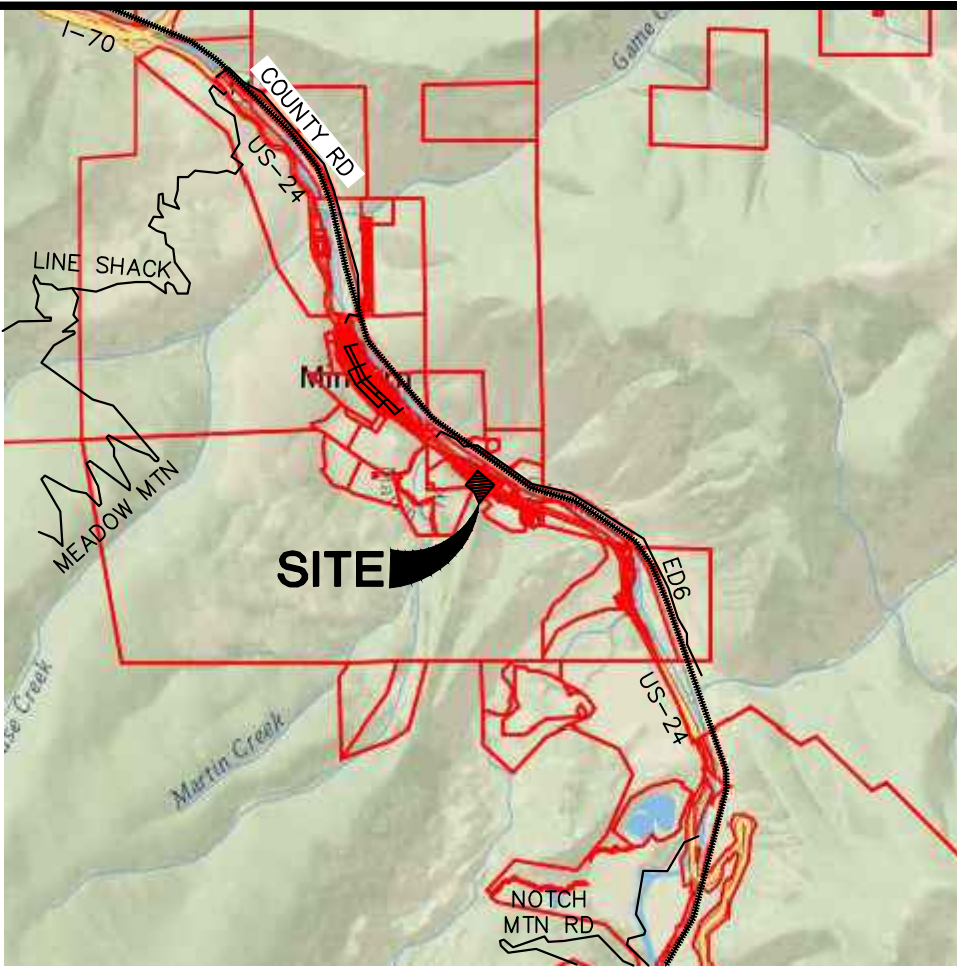


M:\Civil\134\_Pros\120067\Site Plan\20067CV1.dwg, 10/29/2024 2:40 PM, Colton M. Welton, 01 COVER SHEET, MCLLC PDF, p.3  
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# MIDTOWN VILLAGE PUD

## MINTURN, EAGLE COUNTY, COLORADO

### PLANNED UNIT DEVELOPMENT



VICINITY MAP  
SCALE : NTS

#### OWNER/APPLICANT

10TH MOUNTAIN BUILDERS  
1632 MAIN STREET  
MINTURN, MICHIGAN, 81645  
CONTACT: JEFF ARMISTEAD  
970-471-0618

#### ENGINEER/LANDSCAPE ARCH.

MIDWESTERN CONSULTING, LLC  
3815 PLAZA DR.  
ANN ARBOR, MI 48108  
CONTACT: KATE BOND  
734-995-0200

#### ARCHITECT

TK DESIGN & ASSOCIATES  
26030 PONTIAC TRAIL  
SOUTH LYON, MI 48178  
CONTACT: TODD HALLETT  
248-446-1960

#### SURVEYOR

GORE RANGE SURVEYING, LLC  
953 S. FRONTAGE RD W.  
VAIL, CO. 81657  
CONTACT: SAMUEL ECKER  
970-479-8698

#### SIGNATURES

OWNER DEVELOPER DATE

FIRE DEPARTMENT DATE



SITE MAP  
SCALE : NTS

#### SITE DATA

Parcel size	Existing	Proposed			
Zoning	Commercial	Commercial			
Lot coverage		Masterplan	Phase I		
Impervious area		73,657.98 SF	44,111 SF		
Pervious area		36,547.02 SF	14,544 SF		
Setbacks	Required	Provided	Parking Requirement	Parking Provided	Notes
Front	20'	20'			
Side	5'	5'			
Rear	10'	5'			5' at proposed apartment building only
Residential					
Town House		10 Units	2/unit: 2x10=20	20 (+ 20 Guest)	2 car tandem garages in each unit + 2 car side by side driveway for guests
Cottage		2 Units	2/unit: 2x2=4		2 car side by side driveway at each unit
2 Story Micro Home		4 Units	1/unit: 1x4=4	4	Surface parking
Micro Home		4 Units	1/unit: 1x4=4	4	Surface parking
Apartment					
Apartment Bldg		15 (2 bdrm) Units	2/unit=30 + 1= 31		31 spaces beneath structure
Lofts Bldg A		4 Units	2/unit=8		Garage provided with 4 stacked spaces + 4 surface spaces
Exist Bldg B		2 Units	2/unit=4	2/unit+ 1/8 units=46	4 surface spaces
			Guest 1 space/8 units=3		3 surface spaces
Commercial					
Bldg A: Proposed		3600 sf (80%)	1/300sf: 3600/300=12	12	12 in surface lot
Bldg B: Existing		5280sf (80%)	1/300sf: 5280/300=18	14	4 in surface lot and 10 stacked in driveways
			Total	28 Phase I (108)	
Open Space		Masterplan	Phase I		
Active		17,861 sf / 16%	6,619 sf / 6%		Pocket parks, Public plaza, Community garden
Passive		2,692 sf / 2%	2,692 sf / 2%		Connector Trail
		deviation required			

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## MIDTOWN VILLAGE PUD

JOB No. **20067**

DATE: 10/29/24

REVISIONS:

PER MUNICIPAL REVIEW 03/31/23

REV. DATE

PER ERWSD REVIEW

04/06/23

PER ERWSD REVIEW

08/21/23

PER ERWSD & IME REVIEW

01/15/24

PER ERWSD & IME REVIEW

02/23/24

PER ERWSD REVIEW

05/15/24

10/30/24

SHEET 01 OF 38

CADD:

ENG: CMW

PM: RCW

TECH:

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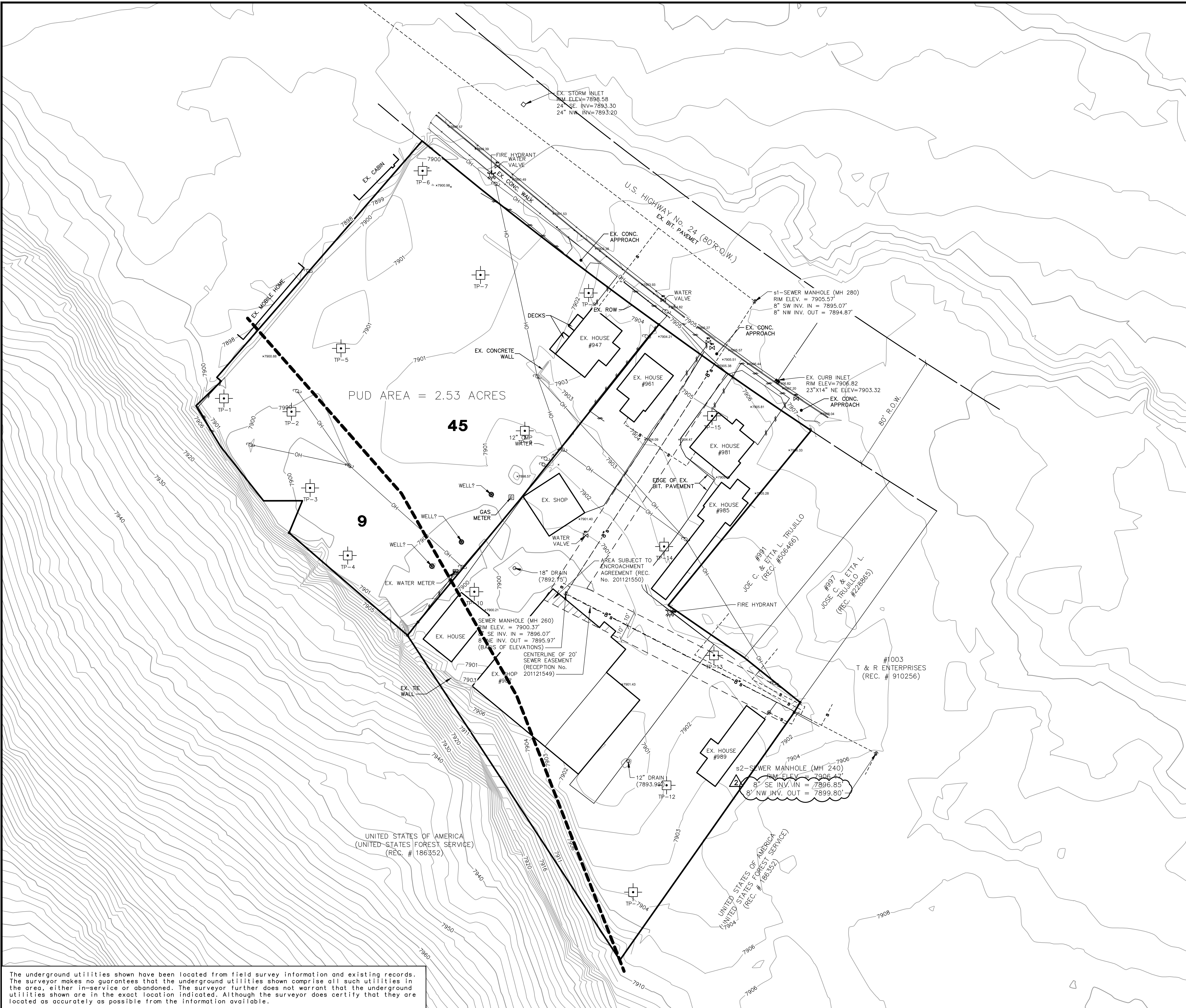
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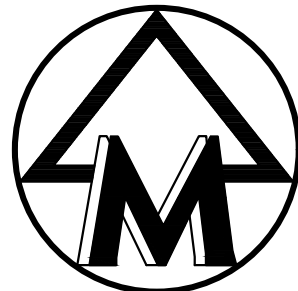
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SCALE: 1" = 30'  
0 30 60 90



Know what's below.  
Call before you dig.

### BASIS OF ELEVATIONS

EXISTING SANITARY SEWER MANHOLE AT THE CENTER OF THE SOUTH PROPERTY.  
ELEV=7900.37 (NAVD88)

### LEGEND

- 838 EXISTING CONTOUR
- x836.2 EXISTING SPOT ELEVATION
- OH EXISTING UTILITY POLE
- OH EXISTING OVERHEAD UTILITY LINE
- OH EXISTING HYDRANT
- OH EXISTING WATER VALVE
- OH EXISTING STORM SEWER
- OH EXISTING CATCH BASIN OR INLET
- OH EXISTING SANITARY SEWER
- OH SIGN
- OH POST
- OH EXISTING GAS VALVE
- OH WELL
- OH FENCE
- 45 EXISTING SOIL TYPE & BOUNDARY
- TP-1 TEST PIT LOCATION

### GENERAL SOILS DESCRIPTION

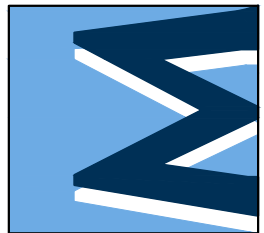
BASED ON SOIL SURVEY OF EAGLE COUNTY COLORADO

- 9 - ANSEL-ANVIL ASSOCIATION, 25 TO 45 PERCENT SLOPES
- 45 - FORSEY COBBLY LOAM, 3 TO 12 PERCENT SLOPES

### NOTES

- SOIL BORINGS PERFORMED BY KUMAR & ASSOCIATES, INC. ON MAY 31, 2022.
- THE BOUNDARY & TOPOGRAPHIC SURVEY WAS PREPARED BY GORE RANGE SURVEYING, LLC DATED 11/1/2021

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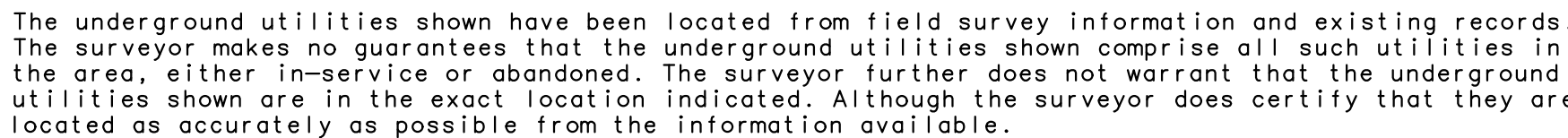
MIDTOWN VILLAGE PUD

EXISTING CONDITIONS

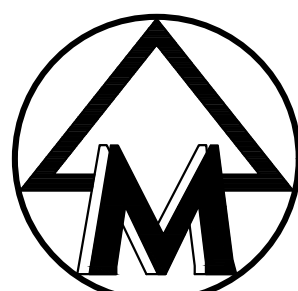
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JOB No.	20067	DATE: 10/29/24	SHEET 02 OF 38
REVISIONS:	REV. DATE	REV. DATE	REV. DATE
PER ERWSD & IME REVIEW	02/23/24	CADD:	08/19/24
PER ERWSD & IME REVIEW	08/19/24	ENG. CWM	10/20/24
PER ERWSD & IME REVIEW	10/20/24	ENG. RCW	10/20/24
PER ERWSD & IME REVIEW	10/20/24	TECH:	10/20/24






838	EXISTING CONTOUR
x836.2	EXISTING SPOT ELEVATION
o- U.P.	EXISTING UTILITY POLE
o- U.P.	EXISTING UTILITY POLE W/ TRANSFORMER
o- GP	EXISTING GUY POLE
—	GUY WIRE
	ELECTRIC TRANSFORMER
	EXISTING AC UNIT
	EXISTING GENERATOR
— OH —	EXISTING OVERHEAD UTILITY LINE
	EXISTING LIGHT POLE
t —	EXISTING TELEPHONE LINE
e —	EXISTING ELECTRIC LINE
g —	EXISTING GAS LINE
g —	EXISTING GAS VALVE
f. o. —	EXISTING FIBER OPTIC LINE
w —	EXISTING WATER MAIN
	EXISTING HYDRANT
	EXISTING GATE VALVE IN BOX
	EXISTING GATE VALVE IN WELL
x —	EXISTING CURB STOP & BOX
o —	EXISTING BLOW-OFF
p.i.v. —	POST INDICATOR VALVE
f.d.c. —	FIRE DEPARTMENT CONNECTION
r —	EXISTING STORM SEWER
	EXISTING CATCH BASIN OR INLET
	EXISTING BEEHIVE INLET
) —	END SECTION
	HEAD WALL
	CULVERT
ds	EXISTING DOWNSPOUT
--- s —	EXISTING SANITARY SEWER
o	EXISTING CLEANOUT
... —	C/L OF DITCH
b	SIGN
	MAILBOX
t	TELEPHONE RISER
catv	CABLE TELEVISION RISER
e	ELECTRIC METER
w	WATER METER
scb	SPRINKLER CONTROL BOX
g	GAS METER
glm	GAS LINE MARKER
fiber	FIBER OPTIC MARKER
ped	PEDESTRIAN CROSSING SIGNAL
tscb	TRAFFIC SIGNAL CONTROL BOX
•	POST
•	WELL
— / — / —	FENCE
	SECTION CORNER
	SOIL BORING LOCATION
SB-1	
o S	SET IRON PIPE
o F	FOUND IRON PIPE
o S	SET MONUMENT
o F	FOUND MONUMENT
spk	SET PARKER KRYLON
o FPK	FOUND PARKER KRYLON
o S	SET IRON ROD
o FIR	FOUND IRON ROD
	CONTROL POINT
	CENTERLINE
	PROPERTY LINE
o gfc	EXISTING GAS FILLER CAP
	STRUCTURE TO BE REMOVED
	BITUMINOUS TO BE REMOVED
//////////	UTILITY TO BE REMOVED
XXXXXXXXXXXXXXXXXXXX	FENCE TO BE REMOVED
(REL) —	ITEM TO BE RELOCATED
(REM) —	ITEM TO BE REMOVED
	CONCRETE WALK TO BE REPLACED
	BITUMINOUS PAVEMENT TO BE REPLACED



SCALE: 1" = 30'



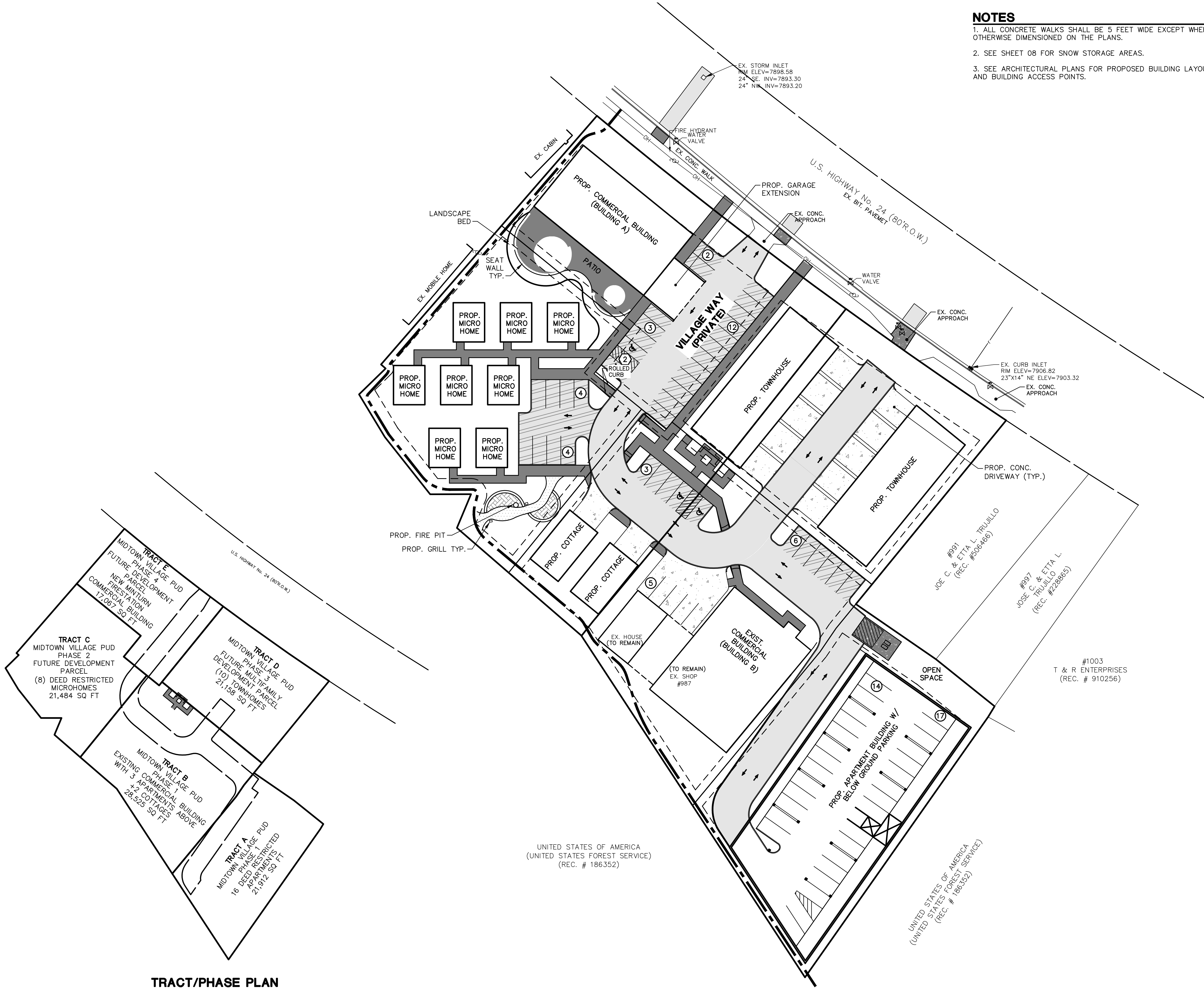
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1. LIMITS OF PAVEMENT REMOVAL ARE NOT FIELD VERIFIED.
2. ALL BUILDING REMOVALS SHALL INCLUDE REMOVAL OF FOUNDATIONS, UTILITY SERVICES, DRIVEWAYS, DECKS AND ANY OTHER IMPROVEMENTS.
3. ITEMS TO REMAIN SHALL BE PROTECTED THROUGHOUT THE ENTIRETY OF CONSTRUCTION.
4. ALL UTILITY REMOVALS SHALL BE COORDINATED WITH THE APPLICABLE UTILITY ENTITY.
5. ALL ASPHALT PAVEMENT REMOVALS SHALL BE SAWCUT AT REMOVAL LIMITS.
6. EAST CONCRETE APRON TO REMAIN AND BE PROTECTED THROUGHOUT THE ENTIRETY OF CONSTRUCTION.
7. SANITARY SEWER TO BE ABANDONED PER ALL PERTINENT LOCAL AND REGIONAL STANDARDS.



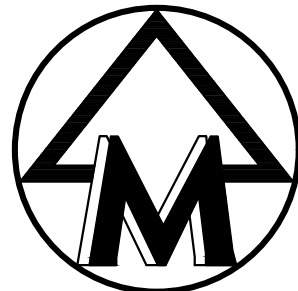


M:\Civil\134\_Pros\20067\Site Plan\20067SP1.dwg, 10/29/2024 2:40 PM, Colton M. Welton, 04 MASTER PLAN, MCLLC PDF, ps3  
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NOTES

1. ALL CONCRETE WALKS SHALL BE 5 FEET WIDE EXCEPT WHERE OTHERWISE DIMENSIONED ON THE PLANS.
2. SEE SHEET 08 FOR SNOW STORAGE AREAS.
3. SEE ARCHITECTURAL PLANS FOR PROPOSED BUILDING LAYOUTS AND BUILDING ACCESS POINTS.



SCALE: 1" = 30'



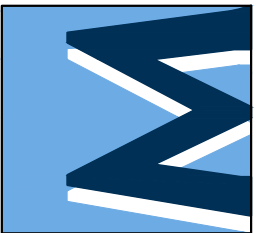
LEGEND

- |      |  |
|------|--|
| OH   | EXISTING UTILITY POLE                        |
| OH   | EXISTING OVERHEAD UTILITY LINE               |
| OH   | EXISTING HYDRANT                             |
| WV   | EXISTING WATER VALVE                         |
| SS   | EXISTING STORM SEWER                         |
| CB   | EXISTING CATCH BASIN OR INLET                |
| SS   | EXISTING SANITARY SEWER                      |
| P    | SIGN   |
| P    | POST   |
| G    | EXISTING GAS VALVE                           |
| W    | WELL   |
| F    | FENCE  |
| RT   | RUSTIC TRAIL                                 |
| PCW  | PROPOSED CONCRETE WALK                       |
| SDP  | PROPOSED STANDARD DUTY BITUMINOUS PAVEMENT   |
| HPD  | PROPOSED HEAVY DUTY BITUMINOUS PAVEMENT      |
| SDC  | PROPOSED STANDARD DUTY CONCRETE PAVEMENT     |
| HPD  | PROPOSED HEAVY DUTY CONCRETE PAVEMENT        |
| PM   | PAVEMENT MARKING                             |
| SP   | NUMBER OF STANDARD PARKING SPACES IN ROW     |
| BFSP | NUMBER OF BARRIER FREE PARKING SPACES IN ROW |
| TA   | TRAFFIC DIRECTION ARROWS                     |
| LP   | PROPOSED LIGHT POLE                          |

TRACT/PHASE PLAN

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MIDTOWN VILLAGE PUD

MASTER PLAN

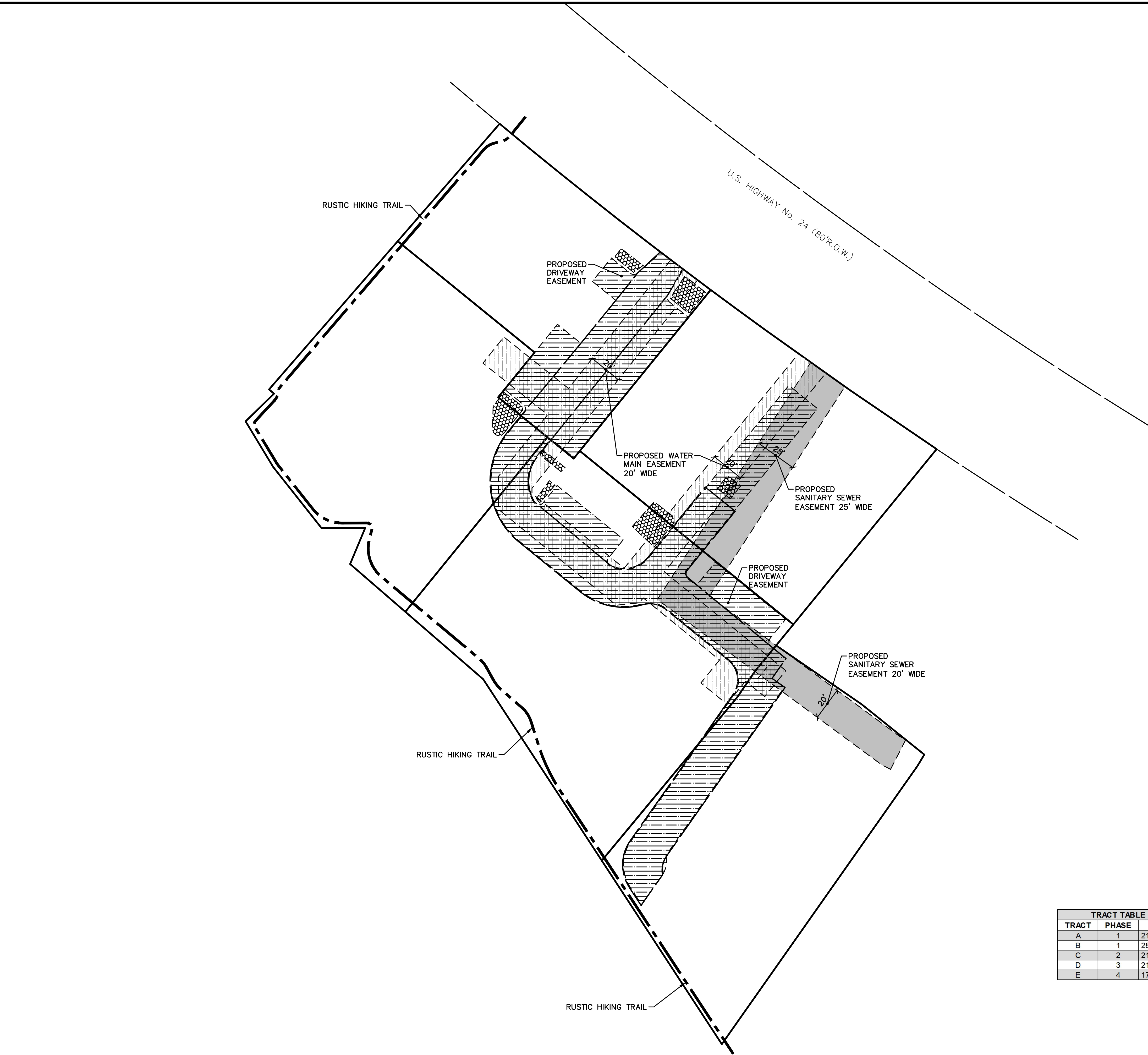
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JOB No.	20067	DATE: 8/19/24	SHEET 04 OF 38
REVISIONS:	REV. DATE	REV. DATE	REV. DATE
PER ERWSD & IME REVIEW	01/15/24	CADD:	02/23/24
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PER ERWSD & IME REVIEW		FM: RCW	
		TECH:	7/2026/SP1



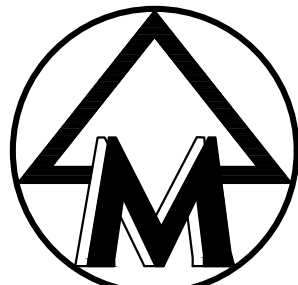


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TRACT TABLE		
TRACT	PHASE	AREA
A	1	21,912 SF
B	1	28,525 SF
C	2	21,484 SF
D	3	21,158 SF
E	4	17,067 SF

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SCALE: 1" = 30'



LEGEND

TRACT BOUNDARY

PROPOSED R.O.W. (RIGHT-OF-WAY)

WATER MAIN EASEMENT

SANITARY SEWER EASEMENT

DRIVEWAY EASEMENT

SNOW STORAGE EASEMENT



JOB No. 20067

REVISIONS:  
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PER ERWSD & IME REVIEW

DATE: 02/23/24  
DATE: 08/19/24

REV. DATE  
02/23/24  
08/19/24

REV. DATE  
02/23/24  
08/19/24

REV. DATE  
02/23/24  
08/19/24

REV. DATE  
02/23/24  
08/19/24

DATE: 8/19/24

SHEET 05 OF 38

CADD: ENG: CMM  
PLOT: RCW  
TECH: /2006PH1

MIDTOWN VILLAGE PUD

TRACT PLAN

05

CLIENT

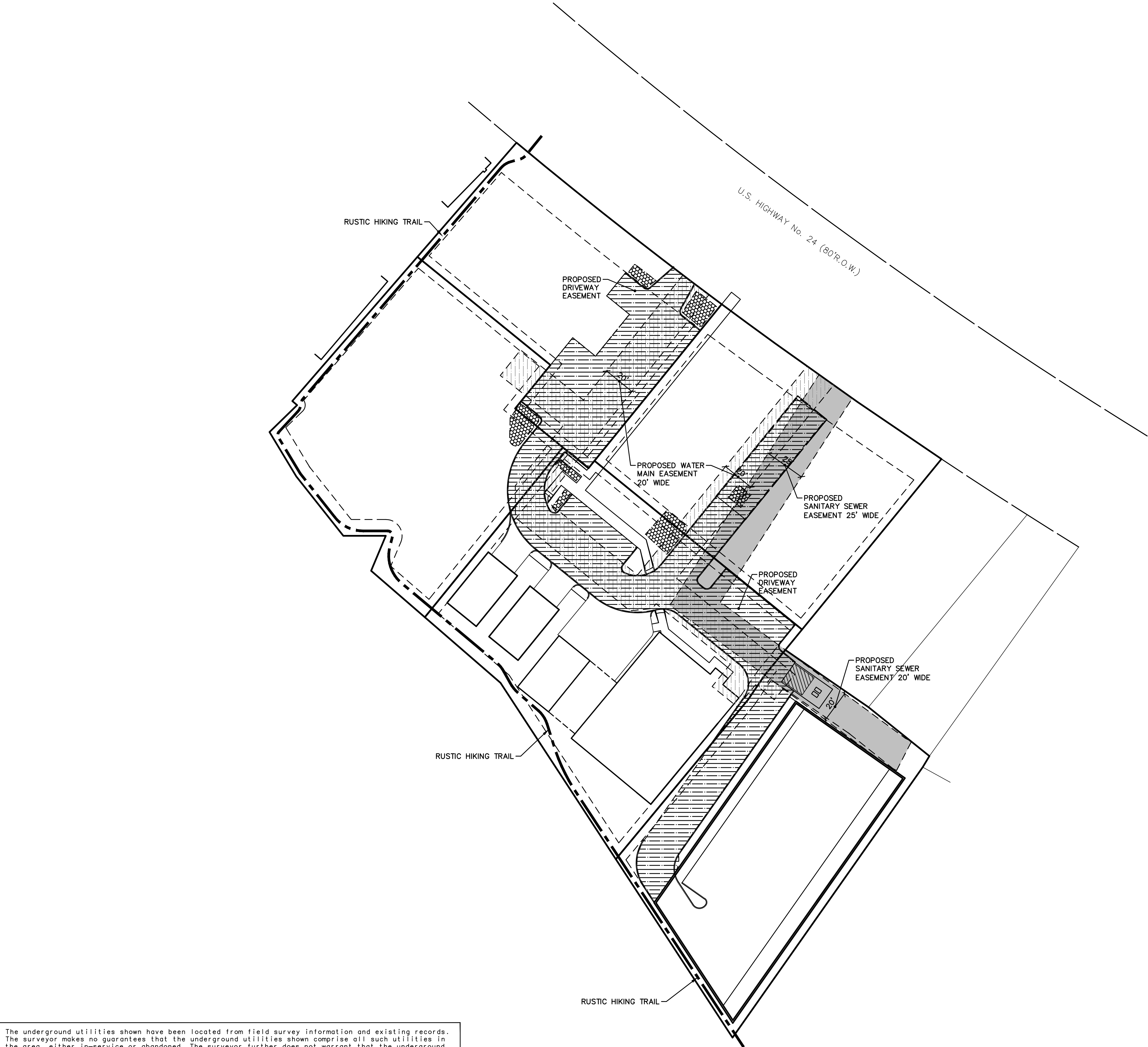
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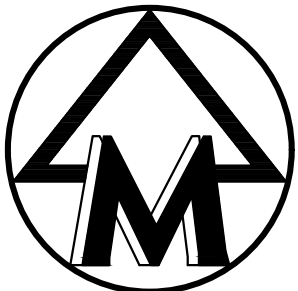
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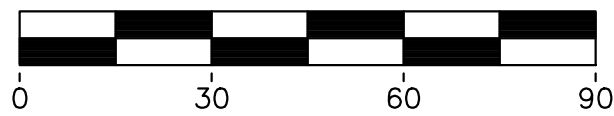
M:\Civ\134\_Pros\Site Plan\20067PM.dwg, 10/29/2024 2:40 PM, Colton M. Wallace, 06 TRACT PLAN WITH BUILDINGS, MLLC PDF ps3  
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SCALE: 1" = 30'



LEGEND	
	TRACT BOUNDARY
	PROPOSED BUILDING
	SETBACK LIMITS
	WATER MAIN EASEMENT
	SANITARY SEWER EASEMENT
	DRIVEWAY EASEMENT
	SNOW STORAGE EASEMENT



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08/19/24

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DATE: 8/19/24

SHEET 06 OF 38

CADD:

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MIDTOWN VILLAGE PUD

TRACT PLAN WITH BUILDINGS

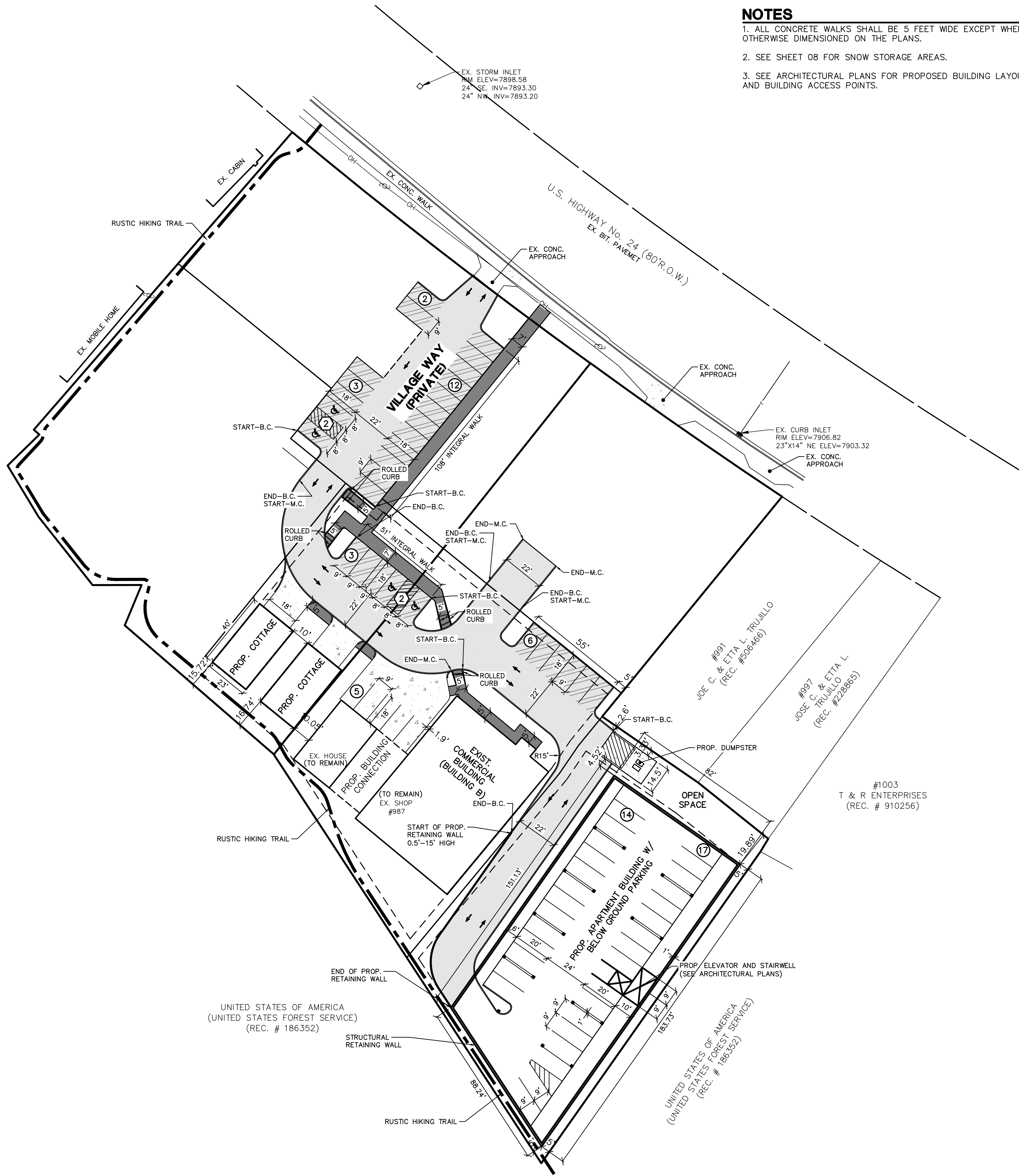
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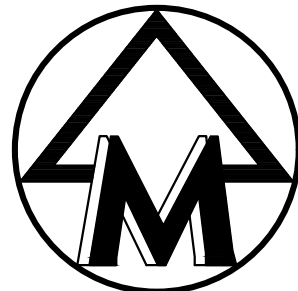
M:\Civ\134\_Pros\20067\Site Plan\20067SP1.dwg, 10/29/2024 2:40 PM, Colton M. Wallace, 07 SITE PLAN PHASE 1, MLLC PDF ps3  
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### NOTES

1. ALL CONCRETE WALKS SHALL BE 5 FEET WIDE EXCEPT WHERE OTHERWISE DIMENSIONED ON THE PLANS.
2. SEE SHEET 08 FOR SNOW STORAGE AREAS.
3. SEE ARCHITECTURAL PLANS FOR PROPOSED BUILDING LAYOUTS AND BUILDING ACCESS POINTS.



SCALE: 1" = 30'



### LEGEND

	EXISTING UTILITY POLE
	EXISTING OVERHEAD UTILITY LINE
	EXISTING HYDRANT
	EXISTING WATER VALVE
	EXISTING STORM SEWER
	EXISTING CATCH BASIN OR INLET
	EXISTING SANITARY SEWER
	SIGN
	POST
	EXISTING GAS VALVE
	WELL
	FENCE
	RUSTIC TRAIL
	PROPOSED CONCRETE WALK
	PROPOSED STANDARD DUTY BITUMINOUS PAVEMENT
	PROPOSED HEAVY DUTY BITUMINOUS PAVEMENT
	PROPOSED STANDARD DUTY CONCRETE PAVEMENT
	PROPOSED HEAVY DUTY CONCRETE PAVEMENT
	PAVEMENT MARKING
	NUMBER OF STANDARD PARKING SPACES IN ROW
	NUMBER OF BARRIER FREE PARKING SPACES IN ROW
	TRAFFIC DIRECTION ARROWS
	PROPOSED LIGHT POLE



JOB No. 20067

DATE: 8/19/24  
SHEET 07 OF 38

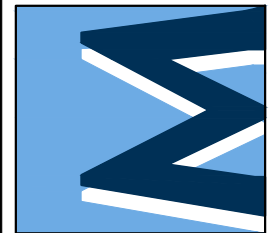
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PER ERWSD & IME REVIEW	01/15/24	CADD:	02/23/24	ENG. CWM
PER ERWSD & IME REVIEW	08/19/24	ENG. RCW		
PER ERWSD & IME REVIEW		TECH:		
				7/2026/SP1

MIDTOWN VILLAGE PUD

SITE PLAN PHASE 1

CLIENT  
10TH MOUNTAIN BUILDERS  
1632 MAIN STREET  
MINTURN, CO 81645  
JEFFREY D. ARMISTEAD  
970-471-0618

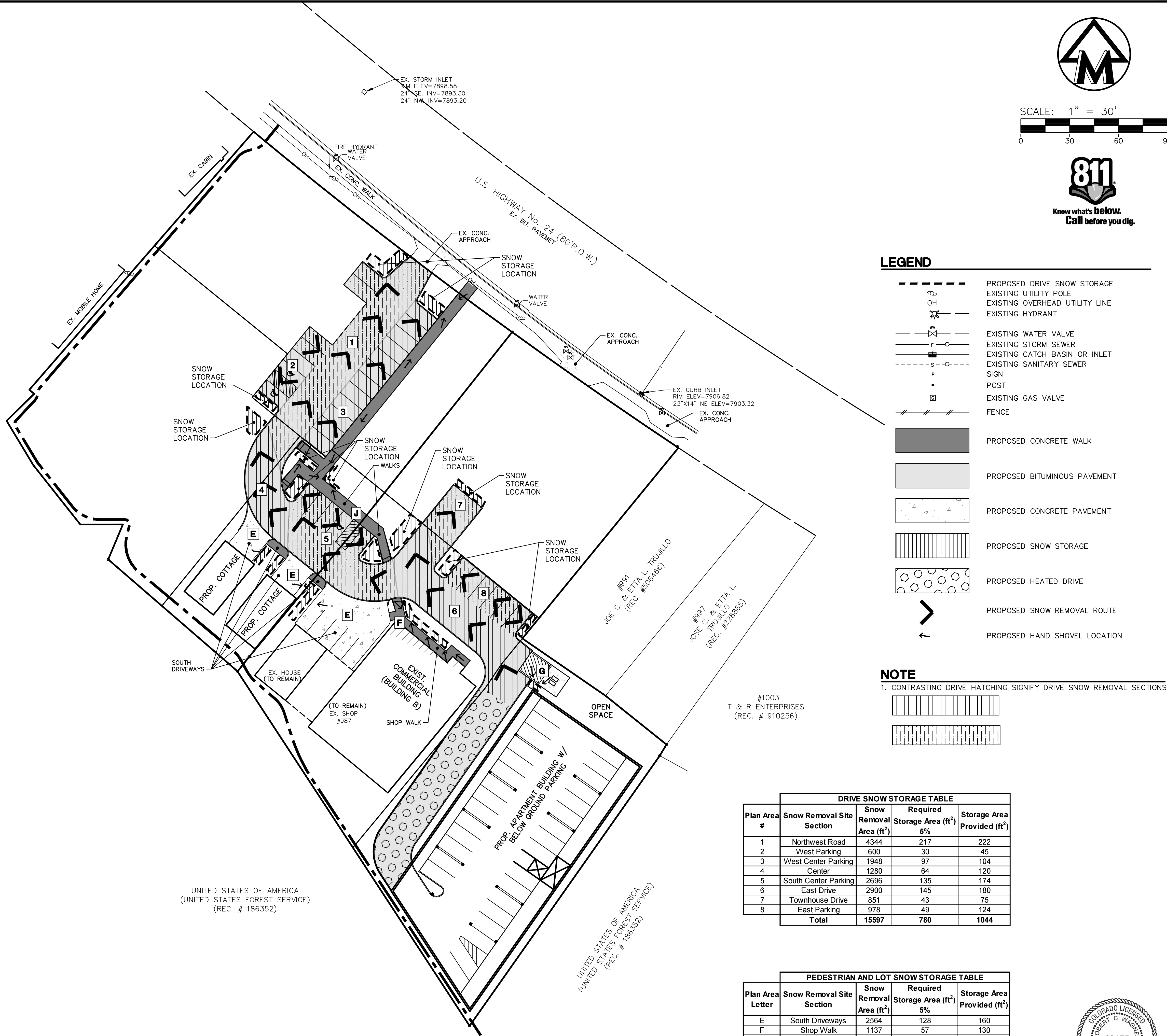
CLIENT



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Plan Area #	Snow Removal Site Section	Snow Removal Area (ft <sup>2</sup> )	Required Storage Area (ft <sup>2</sup> )	
			5%	Storage Area Provided (ft <sup>2</sup> )
1	Northwest Road	4344	217	222
2	West Parking	600	30	45
3	West Center Parking	1948	97	104
4	Center	1280	64	120
5	South Center Parking	2696	135	174
6	East Drive	2900	145	180
7	Townhouse Drive	851	43	75
8	East Parking	978	49	124
Total		15597	780	1044

Plan Area Letter	Snow Removal Site Section	Snow Removal Area (ft <sup>2</sup> )	Required Storage Area (ft <sup>2</sup> )	
			5%	Storage Area Provided (ft <sup>2</sup> )
E	South Driveways	2564	128	160
F	Shop Walk	1137	57	130
G	Dumpster Walk	114	6	22
J	S Center Pkg Walk	622	31	70
Total		3815	191	382



JOB No.	20067
REVISIONS:	
PER: RMWD & IME REVIEW	REV. DATE: 02/23/24
PER: RMWD & IME REVIEW	ENG: CWM
	PM: RCW
	TECH: /20067SP1

08

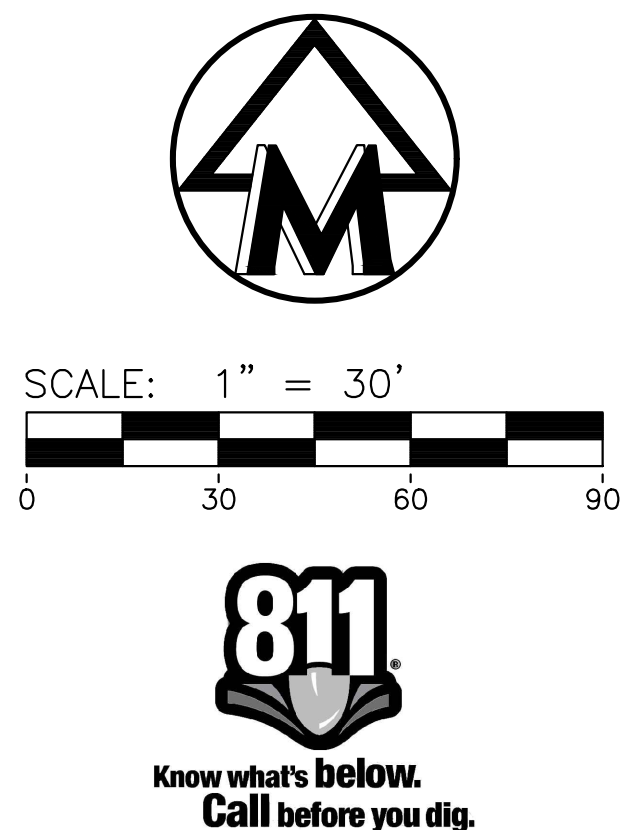
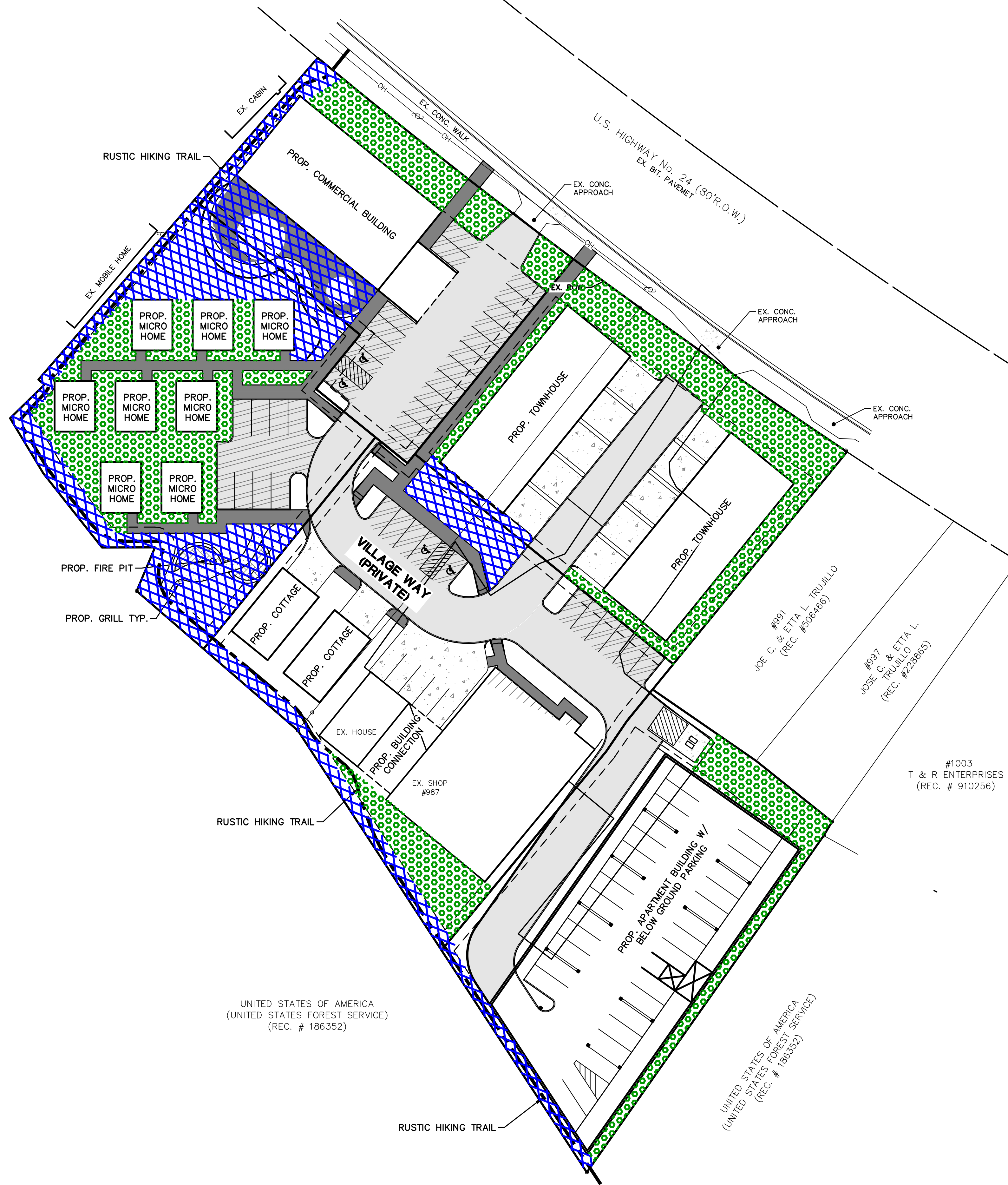
MIDTOWN VILLAGE PUD  
SNOW REMOVAL PLAN

CLIENT  
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## LEGEND

- |   |                                |
|---|--------------------------------|
|  | EXISTING UTILITY POLE          |
|  | EXISTING OVERHEAD UTILITY LINE |
|  | EXISTING HYDRANT               |
|  | EXISTING WATER VALVE           |
|  | EXISTING STORM SEWER           |
|  | EXISTING CATCH BASIN OR INLET  |
|  | EXISTING SANITARY SEWER        |
|  | SIGN                           |
|  | POST                           |
|  | EXISTING GAS VALVE             |
|  | WELL                           |
|  | FENCE                          |
|  | PROPOSED LIGHT POLE            |
|  | PASSIVE PUBLIC OPEN SPACE      |
|  | ACTIVE PUBLIC OPEN SPACE       |

## SITE OPEN SPACE DATA

TOTAL OPEN SPACE REQUIRED: 25% OR 27,552 SF

PHASE I/TRACT A	21,912 SF	
PHASE I/TRACT B	28,525 SF	
PHASE II/TRACT C	21,484 SF	
PHASE III/TRACT D	21,158 SF	
PHASE IIII/TRACT E	17,067 SF	
TOTAL	110,146 SF	%
ACTIVE PUBLIC OPEN SPACE	13,555.07 SF	12.3%
PASSIVE PUBLIC OPEN SPACE	16,989.4 SF	15.4%
TOTAL	30,544.47 SF	28%

## OPEN SPACE NARRATIVE

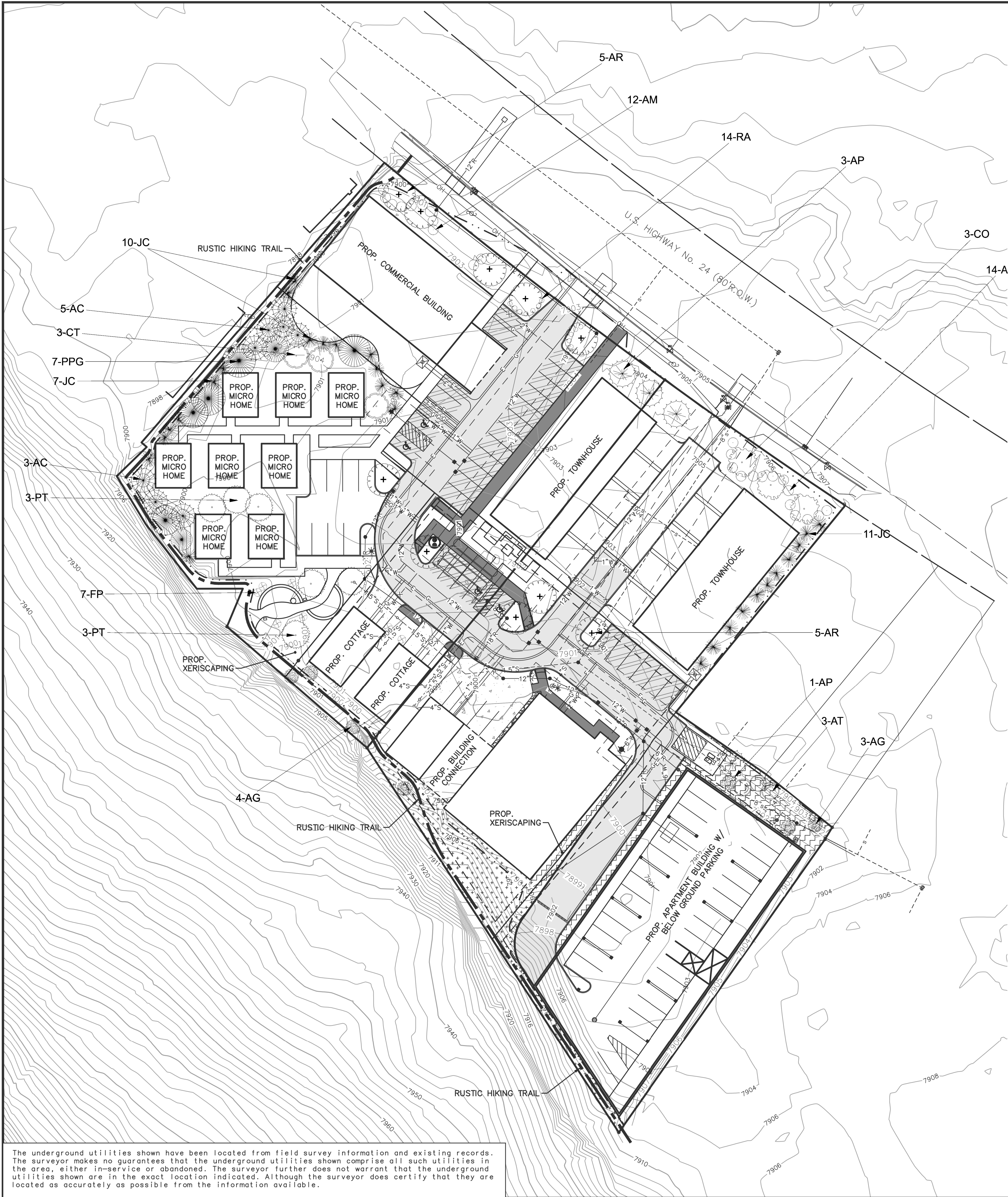
OPEN SPACE FOR THE PUD IS COMPRISED OF AREAS THAT CAN BE UTILIZED BY RESIDENTS WITHIN THE DEVELOPMENT; CONNECTING WALKWAYS, PATIOS WITH SEATING/GRILLS/FIRE PITTS, OPEN SPACES FOR COMMUNITY GARDENING, PLAZAS, AREAS AROUND THE COTTAGES AND MICRO HOMES IS INCLUDED AS OPEN SPACE CONSIDERED AS USEABLE YARD SPACE. OTHER OPEN SPACES ARE AVAILABLE FOR PLAY STRUCTURES OR SIMILAR USES. OPEN SPACE ALONG THE NORTH, SOUTH AND WEST IS PROVIDED FOR A RUSTIC HIKING TRAIL TO BE USED AS A CONNECTOR TO THE OTHER HIKING TRAILS IN THE VILLAGE.



JOB No. <b>20067</b> REVISIONS:	PER MUNICIPAL REVIEW 03/31/23	REV. DATE	DATE: 11/22/24
	PER ERMSD & IRE REVIEW	04/06/23	SHEET 09 OF 38
	PER ERMSD & IRE REVIEW	02/23/24	CAUD:
	PER PLANNING COMMISSION	08/19/24	ENG: CMW
		11/13/24	PM: RCW
		TECH:	
			/20067SP2



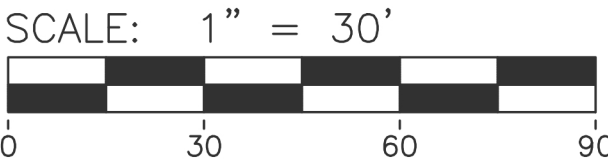
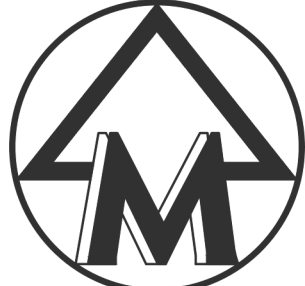
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LANDSCAPE LEGEND

- PROPOSED XERISCAPING
- PROPOSED RIVERSTONE
- PROPOSED RESTORATION SEED MIX
- PROPOSED SEEDED AREA
- PROPOSED CONCRETE WALK
- PROPOSED BITUMINOUS PAVEMENT
- PROPOSED CONCRETE PAVEMENT



LANDSCAPE REQUIREMENTS BY TRACT  
(1 TREE PER 1,000 SQ FT OF OPEN SPACE)

TRACT	SQ FOOTAGE	TREES OR EVERGREENS REQUIRED	PROVIDED
A	21,912	22	7
B	3,509	4	4
C	21,484	22	41
D	21,158	22	23
E	0	0	4
		TOTAL	79

PLANT SCHEDULE						
Symbol	Qty	Key	Common	Botanical	Root	Size Notes
	43	JC	Spartan Juniper	Juniperus chinensis 'Spartan'		
		AC	White Fir	Abies concolor 'Rochester'		
		PPG	Blue Colorado Spruce	Picea Pungens Glauca		
	36	CO	Common Hackberry	Celtis Occidentalis	B&B	2.5" Ca
		AT	Hot Wings Tatarian Maple	Acer tataricum GarAnn		
		CT	Northern Catalpa	Catalpa speciosa		
		AP	Norway Maple - Royal Red	Acer Platanoides 'Royal Red'	B&B	2.5" Ca
		PT	Quaking Aspen	Populus tremuloides		
		AG	Rocky Mountain Maple	Acer glabrum		
	10	AR	Red Maple	Acer rubrum 'Red Sunset'	B&B	2.5" Ca Male only
		FP	Apache Plume	Fallugia paradoxa	#3 Cont	30-36" ht
		AM	Black Chokeberry	Aronia melanocarpa		
	14	RA	Golden Currant	Ribes aureum		
		AC	Arctostaphylos x coloradoensis 'Panchito'	Panchito Manzanita	#3 Cont	
		CM	Chamaebatiaria millefolium	Fernbush	#3 Cont	
		CP	Cytisus purgans 'Spanish Gold'	Spanish Gold Broom	#3 Cont	
		BT	Berberis thunbergii 'Crimson Pygmy'	Crimson Pygmy Barberry	#3 Cont	30-36" ht
		PB	Prunus besseyi 'Pawnee Buttes'	Creeping Western Sand Cherry	#3 Cont	30-36" ht
		AS	Achillea ssp.	Yarrow		
		AG	Agastache ssp.	Agastache		
		CO	Callirhoe onvolucrata	Prairie Winecups		
		DS	Delosperma ssp.	Iceplant		
		HS	Helictotrichon sempervirens	Blue Avena Grass		
		KS	Kniphofia spp.	Torch Lily		
		NT	Nassella tenuissima	Mexican Feather Grass		
		Sp	Salvia pachyphylla	Mojave Sage		

RESTORATION SEED MIX

Lower Montane Mix: 7,501 - 8,500 feet a.s.l.					
Scientific Name (USDA)	Common Name (USDA)	Cultivar or Ecotype	Cultivar or Ecotype	Life History	% Mix Pounds PLS Needed
Adenolinum lewisii	Lewis flax	CO ecotype or Maple Grove	NPF	2	0.32
Bouteloua gracilis	Blue Grama	Fremont CO ecotype	NPG-L	8	0.52
Cleome serrulata	Rocky Mountain Beeplant	CO Ecotype (or VNS)	NAF	2	0.84
Elymus elymoides	Squirreltail	Pueblo or Wapiti	NPG-L	10	2.5
Elymus trachycaulus	Slender Wheatgrass	Pryor or Frist Strike or San Luis	NPG-L	14	4.63
Festuca arizonica	Arizona Fescue	Redondo	NPG-L	10	1
Gallardia aristata	Blanketflower	CO Ecotype (or VNS)	NPF	3	0.77
Pascopyrum smithii	Western Wheatgrass	Arriba	NPG-L	14	5.89
Poa secunda	Sandberg Bluegrass	Sims Mesa or high Plains	NPG-L	12	0.55
Pseudoroegneria spicata	Bluebunch Wheatgrass	Anatone	NPG-L	8	3.28
Quickguard	Quickguard	Quickguard	Cover Crop	1	3.42
Rudbeckia hirta	Black-eyed Susan	CO Ecotype (or VNS)	NBF	3	0.09
Bromus marginatus	Mountain Brome	Cold Springs or Eco type	NPG-L	12	6.85
Penstemon strictus	Rocky Mountain Penstemon	Bandera	NPF	1	0.11



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MIDTOWN VILLAGE PUD

LANDSCAPE PLAN

JOB No. 20067

DATE: 11/22/24

REVISIONS:

SHEET 10 OF 38

REV. DATE

02/23/24

PER. ERWSD. & IME REVIEW

08/19/24

ENG. CMW

11/27/24

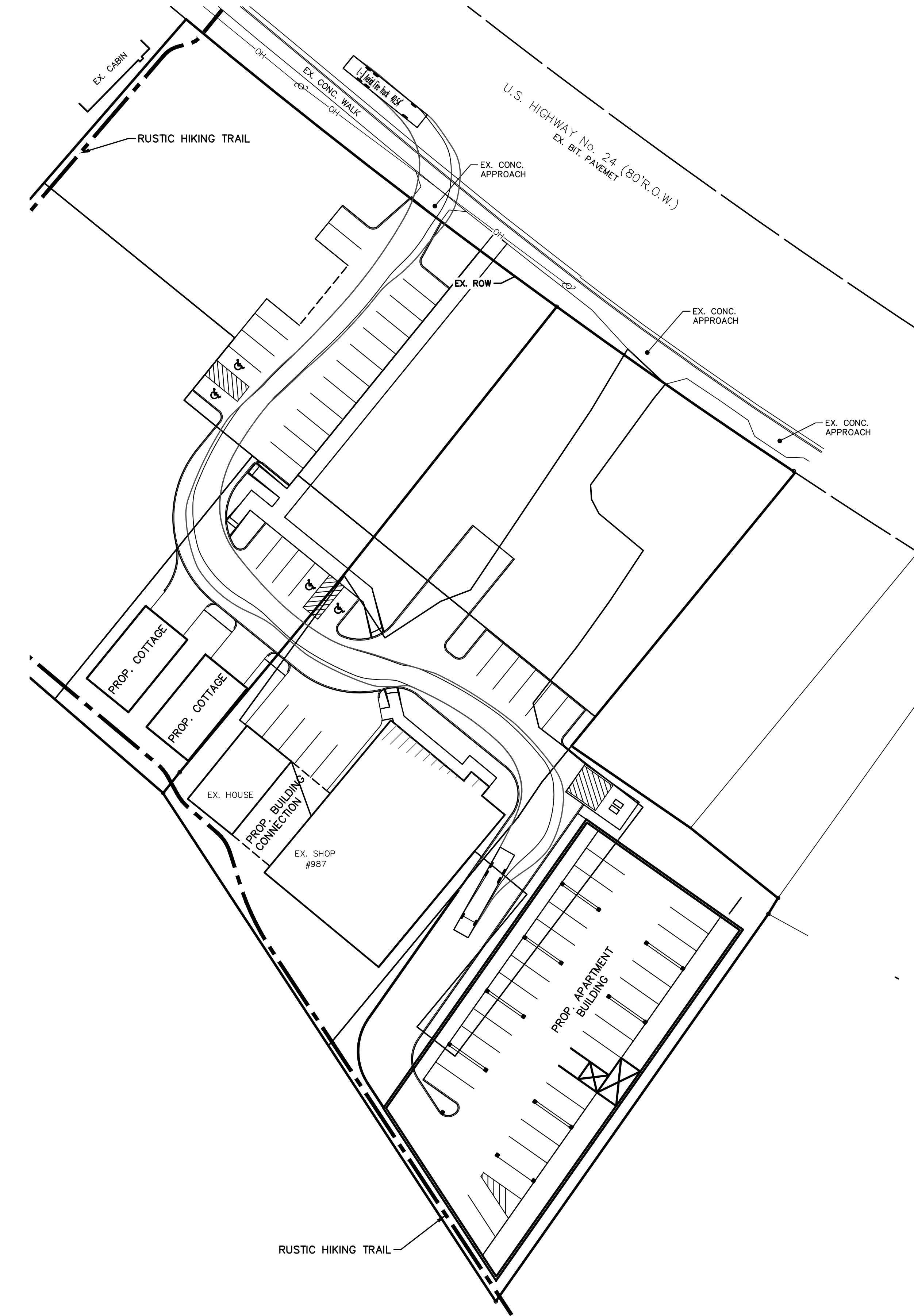
PER. PLANNING COMMISSION (11/13/24)

7/20067LP1

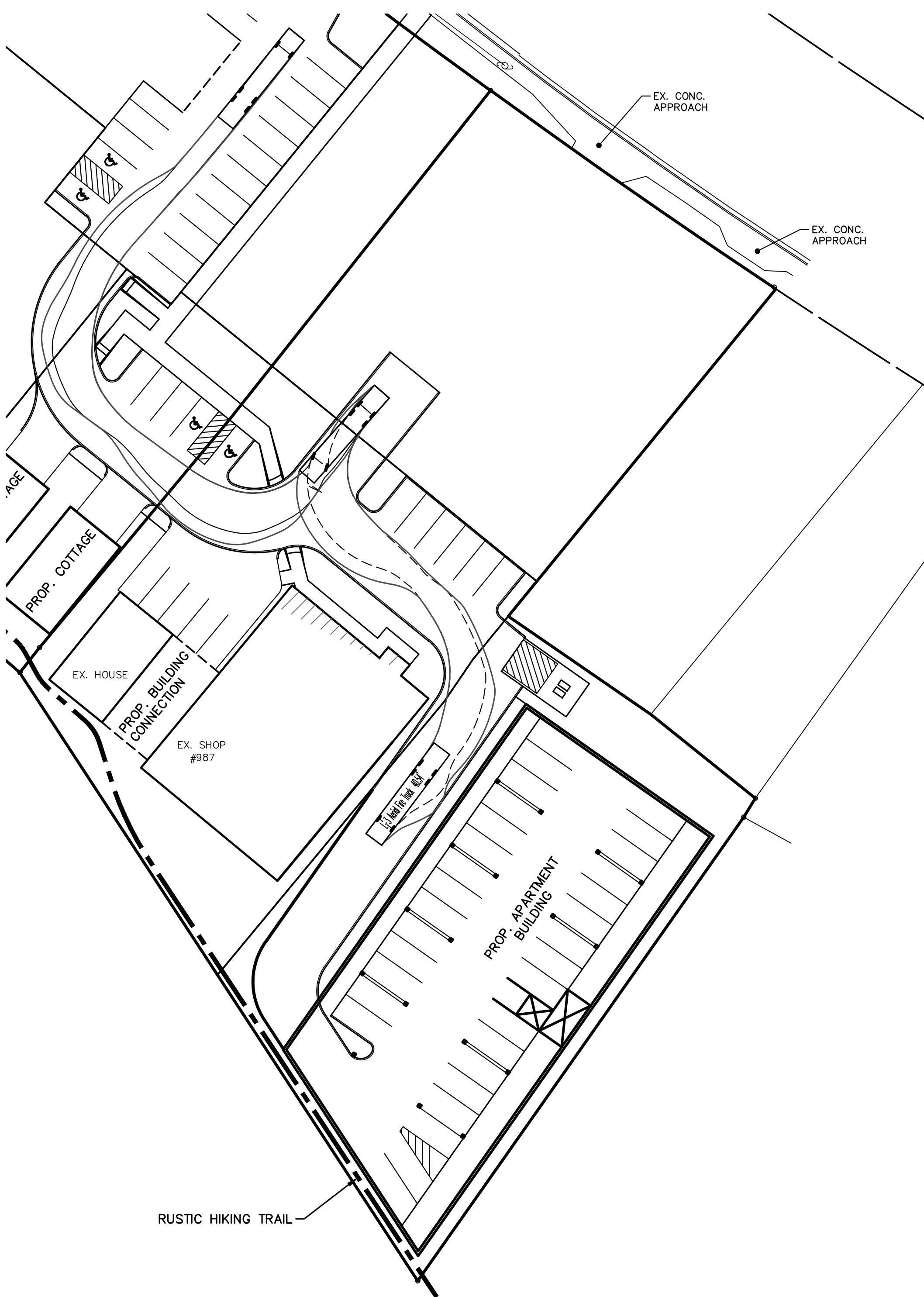




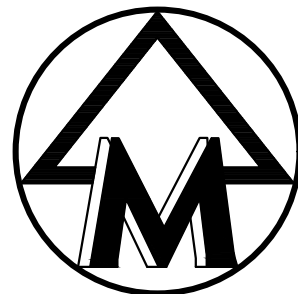




**FIRE TRUCK TURNING TEMPLATE ENTER ROUTE**



**FIRE TRUCK TURNING TEMPLATE EXIT ROUTE**

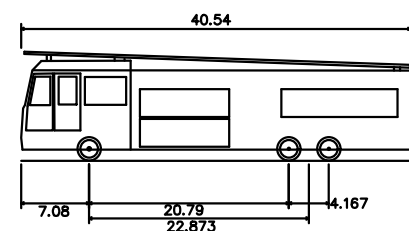


SCALE: 1" = 30'



**LEGEND**

- OH EXISTING UTILITY POLE
- EXISTING OVERHEAD UTILITY LINE
- EXISTING HYDRANT
- EXISTING WATER VALVE
- EXISTING STORM SEWER
- EXISTING CATCH BASIN OR INLET
- EXISTING SANITARY SEWER
- SIGN
- POST
- EXISTING GAS VALVE
- WELL
- FENCE



L-3 Aerial Fire Truck 40.54'  
Overall Length 40.540ft  
Overall Width 7.080ft  
Overall Body Height 11.354ft  
Min. Body Ground Clearance 1.444ft  
Track Width 6.910ft  
Lock-to-lock time 6.008s  
Max Steering Angle (Virtual) 45.00°

**FIRE TRUCK DETAIL**

NOT TO SCALE



JOB No. 20067

DATE: 8/19/24  
SHEET 11 OF 38

REV. DATE	01/15/24	CADD
PER ERWSD & IME REVIEW	02/23/24	ENG: CMW
PER ERWSD & IME REVIEW	08/19/24	PM: RCW
TECH:	7/2026/T11	

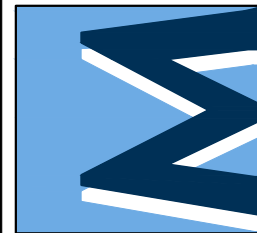
**MIDTOWN VILLAGE PUD**

FIRE TRUCK TURNING TEMPLATES

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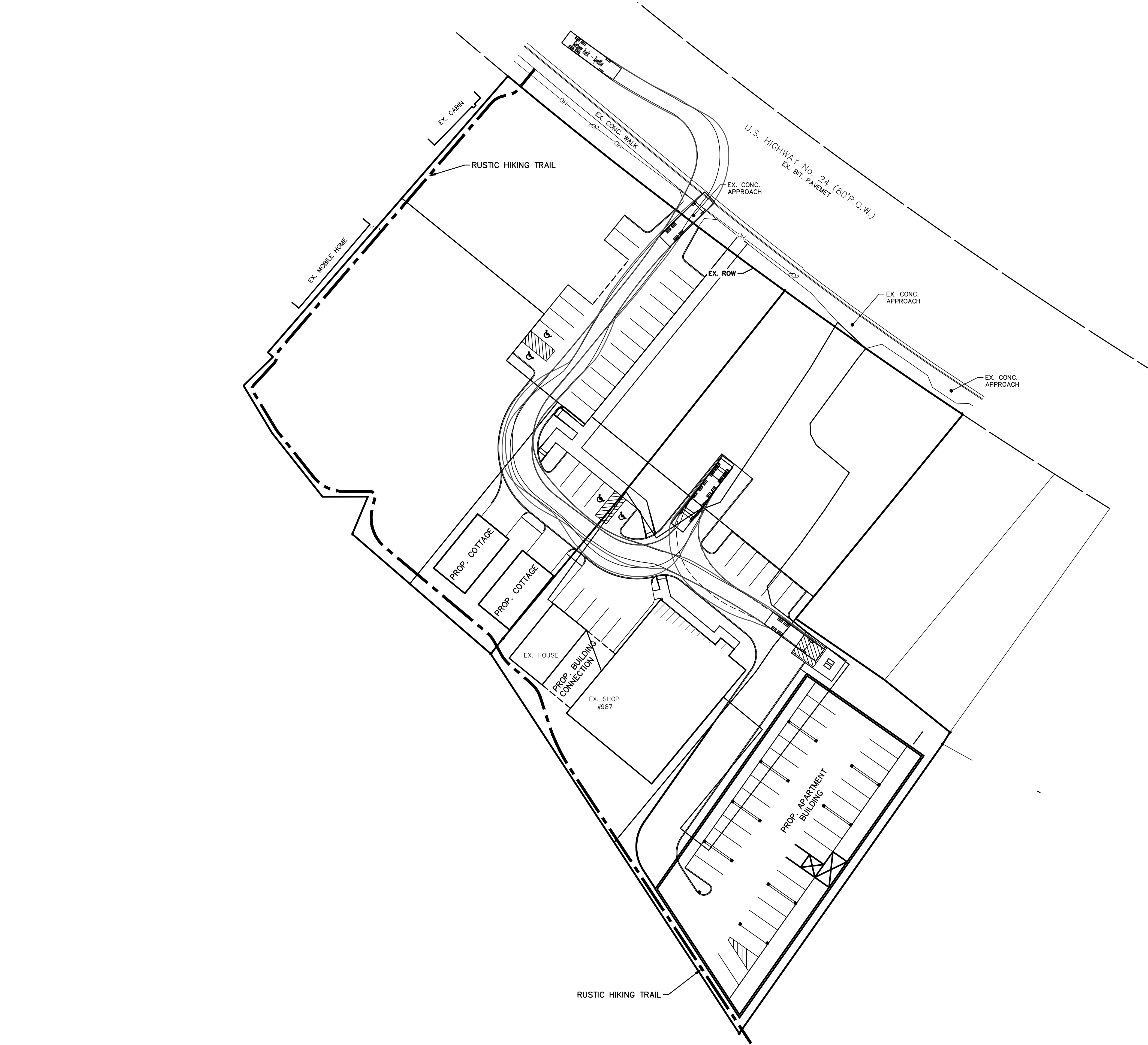
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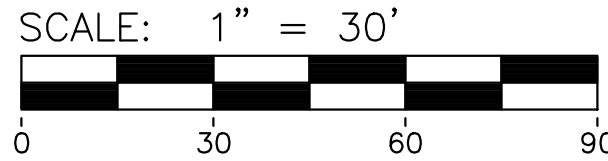
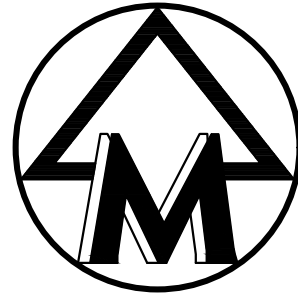


M:\Civ\134\_Pros\Site Plan\20067T1.dwg, 10/29/2024 2:41 PM, Colton M. Wallace, 12 SOLID WASTE TRUCK TURNING TEMPLATE, MCLC PDF .pdf  
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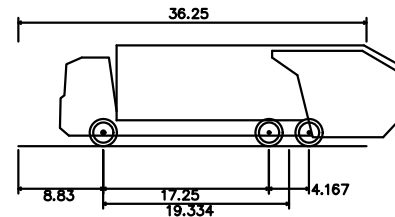
SOLID WASTE TRUCK TURNING TEMPLATE

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LEGEND

- |           |                                |
|-----------|--------------------------------|
| — OH —    | EXISTING UTILITY POLE          |
| — r —     | EXISTING OVERHEAD UTILITY LINE |
| — S —     | EXISTING HYDRANT               |
| — W —     | EXISTING WATER VALVE           |
| — S —     | EXISTING STORM SEWER           |
| — S —     | EXISTING CATCH BASIN OR INLET  |
| — S —     | EXISTING SANITARY SEWER        |
| — P —     | SIGN                           |
| •         | POST                           |
| •         | EXISTING GAS VALVE             |
| •         | WELL                           |
| — / / / — | FENCE                          |



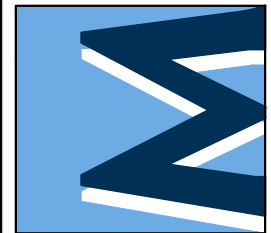
Garbage Truck - Xpeditor  
Overall Length 36.25ft  
Overall Width 8.42ft  
Overall Body Height 10.43ft  
Min Body Ground Clearance 0.93ft  
Track Width 8.00ft  
Lock-to-lock time 6.00s  
Max Steering Angle (Virtual) 31.50°

SOLID WASTE TRUCK DETAIL

NOT TO SCALE



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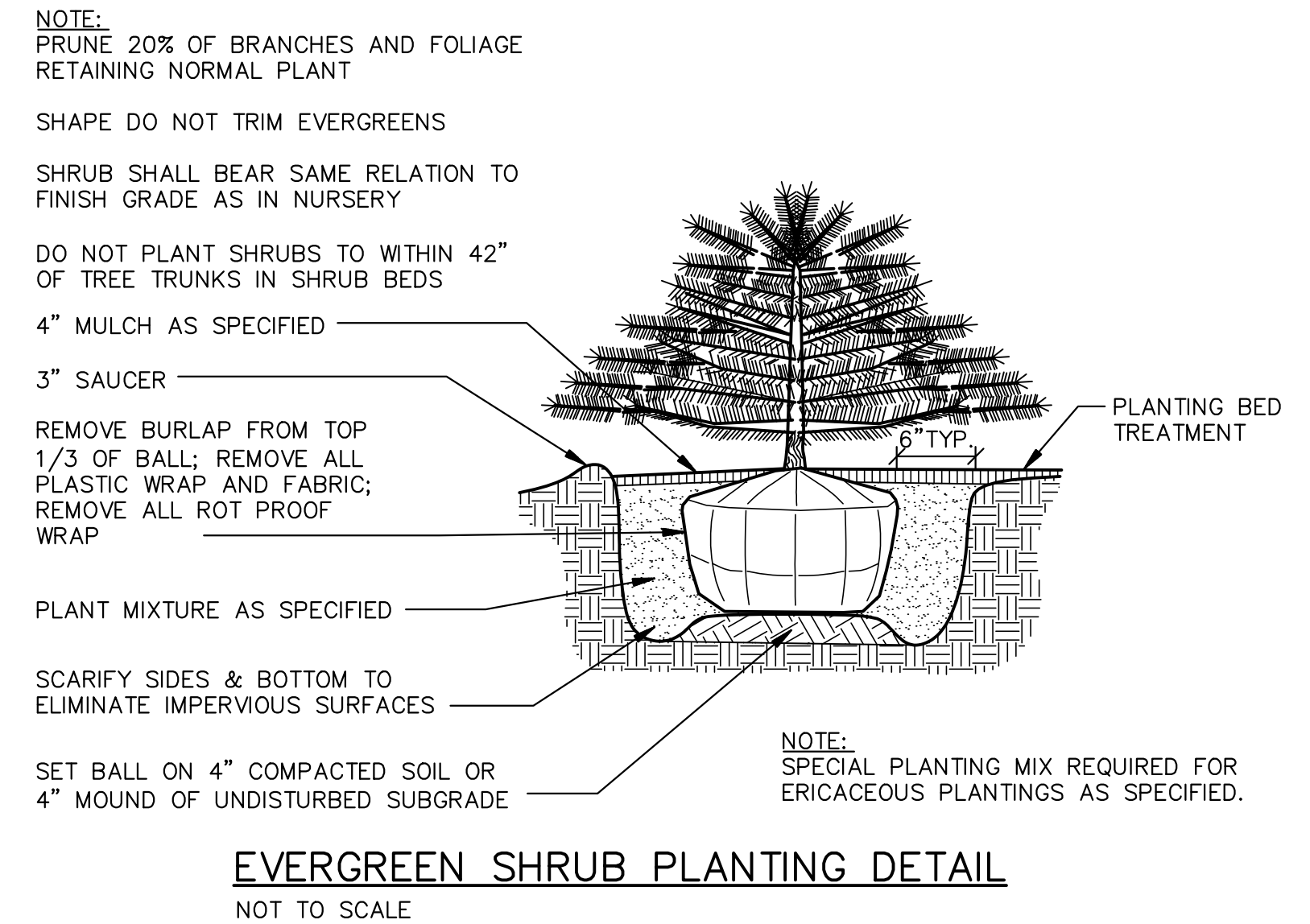
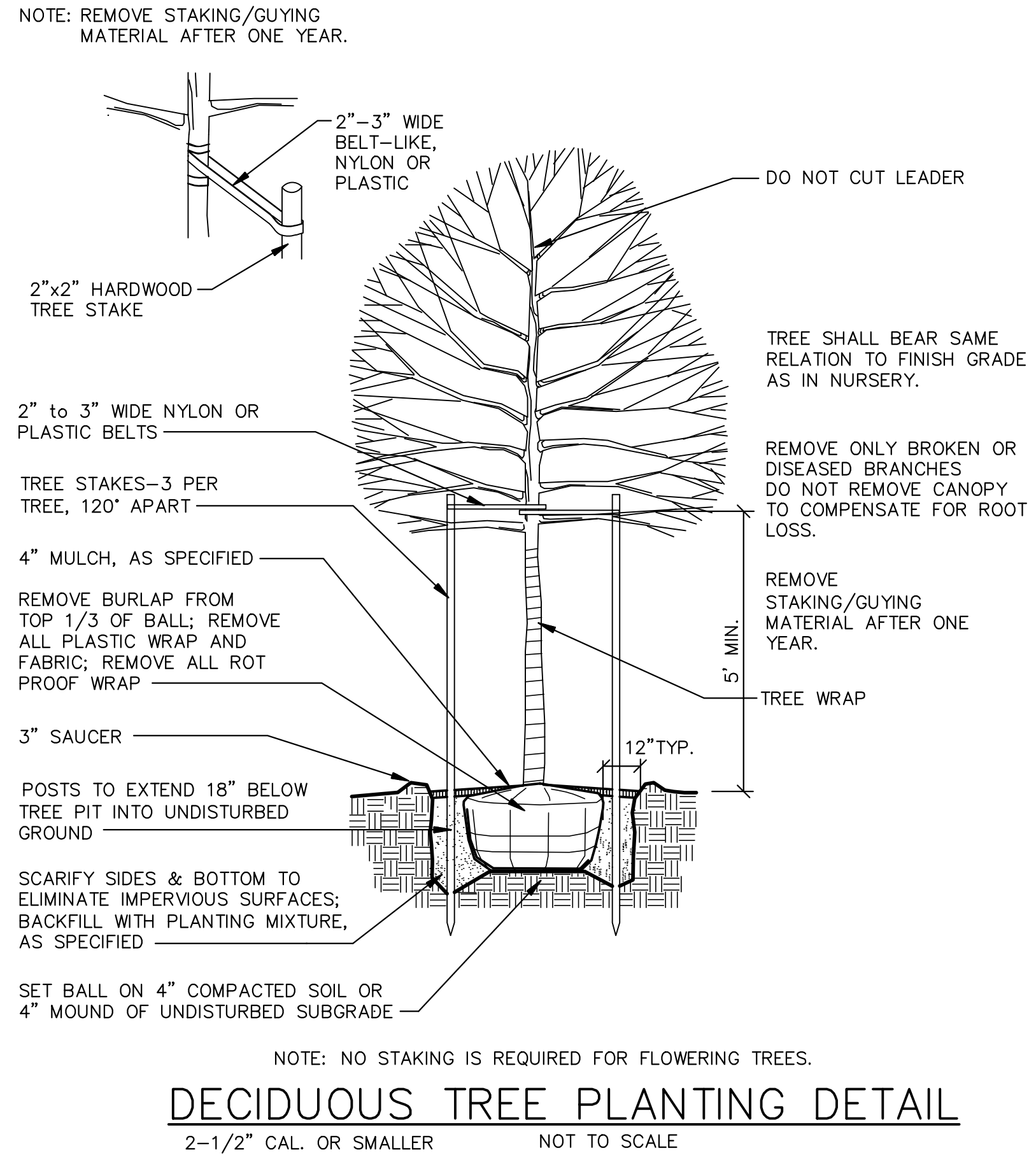
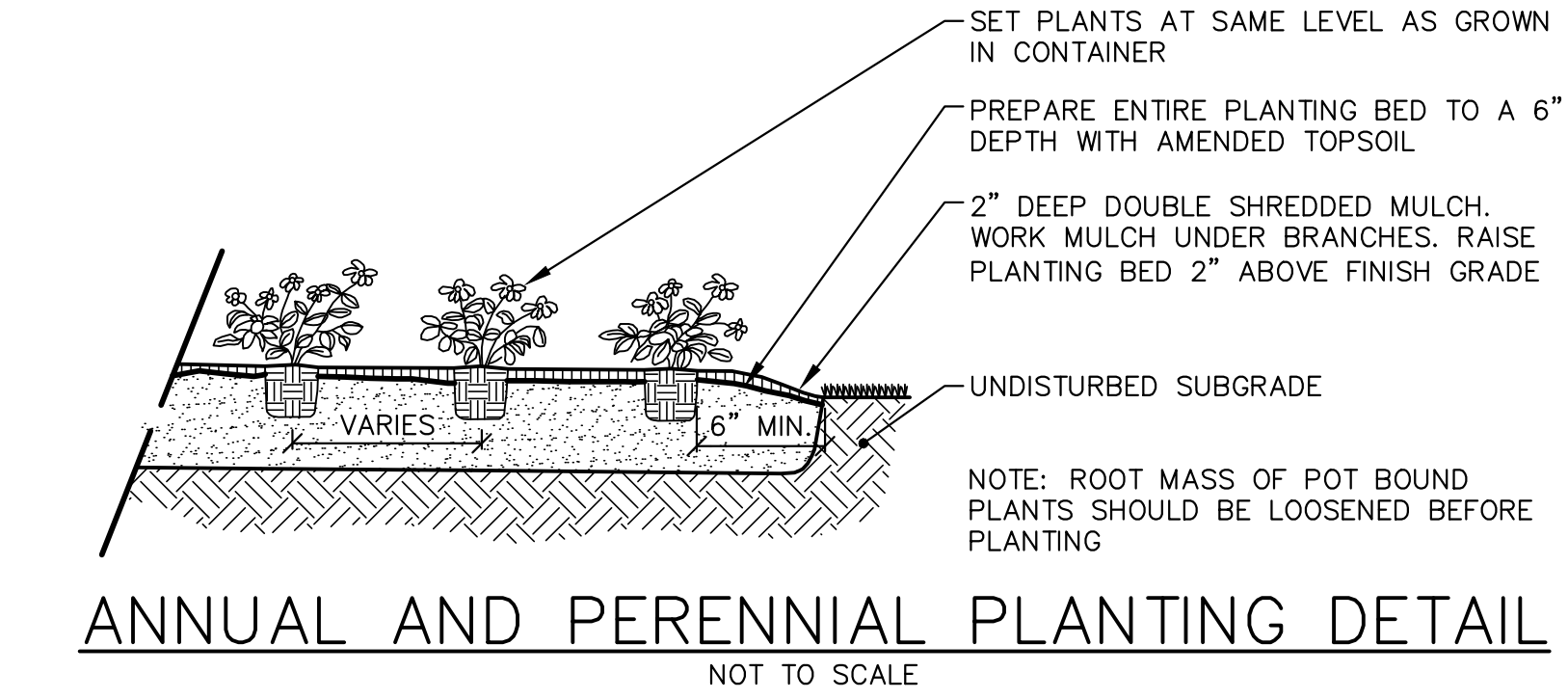
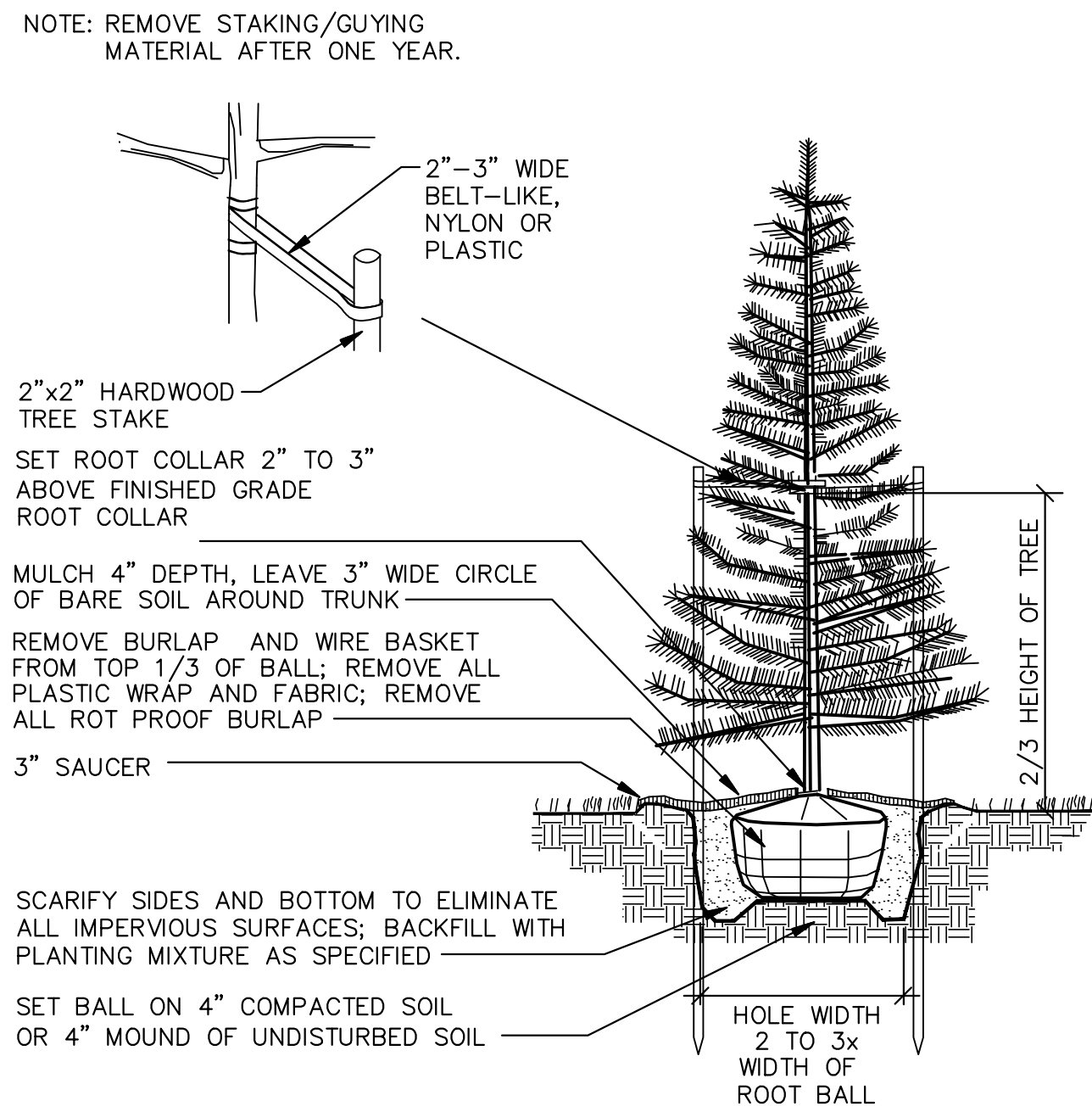
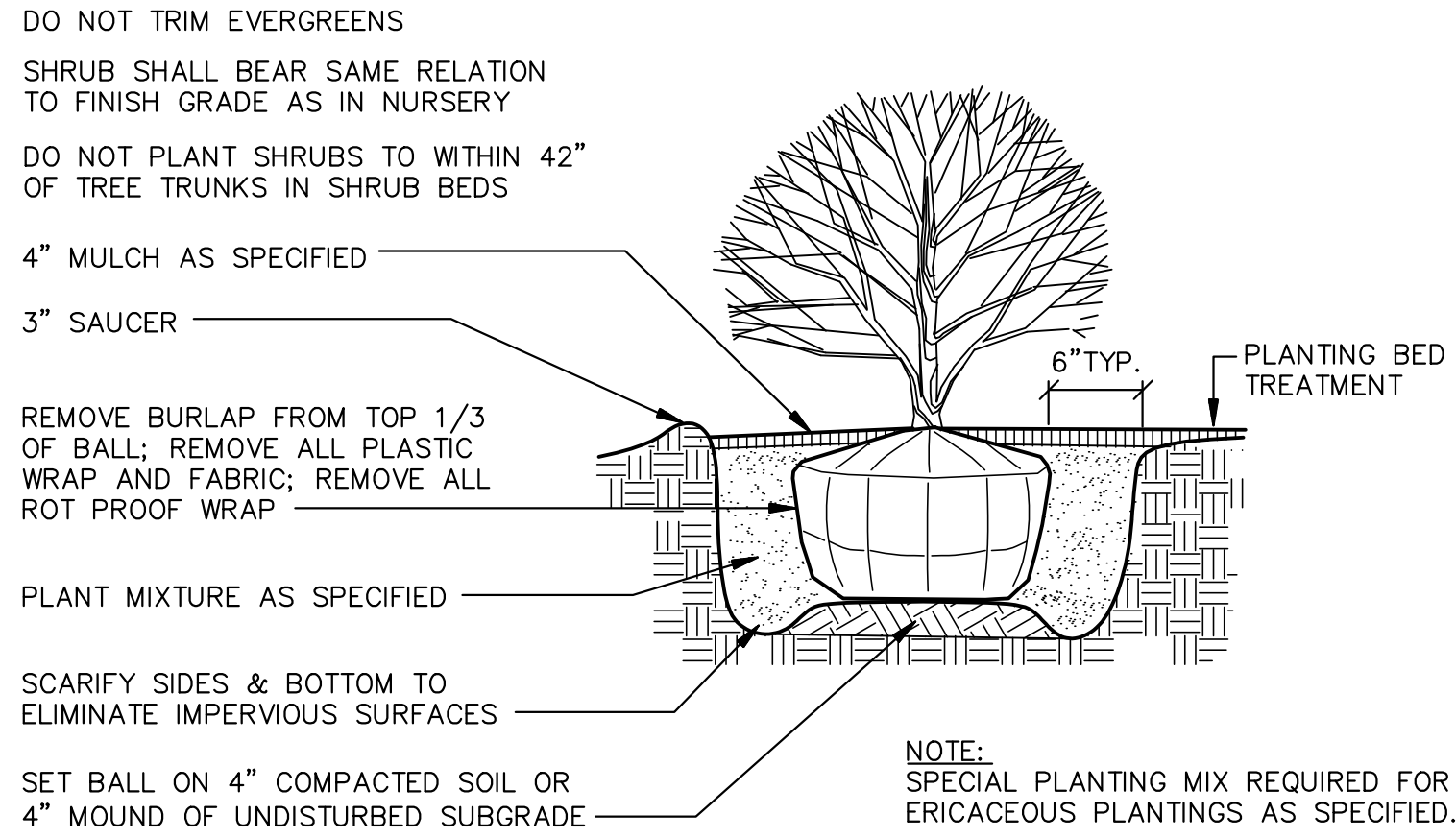
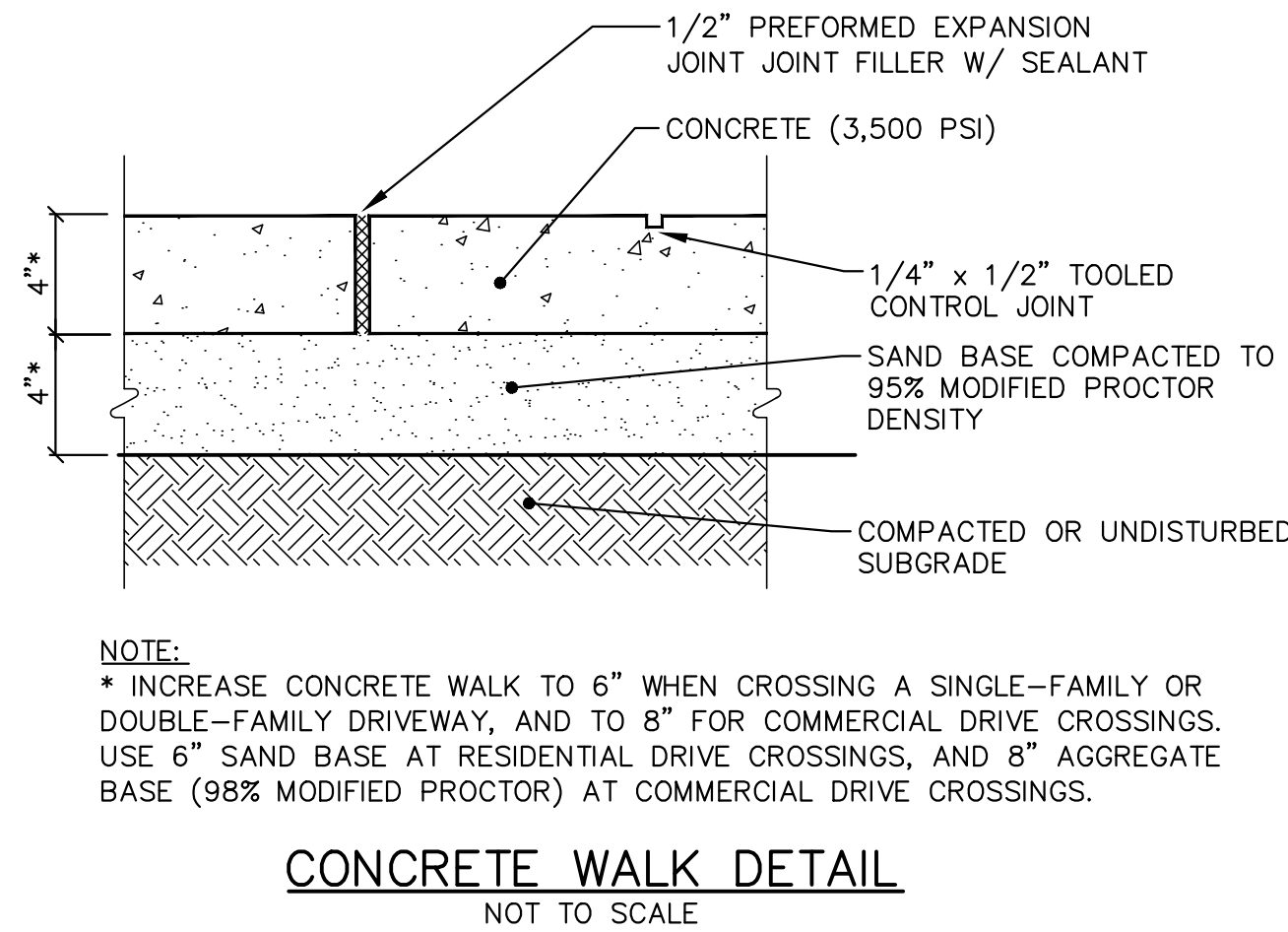
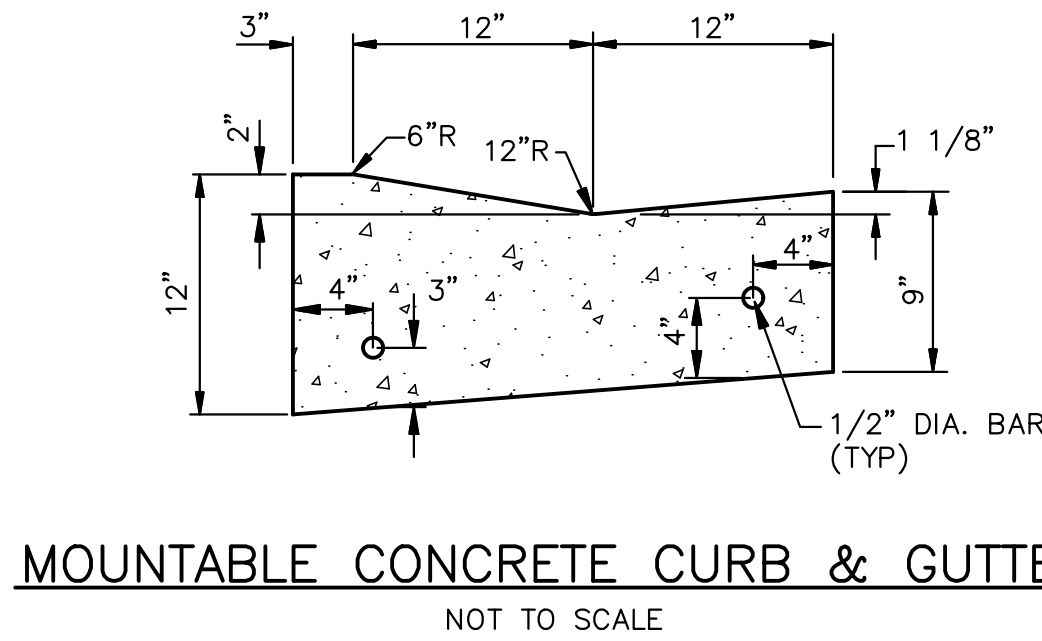
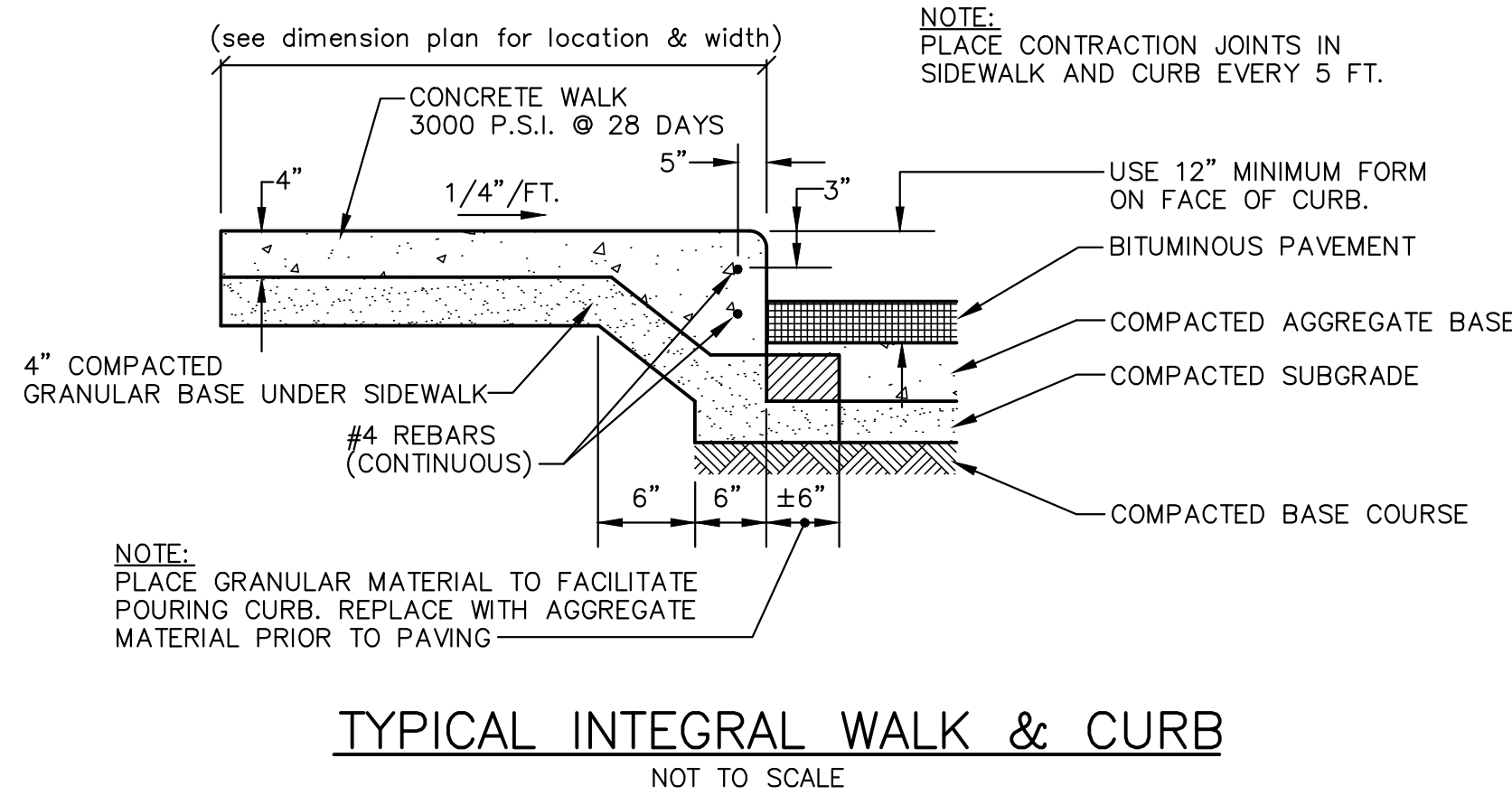
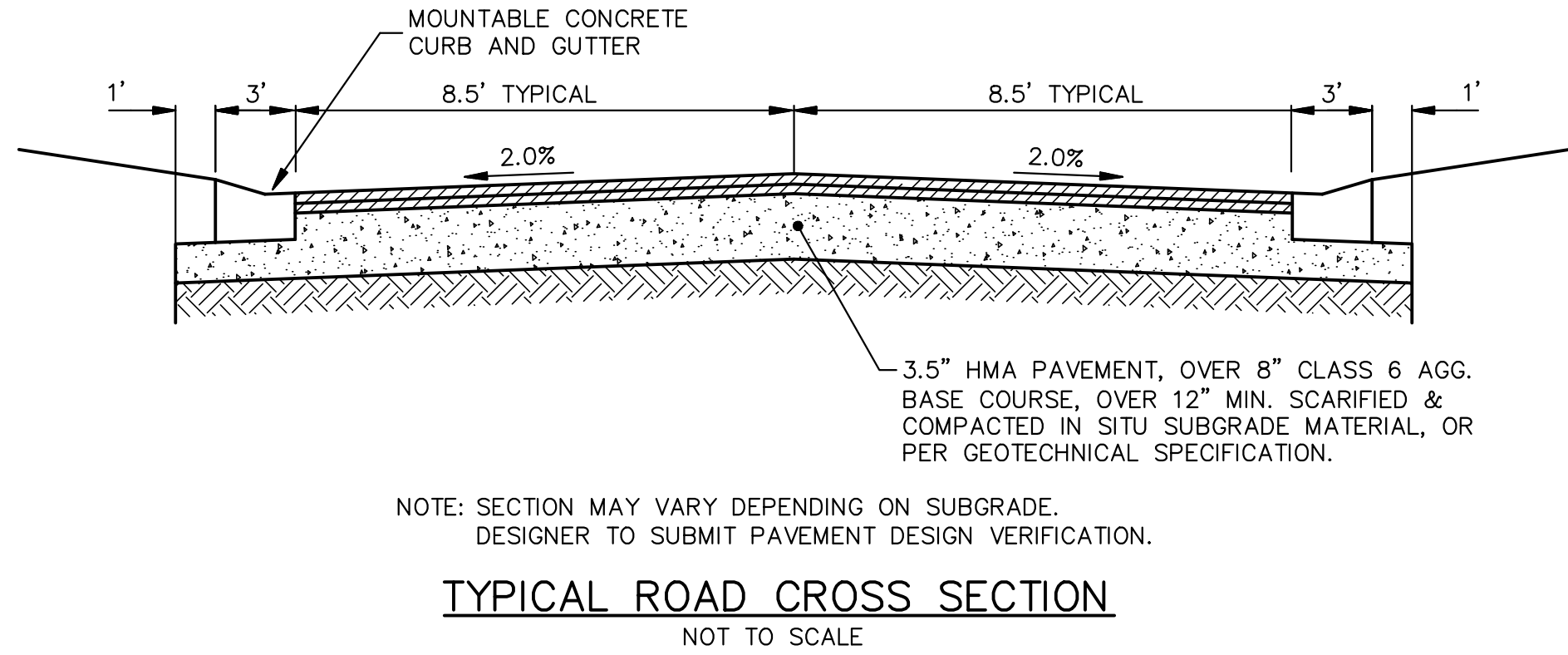
MIDTOWN VILLAGE PUD  
SOLID WASTE TRUCK TURNING TEMPLATE

12

JOB No.	20067	DATE: 8/19/24	SHEET 12 OF 38
REVISIONS:	REV. DATE	01/15/24	CADD:
PER ERWSD & IME REVIEW	02/23/24	ENG: CMW	
PER ERWSD & IME REVIEW	08/19/24	PM: RCW	
PER ERWSD & IME REVIEW		TECH: /2026/T11	



M:\Civil\134\_P\01\Site Plan\2006\PLT.dwg, 10/29/2024 2:41 PM, Colton M. Wallace, 13 LANDSCAPE AND SITE DETAILS, MCLC PDF .pct3  
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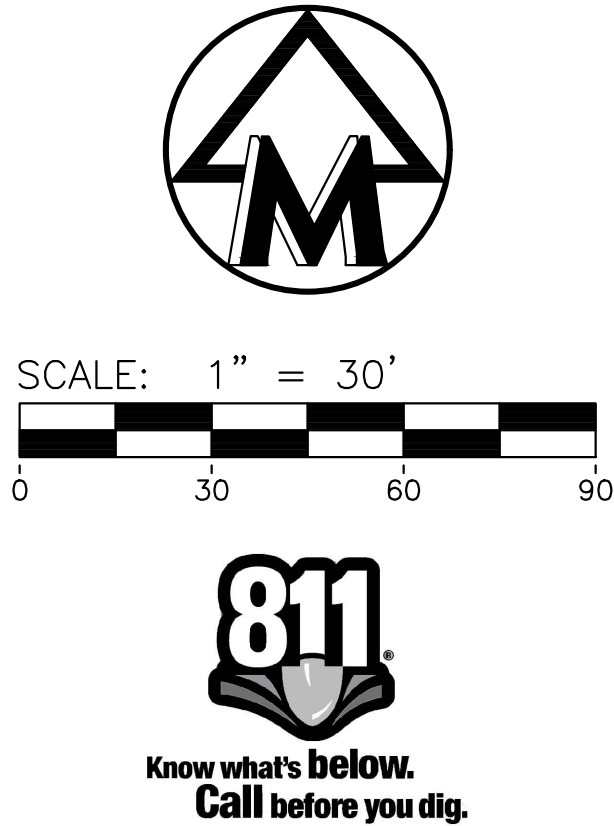
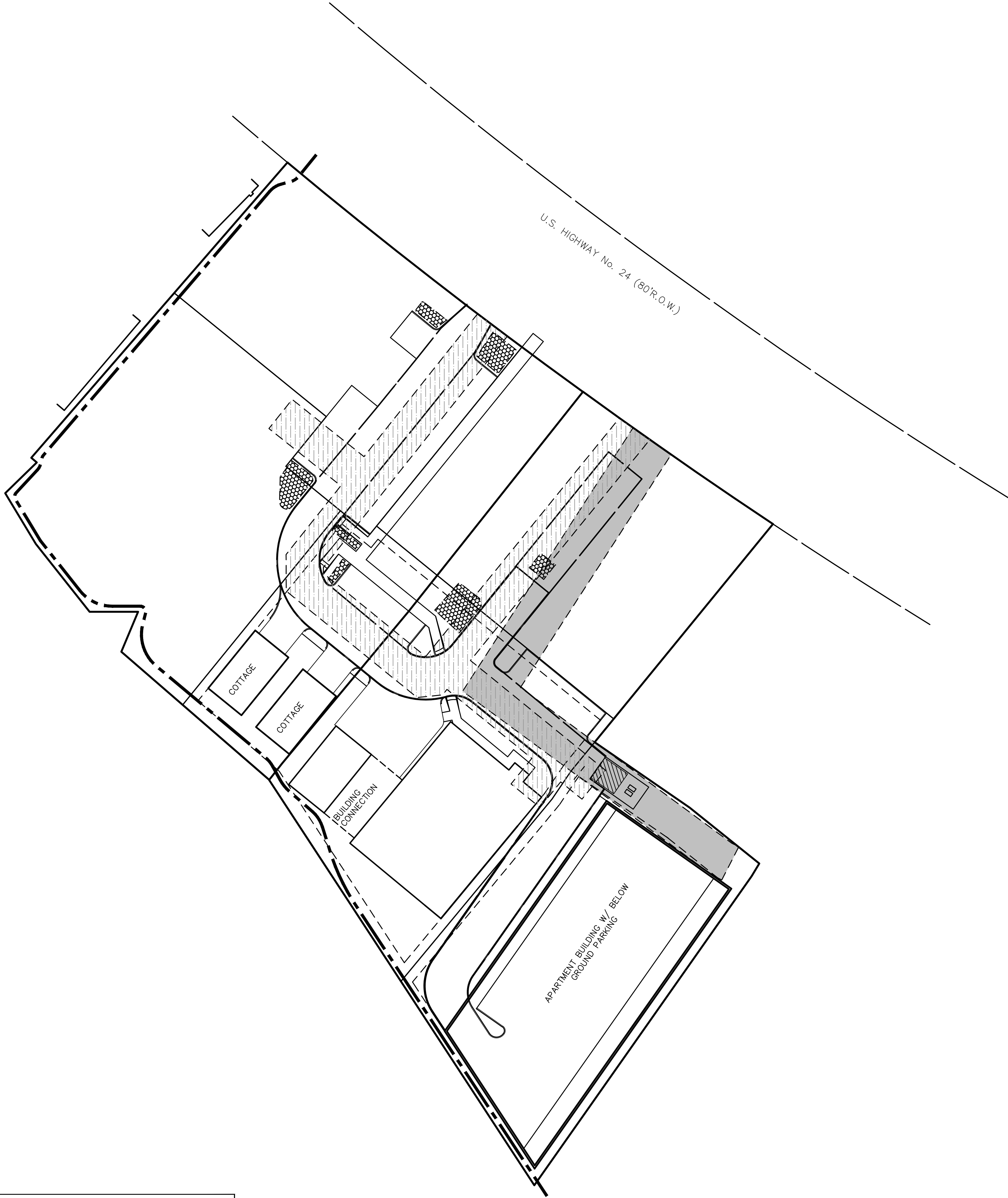
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#### NOTES

1. A NON EXCLUSIVE WATER EASEMENT, AS SHOWN, IS TO BE DEDICATED TO THE TOWN OF MINTURN FOR MAINTENANCE AND OPERATION OF THE WATER SYSTEM.
2. A NON EXCLUSIVE SEWER EASEMENT, AS SHOWN, IS TO BE DEDICATED TO THE TOWN OF MINTURN FOR MAINTENANCE AND OPERATION OF THE WATER SYSTEM.

#### LEGEND

	EXISTING UTILITY POLE
	EXISTING OVERHEAD UTILITY LINE
	EXISTING HYDRANT
	EXISTING WATER VALVE
	EXISTING STORM SEWER
	EXISTING CATCH BASIN OR INLET
	EXISTING SANITARY SEWER
	SIGN
	POST
	EXISTING GAS VALVE
	WELL
	FENCE
	PROPOSED SANITARY SEWER
	PROPOSED WATER MAIN
	PROPOSED CATCH BASIN OR INLET
	PROPOSED UNDERGROUND STORM SEWER STORAGE
	PROPOSED R.O.W. (RIGHT-OF-WAY)
	WATER MAIN EASEMENT
	SANITARY SEWER EASEMENT
	SNOW STORAGE EASEMENT

JOB No. 20067

DATE: 8/20/24  
SHEET 14 OF 38

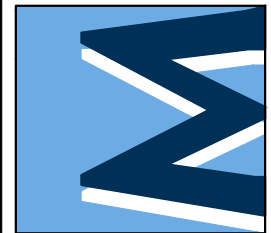
REV. DATE	REV. DATE	REV. DATE	REV. DATE	REV. DATE
01/15/24	02/23/24	08/19/24	08/19/24	08/19/24
PER ERWSD & IME REVIEW	PER ERWSD & IME REVIEW	PER ERWSD & IME REVIEW	PER ERWSD & IME REVIEW	PER ERWSD & IME REVIEW
ENG: CWM	ENG: CWM	ENG: CWM	ENG: CWM	ENG: CWM
PM: RCW	PM: RCW	PM: RCW	PM: RCW	PM: RCW
TECH: RCW	TECH: RCW	TECH: RCW	TECH: RCW	TECH: RCW
7/2026/PH1	7/2026/PH1	7/2026/PH1	7/2026/PH1	7/2026/PH1

## MIDTOWN VILLAGE PUD

WATER AND SANITARY SEWER EASEMENTS

CLIENT  
10TH MOUNTAIN BUILDERS  
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MINTURN, CO 81645  
JEFFREY D. ARMISTEAD  
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GENERAL  
TRACER WIRE SHALL BE INSTALLED WITH ALL BURIED MAIN AND SERVICE PIPELINES IN THE WATER AND WASTEWATER SYSTEM. ALL TRACER WIRE SHALL HAVE HDPE INSULATION INTENDED FOR DIRECT BURY, COLOR CODED PER AMERICAN PUBLIC WORKS ASSOCIATION (APWA) STANDARD FOR THE SPECIFIC UTILITY BEING MARKED. WIRE INSULATION FOR POTABLE WATER WILL BE COLORED BLUE AND WIRE INSULATION FOR WASTEWATER WILL BE COLORED GREEN. WIRE INSULATION FOR THE LEAD FROM THE OPEN TRENCH - TRACER WIRE SHALL BE #12 AWG COPPER CLAD STEEL, OR SOLID COPPER, HIGH STRENGTH WITH MINIMUM 300 LB. BREAK LOAD, WITH MINIMUM 30 MIL HDPE INSULATION THICKNESS. APPROVED MANUFACTURER: COPPERHEAD INDUSTRIES, PRO LINE SAFETY PRODUCTS, OR APPROVED EQUIV.

ALL MAINLINE TRACER WIRE MUST BE INTERCONNECTED IN INTERSECTIONS, AT MAINLINE TEES AND MAINLINE CROSSES. AT TEES, THE THREE WIRES SHALL BE JOINED USING A SINGLE 3-WAY LOCKABLE CONNECTOR. AT CROSSES, THE FOUR WIRES SHALL BE JOINED USING A 4-WAY CONNECTOR. USE OF THE 3-WAY CONNECTORS WITH A SHORT JUMPER WIRE BETWEEN THEM IS NOT ACCEPTABLE. ALL LATERAL TRACER WIRE SHALL BE INTERCONNECTED TO THE MAINLINE USING LOCKABLE CONNECTORS AND MAINLINE TO LATERAL LUG CONNECTORS SPECIFICALLY MANUFACTURED FOR USE IN UNDERGROUND TRACER WIRE INSTALLATION. CONNECTORS SHALL BE DIELECTRIC SILICONE FILLED TO SEAL OUT MOISTURE AND CORROSION, AND SHALL BE INSTALLED IN A MANNER SO AS TO PREVENT ANY UNINSULATED WIRE EXPOSURE. NON LOCKING FRICTION FIT, TWIST ON OR TAPED CONNECTORS ARE NOT ALLOWED. ALL MAINLINE TRACER WIRE SHALL BE INTERCONNECTED TO THE CONNECTOR, COPPER TO COPPER, SQUARE HEAD WITH KING INNOVATION SPLIT BOLT AQUA HOUSING 69105 OR COPPERHEAD INDUSTRIES SNAKEBITE CONNECTOR, OR APPROVED EQUIVALENTS.

ALL TRACER WIRE TERMINATION POINTS AT WATER SERVICE CURB STOPS AND SEWER SERVICE  
CLANETS MUST USE AN APPROVED TRACER WIRE ACCESS BOX (ABOVE GROUND ACCESS BOX OR  
GRADE LEVEL-IN-GROUND ACCESS BOX AS APPLICABLE), SPECIFICALLY MANUFACTURED FOR THIS  
PURPOSE AS SPECIFIED BELOW FOR THE TYPE OF PIPELINE. ALL GRADE LEVEL-IN-GROUND ACCESS  
BOXES SHALL BE APPROPRIATELY IDENTIFIED WITH "SEWER" OR "WATER" CAST INTO THE CAP AND BE  
COLOR CODED. A MINIMUM OF TWO (2) FEET OF SERVICE LOOP WIRE IS REQUIRED IN ALL TRACER WIRE  
ACCESS BOXES. MEETING FINAL ELEVATION. ALL TRACER WIRE ACCESS BOXES MUST INCLUDE A  
MANUALLY INTERRUPTIBLE CONDUCTIVE/CONNECTIVE LINK BETWEEN THE TERMINAL(S) FOR THE  
TRACER WIRE CONNECTION AND THE TERMINAL FOR THE GROUNDING ANODE WIRE CONNECTION.  
GROUNDING ANODE WIRE SHALL BE CONNECTED TO THE IDENTIFIED (OR BOTTOM) TERMINAL ON ALL  
ACCESS BOXES.

TRACER WIRE MUST BE PROPERLY GROUNDED AT ALL DEAD ENDS/STUBS AND AT ALL CONNECTION POINTS TO EXISTING SYSTEMS WITHOUT TRACER WIRE. GROUNDING OF TRACER WIRE SHALL BE ACHIEVED BY USE OF A DRIVE-IN MAGNESIUM GROUNDING ANODE ROD WITH A MINIMUM OF 20 FEET OF #12 RED HDPE INSULATED COPPER CLAD STEEL OR SOLID COPPER WIRE CONNECTED TO ANODE (MINIMUM 1 LB.) SPECIFICALLY MANUFACTURED FOR THIS PURPOSE, AND BURIED AT THE SAME ELEVATION AS THE UTILITY. WHEN GROUNDING THE TRACER WIRE AT DEAD ENDS/STUBS, THE GROUNDING ANODE SHALL BE INSTALLED IN A DIRECTION 180 DEGREES OPPOSITE OF THE TRACER WIRE, AT THE MAXIMUM POSSIBLE DISTANCE. WHERE THE ANODE WIRE WILL BE CONNECTED TO A TRACER WIRE ACCESS BOX, A MINIMUM OF TWO (2) FEET OF SERVICE LOOP IS REQUIRED AFTER MEETING FINAL ELEVATION.

TRACER WIRE INSTALLATION SHALL BE PERFORMED IN SUCH A MANNER THAT ALLOWS PROPER ACCESS FOR CONNECTION OF LINE TRACING EQUIPMENT, PROPER LOCATING OF WIRE WITHOUT LOSS OR DETERIORATION OF LOW FREQUENCY (512HZ) SIGNAL FOR DISTANCES IN EXCESS OF 1,000 LINEAL FEET AND WITHOUT DISTORTION OF SIGNAL CAUSED BY MULTIPLE WIRES BEING INSTALLED IN CLOSE PROXIMITY TO ONE ANOTHER. TRACER WIRE SYSTEMS MUST BE INSTALLED AS A SINGLE CONTINUOUS WIRE, EXCEPT WHERE USING APPROVED CONNECTORS. NO LOOPING OR COILING OF WIRE IS ALLOWED ANY DAMAGE OCCURRING DURING INSTALLATION OF THE TRACER WIRE MUST BE IMMEDIATELY REPORTED TO THE PROJECT SUPERVISOR. TRACER WIRE SHALL BE INSTALLED IN A SECTION OF PIPE WITH APPROVED CONNECTORS, TAPING AND/OR SPRAY COATING ARE PROHIBITED. TRACER WIRE SHALL BE INSTALLED AT THE TOP HALF OF THE PIPE AND SECURED (TAPED/TIED) AT FIVE (5) FEET INTERVALS. TRACER WIRE MUST BE PROPERLY GROUNDED AS SPECIFIED.

AT ALL WATER AND WASTEWATER MAINLINE DEAD-ENDS, AND AT WATER SERVICE LINE CURB STOPS AND WASTEWATER SERVICE LINE CLEANOUTS CLOSEST TO THE PROPERTY BEING SERVED, TRACER WIRE SHOULD GO TO GROUND USING AN APPROVED CONNECTION TO A DRIVE-IN MAGNESIUM GROUNDING ANODE ROD, BURIED AT THE SAME DEPTH AS THE SERVICE. (SEE GUIDANCE) IF NO MAINLINE TRACER WIRE IS AVAILABLE, THE SERVICE LINE SHALL BE GROUND TO THE SAME DEPTH AS THE MAIN. ALL SERVICE CONDUCTIVE PIPES, TREATING AS A MAINLINE DEAD END, GROUND USING AN APPROVED WATERPROOF CONNECTION TO A GROUNDING ANODE BURIED AT THE SAME DEPTH AS THE MAIN. ALL SERVICE LATERAL TRACER WIRE SHALL BE A SINGLE WIRE, CONNECTED TO THE MAINLINE TRACER WIRE USING A MAINLINE TO LATERAL LGW CONNECTOR, INSTALLED WITHOUT CUTTING/SPlicing THE MAINLINE TRACER WIRE. IN SITUATIONS WHERE AN EXISTING TRACER WIRE IS ENCOUNTERED ON AN EXISTING UTILITY THAT IS BEING EXTENDED, THE NEW TRACER WIRE AND EXISTING TRACER WIRE SHALL BE CONNECTED USING APPROVED SERVICE CONNECTORS.

A MAINLINE TRACER WIRE MUST BE INSTALLED, WITH ALL SERVICE LATERAL TRACER WIRE PROPERLY CONNECTED TO THE MAINLINE TRACER WIRE, TO ENSURE FULL TRACING/LOCATING CAPABILITIES FROM A SINGLE CONNECTION POINT. TRACER WIRE ON ALL SEWER SERVICE LATERALS MUST TERMINATE AT AN APPROVED TRACER WIRE ACCESS BOX COLOR CODED GREEN AND LOCATED DIRECTLY ADJACENT TO THE SEWER SERVICE CLEANOUT CLOSEST TO THE STRUCTURE BEING SERVED. A GROUNDING ANODE SHALL BE INSTALLED BENEATH THE CLEANOUT AT THE DEPTH OF THE SERVICE. ACCESS BOX APPROVED MANUFACTURER: COPPERHEAD INDUSTRIES SNAKE-PIP OR APPROVED EQUAL.

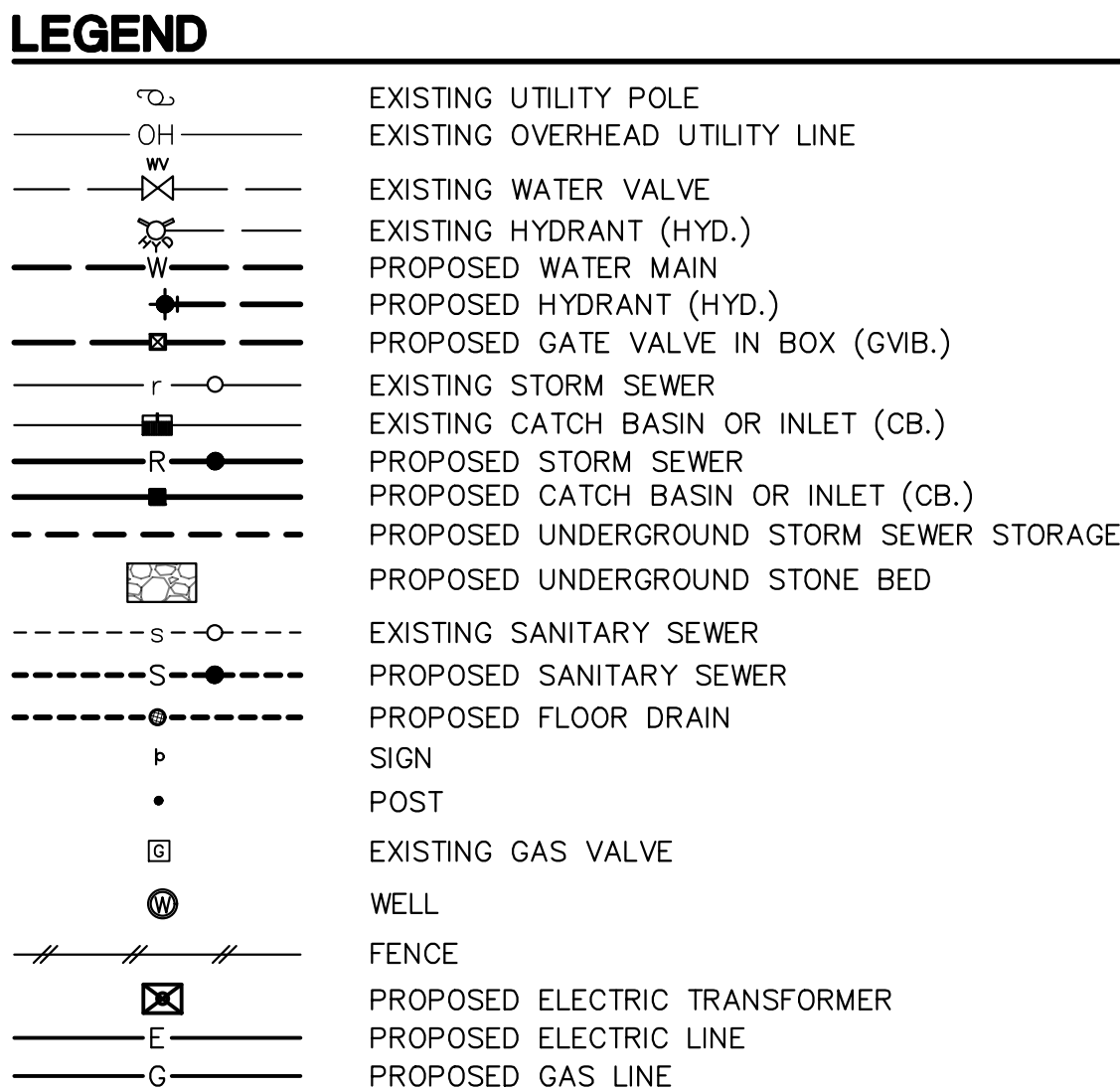
1. All materials, workmanship, and construction shall meet or exceed the standards and specifications set forth in the Eagle River Water and Sanitation District Rules and Regulations. Where there is conflict between these plans and the Rules and Regulations or any applicable standards, the more stringent standard shall apply. All work shall be inspected and approved by the ERWSD Inspector.
2. The contractor shall schedule a mandatory pre-construction meeting at the Participants site a minimum of three (3) business days after the plans have been submitted. Participants shall include but are not limited to the Applicant, contractor, excavator, engineer, and the contractor representative. Construction may begin once the meeting has concluded, and the ERWSD Inspector has been notified.
3. The contractor shall have one (1) signed copy of the approved plans, one (1) copy of the appropriate criteria and specifications, and a copy of any permits and extension agreements needed for the job onsite at all times.
4. The contractor shall provide a complete bill of materials for all proposed water and wastewater infrastructure.
5. The contractor shall be responsible for all aspects of safety including, but not limited to, excavation, trenching, shoring, traffic control, and security.
6. If during the construction process conditions are encountered which could indicate a situation that is not identified in the plans or specifications, the contractor shall contact the ERWSD Inspector immediately.
7. The contractor shall submit traffic control plans as approved by the appropriate governing agency.
8. The contractor is responsible for providing all labor and materials necessary for the completion of the intended improvements shown on the drawings or as designated to be provided, installed, or constructed unless specifically noted otherwise.
9. The contractor shall be responsible for recording as-built information on a set of record drawings that show the construction site and available to the ERWSD Inspector at all times. All as-built information shall be field surveyed under the direct care and supervision of a licensed Professional Land Surveyor.
10. The contractor shall obtain locates prior to any excavation.
11. The contractor is responsible for any damage to any utility facilities as a result of their actions. The contractor shall make the required repairs immediately to the satisfaction of the affected utility.
12. Eagle River Water and Sanitation District does not guarantee the accuracy of the locations of existing pipelines, manholes, hydrants, valves and service lines. If field conditions are found to be different than shown on the plans, the contractor shall notify the inspector and design engineer immediately.
13. All trenching and backfill shall be in accordance with Appendix E of the ERWSD Rules and Regulations.

THE FLOW THROUGH THE EXISTING SEWER WILL NEED TO BE MAINTAINED DURING CONSTRUCTION AND SO WILL NEED TO PROVIDE A BYPASS. BELOW IS THE SEQUENCE OF CONSTRUCTION:

- i. **CONSTRUCT DOGHOUSE MANHOLE S3 (THIS WILL AVOID ANY CLOSURE OF THE SEWER).**
- ii. **PLUG MANHOLE S2, INSTALL PUMP AND PROVIDE A BYPASS FROM S2 TO S3.**
- iii. **COORDINATE TEMPORARY SERVICE SHUTOFF FOR LOTS [989 MAIN ST., 991 MAIN ST., 997 MAIN ST. & 1003 MAIN ST.].**
- iv. **CONSTRUCT THE LINE FROM S3 TO S4 AND MANHOLE S4.**
- v. **PERFORM AIR TEST AND RUN A MANDELB BETWEEN S4 TO S3.**
- vi. **REMOVE EXISTING PIPES AND MANHOLE AS CALLED OUT ON PLAN.**
- vii. **REMOVE THE BYPASS AND RECONNECT THE FLOW FROM S2 THROUGH S4 TO S3.**

1. EACH OF THE PROPOSED COTTAGES AND THE EXISTING HOUSE SHALL BE CONNECTED TO AN INDIVIDUAL DHO71-124 E-ONE PUMP SYSTEM.
2. THE FORCE MAIN SHALL MAINTAIN A MINIMUM OF 54" COVER.
3. THE FORCE MAIN SHALL MAINTAIN A MINIMUM OF 18" OF VERTICAL SEPARATION AT ALL UTILITY CROSSINGS.
4. THE FORCE MAIN SHALL BE CONNECTED TO THE MANHOLE 53.
5. THE CONTRACTOR SHALL PROVIDE A STUB FOR FUTURE CONNECTION TO THE MICRO HOMES.
6. THE E-ONE PUMPS AND FORCE MAIN SHALL BE OWNED AND MAINTAINED BY THE DEVELOPMENT OWNER.

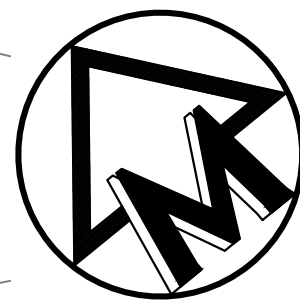
1. ALL SANITARY SEWER LEADS CONNECTING THE ADJACENT PROPERTIES (#987 MAIN ST., #989 MAIN ST., #991 MAIN ST. & #997 MAIN ST.) TO THE EXISTING SANITARY SEWER ON SITE WILL BE TRANSFERRED TO THE NEW SANITARY SEWER ALIGNMENT.





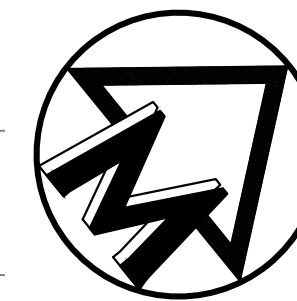
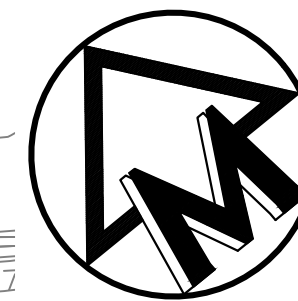
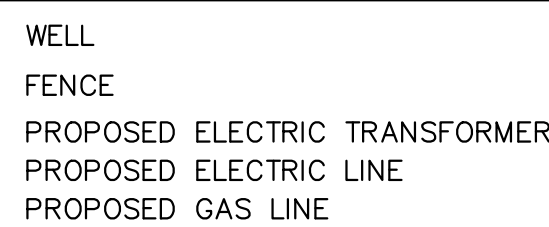
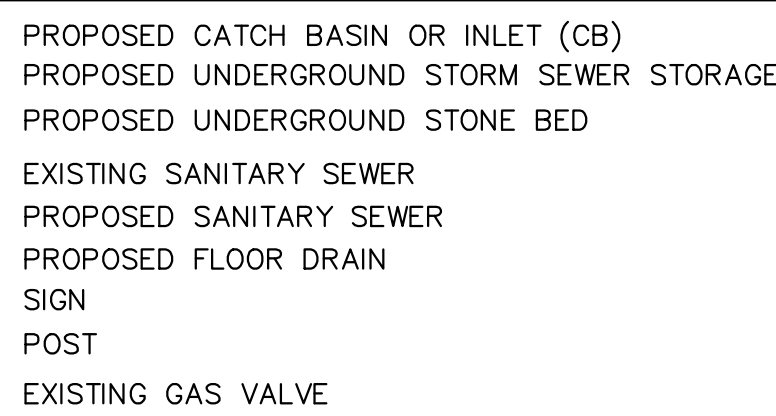
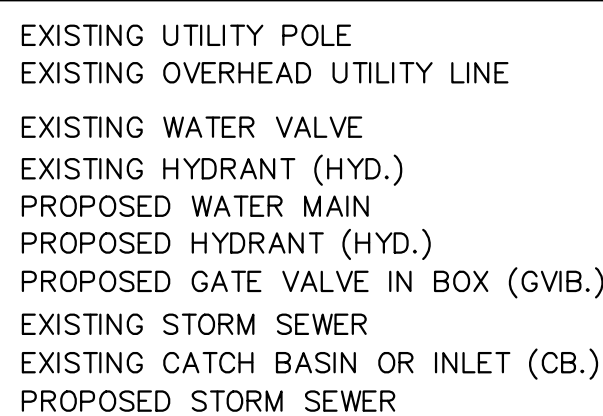






1. All water main construction is subject to the most recently adopted ERWSD Rules and Regulations.
2. Water mains shall be a minimum of 8 inches in diameter, with the exception of fire hydrant laterals.
3. Water mains shall be installed with a minimum of 7 feet of cover and a maximum of 9.5 feet of cover to the top of the pipe.
4. Pipe deflections shall not exceed pipe manufacturers maximum allowable deflection or values in ERWSD Rules and Regulations Appendix C-2.6.9 Table C-1.
5. Ductile iron pipe water mains shall be encased in PE Wrap per ERWSD Rules and regulations Article C-2.9
6. Water mains shall have tracer wire installed meeting ERWSD requirements per ERWSD Rules and Regulations Appendix E-1.12
7. Water mains shall have water specific marking tape installed 24 inches above the water main.
8. Water mains shall be bedded per ERWSD Rules and Regulations Appendix E, Detail E-01.
9. Water mains parallel to non-potable water shall be installed a minimum of 10 feet away horizontally.
10. Water mains shall be tested in accordance with ERWSD Rules and Regulations Article 9.3.3.

## LEGEND



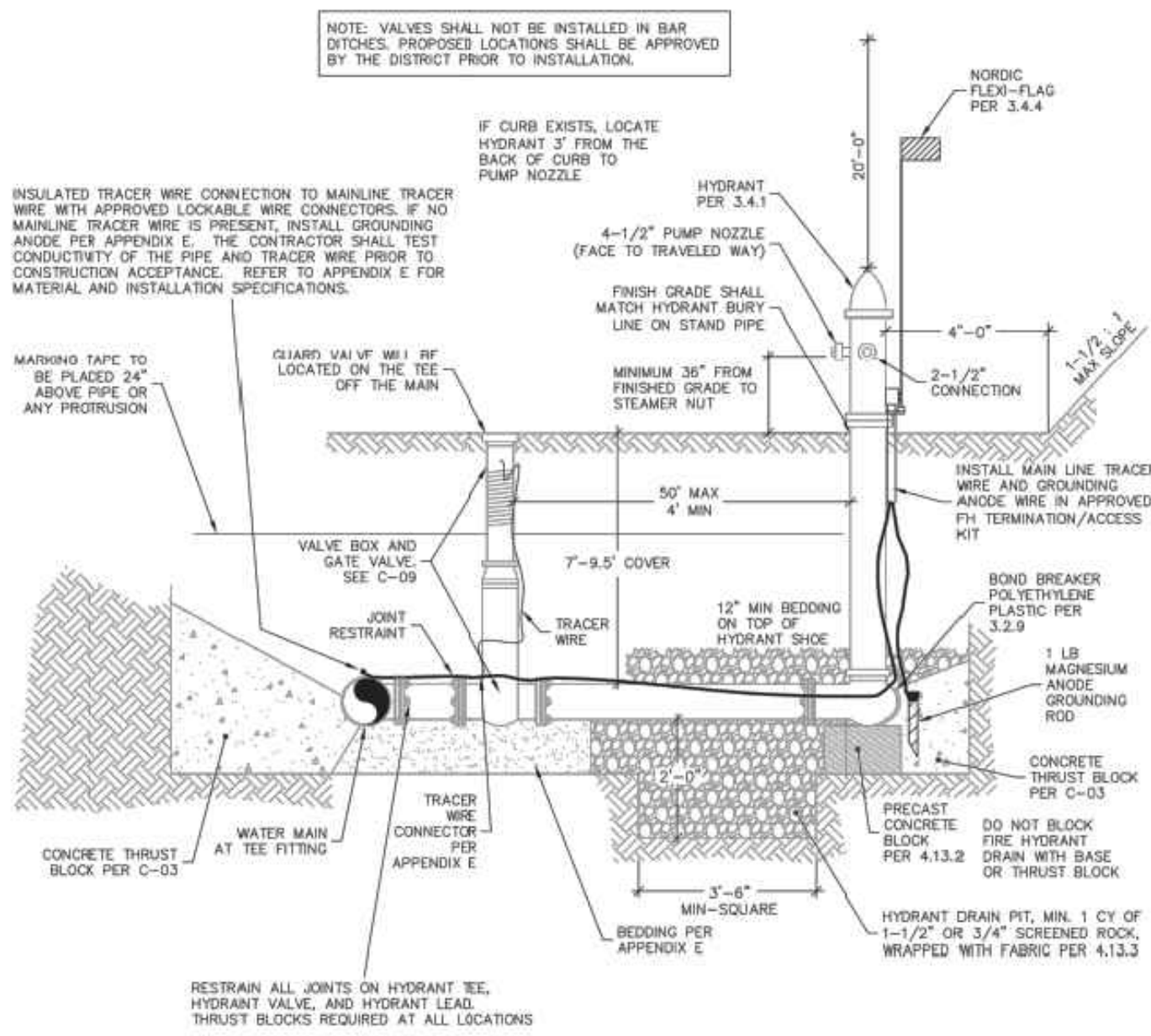
**Know what's below.  
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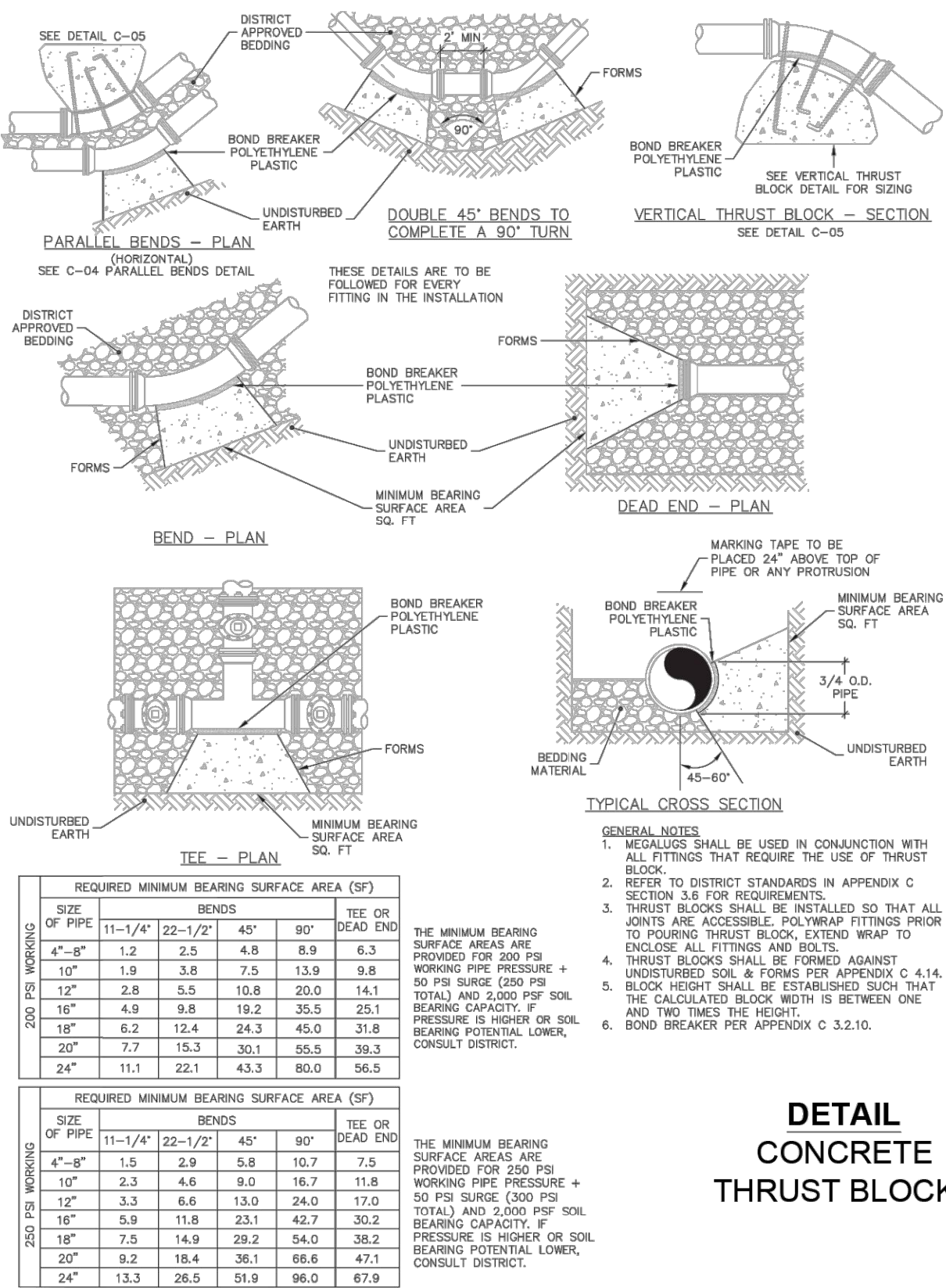
1. ALL HYDRANT LATERALS SHALL BE RESTRAINED.
2. ALL WATER SERVICE LEADS SHALL BE TYPE K COPPER.



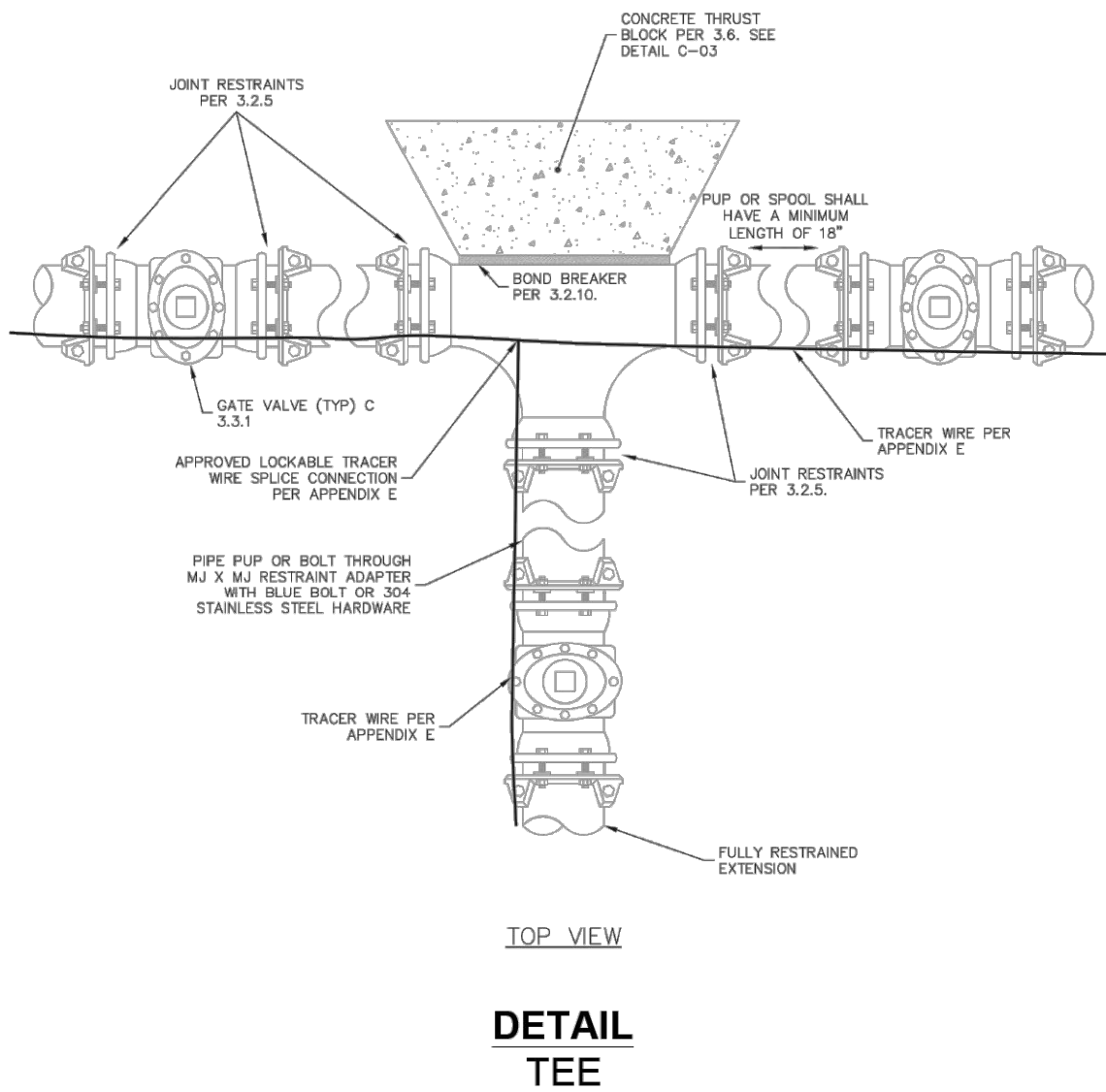




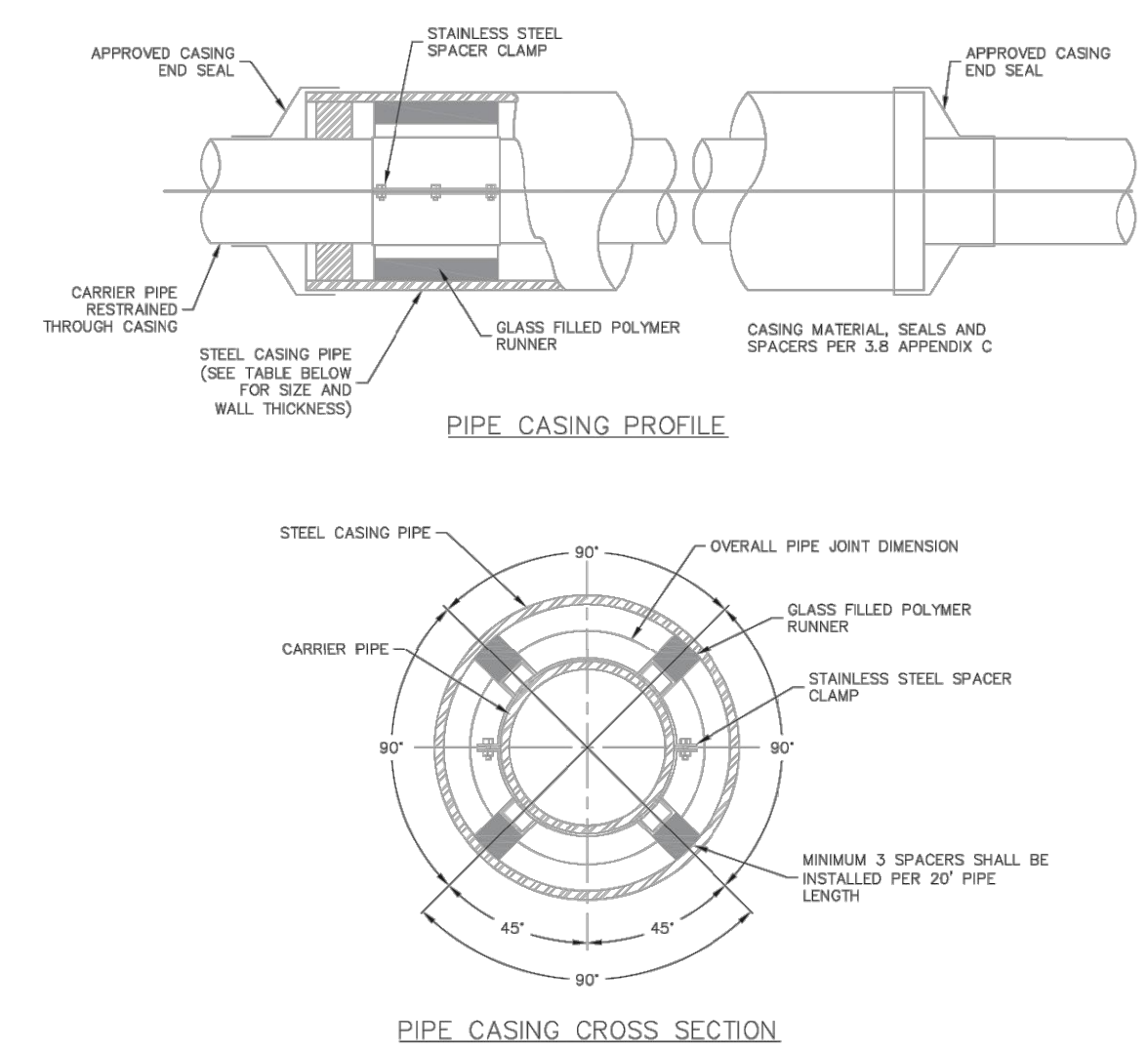
DETAIL  
FIRE HYDRANT ASSEMBLY



DETAIL  
CONCRETE THRUST BLOCKS

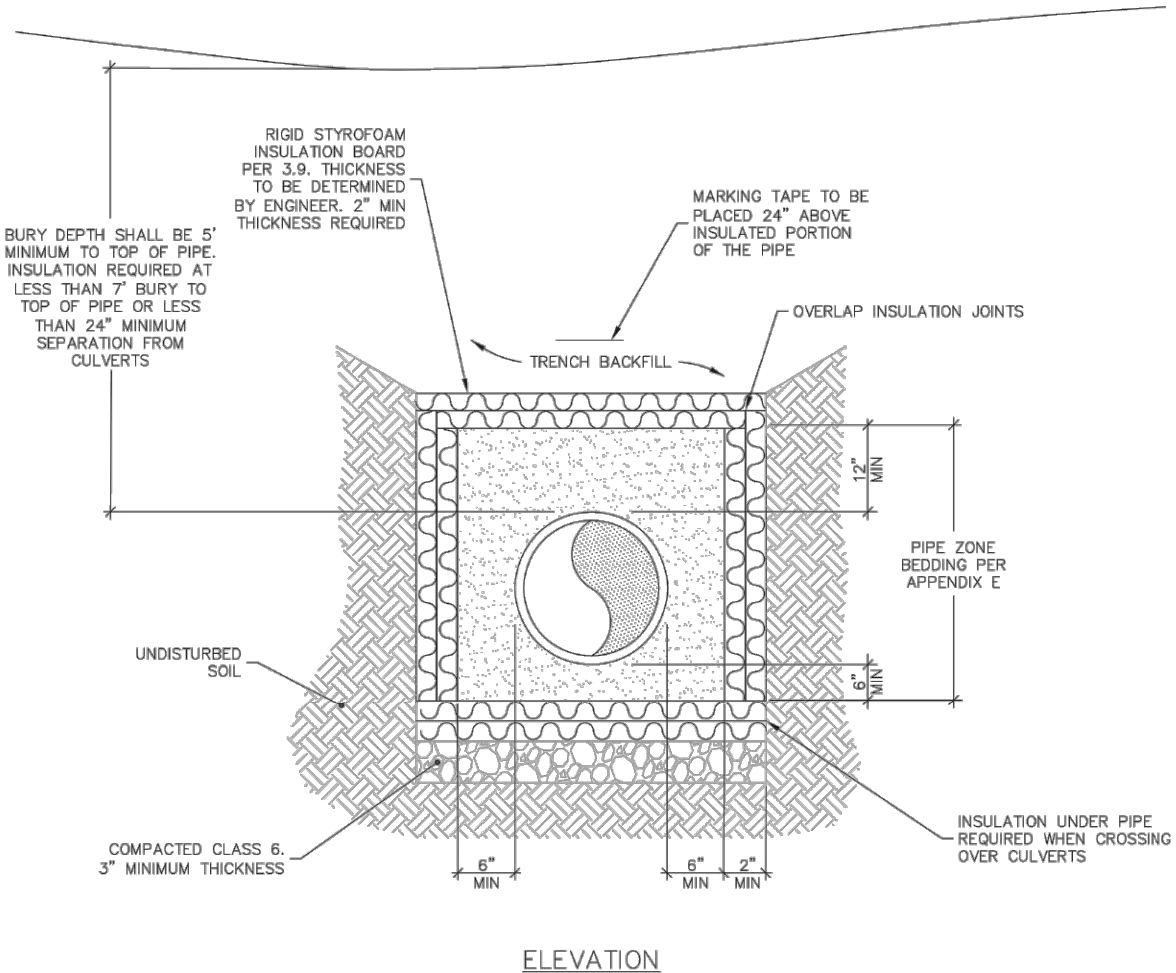


DETAIL  
TEE



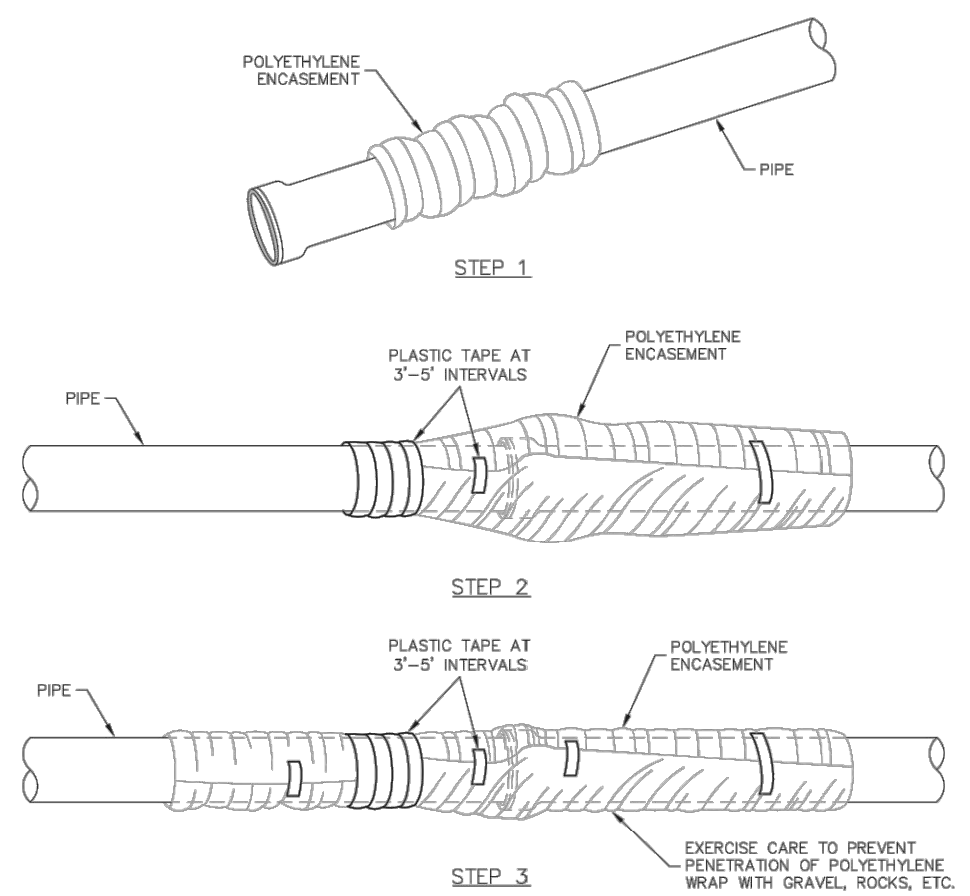
DETAIL  
WATER CASING

CARRIER PIPE NOMINAL #	CASING PIPE	
	MIN OD	MIN WALL THICKNESS
4"	12"	0.25"
6"	16"	0.3125"
8"	18"	0.3125"
12"	22"	0.375"
16"	28"	0.500"
20"	32"	0.500"



- GENERAL NOTES
1. CONDITION OF LESS THAN MINIMUM BURY DEPTH ALLOWED ONLY WITH WRITTEN APPROVAL FROM THE DISTRICT PRIOR TO CONSTRUCTION. INSULATION SHALL BE INSTALLED ON ALL PIPE THAT DOES NOT MEET MINIMUM BURY REQUIREMENTS.
  2. SEE SEWER AND WATER PIPE BEDDING DETAIL AND APPENDIX E FOR BACKFILL MATERIAL AND COMPACTION SPECIFICATIONS.
  3. INSULATION SHALL BE INSTALLED ON ALL PIPES THAT DO NOT HAVE A MINIMUM OF 7' OF EFFECTIVE COVER. EFFECTIVE COVER SHALL BE DEFINED AS SEPARATION FROM COLD AIR SOURCES, INCLUDING STORM SEWERS. 1" OF INSULATION BOARD MAY BE SUBSTITUTED FOR EACH 1" OF SOIL COVER (MIN. 2" INSULATION) REQUIRED TO MEET THE MINIMUM COVER REQUIREMENT.
  4. INSULATION SPECIFICATIONS PER APPENDIX C 3.9.

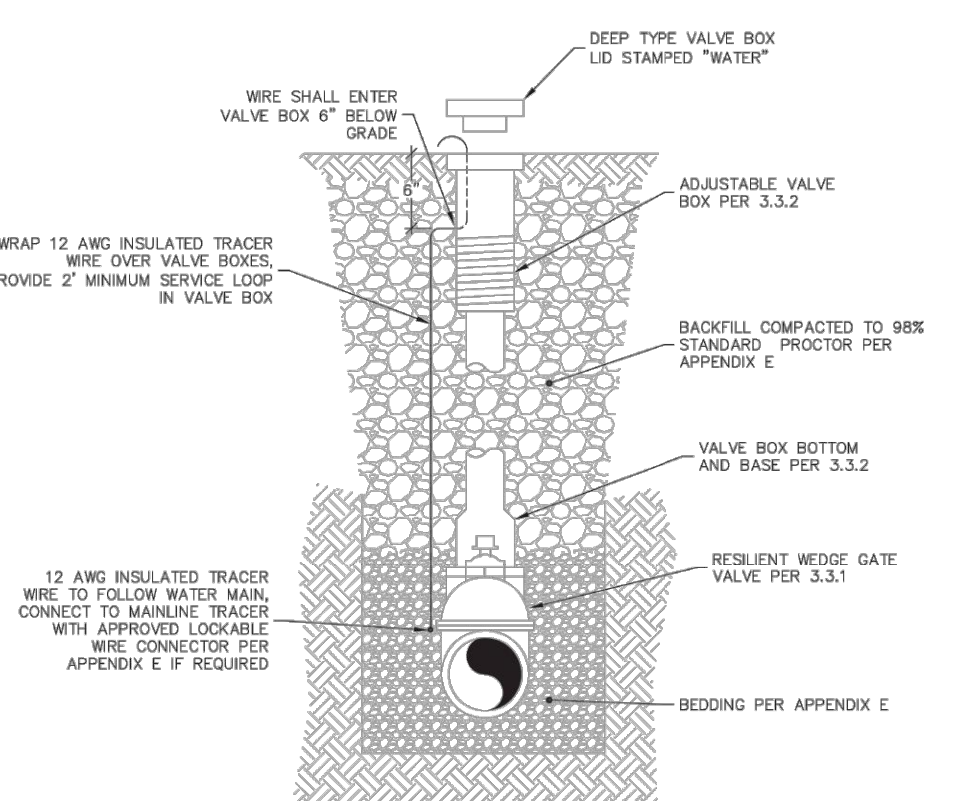
USE OF POLYETHYLENE WRAP FOR CORROSIVE SOILS



DETAIL  
POLYETHYLENE WRAP

- FIELD INSTALLATION - POLYETHYLENE WRAP
- STEP 1 - PLACE POLYETHYLENE MATERIAL ON PIPE PRIOR TO LOWERING IT INTO PLACE.
- STEP 2 - PULL THE TUBE OVER THE LENGTH OF THE PIPE. TUBE TO PIPE AT JOINT, FOLD MATERIAL AROUND THE ADJACENT SPOOT END AND WRAP WITH TAPE TO HOLD THE POLYETHYLENE ENCASEMENT IN PLACE.
- STEP 3 - OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE SHALL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, TIALED ON TOP OF PIPE AND TAPED IN PLACE.

- GENERAL NOTES
1. ALL DUCTILE IRON PIPE REQUIRES THE USE OF POLYETHYLENE WRAP UNLESS APPLICANT SUBMITS A SOILS TEST INDICATING THAT NO CORROSIVE SOILS ARE PRESENT.
  2. POLYETHYLENE ENCASEMENT PER APPENDIX C 3.2.10.



DETAIL  
GATE VALVE & VALVE BOX ASSEMBLY

- GENERAL NOTES
1. VALVE BOX IS TO BE INSTALLED PLUMB, LEVEL, AND CENTERED ON 2" NUT.
  2. IF THE DISTANCE FROM THE TOP OF THE OPERATING NUT TO THE TOP OF THE VALVE COVER IS GREATER THAN 6", A CENTERING RING AND EXTENSION STEM IS REQUIRED. THE EXTENSION MUST BE SECURED TO THE VALVE OPERATING NUT.



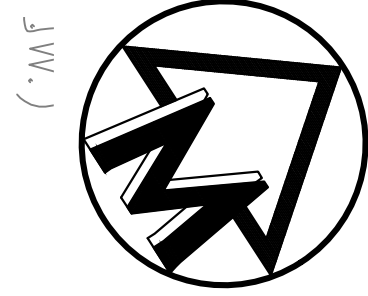
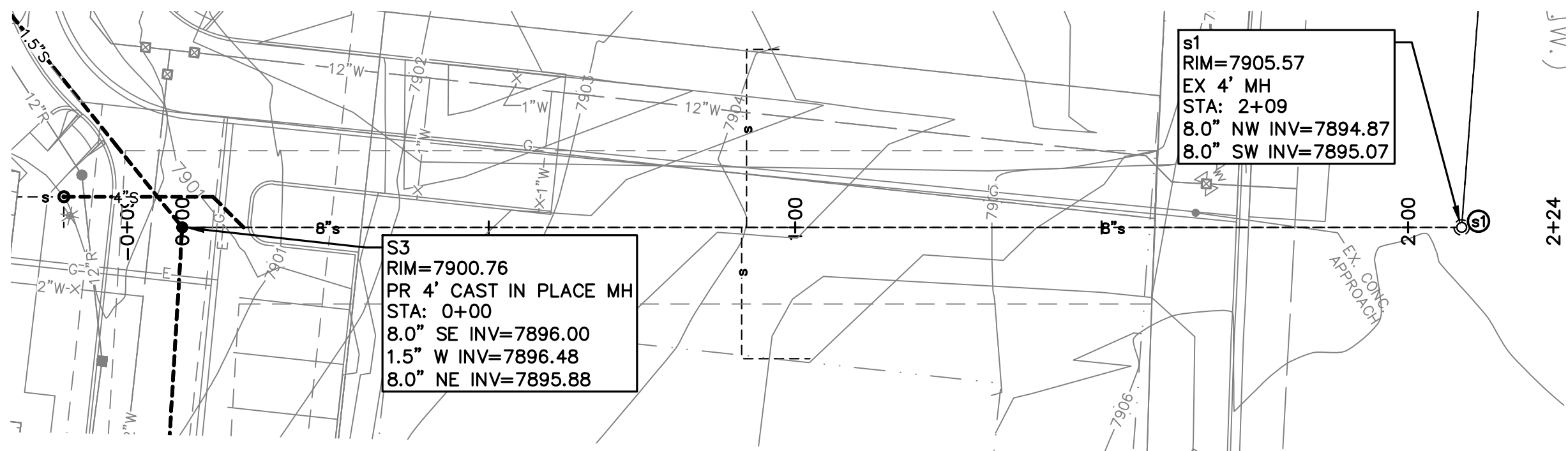




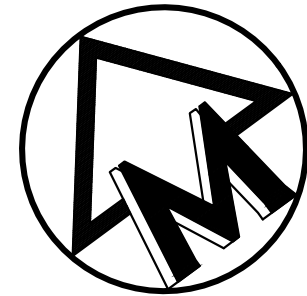
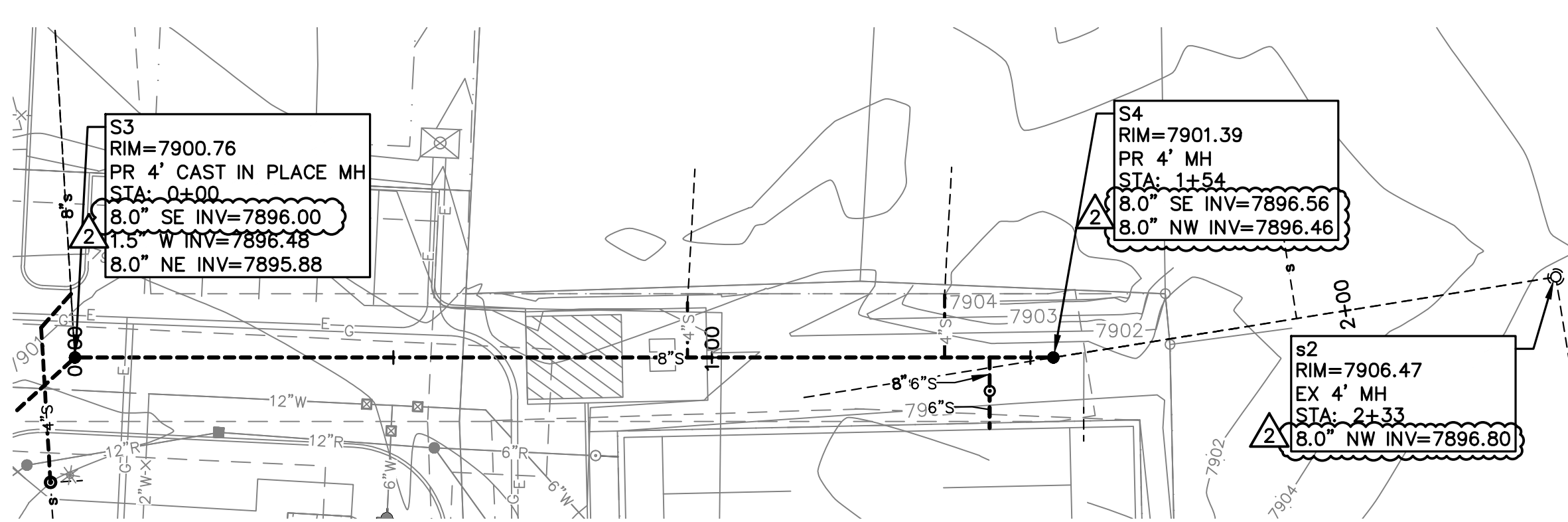








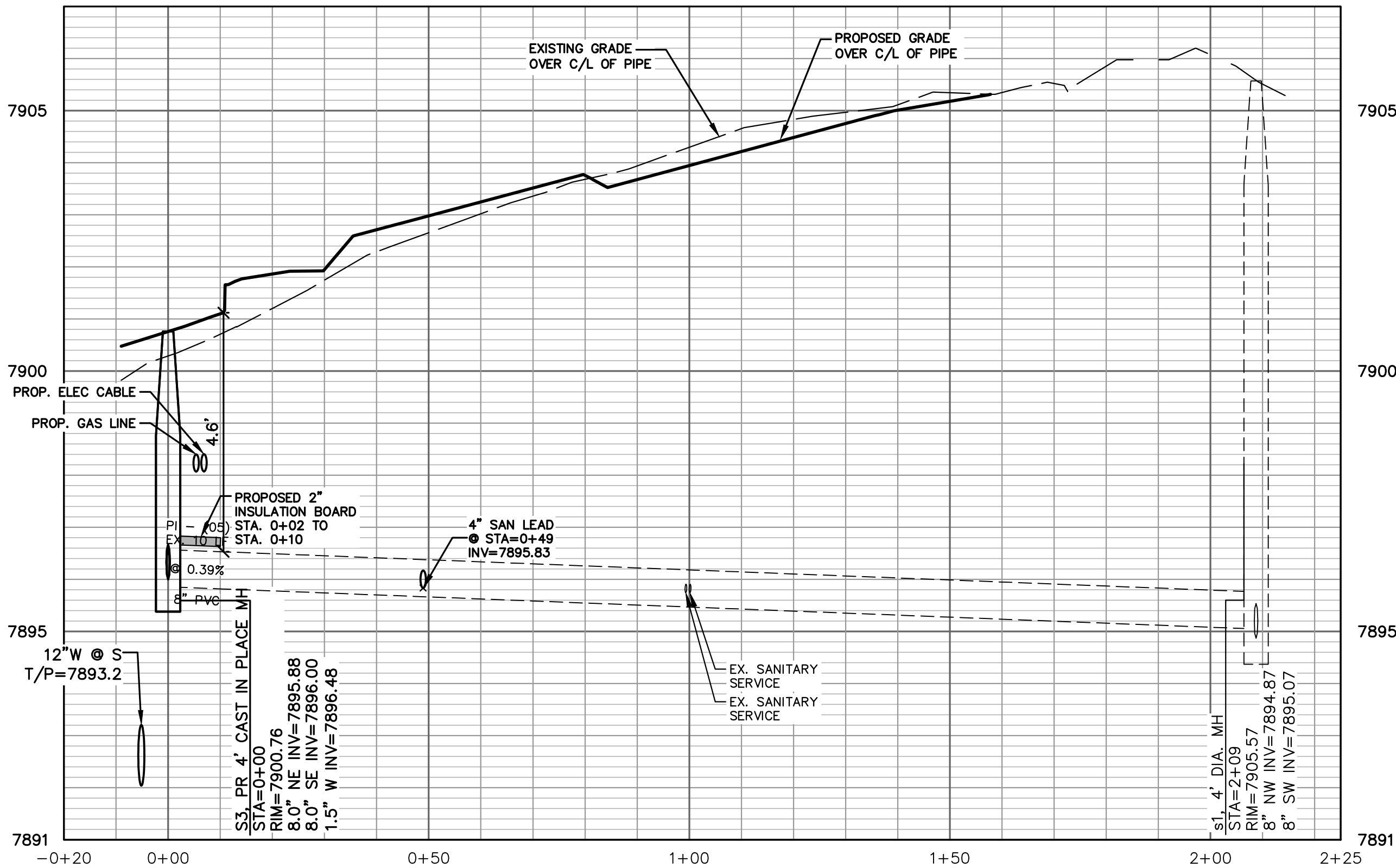
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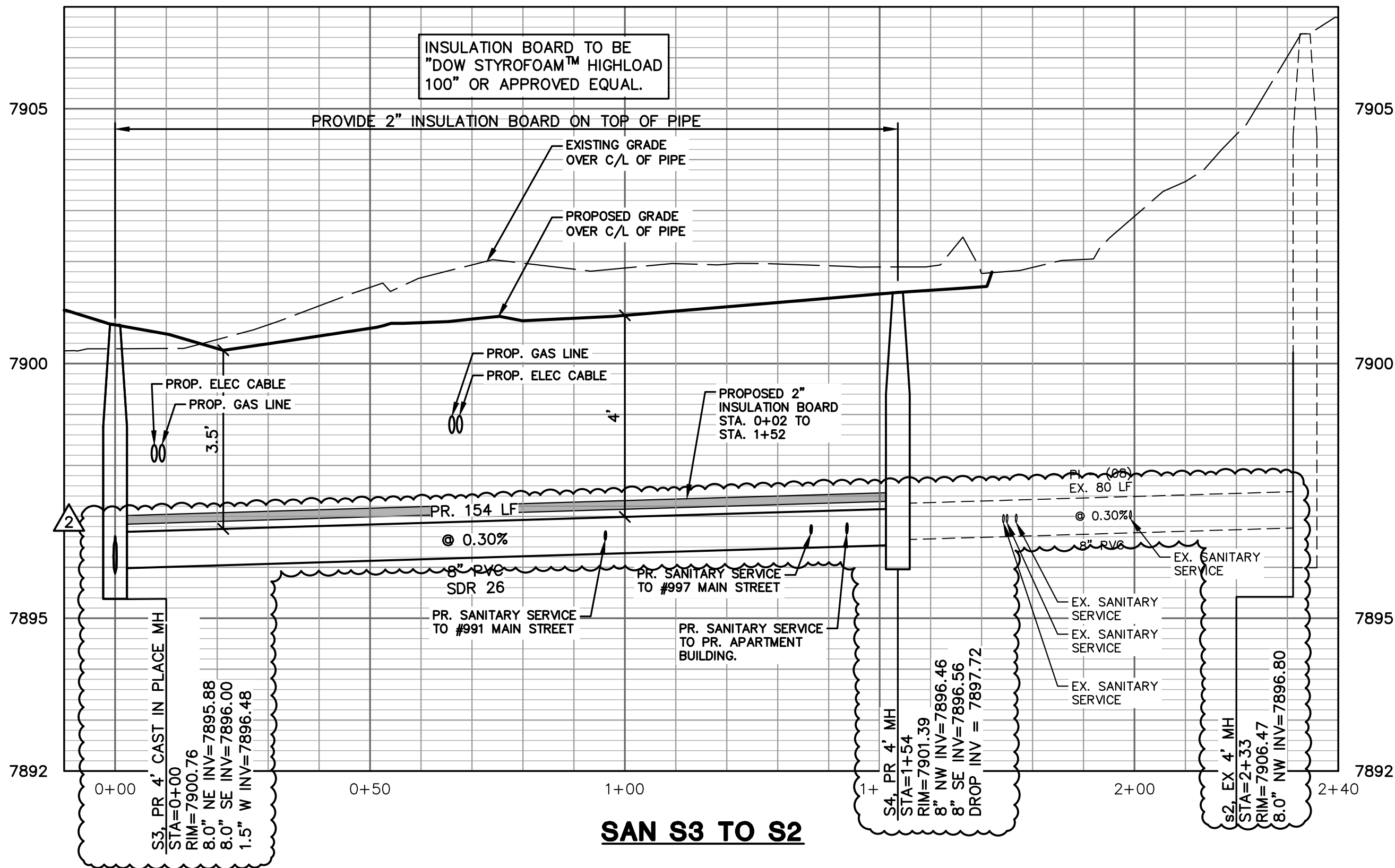
HORZ. SCALE: 1" = 20'  
0 20 40 60  
VERT. SCALE: 1" = 2'  
0 2 4 6



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**SAN S3 TO S1**



**SAN S3 TO S2**

### SANITARY STRUCTURE TABLE

STRUCTURE NO.	TYPE	RIM ELEV.	INV.	DEPTH	TYPE OF CASTING
s2	4' DIAM. MH	7906.47	8.0" NW 7896.80	9.98	TYPE D-01 MANHOLE
S3	4' DIAM. MH	7900.76	8.0" SE 7896.00 1.5" W 7896.48 8.0" NE 7895.88	4.88	TYPE D-01 MANHOLE
S4	4' DIAM. MH	7901.39	8.0" SE 7896.56 8.0" NW 7896.46	4.93	TYPE D-01 MANHOLE

### As-Built Requirements

See ERWSD Rules and Regulations Section 9.4

Name of person submitting:

Date on submitted drawings:

### Overall

### Right of Ways

- ☐ All right of ways shown (including adjacent right of ways)  
☐ Labeled with Eagle County recording information

### Easements

- ☐ Labeled with Eagle County recording information

### Property Boundaries

Pipe ID	Pipe Dia	Upstream Struc No.	Downstream Struc No.	# Of Residential Units Added	# Of Commercial Units Added	Pipe Slope	Q <sub>avg</sub> gpd	Q <sub>avg</sub> gpm	Q <sub>peak</sub> Factor=4 gpm	Q <sub>peak</sub> cfs	Velocity @ Q <sub>peak</sub> ft/s	Q <sub>peak</sub> combined cfs	Pipe Capacity cfs
PI-(01)	8"	S4	S3	16	1	0.94%	3120	2.17	8.67	0.019	0.055	0.031	1.17
PI-(02)	8"	S3	s1	10	0	0.39%	1950	1.35	5.42	0.012	0.035	0.031	0.76
Totals				26	1		5070	3.52	14.08	0.031			
Q <sub>avg</sub> = 195 gpd/unit for Residential units													
Q <sub>avg</sub> = 1500 gpd/unit per gross acre for Commercial units													

### NOTE

- INSULATION BOARD SHALL BE DOW STYROFOAM HIGHLOAD 100, OWENS CORNING FOAMULAR 1000 OR APPROVED EQUAL
- FACTORY WYES SHALL BE USED FOR ALL SERVICE LEAD CONNECTIONS
- ALL PROPOSED SANITARY SERVICE LEADS SHALL BE SDR-26/PS115

THE BASE SURVEY WAS PREPARED BY GORE RANGE SURVEYING, LLC, DATED 11/1/21. ALL UNDERGROUND UTILITIES AND STRUCTURES HAVE BEEN SHOWN TO A REASONABLE DEGREE OF ACCURACY AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THEIR EXACT LOCATION AND TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCING WORK.

### BENCHMARKS

BM#1 - DESCRIPTION  
ELEV=7900.37 (NAVD88)

EXISTING SANITARY SEWER MANHOLE AT THE CENTER OF THE SOUTH PROPERTY.

### LEGEND

—○—	EXIST. UTILITY POLE
—X—	EXIST. OVERHEAD UTILITY LINE
—X—	EXIST. WATER VALVE
—X—	EXIST. HYDRANT (HYD)
—W—	PROP. WATER MAIN
—H—	PROP. HYDRANT (HYD)
—G—	PROP. GATE VALVE IN BOX (GVIB)
—r—	EXIST. STORM SEWER
—R—	EXIST. CATCH BASIN OR INLET (CB)
—R—	PROP. STORM SEWER
—R—	PROP. CATCH BASIN OR INLET (CB)
—R—	PROP. UNDERGROUND STORM SEWER STORAGE
—R—	PROP. UNDERGROUND STONE BED
---s---	EXIST. SANITARY SEWER
---S---	PROP. SANITARY SEWER
---S---	PROP. FLOOR DRAIN
—P—	SIGN
—P—	POST
—G—	EXIST. GAS VALVE
—W—	WELL
—F—	FENCE
—T—	PROP. ELEC. TRANSFORMER
—E—	PROP. ELECTRIC LINE
—G—	PROP. GAS LINE



20067

DATE: 10/29/24  
SHEET 21 OF 38

REV. DATE

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CLIENT  
10TH MOUNTAIN BUILDERS  
1632 MAIN STREET  
MINTURN, CO 81645  
JEFFREY D. ARMISTEAD  
970-471-0618

MIDTOWN VILLAGE PUD

SANITARY SEWER PLAN AND PROFILE VIEW 1

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MIDTOWN VILLAGE PUD

SANITARY SEWER PLAN AND PROFILE VIEW 1

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DATE: 10/29/24  
SHEET 21 OF 38

REV. DATE

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01/15/24  
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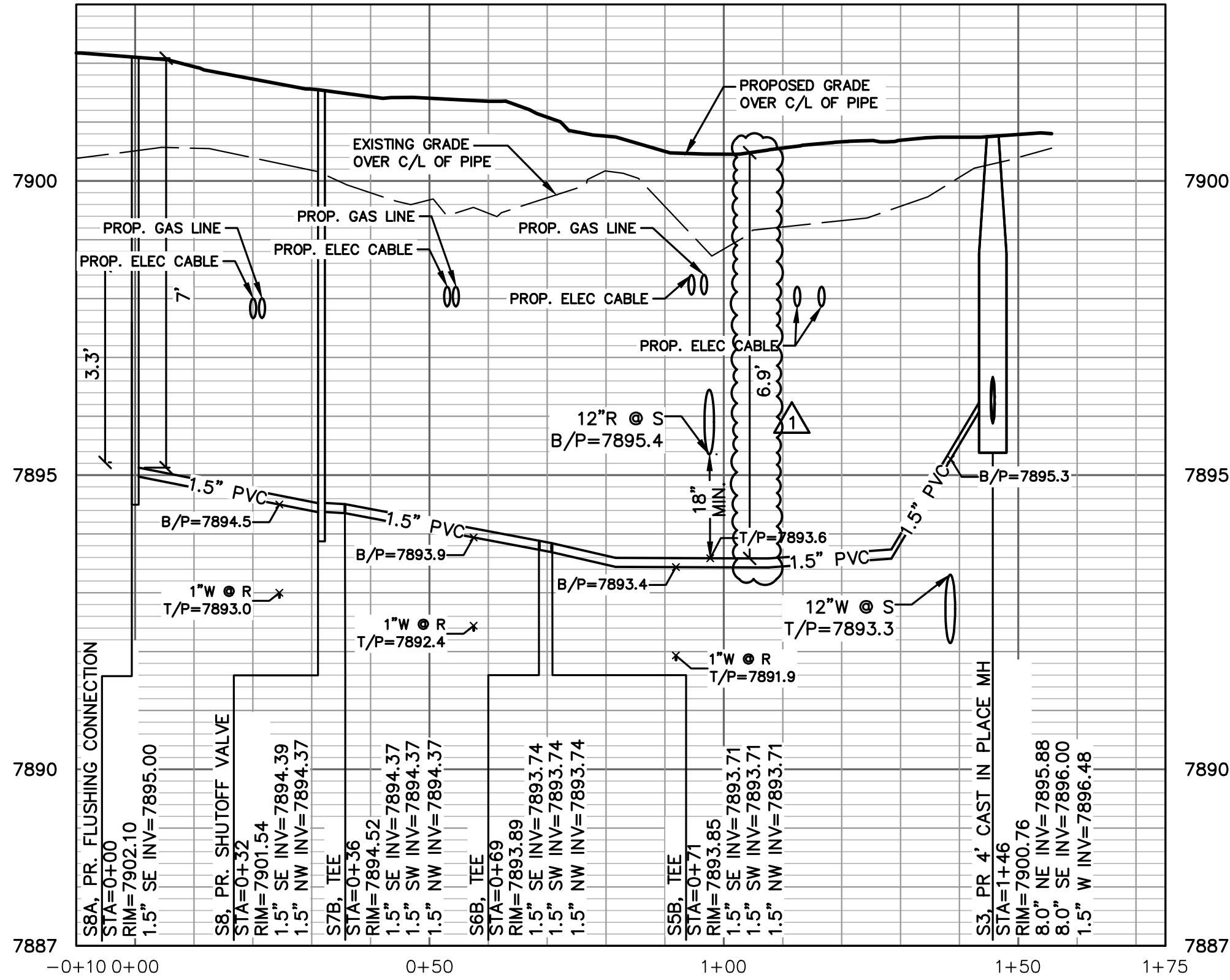
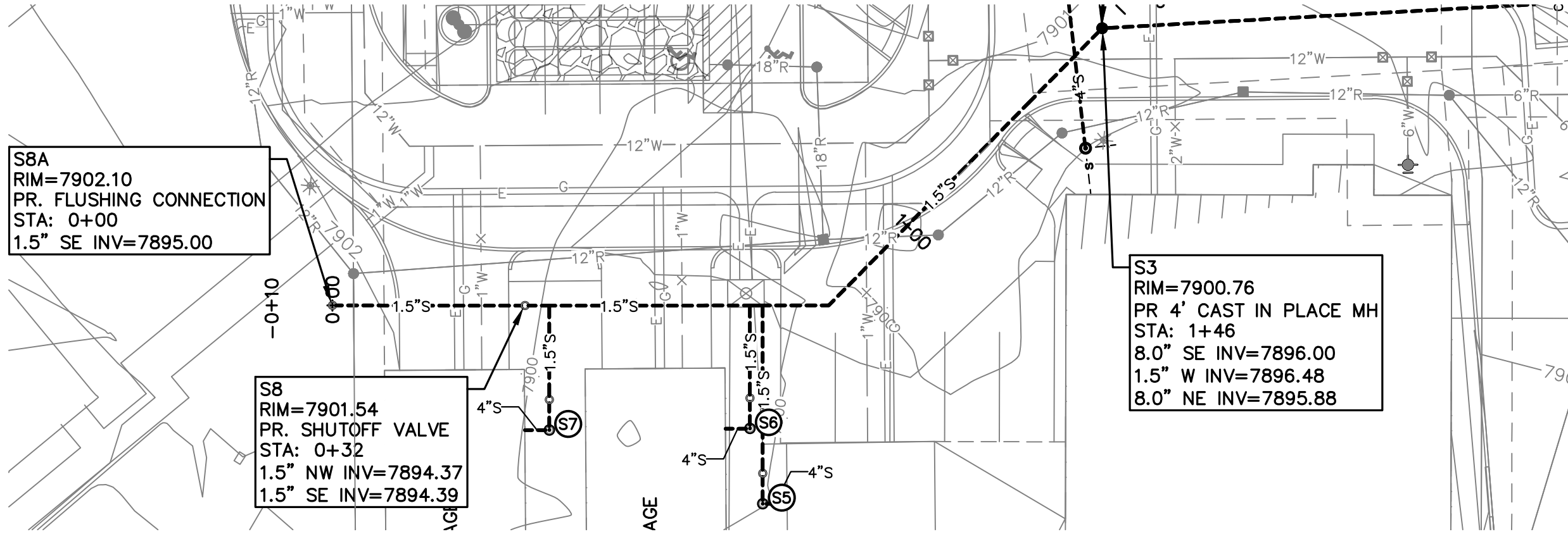
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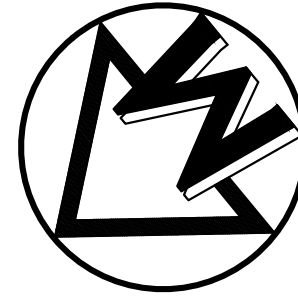
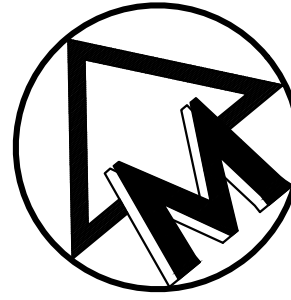
**SAN FORCE MAIN**

**SANITARY STRUCTURE TABLE**

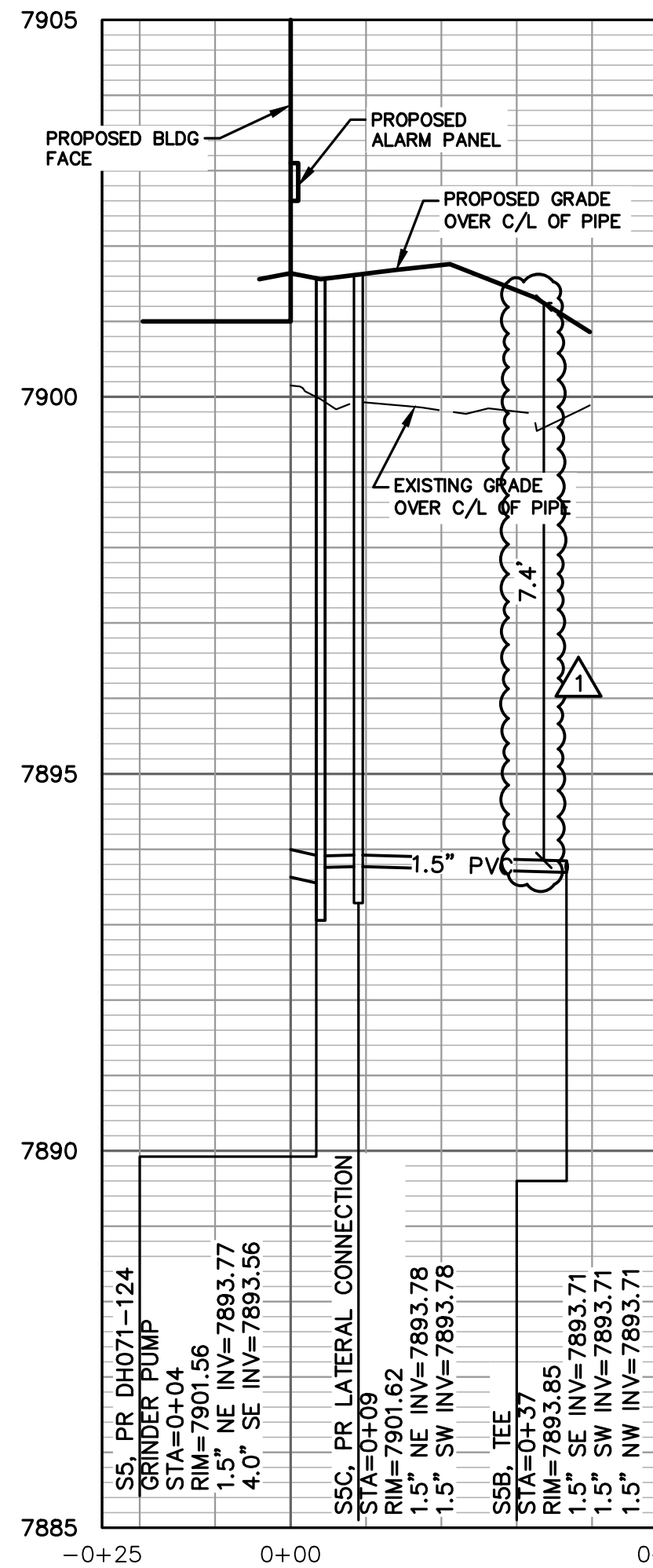
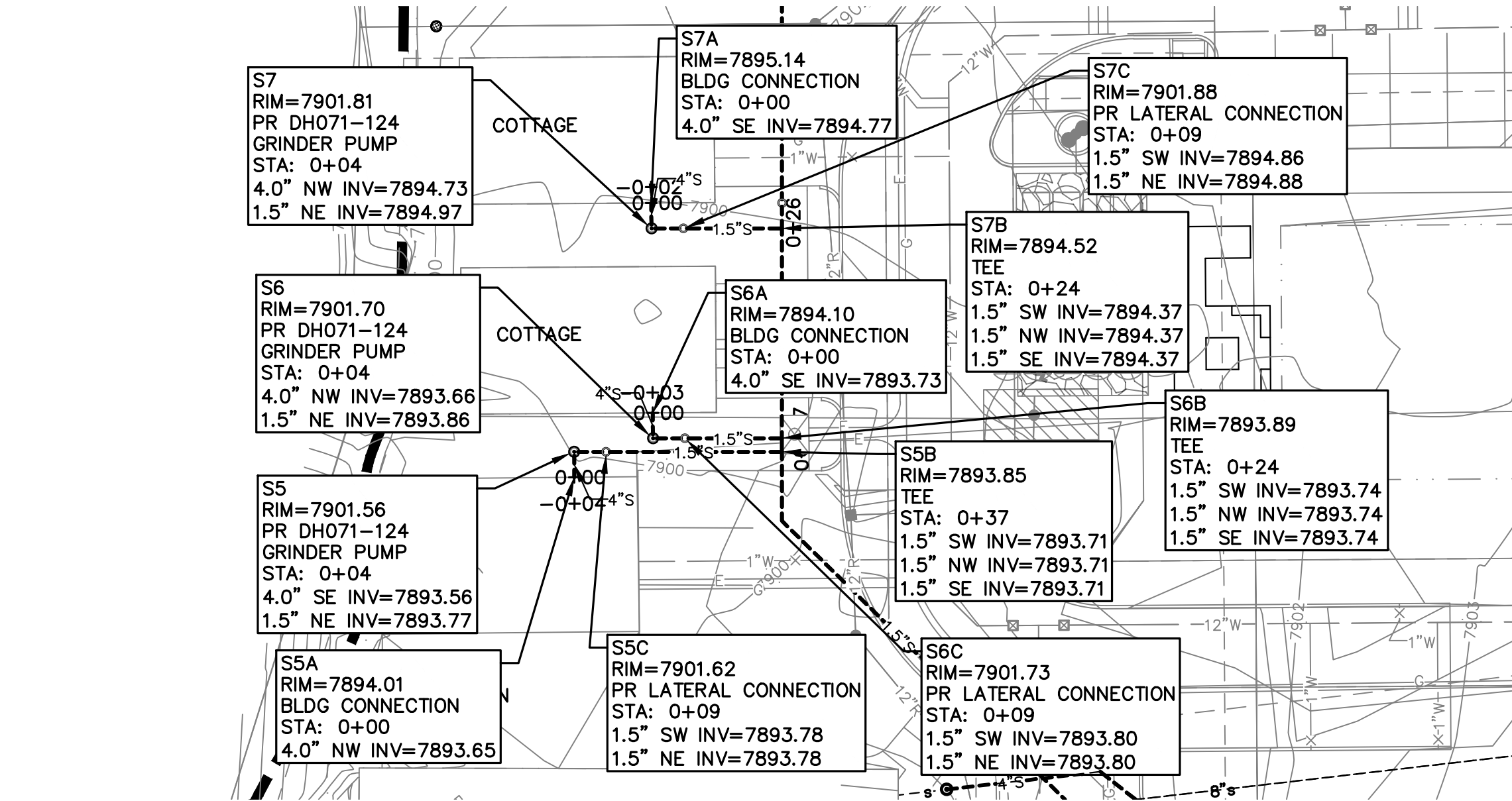
STRUCTURE NO.	TYPE	RIM ELEV.	INV.	DEPTH	TYPE OF CASTING
S3	4' DIAM. MH	7900.76	8.0" SE 7896.00 1.5" W 7896.48 8.0" NE 7895.88	4.88	TYPE D-01 MANHOLE

**LEGEND**

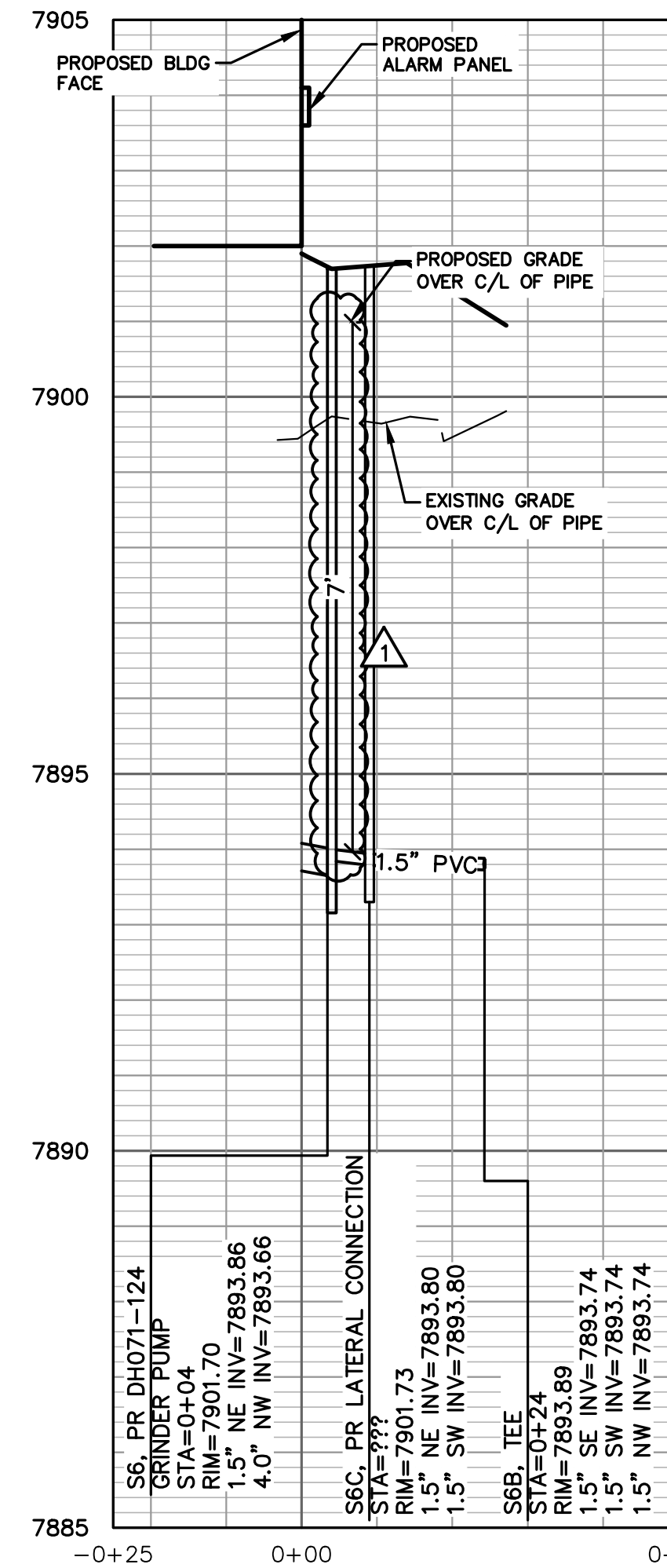
	EXIST. UTILITY POLE
	EXIST. OVERHEAD UTILITY LINE
	EXIST. WATER VALVE
	EXIST. HYDRANT (HYD)
	PROP. WATER MAIN
	PROP. HYDRANT (HYD)
	PROP. GATE VALVE IN BOX (GVIB)
	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET (CB)
	PROP. STORM SEWER
	PROP. CATCH BASIN OR INLET (CB)
	PROP. UNDERGROUND STORM SEWER STORAGE
	PROP. UNDERGROUND STONE BED
	EXIST. SANITARY SEWER
	PROP. SANITARY SEWER
	PROP. FLOOR DRAIN
	SIGN
	POST
	EXIST. GAS VALVE
	WELL
	FENCE
	PROP. ELEC. TRANSFORMER
	PROP. ELECTRIC LINE
	PROP. GAS LINE



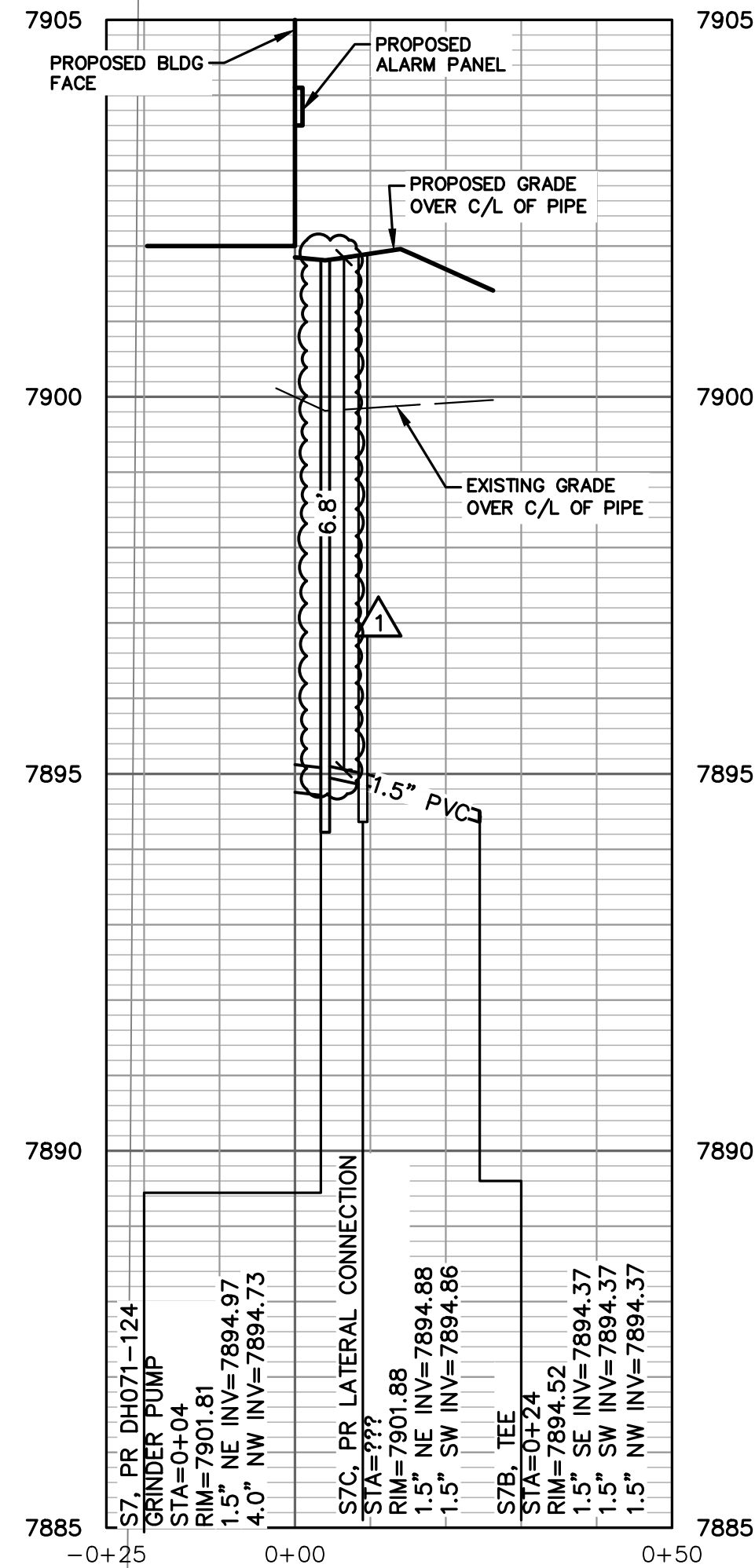
HORZ. SCALE: 1" = 20'  
0 20 40 60  
VERT. SCALE: 1" = 2'  
0 2 4 6



**SAN S5A TO S5B**



**SAN S6A TO S6B**



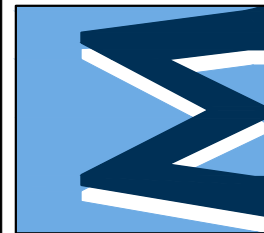
**SAN S7A TO S7B**

THE BASE SURVEY WAS PREPARED BY GORE RANGE SURVEYING, LLC, DATED 11/1/21. ALL UNDERGROUND UTILITIES AND STRUCTURES HAVE BEEN SHOWN TO A REASONABLE DEGREE OF ACCURACY AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THEIR EXACT LOCATION AND TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCING WORK.

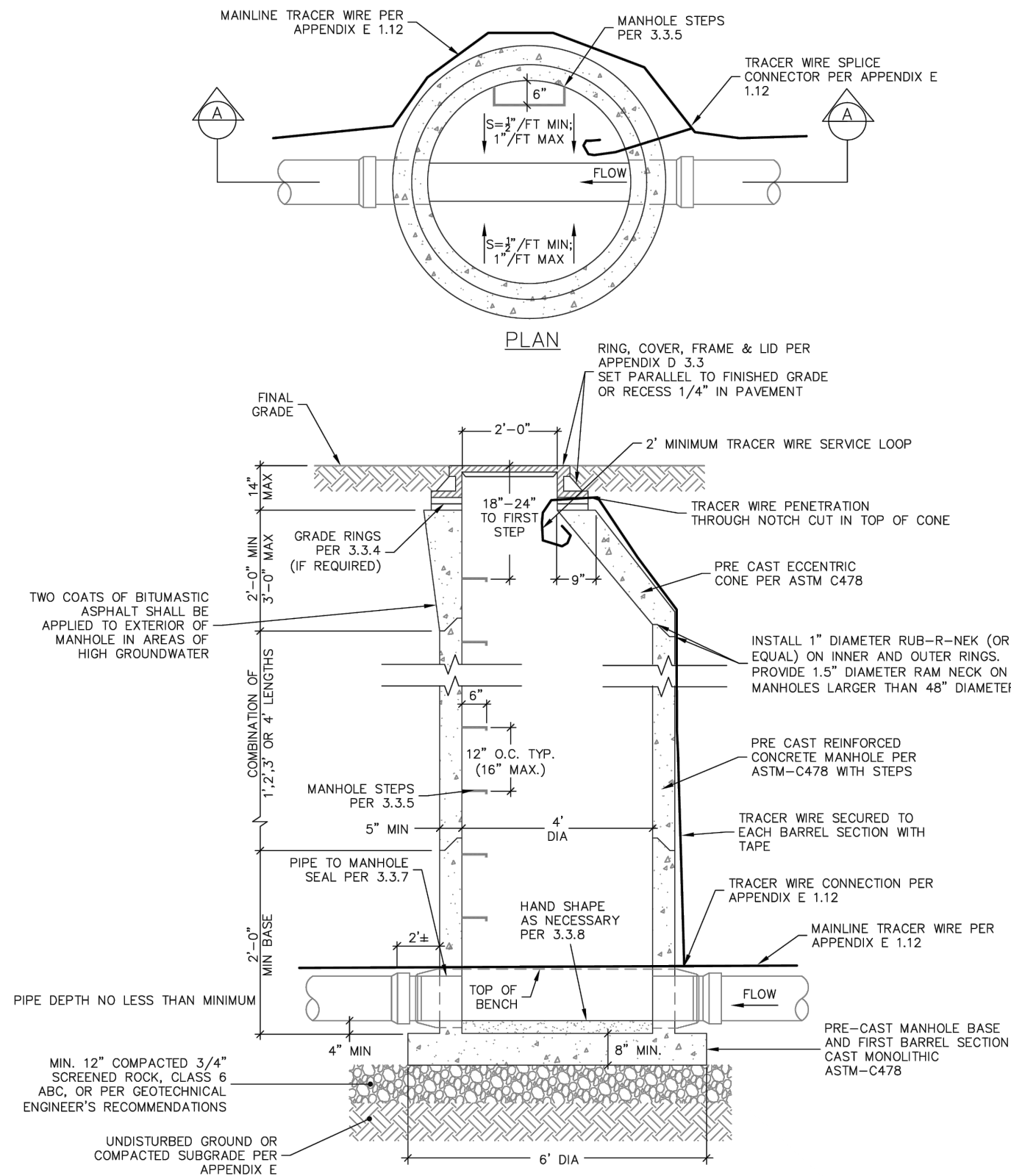
**BENCHMARKS**

BM#1 - DESCRIPTION  
ELEV=7900.37 (NAVD88)

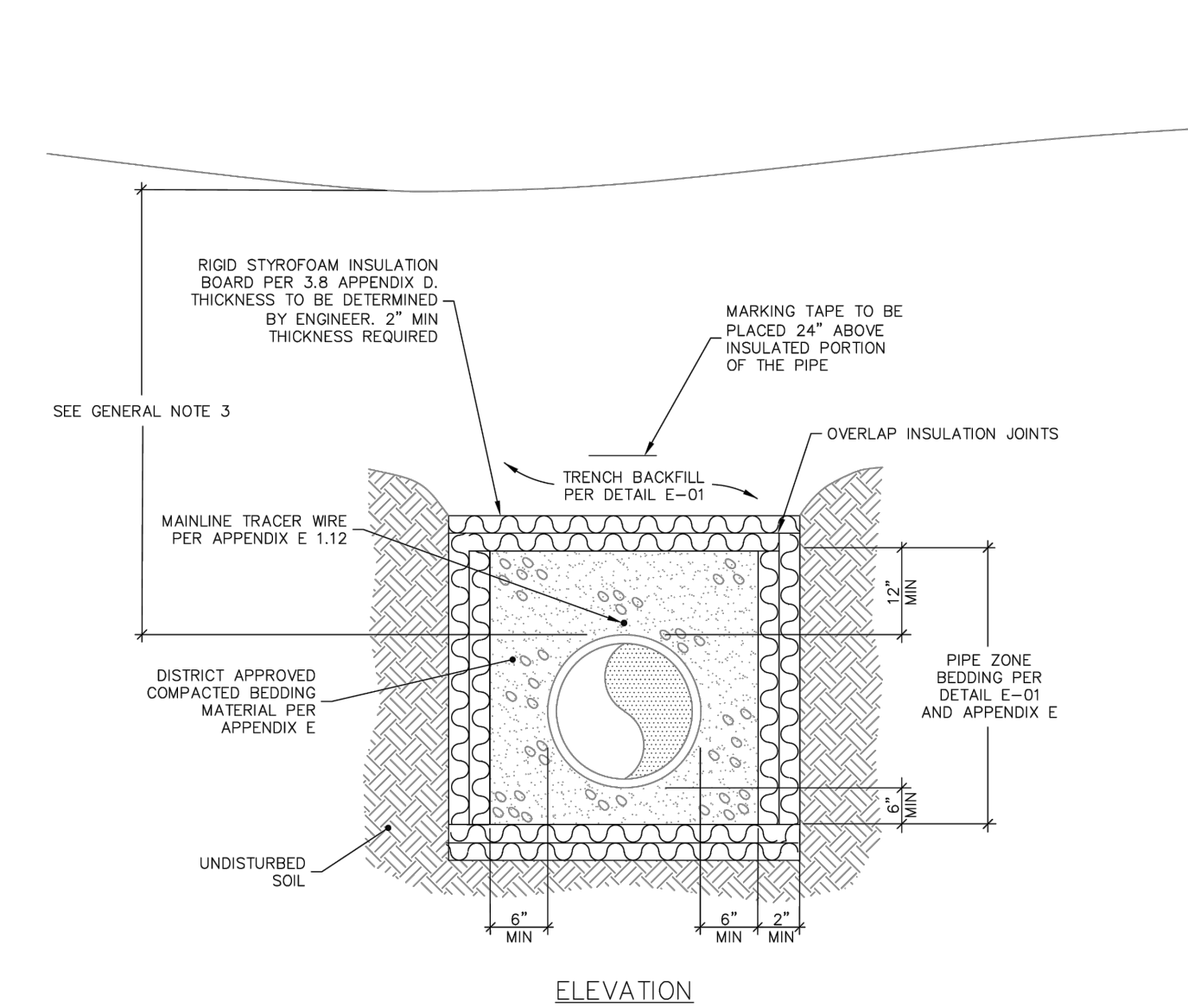
EXISTING SANITARY SEWER MANHOLE AT THE CENTER OF THE SOUTH PROPERTY.



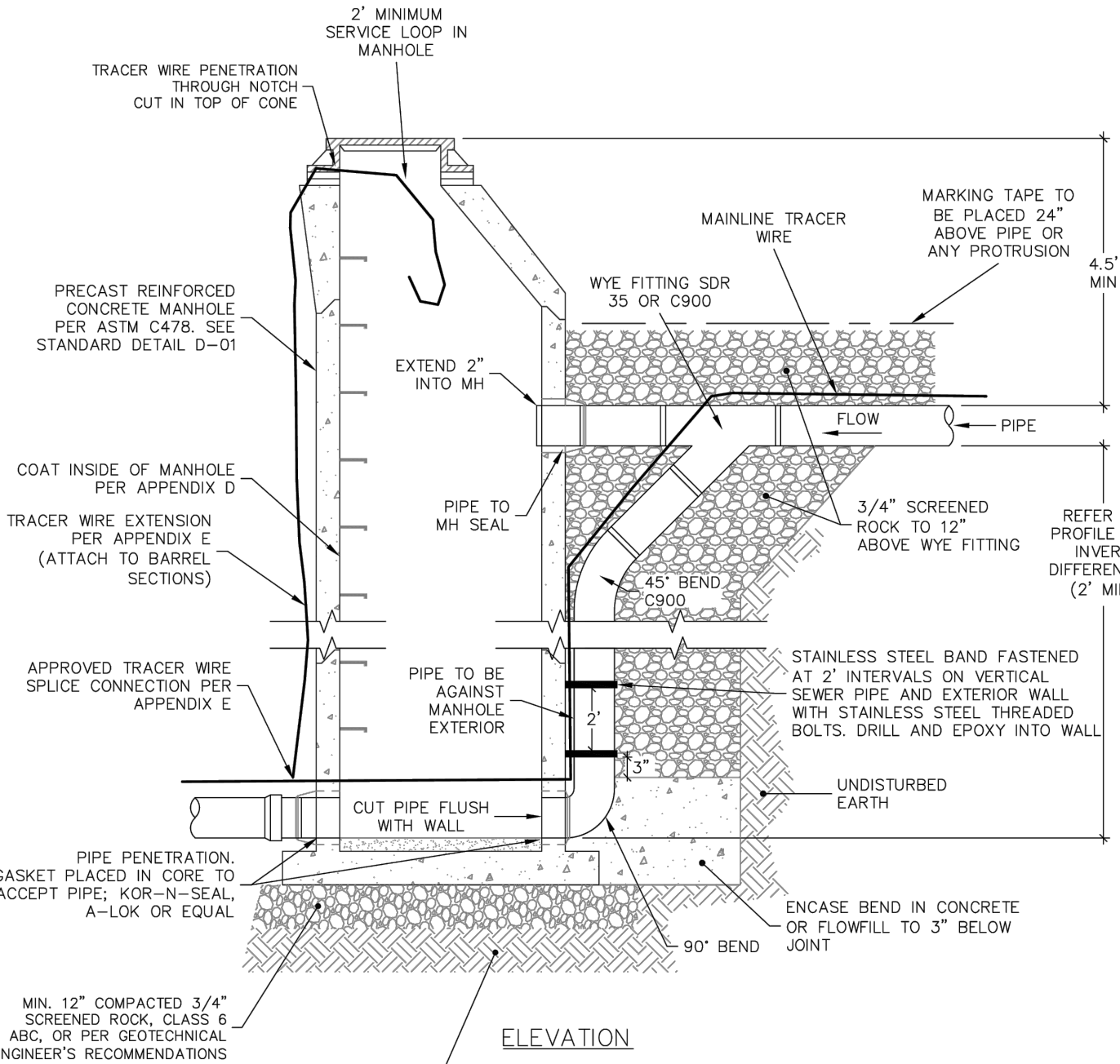




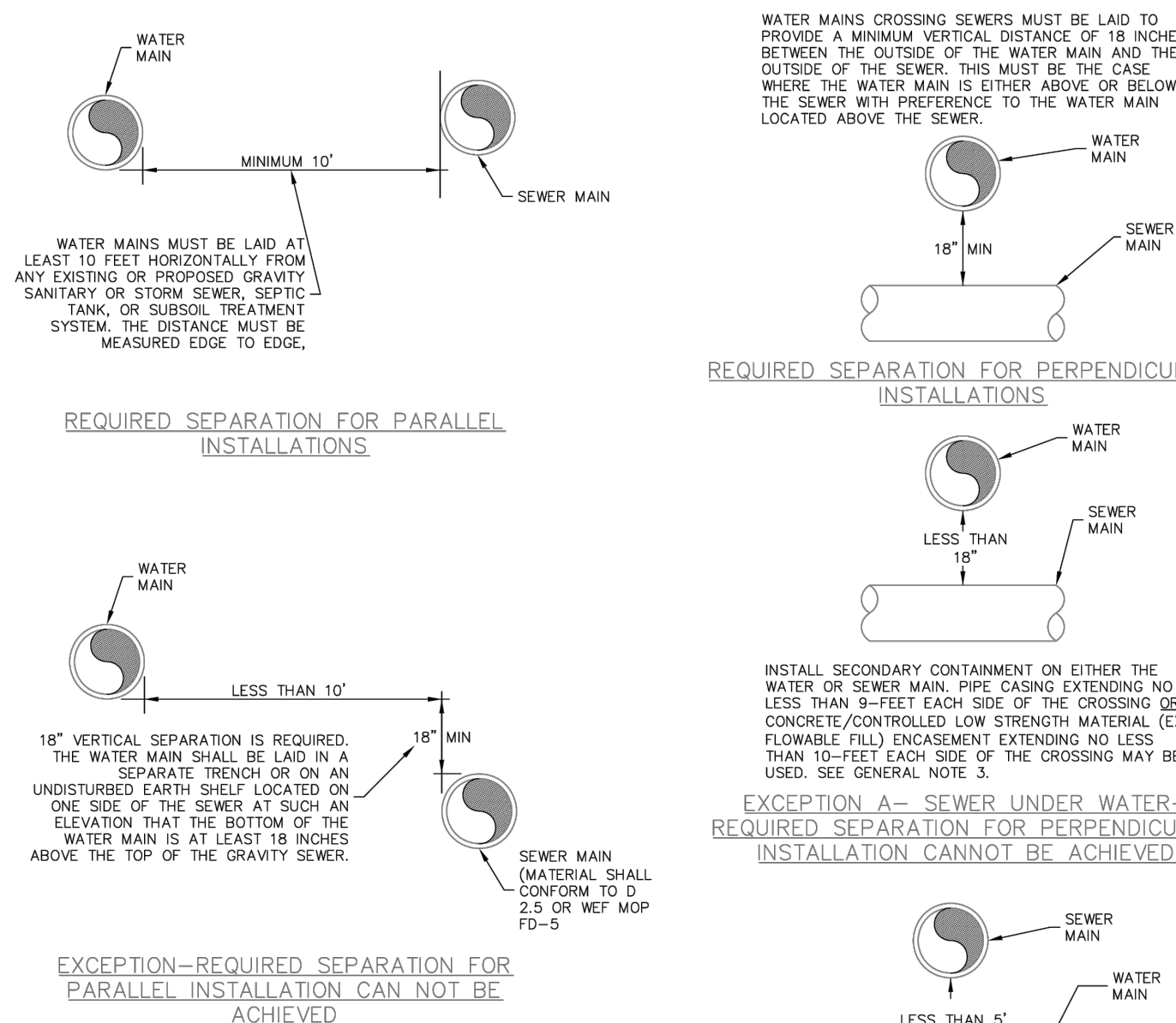
- GENERAL NOTES**
- ALL CONCRETE WORK SHALL COMPLY WITH LATEST ACI-318 SPECIFICATIONS.
  - MANHOLE TROUGH SHALL HAVE A MINIMUM OF 0.2' DROP FROM ENTRANCE THROUGH EXIT.
  - FLOW CHANNEL TO BE SHAPED AS TO NOT ALLOW STANDING WATER PER 3.3.8.
  - MANHOLE SHALL CONFORM TO ASTM C478 AND ALL APPLICABLE DISTRICT STANDARDS (APPENDIX D).
- DETAIL STANDARD MANHOLE**



- GENERAL NOTES**
- CONDITION OF LESS THAN MINIMUM BURY DEPTH IS ALLOWED ONLY WITH WRITTEN APPROVAL FROM THE DISTRICT PRIOR TO CONSTRUCTION. INSULATION SHALL BE INSTALLED ON ALL PIPE THAT DOES NOT MEET MINIMUM BURY REQUIREMENTS.
  - THE USE OF INSULATION MUST BE APPROVED BY THE DISTRICT PRIOR TO INSTALLATION.
  - INSULATION SHALL BE INSTALLED ON ALL PIPES THAT DO NOT HAVE A MINIMUM OF 4.5' OF EFFECTIVE COVER. EFFECTIVE COVER SHALL BE DEFINED AS SEPARATION FROM COLD AIR SOURCES INCLUDING STORM SEWERS. 1" OF INSULATION BOARD MAY BE SUBSTITUTED FOR EACH 1" OF SOIL COVER (MINIMUM 2" OF INSULATION) REQUIRED TO MEET THE MINIMUM COVER REQUIREMENT.
  - INSULATION SHALL BE DOW HIGHLOD 100, OWENS CORNING FOAMULAR 1000, OR APPROVED EQUAL. HIGH COMPRESSIVE STRENGTH FOAM BOARD INSULATION IS REQUIRED WITHIN ALL RIGHT OF WAY AND PAVED AREAS.
- DETAIL SEWER PIPE INSULATION**

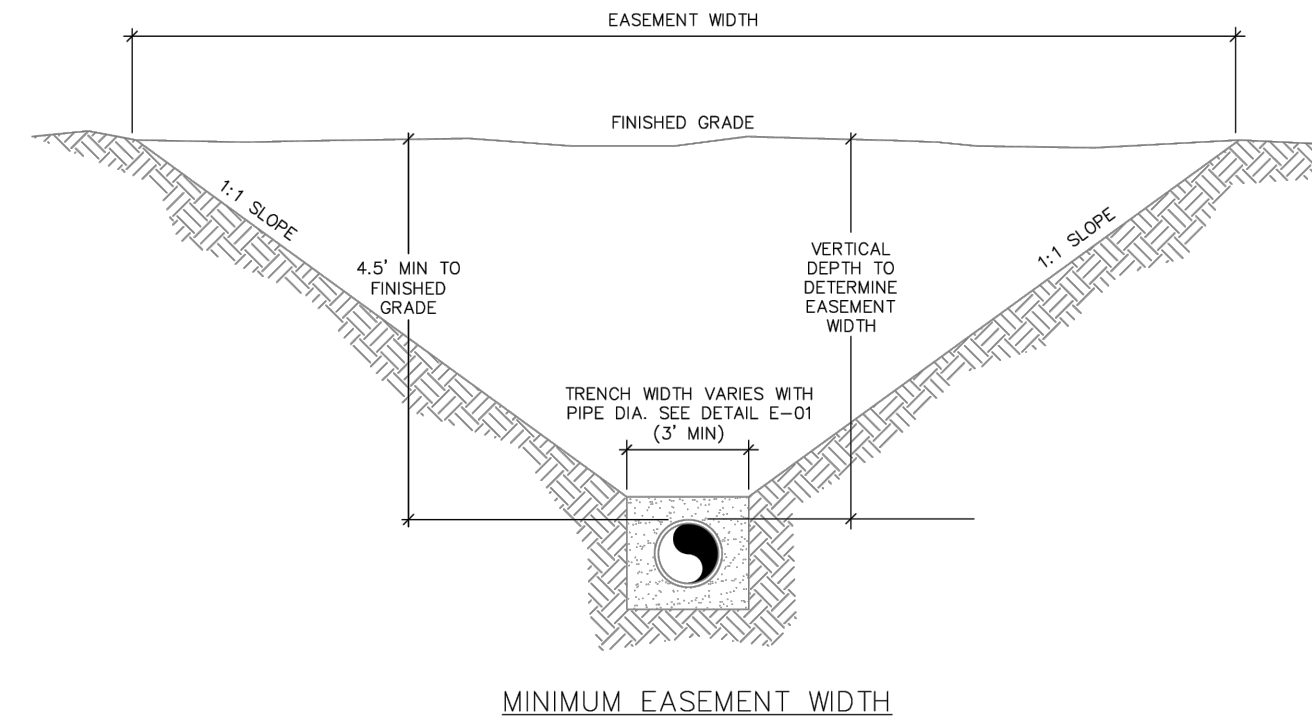


- GENERAL NOTES**
- SEE 2.4.12 AND 3.3.11.
  - MANHOLE SHALL CONFORM TO D-01 STANDARD MANHOLE DETAIL AND ALL APPLICABLE DISTRICT STANDARDS.
  - ALL CONCRETE WORK SHALL COMPLY WITH LATEST ACI-318 SPECIFICATIONS.
  - MANHOLE TROUGH SHALL HAVE A MINIMUM OF 0.20' DROP FROM ENTRANCE THROUGH EXIT.
- DETAIL DROP CONNECTION MANHOLE**

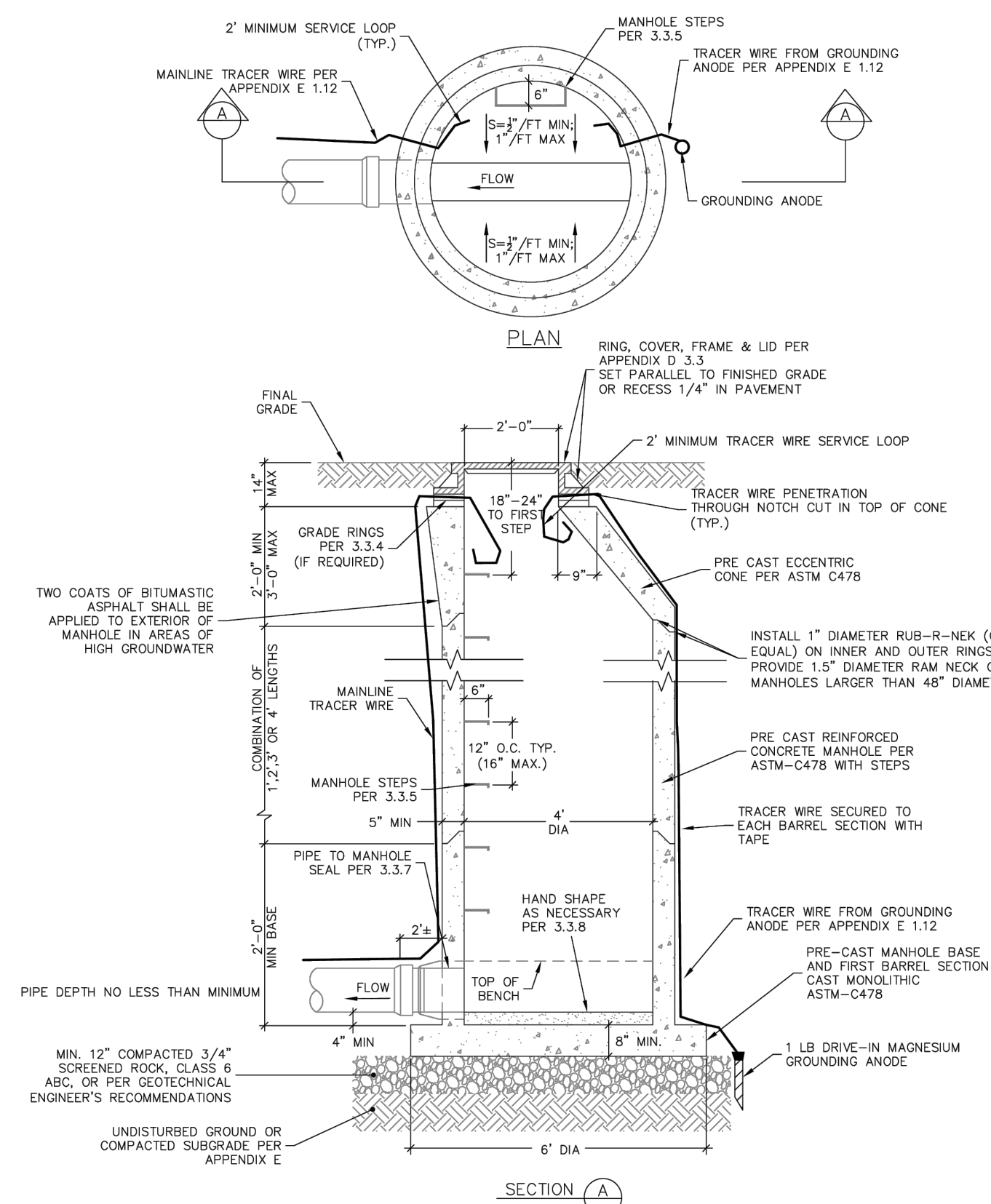


- GENERAL NOTES**
- WATER PIPES MUST NOT PASS THROUGH OR COME IN CONTACT WITH ANY PART OF A SEWER MANHOLE. WATER MAIN SHOULD BE LOCATED AT LEAST 10 FEET FROM SEWER MANHOLES.
  - PIPE SEPARATION MUST COMPLY WITH STATE OF COLORADO DESIGN CRITERIA FOR POTABLE WATER SYSTEMS, SECTION 8.8 (ALL DETAILS REGARDING SEPARATION BETWEEN WATER AND SEWER).
  - SECONDARY CONTAINMENT-THE PIPE CASING MUST BE OF WATERTIGHT MATERIAL WITH NO JOINTS. THE CASING PIPE MATERIALS MAY BE STEEL, DUCTILE IRON, FIBERGLASS, FIBERGLASS REINFORCED POLYMER MORTAR (FRPM), OR POLYVINYLCHLORIDE (PVC) WITH SUITABLE CARRIER PIPE SUPPORTS AND CASING PIPE END SEALS.
  - SECONDARY CONTAINMENT REQUIRED UNLESS THE VERTICAL DISTANCE EXCEEDS 5 FEET. THE CASING MUST BE A SINGLE SECTION OF STEEL OR DUCTILE IRON PIPE. THE DESIGN MUST INCLUDE A MEANS TO SUPPORT THE INTERCEPTOR OR SEWER MAIN TO PREVENT SETTLEMENT AND PERMIT MAINTENANCE OF THE WATER MAIN WITHOUT DAMAGE TO THE SEWER PIPE. CROSSINGS INVOLVING JOINTLESS PIPE SUCH AS HOPE, FUSIBLE PVC OR WELDED STEEL DO NOT REQUIRE INSTALLATION OF SECONDARY CONTAINMENT.
- DETAIL WATER AND SANITARY SEWER SEPARATION**

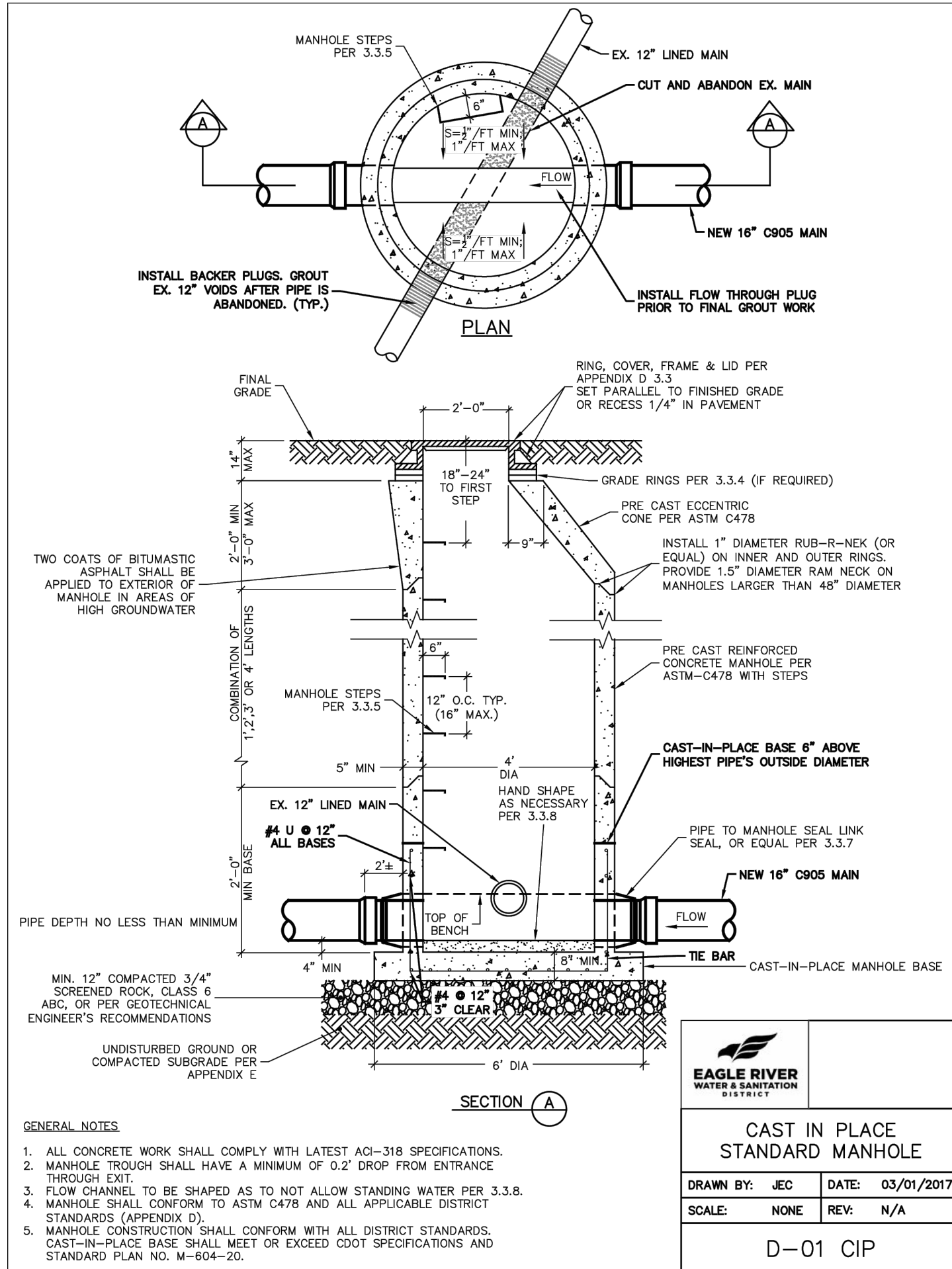
SEWER PIPE COVER DEPTH	MINIMUM EASEMENT WIDTH REQUIRED
4'0" TO 6'6"	20'
6'7" TO 11'0"	25'
11'1" TO 13'6"	30'
13'7" TO 16'0"	35'
16'1" TO 18'6"	40'
18'7" TO 21'0"	45'
21'1" TO 23'6"	50'



- GENERAL NOTES**
- PIPE SHALL BE CENTERED IN EASEMENT.
  - ANY PROPOSED SEWER MAIN DEPTH GREATER THAN 14' DEEP REQUIRES AN ALTERNATIVES ANALYSIS AND DISTRICT APPROVAL.
  - CALCULATE EASEMENT WIDTH AS FOLLOWS:  
W = DEPTH TO TOP OF PIPE X 2 + 3 FEET  
(ROUNDED UP IN 5 FOOT INCREMENTS)  
EXAMPLE:  
10 FOOT DEEP PIPE = 10 X 2 + 3 = 23 FEET  
W = 25 FOOT WIDE EASEMENT ROUNDED
- DETAIL EASEMENT WIDTH DETAIL**



- GENERAL NOTES**
- ALL CONCRETE WORK SHALL COMPLY WITH LATEST ACI-318 SPECIFICATIONS.
  - TRACER WIRE SHOWN ENTERING OPPOSITE SIDES FOR CLARITY. WIRES MAY BE INSTALLED PARALLEL THROUGH SAME NOTCH IN PRECAST CONE SECTION.
  - FLOW CHANNEL TO BE SHAPED AS TO NOT ALLOW STANDING WATER PER 3.3.8.
  - MANHOLE SHALL CONFORM TO ASTM C478 AND ALL APPLICABLE DISTRICT STANDARDS (APPENDIX D).
- DETAIL DEAD END MANHOLE**

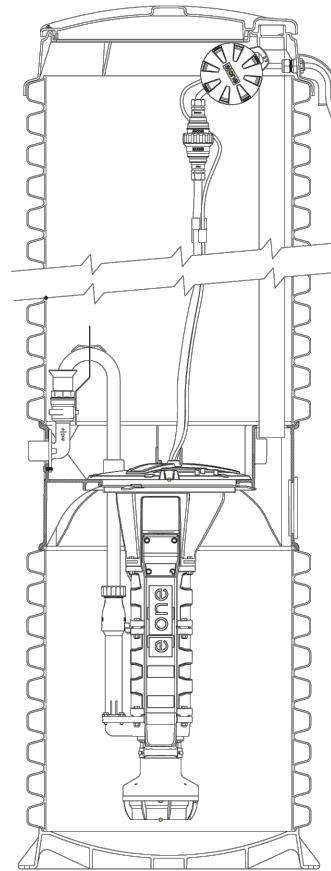


**NOTE**  
THE CONTRACTOR SHALL PROVIDE A SHOP DRAWING FOR THE SANITARY MANHOLE S3. THE SPECIFIC COMPONENTS OF THE MANHOLE SHALL BE CONSTRUCTED AS PER ERWD STANDARDS.





## DH071/DR071



NA0050P01 Rev D

### General Features

The model DH071 or DR071 grinder pump station is a complete unit that includes: the grinder pump, check valve, HDPE (high density polyethylene) tank, controls, and alarm panel. A single DH071 or DR071 is a popular choice for one, average single-family home and can also be used for up to two average single-family homes where codes allow and with consent of the factory.

- Rated for flows of 700 gpd (2650 lpd)
- 70 gallons (265 liters) of capacity
- Indoor or outdoor installation
- Standard outdoor heights range from 61 inches to 160 inches

The DH071 is the "hardwired," or "wired," model where a cable connects the motor controls to the level controls through watertight penetrations.

The DR071 is the "radio frequency identification" (RFID), or "wireless," model that uses wireless technology to communicate between the level controls and the motor controls.

### Operational Information

**Motor**  
1 hp, 1,725 rpm, high torque, capacitor start, thermally protected, 120/240V, 60 Hz, 1 phase

#### Inlet Connections

4-inch inlet grommet standard for DWV pipe. Other inlet configurations available from the factory.

#### Discharge Connections

Pump discharge terminates in 1.25-inch NPT female thread. Can easily be adapted to 1.25-inch PVC pipe or any other material required by local codes.

#### Discharge

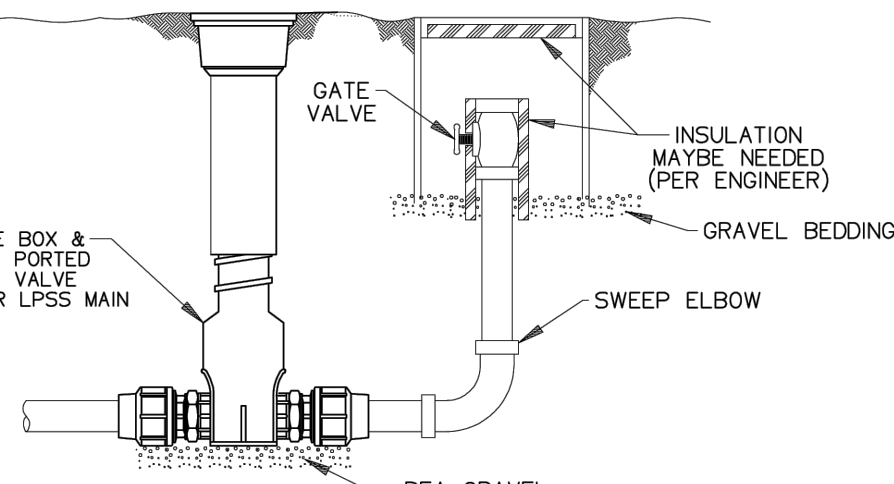
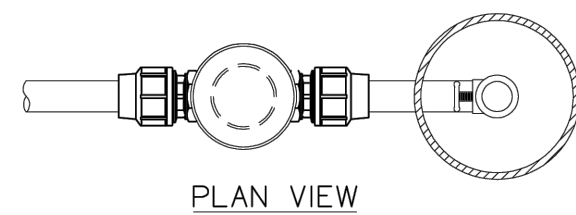
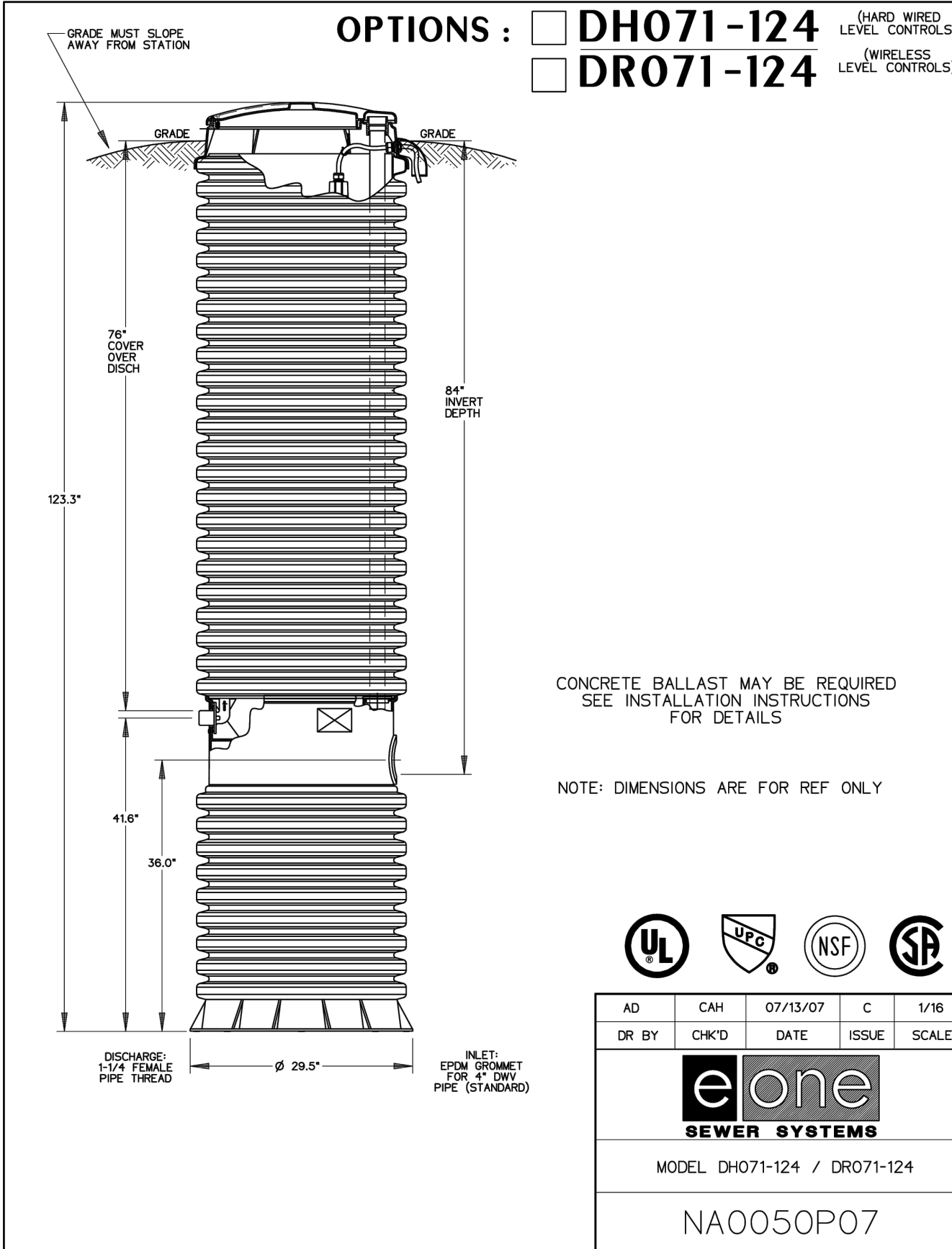
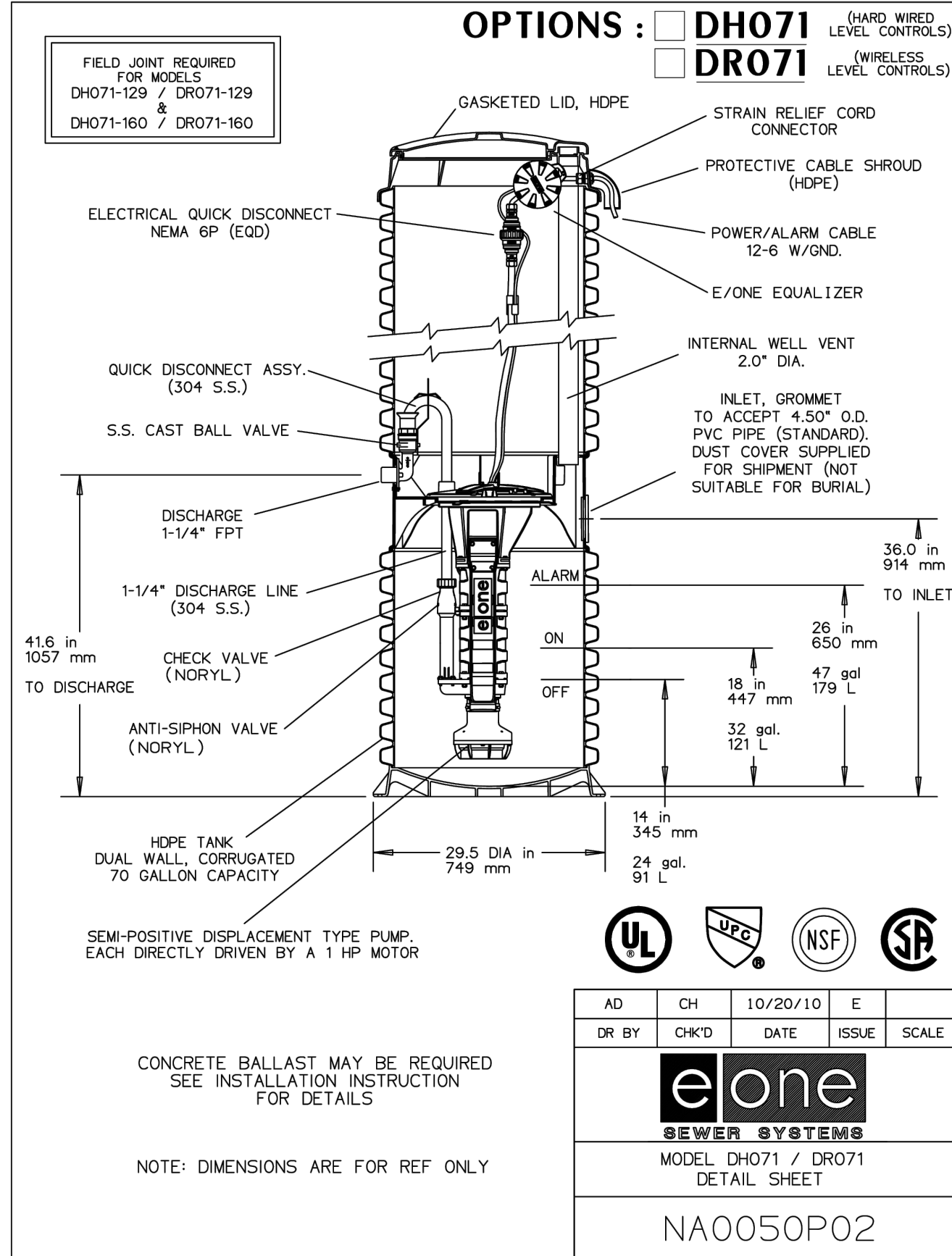
15 gpm at 0 psig (0.95 lps at 0 m)  
11 gpm at 40 psig (0.69 lps at 28 m)  
7.8 gpm at 80 psig (0.49 lps at 56 m)

### Accessories

E/One requires that the Uni-Lateral, E/One's own stainless steel check valve, be installed between the grinder pump station and the street main for added protection against backflow.

Alarm panels are available with a variety of options, from basic monitoring to advanced notice of service requirements.

The Remote Sentry is ideal for installations where the alarm panel may be hidden from view.



### TYPICAL TERMINAL FLUSHING CONNECTION

SGS	05-13-10	1	1/32
DR BY	CHK'D	DATE	ISSUE SCALE
eone SEWER SYSTEMS TYPICAL TERMINAL FLUSHING CONNECTION			
ESD 10-0094			

## E/One Sentry™

### Alarm Panel — Protect Plus Package

#### Description

The E/One Sentry panels are custom designed for use with Environment One grinder pump stations. They can be configured to meet the needs of your application, from basic alarm indication to advanced warning of pending service requirements.

E/One Sentry panels are supplied with audible and visual high level alarms. They are easily installed in accordance with relevant national and local codes. Standard panels are approved by UL, CSA, CE and NSF to ensure high quality and safety.

The panel features a corrosion-proof, NEMA 4X-rated, thermoplastic enclosure. A padlock is provided to prevent unauthorized entry (safety front).

#### Standard Features

Includes all features of the basic configuration of the E/One Sentry panel, including circuit breakers, 240 or 120 VAC service, terminal blocks and ground lugs, audible alarm with manual silence, manual run feature and run indicator, redundant "Start" function with high level alarm, safety front, conformal-coated board and overload protection.

Includes all of the features of the E/One Sentry Protect package, including a Trouble indication that shuts down the pump temporarily in the event of an unacceptable operating condition (brownout, system overpressure, run dry), as well as:

- Predictive status display module
- Pre-alarm indication for major operating parameters
- Alarm indications for major operating parameters
- Hour meter, cycle counter and alarm delay
- LCD display and user-friendly interface
- Inner cover (dead front)
- Contact group — dry and Remote Sentry

#### Optional Features

- Generator receptacle with auto transfer
- GFCI
- Main service disconnect

Please consult factory for special applications.

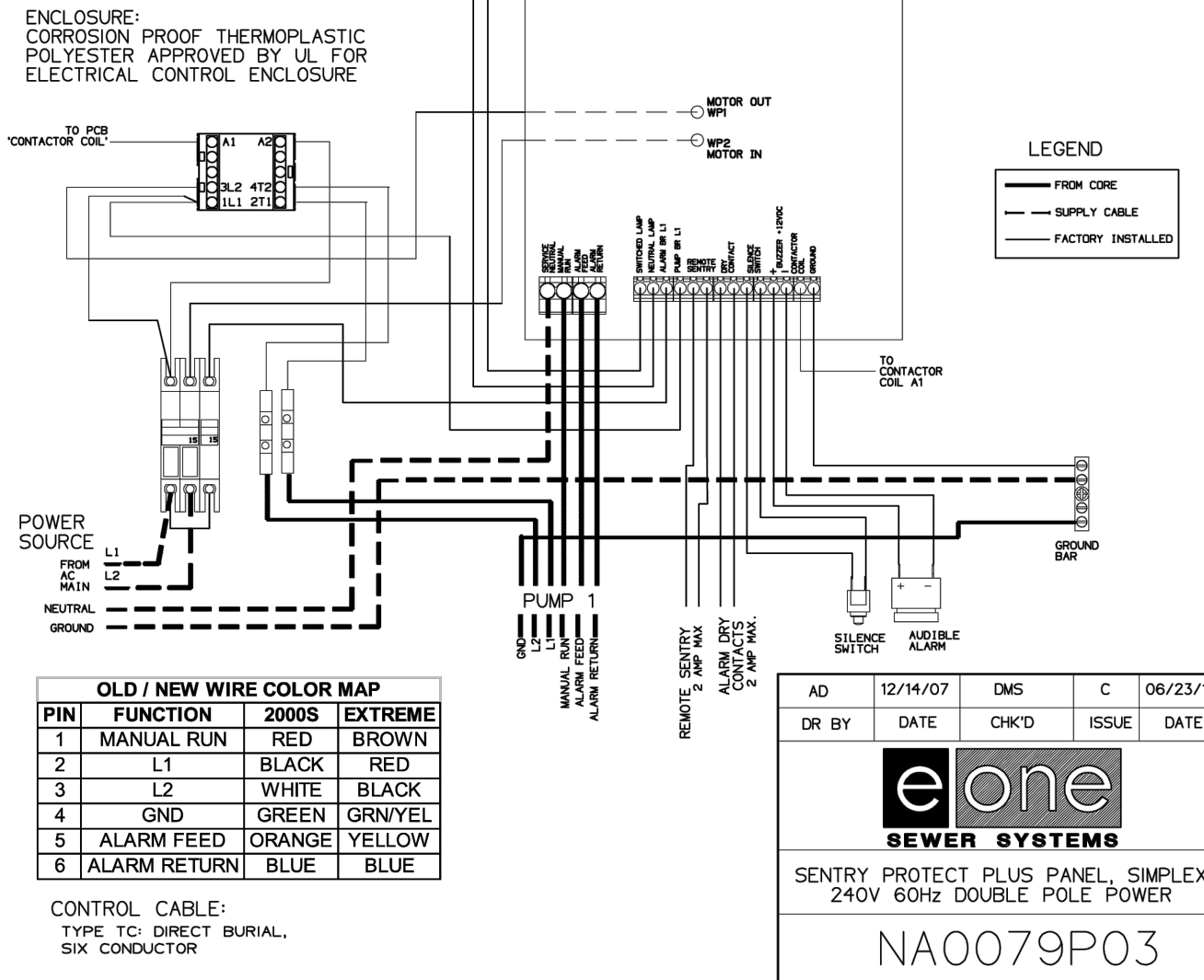


NA0079P01 Rev. B

### SENTRY PROTECT PLUS SIMPLEX

REDUNDANT RUN (HIGH LEVEL)  
EXTERNAL VISUAL & AUDIBLE ALARM  
REMOTE SENTRY DRY CONTACTS FOR  
OPTIONAL POWER LOSS HIGH LEVEL  
ALARM (POWER LOSS ALARM FOR WIRELESS)  
MANUAL ALARM SILENCE  
MANUAL RUN  
STATUS LED'S: NORMAL, PUMP RUNNING, HIGH LEVEL  
TROUBLE INDICATIONS: RUN DRY, OVERPRESSURE, BROWNOUT,  
VOLTAGE, EXTENDED RUN TIME  
DRY CONTACTS  
CONFORMAL COATED CIRCUIT BOARD (BOTH SIDES)  
PADLOCK  
DEAD FRONT  
PREDICTIVE ALARMS  
REAL TIME PUMP PERFORMANCE  
ADJUSTABLE ALARM DELAY  
ADJUSTABLE RUN TIME DELAY  
HOUR/CYCLE COUNTER  
NEMA 4X ENCLOSURE ASSEMBLY

ENCLOSURE  
CORROSION PROOF THERMOPLASTIC  
POLYESTER APPROVED BY UL FOR  
ELECTRICAL CONTROL ENCLOSURE





SEWER SPECIFICATIONS

THE FOLLOWING APPLICABLE CONSTRUCTIONS SPECIFICATIONS ARE A PORTION OF THE THE EAGLE RIVER WATER & SANITATION DISTRICT ("DISTRICT") RULES AND REGULATIONS FOR WATER AND WASTEWATER SERVICE. TABLES, DRAWINGS, DETAILS AND EXHIBITS REFERENCED BELOW ARE INCLUDED IN THE APPENDICES OF THE DISTRICTS' RULES AND REGULATIONS

SECTION I – GENERAL REQUIREMENTS

1.1 Authority  
The Standard Specifications for Sewer Mains (the "Specifications") are promulgated by the Eagle River Water & Sanitation District ("District"). The interpretation and enforcement of the Specifications is hereby delegated to the District Regulations Administrator.

SECTION II – COLLECTION SYSTEM DESIGN AND LAYOUT

2.5.10 Manhole Connections  
Any new main connection eight inches (8") or greater within a manhole shall match the crown of pipe to crown of pipe at the highest existing main currently within the manhole.

2.5.11 Location/Marking Tape  
All lines connected to District mains in any way shall be marked with the appropriate marking tape per Section 3.6 and shall be placed twenty four inches (24") above the pipe.

2.6.3 Horizontal and Vertical Separation from Potable Water Mains  
Refer to detail D-11.

(a) Parallel Main Installations and Appurtenances:

Sewer mains and sewer service lines shall be installed at least ten feet (10') horizontally from any existing or proposed water main. The distance shall be measured edge to edge. In cases where it is not practical to maintain a ten foot (10') separation, the District may allow installation of the sewer main closer to a water main utilizing encasement or pressure rated joints, provided that the water main is on a separate trench or on an undisturbed earth shelf located on one side of the main and at an elevation so the bottom of the water main is at least eighteen inches (18") above the top of the sewer main. The District requires a ten-foot (10') separation between water and sewer appurtenances including manholes. If a manhole is installed, it will be measured from outside of manhole to outside of water attribute.

(b) Perpendicular Crossings – Sewer under Water:

If the sewer pipe crosses under the water main but less than eighteen inches (18") of clear space will exist, either the water main or sewer main must be installed with secondary containment. Acceptable options include a pipe casing extending no less than nine feet (9') each side of the crossing. The pipe casing shall be of watertight material with no joints. The casing pipe materials may be steel, ductile iron, fiberglass, fiberglass reinforced polymer mortar (FRPM), or polyvinylchloride (PVC) with suitable carrier pipe supports and casing pipe end seals. Alternatively, concrete or Controlled Low Strength Material (ex. flowable fill) encasement of either pipe extending no less than ten-feet (10') each side of the crossing may be used.

(c) Perpendicular Crossings – Water under Sewer:

If the sewer pipe will cross above or over the water main, either the sewer pipe or water pipe shall be installed with secondary containment unless the vertical distance exceeds five feet (5'). Acceptable options include a pipe casing extending no less than 9- feet each side of the crossing. The casing must be a single section of steel or ductile iron pipe. The design must include a means to support the interceptor or sewer main to prevent settlement and permit maintenance of the water main without damage to the sewer pipe. Alternatively, concrete or Controlled Low Strength Material (ex. flowable fill) encasement of either pipe extending no less than 10-feet each side of the crossing may be used. Crossings involving jointless pipe such as HDPE, fusible PVE or welded steel do not require installation of secondary containment.

SECTION III – MATERIAL SPECIFICATIONS

3.1 General Requirements  
All materials must conform to these Material Specifications and shall be new and undamaged. Acceptance of materials, or the waiving of inspection thereof, shall in no way relieve the Applicant of the responsibility for furnishing materials that meet the requirements of these Specifications.

3.2 Pipe and Fittings  
The following materials are approved for District mains:

3.2.1 Polyvinyl Chloride (PVC) gravity pipe  
Main installations from eight to fifteen inches (8" to 15") in diameter shall conform to ASTM D3034, and shall be either SDR-35/PS46 or SDR-26/PS115. Main installations from eighteen to twenty-seven inches (18" to 27") in diameter shall conform to ASTM F679 and shall be SDR-26/P115. Push on joints and molded rubber gaskets shall conform to ASTM D3212. Maximum pipe segment lengths shall be twenty feet (20'). Joint lubricant shall be nontoxic and water-soluble and supplied by the pipe manufacturer.

3.2.2 Polyvinyl Chloride (PVC) pressure pipe

(a) Yelomine  
Yelomine pipe shall be SDR-21, restrained joint PVC pressure pipe and fittings having a minimum cell classification of 12454 as defined in ASTM D1784 and materials in conformance with ASTM D2241.

(b) C-900  
AWWA C-900 pipe may be used for 8 " through 12" diameter pipe, and shall be pressure class 235 psi, DR18, with push-on joints and flexible elastomeric seals ASTM D3139/ASTM F477. All spigot ends shall be beveled to manufacturer's specifications with gaskets meeting ASTM F477 and joints in compliance with ASTM D3139.

3.2.3 Ductile Iron Pipe (DIP)  
Ductile Iron Pipe shall be per ASTM A746, Class 52, 350 psi, AWWAC151. Push-on joints shall be ANSI/AWWA C111/A21.11. Factory applied Protecto 401, or equivalent, ceramic epoxy interior lining for DIP & fittings. Manufactured by U.S. Pipe and Foundry Company/Griffin Pipe Products or approved equal.

3.2.4 Service Line Taps  
Factory wyes shall be used for all service line connections with new main installations See Appendix B for requirements for new service line connections to existing mains.

3.2.5 Transition Adapter  
If permitted on a case-by-case basis, Harco transition adapters or Shear Guard couplers may be used for pipe material transitions with prior approval. Fernco couplers shall not be permitted.

3.3 Manholes

3.3.1 Manhole  
Manhole sections, base, riser, conical top sections, flat slab tops, and joint sealants between manhole sections shall be in accordance with ASTM C 478. Concrete used in cast in place manhole bases shall be per Section 3.3.10. All cone sections shall be the eccentric type. Openings through manhole risers shall be cored or cast-in, and access opening shall be twenty four-inch (24") diameter. Flat lid slabs are required on manholes with a depth of less than five feet (5') and must be eccentric.

3.3.2 Water Tightness  
Manholes shall be watertight and constructed of precast concrete. Barrel sections, cones and frame joints shall all be sealed with a double Rub R Nek, or other equivalent material approved by the District. In areas of high groundwater or otherwise required by the District, a bituminous coating, or approved equal waterproofing material, shall be applied to the exterior of the manhole. Manhole vacuum testing shall be required by the District on all manholes in all areas of high groundwater.

3.3.3 Rings and Covers  
Manhole rings and covers shall be heavy duty castings ASTM A 536 or gray cast iron per ASTM A 48 and all components shall be traffic rated to AASHTO HS-20. Ring and cover combined weight shall be greater than 245 pounds and machined to fit securely with a non-rocking cover. Manhole covers shall be twenty-four inch (24") in diameter and have a minimum of twenty-two and one-eighth inches (22-1/8") diameter clearance, have a waffle pattern with a flat lid and the lettering "SEWER" cast on the cover. Covers shall be D & L brand model A-1043 or accepted equal. Precision Cover Systems, Inc. (PCSI) fully-adjustable manhole covers with variable grade rings shall be installed in roadways.

3.3.4 Grade Rings  
Grade rings shall be in accordance with ASTM C 478 and the maximum height of grade rings shall not exceed eleven inches (11").

3.3.5 Manhole steps  
Steps shall be comprised of grade 60 deformed rebar encased in a polypropylene copolymer plastic with a tread width of fourteen inches (14"). The steps shall be M.A. Industries No. PS2-PF or PS2-PF-DF or approved equal. Steps shall be cast in place during manufacturing of the manhole sections and shall be six inches (6") from face of manhole. The top most step shall be installed between eighteen (18") and twenty-four inches (24") from the rim of the manhole. Manhole steps shall be vertically aligned and plumb. Steps shall be typically spaced at twelve inches on-center vertically with a maximum spacing of sixteen inches (16"). Steps shall not be installed in the "chimney" portion of the manhole. Entry steps shall be located in the barrel and cone sections of the manhole. See Standard Manhole Detail D-01.

3.3.6 Joint Sealant  
Joints shall be sealed with Rub-R-Nek LTM or approved equal installed on the inner and outer ring. Sealant shall be a flexible gasket-type of Butyl rubber, Federal Specifications SS-S-210 (210-A), per ASTM C990-09, AASHTO M-198 75.1. Sealant shall be applied on all surfaces between precast concrete adjusting ring and casting, individual precast concrete adjusting rings, and precast concrete adjusting ring and cone joints. A compatible primer or solvent as recommended by manufacturer of butyl base material shall be used to prepare surfaces prior to application of butyl base material and riser rings. Two gaskets with a minimum cross sectional area equivalent to one inch (1") in diameter are required per joint on forty-eight inch (48") diameter manholes. Gaskets for manholes greater than forty-eight inches (48") in diameter shall have a minimum cross sectional area of one and one-half inches (1 ½").

3.3.7 Pipe to Manhole Seal  
KOR-N-Seal, A-Lok, or approved equal flexible rubber boot in a cored hole per ASTM C 923 shall be used for installations in pre-cast bases. For installations in cast-in-place bases (upon approval and on existing mains only), all pipe-to-manhole connections shall use two elastomeric Kor-N-Seal, or approved equal, "O"-ring water stops minimum per ASTM F477.

3.3.8 Flow Channel  
The flow channel straight through a manhole should be made to conform as closely as possible in shape and slope to that of the connecting mains and shall have two tenths of a foot (0.2) minimum fall through the channel for a standard manhole. Channel depth and width shall equal the largest pipe diameter. The channel walls should be formed or shaped to the full height of the crown of the outlet main in such a manner as to not obstruct maintenance, inspection or flow in the sewers.

3.3.9 Bench  
All manholes shall be constructed with a full bench configuration, in which the top of the invert channel walls shall match the crown of pipe elevation. The horizontal bench surface shall be sloped at a minimum of one-half inch (½") per foot, maximum of one inch (1") per foot with a medium broomed finish, perpendicular to the main direction of flow.

3.3.10 Manhole Base  
The foundation for each manhole base shall be prepared by replacing unsuitable material with sub grade stabilization material in accordance with Appendix E-Earthwork. The manhole base shall be precast (in accordance with ASTM C478) unless the manhole ties into an existing main, in which case a cast-in-place base may be used. The invert shall be formed and smoothly finished to match the shape and elevation of all pipes connected to the manhole. Where the sewer line is designed with a continuous grade through the manhole, the pipe shall be laid through the manhole location, the top half of the pipe cut out and the manhole base formed around the bottom half of the pipe. All concrete used in construction of cast-in-place manholes and bases shall be CDOT Class D. Concrete reinforcement shall be epoxy-coated steel reinforcing bars in accordance with ASTM A-615, Grade 60. In instances where a manhole ties into an existing main and a cast-in-place base is used, the first pre-cast manhole section shall be placed on the concrete base structure before the base has taken initial set, or the section shall be grouted into a suitable groove formed in the top of the manhole base. The first section shall be adjusted to the proper grade and alignment so that it is uniformly supported by the base concrete and not bearing on any of the pipes. The manhole steps shall be located one-foot left or right of the main inflow pipe. The remaining pre-cast sections shall be placed and aligned to provide vertical sides and alignment of the ladder rungs. Plumbness shall be checked as each barrel section is added. A bituminous or other approved sealer shall be placed between pre-cast sections so that the completed manhole is rigid and watertight. The sealer shall be placed both on the inside lip as well as the outside lip of each section.

3.3.11 Interior Coatings  
For drop manholes (or other applications as identified by the District), manhole interiors shall be coated with a Polyamidoamine Epoxy Primer with Polyamidoamine Epoxy Top Coat such as Themec Epoxoline Series L69 or equivalent. Preparation and application shall be per manufacturers' recommendations.

3.4 Concrete/Grout

3.4.1 General Requirements  
Contractor shall provide the District Inspector with a specification sheet or mix design from the concrete supplier.

3.4.2 Concrete  
All concrete used in construction of cast-in-place manholes and bases shall be CDOT Class D. Construction shall be in conformance with the Detail D-01.

3.4.3 Mortar and Grout  
Non-shrink mortar and grout used in the shaping of inverts, grade ring gaps, sealing penetrations, or setting and anchoring cast iron shall consist of one part Type II Portland Cement and two parts of fine, clean sand. Only sufficient water shall be added to provide a stiff, workable cement mixture for proper troweling. Hydrate lime or masonry cement shall not be used. Where relatively thin portions of grout are to be applied (to a flow channel or top of bench) an approved epoxy bonding coat shall be applied to the exposed concrete surfaces prior to grouting.

3.5 Locating Disk  
The District will provide green 3M brand Full-Range Disk Marker locating disks to the contractor for stub outs. The contractor shall ensure their correct installation.

3.6 Marking Tape  
The installation of green marking tape is required on all sewer mains and service lines. The tape shall be installed approximately 24 inches (24") above the main or line. The tape shall meet the following specifications:

(a) Five (5)-mil thick Polyethylene material.

(b) Solid green color with black lettering.

(c) Six inches (6") in width.

3.7 Casing Material and Spacers  
Carrier pipes to be installed inside casings shall be installed with self-restraining casing spacers. Casing spacers shall provide axial thrust restraint to prevent pipe joint deflection during and after installation. They shall also provide dielectric insulation between the carrier pipe and the casing and facilitate installation of the carrier pipe into the casing. See Sewer Main Casing Detail D-5. Pipe casing shall be smooth wall welded steel ASTM A-53 Grade B cylinder fabricated in accordance with AWWA C200. External loading shall be AASHTO HS-20 highway or E-80 railroad loading, railroad loading plus jacking load. Casing joints shall have ends beveled for field welding, be butt welded with complete joint penetration welds around the entire circumference of the pipe, and be formed and accurately manufactured so that when pipes are placed together and welded they form a continuous casing with a smooth and uniform interior surface. Interlocking joints shall be Permaloek Interlocking Pipe Joining System. Casing spacers shall be stainless steel, two piece bolt-on style, minimum fourteen (14) gauge thickness and a minimum length of eleven inch (11"); casing spacers shall be installed every six feet (6') of the pipeline to support the pipe barrel and the weight of its contents, or at an appropriate spacing as determined by the engineer. The four runners shall be eleven inches (11") long at a minimum and manufactured of high abrasion resistant, low coefficient of friction, glass filled polymer. Runner heights shall be set to center the carrier pipe in the casing. Risers shall be ten (10) gauge maximum, and the coating shall be fusion-bonded epoxy or heat fused PVC. Casing spacer models shall be Uni-Flange Series UFRCS1300, Advance Products and Systems, Inc. SI-12; Pipeline Seal and Insulator, Inc. C126 or approved equivalent. Restrained casing spacers shall be provided at all pipe joints. Restrained casing spacers shall be UniFlange Series UFRCS1390 P or approved equivalent. Casing end seals shall be preformed and designed to prevent entry of water or loss of material from casing. The end seals shall be made of one-eighth inch (1/8") thick 60 durometer EPDM or neoprene rubber held together with mastic strips to seal the edges. The seals shall overlap the casing pipe by two inches (2") and shall be held on with AISI 304L stainless steel worm gear clamps. Casing end seals shall be Advance Products and Systems, Inc. AC or AW; Pipeline Seal and Insulator, Inc. C or W; or approved equivalent.

3.8 Tracer Wire (REQUIRED)  
See Appendix E

SECTION IV – PIPE INSTALLATION & CONSTRUCTION

4.1 Safety  
Job site safety shall be the responsibility of the contractor. The District Inspector may refuse to enter a jobsite if deemed unsafe by Occupational Health and Safety Act (OSHA) standards. Failure to provide a safe jobsite may prevent the District from conducting an inspection.

4.2 Handling of Materials  
Pipe and fittings shall be loaded and unloaded by lifting so as to avoid shock or damage. Under no circumstances shall material be dropped. If, however, any part of the pipe is damaged, the replacement or repair of the damaged pipe shall be done to the satisfaction of the District. Any pipe or fittings that are not acceptable to the District shall be removed from the job site immediately. All pipe-handling equipment and pipe handling methods shall be in accordance with the methods and equipment recommended by the manufacturer. Under NO circumstance shall forks be inserted into any pipe and or fitting. Pipe shall be stored and handled in accordance with manufacturer's recommendations. Any pipe with UV degradation or bowing may be rejected by the District Inspector. All pipe shall be delivered to the project site and stored with factory applied end caps intact.

4.3 Inspection and Preparation of Pipe and Fittings  
Before placing pipe in the trench, each pipe or fitting shall be thoroughly cleaned of all foreign material, kept clean at all times thereafter, and carefully examined for cracks, warping, or any other defects before installation. Bell ends and spigot ends are to be examined and free of defects. Following the inspection, end caps shall be replaced prior to placing the pipe in the trench. All lumps, blisters and excess coatings shall be removed from the pipe and fitting, and the outside of the spigot and the inside of the bell shall be wiped clean, dry and free from oil and grease before the pipe or fitting is installed. Dirt and any other material must be removed from the barrel of the pipe before installation.

4.4 Cutting and Fitting of Pipe  
Pipe shall be cut in accordance with manufacturer's recommendations, whenever necessary, to conform to location of fittings, line, or grade. All cuts, when required, shall be straight, true and beveled and may be made with plastic pipe cutters or completed per the DIPRA Guidelines for Field Welding and Cutting Ductile Iron Pipe (August 2015). All burrs shall be removed from the ends of cut pipe and the ends of the pipe lightly rasped or filed.

4.5 Pipe Alignment and Grade  
Manholes shall be installed at staked locations and elevations. Main installation stakes for alignment and grade shall be set by a surveyor under the guidance of a Professional Land Surveyor who is registered in the State of Colorado. Pipe shall be installed at a constant grade from manhole to manhole. No grade breaks or low spots will be accepted. Pipe shall be installed with the bell ends facing in the direction of installation, unless directed otherwise by the District. Where pipe is to be installed on a grade of ten percent (10%) or greater, the installation shall start at the bottom and shall proceed upward with the bell ends of the pipe up grade.

4.6 Temporary Plugs  
A mechanical pipe plug shall be used as a temporary plug during line installation to isolate the mainline extension from the existing collection system. All temporary plugs shall be provided by the Contractor.

4.7 Frost  
No pipe or appurtenant structure shall be installed upon a foundation into which frost has penetrated, or if at any time there is danger of ice formation. No pipe or appurtenant structure shall be installed unless backfilling can be completed before the formation of ice and frost.

4.8 Lowering of Material into the Trench  
Proper implements, tools and facilities satisfactory to the District shall be provided and used by the Contractor for the safe and convenient performance of the work. All pipe, manholes, and accessories shall be carefully lowered into the trench piece by piece by means of suitable tools and equipment, in such a manner as to prevent damage to the materials. Under no circumstances shall the materials be dropped or dumped into the trench. If damage occurs to any pipe, manholes or main accessories in handling, the District inspector may reject the damaged material at the discretion of the inspector.

4.9 Installation of Pipe

4.9.1 General Requirements  
Factory applied end caps shall remain installed on the pipe while it is being placed in the trench to prevent foreign material from entering the pipe. The end cap shall be left in place until the connection is to be made to the adjacent pipe. During installation, no debris, tools, clothing or other foreign materials shall be placed in the pipe. As each length of pipe is placed in the trench, the spigot end shall be centered in the bell and the pipe inserted to the manufacturer's recommended depth with a slow steady pressure without jerky or jolting movements and brought to correct line and grade. The pipe shall be secured in place with bedding material tamped under it, except at the bells. Precautions shall be taken to prevent dirt from entering the joint space. No wooden blocking shall be left at any point under the pipeline. All pipe joints shall be uniform and smooth transitions shall exist from joint to joint or fitting. See Appendix E for bedding, backfill and compaction requirements.

4.9.2 Ductile Iron Pipe  
Push-On Joints: The inside of the bell, the outside of the spigot end, and the rubber gasket shall be thoroughly cleaned to remove oil, grit, excess coating, and other foreign matter. The rubber gasket shall be flexed inward and inserted into the gasket recess of the bell socket. NSF-61 approved gasket lubricant per the manufacturers recommendations shall be applied to either the inside face of the gasket, and the spigot end of the pipe, per the manufacturer's recommendations. The spigot end of the pipe shall be placed in the bell end with care to prevent the joint from contacting the ground. Pipe furnished without a depth mark on the spigot end shall be marked before assembly to ensure insertion to the manufacturer's recommended depth. The pipe shall be kept in straight alignment and the joint shall be completed by inserting the pipe to the manufacturer's recommended depth with a slow, steady pressure by using a long pry bar, jack, lever puller, or backhoe bucket. A timber header should be used between the pipe and the jack or backhoe bucket to avoid damage to the pipe. Upon completion of joining push-on joint pipe, an inspection shall be made to ensure that the gasket is correctly aligned in the gasket recess of the bell socket and not twisted or turned.

4.9.3 Polyvinyl Chloride Pipe  
Elastomeric Gasket Joints: Immediately before joining two (2) lengths of PVC pipe, the inside of the bell or coupling, the outside of the spigot and the elastomeric gasket shall be thoroughly cleaned to remove all foreign material. Lubrication of the joint and rubber gasket shall be done in accordance with the pipe manufacturer's specifications. Care shall be taken that the correct elastomeric gasket, compatible with the annular groove of the bell, is used. Insertion of the elastomeric gasket in the annular groove of the bell or coupling must be in accordance with the manufacturer's recommendations. The spigot and bell or coupling shall be aligned and inserted to the manufacturer's recommended depth or reference line. Installation or pushing shall be done in a smooth, steady motion. Upon completion of joining the pipe, an inspection shall be made to assure that the gasket is correctly aligned in the gasket recess of the bell socket and not twisted or turned. NO deflection will be allowed at a joint of PVC pipe.

4.9.4 Yelomine Pipe  
Installation of Yelomine pipe shall be in accordance with the manufacturer's recommendations and specifications. Cleanout caps shall be installed with nonpermanent gaskets where applicable.

4.9.5 Job-Mixed Concrete  
Job-mixed concrete shall be thoroughly mixed to combine aggregates, cement, and water into a uniform mass.

4.9.6 Ready-Mixed Concrete  
Said materials must be proportioned, mixed and transported in accordance with ASTM C94. Any concrete not plastic and workable when it reaches project shall be rejected. See Section 3.4 for material specifications.

4.10 Manholes  
Manholes shall be precast, watertight and constructed in accordance with the District's standard details and per Section 3.3. For precast manhole bases, the area underneath the manhole base shall be excavated and bedding material shall be placed and compacted to 95% Modified Proctor the required elevation. The manhole base shall then be lowered into the trench and checked for proper bearing on the subgrade, proper elevation and orientation to receive the incoming and outgoing sewers at the designated invert elevation. If the invert elevation varies by more than plus or minus one half inch (1/2") from the designated invert elevation, the base shall be removed and reset. The concrete invert channel and bench shall be constructed following the connection of all sewer pipes to the manhole. The flow channel shall be smooth and true to the sewer pipe invert elevations, with uniform cross section and slope, either straight or with a continuous curve between inlet and outlet of pipes. To eliminate free fall conditions in a manhole resulting from invert elevation differentials between incoming and outgoing pipes, the Contractor shall form and construct suitable channels in the bottom of the manhole connecting the inverts. Shape channel base and bench per Sections 3.3.8 and 3.3.9, respectively. New manholes shall have pre-formed holes for pipe installation and existing manholes shall be cored to install pipe and connector. Chip existing concrete bench inside manhole and shape smooth continuous invert for connections to existing manholes. All pipe-to-manhole connections and grade adjustment rings shall be sealed and grouted with non-shrink materials and be watertight. All lift holes shall be filled with non-shrink grout. All dimensions, locations and elevations shall be coordinated by the Applicant and Contractor and meet the requirements of the District. Cast-in-place manhole bases will only be allowed when connecting to an existing main.

4.11 Service Lines  
Refer to Appendix B, Section II.

SECTION V – TESTING AND ACCEPTANCE

5.1 General Requirements for Connections  
Connections to the District system shall be inspected and approved by the District prior to backfilling.

5.1.1 Service Connections  
Refer to Appendix B.

5.1.2 Connections to Manholes  
All connections shall match the crown of pipe to crown of pipe at the highest existing main or per the direction of the District. All new main installations shall require reinforced benches that meet all District standards.

5.2 Testing – Sewer Mains  
5.2.1 Alignment  
Straight alignment shall be checked by using either a laser beam or lamping.

5.2.2 Low Pressure Air Testing – General Requirements  
The air test shall, as a minimum, conform to the test procedure described in ASTM F 1417 Standard Practice for Installation Acceptance of Plastic Non-Pressure Sewer Lines Using Low-Pressure Air. Deflection testing should occur prior to air test.

5.2.3 Low Pressure Air Testing Procedure  
(a) Lines must be cleaned by flushing or by other means before the low pressure air test is to begin.

(b) Isolate the sewer line to be tested and ensure that all other outlets from which air could escape are properly sealed. In this step of the procedure, it is necessary to inspect the manhole invert being plugged to be sure that it has no damage which will be covered by the plug and not detected with the low-pressure air test.

(c) Determine the duration of the test by using the accompanying tables at the end of this section.

(d) Begin the test by connecting the air source to the inlet tap. Slowly add air until the internal pressure of the test section reaches a pressure 4.0 psig. If ground water back pressure exists, it must be quantified by the Engineer prior to testing.

(e) After the constant pressure of 4.0 psig is obtained, regulate the air supply so that the pressure is maintained between 3.5 to 4.0 psig for at least 2 min. Depending on air/ground temperature conditions, the internal air temperature will stabilize in equilibrium with the temperature of the pipe walls. The pressure will normally drop slightly until equilibrium is obtained; however, a minimum of 3.5 psig is required.

(f) Once the pressure has stabilized to 4.0 psig (plus the average ground water back pressure, if applicable) disconnect the air supply from the control panel. Observe the continuous monitoring gauge and decrease the internal pressure to no less than 3.5 psig. At a reading of 3.5 psig or within the range of 3.5 to 4.0 psig, stop decreasing the pressure and commence timing with a stopwatch or watch with a second hand or digital readout in minutes and seconds with an accuracy of 0.1.s.

(g) Once the predetermined time period from the formula or table above has elapsed, observe the continuous monitoring gauge to obtain the amount of pressure lost during the test duration. If the pressure drop is found to be less than 1.0 psig (or 0.5 psig in circumstances where a shorter test duration is desired), the section is presumed to be free of any leaks or defective joints. If the pressure drop is 1.0 psig or greater (0.5 psig or greater in circumstances where a shorter test duration is desired), the test section has failed due to excessive pressure loss. When low-pressure air testing of a sewer line results in a failure the Contractor, at his/her own expense, shall detect the leak or defect and repair or replace whatever is necessary to remedy such defect in a manner acceptable to the Owner.

See TABLE D-3 for Minimum Time for a 1.0 psig Pressure Drop for Size and Length of Pipe for Q = 0.0015  
See Table D-4 for Minimum Time for a 0.5 psig Pressure Drop for Size and Length of Pipe for Q = 0.0015



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MIDTOWN VILLAGE PUD  
SEWER CONSTRUCTION SPECIFICATIONS 1

25

JOB No.	20067	DATE: 10/28/24	SHEET 25 OF 38
REVISIONS:	REV. DATE	BY	DATE
PER ERMSD & IME REVIEW	02/23/24	CADD:	
PER ERMSD & IME REVIEW	08/19/24	ENG: CWM	
		PMC: RCW	
		TECH: JZ	2/26/2011



SEWER SPECIFICATIONS - CONTINUED

5.3 Manhole Testing – General Requirements

Manhole vacuum testing shall be required by the District on all manholes in all areas of high groundwater via the vacuum test per ASTM C1244, "Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) prior to backfill.

5.3.1 Manhole Testing Procedure

- (a) Plug all inlets and outlets.
- (b) Install the vacuum tester head assembly on the manhole.
- (c) Attach the vacuum pump assembly to the proper connection on the test head assembly. Make sure the vacuum inlet/outlet valve is in the closed position.
- (d) Inflate the sealing element to twice the test pressure to be used. Do not over inflate.
- (e) Start the vacuum pump assembly engine and allow preset RPMs to stabilize.
- (f) Open the inlet/outlet ball valve and evacuate the manhole to ten-inch (10") Hg (mercury) that is equivalent to approximately 5 PSIG (0.3 bar) backpressure.
- (g) Close the vacuum inlet/outlet ball valve, disconnect the vacuum pump and monitor the vacuum for one (1) minute.
- (h) Allowable leakage - less than one-inch (1") Mercury (Hg) in one (1) minute.
- (i) All manholes that do not meet the minimum amount for the leakage rests must be repaired and re-tested.

5.4 Television Inspection – General Requirements

Prior to construction/final acceptance of any sanitary sewer line by the District, the main shall be inspected internally by television as outlined in this Section. Leakage testing shall be performed prior to televising. The complete job is ready for television inspection when the following work has been completed.

- (a) All sewer pipelines are installed and backfilled.
- (b) All attributes are in place, all inverts are complete and pipelines are accessible.
- (c) All other underground facilities, utility piping and conduits are installed.
- (d) Pipelines have been jet cleaned.
- (e) Final air test has been completed.

When the above work is complete, the Contractor shall arrange for the television inspection. The Contractor of the project will notify the District in writing as to the scheduled date of the television inspection. After conditions a through e as outlined above, are met, the entire job will be televised.

- (a) A video, accompanied by Standard Form 6.3 shall document defects requiring correction.
- (b) If no deficiencies are observed, the work will be considered satisfactory.

There is no acceptance tolerance for defects such as high and low spots, joint separations, offset joints, chipped ends, cracked or damaged pipe, dimples or bumps in the pipe, or groundwater infiltration.

5.4.1 Inspection Format

Sanitary sewer lines shall be inspected by means of remote CCTV. All CCTV work shall conform to current NASSCO-PACP standards. Contractor shall provide the District with CCTV inspections (video and data collected) entirely in electronic format. Mains shall be tested with three and a half (3.5) gallons of water per minute flowing during televising and shall follow the direction of flow. The camera must be centered in the pipe and the speed of travel shall be slow enough to inspect each pipe joint, and lee connection, and should not, at any time, be faster than 30 feet per minute. The documentation of the work shall consist of PACP CCTV Reports, PACP database, logs, electronic reports, etc. noting important features encountered during the inspection. All CCTV video observations shall be identified by audio and recorded on the District Standard Form 6.3 and is required to accompany each submittal.

5.4.2 CCTV Video Content

Submitted CCTV videos shall include:

- (a) Footage indicator
- (b) Running time
- (c) Date
- (d) Location
- (e) Beginning (upstream) and ending (downstream) manhole numbers for each run. Manhole numbers corresponding with the District's GIS mapping system shall be obtained by the District field inspector.

5.4.3 District Review

The Contractor will be notified in writing of any deficiencies revealed by the television inspection that require repair. If corrective work is indicated and the Contractor wishes to view CCTV videos, he shall contact the District to set a time for the viewing.

5.4.4 Correction of Deficiencies

Those segments of the pipeline system that have been corrected must be re-televised. The procedure outlined in above will be repeated until all deficiencies observed by television inspection have been corrected to the complete satisfaction of the District. Prior to submittal to the District, the CCTV videos shall be reviewed by the Engineer, Applicant, and Contractor for any defect that may be visible. If CCTV videos and cut sheets are submitted to the District that are deemed "unacceptable," the Contractor shall be charged for the time taken by District personnel to review the CCTV videos. The minimum charge shall be one hundred dollars (\$100).

5.5 Sewer Main Repairs

All proposed repairs must be approved by the District Inspector prior to actual repair. Once repair has been made, inspection will be required by a District Inspector. There will be no exception to this requirement. If a repair and/or correction is made in a sewer line segment, the entire line segment shall be required to be re-televised with water flowing. A line segment is defined as the entire length of sewer line from manhole to manhole.

5.6 Protection of Existing Sewer System

On the outlet of the connection point to the existing District sewer main, a mechanical plug shall be installed to prevent any flow, debris and or material from the newly constructed main line from entering the District's system. The plug shall be normally set on the downstream outlet of the manhole. Plugs shall be installed per the direction of the District's Inspector. The plug shall be a mechanical-type device and is to be secured to the existing manhole to prevent loss of plug. The plug shall not be removed until Construction Acceptance has occurred. The Contractor shall be required to make routine inspections of the mechanical plug to insure that no leaking is occurring. If a leak is found, the Contractor shall immediately notify the District and take corrective action. The District may perform a video inspection of existing sewer mains that could potentially be impacted by construction activities prior to the start of construction and after the completion of construction. Any damage to existing facilities caused by the Contractor shall be repaired at the Contractor's expense.

5.7 Manhole Abandonment

Manholes to be abandoned in place shall have all pipes entering or exiting the structure plugged with lean concrete or controlled low strength material backfill (Flo-Fill). For manholes with existing pipes too large to plug with fill, a bulkhead shall be constructed on the inside of the manhole to prevent the fill from entering the pipes. Manhole tops or cone section shall be removed to the top of the full barrel diameter section or to a point not less than eighteen (18) inches below final grade. The structure shall then be backfilled with lean concrete or Flo-Fill. Surface restoration shall be completed to match the surrounding areas.



JOB No. 20067

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PER ERWSD & IME REVIEW	02/23/24	02/23/24	02/23/24
PER ERWSD & IME REVIEW	08/19/24	08/19/24	08/19/24
PER ERWSD & IME REVIEW			
PER ERWSD & IME REVIEW			
PER ERWSD & IME REVIEW			

DATE: 10/28/24	SHEET 26 OF 38
CADD: CMW	ENG: CMW
PM: RCW	TECH: /20067D11

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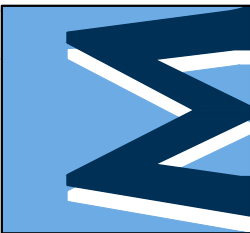
SEWER CONSTRUCTION SPECIFICATIONS 2

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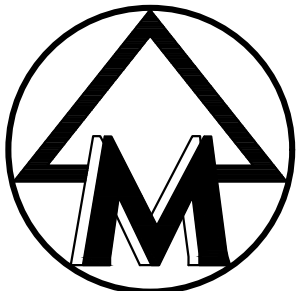
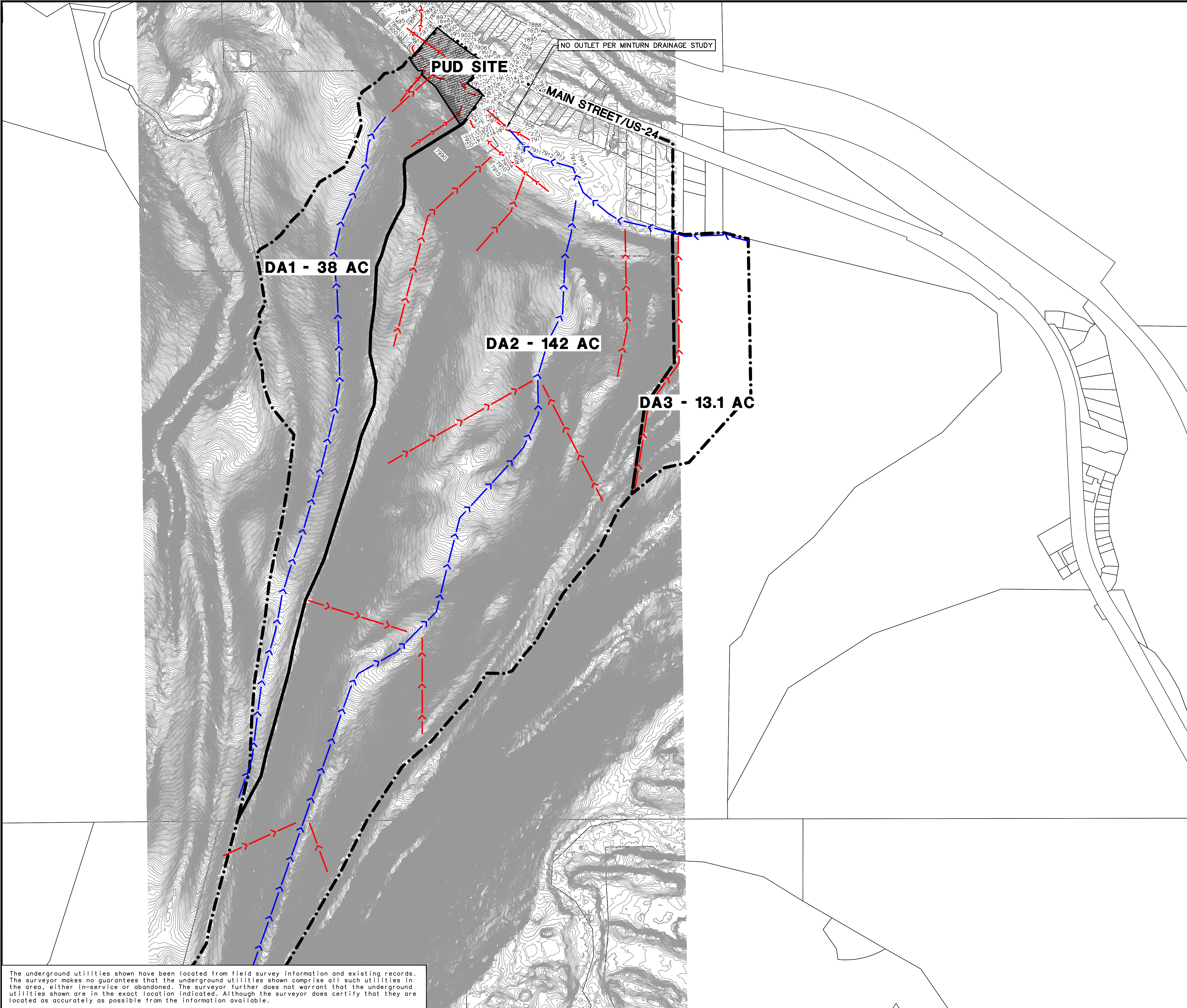
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M:\civil\134\_Pros\Site Plan\20067D01.dwg, 10/29/2024 2:44 PM, Colton M. Wallace, 27 EXISTING DRAINAGE PLAN, MCLLC PDF, pc3  
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SCALE: 1" = 100'



#### NOTES

1. CONTOURS ARE NOT FIELD VERIFIED AND ARE INSERTED PER USGS GIS DATA
2. EXISTING DRAINAGE AREA PATTERNS AND AREAS ARE ESTIMATED.

#### LEGEND

- |  |     |                               |
|--|-----|-------------------------------|
|  | 838 | EXIST. CONTOUR                |
|  |     | EXIST. DRAINAGE AREA BOUNDARY |
|  |     | FLOW PATH CONCENTRATED FLOW   |
|  |     | FLOW PATH SHEET FLOW          |

The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.



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7/2006 D01

DATE: 8/19/24  
SHEET 27 OF 38

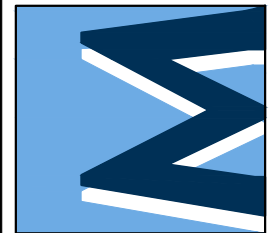
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EXISTING DRAINAGE PLAN

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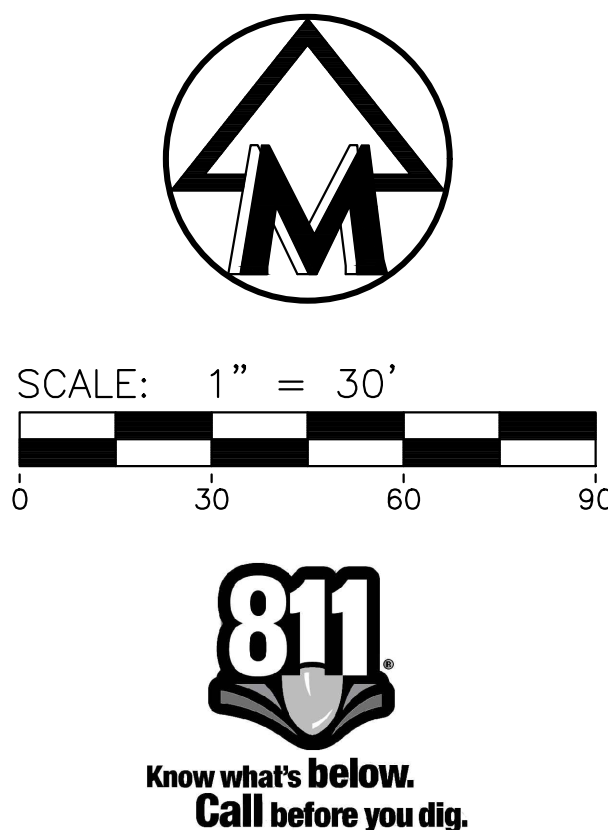
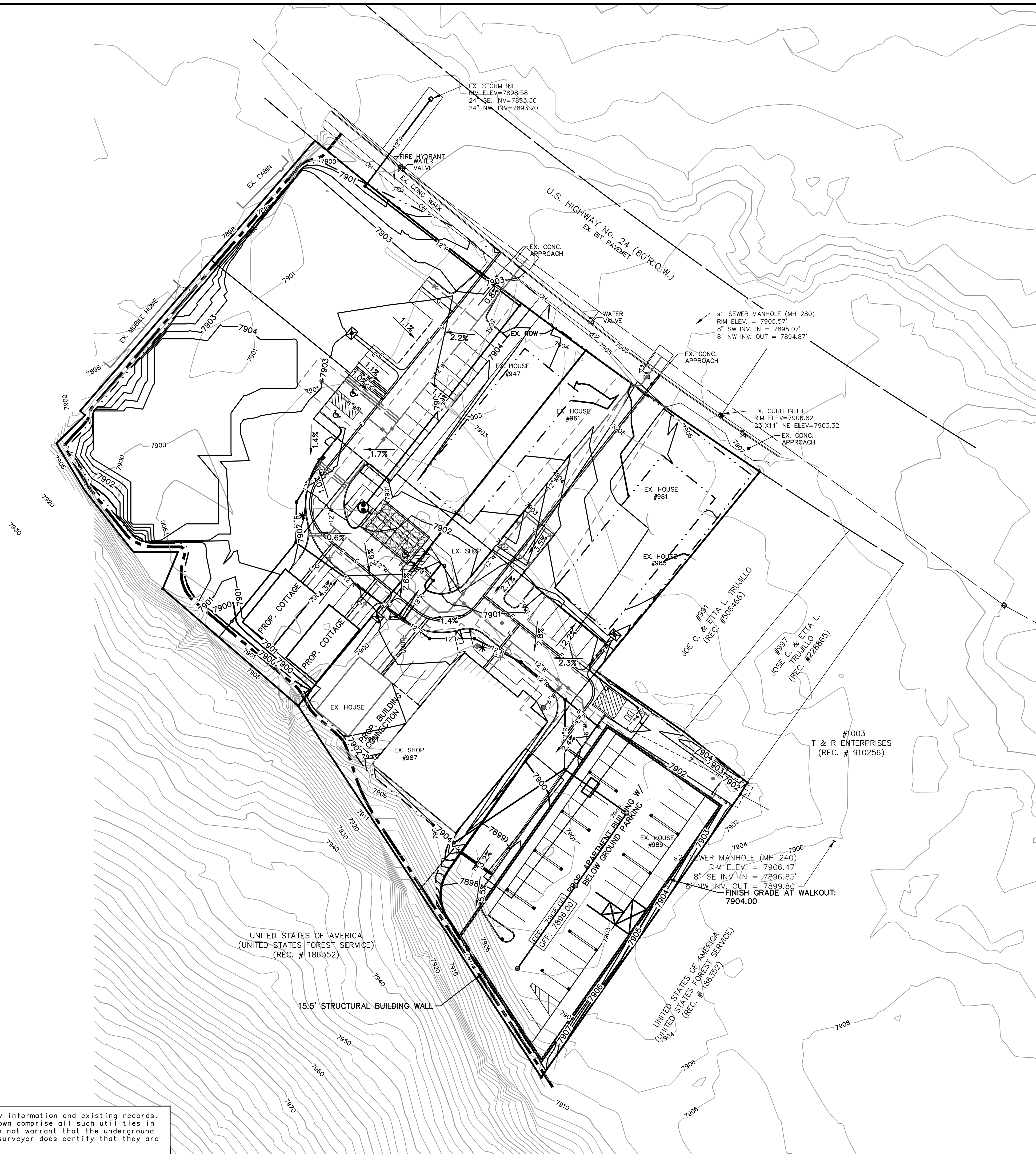
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**27**



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## NOTES

ADD NOTES AS NECESSARY

## LEGEND

	EXIST. CONTOUR
	PROP. CONTOUR
	EXIST. SPOT ELEVATION
	PROP. SPOT ELEVATION
	EXIST. UTILITY POLE
	EXIST. OVERHEAD UTILITY LINE
	EXIST. WATER VALVE
	EXIST. HYDRANT
	PROP. WATER MAIN
	PROP. HYDRANT
	PROP. GATE VALVE IN BOX
	EXIST. STORM SEWER
	EXIST. CATCH BASIN OR INLET
	PROP. STORM SEWER
	PROP. CATCH BASIN OR INLET
	PROP. UNDERGROUND STORM SEWER STORAGE
	PROP. UNDERGROUND STONE BED
	EXIST. SANITARY SEWER
	PROP. SANITARY SEWER
	PROP. FLOOR DRAIN
	SIGN
	POST
	EXIST. GAS VALVE
	WELL
	FENCE
	PROP. ELEC. TRANSFORMER
	PROP. ELECTRIC LINE
	PROP. GAS LINE



	REV.	DATE	CADD:
PER ERMSD REVIEW	02/15/24		
PER ERMSD & IME REVIEW	02/23/24		ENG: CMW
PER ERMSD & IME REVIEW	08/19/24		PM: RCW
			TECH:
			/20067GP1





U.S. HIGHWAY No. 24 (80' R.O.W.)  
EX. BIT. PAVEMET

51-SEWER MANHOLE (MH 25)  
RIM ELEV. = 7905.57'  
8" SW INV. IN = 7895.07'  
NW INV. OUT = 7894.87'

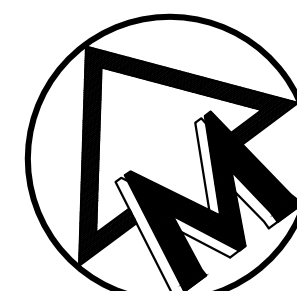
JOE C. & ETTA L. TRUJILLO  
(REC. #506466)

UNITED STATES OF AMERICA  
UNITED STATES FOREST SERVICE  
(REC. # 186352)

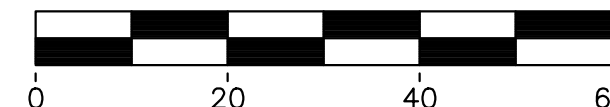
15.5' STRUCTURAL BUILDING WALL

## LEGEND

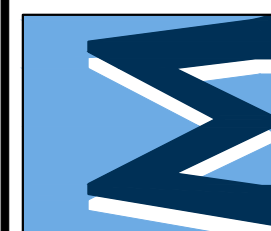
- |  |  |
|--|--|
|  | EXISTING CONTOUR                         |
|  | PROPOSED CONTOUR                         |
|  | EXISTING SPOT ELEVATION                  |
|  | PROPOSED SPOT ELEVATION                  |
|  | EXISTING UTILITY POLE                    |
|  | EXISTING OVERHEAD UTILITY LINE           |
|  | EXISTING WATER VALVE                     |
|  | EXISTING HYDRANT                         |
|  | PROPOSED WATER MAIN                      |
|  | PROPOSED HYDRANT                         |
|  | PROPOSED GATE VALVE IN BOX               |
|  | EXISTING STORM SEWER                     |
|  | EXISTING CATCH BASIN OR INLET            |
|  | PROPOSED STORM SEWER                     |
|  | PROPOSED CATCH BASIN OR INLET            |
|  | PROPOSED UNDERGROUND STORM SEWER STORAGE |
|  | EXISTING SANITARY SEWER                  |
|  | PROPOSED SANITARY SEWER                  |
|  | PROPOSED FLOOR DRAIN                     |
|  | SIGN                                     |
|  | POST                                     |
|  | EXISTING GAS VALVE                       |
|  | WELL                                     |
|  | FENCE                                    |
|  | RUSTIC TRAIL                             |
|  | PROPOSED ELECTRIC TRANSFORMER            |
|  | PROPOSED ELECTRIC LINE                   |
|  | PROPOSED GAS LINE                        |
|  | OFFSITE EXISTING SHEET FLOW PATH         |



SCALE: 1" = 20'



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MINUTURN, CO 81645  
JEFFREY D. ARMISTEAD  
970-471-0618

## MIDTOWN VILLAGE PUD

# DETAILED GRADING PLAN

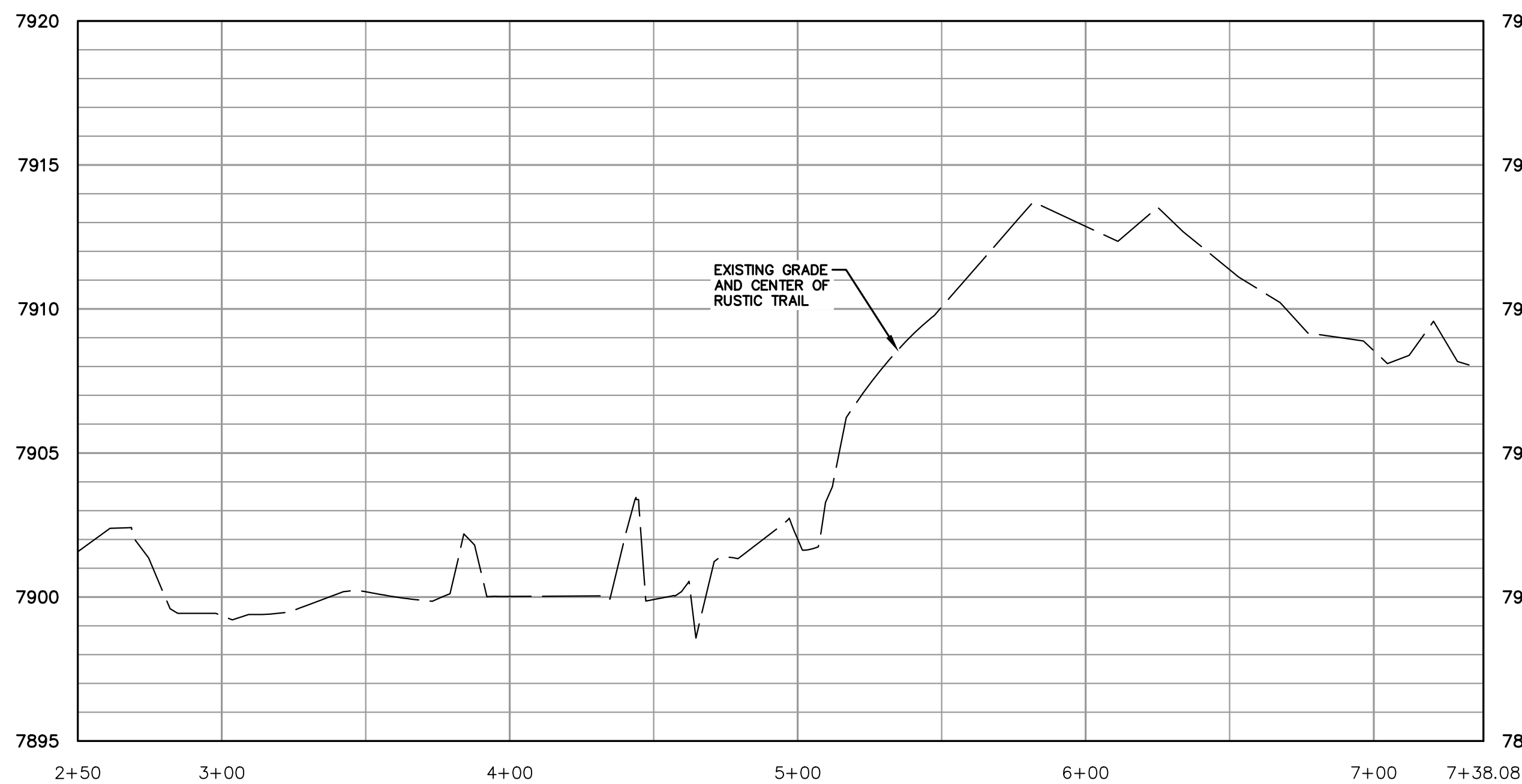
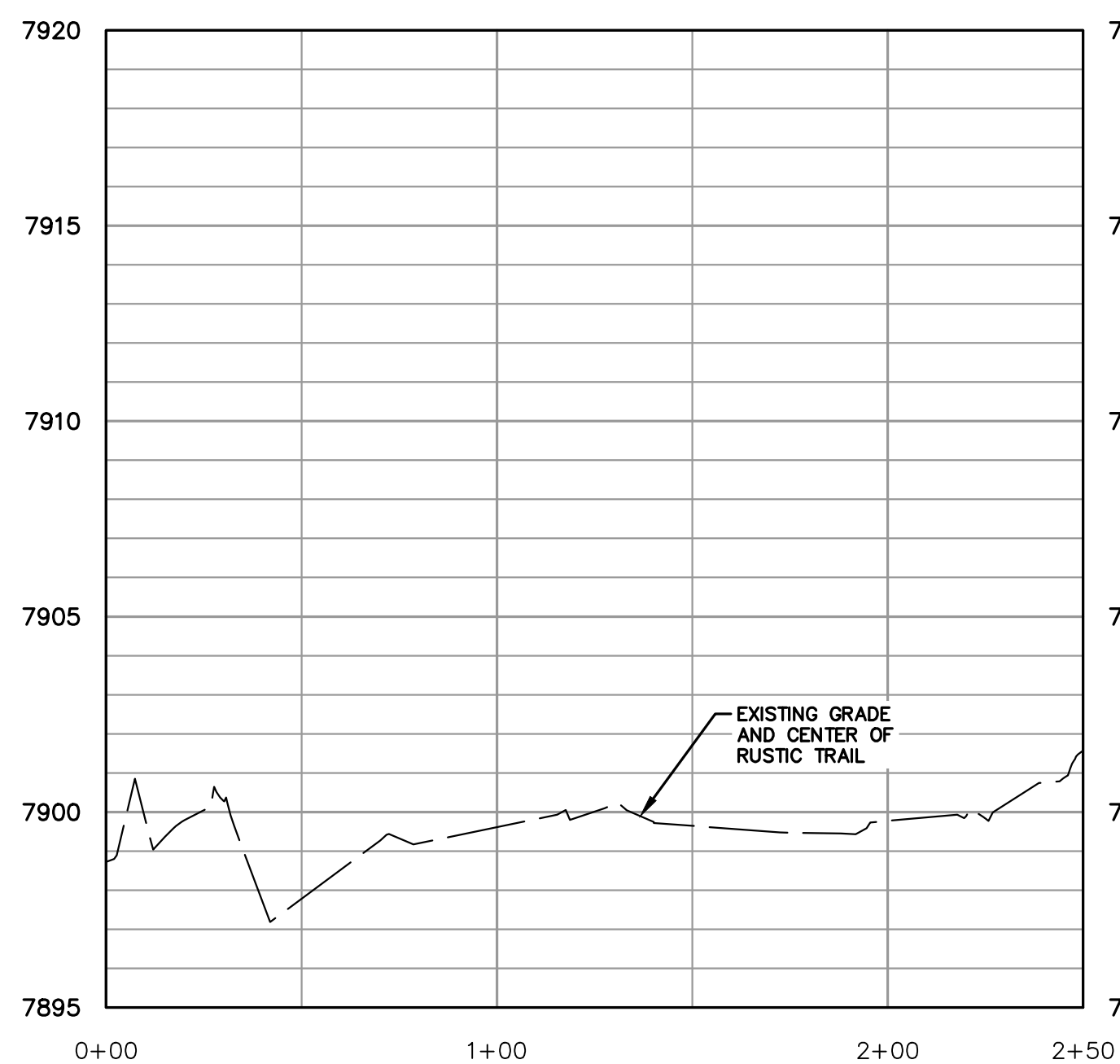
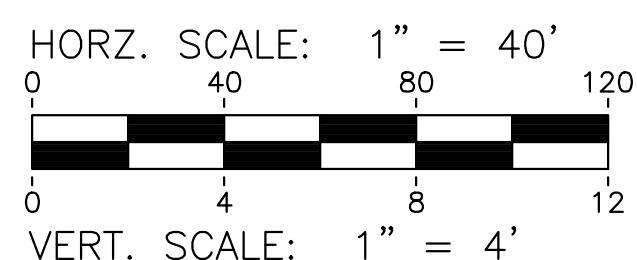
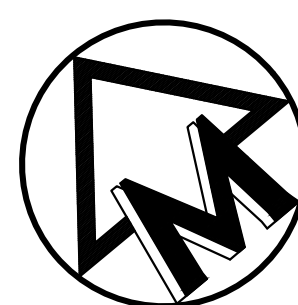
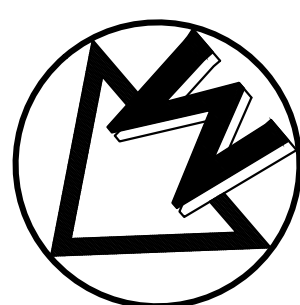
29

20067

REVISIONS:	REV. DATE	SHEET 29 OF 30
R. ERWSD REVIEW	01/15/24	QADD:
R. ERWSD & IME REVIEW	02/23/24	ENG: CMW
R. ERWSD & IME REVIEW	08/19/24	PM: RCW
		TECH:
		/20067GP2







## RUSTIC TRAIL CONSTRUCTION EXAMPLE IMAGES



The underground utilities shown have been located from field survey information and existing records. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area, either in-service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated. Although the surveyor does certify that they are located as accurately as possible from the information available.



**811**  
Know what's **below.**  
**Call** before you dig

## NOTES

ADD NOTES AS NECESSARY

## LEGEND

	EXIST. CONTOUR
	PROP. CONTOUR
	EXIST. UTILITY POLE
	EXIST. OVERHEAD UTILITY LINE
	EXIST. WATER VALVE
	EXIST. HYDRANT
	PROP. WATER MAIN
	PROP. HYDRANT
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	EXIST. STORM SEWER
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	EXIST. SANITARY SEWER
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	PROP. FLOOR DRAIN
	SIGN
	POST
	EXIST. GAS VALVE
	WELL
	FENCE
	RUSTIC TRAIL
	PROP. ELEC. TRANSFORMER
	PROP. ELECTRIC LINE
	PROP. GAS LINE

## **RUSTIC TRAIL BMPS**

1. PROPOSED DESIGN CREATES A STABLE TRAIL THAT WILL RESULT IN FEWER PROBLEMS WITH SOIL EROSION AND SEDIMENTATION.
2. INSTALL TEMPORARY EROSION CONTROL MEASURES SUCH AS HAY BALES BEFORE CONSTRUCTION BEGINS. KEEP THEM IN PLACE AND MAINTAINED DURING CONSTRUCTION AND REMOVE THEM ONLY AFTER THE SITE HAS BEEN STABILIZED.
3. BEFORE BEGINNING ANY TRAIL CONSTRUCTION, INSTALL NECESSARY MEASURES TO MINIMIZE AND PREVENT EROSION.
4. STABILIZING SLOPES, CREATING NATURAL VEGETATION BUFFERS, DIVERTING RUNOFF FROM EXPOSED AREAS, CONTROLLING THE VOLUME AND VELOCITY OF RUNOFF, AND CONVEYING THAT RUNOFF AWAY FROM THE CONSTRUCTION AREA ALL SERVE TO REDUCE EROSION.
5. DURING TRAIL CONSTRUCTION, MINIMIZE THE AMOUNT OF SOIL DISTURBANCE AT STREAM CROSSINGS.
6. TRAIL CONSTRUCTION IS BEST DONE DURING THE DRY MONTHS WHEN SOIL SATURATION AND WATER LEVELS ARE AT THEIR LOWEST.
7. THE THREE MOST IMPORTANT FACTORS TO CONSIDER DURING TRAIL CONSTRUCTION ARE THE CHARACTER OF THE LAND ITSELF (SOIL, SLOPE, AND VEGETATIVE COVER), THE TYPE OF EXPECTED USE, AND THE VOLUME OF THAT EXPECTED USE.
8. RUSTIC TRAIL TO BE DESIGN--BUILT BY 10TH MOUNTAIN BUILDERS.



**JOB No. 20067**

JOB No. **20067** DATE: 04/07/22 SHEET 30 OF 38

REV. DATE	08/19/24
REVISED BY	PER ERWSD & IME REVIEW
ENG: CMW	

30

# MIDTOWN VILLAGE PUD

# RUSTIC TRAIL PLAN

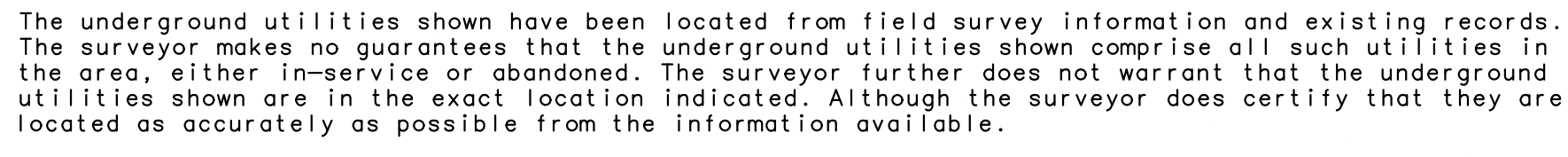
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10TH MOUNTAIN BUILDERS  
1632 MAIN STREET  
MINUTURN, CO 81645  
JEFFREY D. ARMISTEAD  
970-471-0618

MIDWESTERN  
CONSULTING

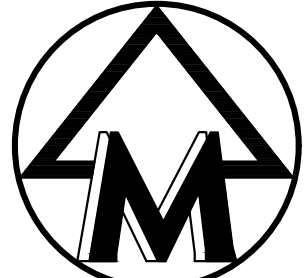
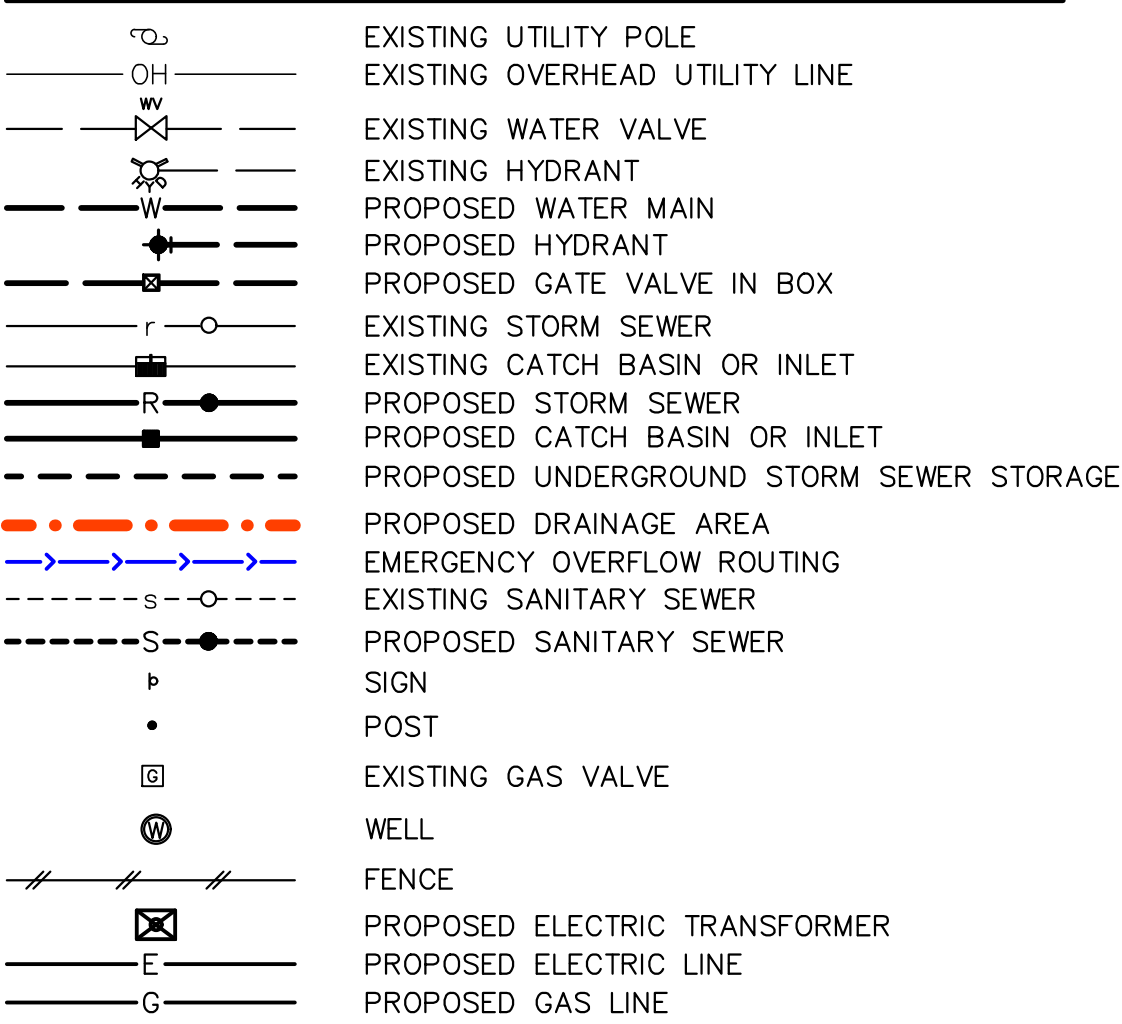
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## LEGEND



SCALE: 1" = 30'

A horizontal scale bar with a black and white checkerboard pattern. Below the bar are tick marks and labels for 0, 30, 60, and 90 feet.



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## STORMWATER VOLUME CALCULATIONS

Subcatchment Name	Area (ac)	NRCS Hydrologic	Percent Impervio	Runoff Coefficient, C						
				2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
Existing Site	2.52	C	28.0	0.20	0.26	0.34	0.48	0.53	0.60	0.68
Proposed Site	2.52	C	68.3	0.54	0.59	0.63	0.70	0.73	0.76	0.80

### SITE DRAINAGE AREA CHARACTERISTICS - EXISTING CONDITIONS

Tributary Area (A) =	2.52	Acres
100 yr Run-off Coefficient (C) =	0.80	
10 yr Run-off Coefficient (C) =	0.34	
5 yr Run-off Coefficient (C) =	0.26	
100 yr Existing Constant (Ke) =	1.51	
10 yr Existing Constant (Ke) =	0.85	
5 yr Existing Constant (Ke) =	0.66	
Allowable Outflow Rate (Qo)* =	0.50	cfs*

\* Allow able outflow rate  $Q_o$  is computed by one of the following cases

Case 1:  $Q_0$  = capacity of existing discharge conduit or channel

N/A	cfs / Acre
0.20	cfs / Acre

### SITE DRAINAGE AREA CHARACTERISTICS - PROPOSED CONDITIONS

Tributary Area (A) =	2.52	Acres
100 yr Run-off Coefficient (C) =	0.76	
10 yr Run-off Coefficient (C) =	0.83	
5 yr Run-off Coefficient (C) =	0.59	
100 yr Design Constant (Kd) =	1.92	
10 yr Design Constant (Kd) =	1.60	
5 yr Design Constant (Kd) =	1.49	
Allowable Outflow Rate (Qo)* =	0.50	cfs*

\* Allow able outflow rate  $Q_0$  is computed by one of the following cases

**1-HOUR RAINFALL DEPTH, P<sub>1</sub>**

2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
0.53	0.69	0.83	1.06	1.26	1.47	2.05

### DETENTION BASIN SIZING

100 YEAR STORM												
1	2	3	4	5	6	7	8	9	10	11	12	
Duration (Minutes)	Duration (Seconds)	Intensity (10-yr Storm) (in/hr)	Co. #2 x Col. #3 (Inches)	Existing Peak Flow (Q (CFS))	Proposed Peak Flow (Q (CFS))	Net Peak Flow Q (CFS) Col. #6 - Col. #5	Existing Volume Generated Col. #4 x #6	Proposed Volume Generated Col. #4 x #7	Net Volume Generated	Outflow Volume (Cu. Ft.)	Storage Volume (Cu. Ft.)	
5	300	4.89	1.496	7.52	9.59	2.07	622	622	0	622	0	
10	600	3.98	2.386	6.00	7.65	1.65	3599	4,571	892	362	800	
15	900	3.34	3.003	5.03	6.42	1.39	4530	5,779	1,249	454	795	
20	1200	2.91	3.415	3.49	5.42	1.93	4,798	6,587	1,789	619	878	
30	1800	2.40	3.944	1.64	4.645	2.92	3,732	6,937	3,205	1,473	1,732	
40	2400	1.99	4.349	0.74	3.948	3.20	3,060	6,067	3,007	1,414	1,593	
60	3600	1.42	5.061	0.26	3.172	2.91	1,612	4,565	2,953	1,341	1,612	
90	5400	1.12	6.061	1.69	2.16	0.47	9142	11,892	2,750	2,722	202	

Note: > Figures in Columns (3) are computed by Equation 5-3 in the UDCSM per the Town of Minturn Ordinance.

Eq. 5-3

$$I = \frac{28.5 P_1}{(10 + T_d)^{0.786}}$$

**1-HOUR RAINFALL DEPTH, P<sub>1</sub>**

2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
0.53	0.69	0.83	1.06	1.26	1.47	2.05

### DETENTION BASIN SIZING

TO TASK 5											
1	2	3	4	5	6	7	8	9	10	11	12
Duration (Minutes)	Duration (Seconds)	Intensity (10-yr Storm) (In/Hr)	Col. #2 x Col. #3 (Inches)	Existing Peak Flow (CFS)	Proposed Peak Flow (CFS)	Net Peak Flow (CFS) Col. #6 - Col. #5	Existing Volume Generated Col. #4 x 6	Proposed Volume Generated Col. #4 x 6	Net Volume Generated	Outflow Volume (Cu. Ft.)	Storage Volume (Cu. Ft.)
5	300	2.83	848	2.41	4.52	2.11	1,355	633	151	462	462
10	600	2.25	1,352	1.92	3.60	1.68	3,362	1,010	352	708	708
15	900	1.89	1,702	1.61	3.02	1.41	4,449	2,126	1,272	454	818
20	1,200	1.51	2,353	1.11	2.09	0.88	2,003	3,768	1,758	907	857
25	1,500	1.20	2,832	0.81	1.50	0.69	2,201	5,987	3,786	1,010	712
30	1,800	0.84	3,031	0.72	1.55	0.83	2,580	8,484	2,264	1,814	450

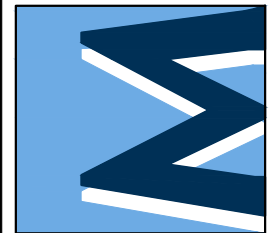
Note: > Figures in Columns (3) are computed by Equation 5-3 in the UDCSM per the Town of Minturn Ordinance.

$$I = \frac{28.5 P_1}{(10 + T_d)^{0.786}}$$



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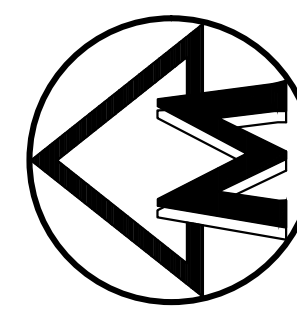
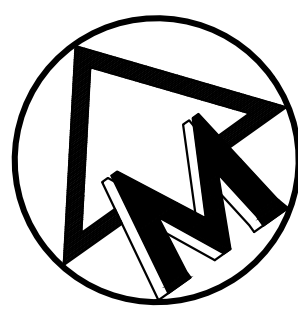
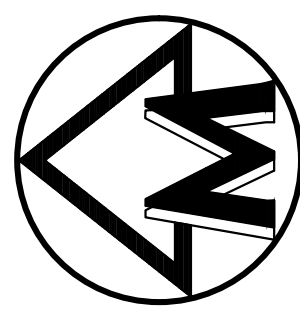
# MIDTOWN VILLAGE PUD

# PRELIMINARY STORM WATER MANAGEMENT PLAN

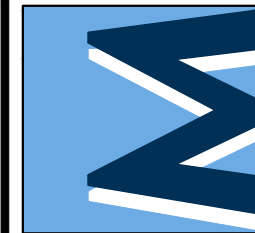
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JOB No.	<b>20067</b>	REV. DATE	DATE: 8/19/24
REVISIONS:			SHEET 31 OF 38
PER ERMSD & IME REVIEW		02/23/24	CADD:
PER ERMSD & IME REVIEW		08/19/24	ENG: CMW
			PM: RCW
			TECH:
			/20067SR1





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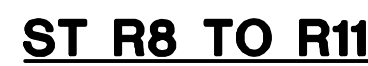
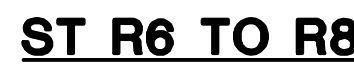
## STORM SEWER PLAN AND PROFILE VIEW 1

32

20067

JOB No.

REV. DATE		SHEET 32 OF 38
PER ERMSD REVIEW	08/21/23	CADD:
PER ERMSD REVIEW	01/15/24	ENG: CMW
PER ERMSD & IME REVIEW	02/23/24	PM: RCW
PER ERMSD & IME REVIEW	08/19/24	TECH:
		/270672PR1



STORM STRUCTURE TABLE						
STRUCTURE NO.	TYPE	RIM ELEV.	INV.	DEPTH	SUMP	TYPE OF CASTING
r7	2' INLET	7898.58	12" SW 7893.40 24" NW 7893.20 24" SE 7893.30	7.38	2'	CDOT TYPE R INLET
R2	4' MH	7900.62	12" SE 7893.82 12" NE 7893.62	7.00	0'	CDOT MANHOLE
R3	4' MH	7903.61	12" SW 7894.20 12" NW 7894.20	9.41	0'	CDOT MANHOLE
R6	4' MH	7901.07	18" SE 7894.94 18" NW 7894.94	6.13	0'	CDOT MANHOLE
R7	4' MH	7901.25	18" SW 7895.01 18" NW 7895.00	6.25	0'	CDOT MANHOLE
R8	6' CB	7900.31	12" NW 7895.33 12" SE 7895.33 18" NE 7895.13	7.18	2'	TYPE 13 CURB INLET
R9	4' MH	7902.03	12" N 7895.99 12" SE 7895.79 12" SW 7896.00	6.24	0'	CDOT MANHOLE Curb

STORM STRUCTURE TABLE						
STRUCTURE NO.	TYPE	RIM ELEV.	INV.	DEPTH	SUMP	TYPE OF CASTING
R10	4' MH	7902.23	12" NE 7896.33 12" S 7896.13	6.10	0'	CDOT MANHOLE
R11	4' CB	7901.83	12" SW 7896.51	5.48	0'	TYPE 13 CURB INLET

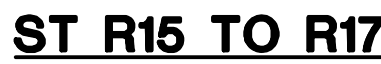
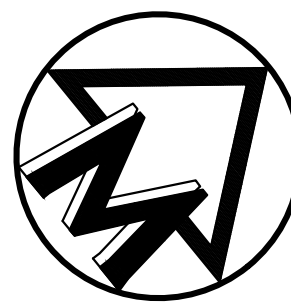
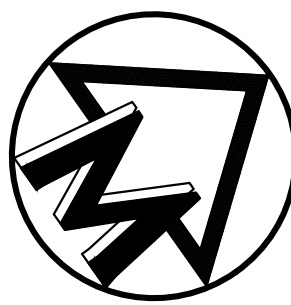
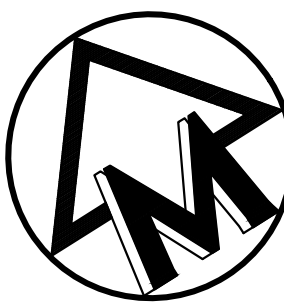
EXISTING UTILITY POLE  
EXISTING OVERHEAD UTILITY LINE  
EXISTING WATER VALVE  
EXISTING HYDRANT (HYD.)  
PROPOSED WATER MAIN  
PROPOSED HYDRANT (HYD.)  
PROPOSED GATE VALVE IN BOX (GVIB)  
EXISTING STORM SEWER  
EXISTING CATCH BASIN OR INLET (CB)  
PROPOSED STORM SEWER

PROPOSED CATCH BASIN OR INLET (CB.)  
PROPOSED UNDERGROUND STORM SEWER STORAGE  
PROPOSED UNDERGROUND STONE BED  
EXISTING SANITARY SEWER  
PROPOSED SANITARY SEWER  
PROPOSED FLOOR DRAIN  
SIGN  
POST  
EXISTING GAS VALVE

WELL  
FENCE  
PROPOSED ELECTRIC TRANSFORMER  
PROPOSED ELECTRIC LINE  
PROPOSED GAS LINE







## STORM STRUCTURE TABLE

- ## LEGEND







### SC-740 STORMTECH CHAMBER SPECIFICATIONS

- CHAMBERS SHALL BE STORMTECH SC-740.
- CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRPD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
- REQUIREMENTS FOR HANDLING AND INSTALLATION
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 500 LB/FT<sup>2</sup>. THE AGC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
- ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
  - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
  - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD. THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRPD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
  - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
- CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

### IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-740 SYSTEM

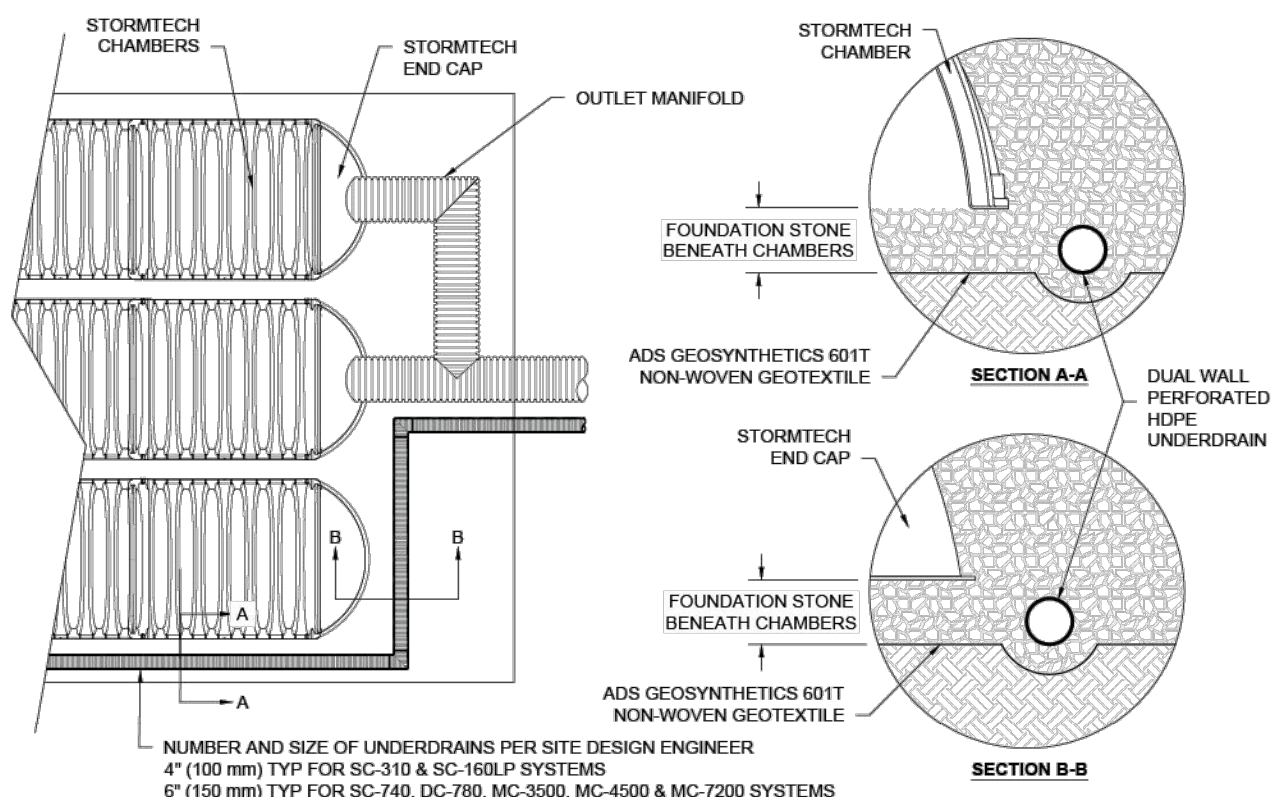
- STORMTECH SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
- STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
  - STONESHOOTER LOCATED OFF THE CHAMBER BED.
  - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
  - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
- THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
- MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4" (20.50 mm).
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
- ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

### NOTES FOR CONSTRUCTION EQUIPMENT

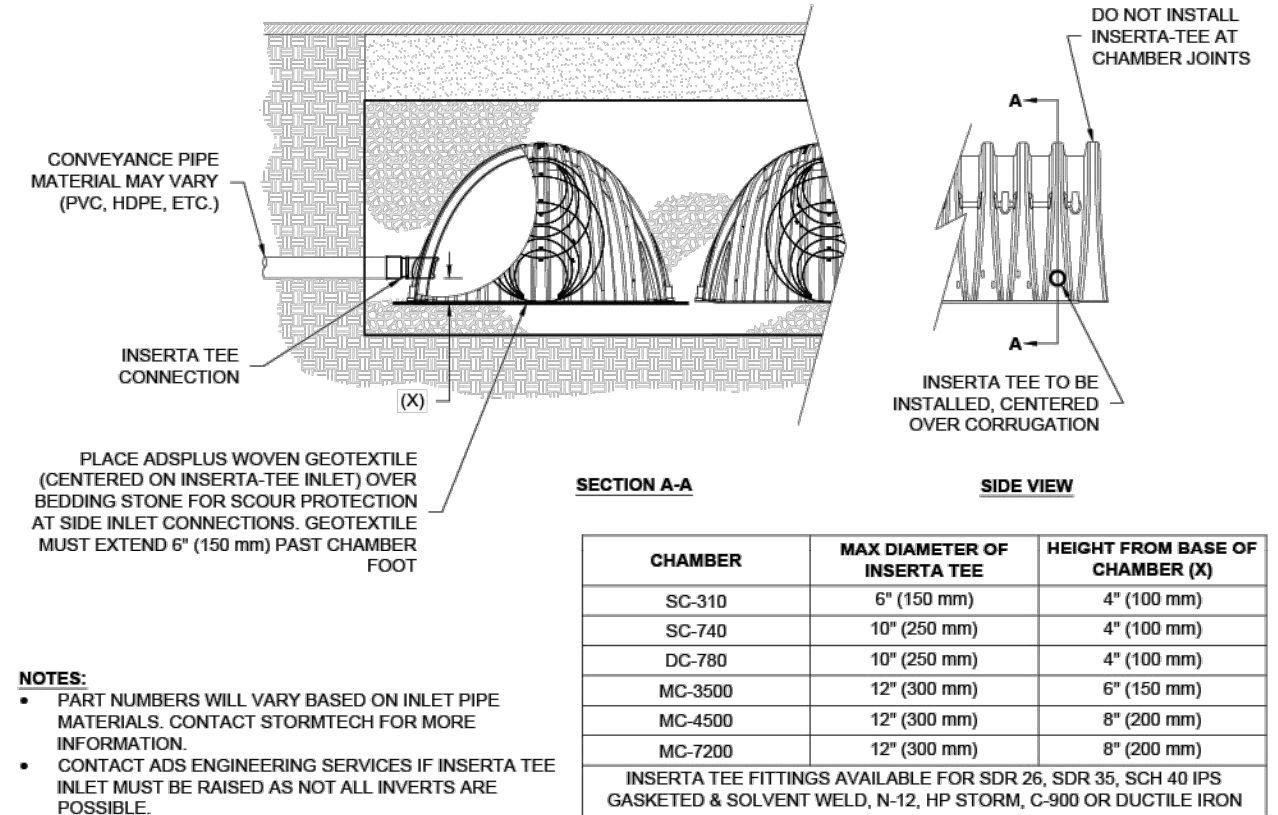
- STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- THE USE OF CONSTRUCTION EQUIPMENT OVER SC-740 CHAMBERS IS LIMITED:
  - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
  - NO RUBBER TIED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
  - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
- FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

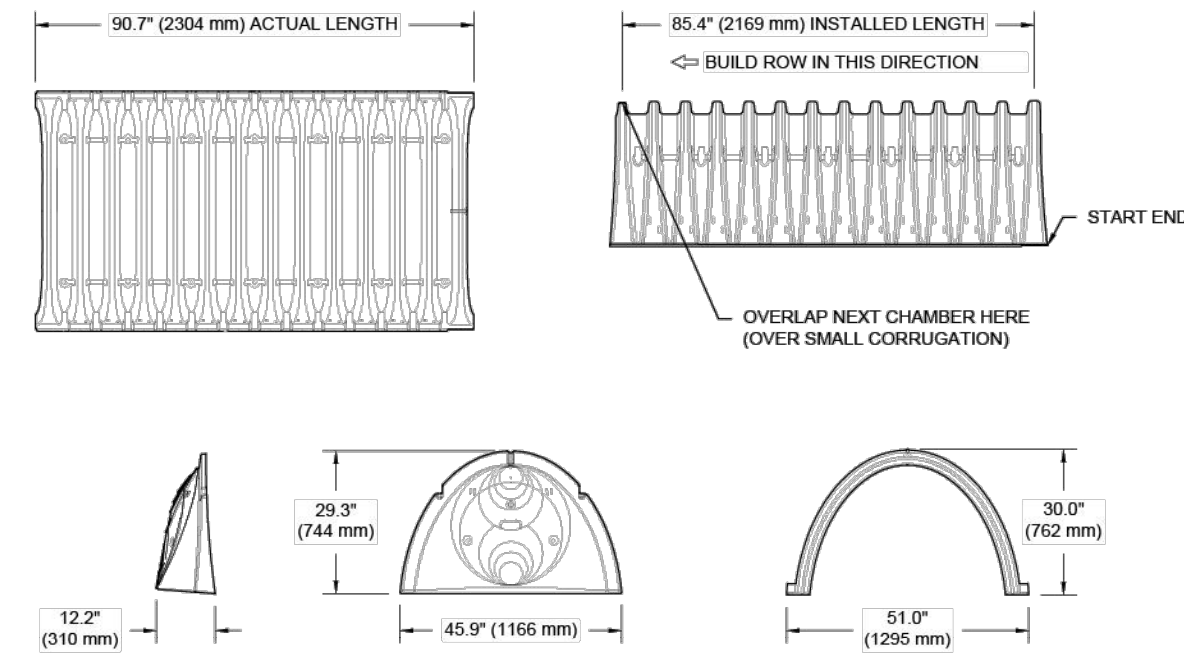
CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.



### 5 UNDERDRAIN DETAIL



### 6 INSERTA-TEE SIDE INLET DETAIL



#### NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)  
CHAMBER STORAGE  
MINIMUM INSTALLED STORAGE<sup>\*</sup>  
WEIGHT

51.0" X 30.0" X 85.4"  
45.9 CUBIC FEET  
74.3 CUBIC FEET  
75.0 lbs.

(1295 mm X 762 mm X 2169 mm)  
(1.30 m<sup>3</sup>)  
(2.12 m<sup>3</sup>)  
(33.6 kg)

<sup>\*</sup> ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS

PRE-FAB STUB AT BOTTOM OF END CAP WITH FLAMP END WITH "BR"  
PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"  
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"  
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EP06B1 / SC740EP06B1PC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	0.5" (13 mm)
SC740EP06B1 / SC740EP06B1PC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	0.5" (13 mm)
SC740EP08B1 / SC740EP08B1PC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	0.6" (15 mm)
SC740EP10B1 / SC740EP10B1PC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	0.7" (18 mm)
SC740EP12B1 / SC740EP12B1PC	12" (300 mm)	14.7" (373 mm)	12.9" (328 mm)	1.2" (30 mm)
SC740EP15B1 / SC740EP15B1PC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	—
SC740EP18B1 / SC740EP18B1PC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	1.3" (33 mm)
SC740EP24B1 / SC740EP24B1PC	24" (600 mm)	18.5" (470 mm)	—	1.6" (41 mm)
SC740EP24B1 / SC740EP24B1PC	24" (600 mm)	18.5" (470 mm)	—	0.1" (3 mm)

ALL STUBS, EXCEPT FOR THE SC740EP24B1/SC740EP24B1PC ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

<sup>\*</sup> FOR THE SC740EP24B1/SC740EP24B1PC THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm) BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

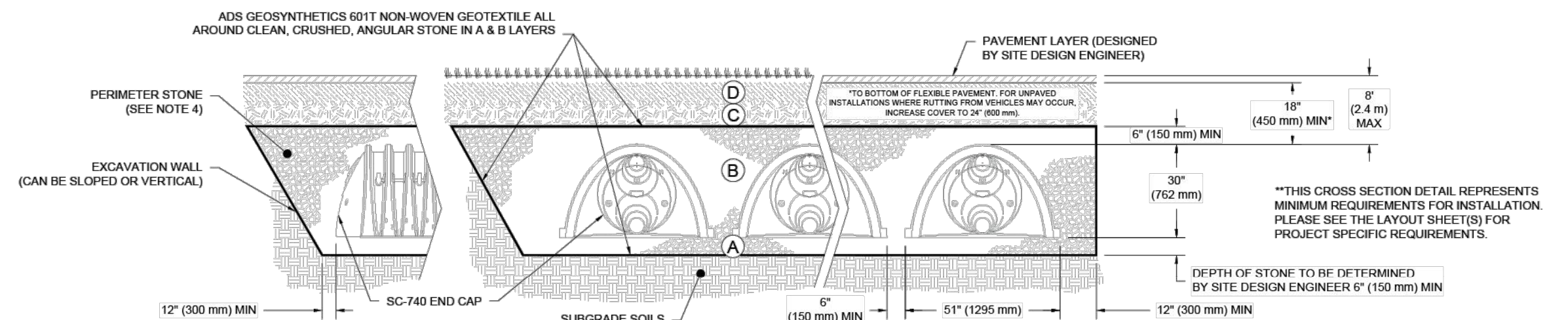
### 2 SC-740 TECHNICAL SPECIFICATIONS

#### ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STORMTECH MATERIAL AND PREPARATION REQUIREMENTS.
C INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <3% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M45 <sup>1</sup> A-1, A-2.4, A-3 OR AASHTO M3 <sup>1</sup> 3, 3S7, 4, 4E7, 5, 5E, 57, 6, 67, 68, 7, 7S, 8, 8S, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL-GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHTS NOT TO EXCEED 12,000 LB (5,443 kg) DYNAMIC FORCE NOT TO EXCEED 20,000 LB (8,896 kg).
B EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M3 <sup>1</sup> 3, 3S7, 4, 4E7, 5, 5E, 57	NO COMPACTION REQUIRED.
A FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M3 <sup>1</sup> 3, 3S7, 4, 4E7, 5, 5E, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2,3</sup>

#### PLEASE NOTE:

- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M3) STONE".
- STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERSAGES WITH A VIBRATORY COMPACTOR.
- WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



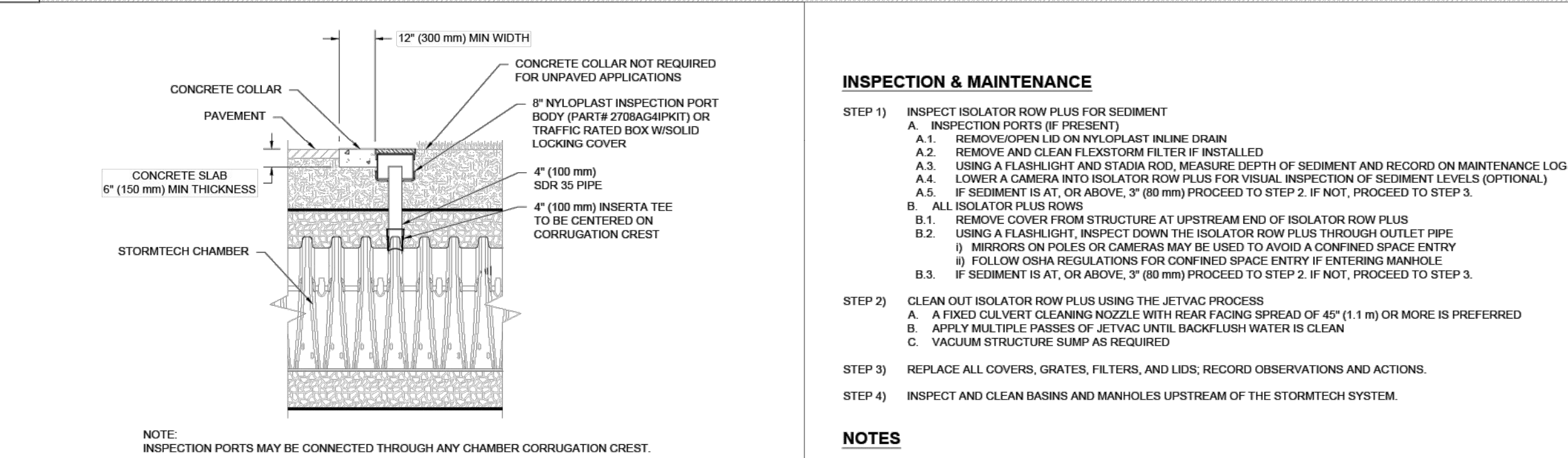
#### NOTES:

- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
- THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
- PERMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
  - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
  - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
  - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LB/FT<sup>2</sup>. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

### 1

### SC-740 CROSS SECTION DETAIL

### 3 SC-740 ISOLATOR ROW PLUS DETAIL



#### INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- INSPECTION PORTS (IF PRESENT)
    - REMOVE COVER LID ON WY. CR. LAST INLINE DRAIN
    - REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
    - USING A FLASHLIGHT AND STADIUM ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
    - LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
    - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
  - ALL ISOLATOR PLUS ROWS
    - REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
    - USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
      - MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
      - FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
    - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
  - APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKLUSH WATER IS CLEAN
  - VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS, RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

#### NOTES

- INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
- CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

### 4 4" PVC INSPECTION PORT DETAIL (SC SERIES CHAMBER)

### PROPOSED ELEVATIONS

BOTTOM OF STONE = 7894.34  
BOTTOM OF SC-740 CHAMBER = 7894.84  
12" ISOLATOR ROW PLUS CONNECTION INVERT = 7894.84  
12" BOTTOM MANIFOLD INVERT = 7894.84  
TOP OF CHAMBER = 7898.34  
MIN ELEV. W/ 6" STONE COVER = 7898.84  
MIN ELEV. W/ 18" TO TOP OF RIGID PAVEMENT = 7899.84

### VOLUME CALCULATIONS

TOTAL NO. OF SC-740 CHAMBERS = 16  
TOTAL NO. OF SC-740 END CAPS = 8  
SYSTEM AREA = 718 SF  
STONE VOID = 25%  
VOLUME OF 6 BEDS = 1180 CF

### SC-740 STANDARD DETAILS

StormTech®  
Chamber System  
888-892-2694 | WWW.STORMTECH.COM

4640 TRUEMAN BLVD  
HILLIARD, OH 43026



SHEET

DRAWN: DATE:  
REVIEWED: PROJECT NO:  
REV: NOT TO SCALE

ADVANCED DRAINAGE SYSTEMS, INC. (ADS) HAS PREPARED THIS DETAIL BASED ON REFERENCED STANDARDS. ADS HAS NOT PERFORMED ANY ENGINEERING OR DESIGN SERVICES FOR THIS PROJECT. NOR HAS ADS INDEPENDENTLY VERIFIED THE INFORMATION SUPPLIED. THE INSTALLATION DETAILS PROVIDED HEREIN ARE GENERAL RECOMMENDATIONS AND ARE NOT SPECIFIC FOR THIS PROJECT. UNLESS THE PLANS ARE SIGNED AND SEALED BY THE SITE DESIGN ENGINEER, THE SITE DESIGN ENGINEER SHALL REVIEW THESE DETAILS PRIOR TO CONSTRUCTION AND SEALING THE DOCUMENT. IT IS THE SITE DESIGN ENGINEER'S RESPONSIBILITY TO ENSURE THE DETAILS PROVIDED HEREIN MEET OR EXCEEDS THE APPLICABLE NATIONAL, STATE OR LOCAL REQUIREMENTS AND TO ENSURE THAT THE DETAILS PROVIDED HEREIN ARE ACCEPTABLE FOR THIS PROJECT.



### MIDTOWN VILLAGE PUD

STORM WATER DETAILS 1

34

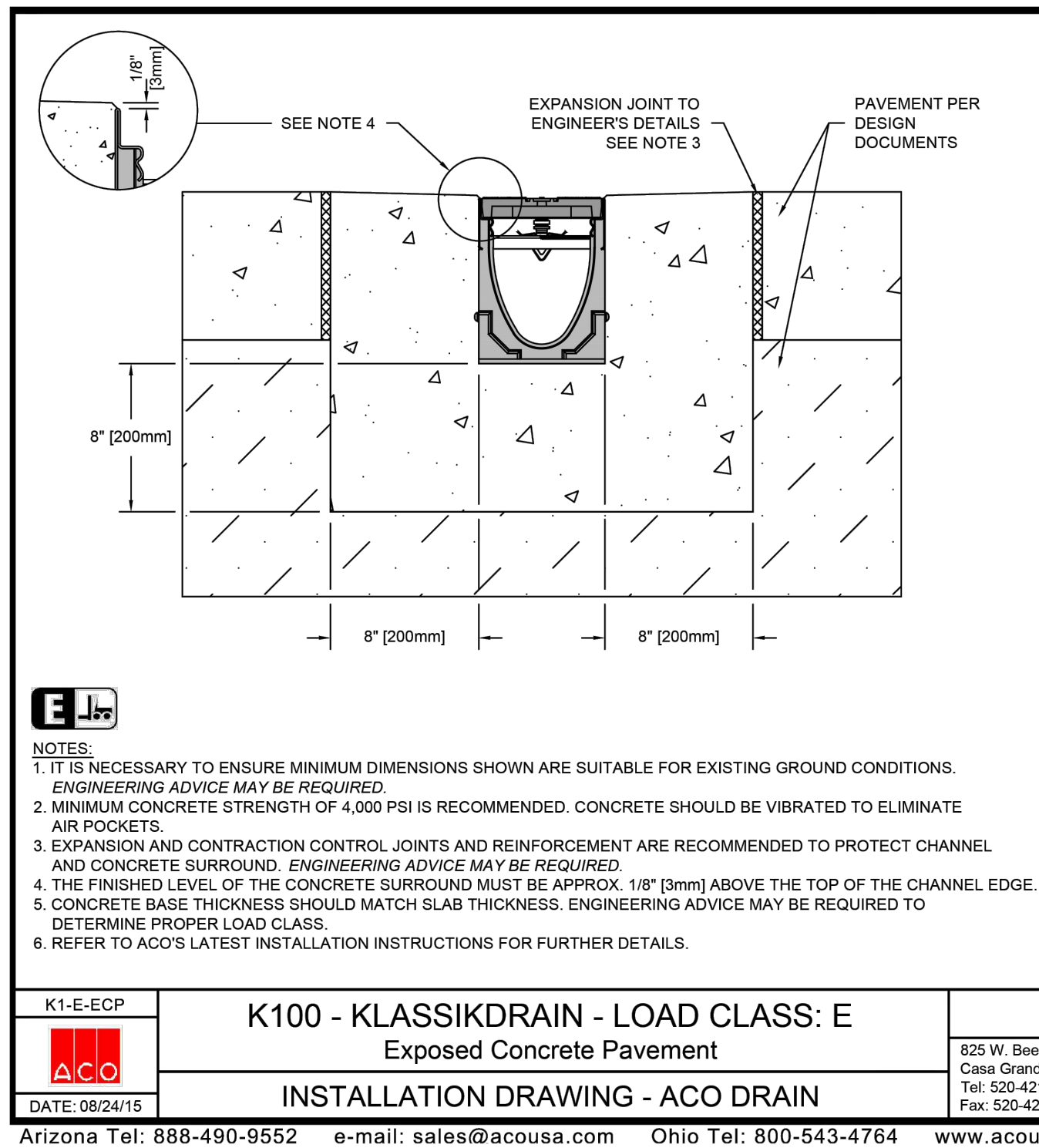
JOB No. 20067

DATE: 10/28/24	SHEET 34 OF 38
REV. DATE: 02/23/24	CADD: ENG. CWM
REVISED: 08/19/24	PER. RCW
REVISED: & ME REVIEW	TECH: /2026-DT1

CLIENT  
10TH MOUNTAIN BUILDERS  
1632 MAIN STREET  
MINTURN, CO 81645  
JEFFREY D. ARMISTEAD  
970-471-0618

MIDWESTERN  
CONSULTING  
3845 Plaza Drive Ann Arbor, Michigan 48108  
(734) 995-0200 • www.midwesternconsulting.com  
Land Development • Land Survey • Institutional • Municipal  
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**SPECIFICATION CLAUSE**

**K100 KLASSIKDRAIN - LOAD CLASS E**

**GENERAL**  
THE SURFACE DRAINAGE SYSTEM SHALL BE POLYMER CONCRETE K100 CHANNEL SYSTEM WITH GALVANIZED STEEL EDGE RAILS AS MANUFACTURED BY ACO POLYMER PRODUCTS, INC.

**MATERIALS**  
CHANNELS SHALL BE MANUFACTURED FROM POLYESTER RESIN POLYMER CONCRETE WITH AN INTEGRALLY CAST-IN GALVANIZED STEEL EDGE RAIL. MINIMUM PROPERTIES OF POLYMER CONCRETE WILL BE AS FOLLOWS:  
COMPRESSIVE STRENGTH: 14,000 PSI  
FLEXURAL STRENGTH: 4,000 PSI  
TENSILE STRENGTH: 1,500 PSI  
WATER ABSORPTION: 0.07%  
FROST PROOF: YES  
DILUTE ACID AND ALKALI RESISTANT: YES  
B117 SALT SPRAY TEST COMPLIANT: YES

THE SYSTEM SHALL BE 4" (100mm) NOMINAL INTERNAL WIDTH WITH A 5.1" (130mm) OVERALL WIDTH AND A BUILT-IN SLOPE OF 0.5%. CHANNEL INVERT SHALL HAVE DEVELOPED "V" SHAPE. ALL CHANNELS SHALL BE INTERLOCKING WITH A MALE/FEMALE JOINT.

THE COMPLETE DRAINAGE SYSTEM SHALL BE BY ACO POLYMER PRODUCTS, INC. ANY DEVIATION OR PARTIAL SYSTEM DESIGN AND/OR IMPROPER INSTALLATION WILL VOID ANY AND ALL WARRANTIES PROVIDED BY ACO POLYMER PRODUCTS, INC.

CHANNEL SHALL WITHSTAND LOADING TO PROPER LOAD CLASS AS OUTLINED BY EN 1433. GRATE TYPE SHALL BE APPROPRIATE TO MEET THE SPECIFIED EN 1433 LOAD CLASS. THE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

**ACO Polymer Products, Inc.**  
825 W. Beechcraft St. Casa Grande, AZ 85122  
Tel: 520-421-9899 Fax: 520-421-9899  
9470 Pinecone Dr. Mentor, OH 44060  
Tel: 440-639-7230 Fax: 440-639-7235  
4211 Pleasant Rd. Fort Mill, SC 29708  
Tel: 803-802-1063 Fax: 803-802-1063

**K100 - KLASSIKDRAIN - LOAD CLASS: E**  
**Exposed Concrete Pavement**  
**INSTALLATION DRAWING - ACO DRAIN**  
Arizona Tel: 888-490-9552 e-mail: sales@acousa.com Ohio Tel: 800-543-4764 www.acousa.com South Carolina Tel: 800-543-4764

**ACO DRAIN**  
**Type 478Q Longitudinal ductile iron grate (ADA)**

**Product Features**

- Certified to EN 1433 Load Class E - 135,000 lbs - 2,788 psi
- Uses 'QuickLok' boltless locking system
- Suitable for use with K100, KS100, H100-8, H100-10, H100K-8, H100K-8, and NW100 channels
- Manufactured from ductile iron to ASTM A 536-84 - Grade 65-45-12
- E-coated for improved resistance against rust
- Complies with ADA - American Disabilities Act of 1990 Section 4.5.4
- Bicycle Tire Penetration Resistant to AS 3996 - 2006



**Specifications**

**General**  
The surface drainage system shall be ACO Drain K100, KS100, H100-8, H100-10, H100K-8, H100K-8, and NW100 channels "complete with ACO Type 478Q longitudinal ductile iron grate with 'QuickLok' locking as manufactured by ACO, Inc. or similar approved.

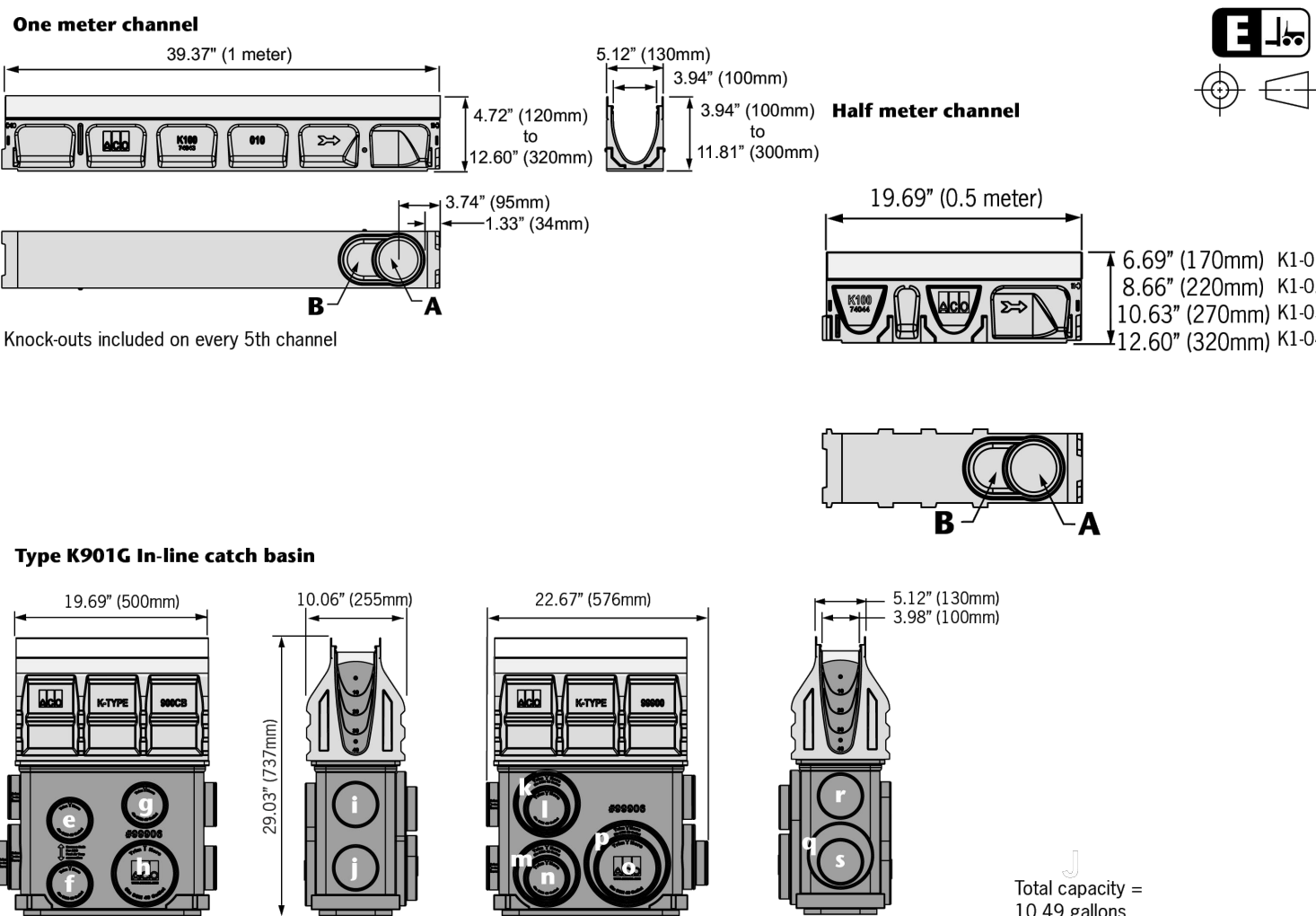
**Materials**  
The covers shall be manufactured from ductile iron and have minimum properties as follows:  
• Independently certified to meet Load Class E to EN 1433 - 135,000 lbs - 2,788 psi  
• Ductile iron to ASTM A 536-84 - Grade 65-45-12  
• Intake area of 22.5 sq. in. (145.16 cm²) per half meter of grate

The overall width of 4.85" (123mm) and overall length of 19.69" (500mm). Slots measure at a maximum of 0.28" (7mm).

**Installation**  
The trench drain system and grates shall be installed in accordance with the manufacturer's installation instructions and recommendations.

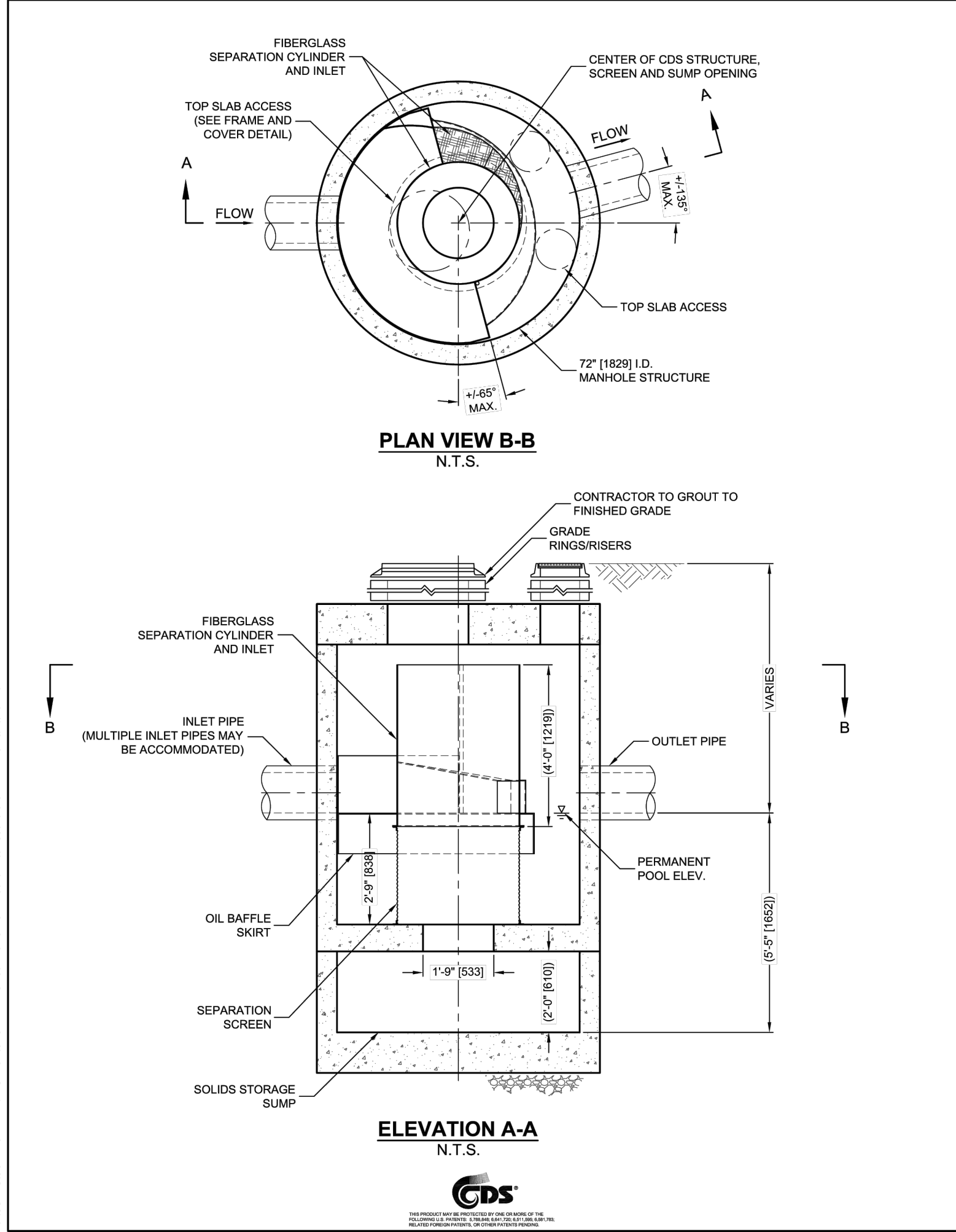
ACO Specification Information

**ACO DRAIN**  
**KlassikDrain - K100 Galvanized steel edge rail channel system**



Outlet	Product	Outlet size (Sch. 40)	Invert Depth	GPM	CFS	End Cap
a	Bottom outlet - K00	4" round	3.94"	108	0.24	
b	Bottom outlet - K40	4" round	11.81"	187	0.42	
c	Bottom outlet - K00	6" oval	3.94"	177	0.39	
d	Bottom outlet - K40	6" oval	11.81"	306	0.68	
e	End outlet - K20	4" round	7.87"	132	0.29	
f	End outlet - K40	4" round	11.81"	171	0.38	
g	K1-308-6" outlet cap	6" oval	9.84"	233	0.52	
h	K1-408-6" outlet cap	6" oval	11.81"	264	0.59	
i	Type K1-901G	4" round	19.30"	226	0.50	
j	Type K1-901G	4" round	25.67"	265	0.59	
k	Type K1-901G	4" round	29.30"	263	0.59	
l	Type K1-901G	4" round	18.56"	222	0.49	
m	Type K1-901G	6" round	25.85"	586	1.30	
n	Type K1-901G	6" round	26.43"	269	0.60	
o	Type K1-901G	4" round	19.36"	227	0.51	
p	Type K1-901G	6" round	27.30"	604	1.35	
q	Type K1-901G	6" round	19.99"	505	1.12	
r	Type K1-901G	6" round	26.43"	593	1.32	
s	Type K1-901G	8" round	27.30"	1051	2.34	
t	Type K1-901G	4" round	27.17"	273	0.61	
u	Type K1-901G	4" round	20.68"	235	0.52	
v	Type K1-901G	6" round	18.99"	224	0.50	
w	Type K1-901G	6" round	27.17"	6.02	1.34	

**Notes:** These are the size flow rates at the specified outlet. NOT channel flow rates. Catch basin flow rates are without trash basket - using trash basket reduces flow.



**CDS3020-6-C DESIGN NOTES**

THE STANDARD CDS3020-6-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

**CONFIGURATION DESCRIPTION**

GRATED INLET ONLY (NO INLET PIPE)	
GRATED INLET WITH INLET PIPE OR PIPES	
CURB INLET ONLY (NO INLET PIPE)	
CURB INLET WITH INLET PIPE OR PIPES	
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)	
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS	

**SITE SPECIFIC DATA REQUIREMENTS**

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	
PEAK FLOW RATE (CFS OR L/s)	
RETURN PERIOD OF PEAK FLOW (YRS)	
SCREEN APERTURE (2400 OR 4700)	
PIPE DATA	
INLET PIPE 1	
INLET PIPE 2	
OUTLET PIPE	
RIM ELEVATION	
ANTI-FLOTATION BALLAST	
NOTES/SPECIAL REQUIREMENTS:	
* PER ENGINEER OF RECORD	

**FRAME AND COVER (DIAMETER VARIES) N.T.S.**

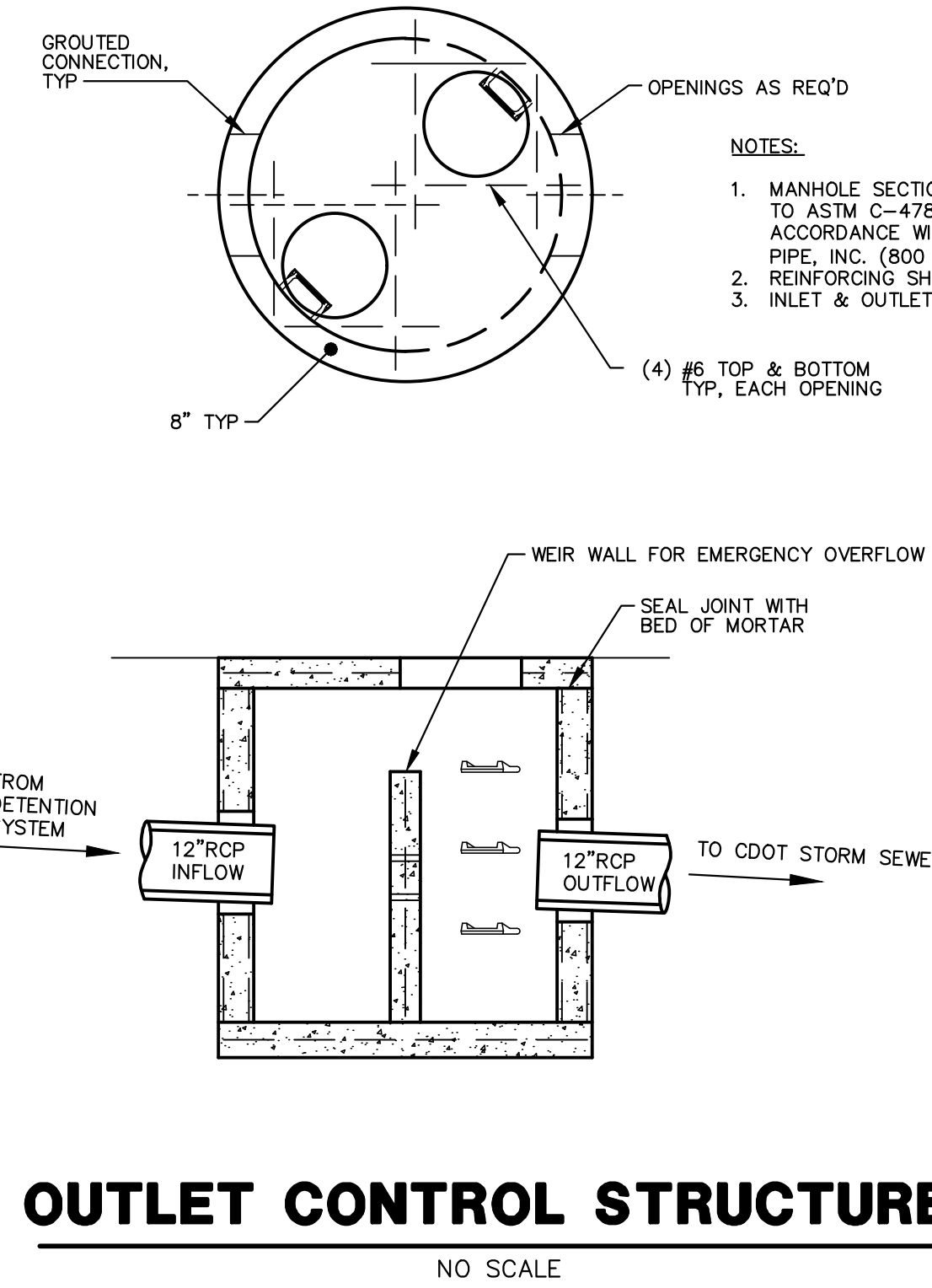
**GENERAL NOTES**

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. [www.contechES.com](http://www.contechES.com)
- CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- STRUCTURE SHALL MEET ASHITO HSD20 (ASHTO M 308) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
- PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

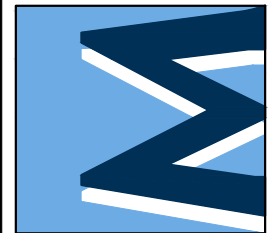
**INSTALLATION NOTES**

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

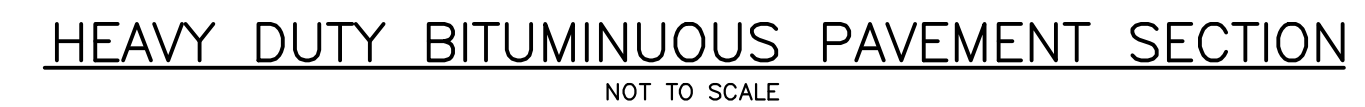
**CDS3020-6-C**  
**INLINE CDS**  
**STANDARD DETAIL**



DATE: 10/28/24	SHEET 35 OF 38	REV. DATE: 02/23/24	CAAD: ENG. CMW
REVISIONS:	PER ERWSD & IME REVIEW	08/19/24	FM: RCW
	PER ERWSD & IME REVIEW		TECH: RCW
			2/2026 D11



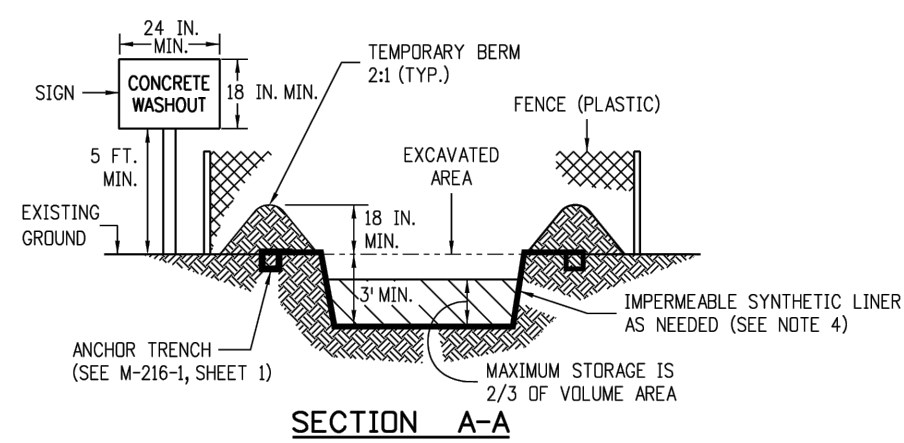
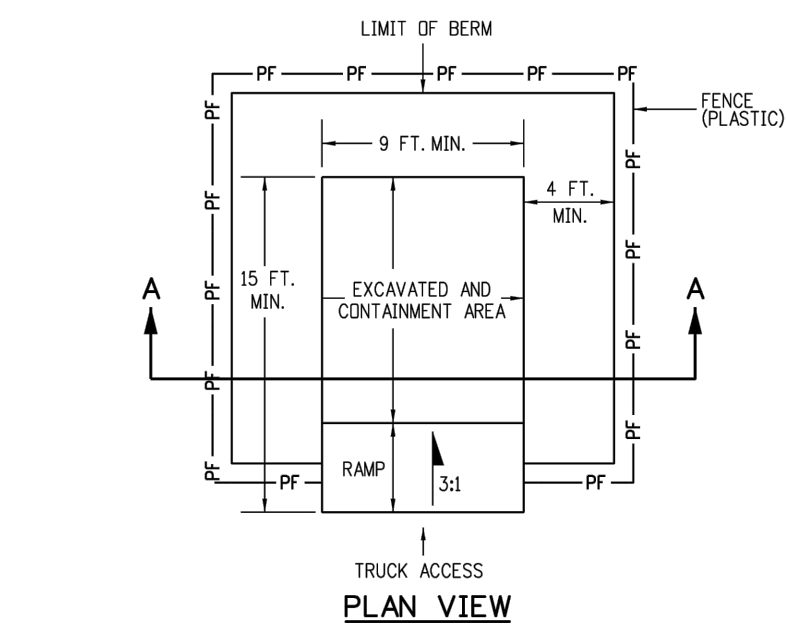






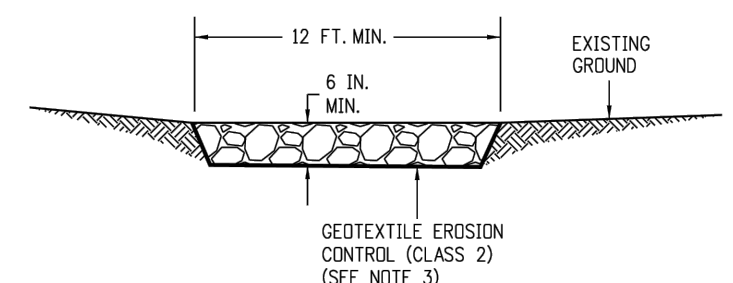
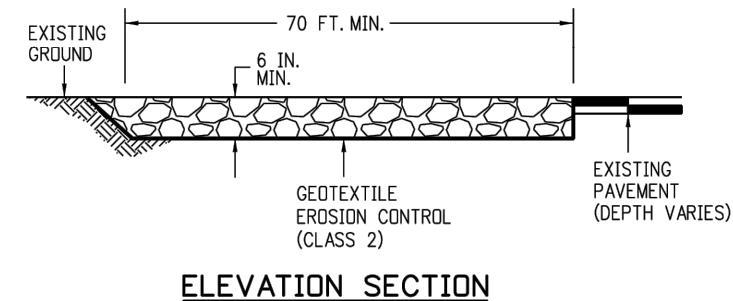
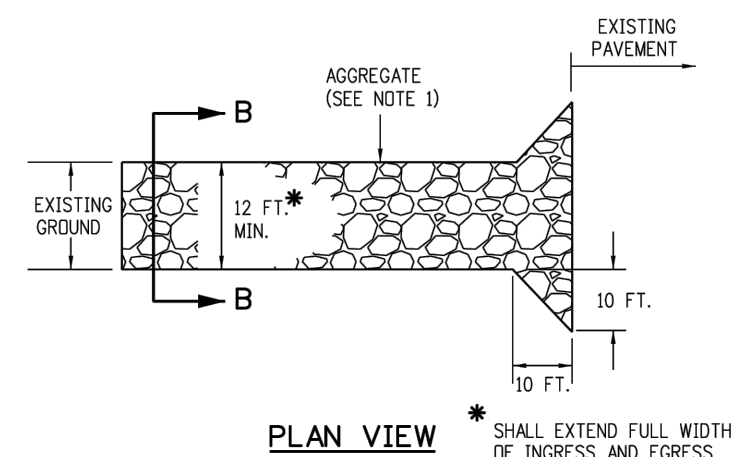






- NOTES:
1. A FENCE (PLASTIC) CONFORMING TO SECTION 607 SHALL BE INSTALLED AROUND THE CONCRETE WASHOUT AREA, EXCEPT AT THE OPENING.
  2. THE CONCRETE WASHOUT SIGN SHALL HAVE LETTERS AT LEAST 3 INCHES HIGH AND CONFORM TO SUBSECTION 630.02.
  3. ALL MATERIALS AND LABOR TO COMPLETE THE CONCRETE WASHOUT STRUCTURE SHALL BE INCLUDED IN THE COST OF WORK AND NOT PAID FOR SEPARATELY.
  4. THE BOTTOM OF EXCAVATION SHALL BE A MINIMUM OF FIVE FEET ABOVE GROUND WATER. IF NOT, THE BOTTOM OF EXCAVATION SHALL BE IN ACCORDANCE WITH 208.02 (J).
  5. THE PAY ITEM NUMBER FOR CONCRETE WASHOUT STRUCTURE (EACH) IS 208-00045.

#### CONCRETE WASHOUT STRUCTURE



- NOTES:
1. AGGREGATE SHALL CONFORM TO SUBSECTION 208.02 (I).
  2. THE CONTRACTOR SHALL PROTECT CURB AND GUTTER THAT CROSSES THE ENTRANCE FROM DAMAGE WHILE NOT BLOCKING FLOW OF WATER THRU STRUCTURE. PROTECTION OF THE CURB AND GUTTER SHALL BE INCLUDED IN THE COST OF WORK AND NOT PAID FOR SEPARATELY.
  3. GEOTEXTILE SHALL CONFORM TO SUBSECTION 712.08.
  4. ALL MATERIALS AND LABOR TO COMPLETE THE VEHICLE TRACKING PAD SHALL BE INCLUDED IN THE COST OF WORK AND NOT PAID FOR SEPARATELY.
  5. THE PAY ITEM NUMBER FOR VEHICLE TRACKING PAD (EACH) IS 208-00070.

#### VEHICLE TRACKING PAD

Computer File Information	
Creation Date:	07/31/19
Designer Initials:	JBK
Last Modification Date:	07/31/19
Detailer Initials:	LTA
CAD Ver.:	MicroStation V8 Scale: Not to Scale Units: English

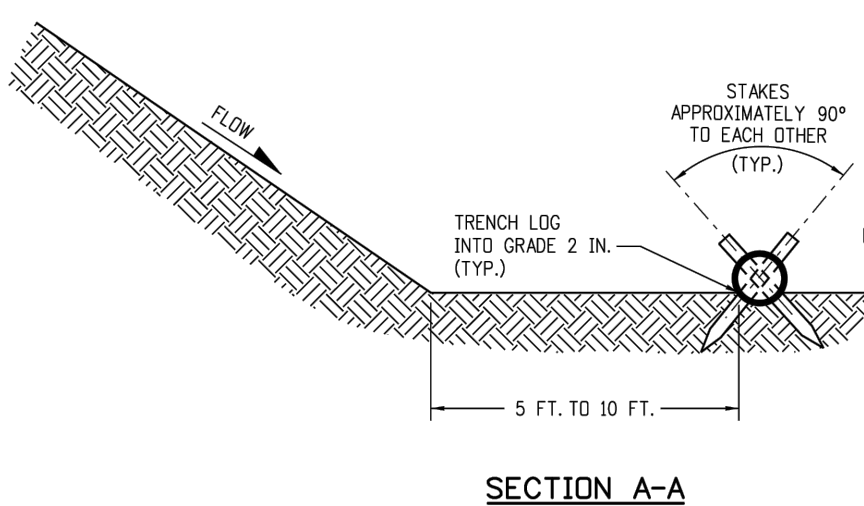
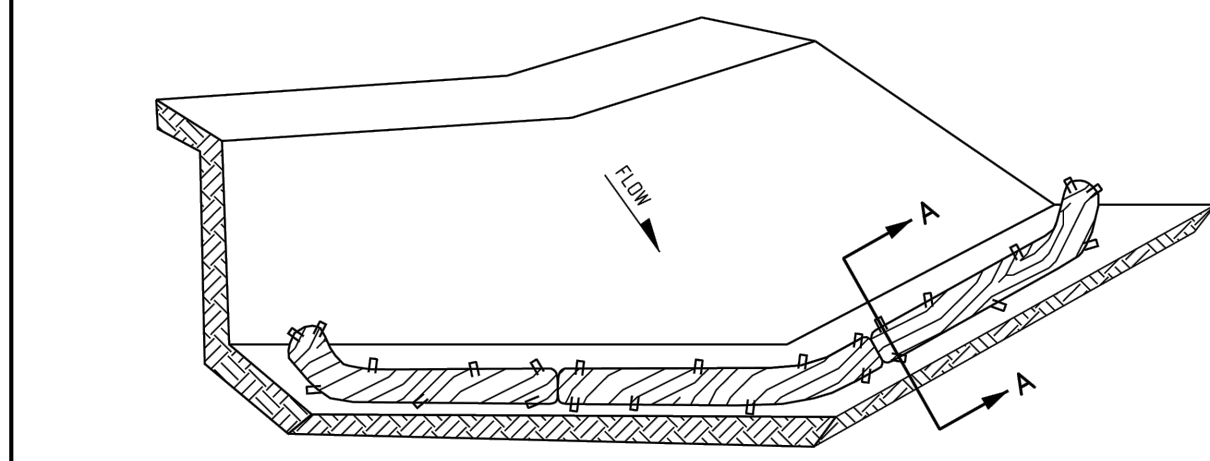
Sheet Revisions	
Date:	Comments

	Colorado Department of Transportation
	2829 West Howard Place CDOT HQ, 3rd Floor Denver, CO 80204 Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK	

### TEMPORARY EROSION CONTROL

Issued by the Project Development Branch: July 31, 2019

STANDARD PLAN NO.	
M-208-1	
Standard Sheet No. 1 of 11	
Project Sheet Number:	



- NOTES:
1. EROSION LOGS USED AT TOE OF SLOPE SHALL BE PLACED 5 TO 10 FEET BEYOND TOE OF SLOPE TO PROVIDE STORAGE CAPACITY.
  2. EROSION LOGS SHALL BE PLACED ON THE CONTOUR WITH ENDS FLARED UP SLOPE.
  3. SEE SHEET 2 OF 11 FOR JOINING LOGS DETAIL.

#### EROSION LOG TOE OF SLOPE PROTECTION

EROSION LOGS PAY ITEMS	
NUMBER	DESCRIPTION
208-00012	TYPE 1 (8 IN.)
208-00002	TYPE 1 (12 IN.)
208-00013	TYPE 1 (20 IN.)
208-00007	TYPE 2 (8 IN.)
208-00008	TYPE 2 (12 IN.)
208-00009	TYPE 2 (18 IN.)
208-00022	TYPE 3 (8 IN.)
208-00023	TYPE 3 (12 IN.)
208-00024	TYPE 3 (20 IN.)

#### TOE OF SLOPE PROTECTION APPLICATIONS

Computer File Information	
Creation Date:	07/31/19
Designer Initials:	JBK
Last Modification Date:	07/31/19
Detailer Initials:	LTA
CAD Ver.:	MicroStation V8 Scale: Not to Scale Units: English

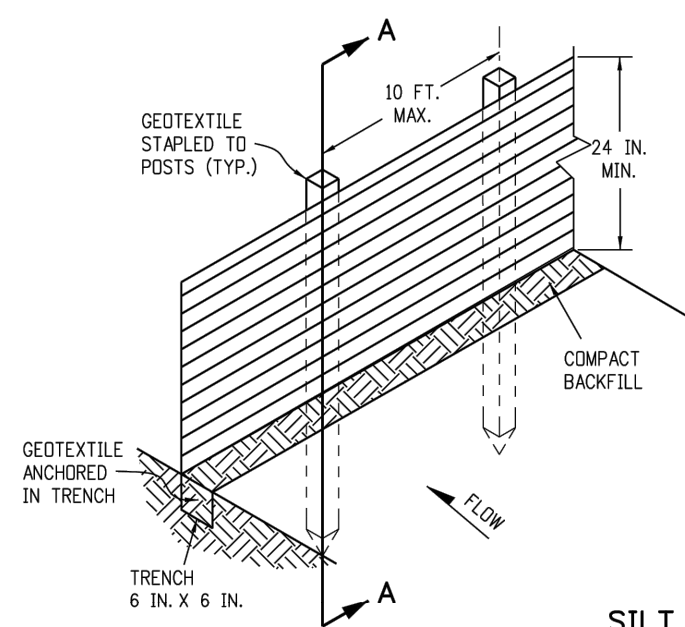
Sheet Revisions	
Date:	Comments

	Colorado Department of Transportation
	2829 West Howard Place CDOT HQ, 3rd Floor Denver, CO 80204 Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK	

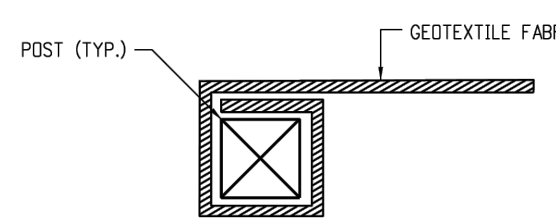
### TEMPORARY EROSION CONTROL

Issued by the Project Development Branch: July 31, 2019

STANDARD PLAN NO.	
M-208-1	
Standard Sheet No. 3 of 11	
Project Sheet Number:	

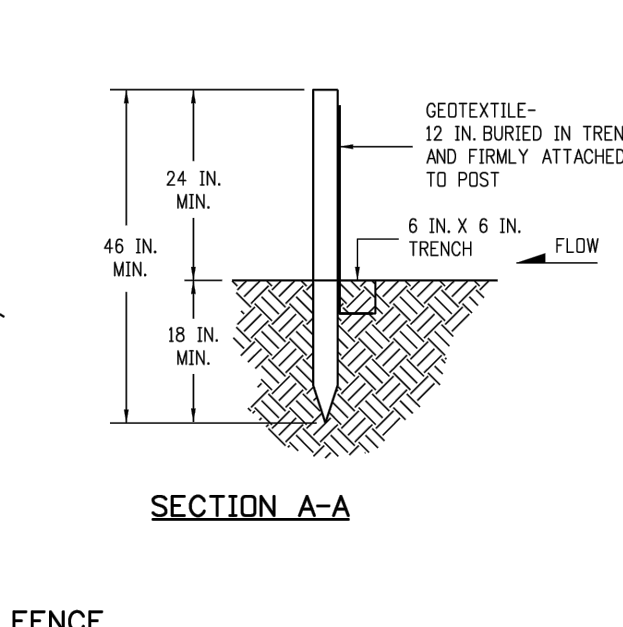


- NOTES:
1. GEOTEXTILE SHALL BE ATTACHED TO WOOD POSTS WITH THREE OR MORE STAPLES PER POST. STAPLES SHALL BE HEAVY DUTY WIRE AND AT LEAST 1 INCH LONG.
  2. WOOD POST SHALL BE 1 IN. X 1 IN. NOMINAL.
  3. THE PAY ITEM NUMBER FOR SILT FENCE (LF) IS 208-00020.
  4. THE SILT FENCE SHALL BE PLACED ON THE CONTOUR (AT THE SAME ELEVATION ±6 IN.). THE ENDS SHALL BE FLARED UP SLOPE (MINIMUM ELEVATION GAIN OF 18 IN.).

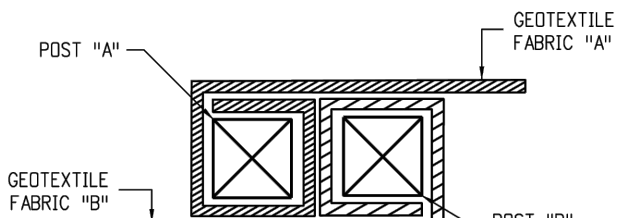


#### END SECTION DETAIL (PLAN VIEW)

- NOTE:
1. THE END OF THE SILT FENCE FABRIC SHALL BE WRAPPED APPROX. 6 INCHES AROUND A WOODEN POST ONE FULL TURN, THEN SECURED ALONG THE POST WITH 6 HEAVY DUTY WIRE STAPLES AT LEAST 1 INCH LONG.

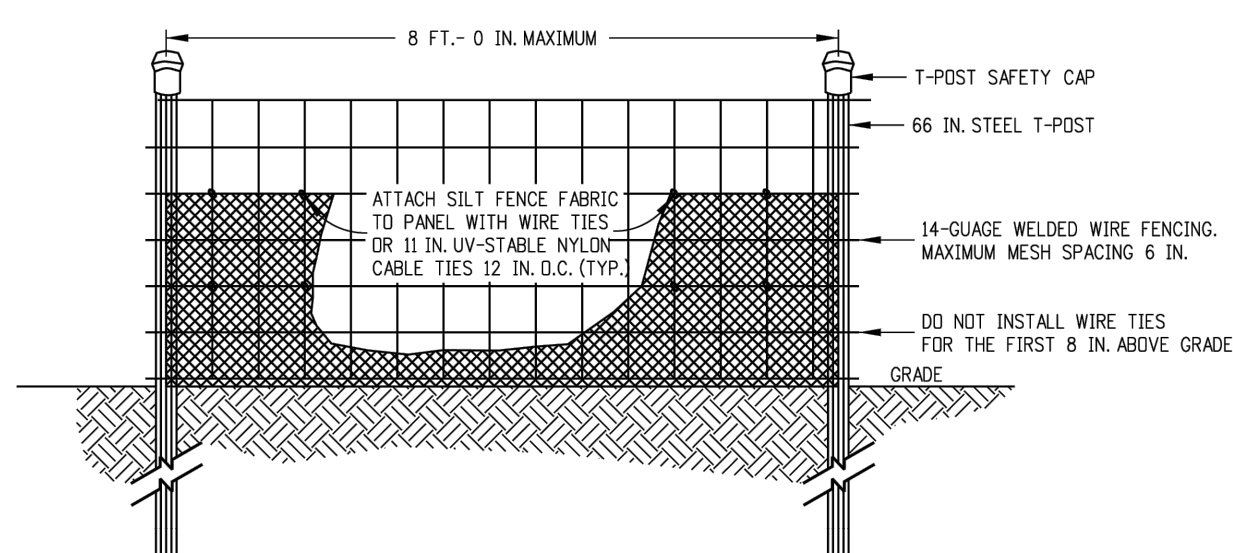


- NOTES:
1. THE ENDS OF THE SILT FENCE FABRIC SHALL BE JOINED TOGETHER BY WRAPPING APPROX. 6 INCHES OF EACH END AROUND A STEEL T-POST, THEN SECURED ALONG THE POST WITH WIRE TIES (MINIMUM 3 PER POST).
  2. POSTS SHALL BE 1 IN. X 1 IN. NOMINAL.
  3. THE PAY ITEM NUMBER FOR SILT FENCE (LF) IS 208-00020.
  4. THE SILT FENCE SHALL BE PLACED ON THE CONTOUR (AT THE SAME ELEVATION ±6 IN.). THE ENDS SHALL BE FLARED UP SLOPE (MINIMUM ELEVATION GAIN OF 18 IN.).

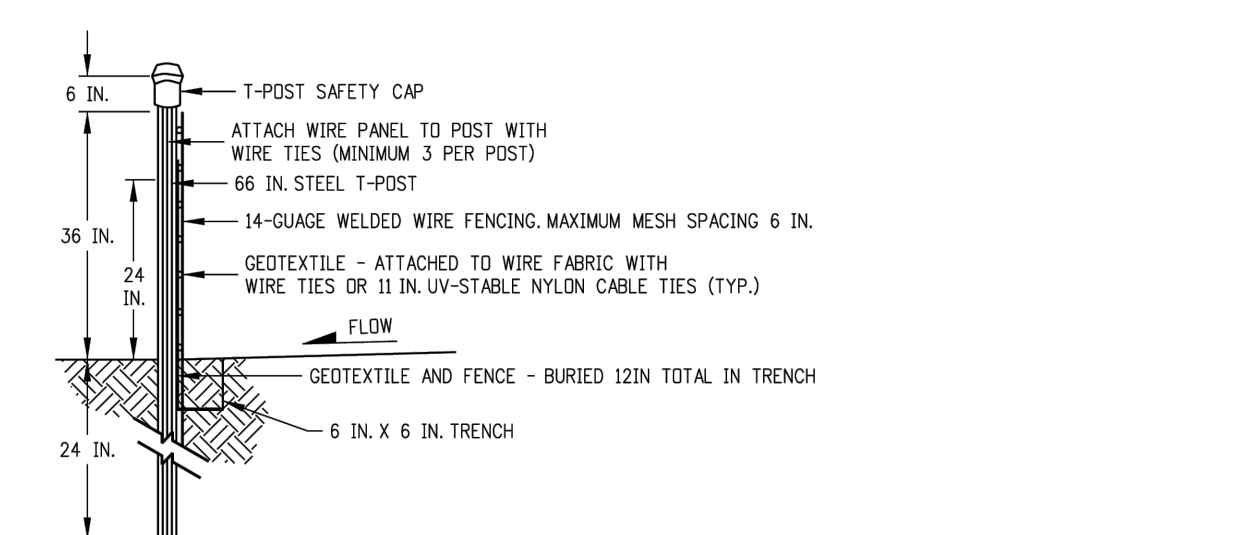


#### JOINING SECTION DETAIL (PLAN VIEW)

- NOTES:
1. THE ENDS OF THE SILT FENCE FABRIC SHALL BE JOINED TOGETHER BY WRAPPING APPROX. 6 INCHES OF EACH END AROUND A STEEL T-POST, THEN SECURED ALONG THE POST WITH WIRE TIES (MINIMUM 3 PER POST).
  2. POSTS SHALL BE 1 IN. X 1 IN. NOMINAL.
  3. THE PAY ITEM NUMBER FOR SILT FENCE (LF) IS 208-00020.
  4. THE SILT FENCE SHALL BE PLACED ON THE CONTOUR (AT THE SAME ELEVATION ±6 IN.). THE ENDS SHALL BE FLARED UP SLOPE (MINIMUM ELEVATION GAIN OF 18 IN.).



#### ELEVATION VIEW



#### SIDE VIEW

- NOTES:
1. THE ENDS OF THE SILT FENCE FABRIC SHALL BE JOINED TOGETHER BY WRAPPING APPROX. 6 INCHES OF EACH END AROUND A STEEL T-POST, THEN SECURED ALONG THE POST WITH WIRE TIES (MINIMUM 3 PER POST).
  2. POSTS SHALL BE 1 IN. X 1 IN. NOMINAL.
  3. THE PAY ITEM NUMBER FOR SILT FENCE (LF) IS 208-00020.
  4. THE SILT FENCE SHALL BE PLACED ON THE CONTOUR (AT THE SAME ELEVATION ±6 IN.). THE ENDS SHALL BE FLARED UP SLOPE (MINIMUM ELEVATION GAIN OF 18 IN.).

#### SILT FENCE (REINFORCED)

Computer File Information	
Creation Date:	07/31/19
Designer Initials:	JBK
Last Modification Date:	07/31/19
Detailer Initials:	LTA
CAD Ver.:	MicroStation V8 Scale: Not to Scale Units: English

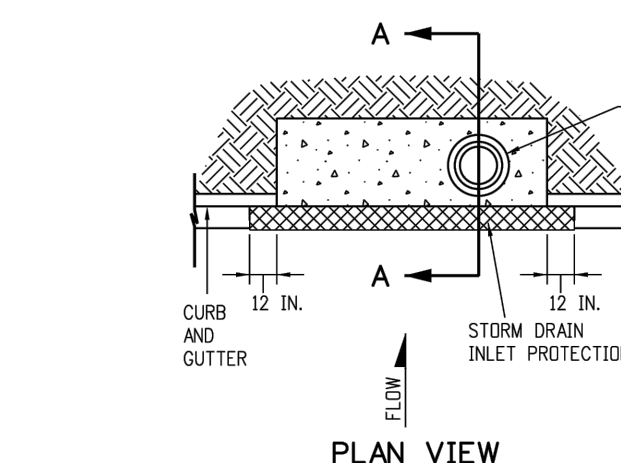
Sheet Revisions	
Date:	Comments

	Colorado Department of Transportation
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Project Development Branch JBK	

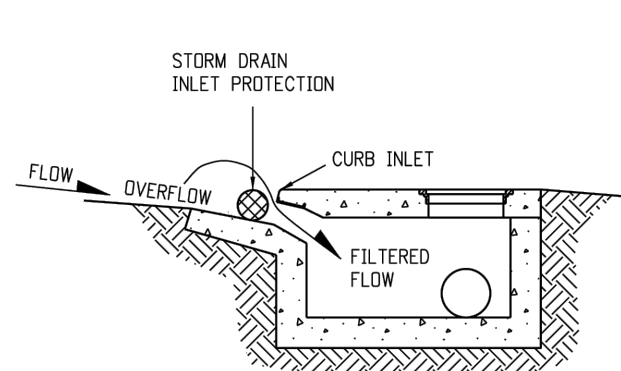
### TEMPORARY EROSION CONTROL

Issued by the Project Development Branch: July 31, 2019

STANDARD PLAN NO.	
M-208-1	
Standard Sheet No. 8 of 11	
Project Sheet Number:	



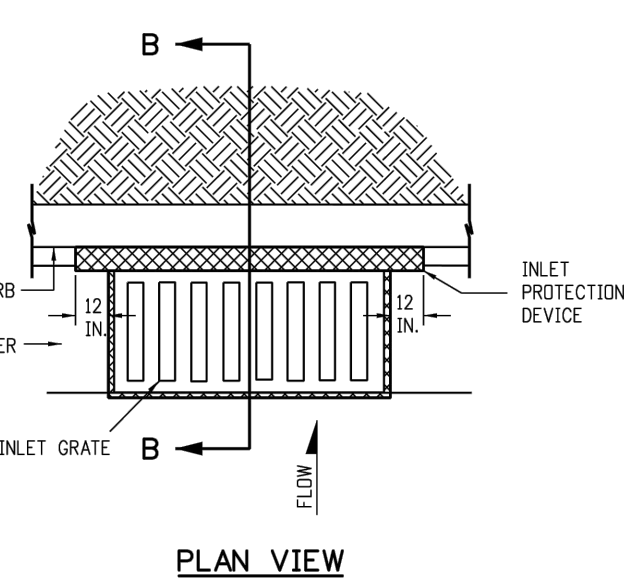
#### PLAN VIEW



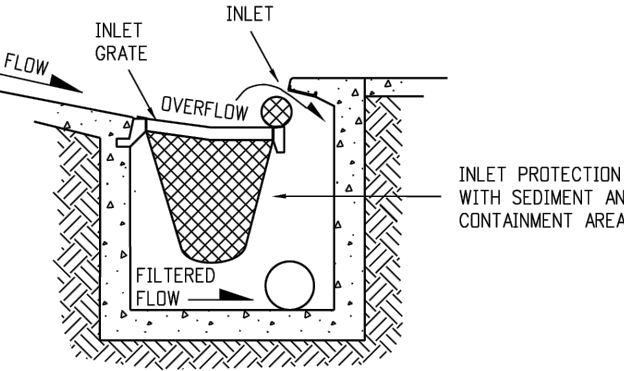
#### SECTION A-A

#### STORM DRAIN INLET PROTECTION (TYPE I)

- NOTES:
1. INLET PROTECTION DEVICE SHALL EXTEND 12 INCHES PAST EACH END OF THE INLET.
  2. THE PAY ITEM NUMBERS FOR STORM DRAIN INLET PROTECTION (TYPE I) ARE 208-00055 (LF), 208-00053 (84 INCHES EACH), 208-00057 (144 INCHES EACH), AND 208-00058 (204 INCHES EACH).
  3. FOR STORM DRAIN INLET TYPES I AND II, IF THERE IS A MINIMUM CLEARANCE OF 3 FEET FROM THE EDGE OF THE TRAVELED WAY TO THE FACE OF CURB, USE THE AGGREGATE BAGS AT STORM DRAIN INLET (TYPE I) DETAIL ON SHEET 4 INSTEAD.



#### PLAN VIEW



#### SECTION B-B

#### STORM DRAIN INLET PROTECTION (TYPE II)

#### OPTION A

#### STORM DRAIN INLET PROTECTION (TYPE II)

#### OPTION B

#### STORM DRAIN INLET PROTECTION (TYPE II)

#### OPTION C

#### STORM DRAIN INLET PROTECTION (TYPE II)

#### OPTION D

#### STORM DRAIN INLET PROTECTION (TYPE II)

#### OPTION E

#### STORM DRAIN INLET PROTECTION (TYPE II)

#### OPTION F

#### STORM DRAIN INLET PROTECTION (TYPE II)

#### OPTION G

#### STORM DRAIN INLET PROTECTION (TYPE II)

#### OPTION H

#### STORM DRAIN INLET PROTECTION (TYPE II)

#### OPTION I

#### STORM DRAIN INLET PROTECTION (TYPE II)

Computer File Information	
Creation Date:	07/31/19
Designer Initials:	JBK
Last Modification Date:	07/31/19
Detailer Initials:	LTA
CAD Ver.:	MicroStation V8 Scale: Not to Scale Units: English

Sheet Revisions	
Date:	Comments

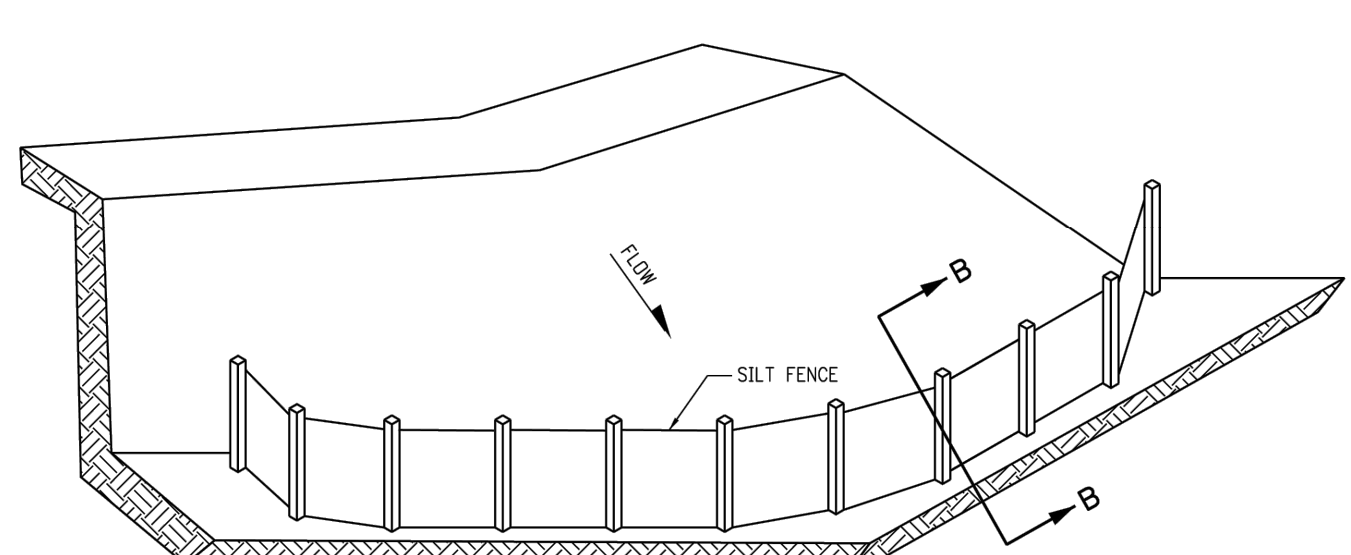
	Colorado Department of Transportation
	2829 West Howard Place CDOT HQ, 3rd Floor Denver, CO 80204 Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK	

### TEMPORARY EROSION CONTROL

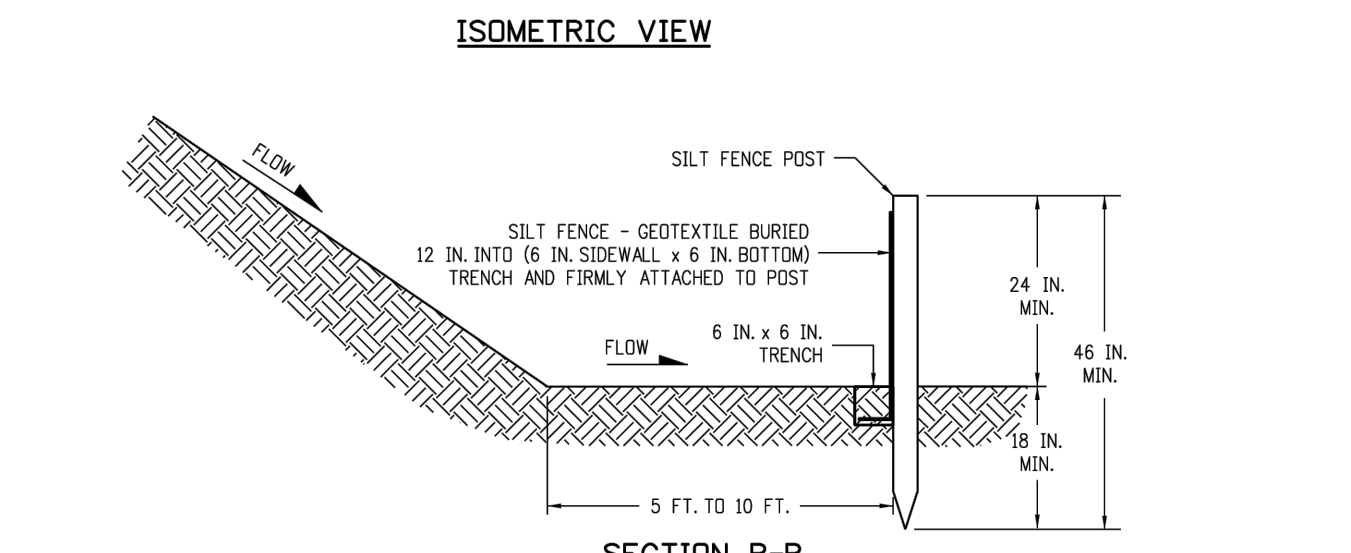
Issued by the Project Development Branch: July 31, 2019

STANDARD PLAN NO.	
M-208-1	
Standard Sheet No. 11 of 11	
Project Sheet Number:	

- NOTES
1. SILT FENCE SHALL HAVE A MAXIMUM DRAINAGE AREA OF ONE-QUARTER ACRE PER 100 FEET OF SILT FENCE LENGTH MAXIMUM SLOPE LENGTH BEHIND BARRIER IS 100 FEET.
  2. SILT FENCE USED AT TOE OF SLOPE SHALL BE PLACED 5 TO 10 FEET BEYOND TOE OF SLOPE TO PROVIDE STORAGE CAPACITY.
  3. SILT FENCE SHALL BE PLACED PARALLEL TO THE CONTOUR WITH ENDS FLARED UP SLOPE.
  4. THE MAXIMUM LENGTH OF EROSION LOGS OR SILT FENCES WITHOUT A FLARED END TURNING UPSLOPE IS 150 FEET.



#### ISOMETRIC VIEW



#### SECTION B-B

#### SILT FENCE TOE OF SLOPE PROTECTION

NOTE: THE PAY ITEM NUMBER FOR SILT FENCE (LF) IS 208-00020.

#### OPTION A

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION B

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION C

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION D

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION E

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION F

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION G

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION H

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION I

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION J

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION K

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION L

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION M

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION N

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION O

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION P

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION Q

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION R

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION S

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION T

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION U

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION V

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION W

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION X

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION Y

#### STORM DRAIN INLET PROTECTION (TYPE III)

#### OPTION Z

#### STORM DRAIN INLET PROTECTION (TYPE III)

60475

PROFESSIONAL ENGINEER





Mc:\civil\134\_P\p\0\2006\Site Plan\2006\DT1.dwg, 10/29/2024 2:45 PM, Colton M. Welton, 39 STORM WATER CONSTRUCTION SPECIFICATIONS 1, MCLLC PDF.pc3  
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CONSTRUCTION SPECIFICATIONS

THE FOLLOWING APPLICABLE CONSTRUCTION SPECIFICATIONS ARE A PORTION OF THE TOWN OF MINTURN ENGINEERING STANDARDS. TABLES, DRAWINGS, DETAILS AND EXHIBITS REFERENCED BELOW ARE INCLUDED IN THE TOWN STANDARDS.

CHAPTER 2 - SITE WORK/EARTHWORK/GRADING  
SECTION 1 - SCOPE

All site work and earthwork shall comply with the requirements of these STANDARDS AND SPECIFICATIONS and any special criteria established by the Town of Minturn. Site work shall be completed as shown on the approved engineering plans. Site work shall consist of demolition, removal, and abandonment; clearing and grubbing; overlot grading; removal of topsoil; site preparation; embankment subgrade preparation; embankment fill; excavation, trenching, bedding and backfill of pipelines and service lines; excess excavation; structure backfill; roadway excavation, backfill and compaction; borrow, and restoration and cleanup. All workmanship and materials shall be in accordance with the requirements of these STANDARDS AND SPECIFICATIONS and shall conform to the lines, grades, quantities, and the typical cross-sections shown on the approved plans, or as directed by the Town Engineer or as directed by the Engineer-of-Record (EOR).

1.01 - Inspections

A Grading Permit shall be required for all construction activities. Construction activities shall be subject to inspection by the Town Engineer, and certain types of construction shall have continuous inspection.

It shall be the responsibility of the person performing the work authorized by a permit to notify the Town Engineer or his authorized representative that such work is ready for inspection. Every request for inspection shall be filed at least one (1) working day before such inspection is desired unless otherwise stated in these STANDARDS AND SPECIFICATIONS. An inspection request may be in writing or by telephone, at the option of the Town Engineer.

It shall be the responsibility of the person requesting an inspection required by these STANDARDS AND SPECIFICATIONS to provide access to and means for proper inspection of all work. All work shall be inspected by the Town Engineer or his designated representative. The Town Engineer has the authority to halt construction when, in his opinion, these STANDARDS AND SPECIFICATIONS and/or standard construction practices are not being followed, or the work is otherwise defective. Whenever any portion of these STANDARDS AND SPECIFICATIONS are violated, the Town Engineer shall give the Contractor written notice listing deficiencies to be corrected and may order further construction stopped until all deficiencies are corrected. If the deficiencies are not corrected within the time limit specified in the notice, the Town Engineer may invoke enforcement options authorized by the Minturn Municipal Code and/or draw upon performance guarantees under which the work is being performed.

For small commercial developments, Minturn may require the development to hire a qualified private contract inspection professional or a Colorado Registered Professional Engineer at the developer's cost to certify to Minturn that the work was completed in accordance with these STANDARDS AND SPECIFICATIONS.

Landscaping that is privately owned and maintained by a Homeowners Association (HOA) or other property management entity shall be designed and constructed in accordance with these STANDARDS AND SPECIFICATIONS. Compliance to these STANDARDS AND SPECIFICATIONS shall be certified by a qualified third party approved by Minturn and paid by the developer. Minturn shall assist with inspection of the irrigation system for the landscaping.

Adequate inspections assure compliance to the Town of Minturn requirements and are the basis for the town's recommendation that said improvements be accepted for maintenance and for release of performance guarantees. It is the responsibility of the Contractor to contact the Town Engineer a minimum of one (1) full working day (twenty-four [24] hours) in advance of the required inspections. Required inspections shall include:

- A. Erosion Control: Ensure that the Erosion Control Plan is adhered to and Best Management Practices (BMP's) are properly installed and maintained.
- B. Geotechnical Testing: Verify that a Colorado Registered Professional Engineer (or designated representative), who practices the field of Geotechnical Engineering, is onsite and that adequate testing is performed. Full-time observation and testing is required for over-excavation work.
- C. Grade Certification: Verify that the extent and depths of proposed work is certified. Verify the final grade.

The Contractor shall provide access to all Minturn Inspectors/Representatives, and all other project quality control (QC) and/or quality assurance (QA) personnel throughout the earthwork process for observation and testing purposes. The Contractor shall not proceed with work until the project Soils Engineer has performed adequate observations and testing, unless approved by the Town Engineer.

All testing and retesting to meet requirements and specifications shall be at the Contractor's or owner's expense.

SECTION 2 - DEMOLITION, REMOVAL AND ABANDONMENT

The Contractor shall remove—wholly or in part—and satisfactorily dispose of all foundations, structures, fences, old pavements, abandoned pipelines, and any other obstructions which are not designated on the approved plans or allowed to remain.

Where portions of structures shall be removed, the remaining parts shall be prepared to accommodate the new construction. The work shall be performed in such a manner that materials left in place shall be protected from damage. All damage to portions of structures to remain shall be repaired at the Contractor's expense.

2.01 - Disposal

The Contractor shall make all necessary arrangements for obtaining suitable disposal locations. If disposal shall be at other than established dumpsites, the EOR may require the Contractor to furnish written permission from the property owner on whose property the materials and debris is proposed to be placed. Materials and debris shall be disposed of in a manner approved by the Town Engineer. Burning shall not be allowed without prior written approval of the Town of Minturn.

2.02 - Salvage

All salvageable material shown on the approved plans and any additional salvageable material marked by the EOR shall be removed without unnecessary damage in sections or pieces which may be readily transported and shall be stored by the Contractor in locations approved by the EOR. The Contractor shall be required to replace any materials lost from improper storage methods or damaged by negligence. These materials include, but shall not be limited to, manhole frames and covers; inlet grates; valves and jre hydrants; landscape plant materials; fence materials; handrails; culverts; guardrail; walkway; roadway and traffic appurtenances (traffic signals and attached hardware, including mast arms and span wire) and irrigation systems and appurtenances.

2.03 - Pipe and Appurtenances

All pipe and appurtenances to be taken out of service shall be completely removed or abandoned in place, as required by the EOR.

Pipe designated to be reused shall be removed and stored, when necessary, to prevent loss or damage before re-laying.

Excavation required to remove pipe or appurtenances shall be back filled and compacted in accordance with Section 5 - TRENCHING, BACKFILLING AND COMPACTING of these STANDARDS AND SPECIFICATIONS.

When pipe is to be abandoned in place, it shall be completely filled with fly ash slurry composed of approximately sixty-five (65) percent Class C Fly ash and thirty-five (35) percent water, unless otherwise approved by the EOR. Each end of the pipe shall be capped with concrete.

When removing appurtenances such as manholes, catch basins, inlets etc., any live lines connected to these appurtenances shall be properly bypassed and shall remain in operation until abandonment is complete.

When appurtenances are to be abandoned in place, the remaining structure shall be lowered to a minimum of three (3) feet below finished grade, and shall be filled with concrete with a minimum compressive strength of 3000 psi (at 28 days) to the top of the remaining structure and then backfilled and compacted to the required grades.

2.04 - Pavement and Concrete Flatwork

All concrete or asphalt to remain shall have a straight, true break line and a vertical face. Concrete or asphalt may be cut with a cutting wheel, jackhammer, or saw. The EOR may require that saw-cutting be performed. Any damage to adjacent concrete or asphalt to remain in place shall be repaired at the Contractor's expense. The minimum depth of saw cuts in concrete shall be two (2) inches.

If areas cut for future placement of concrete or asphalt adjacent to existing asphalt or concrete are left exposed for longer than thirty (30) days or are subjected to inclement weather, the areas shall be evaluated by a Geotechnical Engineer and a recommendation shall be provided to the EOR. An additional cut of at least six (6) inches behind and/or below the existing structure—or until competent subgrade is encountered—may be required by the EOR.

SECTION 3 - SITE PREPARATION

SECTION 3 - SITE PREPARATION

3.01 - Clearing

All sites to receive fill shall be cleared of organic materials, including root structures, at the Contractor's expense. Vegetation shall be pulled or grubbed in such a manner as to assure complete and permanent removal. Branches of trees extending over the roadbed shall be trimmed to give a clear height of twenty (20) feet above the road bed surface. All surface objects and trees, stumps, roots, and other protruding obstructions not designated to remain shall be cleared and/or grubbed as required. Non-biodegradable, solid objects located at least two (2) feet below the final subgrade surface may remain at the discretion of the EOR.

The EOR may establish clearing lines and designate items and materials to remain. The Contractor shall preserve all materials and items to remain. Paint used for cut or scarred surfaces of trees or shrubs to remain shall be an approved asphalt base paint formulated especially for tree surgery.

Except in areas to be excavated, stump holes and other holes from which obstructions are removed shall be backfilled with suitable material and compacted in accordance with these STANDARDS AND SPECIFICATIONS.

The Contractor shall scalp areas where excavation or embankment shall be made. Scalping shall include the removal of organic material such as brush, roots, sod, grass, residue of agricultural crops, sawdust, and vegetable matter from the surface of the ground.

An overlot grading summary report prepared by the project Soils Engineer which states that fill placement is in conformance to approved plans and reports and includes locations and elevations of field density tests (referenced from a permanent landmark or permanent control point), summaries of field and laboratory tests and any other substantiating data and comments regarding deviations from the approved plans and reports and how they relate to or affect recommendations in the approved Geotechnical Engineering Report and grading plan.

SECTION 4 - EARTHWORK

Earthwork shall consist of excavation, disposal, shaping and compaction of all material encountered within the limits of the project, including but not limited to excavation of ditches and channels, surface boulders, muck, rock, concrete foundations, slabs, stripping, etc. Excavation shall be performed to the line and grade and typical cross-sections shown on the approved plans or as required by the EOR. Free-running water shall be drained from all earthwork materials prior to construction of structures, utilities, or concrete 4atwork construction.

4.01 - Definitions

- A. **Suitable Material:** Any earthen material that consists of onsite or similar non-organic sands, gravels, clays, silts and mixtures thereof with a maximum size of six (6) inches. Claystone fragments exceeding three (3) inches in particle size are not to be incorporated in embankment material unless specifically approved by the project Soils Engineer and the EOR.
- B. **Bedrock:** Bedrock that breaks down to specified soil types and sizes during excavation, hauling and placement may be considered as suitable material.
- C. **Rock Excavation:** Igneous, metamorphic or sedimentary rock formations that cannot be excavated with a D-9 tractor in good repair with a single hydraulic ripper.

4.02 - Borrow

It shall be the Contractor's responsibility to stockpile suitable materials for use in the project. Only after the Contractor estimates that sufficient suitable backfill material is stockpiled to complete all earthwork operations of the project, shall excavated material be removed from the project site.

If the Contractor fails to preserve onsite, sufficient suitable material, and removes or disposes of suitable material, suitable material shall be recovered at the Contractor's expense.

4.03 - Embankment Construction

Embankment construction shall include placement, processing and compaction of all embankment material, and all related work required to ensure proper bond of materials with previously placed embankment material.

- A. **Preparation of Embankment Subgrade:** The grade shall be maintained so that the surface is well drained at all times. When necessary, temporary drain systems shall be installed to intercept or divert surface water that may affect the work.

Where an embankment shall be constructed, unsuitable material shall be removed from the surface. The cleared surface shall be plowed or scarified to a minimum depth of six (6) inches. The embankment area shall adhere to the density and moisture content requirements shown in the following table, unless otherwise approved by the project Soils Engineer and the EOR:

TABLE 2.01

<i>Soil Classification</i> AASHTO M145	<i>Relative Compaction by Standard Proctor</i> ASTM D698 or AASHTO T99 (percent compaction)	<i>Relative Compaction by Modified Proctor</i> ASTM D1557 or AASHTO T180 (percent compaction)	<i>Moisture Content Range (with respect to Optimum Moisture Content)</i>
A-1, A-2, A-3	—	95	+2 to +2 (based on AASHTO T180)
A-4, A-5, A-6	95	—	+1 to +3 (based on AASHTO T99)

If equipment is deemed inadequate, the project Soils Engineer and/or the EOR may recommend the use of larger or different types of equipment.

After subgrade is properly prepared, the embankment filling operation shall begin in the deepest part of the area to be filled. Embankment material shall be placed and compacted in parallel layers until the finished rough grade is reached. Temporary gaps through the embankment shall not be allowed without approval of the EOR. All temporary slopes shall not be steeper than 4:1 (horizontal:vertical).

The thickness of each layer shall not exceed six (6) inches before compacting.

- B. Embankments Greater Than Twelve (12) Feet in Height

Compaction operations shall continue until each layer of embankment material for embankments greater than twelve (12) feet in height is compacted to the moisture and density requirements shown in the following table, unless otherwise required by the project Soils Engineer and the EOR.

TABLE 2.02

<i>Soil Classification</i> AASHTO M145	<i>Relative Compaction by Standard Proctor</i> ASTM D698 or AASHTO T99 (percent compaction)	<i>Relative Compaction by Modified Proctor</i> ASTM D1557 or AASHTO T180 (percent compaction)	<i>Moisture Content Range (with respect to Optimum Moisture Content)</i>
A-1, A-2, A-3	—	96	+2 to +2 Based on AASHTO T180
A-4, A-5, A-6	100	—	+1 to +2 (based on AASHTO T99)

4.04 - Excavation

It is the sole responsibility of the Contractor to become familiar with the existing conditions and potential excess excavation at each project site. Geotechnical reports or other data provided by Minturn may be used to assist in determining general site and soil characteristics.

4.05 - Structure Backfill

Structure backfill shall comply with Section 4.01 Definitions of these STANDARDS AND SPECIFICATIONS. Structure backfill material shall have a liquid limit not exceeding thirty-five (35) and a plasticity index less than fifteen (15), as determined by AASHTO T 89 and T 90, unless otherwise approved by the project Soils Engineer and the EOR.

Areas adjacent to structures and other areas inaccessible to mobile compaction equipment shall be compacted with suitable power-driven hand tampers or other approved devices. Backfilling shall consist of placing materials in horizontal, uniform layers brought up uniformly on all sides of the structure. The thickness of each layer of back fill shall not exceed SIX (6) inches before compacting to the required density.

Backfill material shall not be deposited against the back of concrete abutments, concrete retaining walls, or the outside of cast-in-place concrete structures until the concrete has developed a strength of not less than eighty (80) percent of the required design strength. Backfill placed within two (2) feet of any structure shall be placed evenly on all sides to avoid unequal lateral pressures.

In the event that suitable backfill material is not available on the site, the Contractor shall import Class 1 structure backfill materials as defined in Section 4.01 Definitions of these STANDARDS AND SPECIFICATIONS, or other material approved by the project Soils Engineer and the EOR. The Contractor shall not be required to excavate below the depths of excavation indicated on the approved plans to provide structure backfill material.

The Contractor shall uniformly process, maintain proper moisture in, and properly compact each lift throughout the backfilling process. All testing shall comply with Section 5.07 Compaction Testing of these STANDARDS AND SPECIFICATIONS.

SECTION 5 - TRENCHING, BACKFILLING AND COMPACTION

This work shall consist of furnishing all labor, materials, tools and equipment for trenching, bedding, backfill and compaction for all underground utilities (inclusive of "dry" utility trenches located under roadways or within roadway R.O.W.) as specified herein and shown on the approved plans. The excavation shall be made to lines and grades shown on the approved plans and as established by the EOR. Except where shown otherwise on the approved plans and except where the EOR gives written permission to do otherwise, all trench excavation shall be made by open cut to the depth required to construct the pipelines as shown on the approved plans. All excavation shall be "unclassified", as defined in Section 4.01 Definitions of these STANDARDS AND SPECIFICATIONS. All trenching shall be performed in accordance with all Occupational Safety and Health Administration (OSHA) requirements. These regulations are described in Subpart P, Part 1926 of the Code of Federal Regulations.

All excavated material which meets the requirements for backfill materials shall be stockpiled in a manner which shall not contaminate the excavated material, and shall be located a sufficient distance from the trench to avoid overloading, to avoid obstructing sidewalks, driveways, or streets, and to provide the least possible interference with traffic

5.01 - Special Conditions

- A. Subsurface Investigation: Prior to the connection of any planned utility line to an existing line, the Contractor shall expose the existing utility at the points of connection in order to verify the elevations and materials of construction. The EOR shall be notified a minimum of two (2) working days before such an investigation is performed. The Contractor shall also expose utilities as they cross each other to allow for verification of elevation and materials of construction. The EOR shall evaluate this information and provide revisions, if required, within three (3) working days of the completion of the investigation.
- B. Underground Wire, Cable, Fiber Optic, or Similar Lines: Where underground wire, cable, fiber optic or similar lines are encountered, they shall be relocated as directed by the telephone service provider and in accordance with their specifications. The Contractor shall coordinate this work with all other phases of construction to avoid further conflicts.
- C. Gas and Electric Lines: Where underground gas and electric lines are encountered, they shall be relocated as directed by the gas and electric service provider and in accordance with their specifications. The Contractor shall coordinate this work with all other phases of construction to avoid further conflicts.

5.02 - Removal of Water

The Contractor shall provide and maintain adequate equipment to properly remove and dispose of all surface or ground water that enters the trench. Water shall be disposed of without damage to adjacent property and without being a nuisance to public health and convenience. The use of any sanitary sewer to dispose of trench water shall not be allowed. The trench shall be dry at all times during pipe installation. Dewatering shall be accomplished by well points, sumping or any other method approved by the Engineer.

5.03 Trench Excavation for Pipelines and Service Lines

The width of the trench shall comply with the requirements set forth in these STANDARDS AND SPECIFICATIONS and shall be sufficient to allow pipe to be installed and backfill placed and compacted. The allowable trench width, regardless of the type of soil encountered, the depth of excavation or method of bedding densification, shall not exceed the outside diameter of the pipe barrel plus twenty-four (24) inches, or be less than the outside diameter of the pipe barrel plus twelve (12) inches when measured at any point below the top of the pipe bell, flange or collar.

Where the width of the lower portion of the trench exceeds the maximum width herein stated, the Contractor shall furnish and install special pipe embedment or concrete encasement to protect the pipe from the additional loading. The type and quantities of special pipe embedment shall be determined by the pipe supplier, using trench loading criteria based upon saturated backfill weighing one-hundred twenty (120) pounds per cubic foot and allowance for other superimposed live loads.

- A. Preparation of Foundation for Pipe Laying: When the excavation is in firm earth, care shall be taken to avoid excavation below the established grade plus the required specified over-depth to accommodate the pipe bedding material.

In case soft or otherwise unsuitable foundation material is encountered in the bottom of the trench, the project Soils Engineer and/or the EOR may require removal and replacement with stabilization material to provide a suitable foundation for the pipe. If the trench bottom is wet, the project Soils Engineer shall determine whether it is stable. The bottom of sumps utilized for dewatering shall be two (2) inches minimum below the bottom of the trench excavation to prevent the upward flow of water into the excavation, which may result in unstable bottom conditions.

5.04 - Bedding for Pipelines and Service Lines

See Sheets C.500 and C.501 for Specifications for Bedding Requirements for Water Mains, Sewer Mains and water and sewer Service Lines.

Bedding material type and placement for storm sewer pipe shall be that specified in the latest version of the "Standard Plans M&S Standards" Plan No. 5 M-603-1 through M-603-3 for metal, plastic, and reinforced concrete pipe.

5.05 - Backfill for Pipelines and Service Lines

Suitable backfill shall be as defined in Section 4.01 Definitions of these STANDARDS AND SPECIFICATIONS. Clay and similar material with a liquid index in excess of thirty-five (35) and a plasticity index in excess of six (6), as determined in accordance with AASHTO T89 and T90, shall not be considered suitable for backfilling in trenches located in improved streets, roads, highways and thoroughfares, unless approved by the Town Engineer.

When the excavated material is unsuitable for compaction, import material shall be approved by the project Soils Engineer and the EOR prior to placement.

- A. Backfill Compaction: Trench backfill shall be placed in loose six (6) inch lifts, processed and moisture-conditioned, and each lift thoroughly consolidated by tamping, vibrating, or a combination thereof, until the moisture content and the relative compaction complies with the values shown in the Moisture and Density Requirements for Embankment Materials table in Section 4.03 Embankment Construction of these STANDARDS AND SPECIFICATIONS for the various soil classifications and relative compaction.

For new landscape areas with trees, compaction shall be between eighty-five (85) and ninety (90) percent of the maximum Standard Proctor dry density in the top two (2) feet of soils below finished grade.

Where sidewalk or concrete trail will be constructed, soils shall be scarified, moisture treated and recompacted two (2) feet wider than the footprint of the sidewalk or trail until the moisture content and the relative compaction complies with the values shown in the table in Section 4.03 Embankment Construction.

Backfill of utilities, pipes, culverts, or other miscellaneous structures located in areas that will not have a hard surface shall be placed in six (6) inch lifts at ninety (90) percent of the maximum Standard Proctor dry density and within two (2) percent of the optimum moisture content. All other requirements for particle size and processing shall be met.

5.06 - Compaction Testing

Testing shall be performed at various depths and locations, and at all vertical structures. The project Soils Engineer and/or the EOR may require additional testing around structures, manholes, valve boxes, etc.

Field test results shall be submitted to the EOR within twenty-four (24) hours of the test or on the next working day. In no case shall fill or backfill be placed on materials that did not pass moisture and density testing.

Moisture and density testing shall be performed by a qualified technician who works under the direct supervision of a Colorado Registered Professional Engineer. Final soil compaction reports shall be prepared and signed by a Colorado Registered Professional Engineer, and who is qualified to prepare such reports. Reports shall be submitted to the EOR within one (1) week of the test.

SECTION 6 - RESTORATION AND CLEANUP



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CONSTRUCTION SPECIFICATIONS

THE FOLLOWING APPLICABLE CONSTRUCTION SPECIFICATIONS ARE A PORTION OF THE TOWN OF MINTURN ENGINEERING STANDARDS AND OTHER STANDARDS. TABLES, DRAWINGS, DETAILS AND EXHIBITS REFERENCED BELOW ARE INCLUDED IN THE TOWN STANDARDS.

SECTION 6 - RESTORATION AND CLEANUP

At all times during construction, the Contractor shall maintain the site, including partially finished structures, material stockpiles and other like areas, in a reasonable state of order and cleanliness.

The grade and condition of all unsurfaced areas shall be restored to a condition equal to or better than the grade and condition immediately prior to construction, unless otherwise shown in the approved plans and approved by the Town of Minturn. The Contractor shall restore or replace all seeded areas, sod, trees, landscaping materials, landscape irrigation systems, fences, and any other items, to a condition equal to or better than before the work began and to the satisfaction of the EOR.

All pavement and concrete flatwork shall be restored or replaced to a condition equal to or better than before the work began and to the satisfaction of the EOR.

CHAPTER 3 - EROSION CONTROL AND SEDIMENTATION

3.01 - Infiltration Practices

Infiltration practices include measures to percolate runoff into soils. Typical practices include rock-filled trenches or basins (dry wells) and diversion of storm runoff into vegetated areas. Directing water from impervious areas and allowing it to percolate reduces sediment transported off-site.

A. Maintenance

1. Clean out accumulated sediment and debris before the system fails to infiltrate storm runoff. It may be necessary to replace the upper layer of stone.
2. If rapid clogging occurs and pre-sedimentation BMP's cannot be placed upstream, install surface-maintained BMP's
3. Monitor observation well to evaluate whether soil is clogging or infiltration device is not performing as designed

4.01 - Silt Fences

Silt Fences are temporary barriers constructed of woven synthetic material, buried at the bottom, stretched and supported by posts. The goal of this BMP is to reduce velocity and pool sheet flow from an eroding area, allowing the sediment to settle. Silt fences can be used along the base of slopes, around stockpiles and at other discrete areas where erosion is likely to occur

A. Installation/ Design Guidelines

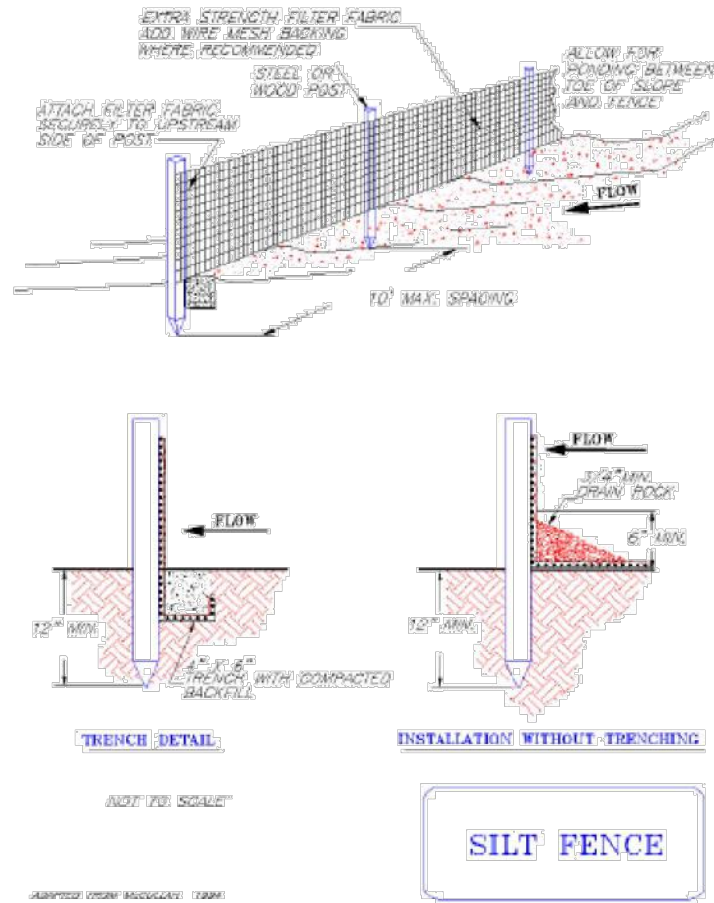
1. Use only in areas of dispersed low-velocity runoff. Less than 1/4 acre should drain to each 100 foot of fence.
2. Anchor fences along the contour below the toe of disturbed slopes. Place fences to pond, not □ iter, runoff. A minimum of five feet of potential ponding area is recommended between the fence and the toe of the slope.
3. Avoid placing silt fences in ditches, except where erosion potential is low
4. To properly install silt fence:
  - 4.1. Excavate a trench at least 6" deep, the length of the proposed barrier
  - 4.2. Place the bottom 6" to 1" of the fence material into the trench (see diagram).
  - 4.3. Drive posts at least 12" into the ground at intervals of 10' or less on the down gradient side of the trench
  - 4.4. Backfill and compact soil over the fence material in the trench.
  - 4.5. Secure the fence to the posts.
5. Minimize the number of joints between fences and overlap joints where they are unavoidable.
6. Silt fences should remain in place until vegetation has been established.

B. Special Considerations in Mountain Areas

1. Thin, rocky soils may preclude the use of this BMP.
2. Sediment traps, check dams, or berms are often better alternatives in rocky soils, especially where depth to bedrock is shallow.
3. Wire mesh and steel posts are recommended to reinforce the fence where rockfalls may occur, grading may place soils against fence, or near environmentally sensitive areas.
4. Leave enough area up gradient of the fence for runoff to pond and sediment to settle. Excavating up gradient of fence may be necessary to pond sufficient water to cause sediment deposition.
5. Silt fence often must be installed several times during construction due to changing slopes and hydrology of the site.

C. Maintenance

1. Check fences weekly and after rain or snowmelt.
2. Ensure silt fence material remains entrenched and anchored.
3. Look for rills under or around fences.
4. Replace torn or damaged sections of fence.
5. Remove excess sediment periodically, at a minimum when sediment reaches a depth of 8 inches.
6. Silt fences may only detain sediment for a period of weeks or months. Remove fabric, stakes, and accumulated sediments when there are has been successfully revegetated.



CHAPTER 4 - ROADWAY DESIGN & TECHNICAL CRITERIA

SECTION 1 - SIDEWALKS, CURBS AND GUTTERS, DRIVEWAYS, RAMPS, AND TRAILS

Curbs, gutters, and walks shall be constructed to comply with the approved details and Specifications.

1.01- Sidewalks

- A. Minimum Width: All sidewalks used in conjunction with vertical curb and gutter shall have a minimum width per the approved plans. Tooled or saw cut joints are required at 10 foot intervals.
- B. Minimum Thickness: All sidewalks used in conjunction with vertical curb and gutter shall have a minimum thickness of six (6) inches. All sidewalks shall consist of air-entrained (5%-7%), reinforced concrete (4000 psi) over a compacted six (6) inches of CDOT Class 6 ABC.
- C. Drainage and Grading: Sidewalks shall have a positive drainage towards the street flowline.

1.02 - Curb and Gutter

Curbs, gutters, and ramps shall be constructed to comply with the approved plans. All material for construction of driveway, drive ramp, curb and gutter, and drainage pan must be made with CDOT's concrete designation Class and minimum strength of 4000 psi, in 28 consecutive days.

1.03 - Driveways

All material for construction of driveway, drive ramp, curb and gutter, and drainage pan must be made with CDOT's concrete designation Class and minimum strength of 4000 psi, in 28 consecutive days.

9.00 SHALLOW UTILITIES (UNDER GROUND ELECTRIC, TELEPHONE, CABLE TELEVISION, NATURAL GAS & IRRIGATION)

9.01 SCOPE

Shallow utilities are defined as any wire, pipe conduit or cable and shall include but not be limited to underground electric, telephone, cable television, natural gas and irrigation water systems.

9.02 SPECIAL CONDUIT ENCASEMENT

Any shallow utility which crosses under or is within 5 feet horizontally of any road or street structure, including, pavement, curb and gutter, sidewalk, bike path, or bridge shall be encased in conduit so that repair or replacement of the utility may be accomplished without disturbing the road or street structure.

For natural gas and irrigation water systems, the carrier pipes for the natural gas and irrigation water shall be installed inside of a second pipe having strength equal to or greater than the carrier pipe and of sufficient diameter to allow free movement of the carrier pipe in the event that replacement is required.

It is recommended that consideration be given to the potential for future increase in size/capacity of the respective utility when sizing the conduit.

9.03 SHALLOW UTILITY INSTALLATION

- A. Electric system underground facilities shall be buried a minimum of 4.0 feet below finished grade. Electric system vaults and transformers shall be designed to be located and installed in areas that will not be subject to concentrated surface drainage flow.
- B. Telephone system underground facilities shall be buried a minimum of 2.0 feet below finished grade. Telephone pedestals shall be designed to be located and installed in areas that will not be subject to concentrated surface drainage flow.
- C. Cable television system underground facilities shall be buried a minimum of 2.0 feet below finished grade. Cable television risers and surface facilities shall be designed to be located and installed in areas that will not be subject to concentrated surface drainage flow.
- D. Natural gas system underground facilities shall be buried a minimum of 3.5 feet below finished grade.
- E. Whenever any shallow utility parallels or generally parallels a domestic water or sewer utility, a minimum horizontal separation of 4 feet shall be maintained between the domestic water or sewer main or service and the shallow utility. Where it must cross domestic water it must cross above and with a 1' minimum separation. Nonpotable water tape.



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MIDTOWN VILLAGE PUD

STORM WATER CONSTRUCTION SPECIFICATIONS 2

CLIENT

10TH MOUNTAIN BUILDERS

1632 MAIN STREET

MINTURN, CO 81645

JEFFREY D. ARMISTEAD

970-471-0618

MIDWESTERN

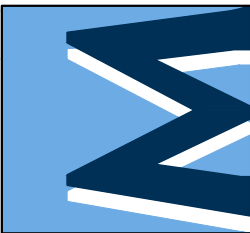
CONSULTING

3845 Plaza Drive Ann Arbor, Michigan 48108

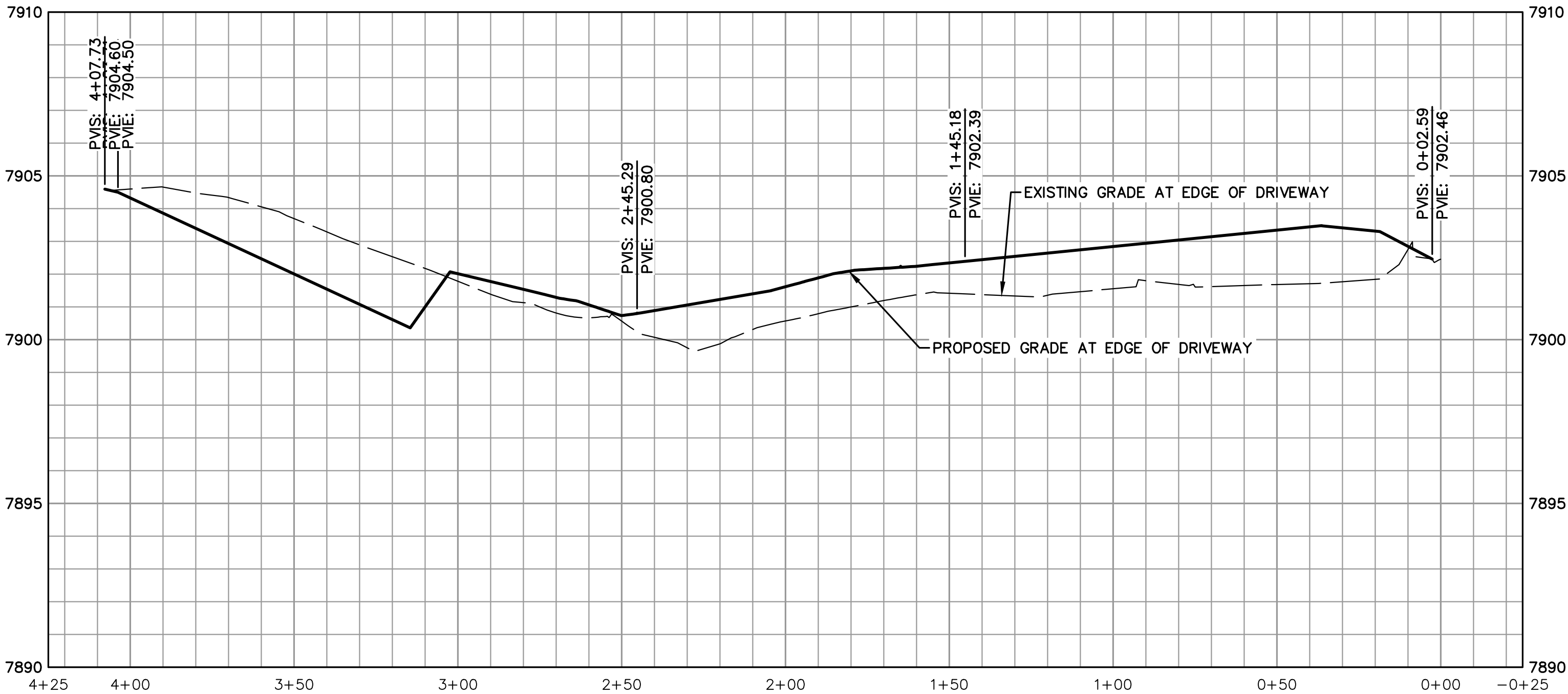
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Land Development • Land Survey • Institutional • Municipal

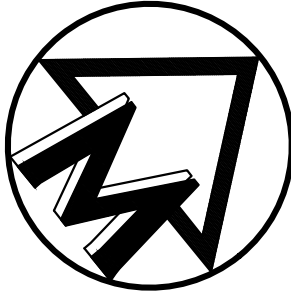
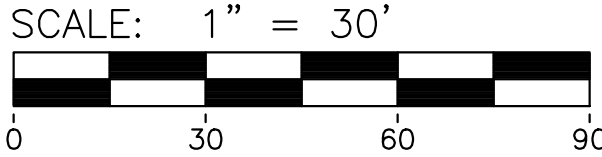
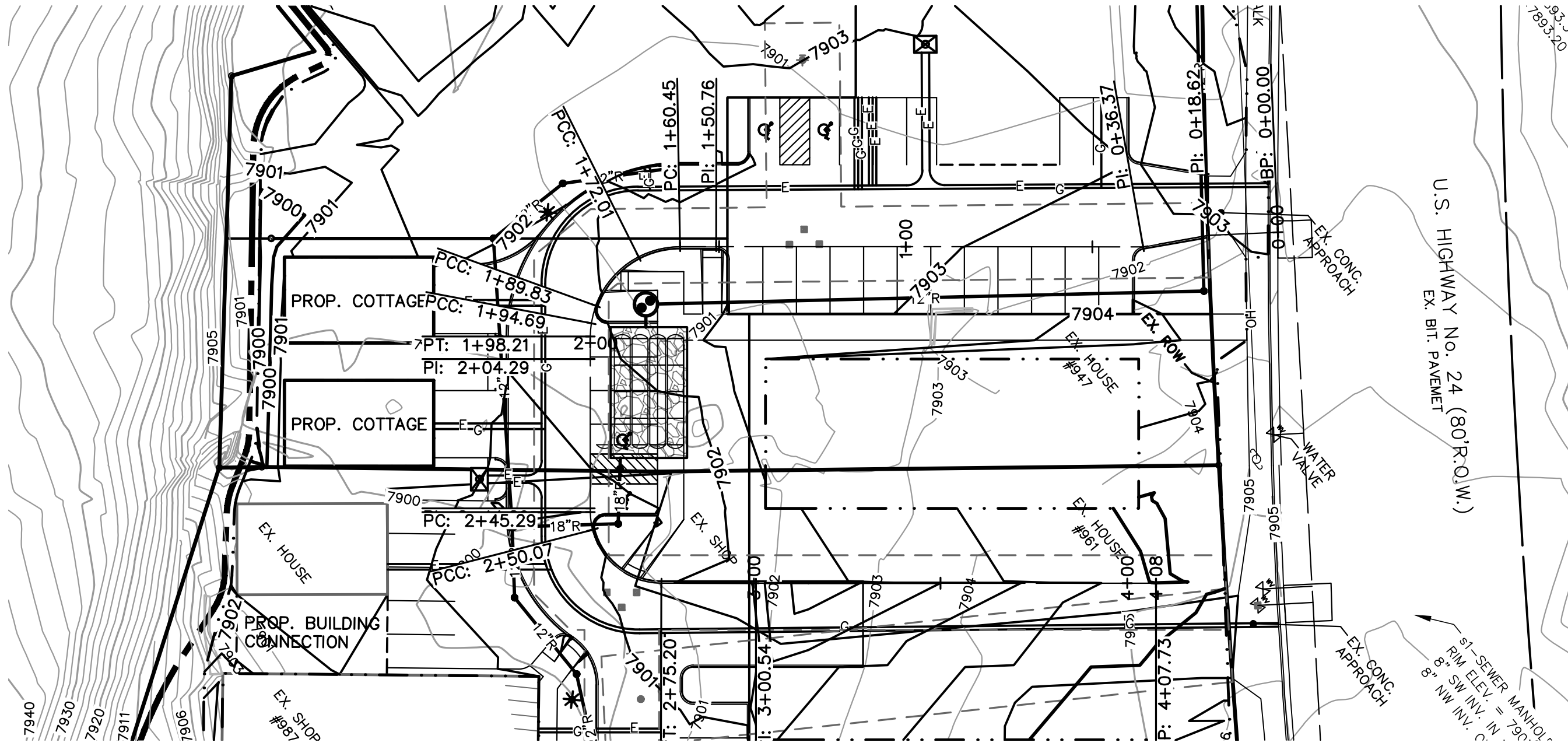
Wireless Communications • Transportation • Landfill Services







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LEGEND	
	EXISTING CONTOUR
	PROPOSED CONTOUR
	EXISTING SPOT ELEVATION
	PROPOSED SPOT ELEVATION
	EXISTING UTILITY POLE
	EXISTING OVERHEAD UTILITY LINE
	EXISTING WATER VALVE
	EXISTING HYDRANT
	PROPOSED WATER MAIN
	PROPOSED HYDRANT
	PROPOSED GATE VALVE IN BOX
	EXISTING STORM SEWER
	EXISTING CATCH BASIN OR INLET
	PROPOSED STORM SEWER
	PROPOSED CATCH BASIN OR INLET
	PROPOSED UNDERGROUND STORM SEWER STORAGE
	EXISTING SANITARY SEWER
	PROPOSED SANITARY SEWER
	PROPOSED FLOOR DRAIN
	SIGN
	POST
	EXISTING GAS VALVE
	WELL
	FENCE
	PROPOSED ELECTRIC TRANSFORMER
	PROPOSED ELECTRIC LINE
	PROPOSED GAS LINE

JOB No.	20067	DATE: 04/07/22
REVISIONS:	REV. DATE	SHEET 41 OF 38
PER ERWSD & IME REVIEW	02/23/24	CADD:
PER ERWSD & IME REVIEW	08/19/24	ENG: CMW
		PM: RCW
		TECH: /2006PR2

## MIDTOWN VILLAGE PUD

DRIVEWAY PROFILE VIEW

CLIENT  
10TH MOUNTAIN BUILDERS  
1632 MAIN STREET  
MINTURN, CO 81645  
JEFFREY D. ARMISTEAD  
970-471-0618

MIDWESTERN  
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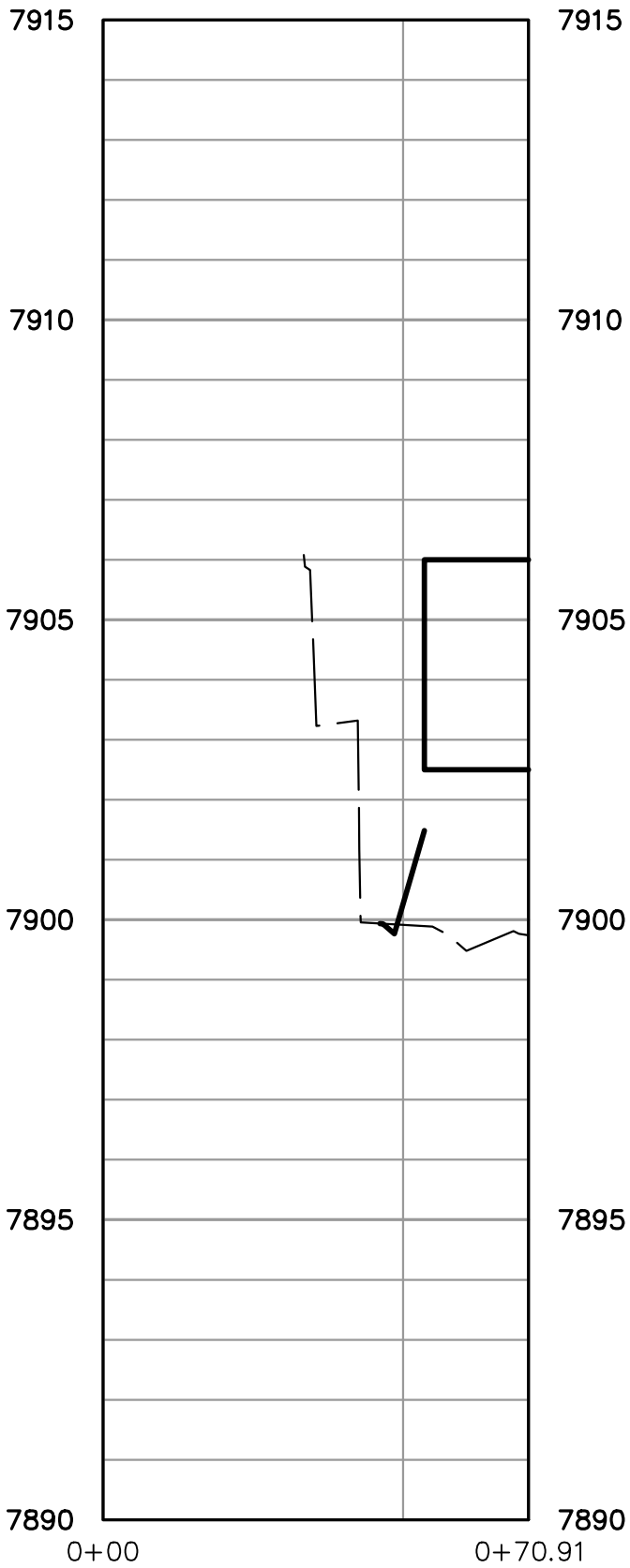


M:\Civil\134\_Pros\20067\Site Plan\20067PR3.dwg, 10/29/2024 2:46 PM, Colton M. Wallace, 42 CROSS SECTION, MCLLC PLOT.pct, pc3  
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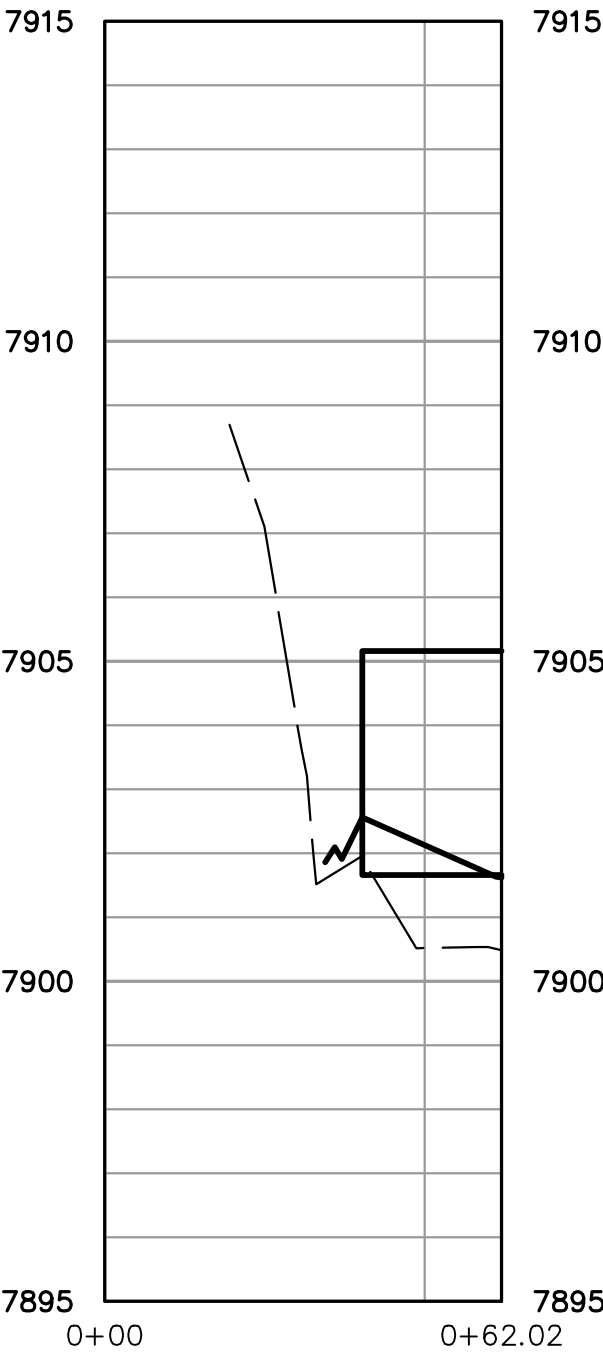
LEGEND

- 7902 EXISTING CONTOUR
- 7902 PROPOSED CONTOUR
- x7902.2 EXISTING SPOT ELEVATION
- 7902.2\* PROPOSED SPOT ELEVATION
- OH EXISTING UTILITY POLE
- OH EXISTING OVERHEAD UTILITY LINE
- WV EXISTING WATER VALVE
- WV EXISTING HYDRANT
- W PROPOSED WATER MAIN
- W PROPOSED HYDRANT
- W PROPOSED GATE VALVE IN BOX
- r-o EXISTING STORM SEWER
- R-o EXISTING CATCH BASIN OR INLET
- R-o PROPOSED STORM SEWER
- R-o PROPOSED CATCH BASIN OR INLET
- - - PROPOSED UNDERGROUND STORM SEWER STORAGE
- s-o EXISTING SANITARY SEWER
- S-o PROPOSED SANITARY SEWER
- o- PROPOSED FLOOR DRAIN
- P SIGN
- POST
- ⊠ EXISTING GAS VALVE
- ⊙ WELL
- / — FENCE
- ⊠ PROPOSED ELECTRIC TRANSFORMER
- E PROPOSED ELECTRIC LINE
- G PROPOSED GAS LINE

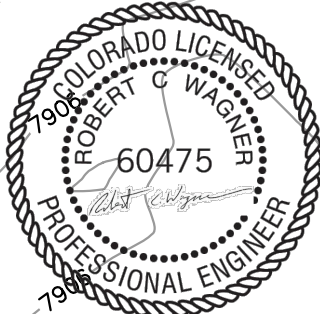
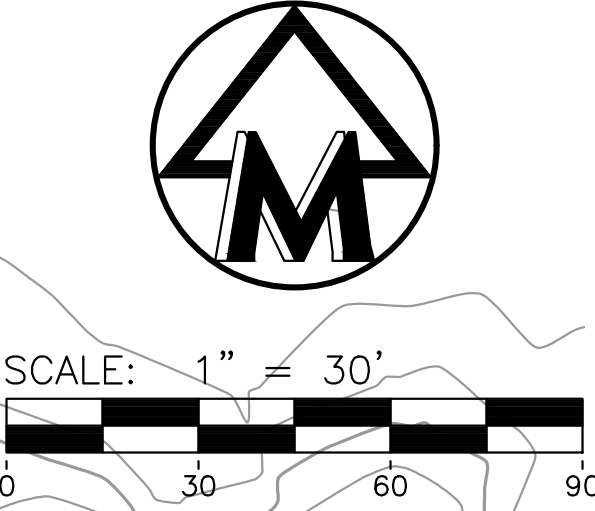
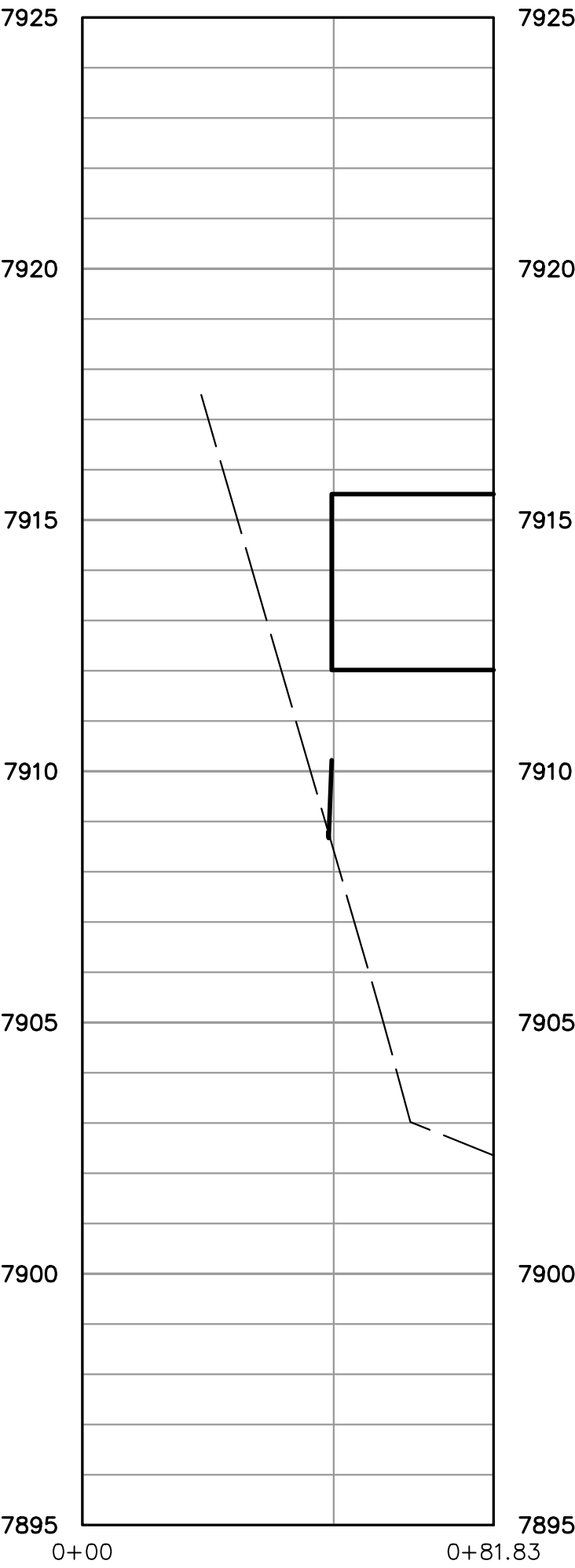
CROSS SECTION A-A



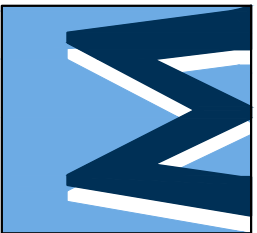
CROSS SECTION B-B



CROSS SECTION C-C



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JOB No.	20067	DATE:	10/26/23
REVISIONS:		REV. DATE:	
PER ERWSD & IME REVIEW		02/23/24	
PER ERWSD & IME REVIEW		08/19/24	
ENG: CMW			
PM: RCW			
TECH: RCW			