

Appendix A - Maps

ABBREVIATIONS

ABS	ACRYLONITRILE BUTADIENE STYRENE, SCHEDULE 40	LIP	LIP OF CURB
ADEC	ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION	LT	LEFT
AL-MON	ALUMINUM MONUMENT	MAX	MAXIMUM
AWWA	AMERICAN WATER WORKS ASSOCIATION	MDD	MAXIMUM DRY DENSITY
AWG	AMERICAN WIRE GUAGE	MJ	MECHANICAL JOINT
AWWU	ANCHORAGE WATER & WASTEWATER	MIN	MINIMUM
APPROX	APPROXIMATE	#	NUMBER
BGS	BELOW GROUND SURFACE	NPT	NATIONAL PIPE THREAD
BOP	BOTTOM OF PIPE	NSF	NATIONAL SANITATION FOUNDATION
BLDG	BUILDING	OSHA	OCCUPATIONAL SAFETY AND HEATH ADMINISTRATION
¢	CENTERLINE	OC	ON CENTER
CMP	CORRUGATED METAL PIPE	O&M	OPERATIONS AND MAINTENANCE
CONST	CONSTRUCT	ORIG	ORIGINAL
COW	CITY OF WASILLA	PFD	PALMER FIRE DEPARTMENT
DIA/ø	DIAMETER	PVC	POLYVINYL CHLORIDE
DIP	DUCTILE IRON PIPE	PSI	POUNDS PER SQUARE INCH
ELEV	ELEVATION	PL/ℓ	PROPERTY LINE
EX	EXISTING	RT	RIGHT
FT	FOOT	ROW	RIGHT-OF-WAY
F&I	FURNISH AND INSTALL	SSMH	SANITARY SEWER MANHOLE
FG	FINAL GRADE	SCH	SCHEDULE
FH	FIRE HYDRANT	SP	SINGLE PUMPER
GALVS	GALVANIZED STEEL	SF	SQUARE FEET/FOOT
GV	GATE VALVE	SS	STAINLESS STEEL
HDPE	HIGH DENSITY POLYETHYLENE PIPE	STD	STANDARD/STANDARDS
HMWPE	HIGH MOLECULAR WEIGHT POLYETHYLENE	STA	STATION
H	HORIZONTAL	TBC	TOP BACK OF CURB
IAW	IN ACCORDANCE WITH	TBM	TEMPORARY BENCHMARK
IE	INVERT ELEVATION	TH	TEST HOLE
IN	INCH/INCHES	TOP	TOP OF PIPE
INV	INVERT	VB	VALVE BOX
IPS	IRON PIPE SIZE	V	VERTICAL
L-POLE	LIGHT POLE	W/	WITH
LF	LINEAR FOOT/FEET	YPC	YELLOW PLASTIC CAP

GENERAL NOTES:

- ALL CONSTRUCTION SHALL BE INSTALLED AS SPECIFIED IN THE CITY OF WASILLA STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS, THE MOST CURRENT EDITION OF THE MUNICIPALITY OF ANCHORAGE STANDARD SPECIFICATIONS (MASS), AND THE 2018 AWWU DESIGN AND CONSTRUCTION PRACTICES MANUAL(DCPM).
- NO WATER OR SEWER WORK SHALL BE BURIED NOR CONCEALED PRIOR TO BEING INSPECTED AND ACCEPTED BY THE CITY OF WASILLA AND THE ENGINEER OF RECORD. CONTRACTOR SHALL COORDINATE WITH PUBLIC WORKS DEPARTMENT AND ENGINEER OR RECORD REGARDING SCHEDULING.
- ENGINEER MUST BE PRESENT FOR ALL WATER AND SEWER SYSTEM TESTING. PROVIDE 48 HOURS MINIMUM WRITTEN NOTICE TO THE ENGINEER OF RECORD.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES WITHIN THE LIMITS OF CONSTRUCTION, WHETHER OR NOT SHOWN ON THE PLANS. THIS RESPONSIBILITY INCLUDES CONTACTING UTILITY COMPANIES FOR LOCATIONS OR POT HOLING PRIOR TO CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION IS THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL WATER PIPE, FITTINGS AND APPURTENANCES SHALL BE NSF 61 CERTIFIED. ALL DISINFECTANTS SHALL BE NSF 60 CERTIFIED.
- ALL WATER AND SANITARY SEWER MAINS SHALL BE PRESSURE TESTED AS PRESCRIBED IN DCPM.
- DO NOT CONSTRUCT WATER AND SANITARY OR STORM SEWER IN THE SAME TRENCH.
- MAINTAIN A MIN OF 10’ H AND 18” V (AT CROSSINGS) SEPARATION BETWEEN WATER AND SANITARY SEWER MAINS AND SERVICES. WATERLINE PIPE JOINTS SHALL BE PLACED AT LEAST 9’ H FROM ANY SANITARY AND STORM SEWER PIPE JOINTS INCLUDING WELDED JOINTS.
- MAINTAIN A MIN OF 10’ H FROM WATER LINE AND OUTSIDE EDGE OF SANITARY SEWER MANHOLES.
- IN LOCATIONS WHERE THE WATER PIPE PASSES UNDER A SANITARY OR STORM SEWER PIPE, USE AWWA C600-05 TYPE 4 OR 5 BEDDING.
- WITHIN 10 FT OF CROSSING A WATER PIPE, SANITARY AND STORM SEWER PIPE SHALL BE CONSTRUCTED IN A MANNER EQUIVALENT TO THE WATER LINE. THEY SHALL BE PRESSURE TESTED TO ENSURE WATER TIGHTNESS PER MASS SECTION 60 ARTICLE 2.5 OR ENCASED IN A PIPE WITH EQUAL OR BETTER STRENGTH.
- ALL WATER/SEWER PIPE INSULATION SHALL BE 4’ WIDE BY 8’ LONG RIGID BOARD, HIGH DENSITY EXTRUDED POLYSTYRENE, MIN 60 PSI, FOR UNDERGROUND INSTALLATIONS EQUIVALENT TO R-20 PER 4” THICK INSULATION.
- CONTRACTOR SHALL VERIFY AND RECORD THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL UTILITIES ENCOUNTERED IN THE FIELD AND RECORD ANY CHANGES ON THE CONTRACTOR RECORD DRAWINGS.
- THE CONTRACTOR SHALL RESTORE ALL DISTURBED PROPERTY, INCLUDING DRAINAGE SWALES, DISTURBED BY CONTRACT ACTIVITIES TO PRE-CONSTRUCTION CONDITION.
- IN CASE OF CONFLICT BETWEEN STATIONING LOCATION OF PIPE OR FITTINGS, USE DIMENSIONED LOCATIONS RELATIVE TO THE CENTERLINE AND PROPERTY LINE, THE DIMENSIONED LOCATIONS SHALL GOVERN.
- THE CONTRACTOR SHALL RECORD SURVEY NOTES IN A FORMAT SIMILAR TO THAT SHOWN IN MASS, DIVISION 65 FOR SUBMITTAL WITH RECORD DRAWING PLANS PRIOR TO CONTRACT FINAL PAYMENT.
- CONTRACTOR SHALL FIELD INSTALL RESTRAINED FITTINGS ON ALL MECHANICAL JOINTS.
- CONTRACTOR IS RESPONSIBLE FOR THE SITE’S SWPPP AND CGP COMPLIANCE. CONTRACTOR SHALL COMPLETE A SWPPP SUBCONTRACTORS’ CERTIFICATION FORM. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING HAUL ROUTES, PAVED OR UNPAVED, ON THE PROJECT OR OFF AND ALL OTHER AREAS EFFECTED BY CONTRACTOR’S OWN OPERATIONS AS REQUIRED BY THE SWPPP AND/OR COW CODE.
- FINISH GRADE (FG) REPRESENTS THE ELEVATION OF THE FINISHED SURFACE. THIS INCLUDES LANDSCAPE AREAS, PAVED OR CONCRETE SURFACES, ROCK RIP-RAP SURFACE AND ELEVATION AT EXTERIOR OF STRUCTURE FOUNDATION, UNLESS OTHERWISE DENOTED ON DETAIL OR SPECIAL LABEL. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ADJUST SUBGRADE OR TOPSOIL TO ALLOW FOR FINISHED SURFACE MATERIAL DIMENSIONS. IF DETAIL IS PROVIDED FOR SPECIAL AREA, DETAIL SHALL DENOTE FINISH GRADES.
- COLD BEND HDPE PIPE PER MANUFACTURES RECOMMENDATIONS OR DCPM.

CIVIL SHEET INDEX	
SHEET NO.	SUBJECT
C1	GENERAL NOTES, ABBREVIATIONS & INDEX
C2	LEGEND
C3	OVERALL SITE PLAN
C4	PHASE 1 SITE PLAN
C5	GRADING PLAN
C6	LINE, CURVE, AND POINT TABLES
C7	RETENTION BASIN GRADING
C8	WATER MAIN AND SERVICE PLAN AND PROFILE
C9	SEWER SERVICE PLAN AND PROFILE
C10-11	SEWER MAIN PLAN AND PROFILE
C12	STORM DRAIN PLAN AND PROFILE
C13-16	DETAILS
C17	STRIPING PLAN
C18	SIDEWALK JOINT PLAN
C19	CARPORT PLAN



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Ph. 907-522-6776
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CONSULTANT

ASPEN HOUSE
SENIOR APARTMENTS
WASILLA, ALASKA

REVISION SCHEDULE

#	DESCRIPTION	DATE

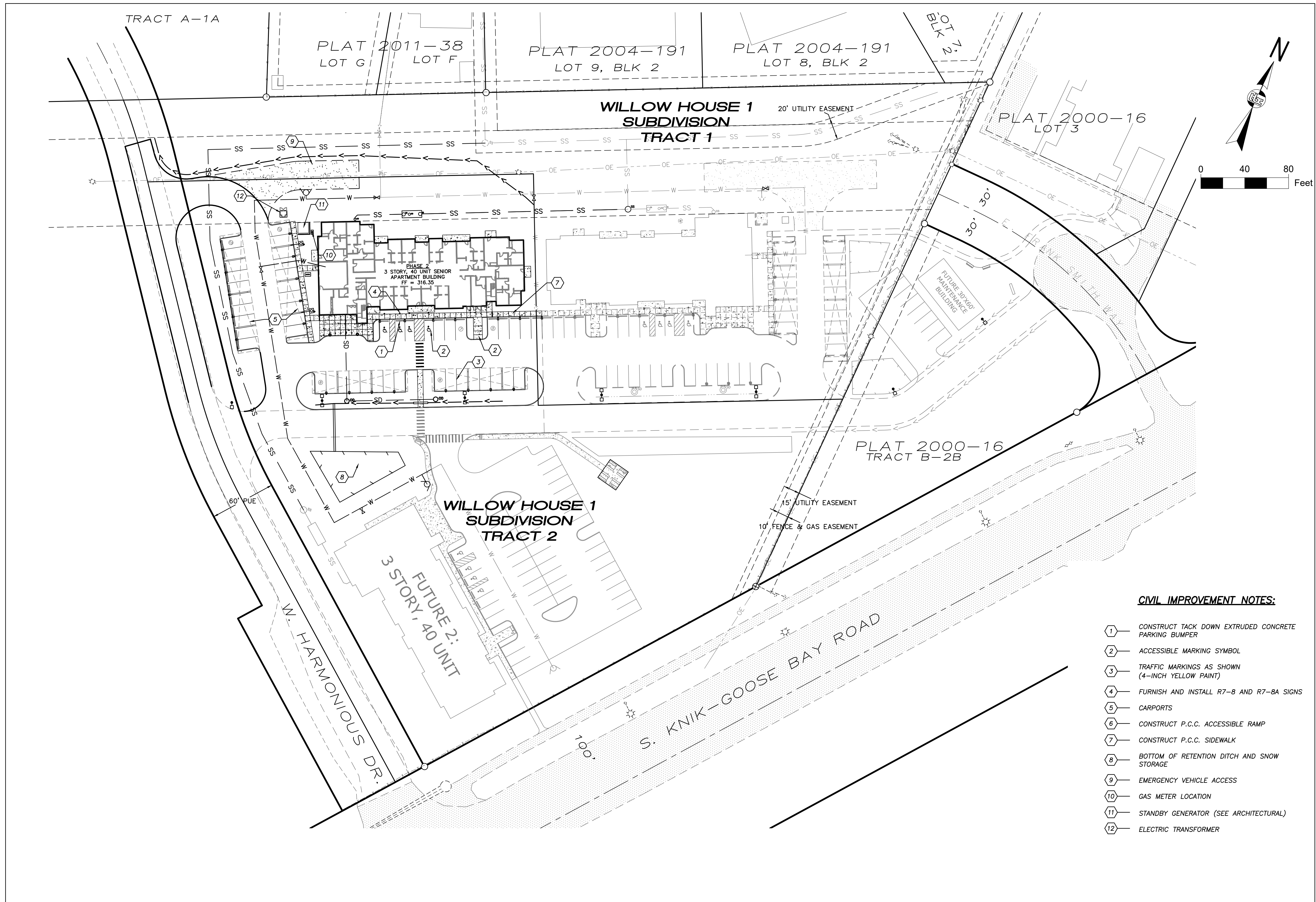
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SHEET NAME
CIVIL NOTES & KEY MAPS

SHEET NO.
C1



Know what's below.
Call before you dig.



CIVIL IMPROVEMENT NOTES:

- 1 CONSTRUCT TACK DOWN EXTRUDED CONCRETE PARKING BUMPER
- 2 ACCESSIBLE MARKING SYMBOL
- 3 TRAFFIC MARKINGS AS SHOWN (4-INCH YELLOW PAINT)
- 4 FURNISH AND INSTALL R7-8 AND R7-8A SIGNS
- 5 CARPORTS
- 6 CONSTRUCT P.C.C. ACCESSIBLE RAMP
- 7 CONSTRUCT P.C.C. SIDEWALK
- 8 BOTTOM OF RETENTION DITCH AND SNOW STORAGE
- 9 EMERGENCY VEHICLE ACCESS
- 10 GAS METER LOCATION
- 11 STANDBY GENERATOR (SEE ARCHITECTURAL)
- 12 ELECTRIC TRANSFORMER





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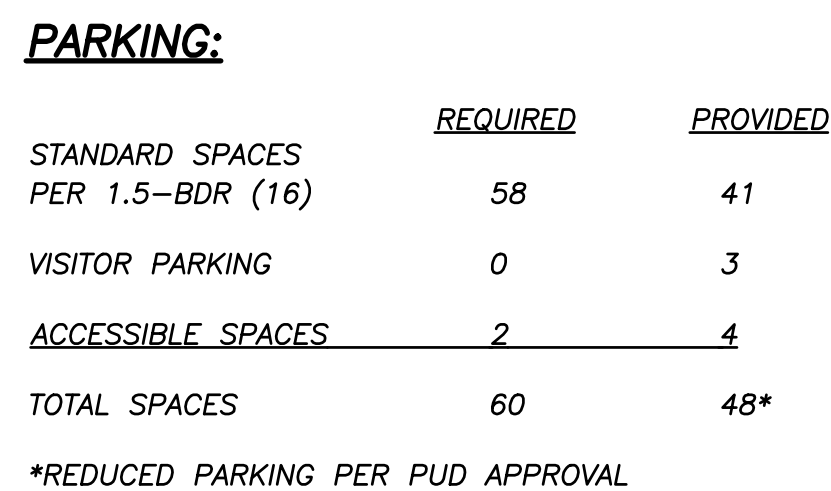
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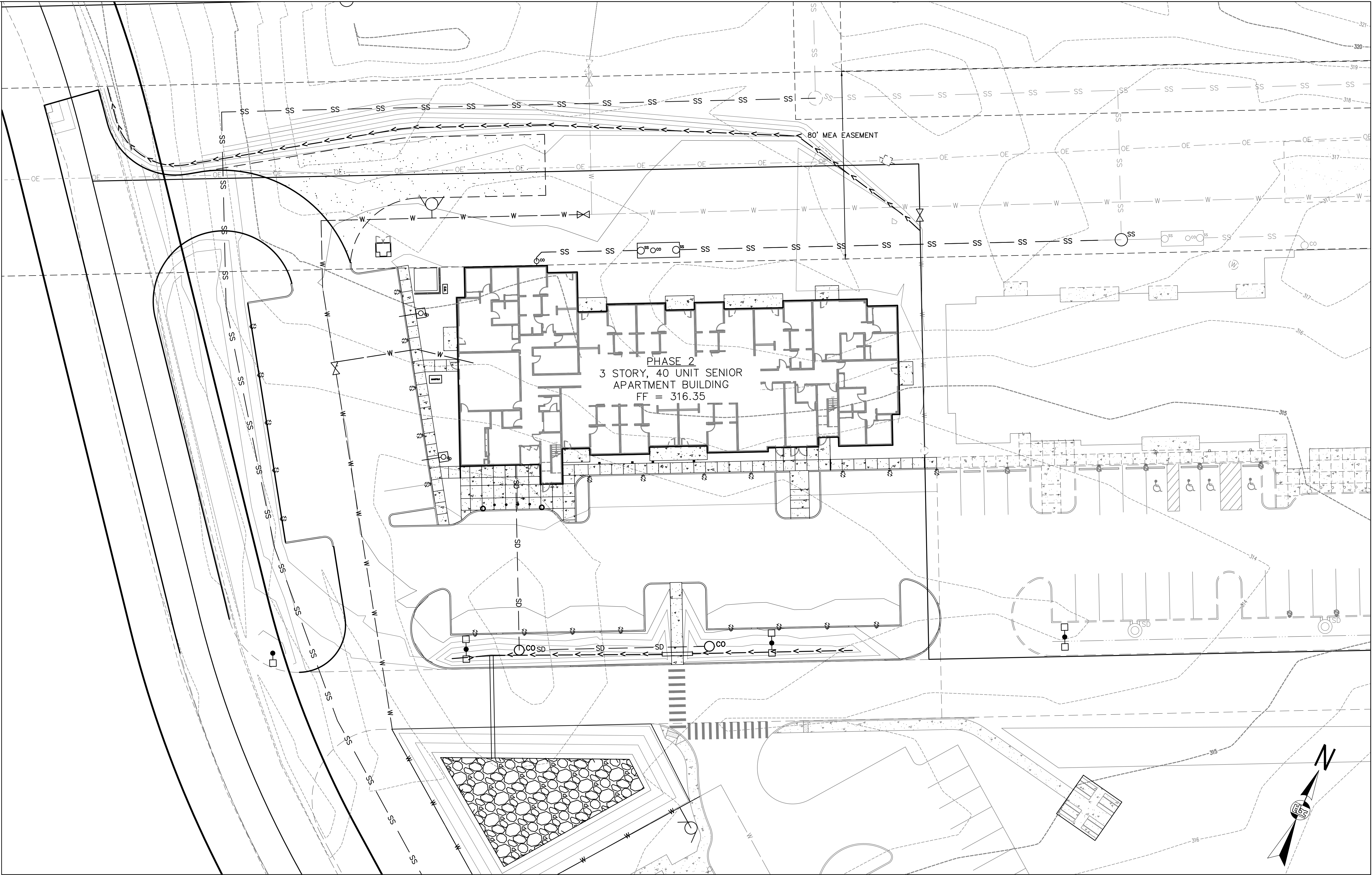
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SHEET NAME
OVERALL SITE PLAN

SHEET NO.
C3



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| REVIEWED | TJA | |
| SHEET NAME | | |
| PHASE 1 SITE PLAN | | |
| SHEET NO. | | |

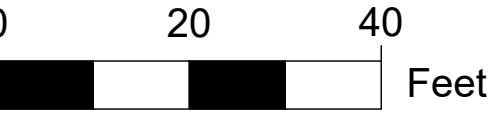
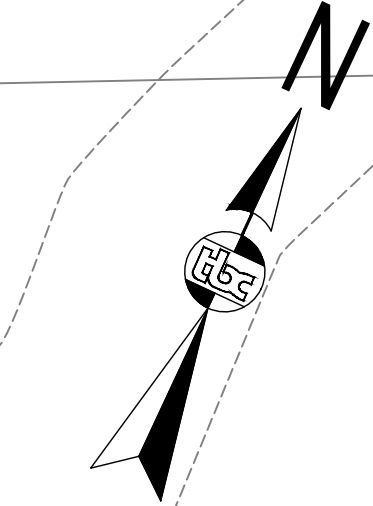


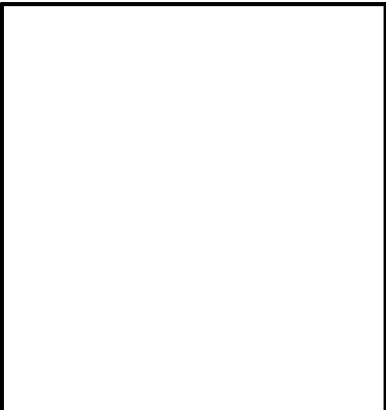
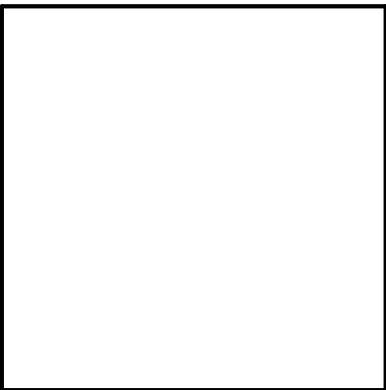
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SHEET NAME GRADING PLAN	
SHEET NO. C5	





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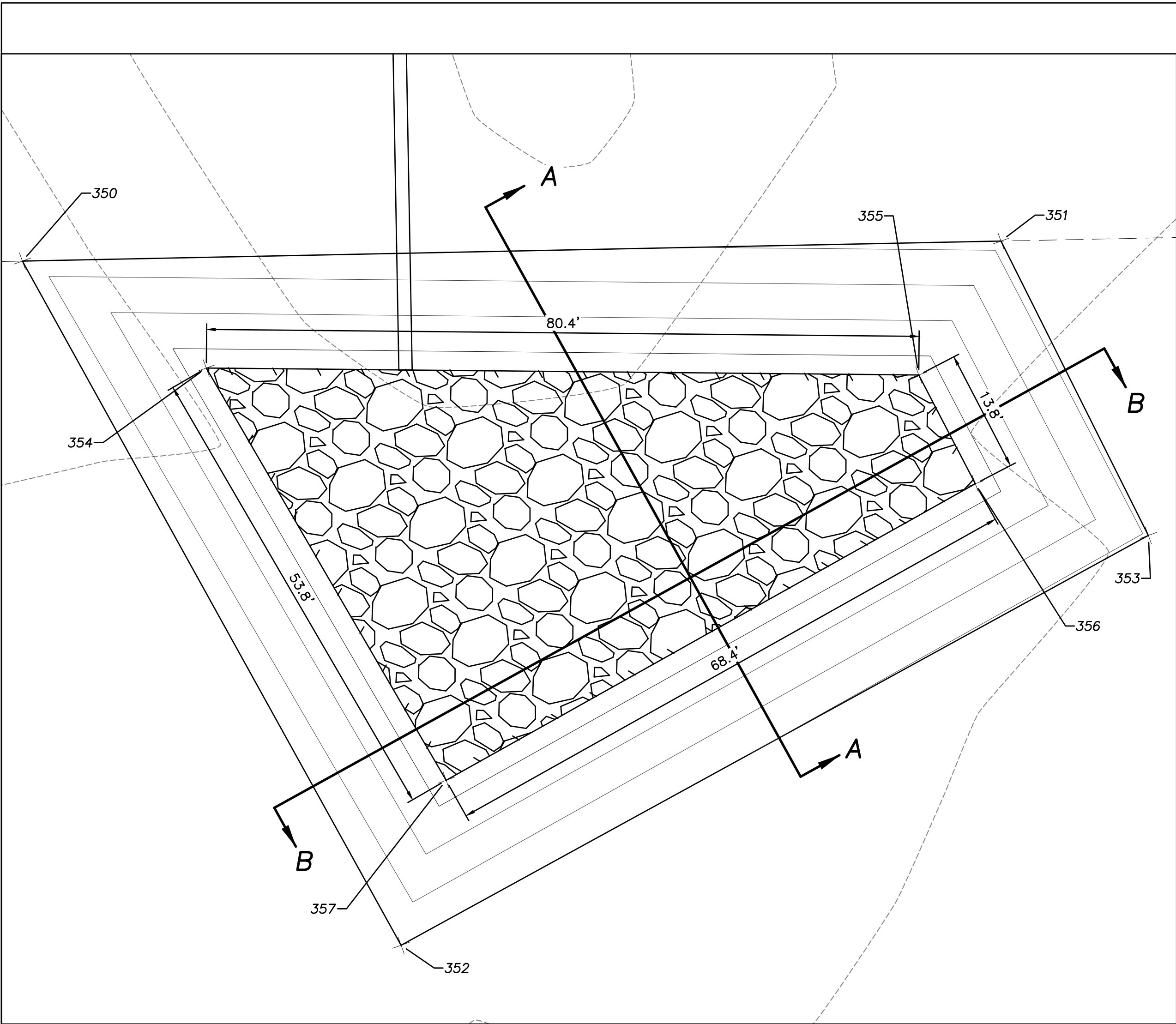
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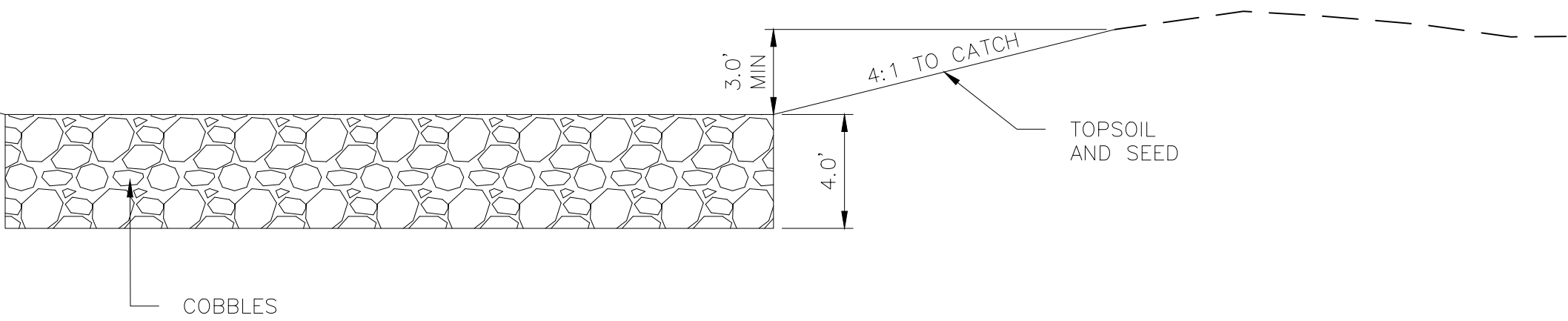
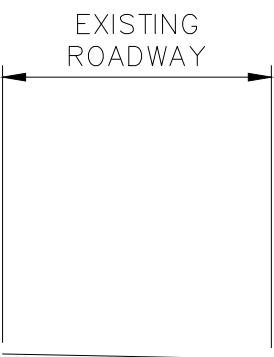
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SHEET NAME
LINE, CURVE AND POINT
TABLES

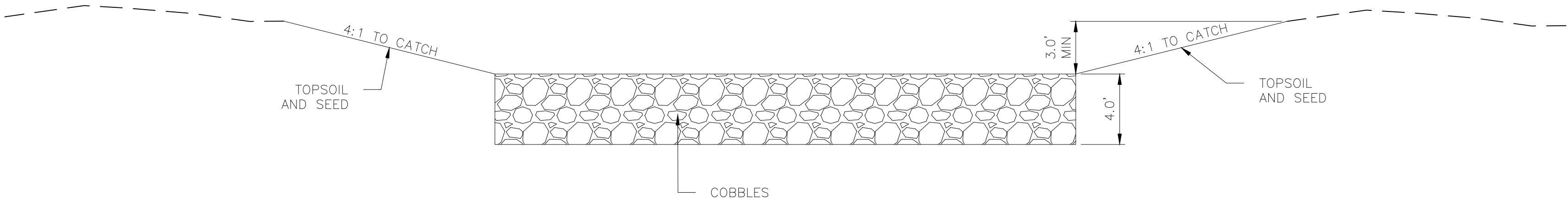
SHEET NO.
C6



Point Table				
Point #	Elevation	Northing	Easting	Description
350	312.43	2764572.36	1735747.92	MATCH EXISTING
351	313.26	2764621.06	1735847.02	MATCH EXISTING
352	312.90	2764520.47	1735819.26	MATCH EXISTING
353	313.12	2764598.00	1735876.12	MATCH EXISTING
354	309.46	2764570.20	1735771.82	TOP OF COBBLES
355	309.46	2764603.45	1735845.00	TOP OF COBBLES
356	309.46	2764595.03	1735855.97	TOP OF COBBLES
357	309.46	2764539.48	1735816.00	TOP OF COBBLES



BASIN SECTION A-A



BASIN SECTION B-B



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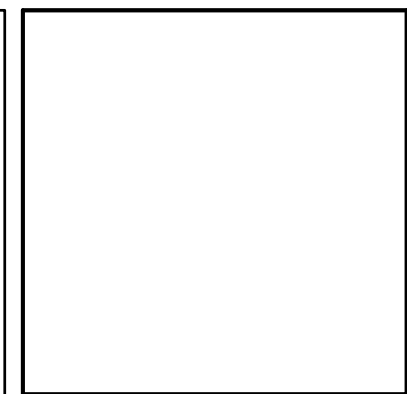
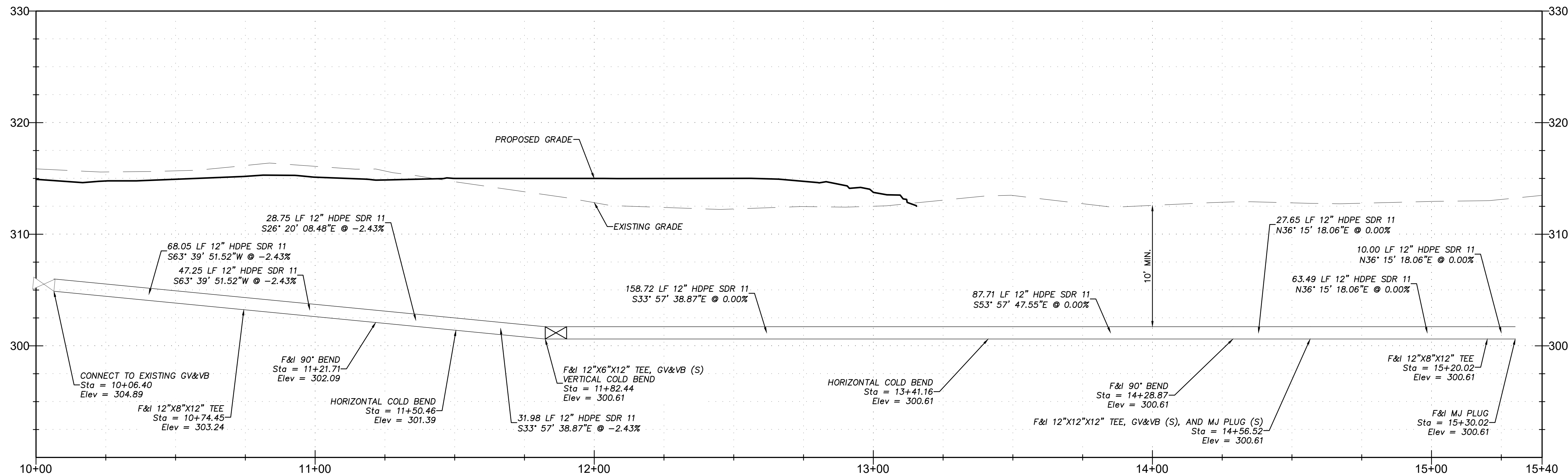
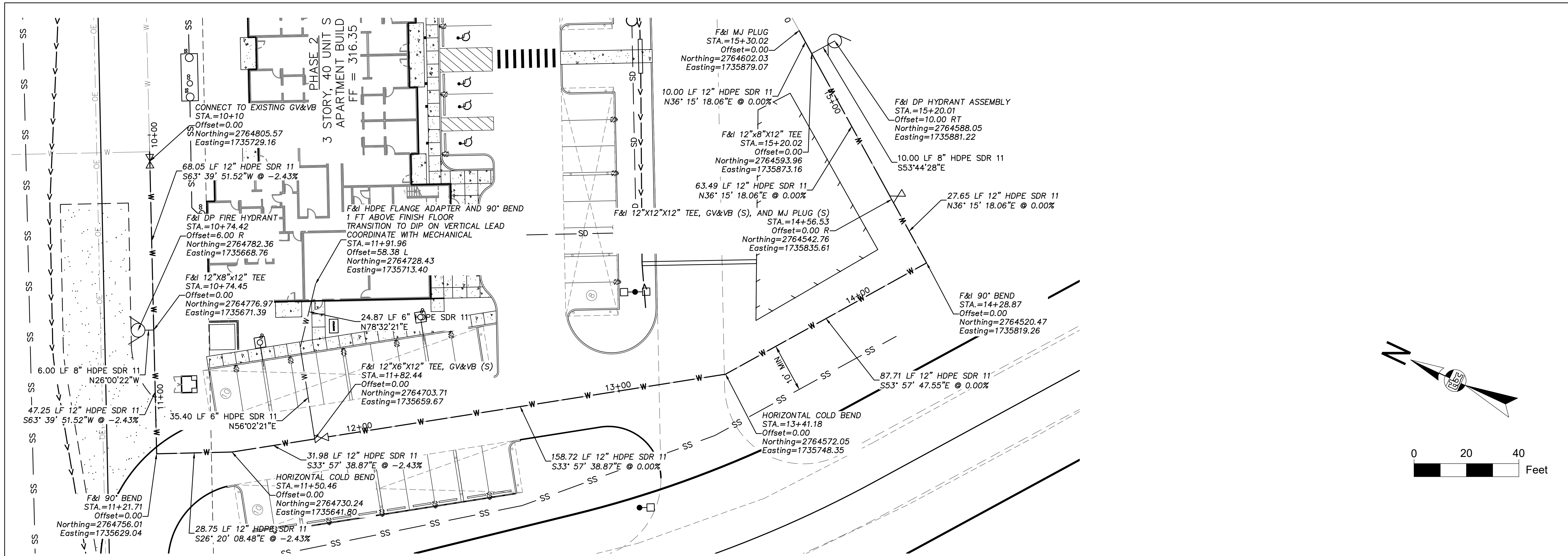
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SHEET NAME
GRADING PLAN

SHEET NO.
C7



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#	DESCRIPTION	DATE
1	WATER MAIN EXTENSION AND SERVICE PLAN AND PROFILE	02.17.2023

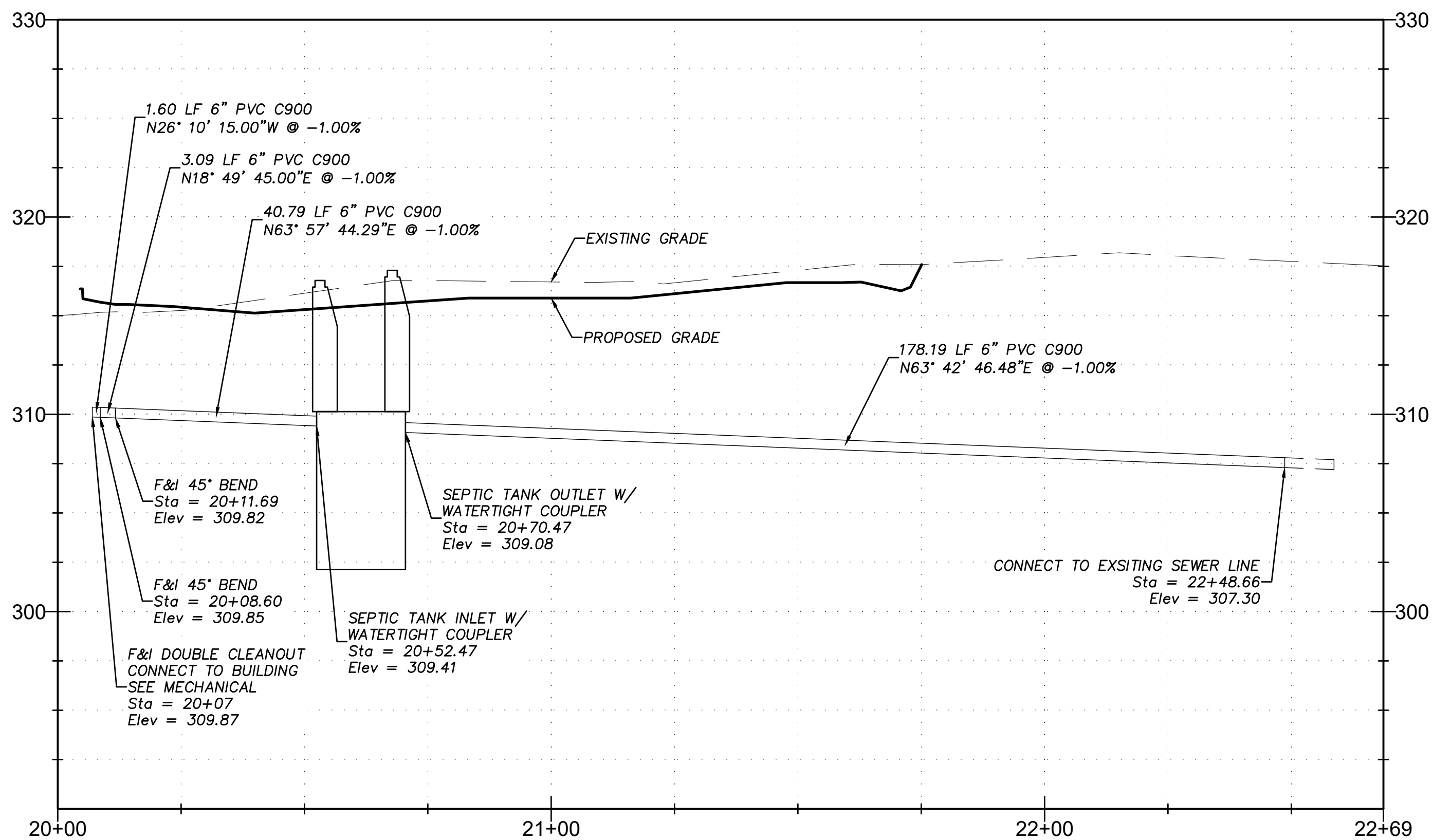
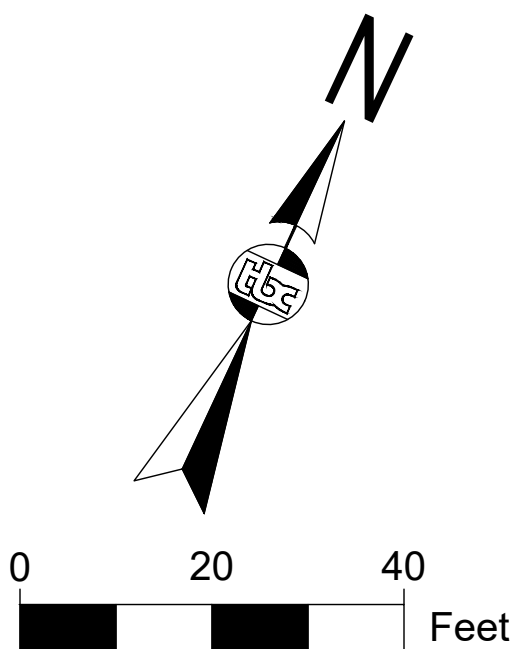
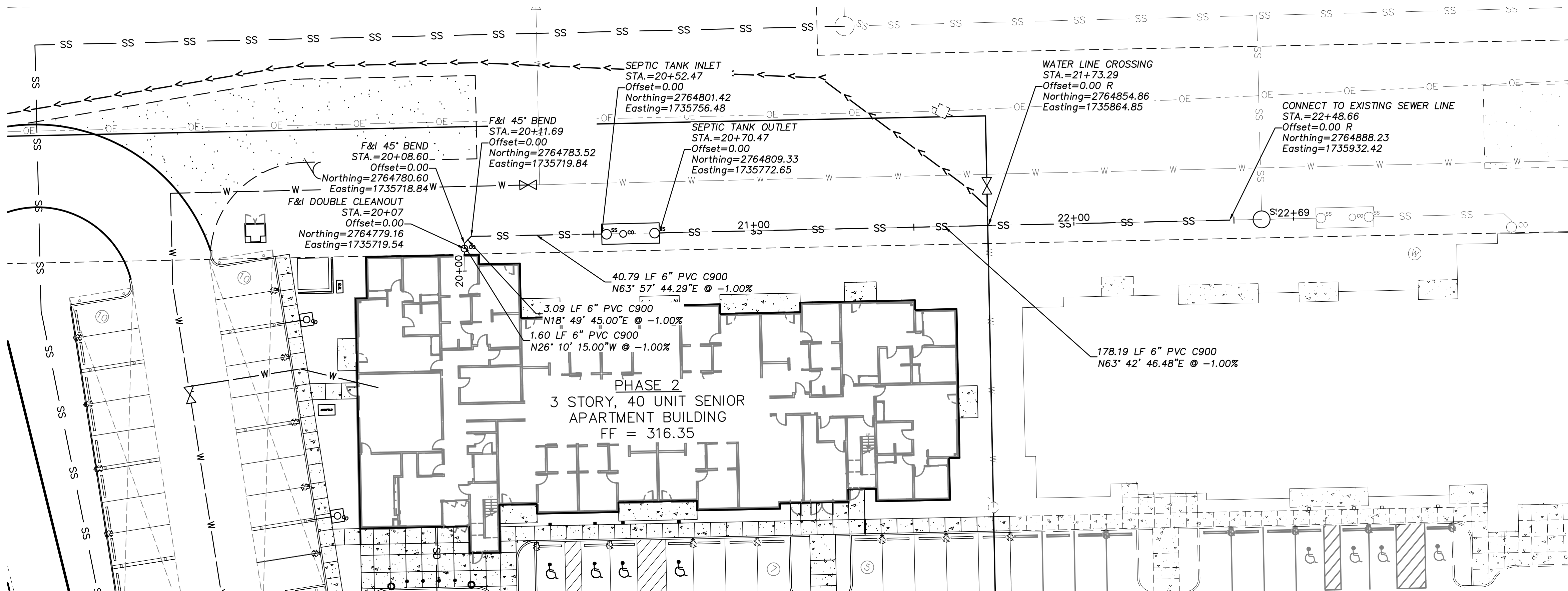
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SHEET NAME
WATER MAIN EXTENSION AND SERVICE PLAN AND PROFILE

SHEET NO.
C8

PERMIT DOCUMENTS

HALF SCALE WHEN PRINTED AT 11x17



SEWER NOTES:

1. ALL SEWER PIPE AND SEPTIC TANK SHALL BE INSULATION 4' WIDE BY 8' LONG RIGID BOARD, HIGH DENSITY EXTRUDED POLYSTYRENE, MIN 60 PSI, FOR UNDERGROUND INSTALLATIONS EQUIVALENT TO R-20 PER 4" THICK INSULATION.
2. FURNISH AND INSTALL HEAT TRACE ALONG 3" FORCE MAIN SEWER FROM PUMP VAULT TO CONNECTION WITH 8" FORCE MAIN.

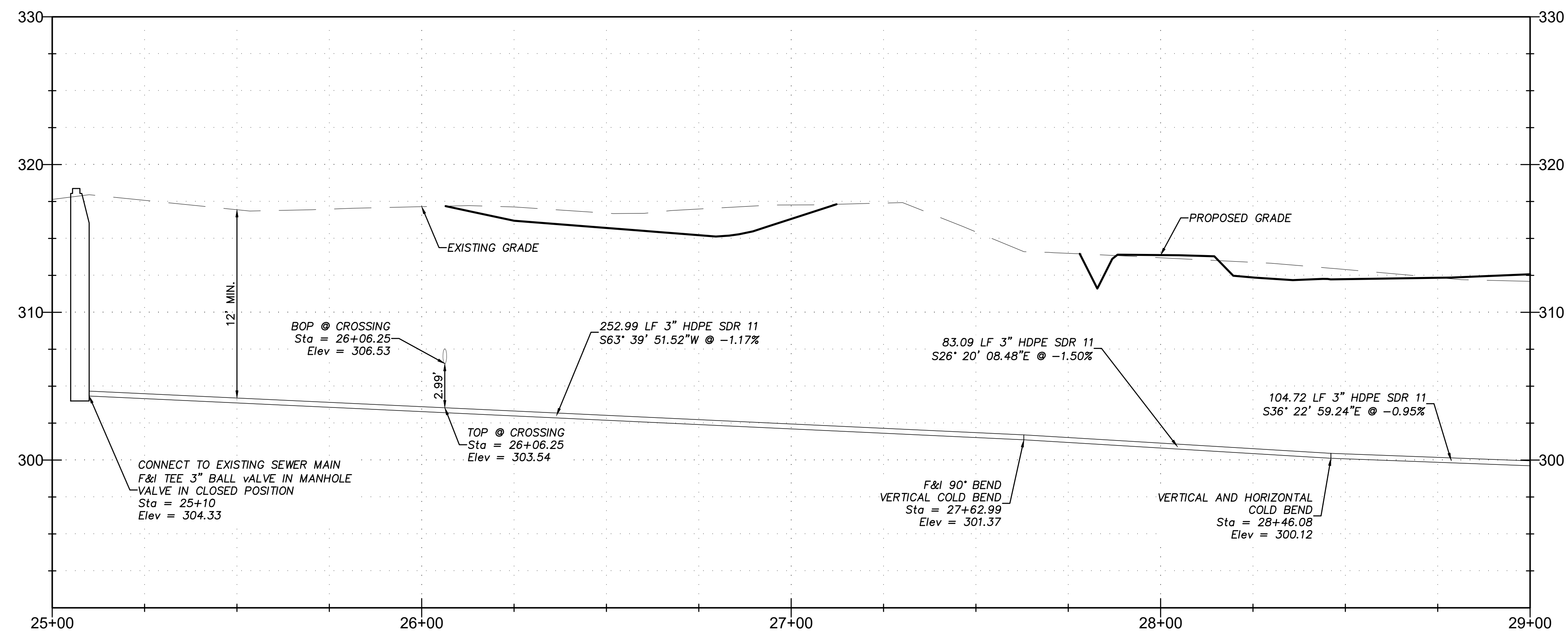
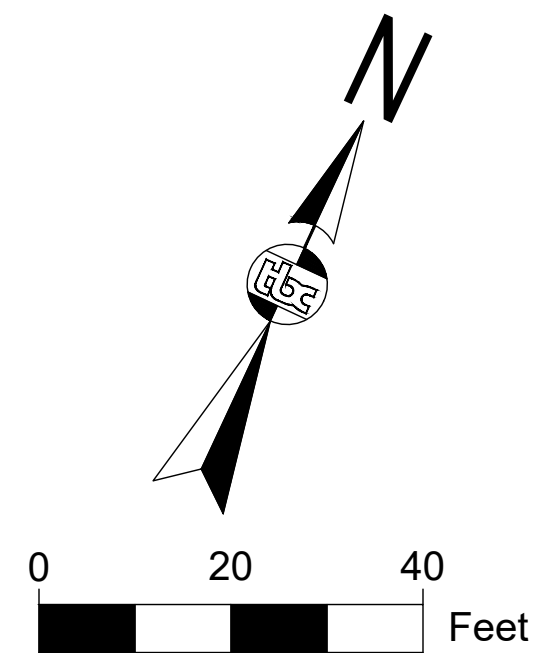
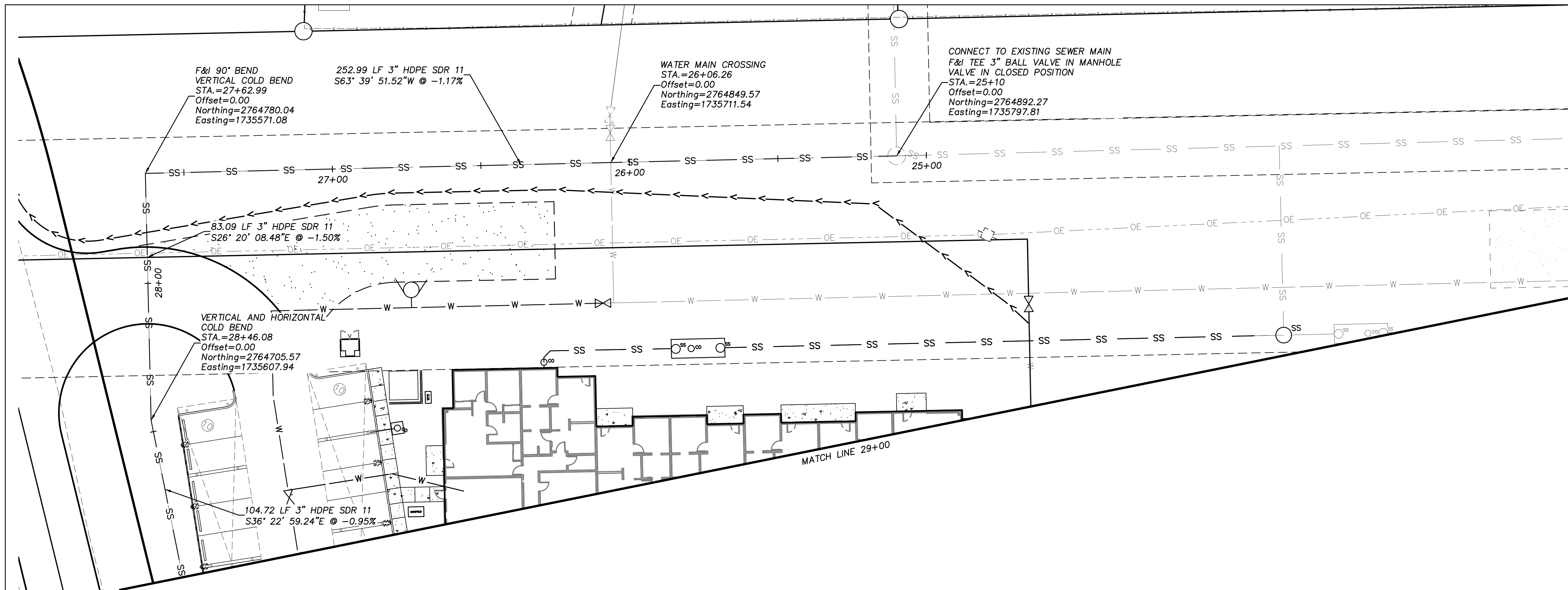
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SHEET NAME
SEWER SERVICE
PLAN AND PROFILE

SHEET NO.
C9



SEWER NOTES:

- ALL SEWER PIPE AND SEPTIC TANK SHALL BE INSULATION 4" WIDE BY 8" LONG RIGID BOARD, HIGH DENSITY EXTRUDED POLYSTYRENE, MIN 60 PSI, FOR UNDERGROUND INSTALLATIONS EQUIVALENT TO R-20 PER 4" THICK INSULATION.



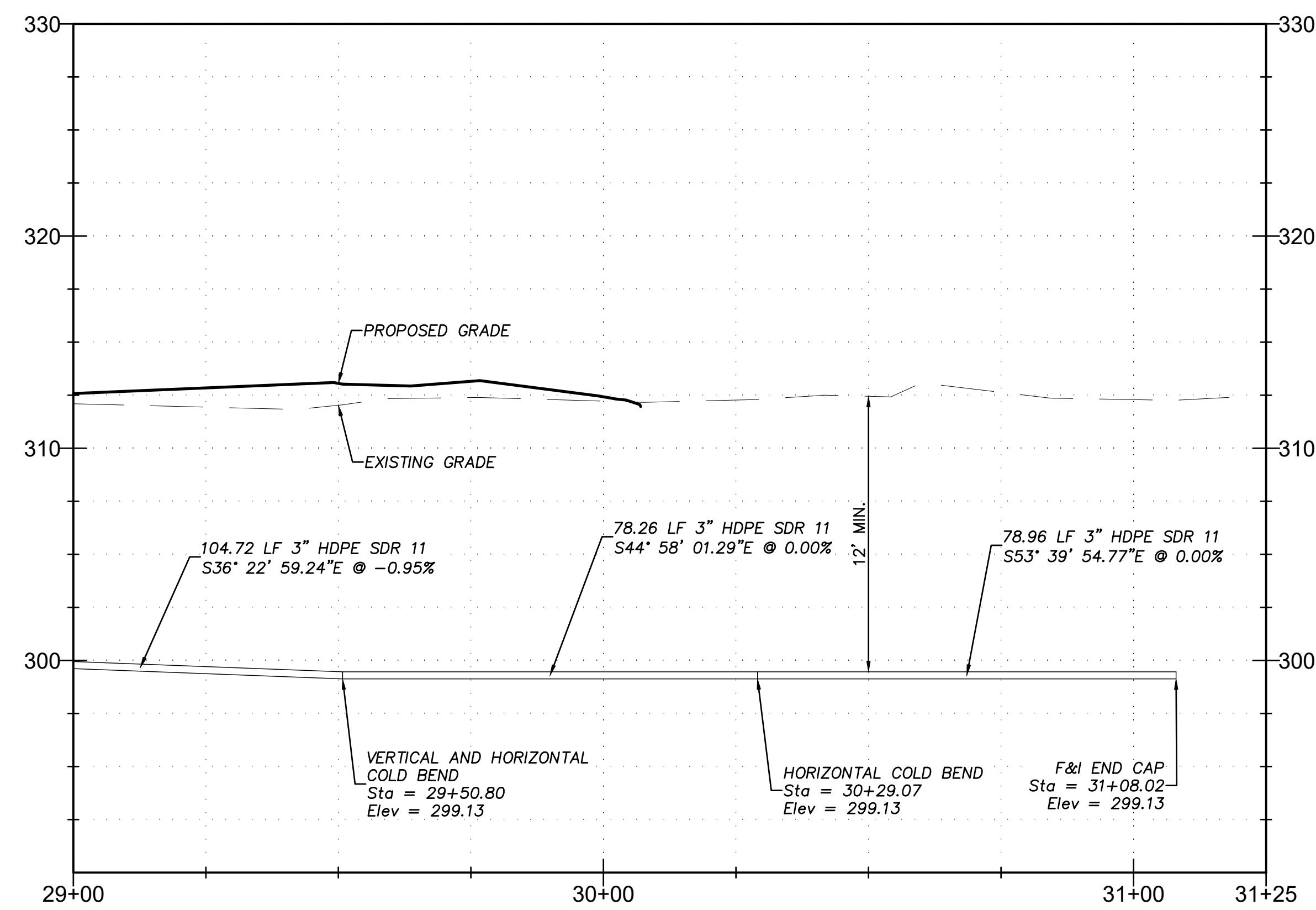
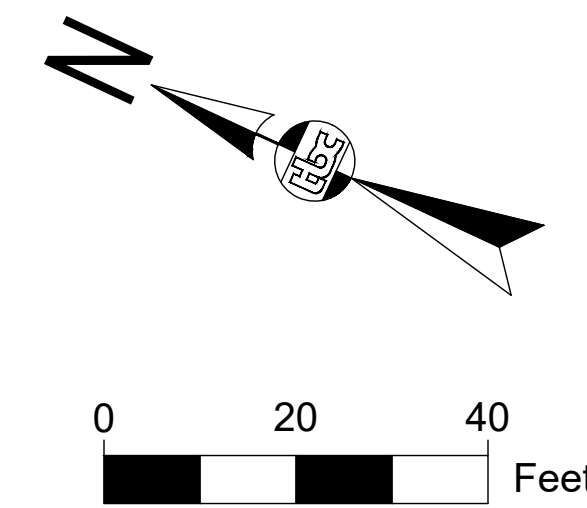
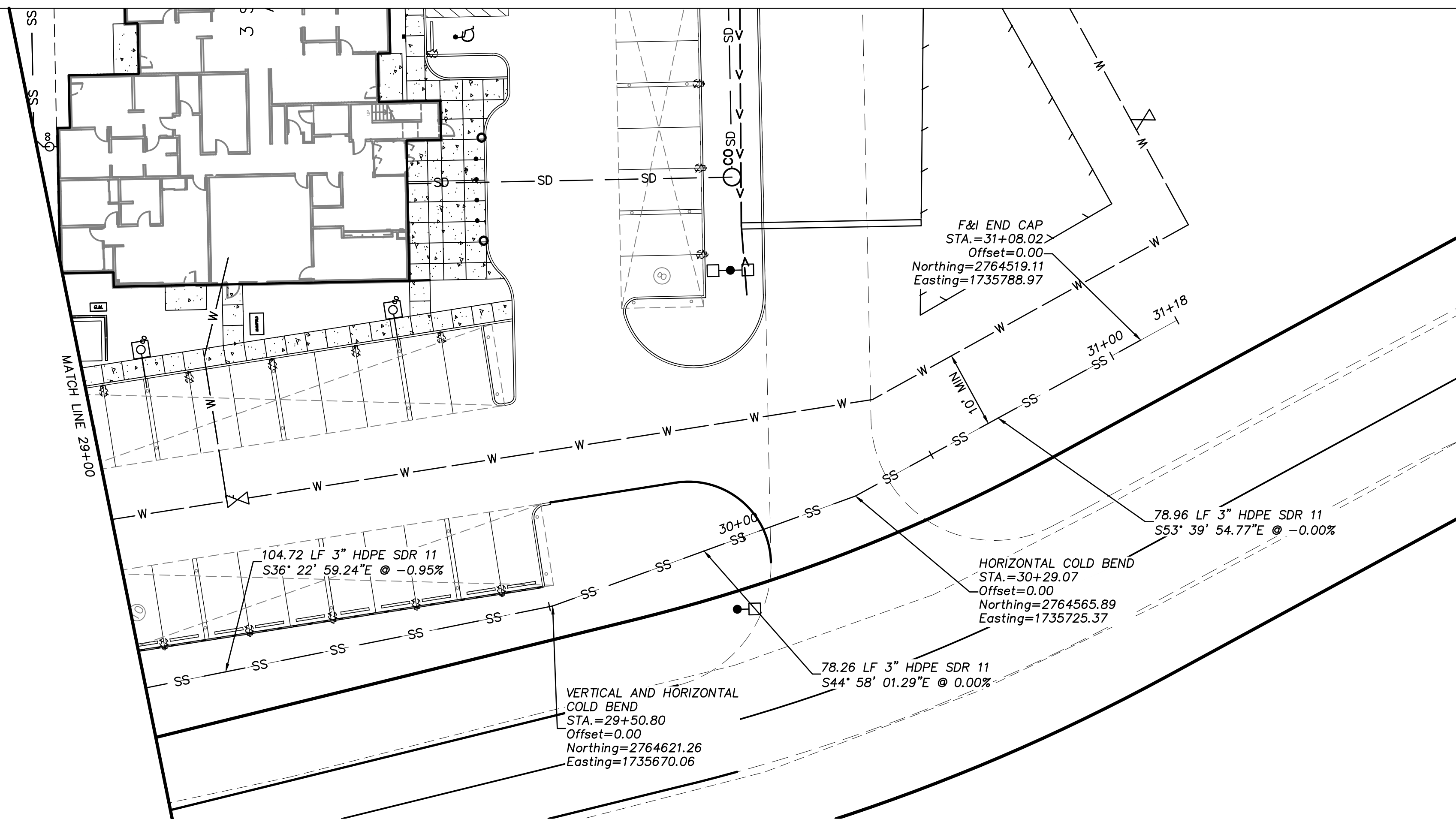
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SHEET NAME	SEWER MAIN PLAN AND PROFILE
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SHEET NO.	C10
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SEWER NOTES:

1. ALL SEWER PIPE AND SEPTIC TANK SHALL BE INSULATION 4' WIDE BY 8' LONG RIGID BOARD, HIGH DENSITY EXTRUDED POLYSTYRENE, MIN 60 PSI, FOR UNDERGROUND INSTALLATIONS EQUIVALENT TO R-20 PER 4" THICK INSULATION.



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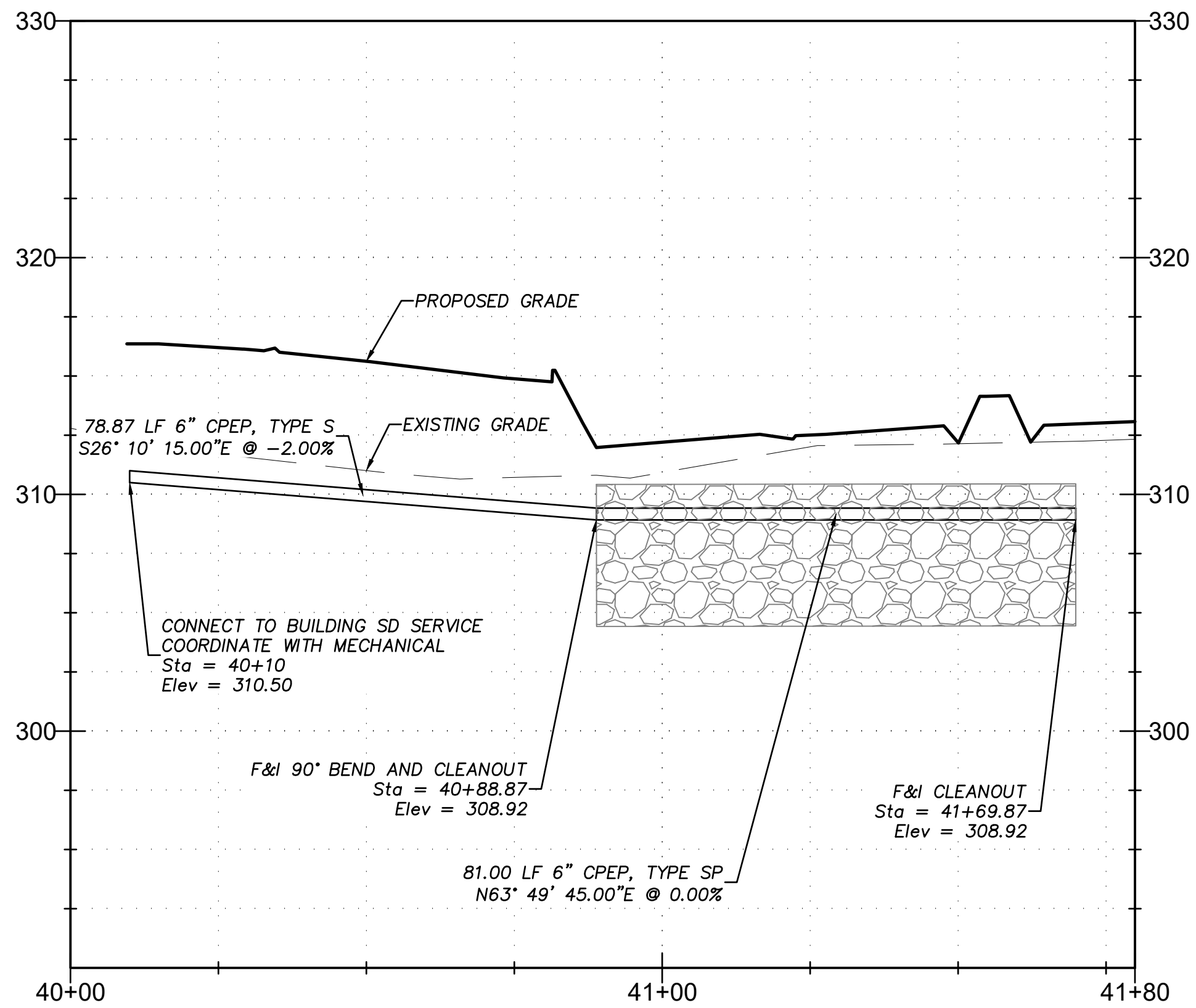
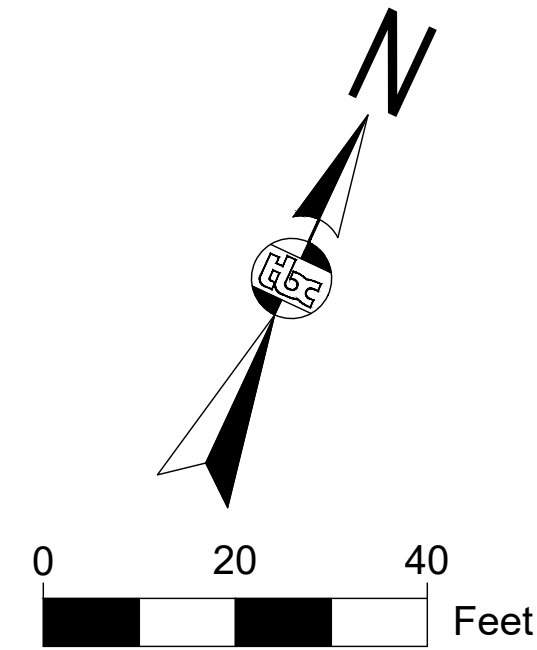
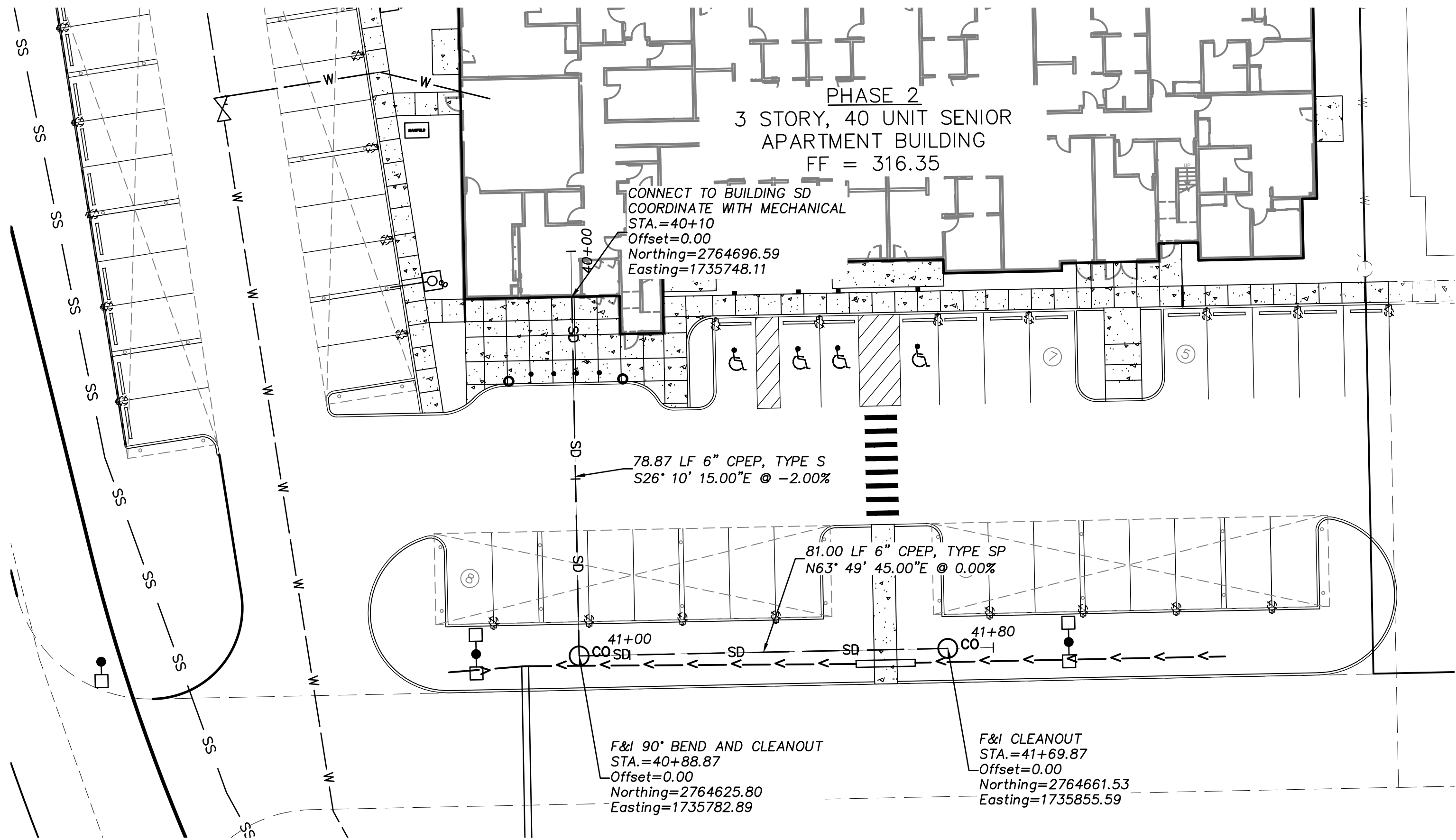
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SHEET NAME
SEWER MAIN
PLAN AND PROFILE

SHEET NO.
C11



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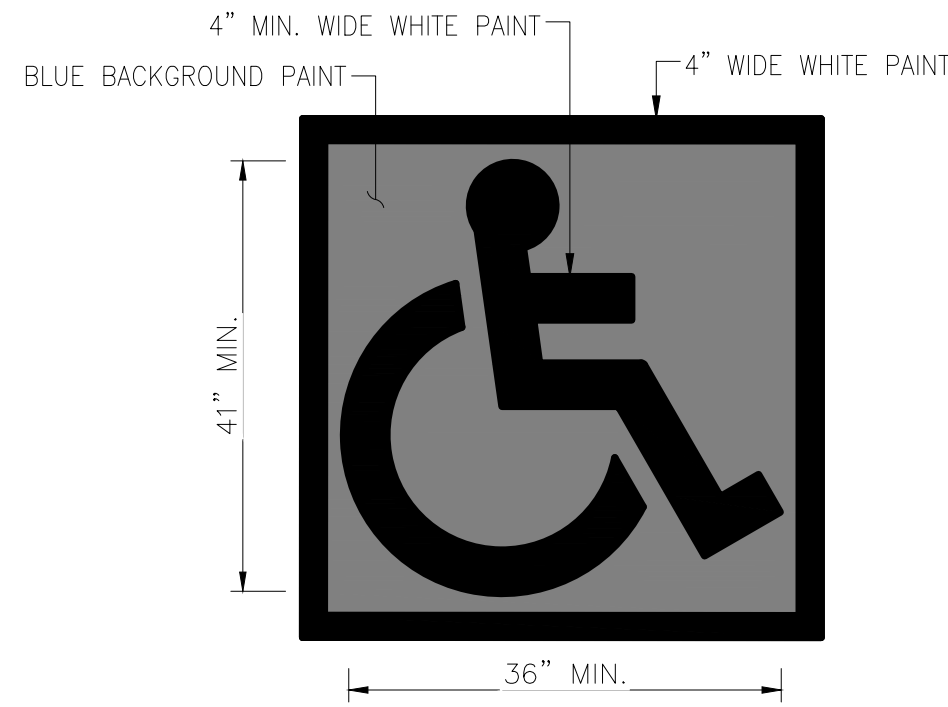
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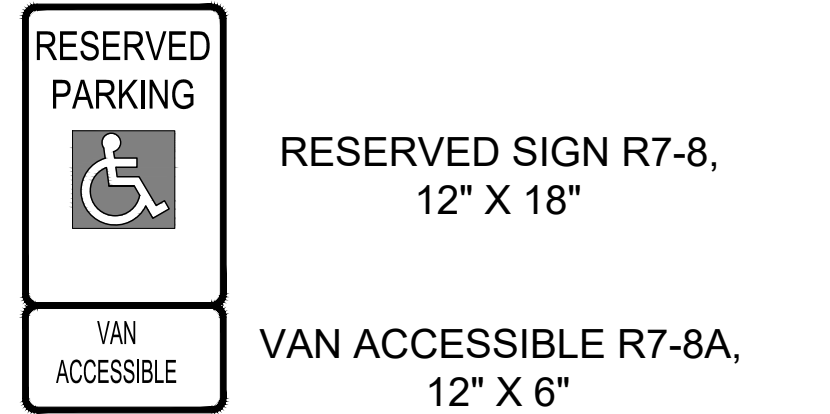
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SHEET NAME
STORM DRAIN
PLAN AND PROFILE

SHEET NO.
C12

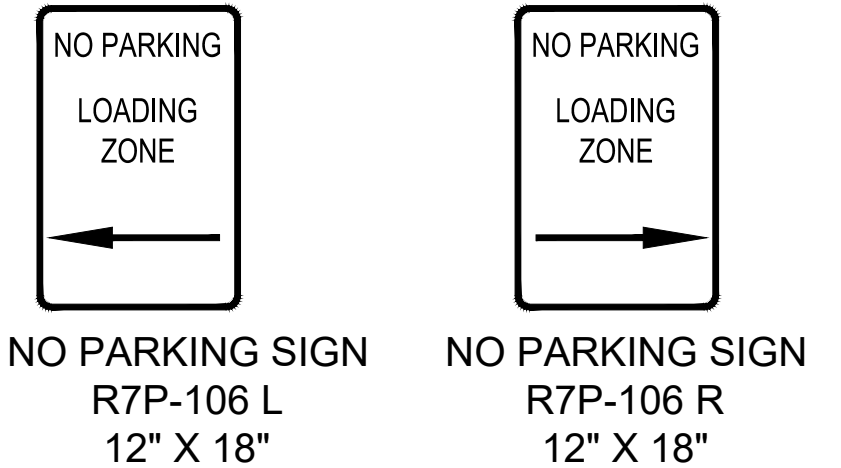


PAVEMENT MARKING SYMBOL



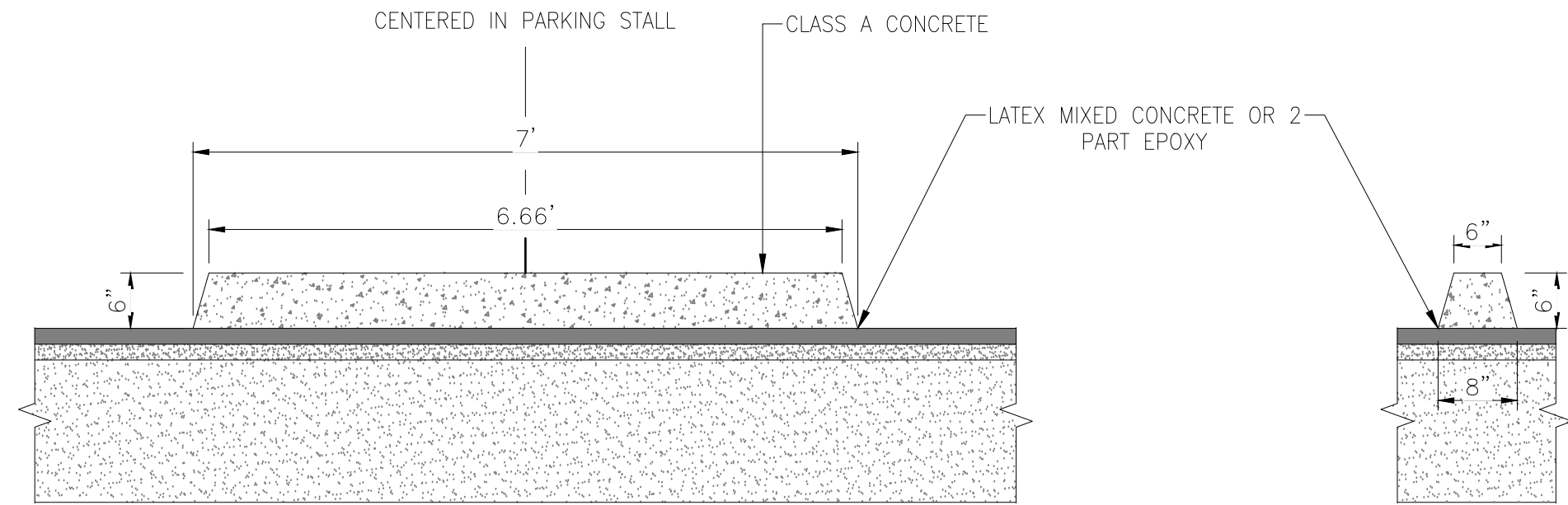
- ACCESSIBLE PARKING SIGN NOTES:
1. MOUNT SIGN ON 2"x2" P.S.T. POST PER DETAIL 70-24
 2. MOUNTING HEIGHT SHALL BE BETWEEN 6'-3" AND 6'-6" AS MEASURED FROM THE FINISH GRADE TO BOTTOM OF R7-8A SIGN

ACCESSIBLE PARKING SIGN

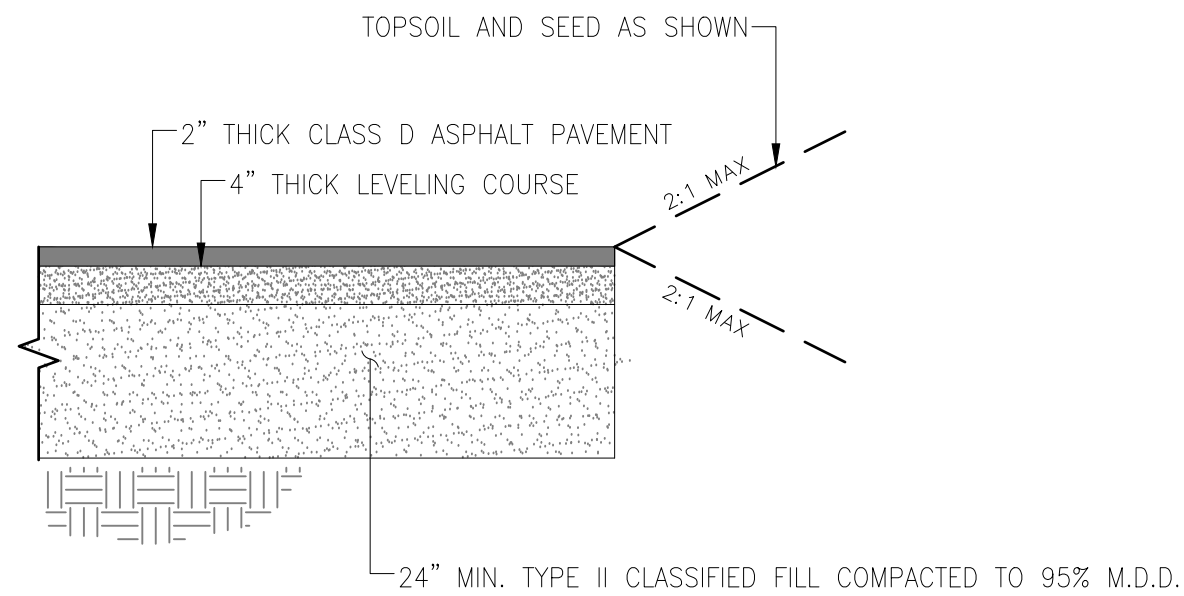


- NO PARKING SIGN NOTES:
1. MOUNT SIGN ON STRUCTURAL COLUMN
 2. MOUNTING HEIGHT SHALL BE BETWEEN 6'-3" AND 6'-6" AS MEASURED FROM THE FINISH GRADE TO BOTTOM OF SIGN

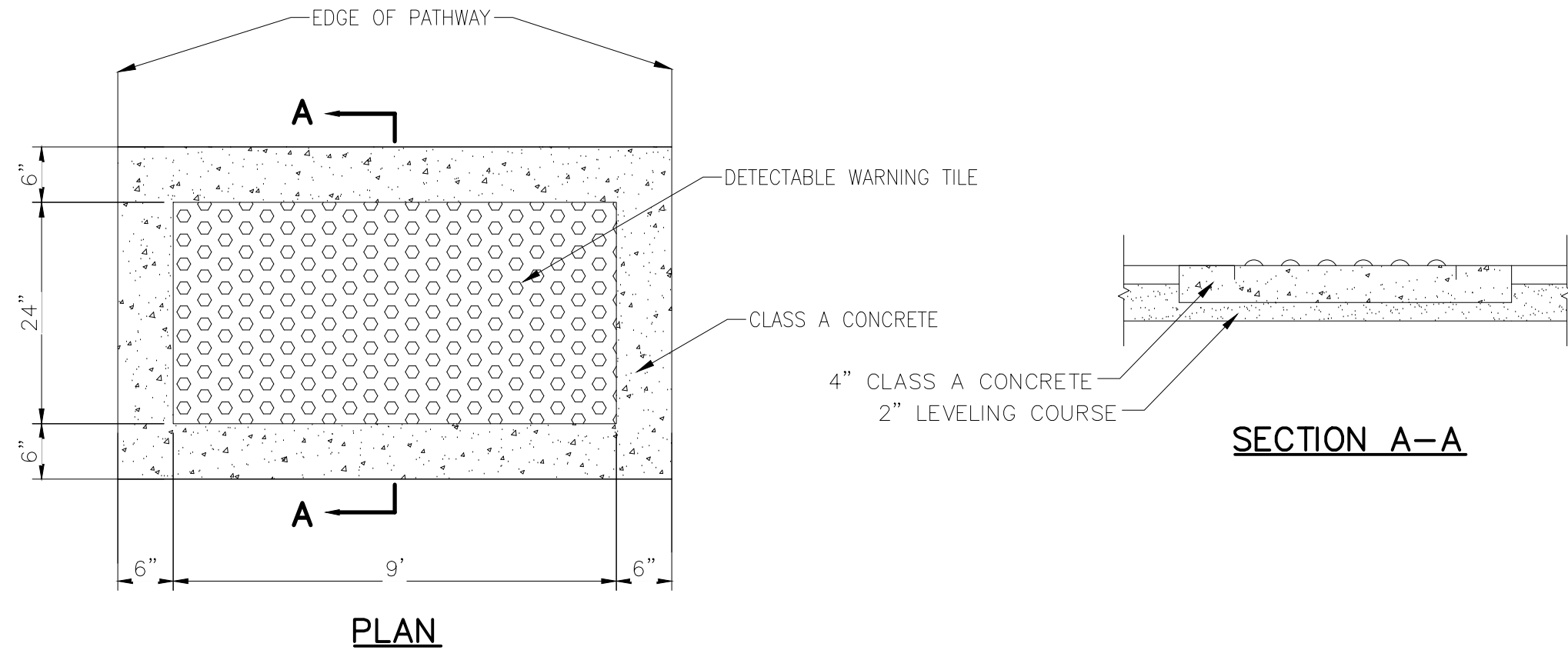
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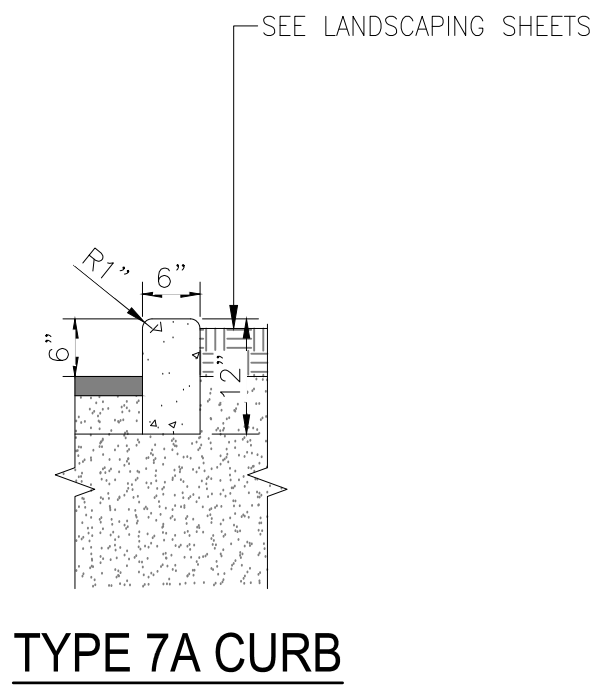
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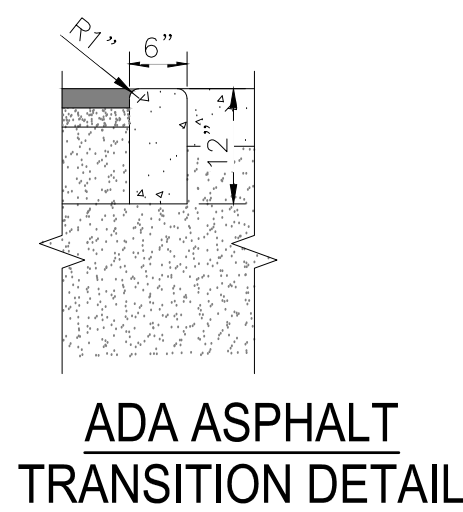
ASPHALT PAVING SECTION



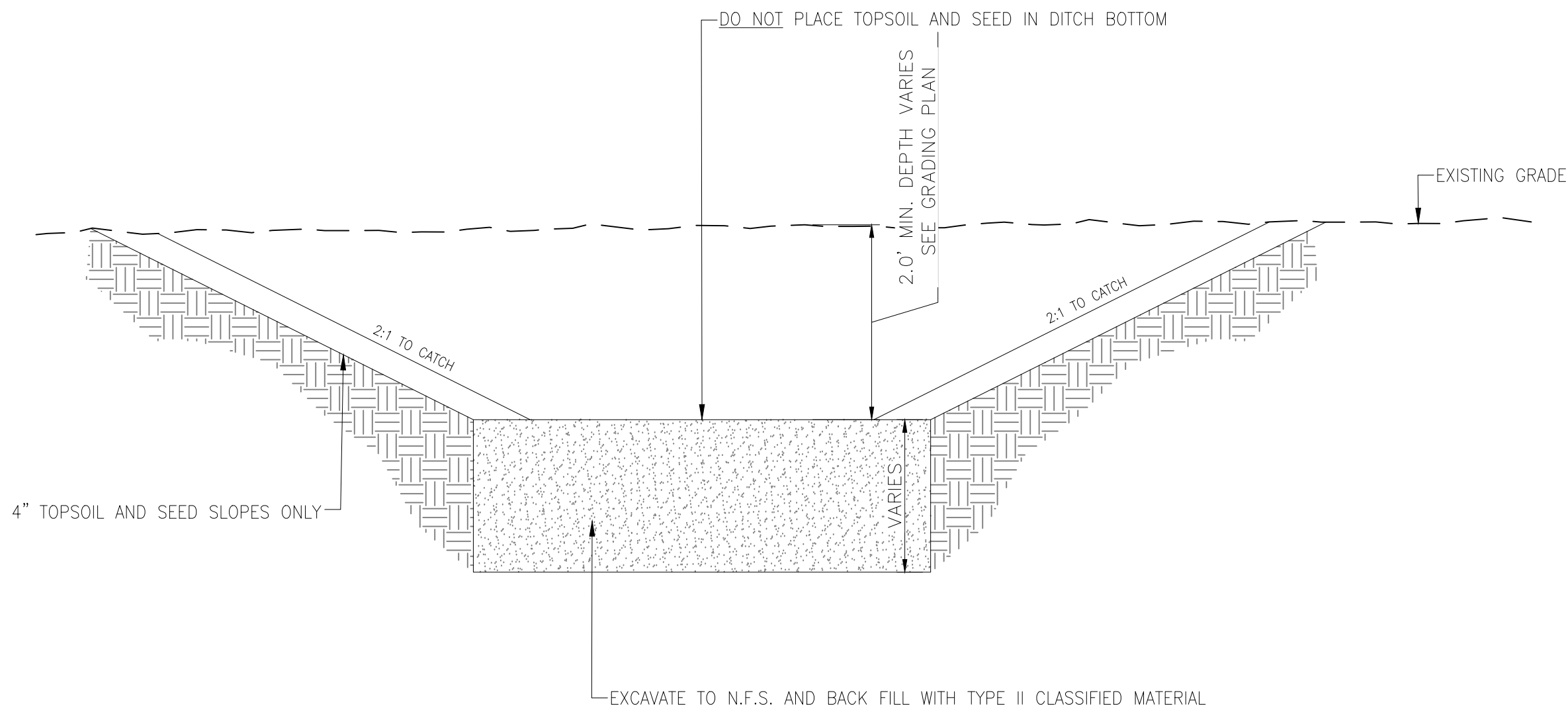
PATHWAY DETECTABLE WARNING TILE



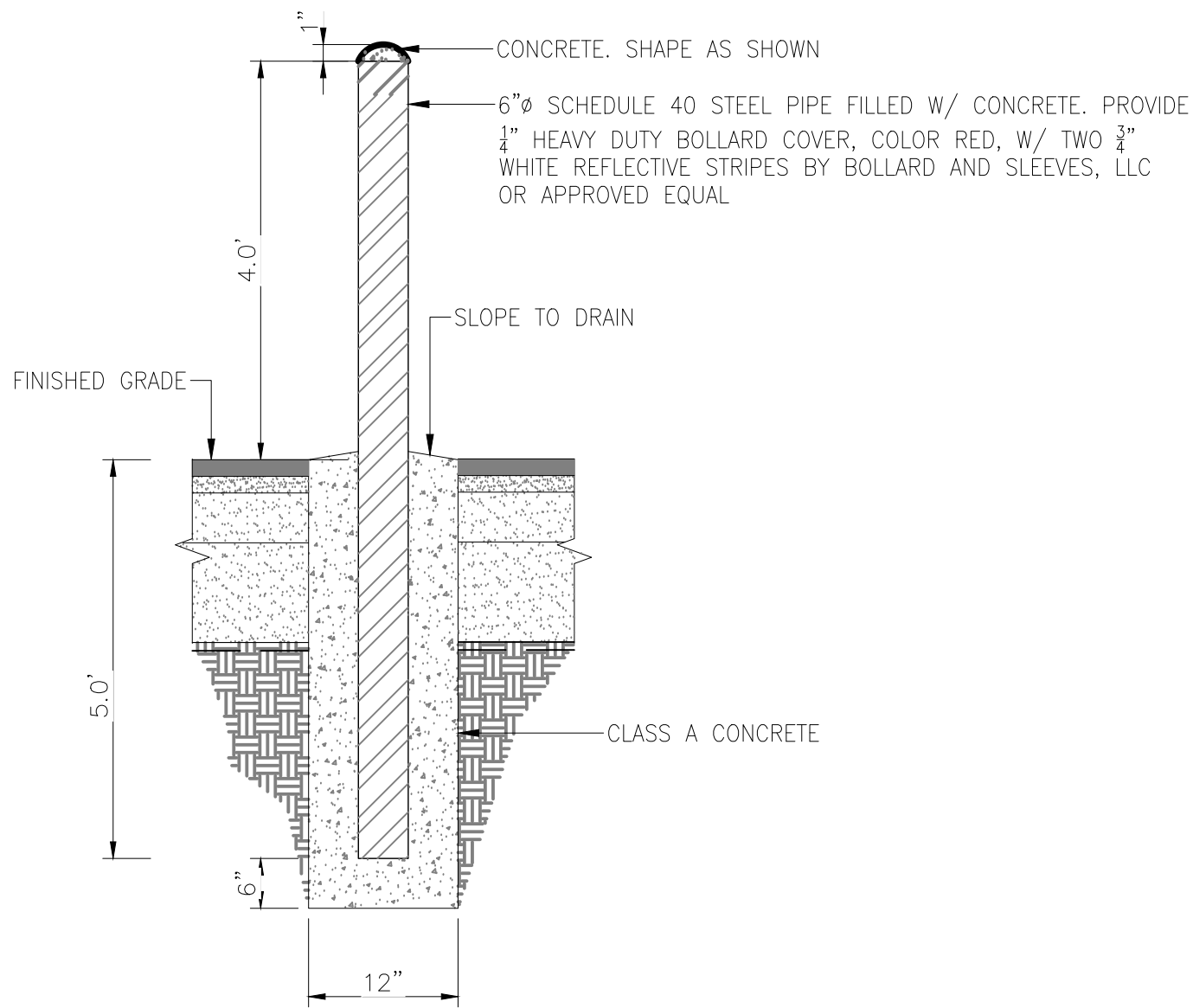
TYPE 7A CURB



ADA ASPHALT
TRANSITION DETAIL



SNOW STORAGE AND RETENTION BASIN



STEEL BOLLARD - FIXED
(N.T.S.)



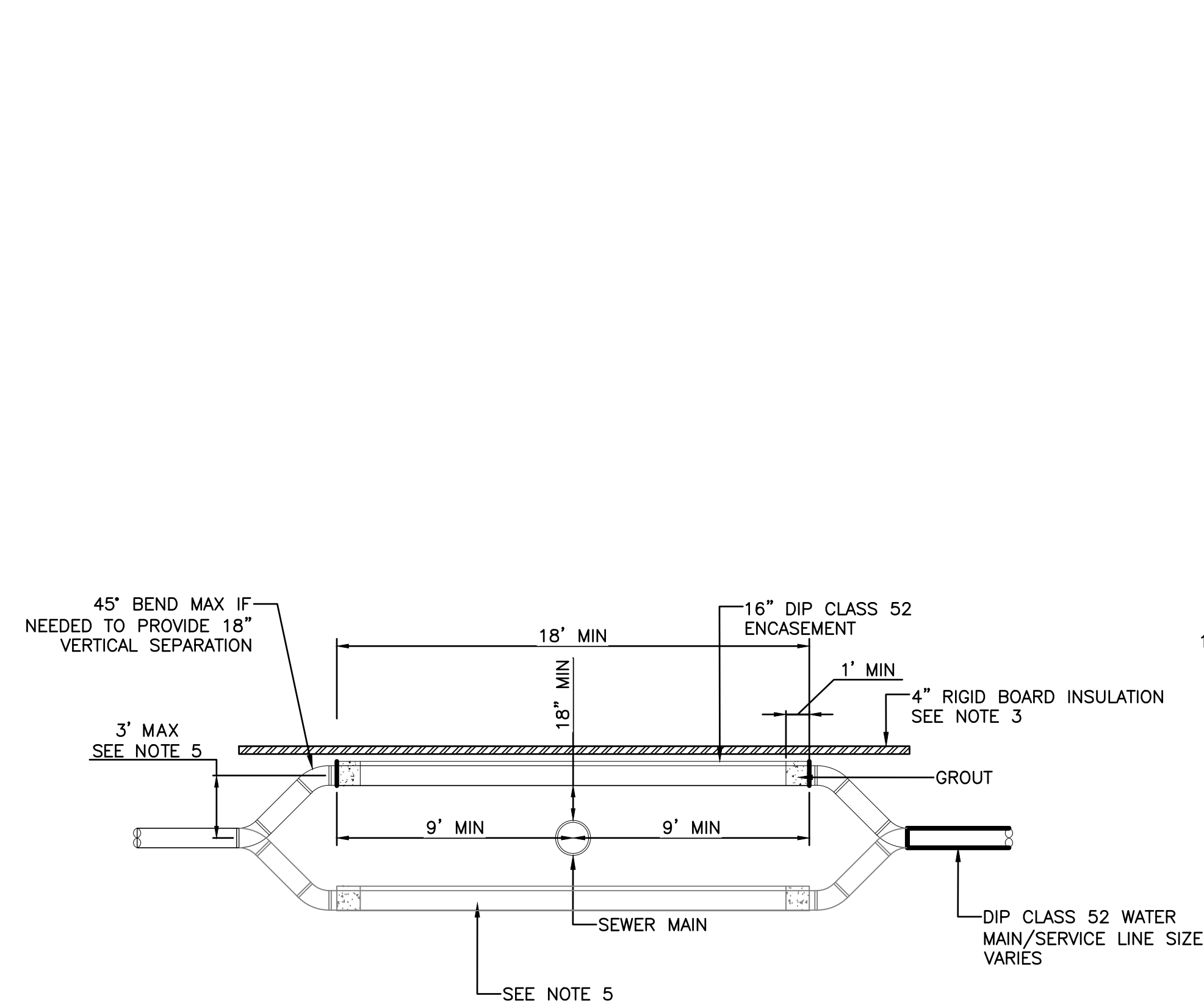
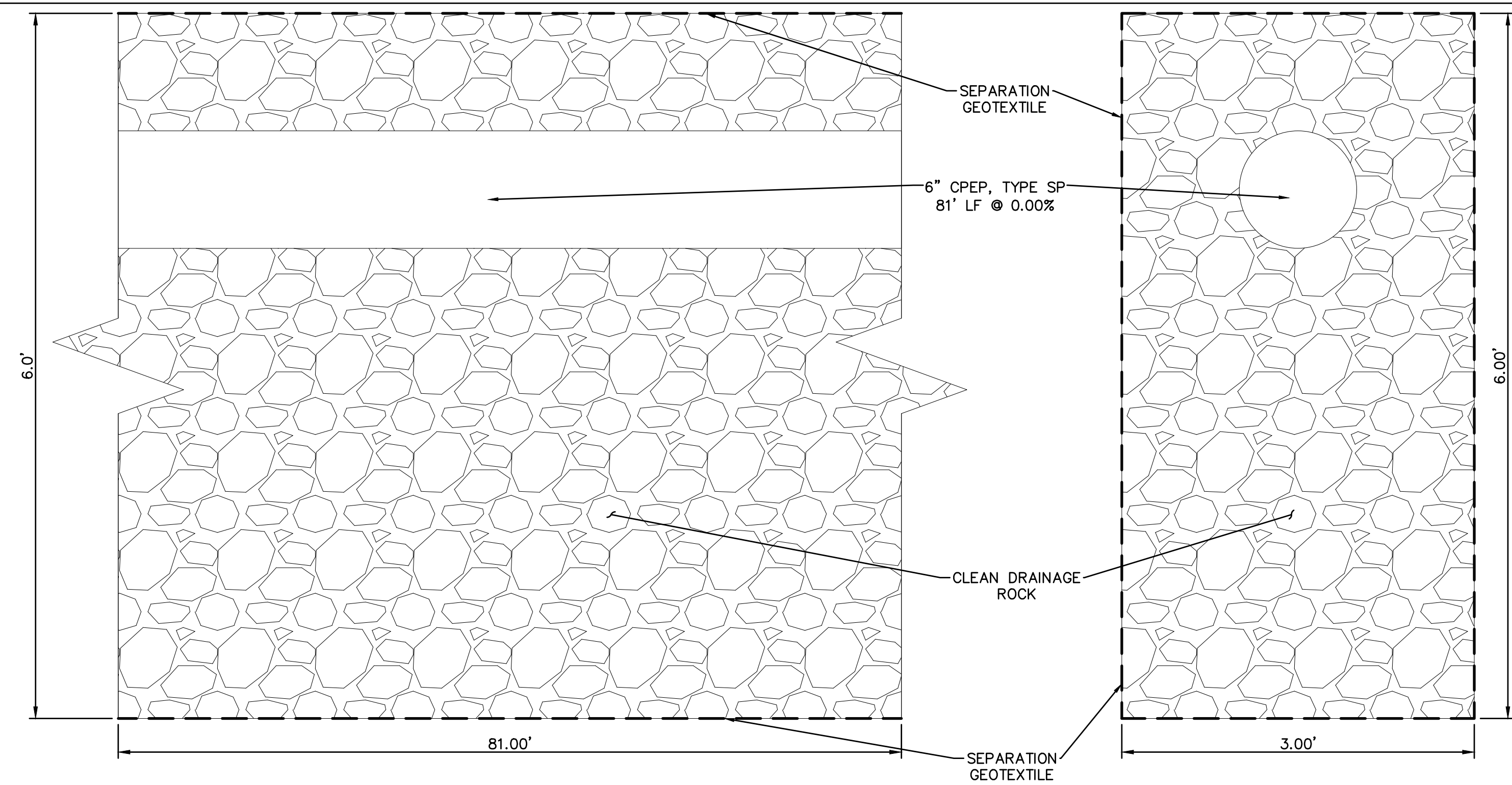
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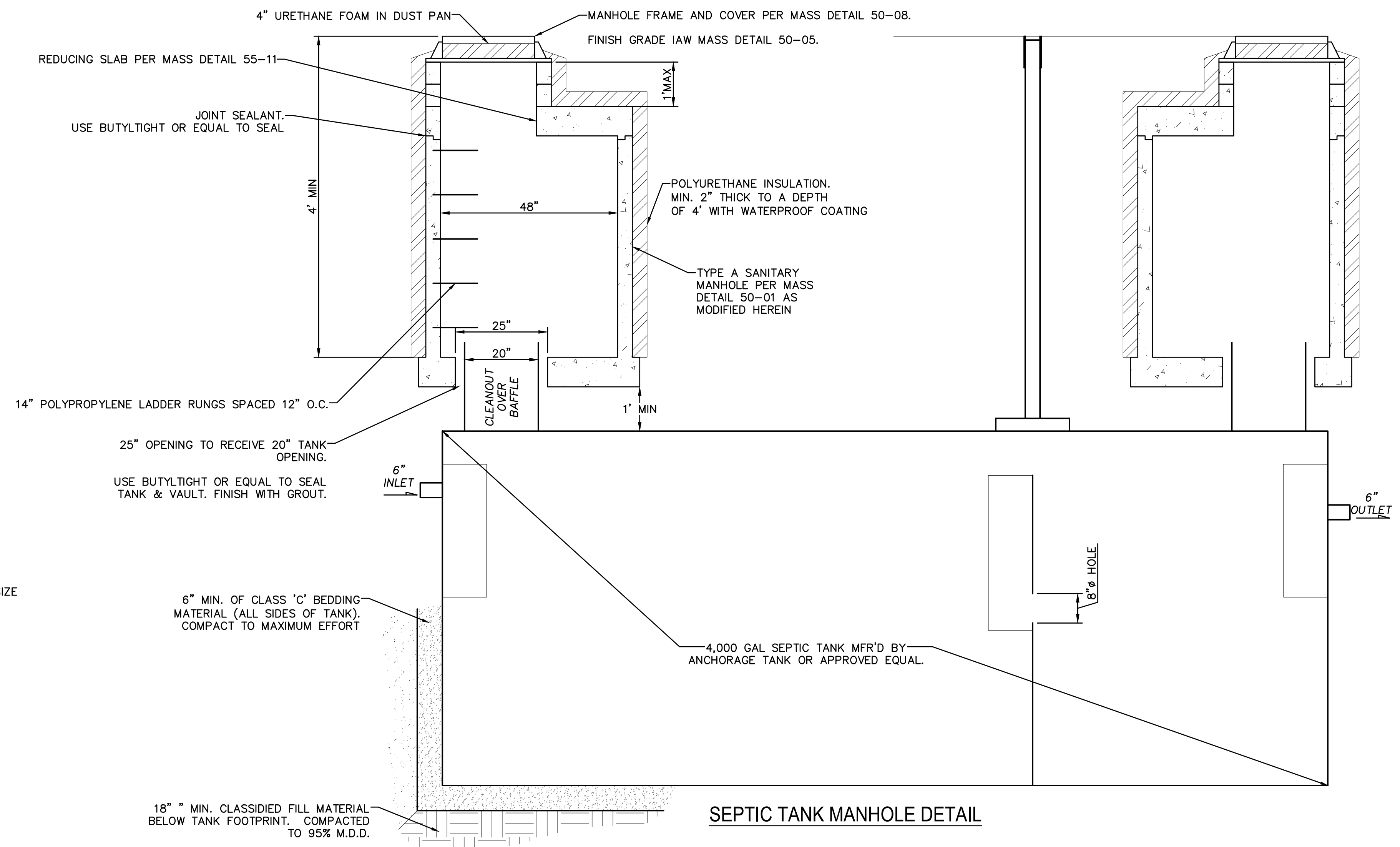
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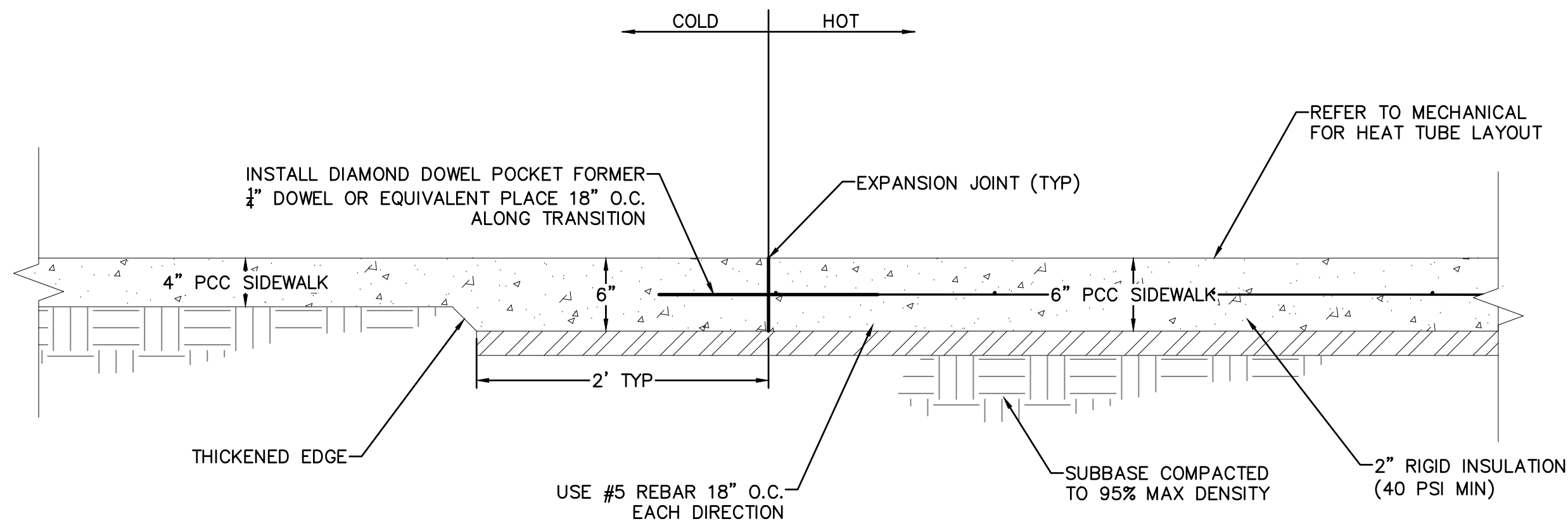
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DETAILS

SHEET NO.
C13

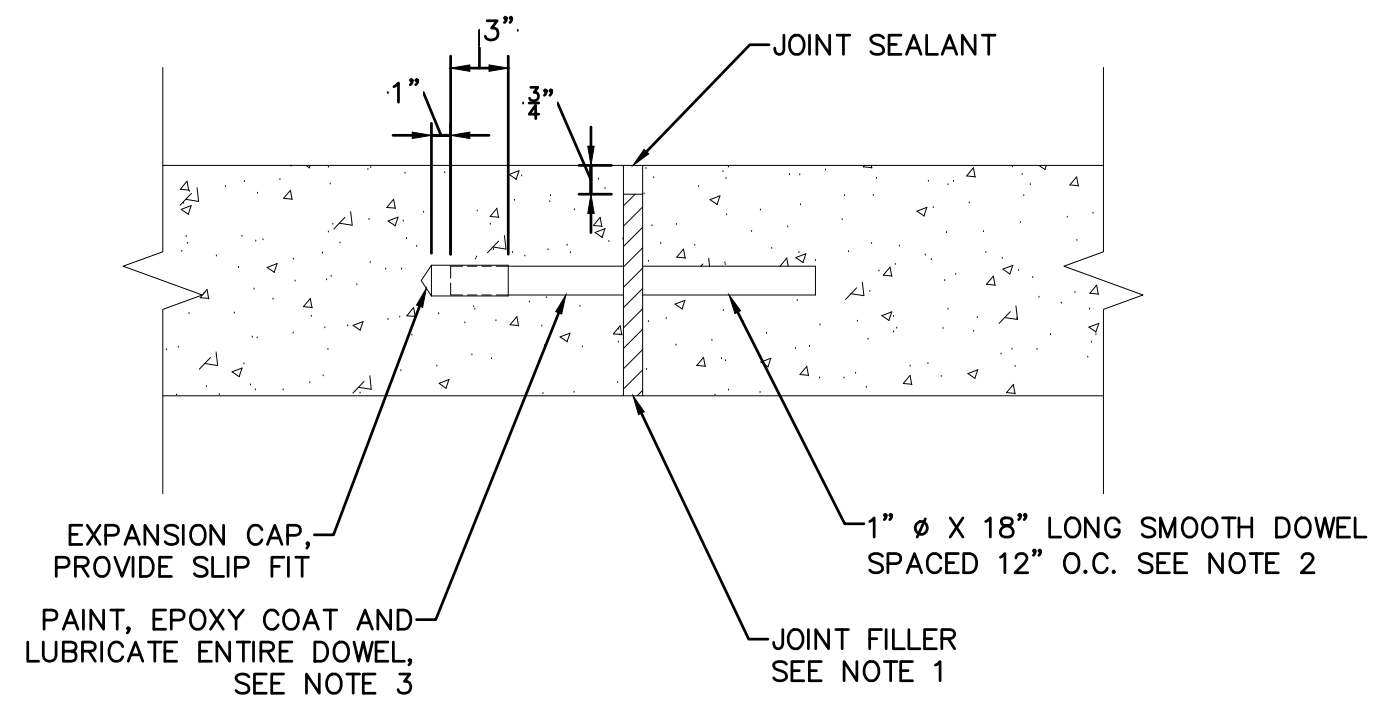


1. WATER PIPE JOINTS SHALL BE 9' MIN (HORIZONTAL) FROM SEWER JOINTS.
2. MAINTAIN 18" MIN (VERTICAL) SEPARATION BETWEEN SEWER MAIN AND WATER PIPE.
3. INSULATION SHALL BE INSTALLED WHEN 10' MIN COVER OVER WATER PIPE CANNOT BE MAINTAINED.
4. RIGID BOARD INSULATION SHALL BE 4' x 8' HIGH DENSITY POLYSTYRENE, MIN. 60 PSI, EQUIVALENT TO R-20 PER FOUR INCH (4") THICKNESS.
5. INSTALL WATER LINE BELOW SANITARY SEWER WHEN DEPTH OF COVER IS LESS THAN 7' ABOVE WATER LINE OR VERTICAL CHANGE IN WATERLINE IS GREATER THAN 3'.





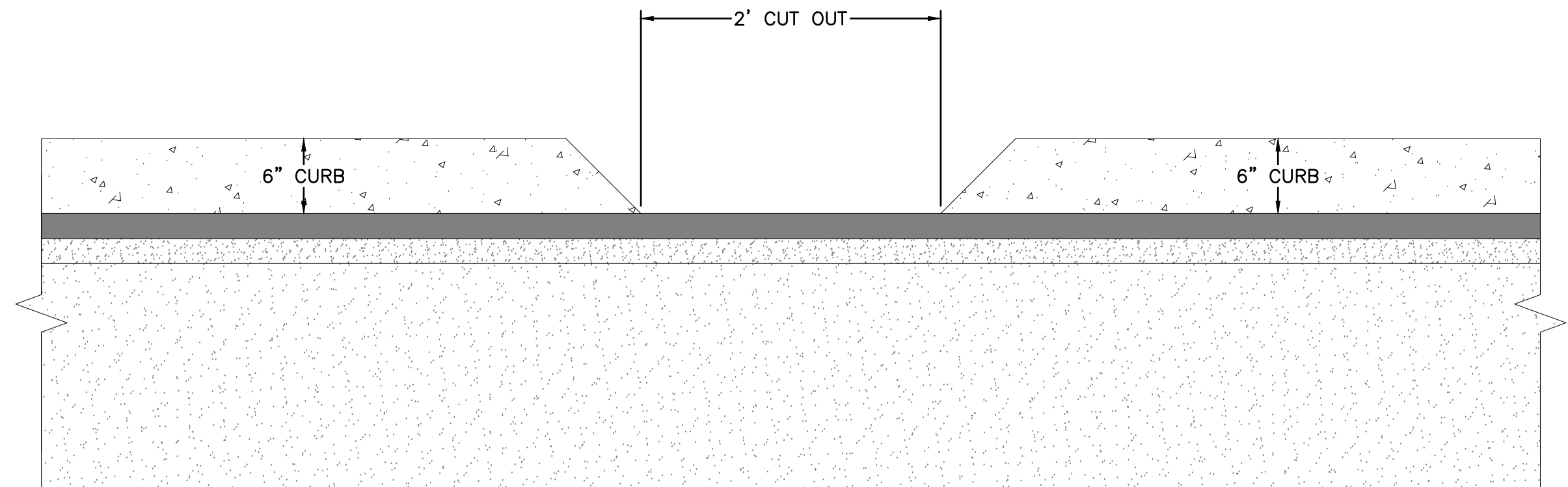
HOT TO COLD SIDEWALK TRANSITION



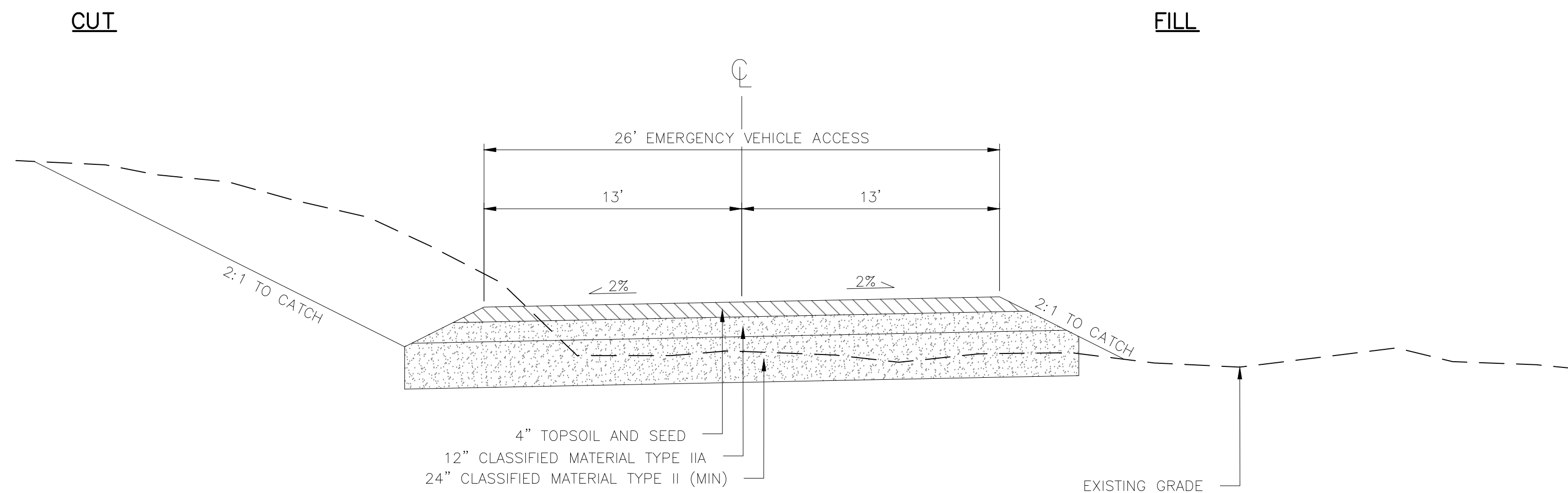
CONCRETE EXPANSION & CONSTRUCTION JOINT

EXPANSION AND CONSTRUCTION NOTES:

1. JOINT FILLER AND SEALANT, USE SILICONE BASED SEALANT APPROVED BY THE ENGINEER.
2. DOWELS SHALL BE EPOXY COATED STEEL IN ACCORDANCE WITH ASTM A 615M, GRADE 280 OR 420.
3. DOWEL BARS SHALL BE PAINTED AND LUBRICATED WITH BOND BREAKER OVER THE ENTIRE BAR PRIOR TO PLACEMENT. LUBRICATED SHALL BE PETROLEUM PARAFFIN BASED.



CURB CUT DETAIL



EMERGENCY VEHICLE ACCESS



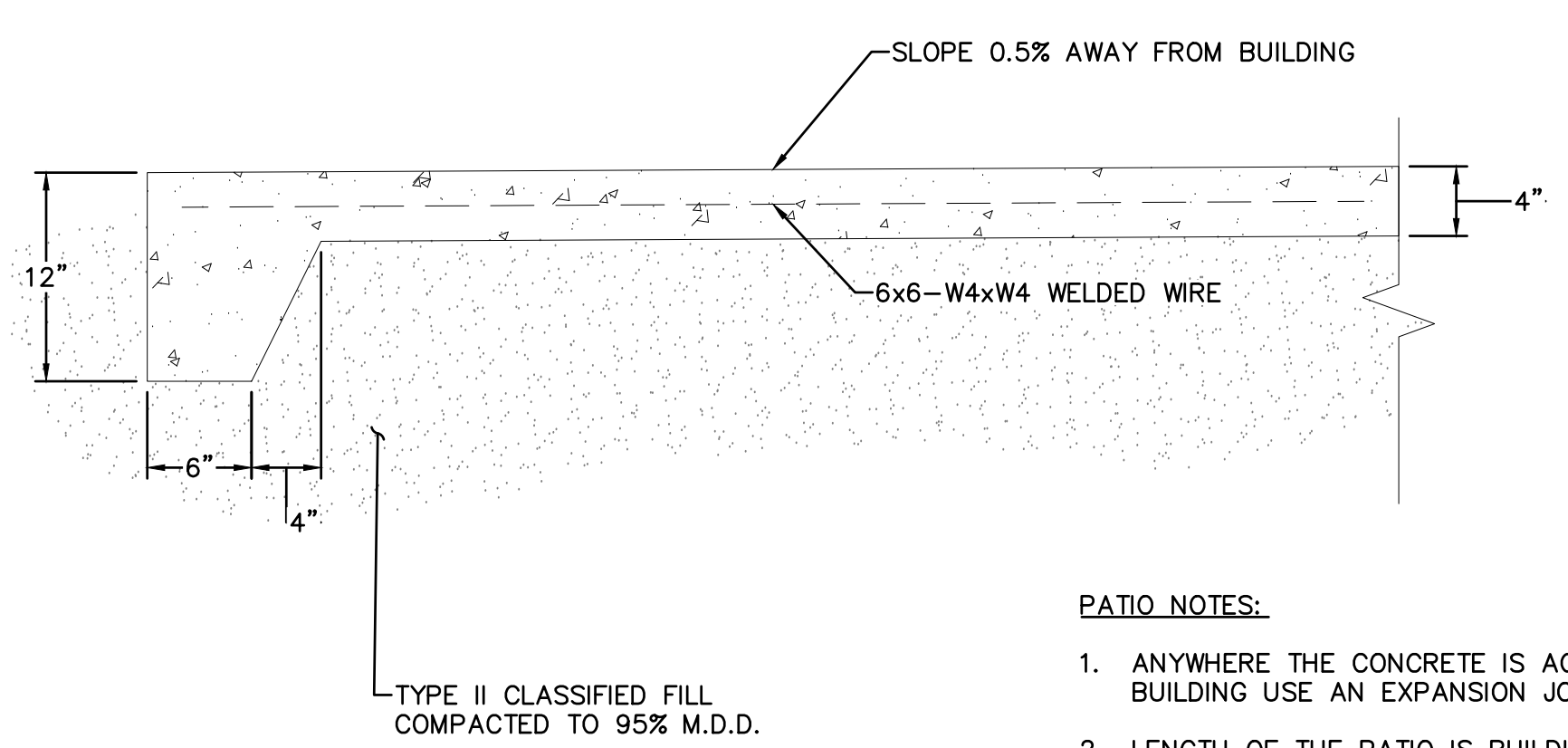
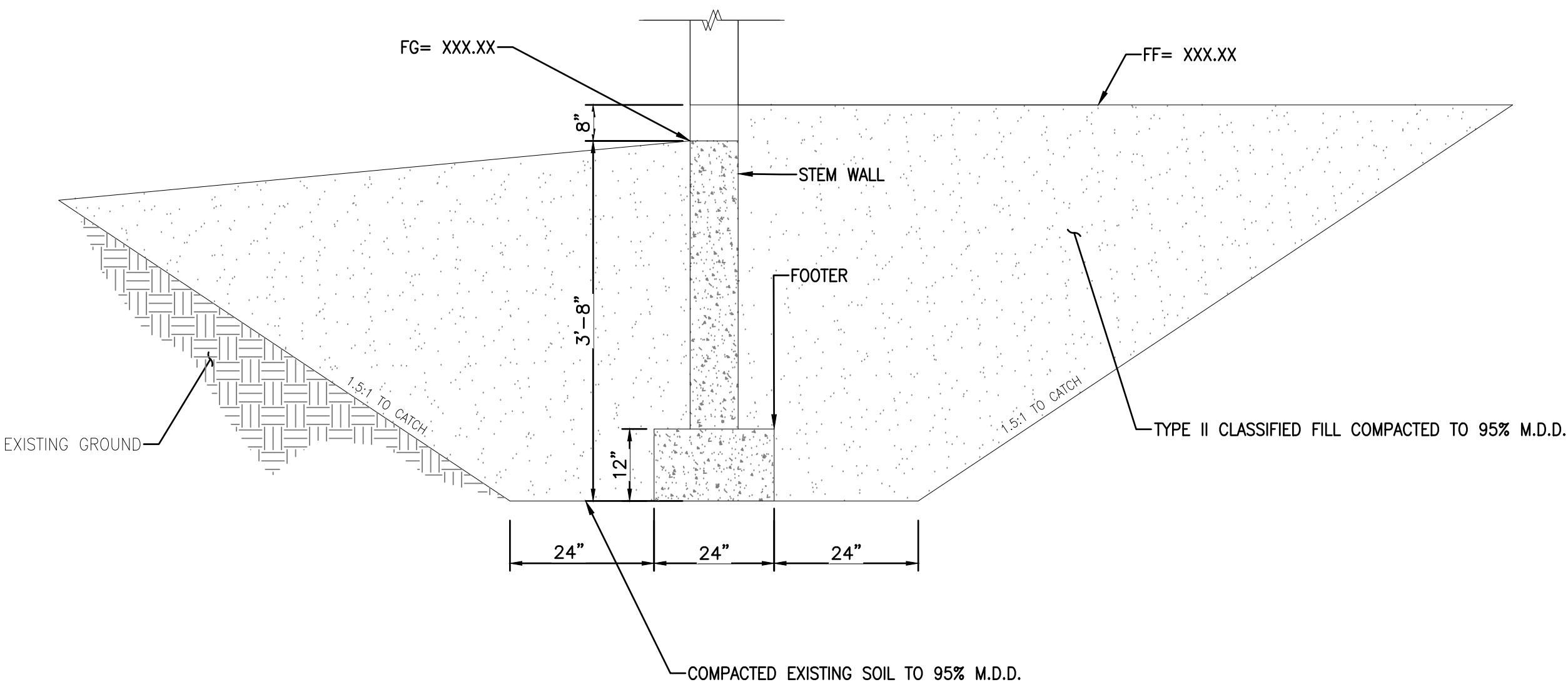
ASPEN HOUSE
SENIOR APARTMENTS
WASILLA, ALASKA

REVISION SCHEDULE		
#	DESCRIPTION	DATE

JOB NO.	17-056
DATE	02.17.2023
DRAWN	CW
REVIEWED	TJA

SHEET NAME
DETAILS

SHEET NO.
C15



- PATIO NOTES:**
1. ANYWHERE THE CONCRETE IS AGAINST THE BUILDING USE AN EXPANSION JOINT.
 2. LENGTH OF THE PATIO IS BUILDING TO BUILDING UNLESS NOTED.

PATIO DETAIL

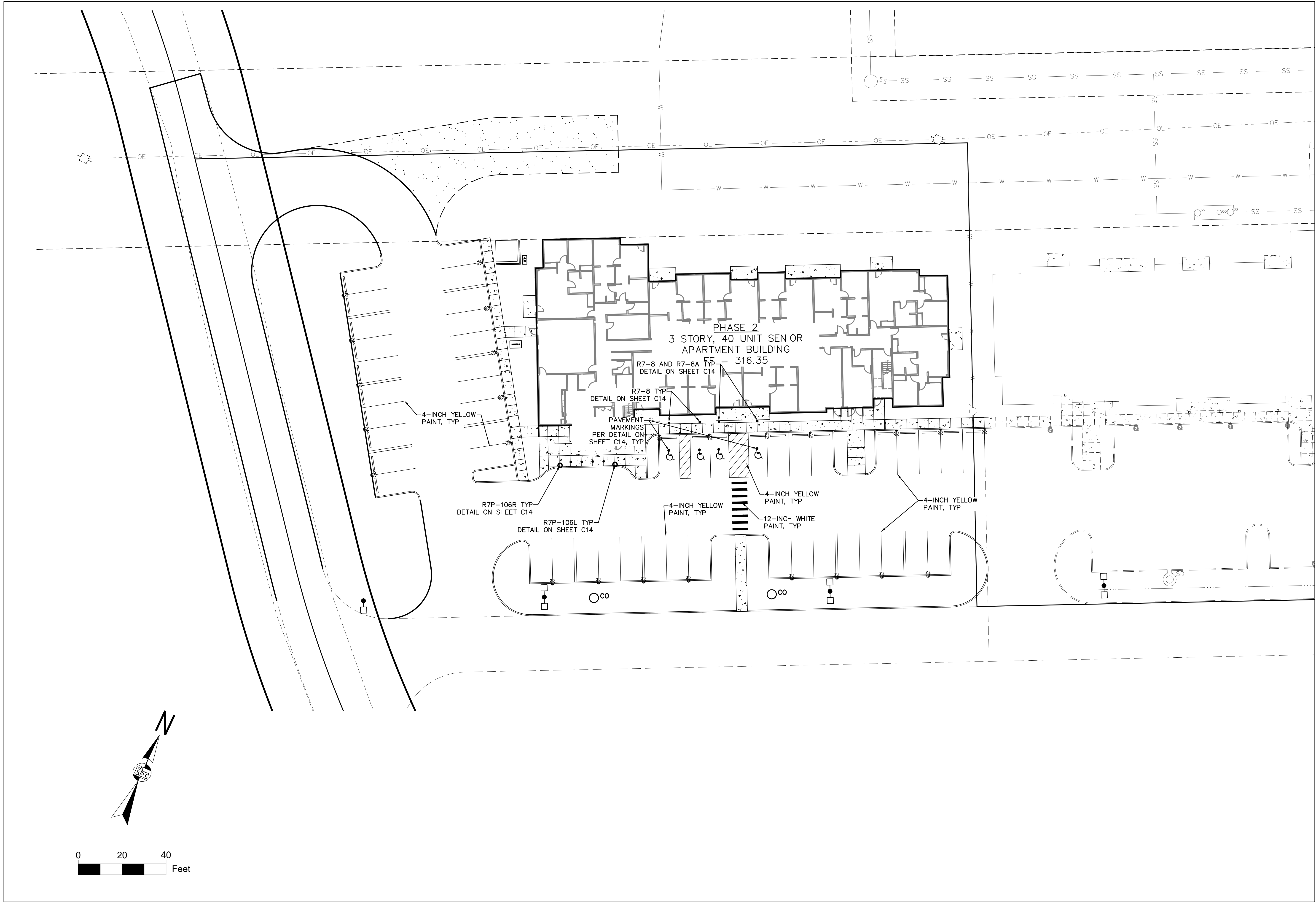
ASPEN HOUSE
SENIOR APARTMENTS
WASILLA, ALASKA

REVISION SCHEDULE		
#	DESCRIPTION	DATE

JOB NO.	17-056
DATE	02.17.2023
DRAWN	CW
REVIEWED	TJA

SHEET NAME
DETAILS

SHEET NO.
C16



The Boulet Company, Inc.
601 E. 57th Place #102
Anchorage, AK. 99518
Ph. 907-522-6776
License No. AECC957
CONSULTANT

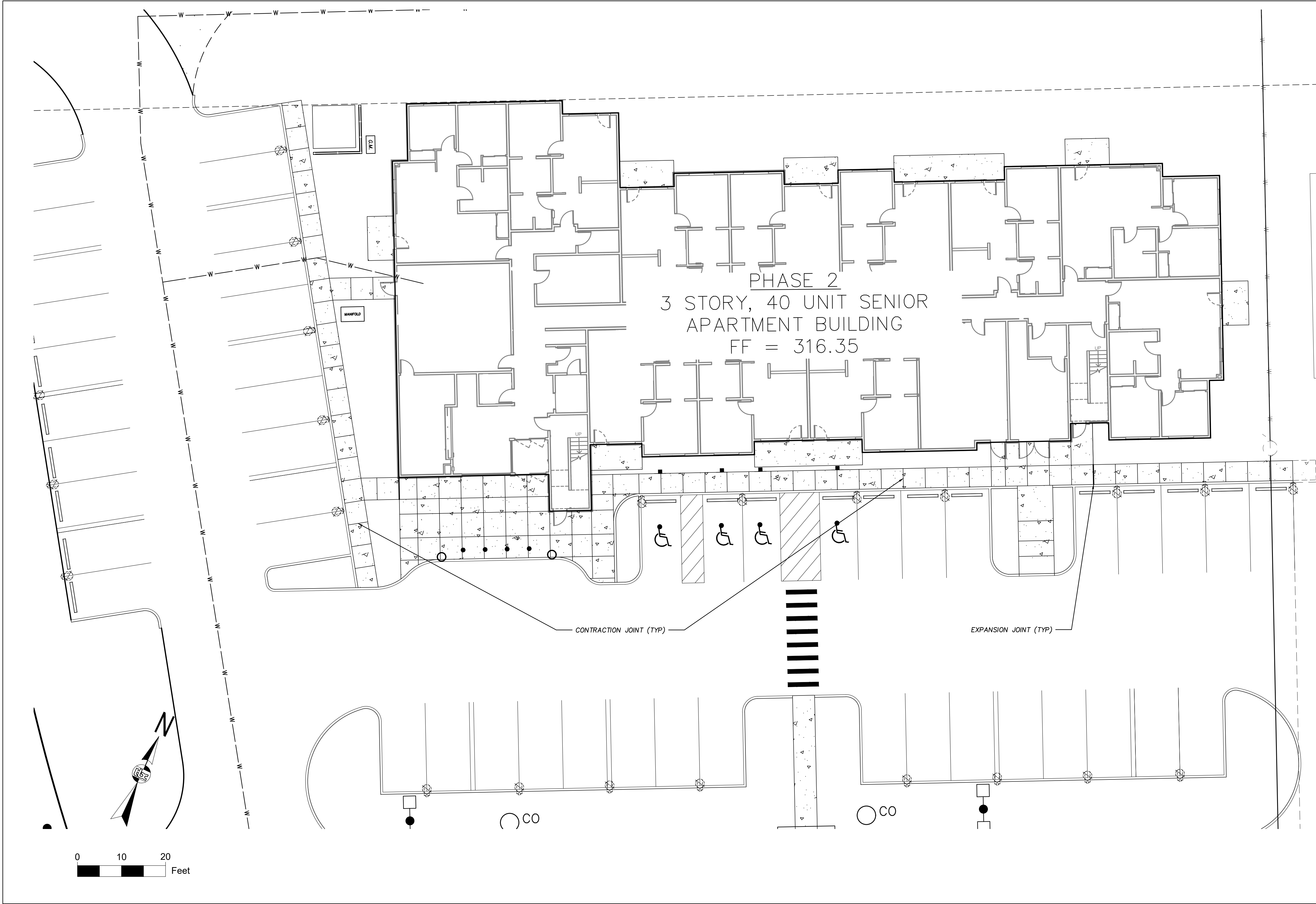
**ASPEN HOUSE
SENIOR APARTMENTS
WASILLA, ALASKA**

REVISION SCHEDULE		
#	DESCRIPTION	DATE

JOB NO. 17-056
DATE 02.17.2023
DRAWN CW
REVIEWED TJA

SHEET NAME
SIGN AND STRIPING
PLAN

SHEET NO.
C17



The Boulet Company, Inc.
601 E. 57th Place #102
Anchorage, AK 99518
Ph. 907-522-8776
License No. AECC987

CONSULTANT

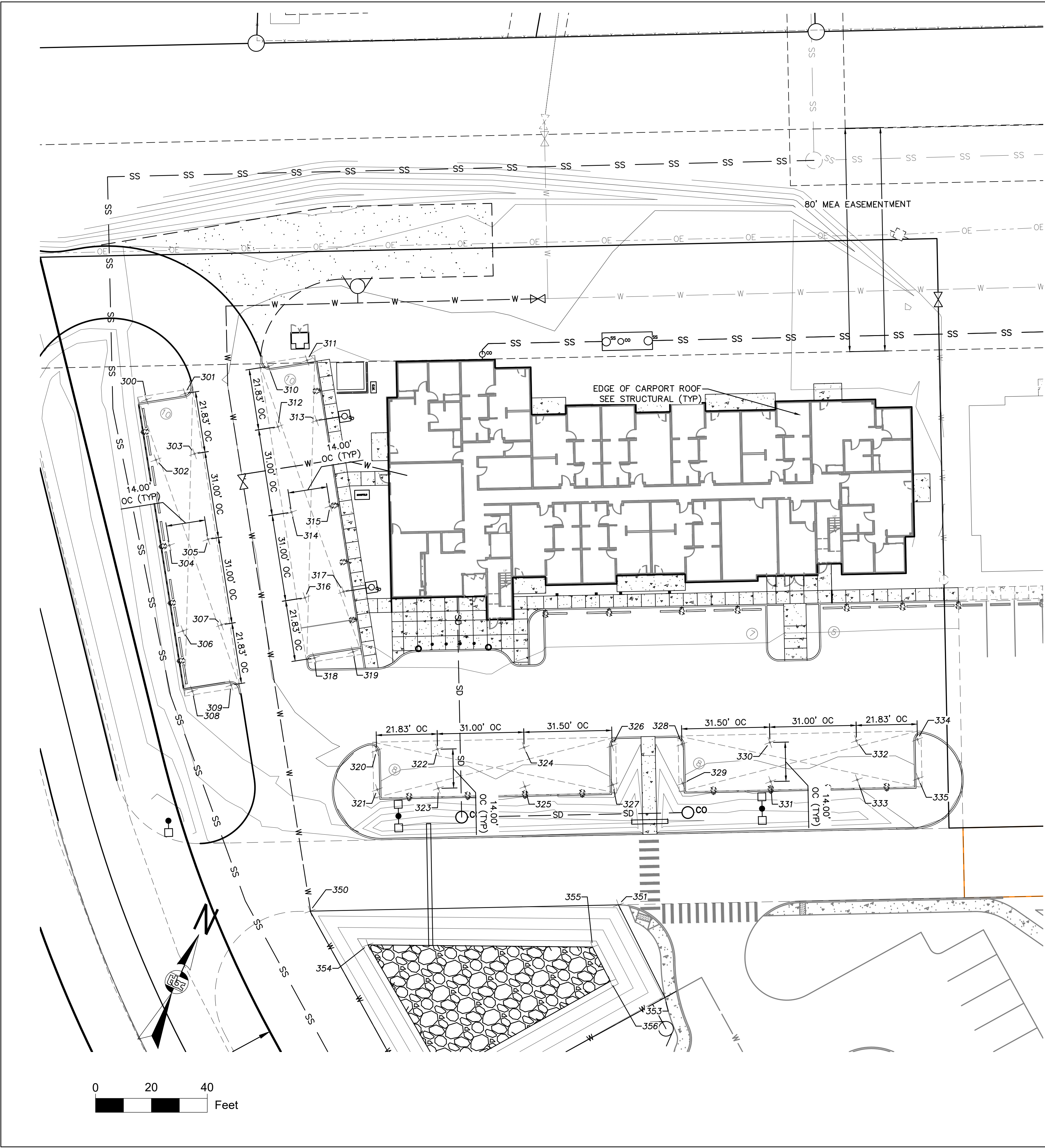
ASPEN HOUSE
SENIOR APARTMENTS
WASILLA, ALASKA

REVISION SCHEDULE		
#	DESCRIPTION	DATE

JOB NO.	17-056
DATE	02.17.2023
DRAWN	CW
REVIEWED	TJA

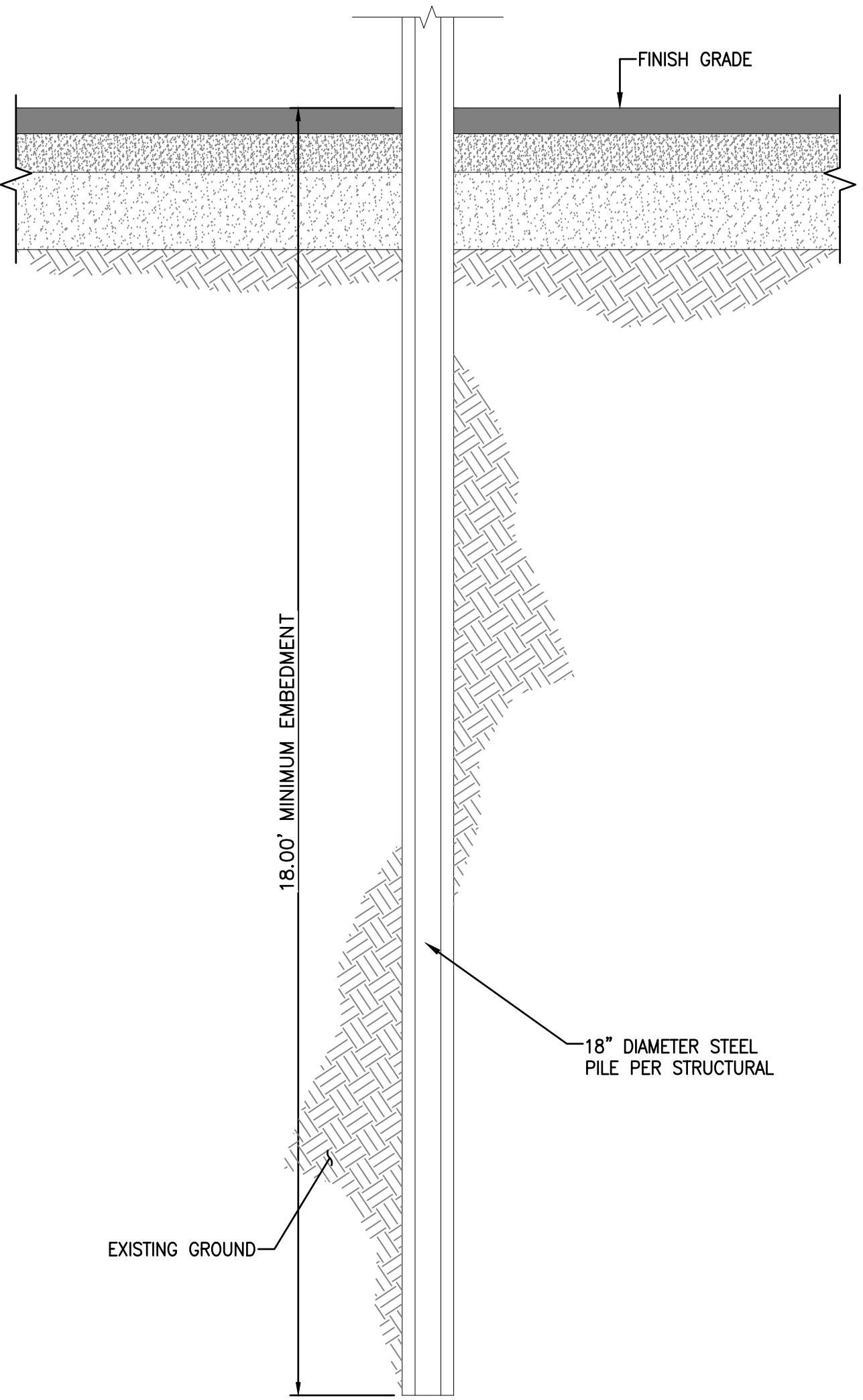
SHEET NAME
JOINT PLAN

SHEET NO.
C18



Point Table			
Point #	Northing	Easting	Description
300	2764713.62	1735617.43	CARPORT COLUMN
301	2764721.45	1735629.04	CARPORT COLUMN
302	2764695.52	1735629.62	CARPORT COLUMN
303	2764703.34	1735641.23	CARPORT COLUMN
304	2764669.80	1735646.94	CARPORT COLUMN
305	2764677.62	1735658.55	CARPORT COLUMN
306	2764644.09	1735664.26	CARPORT COLUMN
307	2764651.91	1735675.87	CARPORT COLUMN
308	2764625.98	1735676.45	CARPORT COLUMN
309	2764633.80	1735688.06	CARPORT COLUMN
310	2764742.84	1735652.00	CARPORT COLUMN
311	2764750.67	1735663.61	CARPORT COLUMN
312	2764724.74	1735664.19	CARPORT COLUMN
313	2764732.56	1735675.81	CARPORT COLUMN
314	2764699.03	1735681.51	CARPORT COLUMN
315	2764706.85	1735693.12	CARPORT COLUMN
316	2764673.31	1735698.83	CARPORT COLUMN
317	2764681.13	1735710.44	CARPORT COLUMN

Point Table			
Point #	Northing	Easting	Description
318	2764655.21	1735711.02	CARPORT COLUMN
319	2764663.03	1735722.64	CARPORT COLUMN
320	2764634.57	1735745.18	CARPORT COLUMN
321	2764622.01	1735751.36	CARPORT COLUMN
322	2764644.20	1735764.77	CARPORT COLUMN
323	2764631.63	1735770.95	CARPORT COLUMN
324	2764657.87	1735792.60	CARPORT COLUMN
325	2764645.31	1735798.77	CARPORT COLUMN
326	2764671.76	1735820.87	CARPORT COLUMN
327	2764659.20	1735827.04	CARPORT COLUMN
328	2764682.79	1735843.30	CARPORT COLUMN
329	2764670.23	1735849.48	CARPORT COLUMN
330	2764696.68	1735871.57	CARPORT COLUMN
331	2764684.12	1735877.75	CARPORT COLUMN
332	2764710.36	1735899.40	CARPORT COLUMN
333	2764697.79	1735905.57	CARPORT COLUMN
334	2764719.98	1735918.99	CARPORT COLUMN
335	2764707.42	1735925.17	CARPORT COLUMN



CARPORT COLUMN

ASPEN HOUSE
SENIOR APARTMENTS
WASILLA, ALASKA

REVISION SCHEDULE		
#	DESCRIPTION	DATE

JOB NO.	17-056
DATE	02.17.2023
DRAWN	CW
REVIEWED	TJA

SHEET NAME	CARPORT PLAN
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SHEET NO.	C19
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Appendix B - BMPs

4.1.4 BMP E1.20: Clear Plastic Covering

4.1.4.1 Definition

The covering with clear plastic sheeting of bare areas that need immediate protection from erosion.

4.1.4.2 Purpose

To provide immediate temporary erosion protection to slopes and disturbed areas that cannot be covered by mulching, to provide protection to plantings during winter, or to cover stockpiles. Clear plastic also is used to protect disturbed areas that must be covered during short periods of inactivity to meet November 1 through March 31 cover requirements. Because of many disadvantages, clear plastic covering is the least preferred covering BMP (Figure 6).



Figure 6. Stockpile Covered with Plastic Sheetting.

4.1.4.3 Conditions Where Practice Applies

- Disturbed areas that require immediate erosion protection for less than 30 days.
- Areas seeded during the time period from November 1 to March 1.

4.1.4.4 Planning Considerations

Plantings at this time require clear plastic covering for germination and protection from heavy rains.

4.1.4.5 Design Criteria

- Clear plastic sheeting shall have a minimum thickness of 6 mil and shall meet the requirements of the City of Seattle Standard Specifications Section 9-14.5.
- Place plastic into a small (12-inch wide by 6-inch deep) slot trench at the top of the slope and backfill with soil to keep water from flowing underneath.
- Covering shall be installed and maintained tightly in place by using sandbags or tires on ropes with a maximum 10 foot grid spacing in all directions. All seams shall be taped or weighted down full length and there shall be at least a 1- to 2-foot overlap of all seams. Seams should then be rolled and staked or tied.
- Covering shall be installed immediately on areas seeded between November 1 to March 1, and remain until vegetation is firmly established.
- When the covering is used on unseeded slopes, it shall be left in place until the next seeding period.
- Sheeting should be toed in at the top of the slope to prevent surface flow beneath the plastic. If erosion at the toe of a slope is likely, a gravel berm, riprap, or other suitable protection shall be installed at the toe of the slope in order to reduce the velocity of runoff.
- Sheeting should be removed as soon as is possible once vegetation is well grown to prevent burning the vegetation through the plastic sheeting, which acts as a greenhouse.

4.1.4.6 Maintenance

- Check regularly for rips and places where the plastic may be dislodged. Contact between the plastic and the ground should always be maintained. Any air bubbles found should be removed immediately or the plastic may rip during the next windy period. Re-anchor or replace the plastic as necessary.

BMP 05.00. Compost Sock

DESIGN CONSIDERATIONS

Objectives

Compost Socks are intended to intercept and slow sheet flow runoff, allowing suspended sediments to settle or be filtered out by the compost material.

Description

Compost Socks are biodegradable (or photodegradable) mesh tubes/socks filled with compost. The socks can be temporary or permanent installations.

Other Names

Filter Socks

Applicability

Compost Socks can be used in place of sediment (silt) fences and fiber rolls. They can sometimes be the most economical solution because compost does not require any special trenching or construction. This is especially important near streams since compost is an organic, biodegradable, renewable material and is not required to be removed at the end of a project. Removal of other types of best management practices (BMPs) can disturb soil by dislodging vegetation and exposing soil. Compost Socks can also be easily repaired if they become damaged. Compost Socks are not intended to be installed in areas with concentrated flow.

Selection Considerations

Compost used in socks needs to be stable and mature. It should consist of both small and larger particle sizes, which will affect the filtration performance and longevity. Coarser grade compost is better for filtration and is less likely to be disturbed by rainfall or runoff. Finer grade compost is better for vegetation establishment. For socks, the ratio of coarse to fine grades should be 1:1. No compost should have particle sizes larger than 3 inches. All compost used should conform to U.S. Composting Council (USCC) standards

Design

Compost Socks should be constructed of 8-inch to 12-inch diameter, or larger, biodegradable (or photodegradable) mesh tubes/socks. Compost Socks can be placed on any slope but they need to be anchored appropriately. Compost Socks should be

placed no closer than 5 feet from the toe of slopes to allow runoff to pool. They should be installed parallel with the contours of the slope with the ends of the socks pointed towards the upslope. This enables runoff to pond within the extent of the sock and allows suspended sediments to settle.

For long-run applications, the ends of Compost Socks should be laced together or be overlapped to form a continuous length. Wood stakes should be used to secure compost socks in place if installed on slopes. The drawing says to stake per the manufacturer's recommendations, but generally stakes are needed if 3:1 or steeper. To provide extra support for staked Compost Socks, rope can be used to lash the stakes together. However, if stakes and rope are used they are required to be removed after a project is completed. The contents of Compost Socks can remain after a project is completed but the all netting (or mesh) is required to be removed after a project is completed.

Relationship to Other Erosion and Sediment Control Measures

Compost Socks can be used in place of sediment fences, and fiber rolls. Compost filters sediment and allows the runoff to pass through relatively more easily than silt fence, which acts as a dam to create ponding and settling. Tackifiers can be applied to compost installations to enhance performance if needed.

Common Failures or Misuses

Common failures are generally due to faulty application and maintenance. These failures include:

- Non-certified compost used.
- Non-biodegradable mesh tubes used.
- Can become plugged with fines and sediments.
- Used in highly concentrated flow areas.
- Damaged by construction-related activities.
- Ends of socks are not pointed upwards towards the top of the slope.
- Socks must be in uniform contact with the ground for maximum effectiveness.

- 12-inch diameter socks can become heavy and sag when installed on slopes steeper than 3:1

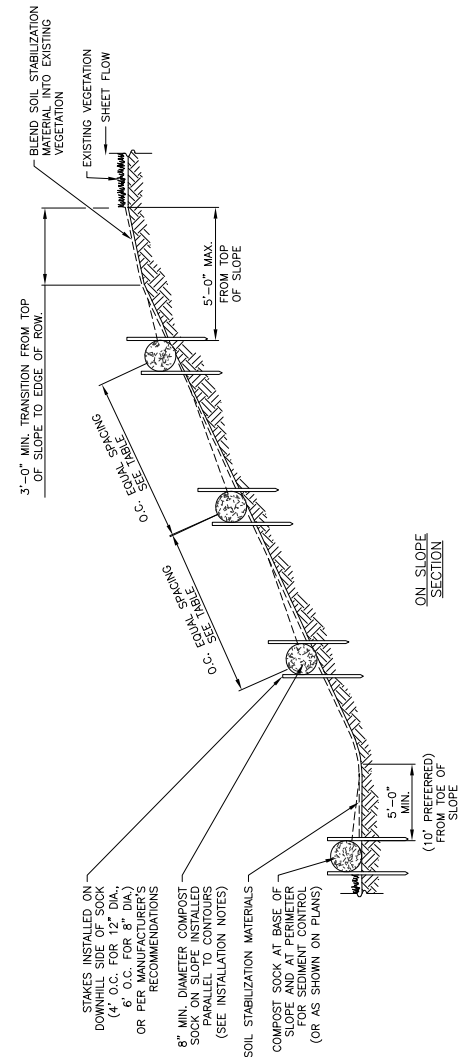
SPECIFICATIONS

Drawing

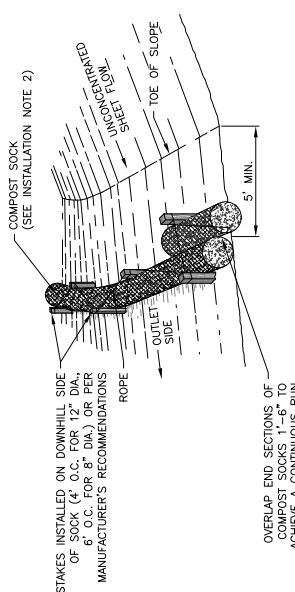
- BMP-05.00 -- Compost Sock

Standard Specification

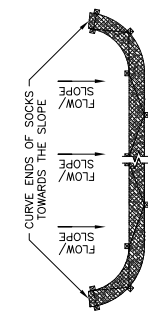
- 664 – Compost Sock
- 750 – Compost



ON SLOPE SECTION



PERSPECTIVE



COMPOST SOCK
NOT TO SCALE

- COMPOST SOCK NOTES:
- MATERIALS
- COMPOST PER SECTION 750
- COMPOST SOCKS: 8", 12", 18", 24" NOMINAL
- STAKES: NON-TREATED WOOD.
- INSTALLATION
1. INSTALL STAKES PER MANUFACTURER'S RECOMMENDATIONS.
 2. PLACE COMPOST SOCKS NO CLOSER THAN 5 FEET FROM THE TOE OF SLOPES TO ALLOW RUNOFF TO POOL.
 3. INSTALL PARALLEL WITH THE CONTOURS OF THE SLOPE WITH THE ENDS OF THE SOCKS POINTED TOWARDS THE UPSLOPE.
 4. LACE TOGETHER AND OR OVERLAP FOR LONG-RUN APPLICATIONS TO FORM A CONTINUOUS LENGTH.
 5. USE WOOD STAKES TO SECURE COMPOST SOCKS IN PLACE IF INSTALLED ON SLOPES.
 6. SOIL STABILIZATION MATERIALS INCLUDE ROLLED EROSION CONTROL PRODUCTS, MULCH, OR OTHER TEMPORARY GROUND COVER TO STABILIZE UNTIL VEGETATION IS ESTABLISHED.
- INSPECTION
1. INSPECT FOR DAMAGE, DISPLACEMENT, SEDIMENT DEPTH, UNDERMINING, AND/OR OVERTOPPING.
- MAINTENANCE
1. REPAIR OR REPLACE DAMAGED OR DISPLACED COMPOST SOCKS.
 2. REMOVE ACCUMULATED SEDIMENT BEFORE IT REACHES ONE-HALF OF THE SOCK HEIGHT OR CLEARANCE OF THE AVAILABLE STORAGE IF PROTECTING A WATER BODY OR STORM DRAIN INLET.
- REMOVAL
1. REMOVE MESH/TUBES FOR PERMANENT COMPOST SOCKS AND THE CONTENTS MAY REMAIN. ALL STAKES AND ROPE, IF USED, SHOULD BE REMOVED FROM THE PROJECT AND DISCARDED.

COMPOST SOCK SPACING BASED ON SLOPE	
SLOPE (H:V)	SOCK O.C. SPACING
5:1 - 2:1	50 FT
> 2:1	25 FT

REVISIONS	
Date	Description
State of Alaska DOT&PF	
COMPOST SOCK	
A P R O V E D	
Date	12/2015

BMP 06.00. Concrete Washout

DESIGN CONSIDERATIONS

Objectives

Concrete Washout Containment prevents the discharge of concrete waste pollutants to stormwater by providing on-site washout containment in a designated and contained area.

Description

Concrete Washout Containment contains concrete and fluids from the chutes of concrete mixers and hoppers of concrete pumps when they are rinsed out after delivery. Containment areas allow for easier disposal of consolidated solids and prevent pollution from run-off or infiltration to groundwater. A washout facility can consist of a pre-fabricated container or self-installed (fabricated on-site) lined containment area, which can be above- or below-grade. Containment areas require sufficient volume to completely contain all liquid and waste concrete materials.

Applicability

Concrete Washout Containment is required on projects where concrete, stucco, mortar, grout, and/or cement are used as construction materials.

Selection Considerations

The number and size of containment areas provided should be based on the expected demand for storage capacity.

- *Pre-fabricated Washout Containers:* Pre-fabricated washout containments can be any watertight unit that can contain all liquids and solid waste generated by washout operations. When available, pre-fabricated containers are delivered to the site and minimize installation efforts. They are also resistant to damage and protect against spills and leaks. Some companies will also offer complete service with their product, such as providing maintenance and regular disposal of waste materials. Such full-service options could relieve the superintendent of these responsibilities. However, when a contractor selects a company that provides such an option, they must also ensure that the company is properly disposing of materials and it would be prudent to give preference to companies that recycle collected materials.

- *Below-grade Containment:* Use of below-grade containment areas helps prevent breaches and reduces the likelihood of run-off. This option is recommended for projects expecting extensive concrete work or for airport projects. However, this option is not recommended for areas with high water tables or shallow groundwater; such as near natural drainages, springs, or wetlands.
- *Above-grade Containment:* Above-grade containment areas must be sized and installed correctly, and diligently maintained in order to be effective. However, particularly if a pre-fabricated container is unavailable, this option is better suited in areas with potentially high water tables to prevent leaching of wash water into groundwater, or in areas where excavation is not practical.

Design

Location: Concrete Washout Containment should be placed in a location that provides convenient access for concrete trucks, preferably near the area where the concrete is being poured. Place Concrete Washout Containment a minimum of 50 feet from storm drains, open ditches, or waterbodies, or provide secondary containment for the Concrete Washout Containment.

Number of Containments: Larger sites with extensive concrete work should have Concrete Washout Containment at multiple locations for ease of use. Multiple Washout Containments are also required if a single containment unit is not adequate for the volume of waste material generated before the containment structure is cleaned.

Capacity: Concrete Washout Containment should provide sufficient capacity to handle the expected volume of solids, wash water, and rainfall to prevent overflow and allow 12 inches of freeboard. To estimate capacity, assume 7 gallons of wash water and solids are generated from washing one truck chute, and 50 gallons are generated in washing out the hopper of a concrete ready-mix or pump truck. Estimate the number of trucks based on the total volume of concrete in the project, the hopper capacity of each concrete pump truck, the expected number of loads, and the planned maintenance interval.

Containment Area: For larger sites, it is recommended that self-installed containment (both above- and below-grade) areas be at least 10 feet wide with sufficient length and depth to provide the required capacity. Above-grade self-installed containment areas shall be limited to a size and capacity for which the selected outside barrier is designed to remain structurally sound when filled with waste materials.

Cover: A temporary cover should be provided to prevent rain or other precipitation from filling the containment area and causing wash water overflow. The cover should be a secure, non-collapsing, non-water collecting cover.

Signage: Each on-site facility must have highly visible signage to indicate washout containment locations. Signs should be at least 48 by 24 inches and have 6-inch high contrasting letters, placed at a height of at least 3 feet above ground level and within 30 feet of the facility.

Relationship to Other Erosion and Sediment Control Measures

Operator Education: Use of Concrete Washout Containment as a best management practice (BMP) is only successful if concrete truck operators utilize them. Operators need to be made aware of the presence of these containments. All concrete truck operators, including those of subcontractors, should be trained on the importance of managing concrete waste, washout procedures, and washout locations.

Common Failures or Misuses

- Overflow and discharge of waste when the containment area is not covered prior to anticipated rainfall and/or when accumulated liquid wastes have not been removed.
- Leaking resulting from torn or damaged liners going unnoticed or not being replaced, with consequent discharge of washout liquid or slurry to waterways, storm drains, or directly onto the ground.
- Lack of communication to truck drivers of the necessity of using the containment area for washout.
- Compromised structural integrity due to miscalculated capacity and installation,

particularly for self-installed, above-grade containment.

- Insufficient quantity and/or size to contain all liquid and concrete waste generated by washout operations.

SPECIFICATIONS

Standard Specification

- 665 – Concrete Washout

Drawing

- BMP – 06.00 Concrete Washout, Sheets 1 & 2

CONCRETE WASHOUT GENERAL NOTES:

MATERIALS
PRE-FABRICATED CONTAINERS, MADE OF STURDY MATERIALS THAT ARE WATER TIGHT.

FABRICATED ON-SITE CONTAINMENT

1. BARRIER SIDEWALLS: MAKE SIDEWALLS OF AN ABOVE-GRADE CONTAINMENT AREA FROM EARTHEN BERMS, BARRIER WALLS, WOOD PLANKS, OR OTHER MATERIALS THAT WILL BE STRUCTURALLY SOUND WHEN FILLED WITH WASTE MATERIALS.

2. LINER: IMPERMEABLE PLASTIC SHEETING OF AT LEAST 10 MIL THICKNESS, AND FREE OF HOLES, TEARS, AND OTHER DEFECTS THAT COMPROMISE THE IMPERMEABILITY OF THE MATERIAL.

3. ANCHORS: SECURE THE LINER FOR ABOVE-GRADE CONTAINMENT AREAS AND SIDEWALL MATERIALS OTHER THAN BERMS WITH ANCHORS. USE SANDBAGS, 6-INCH WIRE STAPLES, AND WOOD OR METAL STAKES AS ANCHORS, BUT NOT LIMITED TO ONLY THEM.

SIGNS: DURABLE, RIGID MATERIAL WITH 8-INCH HIGH CONTRASTING LETTERS, PLACED AT A HEIGHT OF AT LEAST 3 FEET ABOVE GROUND LEVEL.

RAIN COVER: SECURE, NON-COLLAPSING, NON-WATER COLLECTING RAIN COVER, REQUIRED PRIOR TO PREDICTED WET WEATHER TO PREVENT ACCUMULATION AND OVERFLOW OF PRECIPITATION.

INSTALLATION

1. INSTALL SIGNS WITHIN 30 FEET OF THE WASHOUT.
2. IF THE WASHOUT IS LOCATED ON UNDEVELOPED PROPERTY OR OFF-PAVEMENT, PROVIDE A STABILIZED CONSTRUCTION EXIT.
3. PLACE CONCRETE WASHOUT CONTAINMENT A MINIMUM OF 50 FEET FROM STORED DRUMS, OPEN DITCHES, OR WATERBODIES, OR PROVIDE SECOND-ARY CONTAINMENT FOR THE WASHOUT.
4. PROVIDE SUFFICIENT CAPACITY TO HANDLE THE EXPECTED VOLUME OF SOLIDS AND WASH WATER AT 50% MAX CAPACITY AND ALLOW 12 INCHES MINIMUM OF FREEBOARD.
5. PRE-FABRICATED WASHOUT CONTAINERS ARE USUALLY DELIVERED ASSEMBLED. IF ASSEMBLY IS REQUIRED, FOLLOW MANUFACTURER'S INSTRUCTIONS.
6. SELF-INSTALLED CONTAINMENT:
 - a. ABOVE-GRADE WASHOUT: CONSTRUCT THE SIDEWALLS TO THE DIMENSIONS SHOWN ON THE DRAWINGS. IF NOT USING AN EARTHEN BERM FOR THIS PURPOSE, ENSURE THAT THE SIDEWALL MATERIAL IS SECURE AND EACH UNIT IS BUTTED TIGHTLY END TO END. LINE THE ENTIRE AREA WITH THE LINING MATERIAL, BRINGING THE SHEETING UP OVER THE SIDEWALLS AND SECURING THE ENDS WITH SANDBAGS, STAPLES OR OTHER APPROPRIATE ANCHORS.
 - b. BELOW-GRADE WASHOUT: EXCAVATE A FLAT, SUBSURFACE PIT TO THE DESIRED SIZE AND CAPACITY FOR THE CONTAINMENT AREA. THE RESULTING SIDEWALL SHOULD NOT EXCEED 3:1 SLOPES. PREVENT DAMAGE TO THE LINER BY KEEPING THE BASE OF THE PIT FREE OF ROCKS AND DEBRIS. USE THE EXCAVATED MATERIAL TO CREATE A BERM ALONG THREE SIDES OF THE PIT, LEAVING THE SIDE PROVIDING ACCESS RELATIVELY FLAT. IT IS RECOMMENDED THAT THE BERM BE AT LEAST 1-FOOT HIGHER THAN EXISTING GROUND. LINE THE ENTIRE AREA WITH THE LINING MATERIAL, BRINGING THE SHEETING UP OVER THE SIDEWALLS AND BERM, AND SECURING THE ENDS WITH SANDBAGS OR OTHER APPROPRIATE ANCHORS.

INSPECTION

1. INSPECT AND VERIFY THAT CONCRETE WASHOUT BIRPS ARE IN PLACE PRIOR TO THE COMMENCEMENT OF CONCRETE WORK.
2. DETERMINE IF THE CONCRETE WASHOUT IS FILLED TO 30 PERCENT CAPACITY.
3. FOR SELF-INSTALLED CONTAINMENT:
 - a. INSPECT THE PLASTIC LINER TO ENSURE IT IS SECURELY ANCHORED AND INTACT.
 - b. INSPECT THE SIDEWALLS FOR LEAKS. ENSURE THE CONSTRUCTION DOESN'T DAMAGE THE SIDEWALLS.
4. FOR PRE-FABRICATED CONTAINMENT, INSPECT THE UNIT FOR LEAKS AND POTENTIAL DAMAGE.
5. CHECK TO ENSURE THAT EACH WASHOUT SIGN IS STILL SECURE AND VISIBLE.
6. IF THERE IS EVIDENCE THAT WASHOUTS ARE OCCURRING IN LOCATIONS OTHER THAN THE DESIGNATED WASHOUT, IMPROVE EXISTING SIGNAGE, INSTALL ADDITIONAL SIGNAGE, INCREASE COMMUNICATION WITH CONCRETE TRUCK DRIVERS, AND PROVIDE CONCRETE TRUCK DRIVERS WITH MAPS OF WASHOUT LOCATIONS WITH RESPECT TO POUR LOCATIONS.

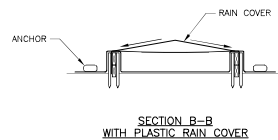
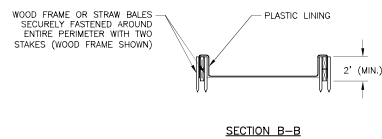
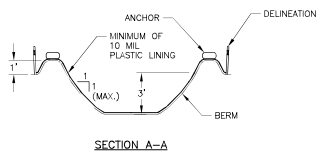
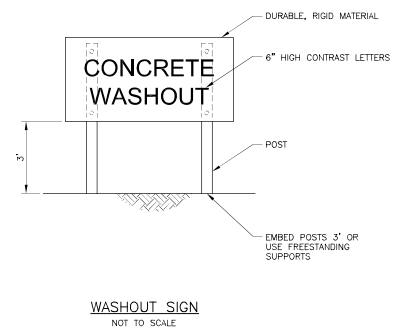
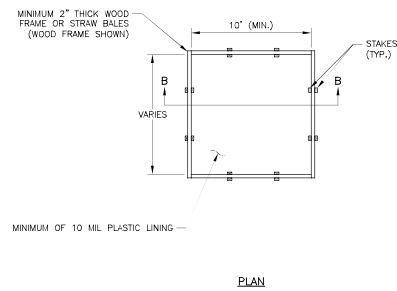
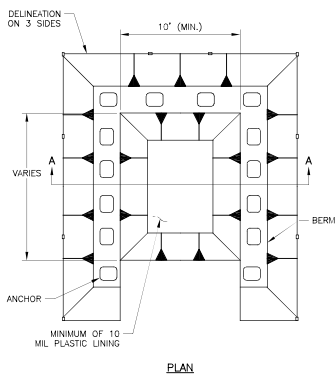
MAINTENANCE

1. CLEAN EXISTING WASHOUTS BEFORE THE WASHOUT IS 50 PERCENT FULL. SOLIDIFY WITH BAGGED GROUT, VACUUM AND DISPOSE OF LIQUIDS IN AN APPROVED MANNER, OR ALLOW FOR EVAPORATION (CHECK WITH THE LOCAL SANITARY SEWER AUTHORITY TO DETERMINE IF THERE ARE SPECIAL DISPOSAL REQUIREMENTS FOR CONCRETE WASH WATER).
2. IF NECESSARY, PROVIDE AN ALTERNATE WASHOUT DURING EXISTING WASHOUT CLEANING.
3. RELINE SELF-INSTALLED CONTAINERS AFTER EACH CLEANING, BECAUSE EQUIPMENT CAN DAMAGE THE LINER. BEFORE RELINING, INSPECT THE CONTAINMENT STRUCTURE FOR SIGNS OF WEAKENING OR DAMAGE AND MAKE ANY NECESSARY REPAIRS. THEN LINE THE STRUCTURE WITH NEW PLASTIC SHEETING, CHECKING THAT IT IS FREE OF HOLES, TEARS, AND OTHER DAMAGE.
4. REPAIR DAMAGED WASHOUTS BEFORE THE NEXT CONCRETE POUR. IF NECESSARY, PROVIDE NEW WASHOUTS UNTIL THE EXISTING WASHOUTS ARE OPERATIONAL.
5. CONTAIN ANY SPILL OR DISCHARGE OF CONCRETE WASTE MATERIALS.
6. REPLACE OR INSTALL NEW SIGNAGE AS NEEDED.

REMOVAL

1. AN OPERATIONAL CONCRETE WASHOUT SHOULD REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT (OR PHASE OF THE PROJECT) IS POURED. WHEN THE CONCRETE WASHOUT IS NO LONGER NEEDED, THE LIQUID MUST BE EVAPORATED OR VACUUMED FOR DISPOSAL AND THE HARDENED SOLIDS MUST BE BROKEN UP, REMOVED, AND PROPERLY DISPOSED OF, DISPOSAL LOCATION TO BE APPROVED BY ENGINEER.
2. REMOVE FROM THE SITE PRE-FABRICATED WASHOUTS AND MATERIALS USED TO CONSTRUCT ABOVE-GRADE CONTAINMENT AREA AND PROPERLY DISPOSE OF THEM.
3. BACKFILL AND STABILIZE HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCE CAUSED BY THE CREATION OR REMOVAL OF THE WASHOUT WITH AN APPROVED BMP.

REVISIONS		
Date	Description	By
State of Alaska DOT&PF		
CONCRETE WASHOUT		
(NOTES)		
A P P R O V E D		
Date	12/2015	KAC/CFX



BELOW-GRADE CONCRETE WASHOUT
FABRICATED ON-SITE
NOT TO SCALE

ABOVE GRADE CONCRETE WASHOUT
FABRICATED ON-SITE
NOT TO SCALE

REVISIONS		
Date	Description	By

State of Alaska DOT&PP

CONCRETE WASHOUT (FABRICATED ON-SITE)

A

P

P

P

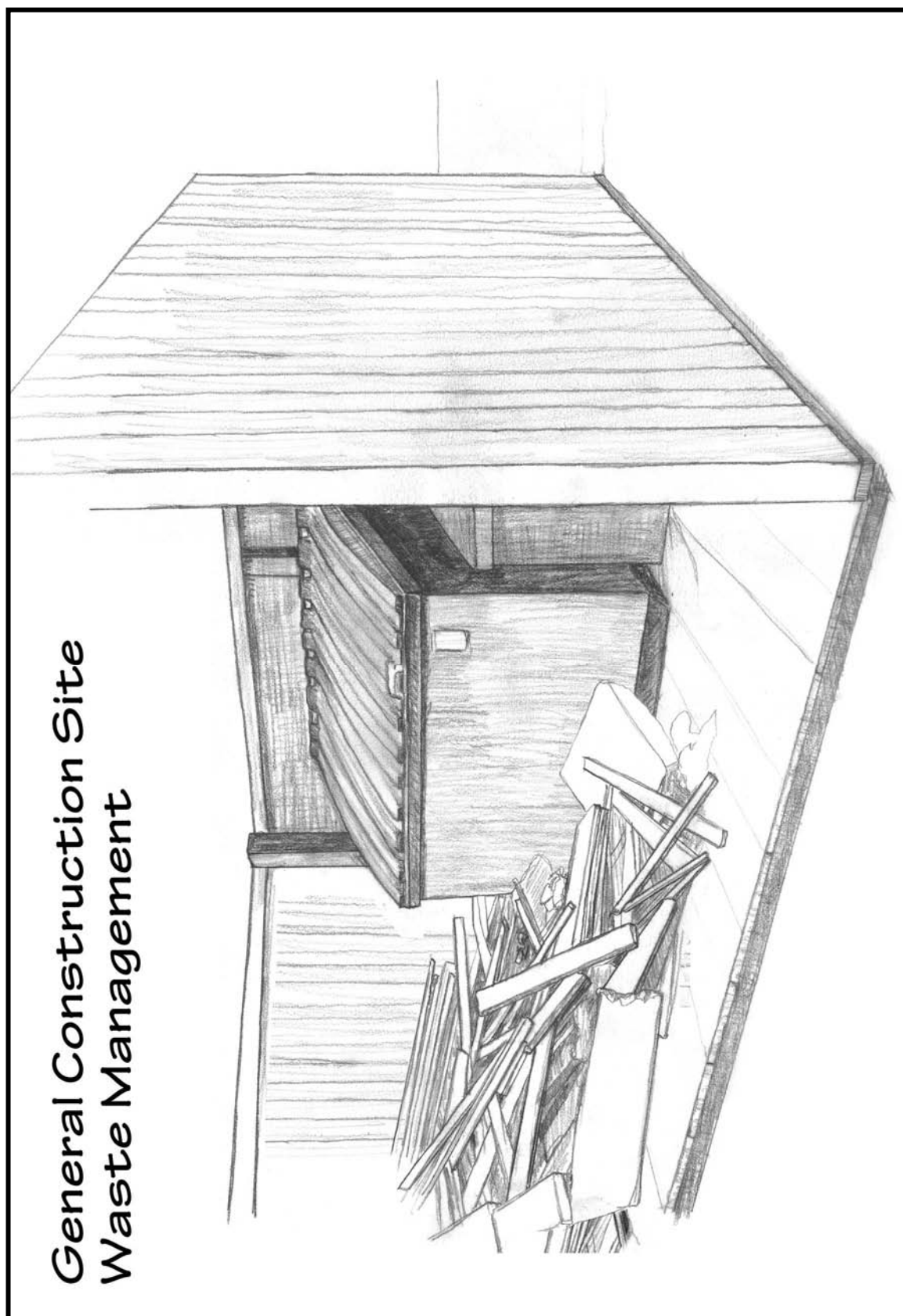
O

V

E

D

Date:



General Construction Site Waste Management

Construction BMP	Alaskan climatic regions				
	Coastal	Southcentral	Western	Interior	Arctic
General Construction Site Waste Management Feasibility	○	○	○	○	○
Description	<p>Building materials and other construction site wastes must be properly managed and disposed of to reduce the risk of pollution from materials such as surplus or refuse building materials or hazardous wastes. Practices such as trash disposal, recycling, proper material handling, and spill prevention and cleanup measures can reduce the potential for storm water runoff to mobilize construction site wastes and contaminate surface or groundwater.</p>				
Installation	<p>Solid Wastes:</p> <ul style="list-style-type: none"> • Designate a waste collection area on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a waterbody. • Ensure that containers have lids so they can be covered before periods of rain, and keep containers in a covered area whenever possible. • If secondary containment is used, include a protocol in the SWPPP and train employees on disposal of accumulated precipitation. • Schedule waste collection to prevent the containers from overfilling. • Clean up spills immediately. For hazardous materials, follow cleanup instructions on the package. Use an absorbent material such as sawdust or kitty litter to contain the spill. • During the demolition phase of construction, provide extra containers and schedule more frequent pickups. • Collect, remove and dispose of all construction site wastes at authorized disposal areas. Contact a local environmental agency to identify these disposal sites. <p>Hazardous Materials and Wastes:</p> <ul style="list-style-type: none"> • Consult with local waste management authorities about the requirements for disposing of hazardous materials. • To prevent leaks, empty and clean hazardous waste containers before disposing of them. • Never remove the original product label from the container because it contains important safety information. Follow the manufacturer's recommended method of disposal, which should be printed on the label. • Never mix excess products when disposing of them, unless specifically recommended by the manufacturer. 				

General Construction Site Waste Management *(continued)*

Installation <i>(continued)</i>	<p>Pesticides and fertilizers:</p> <ul style="list-style-type: none"> • Follow all federal, state and local regulations that apply to the use, handling or disposal of pesticides and fertilizers. • Store pesticides and fertilizers in a dry, covered area. • Construct berms or dikes to contain stored pesticides and fertilizers in case of spillage. • Follow the recommended application rates and methods. • Have equipment and absorbent materials available in storage and application areas to contain and clean up any spills that occur. <p>Petroleum Products:</p> <ul style="list-style-type: none"> • Store new and used petroleum products in covered areas, where practicable, and place within berms or dikes to contain any spills. • Immediately contain and clean up any spills with absorbent materials. • Have equipment available in fuel storage areas and in vehicles to contain and clean up any spills that occur. <p>Detergents:</p> <ul style="list-style-type: none"> • Use detergents only as recommended, and limit their use on the site. Do not dump wash water containing detergents into the storm drain system; direct it to a sanitary sewer or contain it so that it can be treated at a wastewater treatment plant.
Maintenance	<p>Inspect storage and use areas and identify containers or equipment that could malfunction and cause leaks or spills. Check equipment and containers for leaks, corrosion, support or foundation failure, or other signs of deterioration, and test them for soundness. Immediately repair or replace any that are found to be defective.</p>
<p>Feasibility symbols:</p> <div style="display: flex; justify-content: space-between;"> <div> <p><input type="radio"/> Widely feasible</p> <p><input type="checkbox"/> Might be feasible in certain situations</p> </div> <div> <p><input checked="" type="radio"/> Feasible only with major design adaptation</p> <p><input type="checkbox"/> Infeasible and not recommended</p> </div> </div>	

BMP 08.00. Culvert Inlet Protection

DESIGN CONSIDERATIONS

Objectives

Culvert Inlet Protection is used to trap sediment and reduce the amount of sediment entering a culvert.

Description

Culvert Inlet Protection is a low barrier, similar to a check dam, placed up-gradient of a culvert inlet to temporarily impound water and trap sediment while still allowing flow to enter the culvert. There are several types of temporary barriers applicable for different conditions:

- Geotextile-wrapped foam barriers
- Sand bags or gravel-filled sand bags
- Fiber rolls
- Geotextile-wrapped wire cage barrier

Other Names

Filter Inlet.

Applicability

Culvert Inlet Protection is applicable when there is potential for sediment to be transported to and through the culvert. Placement in the flowline is applicable for culverts conveying runoff or project drainage that must remain operational before permanent stabilization of the disturbed area. Placement above (all the way around) a culvert inlet is applicable when earth disturbing activities are occurring upslope of the inlet, to prevent sediment and runoff from entering the culvert inlet from above. Culvert Inlet Protection is not generally placed in the flowline of culverts conveying stream flow, since the purpose of the best management practice (BMP) is to treat run-off before it reaches receiving waterbodies such as streams. If placement in the flowline of streams is required, applicable permits must be obtained.

Selection Considerations

- Culvert Inlet Protection should be sited and constructed in a manner that will facilitate cleanout and disposal of trapped sediment.

- Culvert Inlet Protection should be constructed in a manner that will allow flow to pass and minimize ponding after the run-off has ceased.
- Blocking the inlet can cause flooding affecting streets and the construction area. Where flooding would cause a hazard, consider where overflow will go in extreme events and provide emergency overflows with additional treatment.
- Slope Gradient: The slope of the ditch discharging to the culvert inlet should not exceed 5 percent or flow velocity exceeding 2.5 to 3 cubic feet per second. The steeper the slope or the higher the velocity and shear stress, the larger the particle diameter that can be transported. The flatter the slope and the slower the flow, the longer the travel distance and time behind the barrier, allowing for sediment to settle. If Culvert Inlet Protection is required on steeper grades, consider using a series of barriers or a widened channel to provide velocity reduction or barriers of greater depth to lengthen the settling distance.
- Inlet protection should extend all the way around the inlet when upgradient slopes are not stabilized.
- Consider the effects if the barrier were to fail when water is ponded. Provide additional downstream protection if warranted.

Design

Drainage Area: The area of the construction drainage area to the culvert inlet should not exceed 1-acre. The total drainage area to the inlet may be larger than 1-acre, provided that the additional area is vegetated and/or permanently stabilized and that the spillway and ponding area is sized to adequately treat, impound, and convey the runoff from the tributary area.

Depth: Provide a temporary minimum ponding depth of 6 to 8 inches. The design must specify fiber rolls of adequate diameter, foam barriers, or sandbags of adequate thickness to provide the minimum ponding depth, and spillways with minimum elevations and width must be provided to limit the maximum ponding depth.

Modified by SWPPP Preparer

Relationship to Other Erosion and Sediment Control Measures

Erosion control measures in the contributing areas must be in place to minimize the amount of sediment that must be treated at inlets. Culvert Inlet Protection is installed as a secondary measure to remove residual sediment that was not removed by other measures such as check dams, grassed swales, and sediment traps.

Common Failures or Misuses

- Sediment accumulation resulting in reduced settling capacity.
- Improper installation, resulting in sediment bypassing filter and entering the culvert.
- Tearing, undermining, or collapsing of the barrier, resulting in sediment entering the culvert.

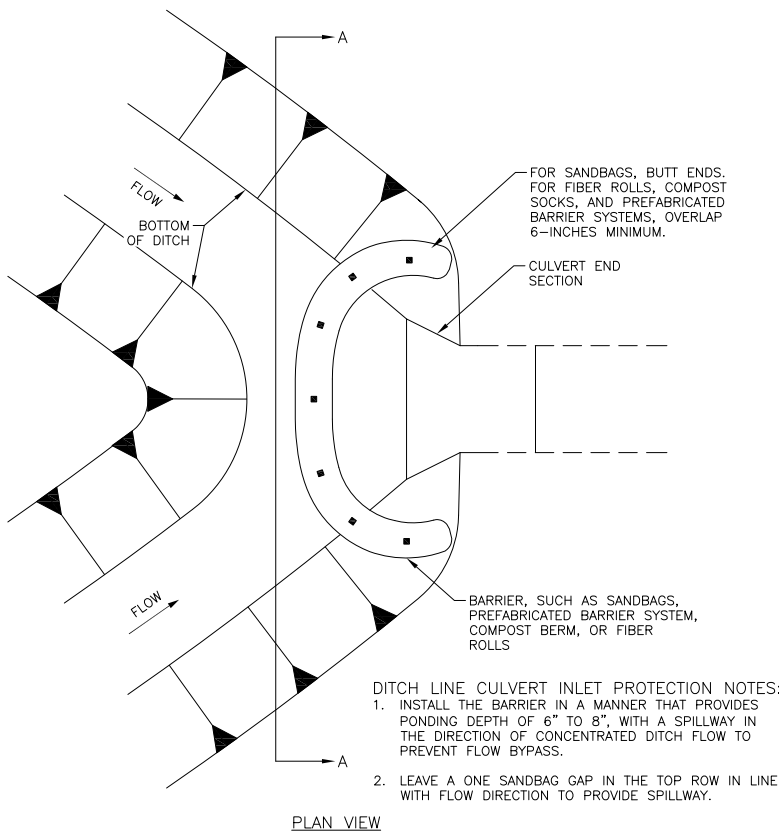
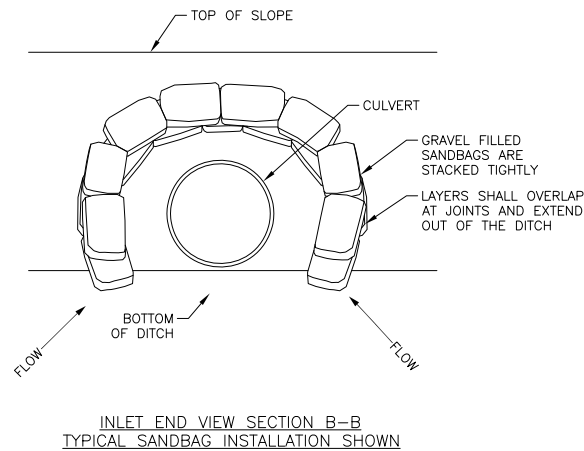
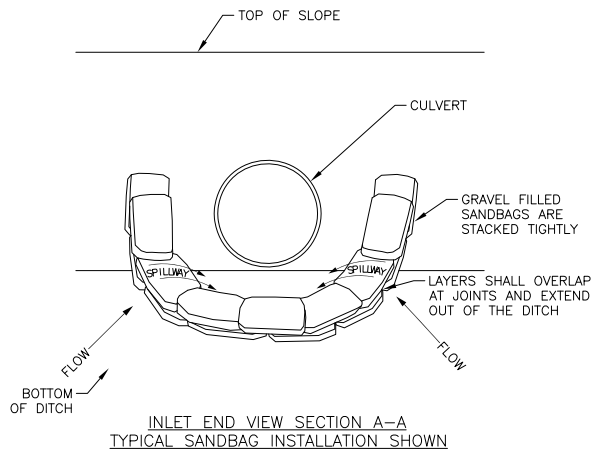
SPECIFICATIONS

Standard Specification

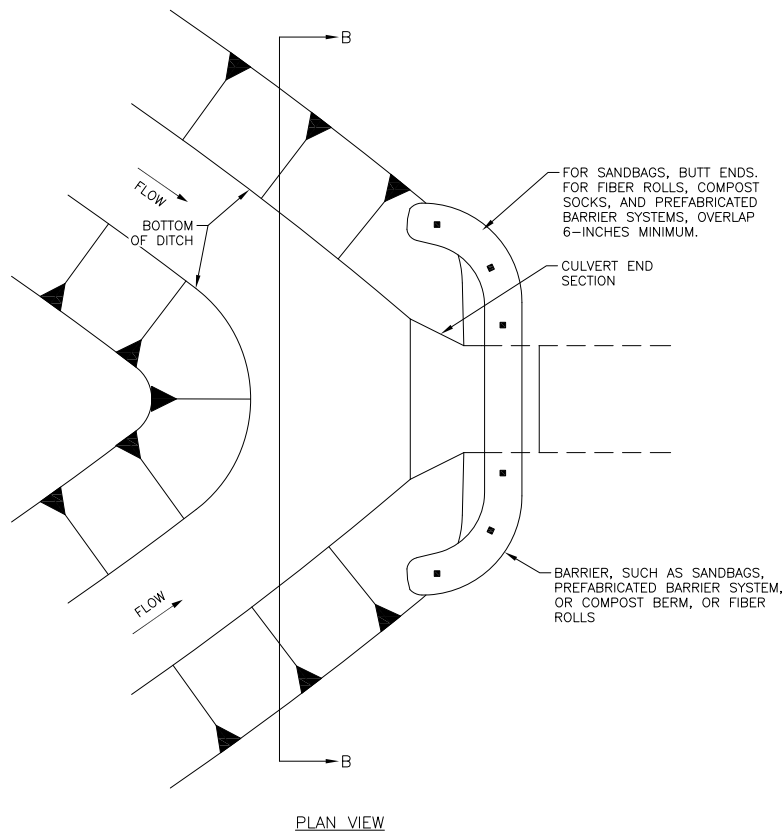
- 667 – Culvert Inlet Protection

Drawing

- BMP – 08.00 Culvert Inlet Protection



DITCH LINE CULVERT INLET PROTECTION
NOT TO SCALE



TOP OF PIPE CULVERT INLET PROTECTION
NOT TO SCALE

- CULVERT INLET PROTECTION NOTES:
- MATERIALS
- BARRIER MATERIALS:
- PREFABRICATED BARRIER SYSTEM, AS SHOWN ON DRAWING BMP-13.00.
 - SANDBAG BARRIER, CONSISTING OF TIGHTLY WOVEN BURLAP OR WOVEN GEOTEXTILE BAG MATERIAL SUFFICIENTLY DURABLE TO REMAIN INTACT FOR THE TIME INTENDED. BAGS 2/3 FULL OF GRAVEL OR SAND WITH A GRADATION SUCH THAT NO FINE SEDIMENT PASSES THROUGH THE BAG. IF THE SANDBAGS ARE NEEDED FOR MORE THAN ONE SUMMER SEASON, PROVIDE BAG MATERIAL THAT HAS ULTRAVIOLET STABILITY OF AT LEAST 70% IN CONFORMANCE WITH ASTM D4355 REQUIREMENTS. SECURELY CLOSE THE SANBAGS.
 - FIBER ROLL, AS SHOWN ON DRAWING BMP-10.00, 8 INCHES MINIMUM DIAMETER.
 - COMPOST SOCK, AS SHOWN ON DRAWING BMP-05.00.
- INSTALLATION
- INSTALL WHERE INDICATED IN THE PLANS OR WHERE APPROVED BY THE ENGINEER.
 - ASSURE THAT BARRIER MAKES FULL CONTACT WITH SOIL ALL AROUND THE INLET.
 - IF PROTECTING BOTH DITCHLINE AND TOP OF PIPE, THE PROTECTION BARRIER CAN BE A SINGLE CONTINUOUS CIRCLE.
 - IN ADDITION:
 - PREFABRICATED BARRIER SYSTEM – ANCHOR WITH WIRE STAPLES ON SOIL, OR ADHESIVE ON PAVEMENT. OVERLAP 6 INCHES.
 - SANDBAG BARRIER – LAYER AND OVERLAP AT JOINTS.
 - FIBER ROLL – TRENCH A MINIMUM OF 2 INCHES. SEE STAKING REQUIREMENTS ON DRAWING BMP-10.00.
 - COMPOST SOCK – SEE STAKING REQUIREMENTS ON DRAWING BMP-05.00. STAKING REQUIRED WHEN PLACED WITHIN FLOWLINE/DITCH.
- INSPECTION
- CONFIRM THAT BARRIERS ARE IN FULL CONTACT WITH THE SOIL AND THAT BYPASS ROUTES ARE NOT PRESENT.
 - INSPECT FOR SEDIMENT ACCUMULATION, DISPLACEMENT, AND STRUCTURAL DAMAGE.
- MAINTENANCE
- REMOVE ACCUMULATED SEDIMENT BEFORE IT REACHES ONE-~~THIRD~~^{Half} OF THE DESIGN DEPTH OF SPILLWAY.
 - RESTORE STRUCTURE TO ITS ORIGINAL DIMENSIONS AND FULL CONTACT WITH SOIL AROUND THE INLET AS SOON AS PRACTICABLE.
 - REPAIR ANY STRUCTURAL DAMAGE, INCLUDING REPLACING DAMAGED SANDBAGS, AS SOON AS PRACTICABLE.

REVISIONS		
Date	Description	By
State of Alaska DOT&PF		
CULVERT INLET PROTECTION		
APPROVED		
Date	12/2015	XXXXXX

BMP 10.01.a. Fiber Rolls for Erosion Control

DESIGN CONSIDERATIONS

Objectives

The purpose of Fiber Rolls for Erosion Control is to shorten the slope and help to slow, filter, and spread overland flows. They capture sediment, organic matter, and seeds that might otherwise be washed downslope.

Description

Fiber Rolls are long rolls of material such as wood excelsior, rice or wheat straw, flax, coconut fibers, or compost, which is rolled or bound in a tight tubular roll and wrapped in plastic or biodegradable netting. They are typically about 8 inches in diameter and under 30 feet long.

They may come pre-fabricated or they can be fabricated on-site.

Other Names

Wattles, Straw Wattles, Straw Rolls, Coir Logs, Excelsior Log, Straw Log, Filter Logs, Fiber Logs.

Applicability

Fiber Rolls can be applied to steep or long slopes and slopes that are susceptible to freeze/thaw activity, sheet and rill erosion, or dry ravel. They can be placed along the toe, top, face, and at grade-breaks on disturbed or erodible slopes. They can be used as a temporary berm to direct flow around exposed soils or to a sediment trap and as a check dam in unlined ditches. They can be used at other locations at the project site for sediment control.

Selection Considerations

- Use in areas of low shear stress.
- Avoid use on slopes that could build up ice; for instance, where seepage occurs.
- They are effective for one to two seasons.
- Fiber Rolls can be staked to the ground using willow cuttings to increase the revegetation effort. Since the fiber roll will retain moisture, it will provide a good site for the willow cuttings to root. The Alaska Department of Fish and Game (ADF&G) has prepared guidance for willow cuttings and dormant cuttings in the

Streambank Revegetation and Protection: A Guide for Alaska at:

<http://www.adfg.alaska.gov/index.cfm?adfg=streambankprotection.staking>

and

<http://www.adfg.alaska.gov/index.cfm?adfg=streambankprotection.cuttings>

- The quantity of sediment that a roll can capture prior to maintenance is limited to one-half the exposed height of the roll.
- Rolls will be difficult to move once they are saturated. Determine whether Fiber Rolls must be removed at the end of the project based on the use of the area. If removal is required, specify in the plan set and require removal of netting upon final stabilization.

Relationship to Other Erosion and Sediment Control Measures

Fiber Rolls are best used in combination with seeding, mulch, hydraulic erosion control products (HECPs), and/or rolled erosion control products (RECPs). They can be used to stabilize slopes until the permanent vegetation becomes established.

Common Failures or Misuses

- Unless they are placed in a trench, run-off can flow underneath Fiber Rolls and cause failure.
- Unless they are properly staked, Fiber Rolls can be transported by high flows.
- Water can flow between Fiber Rolls if they are not overlapped.
- Fiber Rolls must be placed perpendicular to flow (parallel to the slope contour).
- Fiber Rolls will not work if the slope is slumping, creeping, or sliding.

SPECIFICATIONS

Standard Specification

- 669 – Fiber Rolls for Erosion and Sediment Control

Drawings

- BMP-10.00 Fiber Rolls for Erosion and Sediment Control
- BMPs -31.00, 32.00 and 33.00 Temporary Check Dam

BMP 10.01.b. Fiber Rolls for Sediment Control

DESIGN CONSIDERATIONS

Objectives

The purpose of Fiber Rolls for Sediment Control is to trap sediment and prevent it from being transported out of the project area, to another area, or to waters of the U.S.

Description

Fiber Rolls are long rolls of material such as wood excelsior, rice or wheat straw, flax, coconut fibers, or compost, which is rolled or bound in a tight tubular roll and wrapped in plastic or biodegradable netting. They are typically about 8 inches in diameter and under 30 feet long.

They may come pre-fabricated or they can be fabricated on-site.

Other Names

Wattles, Straw Wattles, Straw Rolls, Coir Logs, Excelsior Log, Straw Log, Filter Logs, Fiber Logs.

Applicability

Fiber Rolls can be placed at the perimeter of a project, below the toe of exposed and erodible slopes, and around temporary stockpiles. They may also be used for inlet protection. They can be used at other locations at the project site for erosion control.

Selection Considerations

- Use in areas of low shear stress.
- Avoid use on slopes that could build up ice; for instance, where seepage occurs.
- They are effective for one to two seasons.
- Fiber Rolls can be staked to the ground using willow cuttings to increase revegetation efforts. Since the Fiber Roll will retain moisture, it will provide a good site for the willow cuttings to root. The Alaska Department of Fish and Game has prepared guidance for willow cuttings and dormant cuttings in the *Streambank Revegetation and Protection: A Guide for Alaska* at:
<http://www.adfg.alaska.gov/index.cfm?adfg=streambankprotection.staking>

and

<http://www.adfg.alaska.gov/index.cfm?adfg=streambankprotection.cuttings>

- The quantity of sediment that a roll can capture prior to maintenance is limited to one-half the exposed height of the roll.
- Rolls will be difficult to move once they are saturated. Determine whether Fiber Rolls must be removed at the end of the project based on the use of the area. If removal is required, specify in the plan set and require removal of netting upon final stabilization.

Relationship to Other Erosion and Sediment Control Measures

Fiber Rolls are best used in combination with seeding, mulch, hydraulic erosion control products (HECPs), and/or rolled erosion control products (RECPs).

- Fiber Rolls can be used in place of silt fence. The advantage of fiber rolls over silt fence is that installation is much easier, they do not have to be removed, and hydroseeding can be done after their installation.
- Compost socks can be used in place of Fiber Rolls and do not require trenching. Compost socks are also heavy enough that they can be placed on paved surfaces.
- A prefabricated barrier system can be used in place of fiber rolls and requires a smaller trench. A prefabricated barrier system can also be adhered to paved surfaces.

Common Failures or Misuses

- Unless they are placed in a trench and have tamped backfill in the trench on the uphill side, runoff can flow underneath Fiber Rolls and cause failure.
- Unless they are properly staked, Fiber Rolls can be transported by high flows.
- Water can flow between Fiber Rolls if they are not overlapped.

- Fiber Rolls must be placed perpendicular to flow (parallel to the slope contour).
- Fiber Rolls will not work if the slope is slumping, creeping, or sliding.

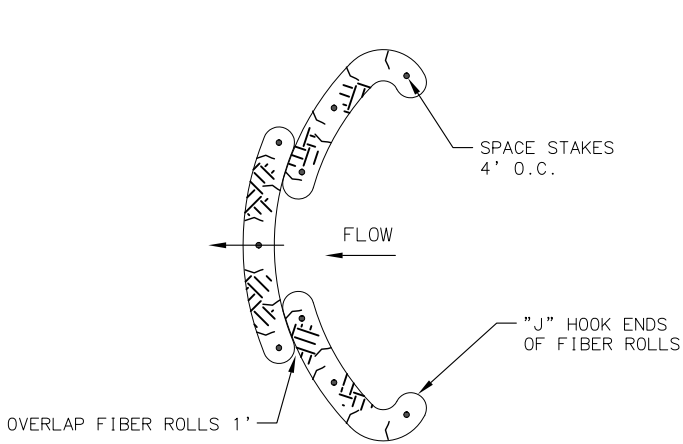
SPECIFICATIONS

Standard Specification

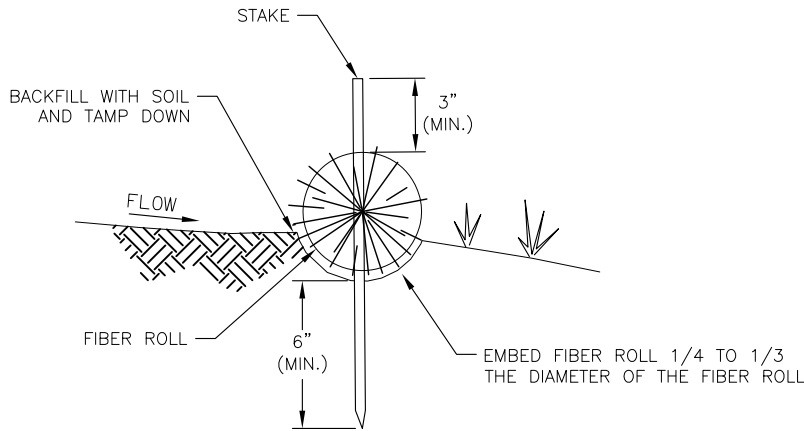
- 669 – Fiber Rolls for Erosion and Sediment Control

Drawings

- BMP-10.00 Fiber Rolls for Erosion and Sediment Control
- BMP-08.00 Culvert Inlet Protection
- BMPs -25.00, 26.00, 27.00, 28.00 and 29.00 Storm Drain Inlet Sediment Protection



PLAN

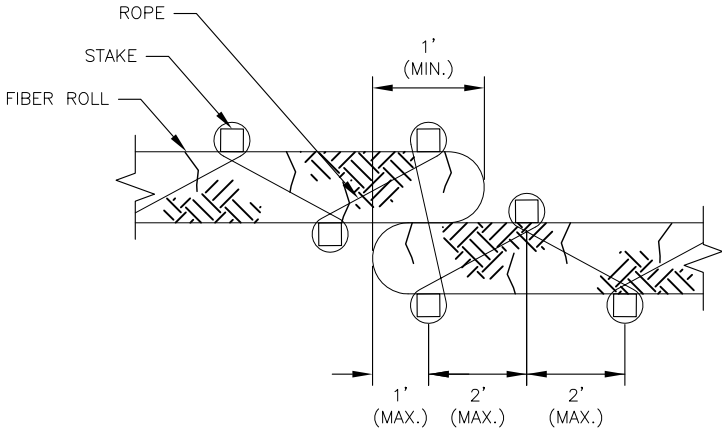


SECTION

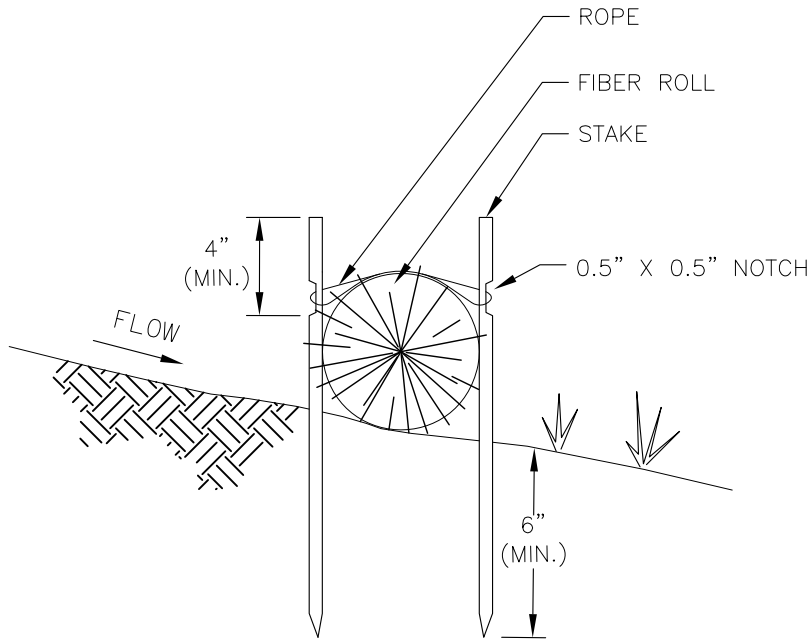
TRENCHED INSTALLATION

NOT TO SCALE

- TRENCHED INSTALLATION NOTES:
1. DIG TRENCHES AND PLACE FIBER ROLLS IN THE TRENCHES.
 2. CURVE BACK THE UPSLOPE END OF THE FIBER ROLL IN A "J" HOOK.
 3. SPREAD EXCAVATED MATERIAL EVENLY ALONG THE UPHILL SLOPE AND COMPACT USING HAND TAMPING OR OTHER METHODS.
 4. STAKE THE ROLL EVERY 4 FEET AND WITHIN 1-FOOT OF THE ENDS. LEAVE 3 INCHES OF THE STAKE ABOVE THE ROLL.
 5. DRIVE STAKES THROUGH THE MIDDLE OF THE FIBER ROLL.
 6. IF REQUIRED, PILOT HOLES FOR THE STAKES MAY BE CREATED BY DRIVING A STRAIGHT BAR THROUGH THE ROLL.



PLAN

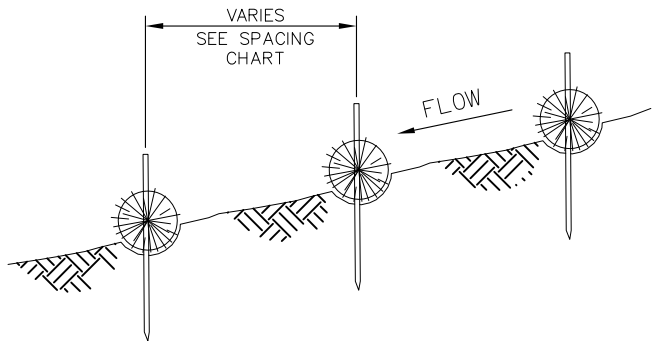


SECTION

ROPE INSTALLATION

NOT TO SCALE

ALL-PURPOSE BIODEGRADABLE
ROPE 3/8 OR LARGER



TYPICAL SPACING CHART	
SLOPE	SPACING (FEET)
1:1	10
2:1	20
3:1	30

SLOPE INSTALLATION

NOT TO SCALE

- SLOPE INSTALLATION NOTES:
1. INSTALL ON A SLOPE TO SHORTEN THE SLOPE LENGTH.
 2. START INSTALLATION DOWNSLOPE.
 3. SPACE ROLLS ACCORDING TO THE SPACING CHART AND DECREASE SPACING ON MORE ERODIBLE SOILS AND INCREASE SPACING ON ROCKY SOILS.

FIBER ROLL GENERAL NOTES:
MATERIALS

FIBER ROLLS: THE NETTING MAY BE UV-DEGRADABLE POLYPROPYLENE, BIODEGRADABLE BURLAP, JUTE OR COIR. THE FILLINGS MAY BE STRAW, FLAX, RICE, OR COCONUT-FIBER. MINIMUM DIAMETER OF 6 INCHES.

STAKES: 1-INCH BY 1-INCH WOODEN STAKES 24 INCHES LONG (18 INCHES IF SOILS ARE ROCKY) OR 3/8-INCH REBAR WITH SAFETY CAPS OR 3/4-INCH TO 1 1/2-INCH DIAMETER LIVE WILLOW CUTTINGS. IF USING LIVE WILLOW CUTTINGS, DO NOT INSTALL ROPE.

INSTALLATION

1. PLACE FIBER ROLLS PERPENDICULAR TO FLOW AND PARALLEL TO THE SLOPE CONTOUR.
2. AT THE END OF THE ROLL, TURN THE END UPSLOPE TO PREVENT RUN-OFF FROM GOING AROUND THE ROLL END.

INSPECTION

1. ENSURE THAT THE ROLLS ARE IN CONTACT WITH THE SOIL AND THOROUGHLY ENTRENCHED.
2. LOOK FOR SCOURING UNDERNEATH THE ROLLS.
3. LOOK FOR SPLIT, TORN, UNRAVELING, OR SLUMPING FIBER ROLLS.
4. ENSURE EQUIPMENT HAS NOT DRIVEN OVER THE INSTALLED FIBER ROLLS.

MAINTENANCE

1. REPLACE DAMAGED SECTIONS OF FIBER ROLL.
2. REMOVE ACCUMULATED SEDIMENT UPSLOPE OF THE ROLL BEFORE IT REACHES ONE-HALF THE DISTANCE BETWEEN THE TOP OF THE FIBER ROLL AND THE GROUND SURFACE. ~~WHEN PROTECTING A WATER BODY OR STORM DRAIN INLET, REMOVE ACCUMULATED SEDIMENT UPSLOPE OF THE ROLL WHEN IT REACHES ONE-THIRD OF THE DISTANCE BETWEEN THE TOP OF THE FIBER ROLL AND THE GROUND SURFACE.~~

REMOVAL

1. REMOVE FIBER ROLLS WHEN THE AREA IS STABILIZED OR WHEN THEY ARE NO LONGER NECESSARY.
2. COLLECT AND DISPOSE OF THE ACCUMULATED SEDIMENT.
3. REMOVE AND DISPOSE OF FIBER ROLLS.
4. FILL THE TRENCHES AND STAKE HOLES TO BLEND WITH THE ADJACENT GROUND AND REVEGETATE AS NECESSARY.

RETENTION

1. LEAVE FIBER ROLLS IN PLACE WHEN THE AREA IS STABILIZED OR WHEN THEY ARE NO LONGER NECESSARY.
2. COLLECT AND DISPOSE OF THE ACCUMULATED SEDIMENT.
3. REMOVE AND DISPOSE OF THE NETTING, STAKES, AND ROPE.

REVISIONS		
Date	Description	By
7/6/2018	Adjusted Stake Spacing from 4' to 2' in Rope Plan	Missler
State of Alaska DOT&PF		
FIBER ROLLS FOR EROSION AND SEDIMENT CONTROL		
APPROVED		
Date	7/06/2018	

BMP 36: Construction Timing

Description

Proper timing and sequencing of construction activities minimizes erosion and sediment transport by coordinating land-disturbing activities and erosion and sediment control measures installation and by completing construction during periods of low erosion potential (Figure 97). In construction phasing, only a portion of a site is disturbed at one time, and final stabilization is completed before moving on to another part of the site, which limits potential erosion (BMP 1: Minimize Land Disturbance, BMP 39: Clearing Limits, BMP 38: Preserve Topsoil and Vegetation, and BMP 45: Minimize Soil Compaction).

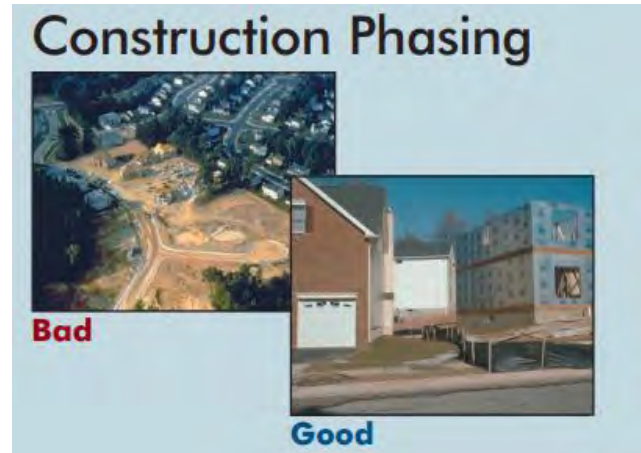


Figure 97. Construction phasing reduces the amount of time soil is exposed (EPA 2003).

Applicability

All construction projects can benefit from upfront planning to phase and sequence construction activities to minimize the extent and duration of disturbance.

Large construction projects and areas where work activities can be timed to coincide with periods of low erosion potential, such as during dry weather, especially benefit from good construction timing. Small projects that are less than 5 acres in size and occur during a short time period during the dry season may qualify for waived NPDES permitting requirements. See EPA's [rainfall erosivity waivers](#).

Limitations

Timing construction based on seasonal limitations may not always be possible due to bidding, letting, timing, and contract administration. Additional restrictions may exist on scheduling or sequencing of certain work activities and the maximum allowable exposure of surface area based on environmental permits and requirements.

Primary BMP Functions and Controls

- | | |
|---|--|
| <input checked="" type="checkbox"/> Construction | <input type="checkbox"/> Permanent |
| <input checked="" type="checkbox"/> Erosion Control | <input checked="" type="checkbox"/> Sediment Control |
| <input type="checkbox"/> Source Control | <input type="checkbox"/> Flood Control |
| <input type="checkbox"/> Filtration | <input type="checkbox"/> Infiltration |

Typical Effectiveness for Targeted Pollutants

- Sediment
- Phosphorus
- Metals
- Bacteria
- Hydrocarbons
- Litter

Other BMP Considerations

Relative Cost	\$
Maintenance Requirements	Low
Ease of Installation	Easy
Freeze/Thaw Resistance	N/A
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	ABCD
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

Design Basis

The locations and dimensions of BMPs appropriate to the major phases of development should be clearly identified on the SWPPP map and included in the construction drawings (Table 21). In some cases, several drawings may be needed to show construction-phase BMPs placed according to phases of construction (e.g., clearing and grading, utility installation, active construction, and final stabilization) as erosion and sediment controls needed at a site will change as construction progresses.

Consider site characteristics and permit conditions when deciding what kind of erosion control devices to incorporate into a construction project. Select measures that can be installed without disrupting critical timing or sequencing of other construction or erosion control activities.

Construction Guidelines

Phasing

Typical phasing best practices include the following:

- Conduct work in phases so that some portions of the project site are final-graded and stabilized before the next phase of the project is started.
- Limit the amount of disturbed area at any given time on a site to the extent practical. For example, a 100-acre subdivision might be constructed in five phases of 20 acres each.
- If stockpiled material is carried over from one phase to the next, position carryover material in a location easily accessible for the pending phase so the stabilized area is not disturbed.

Timing and Sequencing

Typical timing and construction sequencing best practices include the following:

- Schedule construction during seasonal low-runoff periods under favorable soil moisture conditions, whenever possible.
- Allow time to install sediment collection systems, drainage systems, and runoff diversion devices before beginning ground-disturbing work in an area.
- Install and maintain effective soil stabilization measures as work progresses, not just when construction is completed.
- ~~Initiate slope stabilization measures within 14 calendar days after construction activities in the portion of the site where earthmoving activities have temporarily or permanently ceased.~~
- Develop a scheduling/sequencing plan addressing the construction sequencing to reduce erosion potential. If using a Critical Path Method (CPM) for scheduling, incorporate the erosion control and storm water management practices into the method.

* Stabilization will be initiated immediately whenever any clearing, grubbing, excavating or other earth disturbing activities have permanently ceased or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 days

Table 21. Recommended BMPs for construction phases (Colorado UDFCD 2010).

Project Phase	Best Management Practice
Predisturbance site access	<ul style="list-style-type: none"> • Install sediment controls downgradient of access point (on paved streets this may consist of inlet protection) (BMP 66, BMP 74). • Establish vehicle tracking control at entrances to paved street. Fence as needed (BMP 40, BMP 65). • Use construction fencing to define the project's boundaries and limit access to areas of the site not to be disturbed (BMP 41). <p>Note: it may be necessary to protect inlets in the general vicinity of the site, even if not downgradient, if there is a possibility that sediment tracked from the site could contribute to the inlets.</p>
Site clearing and grubbing	<ul style="list-style-type: none"> • Install perimeter controls (e.g., silt fence and wattles) as needed on downgradient perimeter of site (BMP 64, BMP 65). • Limit disturbance to areas planned for disturbance and protect undisturbed areas within the site (e.g., construction fence and flagging) (BMP 1, BMP 2, BMP 3, BMP 39). • Preserve vegetative buffer at site perimeter (BMP 2, BMP 38). • Create stabilized staging area (BMP 37). • Locate portable toilets on flat surface away from drainage paths. Stake in areas susceptible to high winds (BMP 50). • Construct concrete washout area and provide signage (BMP 47). • Establish waste disposal areas (BMP 51). • Install sediment basins (BMP 66). • Create dirt perimeter berms and or brush barriers during grubbing and clearing (BMP 70). • Separate and stockpile topsoil; leave roughened and/or cover (BMP 31). • Protect stockpiles with perimeter control BMPs. Locate stockpiles away from drainage paths and access from the upgradient side so perimeter controls can remain in place on the downgradient side. Use erosion control blankets, temporary seeding, and/or mulch for stockpiles that will be inactive for an extended period (BMP 44). • Leave disturbed area of site in a roughened condition to limit erosion. Consider temporary revegetation for areas of the site that have been disturbed but will be inactive for an extended period (BMP 8, BMP 32, BMP 58). • Water to minimize dust but not to the point that watering creates runoff (BMP 43).
Utility and infrastructure installation	<p>In addition to the BMPs above:</p> <ul style="list-style-type: none"> • Close trench as soon as possible (generally at the end of the day). • Use rough-cut street control or apply road base for streets that will not be promptly paved (BMP 40, BMP 41). • Provide inlet protection as streets are paved and inlets are constructed (BMP 74). • Protect and repair BMPs as necessary. • Perform street sweeping as needed (BMP 75).
Building construction	<p>In addition to the BMPs above:</p> <ul style="list-style-type: none"> • Implement materials management and good housekeeping practices for home building activities (BMP 80, BMP 90). • Use perimeter controls for temporary stockpiles from foundation excavations (BMP 44). • For lots adjacent to streets, lot-line perimeter controls may be needed at the back of curb (BMP 41).
Final grading	<p>In addition to the BMPs above:</p> <ul style="list-style-type: none"> • Remove excess or waste materials (BMP 48, BMP 49, BMP 50, BMP 51). • Remove stored materials (BMP 32).

Project Phase	Best Management Practice
Final stabilization	<p>In addition to the BMPs above:</p> <ul style="list-style-type: none"> • Seed and mulch/ tackify (BMP 32, BMP 52). • Seed and install blankets on steep slopes (BMP 32, BMP 53, BMP 54) • Remove all temporary BMPs when site reaches final stabilization (BMP 62, BMP 68, BMP 70).

Maintenance

Continually monitor site conditions and work progress. Update the project work schedule to maintain appropriate timing and sequencing of construction and control applications. When the construction schedule is altered, erosion and sediment control measures in the SWPPP and construction drawings should be adjusted to reflect exiting conditions. Maintain appropriate erosion and sediment control measures that align with construction phasing and sequencing.

Additional Resources

Colorado UDFCD (Colorado Urban Drainage and Flood Control District). 2010. *Urban Storm Drainage Criteria Manual, Volume 3 Best Management Practices*. Denver, CO.
<http://udfcd.org/wp-content/uploads/2014/07/Title-Page.pdf>

ITD (Idaho Transportation Department). 2014. *Best Management Practices*. Boise, ID: ITD.

Washington State Department of Ecology. 2012. *Stormwater Management Manual for Western Washington*. Lacey, WA. Publ. 12-10-030.
<http://www.ecy.wa.gov/programs/wq/stormwater/manual.html>

BMP 38: Preserve Topsoil and Vegetation

Description

Protect topsoil and vegetation (e.g., trees, grasses, and other plants) by preventing disturbance or damage to specified areas of the construction site. Preserving natural vegetation and native topsoil prevents soil erosion by minimizing the amount of bare soil exposed to erosive forces (Figure 99). Vegetation also provides storm water detention, biofiltration, and aesthetic value.

Even if existing vegetation will not remain permanently after construction is completed, existing vegetation and topsoil can still be preserved with proper phasing during construction to provide a stable surface cover.



Figure 99. Preserve vegetation (Elkhart County SWCD 2007).

Applicability

This BMP applies to all construction sites with existing vegetation. Areas where preserving vegetation and topsoil can be particularly beneficial are floodplains, wetlands, streambanks, steep slopes, and other areas where structural erosion controls would be difficult to establish, install, or maintain.

Compared to newly planted or seeded areas, preserving natural vegetation has many advantages:

- Handles higher quantities of storm water runoff than newly seeded areas.
- Does not require time to establish.
- Greater filtering capacity because the vegetation and root structure are denser in preserved natural vegetation than in newly seeded areas.
- Requires less maintenance, watering, and chemical application (e.g., fertilizer and pesticides) than new vegetation.
- Enhances aesthetics.
- Provides areas for infiltration, reducing the quantity and velocity of storm water runoff.
- Allows areas where wildlife can remain undisturbed.
- Provides noise buffers and visual screens for construction operations.

Primary BMP Functions and Controls

- | | |
|---|---|
| <input checked="" type="checkbox"/> Construction | <input type="checkbox"/> Permanent |
| <input checked="" type="checkbox"/> Erosion Control | <input type="checkbox"/> Sediment Control |
| <input type="checkbox"/> Source Control | <input type="checkbox"/> Flood Control |
| <input type="checkbox"/> Filtration | <input type="checkbox"/> Infiltration |

Typical Effectiveness for Targeted Pollutants

- Sediment
- Phosphorus
- Metals
- Bacteria
- Hydrocarbons
- Litter

Other BMP Considerations

Relative Cost	\$
Maintenance Requirements	Low
Ease of Installation	Easy
Freeze/Thaw Resistance	Good
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	ABCD
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

Limitations

Preserving natural vegetation may be impractical in some situations because it may constrict the area available for construction activities, or it may not be cost-effective in areas with high land values. In areas with high land values, projects may need to be designed with little or no vegetation intended to remain to maximize development density. For sites with diverse topography, it may be difficult and expensive to save existing vegetation while grading the site for the development.

Design Basis

Successfully preserving vegetation requires good planning and site management. Preserving natural vegetation may affect some aspects of staging, work sequencing, and construction cost. Erosion control measures may be needed around the perimeter of the preserved area to maintain adequate water flow and drainage and prevent damage from excessive erosion or sedimentation.

Identify areas to be protected on the construction plans. Preserve individual natural vegetation, such as trees, shrubs, or vines, although preserving vegetation in clumps may be more practical. Protection areas should extend to the dripline of any trees to be preserved. The dripline marks the edge of the tree's foliage where drips from rainfall would drop. When selecting trees to be preserved, consider the location, vigor, age, species, and wildlife benefits of the tree. Healthy, older trees that are well-suited to the site conditions and are beneficial to wildlife are most important to preserve.

Vegetation protection areas should be marked in the field before any site disturbance begins. Clearly mark the areas to be preserved with construction fencing and/or a perimeter control, such as silt fencing (BMP 65) or fiber rolls (BMP 64) if the protected area is located downgradient of areas to be disturbed. Use appropriate fence posts and adequate post spacing and depth to completely support the fence in an upright position. No construction activity, including stockpiling, materials storage, or equipment parking, should be allowed within the protected area.

Plants must be protected from three types of injuries possible during construction: impacts, grade changes, and excavations. By instructing employees and subcontractors to honor the limits of protection areas, the vegetation should be protected from these injuries.

Construction Guidelines

Check the project plans for areas designated for preserving natural vegetation. Keep all construction equipment, materials, and waste out of the designated areas. Root pruning and fertilizing before construction is recommended where trees are near the edge of protected areas. These practices should be supervised by a licensed arborist for the maximum survival rate.

Do not modify existing drainage patterns through or into any preservation area unless specifically directed by the plans or approved by the local permitting authority.

Retain protective fencing until all construction activity is complete to avoid damage during site cleanup and final stabilization.

Maintenance

Inspect fencing at regular intervals to ensure it is in place, and the preserved vegetated areas remain undisturbed and are not overwhelmed by sediment. Implement maintenance or restorative actions as needed. Proper maintenance is important to ensure healthy vegetation that can control erosion.

Different species, soil groups, and climatic conditions will require different maintenance activities such as mowing. Perform maintenance regularly, especially during construction.

If damage occurs to a tree, consult an arborist for guidance on how to care for the tree. If a tree in a designated preservation area is damaged beyond repair, remove and replace with a 2-inch diameter tree of the same or similar species. If damage occurs to vegetation, reseed the area with the same or similar species.

Additional Resources

CASQA (California Stormwater Quality Association). 2015. *California Stormwater Best Management Practices Handbook: Construction*. Menlo Park, CA. <https://www.casqa.org>

Colorado UDFCD (Colorado Urban Drainage and Flood Control District). 2010. *Urban Storm Drainage Criteria Manual, Volume 3 Best Management Practices*. Denver, CO. <http://udfcd.org/wp-content/uploads/2014/07/Title-Page.pdf>

Elkhart County SWCD (Elkhart County Soil and Water Conservation District). 2007. *BMP Hall of Fame*. Goshen, IN.

EPA (US Environmental Protection Agency). 2014. *Preserving Natural Vegetation*. Water: Best Management Practices. <https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#edu>

King County (King County, Washington). 2009. *King County, Washington Surface Water Design Manual*. Seattle, WA: King County, Department of Natural Resources.

BMP 43: Dust Control

Description

Dust control and wind erosion prevention BMPs keep soil particles from entering the air as a result of land-disturbing construction activities by protecting the soil surface, roughening the surface, and/or reducing the surface wind velocity (Figure 113).

Dust control practices apply to either disturbed graded areas or construction roadways. For disturbed graded areas, practices such as seeding or sodding (BMP 32), mulching (BMP 52), using soil binders (BMP 55), sprinkling, surface roughing (BMP 58) or practices that provide prompt surface cover can be used. For construction roadways, practices such as using a stabilized surface (BMP 41), sprinkling, or using chemical dust tackifiers are options. Wind barriers can control wind currents and minimize the amount of dust transported into air and water.

Applicability

Use control measures on any construction site where the potential exists for air or water pollution from dust, especially when open, dry areas of soil are anticipated on site and where heavy construction activity such as clearing, grading, excavation, demolition, or excessive vehicle traffic takes place. Dust control is especially important in regions experiencing long periods without rain and during the summer when soil can become dry and vulnerable to transport by wind. In many cases, water erosion control measures incorporated into the project will indirectly prevent wind erosion.

Limitations

Vegetative dust control measures may not be practical during dry periods without a reliable supply of establishment water. Other methods should be stipulated in the project contract to ensure that dust control is not overlooked.



Figure 113. Sprinkling water for dust control on a pathway construction project, Driggs, Idaho.

Primary BMP Functions and Controls

- | | |
|---|---|
| <input checked="" type="checkbox"/> Construction | <input type="checkbox"/> Permanent |
| <input checked="" type="checkbox"/> Erosion Control | <input type="checkbox"/> Sediment Control |
| <input type="checkbox"/> Source Control | <input type="checkbox"/> Flood Control |
| <input type="checkbox"/> Filtration | <input type="checkbox"/> Infiltration |

Typical Effectiveness for Targeted Pollutants

- | | |
|---|--------------|
| ● | Sediment |
| ○ | Phosphorus |
| ◐ | Metals |
| ○ | Bacteria |
| ◐ | Hydrocarbons |
| ○ | Litter |

Other BMP Considerations

Relative Cost	\$
Maintenance Requirements	Medium
Ease of Installation	Easy
Freeze/Thaw Resistance	Good
Max. Tributary Drainage Area	N/A
Max. Upstream Slope	N/A
NRCS Soil Group	ABCD
Min. Ground Water Separation	N/A
Min. Bedrock Separation	N/A

Wind barriers (such as walls or fences) can be part of the long-term dust control strategy in arid and semiarid areas, but they are not a substitute for permanent stabilization.

Chemically treated subgrades may make the soil water repellent, interfering with long-term infiltration and vegetation/revegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents that must be handled properly.

Overwatering may cause erosion and wash sediment or other constituents into the drainage system.

Design Basis

Develop a dust control plan before construction. The plan should evaluate the site with potential dust emission sources identified, provide a selection of dust control methods for each area of the site, determine the maintenance needed, and monitor the effectiveness of the selected dust control measures. The site evaluation should consider the soil type, prevailing wind direction, and effects of other prescribed erosion control measures.

Dust Prevention

The best method of controlling dust is to prevent dust production:

- **Minimize the surface area disturbed**—By limiting the amount of bare soil exposed at one time, less ground is disturbed, less dust is raised while working, and less cleanup is required when work is done. During project design, identify areas where ground disturbance will not be allowed and fence or provide signage during construction. Design and locate haul roads, detours, and staging areas to avoid unnecessary exposure of bare ground.
- **Limit dusty work on windy days**—Minimize amount of ground disturbance occurring when potential for wind erosion is highest. Apply dust suppression measures when needed. Monitor dust suppression efforts to ensure dust emissions are adequately controlled. Depending on weather conditions, adjust to fewer or more frequent application intervals.
- **Clean up dusty spills immediately**—Do not wait for the next scheduled housekeeping; the mess will just get bigger and cleanup will take longer.
- **Plan ahead to limit dust**—Avoid using areas most susceptible to wind erosion. In the storm water site plan, specify staging or work-sequencing techniques that minimize the risk of wind erosion from bare soil. In most cases, a change will be required from traditional construction techniques that allow large areas to be disturbed at the outset of construction and remain exposed for long periods of time.

Graded Areas

Clearing and grading activities create the opportunity for large amounts of dust to become airborne. Stabilize graded areas as soon as practicable after disturbance and do not leave open areas uncovered. The following practices can help with dust control in graded areas:

- **Grow vegetative ground cover**—Exposed areas that are not being paved should be stabilized using vegetation and landscaping (BMP 32) to prevent wind and water erosion. When rainfall is insufficient to establish vegetative cover, mulching (BMP 52) conserves

moisture, prevents surface crusting, reduces run-off erosion, and helps to establish vegetation. It is a critical treatment on sites with erosive slopes.

- **Use wind barriers**—Barriers prevent erosion by obstructing the wind near the ground and preventing the soil from blowing off site. Wind, snow, or silt fences or similar barriers are temporary measures that can reduce wind velocity. Perennial grass, bushes, stands of trees, rock walls, wooden board fences, or earthen banks are more permanent measures that can serve as wind barriers. A wind barrier generally protects soil downwind for a distance of 10 times the height of the barrier. If additional protection is needed, use other methods with the barrier.
- **Surface roughening**—Deep tillage in large open areas brings soil clods to the surface where they rest on top of dust, preventing it from becoming airborne. Tilling or disking should leave 6-inch (minimum) furrows, preferably perpendicular to the prevailing wind direction, to gain the greatest reduction in wind erosion. If the surface cannot be furrowed perpendicular to the prevailing wind direction, roughening the surface by using a ripper/scarifier (grader) or a ripper (cat) will produce the desired result of a 6-inch irregular surface. BMP 58: Slope Roughening provides more information.

Construction Roadways and Storage Areas

Temporary construction roads and storage areas should be stabilized using recommendations in BMP 42: Erosion Prevention on Construction Roads to minimize the amount of dust generated by construction vehicles. Other recommendations for dust control on construction roadways and storage areas include the following:

- **Water and/or sweep often**—Sprinkle the site with water until the surface is wet. Apply at a rate of 3 gallons per acre so that the soil is wet but not saturated or muddy and so that no dust is being generated. To ensure vehicle traffic is not picking up dust from wind action and carryout, water and sweep roadways often. Fewer treatments are necessary in cool, wet weather.
- **Spray-on chemical soil treatments (palliatives)**—Spray-on soil binders form a bond between soil particles keeping them grounded. Chemicals include mineral salts, petroleum resins, asphalt emulsion, acrylics, and adhesives. These treatments must be reapplied periodically to ensure continued effectiveness. Chemical tackifiers should only be used on mineral soils, and the chemicals should not create any adverse effects on storm water, plant life, surface water, or ground water. Check with DEQ to ensure the material to be applied is not harmful and may be used for this purpose.
- **Reduce speed limits**—Reduce speed limits on unpaved surfaces to 10 to 15 miles per hour for well-traveled areas and heavy vehicles. Never exceed 25 miles per hour for any vehicle on any unpaved surface.
- **Prevent transport of dusty material off site**—Minimize transport of dusty material off site by rinsing vehicles before they leave the property, tightly cover loaded trucks, and provide stabilized construction roads and staging areas (BMP 41).
- **Enclose storage and handling areas**—If dusty materials are frequently loaded and unloaded in storage and handling areas, enclose the areas to reduce dust production. Use storage silos, three-sided bunkers, or open-ended buildings. If handling is less frequent, try wind fencing. Conveyor loading may require enclosure or the use of water or foam spray bars both above and below the belt surface to reduce emissions.

- **Keep storage piles covered**—When storage piles are not in use, apply a physical cover or a dust suppressant spray to reduce dust emissions. Limit the working face of the pile to the downwind side. Most emissions come from loading the pile, loadout from the pile, and truck and loader traffic in the immediate area if the pile is batch loaded. Keep the drop height low to reduce dust and the ground at the base of the pile clear of spills.

Construction Guidelines

Dust control measures should be considered and selected before clearing and grading activities. During construction, monitor dust control activities on a regular basis to ensure the measures taken are adequately preventing airborne dust from leaving the site.

Maintenance

Dust control requires constant attention: it is not a one-time or once-in-awhile activity. Dust control sprinkling may have to be done several times a day during hot, dry weather.

Areas protected by mulch, adhesive emulsions, or barriers need to be checked at regular intervals according to the inspection schedule in the storm water plan.

Apply spray-on chemical treatments using the manufacturer's specified rates and according to all federal, state, and local regulations. Chemical products should be stored, handled, and disposed of according to all applicable local and state regulations and policies.

Additional Resources

DEQ (Idaho Department of Environmental Quality). 2013. *Controlling Fugitive Dust at Construction Sites*. Boise, ID: DEQ.

EPA (US Environmental Protection Agency). 2014. *Dust Control*. Water: Best Management Practices. <https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#constr>

BMP 14.00. Prefabricated Driving Ground Protection Mat

DESIGN CONSIDERATIONS

Objectives

The purpose of a Prefabricated Driving Ground Protection Mat is to prevent rutting, minimize sediment tracking, protect wetlands from equipment damage, and avoid equipment getting stuck when driving through soft or muddy ground.

Description

Prefabricated Ground Protection Mats are flexible, sturdy fabric mats with ribs, or solid or flexible plastic mats or tiles.

Other Names

Mud Mats, Tundra Mats, Portable Access Mats, Temporary Roadway System.

Applicability

Prefabricated Driving Ground Protection Mats can be used to protect the ground surface from eroding when equipment is driving on it or to protect sensitive areas.

Selection Considerations

Prefabricated Driving Ground Protection Mats come in light- and heavy-duty grades. The grade of the mat needed should be determined based on the size and type of equipment that will use the mat, the frequency of use, and the type of ground the mat is protecting. Mats that are placed over a ground surface that requires preservation may require a heavier grade than mats placed on dirt surfaces without vegetation.

Prefabricated Driving Ground Protection Mats surfaces can be smooth or cleated to provide traction for vehicular traffic or pedestrians. When placed with the cleated side down, the cleats provide additional protection for solid surfaces such as concrete or asphalt surfaces.

- Prefabricated Driving Ground Protection Mats have the ability to interlock to form custom sizes.
- Ground pressure from vehicles may be reduced, causing minimal ground disturbance.

- Prefabricated Driving Ground Protection Mats can be rolled up or stacked for easy transport, storage, and reuse.
- Prefabricated Driving Ground Protection Mats can be washed and reused depending on the amount of wear.

Common Failures or Misuses

- Placement of reinforcing ribs in fabric mats parallel to the direction of traffic.
- Unless properly secured, mats can be dislodged or transported by traffic or high winds.

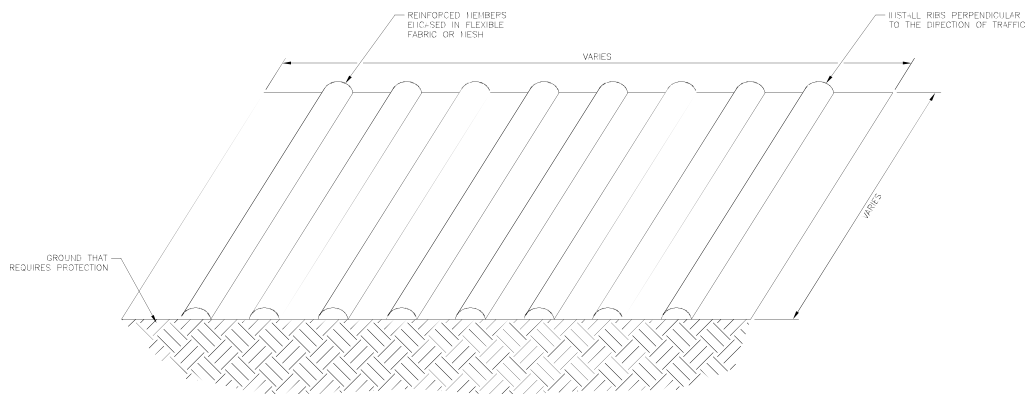
SPECIFICATIONS

Standard Specification

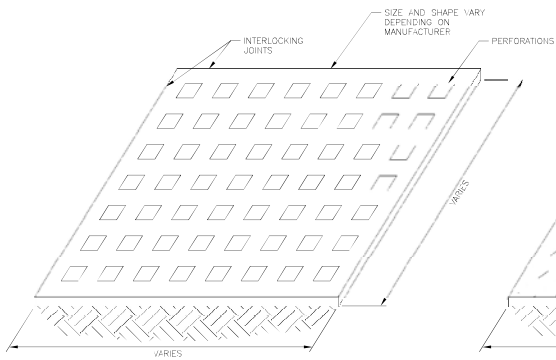
- 676 – Prefabricated Driving Ground Protection Mat

Drawing

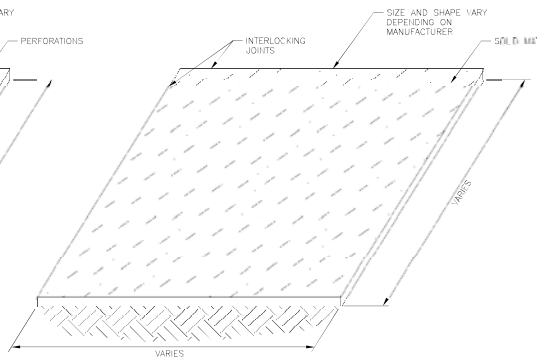
- BMP-14.00 Prefabricated Driving Ground Protection Mat



FABRIC MATS
NOT TO SCALE



PERFORATED PLASTIC MATS
NOT TO SCALE



NON-PERFORATED PLASTIC MATS
NOT TO SCALE

PREFABRICATED DRIVING GROUND PROTECTION MAT NOTES:
MATERIALS
PREFABRICATED GROUND PROTECTION MAT

INSTALLATION

1. ENSURE THAT THE GROUND IS CLEAR OF LARGE ROCKS OR OBJECTS.
2. LAY THE MAT FLAT ONTO SURFACE.
3. INTERLOCK MULTIPLE MATS TO COVER AREAS THAT REQUIRE PROTECTION.
4. CONNECT THE MATS ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

INSPECTION

1. LOOK FOR SPLIT, TORN, OR UNRAVELLING FABRIC OR BROKEN UNITS.
2. ENSURE THAT THE MATS ARE COVERING AREAS THAT REQUIRE PROTECTION.
3. ENSURE VEHICLES DO NOT DRIVE ON SURFACES OUTSIDE OF THE MATS.
4. INSPECT FOR TRACK-OUT.

MAINTENANCE

1. REPLACE DAMAGED MATS.
2. REMOVE SEDIMENT THAT ACCUMULATES ON THE MATS.
3. CLEAN OR REPLACE MATS IF THERE IS EVIDENCE OF TRACK-OUT.

REMOVAL

1. REMOVE AND DISPOSE OF THE ACCUMULATED SEDIMENT THEN REMOVE THE MAT.
2. AFTER REMOVAL OF THE MAT AND IF NOT IN WETLANDS, FILL DISTURBED GROUND TO BLDG WITH THE ADJACENT GROUND AND REVEGETATE AS NECESSARY.

REVISIONS		
Date	Description	By
State of Alaska DOT&PF		
PREFABRICATED DRIVING GROUND PROTECTION MAT		
A P P R O V E D		
Date	12/2015	K/GR/EX

BMP AK-1

Preservation of Existing Vegetation

Purpose and Description

- The purpose of preserving existing vegetation is to limit site disturbance and to minimize soil erosion by identifying and protecting pre-existing vegetation on the construction site.¹

Applicability

- Natural vegetation must be preserved in all areas where no construction is planned or will occur at a later date.
- Clear only land that is needed for building activities or vehicle traffic.²
- This BMP is not to supersede existing guidelines, restrictions or law, preserve vegetation as required by local governments (such as stream buffers).
- The preservation of existing vegetation is an applicable practice in all regions and climates in Alaska.

Design and Installation

- Before any clearing begins, vegetation selected for preservation must be clearly marked with established barriers.³ These barriers must be about 1 meter in height, must be highly visible and be anchored by wood or metal fence posts at spacing and depth that will adequately support the fence for the entirety of the project.¹

- A site map must be prepared clearly outlining all areas of vegetation that is to be preserved.²
- Vehicle traffic, equipment storage and parking shall be kept away from these areas to prevent soil and root compaction.¹
- Ground disturbance must be kept from these areas at least as far out as the leaf drip line.³
- Maintain pre-existing irrigation systems that may supply water to vegetation selected for preservation.¹
- To increase chances of survival it is best to limit grade changes in these areas and areas within the drip line.³

Maintenance and Inspection

- Repair or replace damaged vegetation immediately.²
- Inspect preservation areas regularly, if barrier has been removed or visibility reduced repair or replace barrier so that visibility is restored.³
- If roots are exposed or damaged, prune ends just above damage with pruning shears or loppers and recover with native soil.³

References

- ¹Caltrans Storm Water Quality Handbooks, March 2003, Construction Site Best Management Practices Manual, SS-2 Preservation of Existing Vegetation, [Uhttp://www.dot.ca.gov/hq/construc/stormwater/CSBMPM_303_Final.pdf](http://www.dot.ca.gov/hq/construc/stormwater/CSBMPM_303_Final.pdf)

(Continued on next page)

²USEPA (United States Environmental Protection Agency), October 2000, National Menu of Best Management Practices, Preserving Natural Vegetation,
<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&Rbutton=detail&bmp=34&minmeasure=4>

³Washington State Department of Ecology, February 2005, Storm Water Management Manual for Western Washington, Construction Storm Water Pollution Prevention, BMP C101: Preserving Natural Vegetation,
<http://www.ecy.wa.gov/pubs/0510030.pdf>

BMP 17.00. Rock Slope Armor

DESIGN CONSIDERATIONS

Objectives

The primary purpose of Rock Slope Armor is to protect slopes with erodible or ice-rich soils from wind and water erosion, including rainfall, sheet flow run-on, or seepage. Rock Slope Armor may temporarily stabilize slopes until final stabilization is achieved, or may serve as final non-vegetative permanent stabilization on slopes when implemented in accordance with the Alaska Construction General Permit (Alaska CGP).

Description

Rock Slope Armor is a layer of rock, such as ditch lining rock, cobble rock, concrete rubble, or riprap, which is hand or mechanically placed on an erodible soil slope.

Other Names

Rock Slope Protection.

Applicability

Rock Slope Armor is applicable to:

- Slopes where unanticipated flows are encountered. On a cut slope, this could be due to run-on. A temporary diversion should be installed to allow construction of the cut slope, but the rock slope armor provides permanent stabilization.
- Fill slopes around the inlet and outlet of culverts.
- On bridge abutments above the design water elevation and at points where bridge scuppers discharge near or on abutments.
- The downside of roadway superelevations where the ground surface slopes away from the roadway (foreslopes).
- On slopes where groundwater seeps or springs occur.
- On cut slopes into ice-rich soils or that seep permafrost melt.

Selection Considerations

The designer must have information about the slope length, steepness, embankment or cut slope soil type

and gradation, groundwater seepage, and potential for melting permafrost. The ditch may also need to be lined.

This best management practice (BMP) is not intended for stream banks, channel bottoms, the side slopes of waterbodies below the design high water surface elevation, or for shorelines subject to wave action, because these situations require more design.

Geotechnical expertise is required when using this BMP for embankments over 20 feet in height, embankments on soft or ice-rich soils or potentially unstable ground, embankments that could impact adjacent structures, if there is a potential for a significant groundwater gradient beneath the cut slope or embankment, or if surface water levels are significantly higher on one side of the embankment than the other.

Rock size and range of sizes should be considered. A well graded mix, with rocks in a range of sizes, should be selected. Rocks of uniform rock size, or a rock mix with very large and very small rocks with few intermediate-sized rocks (a "gap-graded" mixture), is more likely to become dislodged causing the armor to fail.

Rock shape should be considered. Angular or sub-angular rocks have better performance than round rocks because they are less likely to become dislodged. Round rock should not be used on slopes steeper than 2:1. Soundness and durability should be indicated.

The designer may specify whether rock is hand placed or spread mechanically. When placing by hand, rocks should be placed so that the longitudinal axis is perpendicular to the slope face and fall line. Rocks may also be dumped and spread in layers using a bulldozer or other means, in which case care should be taken not to damage underlying filter material (if specified). In either case, the larger rocks should be placed in the footing trench, segregation by rock size should be minimized, and rocks should be placed so there is a minimum of voids.

When considering rock for bridge scuppers or downspout energy dissipaters, consider whether downspout extenders to route water to vegetated or stabilized areas could be used instead.

Design

Slope of Area to be Protected: Slopes between 1.5:1 and 3:1. Flatter slopes should be seeded or revegetated; or, if in a location where vegetation cannot be established (such as areas shaded by bridges), consider a pea gravel layer. Steeper slopes require geotechnical engineering and a specification for angular rock.

Rock Properties: Specify rock properties or criteria, such as durability, wear (for instance, per AASHTO T 96), minimal clay lumps and friable particles (for instance, per AASHTO T 112), or shape.

Aarmor Rock Size: When used on a slope, specify a rock size based on steepness of slope, soil type, and expected seepage pore water pressure. Specify whether a key-in trench is required at the toe of the slope and, if so, the key-in dimensions.

Size rock for bridge scuppers or downspout energy dissipaters based on expected flow velocity.

Rock Gradation: Design particle size distribution of the armor rock mix. Once a size range has been designed, the designer can reference an Alaska Department of Transportation & Public Facilities (ADOT&PF) riprap, rock, ditch lining, or aggregate specification (e.g. ADOT&PF's Standard Specification for Highways or Standard Specifications for Airport Construction) if one is available or create a specification for the project's bid documents.

Rock Layer Thickness: Unless rip rap is specified, the designer needs to specify the thickness. If using riprap, the layer thickness will be defined by the riprap classification. Typically, only one layer is needed.

Rock Layer Height and Length: The designer needs to specify this on the plans.

Filter Fabric or Layer: A filter fabric or filter layer should be specified if either of the following apply:

$$\frac{D_{15} \text{ rock armor layer}}{D_{85} \text{ fill or cut slope soil}} > 5$$

or

$$\frac{D_{15} \text{ rock armor layer}}{D_{15} \text{ fill or cut slope soil}} > 40$$

Other Designer Responsibilities: The designer needs to add slope preparation and run-on diversion, as appropriate.

Relationship to Other Erosion and Sediment Control Measures

This should be a BMP of last resort, except in ice-rich permafrost slopes, where it is the preferred treatment. Install upgradient controls to divert water from the slope shoulder where possible. Other temporary or permanent stabilization methods should be considered, including: Rolled Erosion Control Product (RECP), Hydraulic Erosion Control Product, (HECP), Compost Blanket, Temporary Seeding, and Permanent Seeding.

Rock Slope Armor is different from Slope Drain in that it is used to stabilize a slope in response to dispersed or minimally concentrated flow; whereas a Slope Drain is used to convey concentrated flows down a slope to an appropriate discharge location.

Common Failures or Misuses

- Slope too steep for rock size results in rock displacement and downslope movement of rocks.
- Failure to install up-gradient stormwater controls.
- Rock not properly graded results in downslope movement of rocks.

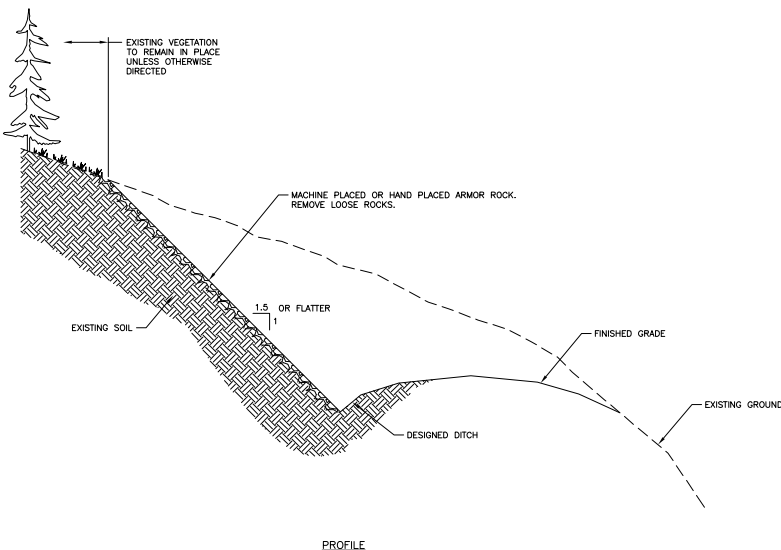
SPECIFICATIONS

Standard Specifications

- 679 – Rock Slope Armor
- 610-2.01 Ditch Lining (0-50 percent less than 3-inch; up to 8-inch maximum)
- 611-2.01 Riprap
- 703-2.10 Porous Backfill (3-inch minus rock)

Drawing

- BMP-17.00 Rock Slope Armor



ROCK SLOPE ARMOR
NOT TO SCALE

ROCK SLOPE ARMOR NOTES:
MATERIALS
ROCK, COBBLE, GRAVEL, CRUSHED GRAVEL, CRUSHED ROCK, OR ANY COMBINATION OF THESE, MEETING SPECIFICATIONS AT 610-2.01 (DITCH LINING), 611-2.01 (RIPRAP), OR 703-2.10 (POROUS BACKFILL). USE ANGULAR ROCK ON SLOPES STEEPER THAN 2:1.

- INSTALLATION
1. PREPARE THE SLOPE AS DESCRIBED IN THE CONTRACT OR AS DIRECTED BY THE ENGINEER.
 2. MINIMIZE CONCENTRATED RUN-ON FROM CROSS-GRADIENT AND UP-GRADIENT SOURCES BY SITE GRADING AND/OR DIRECTING OR DIVERTING RUN-ON OR RUN-OFF AWAY FROM THE SLOPE FACE.
 3. IF SPECIFIED ON THE PLANS OR DIRECTED BY THE ENGINEER, INSTALL THE FILTER FABRIC OR FILTER LAYER. AFTER CLEARING DEBRIS FROM SLOPE INSTALL FILTER FABRIC ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
 4. INSTALL THE ROCK STARTING AT THE BOTTOM OF THE SLOPE AND PROCEEDING IN HORIZONTAL LIFTS UPWARDS.
 5. PLACE STONES TO THE THICKNESS, HEIGHT, AND LENGTH SHOWN ON THE PLANS. DUMP SMALL ROCKS AND SPREAD BY BULLDOZER OR OTHER SUITABLE EQUIPMENT. DURING SPREADING, DO NOT CRACK THE ROCK.

- INSPECTION
1. INSPECT FOR DAMAGE TO THE ROCK ARMOR, INCLUDING DISPLACED STONES, SLUMPING, AND EROSION AT EDGES, ESPECIALLY DOWNSLOPE.

- MAINTENANCE
1. REPAIR DAMAGED ROCK ARMOR SLOPE OR EDGES AS SOON AS PRACTICABLE AND BEFORE FURTHER DAMAGE CAN OCCUR.

REVISIONS		
Date	Description	By
State of Alaska DOT&PF		
ROCK SLOPE ARMOR		
APPROVED		
Date	12/2015	XX/XX/XX

BMP 41.00. Sanitary Waste Management

Objectives

Eliminate discharge of sanitary/septic waste materials to storm drain systems, waters of the U.S., or groundwater.

Description

Provide convenient, well-maintained facilities, arrange for regular service and disposal. Ensure portable facilities include containment to prevent discharge of pollutants.

Applicability

Sanitary Waste Management practices are suitable for construction sites where portable or temporary facilities are required.

Installation

- Install temporary facilities as far away from stormwater drainage systems and waters of the U.S. as practicable.
- Secure from overturning.
- Provide containment to prevent any discharge.
- Ensure the facility is in an area that does not collect water.

Maintenance and Inspection

- Prohibit discharge or burial of sanitary/septic waste materials.
- Clean or replace sanitation facilities regularly. Use a reputable service provider that disposes of or treats the sanitary/septic waste materials in accordance with state and local requirements.
- Inspect facilities regularly for leaks and spills.
- Ensure sanitation facilities are secure from overturning due to high winds or other forces.

BMP 20.00. Silt Fence

DESIGN CONSIDERATIONS

Objectives

The purpose of Silt Fence is to trap sediment and prevent it from being transported out of the project area to another area, or to a water body.

Description

Silt Fence is geotextile fabric secured to posts and secured in a trench, and/or with sandbags or drain rock.

Other Names

Geotextile for Sediment Control, Sediment Barrier.

Applicability

Silt Fence is used downslope from erosion-susceptible terrain to trap sheet flow run-off before the drainage exits the project site. Adequate space must be provided for pooled water on the uphill side of the fence.

Barrier locations are chosen based on site features and conditions (e.g. soil types, climate, terrain features, sensitive areas, etc.), design plans, existing and anticipated drainage courses, and other available erosion and sediment controls. Typical barrier sites are catchpoints beyond the toe of fill, or on sideslopes above waterways or drainage channels.

Although drainage in contact with the fence is to some degree filtered by the geotextile, the fabric's small pores not only block larger-sized eroded particles but also severely restrict water exfiltration rates and behaves like a dam. For this reason, Silt Fences are not to be used for concentrated flows in continuous flow streams or ditches; or as check dams.

Silt Fence can be installed in standing water to provide time for particles to settle.

Silt Fences are used to encircle stockpiled erodible material to prevent off-site sediment transport.

Since Silt Fence installation can cause significant damage, alternative best management practices (BMPs) should be considered for installation instead of Silt Fence. Use Fiber Rolls, compost socks, brush bundles to filter small amounts of sediment in shallow gullies or ditches. Temporary settlement

basins, gravel berms, or foam barriers can be used as alternatives to Silt Fence.

Do not use Silt Fence on airport runways, taxiways, aprons, or within the Runway Safety Areas.

Selection Considerations

Use of sediment control measures and the level of effort should be commensurate with the potential problem. Silt Fence is not to be used solely as a project delineator (see Site Delineation, BMP-55).

- Use of a Silt Fence sediment control measure is usually more complex, expensive, and maintenance-prone than other sediment control measures.
- Consider impacts of the fence installation, maintenance, and removal on sensitive areas needing protection (e.g. avoid equipment encroachment on wetlands).
- Consider potential undesirable effects of fence placement (e.g. a trench in ground that will not readily "heal" after fence removal; undesirable effects of extent or depth of ponded water, etc.)
- An equipment access route and space for fence installation, maintenance, and removal must be available without encroaching into sensitive areas or off the project limits.
- Wire reinforcement can be used with Silt Fence by backing the geotextile fabric with chain link, polymeric mesh, or welded wire fencing. Below is a list of considerations for adding wire reinforcement to Silt Fence installation:
 - Consider using wire reinforcement and longer posts to resist overturn.
 - Consider using wire reinforcement in areas of high wind.
 - Consider using wire reinforcement for standing water installations.

Types of Silt Fence for Purchase:

- *With Pockets:* Sewn-in pocket Silt Fence is geotextile that has factory-sewn pockets for the posts and does not require post fasteners.
- *Without Pockets:* Silt Fence without pockets is geotextile fabric that requires fasteners to attach

the fabric to the posts or Silt Fence that is available with posts pre-attached.

- **Wire Reinforcement:** When Silt Fence is wire reinforced, the geotextile fabric is backed with chain link or welded wire fencing.

Methods of Installation:

- **Trenchless:** Drive support posts into the ground, attach geotextile on the upslope side of the line of stakes with a portion lying flat on the ground, and place clean rock or sandbags on the geotextile. Using sandbags to anchor the fence bottom is a less desirable method because of the tendency for undermining. Require removal of the rock or sandbags when the fence is removed.
- **Trench Key:** Drive support posts into the ground, excavate a trench on the uphill side along the line of the stakes, attach geotextile, and bury fence bottom. Use soil to backfill trench and compact to secure fence bottom. Compacted soil is preferred to gravel fill.
- **Machine Slice:** This method requires a Silt Fence installation machine or attachment. The machine utilizes a blade that plows or slices the fabric directly into the soil minimizing soil disturbance. Displaced soil must be manually backfilled into the slice before the tractor is used to mechanically compact the soil.

Design

Locate Silt Fence at a distance from the base of the slope or pile such that there is space for temporary storage of potential accumulated material. Consider a space of 4 feet for worker access if feasible. The grade and length of slope as well as soil erodibility must be considered when specifying silt fence. If the slope is steep or long, consider intermediate slope breaks.

Below are design considerations for Silt Fence that is not wire-reinforced:

- **Design Life:** 1 season (6 months) or less.
- **Contributing Sheet Flow Drainage Area:** Not to exceed 0.25 acres/100 ft. of fence.
- **Maximum Height of Ponding Water:** 18 in.

Guidelines for Maximum Slope Length for Silt Fence:

Slope (H:V)	Length of Slope Above Fence, Assumes 30 In High Fence
10:1	150 ft.
6:1	85 ft.
5:1	70 ft.
4:1	55 ft.
3:1	40 ft.
2:1	25 ft.
1:1	15 ft.

Relationship to Other Erosion and Sediment Control Measures

Sediment control measures are secondary to erosion prevention or soil stabilizing measures. Silt Fence may be used as part of a sequential system with other temporary or permanent measures such as vegetation, check dams, settling ponds, etc. Occasional flow velocity increases may be offset using corrective measures such as rock berms or other redirecting energy absorbers.

Common Failures or Misuses

- Inappropriate for intended function (e.g. used for check dam, flow diversion, diversion dam, etc.).
- Installation of Silt Fence in streams or concentrated flow.
- Use as a mid-slope protection on slopes greater than 4:1.
- Use as a perimeter control in high flow areas.
- Field-sewn seams.
- Use of incorrect type of fabric.
- Loose or sagging fabric between posts.
- Fence improperly attached or fastened to posts.
- Posts not driven deep enough into the ground.
- Posts spaced too far apart.
- Posts installed on incorrect side of fence.
- Placement of overlapped joints across pooled drainage areas.
- Fence allows spillover or bypass.
- Soil is not compacted next to fence after backfilling trench, allowing water to flow underneath.

- Trenches are too shallow to anchor the Silt Fence below ground or trenchless construction failure.
- Slope erosion occurs below the fenceline due to drainage that bypasses the barrier end, or water build-up that “blows out” a poorly-secured fence bottom.
- Fence function impairment due to sediment build-up, maintenance neglect, etc.
- Fence topples due to poor installation and/or high levels of impounded backup water or sediment.
- Uneven distribution of pooled drainage along non-level fenceline surface reduces efficiency.
- End of fence is not “J-hooked” upslope allowing water to run around the end.
- Poor support system (e.g. soil too rocky to secure posts, fabric stapled to trees, etc.).
- Installation of Silt Fence in a long continuous run.

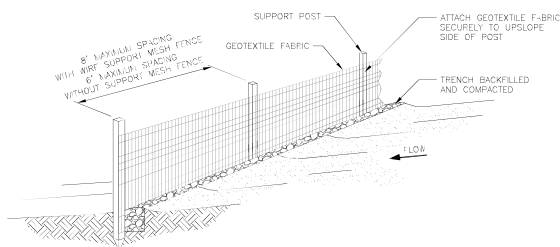
SPECIFICATIONS

Standard Specification

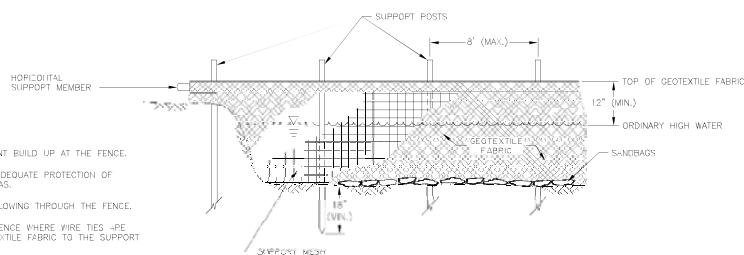
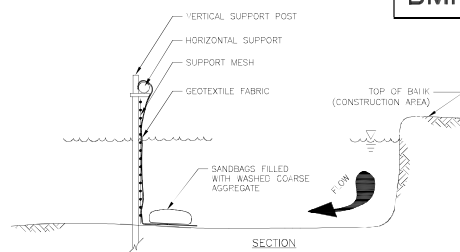
- 633 – Silt Fence
- 729-2.04 - Geosynthetics

Drawing

- BMP-20.00 Silt Fence (Sheets 1 and 2)



GENERAL INSTALLATION
NOT TO SCALE



STANDING WATER INSTALLATION
NOT TO SCALE

SILT FENCE GENERAL NOTES:

SILT-FINE SAND
MATERIALS

SILT FENCE: SEE SPECIFICATION SECTION 633, SILT FENCE.

INSTALLATION

3. INSTALL FENCING ALONG A LEVEL CONTOUR AND PERPENDICULAR TO ANTI-CIPICD SHEET PILE DRAINAGE PATH(S).
4. ORIENT END SECTIONS UPHILL SUFFICIENTLY IN A J-WHOP TO PRE-VENT WATER FROM GOING AROUND THE SILT FENCE.
5. DO NOT EXCEED 100 FEET FOR EACH 1/4-ACRE OF DRAINAGE AREA AND DO NOT EXCEED 500 FEET TOTAL LENGTH OF DRAINAGE AREA.
6. THE DIFFERENCE IN ELEVATION BETWEEN THE HIGHEST AND LOWEST POINT -LONG THE TOP OF THE SEDIMENT FENCE SHALL NOT EXCEED ONE-THIRD THE FENCE HEIGHT.
7. WHERE FENCE SURFACES ARE UNEVEN, INSTALL STAKES OR PILES FOLLOWING CONTOURS (FASTER THAN INSTALLING ONE LONG, CONTOUR-CROSSING FENCE THAT DIRECTS DRAINAGE TO ACCUMULATE IN LONG SPOTS).
8. LOCATE FENCE 3 TO 12 FEET BEYOND TOP OF FILL TO LEAVE ROOM FOR A BROAD, SHALLOW SEDIMENTATION POND FOR EQUIPMENT ACCESS DURING FENCE MAINTENANCE AND REMOVAL.
9. IF FEASIBLE, LEAVE A MINIMUM OF 3.5-FOOT BUFFER BETWEEN FENCING -AND SENSITIVE RECEIVING AREA-S.
10. PLACE GEOTEXTILE ON THE UPSLOPE SIDE OF POSTS OR PILES, USING SALT-ADEN FILL WITH SEED-IN-POCKETS, PLACE POCKETS ON THE UPSLOPE SIDE OF THE FENCE.
11. EXCAVATE TRENCHES NOT DEEPER THAN NECESSARY FOR PROPER INSTALLATION OF THE SILT FENCE. DO NOT EXCAVATE TRENCHES IN PERMAFROST.
12. AT JOINTS, ROLL ENOUGH OF THE ENDS OF SECTIONS TOGETHER SUFFICIENTLY TO SURE THAT THE JOINT PREVENTS SILT-ADEN WATER FROM ESCAPING THROUGH THE FENCE.
13. IF USING THE FRONT WHEEL OF A TRACTOR OR ROLLER, COLLECT THE UPSLOPE SIDE FIRST, THEN E-ACH SIDE

12. KEEP FENCE FABRIC TAUT.

13. WHEN USING SUPPORT MESH, ATTACH GEOTEXTILE TO THE SUPPORT MESH WITH FASTENERS SPACED EVERY 24 INCHES AT THE TOP AND MIDSECTION.

MACHINE SLICE INSTALLATION (NOT IN PERMAFROST)

1. USE A SLICE FENCE INSTALLATION MACHINE OR ATTACHMENT TO PLOW OR SLICE THE FABRIC DIRECTLY INTO THE SOIL.
 2. BACKFILL SOIL LOOSENED BY THE BLADE INTO THE SLICE AND USE THE TRACTOR TO MECHANICALLY COMPACT THE SOIL.
 3. TUCK FABRIC DEEPER INTO THE GROUND WHERE NECESSARY.
 4. INSTALL SUPPORT POSTS ALONG THE LENGTH OF THE FENCE FOLLOWING SIMILAR PROCEDURES FOR THE FENCE METHOD.
- WINTER INSTALLATION (NOT IN PERMAFROST)
1. DIG A TRENCH.
 2. BACKFILL TRENCH WITH THE LOOSENED SOIL AND COMPACT THE BACKFILLED SOIL TO FOST INSTALLATION.
 3. DO NOT LEAVE LARGE FROST CHUNKS AS THE BACKFILL.

INSPECTION

1. INSPECT FENCELINE FOR CONTINUITY, COLLAPSE, UNDERMINED AREAS, AND DAMAGE. DO NOT EXCAVATE TRENCHES IN PERMAFROST.
2. INSPECT FABRIC FOR TEARS, PUNCTURES, FRAYING, WEATHERING, AND COMPROMISED INTEGRITY.
3. CONFIRM THAT THE FENCE POSTS ARE SECURE.
4. ENSURE THE FENCE IS KEYED IN AND THAT THERE IS NO UNDERCUTTING.
5. LOOK FOR EVIDENCE OF SEDIMENT OR EROSION FLOW LEAVING OFF THE DOWNHILL EDGE OF THE FENCE. (THIS MAY BE AN INDICATOR OF DRAINAGE BYPASS OR FENCE UNDERMINE.)

6. NOTE DEPTH OF SEDIMENT BUILD UP AT THE FENCE.

7. LOOK FOR SIGNS OF INADEQUATE PROTECTION OF OFF-SITE SENSITIVE AREAS.

8. CHECK FOR SEDIMENT FLOWING THROUGH THE FENCE.

9. CHECK FOR HOLES IN FENCE WHERE WIRE TIES WERE USED TO SECURE GEOTEXTILE FABRIC TO THE SUPPORT POST.

MAINTENANCE

1. INSTALL ALTERNATE OR ADDITIONAL BIPS AS NEEDED TO PREVENT UNDESIRABLE SEDIMENTATION OF SENSITIVE AREAS.

2. REPLACE DAMAGED FABRIC.

3. REMEDY FENCE SACS AS NEEDED.

4. REMOVE COAGULATED SEDIMENT BEFORE IT ACCUMULATES TO ONE-TWO THE DEPTH OF THE DUE-THIRD OF THE AVAILABLE STORAGE PROTECTING WATER BODIES FROM DRINKING USE.
5. DISPOSE OF SILT WASTE IN APPROVED HILLTOP/LOCATION (TYPICALLY IN A NON-EROSION AREA).
6. IF THERE IS EVIDENCE OF EXCESSIVE SEDIMENTATION AGAINST THE SILT FENCE, PROVIDE INCREASED EROSION CONTROL UPSTREAM.

REMOVAL

1. WHEN DISTURBED AREAS ARE PERMANENTLY STABILIZED OR SEDIMENT PROTECTION IS NO LONGER NEEDED, COLLECT AND PROPERLY DISPOSE OF ACCUMULATED SEDIMENT OR SEED IN PL-CE.
2. CUT FABRIC AT GROUND LEVEL AND REMOVE SUPPORTS.
3. DISCARD FILTER FENCE AS APPROVED. -VOID DAMAGE TO SENSITIVE AREAS (E.G. WETLAND OR SURFACE WATER).

STANDING WATER NOTES:

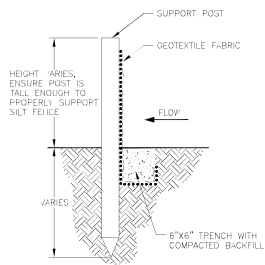
INSTALLATION

1. DRIVE SUPPORT POSTS INTO THE GROUND AND ATTACH A HORIZONTAL SUPPORT MEMBER.
2. ATTACH SUPPORT WIRE AND GLOUTEXILE ON THE UPSHORE SIDE OF THE SANDS. EXTEND GLOUTEXILE ON THE GROUND UPSHORE OF THE FENCE AND ANCHOR THE GLOUTEXILE WITH SANDBAGS OR EQUIVALENT TO PREVENT GAPS.
3. SPACE SUPPORT POSTS A MAXIMUM OF 8 FEET APART.
4. KEEP FENCE FRAME TIGHT.

REVISIONS		
Date	Description	By

State of Alaska DOT&PF
SILT FENCE
(NOTES, GENERAL
INSTALLATION, & STANDING
WATER INSTALLATION)

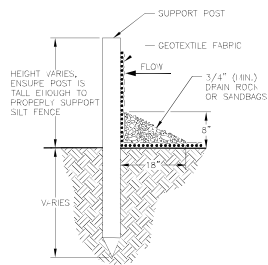
Date **12/2015** **APPROVED** *X/X/X/X*



TRENCH DETAIL
NOT TO SCALE

TRENCH NOTES:
INSTALLATION

1. DRIVE SUPPORT POSTS INTO THE GROUND.
2. FOLLOW MANUFACTURER'S SPECIFICATIONS FOR POST BURIAL DEPTH.
3. EXCAVATE A TRENCH ON THE UPHILL SIDE ALONG THE LINE OF THE STAKES.
4. ATTACH GEOTEXTILE TO STAKES AND BURY GEOTEXTILE BOTTOM.
5. BACKFILL TRENCH AND COMPACT TO SECURE FENCE BOTTOM.



TRENCHLESS DETAIL
NOT TO SCALE

TRENCHLESS NOTES:
MATERIALS

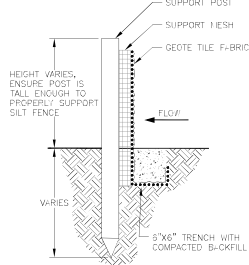
GLENN ROCK OR S-NDBAGS.

INSTALLATION

1. DRIVE SUPPORT POSTS INTO THE GROUND.
2. ATTACH GEOTEXTILE ON THE UPHILL SIDE ALONG THE LINE OF THE STAKES.
3. EXTEND GEOTEXTILE ON THE GROUND UPHILL OF THE FENCE.
4. PLACE DRAIN ROCK ON GEOTEXTILE.

REMOVAL

1. WHEN SILT FENCE IS LOCATED IN WETLANDS OR SENSITIVE AREAS, REMOVE CLEAN ROCK OR S-NDBAGS WHEN THE SILT FENCE IS REMOVED.

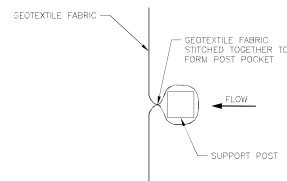


SUPPORT MESH REINFORCED
FABRIC DETAIL
NOT TO SCALE

SUPPORT MESH REINFORCED FABRIC NOTES:

INSTALLATION

1. DRIVE SUPPORT POSTS INTO THE GROUND.
2. EXCAVATE A TRENCH ON THE UPHILL SIDE ALONG THE LINE OF THE STAKES. DO NOT EXCAVATE TRENCHES IN PERMAFROST.
3. EXTEND SUPPORT MESH A MINIMUM OF 3 INCHES INTO THE TRENCH.
4. ATTACH GEOTEXTILE TO STAKES AND BURY GEOTEXTILE BOTTOM.
5. BACKFILL TRENCH AND COMPACT TO SECURE FENCE BOTTOM.



SEWN-IN POCKET DETAIL
NOT TO SCALE

REVISIONS		
Date	Description	By

State of Alaska DOT&PF

SILT FENCE
(DETAILS)

A
P
P
R
O
V
E
D

Date: 11/11/11

BMP 54.00. Site Delineation

DESIGN CONSIDERATIONS

Objectives

Site delineation measures are intended to mark (1) all areas where land disturbing activities will occur, including clearing and grading, and (2) specific areas that will be left undisturbed, such as trees, boundaries of sensitive areas, or environmental buffer zones, prior to work beginning. Buffer zones may include those at stream crossings and around the edges of any wetlands or waters of the U.S. that are located within or immediately adjacent to the property where the construction activity will take place.

This measure is intended to comply with the requirements of Alaska Construction General Permit.

Description

Site delineation measures may be physical barriers, such as temporary fencing, or visual indications, such as staking and flagging, used to delineate specific areas. They are intended to remain until construction activity is completed. The most common measures include temporary fencing, survey flagging tape, stakes, paint on asphalt or concrete, and signs.

Other Names

Flagging, temporary fencing, high-visibility fencing, staking, signs, paint markings.

Applicability

Site delineation applies to all construction projects involving land disturbing activities.

Selection Considerations

Choose marking materials that have high visibility and contrast with the natural surroundings. Select materials based on ability to last for the duration of construction. This is especially important for construction that will span multiple seasons, or last several years.

Sensitive areas and their buffers may require more substantial protection, such as work zone safety fences. Silt fence, in combination with survey flagging, can be an acceptable method of marking sensitive areas and buffers. However, silt fencing

should only be used for this purpose if it is also needed for, and properly installed and maintained as, a sediment control measure.

If fencing other than orange fencing is used, provide signage with wording describing the purpose of the fence.

If signs are to be used, specify the type and spacing of signs and the wording on the sign, such as 'No Entry,' 'Keep Out,' 'No Grade Change', 'No Work, Storage Of Materials or Equipment Permitted Beyond This Point,' or other appropriate directive. Specify minimum lettering size for signs.

For long linear projects that are constructed in phases, consider the following:

- Provide delineation to protect adjacent out-of-phase areas that are not part of the current phase of construction.
- Specify installation of site delineation to coincide with phases of construction so that the length of time the site delineation must be inspected and maintained is sufficient but no longer (too far in advance) than necessary.

Common Failures or Misuses

- Failure to install prior to land disturbing activities.
- Inappropriately using materials intended for other purposes. For example, silt fencing material should not be used unless it is properly installed as a sediment control measure (BMP-20).
- Installing markers too close to areas of construction activity; failure to provide adequate maneuvering room for construction activities.
- Damage to markings and flagging cut down during clearing activities.
- Using products that are easily vandalized by humans or disturbed by animals.

BMP 25.00 – 29.00. Storm Drain Inlet Sediment Protection – Curb and Area Inlets

These instructions cover BMP 25.00, 26.00, 27.00, 28.00 and 29.00.

DESIGN CONSIDERATIONS

Objectives

Storm Drain Inlet Sediment Protection is used prior to permanent stabilization of the disturbed area to prevent sediment from entering downgradient storm drainage systems.

Description

Storm Drain Inlet Sediment Protection is a device or mechanism, either internal or external, for preventing sediment from entering a storm drain; generally by trapping sediment within or immediately adjacent to a storm drain inlet. Types of temporary protection devices applicable for different conditions are listed in the table. Pre-fabricated devices are available for internal and external applications.

Other Names

Storm Drain Inlet Protection, Filter Bag Insert, “Witch’s Hat,” Silt Sack

Applicability

Storm Drain Inlet Sediment Protection – Curb and Area Inlets are applicable when storm drain inlets must remain operational before permanent stabilization of the disturbed area and when there is potential for sediment to be transported into the storm drain system.

Selection Considerations

Internal devices generally consist of nonwoven, semi-porous material that traps larger sediment, but allows silt and clay-size particles to pass. They are most appropriate in situations where roadway flooding is a concern or where construction traffic will damage an external device.

External devices trap sediment by creating a ponding area surrounding or adjacent to the inlet, reducing velocities and allowing sediment to settle. This process allows external devices to be more efficient at trapping greater volumes of smaller sized sediment.

Curb inlets are distinguished from area inlets by their roadway edge location and proximity to traffic. Both are grated inlets, but whereas curb inlets are in-line with concrete curbing or curb and gutter features, area inlets are located in open areas and are generally surrounded by unpaved surfaces. These are also known as field inlets when they are permanent features, or they may be inlets in unpaved areas that will have paving around them as construction progresses.

Storm Drain Inlet Sediment Protection types applicable to curb inlets and area inlets are summarized in the following table:

Storm Drain Inlet Sediment Protection Types and Applicability Table

Storm Drain Inlet Sediment Protection Type	Applicability	
	Curb Inlet	Area Drain Inlet
External Sediment Protection		
Prefabricated Barrier System	Yes *	Yes
Gravel or Sand Bag Berm	Yes *	Yes
Fiber Roll	No	Yes
Filter Fabric (Silt Fence)	No	Yes
Inlet Grate Covers		
Filter Mat	No	Yes
Curb Face Mesh Filter	Yes	No
Internal Sediment Protection		
Filter Bag Insert	Yes	Yes
Sediment Control Inlet Hat	Yes	Yes
* If neither the sediment protection structure nor ponding will intrude into travel way		

- Fiber rolls and prefabricated barrier systems are not appropriate for locations where they cannot be properly anchored to the surface.
- Filter fabric (silt fence) as a sediment protection device is applicable to area inlets and for flows

less than 0.5 cubic feet per second (cfs) on flat grades (5 percent or less).

- Inlet grate filter mats are only applicable where heavy concentrated flows are not expected and are not applicable where ponding around the structure might cause excessive damage to adjacent structures and unprotected areas.
- Curb face inlet mesh filters for curb inlets prevent sediment from entering the inlet but they also require that runoff is bypassed. This sediment protection device should not be used at a sag inlet (an inlet at the lowest point on a vertical curve or in a depression); and, if used, conveyance to another point of discharge must be provided.

Any of these sediment protection devices may cause flooding affecting streets and the construction area. Where flooding would cause a hazard, consider where overflow will go in extreme events and provide emergency overflows with additional treatment.

Design

Drainage Area: Not to exceed 1 acre.

Slope Gradient: Not to exceed 5 percent.

Site and construct Storm Drain Inlet Sediment Protection in a manner that will facilitate cleanout and disposal of trapped sediment.

Design and construct the Storm Drain Inlet Sediment Protection in a manner that will allow flow to pass and to minimize ponding after the runoff has ceased.

Relationship to Other Erosion and Sediment Control Measures

Erosion and sediment control measures in the contributing areas must be in place to minimize the amount of sediment that must be treated at inlets. Storm Drain Inlet Sediment Protection is installed as a secondary measure to remove residual sediment that was not removed by other measures such as check dams, grassed swales, and sediment traps.

Common Failures or Misuses

- Sediment accumulation, by which filtering capacity is reduced, resulting in ponding of water.

- Improper installation, resulting in sediment bypassing filter and entering the inlet.
- Tearing, undermining, or collapsing of filter fabric, resulting in sediment entering the inlet.

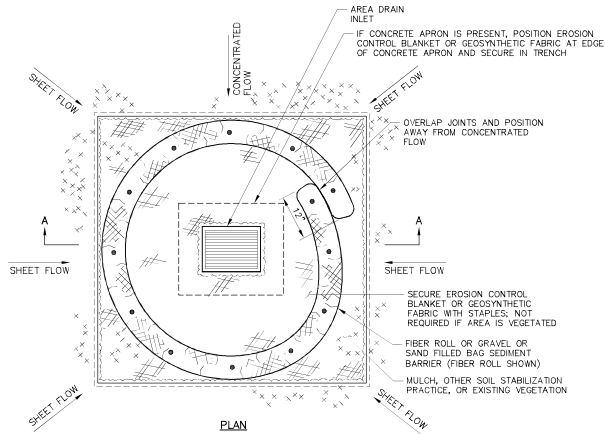
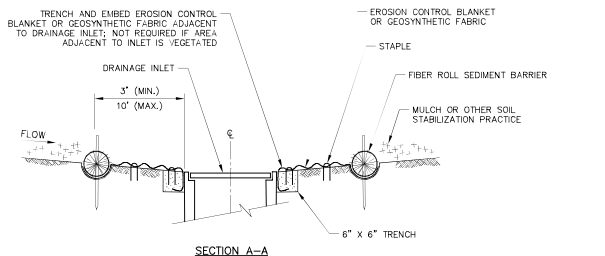
SPECIFICATIONS

Standard Specifications

- 683 – Storm Drain Inlet Sediment Protection
- 633 – Silt Fence
- 729-2.04 Geosynthetics

Drawings

- BMP-25.00 Storm Drain Inlet Sediment Protection (Sheets 1 of 5)
- BMP-26.00 Storm Drain Inlet Sediment Protection
- BMP-27.00 Storm Drain Inlet Sediment Protection
- BMP-28.00 Storm Drain Inlet Sediment Protection
- BMP-29.00 Storm Drain Inlet Sediment Protection
- BMP-13.00 Prefabricated Barrier System
- BMP-10.00 Fiber Rolls for Erosion and Sediment Control



FIBER ROLL OR GRAVEL OR SAND BAG BERM
FOR AREA INLETS
NOT TO SCALE

FIBER ROLL OR GRAVEL OR SAND BAG BERM NOTES:
MATERIALS

FIBER ROLL AND STAPLES: SEE DRAWING BMP-10.00 FIBER ROLL FOR EROSION AND SEDIMENT CONTROL.
GRAVEL— OR SAND— FILLED BAG: TIGHTLY WOVEN BURLAP OR WOVEN GEOTEXTILE BAG MATERIAL THAT IS SUFFICIENTLY DURABLE TO REMAIN INTACT FOR THE TIME INTENDED. FILL BAGS 3/4 FULL OF GRAVEL OR SAND WITH A GRADATION SUCH THAT NO FINE SEDIMENT PASSES THROUGH THE BAG. IF THE SANDBAGS ARE NEEDED FOR MORE THAN ONE SUMMER SEASON, PROVIDE BAG MATERIAL THAT HAS ULTRAVIOLET STABILITY OF AT LEAST 70% IN CONFORMANCE WITH ASTM D4355 REQUIREMENTS. SECURELY CLOSE THE SAND BAGS.

PREFABRICATED UNITS: MAY BE USED IN PLACE OF THE DESIGN SHOWN ON THIS DRAWING UPON APPROVAL BY THE ENGINEER.

INSTALLATION

1. IF PREFABRICATED BARRIERS ARE USED, INSTALL AS SPECIFIED BY THE VENDOR OR MANUFACTURER.

2. FIBER ROLL — SEE DRAWING BMP-10.00 [FIBER ROLL]

INSPECTION, MAINTENANCE, AND REMOVAL

1. SEE STORM DRAIN INLET SEDIMENT PROTECTION GENERAL NOTES, THIS SHEET.

STORM DRAIN INLET SEDIMENT PROTECTION GENERAL NOTES:
INSTALLATION

1. IF PREFABRICATED BARRIERS ARE USED, INSTALL AS SPECIFIED BY THE VENDOR OR MANUFACTURER. 1/2

INSPECTION

1. CHECK FOR SEDIMENT DEPTH. CLEANSING IS REQUIRED WHEN SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH (OR LESS WHEN SPECIFIED BY THE MANUFACTURER OF PREFABRICATED BARRIERS).

2. CHECK FOR UNDERMINING OR BYPASSING, SUCH AS EVIDENCE THAT SEDIMENT IS ENTERING THE INLET OR THAT RUN-OFF IS BYPASSING THE BARRIER AND ENTERING THE INLET UNTREATED.

MAINTENANCE

1. IF PREFABRICATED BARRIERS ARE USED, MAINTAIN THEM AS SPECIFIED BY THE VENDOR OR MANUFACTURER.

2. CORRECT UNDERMINING OR BYPASSING FAILURES.

3. REMOVE ACCUMULATED SEDIMENT BEFORE IT REACHES ONE-HALF OF THE AVAILABLE STORAGE OF THE SEDIMENT PROTECTION DEVICE OR LESS WHEN SPECIFIED BY THE MANUFACTURER. 1/2

4. REMOVE AND DISPOSE OF ANY ROCK OR DEBRIS THAT HAS ACCUMULATED BEHIND THE SEDIMENT BARRIER TO PREVENT FURTHER CLOGGING.

5. REPLACE FRAYED OR TORN FABRIC OR MATERIALS AND REPAIR ANY STRUCTURAL DAMAGE AS SOON AS PRACTICABLE.

REMOVAL

1. LEAVE INLET SEDIMENT PROTECTION DEVICES IN PLACE AND OPERATIONAL UNTIL THE DRAINAGE AREA IS PERMANENTLY STABILIZED.

2. REMOVE AND DISPOSE OF TRAPPED OR REMAINING SEDIMENT.

3. STABILIZE DISTURBED SOIL AREAS RESULTING FROM REMOVAL OF BARRIERS OR SEDIMENT.

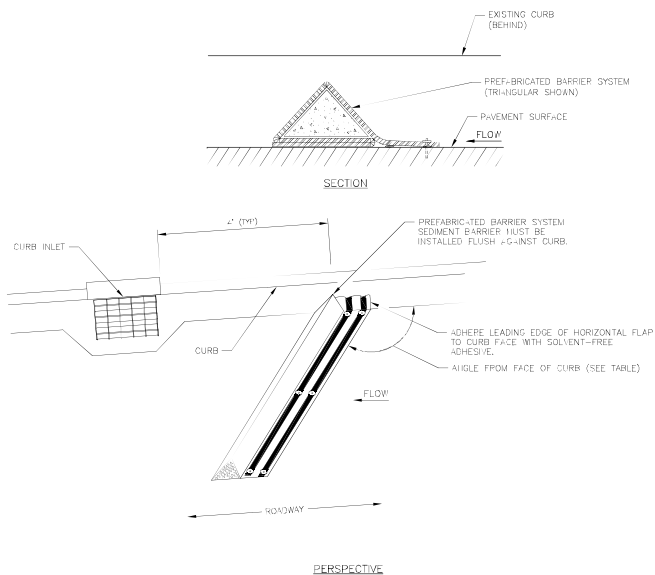
REVISIONS		
Date	Description	By

State of Alaska DOT&PF
STORM DRAIN INLET
SEDIMENT PROTECTION
(NOTES & AREA INLET FIBER ROLL
OR GRAVEL/SAND BAG BERM

Date 12/2015

APP
COR
OF

XXXXXX



PREFABRICATED BARRIER SYSTEM
FOR CURB INLETS
NOT TO SCALE

CURB INLET PREFABRICATED BARRIER NOTES:

MATERIALS
1. PREFABRICATED UNITS: UPON APPROVAL BY THE ENGINEER, USE IN PLACE OF THE DESIGN SHOWN ON THIS DRAWING.

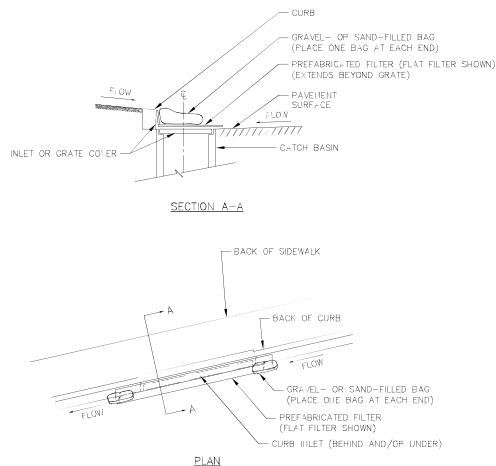
INSTALLATION

1. PREFABRICATED BARRIERS: INSTALL AS SPECIFIED BY THE VENDOR OR MANUFACTURER.
2. PREFABRICATED BARRIER SYSTEM - SEE DRAWING BMP-13.00 PREFABRICATED BARRIER SYSTEM

PREFABRICATED BARRIER SYSTEM SEDIMENT BARRIER DIMENSIONS TABLE		
SLOPE OF ROADWAY (PERCENT)	0 TO 2.9	3 TO 5+
ANGLE FROM FACE OF CURB	70°	45°
SUGGESTED BARRIER LENGTH	4'	
SUGGESTED DISTANCE FROM INLET	4'	

INSPECTION, MAINTENANCE, AND REMOVAL

1. SEE STORM DRAIN INLET SEDIMENT PROTECTION GENERAL NOTES ON BMP-25.00 (STORM DRAIN INLET SEDIMENT PROTECTION) (NOTES & ARE: INLET FILTER ROLL OR GRAVEL/SAND BAG BERM) NOTES FOR INSPECTION, MAINTENANCE, AND REMOVAL.



CURB FACE INLET FILTER SYSTEM
FOR CURB INLETS
NOT TO SCALE

CURB FACE INLET FILTER SYSTEM NOTES:

MATERIALS
PREFABRICATED FILTER: LINEAR, FLAT OR TUBE SHAPED CURB INLET FILTER

GRAVEL - OR SAND-FILLED BAG: TIGHTLY WOVEN BURLAP OR WOVEN GEOTEXTILE BAG MATERIAL THAT IS SUFFICIENTLY DURABLE TO REMAIN INTACT FOR THE TIME INTENDED. FILL BAGS 1/2 FULL OF GRAVEL OR SAND WITH A GRAINATION SUCH THAT NO FINE SEDIMENT PASSES THROUGH THE BAG. IF THE SANDBAGS ARE NEEDED FOR MORE THAN ONE SUMMER SEASON, PROVIDE BAG MATERIAL THAT HAS ULTRAVIOLET STABILITY OF AT LEAST 70% IN CONFORMANCE WITH ASTM D4555 REQUIREMENTS. SECURELY CLOSE THE SAND BAGS.

PREFABRICATED UNITS: UPON APPROVAL BY THE ENGINEER, USE IN PLACE OF THE DESIGN SHOWN ON THIS DRAWING.

INSTALLATION

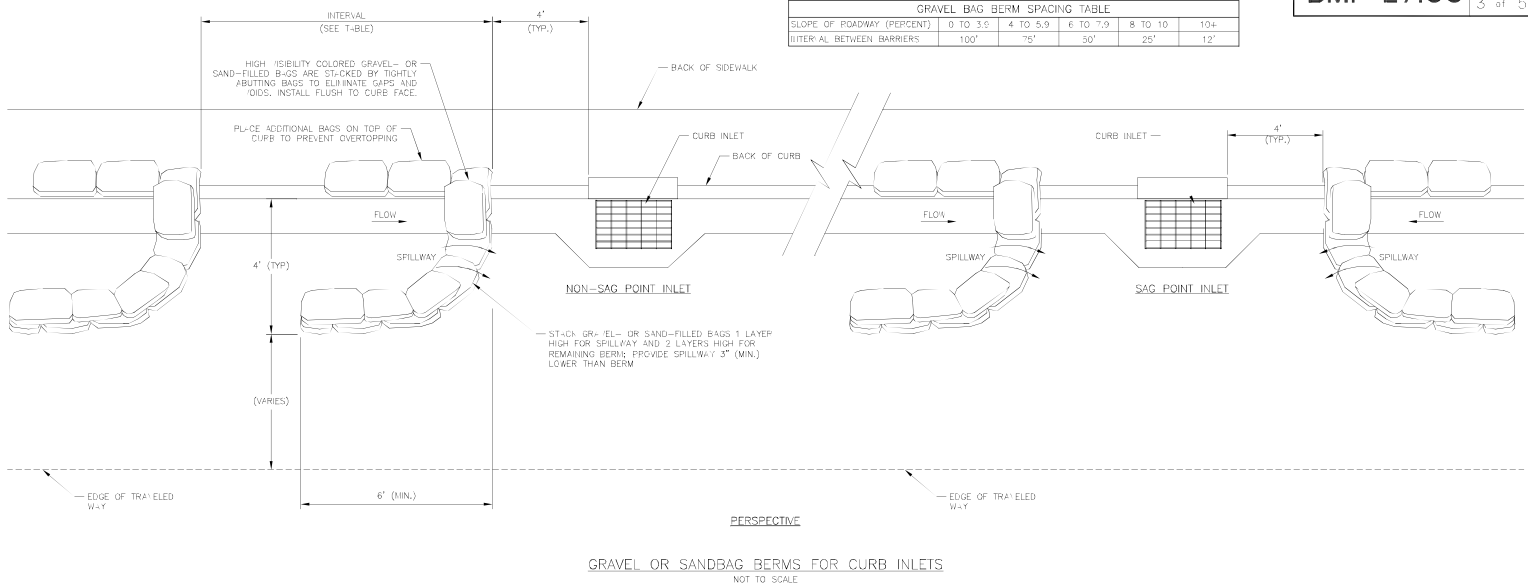
1. INSTALL AS SPECIFIED BY THE VENDOR OR MANUFACTURER.

INSPECTION, MAINTENANCE, AND REMOVAL

1. SEE NOTES ON BMP-23.00 STORM DRAIN INLET SEDIMENT PROTECTION BARRIERS, SHEET 1 - NOTES FOR INSPECTION, MAINTENANCE, AND REMOVAL.

REVISIONS		
Date	Description	By
State of Alaska DOT&P STORM DRAIN INLET SEDIMENT PROTECTION (CURB INLET PREFABRICATED BARRIER SYSTEM & CURB FACE INLET FILTER)		
Date	12/2015	XXXXXX

GRAVEL BAG BERM SPACING TABLE					
SLOPE OF ROADWAY (PERCENT)	0 TO 3.5	4 TO 5.9	6 TO 7.9	8 TO 10	10+
INTERVAL BETWEEN BARRIERS	100'	75'	50'	25'	12'



CURB INLET GRAVEL OR SANDBAG BERM NOTES:

MATERIALS

PREFABRICATED UNITS: UPON APPROVAL BY THE ENGINEER, USE IN PLACE OF THE DESIGN SHOWN ON THIS DRAWING.

GRAVEL— OR SAND— FILLED BAGS: TIGHTLY WOVEN BURLAP OR WOVEN GEOTEXTILE BAG MATERIAL THAT IS SUFFICIENTLY DURABLE TO REMAIN INTACT FOR THE TIME INTENDED. FILL BAGS 3/4 FULL OF GRAVEL OR SAND WITH A GRADATION SUCH THAT NO FINE SEDIMENT PASSES THROUGH THE BAG. IF THE SANDBAGS ARE NEEDED FOR MORE THAN ONE SUMMER SEASON, PROVIDE BAG MATERIAL THAT HAS ULTRAVIOLET STABILITY OF AT LEAST 70% IN CONFORMANCE WITH ASTM D4355 REQUIREMENTS. SECURELY CLOSE THE SAND BAGS.

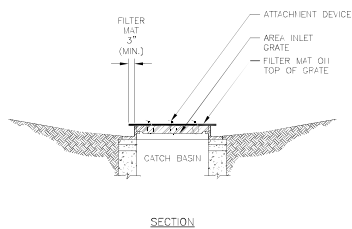
INSTALLATION

1. DELINEATE SAND BAGS WITH TRAFFIC CONTROL DEVICES WHERE NECESSARY.
2. IF PREFABRICATED BARRIERS ARE USED, INSTALL AS SPECIFIED BY THE VENDOR OR MANUFACTURER.

INSPECTION, MAINTENANCE, AND REMOVAL

1. SEE STORM DRAIN INLET SEDIMENT PROTECTION GENERAL NOTES ON BMP-25.00 (STORM DRAIN INLET SEDIMENT PROTECTION (NOTES & AREA INLET FIBER ROLL OR GRAVEL/SAND BAG BERM)) NOTES FOR INSPECTION, MAINTENANCE, AND REMOVAL.

REVISIONS		
Date	Description	By
State of Alaska DOT&PF		
STORM DRAIN INLET		
SEDIMENT PROTECTION		
(CURB INLET GRAVEL		
OR SANDBAG BERMS)		
A T T E S T E D		
Date	12 2015	



FILTER MAT FOR AREA INLETS
NOT TO SCALE

AREA INLET FILTER MAT NOTES:
MATERIALS
MFG. FABRICATED FROM COR OR EQUIVALENT MATERIAL FOR INLET PROTECTION.

ATTACHMENT DEVICES: WIRE OR PLASTIC TIES

PREFABRICATED UNITS: UPON APPROVAL BY THE ENGINEER, USE IN PLACE OF THE DESIGN SHOWN ON THIS DRAWING.

INSTALLATION

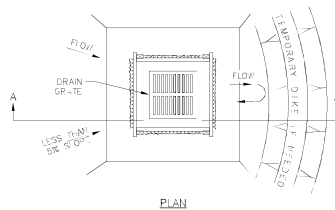
1. POSITION THE MAT OVER THE INLET GRATE AND ENSURE THAT IT EXTENDS BEYOND THE EDGE OF THE GRATE BY 3-INCHES MINIMUM ON ALL SIDES.
2. INSTALL AND ATTACH THE MAT TO THE GRATE AS SPECIFIED BY THE MANUFACTURER.
3. IF OTHER PREFABRICATED UNITS ARE USED, INSTALL AS SPECIFIED BY THE VENDOR OR MANUFACTURER.

MAINTENANCE

1. SWEEP TOP AND SIDES OF THE MAT TO REMOVE SEDIMENT AND DEBRIS.
2. REMOVE AND REPLACE MAT IF IT BECOMES CLOGGED.

INSPECTION, MAINTENANCE, AND REMOVAL

1. SEE STORM DRAIN INLET SEDIMENT PROTECTION GENERAL NOTES ON BMP-25.00 [STORM DRAIN INLET SEDIMENT PROTECTION (NOTES & AREA INLET FIBER ROLL OR GRAVEL/SAND BAG BERM)] NOTES FOR INSPECTION, MAINTENANCE, AND REMOVAL.



FILTER FABRIC FOR AREA INLETS
NOT TO SCALE

AREA INLET FILTER FABRIC NOTES:
MATERIALS
PREFABRICATED UNITS: UPON APPROVAL BY THE ENGINEER, USE IN PLACE OF THE DESIGN SHOWN ON THIS DRAWING.

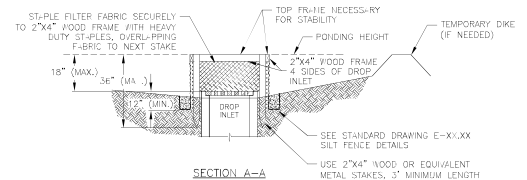
FILTER FABRIC (SILT FENCE) SHALL COMPLY WITH SECTION 729-2.014 SILT FENCE

INSTALLATION

1. IF PREFABRICATED BARRIERS ARE USED, INSTALL AS SPECIFIED BY THE VENDOR OR MANUFACTURER.
2. PLACE A STAKE AT EACH CORNER OF THE INLET OR IN A CIRCULAR PATTERN AROUND THE INLET NO MORE THAN 3 FEET APART. DRIVE STAKES INTO THE GROUND A MINIMUM OF 12 INCHES.
3. ENSURE STABILITY BY BRACING AT THE TOP.
4. INSTALL FILTER FABRIC (SILT FENCE) AS SHOWN ON DRAWING BMP-28.00 SILT FENCE.

INSPECTION, MAINTENANCE, AND REMOVAL

1. SEE STORM DRAIN INLET SEDIMENT PROTECTION GENERAL NOTES ON BMP-25.00 [STORM DRAIN INLET SEDIMENT PROTECTION (NOTES & AREA INLET FIBER ROLL OR GRAVEL/SAND BAG BERM)] NOTES FOR INSPECTION, MAINTENANCE, AND REMOVAL.



REVISIONS		
Date	Description	By
State of Alaska DOT&PF STORM DRAIN INLET SEDIMENT PROTECTION (AREA INLET FILTER MAT & FILTER FABRIC)		
A T T A C H M E N T		
Date	12/2015	XXXXXX

AREA DRAINS OR CURB INLET NOTES:

MATERIALS
PREFABRICATED UNITS: UPON APPROVAL BY THE ENGINEER, USE IN PLACE OF THE DESIGN SHOWN ON THIS DRAWING.

SEDIMENT CONTROL INLET HATS: SHALL BE A POLYETHYLENE HAT-LIKE STRUCTURE COVERING THE INLET WITH SMALL VEEB HOLES ON THE SIDE PROVIDING A FILTERING FUNCTION FOR THE STORMWATER RUNOFF, AND A LARGE OPENING ABOVE THE VEEB HOLES FOR EMERGENCY OVERFLOW.

FILTER BAG INSERTS: SHALL CONSIST OF A REPLACEABLE FILTER BAG REINFORCED WITH AN OUTER POLYESTER MESH FABRIC:

1. THE FILTER BAG SHALL BE SUSPENDED FROM A GALVANIZED STEEL RING, REBAR OR STEEL RODS, OR FRAME THAT FITS WITHIN A GRATE UTILIZING A STAINLESS STEEL BAND AND LOCKING CLAMP.
2. CONSTRUCT THE FILTER BAG THAT IS SUSPENDED FROM A FRAME OF A POLYPROPYLENE FILTER GEOTEXTILE FABRIC, THAT MEETS THE FOLLOWING MINIMUM REQUIREMENTS:

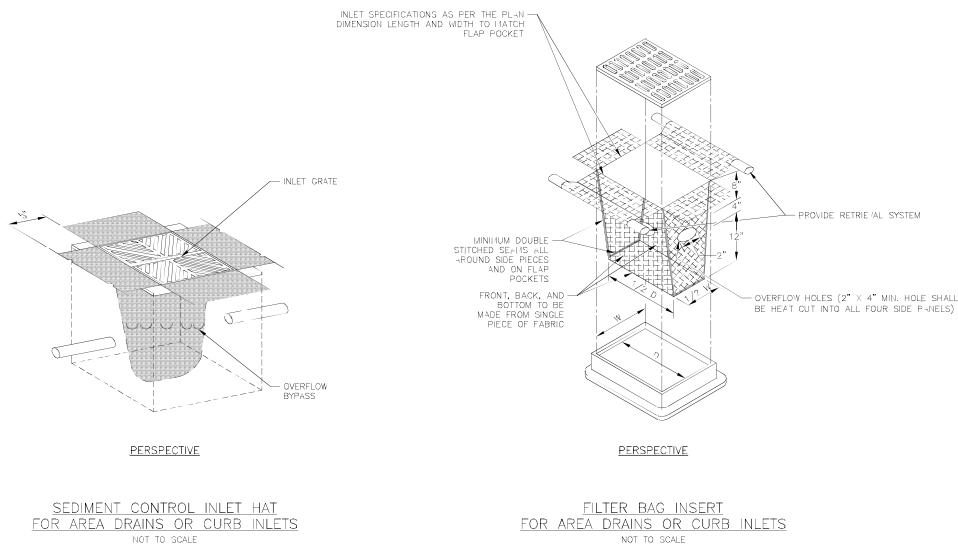
	ASTM METHOD	VALUE	UNITS
UNIT WEIGHT	--	4	OUNCES/SQ YD
FLOW RATE	--	145	GALLONS/MINUTE/SQ FT
PERMITTIVITY	D4491	3.5	PER SECOND
GRAB TENSILE STRENGTH	D4632	200	POUNDS
PUNCTURE STRENGTH	D4621	80	POUNDS
TEAR STRENGTH	D4533	50	POUNDS
DEBRIS CAPACITY	--	2	CUBIC FT

3. DOUBLE STITCH ALL EDGES AND SEAMS.
4. THE FILTER BAG INSERT SHALL HAVE 0.41" EDGE-HEAT-SEALED OVERFLOW HOLES, MINIMUM 2 INCHES X 4 INCHES, CUT INTO ALL FOUR PANEL SIDES.
5. PROVIDE BUILT-IN OVERFLOW BYPASS.
6. THE INLET STRUCTURE'S GRATE OVERFLOW CAPACITY IS AT A MINIMUM EQUAL TO THE DESIGN FLOW CAPACITY.
7. PROVIDE A RETRIEVAL SYSTEM, SUCH AS FLAPS, HANDLES, OR CORDS, TO ALLOW REMOVAL OF THE BELOW-INLET GRATE BARRIER WITHOUT SPILLING THE COLLECTED MATERIAL.

INSTALLATION
1. IF PREFABRICATED SEDIMENT PROTECTION DEVICES ARE USED, INSTALL AS SPECIFIED BY THE VENDOR OR MANUFACTURER.

INSPECTION, MAINTENANCE, AND REMOVAL
1. SEE STORM DRAIN INLET SEDIMENT PROTECTION GENERAL NOTES ON BMP-25.00 [STORM DRAIN INLET SEDIMENT PROTECTION (NOTES & AREA INLET FIBER ROLL OR GRAVEL/SAND BAG BERM)] NOTES FOR INSPECTION, MAINTENANCE AND REMOVAL.

REVISIONS		
Date	Description	By
State of Alaska DOT&PF STORM DRAIN INLET SEDIMENT PROTECTION (AREA OR CURB INLET FILTER INSERT)		
Date	12/2015	XXXXXX



BMP 55.00. Street Sweeping and Vacuuming for Sediment Control

DESIGN CONSIDERATIONS

Objectives

Street Sweeping and Vacuuming for Sediment Control is used to remove sediment from paved surfaces to prevent it from entering storm drain systems or waters of the U.S.

Description

Sediment is removed from roads and paved surfaces by power sweepers or manual methods and disposed of in a controlled sediment disposal area.

Applicability

Sweeping is implemented anywhere sediment is tracked from the project area onto public or private paved roads and other paved surfaces. Street Sweeping and Vacuuming for Sediment Control should be conducted when sediment accumulation is visible on paved surfaces. Typically, this will be concentrated at the exit to the construction site

Selection Considerations

- Sweepers that pick up sediment and control dust emissions should be specified. Of the four types of mechanical power sweepers available, three (vacuum, regenerative air, and high efficiency sweepers) are acceptable. Prohibit the use of methods that use only mechanical kick brooms. Conventional mechanical broom sweepers have been found to have a negative effect on the amount of stormwater runoff pollution. Mechanical sweepers may only be used if followed by a vacuum-assisted sweeper.
- Manual broom sweeping with pickup is acceptable. On smaller construction sites and in areas not accessible by power sweepers, sweeping can be conducted manually using a broom and shovel.
- The use of leaf blowers and other similar equipment for sweeping is unacceptable.
- Reasonable measures must be employed to prevent dust from becoming airborne during any operation where material that may create dust is handled, transported, or stored.

- If the sediment or soil is wet or muddy, paved surfaces will need to be scraped manually or mechanically.

Relationship to Other Erosion and Sediment Control Measures

Erosion and sediment control measures in the contributing areas must be in place to minimize the amount of sediment that must be swept. Stabilized Construction Exit (BMP-23 and BMP-24) or Tire Wash (BMP-36 and BMP-37) should be included in the contract. Street Sweeping and Vacuuming for Sediment Control is a secondary measure to remove residual sediment that was not removed by other measures. Well-maintained stabilized construction exits, vehicle tracking controls, and tire wash facilities can help reduce the necessary frequency of Street Sweeping and Vacuuming for Sediment Control.

Common Failures or Misuses

- Insufficient erosion controls in the contributing disturbed area.

SPECIFICATIONS

Standard Specifications

- 656 Street Sweeping and Vacuuming for Sediment Control

BMP 30.00. Surface Roughening

DESIGN CONSIDERATIONS

Objectives

Surface roughening measures are intended to aid in the establishment of vegetative cover from seed, to reduce runoff velocity and increase infiltration, and to reduce erosion.

A rough, loose soil surface provides more favorable moisture conditions for seed germination than hard, smooth surfaces. It provides interstitial space for seed deposition and germination and root growth.

Description

Surface roughening establishes a rough soil surface by creating horizontal grooves, furrows, or depressions running parallel to the slope contour over the entire face of the slope. The most common measures include:

- **Stair-Step Grading** - This is done by cutting “steps” along the contour of a slope, and is applicable to slopes with a gradient greater than 3:1, which have material soft enough to be bulldozed.
- **Tracking** - This is done by running tracked machinery (such as bulldozers) up and down slopes to leave horizontal depressions in the soil.
- **Mechanical methods** – This is done by drawing or rolling equipment such as punch or sheepfoot rollers over the surface.
- **Manual Raking** - This is done manually by using hand tools such as rakes or hoes to create grooves at least 1-inch deep and no more than 12 inches apart.

Other Names

Contour grading, serration, cat tracking, track walking

Applicability

Surface roughening measures provide simple, inexpensive, and immediate short-term erosion control for bare soil where vegetative cover is not yet established on construction slopes greater than 5 vertical feet. By themselves, they are not soil

stabilization and must be seeded, fertilized, and mulched as soon as possible.

Selection Considerations

Selection of slope roughening measures should be based on slope grade, slope type (cut or fill), type of equipment available, and soil type.

1. Cut slopes steeper than 3:1. Use stair-step grading on any erodible material soft enough to be ripped with a bulldozer. Slopes consisting of soft rock with some subsoil are particularly suited to stair-step grading.
2. Fill slopes steeper than 2:1. Use tracking to roughen the face of the slope. If soil is loose, such as sandy soil, manual raking is more suitable.
3. Fill slopes between 2:1 and 3:1. Use tracking or mechanical methods to roughen the face of the slope, if necessary.
4. Cuts, fills, and graded areas no steeper than 3:1. Roughen these areas by tracking, mechanical methods, manual raking, or by using tilling, disking, or harrowing implements.

Surface roughening is suitable for all erodible soils. Stable, sloping rocky faces may not require roughening, while erodible slopes steeper than 3:1 require special attention to surface roughening.

Relationship to Other ESC Measures

Diversions at the upper perimeter of the area function to prevent runoff from causing erosion on the exposed soil. Hydromulch/seed on slopes for erosion control. Silt fences and sediment basins at the lower perimeter of the area function to prevent off-site sedimentation.

Common Failures or Misuses

- Roughening washed away by heavy rain, necessitating re-roughening and reseeded.
- Failure of upslope control measures (diversions), resulting in excessive flows over area and erosion of soil.
- Surface roughening alone is not considered stabilization.

- Surface roughening must not be used as a means to keep an area “actively worked” to reset the stabilization deadline.
- Track walking in the wrong direction is a common failure that provides valleys for the water to concentrate in.

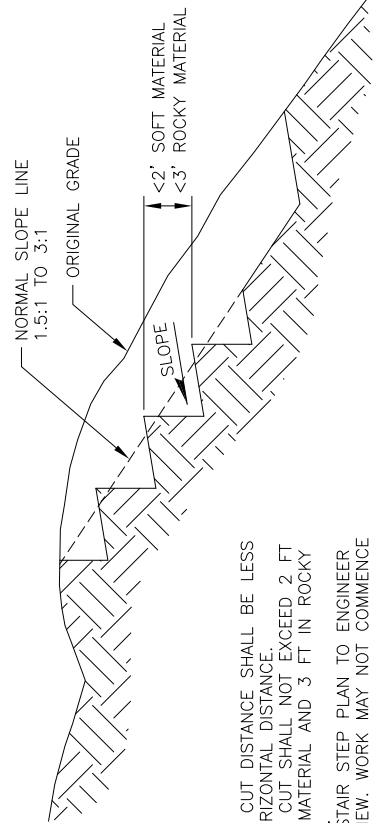
SPECIFICATIONS

Standard Specification

- 684 – Surface Roughening

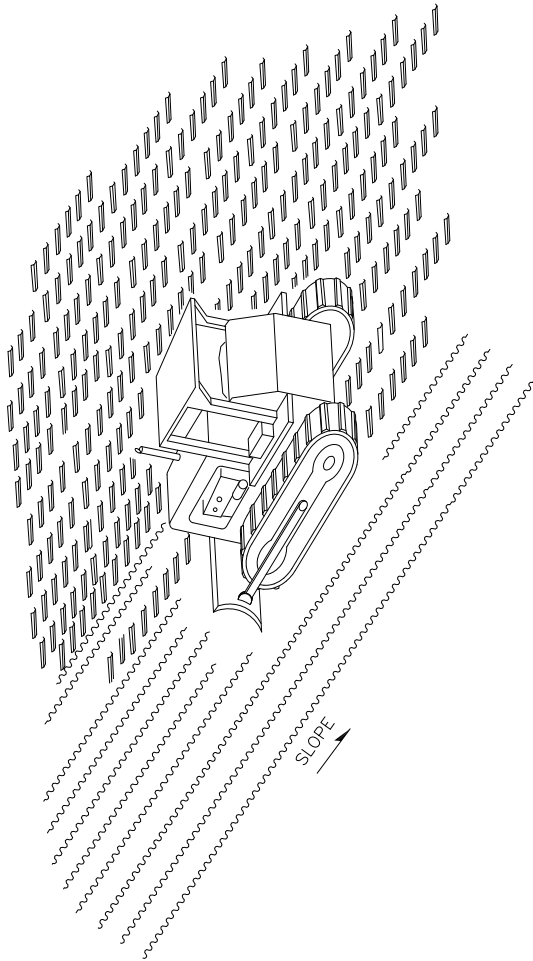
Drawing

- BMP-30.00 – Surface Roughening



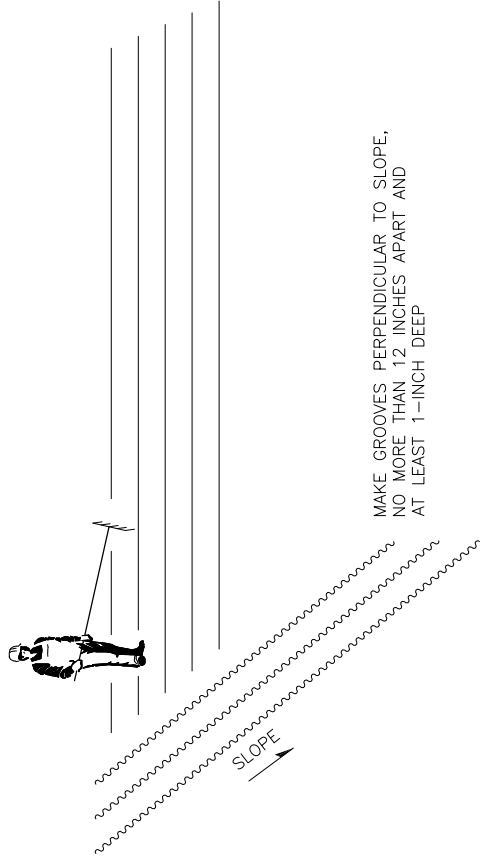
- NOTES:
- VERTICAL CUT DISTANCE SHALL BE LESS THAN HORIZONTAL DISTANCE.
 - VERTICAL CUT SHALL NOT EXCEED 2 FT IN SOFT MATERIAL AND 3 FT IN ROCKY MATERIAL.
 - SUBMIT STAIR STEP PLAN TO ENGINEER FOR REVIEW. WORK MAY NOT COMMENCE UNTIL AFTER APPROVAL.

DETAIL 1: STAIR STEP GRADING



TRACK WITH MACHINERY UP AND DOWN THE SLOPE TO PROVIDE GROOVES TO CATCH SEED AND RAINFALL AND TO REDUCE RUNOFF.

DETAIL 2: TRACKING



MAKE GROOVES PERPENDICULAR TO SLOPE, NO MORE THAN 12 INCHES APART AND AT LEAST 1-INCH DEEP

DETAIL 3: MANUAL RAKING

EQUIPMENT

TRACKED EQUIPMENT (SUCH AS BULLDOZERS), SHEEPSFOOT OR PUNCH ROLLERS, RAKES, HOES, HARROWING TOOLS OR OTHER EQUIPMENT AS APPROVED BY THE ENGINEER.

INSTALLATION

- GROOVE THE SLOPE TO CREATE A SERIES OF RIDGES AND DEPRESSIONS THAT RUN ACROSS THE SLOPE, ALONG THE CONTOUR OF THE GROUND.
- ON FILL SLOPES STEEPER THAN 3:1, ENSURE THAT THE FACE OF THE SLOPE CONSISTS OF LOOSE, UNCOMPACTED FILL 4 INCHES TO 8 INCHES DEEP.
- DO NOT BLADE OR SCRAPE THE FINAL SLOPE FACE. DO NOT BACK BLADE DURING THE FINAL GRADING OPERATION.
- WHEN ROUGHENING WITH TRACKED MACHINERY (DETAILS 1 OR 2), LIMIT THE NUMBER OF PASSES TO AVOID UNDUE COMPACTION OF THE SOIL.
- AVOID EXCESSIVE ROUGHNESS THAT WOULD HINDER UNIFORM PLANT ESTABLISHMENT, SUCH AS A LARGE PERCENTAGE OF THE AREA WITH FURROWS DEEPER OR CLODS LARGER THAN 4 INCHES.

SEED, FERTILIZE, AND MULCH AREAS THAT ARE ROUGHENED AS SOON AS PRACTICABLE.

INSPECTION

ENSURE THE AREA HAS AN ADEQUATE DEPTH AND COVERAGE OF ROUGHENING. INSPECT THE AREAS ACCORDING TO ESTABLISHED SCHEDULES AS REQUIRED BY THE CGP AND THE SWPPP.

MAINTENANCE

REGRADE AND RESEED AS SOON AS PRACTICABLE IF RILLS OR CHANNELIZATION OF RUNOFF APPEAR.

REVISIONS	
Date	By

State of Alaska
Department of Transportation
& Public Facilities

SURFACE ROUGHENING

APPROVED
Date 12/2015

NOT TO SCALE

BMP 42.00. Vehicle/Equipment Storage, Maintenance and Fueling

SPECIFICATIONS

Objectives

Minimize or eliminate the discharge of pollutants and hazardous materials into storm drain systems, waters of the U.S., or groundwater.

Applicability

- Procedures and practices are used where on-site storage, maintenance, and fueling takes place.
- When practical, storage, maintenance, and fueling must be done off-site.

GENERAL VEHICLE/EQUIPMENT PRACTICES

- Designate areas to be used for storage, washing, maintenance, and fueling of equipment and vehicles. Locate these areas as far away from stormwater drainage systems and waters of the U.S. as practicable. Use paved surfaces if practicable.
- Provide appropriate perimeter best management practices (BMPs) to divert clean stormwater run-on from the storage, maintenance, or fueling area and to protect stormwater from maintenance area run-off (i.e. berms, silt fence or fiber rolls.)
- Place drip pans or absorbent pads under vehicles or equipment to contain potential drips or leaks that may develop during storage, maintenance, or fueling.
- Have drip pans, absorbent pads, and spill kits located near or within the storage, maintenance or fueling area.
- Properly dispose of any used absorbent pads or any wastes collected in drip pans.
- Check ground under vehicles and equipment for evidence of leaks or drips.
- Clean up any leaks, spills, or contaminated surfaces immediately. Use absorbent pads to clean small spills and properly dispose of used pads.
- Make sure spill kit is adequately stocked and replace used supplies promptly.

- Check perimeter BMPs according to their specified inspection guidelines.

VEHICLE/EQUIPMENT STORAGE

Description

If overnight storage of vehicles and equipment on-site is necessary, follow these procedures:

Procedures

- Inspect vehicles and equipment to be stored on-site for leaks. If leaks are found, either immediately repair the leak or contain the leak and repair as soon as possible.

VEHICLE/EQUIPMENT MAINTENANCE

Description

If maintenance or washing of vehicles and equipment on-site is necessary, follow these procedures:

Procedures

- Store waste fluids in labeled, sealable, leak-proof containers. Check containers used to store waste fluids and other liquids used for maintenance to make sure they are sealed and free of leaks.
- Properly dispose of fuels, lubricants, and other materials used for maintenance in accordance with manufacturer's instructions and state, federal, and local regulations.
- Any maintenance materials stored on-site must be protected from exposure to precipitation. Use secondary containment designed to prevent spills or leaked chemicals from mixing with stormwater.
- Detergents, soaps and solvents are prohibited from use by the CGP for any equipment washing.
 - All wash water must be treated through an appropriate control measure (i.e. sediment basin or equivalent) prior to discharge to stormwater drainage systems or waters of the U.S.

- Check vehicles and equipment for excess buildup of oil and grease. Clean vehicle or equipment and properly dispose of excess oil and grease.

VEHICLE/EQUIPMENT FUELING

Description

If fueling on-site is necessary, follow these procedures:

Procedures

- Fuel on a level grade area as far away from stormwater drainage systems and waters of the U.S., as practicable.
- Place drip pans or absorbent pads under vehicles or equipment to contain drips or leaks.
- Have drip pans, absorbent pads, and spill kits located nearby.
- During mobile fueling of equipment, properly protect the fueling hose from any damage.
- Fueling operations shall be attended at all times.
- Automatic shut-off nozzles are preferred. Do not “top off” fuel tanks. Leave adequate space for fuel expansion and movement in the tank while equipment is in operation.

Appendix C - Project Schedule

Appendix D - Supporting Documentation

WASILLA 2 NE, ALASKA (509765)

Period of Record Monthly Climate Summary

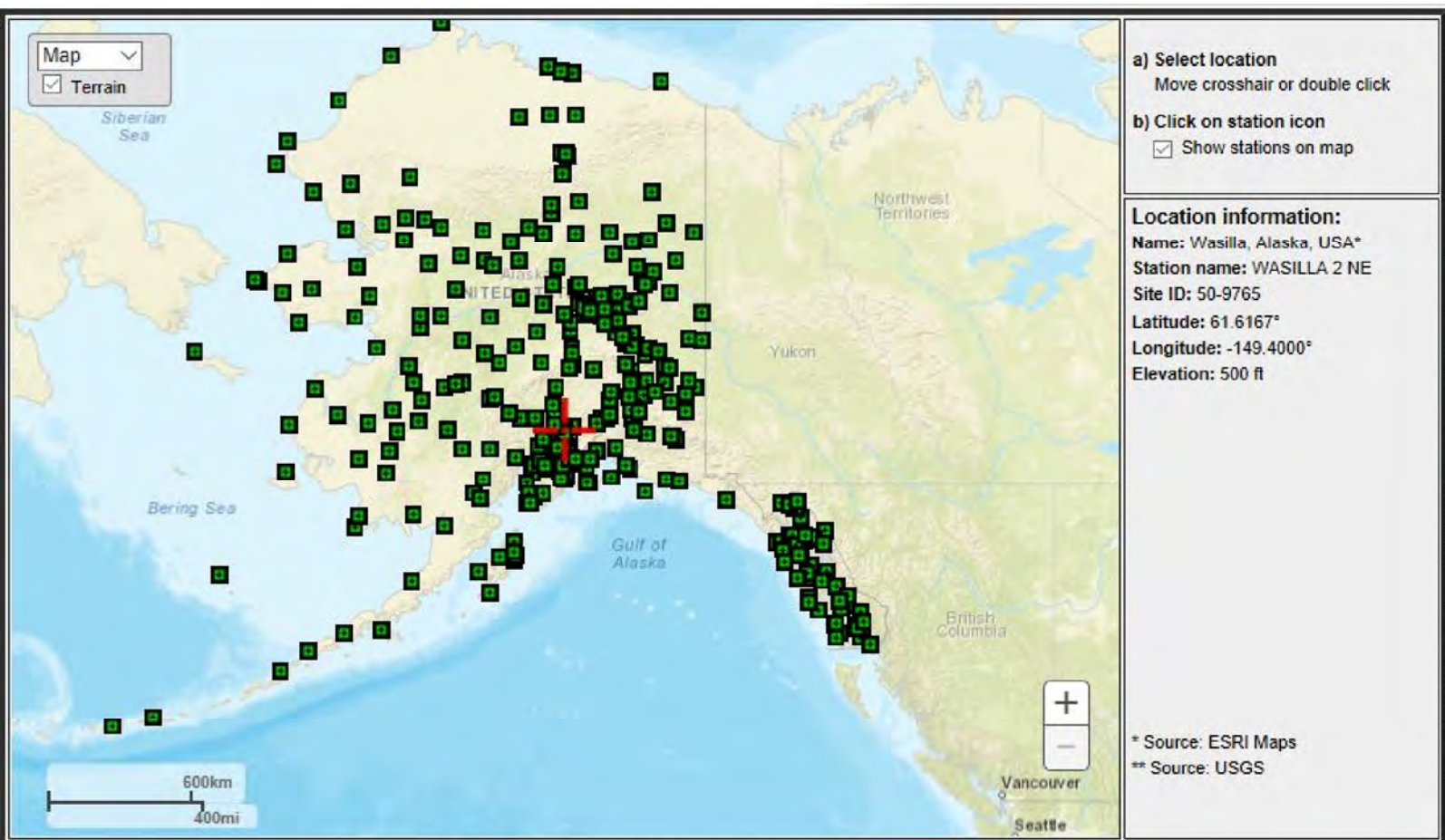
Period of Record : 07/01/1968 to 05/31/1984

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	21.6	28.6	36.6	46.1	58.0	64.1	67.3	65.4	56.5	41.4	29.5	22.3	44.8
Average Min. Temperature (F)	5.6	12.0	18.0	25.7	33.8	41.2	45.6	43.6	36.5	26.1	14.0	6.6	25.7
Average Total Precipitation (in.)	0.55	0.61	0.66	0.80	0.91	2.25	2.95	2.59	2.94	2.08	0.98	0.99	18.32
Average Total SnowFall (in.)	6.3	7.5	8.8	5.9	0.5	0.0	0.0	0.0	0.2	8.2	8.9	12.9	59.3
Average Snow Depth (in.)	7	7	6	2	0	0	0	0	0	1	3	7	3

Percent of possible observations for period of record.

Max. Temp.: 99.8% Min. Temp.: 99.8% Precipitation: 99.8% Snowfall: 99.8% Snow Depth: 99.3%

Check [Station Metadata](#) or [Metadata graphics](#) for more detail about data completeness.



POINT PRECIPITATION FREQUENCY (PF) ESTIMATES

WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
NOAA Atlas 14, Volume 7, Version 2

PF tabular

PF graphical

Supplementary information

Print page

PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)¹

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.096 (0.070-0.134)	0.117 (0.083-0.168)	0.149 (0.104-0.223)	0.175 (0.120-0.270)	0.211 (0.141-0.340)	0.239 (0.157-0.387)	0.267 (0.173-0.458)	0.303 (0.193-0.535)	0.350 (0.218-0.643)	0.386 (0.238-0.722)
10-min	0.128 (0.093-0.179)	0.157 (0.112-0.225)	0.200 (0.139-0.299)	0.235 (0.161-0.363)	0.284 (0.190-0.457)	0.321 (0.211-0.534)	0.359 (0.232-0.616)	0.407 (0.259-0.719)	0.470 (0.293-0.883)	0.518 (0.317-0.969)
15-min	0.150 (0.109-0.210)	0.184 (0.131-0.264)	0.234 (0.163-0.350)	0.276 (0.189-0.426)	0.332 (0.222-0.535)	0.376 (0.248-0.625)	0.420 (0.272-0.720)	0.476 (0.303-0.841)	0.550 (0.342-1.01)	0.606 (0.371-1.13)
30-min	0.199 (0.145-0.278)	0.244 (0.174-0.350)	0.310 (0.216-0.463)	0.366 (0.251-0.565)	0.441 (0.295-0.710)	0.499 (0.329-0.830)	0.558 (0.361-0.957)	0.632 (0.402-1.12)	0.730 (0.454-1.34)	0.804 (0.492-1.50)
60-min	0.273 (0.199-0.382)	0.334 (0.238-0.479)	0.425 (0.296-0.635)	0.501 (0.344-0.773)	0.604 (0.405-0.973)	0.684 (0.450-1.14)	0.764 (0.495-1.31)	0.866 (0.551-1.53)	1.00 (0.623-1.84)	1.10 (0.675-2.06)
2-hr	0.343 (0.250-0.480)	0.420 (0.299-0.603)	0.534 (0.372-0.798)	0.629 (0.431-0.971)	0.759 (0.509-1.22)	0.859 (0.566-1.43)	0.959 (0.621-1.64)	1.09 (0.692-1.92)	1.25 (0.781-2.31)	1.38 (0.847-2.59)
3-hr	0.412 (0.301-0.576)	0.504 (0.359-0.723)	0.642 (0.448-0.959)	0.756 (0.518-1.17)	0.912 (0.611-1.47)	1.03 (0.680-1.72)	1.15 (0.748-1.98)	1.31 (0.830-2.31)	1.51 (0.939-2.77)	1.66 (1.02-3.11)
6-hr	0.583 (0.425-0.816)	0.713 (0.508-1.02)	0.907 (0.633-1.36)	1.07 (0.732-1.65)	1.29 (0.863-2.07)	1.46 (0.961-2.43)	1.63 (1.06-2.79)	1.85 (1.18-3.26)	2.13 (1.33-3.92)	2.35 (1.44-4.39)
12-hr	0.800 (0.584-1.12)	0.980 (0.698-1.41)	1.24 (0.866-1.86)	1.46 (0.999-2.25)	1.76 (1.18-2.83)	2.00 (1.32-3.32)	2.25 (1.45-3.85)	2.55 (1.62-4.50)	2.94 (1.83-5.41)	3.24 (1.99-6.07)
24-hr	1.09 (0.980-1.22)	1.33 (1.19-1.51)	1.68 (1.46-1.95)	1.96 (1.68-2.32)	2.37 (1.98-2.86)	2.69 (2.22-3.31)	3.04 (2.46-3.80)	3.45 (2.74-4.38)	3.98 (3.09-5.18)	4.39 (3.35-5.80)

Fall 'Freeze' Probabilities (Jul. 31 - Dec. 31)

WASILLA 2 NE, e: (509765)											
<u>Temp F</u>	<u>Earliest</u>	<u>10%</u>	<u>20%</u>	<u>30%</u>	<u>40%</u>	<u>50%</u>	<u>60%</u>	<u>70%</u>	<u>80%</u>	<u>90%</u>	<u>Latest</u>
36.5	08/02	08/09	08/15	08/16	08/21	08/22	08/23	08/26	08/29	09/02	09/04
32.5	08/14	08/14	08/16	08/22	08/25	08/31	09/03	09/08	09/13	09/16	09/19
28.5	08/14	09/02	09/05	09/09	09/14	09/18	09/21	09/24	09/26	09/29	09/30
24.5	09/02	09/09	09/20	09/22	09/24	09/28	09/30	10/04	10/08	10/18	10/21
20.5	09/02	09/09	09/21	09/25	10/01	10/13	10/13	10/15	10/18	10/19	10/22

Spring 'Freeze' Probabilities (Jan 1 - Jul 31)

WASILLA 2 NE, e: (509765)											
<u>Temp F</u>	<u>Earliest</u>	<u>90%</u>	<u>80%</u>	<u>70%</u>	<u>60%</u>	<u>50%</u>	<u>40%</u>	<u>30%</u>	<u>20%</u>	<u>10%</u>	<u>Latest</u>
36.5	06/12	06/12	06/18	06/21	06/26	07/02	07/05	07/08	07/19	07/26	07/29
32.5	05/22	05/22	05/27	05/29	05/31	06/04	06/07	06/12	06/16	07/03	07/26
28.5	05/07	05/07	05/09	05/15	05/16	05/17	05/20	05/21	05/24	05/29	06/04
24.5	04/11	04/18	04/21	04/23	04/27	04/28	05/02	05/04	05/09	05/10	05/22
20.5	03/18	03/27	04/01	04/10	04/11	04/15	04/22	04/23	04/27	05/03	05/04

Appendix E - Certifications

Appendix F - Permit Conditions

Appendix G - Grading and Stabilization Log

Appendix G – Grading and Stabilization Activity Logs

Project Name: Aspen House Senior Apartments

[illegible]

Appendix C - Project Schedule

Appendix I - Training Log

Appendix I

Training Record

Project Name: Aspen House Senior Apartments

Project Number:

Instructor's Name:

Date:

ESCP Training Topic:

[illegible]

Appendix J - Corrective Action Log

Appendix J – Corrective Action Log

Project Name: Aspen House Senior Apartments

[illegible]

Appendix K - Inspection Log

Stormwater Construction Site Inspection Report

General Information			
Project Name	Aspen House Senior Apartments		
APDES Tracking No.		Location	
Date of Inspection		Start/End Time	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspectors Qualifications			
Describe present phase of construction			
Type of Inspection <input type="checkbox"/> Regular <input type="checkbox"/> Pre-storm event <input type="checkbox"/> During storm event <input type="checkbox"/> Post-storm event			
Weather Information			
Has it rained since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No			
If yes, provide: <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Storm Start Date & Time: Storm Duration (hrs): Approximate Rainfall (in): </div>			
Weather at time of this inspection?			
Do you suspect that discharges may have occurred since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Are there any discharges at the time of inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No			

Site-specific BMPs

Number the structural and non-structural BMPs identified in your SWPPP on your site map and list them below (add as many BMPs as necessary). Carry a copy of this numbered site map with you during your inspections. This list will help ensure that you are inspecting all required BMPs at your site. Customize this section as needed.

	BMP Description	BMP Installed and Operating Properly?	Corrective Action Needed	Date for corrective action/responsible person
1		<input type="checkbox"/> Yes <input type="checkbox"/> No		
2		<input type="checkbox"/> Yes <input type="checkbox"/> No		
3		<input type="checkbox"/> Yes <input type="checkbox"/> No		
4		<input type="checkbox"/> Yes <input type="checkbox"/> No		
5		<input type="checkbox"/> Yes <input type="checkbox"/> No		
6		<input type="checkbox"/> Yes <input type="checkbox"/> No		
7		<input type="checkbox"/> Yes <input type="checkbox"/> No		
8		<input type="checkbox"/> Yes <input type="checkbox"/> No		
9		<input type="checkbox"/> Yes <input type="checkbox"/> No		
10		<input type="checkbox"/> Yes <input type="checkbox"/> No		
11		<input type="checkbox"/> Yes <input type="checkbox"/> No		
12		<input type="checkbox"/> Yes <input type="checkbox"/> No		
13		<input type="checkbox"/> Yes <input type="checkbox"/> No		
14		<input type="checkbox"/> Yes <input type="checkbox"/> No		
15		<input type="checkbox"/> Yes <input type="checkbox"/> No		
16		<input type="checkbox"/> Yes <input type="checkbox"/> No		
17		<input type="checkbox"/> Yes <input type="checkbox"/> No		
18		<input type="checkbox"/> Yes <input type="checkbox"/> No		
19		<input type="checkbox"/> Yes <input type="checkbox"/> No		
20		<input type="checkbox"/> Yes <input type="checkbox"/> No		

	BMP Description	BMP Installed and Operating Properly?	Corrective Action Needed	Date for corrective action/responsible person
21		<input type="checkbox"/> Yes <input type="checkbox"/> No		
22		<input type="checkbox"/> Yes <input type="checkbox"/> No		
23		<input type="checkbox"/> Yes <input type="checkbox"/> No		
24		<input type="checkbox"/> Yes <input type="checkbox"/> No		
25		<input type="checkbox"/> Yes <input type="checkbox"/> No		
26		<input type="checkbox"/> Yes <input type="checkbox"/> No		
27		<input type="checkbox"/> Yes <input type="checkbox"/> No		
28		<input type="checkbox"/> Yes <input type="checkbox"/> No		
29		<input type="checkbox"/> Yes <input type="checkbox"/> No		
30		<input type="checkbox"/> Yes <input type="checkbox"/> No		
31		<input type="checkbox"/> Yes <input type="checkbox"/> No		
32		<input type="checkbox"/> Yes <input type="checkbox"/> No		
33		<input type="checkbox"/> Yes <input type="checkbox"/> No		
34		<input type="checkbox"/> Yes <input type="checkbox"/> No		
35		<input type="checkbox"/> Yes <input type="checkbox"/> No		
36		<input type="checkbox"/> Yes <input type="checkbox"/> No		
37		<input type="checkbox"/> Yes <input type="checkbox"/> No		
38		<input type="checkbox"/> Yes <input type="checkbox"/> No		
39		<input type="checkbox"/> Yes <input type="checkbox"/> No		
40		<input type="checkbox"/> Yes <input type="checkbox"/> No		

Overall Site Issues

	BMP/activity	Implemented?	Maintained?	Corrective Action/Comment	Date for corrective action/responsible person
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	None on site	
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
4	Are discharge points and receiving waters free of sediment deposits?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
5	Are storm drain inlets properly protected?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
6	Is there evidence of sediment being tracked into the street?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
7	Is trash/litter from work areas collected and placed in covered dumpsters?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		

	BMP/activity	Implemented?	Maintained?	Corrective Action/Comment	Date for corrective action/responsible person
9	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
10	Are materials that are potential stormwater contaminants stored inside or under cover?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
12	(Other)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		

Compliance with Permit Conditions and Certification Statement

Check one of the following statements:

☐ I did not identify any incidents of non-compliance with the CGP conditions. The Aspen House Senior Apartments project is in compliance with this permit.

or

☐ I identified incidents of non-compliance with the CGP conditions. These incidents are noted in the preceding checklist and corrective action will be taken to bring the project into permit compliance.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print name: _____

Signature: _____

Date: _____

Appendix L - Hazardous Material Control Plan

Hazardous Material Control Plan (HMCP)

Aspen House Senior Apartments
Wasilla Alaska

February 8, 2023

A. Project Description

Construction of site civil improvements (ground disturbance) will begin in May, 2023.

The project is estimated to be completed in the following sequence:

1. Mobilize to the site (June 2023)
2. Install BMP's (June 2023)
3. Clear and Grub as needed (site mostly cleared already)(July 2023)
4. Utility extensions (June-July 2023)
5. Excavate, fill and grade site (July-August 2023)
6. Install site lighting conduit and pole foundations (August 2023)
7. Complete temporary stabilization and landscaping outside of paved areas (August 2023)
8. Finish Leveling Course Grade (June 2024)
9. Pave (July 2024)
10. Stripe (July 2024)
11. Complete landscaping and Final stabilization (August 2024)
12. Maintain landscaping/seeded areas until site is permanently stabilized. (August 2024-September 2024)

This Hazardous Material Control Plan applies to construction activities associated with the project described above. The anticipated schedule for the project is to begin activity May 15, 2023 with a completion date of September 30, 2024.

B. Hazardous Materials On-Site

For a list of hazardous materials on-site please refer to the project MSDS binder's table of contents.

C. Spill Assessment

Any material identified as "hazardous" and handled improperly (spilled) will be responded to as per the manufacturer recommendation as described on the MSDS.

Response, recovery and disposal procedures will be as identified in sections of this plan.

D. Training Program

The contractor insists that our employees are well trained and informed of the environment that they will be working, in, with, and around.

When "hazardous" materials are introduced to the job site, the MSDS will be available in the project office for the review of our employees that will be working with the material. Weekly safety meetings will be held on the job site and new materials will be discussed as well as other safety precautions and procedures applicable for that week's work.

E. Response Organization

Whenever there is an imminent or actual emergency situation such as a release, the following steps will be completed:

1. Identify the character, exact source, amount, and areal extent of any released hazardous materials.
2. Assess possible hazards to human health or the environment that may result from the release. This assessment must consider both direct and indirect effects.
3. Activate internal facility alarms or communication systems, where applicable, to notify all facility personnel.
4. Notify appropriate local authorities.
5. Monitor for leaks, pressure build-up, gas generation, or ruptures in valves, pipes or other equipment shut down in response to the incident.
6. Take all reasonable measures necessary to ensure that fires, explosions and releases do not occur, recur or spread to other hazardous material at the facility.
7. Complete spill report

Follow-up on spill with investigation and submit handling report.

The following are ADEC guidelines on when to report a spill:

Hazardous Substance Releases

Any release of a hazardous substance must be reported as soon as the person has knowledge of the discharge.

Oil/Petroleum Releases

- **TO WATER:** *Any release of oil to water must be reported as soon as the person has knowledge of the discharge.*
- **TO LAND:** *Any release of oil in excess of 55 gallons must be reported as soon as the person has knowledge of the discharge. Any release of oil in excess of 10 gallons but less than 55 gallons must be reported within 48 hours after the person has knowledge of the discharge. A person in charge of a facility or operation shall maintain, and provide to the Department on a monthly basis, a written record of any discharges any discharge of oil from 1 to 10 gallons.*
- **TO IMPERMEABLE SECONDARY CONTAINMENT AREAS:** *Any release of oil in excess of 55 gallons must be reported within 48 hours after the person has knowledge of the discharge.*

Before facility operations are resumed in areas of the facility affected by the incident, the following actions will be completed:

1. Provide for proper storage and disposal of recovered waste, contaminated soil or surface water, or any other material that results from the release.

2. Ensure that no material that is incompatible with the released material is transferred, stored, or disposed of in areas of the facility affected by the incident until cleanup procedures are completed.
3. Ensure that all emergency equipment is cleaned, fit for its intended use, and available for use.

F. Emergency Notification

Contractor contact information

ADEC	1-800-478-9300
National Response Center	1-800-424-8802
Emergency	#911

G. Post Incident Reporting/Recording Procedures

In the event a spill occurs, the project engineer on-site will be immediately notified. A spill report will be filed with ADEC and other agencies they deem necessary; in accordance with section E. Full cooperation by the contractor is assured.

The time, date, and details of any hazardous materials incident that requires implementation of this plan shall be noted in the SWPPP.

H. Safety Guidelines

Material manufacturers' recommendations will be followed in all spill cases. OSHA regulations will be followed as well. All hazardous materials will be handled according to the MSDS specifications. Hazardous materials and waste will be stored either inside or under a covered area with containment underneath.

I. Control Actions

The contractor will take responsibility of a spill related to our scope of work and control this plan to ensure proper actions are taken. This means that if a tanker truck driving through the job has a structural failure and spills an unknown chemical we will notify authorities and the producer/transporter will be responsible.

Absorbent pads and containment tools will be located on the job crew trucks to begin control of a spill. Most vehicles will have radio (minimum) and phone communication for quick response to spills. Spill cleanup kits will be on-site from start to finish. These kits will be located in a conspicuous place on our crew truck and in a recognizable drum.

J. Disposal of Spill Waste

If any spill occurs, the waste will be disposed of per local, state, and federal regulations.

Absorbent materials, spill booms, and other containment materials will be disposed of properly.

K. Reclamation of Spill Sites

If required, this will be done per local, state, and federal regulations.

L. Contaminated Soil and/or Water

If contaminated soil or water is encountered, the contractor will stop work and notify the Department for further direction. When required, the contractor shall perform testing to assure the proper disposal of contaminated materials. The soil and/or water sampling and testing procedures shall follow ADEC procedures.

SPILL RESPONSE KIT

A spill response kit will be located on-site during construction and will comply with 49 CFR 178, and contain at a minimum the following:

- Oily waste disposable bags
- Assorted sizes of Absorbent pads
- Personal protection safety equipment
- Granular sorbent
- Sorbent boom
- Fire Extinguisher (Will be located on site)
- Shovel (Will be located on site)

Appendix M - Record of Rainfall

Daily Record of Rainfall

Project: Aspen House Senior Apartments

Page:

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