHT (145 PCF, STONE AGGREGATE) WITH THE FOLLOWING REQUIREMENTS:
 - A. USE TYPE II PORTLAND CEMENT.
 - B. CONCRETE (28 DAY STRENGTH) ----- $f'_c=4000$ PSI
 - C. REINFORCING STEEL (ASTM 615, GRADE 60) ----- $F_y=60,000$ PSI
3. CHAMFER ALL EXPOSED CORNERS $\frac{3}{4}$ INCH.
4. PROVIDE COVER FOR REINFORCING IN ACCORDANCE WITH THE STANDARD DETAILS, UNLESS NOTED OTHERWISE, RE: (3003).
5. PROVIDE MINIMUM SPLICE LENGTHS IN ACCORDANCE WITH THE STANDARD DETAILS, UNLESS NOTED OTHERWISE, RE: (3009).
6. MAKE HORIZONTAL BARS CONTINUOUS AROUND CORNERS OR PROVIDE CORNER BARS IN ACCORDANCE WITH STANDARD DETAIL (3203).
7. ALL DETAILING, FABRICATION AND ERECTION OF REINFORCING BARS SHALL COMPLY WITH THE ACI MANUAL SP-66 OF STANDARD PRACTICE.
8. NO WELDING OF REINFORCING SHALL BE PERMITTED UNLESS SHOWN ON DRAWINGS OR APPROVED BY THE STRUCTURAL ENGINEER. USE ASTM A706 REINFORCING STEEL FOR WELDABLE STEEL.

ISSUE DATE: --/~/-- Plot Date/Time: 05/05/2014, 12:26:29 PM; S:\1300 JOBS\1335 - MANITOU SPRINGS\CURRENT DRAWINGS\S-1.DWG-LAYOUT1



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△		1/22/14	30% DESIGN SUBMITTAL	
△		2/21/14	60% DESIGN SUBMITTAL	
△		3/20/14	BID SET SUBMITTAL	
△		5/5/14	CONSTRUCTION DOCUMENTS	

	DATE
DESIGN	C.A.B. -
DETAIL	C.A.B. -
CHECK	J.F.S. -
APPROVAL	J.F.S. -

*Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I*

GENERAL NOTES



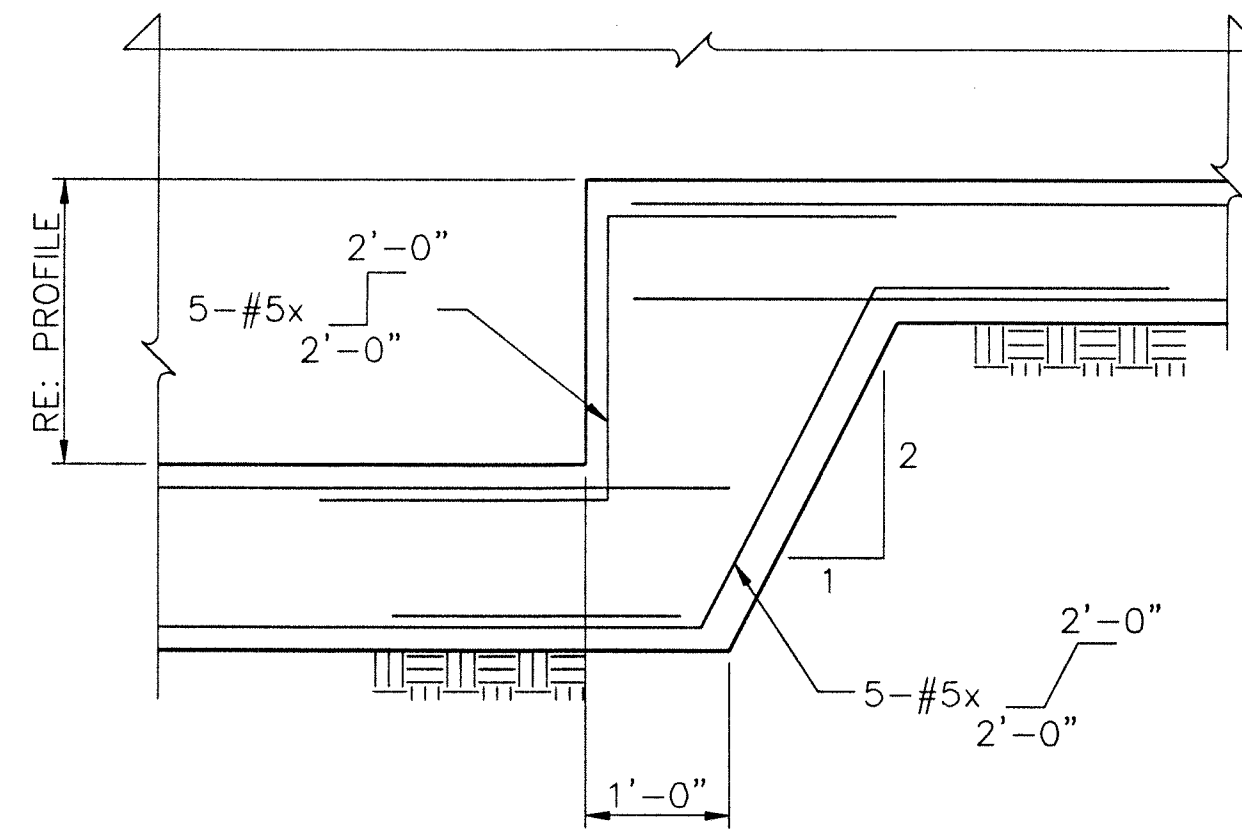
JOB NO. XXX-XXX-XXX
REVISION NO. 0
SHEET NO. S1

EXCEPT AS OTHERWISE NOTED OR SHOWN ON THE DRAWINGS REINFORCEMENT SHALL HAVE A MINIMUM CONCRETE COVER AS FOLLOWS:

BOTTOM OF FOUNDATIONS AND FOOTINGS OR OTHER CONC. CAST AGAINST EARTH:	3"
BACKFILLED SURFACES OR CONCRETE EXPOSED TO EARTH OR WEATHER:	2"
ALL OTHER WALLS, BEAMS, SLABS AND COLUMNS NOT EXPOSED TO EARTH OR WEATHER:	1 1/2"

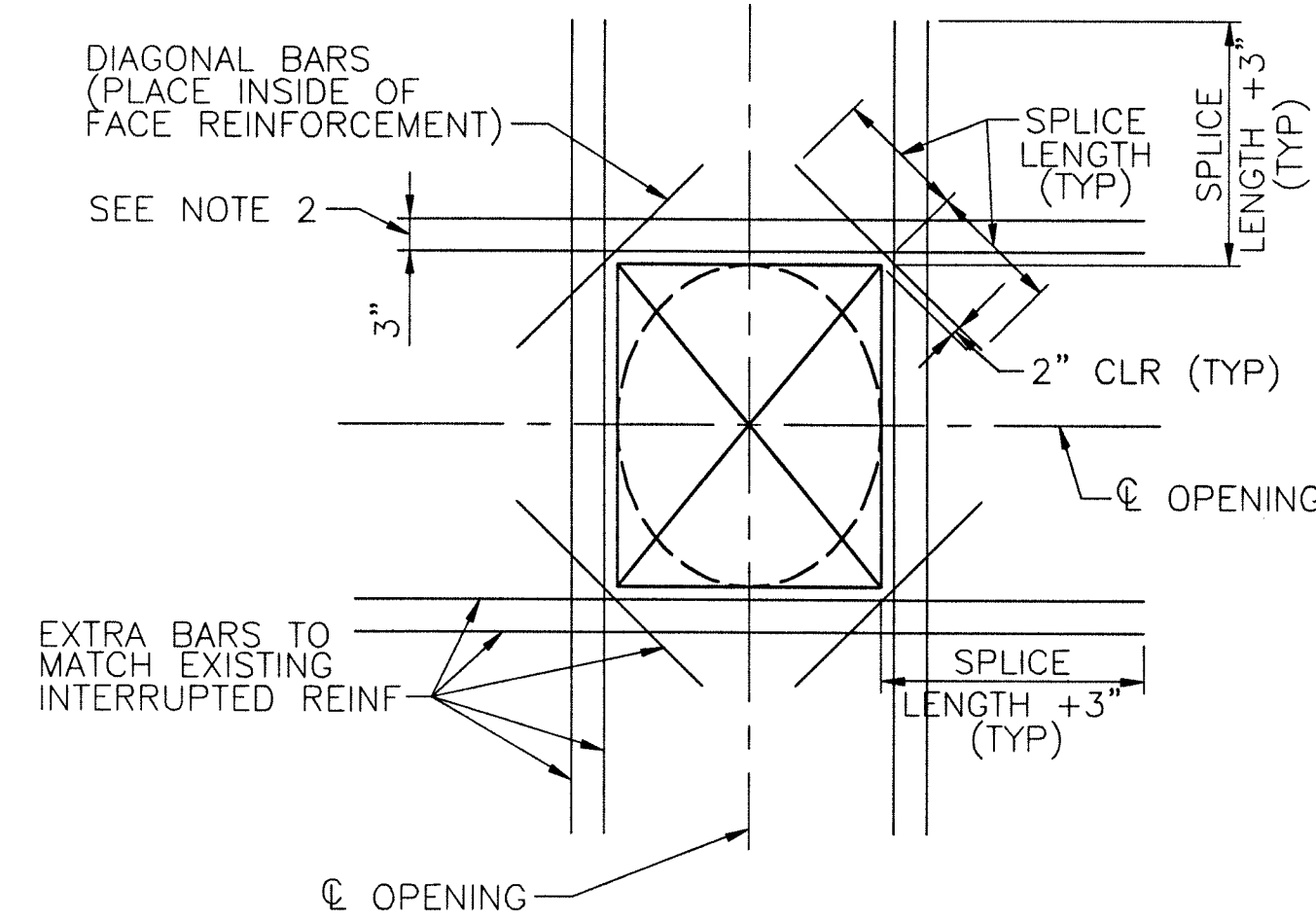
REINFORCEMENT CONCRETE COVER

3003



STEPPED FOOTING SECTION
N.T.S.

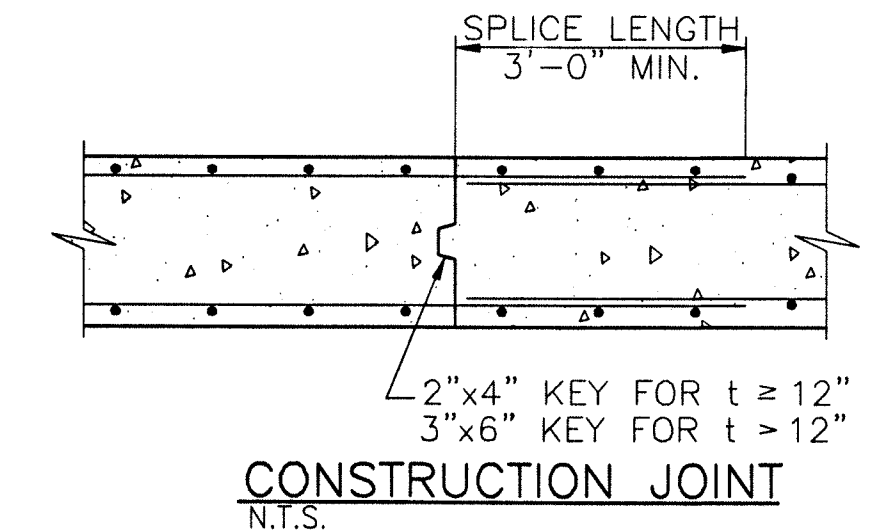
3114



REINFORCING AROUND OPENINGS
N.T.S.

- NOTES:
1. THIS STANDARD IS LIMITED TO OPENINGS OF GREATER THAN 10" BUT NOT LARGER THAN 6'-0" EACH WAY. OTHERWISE SEE DRAWINGS.
 2. PLACE EXTRA BARS CLOSE TO EACH SIDE OF OPENING EQUAL TO HALF OF THE INTERRUPTED BARS. (WITH A MINIMUM OF 2-#5'S AT EA. SIDE), USE 3" SPACING OR SPACING OF INTERRUPTED BARS, WHICHEVER IS LESS.
 3. IN ADDITION, AT CIRCULAR OPENINGS PROVIDE 2-#5x ϕ .
 4. COORDINATE WITH CIVIL DRAWINGS FOR OPENING SIZE AND LOCATION.

3211

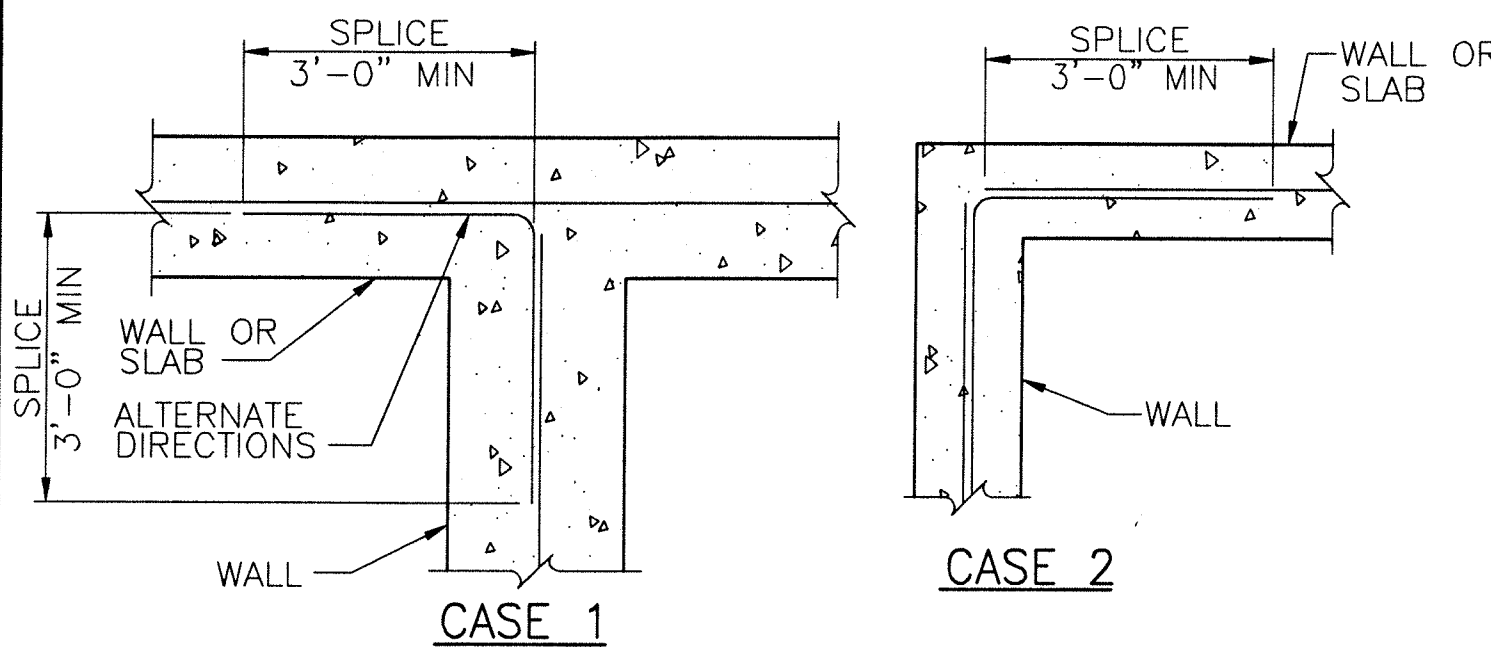


- NOTES:
1. REINFORCING CONTINUOUS THRU CONSTRUCTION JOINTS.
 2. PROVIDE CONSTRUCTION JOINTS @ 30'-0" MAX IN LIQUID CONTAINING STRUCTURES AND @ 40'-0" MAX IN OTHER STRUCTURES.

3233

1 1/2" Cover		f'c=4,000 psi		fy=60,000 psi	
6" or Greater Spacing					
BAR SIZE	TENSION				COMPRESSION ALL
	90° HOOK	STRAIGHT	TOP SPLICE	OTHER SPLICE	
	ldh	A			
4	7	8	25	19	15
5	9	10	31	24	19
6	10	12	37	29	23
7	12	14	54	42	26
8	13	16	62	48	30
9	15	19	70	54	34
10	17	20	79	61	37
11	19	24	87	67	41

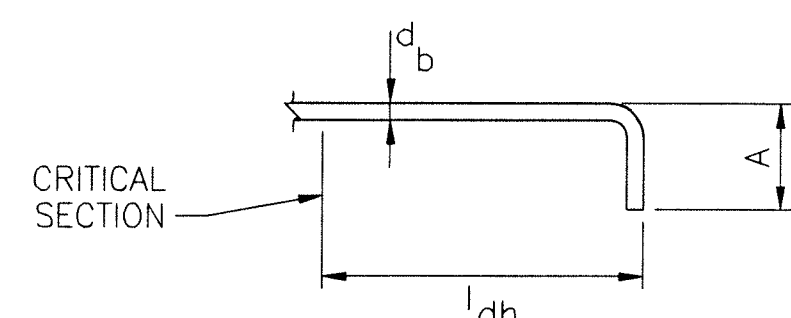
LENGTHS IN INCHES



CORNER BARS
N.T.S.

NOTE: FOR SPLICE & ldh, SEE 3009.

3203

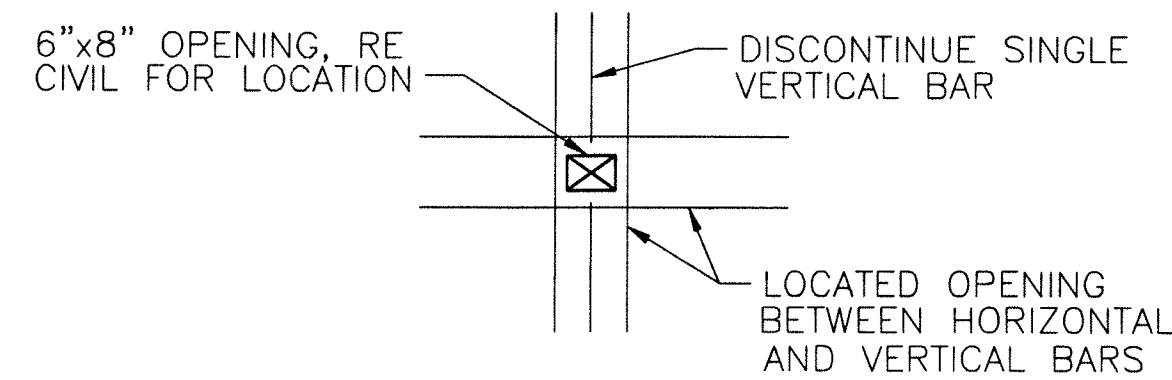


NOTES

1. TOP BARS ARE HORIZ. BARS PLACED SUCH THAT MORE THAN 12" OF CONC. IS CAST BELOW THE BAR. HORIZONTAL WALL BARS ARE TOP BARS.
2. FOR EPOXY COATED REINFORCING BARS, INCREASE STRAIGHT SPLICE LENGTH BY 50%.
3. 90° HOOKS SHALL BE LOCATED WITHIN THE CONFINED CORE OF A COLUMN OR BOUNDARY ELEMENT.

TYPICAL DEVELOPMENT AND SPLICE LENGTHS
TYPICAL REINFORCING

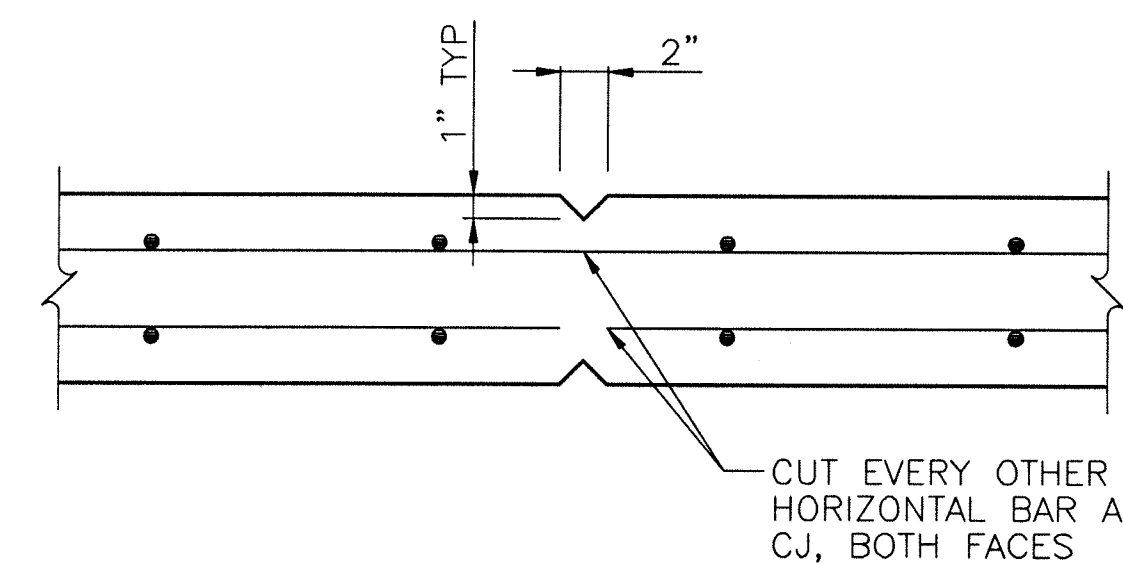
3009



REINFORCING AROUND OPENINGS
N.T.S.

- NOTES:
1. THIS STANDARD IS LIMITED TO OPENINGS OF LESS THAN 10" FOR ROAD DRAINAGE INTO CHANNEL, SEE DRAWINGS.

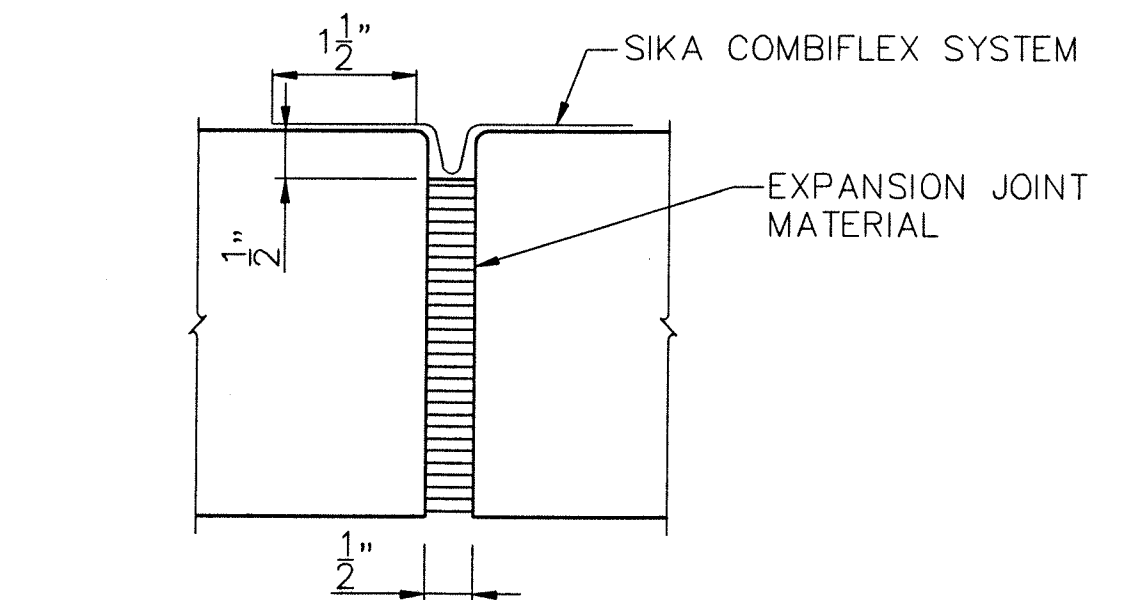
3210



TYP RETAINING WALL CONTROL JOINT DETAIL
N.T.S.

- NOTES:
1. PROVIDE CONTROL JOINTS AT 15'-0" O.C. UNLESS NOTED OTHERWISE

3232



TYPICAL EXPANSION JOINTS
N.T.S.

- NOTE:
1. USE SEALED JOINT BETWEEN STRUCTURAL WALL AND SOIL NAIL WALL.

3234



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3		3/20/14	BID SET SUBMITTAL
4		5/5/14	CONSTRUCTION DOCUMENTS

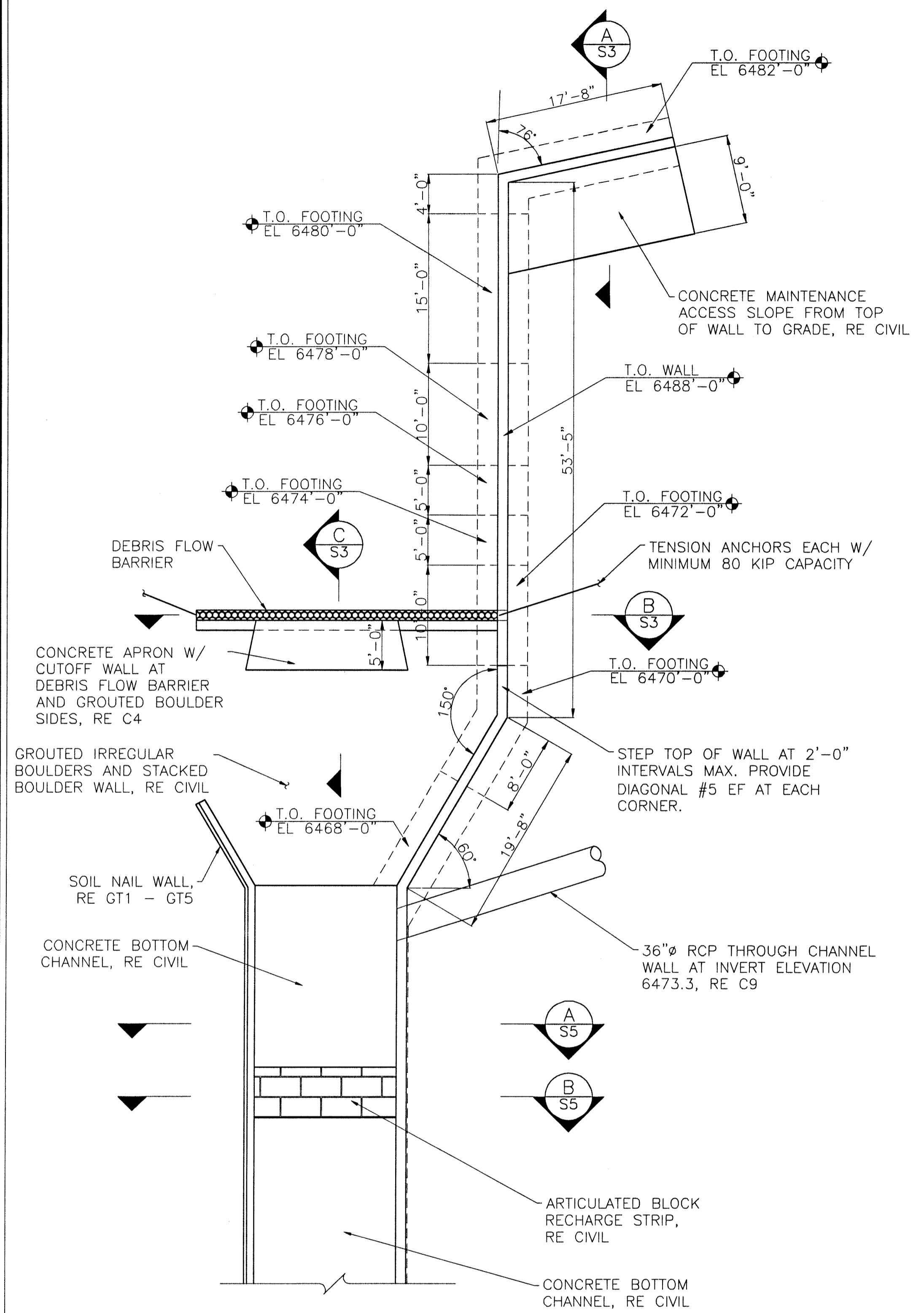
DATE	
DESIGN	C.A.B. -
DETAIL	C.A.B. -
CHECK	J.F.S. -
APPROVAL	J.F.S. -

Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

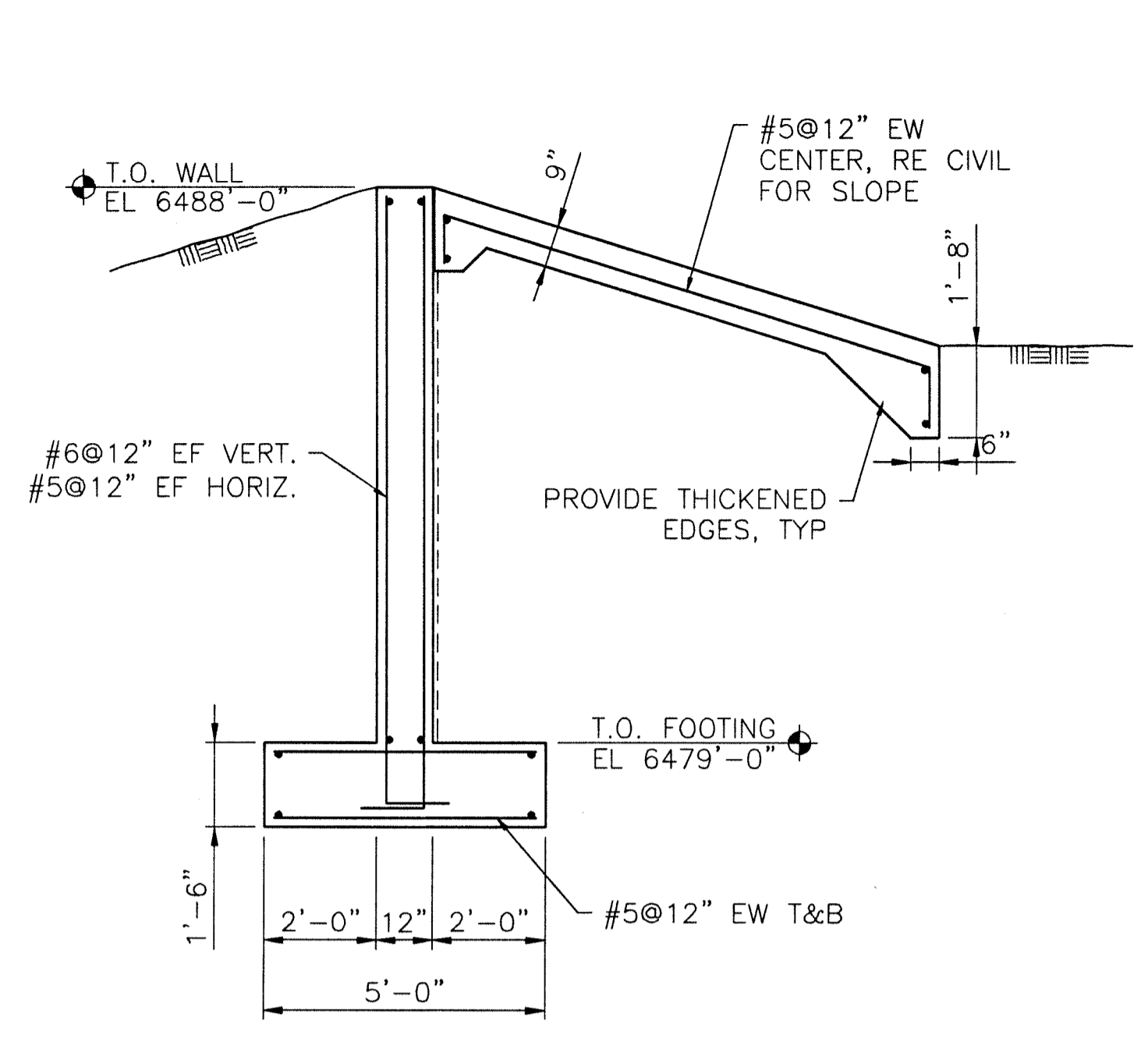
STANDARD DETAILS

JOB NO. XXX-XXX-XXX
REVISION NO. 0
SHEET NO. S2

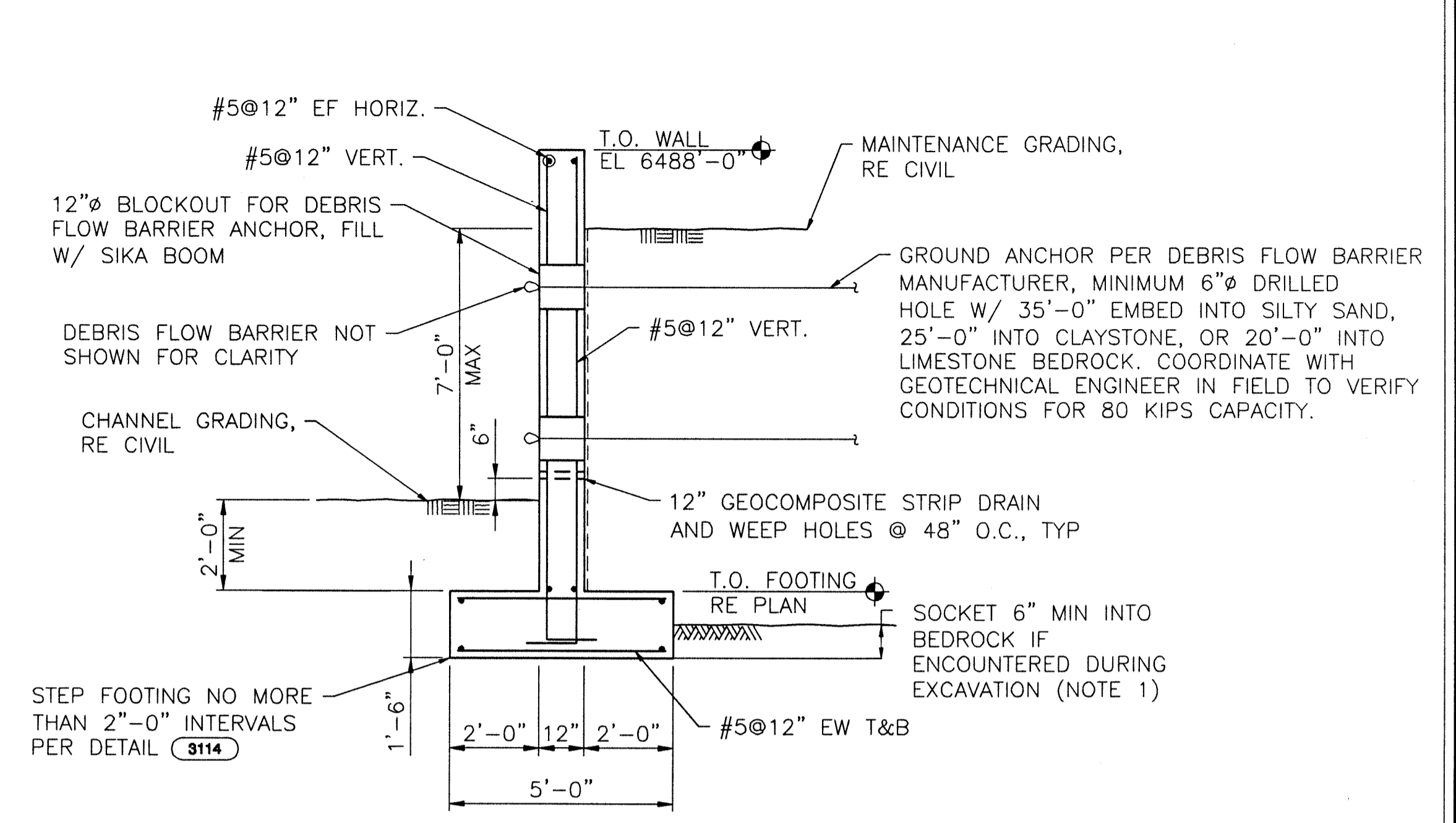
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UPPER DEBRIS STRUCTURE PLAN
SCALE: 1/8" = 1'-0"

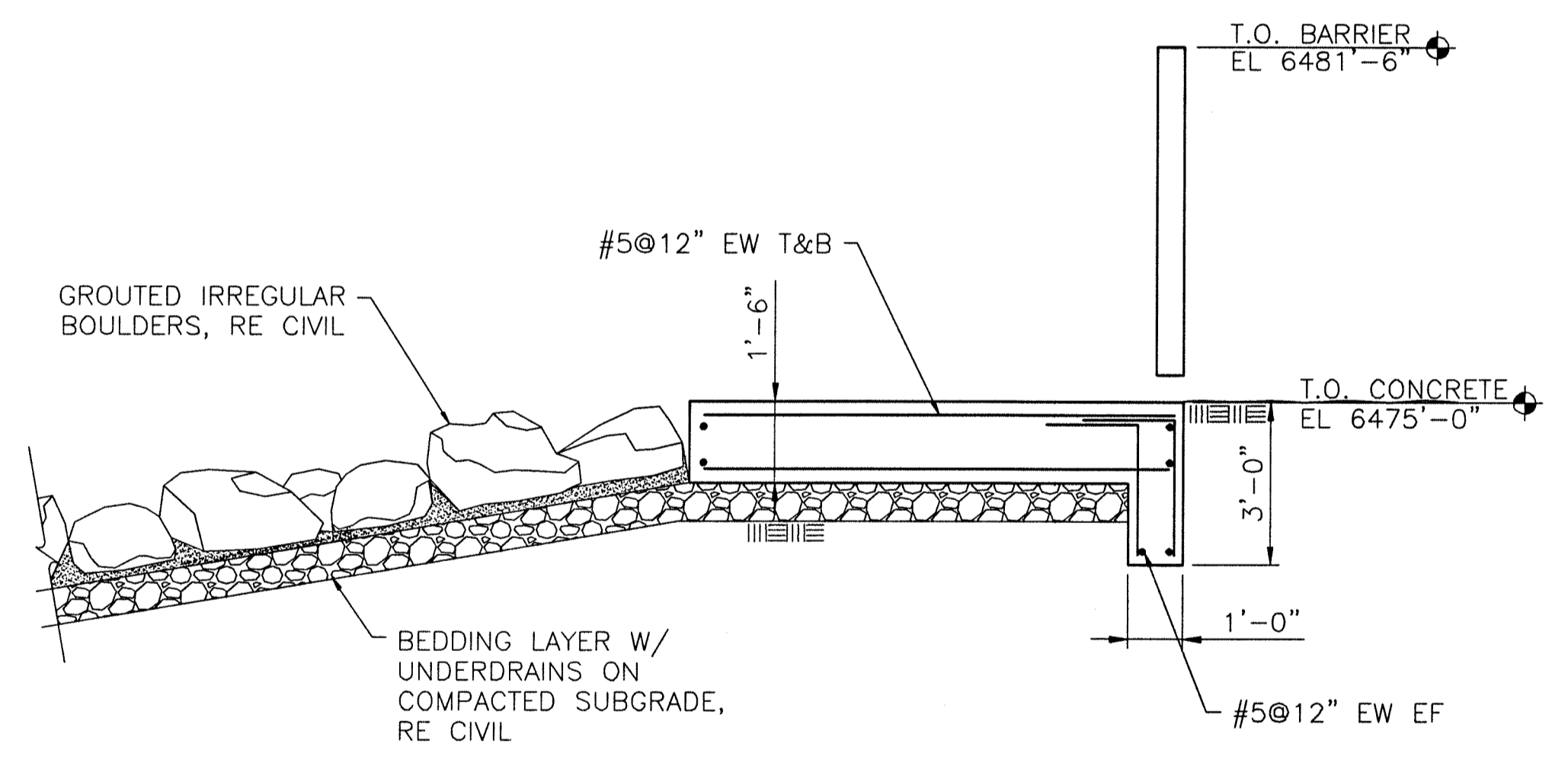


MAINTENANCE ACCESS SECTION A
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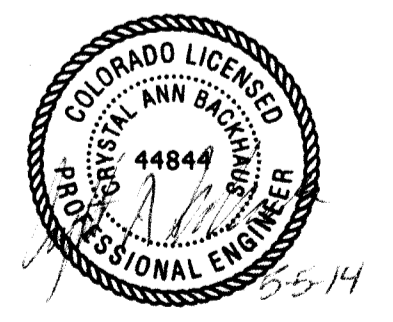


UPPER DEBRIS STRUCTURE SECTION B
SCALE: 3/8" = 1'-0"

NOTES:
1. SOCKET FOOTING INTO BEDROCK OR PROVIDE MINIMUM FROST DEPTH WITH 2'-0" OF COVER OVER TOP OF FOOTING.



UPPER DEBRIS STRUCTURE SECTION C
SCALE: 3/8" = 1'-0"



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4	JFS	5/5/14	CONSTRUCTION DOCUMENTS	

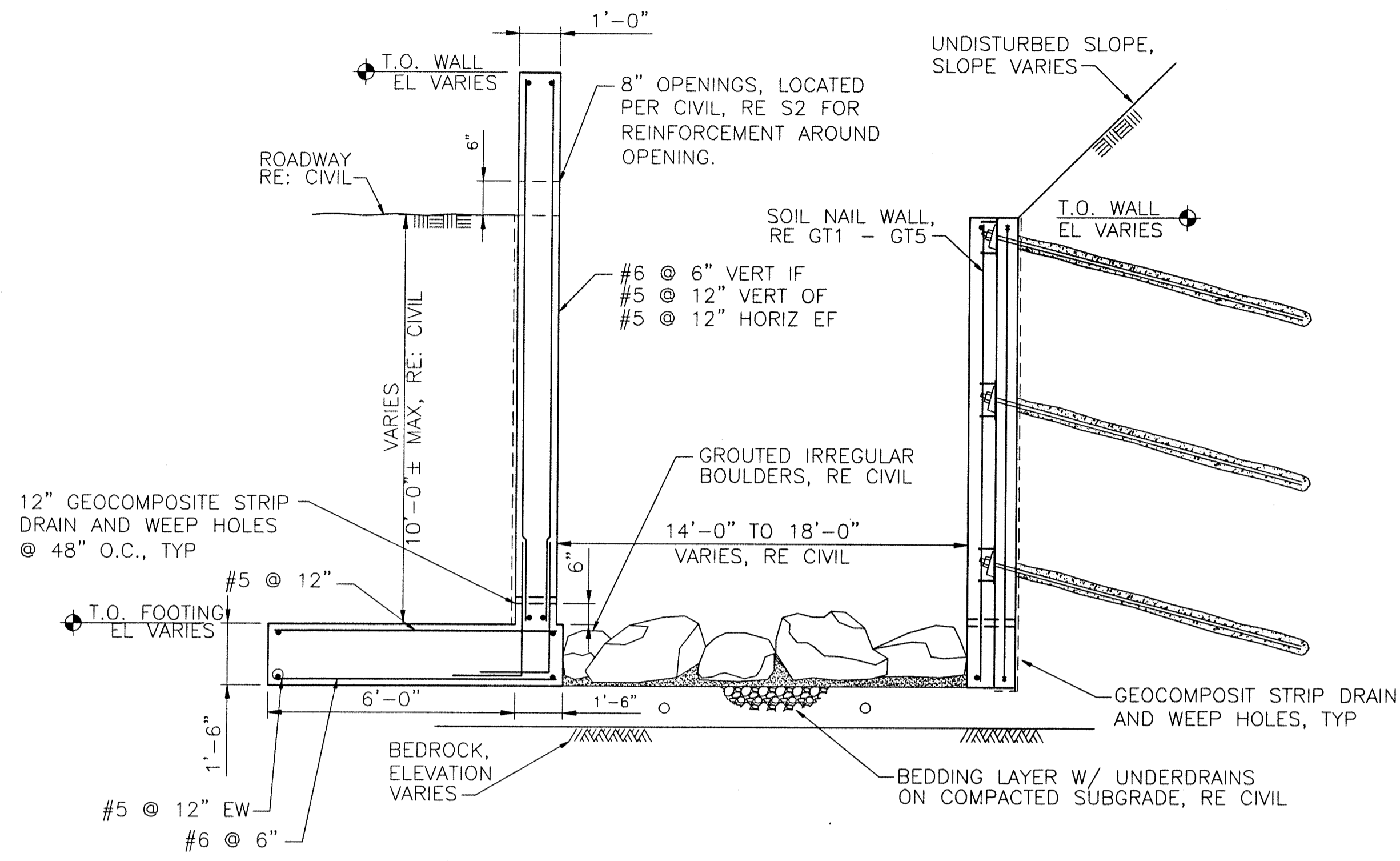
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APPROVAL	J.F.S.	-

Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

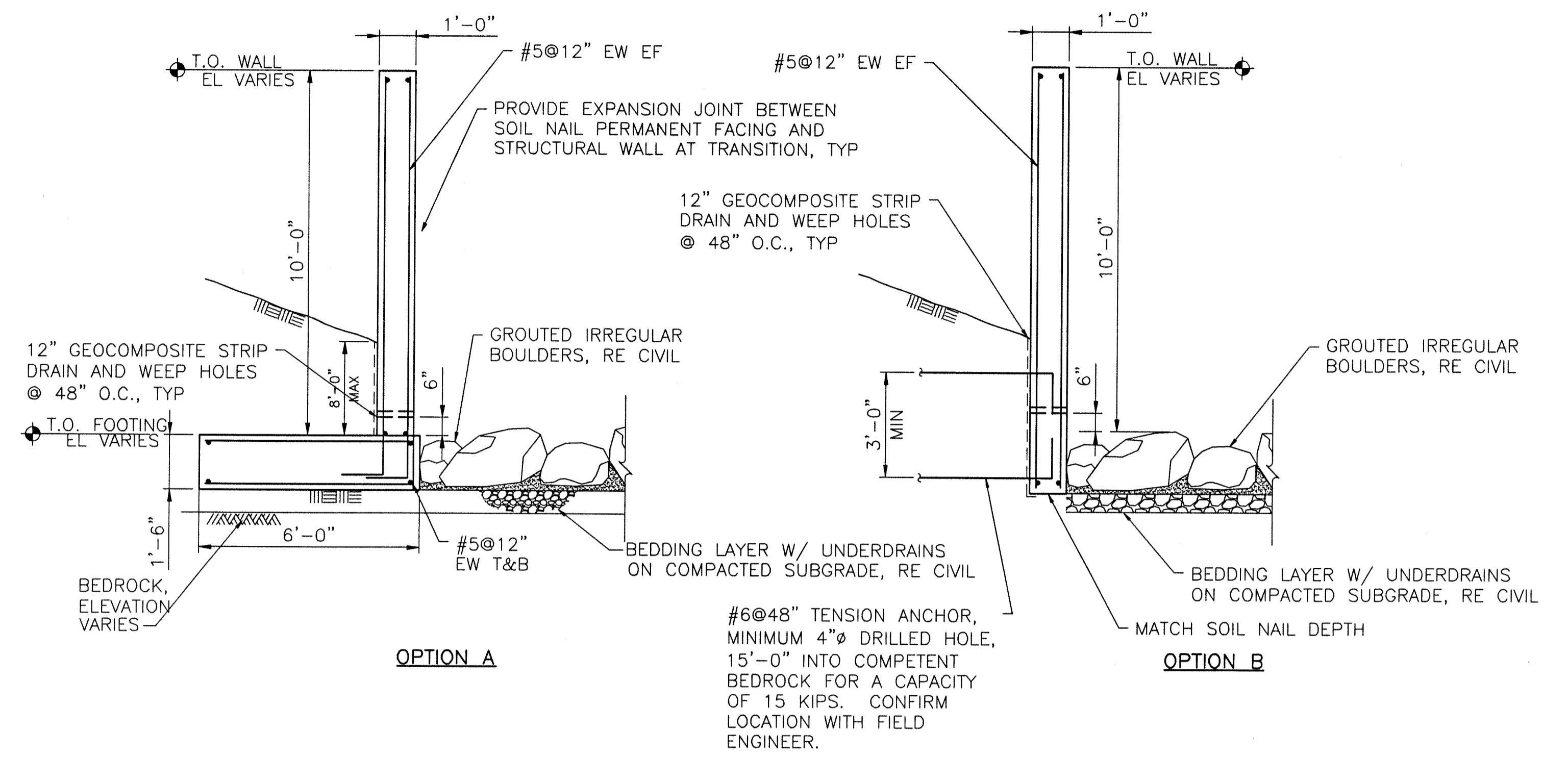
UPPER DEBRIS STRUCTURE

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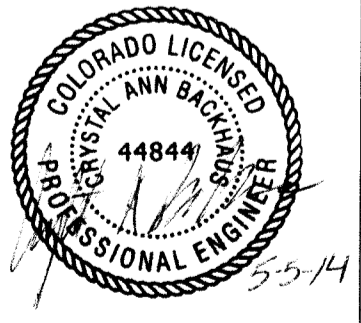


TYPICAL CHANNEL SECTION
 SCALE: 3/8" = 1'-0"
 A
 S4



STRUCTURAL WALL SECTION
 SCALE: 3/8" = 1'-0"
 B
 S4

- NOTES:
- WHERE COMPETENT BEDROCK IS ENCOUNTERED DURING EXCAVATION, GROUND ANCHORS MAY BE USED IN PLACE OF SPREAD FOOTING. (OPTION B). WHERE BEDROCK IS NOT ENCOUNTERED OR NOT CONSIDERED COMPETENT BY THE FIELD ENGINEER, USE SPREAD FOOTING (OPTION A).
 - STRUCTURAL WALL IS LOCATED BETWEEN WALL STATION 3+90 TO 5+00 AND 6+30 TO 8+00 IN PLACE OF SOIL NAIL WALL, RE GT1 - GT5 FOR SOIL NAIL WALL LAYOUT AND DETAILS.



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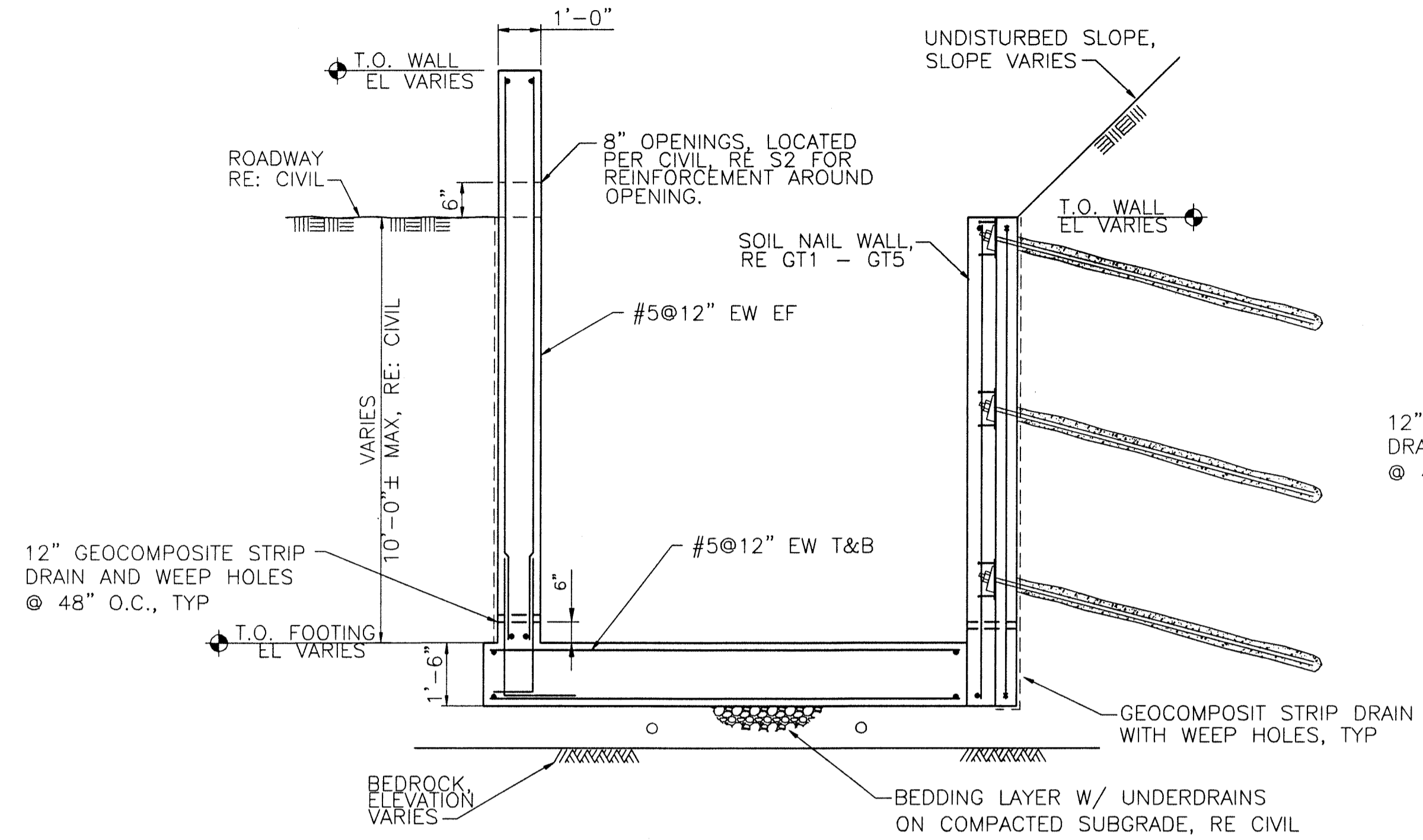
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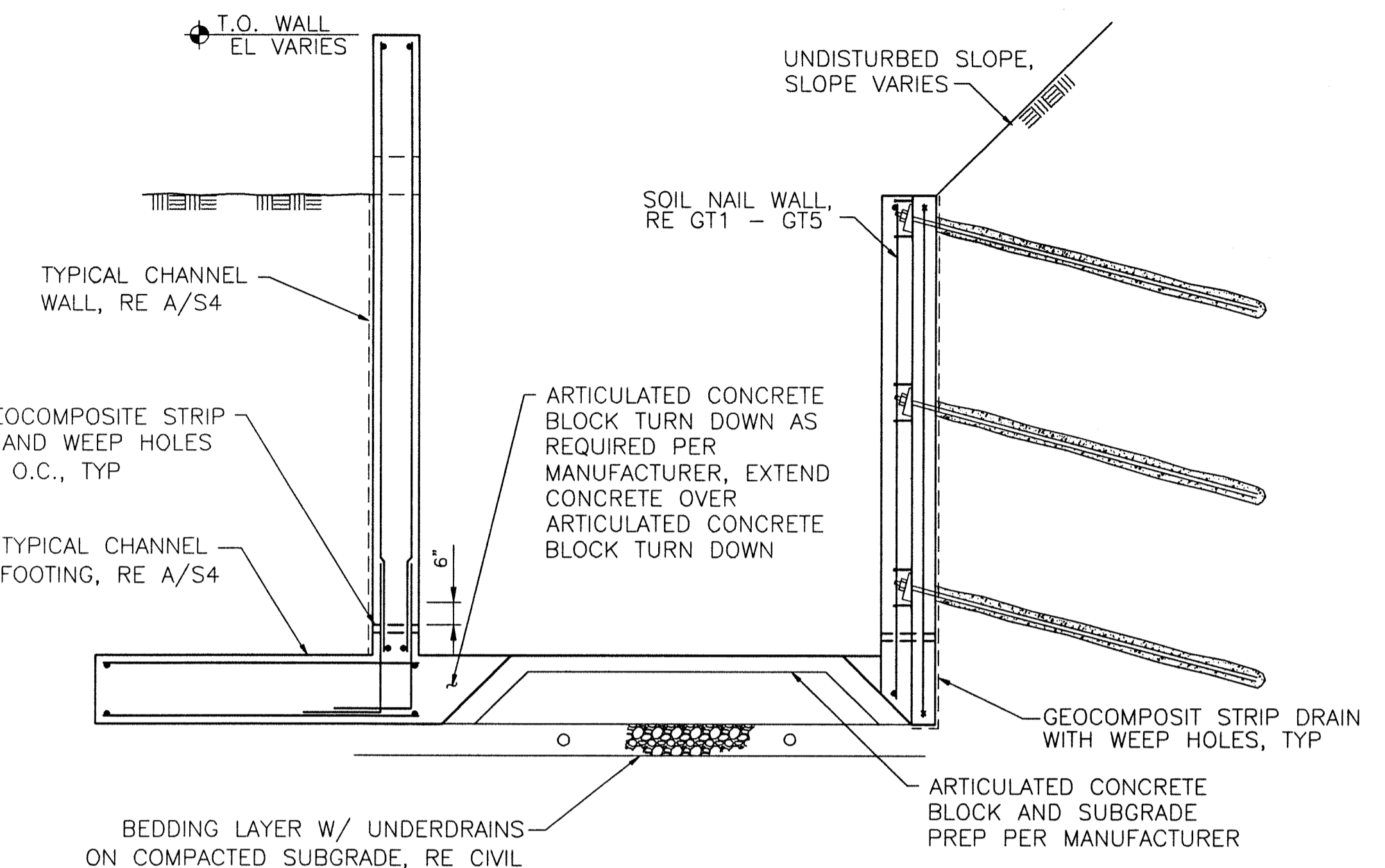
CHANNEL DETAILS

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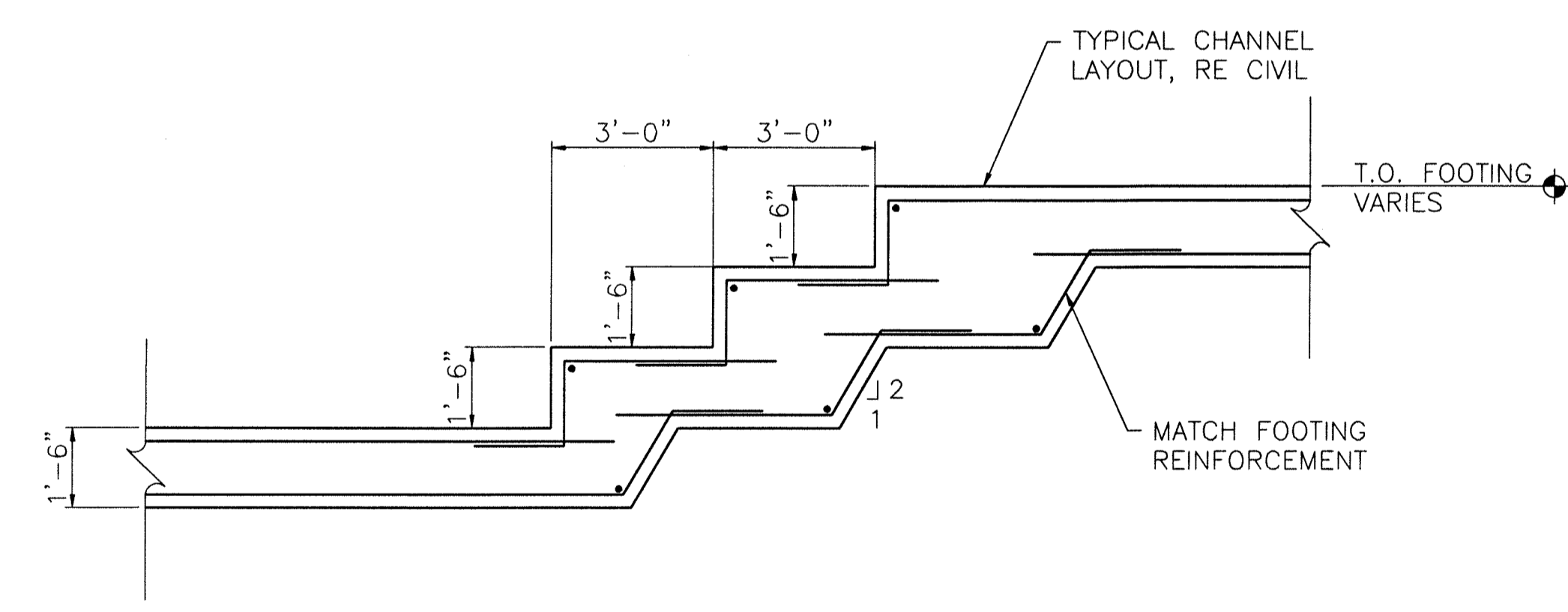
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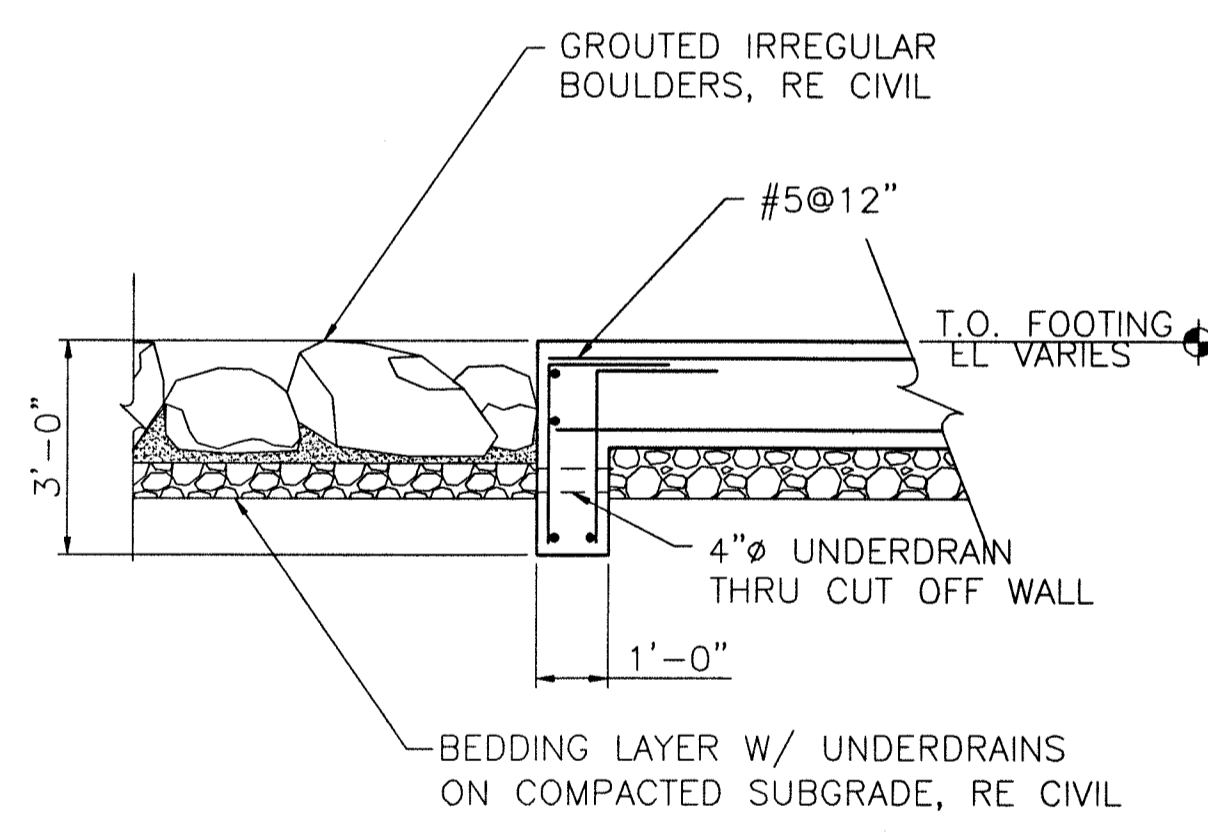
TYPICAL CONCRETE BOTTOM CHANNEL SECTION (A)
 SCALE: 3/8" = 1'-0"



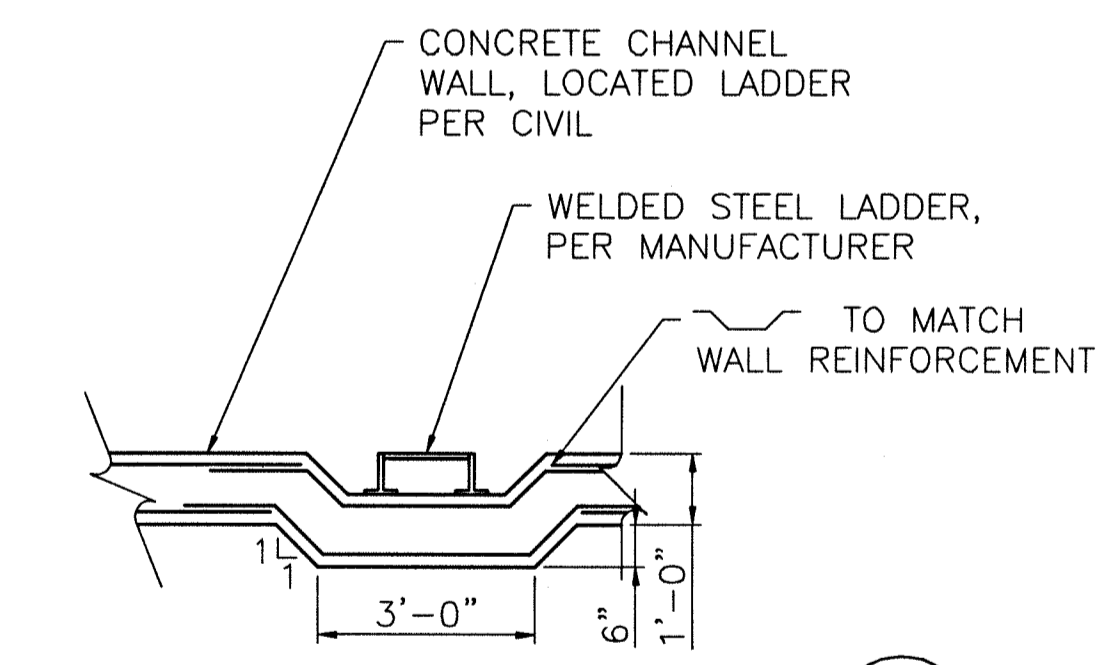
TYPICAL ARTICULATED CONCRETE BLOCK BOTTOM CHANNEL SECTION (B)
 SCALE: 3/8" = 1'-0"



DROP STRUCTURE WALL FOOTING SECTION (C)
 SCALE: 3/8" = 1'-0"



CUT OFF WALL SECTION (D)
 SCALE: 3/8" = 1'-0"



EMERGENCY EGRESS LADDER SECTION (E)
 SCALE: 3/8" = 1'-0"



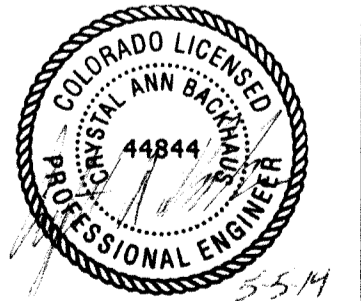
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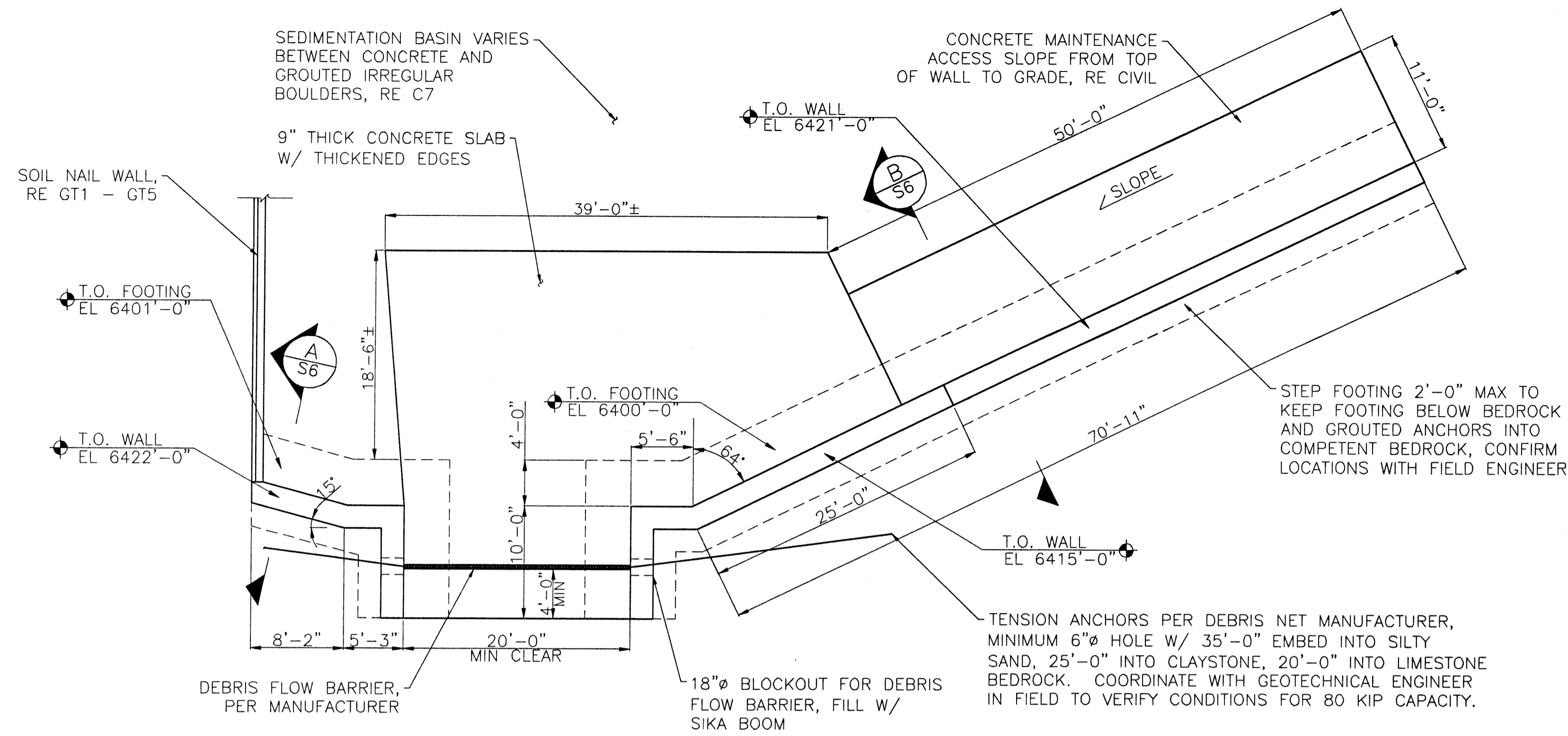
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Williams Canyon Drainage
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CHANNEL DETAILS

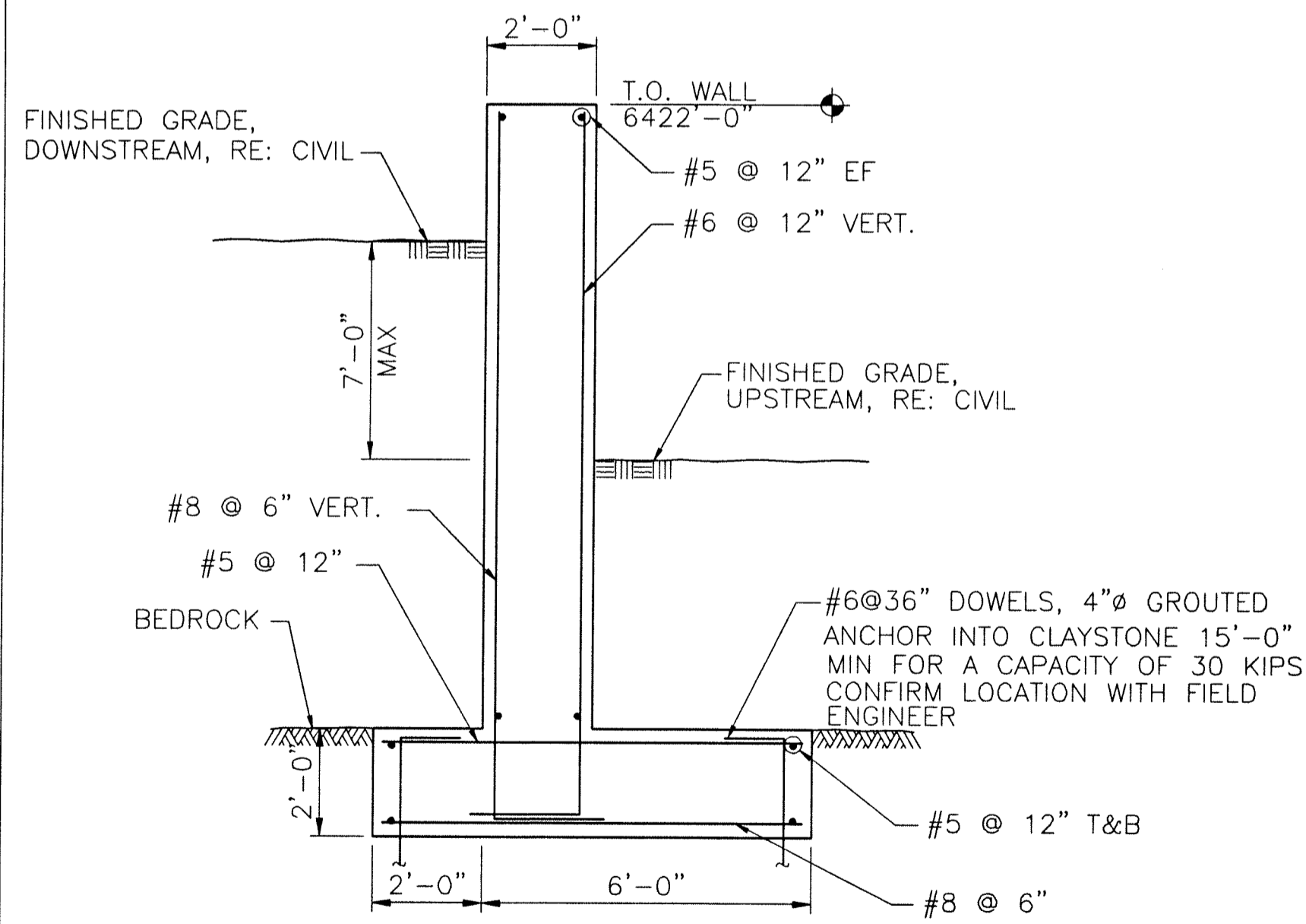


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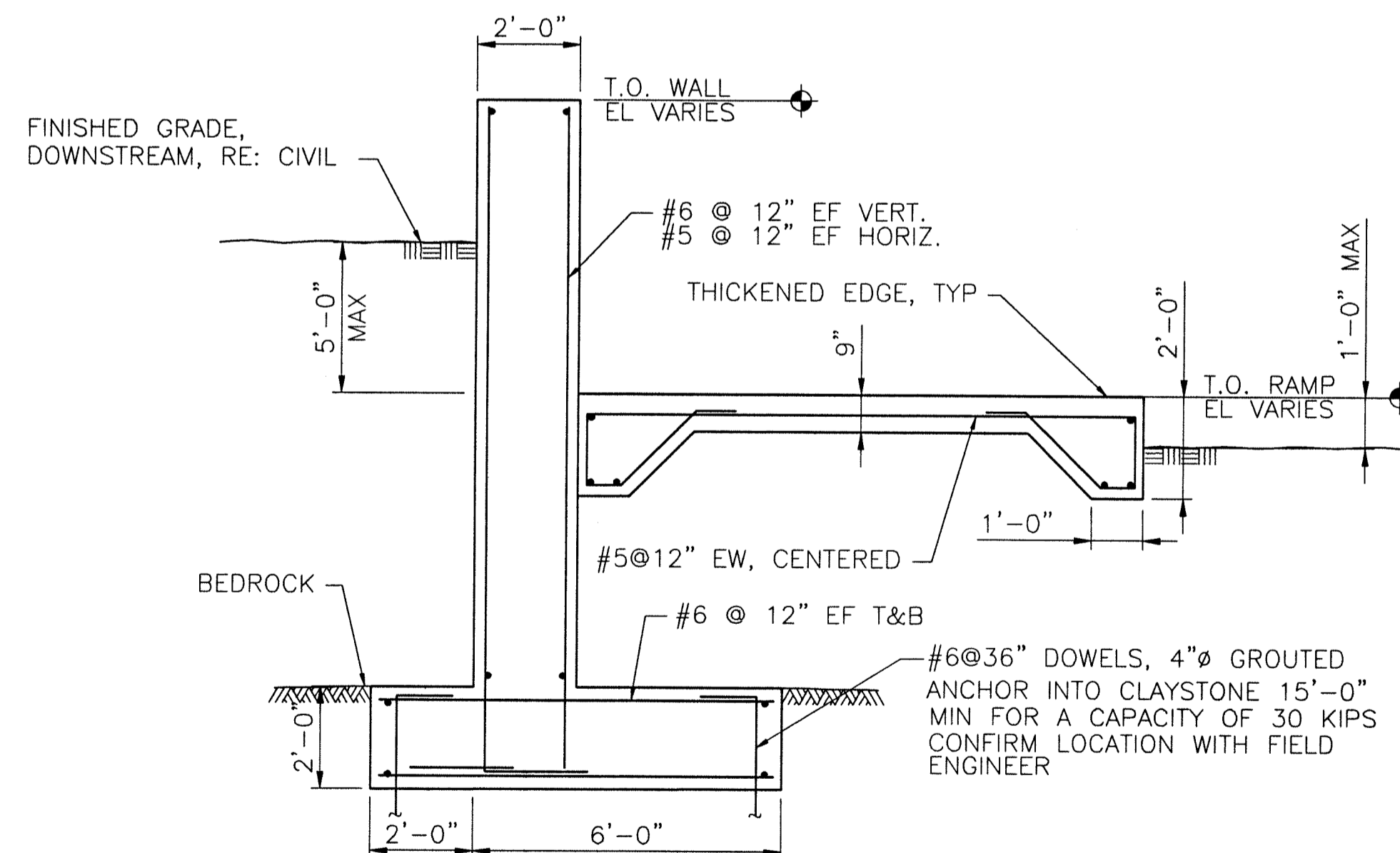


SEDIMENTATION BASIN WALL PLAN
SCALE: 1/8" = 1'-0"

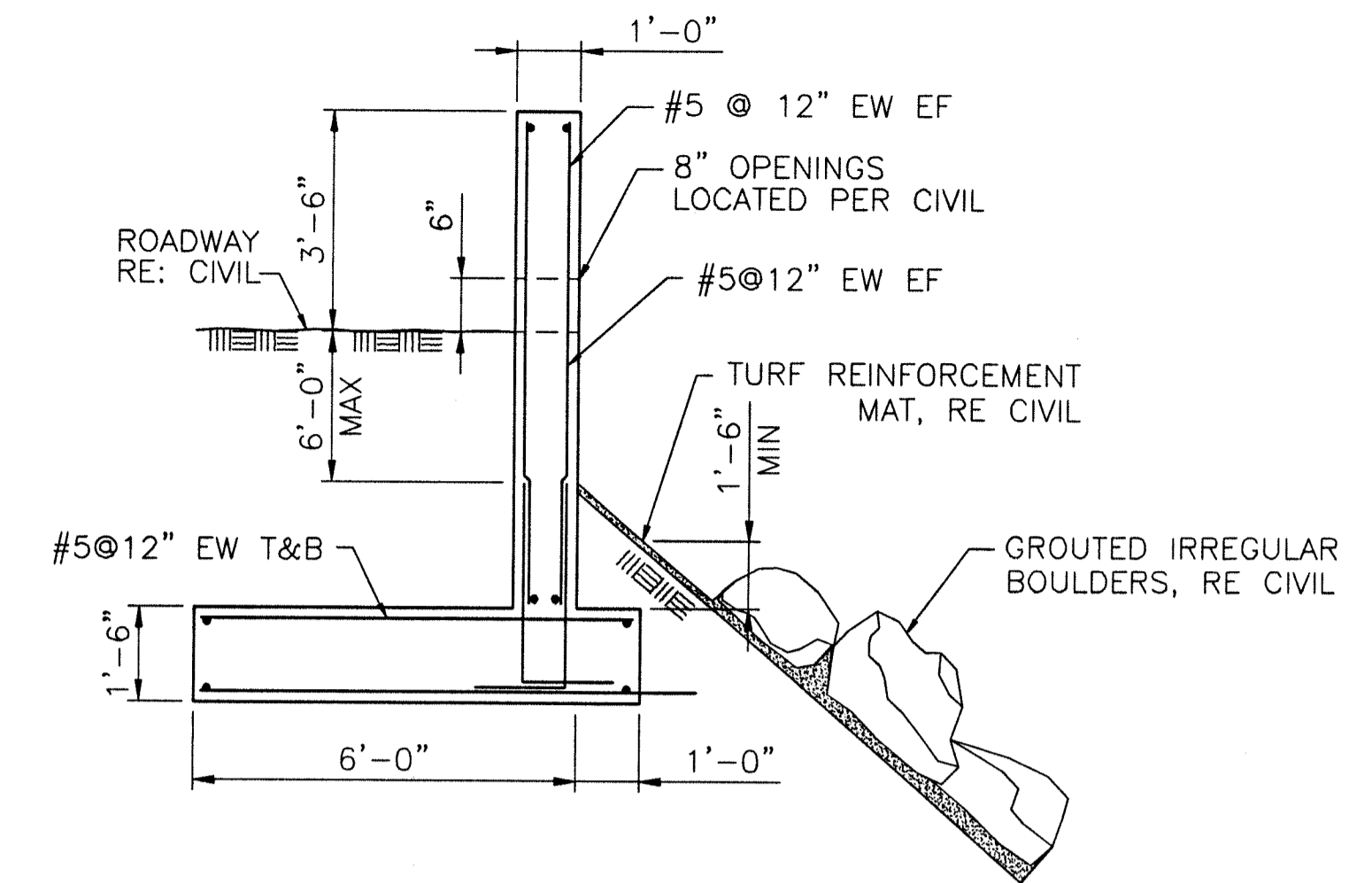
- NOTES:
1. REFER TO CIVIL FOR EXTENTS OF DEMOLITION, CONSTRUCTION LIMITS, GRADING, AND ADDITIONAL INFORMATION.
 2. TOP OF FOOTING ELEVATIONS ARE APPROXIMATE AND WILL HAVE TO BE FIELD VERIFIED. BEDROCK ELEVATIONS MAY VARY AND ARE TO BE COORDINATED WITH GEOTECHNICAL ENGINEER TO DETERMINE COMPETENT BEDROCK AND SOIL CONDITIONS.
 3. SEDIMENT BASIN DEBRIS NET DETAILS, RE CIVIL.



SEDIMENTATION BASIN WALL (TYPICAL) A
SCALE: 3/8" = 1'-0"

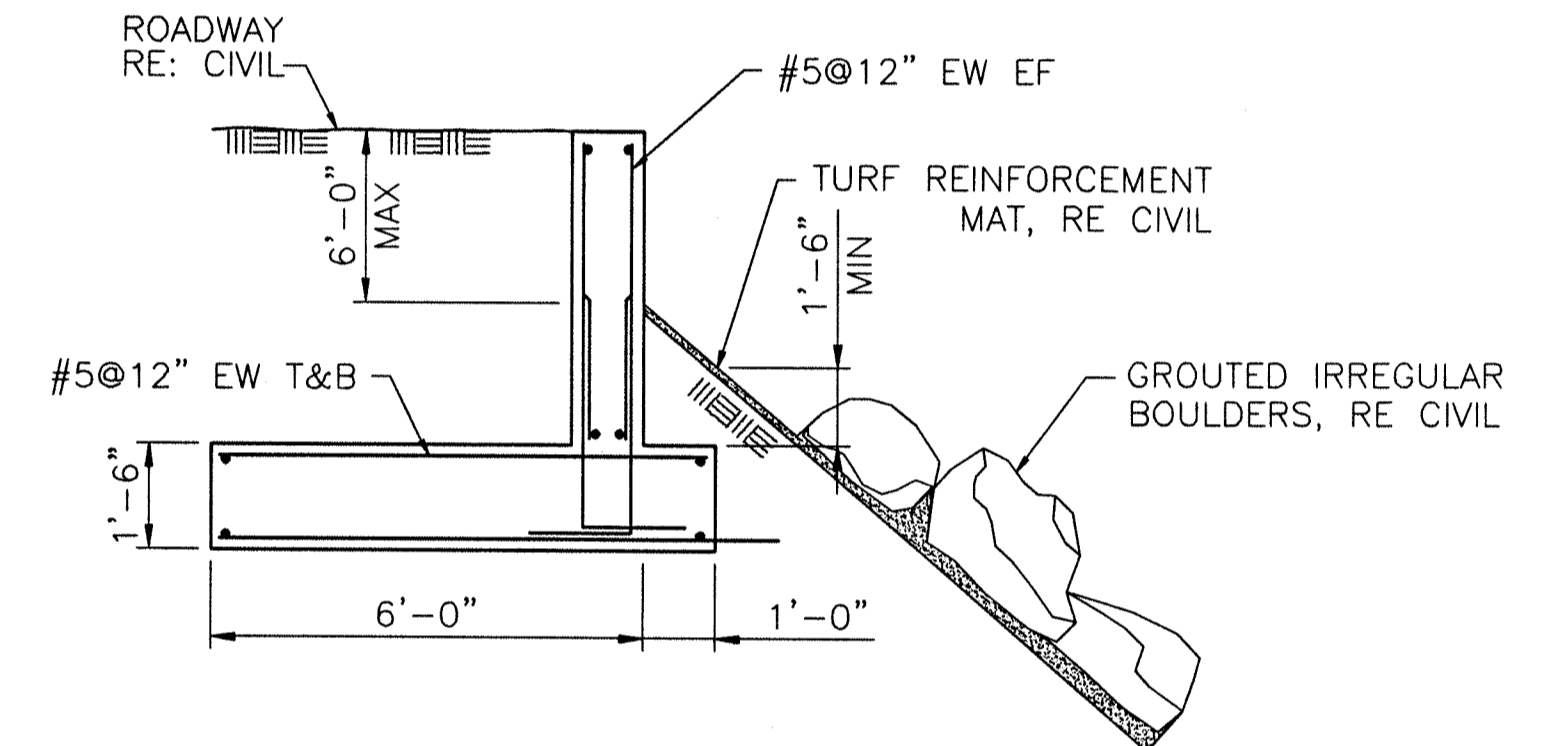


SEDIMENTATION BASIN WALL (@ ACCESS) B
SCALE: 3/8" = 1'-0"



ROADWAY WALL SECTION @ SEDIMENTATION BASIN C
SCALE: 3/8" = 1'-0"

- NOTE:
1. REFER TO CIVIL FOR LOCATIONS OF WALL.



ROADWAY WALL SECTION @ SEDIMENTATION BASIN C
SCALE: 3/8" = 1'-0"

- NOTE:
1. REFER TO CIVIL FOR LOCATIONS OF WALL.



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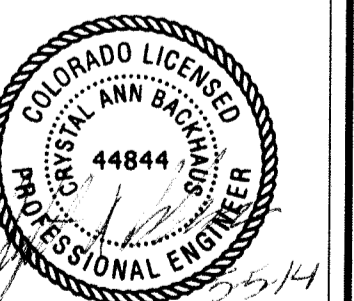
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4		5/5/14	CONSTRUCTION DOCUMENTS	

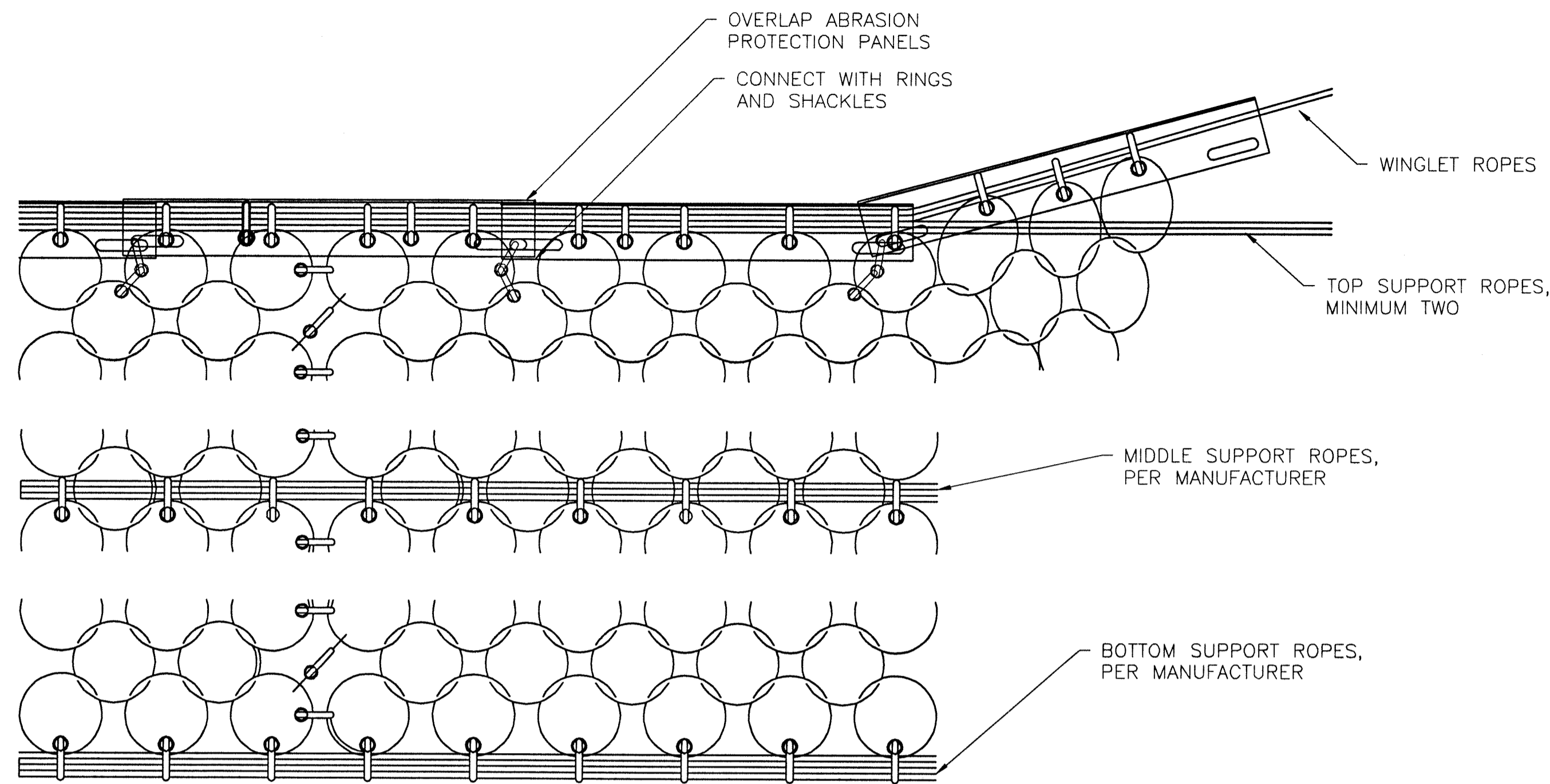
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DESIGN	C.A.B.
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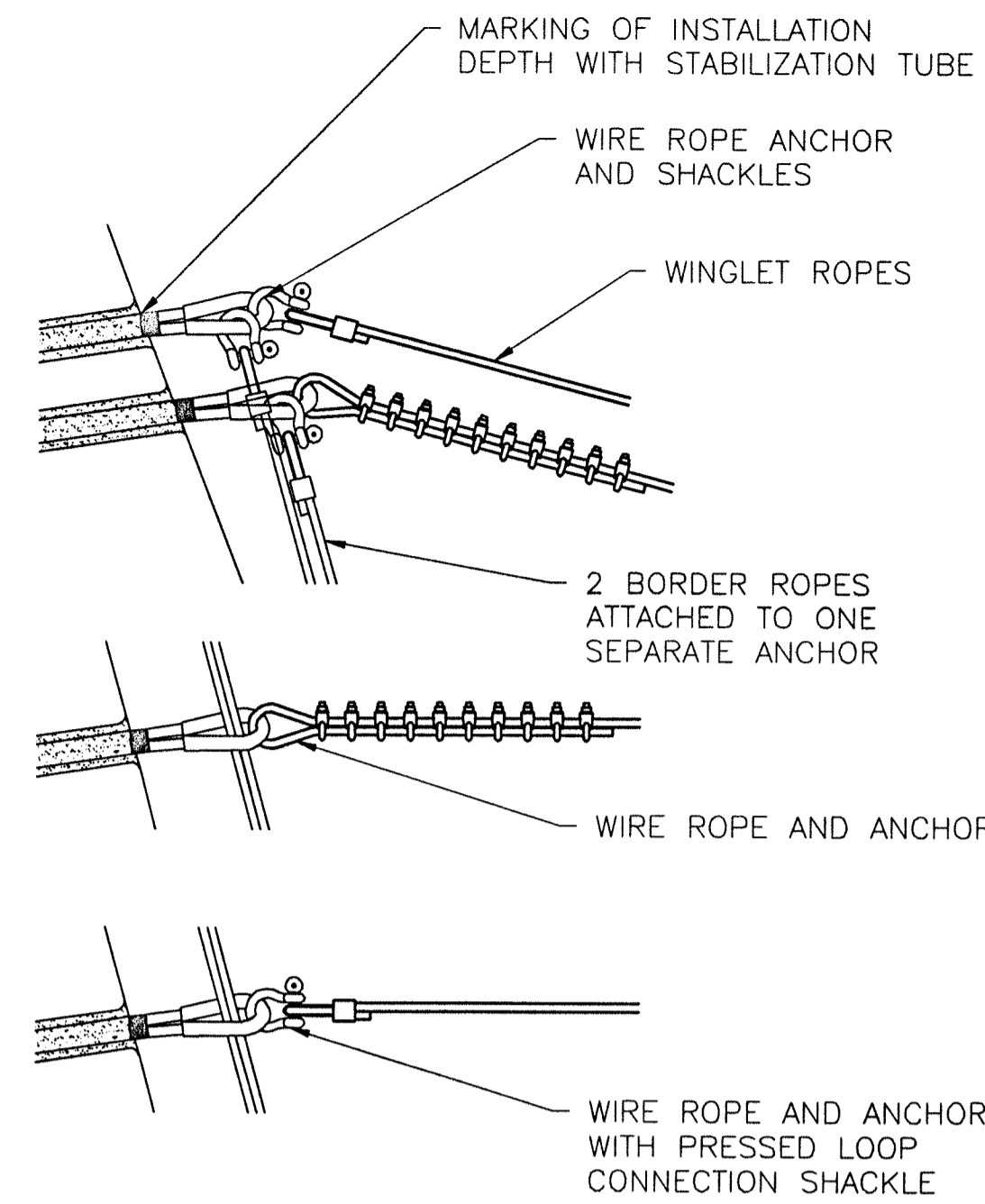
SEDIMENTATION BASIN

JOB NO. XXX-XXX-XXX
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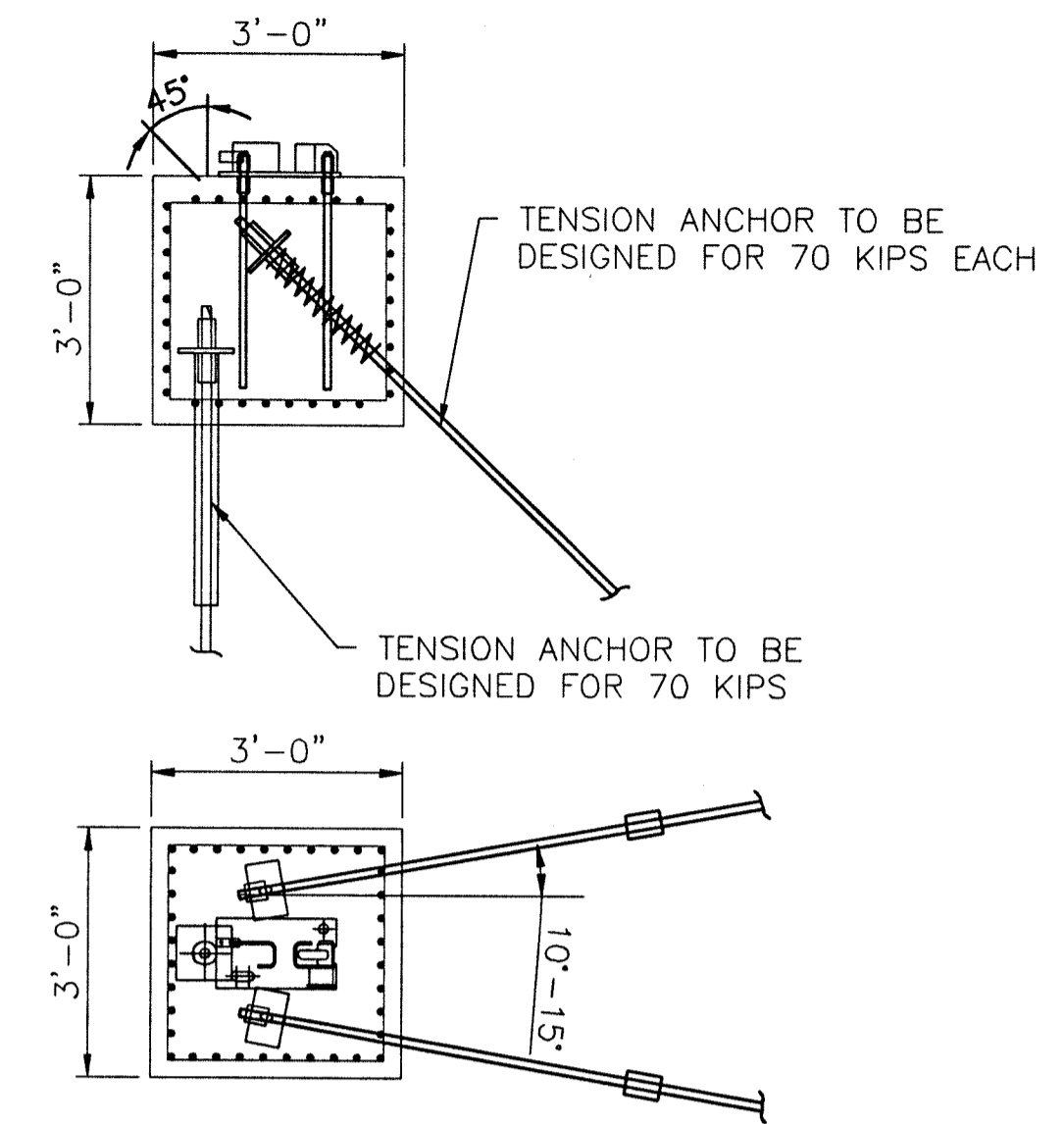




TYPICAL DEBRIS FLOW ELEVATION
SCALE: NTS



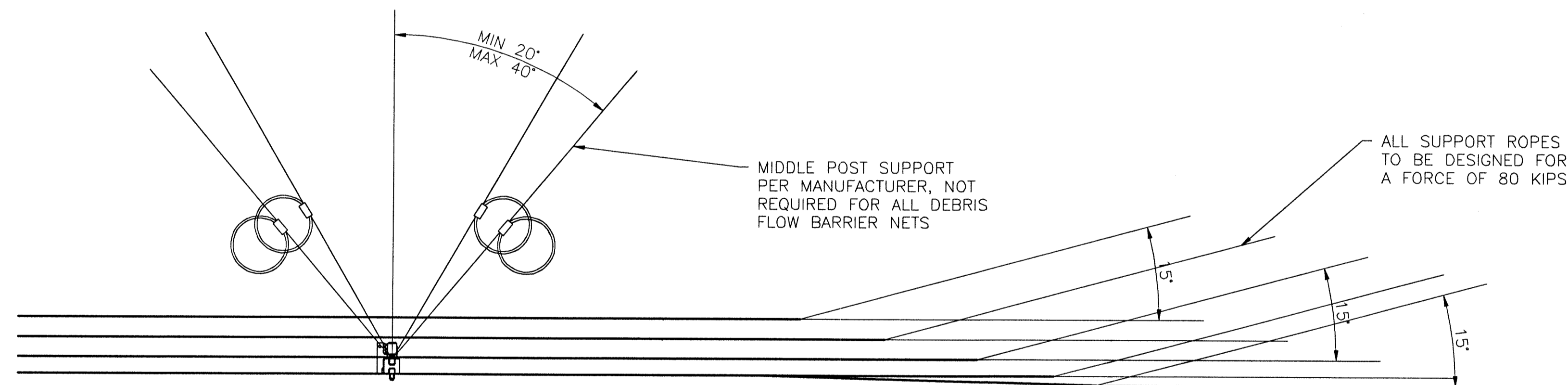
TYPICAL DEBRIS FLOW BARRIER CABLES
SCALE: NTS



DEBRIS FLOW BARRIER POST FOUNDATION
SCALE: NTS

NOTE:
1. DEBRIS FLOW BARRIER MANUFACTURER TO PROVIDE PROTECTION RECOMMENDATIONS FOR SERVICE CONDITIONS AT CONNECTION.

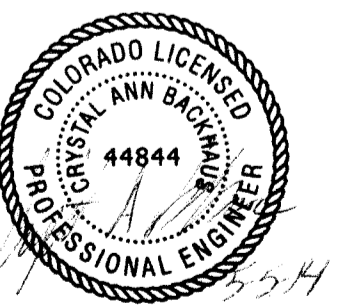
NOTE:
1. MIDDLE POST SUPPORT NOT REQUIRED FOR ALL DEBRIS FLOW BARRIERS, PER MANUFACTURER REQUIREMENTS.



DEBRIS FLOW BARRIER SYSTEM SUPPORT LOCATIONS
SCALE: NTS

DEBRIS FLOW BARRIER SCHEDULE					
LOCATION	MODEL	MAX HEIGHT	MAX WIDTH	SHEET	GROUND ANCHORS
UPPER DEBRIS BASIN	VX160-H6	6.5' ±	30.0 ±	C4	16 (8 ES)
STATION 21+81.83	VX100-H6	5.0' ±	17.8 ±	C6	14 (7 ES)
SEDIMENTATION BASIN	UX180-H6	8.0' ±	20.0 ±	C7	22 (11 ES)

- NOTES:
- DEBRIS FLOW BARRIER MODEL NUMBER IS PROVIDED BASED ON GEOBRUGG DESIGN GUIDE. ACTUAL MODEL NUMBER AND SIZE TO BE CONFIRMED BY DEBRIS FLOW BARRIER MANUFACTURER.
 - NUMBER OF GROUND ANCHORS IS BASED ON GEOBRUGG RECOMMENDATIONS AND PROVIDED FOR BID PURPOSES. FINAL NUMBER AND LOCATION OF GROUND ANCHORS TO BE CONFIRMED BY DEBRIS FLOW BARRIER MANUFACTURER.
 - UX180-H6 AT SEDIMENTATION BASIN DOES NOT REQUIRE A MIDDLE POST SUPPORT DUE TO GEOMETRY, TO BE CONFIRMED BY DEBRIS FLOW BARRIER MANUFACTURER.
 - GROUND ANCHORS PER DEBRIS FLOW BARRIER MANUFACTURER. MINIMUM 6"Ø DRILLED HOLE. AT UPPER DEBRIS BASIN AND SEDIMENTATION BASIN, EMBED 35'-0" INTO SILTY SAND, 25'-0" INTO CLAYSTONE, OR 20'-0" INTO LIMESTONE BEDROCK. AT STATION 21+81.83, PROVIDE A MINIMUM UNBONDED LENGTH EXTENDING 5'-0" BEYOND THE LIMITS OF SOIL NAILS AND 8'-0" BEYOND STRUCTURAL WALL WITH A MINIMUM OF 20'-0" EMBED INTO LIMESTONE BEDROCK. COORDINATE WITH GEOTECHNICAL ENGINEER IN THE FIELD TO VERIFY CONDITIONS FOR 80 KIP CAPACITY PER ANCHOR REQUIRED.



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△		5/5/14	CONSTRUCTION DOCUMENTS	

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Williams Canyon Drainage
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Debris Control Measures and Channel Repairs - Phase I

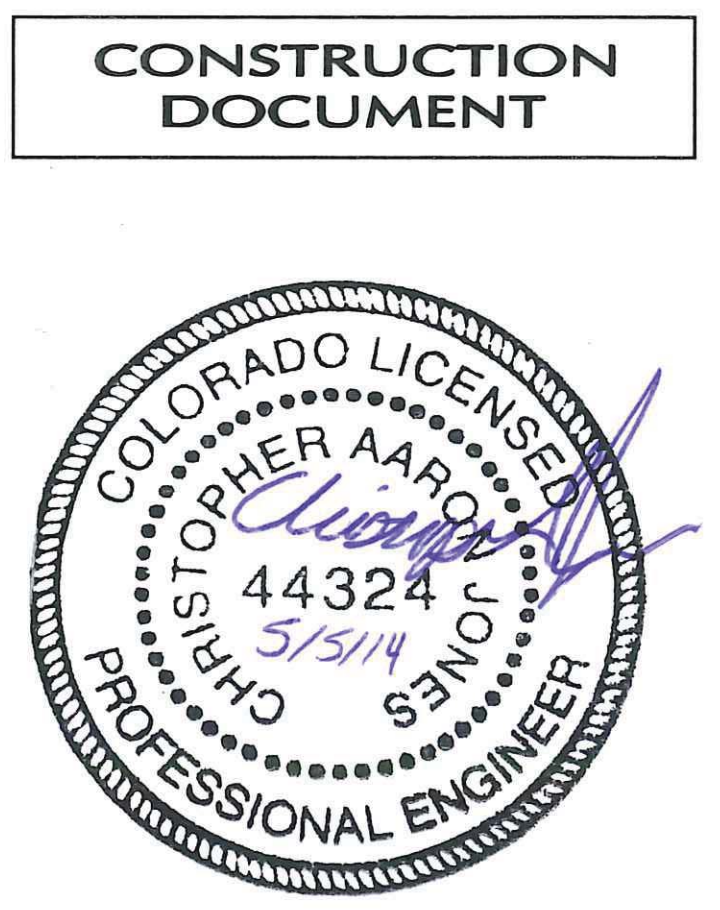
DEBRIS FLOW BARRIER SYSTEM

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SHEET NO.
S7

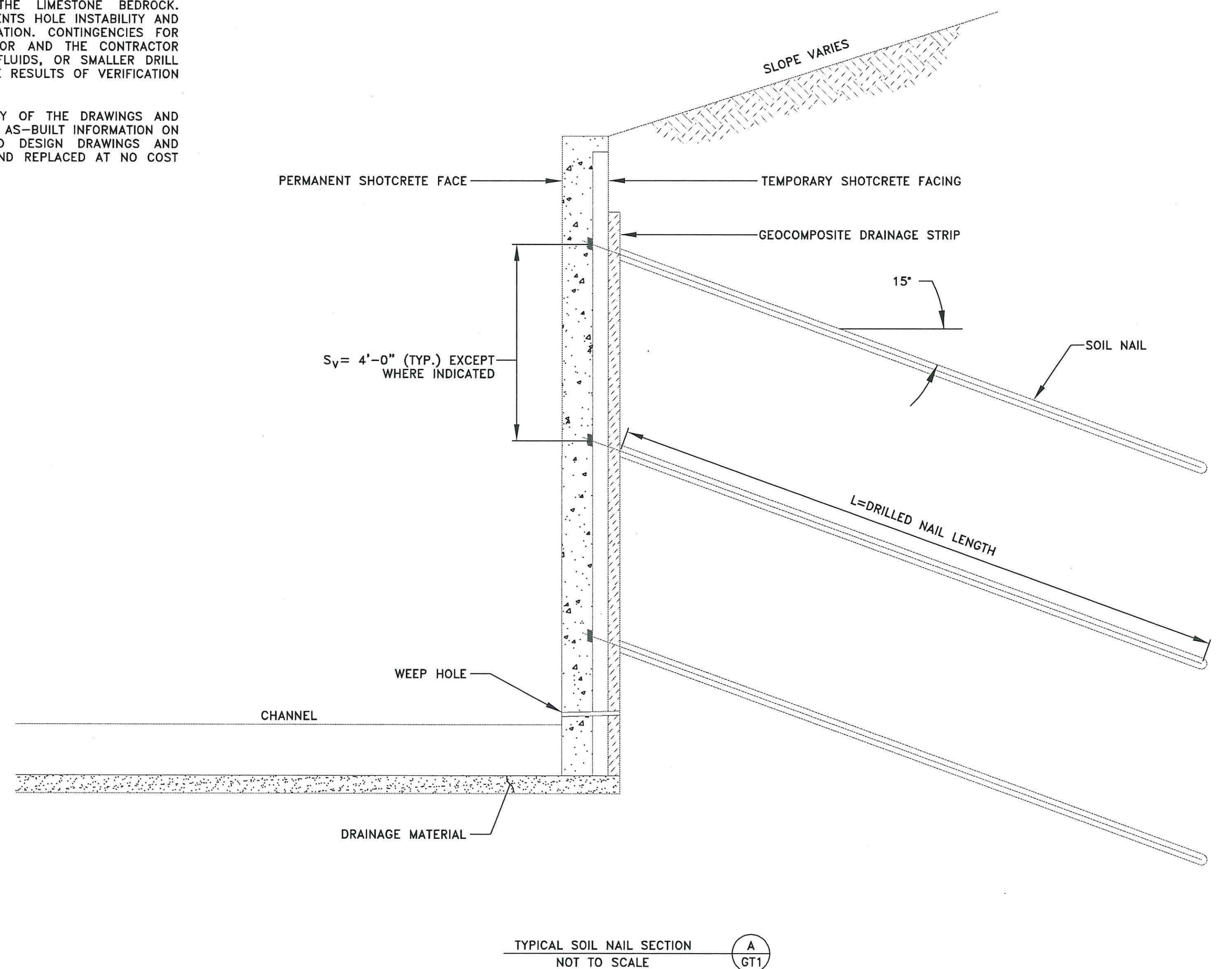
SOIL NAIL WALL GENERAL NOTES AND DESIGN PARAMETERS

1. THE DESIGN WAS PERFORMED IN ACCORDANCE WITH FHWA REPORT NO. FHWA-IF-03-017, "GEOTECHNICAL ENGINEERING CIRCULAR NO. 7, SOIL NAIL WALLS," MARCH 2003 USING THE ALLOWABLE STRESS DESIGN (ASD) METHOD.
2. REINFORCED SHOTCRETE:
 - SHOTCRETE: $f'_c = 4,000$ psi
3. SOIL NAILS:
 - NAIL TENDON: $f'_t = 75,000$ psi, ASTM 520
 - NAIL GROUT: $f'_c = 4,000$ psi
4. STRUCTURAL STEEL: AASHTO M183/ASTM A36.
5. WELDED WIRE FABRIC: AASHTO M55/ASTM A185 OR A497 @ GRADE 420
6. BEARING PLATES, NUTS, WELDED STUD CONNECTORS: AASHTO M183/ASTM A36; AASHTO M291
7. UNLESS OTHERWISE NOTED ON THE PLANS, MINIMUM SHOTCRETE COVER MEASURED FROM THE FACE OF SHOTCRETE/CONCRETE TO THE FACE OF ANY REINFORCING BAR SHALL BE AS FOLLOWS:
 - a. FRONT SIDE OF FACINGS EXPOSED TO WEATHER: 2 INCHES.
 - b. PERMANENT FACINGS EXPOSED TO SOIL: 3 INCHES.
 - c. PERMANENT FACINGS CAST AGAINST TEMPORARY SHOTCRETE: 1.5 INCHES.
8. DESIGN PARAMETERS:
 - a. ANTICIPATED FACE CONDITIONS ARE AS FOLLOWS:
 1. WALL STA 0+00 TO STA 2+00 - MIXED FACE CONSISTING OF OVERBURDEN SOILS ABOVE CLAYSTONE BEDROCK.
 2. WALL STA 2+00 TO STA 3+90 - MIXED FACE CONSISTING OF OVERBURDEN SOILS ABOVE LIMESTONE BEDROCK.
 3. WALL STA 5+00 TO STA 6+30 - MIXED FACE CONDITIONS CONSISTING PRIMARILY OF OVERBURDEN SOILS ABOVE LIMESTONE BEDROCK.
 4. WALL STA 8+00 TO STA 9+00 - OVERBURDEN SOILS.
 5. WALL STA 9+00 TO STA 10+22 PRIMARILY LIMESTONE, LESSER THICKNESS OF OVERBURDEN SOIL.
(NOTE: STA 3+90 TO STA 5+00 AND STA 6+30 TO STA 8+00 ARE STRUCTURAL WALLS)
 - b. MATERIAL PROPERTIES AND SHEAR STRENGTHS:
 1. GRANULAR OVERBURDEN SOILS, $\gamma = 125$ pcf, FRICTION ANGLE = 32° , COHESION = 0 psf.
 2. CLAYSTONE BEDROCK, $\gamma = 130$ pcf, FRICTION ANGLE = 24° , COHESION = 750 psf.
 3. LIMESTONE BEDROCK, $\gamma = 135$ pcf, FRICTION ANGLE = 30° , COHESION = 2,000 psf.
 - c. ESTIMATED ALLOWABLE BOND STRENGTHS:
 1. GRANULAR OVERBURDEN SOILS = 10 psi
 2. CLAYSTONE BEDROCK = 15 psi
 3. LIMESTONE BEDROCK = 25 psi
9. CONSTRUCTION REQUIREMENTS:
 - A. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING EXISTING UNDERGROUND STRUCTURES OR UTILITIES PRIOR TO CONSTRUCTION.
 - B. UNLESS SPECIFIED OTHERWISE, ENGINEER WILL PROVIDE SURVEY CONTROL POINTS FOR TOP OF WALL ALIGNMENT. CONTRACTOR RESPONSIBLE FOR SURVEY CONTROL AS EXCAVATION IS ADVANCED.
 - C. INSTALL THREE PRE-PRODUCTION VERIFICATION NAILS AT LOCATIONS SELECTED BY THE ENGINEER AND COMPLETE VERIFICATION TESTS PER ABOVE-CITED FHWA GEOTECHNICAL ENGINEERING CIRCULAR NO. 7 PRIOR TO INSTALLING PRODUCTION NAILS. SUBMIT VERIFICATION TEST RESULTS TO ENGINEER FOR ACCEPTANCE.
 - D. PLACE STRUCTURAL BACKFILL IN AREAS WHERE WALL EXTENDS ABOVE THE EXISTING GRADE PRIOR TO WALL CONSTRUCTION. SLOPE OF BACKFILL SHALL NOT EXCEED MIN 5% FOR DRAINAGE BEHIND WALL AND MAY HAVE A TEMPORARY SLOPE FACE OF 1:1 (HORIZONTAL TO VERTICAL) IN FRONT OF THE WALL.
 - E. THE FOLLOWING WALL CONSTRUCTION SEQUENCE FOR EACH EXCAVATION LIFT SHALL BE COMPLETE PRIOR TO INITIATING WORK ON THE NEXT EXCAVATION LIFT UNLESS OTHERWISE APPROVED BY THE ENGINEER.
 - a. EXCAVATE TO FIRST STAGE ROUGH GRADE. TOP-DOWN EXCAVATION STAGES SHALL NOT EXCEED 4 FEET.
 - b. TRIM TO FINAL WALL FACE EXCAVATION LINE.
 - c. MARK NAIL LOCATIONS. NOTIFY ENGINEER OF NAILS LOCATED GREATER THEN 2' BELOW THE TOP OF EXCAVATION CUT. FIELD MODIFICATIONS TO RELOCATE NAILS GREATER THAN 2' BELOW THE TOP OF THE WALL MAY BE REQUIRED.
 - d. DRILL, INSTALL AND GROUT NAILS.
 - e. INSTALL GEOCOMPOSITE DRAINAGE STRIP.
 - f. PLACE REINFORCING AND APPLY SHOTCRETE. NO EXCAVATION THAT HAS EXPOSED WALL FACE SHALL BE LEFT UNSTABILIZED BY SHOTCRETE AT THE END OF THE WORK DAY UNLESS ENGINEER APPROVES OTHERWISE.
 - g. REPEAT STEPS, a, b, c, e AND f FOR SUBSEQUENT EXCAVATION STAGES.
 - F. ALL NAIL LENGTHS (L) INDICATED ARE DRILLED LENGTHS MEASURED BEHIND THE SOIL FACE. CONTRACTOR SHALL PROVIDE ADDITIONAL LENGTH NEEDED TO ASSEMBLE NAIL TO FACING.

- G. PERFORM PROOF TESTS IN ACCORDANCE WITH THE ABOVE-CITED FHWA GEOTECHNICAL ENGINEERING CIRCULAR NO. 7. BOTH A CALIBRATED LOAD CELL AND PRESSURE GAUGE WILL BE REQUIRED FOR TESTING. PERFORM PROOF TESTS ON 5% OF SOIL NAILS. PERFORM ADDITIONAL PERFORMANCE TESTS IF REQUESTED BY ENGINEER TO EVALUATE FAILING PROOF TEST.
- H. PROVIDE FOR POSITIVE DRAINAGE CONNECTION BETWEEN THE GEOCOMPOSITE STRIPS AND THE WALL WEEP HOLES. FOR THE PORTION OF THE WALL ALONG THE CHANNEL, PROVIDE CONNECTION BETWEEN THE BOTTOM OF THE GEOCOMPOSITE STRIPS AND THE CDOT CLASS B DRAINAGE MATERIAL BELOW THE CHANNEL.
- I. PREPARE BEARING SUBGRADE FOR THE PERMANENT SHOTCRETE FACING.
- J. INSTALL PERMANENT CONCRETE FACING.
- K. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND MAINTAINING STABLE SLOPES ABOVE AND BELOW THE SOIL NAIL WALLS.
- L. NO EXCAVATION CUT SLOPES STEEPER THAN 1.5H:1V SHALL BE MADE WITHIN 15 FEET IN FRONT OF THE SOIL NAIL WALL WITHOUT APPROVAL OF THE ENGINEER.
- M. CONTINGENCY FOR PROVIDING BUTTRESSING FILL, FLASH COAT OF SHOTCRETE, OR OTHER MEASURES BETWEEN THE NAIL LOCATIONS TO CONTROL UNSTABLE FACE CONDITIONS SHOULD BE PLANNED FOR IN THE OVERBURDEN SOILS.
- N. CONTINGENCY FOR INSTALLING A SINGLE ROW OF POST-TENSIONED GROUND ANCHORS ON 15-FOOT CENTERS SHOULD BE ASSUMED WHERE THERE IS A POTENTIAL FOR UNSTABLE ROCK WEDGES TO BE ENCOUNTERED IN THE WALL EXCAVATION. WE ANTICIPATE THESE AREAS TO EXTEND FROM STA 2+00 TO STA 3+90 AND ABOUT STA 9+00 TO STA 10+22 FOR A TOTAL OF APPROXIMATELY 25 ANCHORS.
- O. COBBLES AND BOULDERS MAY BE ENCOUNTERED IN THE OVERBURDEN, AND VERY HARD ROCK CONDITIONS AND/OR OCCASIONAL VOIDS MAY BE ENCOUNTERED IN THE LIMESTONE BEDROCK. CONTRACTOR IS RESPONSIBLE FOR SELECTING DRILLING METHOD THAT PREVENTS HOLE INSTABILITY AND MAINTAINS MINIMUM HOLE DIAMETER DURING NAIL DRILLING AND INSTALLATION. CONTINGENCIES FOR CASING THE HOLES DUE TO CAVING OR VOIDS SHOULD BE PLANNED FOR AND THE CONTRACTOR SHOULD SUBMIT A WRITTEN PLAN FOR CASING. USE OF BIODEGRADABLE FLUIDS, OR SMALLER DRILL HOLE DIAMETERS THAN THOSE SHOWN, MAY BE CONSIDERED BASED ON THE RESULTS OF VERIFICATION TESTS, BUT ARE SUBJECT TO ENGINEER'S APPROVAL.
- P. ON-SITE CONSTRUCTION SUPERINTENDENT AND CREW SHALL HAVE A COPY OF THE DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES, AND SHALL UPDATE DRAWINGS WITH AS-BUILT INFORMATION ON A DAILY BASIS. CONSTRUCTION THAT DEVIATES FROM THE APPROVED DESIGN DRAWINGS AND SPECIFICATIONS, AS DETERMINED BY THE ENGINEER, SHALL BE REMOVED AND REPLACED AT NO COST TO THE OWNER.



SOIL NAIL WALL QUANTITIES		
ITEM	QUANTITY	UNIT
WALL FACE AREA	12,378	SQ FT
NAIL (L = 20 FT)	198	EACH
NAIL (L = 15 FT)	185	EACH
ANCHOR (L = 25 FT)	25	EACH
DRAIN STRIP	2,350	SQ FT



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2390 S. Lipan St.
Denver, Colorado, 80223
Phone: 303-742-9700
FAX: 303-742-9666
Kumar & Associates

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		05/05/14	FOR CONSTRUCTION
			REMOVED REFERENCE TO PERMANENT CONCRETE

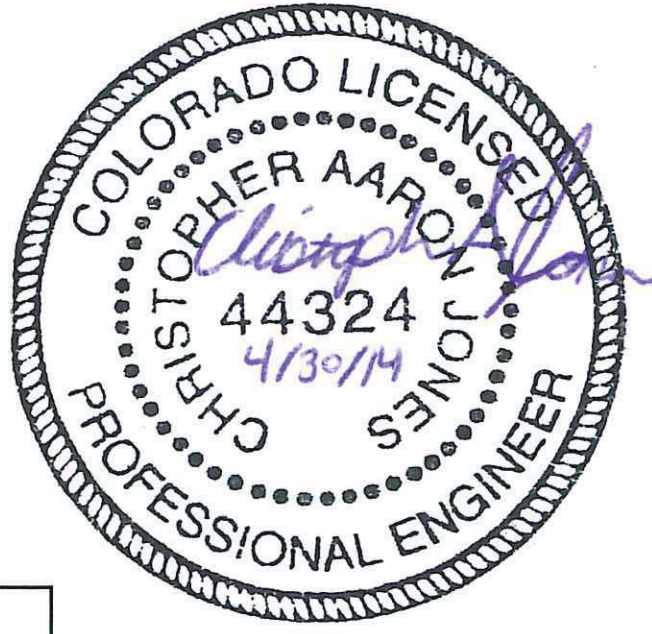
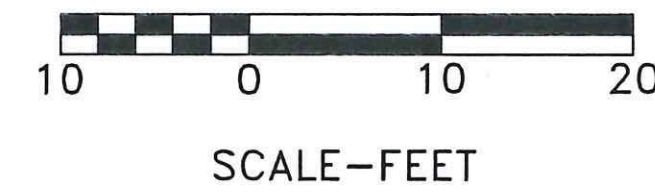
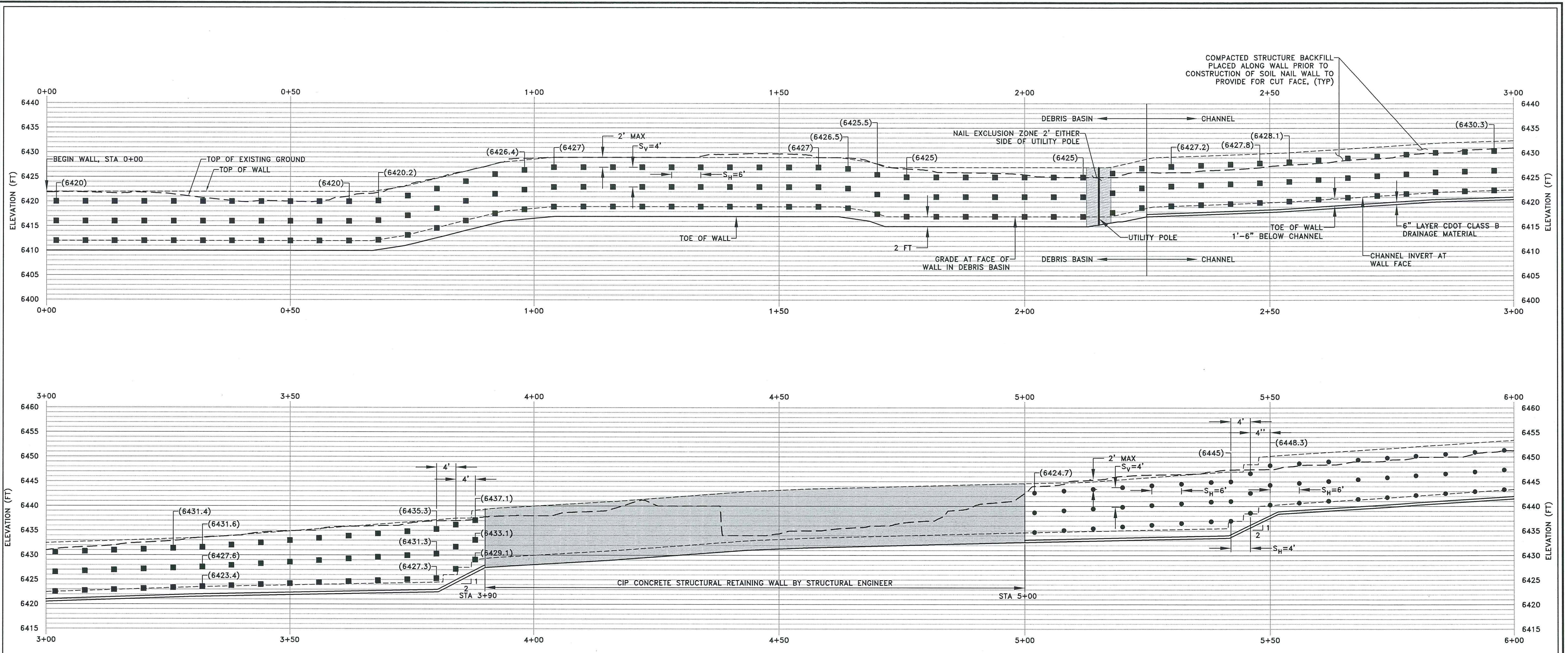
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APPROVAL	CAJ 05/05/14

Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

GENERAL NOTES

JOB NO. 13-2-211A
REVISION NO. 0
SHEET NO. GT1

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CONSTRUCTION DOCUMENT

K+A
 2390 S. Lipan St.
 Denver, Colorado, 80223
 Phone: 303-742-9700
 FAX: 303-742-9666
 Kumar & Associates

REVISIONS			DESCRIPTION	COMMENTS
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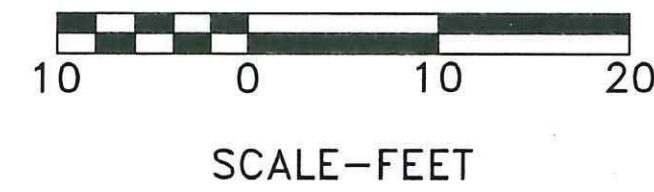
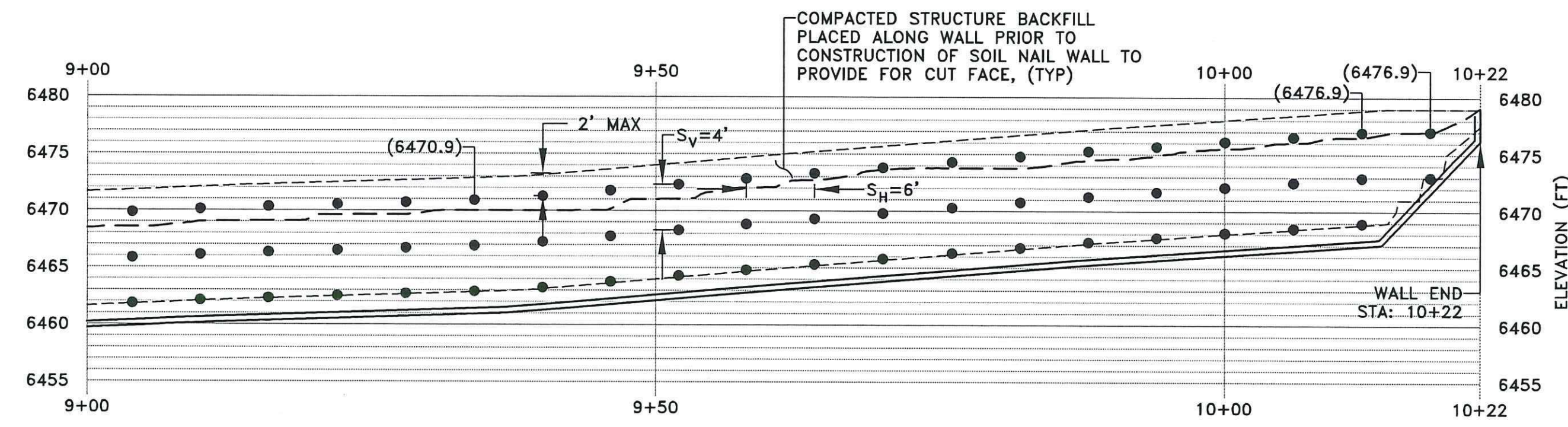
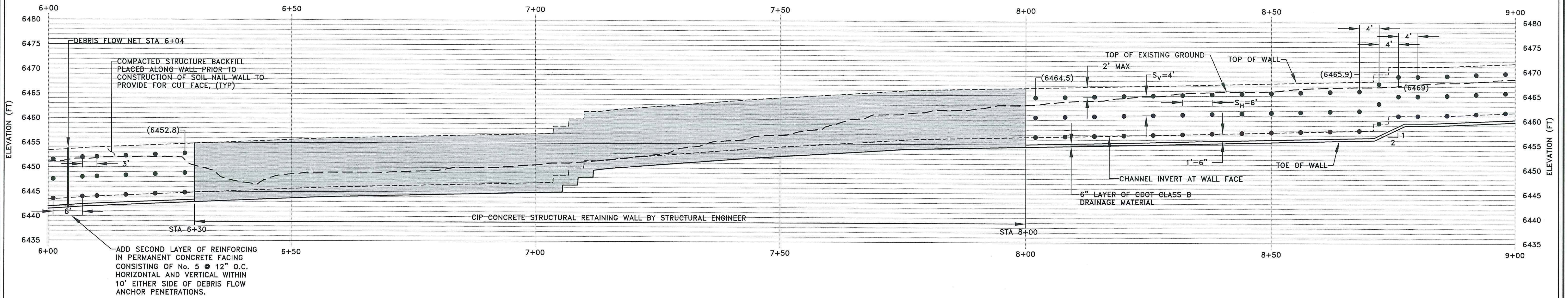
Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

SOIL NAIL WALL ELEVATION VIEW

JOB NO. 13-2-211A
 REVISION NO. 0
 SHEET NO. GT2

- LEGEND:**
- 20 FOOT NAILS
 - 15 FOOT NAILS
 - S_H HORIZONTAL NAIL SPACING (FEET)
 - S_V VERTICAL NAIL SPACING (FEET)
- NOTES:**
- ELEVATIONS SHOWN ARE BASED ON GRADING INFORMATION PROVIDED BY WRIGHT WATER ENGINEERS, INC. SEE PLAN VIEW ON SHEET No. C10 AND C11.
 - NAIL ELEVATIONS NOT SHOWN SHALL BE LINEARLY INTERPOLATED BETWEEN THOSE SHOWN BY NAIL/SOIL CONTACT ELEVATIONS.
 - EXPANSION JOINTS AND CONTROL JOINTS FOR THE PERMANENT WALL FACING ARE NOT SHOWN. SPACE EXPANSION JOINTS MAXIMUM 75 FEET ON CENTER, AND CONTROL JOINTS (BETWEEN EXPANSION JOINTS) MAXIMUM 25 FEET ON CENTER. AT LEAST 12 INCHES CLEAR DISTANCE SHALL BE PROVIDED BETWEEN THE JOINT AND THE NAILS.

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CONSTRUCTION DOCUMENT

LEGEND:

- 20 FOOT NAILS
- 15 FOOT NAILS
- S_H HORIZONTAL NAIL SPACING (FEET)
- S_V VERTICAL NAIL SPACING (FEET)

NOTES:

1. ELEVATIONS SHOWN ARE BASED ON GRADING INFORMATION PROVIDED BY WRIGHT WATER ENGINEERS, INC. SEE PLAN VIEW ON SHEET No. C10 AND C11.
2. NAIL ELEVATIONS NOT SHOWN SHALL BE LINEARLY INTERPOLATED BETWEEN THOSE SHOWN BY NAIL/SOIL CONTACT ELEVATIONS.
3. EXPANSION JOINTS AND CONTROL JOINTS FOR THE PERMANENT WALL FACING ARE NOT SHOWN. SPACE EXPANSION JOINTS MAXIMUM 75 FEET ON CENTER, AND CONTROL JOINTS (BETWEEN EXPANSION JOINTS) MAXIMUM 25 FEET ON CENTER. AT LEAST 12 INCHES CLEAR DISTANCE SHALL BE PROVIDED BETWEEN THE JOINT AND THE NAILS.

K+A
 2390 S. Lipan St.
 Denver, Colorado, 80223
 Phone: 303-742-9700
 FAX: 303-742-9666
 Kumar & Associates

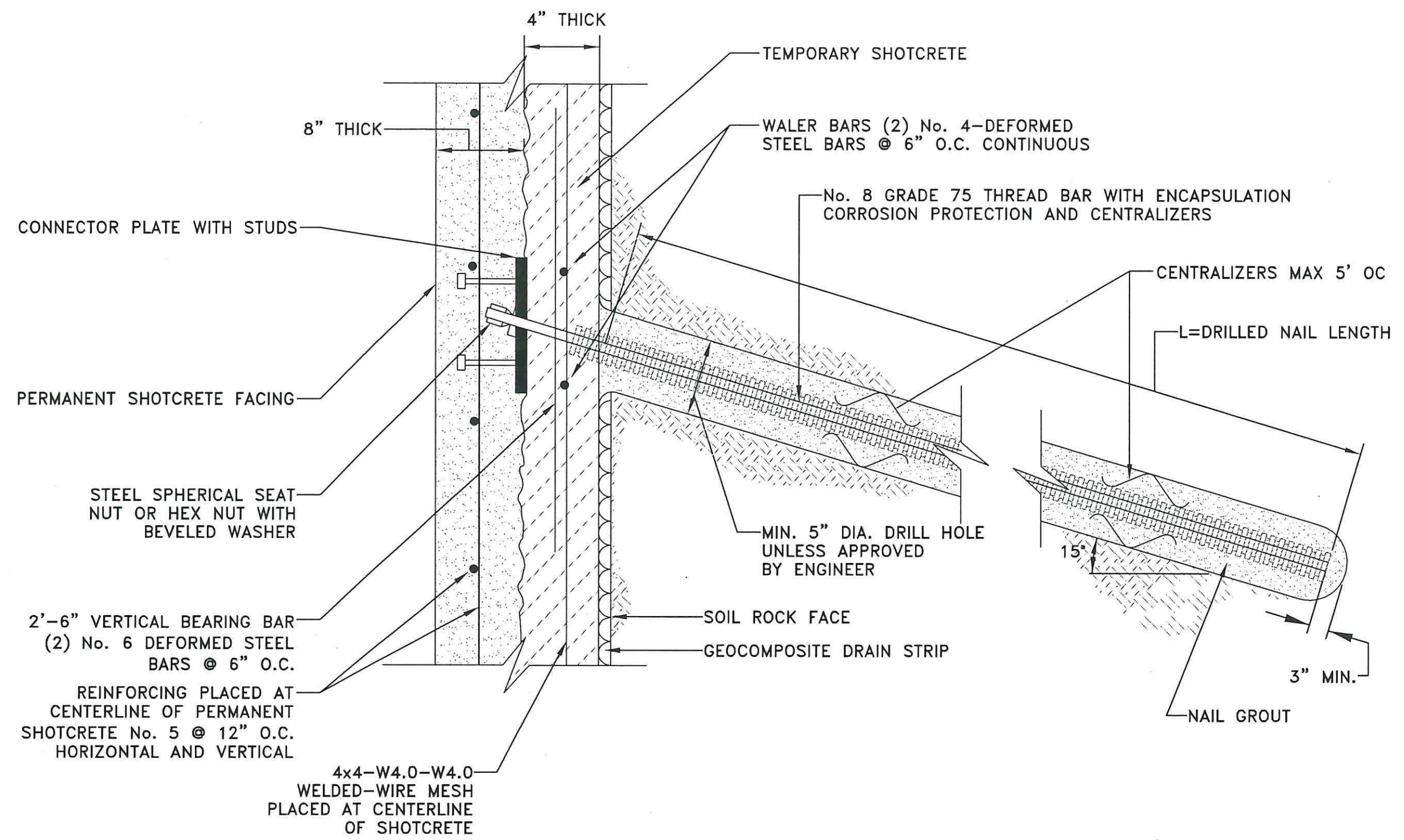
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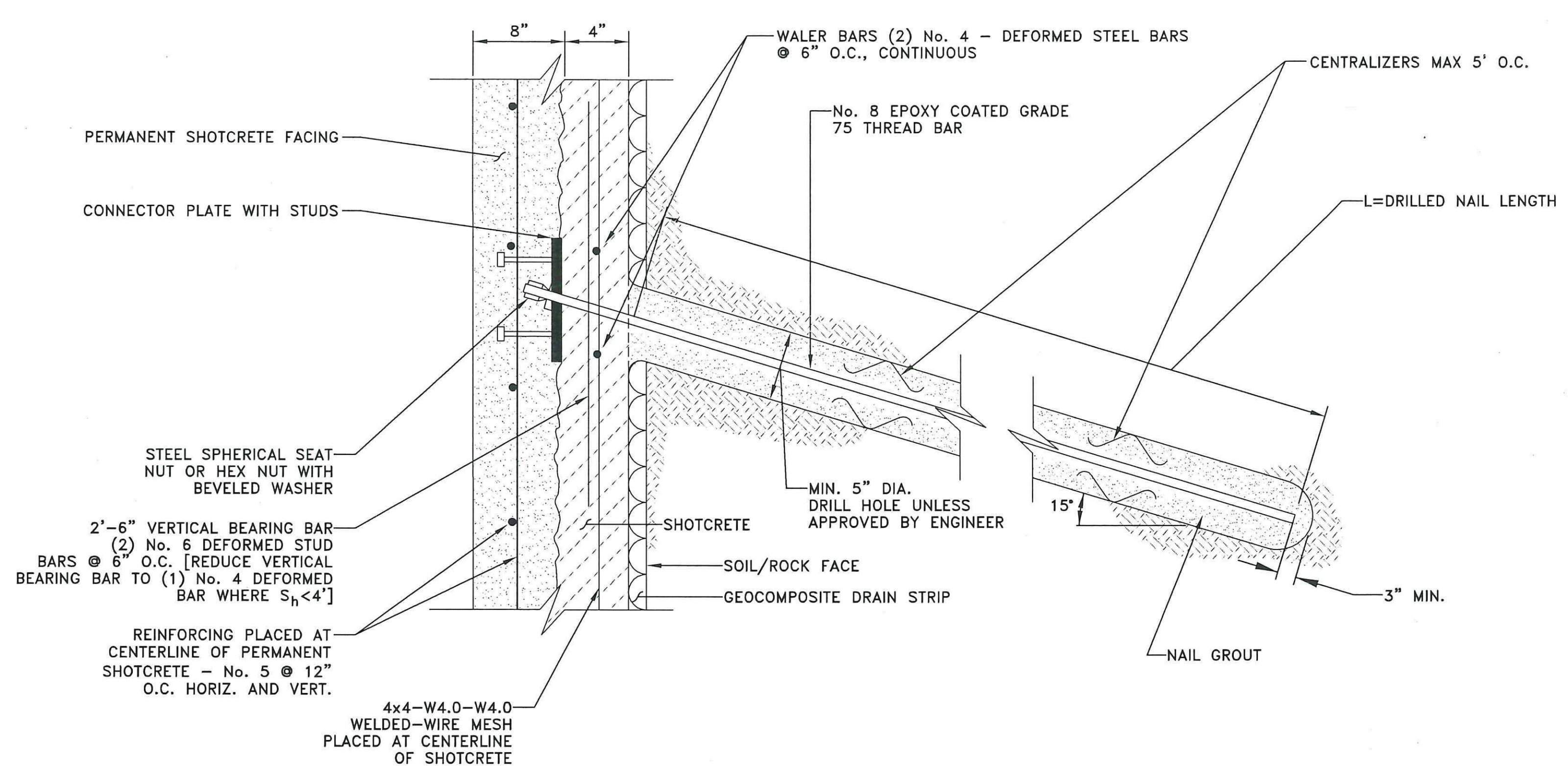
Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

SOIL NAIL WALL ELEVATION VIEW

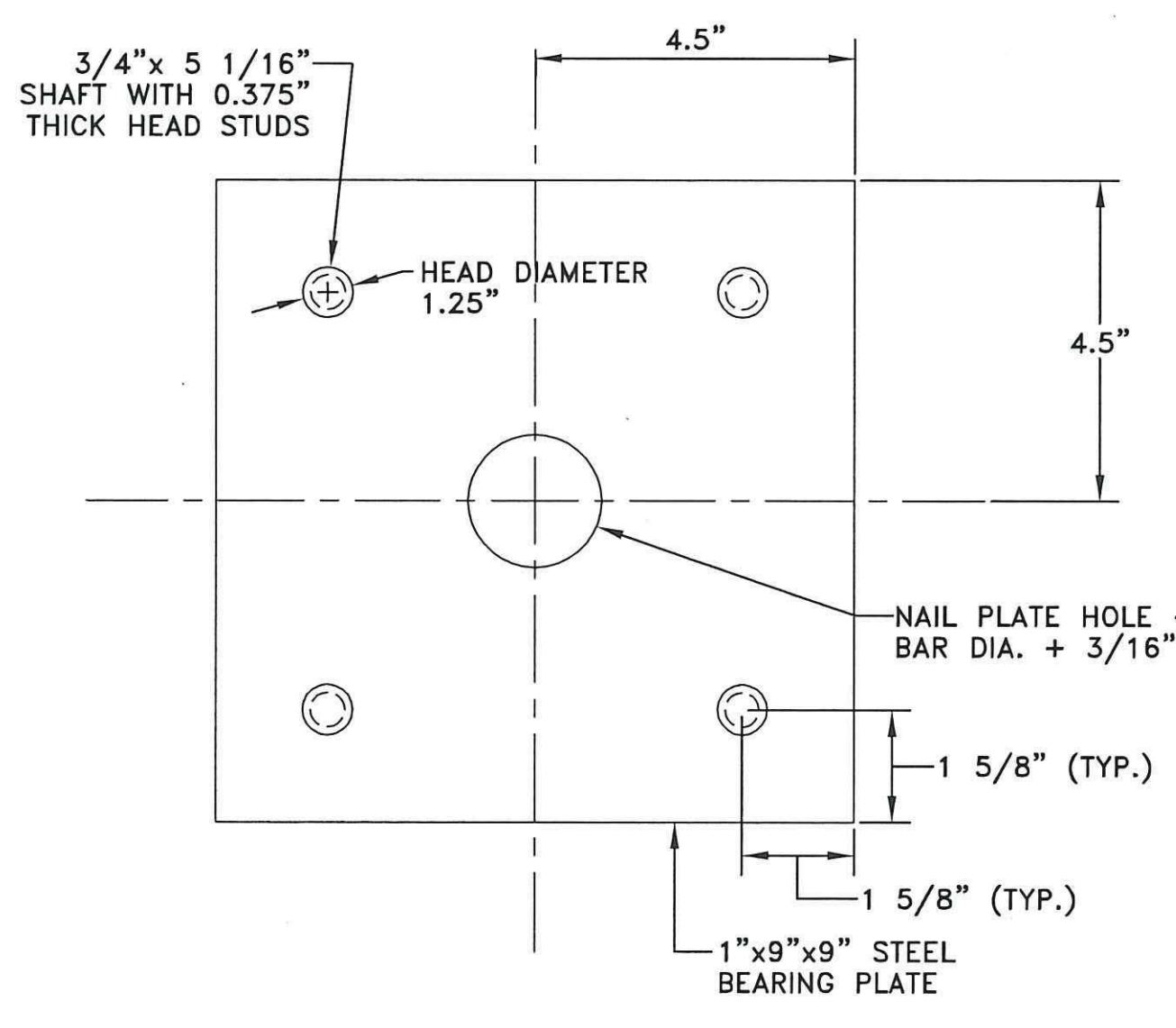
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REVISION NO. 0
SHEET NO. GT3



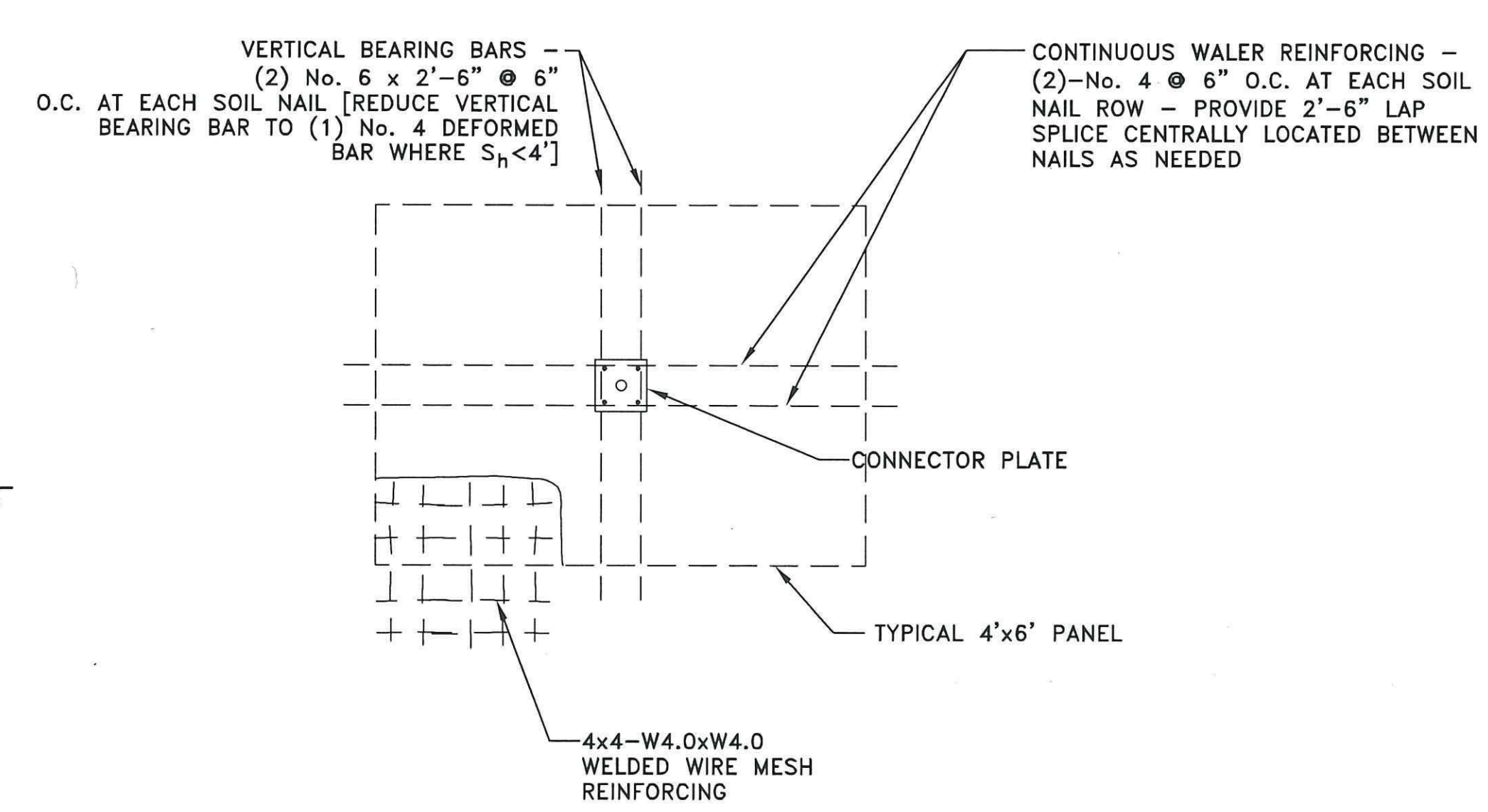
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NOT TO SCALE



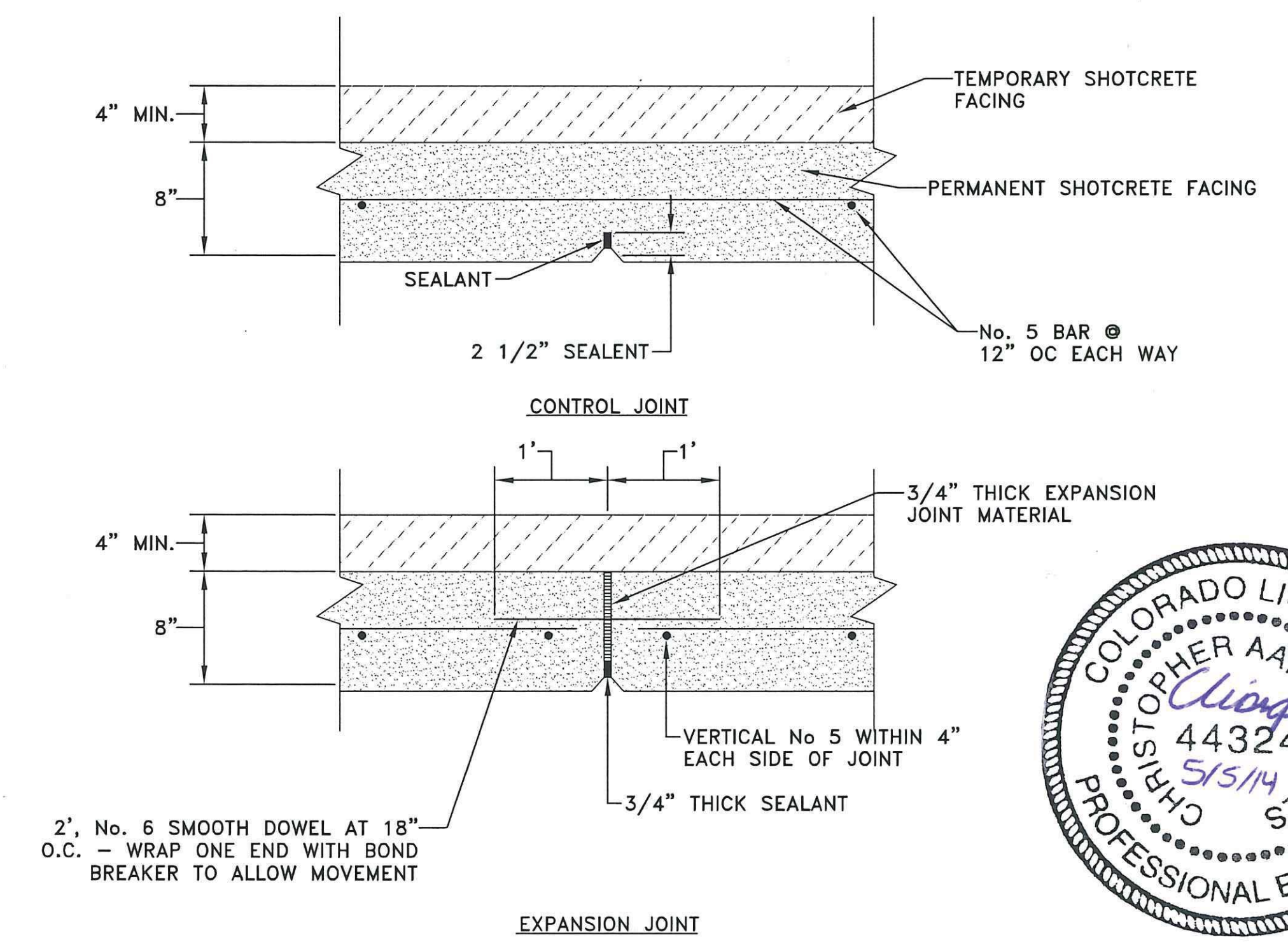
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CONNECTOR PLATE WITH STUD DETAIL
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TYPICAL SHOTCRETE PANEL STEEL
NOT TO SCALE



CONTROL AND EXPANSION JOINT DETAILS
NOT TO SCALE



CONSTRUCTION DOCUMENT

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K+A
2390 S. Lipan St.
Denver, Colorado, 80223
Phone: 303-742-9700
FAX: 303-742-9666
Kumar & Associates

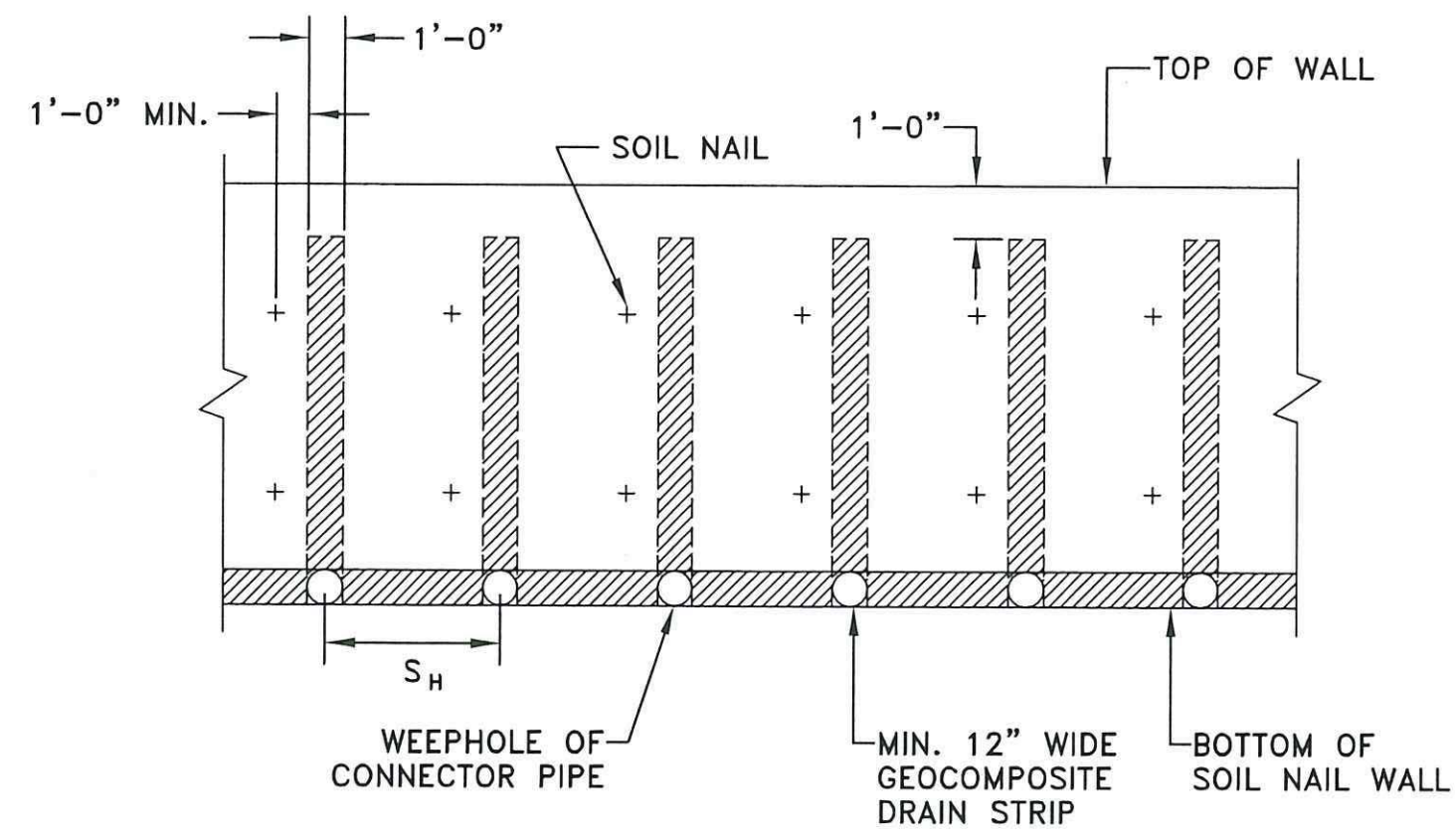
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Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

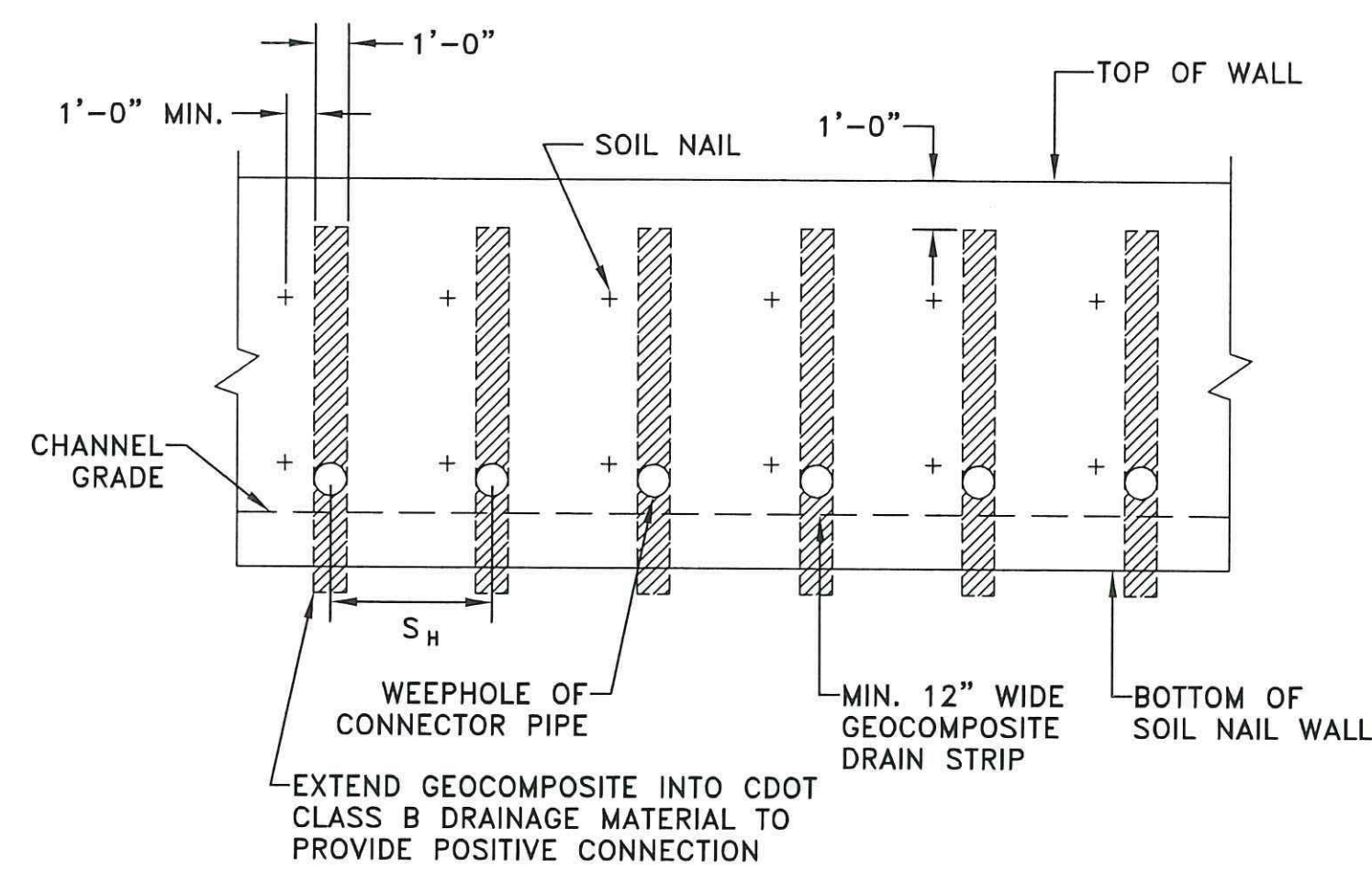
SOIL NAIL WALL DETAILS

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SHEET NO. **GT4**



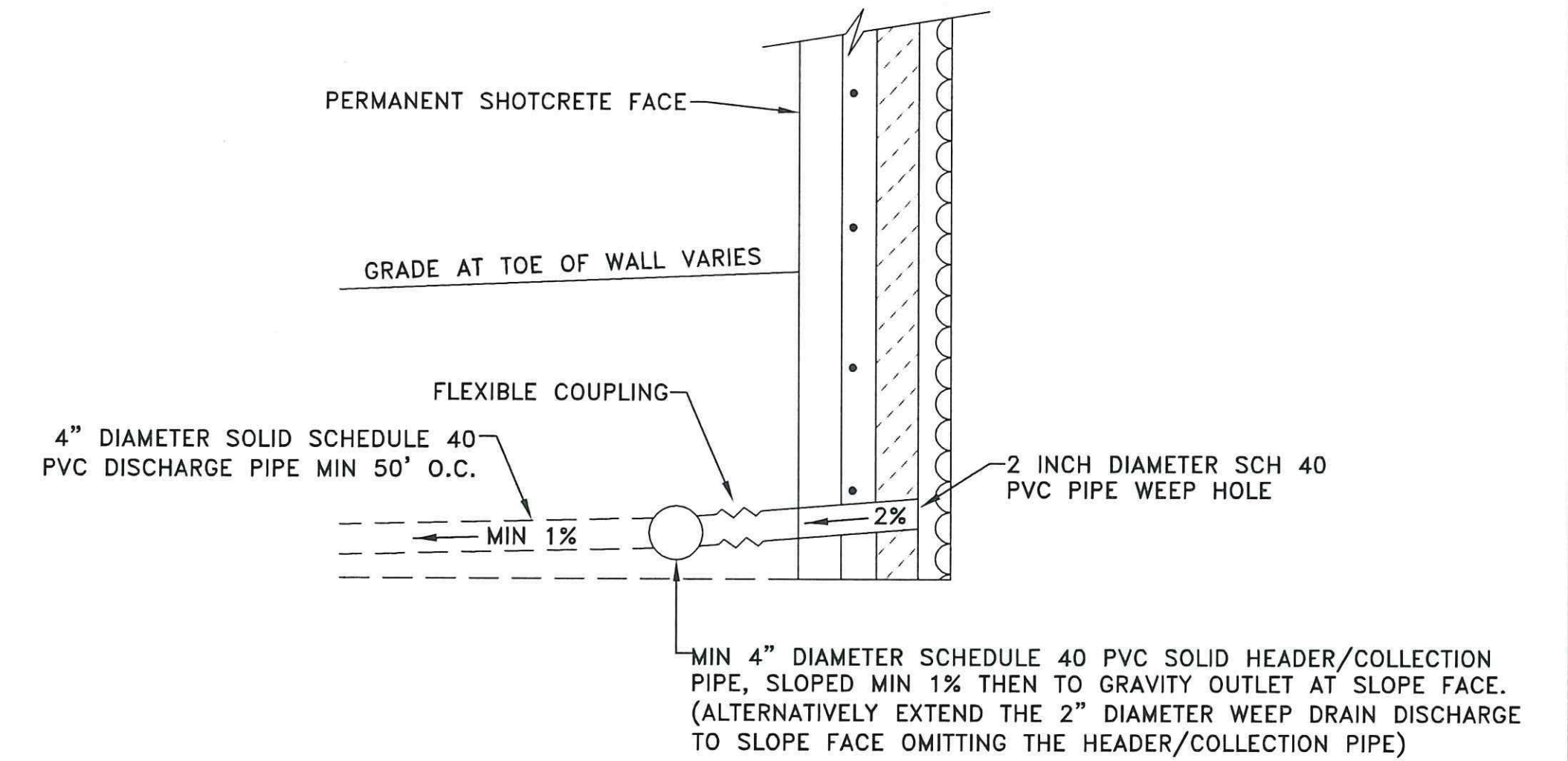
GEOCOMPOSITE DRAINAGE STRIP DETAIL AT DEBRIS BASIN STA 0+00 TO STA 2+25
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A
GT5



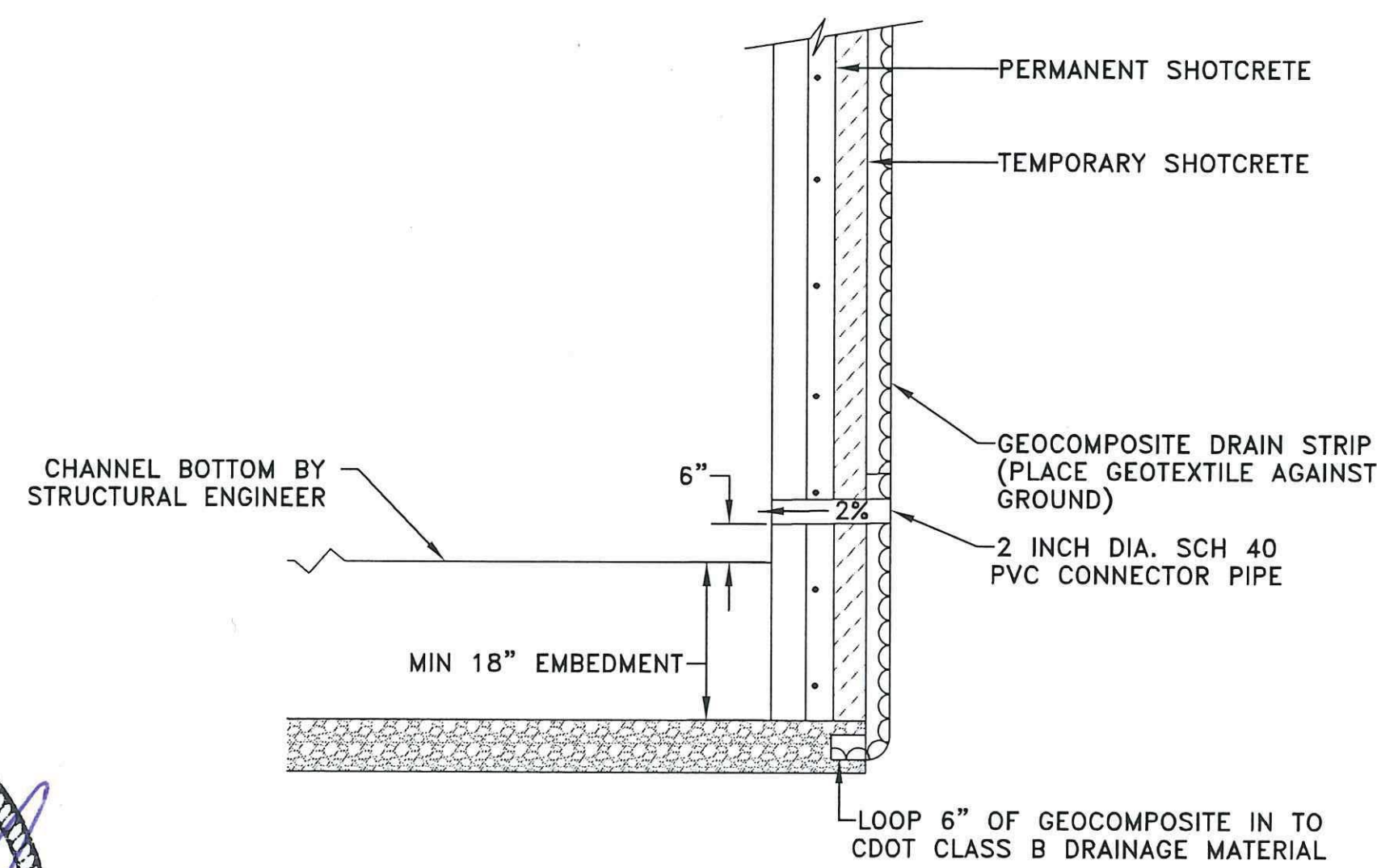
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NOT TO SCALE

B
GT5



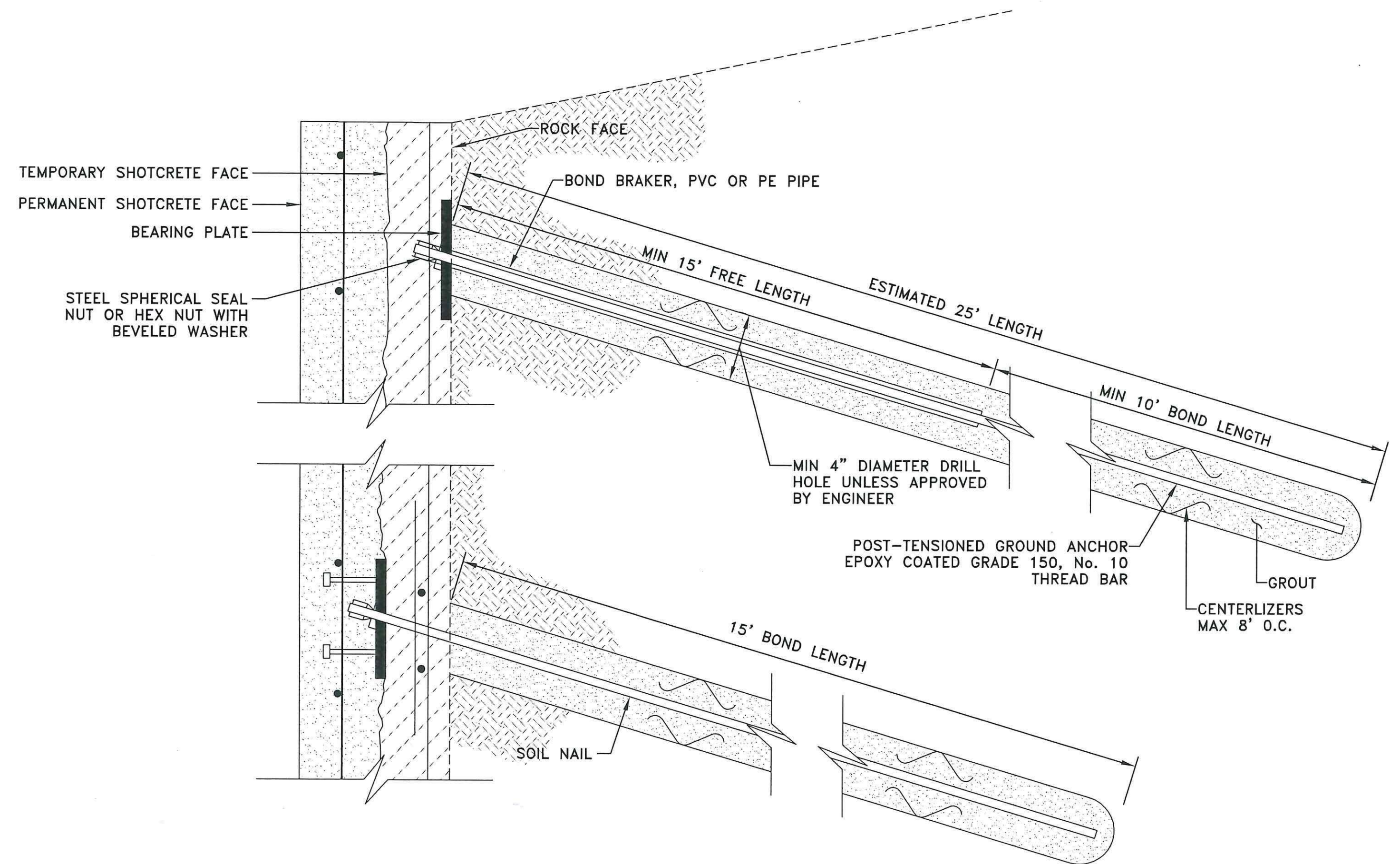
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C
GT5



TYPICAL DRAINAGE DETAIL ALONG CHANNEL SECTION - STA 2+25 TO STA 10+22
NOT TO SCALE

D
GT5



TYPICAL POST TENSIONED GROUND ANCHOR DETAIL
NOT TO SCALE

E
GT5

CONSTRUCTION DOCUMENT



K+A
Kumar & Associates
2390 S. Lipan St.
Denver, Colorado, 80223
Phone: 303-742-9700
FAX: 303-742-9666

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Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I

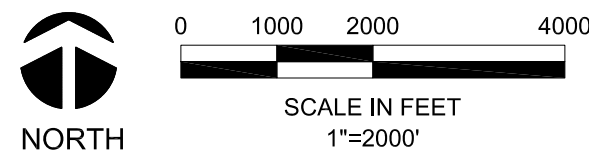
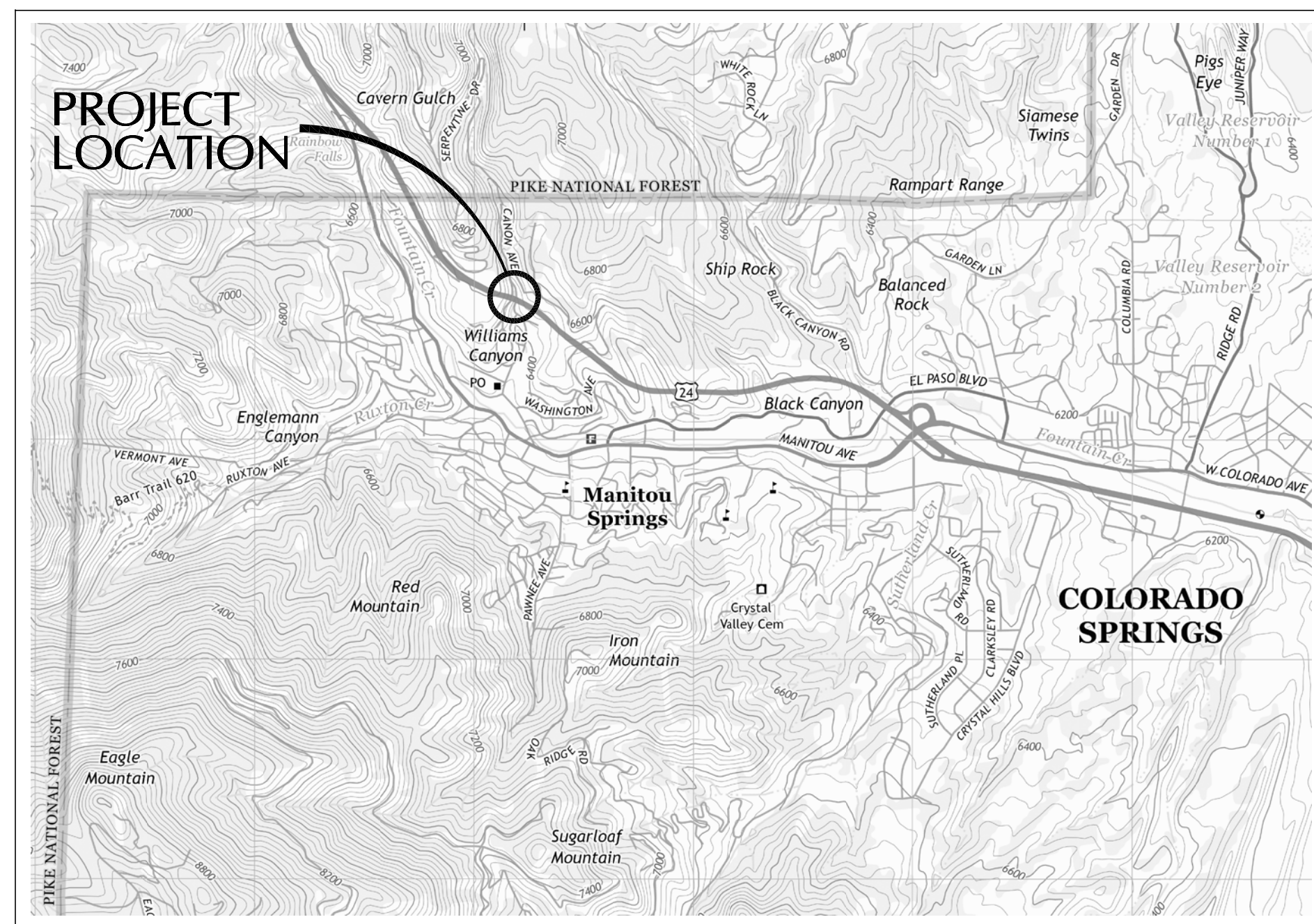
SOIL NAIL WALL DETAILS

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REVISION NO. 0
SHEET NO. GT5

WILLIAMS CANYON DRAINAGE NRCS EMERGENCY WATERSHED PROTECTION PROGRAM DEBRIS CONTROL MEASURES AND CHANNEL REPAIRS PHASE I EROSION CONTROL PLAN

MANITOU SPRINGS, EL PASO COUNTY, COLORADO

LOCATION MAP



SOURCE:
USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)
QUADRANGLE OF MANITOU SPRINGS, COLO.
2013

SHEET INDEX

- EC1 COVER SHEET
- EC2 GENERAL NOTES AND PLAN INDEX
- EC3 EROSION CONTROL PLAN
- EC4 EROSION CONTROL DETAILS
- EC5 EROSION CONTROL DETAILS

CONTACTS

OWNER:
CITY OF MANITOU SPRINGS
606 MANITOU AVENUE
MANITOU SPRINGS, CO 80829

CONTACT: JACK BENSON
CITY ADMINISTRATOR
719-685-2560 (OFFICE)

ENGINEER:
WRIGHT WATER ENGINEERS, INC.
2490 W. 26TH AVENUE
SUITE 100A
DENVER, CO 80211

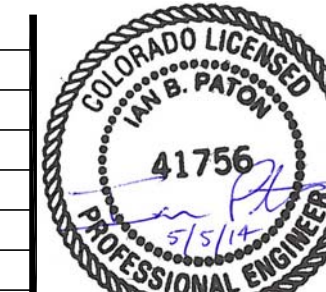
CONTACT: IAN PATON, P.E.
303-480-1700 (OFFICE)
303-875-5583 (CELL)

CALL COLORADO
811
OR CALL UTILITY NOTIFICATION
CENTER OF COLORADO
1-800-922-1987
CALL 3-BUSINESS DAYS IN ADVANCE
BEFORE YOU DIG, GRADE, OR EXCAVATE
FOR THE MARKING OF UNDERGROUND
MEMBER UTILITIES

CONSTRUCTION DOCUMENT

WWE WRIGHT WATER ENGINEERS, INC.
2490 W. 26TH AVE. SUITE 100A
DENVER, CO 80211
(303)480-1700 FAX(303)480-1020

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△	-	2/27/14	60% DESIGN SUBMITTAL				
△	-	3/11/14	BID SET FOR NRCS REVIEW				
△	IBP	3/19/14	RELEASE FOR BID				
△	IBP	4/4/14	ADDENDUM - RELEASE FOR BID				



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*Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I
Erosion Control Plan*

COVER SHEET

JOB NO.
131-080.040
REVISION NO.
3
SHEET NO.
EC1

GENERAL NOTES

- GRADING AND STORM SEWER CONSTRUCTION PLANS WERE PREPARED BY WRIGHT WATER ENGINEERS, INC.
- THE OWNER/DEVELOPER AND/OR THEIR ASSIGNS IS HEREBY NOTIFIED THAT IT IS TYPICAL AND LIKELY THAT SOME MOVEMENT OF THE SURFACE GRADES WILL OCCUR OVER TIME DUE TO VARIOUS FACTORS THAT ARE NOT IN CONTROL OF THE DESIGNERS. THUS, A ROUTING AND DILIGENT MAINTENANCE PROGRAM IS REQUIRED TO MAINTAIN THE PROPER GRADING AND DRAINAGE THROUGHOUT THE PROJECT.
- THESE CONSTRUCTION DOCUMENTS ARE INTENDED SOLELY FOR THE DESIGN AND CONSTRUCTION OF THE DEVELOPMENT DEPICTED HEREIN. PERIODIC, SYSTEMATIC MAINTENANCE IS NECESSARY FOR THE OWNERS TO REALIZE THE DESIGN LIFE AND PERFORMANCE OF THE FACILITIES OF THIS PROJECT. INSPECTION, MAINTENANCE AND REPAIR ARE THE SOLE RESPONSIBILITY OF THE OWNER. THE DESIGN RELIES UPON A RESPONSIBLE EFFORT BY THE OWNERS TO MAINTAIN THE FACILITIES. THUS, ANY DAMAGES ARISING OUT OF THE OWNER'S FAILURE TO PERFORM SAID MAINTENANCE ARE NOT THE DESIGNER'S RESPONSIBILITY. WRIGHT WATER ENGINEERS, INC. EMPHASIZES THE IMPORTANCE OF A MAINTENANCE PROGRAM AND IF REQUESTED WOULD BE AVAILABLE TO SUBMIT A PROPOSAL FOR ASSISTING THE OWNER IN THE DEVELOPMENT OF A COMPREHENSIVE, SYSTEMATIC MAINTENANCE PROGRAM TO MAINTAIN THE MAJOR INFRASTRUCTURE COMPONENTS OF THIS PROJECT. OWNERS SHOULD BE COGNIZANT OF THE IMPORTANCE OF MAINTAINING DRAINAGE PATTERNS AND TO AVOID EXCESSIVE IRRIGATION. THE SOILS TYPICALLY FOUND IN COLORADO ARE SENSITIVE TO EXCESS MOISTURE AND POTENTIALLY RESULT IN PAVEMENT/STRUCTURE MOVEMENTS WHICH MAY BE UNACCEPTABLE AND COMPROMISE THE DESIGN INTENT AND FUNCTIONALITY OF THE PROJECT. WRIGHT WATER ENGINEERS, INC. RECOMMENDS THE OWNER MAINTAIN A COMPLETE SET OF SOILS/DRAINAGE REPORTS, AND DESIGN PLANS OF THE PROJECT FOR FUTURE REFERENCE.
- PROPOSED CONTOURS AND SPOT ELEVATIONS AS SHOWN HEREON ARE DEFINED AS FINISHED ELEVATION AFTER PAVING, LANDSCAPING, ETC. CONTRACTOR SHALL COORDINATE WITH GEOTECH FOR PAVEMENT THICKNESS AND LANDSCAPE FOR THICKNESS.
- CONTRACTOR SHALL REVIEW THE GEOTECHNICAL REPORT TITLED, GEOTECHNICAL ENGINEERING STUDY AND GEOLOGIC RECONNAISSANCE, WILLIAMS CANYON DRAINAGE IMPROVEMENTS, MANITOU SPRINGS, COLORADO, DATED MARCH 7, 2014, PREPARED BY KUMARAND ASSOCIATES, INC., FOR PAVEMENT DESIGN AND RECOMMENDATIONS REGARDING EXCAVATION, COMPACTION, EMBANKMENT, AND TOPSOIL REMOVAL AND REPLACEMENT. FINAL PAVEMENT DESIGN TO BE DETERMINED BY THE GEOTECHNICAL ENGINEER AFTER SUBGRADE IS COMPLETE. CONTRACTOR TO COORDINATE THIS WORK. THE CONSTRUCTION METHODS FOR EXCAVATION/EMBANKMENTS, COMPACTION, AND SUBGRADE PREPARATION SHALL BE IN STRICT CONFORMANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF DISCREPANCIES BETWEEN THE GEOTECHNICAL REPORT RECOMMENDATIONS AND REQUIREMENTS OF THESE CONSTRUCTION DOCUMENTS AND SPECIFICATIONS.
- EXISTING GRADES AND SPOT ELEVATIONS SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM BEST AVAILABLE INFORMATION AND ARE SHOWN TO THE EXTENT KNOWN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY EXISTING GRADE CONDITIONS AT THE LIMITS OF CONSTRUCTION AND AT LOCATIONS THAT INTERFACE WITH EXISTING OR PROPOSED BUILDINGS AND NOTIFY THE CIVIL ENGINEER OF ANY DISCREPANCIES THAT CONTRADICT THE CIVIL ENGINEER'S INTENT FOR DRAINAGE PATTERNS, MAXIMUM AND MINIMUM SLOPES, AND PROPOSED ELEVATIONS AS SHOWN ON THE PLAN. THE ENGINEER WILL NOT BE LIABLE FOR ANY COSTS ASSOCIATED WITH CHANGES TO THE DESIGN WITHOUT PROPER NOTIFICATION.
- IF QUANTITIES ARE SHOWN ON PLAN; EARTHWORK QUANTITIES ARE RAW NUMBERS AND HAVE NOT BEEN ADJUSTED TO ACCOUNT FOR SHRINK, SWELL, COMPACTION, PAVING, UTILITY SPOILS, BUILDING FOUNDATION/BASEMENT ETC. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EARTHWORK VALUES.
- CONTRACTOR LAYDOWN/MATERIAL AREA, CONCRETE WASHOUT AREA AND STOCKPILE AREA ARE SHOWN FOR INFORMATION ONLY. FINAL LOCATIONS OF THESE AREAS SHALL BE COORDINATED BETWEEN CONTRACTOR AND OWNER'S REPRESENTATIVE. STORM WATER MANAGEMENT IS STRICTLY THE CONTRACTOR'S RESPONSIBILITY AND THE CONTRACTOR MUST ADHERE TO LOCAL AND STATE JURISDICTIONAL CRITERIA.
- SLOPE INLET FLOW LINE OR GRATE TO MATCH STREET OR OTHER PAVEMENT GRADE UNLESS INLET IS AT A SUMP LOCATION.
- IF CONSTRUCTING NEW CURB AND GUTTER ADJACENT TO EXISTING ASPHALT PAVEMENT, CONTRACTOR SHALL REVIEW EXISTING PAVEMENT ELEVATIONS AND PROPOSED GRADES FOR CURB AND GUTTER AND NOTIFY ENGINEER IF MAXIMUM OR MINIMUM CROSS SLOPES ON ASPHALT PATCH ARE NOT WITHIN THE LIMITS INDICATED ON THE PLANS.
- WRIGHT WATER ENGINEERS, INC. ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS. THE UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS HOWEVER, THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION, (HORIZONTAL AND VERTICAL) OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.

GENERAL NOTES

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION, PROTECTION, AND REPAIR OF ALL UTILITIES ENCOUNTERED DURING CONSTRUCTION. CONTRACTOR SHALL CONTACT REPRESENTATIVES OF THE RESPECTIVE UTILITIES AND HAVE ALL UTILITIES FIELD LOCATED PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL LOCATIONS OF EXISTING STRUCTURES AND UTILITIES SHOWN ON THE DRAWINGS, TO ASCERTAIN WHETHER ANY STRUCTURES AND UTILITIES MAY EXIST, AND REPAIR AND/OR REPLACE ANY STRUCTURES AND/OR UTILITIES THAT ARE DAMAGED BY THE CONTRACTOR.
- ALL CONTRACTORS AND SUBCONTRACTORS SHALL OBTAIN AT THEIR EXPENSE ALL NECESSARY PERMITS.
- CONTRACTOR SHALL HAVE IN HIS POSSESSION AT ALL TIMES ONE (1) SIGNED COPY OF THE APPROVED PLANS.
- ALL DIMENSIONS, CURVE DATA AND LINE DATA ARE AT FLOWLINE UNLESS OTHERWISE NOTED. (HORIZONTAL LAYOUT PLAN)
- ALL SPOT ELEVATIONS ARE AT FLOWLINE OR FINAL SURFACE GRADE UNLESS OTHERWISE NOTED.
- TEMPORARY EROSION CONTROL MEASURES ARE TO BE MAINTAINED THROUGHOUT CONSTRUCTION.
- THE CONTRACTOR SHALL FURNISH THE ENGINEER WITH A SET OF "AS-BUILT" PLANS MARKED WITH ALL DEVIATIONS FROM THE CONSTRUCTION PLANS PRIOR TO FINAL ACCEPTANCE. CERTIFIED SURVEY INFORMATION WILL BE REQUIRED FOR POND VOLUME, STORM INVERTS, SANITARY INVERTS, OUTLET ELEVATIONS AND ANY ADDITIONAL UTILITY LAYOUT INFORMATION REQUIREMENTS REQUIRED BY ENGINEER.

STORM SEWER NOTES

- DIMENSIONS SHOWN ON PIPE ARE THE HORIZONTAL DISTANCES BETWEEN STRUCTURES. THEREFORE, DISTANCES SHOWN ON THE PLANS ARE APPROXIMATE AND MAY VARY DUE TO VERTICAL ALIGNMENT AND STRUCTURE DIMENSIONS.
- STORM SEWER PIPE SHALL BE WATERTIGHT RCP MANUFACTURED IN ACCORDANCE WITH ASTM C-76 UNLESS OTHERWISE NOTED ON THE PLANS.
- ALL MAINLINE STORM SEWER PIPES SHALL BE INSTALLED WITH CLASS "B" BEDDING AS A MINIMUM. ALL CLASS "B" BEDDING MATERIAL SHALL CONFORM TO ASTM C-33 OR ASTM D-448 GRADATION SIZE #67.
- ALL STORM SEWER 18" & LARGER TO BE CLASS III RCP.

NPDES (STORMWATER QUALITY) NOTES

- THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE AND EPA CRITERIA FOR STORMWATER QUALITY CONTROL DURING CONSTRUCTION.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL NECESSARY PERMITS RELATED TO GRADING AND STORMWATER QUALITY.

GRADING AND SITE LAYOUT NOTES

- COMPACT ALL FILL AREA INCLUDING BACKFILL AND BEDDING FOR UTILITY TRENCH TO 95% OF MAXIMUM DENSITY AS PER AASHTO T-99 (STANDARD PROCTOR) AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT AND IN ACCORDANCE WITH FINAL GEOTECHNICAL REPORT.
- ALL TRENCHES SHALL BE ADEQUATELY SUPPORTED AND THE SAFETY OF WORKERS PROVIDED FOR AS REQUIRED BY THE MOST RECENT OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) "SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION." THESE REGULATIONS ARE DESCRIBED IN SUBPART P, PART 1926 OF THE CODE OF FEDERAL REGULATIONS. SHEETING AND SHORING SHALL BE UTILIZED WHERE REQUIRED TO PREVENT ANY EXCESSIVE WIDENING OR SLOUGHING OF THE TRENCH WHICH MAY BE DETRIMENTAL TO HUMAN SAFETY, TO THE PIPE BEING PLACED, TO TREES, OR TO ANY EXISTING STRUCTURE WHERE EXCAVATIONS ARE MADE UNDER SEVERE WATER CONDITIONS. THE CONTRACTOR MAY BE REQUIRED TO USE AN APPROVED PILING INSTEAD OF SHEETING AND SHORING.
- EXCAVATED MATERIAL SHALL NOT BE PLACED NEARER THAN TWO (2) FEET FROM THE SIDES OF THE TRENCH. HEAVY EQUIPMENT SHALL NOT BE USED OR PLACED NEAR THE SIDES OF THE TRENCH UNLESS THE TRENCH IS ADEQUATELY BRACED.
- CONTRACTOR SHALL UTILIZE PAVEMENT REPLACEMENT DETAIL PROVIDED FOR ALL STREET CUT REPAIRS. SAWCUT OF EXISTING CONCRETE PAVEMENT SHALL BE SCORED THEN BROKEN AT JOINT TO CREATE A ROUGH SURFACE FOR THE CONTRACTION JOINT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ALL REQUIREMENTS FOR STREET REPAIRS.
- DIMENSIONS FOR LAYOUT OF CURB AND GUTTER ARE TO FLOWLINE UNLESS NOTED OTHERWISE.
- THE CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES WITH THE PROPOSED ELEVATIONS SHOWN ON THE GRADING PLANS. THE ENGINEER WILL NOT BE LIABLE FOR ANY COSTS ASSOCIATED WITH CHANGES TO THE DESIGN WITHOUT PROPER NOTIFICATION.
- THE CONTRACTOR SHALL ADJUST ALL MANHOLE RIMS, VALVE BOXES AND UTILITY BOX LIDS TO MATCH FINAL GRADE.
- ANY SETTLEMENT OR SOIL ACCUMULATIONS BEYOND THE PROPERTY LIMITS DUE TO GRADING OR EROSION SHALL BE REPAIRED IMMEDIATELY BY THE CONTRACTOR.
- VEGETATED AREAS BEING DISTURBED BY THE GRADING AND NOT STABILIZED WITH OTHER PERMANENT SURFACE SHALL BE RESEED WITH NATIVE VEGETATION. DISTURBED AREAS STEEPER THAN 6:1 SHALL RECEIVE EROSION CONTROL BLANKETS IN ADDITION TO SEEDING.
- THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
- CALL UTILITY NOTIFICATION CENTER OF COLORADO FOR LOCATION OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION. CALL 1-800-922-1987.
- REPAIR OF ANY DAMAGE TO EXISTING IMPROVEMENTS OR LANDSCAPING IS THE RESPONSIBILITY OF THE CONTRACTOR AT NO EXPENSE TO THE OWNER.
- EXPANSION JOINTS WILL BE PLACED IN ALL SIDEWALKS AT PC'S, PT'S, AND AT ANY FIXED OBJECTS, BUT IN NO CASE ANY FURTHER THAN 500 FEET APART.

STANDARD EROSION AND SEDIMENT CONTROL NOTES

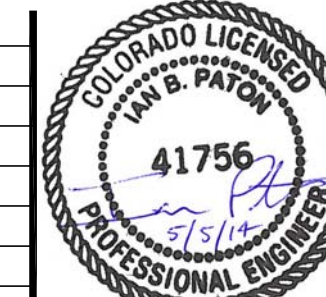
- ALL GRADING, EROSION, AND SEDIMENT CONTROL MUST CONFORM TO APPROVED PLANS. REVISIONS TO DISTURBANCE AREAS, SLOPES, AND/OR EROSION AND SEDIMENT CONTROL MEASURES ARE NOT PERMITTED WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
- THE LANDOWNER AND/OR CONTRACTOR IS RESPONSIBLE FOR OBTAINING A PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY FROM THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, AT LEAST 10 DAYS PRIOR THE START OF CONSTRUCTION ACTIVITIES FOR LAND DISTURBANCE AREAS OF ONE ACRE OR GREATER. THE PERMIT MUST BE KEPT CURRENT THROUGHOUT THE CONSTRUCTION DURATION. STATE STORMWATER PERMIT APPLICATIONS ARE AVAILABLE AT THIS ADDRESS: [HTTP://WWW.CDPHE.STATE.CO.US/WA/PERMITS/UNIT/WACDOMT.HTML](http://www.cdphe.state.co.us/wa/permits/unit/wacdomt.html).
- EROSION CONTROL BEST MANAGEMENT PRACTICES (BMPs) MUST BE INSTALLED PRIOR TO GRADING ACTIVITIES, TO THE MAXIMUM EXTENT PRACTICABLE.
- ALL TEMPORARY AND PERMANENT SOIL EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. FOR EXAMPLE, EROSION CONTROL BLANKETS, SEDIMENT CONTROL LOGS, OR SILT FENCES MAY REQUIRE PERIODIC REPLACEMENT. SEDIMENT TRAPS AND BASINS WILL REQUIRE PERIODIC SEDIMENT REMOVAL.
- ALL TOPSOIL, WHERE PHYSICALLY PRACTICABLE, MUST BE SALVAGED AND NO TOPSOIL SHALL BE REMOVED FROM THE SITE EXCEPT AS SET FORTH IN THE APPROVED PLANS. TOPSOIL AND OVERBURDEN MUST BE SEGREGATED AND STOCKPILED SEPARATELY. TOPSOIL AND OVERBURDEN MUST BE REDISTRIBUTED WITHIN THE GRADED AREA AFTER ROUGH GRADING TO PROVIDE A SUITABLE BASE FOR AREAS THAT MUST BE SEED AND PLANTED. RUNOFF FROM THE STOCKPILED AREA MUST BE CONTROLLED TO PREVENT EROSION AND SEDIMENTATION OF RECEIVING WATERS.
- THE LANDOWNER AND/OR CONTRACTOR MUST IMMEDIATELY TAKE ALL NECESSARY STEPS TO CONTROL SEDIMENT DISCHARGE.
- THE LANDOWNER AND/OR CONTRACTOR IS RESPONSIBLE FOR CLEAN UP AND REMOVAL OF ALL SEDIMENT AND DEBRIS FROM ALL DRAINAGE INFRASTRUCTURE AND OTHER PUBLIC FACILITIES.
- THE LANDOWNER AND/OR CONTRACTOR MUST TAKE REASONABLE PRECAUTIONS TO ENSURE THAT VEHICLES DO NOT TRACK OR SPILL EARTH MATERIALS ON TO STREETS/ROADS AND MUST IMMEDIATELY REMOVE SUCH MATERIALS IF THIS OCCURS.
- THE LANDOWNER AND/OR CONTRACTOR IS RESPONSIBLE FOR CONTROLLING LITTER SUCH AS DISCARDED BUILDING MATERIALS, CONCRETE TRUCK WASHOUT, CHEMICALS, AND SANITARY WASTE, AS APPLICABLE. IN ADDITION, SPILL PREVENTION AND CONTAINMENT BMPs FOR CONSTRUCTION MATERIALS, WASTE, AND FUEL MUST BE PROVIDED, AS APPLICABLE. LITTERING IS DEFINED AND ENFORCED BY CRS 18-4-511.
- SEEDING AND MULCHING SHALL BE COMPLETED WITHIN 30 DAYS OF INITIAL EXPOSURE AFTER GRADING IS SUBSTANTIALLY COMPLETED IN A GIVEN AREA. THIS MAY REQUIRE MULTIPLE MOBILIZATIONS FOR SEEDING AND MULCHING.
- FUGITIVE DUST EMISSIONS RESULTING FROM GRADING ACTIVITIES AND/OR WIND SHALL BE CONTROLLED USING THE BEST AVAILABLE CONTROL TECHNOLOGY, AS DEFINED BY THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, AT THE TIME OF GRADING. DURING GRADING, APPLYING A COMBINATION OF WATER, TACKIFIER AND SILT FENCE TO BREAK UP WIND SURFACE VELOCITIES MAY CONTROL DUST. IF WIND SPEEDS EXCEED THE ABILITY OF BMPs TO CONTROL FUGITIVE DUST, GRADING ACTIVITIES MUST CEASE.

PLAN INDEX - PHASE I



WWE WRIGHT WATER ENGINEERS, INC.
2490 W. 26TH AVE. SUITE 100A
DENVER, CO 80211
(303)480-1700 FAX(303)480-1020

REVISIONS					REVISIONS				
NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION		
1	IBP	1/22/14	30% DESIGN SUBMITTAL	1	IBP	5/1/14	RELEASE FOR CONSTRUCTION		
2	IBP	2/27/14	60% DESIGN SUBMITTAL						
3	IBP	3/11/14	BID SET FOR NRCS REVIEW						
4	IBP	3/19/14	RELEASE FOR BID						
5	IBP	4/4/14	ADDENDUM - RELEASE FOR BID						



DESIGN	DATE
IBP/DAF	03/19/14
DETAIL	KAL
CHECK	JEJ/WFL
APPROVAL	03/19/14
SCALE	AS NOTED
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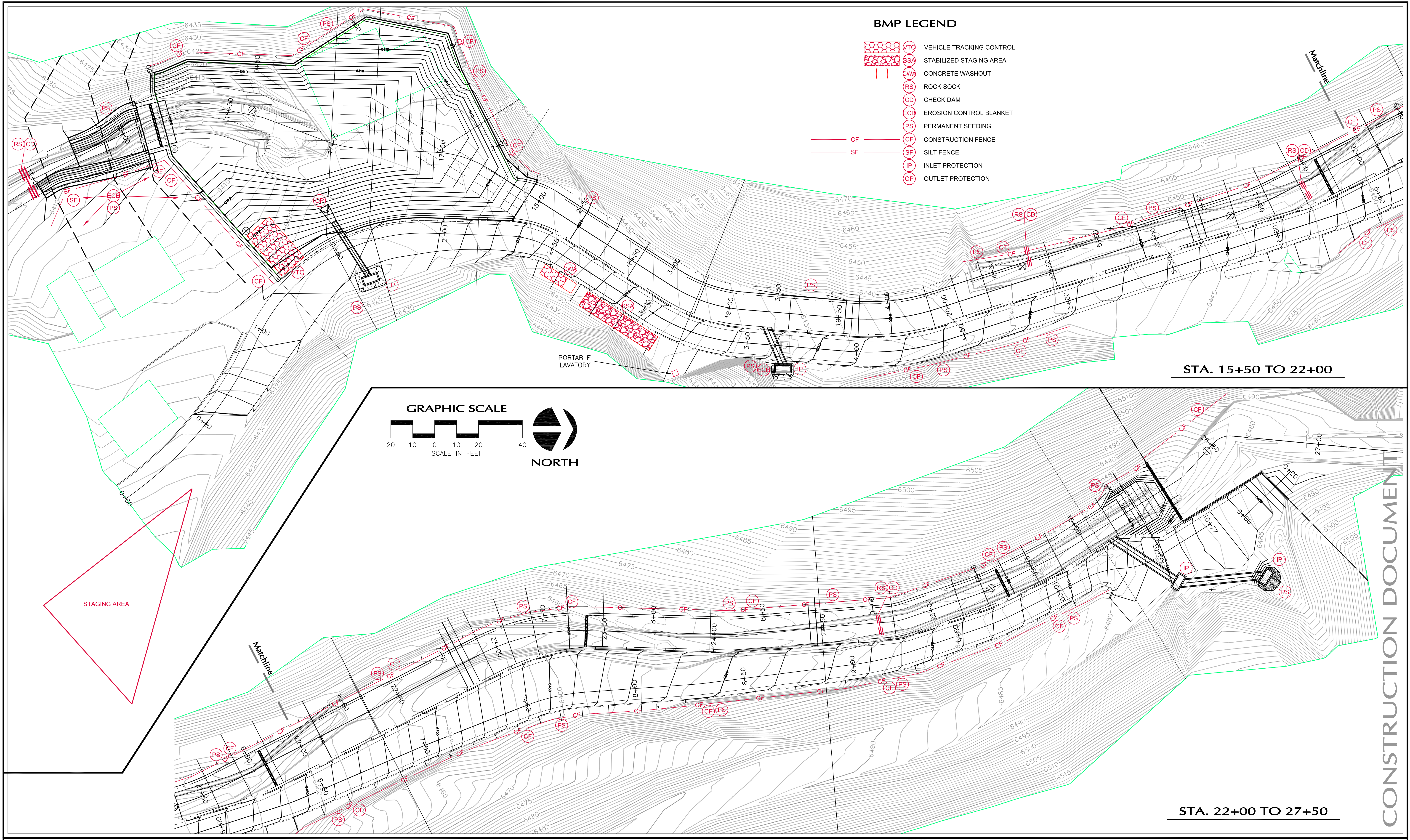
*Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I
Erosion Control Plan*

GENERAL NOTES AND PLAN INDEX

JOB NO.
131-080.040
REVISION NO.
3
SHEET NO.
EC2

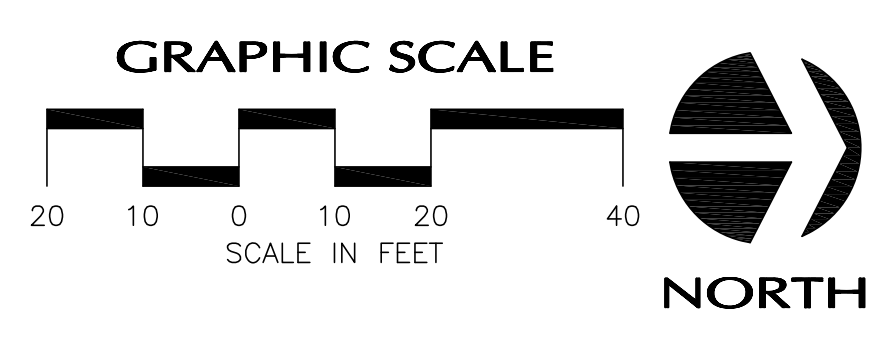
CONSTRUCTION DOCUMENT

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BMP LEGEND

	VTC	VEHICLE TRACKING CONTROL
	SSA	STABILIZED STAGING AREA
	CWA	CONCRETE WASHOUT
	RS	ROCK SOCK
	CD	CHECK DAM
	ECB	EROSION CONTROL BLANKET
	PS	PERMANENT SEEDING
	CF	CONSTRUCTION FENCE
	SF	SILT FENCE
	IP	INLET PROTECTION
	OP	OUTLET PROTECTION



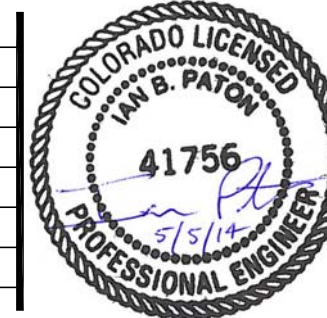
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STA. 22+00 TO 27+50

CONSTRUCTION DOCUMENT

WWE WRIGHT WATER ENGINEERS, INC.
 2490 W. 26TH AVE. SUITE 100A
 DENVER, CO 80211
 (303)480-1700 FAX(303)480-1020

REVISIONS				REVISIONS			
NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION
1		1/22/14	30% DESIGN SUBMITTAL	1	IBP	5/1/14	RELEASE FOR CONSTRUCTION
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5	IBP	4/4/14	ADDENDUM 2				



	DATE
DESIGN	IBP/DAF 03/19/14
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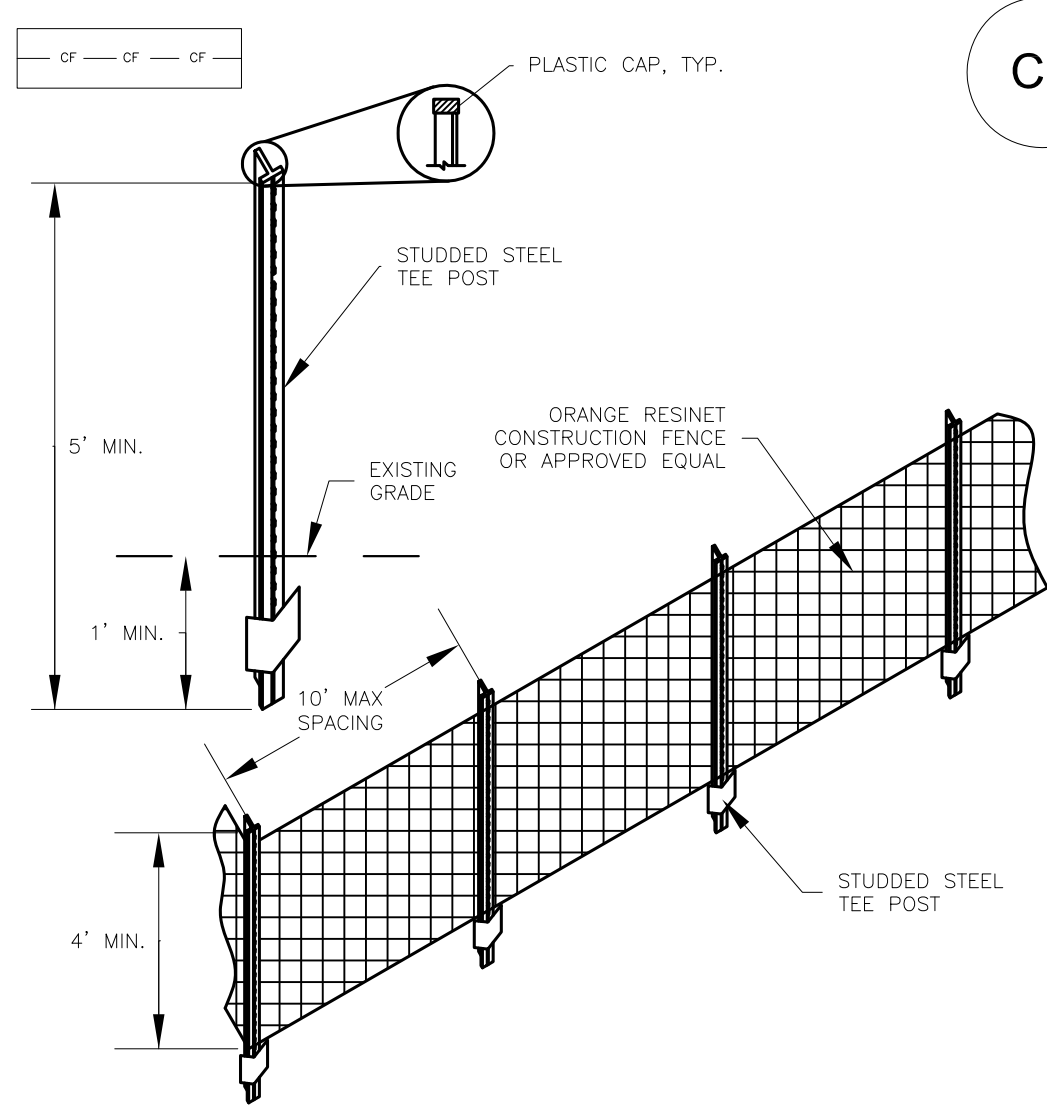
Williams Canyon Drainage
 NRCS Emergency Watershed Protection Program
 Debris Control Measures and Channel Repairs - Phase I

EROSION CONTROL PLAN

JOB NO.
131-080.040

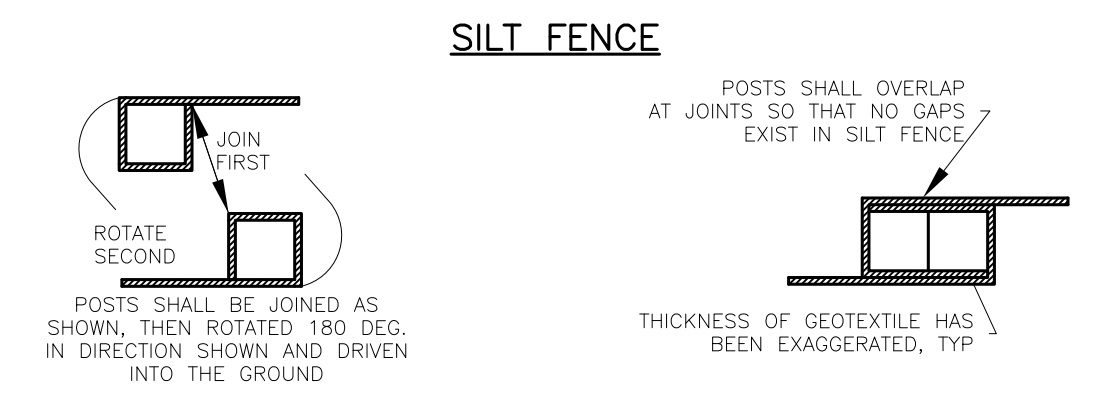
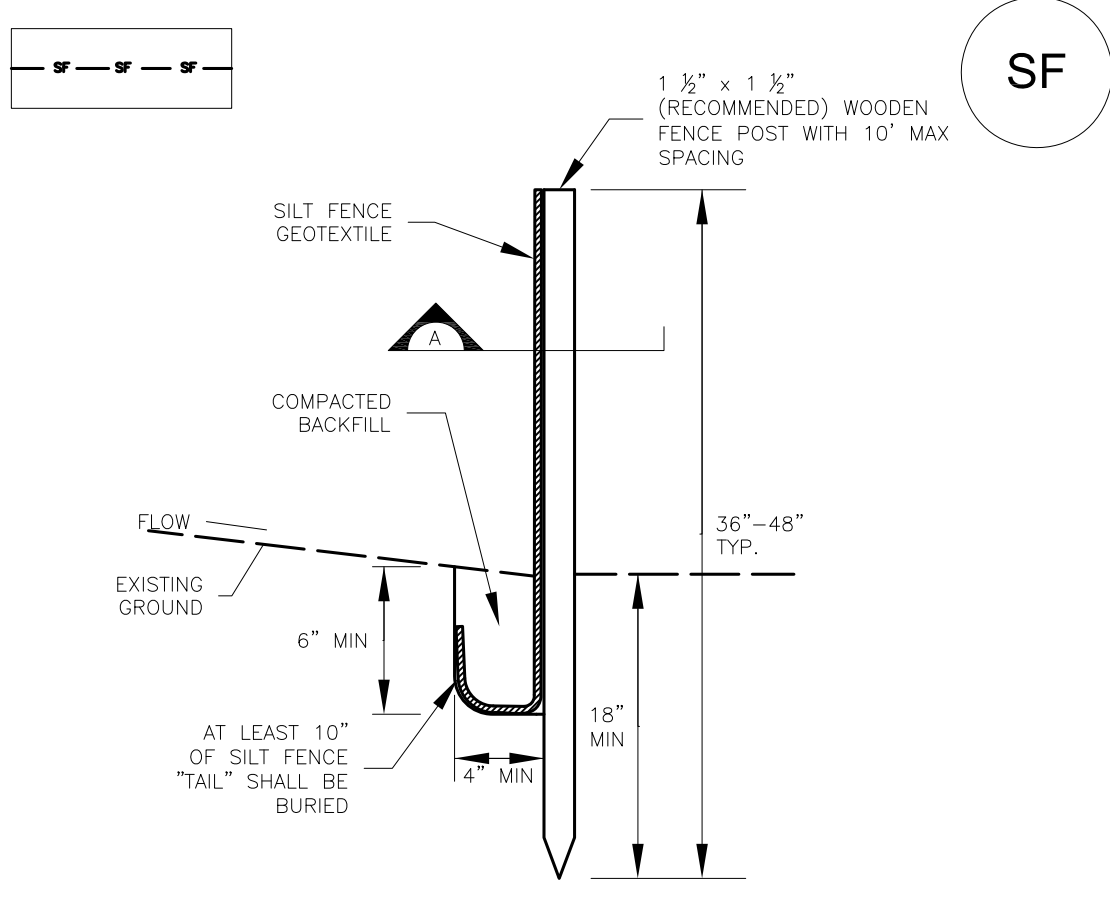
REVISION NO.
3

SHEET NO.
EC3



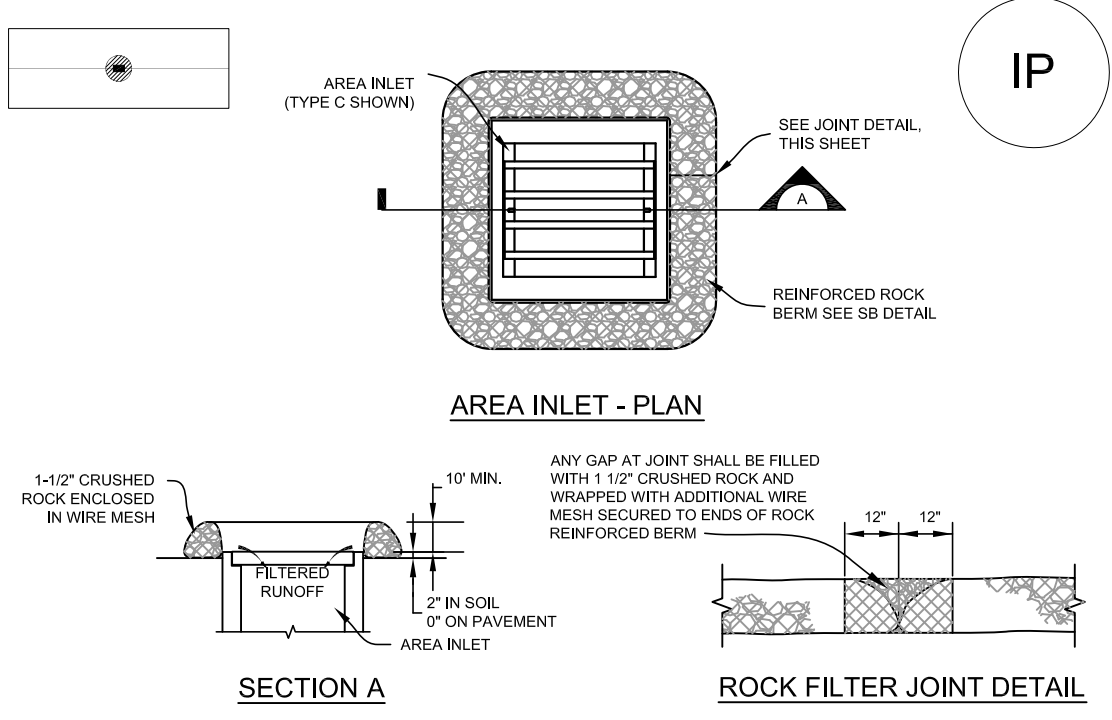
- CONSTRUCTION FENCE INSTALLATION NOTES**
- SEE PLAN VIEW FOR LOCATION OF CONSTRUCTION FENCE.
 - CONSTRUCTION FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
 - CONSTRUCTION FENCE SHALL BE COMPOSED OF ORANGE, CONTRACTOR-GRADE MATERIAL THAT IS AT LEAST 4' HIGH. METAL POSTS SHOULD HAVE A PLASTIC CAP FOR SAFETY.
 - STUDDED STEEL TEE POSTS SHALL BE UTILIZED TO SUPPORT THE CONSTRUCTION FENCE. MAXIMUM SPACING FOR STEEL TEE POSTS SHALL BE 10'.
 - CONSTRUCTION FENCE SHALL BE SECURELY FASTENED TO THE TOP, MIDDLE, AND BOTTOM OF EACH POST.

1 CONSTRUCTION FENCE
EC4 NOT TO SCALE



- SILT FENCE**
- POSTS SHALL BE JOINED AS SHOWN, THEN ROTATED 180 DEG. IN DIRECTION SHOWN AND DRIVEN INTO THE GROUND.
- POSTS SHALL OVERLAP AT JOINTS SO THAT NO GAPS EXIST IN SILT FENCE.
- THICKNESS OF GEOTEXTILE HAS BEEN EXAGGERATED, TYP.

2 SILT FENCE
EC4 NOT TO SCALE



- AREA INLET - PLAN**
- SECTION A**
- ROCK FILTER JOINT DETAIL**
- INLET PROTECTION INSTALLATION NOTES**
- INLET PROTECTION AFTER INLET CONSTRUCTION OR AFTER PAVEMENT SHALL BE INSTALLED WITHIN 48 HOUR AFTER INLET CONSTRUCTION OR PAVING IS COMPLETED.
 - CRUSHED ROCK SHALL BE FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN IN CDOT SECT. 703-2. #4 aggregate (1-1/2" MINUS), RECYCLED CONCRETE MEETING THIS GRADATION MAY BE USED.
 - WIRE MESH SHALL BE FABRICATED OF 10 GAUGE WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1.0 INCH (COMMONLY TERMED "CHICKEN WIRE"). ROLL WIDTH SHALL BE 48-INCHES.
 - WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6-INCH CENTERS ALONG ALL JOINTS AND AT 2-INCH CENTERS ON ENDS OF BERMS.
 - REINFORCED ROCK BERM SHALL BE CONSTRUCTED IN ONE PIECE OR SHALL BE CONSTRUCTED USING JOINT DETAIL.
- INLET PROTECTION MAINTENANCE NOTES**
- THE SWMP MANAGER SHALL INSPECT INLET PROTECTION WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY. INSPECT MORE FREQUENTLY DURING WINTER CONDITIONS DUE TO FREEZE/THAW PROBLEMS. REPAIRS AS NEEDED.
 - SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF ROCK BERM IS WITHIN 2-1/2 INCHES OF THE CREST.
 - INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED, UNLESS THE LOCAL JURISDICTION APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.
 - WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, DRILL SEEDING AND CRIMP MULCH, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

3 INLET PROTECTION
EC4 NOT TO SCALE

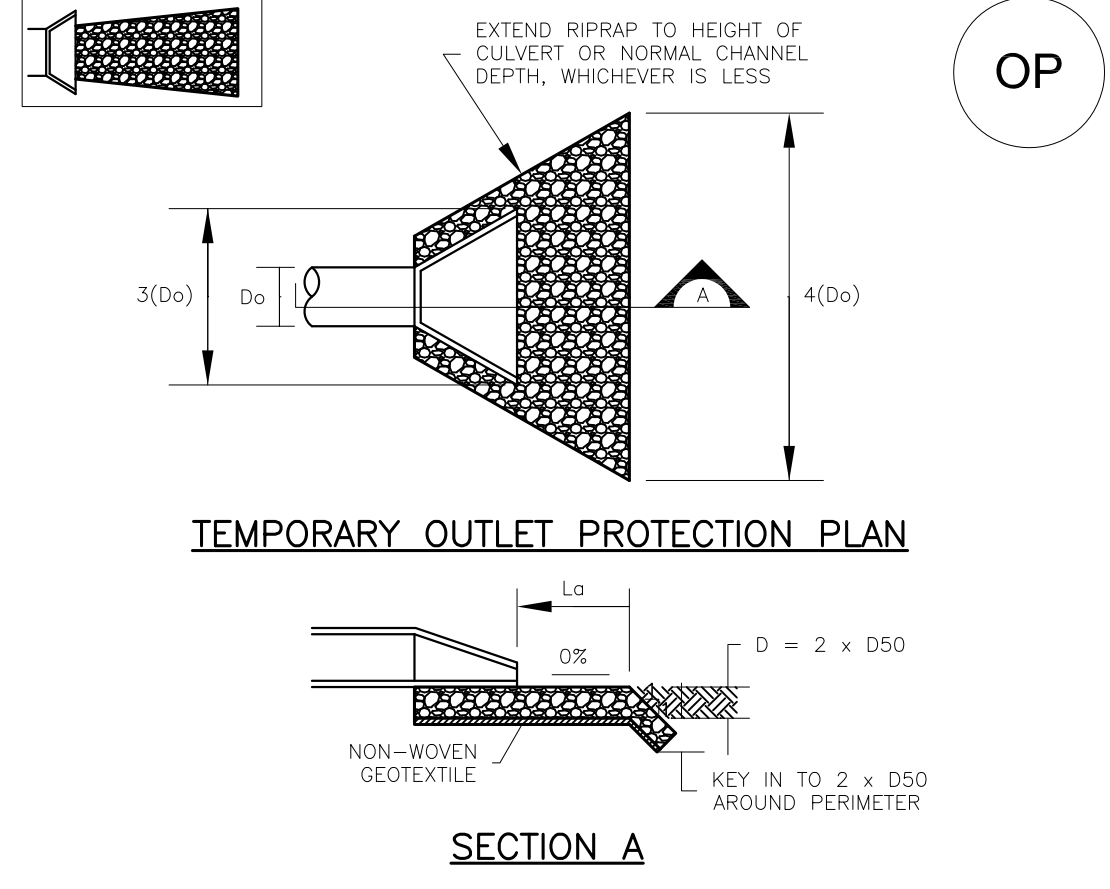
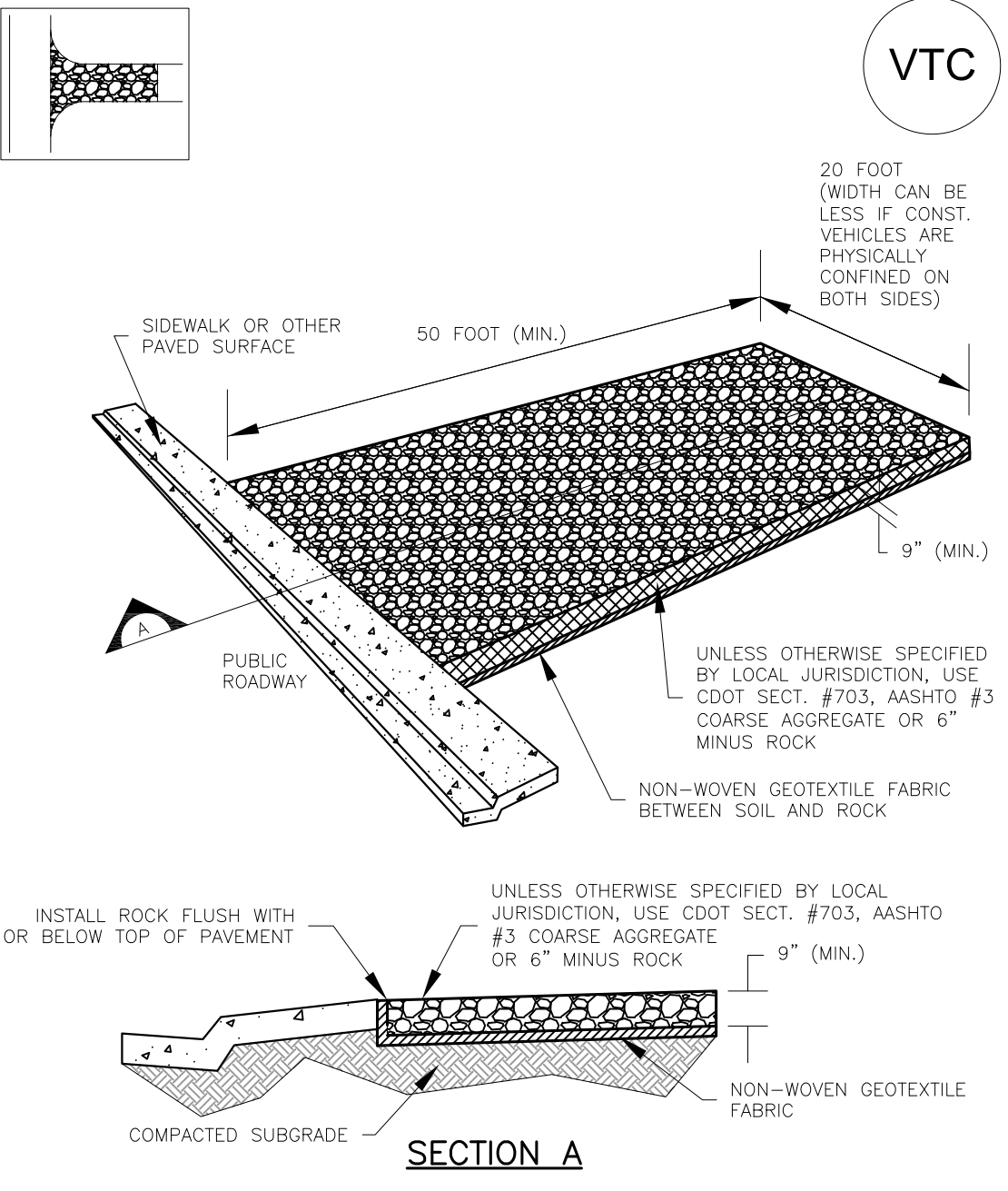


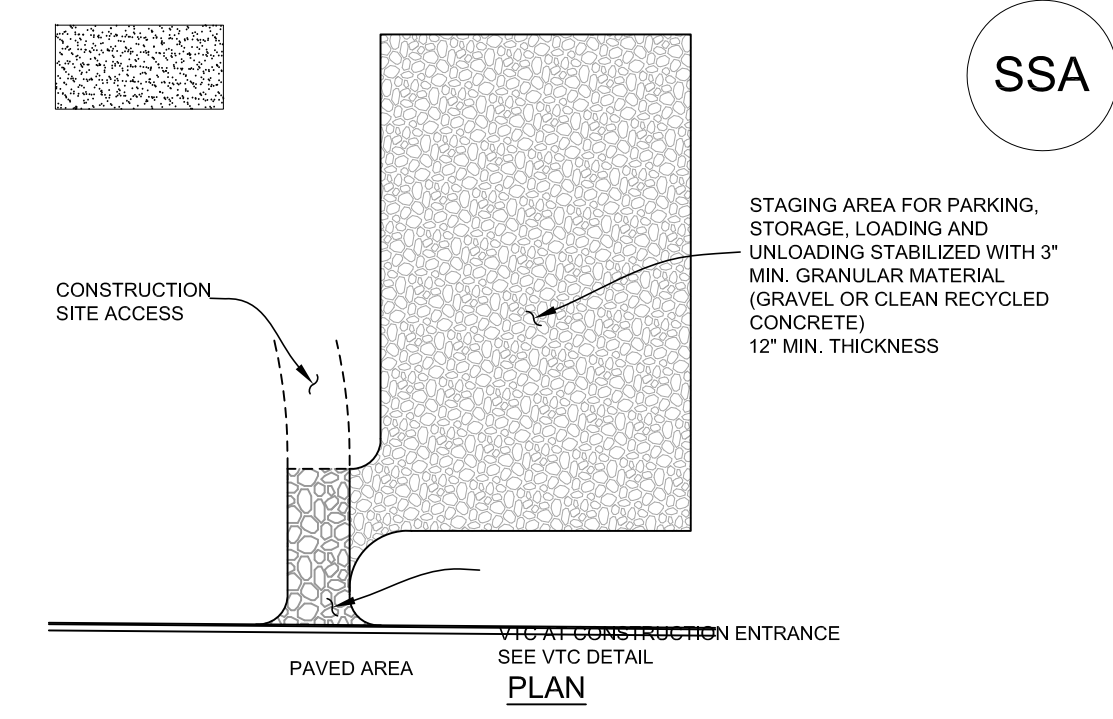
TABLE OP-1. TEMPORARY OUTLET PROTECTION SIZING TABLE

PIPE DIAMETER, Do (INCHES)	DISCHARGE, Q (CFS)	APRON LENGTH, Ld (FT)	RIPPRAP D50 DIAMETER MIN (INCHES)
8	2.5	5	4
	5	10	6
12	10	13	6
	10	10	6
	20	16	9
18	30	23	12
	40	26	16
24	30	16	9
	40	26	9
	50	26	12
	60	30	16

4 OUTLET PROTECTION
EC4 NOT TO SCALE

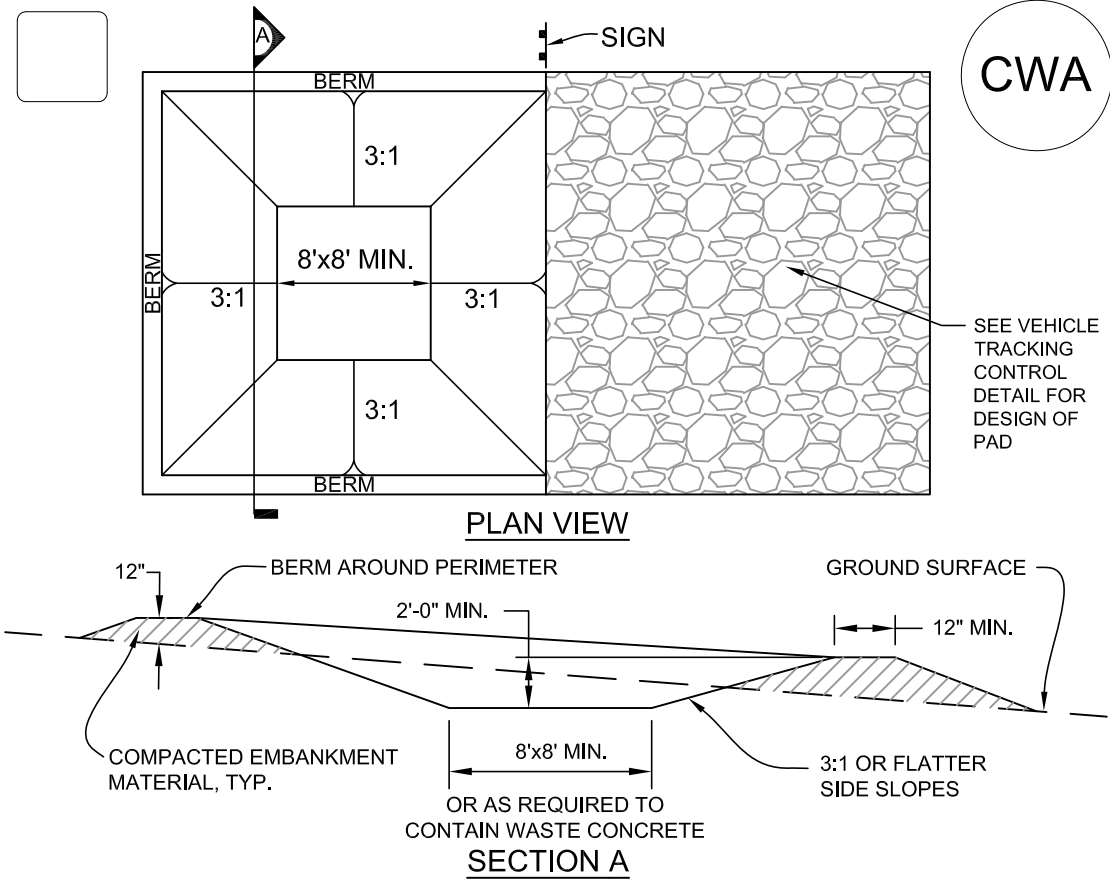


5 VEHICLE TRACKING CONTROL
EC4 NOT TO SCALE



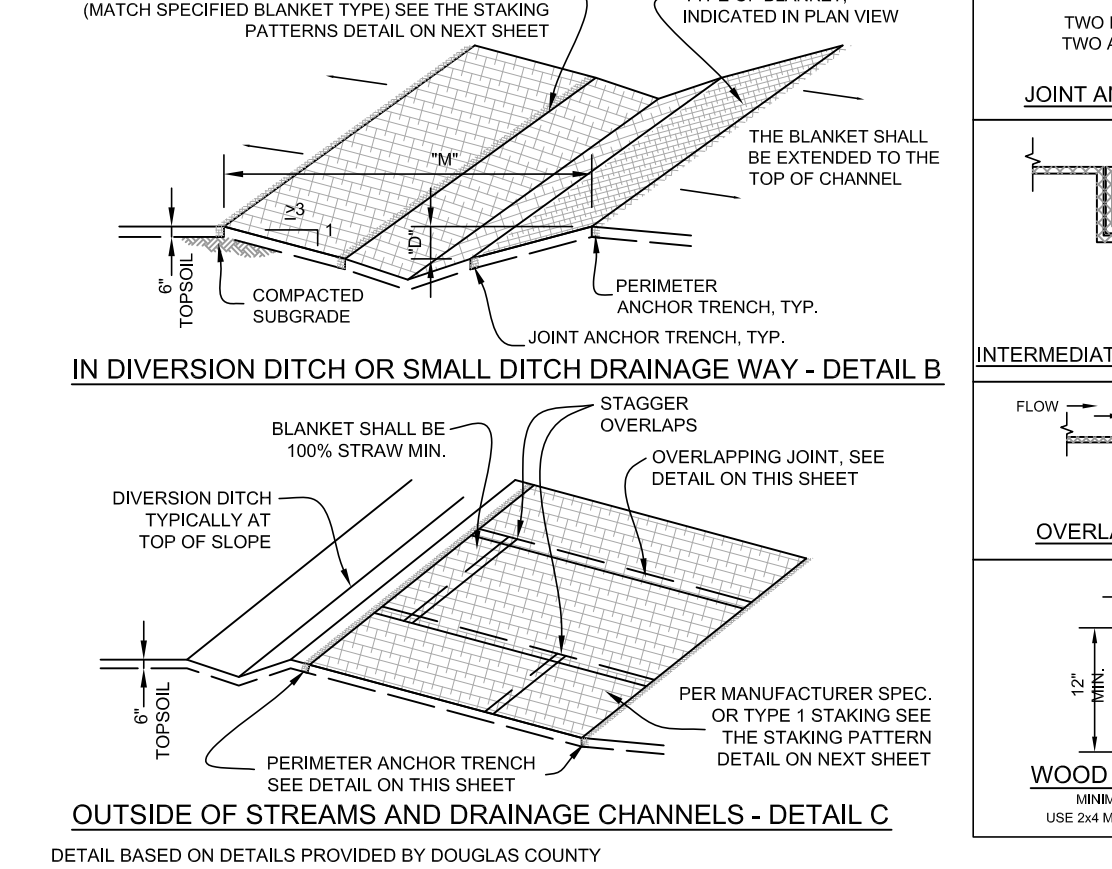
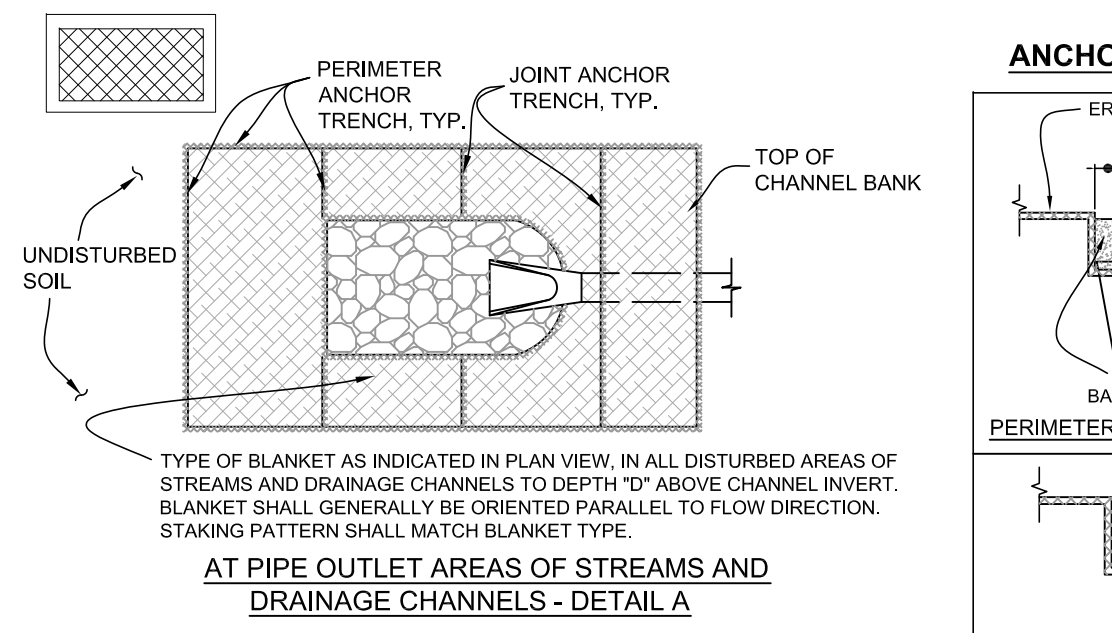
- STABILIZED STAGING AREA INSTALLATION NOTES**
- SEE PLAN VIEW FOR GENERAL LOCATION OF STAGING AREA. CONTRACTOR MAY MODIFY LOCATION AND SIZE OF STABILIZED STAGING AREA WITH APPROVAL FROM LOCAL JURISDICTION.
 - STABILIZED STAGING AREA SHALL BE LARGE ENOUGH TO FULLY CONTAIN PARKING, STORAGE, AND UNLOADING AND LOADING OPERATIONS.
 - IF REQUIRED BY THE LOCAL JURISDICTION, SITE ACCESS ROADS SHALL BE STABILIZED IN THE SAME MANNER AS THE STAGING AREA.
 - STAGING AREA SHALL BE STABILIZED PRIOR TO ANY OTHER OPERATIONS ON THE SITE.
 - THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM OF 3" OF GRANULAR MATERIAL (GRAVEL OR CLEAN RECYCLED CONCRETE).
- STABILIZED STAGING AREA MAINTENANCE NOTES**
- THE SWMP MANAGER SHALL INSPECT THE STABILIZED STAGING AREA WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
 - SWMP MANAGER SHALL PROVIDE ADDITIONAL THICKNESS OF GRANULAR MATERIAL IF ANY RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.
 - STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING AND LOADING OPERATIONS.
 - ANY ACCUMULATED DIRT OR MUD SHALL BE REMOVED FROM THE SURFACE OF THE STABILIZED STAGING AREA.
 - THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE AND THE AREA TOPSOILED, DRILL SEEDING AND CRIMP MULCH OR OTHERWISE STABILIZED.
- DETAIL BASED ON DETAILS PROVIDED BY DOUGLAS COUNTY

6 STABILIZED STAGING AREA
EC4 NOT TO SCALE

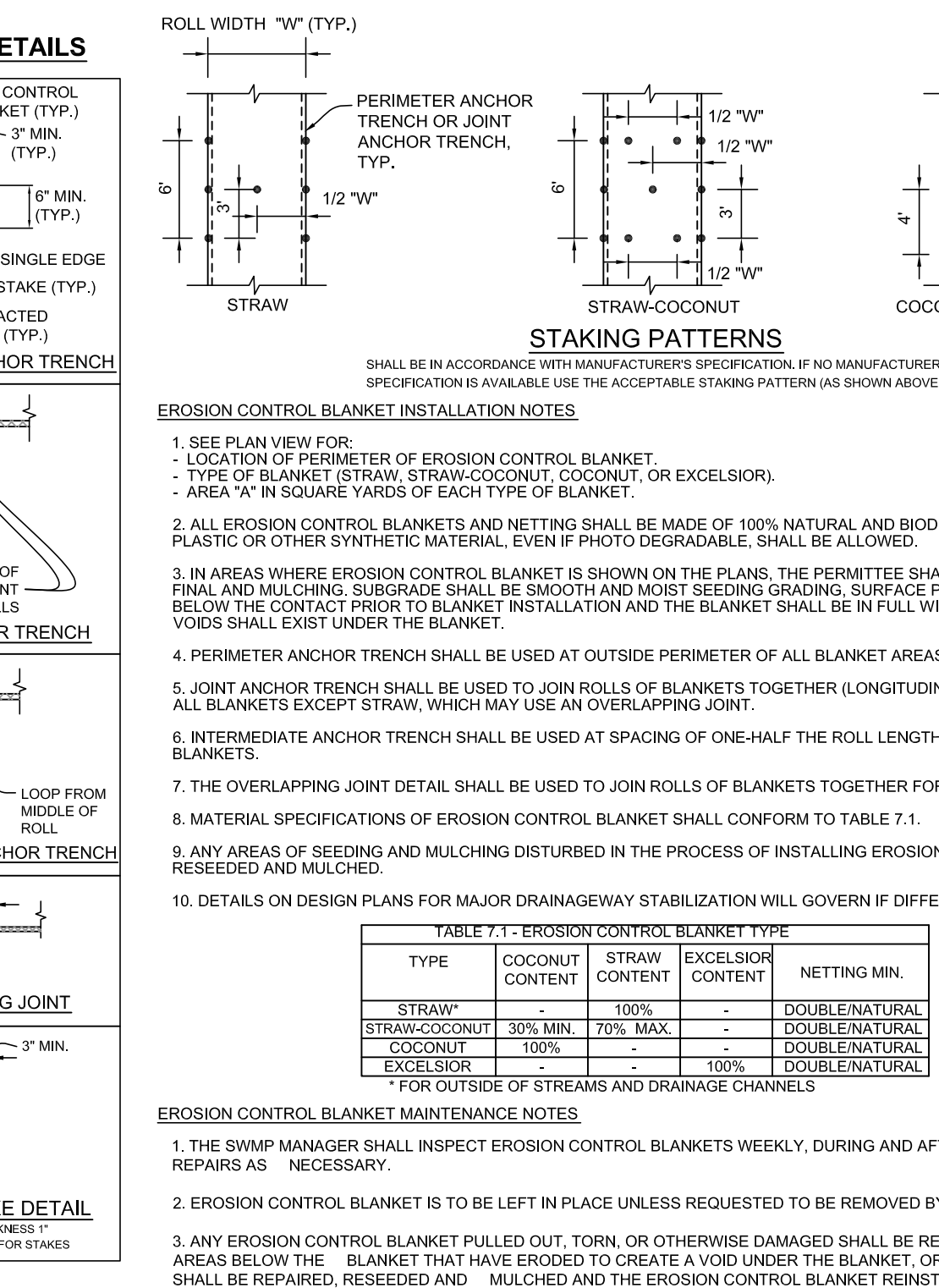


- CONCRETE WASHOUT AREA INSTALLATION NOTES**
- SEE PLAN VIEW FOR LOCATIONS OF CONCRETE WASHOUT AREA.
 - THE CONCRETE WASHOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.
 - VEHICLE TRACKING CONTROL IS REQUIRED AT THE ACCESS POINT.
 - SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE WASHOUT AREA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT AREA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.
 - EXCAVATED MATERIAL SHALL BE UTILIZED IN PERIMETER BERM CONSTRUCTION.
- CONCRETE WASHOUT AREA MAINTENANCE NOTES**
- THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
 - AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AN APPROVED WASTE SITE.
 - WHEN THE CONCRETE WASHOUT AREA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, DRILL SEED AND CRIMP MULCH OR OTHERWISE STABILIZE IN A MANNER APPROVED BY THE LOCAL JURISDICTION.
 - INSPECT WEEKLY, DURING AND AFTER ANY STORM EVENT.
- DETAIL BASED ON DETAILS PROVIDED BY DOUGLAS COUNTY

7 CONCRETE WASHOUT AREA
EC4 NOT TO SCALE



8 OUTSIDE OF STREAMS AND DRAINAGE CHANNELS - DETAIL C
EC4 NOT TO SCALE



EROSION CONTROL BLANKET
EC4 NOT TO SCALE

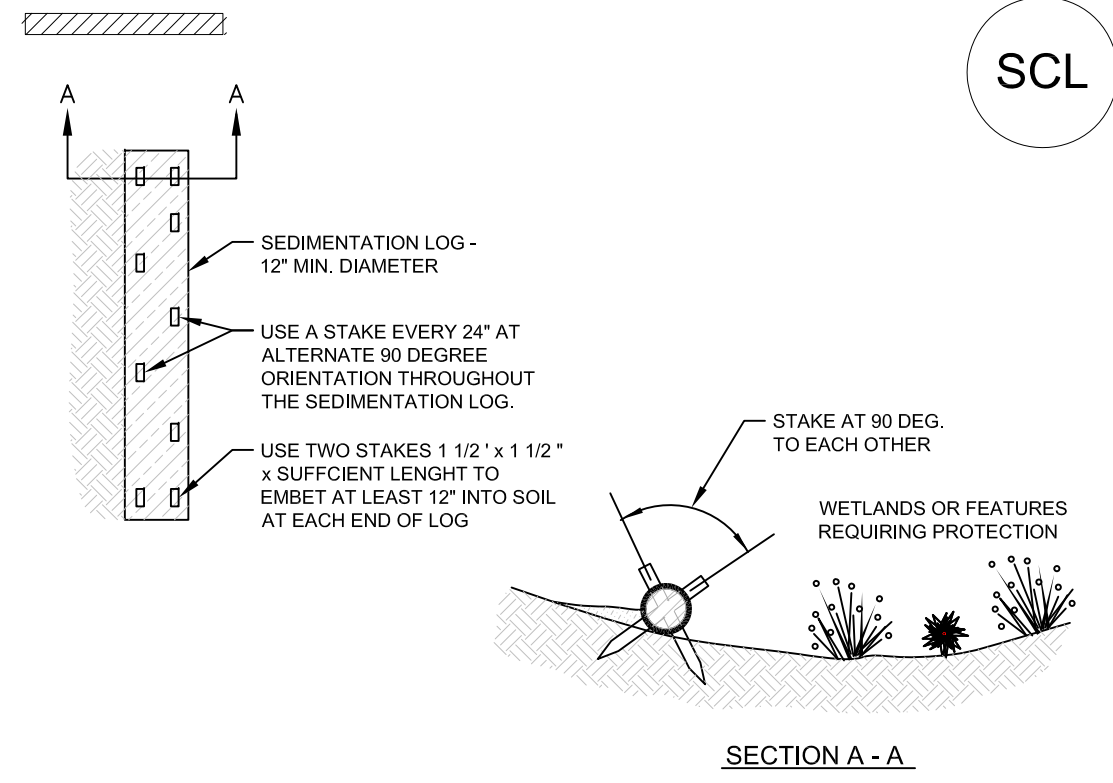
- EROSION CONTROL BLANKET INSTALLATION NOTES**
- SEE PLAN VIEW FOR:
 - LOCATION OF PERIMETER OF EROSION CONTROL BLANKET.
 - TYPE OF BLANKET (STRAW, STRAW-COCOONUT, COCONUT, OR EXCELSIOR).
 - AREA "X" IN SQUARE YARDS OF EACH TYPE OF BLANKET.
 - ALL EROSION CONTROL BLANKETS AND NETTING SHALL BE MADE OF 100% NATURAL AND BIODEGRADABLE MATERIAL; NO PLASTIC OR OTHER SYNTHETIC MATERIAL, EVEN IF PHOTO DEGRADABLE, SHALL BE ALLOWED.
 - IN AREAS WHERE EROSION CONTROL BLANKET IS SHOWN ON THE PLANS, THE PERMITTEE SHALL PLACE TOPSOIL AND PERFORM FINAL AND MULCHING. SUBGRADE SHALL BE SMOOTH AND MOIST SEEDING GRADING, SURFACE PREPARATION, AND SEEDING BELOW THE CONTACT PRIOR TO BLANKET INSTALLATION AND THE BLANKET SHALL BE IN FULL WITH SUBGRADE, NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.
 - PERIMETER ANCHOR TRENCH SHALL BE USED AT OUTSIDE PERIMETER OF ALL BLANKET AREAS.
 - JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF BLANKETS TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL BLANKETS EXCEPT STRAW, WHICH MAY USE AN OVERLAPPING JOINT.
 - INTERMEDIATE ANCHOR TRENCH SHALL BE USED AT SPACING OF ONE-HALF THE ROLL LENGTH FOR COCONUT AND EXCELSIOR BLANKETS.
 - THE OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF BLANKETS TOGETHER FOR BLANKETS ON SLOPES.
 - MATERIAL SPECIFICATIONS OF EROSION CONTROL BLANKET SHALL CONFORM TO TABLE 7.1.
 - ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING EROSION CONTROL BLANKET SHALL BE RESEEDED AND MULCHED.
 - DETAILS ON DESIGN PLANS FOR MAJOR DRAINAGEWAY STABILIZATION WILL GOVERN IF DIFFERENT FROM ONES SHOWN HERE.
- TABLE 7.1 - EROSION CONTROL BLANKET TYPE**
- | TYPE | COCONUT CONTENT | STRAW CONTENT | EXCELSIOR CONTENT | NETTING MIN. |
|----------------|-----------------|---------------|-------------------|----------------|
| STRAW* | - | 100% | - | DOUBLE/NATURAL |
| STRAW-COCOONUT | 30% MIN. | 70% MAX. | - | DOUBLE/NATURAL |
| COCONUT | 100% | - | - | DOUBLE/NATURAL |
| EXCELSIOR | - | - | 100% | DOUBLE/NATURAL |
- * FOR OUTSIDE OF STREAMS AND DRAINAGE CHANNELS
- EROSION CONTROL BLANKET MAINTENANCE NOTES**
- THE SWMP MANAGER SHALL INSPECT EROSION CONTROL BLANKETS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS AS NECESSARY.
 - EROSION CONTROL BLANKET IS TO BE LEFT IN PLACE UNLESS REQUESTED TO BE REMOVED BY THE LOCAL JURISDICTION.
 - ANY EROSION CONTROL BLANKET PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE RE-INSTALLED. ANY SUBGRADE AREAS BELOW THE BLANKET THAT HAVE ERODED TO CREATE A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE EROSION CONTROL BLANKET REINSTALLED.

EROSION CONTROL BLANKET
EC4 NOT TO SCALE

REVISIONS				REVISIONS			
NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION
1	IBP	1/22/14	30% DESIGN SUBMITTAL	3	IBP	5/1/14	RELEASE FOR CONSTRUCTION
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DESIGN	DATE
DESIGN	03/19/14
DETAIL	03/19/14
CHECK	03/19/14
APPROVAL	
SCALE	AS NOTED

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SEDIMENT CONTROL LOG INSTALLATION NOTES

- SEE PLAN VIEW FOR: -LOCATION AND LENGTH OF SEDIMENT CONTROL LOG.
- SEDIMENT CONTROL LOGS INDICATED ON INITIAL SWMP DISTURBING PLAN SHALL BE INSTALLED PRIOR TO ANY LAND -ACTIVITIES.
- SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR, OR COCONUT FIBER.
- NOT FOR USE IN CONCENTRATED FLOW AREAS.
- THE SEDIMENT CONTROL LOG SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 2".

SEDIMENT CONTROL LOG MAINTENANCE NOTES

- THE SWMP MANAGER SHALL INSPECT SEDIMENT CONTROL LOGS DAILY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
- SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOGS SHALL BE REMOVED WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN 1/2 THE HEIGHT OF THE CREST OF LOG.
- SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION. IF ANY DISTURBED AREA EXISTS AFTER REMOVAL, IT SHALL BE COVERED WITH TOP SOIL, DRILL SEEDED AND GRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

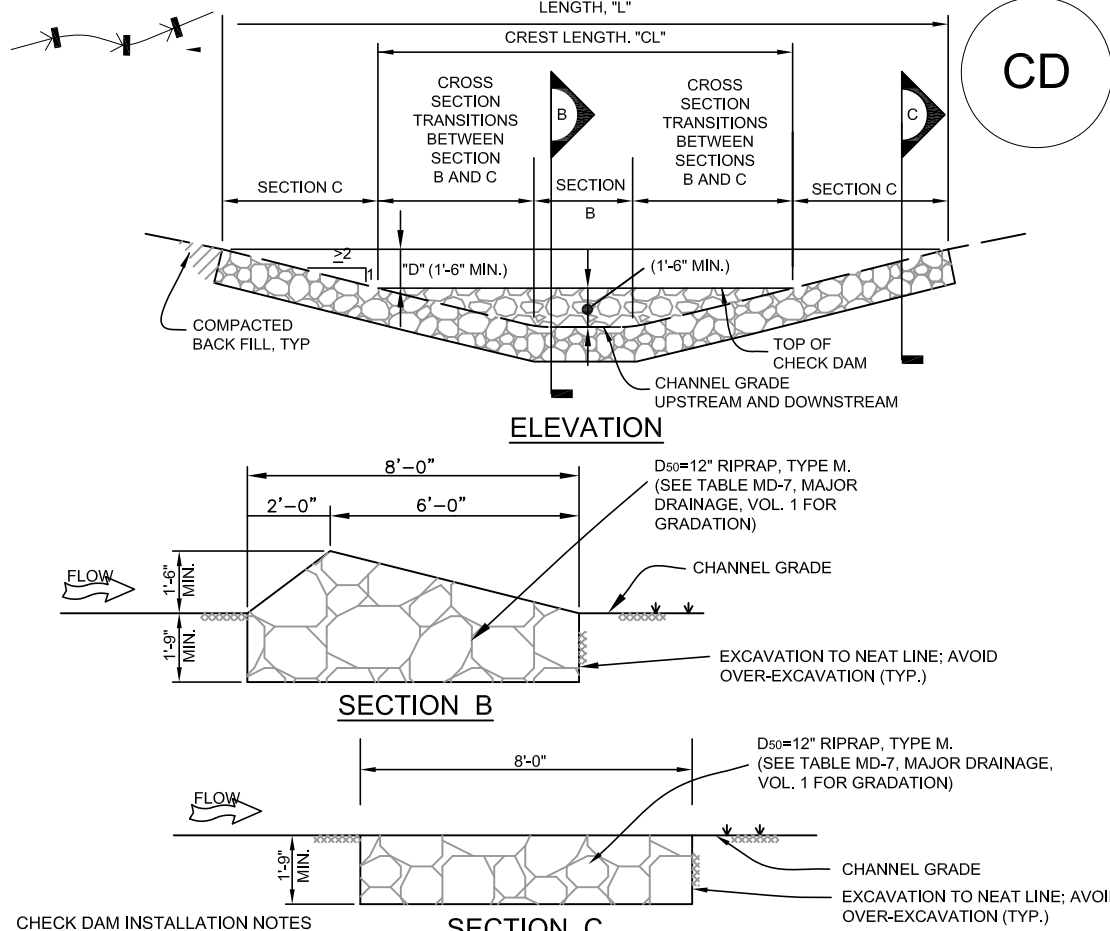
DETAIL BASED ON DETAILS PROVIDED BY DOUGLAS COUNTY AND CDOT

1

SEDIMENT CONTROL LOG

EC5

NOT TO SCALE



CHECK DAM INSTALLATION NOTES

- SEE PLAN VIEW FOR: -LOCATIONS OF CHECK DAMS. -CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM). -LENGTH, "L", CREST LENGTH, "CL", AND DEPTH, "D".
- CHECK DAMS INDICATED ON INITIAL GESC PLAN SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND DISTURBING ACTIVITIES.
- RIPRAP UTILIZED FOR CHECK DAMS SHALL HAVE A D₅₀ MEDIAN STONE SIZE OF 12".
- RIPRAP PAD SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'-8".
- THE ENDS OF THE CHECK DAM SHALL BE A MINIMUM OF 1'-6" HIGHER THAN THE CENTER OF THE CHECK DAM.

CHECK DAM MAINTENANCE NOTES

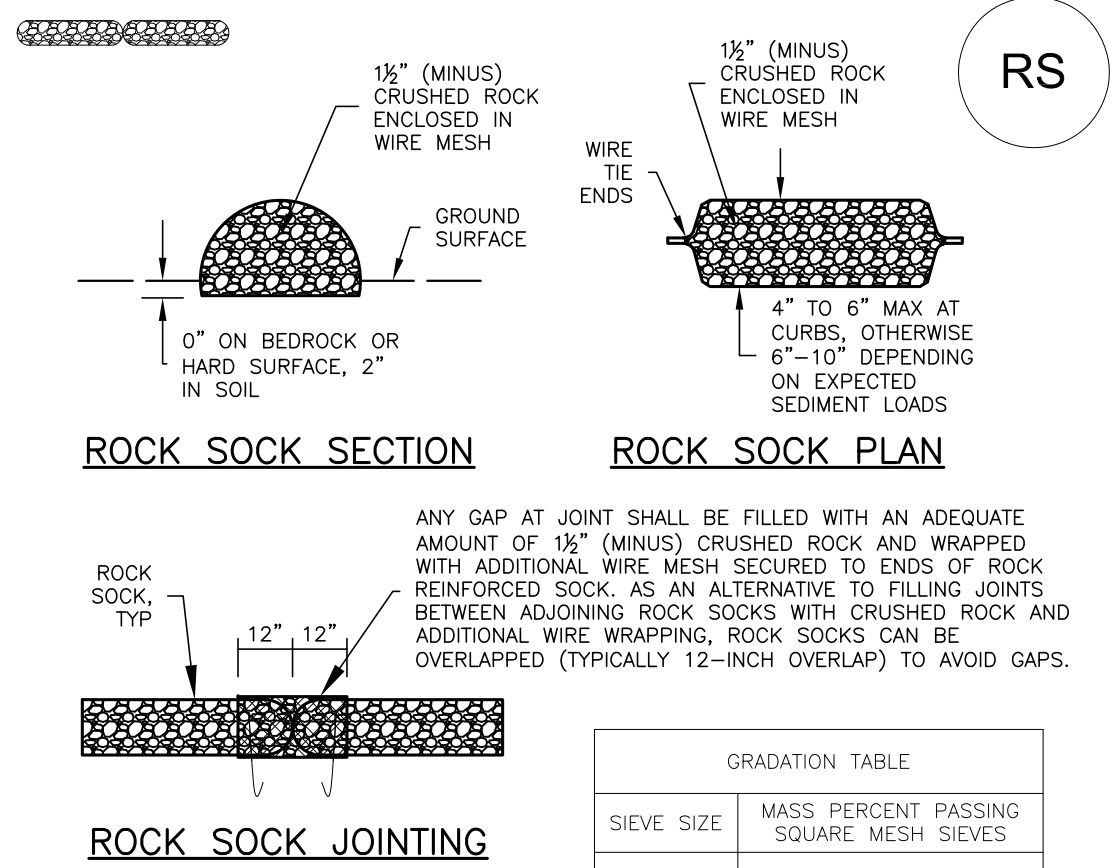
- THE SWMP MANAGER SHALL INSPECT CHECK DAMS WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
- SEDIMENT ACCUMULATED UPSTREAM OF CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF CHECK DAM IS WITHIN 1/2 OF THE HEIGHT OF THE CREST.
- CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE COUNTY.
- WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACK FILL. ANY DISTURBED AREA SHALL BE SEEDED AND MULCHED AND COVERED WITH EROSION CONTROL BLANKET OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

2

CHECK DAM

EC5

NOT TO SCALE



GRADATION TABLE

SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
NO. 4	
2"	100
1 1/2"	90 - 100
1"	20 - 55
3/4"	0 - 15
3/8"	0 - 5

MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M4.3. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.

ROCK SOCK INSTALLATION NOTES

- SEE PLAN VIEW FOR: -LOCATION(S) OF ROCK SOCKS.
- CRUSHED ROCK SHALL BE 1/2" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1/2" MINUS).
- WIRE MESH SHALL BE FABRICATED OF 10 GAGE POULTRY MESH, OR EQUIVALENT, WITH A MAXIMUM OPENING OF 1/2", RECOMMENDED MINIMUM ROLL WIDTH OF 48"
- WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.
- SOME MUNICIPALITIES MAY ALLOW THE USE OF FILTER FABRIC AS AN ALTERNATIVE TO WIRE MESH FOR THE ROCK ENCLOSURE.

3

ROCK SOCK

EC5

NOT TO SCALE

WWE WRIGHT WATER ENGINEERS, INC.
2490 W. 26TH AVE. SUITE 100A
DENVER, CO 80211
(303)480-1700 FAX(303)480-1020

REVISIONS				REVISIONS			
NO.	BY	DATE	DESCRIPTION	NO.	BY	DATE	DESCRIPTION
1	IBP	5/1/14	RELEASE FOR CONSTRUCTION				
2							
3							
4							
5							

	DATE
DESIGN	03/19/14
DETAIL	03/19/14
CHECK	03/19/14
APPROVAL	
SCALE	AS NOTED
SH EC5.dwg	

Williams Canyon Drainage
NRCS Emergency Watershed Protection Program
Debris Control Measures and Channel Repairs - Phase I
Erosion Control Plan

EROSION CONTROL DETAILS

JOB NO.
131-080.040

REVISION NO.
3

SHEET NO.
EC5

CONSTRUCTION DOCUMENT