

[illegible][illegible][illegible]

FOR ENTIRE PLAN SET	
#	NUMBER
#	SLOPE EXPRESSED IN HORIZONTAL/VERTICAL IN FEET
±	PLUS OR MINUS
°	DEGREE
Ø	DIAMETER
ASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AC	ACRE / ACRES
AD	AREA DRAIN
ADA	ACCESSIBLE / AMERICANS WITH DISABILITIES ACT
AG	ABOVE GROUND
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ASPH	ASPHALT
ASSF	AREA SUBJECT TO STORMWATER FLOWAGE
ASSOC	ASSOCIATION
BC	BOTTOM OF CURB
BF	BASEMENT FLOOR
BIO	BIOGARDEN
BIT	BITUMINOUS
BK	BLOCK
BL	BASELINE
BLDG	BUILDING
BM	BENCH MARK
BRL	BUILDING RESTRICTION LINE
BVVW	BORDERING VEGETATIVE WETLAND
CB	CATCH BASIN
CF	CUBIC FEET
CI	CURB INLET
CIT	CHANGE IN TYPE
CL	CENTER LINE
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT
CONC	CONCRETE
CONN	CONNECTION
COORD	COORDINATE
CPP	COORDINATED PLASTIC PIPE
CY	CUBIC YARD
DEC	DECORATIVE
DEP	DEPARTMENT OF ENVIRONMENTAL PROTECTION
DET	DETENTION
DIA	DIAMETER
DMH	DRAINAGE MANHOLE
DOM	DOMESTIC
DOT	DEPARTMENT OF TRANSPORTATION
DP	DESIGN POINT
DWVL	DASHED WHITE LINE
DYL	DOUBLE YELLOW LINE
EG	EXISTING GRADE
ELEC	ELECTRIC
ELEV	ELEVATION
EP / EOP	EDGE OF PAVEMENT
ES / EOS	EDGE OF SHOULDER
EW	END WALL
EX	EXISTING
FEMA	FEDERAL EMERGENCY MANAGEMENT AGENCY
FES	FLARED END SECTION
FF	FINISH / FIRST FLOOR
FFG	FINISH / FIRST FLOOR ELEVATION
FG	FINISH GRADE
FH	FIRE HYDRANT
FO	FORCE MAIN
FM	FIBER OPTIC
G	GRADE
GC	GENERAL CONTRACTOR
GEO	GEOTECH/GEOTECHNICAL
GF / GFE	GARAGE FLOOR ELEVATION (AT DOOR)
GFA	GROSS FLOOR AREA
GH	GRADE HIGH (WALL)
GL	GRADE LOW (WALL)
GRT	GRATE
GT	GREASE TRAP
GV	GATE VALVE
HDPE	HIGH DENSITY POLYETHYLENE
HOR	HORIZONTAL
HP	HIGH POINT
HW	HEADWALL
ICS	INLET CONTROL STRUCTURE
INF	INFILTRATION
INT	INTERSECTION
INV	INVERT
LF	LINEAR FOOT
LOC	LIMIT OF CLEARING
LOD	LIMIT OF DISTURBANCE
LOS	LIMIT OF SIGHT
LOW	LINE OF WORK
LP	LOW POINT
LS	LANDSCAPE
LSA	LANDSCAPE AREA
MAX	MAXIMUM
ME	MATCH EXISTING
MEP	MECHANICAL, ELECTRICAL, AND PLUMBING
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT

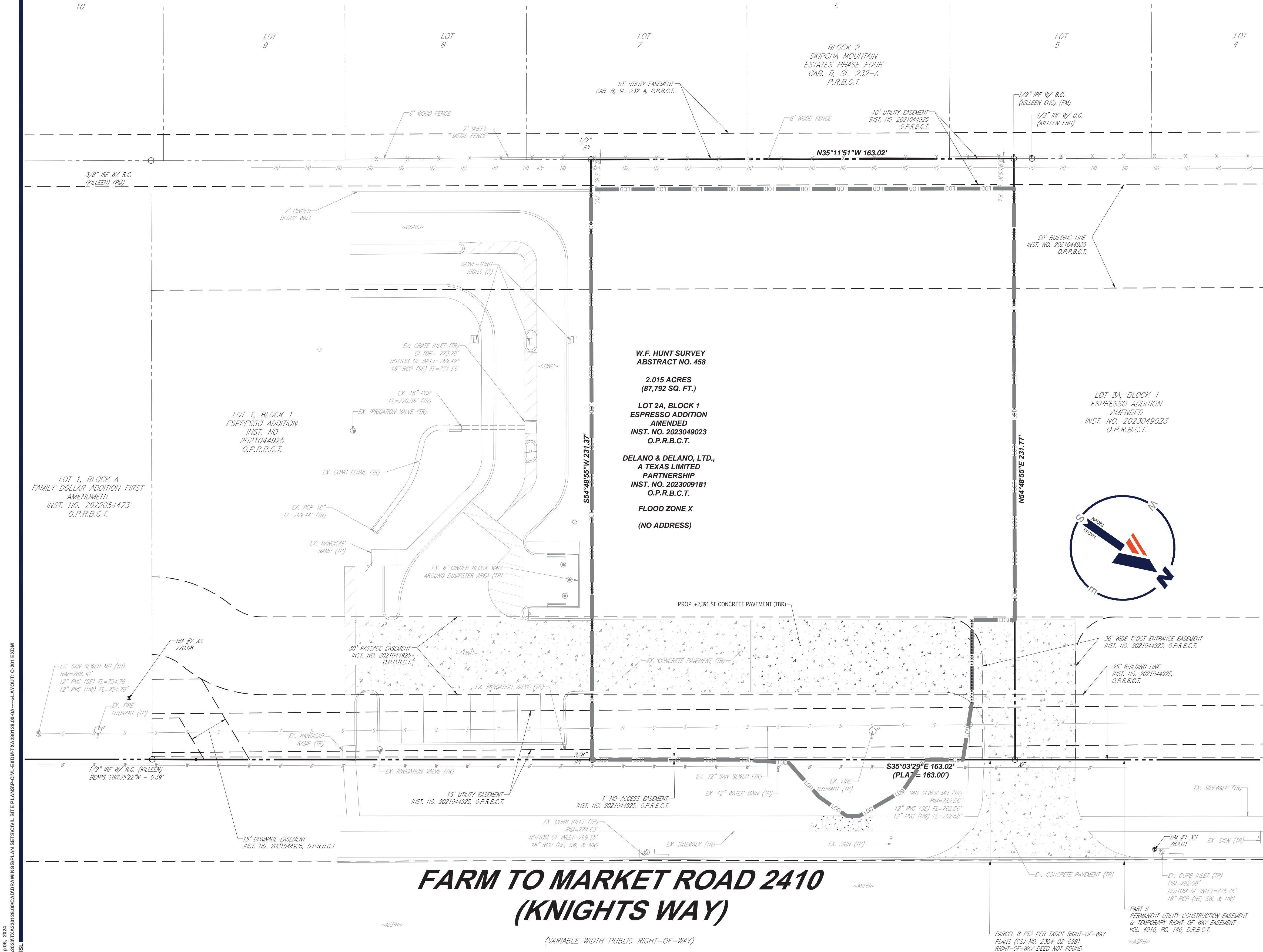
Ø	DIAMETER
O&M	OPERATIONS AND MAINTENANCE
OC	ON CENTER
OCS	OUTLET CONTROL STRUCTURE
OGS	OIL AND GRIT SEPARATOR
ORD	ORDINANCE
PA / POA	POINT OF ANALYSIS
PC	POINT OF CURVATURE
PCCR	POINT OF CURVATURE, CURB RETURN
PERF	PERFORATED
PG	PROPOSED GRADE
PI	POINT OF INTERSECTION
PO	POINT OF GRADE
PP	POLYPROPYLENE PIPE
PROP	PROPOSED
PT	POINT OF TANGENCY
PTCR	POINT OF TANGENCY, CURB RETURN
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
PVT	POINT OF VERTICAL TANGENCY
R	RADIUS / RADII
R/W	RIGHT-OF-WAY / RIGHTS-OF-WAY
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
REGS	REGULATIONS
RELO	TO BE RELOCATED
REQ	REQUIRED
RET	RETENTION
RET WALL	RETAINING WALL
RETO	TO BE RETURNED TO OWNER
RG	RAIN GARDEN
S	SLOPE
SAN	SANITARY SEWER
SESC	SOIL EROSION AND SEDIMENT CONTROL
SHLO	STATE HIGHWAY LAYOUT
SMH	SANITARY MANHOLE
STA	STATION
STM	STORM WATER / STORM SEWER
SWL	SINGLE/SOLID WHITE LINE
SWPPP	STORMWATER POLLUTION PREVENTION PLAN
TBA	TO BE ABANDONED
TBD	TO BE DETERMINED
TBP	TO BE PROTECTED
TBR	TO BE REMOVED
TBRK	TO BE REMOVED AND REPLACED IN KIND
TBS	TO BE SALVAGED
TBV	TO BE VACATED
TC	TOP OF CURB
Tc	TIME OF CONCENTRATION
TD	TRENCH DRAIN
TELE	TELECOMMUNICATIONS / TELEDATA
TPF	TREE PROTECTION FENCE
TR	TO REMAIN
TRANS	TRANSITION
TYP	TYPICAL
UG	UNDERGROUND
UP	UTILITY POLE
USGS	UNITED STATES GEOLOGICAL SURVEY
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	WIDE / WIDTH
WL	WATER LINE
WM	WATER METER
WQU	WATER QUALITY UNIT
YD	YARD DRAIN

STANDARD SYMBOLS FOR ENTIRE PLAN SET		
LIMIT OF WORK	LOW	LOW
LIMIT OF DISTURBANCE	LOD	LOD
SAWCUT LINE	
EXISTING NOTE	TYPICAL NOTE TEXT	PROPOSED NOTE
_____	ONSITE PROPERTY LINE / R.O.W. LINE	_____
_____	NEIGHBORING PROPERTY LINE / INTERIOR PARCEL LINE	_____
_____	EASEMENT LINE	_____
_____	SETBACK LINE	_____
<div> <div></div> <div>CURB AND GUTTER</div> <div> <div>SPILL</div> <div>TRANSITION</div> </div> <div>DEPRESSED CURB AND GUTTER</div> </div>		
_____	CONCRETE CURB & GUTTER	
_____	UTILITY POLE WITH LIGHT	_____
_____	POLE LIGHT	_____
_____	TRAFFIC LIGHT	_____
_____	UTILITY POLE	_____
_____	TYPICAL LIGHT	_____
_____	ACORN LIGHT	_____
_____	TYPICAL SIGN	_____
_____	PARKING COUNTS	_____
<div> <div>_____ 170 _____</div> <div>_____ 169 _____</div> <div>TC 516.0 OR 516.4</div> </div>		
_____	CONTOUR LINE	_____ 190 _____ _____ 187 _____
_____	SPOT ELEVATIONS	<div>TC 516.00</div> <div>TC 516.00 BC 515.55</div> <div>WATCH EX (518.02 ±)</div>
<div> <div>SAN</div> <div>SANITARY LABEL</div> <div>S-100</div> </div>		
<div> <div>X</div> <div>STORM LABEL</div> <div>A-100</div> </div>		
_____ SL _____	SANITARY SEWER LATERAL	_____ SL _____
_____ W _____	UNDERGROUND WATER LINE	_____ W _____
_____ E _____	UNDERGROUND ELECTRIC LINE	_____ E _____
_____ G _____	UNDERGROUND GAS LINE	_____ G _____
_____ OH _____	OVERHEAD WIRE	_____ OH _____
_____ T _____	UNDERGROUND TELEPHONE LINE	_____ T _____
_____ C _____	UNDERGROUND CABLE LINE	_____ C _____
=====	STORM SEWER	=====
===== S =====	SANITARY SEWER MAIN	===== S =====
_____	HYDRANT	_____
_____ S _____	SANITARY MANHOLE	_____ S _____
_____ D _____	STORM MANHOLE	_____ D _____
_____ WM _____	WATER METER	_____ WM _____
_____ WV _____	WATER VALVE	_____ WV _____
_____ GV _____	GAS VALVE	_____ GV _____
_____ G _____	GAS METER	_____ G _____
_____	TYPICAL END SECTION	_____
_____	HEADWALL OR ENDWALL	_____
_____	GRATE INLET	_____
_____	CURB INLET	_____
_____ C/O _____	CLEAN OUT	_____ C/O _____
_____ E _____	ELECTRIC MANHOLE	_____ E _____
_____ T _____	TELEPHONE MANHOLE	_____ T _____
_____ E _____	ELECTRIC BOX	_____ E _____
_____ EP _____	ELECTRIC PEDESTAL	_____ EP _____
<div> <div>_____</div> <div>MONITORING WELL</div> <div>_____</div> </div>		
<div> <div>_____</div> <div>_____</div> <div>_____</div> </div>		

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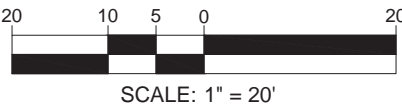


DEMOLITION PLAN NOTES:

- SEE SHEET C-102 FOR GENERAL NOTES, STANDARD ABBREVIATIONS, AND STANDARD DRAWING LEGEND.
- TOTAL LIMITS OF DISTURBANCE IS 0.867 AC.
- CONTRACTOR SHALL PERFORM ALL WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, (29 U.S.C. 651 ET SEQ.), AS AMENDED AND ANY MODIFICATIONS, AMENDMENTS OR REVISIONS TO SAME.
- BOHLER ENGINEERING TX, LLC HAS NO CONTRACTUAL, LEGAL, OR OTHER RESPONSIBILITY FOR JOB SITE SAFETY OR JOB SITE SUPERVISION, OR ANYTHING RELATED TO SAME.
- THE DEMOLITION PLAN IS INTENDED TO PROVIDE GENERAL INFORMATION ONLY, REGARDING ITEMS TO BE DEMOLISHED AND/OR REMOVED. THE CONTRACTOR MUST ALSO REVIEW THE OTHER SITE PLAN DRAWINGS AND INCLUDE IN DEMOLITION ACTIVITIES ALL INCIDENTAL WORK NECESSARY FOR THE CONSTRUCTION OF THE NEW SITE IMPROVEMENTS.
- CONTRACTOR MUST RAISE ANY QUESTIONS CONCERNING THE ACCURACY OR INTENT OF THESE PLANS OR SPECIFICATIONS, CONCERNS REGARDING THE APPLICABLE SAFETY STANDARDS, OR THE SAFETY OF THE CONTRACTOR OR THIRD PARTIES IN PERFORMING THE WORK ON THIS PROJECT, WITH BOHLER ENGINEERING, IN WRITING, AND RESPONDED TO BY BOHLER, IN WRITING, PRIOR TO THE INITIATION OF ANY SITE ACTIVITY AND ANY DEMOLITION ACTIVITY. ALL DEMOLITION ACTIVITIES MUST BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THESE PLANS AND SPECIFICATIONS AND ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, RULES, REQUIREMENTS, STATUTES, ORDINANCES AND CODES.
- PRIOR TO STARTING ANY DEMOLITION, CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS AND MAINTAINING THE SAME ON SITE FOR REVIEW BY THE ENGINEER OF RECORD AND OTHER PUBLIC AGENCIES HAVING JURISDICTION THROUGHOUT THE DURATION OF THE PROJECT, SITE WORK AND DEMOLITION WORK.
- THE LOCATION OF EXISTING UNDERGROUND UTILITIES AS INDICATED ON THE PLAN IS APPROXIMATE. CONTRACTOR TO FIELD LOCATE ALL UNDERGROUND EXISTING UTILITIES LOCATED IN THE AREA OF WORK PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. CALL TEXAS811 PRIOR TO CONSTRUCTION. FOR ASSISTANCE IN LOCATING EXISTING UNDERGROUND UTILITIES, SUBSURFACE FEATURES ARE SHOWN IN AN APPROXIMATE LOCATION, CONTRACTOR IS RESPONSIBLE FOR SUBSURFACE UTILITY EXPLORATION TO DETERMINE UNDERGROUND UTILITY LOCATIONS AND DEPTH. UNDERGROUND UTILITY LOCATIONS SHOWN ARE TO STANDARD OF ACCURACY BASED ON UTILITY MARKOUT METHOD NOTED IN THE REFERENCED SURVEY. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ANY CROSSING/CONFLICT PRIOR TO STARTING CONSTRUCTION OF RELATED ADJACENT INFRASTRUCTURE AND NOTIFYING THE ENGINEER OF RECORD IN WRITING OF ANY CONFLICTS.
- CONTRACTOR TO COORDINATE ALL UTILITY REMOVAL, RELOCATION, & ABANDONMENT WITH THE APPROPRIATE UTILITY SERVICE PROVIDER. CONTRACTOR SHALL COORDINATE WITH UTILITY PROVIDER PRIOR TO DISRUPTING SERVICE. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL UTILITY SERVICES TO ADJACENT PROPERTIES DURING ALL PHASES OF CONSTRUCTION.
- CONTRACTOR TO REMOVE ANY UTILITY SERVICES NO LONGER UTILIZED WITHIN THE PROJECT PARCEL AND REMOVE BACK TO THE MAIN SERVICE LINE IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL STANDARDS AND REGULATIONS.
- ALL SIDEWALKS AND CURB AND GUTTER SECTIONS SHALL BE REMOVED BY SAWCUTTING THE NEAREST CONTROL JOINT AWAY FROM THE LOCATION DESIGNATED FOR REMOVAL ON THE PLANS. EXISTING PAVEMENT SHALL BE SAWCUT IN ALL LOCATIONS WHERE ABUTTING NEW PAVEMENT OR CONCRETE. CONTRACTOR SHALL SAWCUT PAVEMENT NOT EXPLICITLY SHOWN IN THIS PLAN TO ENSURE COMPLIANCE WITH PROPOSED GRADES IF EXISTING CONCRETE IS PRESENT AND MODIFICATION IS NECESSARY.
- EXISTING STRUCTURES WITHIN CONSTRUCTION LIMITS ARE TO BE ABANDONED, REMOVED OR RELOCATED AS NECESSARY. ALL COSTS SHALL BE INCLUDED IN BASE BID. CONTRACTOR IS RESPONSIBLE FOR DAMAGES TO EXISTING INFRASTRUCTURE AND SHALL REPLACE AND/OR REPAIR IN-KIND.
- CONTRACTOR TO ESTABLISH NEW BENCHMARKS IF EXISTING BENCHMARK WILL BE DISTURBED OR REMOVED.
- CONTRACTOR TO REMOVE EXISTING TREES OR PLANTS AS SHOWN ON THE TREE DISPOSITION PLAN WITHIN THE LIMITS OF DISTURBANCE. CONTRACTOR TO OBTAIN APPROVAL FROM THE OWNER AND ENGINEER OF RECORD PRIOR TO REMOVING EXISTING TREES NOT SHOWN ON THE TREE DISPOSITION PLAN.
- THIS PLAN WAS PREPARED WITH THE ALTA/NSPS LAND TITLE SURVEY PREPARED BY BOHLER ENGINEERING, DATED 01/6/2024.

DEMOLITION ABBREVIATIONS	
ABBREVIATION	DESCRIPTION
(TBA)	TO BE ABANDONED
(TBR)	TO BE REMOVED
(TBV)	TO BE VACATED
(RELO)	TO BE RELOCATED

THIS PLAN TO BE UTILIZED FOR DEMOLITION PURPOSES ONLY



BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

REVISIONS				
REV	DATE	COMMENT	DRAWN BY	

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PROJECT No.: TXA230128.00
DRAWN BY: JRB/MG
CHECKED BY: MUH
DATE: 08/06/2024
CAD ID:

CONSTRUCTION DOCUMENTS

FOR

brakes plus

PROPOSED
MINOR AUTO SERVICE
640 E FM 2410 RD,
BELL COUNTY
HARKER HEIGHTS, TX
ESPRESSO ADDITION AMENDED
LOT 2A, BLOCK 1

BOHLER

2600 NETWORK BLVD, SUITE 310
FRISCO, TX 75034
Phone: (469) 458-7300
TX@BohlerEng.com
TBPE No. 180665 | TBPLS No. 10194413

STATE OF TEXAS
North Star
MATHIAS HAUBERT
138306
LICENSED PROFESSIONAL ENGINEER
4/4/24

SHEET TITLE:
EXISTING CONDITIONS/
DEMOLITION PLAN

SHEET NUMBER:
C-201

ORG. DATE - XX/XX/2024

SITE PLAN NOTES:

- SEE SHEET C-102 FOR GENERAL NOTES, STANDARD ABBREVIATIONS, AND STANDARD DRAWING LEGEND.
- ALL CURB RADII ARE 3' UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS ARE SHOWN AT FACE OF CURB, UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF VESTIBULES, TRASH ENCLOSURES, SLOPE PAVING, SIDEWALKS, EXIT PORCHES, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS. ARCHITECTURAL, STRUCTURAL, MECHANICAL/ELECTRICAL/PLUMBING, LANDSCAPE AND LIGHTING PLANS ARE TO BE PROVIDED BY OTHERS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATIONS, (UNLESS OTHERWISE NOTED ON PLANS) INCLUDING BUT NOT LIMITED TO, UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITIES REQUIREMENTS AND PROJECT SITE WORK SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COST SHALL BE INCLUDED IN BASE BID.
- THIS PLAN WAS PREPARED WITH SITE BOUNDARY, TOPOGRAPHY, UTILITY, AND ROAD INFORMATION TAKEN FROM A SURVEY PREPARED BY A LAND SURVEYOR. SEE SHEET XXX FOR SURVEY REFERENCE.
- THIS PLAN WAS PREPARED WITH A GEOTECHNICAL ANALYSIS PREPARED BY A GEOTECHNICAL ENGINEER. SEE SHEET XXX FOR GEOTECHNICAL REFERENCE.
- THE PROPERTY AREA IS LOCATED WITHIN AN AREA OF MINIMAL FLOOD HAZARD (ZONE X) BASED ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD MAP, NUMBER 48027C0295E, DATED 09/28/2008.
- PROPOSED FIRE LANES SHALL BE CONSTRUCTED TO LOCAL, STATE, AND IFC REQUIREMENTS.
- PROPOSED SIGNAGE SHOWN IS FOR REPRESENTATIONAL PURPOSES ONLY AND SHALL BE PERMITTED SEPARATELY.
- CORNERS SHOULD BE STAKED PRIOR TO POURING SLAB DUE TO PROXIMITY TO BUILDING SETBACK LINE.

SITE DATA

LEGAL	
ESPRESSO ADDITION AMENDED LOT 2A, BLOCK 1	
ZONING	
B-4 (SECONDARY AND HIGHWAY BUSINESS DISTRICT) WITH KNIGHTS WAY CORRIDOR OVERLAY	
CURRENT USE	UNDEVELOPED
PROPOSED USE	MINOR AUTO SERVICE
BUILDING / LOT COVERAGE	
NUMBER OF BUILDINGS	1
BUILDING AREA	±4,900 SF
BUILDING HEIGHT	MAX: 30' PROVIDED: 38.5'
LOT AREA	0.867 AC
LOT COVERAGE	12.98%
IMPERVIOUS AREA	0.48 AC
PERVIOUS AREA	0.38 AC

PARKING

REQUIRED	36 TOTAL SPACES
PROPOSED NON-ADA COMPLIANT PARKING SPACES	26 SPACES
PROPOSED ADA-COMPLIANT PARKING SPACES	2 SPACES
SERVICE BAYS	8 SPACES
TOTAL PROPOSED PARKING	36 TOTAL SPACES

SETBACKS

FRONT SETBACK	25'
REAR SETBACK	50'
SIDE SETBACK	NONE

AREA DISTURBED

ONSITE DISTURBANCE	XX.XX AC
OFFSITE DISTURBANCE	XX.XX AC

HATCH LEGEND

REFER TO SHEET C-901 FOR PAVEMENT SECTION DETAILS.

	PAVEMENT & ADA STRIPING		PROPOSED DUMPSTER PAD CONCRETE PAVEMENT
	PROPOSED CONCRETE SIDEWALK		PROPOSED MEDIUM DUTY CONCRETE PAVEMENT
	PROP BUILDING (SEE ARCH DRAWINGS)		PROPOSED STANDARD DUTY CONCRETE PAVEMENT



REVISIONS

REV	DATE	COMMENT	DRAWN BY	CHECKED BY



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PROJECT No.: TXA230128.00
DRAWN BY: JRB/MG
CHECKED BY: MUH
DATE: 08/06/2024
CAD ID:

PROJECT:

CONSTRUCTION DOCUMENTS

FOR



PROPOSED
MINOR AUTO SERVICE
640 E FM 2410 RD,
BELL COUNTY
HARKER HEIGHTS, TX
ESPRESSO ADDITION AMENDED
LOT 2A, BLOCK 1

BOHLER

2600 NETWORK BLVD, SUITE 310
FRISCO, TX 75034
Phone: (469) 458-7300
TX@BohlerEng.com
TBPE No. 18065 | TBPLS No. 10194413



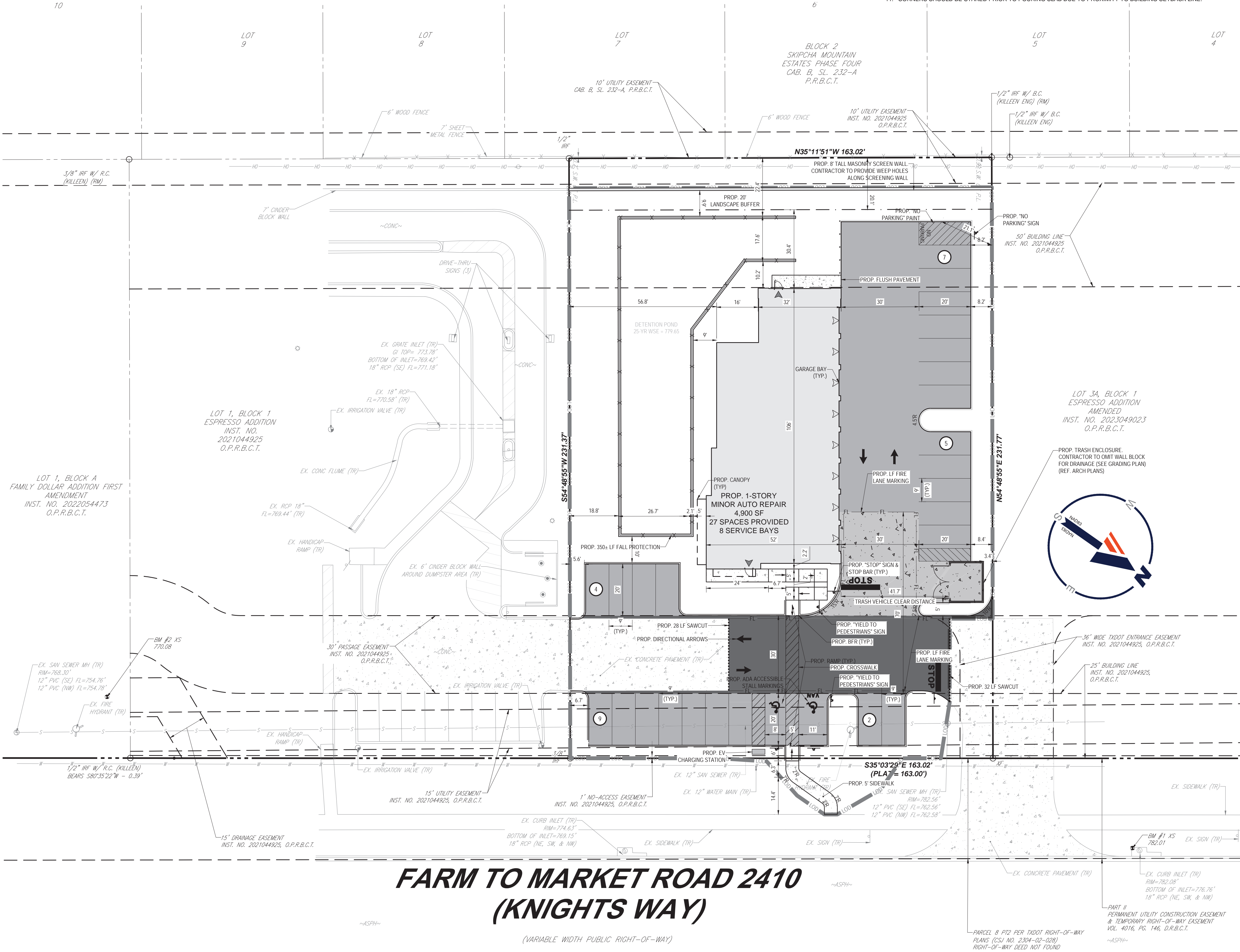
SHEET TITLE:

SITE PLAN

SHEET NUMBER:

C-301

ORG. DATE - XX/XX/2024

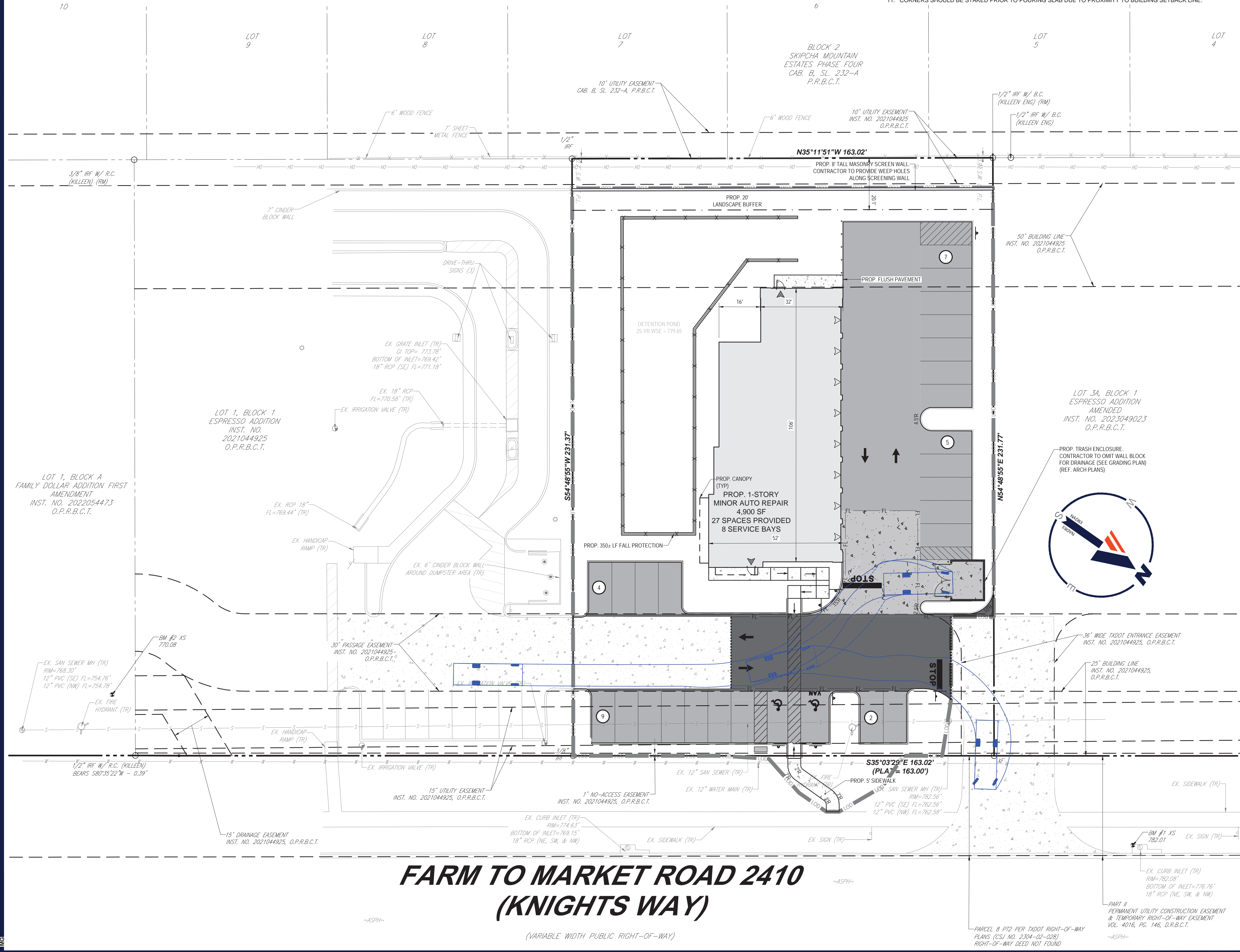


FARM TO MARKET ROAD 2410
(KNIGHTS WAY)

(VARIABLE WIDTH PUBLIC RIGHT-OF-WAY)

THIS PLAN TO BE UTILIZED FOR SITE LAYOUT PURPOSES ONLY





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BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
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REVISIONS

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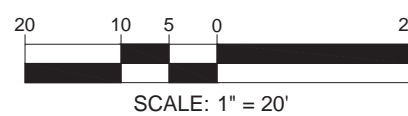
TRUCK
TURNING
PLAN

SHEET NUMBER:

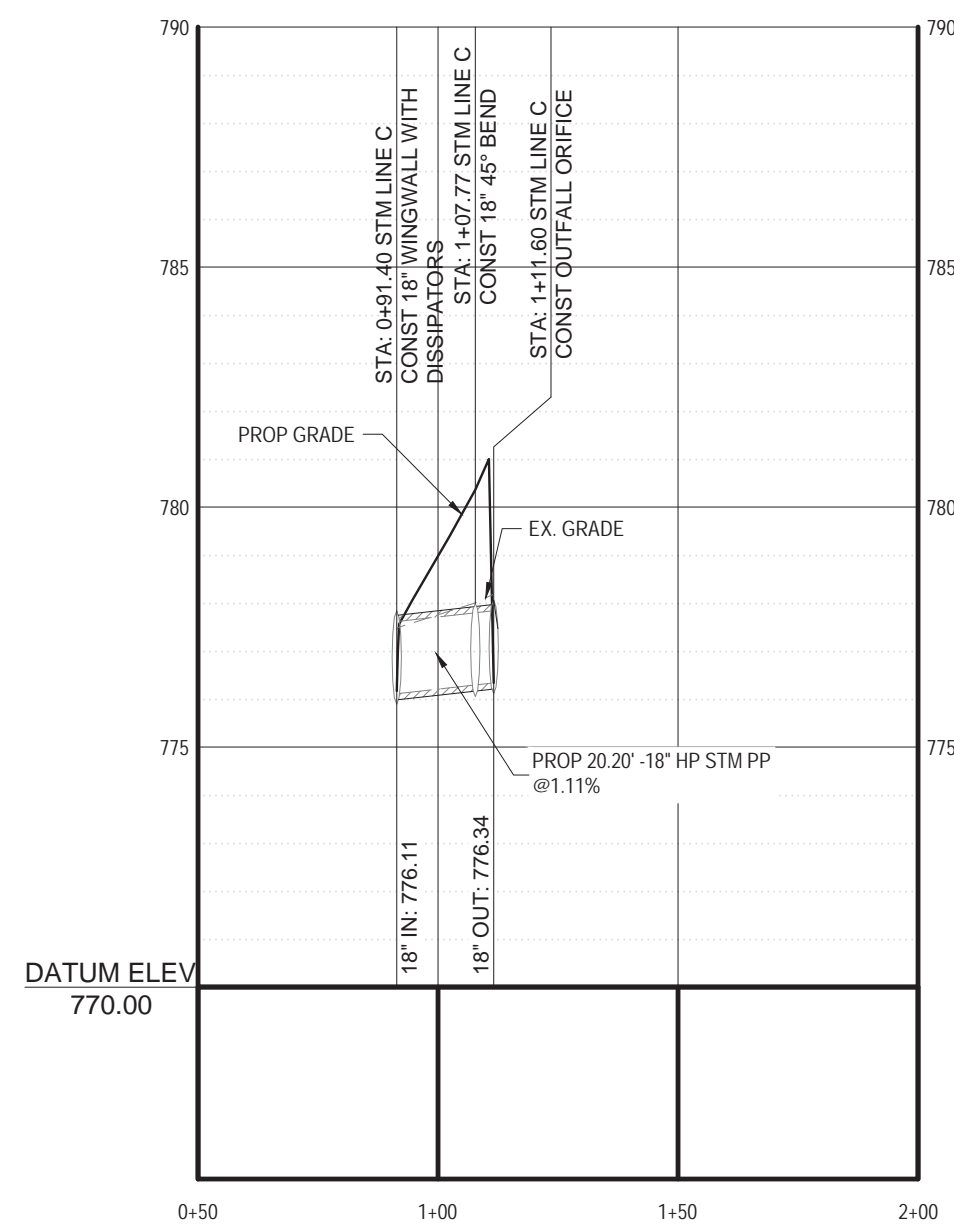
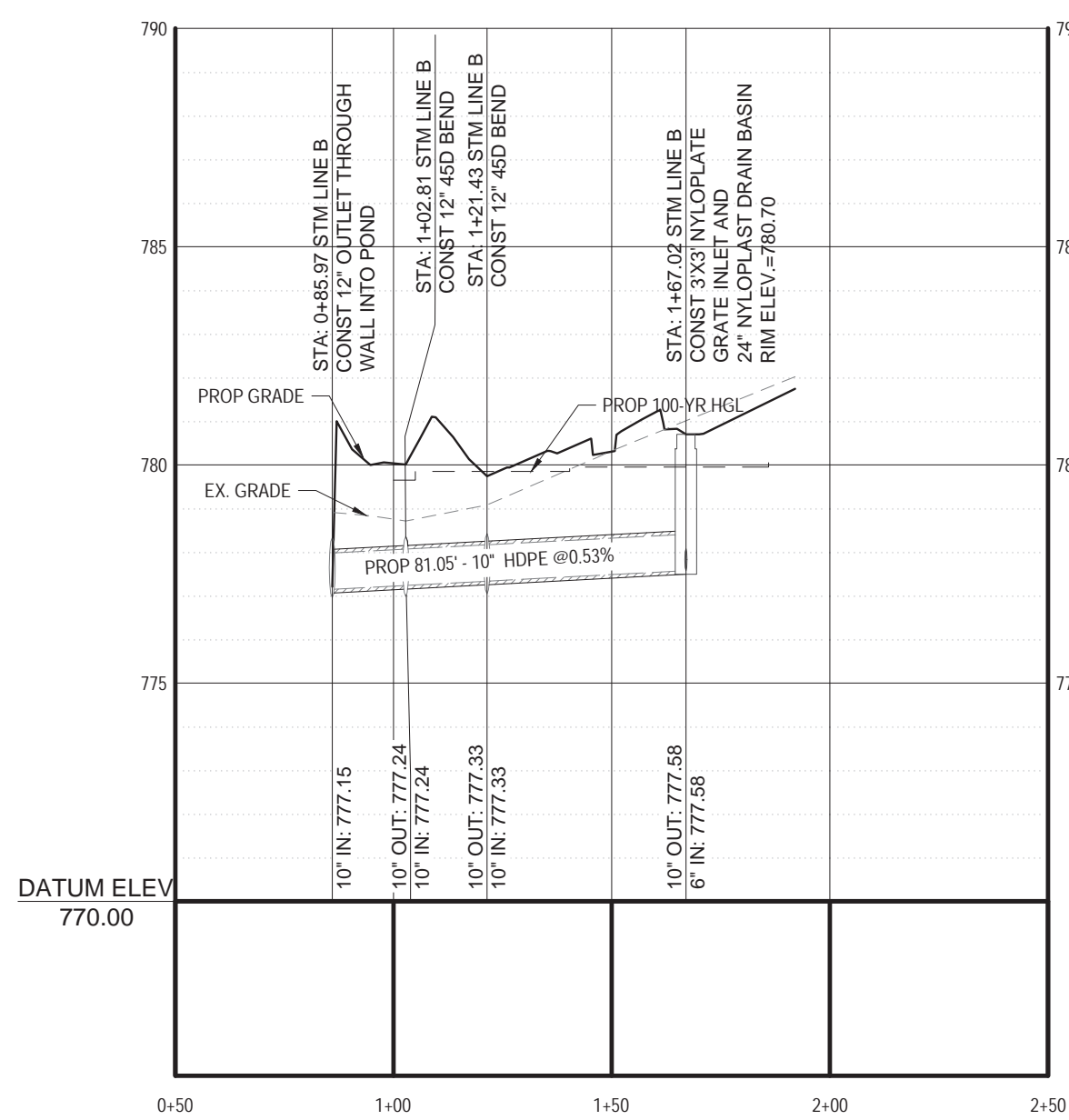
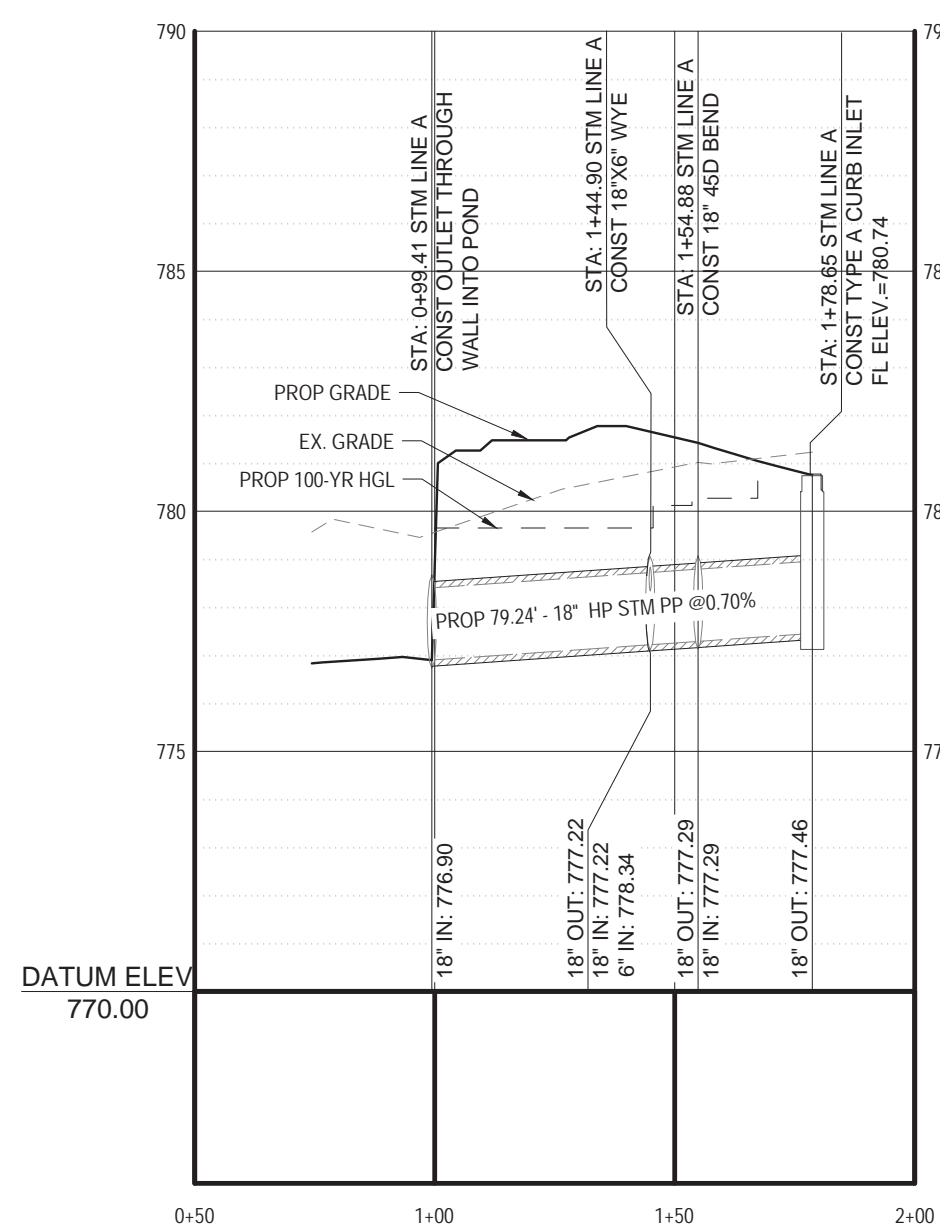
C-302

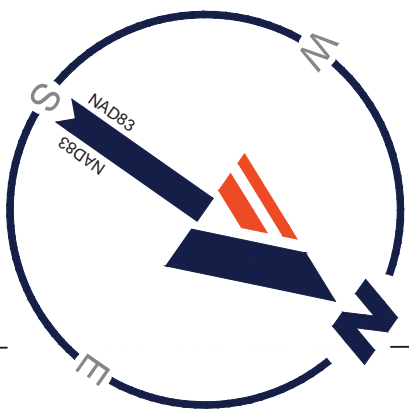
ORG. DATE - XX/XX/2024

THIS PLAN TO BE UTILIZED FOR SITE LAYOUT PURPOSES ONLY









Use only for drainage areas < 20ac.; Storage for 25-year storm event









$C_{25} = 0.44$
 $T_C = 10.00 \text{ min}$
 $I_{25} = 8.63 \text{ in/hr}$
 $A = 0.87 \text{ acres}$
 $Q_{25} = 3.30 \text{ cfs}$

$C_{25} = 0.88$
 $T_C = 10 \text{ min}$
 $I_{25} = 8.63 \text{ in/hr}$
 $A = 1.60 \text{ acres}$
 $Q_{25} = \mathbf{12.15 \text{ cfs}}$

T _c	I ₂₅	Q ₂₅	Inflow	Outflow	Required Storage
min	in/hr	cfs	cf	cf	cf
10	8.63	12.15	7,290.6	1,982.1	5,308.5
20	6.44	9.07	10,881.0	2,973.2	7,907.8
30	4.99	7.03	12,646.7	3,964.3	8,682.4
40	4.42	6.22	14,936.1	4,955.3	9,980.7
50	3.86	5.43	16,304.6	5,946.4	10,358.2
60	3.29	4.63	16,676.4	6,937.5	9,738.9
70	3.10	4.36	18,332.2	7,928.6	10,403.6
80	2.90	4.08	19,599.4	8,919.6	10,679.7
90	2.71	3.82	20,604.7	9,910.7	10,694.0
120	2.12	2.98	21,491.7	12,883.9	8,607.8
360	0.97	1.37	29,591.7	36,669.6	-7,077.9
1440	0.32	0.44	38,441.8	143,705.0	-105,263.3

Provided 25-yr Storage Volume (Cf) = 10,795



<i>GRADING LEGEND:</i>	
PROPERTY LINE/LEASE LINE	
PROPOSED CONTOURS	
MAJOR EXISTING CONTOUR	
MINOR EXISTING CONTOUR	
DRAINAGE ARROW	
SWALE	
RIDGE	
PROP STORM PIPE	

GRADING LEGEND:

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SITE CIVIL AND CONSULTING ENGINEERING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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CHECKED BY:	MJH
DATE:	08/06/2024
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PROJECT:

CONSTRUCTION
DOCUMENTS

FOI

brakes plus 

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640 E FM 3410 RD

BELL COUNTY

HARKER HEIGHTS, TX
FORFECCO ADDITION AMENDED

LOT 2A, BLOCK 1

BOHLER //

2600 NETWORK BLVD, SUITE 310

FRISCO, TX 75034

Phone: (469) 458-7300
TY@BohlerEng.com

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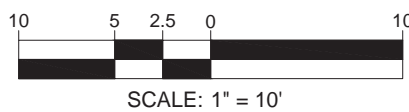
SHEET TITLE:

POND PLAN

SHEET NUMBER:

C-405

ORG. DATE - XX/XX/2024



*PROPOSED OFFSITE DRAINAGE AREAS AND C-VALUES ARE INTERPOLATED BASED ON PLANS ENTITLED "ESPRESSO PROJECT" PREPARED BY KILLEEN ENGINEERING & SURVEYING, LTD, DATED 08/28/2023. BOHLER ENGINEERING DOES NOT CERTIFY THE ACCURACY OF THESE OFFSITE DRAINAGE AREAS AND ARE SHOWN ONLY FOR REFERENCE TO NOT EXCEED THE FLOW RATES ANTICIPATED BY THE PLANS ENTITLED "DUTCH BROS. COFFEE" PREPARED BY MITCHELL & ASSOCIATES, INC., DATED 04/04/2022.

(60' WIDTH PUBLIC RIGHT-OF-WAY)

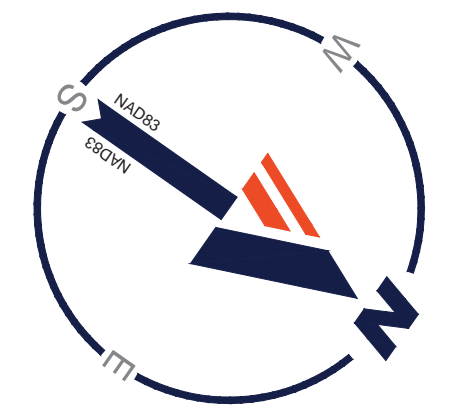
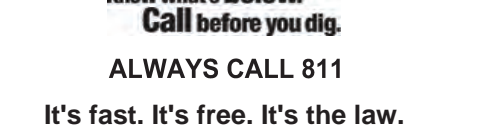


Figure 1 shows a 1D lattice with 30 sites. The top row of the diagram is labeled with site numbers: 30, 15, 7.5, 0, and 30. The bottom row shows a checkerboard pattern of black and white squares. The scale is indicated as $1' = 30'$.

REVISIONS

[illegible]**PERMIT SET**

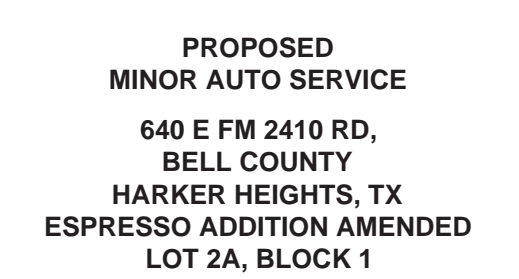
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CHECKED BY:	MJH
DATE:	08/06/2024
CAD I.D.:	

PROJECT:

CONSTRUCTION
DOCUMENTS

FOR _____



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TBPE No. 18065 | TBPLS No. 10194413

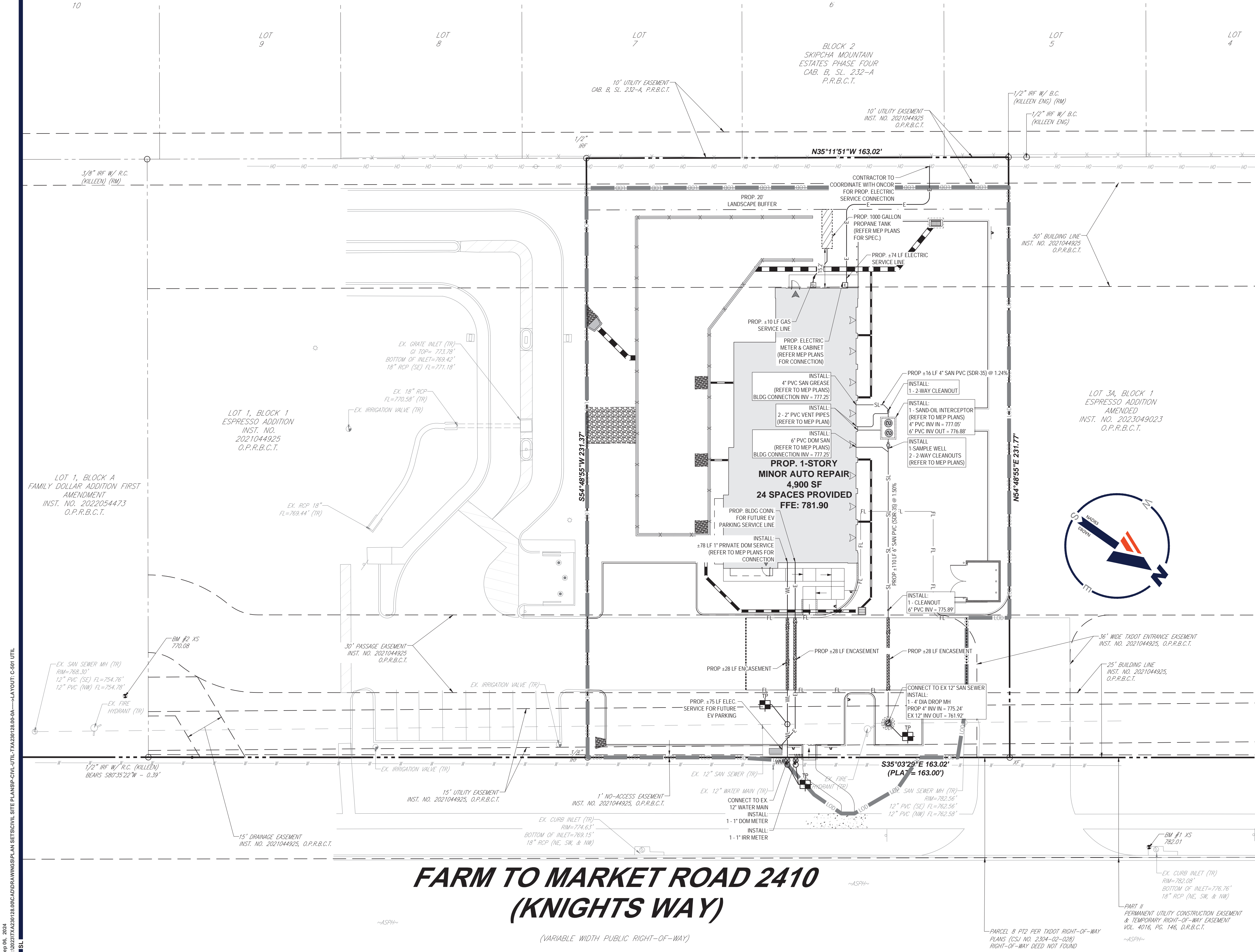


SHEET NUMBER:

C-408

DO DATE: XX/XX/2024

RG. DATE - XX/XX/2024



UTILITY PLAN NOTES:

- SEE SHEET C-102 FOR GENERAL NOTES, STANDARD ABBREVIATIONS, AND STANDARD DRAWING LEGEND
- ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THESE PLANS AND THE CITY OF HARKER HEIGHTS STANDARDS AND SPECIFICATIONS. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL MAKE CERTAIN THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION OR FABRICATION SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED ALL PLANS AND OTHER DOCUMENTS APPROVED BY ALL OF THE PERMITTING AUTHORITIES.
- THE GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS SHALL VERIFY THE SUITABILITY OF ALL EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE COMMENCEMENT OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING IMMEDIATELY OF ANY DISCREPANCIES.
- THE LOCATION OF EXISTING UNDERGROUND UTILITIES AS INDICATED ON THE PLAN IS APPROXIMATE. FIELD LOCATE ALL UNDERGROUND EXISTING UTILITIES LOCATED IN THE AREA OF WORK PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. CALL TEXAS811 PRIOR TO CONSTRUCTION FOR ASSISTANCE IN LOCATING EXISTING UNDERGROUND UTILITIES. SUBSURFACE FEATURES ARE SHOWN IN AN APPROXIMATE LOCATION. CONTRACTOR IS RESPONSIBLE FOR SUBSURFACE UTILITY EXPLORATION TO DETERMINE UNDERGROUND UTILITY LOCATIONS AND DEPTH. UNDERGROUND UTILITY LOCATIONS SHOWN ARE TO STANDARD OF ACCURACY BASED ON UTILITY MARKOUT METHOD NOTED IN SURVEY. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ANY CROSSING/CONFLICT DATE PRIOR TO STARTING CONSTRUCTION OF RELATED ADJACENT INFRASTRUCTURE.
- THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. UNDERGROUND UTILITY LOCATIONS SHOWN ARE TO STANDARD OF ACCURACY BASED ON UTILITY MARKOUT METHOD NOTED IN SURVEY. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
- CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO THE START OF CONSTRUCTION AND NOTIFY THE ENGINEER OR RECORD IN WRITING SHOULD ANY DISCREPANCY EXIST.
- CONTRACTOR IS RESPONSIBLE FOR COORDINATING UTILITY RELOCATIONS WHERE NECESSARY AND PROTECTING EXISTING UTILITIES (BOTH SHOWN AND UNSHOWN).
- CONTRACTOR SHALL REPLACE, AT THEIR OWN EXPENSE, ANY EXISTING UTILITIES DAMAGED.
- THIS PLAN WAS PREPARED WITH SITE BOUNDARY, TOPOGRAPHY, UTILITY, AND ROAD INFORMATION TAKEN FROM A SURVEY PREPARED BY A LAND SURVEYOR. SEE SHEET XXX FOR SURVEY REFERENCE.
- WATER AND SANITARY SEWER SEPARATION (VERTICAL AND HORIZONTAL) SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH TCEQ REQUIREMENTS.

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CHECKED BY: MJH
DATE: 08/06/2024
CAD ID:

CONSTRUCTION DOCUMENTS

FOR

brakes plus

PROPOSED
MINOR AUTO SERVICE
640 E FM 2410 RD,
BELL COUNTY
HARKER HEIGHTS, TX
ESPRESSO ADDITION AMENDED
LOT 2A, BLOCK 1

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TBPE No. 18065 | TBPLS No. 10194413

STATE OF TEXAS
Professional Engineer
MATHIAS HAUBERT
158306
LICENSED
PROFESSIONAL ENGINEER
4/4/24

SHEET TITLE:
UTILITY PLAN

SHEET NUMBER:
C-501

ORG. DATE - XX/XX/2024

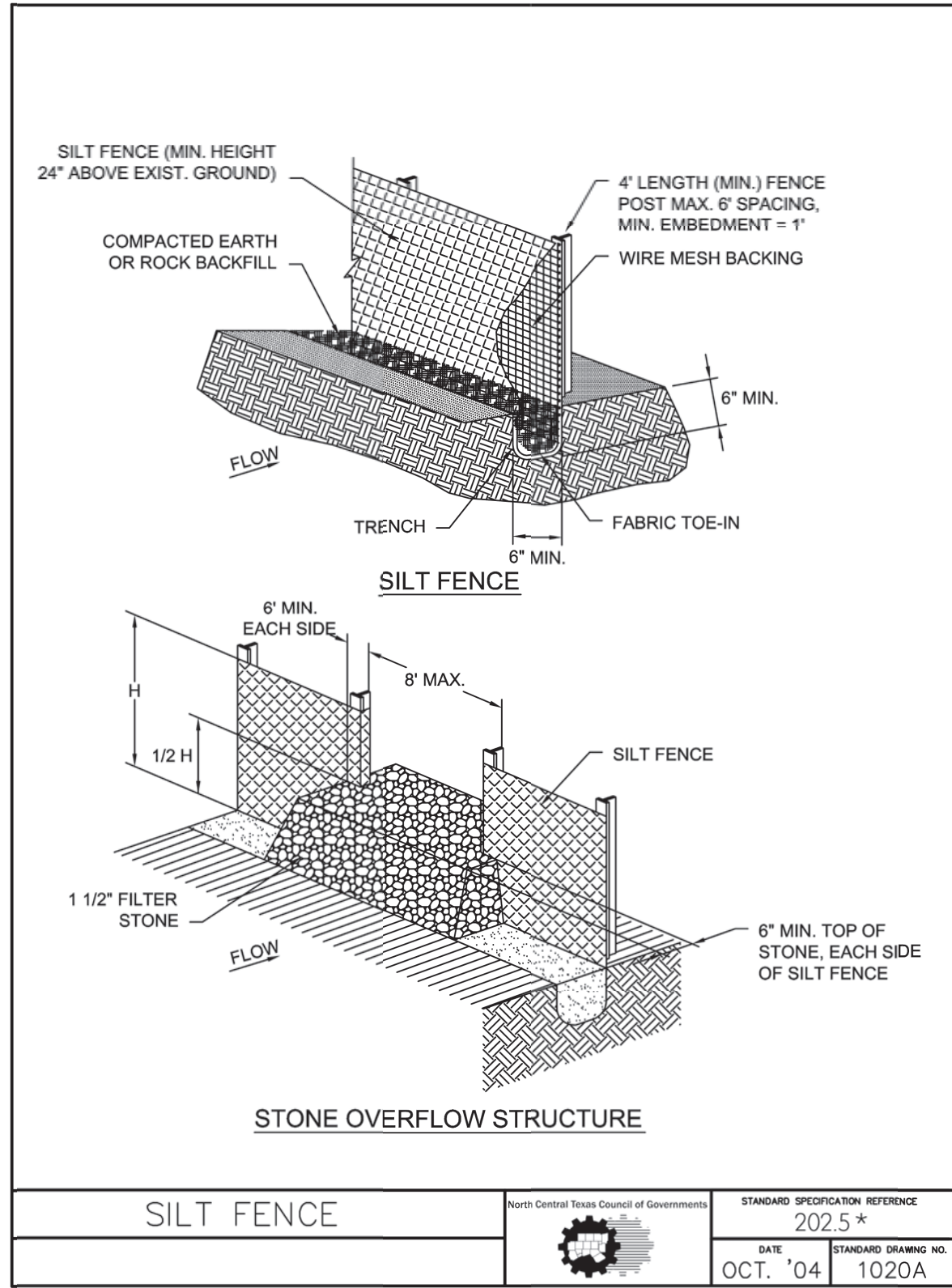


_____ LOD _____	LIMIT OF DISTURBANCE
_____ SF _____	SILT FENCE

20 10 5 0 20

SCALE: 1" = 20'

[illegible]



*Section II Standard Drawings as of October 2004. Reference number only has been updated for Fifth Edition Specifications. Public Works Construction Standards North Central Texas, Fifth Edition.

SILT FENCE GENERAL NOTES:

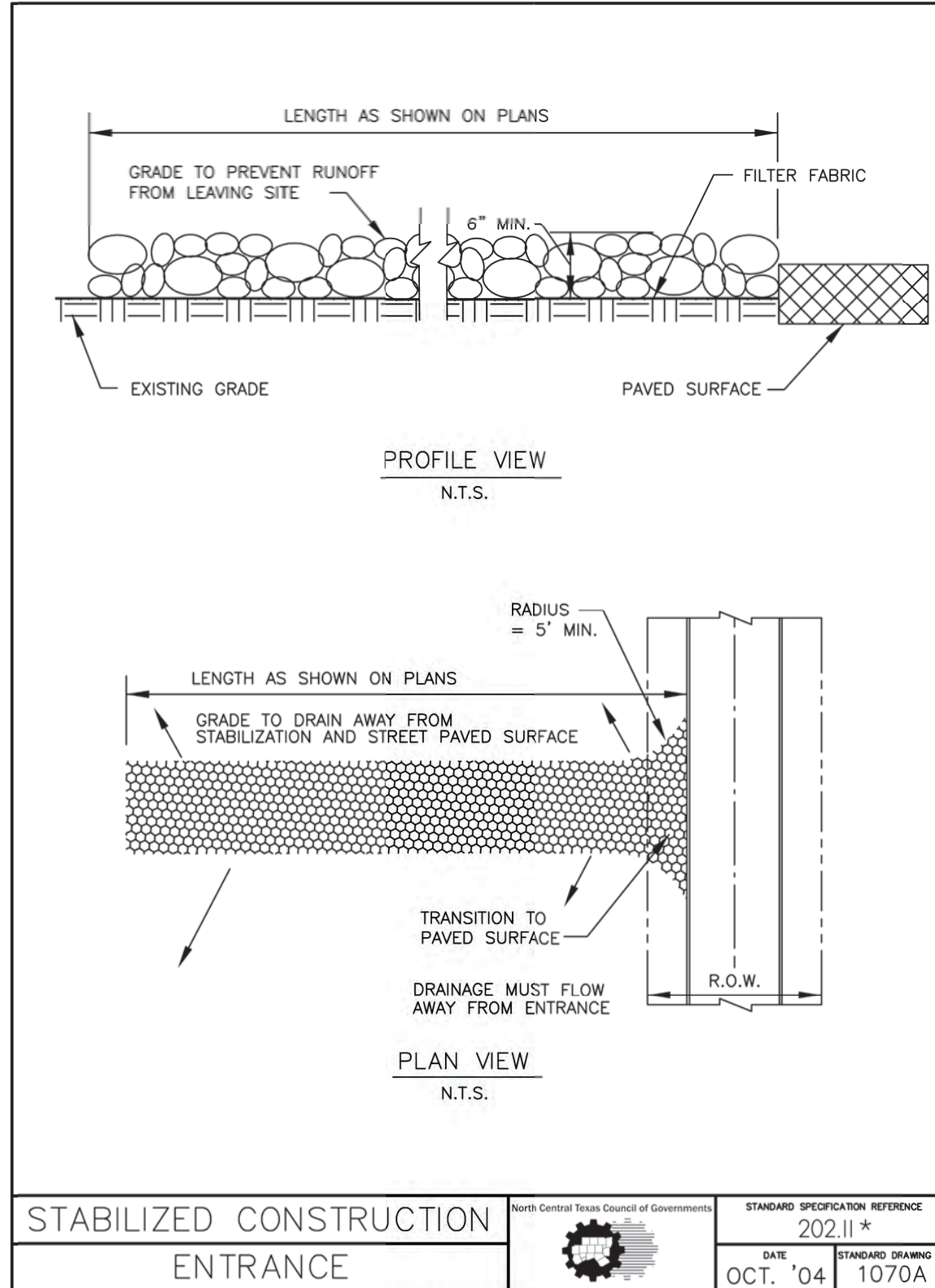
1. POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF ONE FOOT.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (e.g. PAVEMENT), WEIGHT FABRIC FLAP WITH ROCK ON UPHILL SIDE TO PREVENT FLOW FROM SEEPING UNDER FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH SUPPORT POST OR TO WIRE BACKING, WHICH IN TURN IS ATTACHED TO THE FENCE POST. THERE SHALL BE A 3 FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.
5. INSPECTION SHALL BE AS SPECIFIED IN THE SWPPP. REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN FINAL STABILIZATION IS ACHIEVED OR ANOTHER EROSION OR SEDIMENT CONTROL DEVICE IS EMPLOYED.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF HALF THE HEIGHT OF THE FENCE. THE SILT SHALL BE DISPOSED OF AT AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

SILT FENCE



STANDARD SPECIFICATION REFERENCE
202.5 *
DATE
OCT. '04
STANDARD DRAWING NO.
1020A

*Section II Standard Drawings as of October 2004. Reference number only has been updated for Fifth Edition Specifications. Public Works Construction Standards North Central Texas, Fifth Edition.



STABILIZED CONSTRUCTION ENTRANCE



STANDARD SPECIFICATION REFERENCE
202.11 *
DATE
OCT. '04
STANDARD DRAWING NO.
1070A

*Section II Standard Drawings as of October 2004. Reference number only has been updated for Fifth Edition Specifications. Public Works Construction Standards North Central Texas, Fifth Edition.

STABILIZED CONSTRUCTION ENTRANCE GENERAL NOTES:

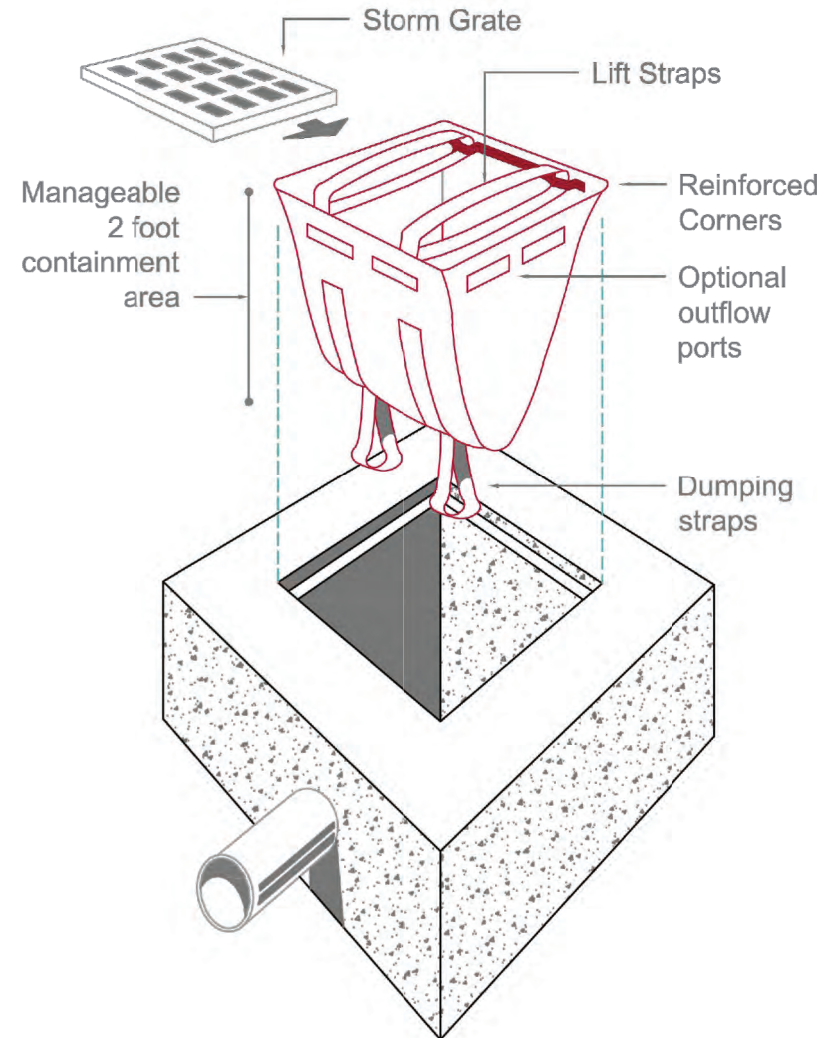
1. STONE SHALL BE 3 TO 5 INCH DIAMETER COARSE AGGREGATE.
2. LENGTH SHALL BE AS SPECIFIED IN THE SWPPP.
3. THE THICKNESS SHALL NOT BE LESS THAN 12 INCHES.
4. THE WIDTH SHALL BE NO LESS THAN THE FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
5. WHEN NECESSARY, VEHICLES SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO A PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WITH DRAINAGE FLOWING AWAY FROM BOTH THE STREET AND THE STABILIZED ENTRANCE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.
6. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PAVED SURFACES. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PAVED SURFACES MUST BE REMOVED IMMEDIATELY.
7. THE ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
8. PREVENT SHORTCUTTING OF THE FULL LENGTH OF THE CONSTRUCTION ENTRANCE BY INSTALLING BARRIERS AS NECESSARY.
9. INSPECTION SHALL BE AS SPECIFIED IN THE SWPPP.

STABILIZED CONSTRUCTION ENTRANCE



STANDARD SPECIFICATION REFERENCE
202.11 *
DATE
OCT. '04
STANDARD DRAWING NO.
1070B

*Section II Standard Drawings as of October 2004. Reference number only has been updated for Fifth Edition Specifications. Public Works Construction Standards North Central Texas, Fifth Edition.



ISOMETRIC ASSEMBLY

NOTES:

1. Remove the grate from the catch basin.
2. Stand grate on end. Move the top lifting straps out of the way and place grate into the unit so that the grate is below the top straps and above the lower straps. The grate should be cradled between the upper and lower straps.
3. Holding the lifting straps, insert the grate into the inlet, being careful that the grate remains in place and being careful not to damage the unit.
4. Remove all accumulated sediment and debris from the vicinity of unit after each storm event.
5. After each storm event and at regular intervals, look into the unit. If the unit is more than 1/3 full of accumulated sediment, the unit must be emptied.
6. To empty the unit, using the lifting straps lift the unit out of the inlet and remove the grate. Transport the unit to an appropriate location for removal of contents. Holding the dumping straps on the bottom of the unit, turn the unit upside down, emptying the contents. Reinstall unit as above.

DROP INLET SEDIMENT BAG

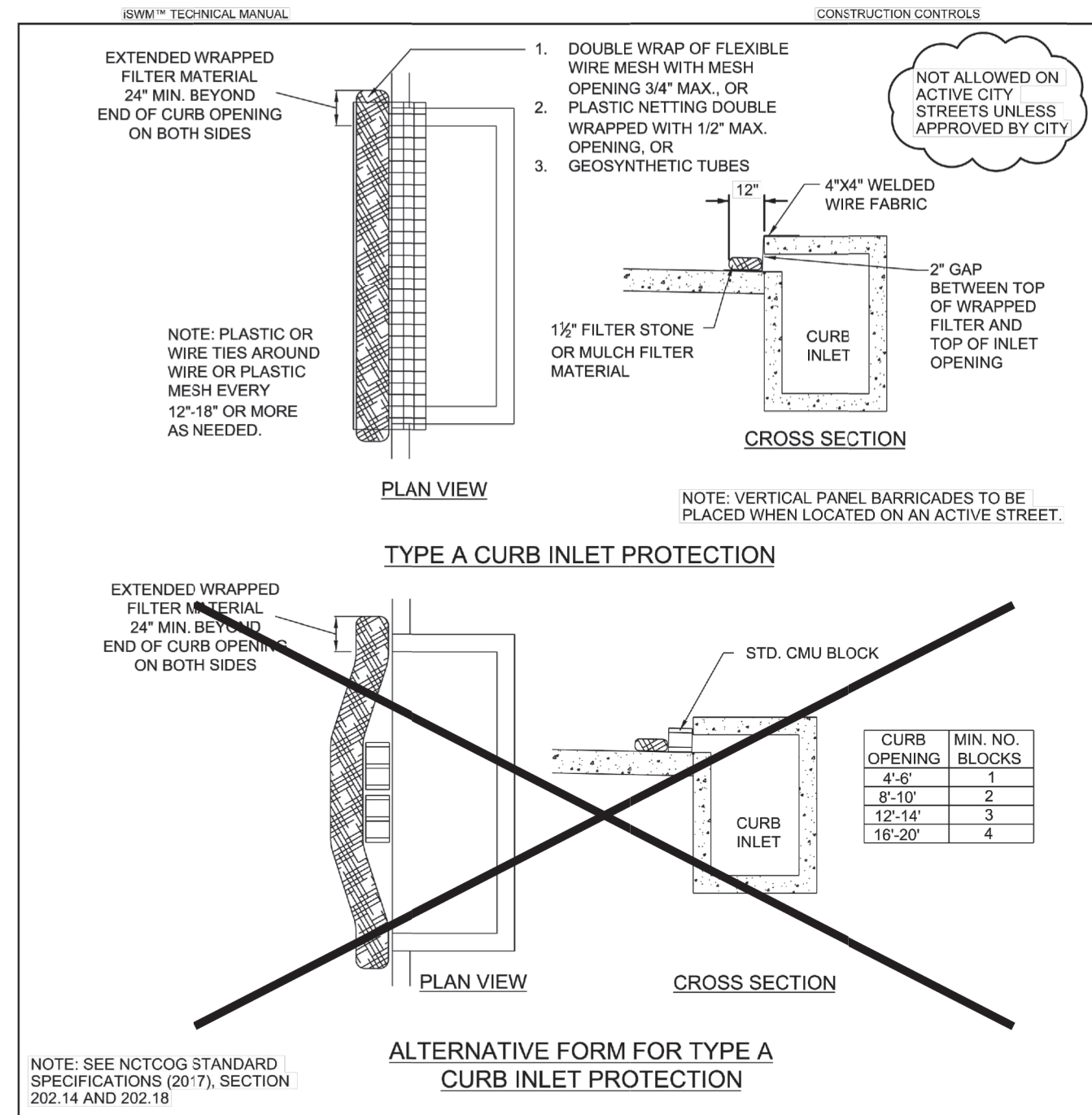


FIGURE 3.6 STANDARD CONSTRUCTION DETAIL - FILTER TUBE CURB INLET PROTECTION

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CHECKED BY: MUH
DATE: 08/06/2024
CAD ID:

PROJECT:

CONSTRUCTION DOCUMENTS

FOR



PROPOSED
MINOR AUTO SERVICE
640 E FM 2410 RD,
BELL COUNTY
HARKER HEIGHTS, TX
ESPRESSO ADDITION AMENDED
LOT 2A, BLOCK 1

BOHLER

2600 NETWORK BLVD, SUITE 310
FRISCO, TX 75034
Phone: (469) 458-7300
TX@BohlerEng.com
TBPE No. 18065 | TBPLS No. 10194413

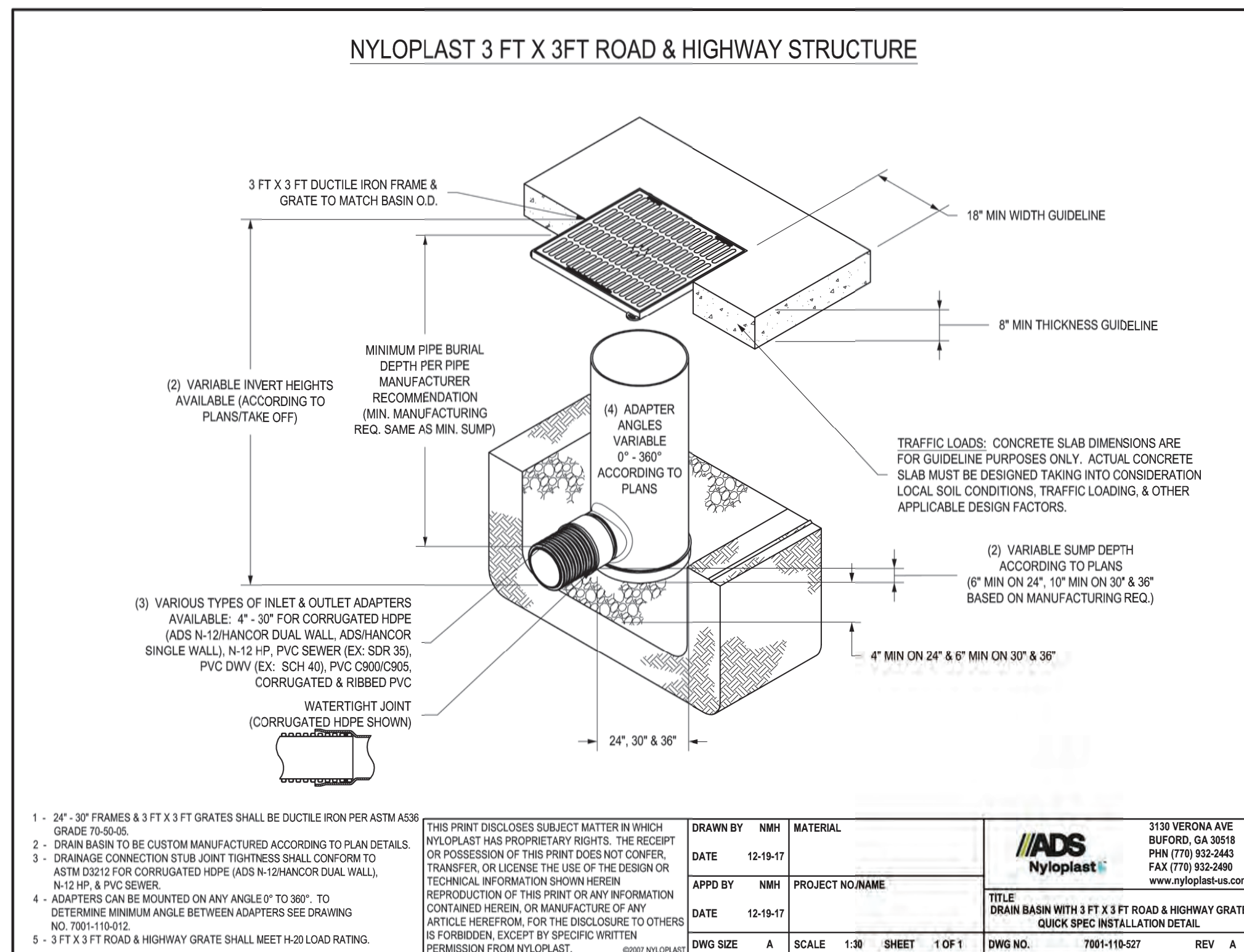
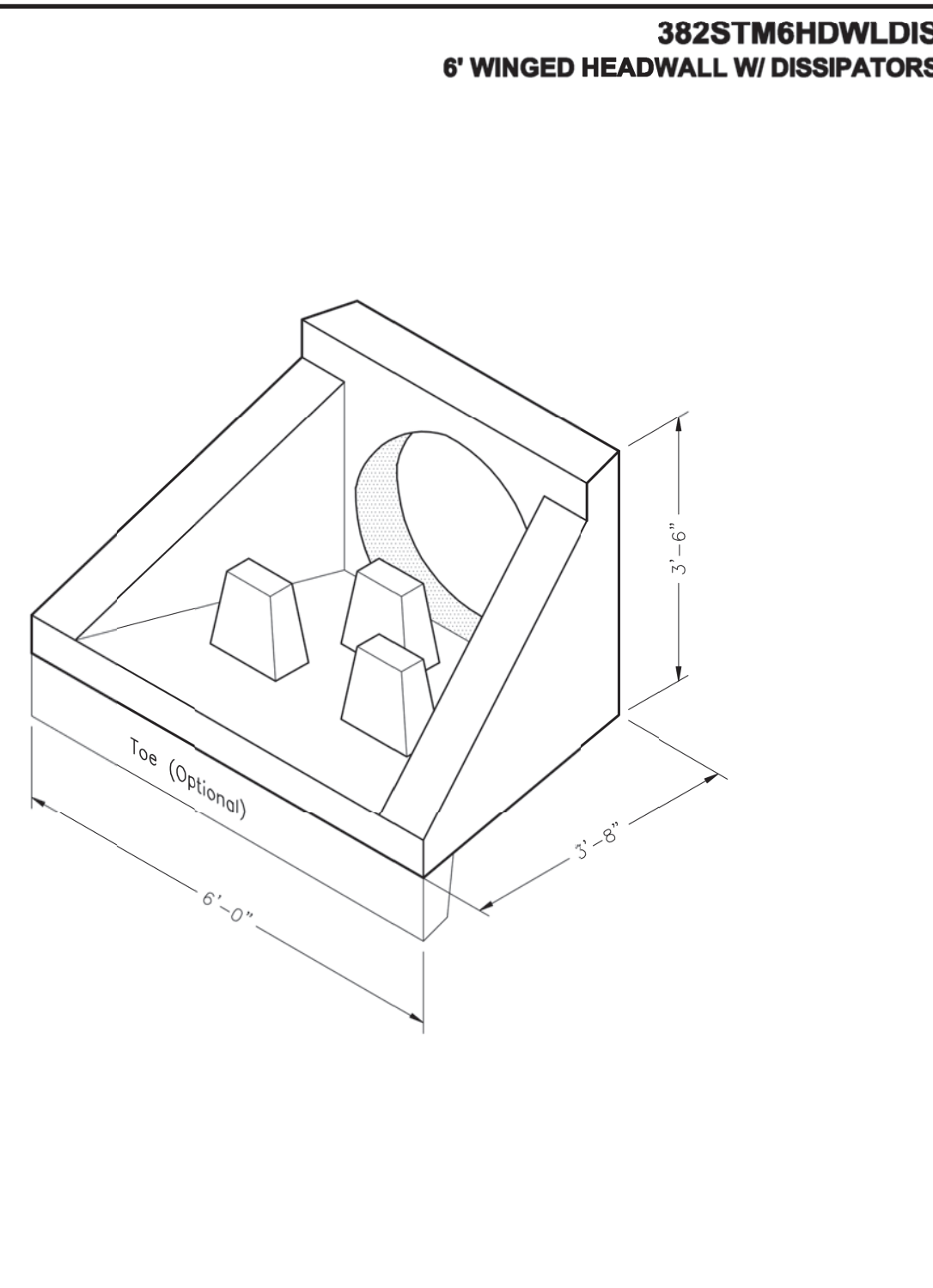
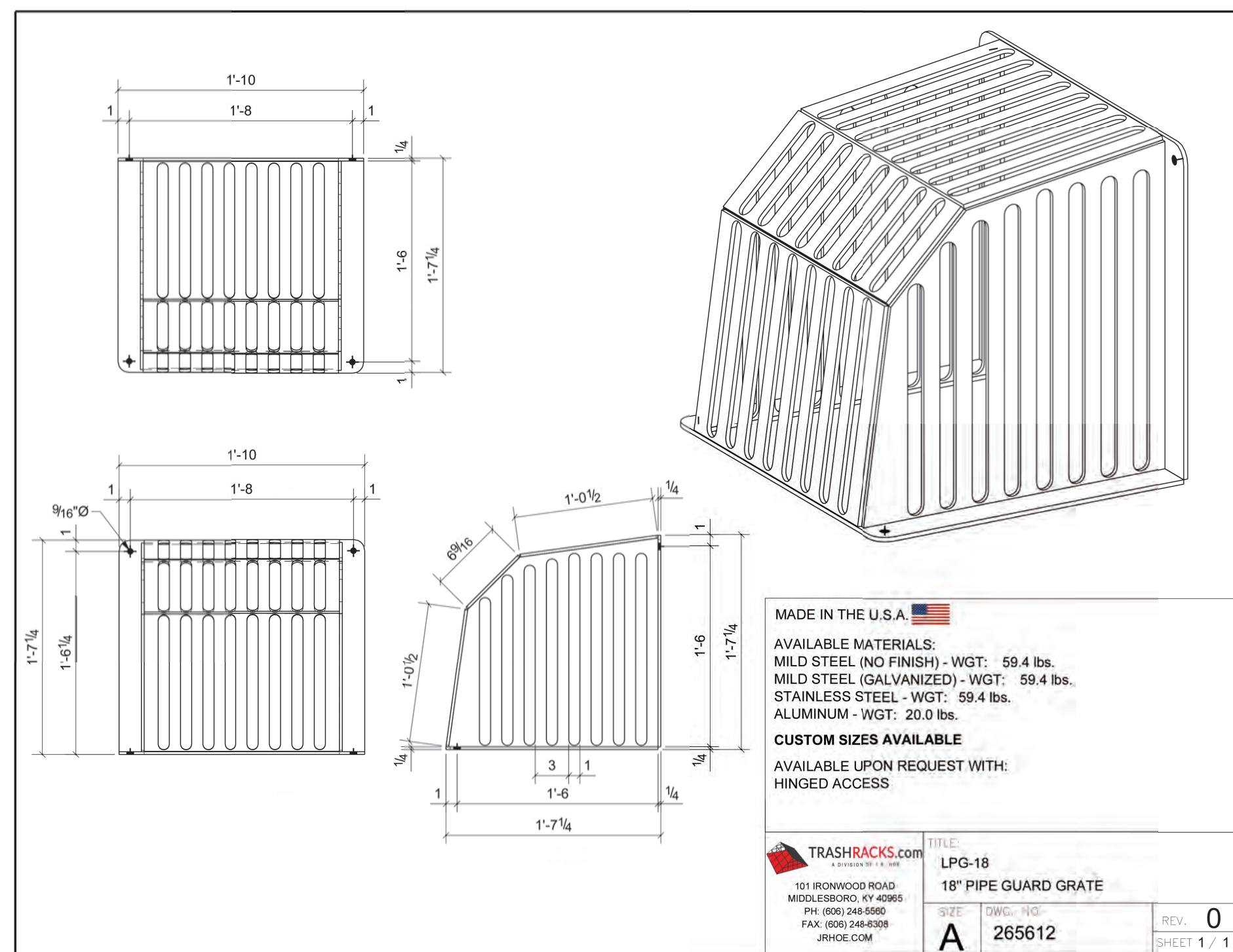
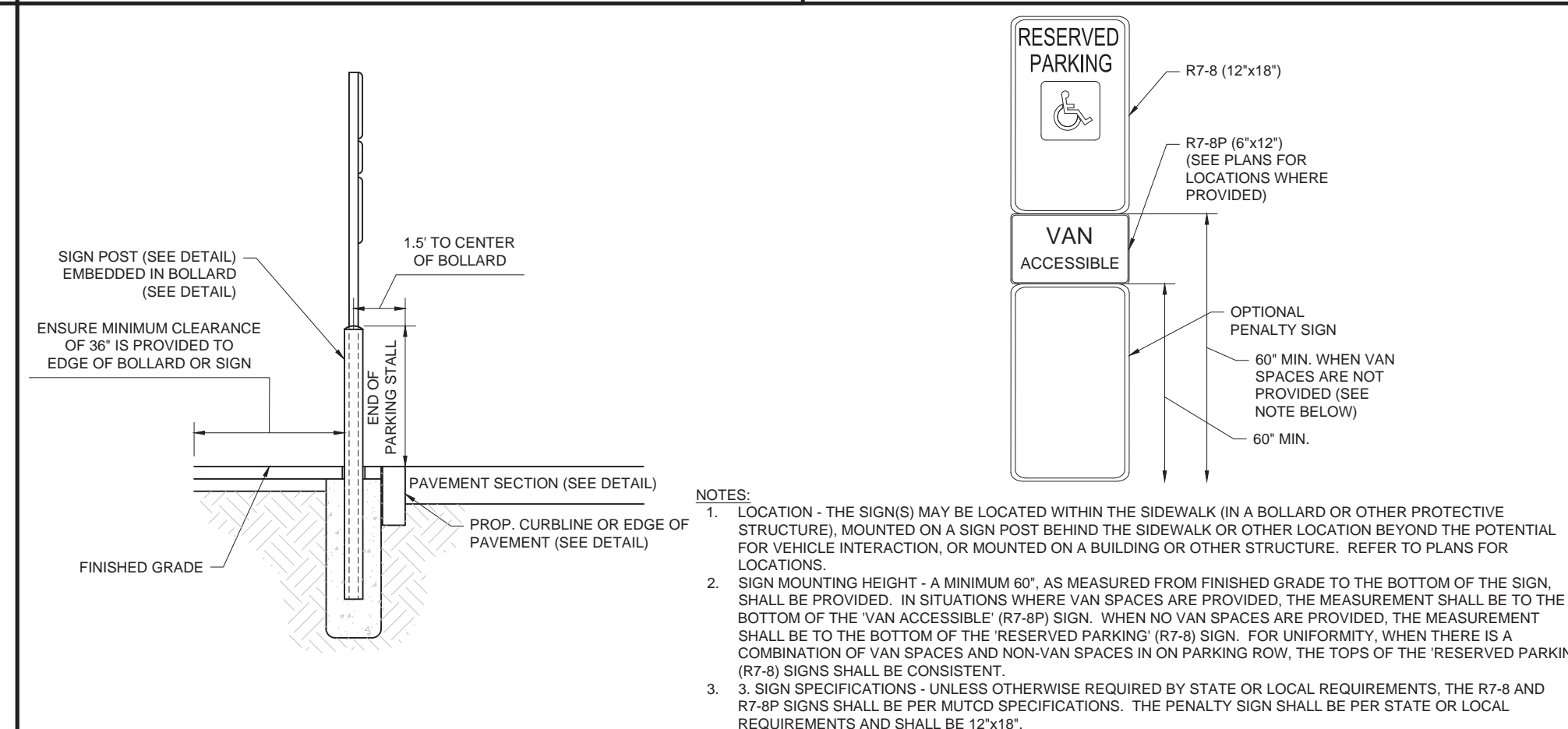
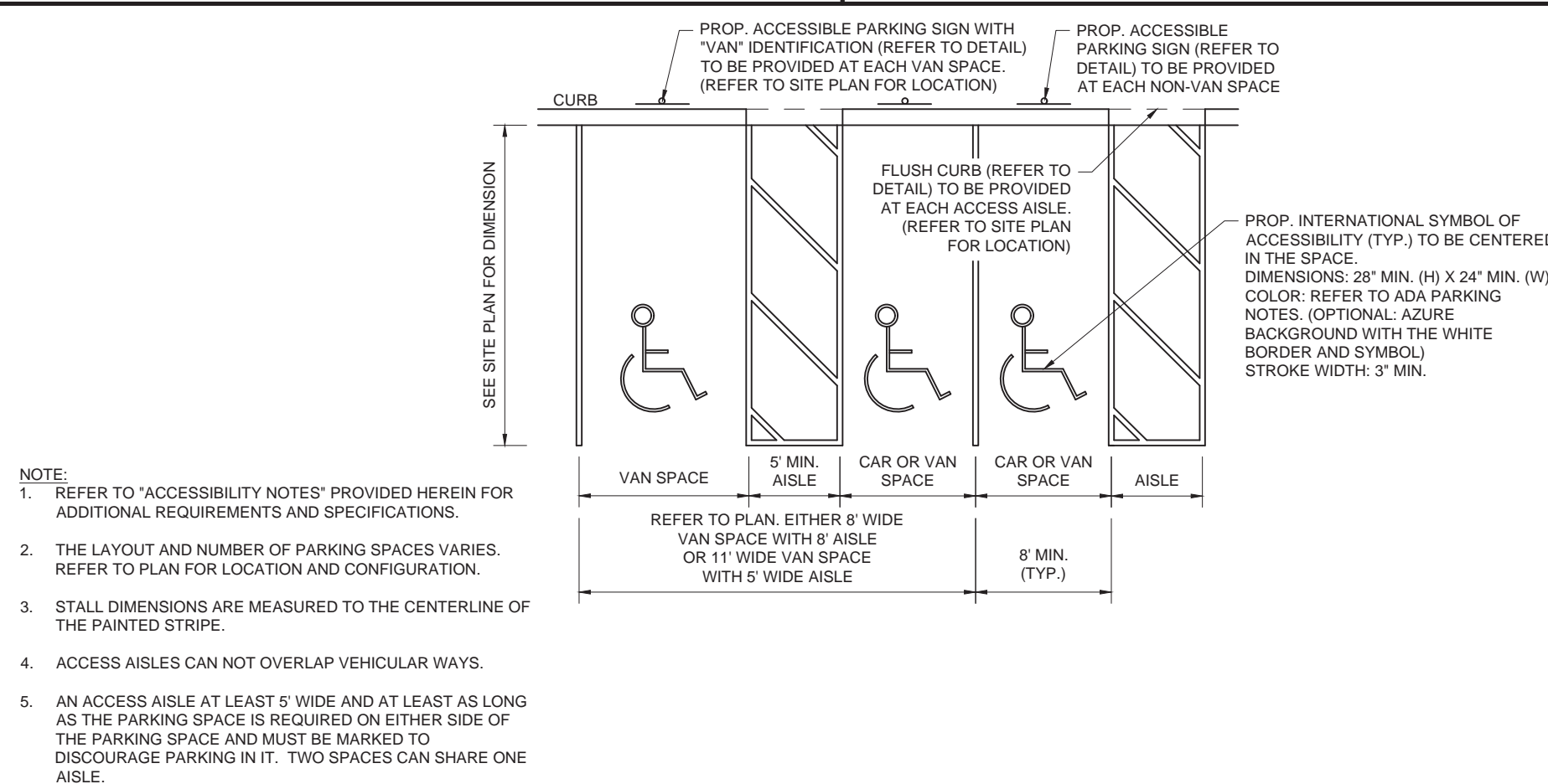
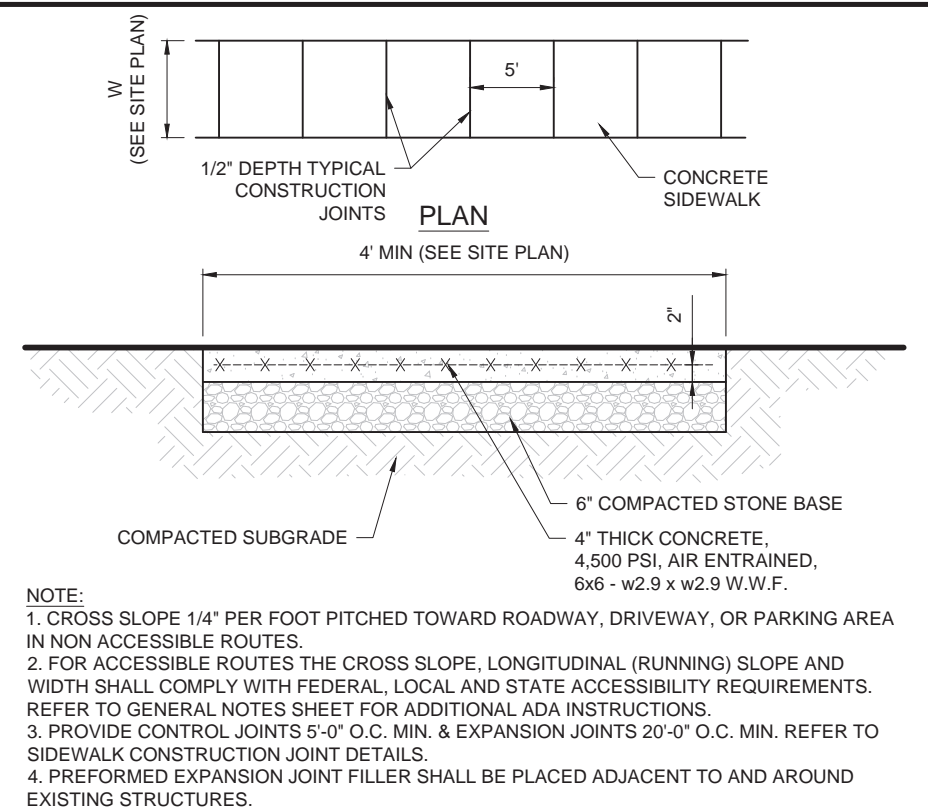
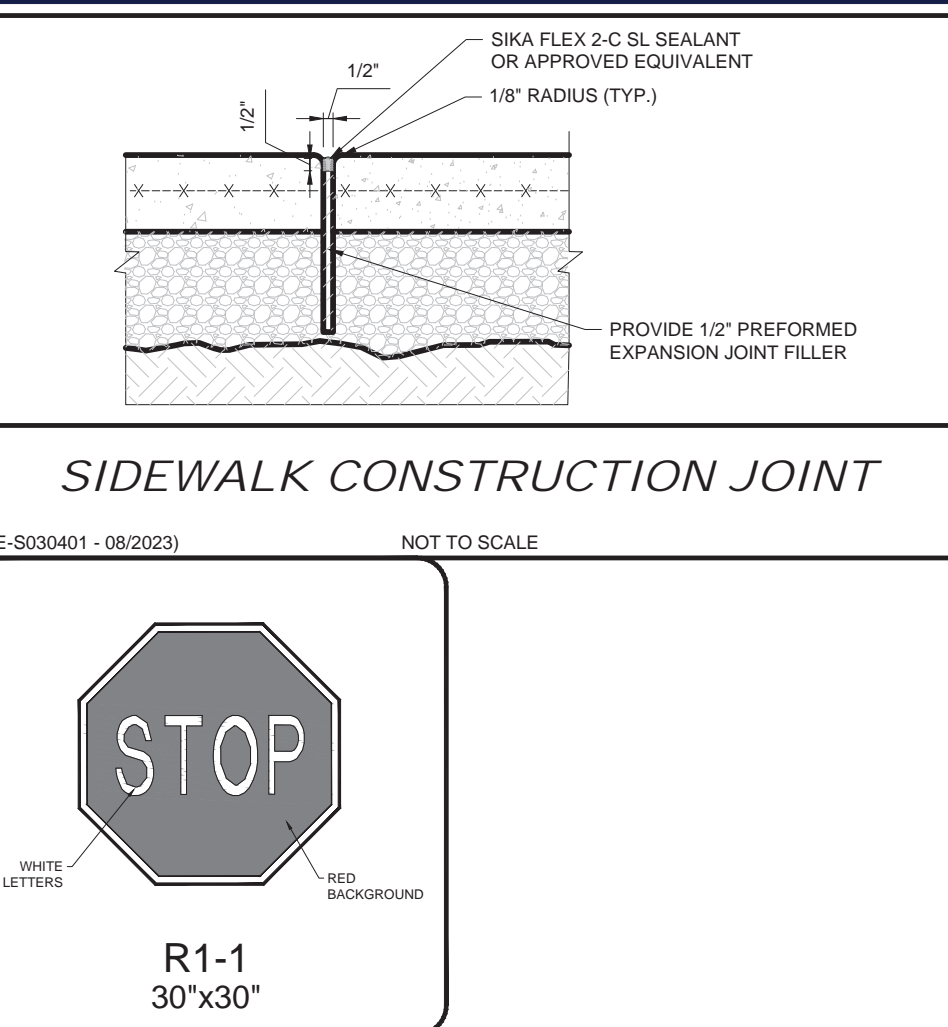
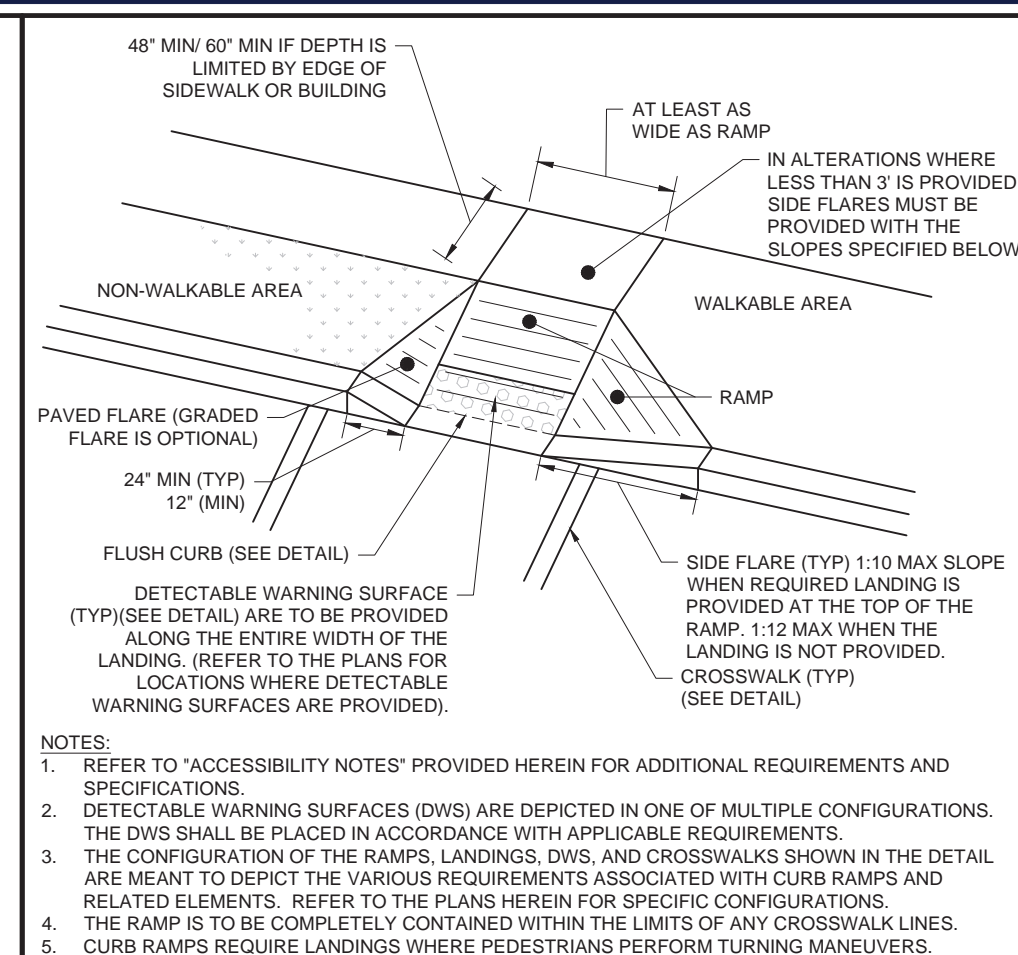
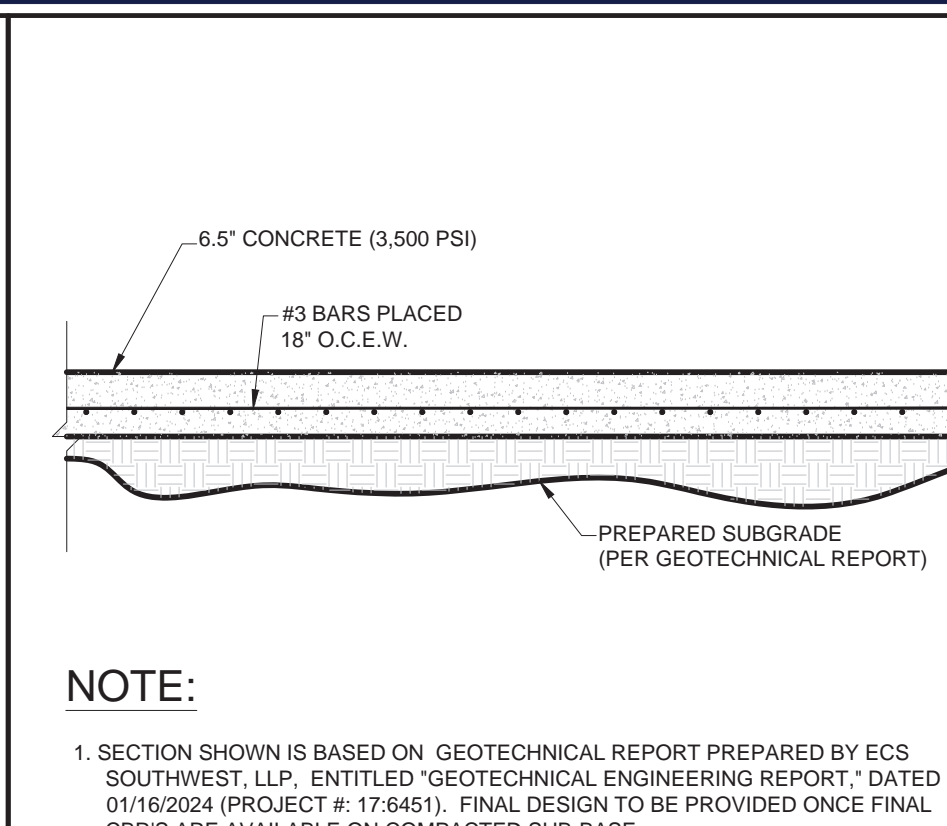
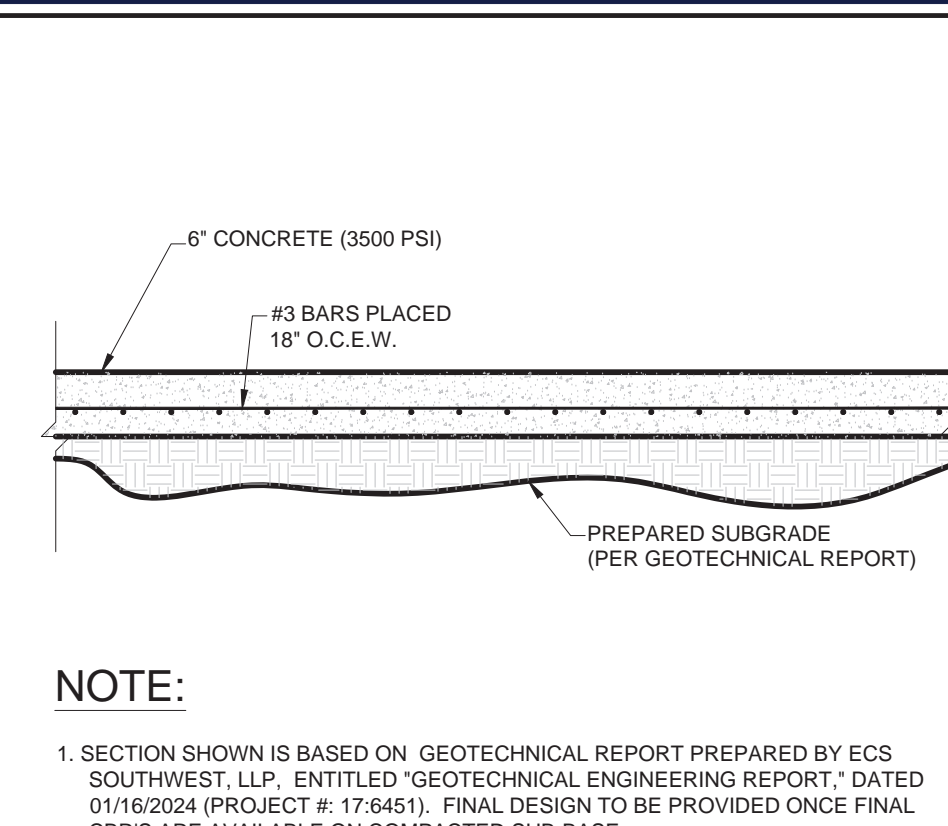
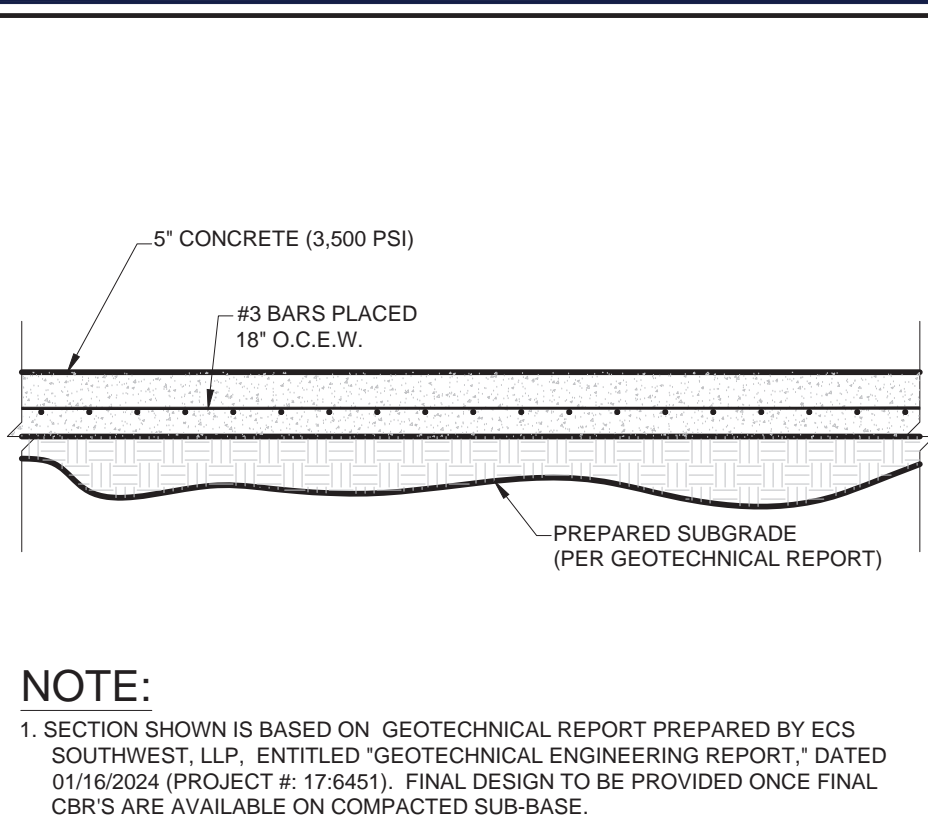
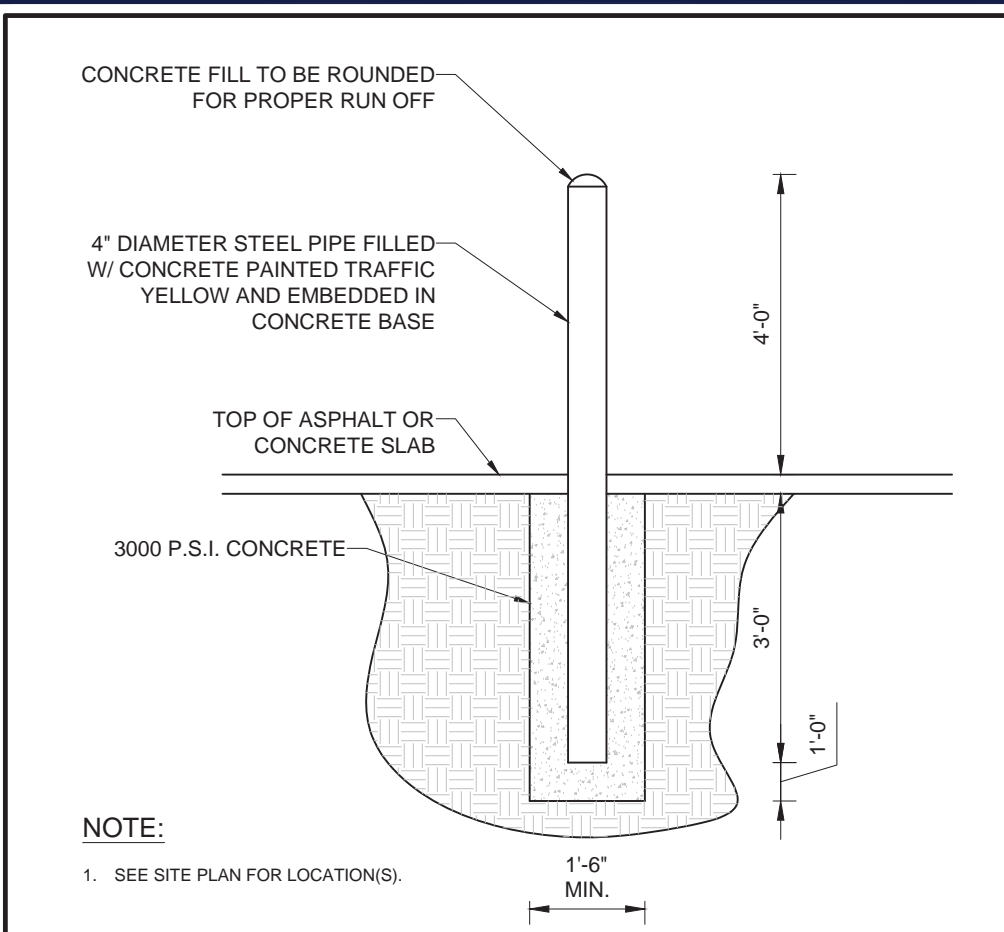


SHEET TITLE: EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

SHEET NUMBER:

C-802

ORG. DATE - XX/XX/2024

[illegible]

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DATE:	08/06/202
CAD I.D.:	

PROJECT:



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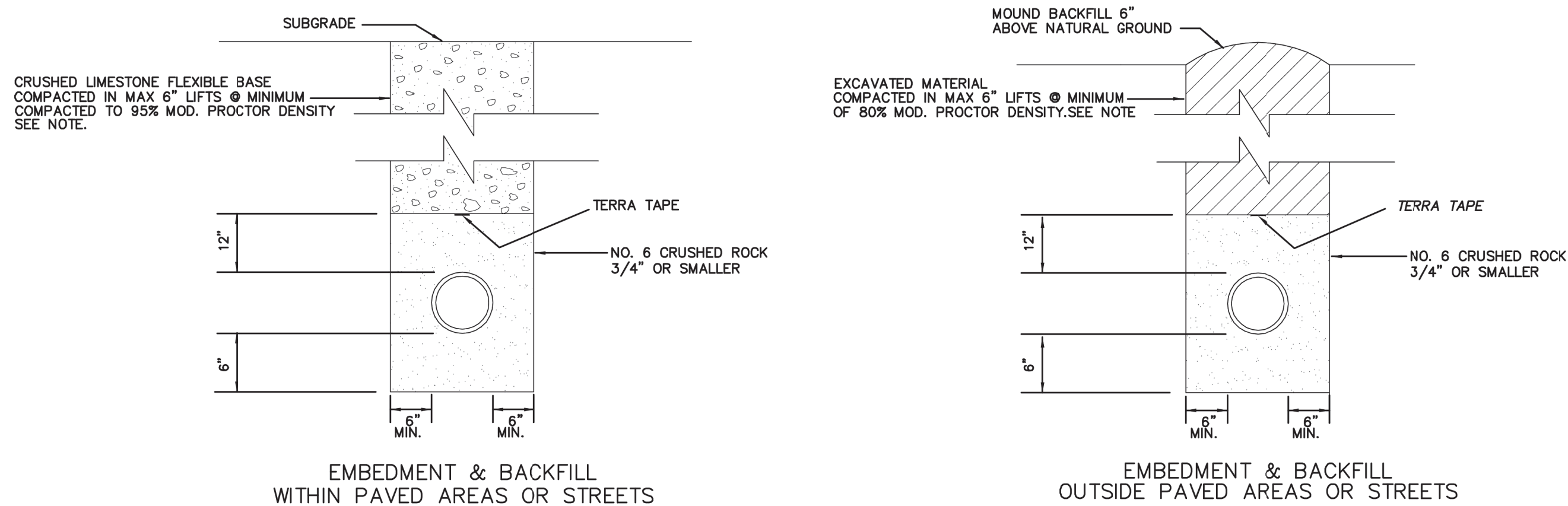
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FRISCO, TX 75034
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SHEET TITLE

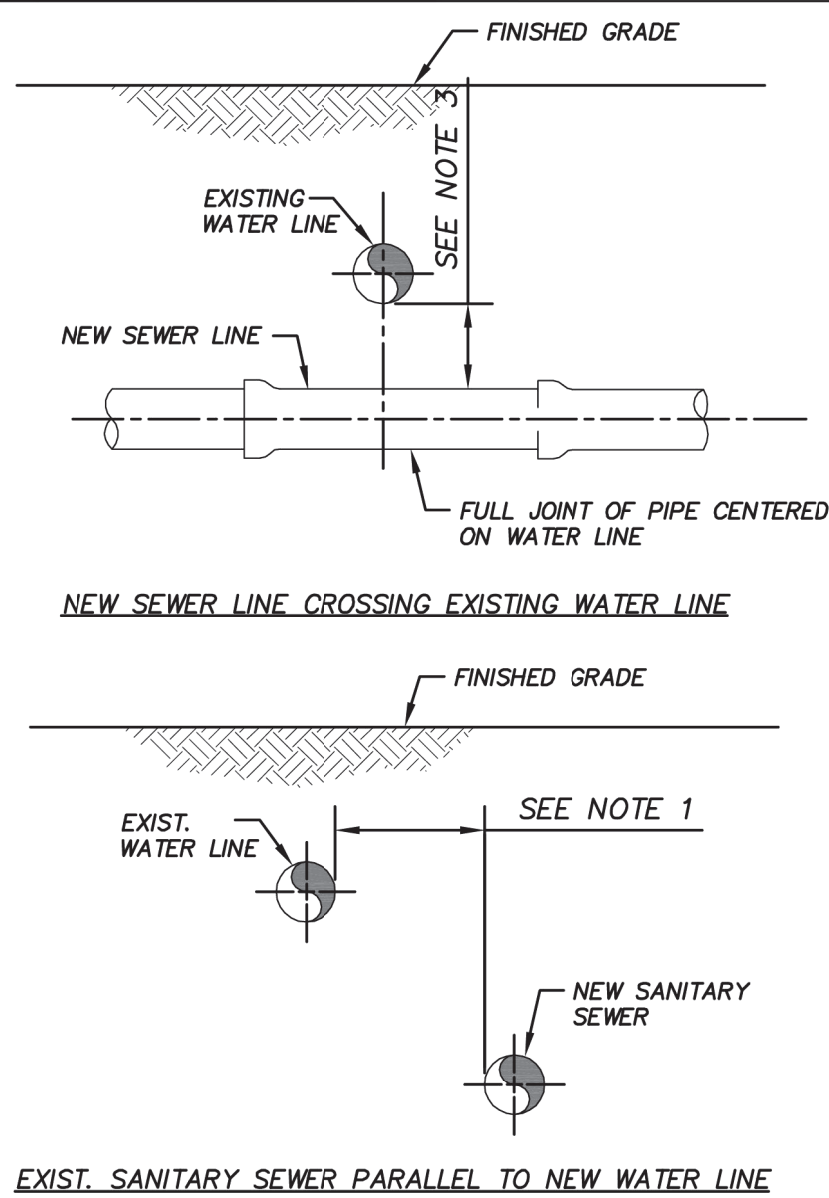
SHEET NUMBER

ORG. DATE - XX/XX/2024



PIPE EMBEDMENT & BACKFILL DETAILS

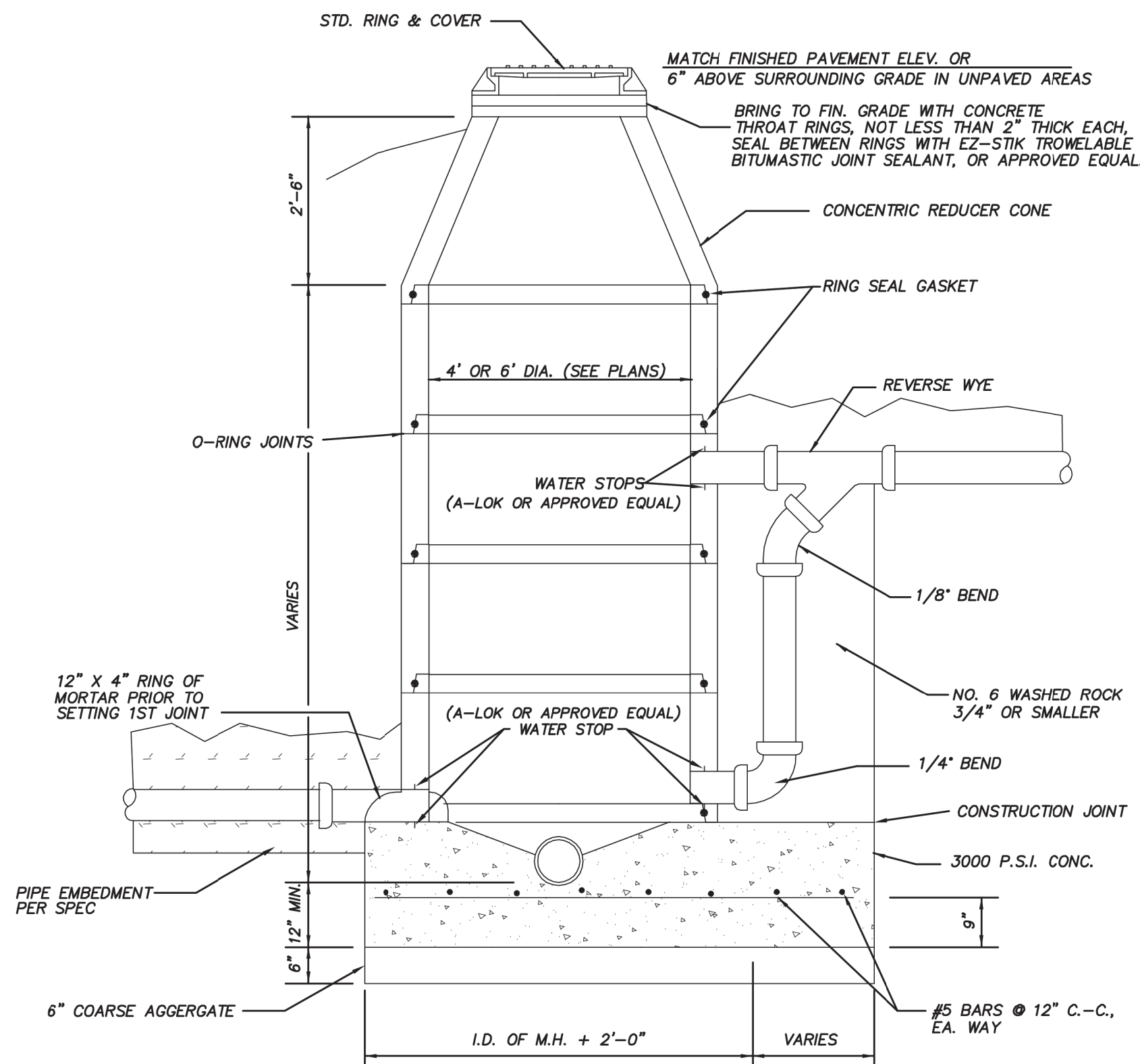
NTS



PIPE SEPERATION DETAILS

NTS

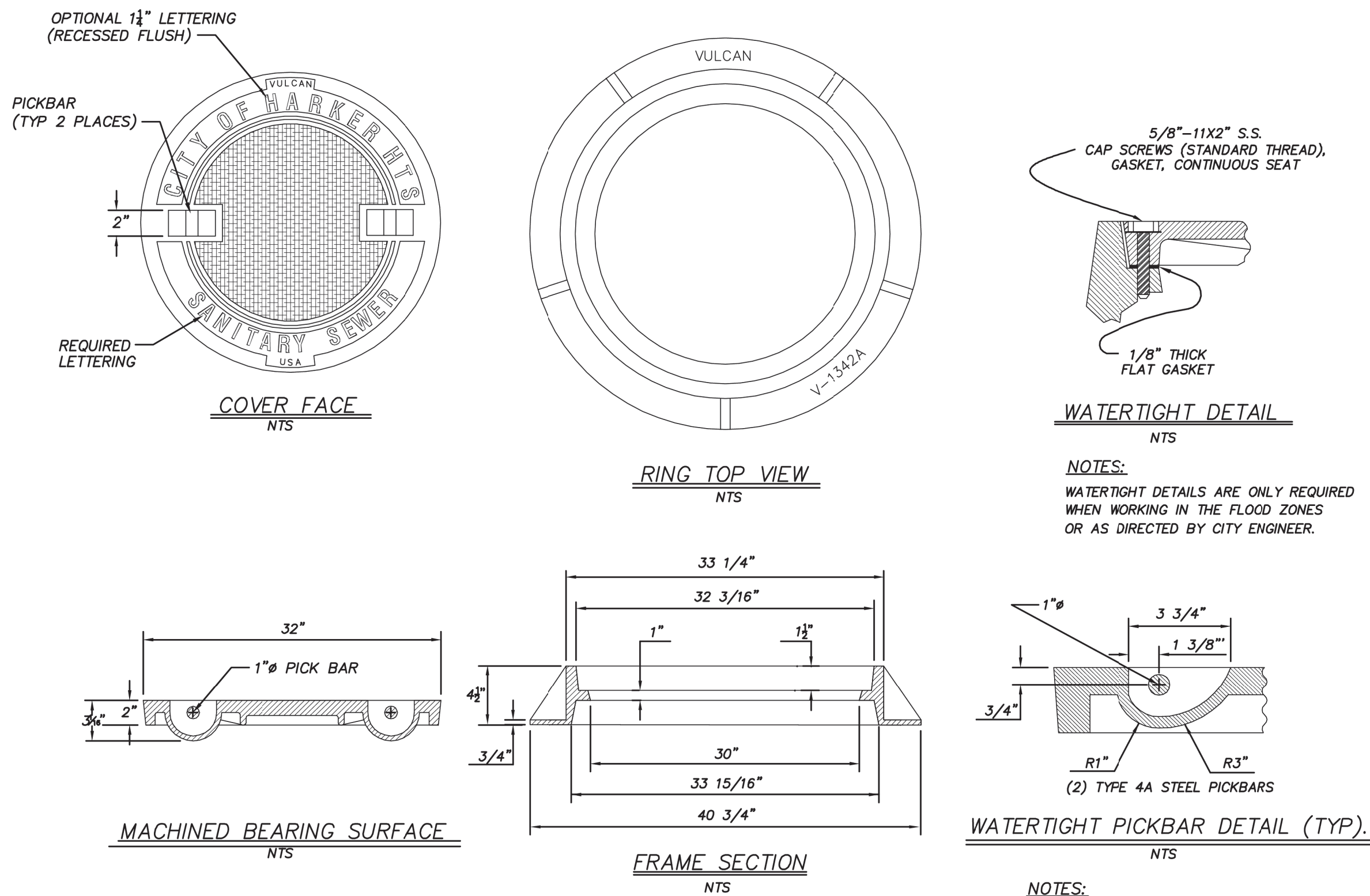
- NOTES:
1. ALL WATER AND SEWER LINE CONSTRUCTION RUNNING PARALLEL WITH EACH OTHER SHALL MAINTAIN A 9' HORIZONTAL SEPARATION, PIPE WALL TO PIPE WALL.
 2. SEPARATION REQUIREMENTS SHOWN HERE DO NOT APPLY TO SERVICE CONNECTIONS - REFER TO PLUMBING CODE FOR APPLICABLE REQUIREMENTS.
 3. ALL SEWER AND WATER LINE CROSSINGS SHALL COMPLY WITH THE TCEQ CHAPTER 290, PUBLIC DRINKING WATER SECTION 290.44 WATER DISTRIBUTION, SUB SECTION B, NEW WATERLINE INSTALLATION-CROSSING LINES, PARAGRAPHS (I) THROUGH (V) AND ALL SUB PARAGRAPHS THEREIN.



- NOTES:
1. MANHOLES SHALL BE PRECAST OR MONOLITHIC CONCRETE. MONOLITHICALLY PLACED MANHOLES SHALL BE CONSTRUCTED OF 3000# CONCRETE.
 2. ALL POURED IN PLACE MANHOLES SHALL BE POURED MONOLITHICALLY, EXCEPT AS APPROVED BY THE CITY ENGINEER OR AS SHOWN ON PLANS.
 3. FOR P.V.C. MAINS, USE DOUBLE FLANGED PIPE COLLARS AT MANHOLES FOR INFILTRATION-EXFILTRATION CONTROL.
 4. THE MANHOLE BASE SHALL BE BEDDED ON 6" COARSE AGGREGATE. THE CONTRACTOR SHALL LEVEL AND PLUMB THE BASE PRIOR TO SETTING THE PRECAST MANHOLE RISER SECTIONS ON THE PRECAST CONCRETE BASE.
 5. INSTALL DROP FITTING WHERE SHOWN ON PLANS.
 6. PRECAST MANHOLES SHALL MEET ASTM SPECIFICATIONS.

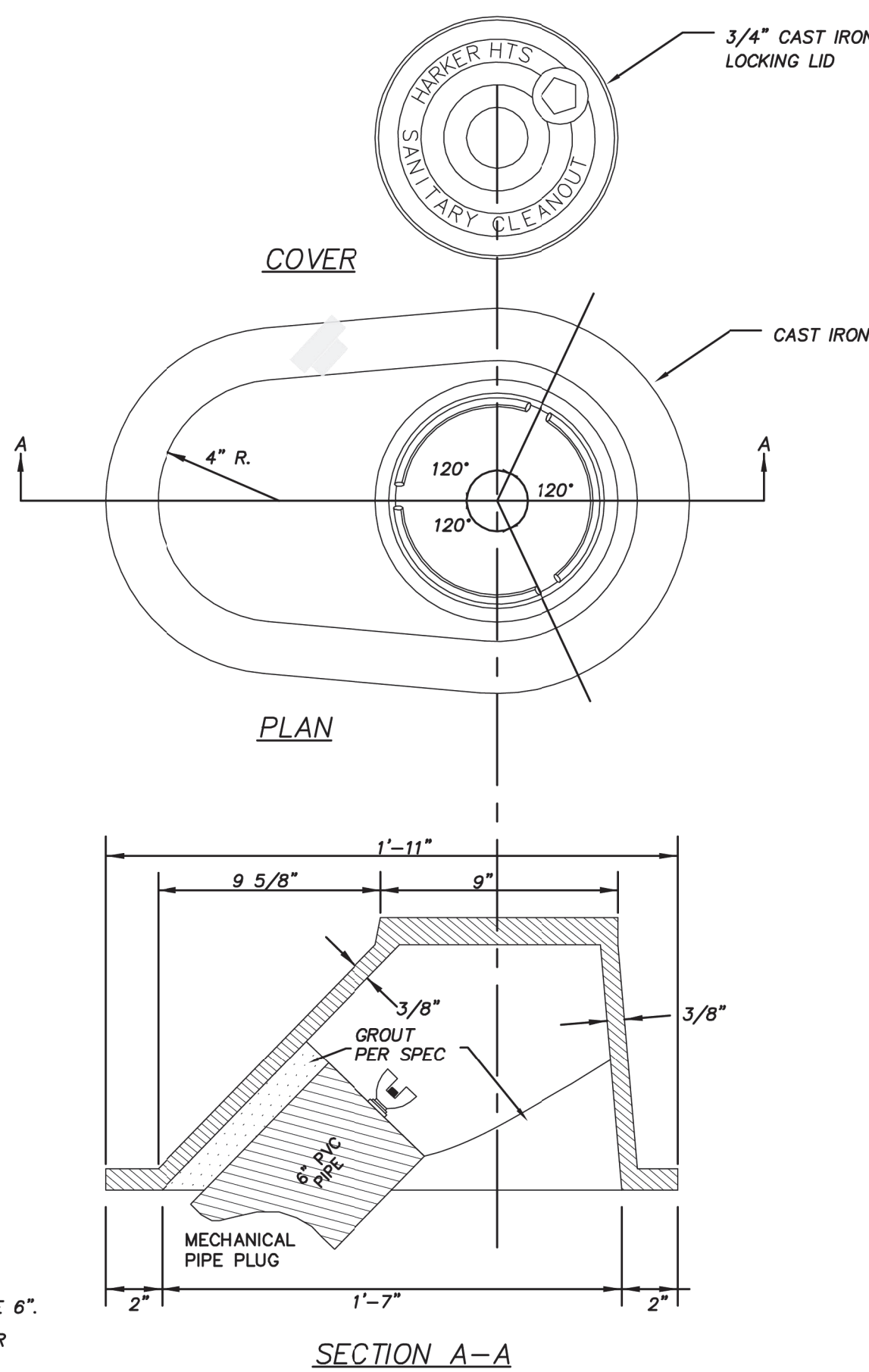
CONCRETE MANHOLE

NTS



STANDARD RING & COVER (30" OPENING)

NTS



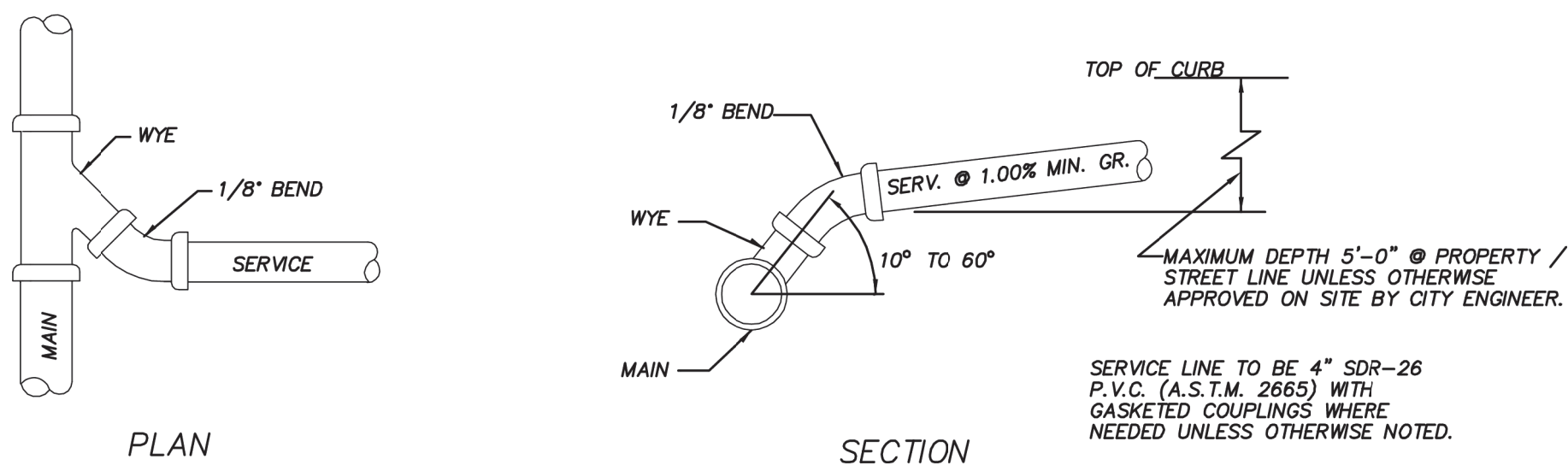
CLEANOUT LID DETAIL

NTS

- NOTES:
1. CLEANOUT AND FITTINGS SHALL BE 6".
 2. USE 8"x6" REDUCER WHERE 1" WER IS 8" IN SIZE.
 3. BACKFILL IN AROUND AND OVER CLEANOUT PIPE SHALL BE TAMPED AT 85% MODIFIED PROCTOR OF SOIL.

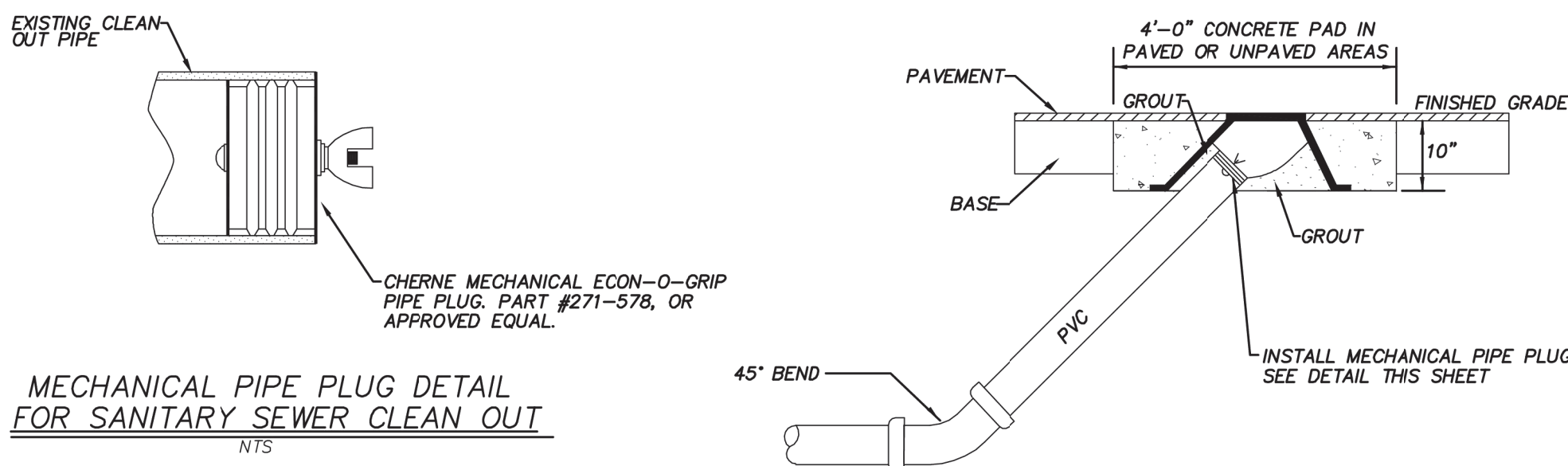
GENERAL NOTES:

1. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND ELEVATION OF ALL UTILITIES BEFORE ANY EXCAVATION BEGINS. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY DAMAGE TO UTILITIES.
2. THE CONTRACTOR SHALL CONTACT ALL LOCAL UTILITIES AND TEXAS ONE CALL SYSTEM BEFORE COMMENCING ANY EXCAVATION OR DIGGING OPERATIONS.
3. BRACE UTILITY POLES AS REQUIRED TO MAINTAIN STABILITY OF THE POLES DURING CONSTRUCTION.
4. NO MANHOLES SHALL BE RAISED MORE THAN 1'-0" THROUGH THE USE OF GRADE RINGS.
5. NO PLASTIC OR BRICK MANHOLES SHALL BE BUILT.
6. FIBERGLASS MANHOLES ACCEPTABLE ONLY WHERE SHOWN ON PLANS AND AS DETAILED BY SEPARATE DRAWING.
7. ALL MATERIALS SHALL BE DOMESTIC / USA.
8. WHEN CROSSING ROADWAYS, CRUSHED LIMESTONE BASE MATERIAL SHALL BE TxDOT ITEM 24B, TYPE A, GRADE 2 AND SHALL BE COMPACTED TO A MINIMUM OF 95% A.S.T.M. D1557, METHOD D @ + OR - 2% OPTIMAL MOISTURE AND LIFTS NOT TO EXCEED 6 INCHES.
9. ALL INFRASTRUCTURE SHALL MEET MINIMUM CURRENT EFFECTIVE TCEQ STANDARDS.



SEWER TAP DETAILS

NTS



TYPICAL SECTION OF SEWER CLEANOUT

NTS

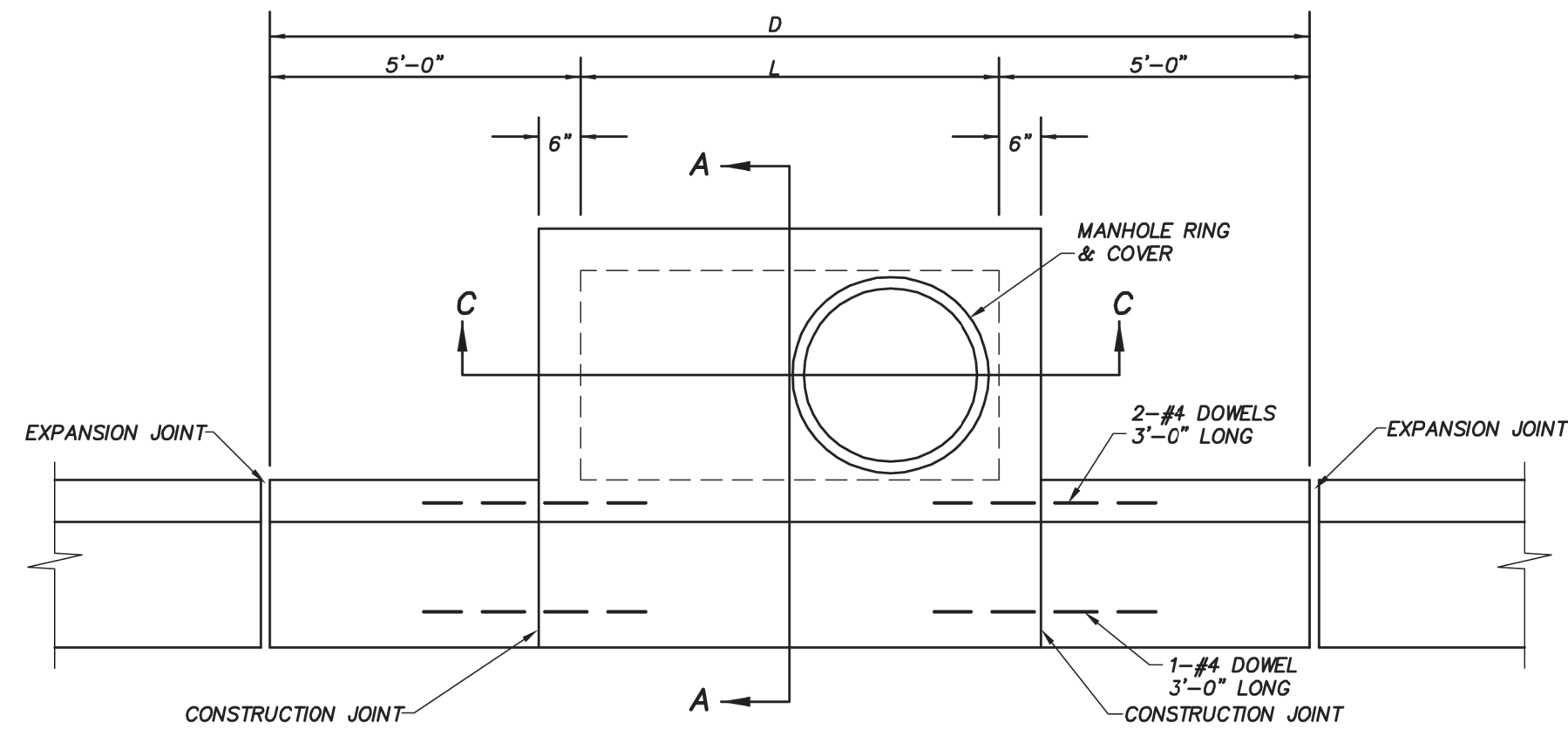
Harker Heights
The Bright Star of
Central Texas

DEPARTMENT OF PUBLIC WORKS



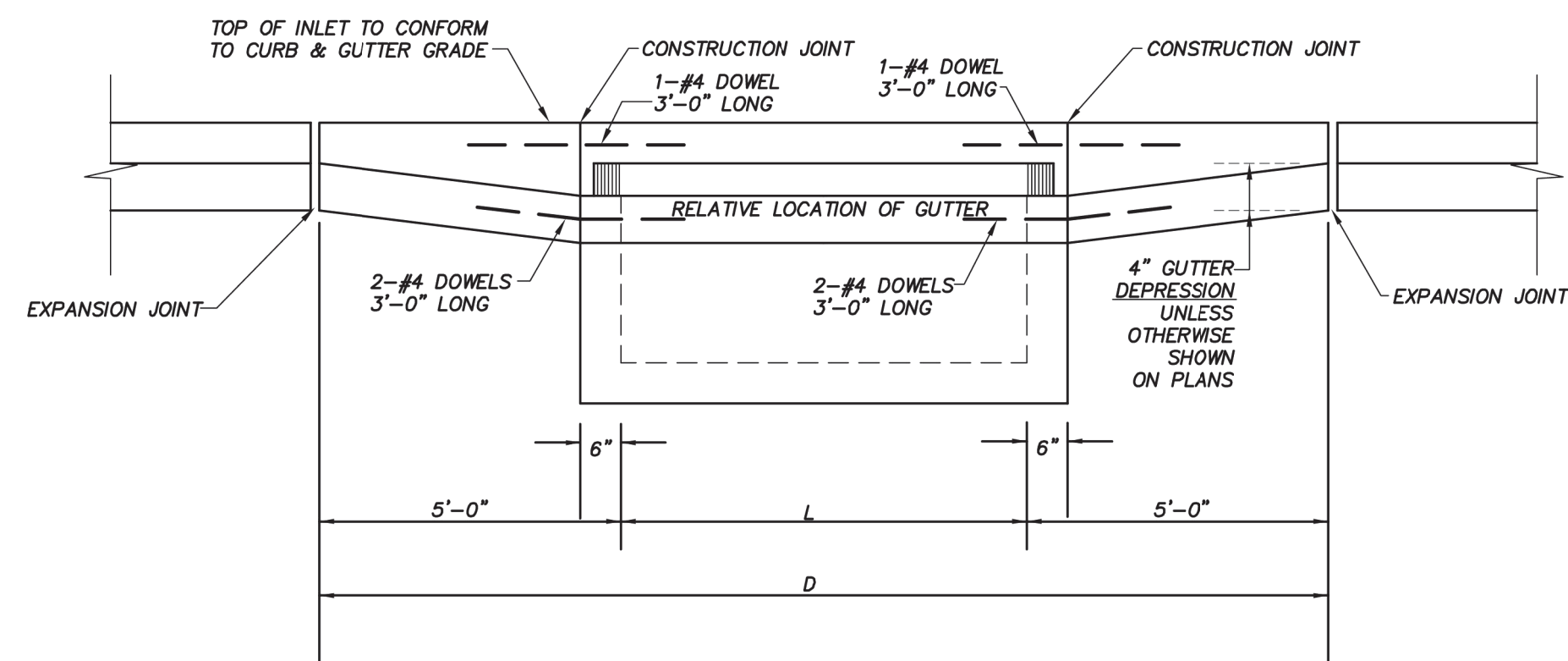
SANITARY SEWER DETAILS

ENGINEER:	SCALE: N.T.S.	DATE: 3/14/11	SHEET # C-902 OF
	DRAWN BY:	CHECKED BY:	

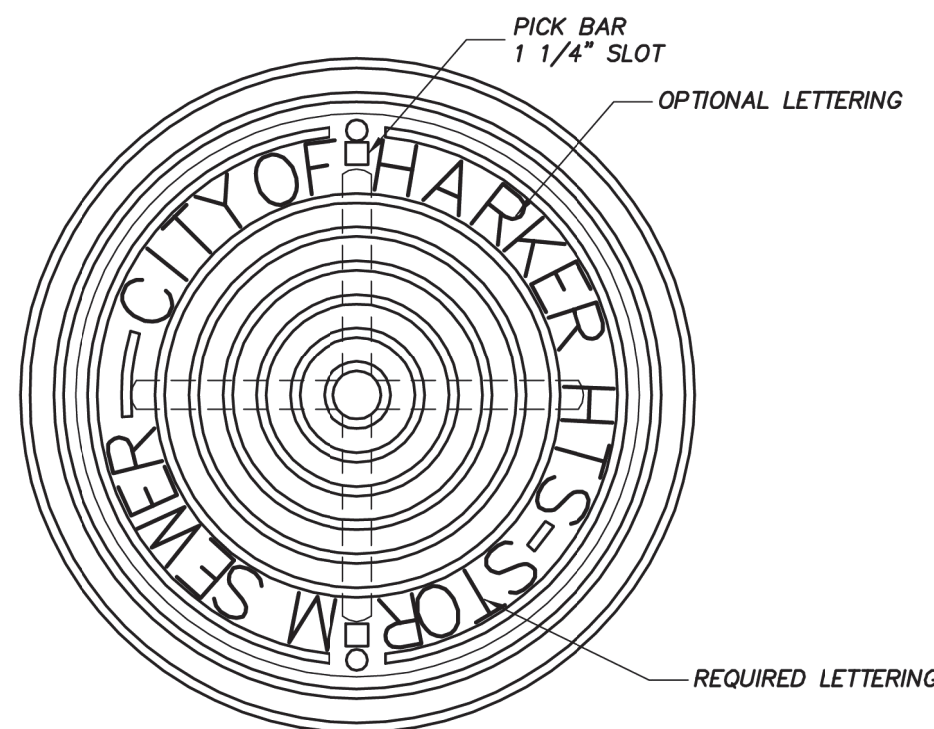


TYPICAL CURB INLET
NTS

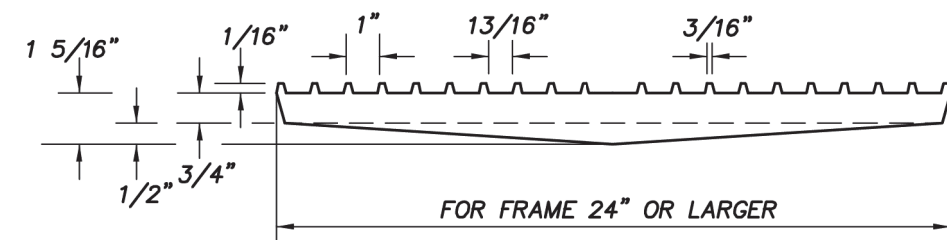
INLET TYPE	D	L
TYPE-A	15'-0"	5'-0"
TYPE-B	20'-0"	10'-0"
TYPE-C	25'-0"	15'-0"
TYPE-D	30'-0"	20'-0"



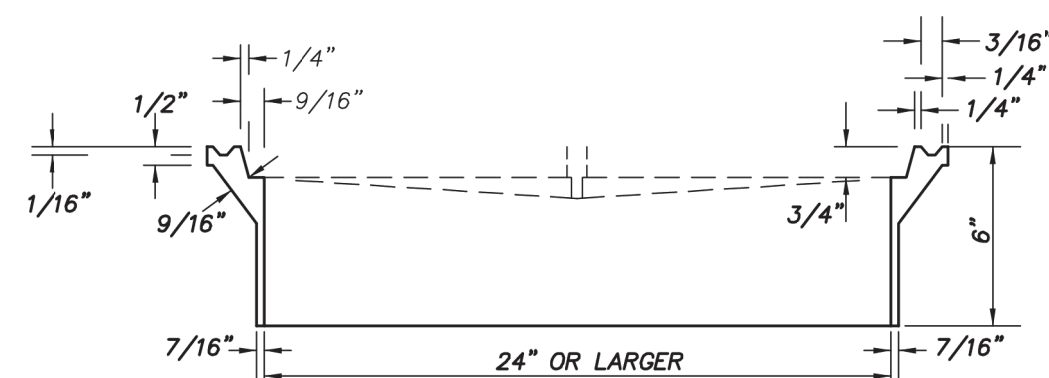
ELEVATION SHOWING RELATIVE ELEVATION OF GUTTER
NTS



PLAN OF COVER

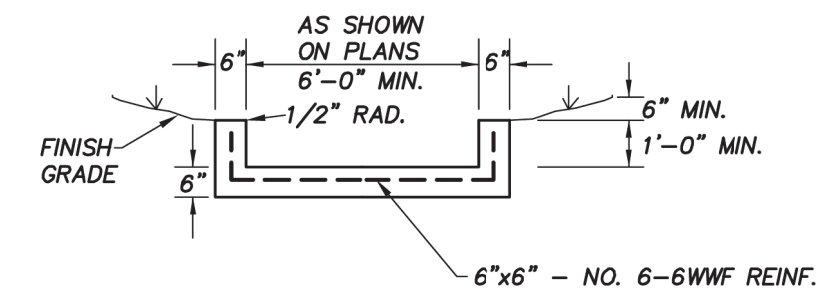


SECTION OF COVER

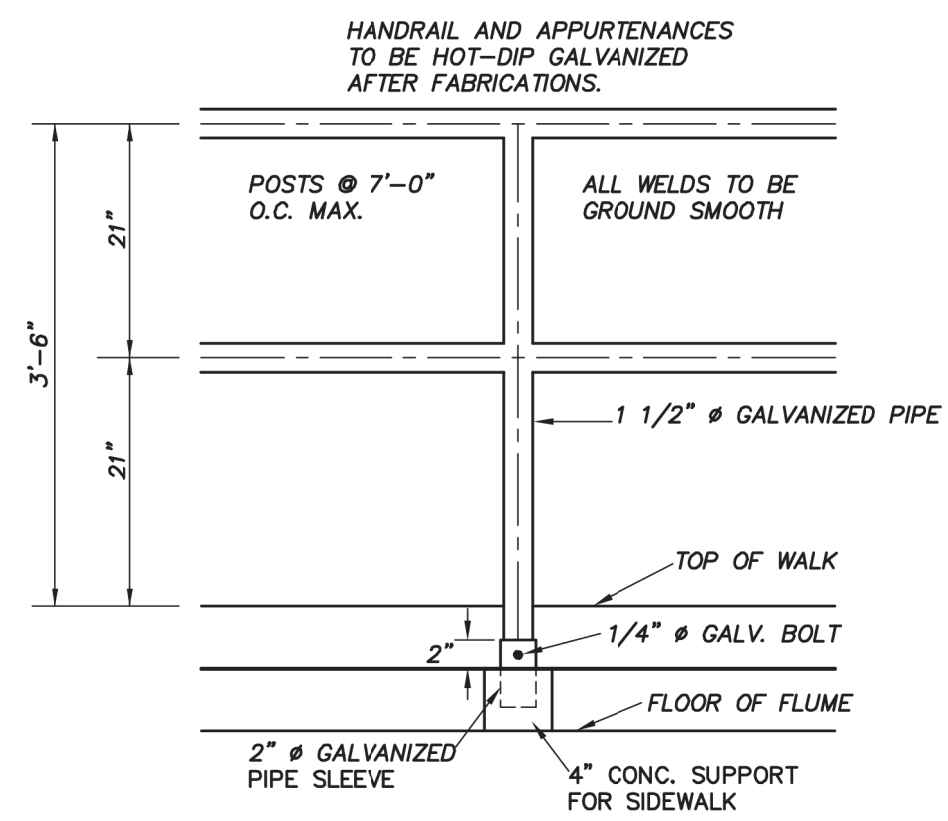


SECTION OF FRAME

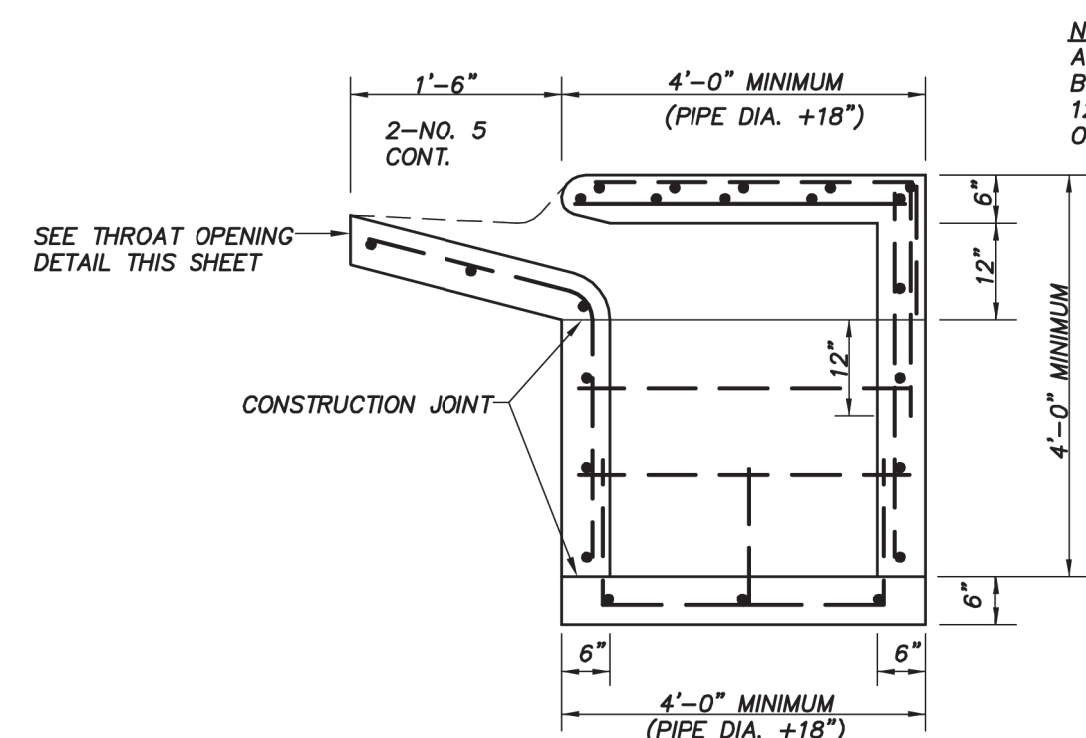
STANDARD MANHOLE FRAME & COVER
NTS



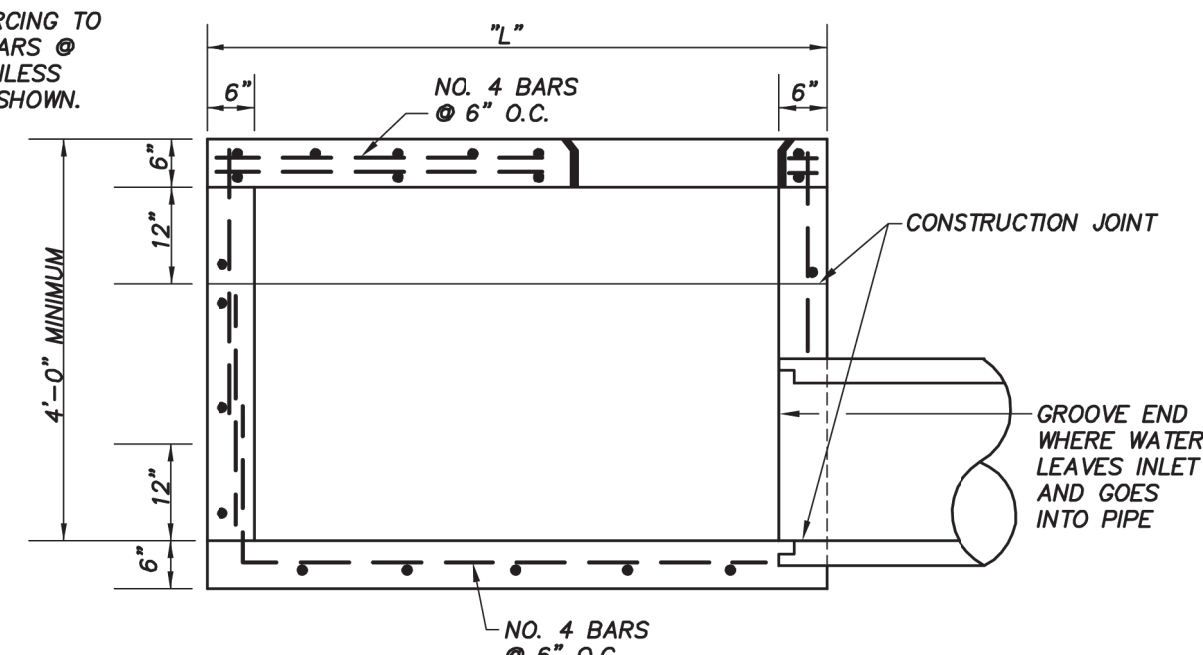
SECTION B-B
NTS



HANDRAIL DETAIL
NTS

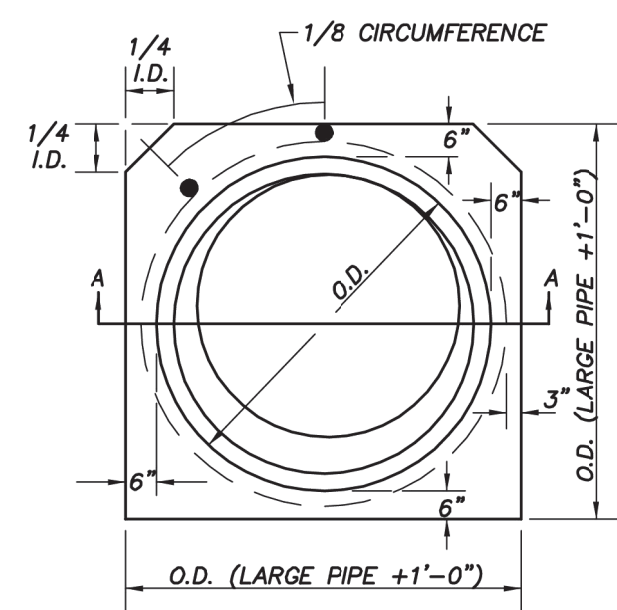


SECTION A-A
TYPICAL FOR ALL TYPES

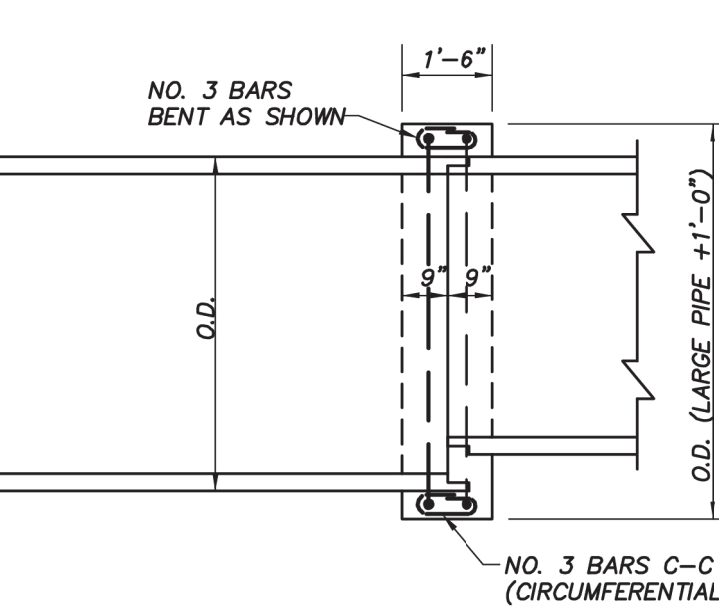


SECTION C-C
SHOWN FOR TYPE A INLET

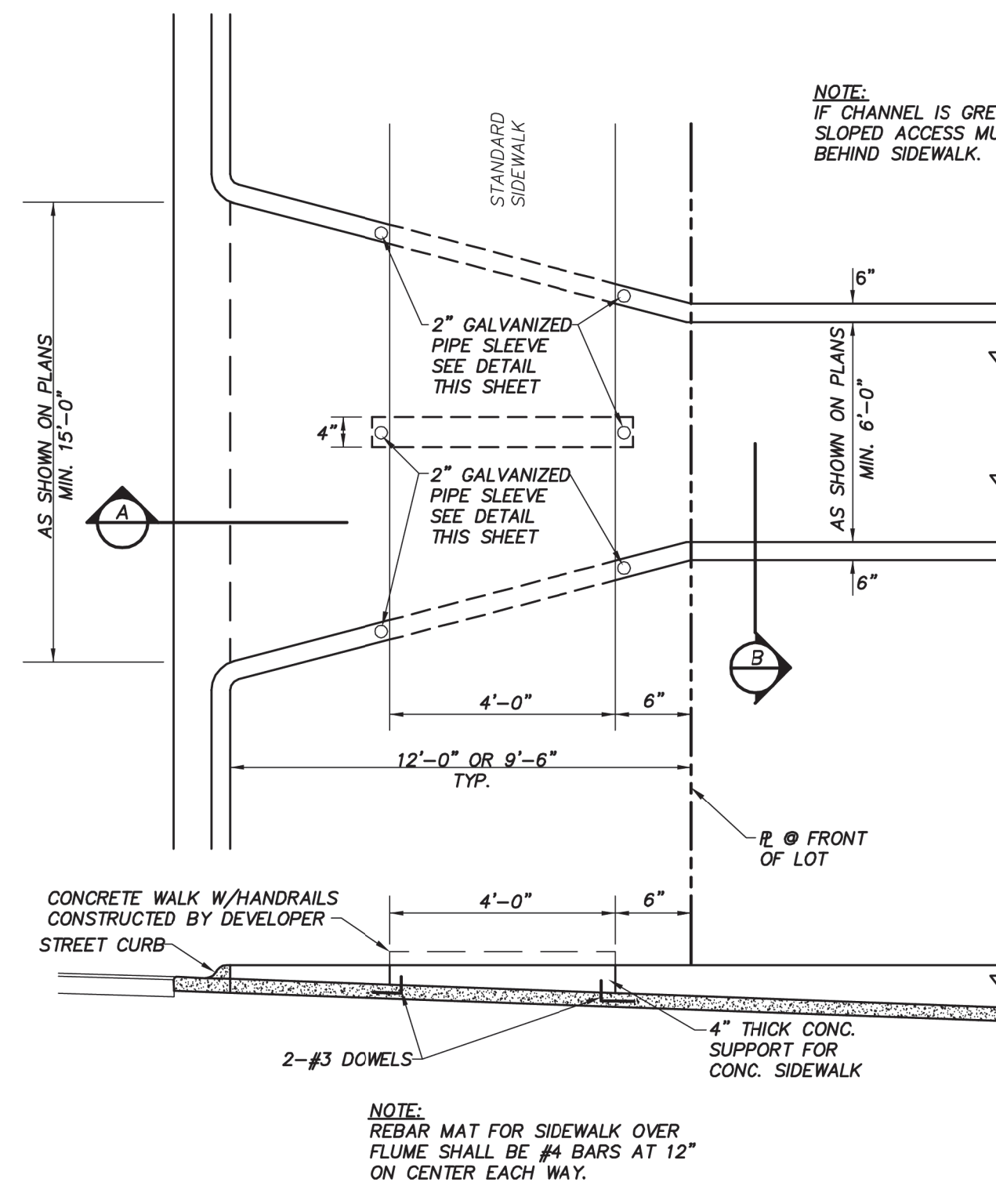
STANDARD CURB INLET SECTIONS
NTS



REINFORCED CONCRETE COLLAR DETAIL
NTS



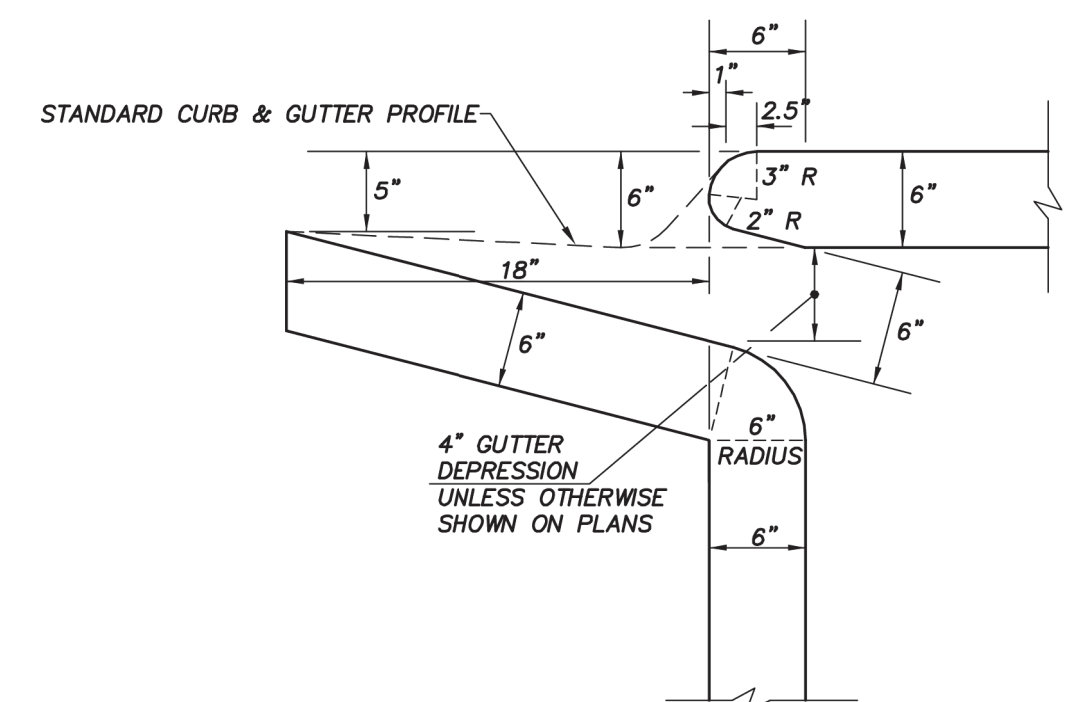
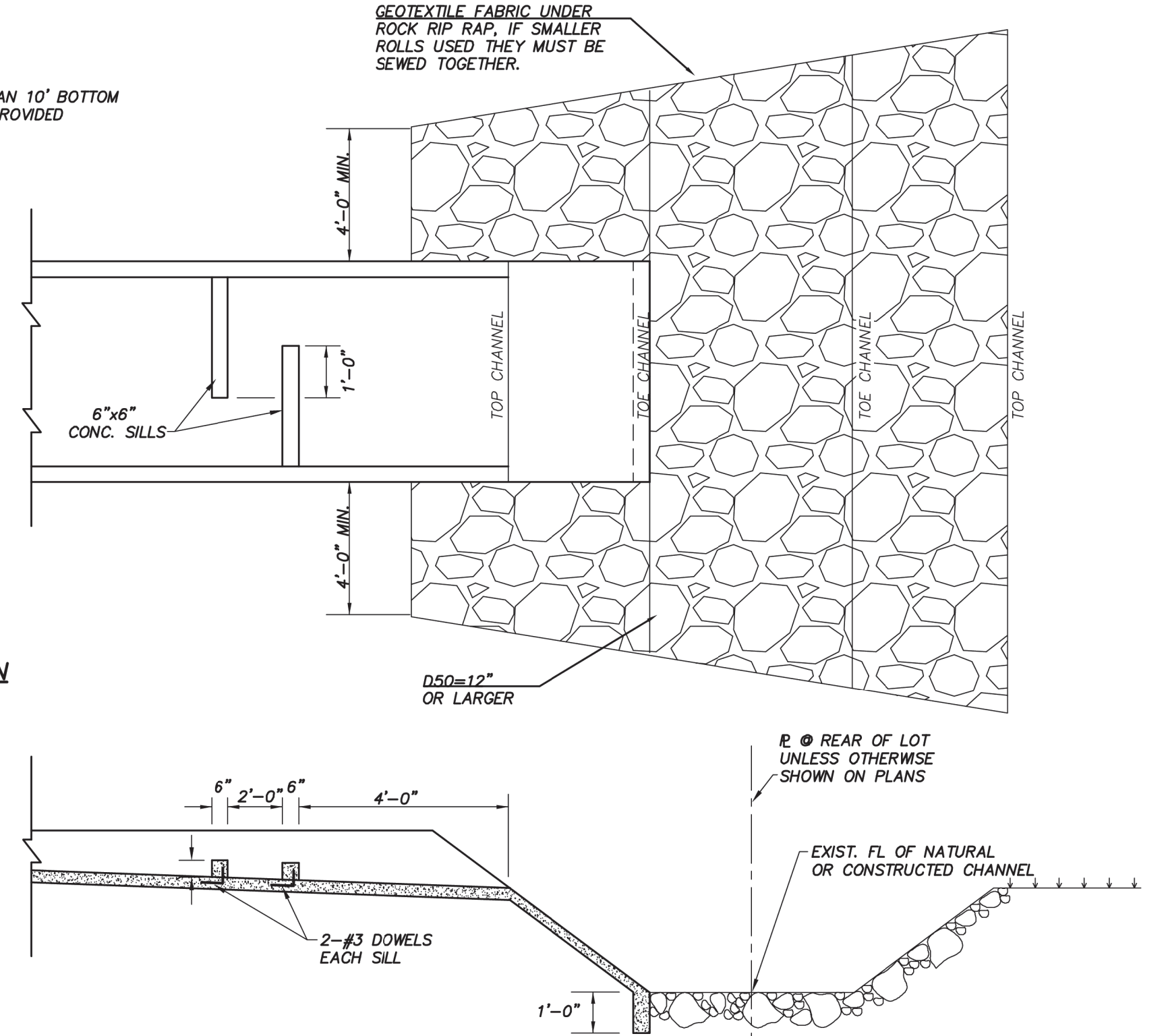
SECTION A-A



PLAN

SECTION A-A

CONCRETE DRAINAGE FLUME
NTS



DETAIL AT INLET THROAT OPENING
NTS

- CONSTRUCTION NOTES:**
1. SEE PLAN - PROFILE SHEETS FOR TYPE, LOCATION, & ELEVATIONS OF CURB INLET.
 2. ALL CONSTRUCTION MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATIONS OF THE CITY OF HARKER HEIGHTS.
 3. CONCRETE COVER OF REINFORCING STEEL SHALL BE AS SHOWN ON THE PLANS & SHALL BE FROM THE CENTER OF THE OUTSIDE LAYER OF STEEL TO THE FACE OF CONCRETE.
 4. DIMENSIONS RELATING TO THE BENDING OF REINFORCING STEEL SHALL BE TO THE CENTER OF BARS.
 5. ALL REINFORCING BARS SHALL HAVE A MINIMUM 1 1/2" CLEARANCE FROM ALL FORMS OR 3" FROM EARTH.
 6. EXPOSED CORNERS OF CONCRETE SHALL BE TOoled TO 3/8" RADIUS UNLESS OTHERWISE SPECIFIED. ALL SLAB SURFACES SHALL BE STEEL TROWELED AND FINISHED WITH A LIGHT BRUSHED SURFACE. ALL EXPOSED WALL SURFACES SHALL BE RUBBED TO A UNIFORM, SMOOTH SURFACE.
 7. THE WIDTH, DEPTH AND LENGTH OF THE INLET BOXES ARE STANDARD DESIGNS AND ARE SUBJECT TO CHANGE WHERE IT IS PRACTICAL TO CONFORM WITH PIPE SIZES COMING IN AND OUT OF THE BOXES. HOWEVER ANY DEVIATION FROM THE STANDARD DIMENSIONS SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO CONSTRUCTION.

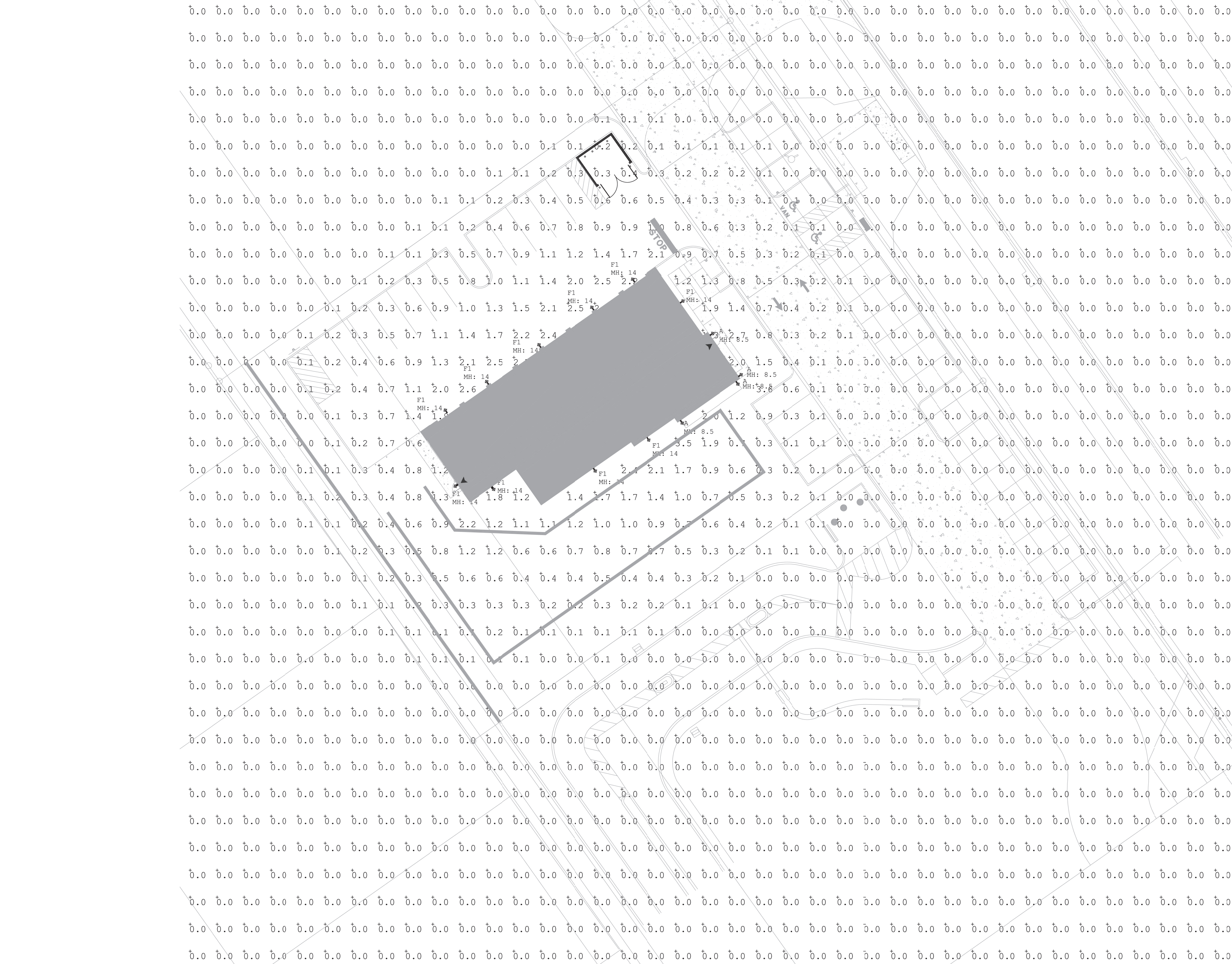
Harker Heights
The Bright Star of Central Texas
DEPARTMENT OF PUBLIC WORKS



STORM SEWER DETAILS

ENGINEER:	SCALE: N.T.S.	DATE: 3/14/11	SHEET # C-903
DRAWN BY:	CHECKED BY:		OF





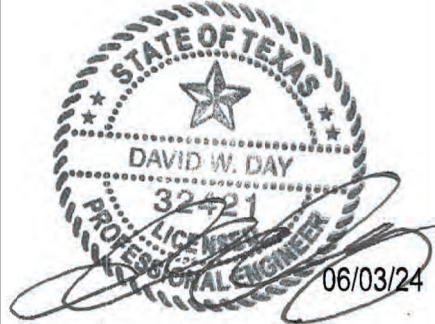
LUMINAIRE SCHEDULE						
SYMBOL	QTY	LABEL	WATTS	LUMENS	LLF	CATALOG
	4	A	15.5	973	0.900	303-W1-LEDB2-3000-UNV-T4-DIM10
	10	F1	20.1	2515	0.900	IST-SA1A-730-U-T4FT

CALCULATION SUMMARY						
LABEL	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
OVERALL	Fc	0.14	3.6	0.0	N.A.	N.A.
PARK & DRIVE	Fc	0.63	2.9	0.0	N.A.	N.A.
SIDEWALK	Fc	1.60	2.0	1.2	1.33	1.67

1 PHOTOMETRIC SITE PLAN
SCALE: 1" = 20'-0"



PROJ #241088
DAVID W DAY , P.E.
102 Poncho St.
P.O. Box 1640 Anahuac, TX 77514
Telephone 713-927-4470



ARCHITECT OF RECORD

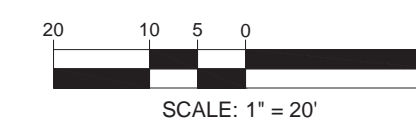
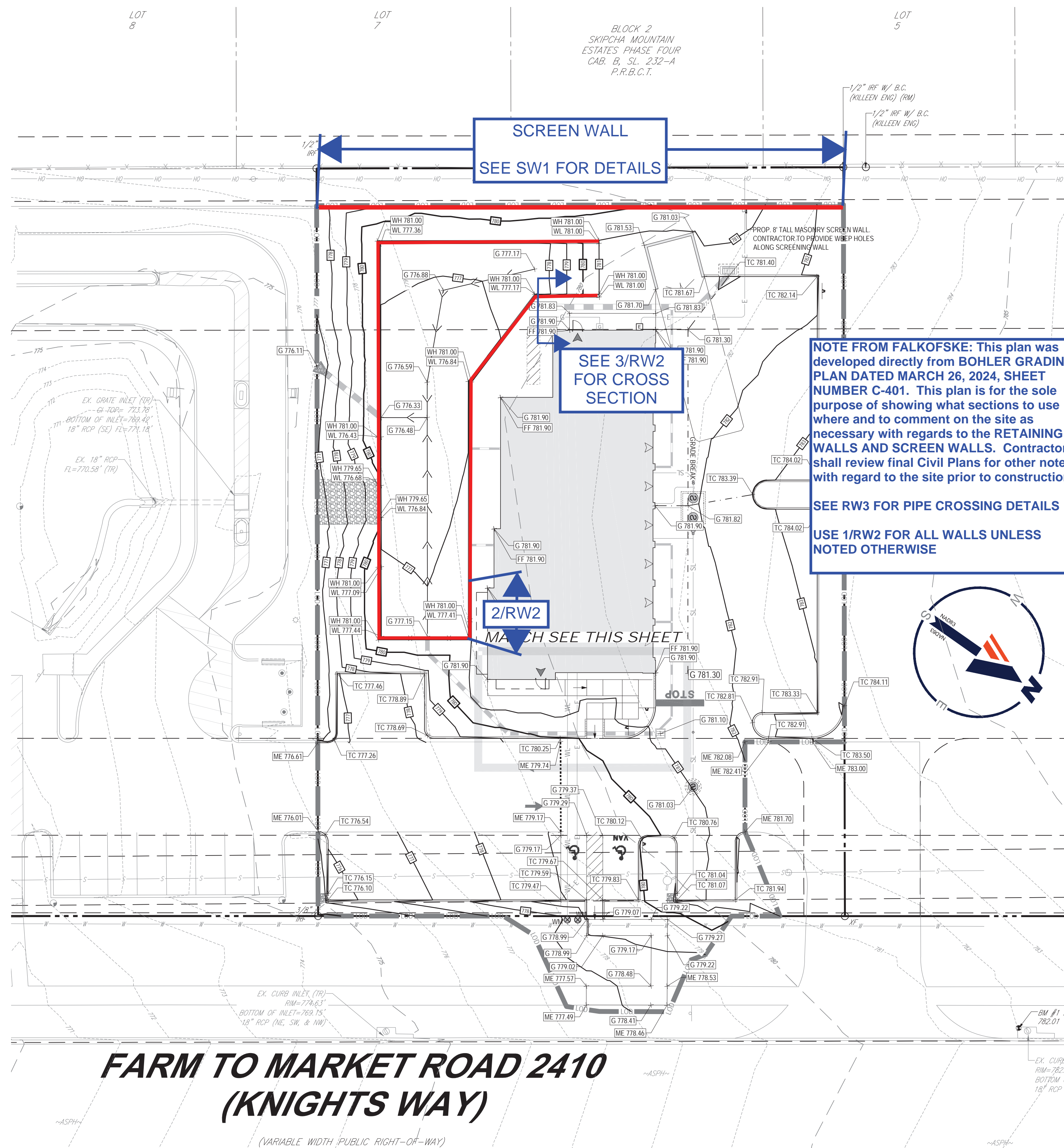
REVISION	DATE	COMMENTS	
		SUBMITTED TO BLDG. DEPT.	CITY COMMENTS
1	06.03.24		

ARCODEV JOB #: -
CLIENT JOB #: -
DRAWN BY: SB
CHECKED BY: LRP
DATE OF ISSUE: 02.27.24



SHEET

PH1.1
PHOTOMETRIC
SITE PLAN



DATE	BY	DES.	CHK.	NO.	DATE	REVISION	BY
06-11-24	BDB						
06-11-24	BDB						
06-11-24	AMB						

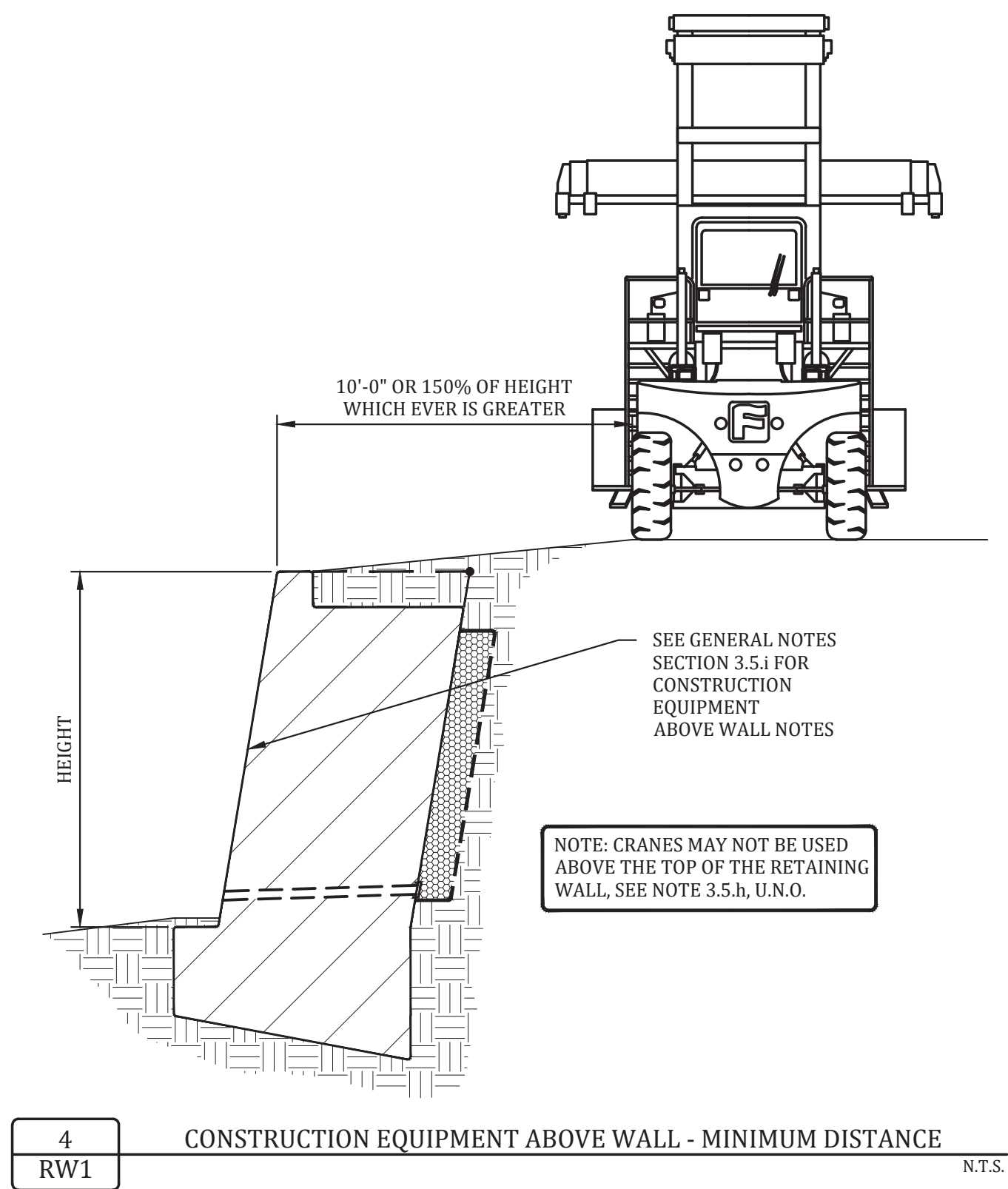
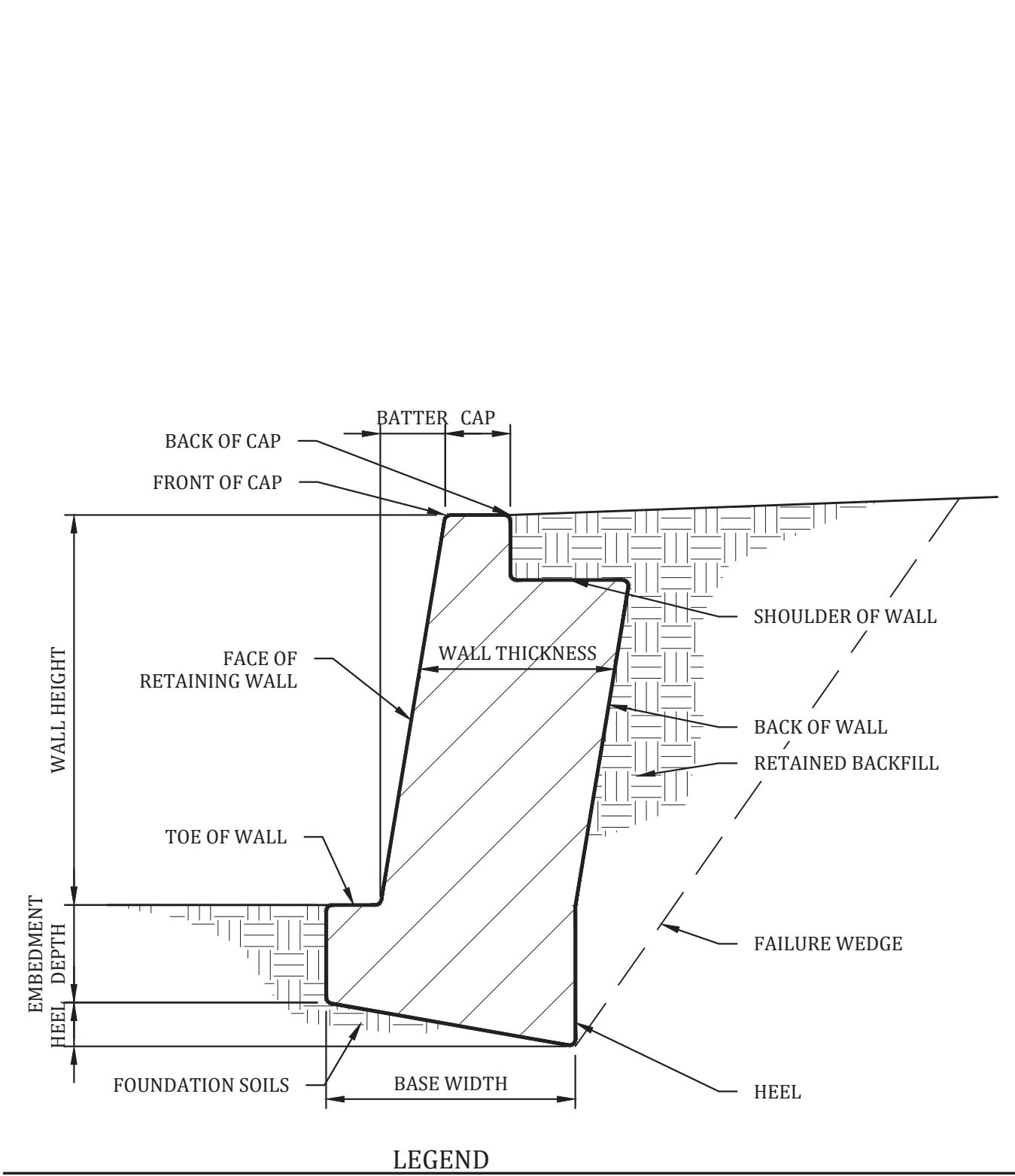
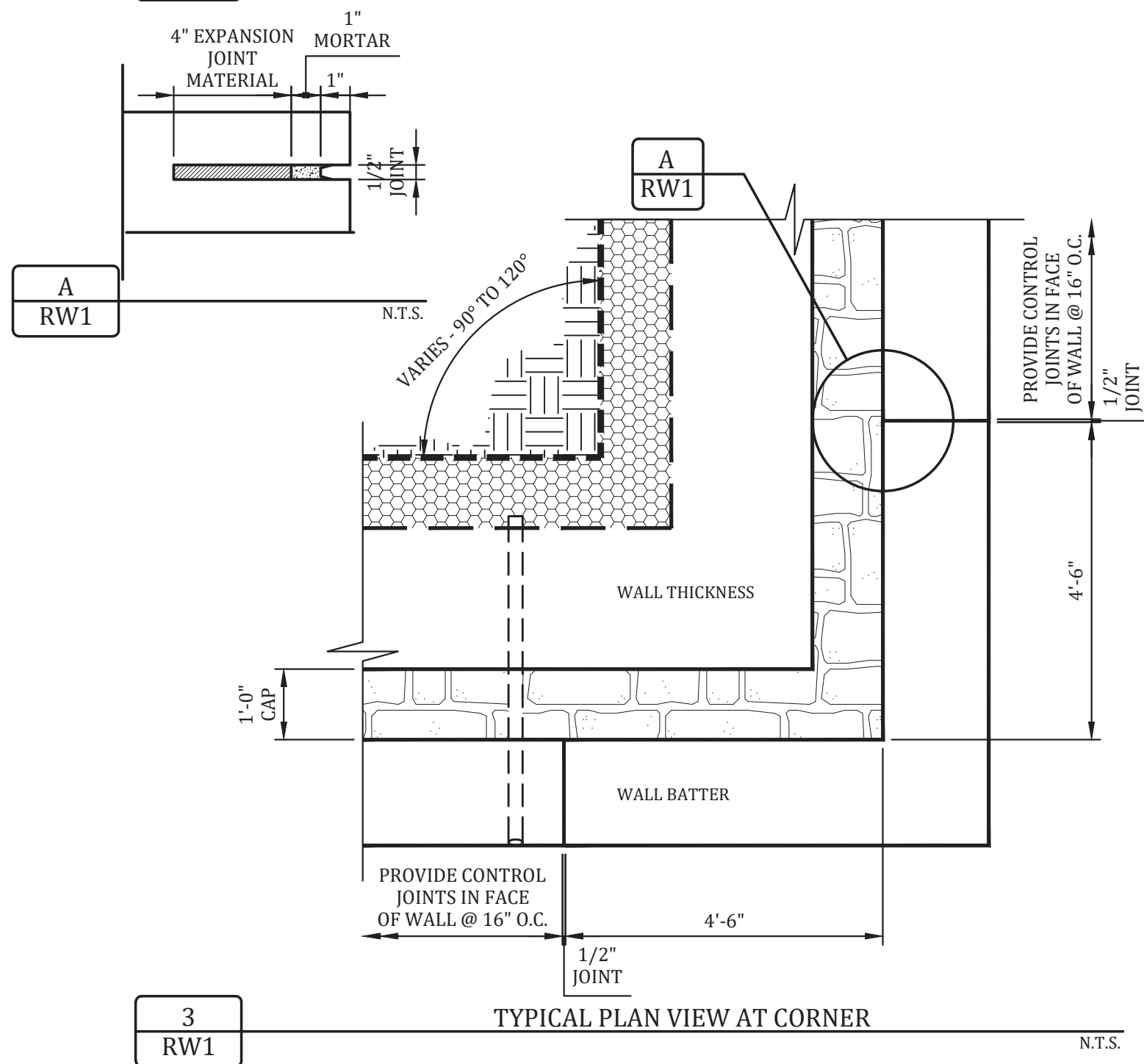
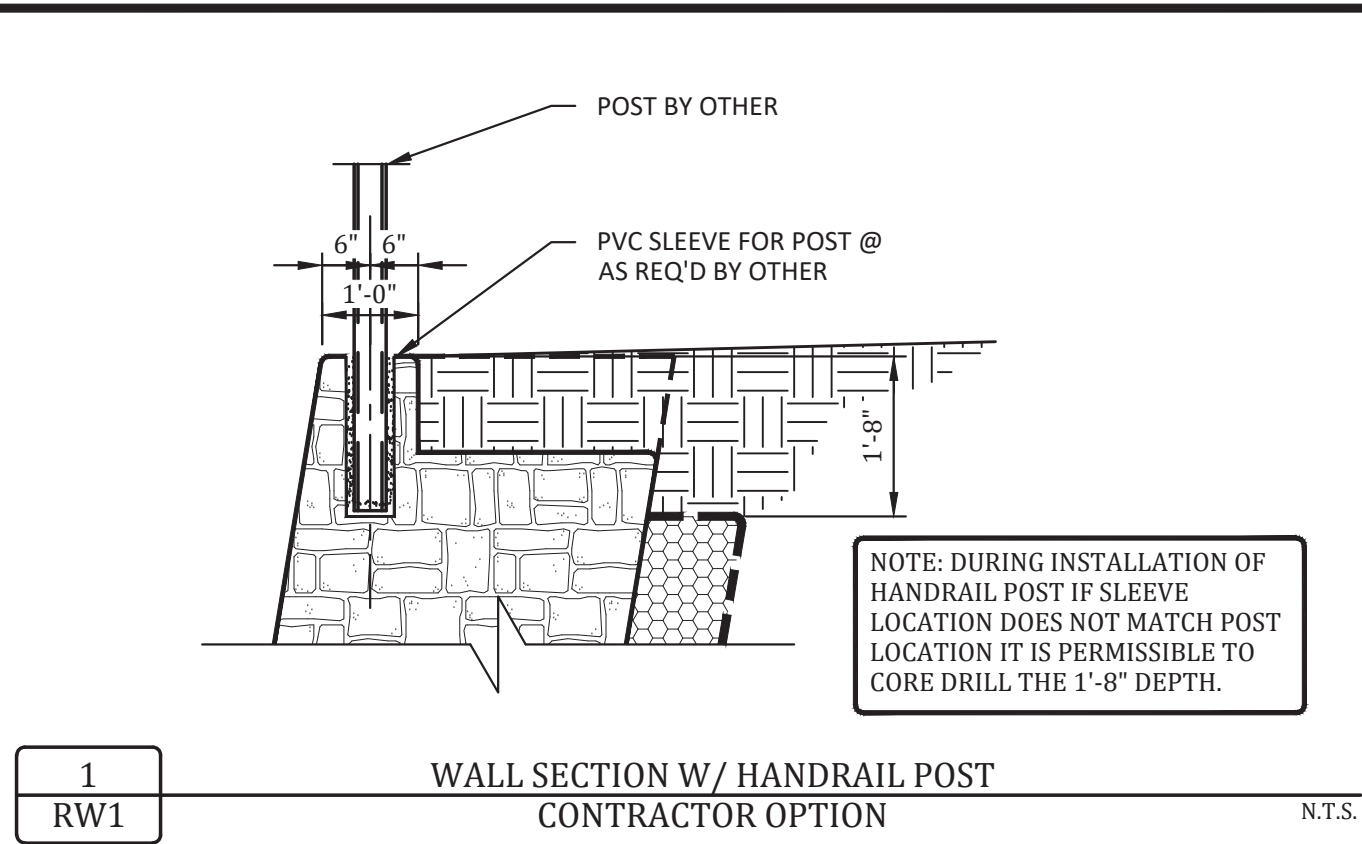
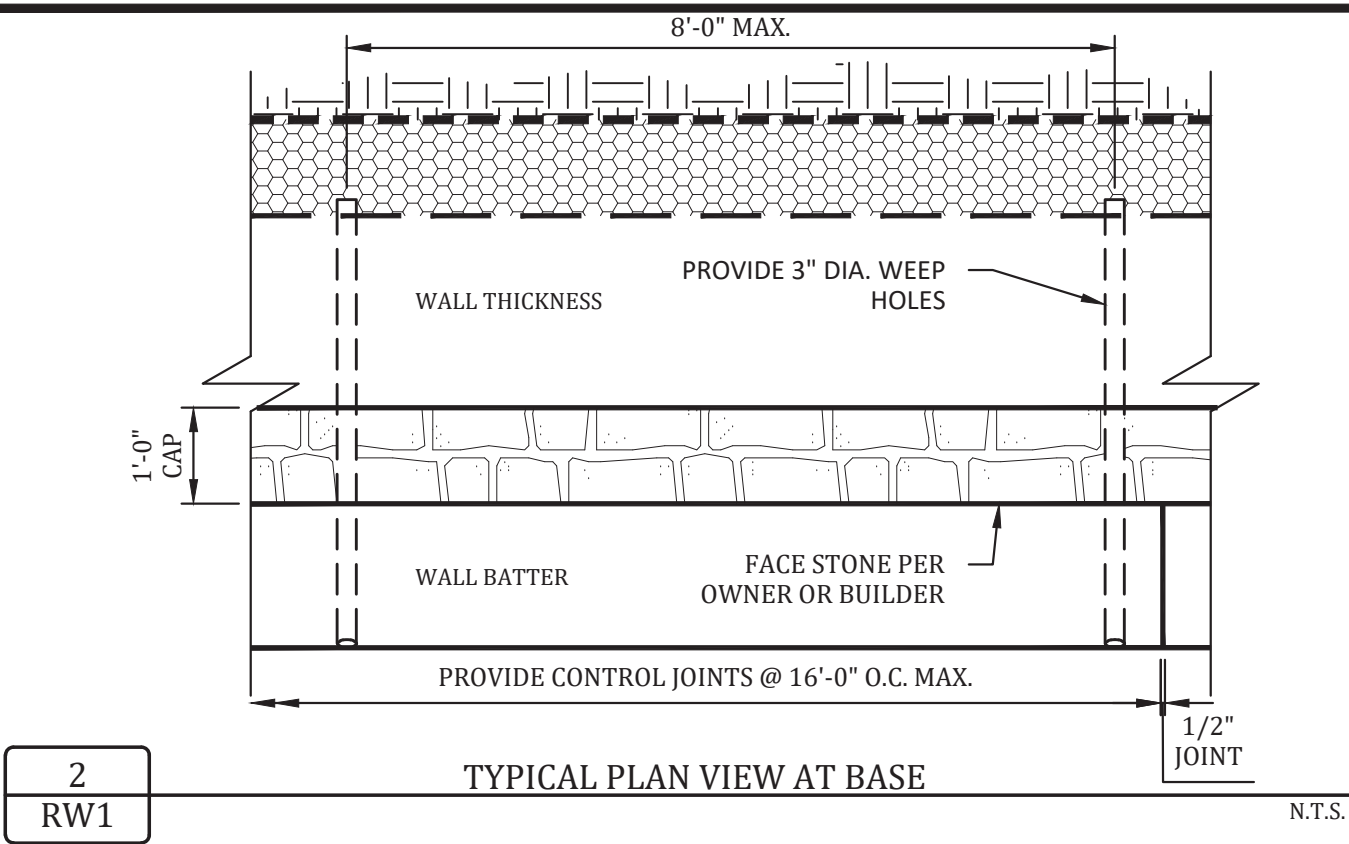
Falkofske Engineering, Inc.
Structural Engineering Consultants
Texas Registration F-4038
722 North Fielder Road
Arlington, Texas 76012
(817) 261-8300

FALKOFSKE
ENGINEERING

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MASONRY RETAINING WALLS - SITE PLAN
640 E FM 2410 RD
FM 2410
HARKER HEIGHTS, TEXAS
BOHLER ENGINEERING
6017 MAIN STREET
FRISCO, TX 75034

STATE OF TEXAS
AARON BERKEE
107154
PROFESSIONAL ENGINEER
06-11-24
JOB NO. 367.24
SP1



GENERAL NOTES

1. Design

1.1. Design Codes

International Building Code, 2021 Edition

1.2. Geotechnical Report

Firm: ECS SOUTHWEST, LLP
Report No. 17-6451 Dated: JANUARY 16, 2024
Allowable Bearing Capacity 2500 psf

1.3. Design Parameters

Soil Parameters:

Soil Type*	Friction Angle	Cohesion (psf)	Unit Weight (pcf)
Retained Backfill (On site clay)	28 deg	0 psf	120 pcf
Foundation Soils (2500 psf)	28 deg	0 psf	120 pcf

*See materials below for a description of each Soil Type.

Factors of Safety:

External Stability	
a. Minimum Factor of Safety Against Base Sliding (Static Condition)	1.5
b. Minimum Factor of Safety Against Overturning	2.0
c. Minimum Factor of Safety Against Global Stability	1.5
d. Minimum Factor of Safety for Bearing Capacity	3.0

Design Loading:

Lateral earth pressures are calculated using Coulombs Lateral Earth Pressure Theory. Designs have been performed to accept loading per the proposed loading conditions based on the Civil Grading Plans. A live loading of 250 psf has been used for all walls supporting areas subject to firelane loading.

Retaining walls should not have solid fence (such as wood fence) placed on top of wall other than that shown on these plans. Retaining walls shall not have additional surcharge placed above wall other than that shown on these plans. Retaining walls shall not have slope at base or top of wall that exceed that which is shown on these plans. The retaining walls noted above require special design.

2. Materials

2.1. Soil Types

- 2.1.a. Retained Backfill
 - 2.1.a.a. On site clayey soils
 - 2.1.a.b. Properly compacted on-site fill soils, verification by others.
- 2.1.b. Foundation Soils (Allowable Bearing = 2500 psf min.)
 - 2.1.b.a. Bearing on Hard Natural Undisturbed Clayey or Sandy Soils
 - 2.1.b.b. Friction Angle between Base of Wall and Soil - 19°
- 2.1.c. Drainage Material
 - 2.1.c.a. Free draining granular backfill, clean, non-plastic, relatively well-graded.

2.2. Dimension Stone

- 2.2.a. Average Density of masonry wall varies from 135 pcf to 145 pcf.
- 2.2.b. Stone size varies from 4" to 18".
- 2.2.c. Face stone shall be coordinated between contractor and owner/developer.
- 2.2.d. Recycled concrete 4" to 18" may be used in place of dimension stone, contractors option. The recycled concrete shall be free of dirt and concrete dust such that mortar can bond the material together. It shall also be mostly free of rebar. Some rebar is acceptable as long as it does not prevent the material from being placed tightly together.

2.3. Rebar/Welded Wire Fabric (If Required)

- 2.3.a. All steel reinforcement shall be new billet steel conforming to ASTM a-615, Grade 60 with $f_y = 60$ ksi.
- 2.3.b. All reinforcement shall not have deleterious material on it.
- 2.3.c. All welded wire fabric shall have a minimum of $f_y=65$ ksi and be hot dip galvanized.

2.4. Drainage Materials

- 2.4.a. Weep pipes shall be PVC or corrugated HDPE pipe.
- 2.4.b. Drainage zone shall be separated from retained backfill by mirafi 140N filter fabric or approved equal.

2.5. Portland Cement Mortar for Retaining Wall Construction

The Portland cement used for construction of the masonry stone retaining walls shall be provided with the following proportions per cubic yard of concrete. The Portland Cement mortar supplier shall provide "batch tickets" clearly indicating the appropriate amount of materials are provided in each truck load. The batch tickets shall clearly indicate the amount batched, the date, the project name and shall be provided to Falkofske Engineering, Inc. for review, documentation, and file.

Contents	Amount per cubic yard	Specific Gravity	Volume (ft³)
Type 1 Portland Cement:	451 lbs	3.15	2.29
Type F Fly Ash:	113 lbs	2.93	0.62
Fine Aggregate (sand):	2746 lbs	2.59	16.99
Potable Water:	367 lbs	44 Gallons	5.88
Sika Air (or equivalent):	(AS REQ'D) oz	4.5%	1.22
			27.0 Total

2.6. Portland Cement Mortar for Retaining Wall Construction (Hand Mixing)

It is acceptable to hand mix mortar on site. The hand mixed mortar shall be in accordance with TMS 402/602-16 Building Code Requirements and Specification for Masonry Structures on SC-1 Part 2.1. This is a proportion specification by volume, and is as follows:

- 1-part Portland Cement
- $\frac{1}{4}$ to $\frac{1}{2}$ part lime (optional)
- 2-1/4 to 3 parts the sum of the separate volumes of cementitious materials - aggregate ratio measured in damp, loose conditions.

For instance, 1 cu. ft. of Portland Cement, $\frac{1}{4}$ cu. ft. of lime and (1.5 x 3) 4.5 cu. ft. of sand could be used to make Type S mortar. Falkofske Engineering, Inc. would recommend that boxes be built for sand so that the proportions can be easily controlled. For instance, a box made with 2 x 6 boards with an interior square dimension of 1'-5.5" would create a box of 1 cu. ft.

If the contractor does not want to use lime, the ratio would be 1-part Portland Cement to 3-parts sand.

3. Construction

3.1. Preparation Work

- 3.1.a. Prior to grading or excavation of the site, confirm the location of the retaining walls and all underground features, including utility location within the area of construction. Ensure surrounding structures are protected from effects of wall excavation, and construction.
- 3.1.b. Coordinate installation of underground utilities and other improvements with wall installation.

3.2. Excavation

- 3.2.a. If a mortared footing is over-excavated, then the dimension stone shall be placed mortared. If a dry stone footing is over excavated, then the dimension stone does not need to be mortared.
- 3.2.b. Fill over-excavated area in front of the wall footing with compacted on site soils before the wall construction exceeds 4 feet in height.
- 3.2.c. In area where the walls are installed in a cut, the required excavation shall extend horizontally to the extent of the width of the retaining wall. The wall may be built to the cut. If the wall is over cut, then soil shall either be compacted or the drainage zone may be widened.

3.3. Wall Construction

- 3.3.a. The wall shall be constructed to the dimensions as shown on these plans. Front leads, back leads, and string lines shall be set for each wall. Care shall be taken to install the mortar zones to the correct thickness, and to place drainage behind the wall as required.
- 3.3.b. Face of wall control joints shall be installed at a maximum of 16'-0" o.c. per these plans.
- 3.3.c. Weep pipes shall be placed at 8'-0" o.c. max.
- 3.3.d. Face rock type shall be coordinated between the architect, owner, and retaining wall contractor.
- 3.3.e. The top of the footing shall be left rough so that the stem of the wall has a good interface to mortar too. The top of the footing shall not be full bed of mortar that is allowed to cure prior to constructing the stem of the wall. This creates a shear plane and weak point in the wall system.
- 3.3.f. It is intended that the wall mass (stem of wall) and the mortared zones be constructed concurrently and with the same

dimension stone material. Such that the mass of the wall will act as a single unit.

3.4. Retained Backfill Placement

- 3.4.a. Retained backfill shall be placed per the recommendations of the geotechnical engineer, but should not be less than 93% Standard Proctor Maximum Dry Density (ASTM D698)
- 3.4.b. Fill should be placed in maximum 8" thick compacted lifts.
- 3.4.c. Large compaction equipment (equipment heavier than 7,500 lb) shall remain a minimum of 1.5x the height of the wall away from the back of the wall for a period of 2 weeks from the time of construction.
- 3.4.d. After a period of 2 weeks from the time of construction compaction equipment may be used to compact soils behind the wall but shall stay a minimum of 5'-0" away from the back of the wall. The responsible contractor for compaction shall take care to not damage the retaining wall during compaction activities.
- 3.4.e. Soil placed with in 5'-0" of the back of the wall shall be placed using handheld compaction equipment.
- 3.4.f. If the wall is in a cut situation the wall may be built up to the cut. If the wall is overcut the drainage zone may be widened to the cut or compacted fill may be placed between the drainage zone and the cut.

3.5. Retaining Wall Performance, Maintenance and Other Comments

- 3.5.a. Control joints are provided in the retaining wall to allow for minor movements due to settlement and shrink swell of the soils. Some cracking may occur in the face of the retaining wall. This cracking, if minor (less than 3/8"), may be cosmetically repaired as desired.
- 3.5.b. The retaining walls are designed to allow surface water to flow over the tops of the retaining walls. Care should be taken during and after construction to not allow water to pond behind the retaining walls, as this can have a negative impact on the stability of the retaining walls. Retaining walls are often constructed early in the site development phase. Water maintenance above the top of them is the general contractors responsibility prior to the site being finished. If necessary temporary swales, replacement of eroded soils, and other water maintenance items may be necessary to protect the retaining walls.
- 3.5.c. If downspouts are located near the back of the retaining wall they should either be plumbed through the retaining wall to drain below the wall or collected and tied into the storm sewer system. Perforated subsurface pipes shall not be used behind the retaining walls.
- 3.5.d. Positive drainage (sheet flow) over the top of the walls shall be maintained throughout the life of the structure. If swales are placed behind the wall they shall remain clean and free draining. If water is found to be ponding in the swale it shall be maintained to allow water to freely drain as soon as possible.
- 3.5.e. Any broken sprinklers behind the retaining wall shall be turned off and repaired as soon as possible.
- 3.5.f. Over time erosion below or above the retaining wall can occur. Eroded soils shall be replaced and maintained to protect and extend the life of the retaining walls.
- 3.5.g. Weep holes shall be maintained to be able to freely drain throughout the life of the retaining wall.
- 3.5.h. Cranes shall not be used above the retaining wall without approval from our office. Cranes apply very large loads to the retaining walls and require special design considerations.
- 3.5.i. Construction equipment used above retaining walls after they are finished can damaged the walls. Care shall be taken to protect the walls during site development. Below is a list of some considerations that should be made to protect the walls.
 - 3.5.i.a. Examples of construction equipment that have been shown to cause damage include skytraks, telehandlers, concrete trucks, skid steers, excavators, and others.
 - 3.5.i.b. Walls shall be a minimum of 2 weeks old prior to equipment use above wall.
 - 3.5.i.c. Equipment shall not be used on wet/saturated soils above the wall where rutting occurs. This condition increases the likelihood of damage to the retaining walls.
 - 3.5.i.d. Equipment maybe used when it is at least 10'-0" from the front of cap of walls or 150% of the wall height which ever is greater.
 - 3.5.i.e. If equipment needs to be used closer than stated in item 3.5.i.d. our office shall be contacted to verify the wall can support the weight of the construction equipment. The construction equipment type and weights will need to be provided. Additionally, mats or plywood will need to be provided to protect the backfill and wall.

3.6. Cold Weather Construction of Retaining Walls

3.6.a. Construction Requirements for ambient air temperatures between 40°F and 32°:

- 3.6.a.a. Water and aggregates used in mortar shall not be heated above 140°F.
- 3.6.a.b. Mortar sand or mixing water shall be heated to produce mortar temperatures between 40°F and 120°F at the time of mixing.
- 3.6.a.c. Heat grout materials when the temperature of the materials is below 32°F.
- 3.6.a.d. Newly constructed masonry shall be completely covered with weather-resistive membrane for 24 hours after being completed.

3.6.b. Construction Requirements for ambient air temperatures between 32°F and 25°F:

- 3.6.b.a. The guidelines above for construction requirements for temperatures between 40°F and 32°F and the following shall be met.
- 3.6.b.b. The mortar temperature shall be maintained above freezing until used in masonry stone retaining wall.
- 3.6.b.c. Visible ice and snow shall be removed from the top surface of existing foundations and masonry to receive new construction. These surfaces shall be heated to above freezing, using methods that do not result in damage.

3.6.c. Construction Requirements for ambient air temperatures between 25°F and 20°F:

- 3.6.c.a. The guidelines above for construction requirements for temperatures between 40°F and 32°F, the construction guidelines for temperatures between 32°F and 25°F, and the following shall be met.
- 3.6.c.b. Masonry (raw stone) surfaces under construction shall be heated to 40°F.
- 3.6.c.c. Wind breaks or enclosures shall be provided when the wind velocity exceeds 15 miles per hour.
- 3.6.c.d. Newly constructed masonry shall be completely covered with weather-resistive insulating blankets, or equal protection, for 48 hours after being completed.

The above procedures are in compliance with The Masonry Society TMS 602 specifications for cold weather construction of masonry structures.

3.7. Hot Weather Construction of Retaining Walls

3.7.a. Above 100°F or above 90°F with a wind velocity greater than 8 mph:

- 3.7.a.a. Preparation (Hand Mixing or at Batch Plant)
 - 3.7.a.a.a. Maintain sand piles in a damp loose condition.
 - 3.7.a.a.b. Provide necessary conditions and equipment to produce mortar having a temperature below 120°F.

- 3.7.a.b. Construction
 - 3.7.a.b.a. Maintain temperature of mortar below 120°F.
 - 3.7.a.b.b. Maintain mortar consistency by re-tempering with cool water;
 - 3.7.a.b.c. When hand mixing mortar use mortar within 2 hours of initial mixing.
 - 3.7.a.b.d. When batch mixing and using retarder, mortar on site that is not in use, shall be covered with plastic sheeting to prevent moisture lost.

3.7.b. Above 115°F or above 105°F with a wind velocity greater than 8 mph:

- 3.7.b.a. Preparation (Hand Mixing or at Batch Plant)
 - 3.7.b.a.a. Items noted above under section 3.7.a.a. shall be met in addition to the requirements below.
 - 3.7.b.a.b. Shade materials and mixing equipment from direct sunlight.

- 3.7.b.b. Construction
 - 3.7.b.b.a. Items noted above under section 3.7.a.b. shall be met in addition to the requirements below.
 - 3.7.b.b.b. When hand mixing mortar cool mixing water shall be used. Ice may be added to the water, but complete melting must take place before mixing with other materials.

4. Construction Observations

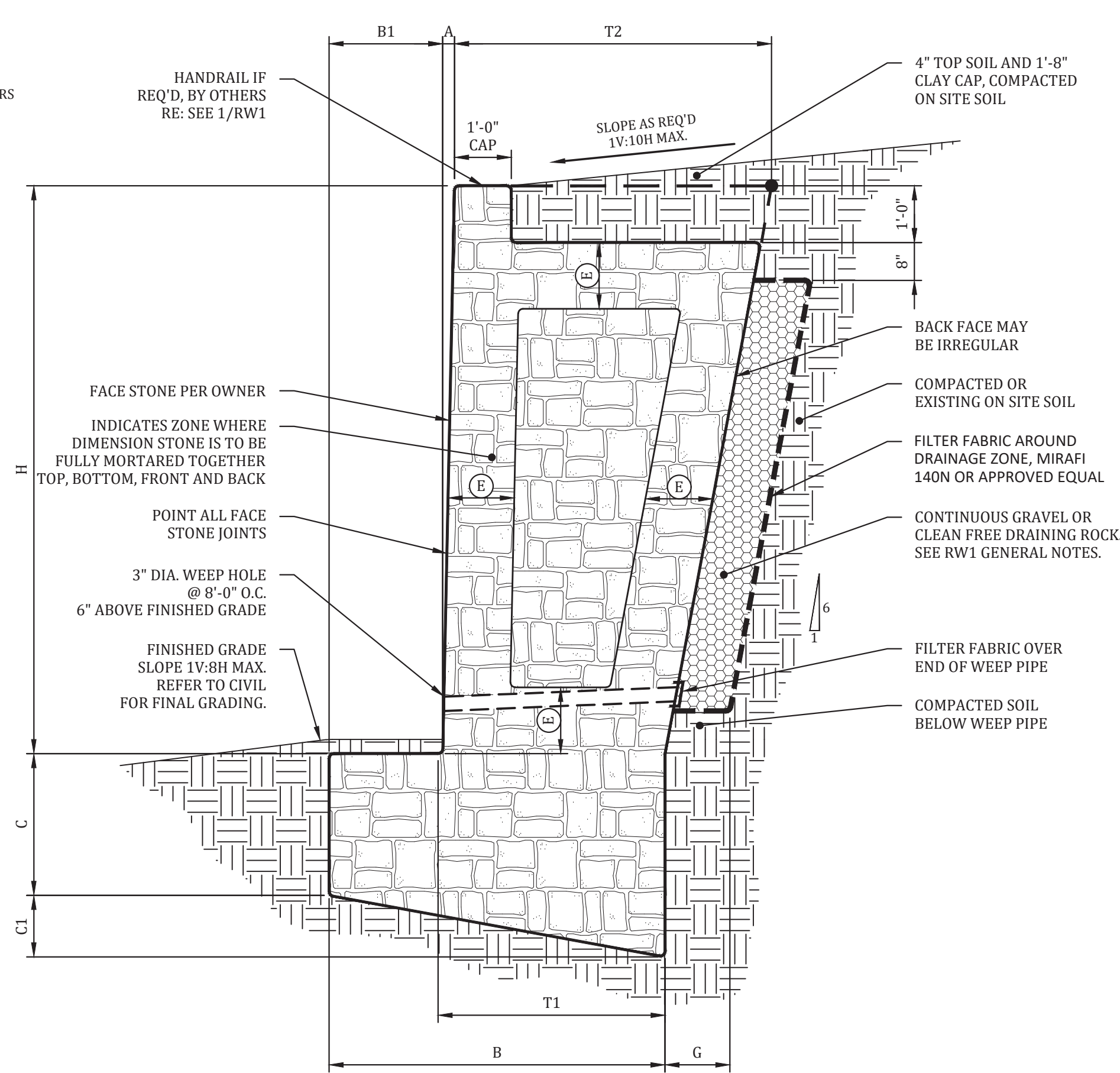
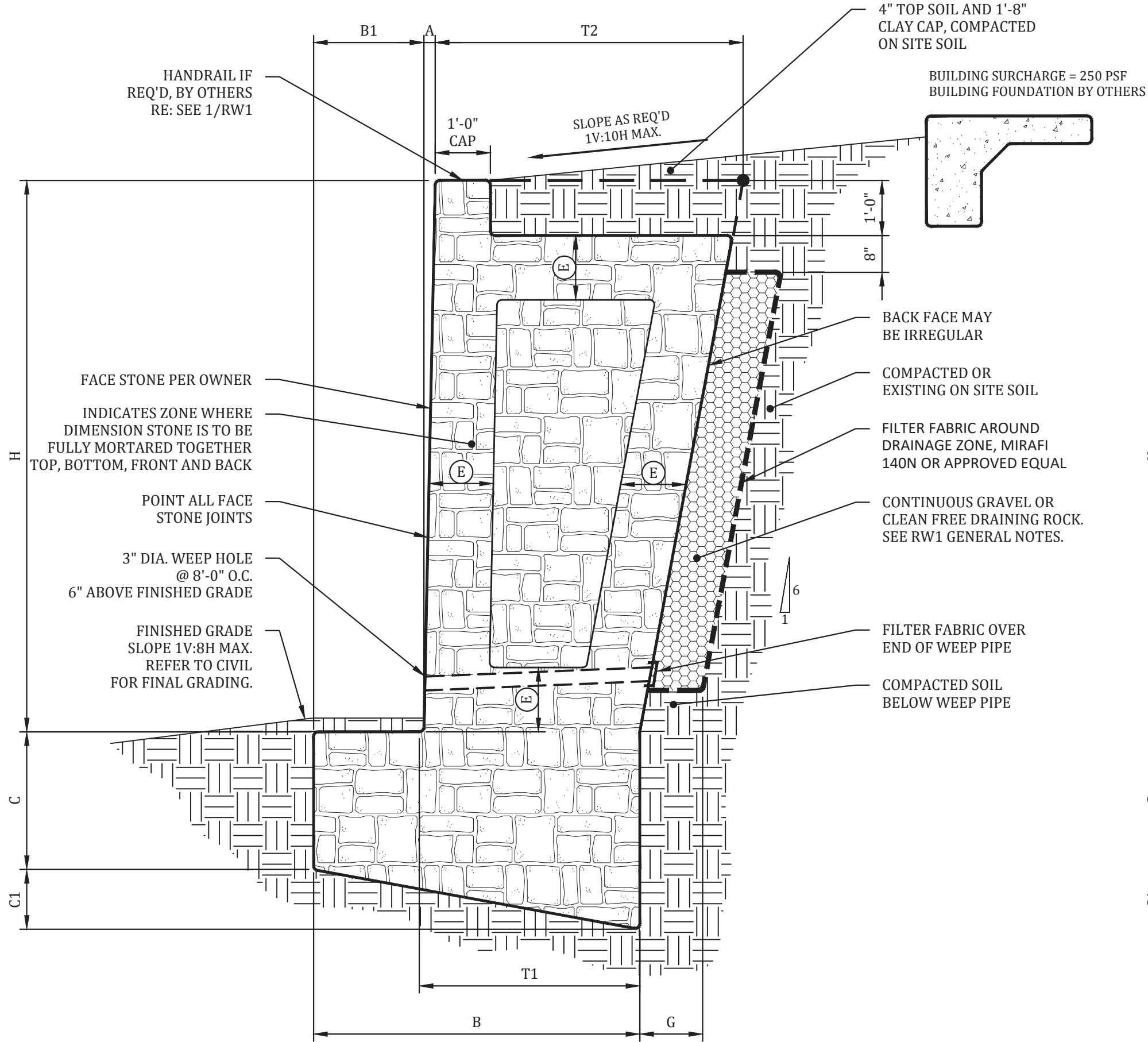
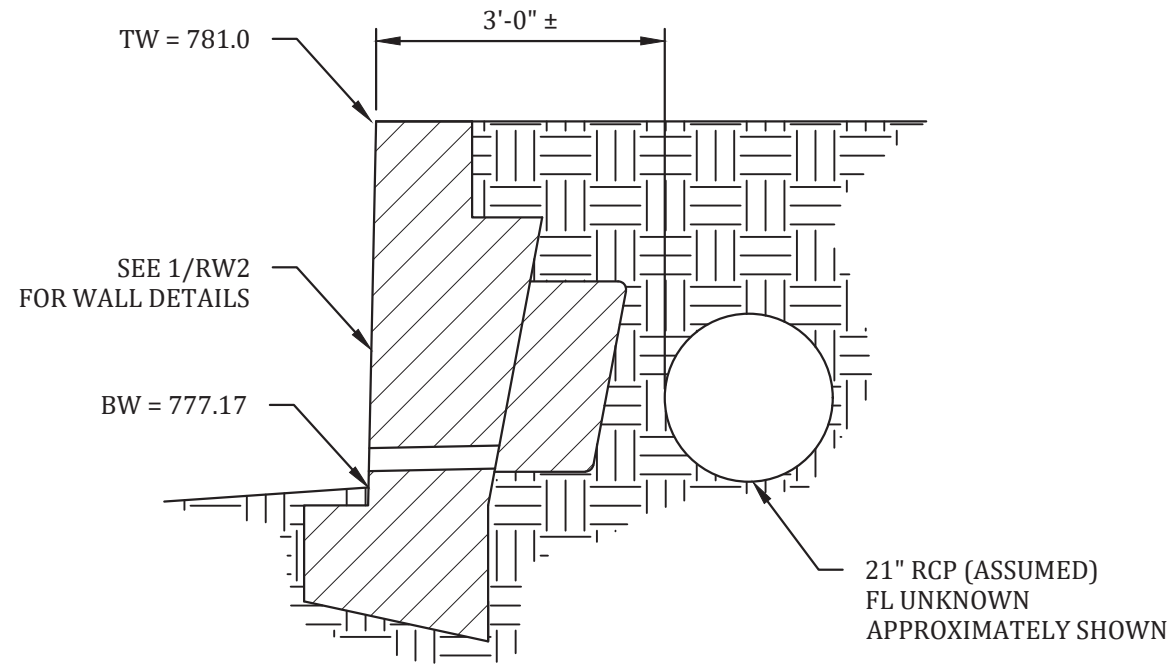
4.1. Construction Observations by Falkofske Engineering, Inc.

- 4.1.a. Falkofske Engineering, Inc. will perform construction observation, but only as a means of verification of the contractors quality control performance.
- 4.1.b. Falkofske Engineering, Inc. will act as the Special Inspector for this project. Contractor shall contact Falkofske Engineering to set up inspections, at least 1 day before construction starts
- 4.1.c. All required materials testing shall be performed by an approved materials testing laboratory.
- 4.1.d. Falkofske Engineering, Inc. is not responsible for means, methods, and material furnished by the retaining wall contractor.

4.2. Construction Observations by Others

- 4.2.a. Construction observations are required by the city shall be coordinated by the contractor.

						BY
						REVISION
						NO.
						DATE
DATE	BY	BDB	BDB	AMB		
06-11-24	DES.	DRN.	CHK.			
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JOB NO. 367.24						
RW1						



MASONRY WALL SCHEDULE									
2500 PSF - BEARING CAPACITY (SEE GENERAL NOTES SHEET RW1)									
WALL HEIGHT H	BASE WIDTH B	WALL TOE B1	BASE DEPTH (TOE) C1	BASE DEPTH (HEEL) C1	WALL BATTER A	FULLY MORTARED ZONE E	WALL THICKNESS T1	WALL THICKNESS T2	DRAINAGE ZONE THICKNESS G
4'-0"	3'-0"	0'-8"	1'-0"	0'-6"	1"	FULLY MORTARED	2'-4"	3'-0"	1'-0"
5'-0"	3'-6"	0'-10"	1'-3"	0'-8"	1 1/4"	FULLY MORTARED	2'-8"	3'-6"	1'-0"
WALL DESIGN CRITERIA									
BEARING Q _a	TOP SLOPE β	BOTTOM SLOPE β ₁	ACTIVE PRESSURE P _a	PASSIVE PRESSURE P _p	BASE FRICTION ANGLE δ	BACK OF WALL SLOPE α	SURCHARGE q		
2500 psf	0°	7.13°	28°	28°	19°	99.46°	250 psf		

USE THIS SCHEDULE FOR 2/RW2

MASONRY WALL SCHEDULE									
2500 PSF - BEARING CAPACITY (SEE GENERAL NOTES SHEET RW1)									
WALL HEIGHT H	BASE WIDTH B	WALL TOE B1	BASE DEPTH (TOE) C1	BASE DEPTH (HEEL) C1	WALL BATTER A	FULLY MORTARED ZONE E	WALL THICKNESS T1	WALL THICKNESS T2	DRAINAGE ZONE THICKNESS G
1'-0"	1'-2"	0'-2"	1'-0"	0'-3"	1/4"	FULLY MORTARED	1'-0"	1'-2"	1'-0"
2'-0"	1'-4"	0'-4"	1'-0"	0'-3"	1/2"	FULLY MORTARED	1'-0"	1'-4"	1'-0"
3'-0"	1'-6"	0'-6"	1'-0"	0'-4"	3/4"	FULLY MORTARED	1'-0"	1'-6"	1'-0"
4'-0"	1'-11"	0'-8"	1'-0"	0'-5"	1"	FULLY MORTARED	1'-3"	1'-11"	1'-0"
5'-0"	2'-3"	0'-10"	1'-3"	0'-5"	1 1/4"	FULLY MORTARED	1'-5"	2'-3"	1'-0"
WALL DESIGN CRITERIA									
BEARING Q _a	TOP SLOPE β	BOTTOM SLOPE β ₁	ACTIVE PRESSURE P _a	PASSIVE PRESSURE P _p	BASE FRICTION ANGLE δ	BACK OF WALL SLOPE α	SURCHARGE q		
2500 psf	5.71°	7.13°	28°	28°	19°	99.46°	0 psf		

USE THIS SCHEDULE FOR 1/RW2

3
RW2

CROSS SECTION

N.T.S.

2
RW2

TYPICAL WALL SECTION - BEARING IN CLAYEY OR SANDY SOILS
250 PSF BUILDING SURCHARGE
1V:8H MAX SLOPE BELOW WALL

N.T.S.

1
RW2

TYPICAL WALL SECTION - BEARING IN CLAYEY OR SANDY SOILS
1V:10H MAX SLOPE ABOVE WALL
1V:8H MAX SLOPE BELOW WALL

N.T.S.

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JOB NO. 367.24

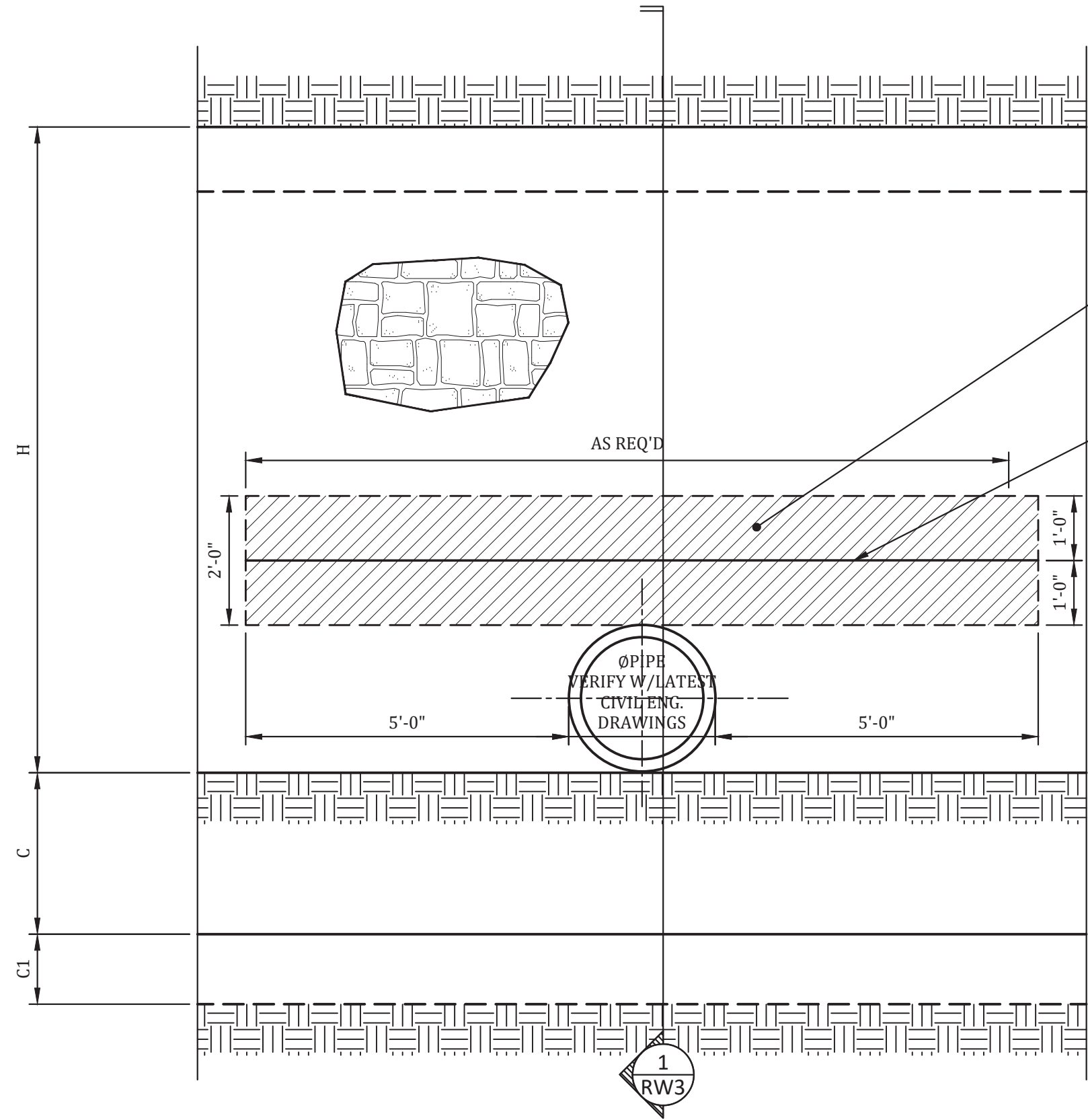
RW2

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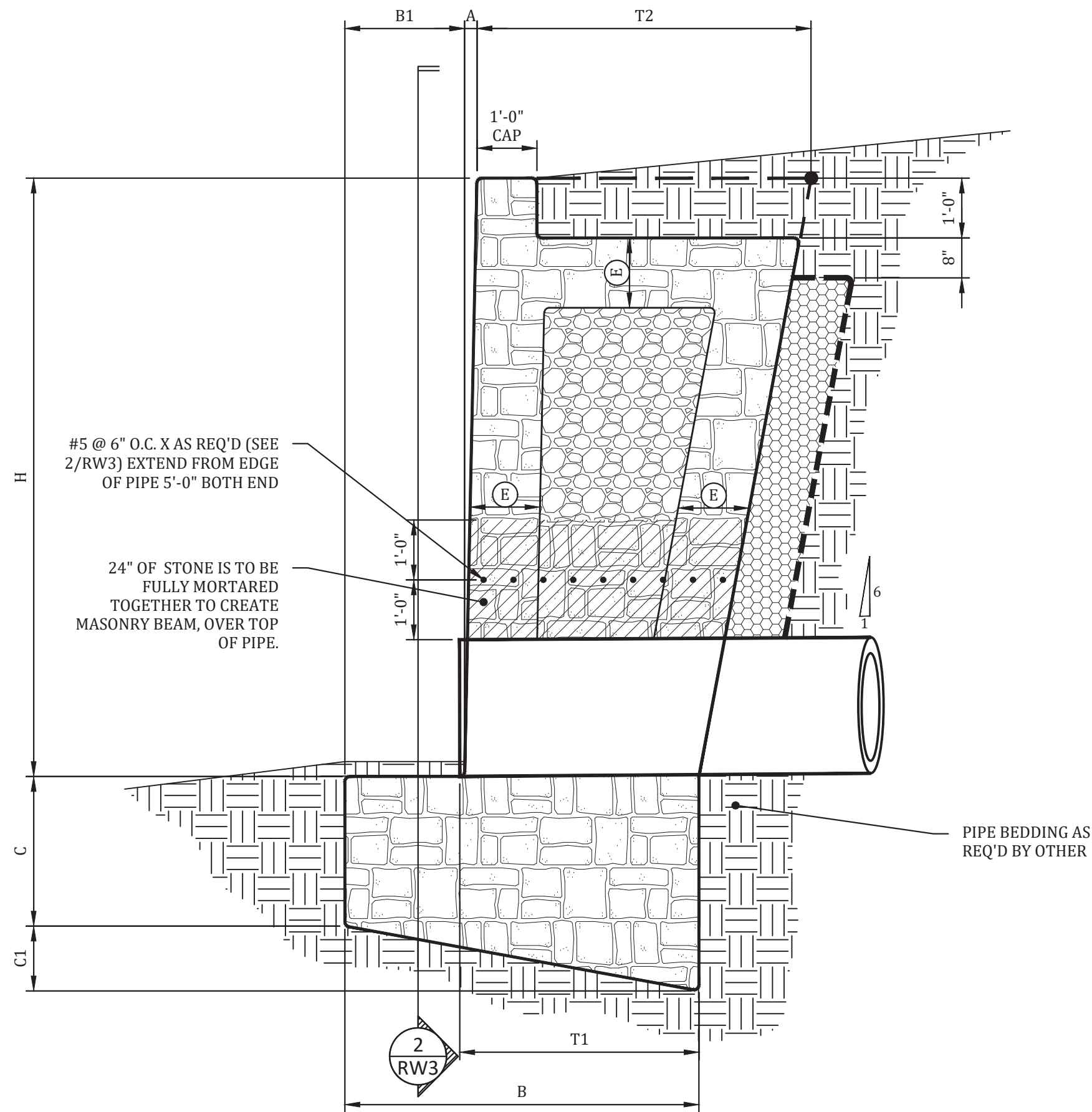
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06-11-24	BDB				
06-11-24	AMB				



2
RW3

WALL SECTION W/PIPE THROUGH WALL

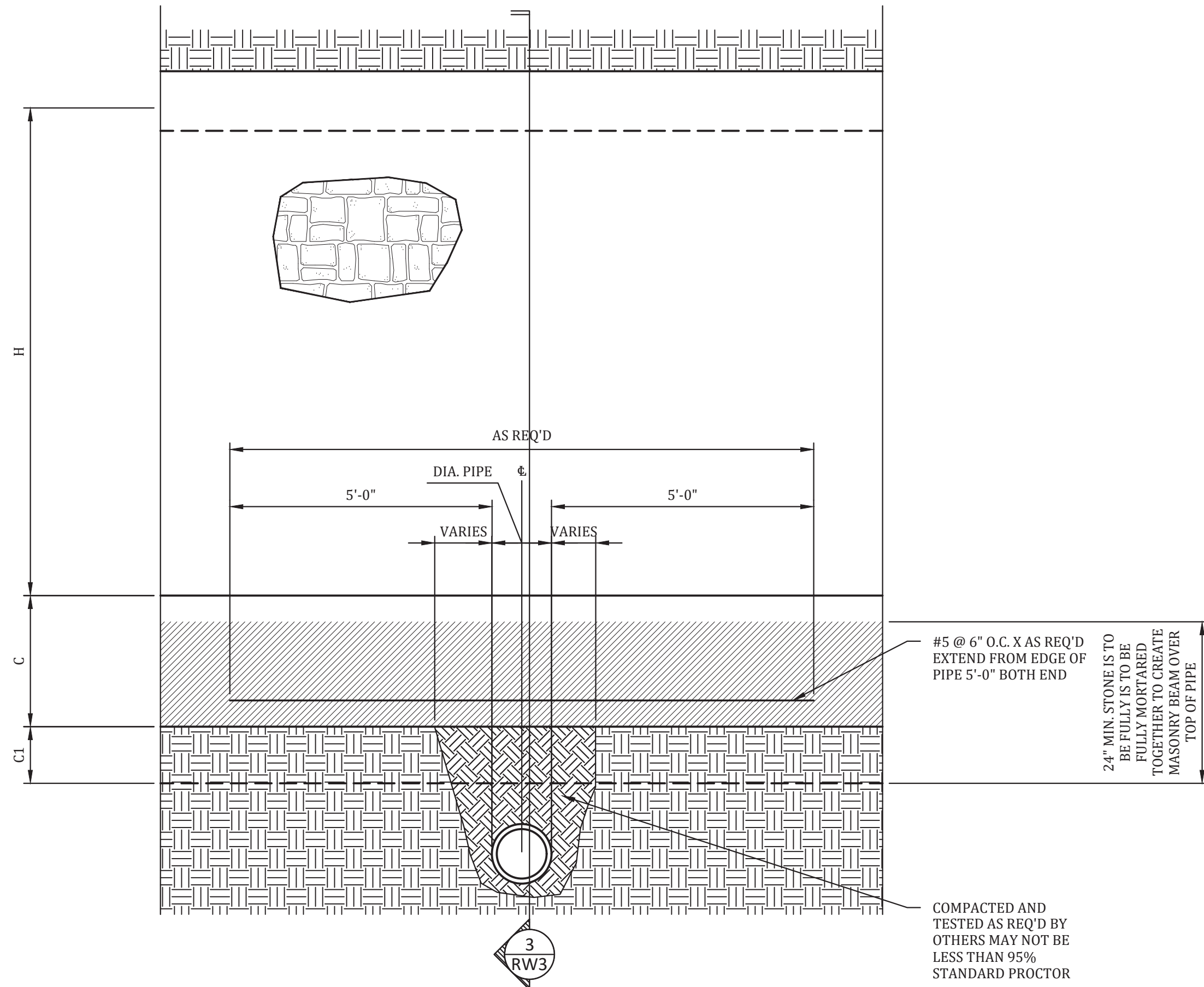
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1
RW3

WALL ELEVATION W/PIPE THROUGH WALL

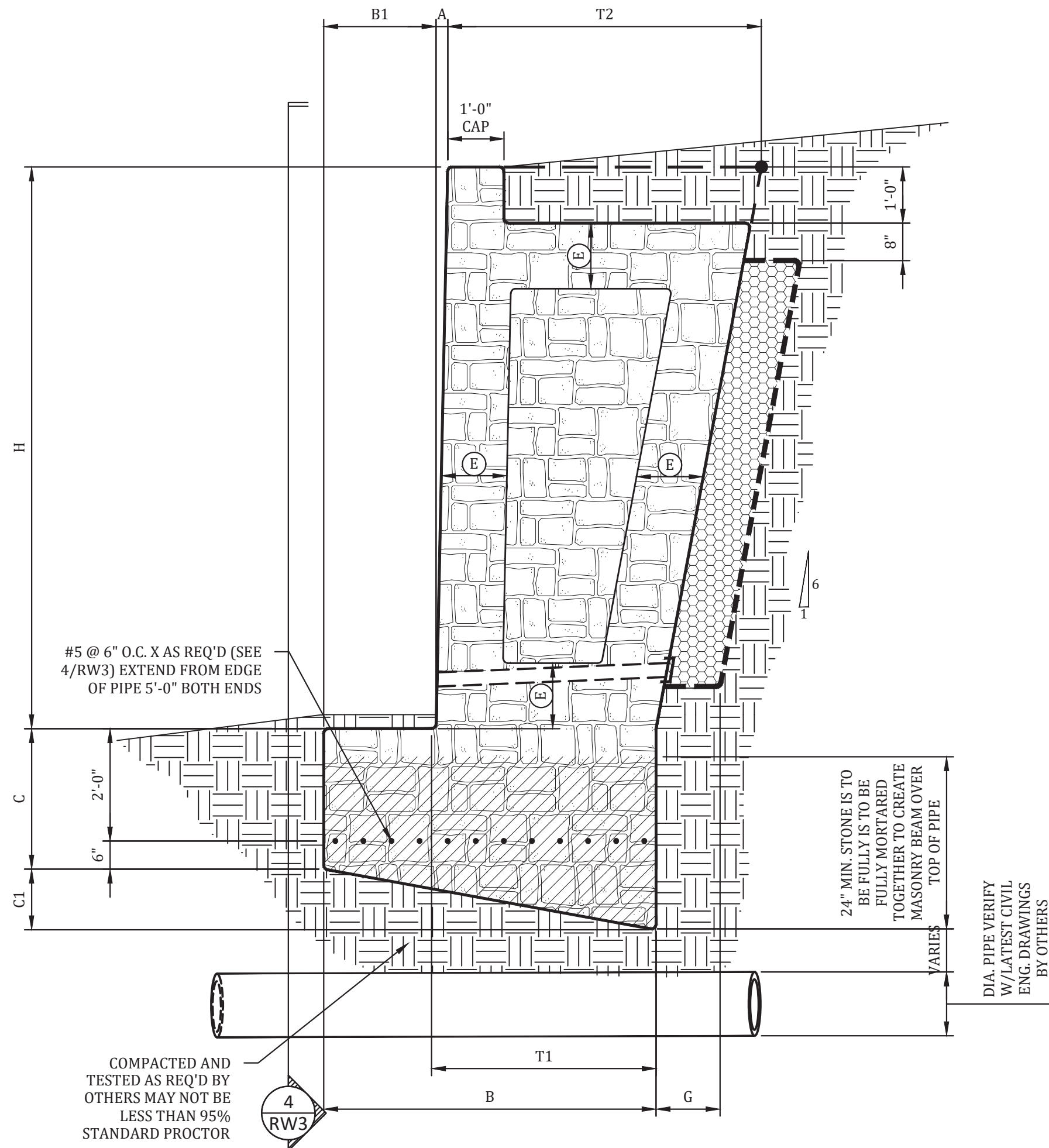
N.T.S.



4
RW3

WALL SECTION W/PIPE BELOW WALL

N.T.S.



3
RW3

WALL ELEVATION W/PIPE BELOW WALL

N.T.S.

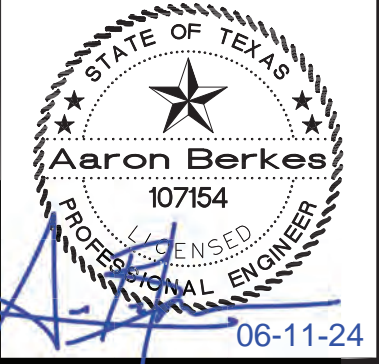
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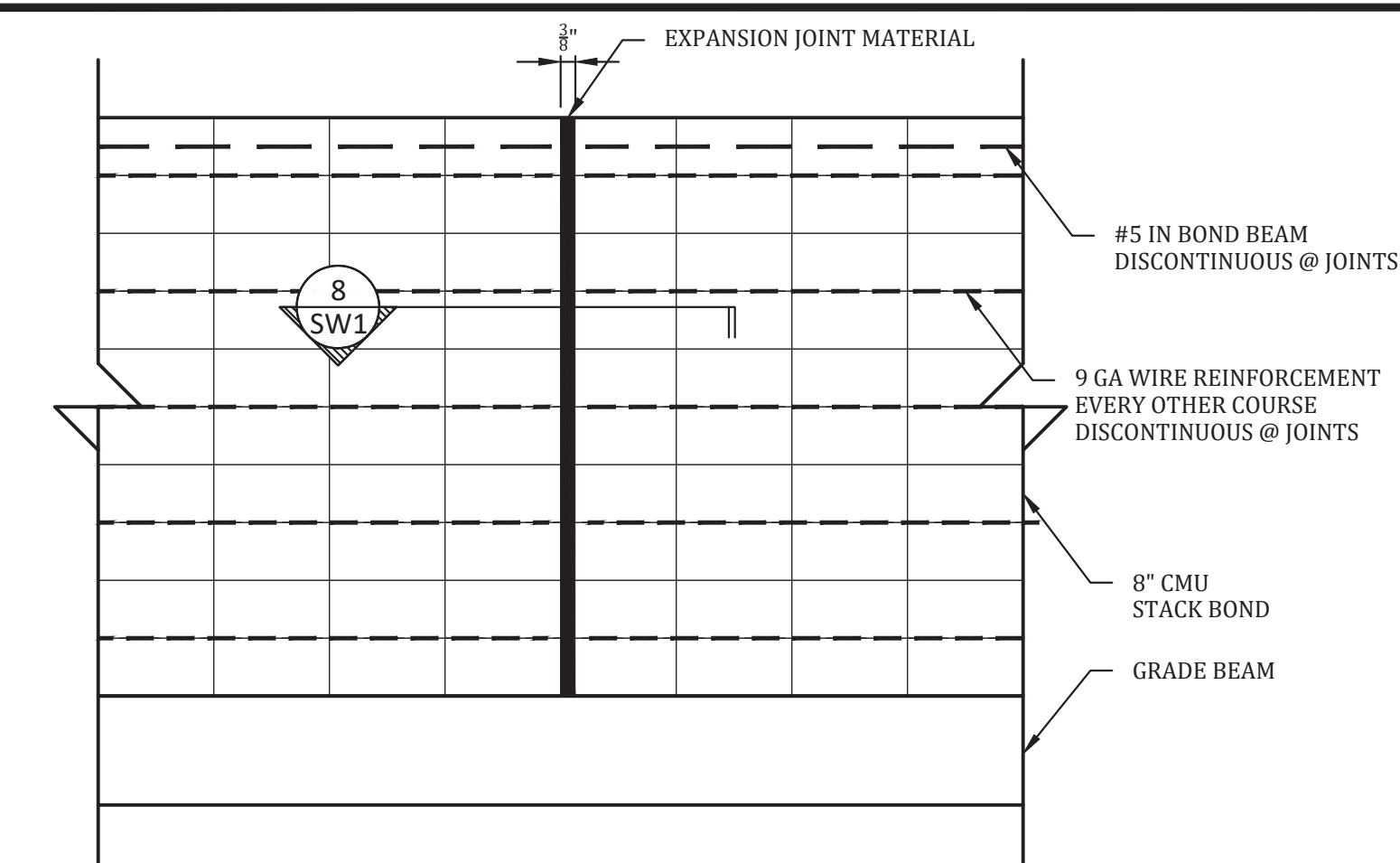
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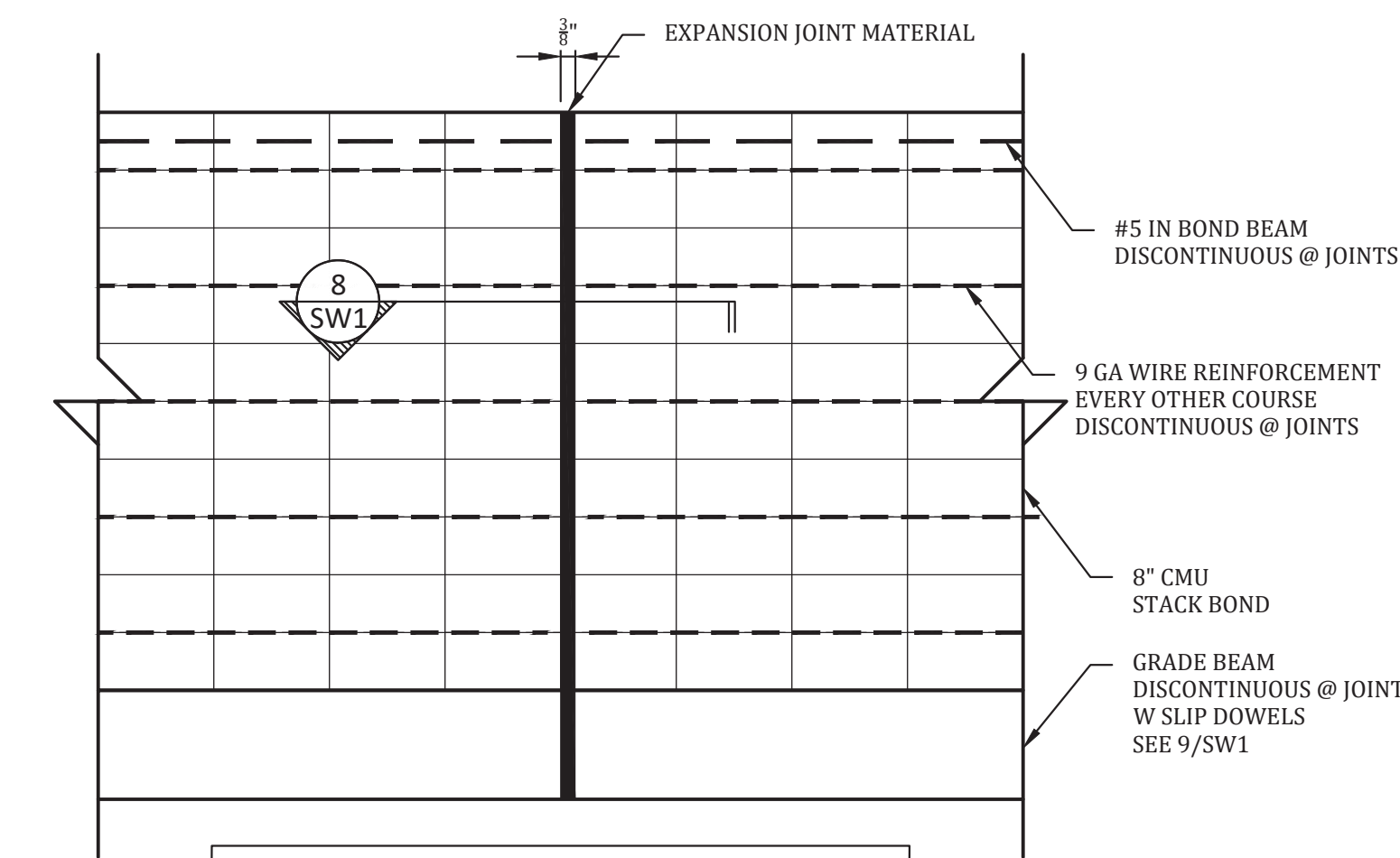
JOB NO. 367.24

RW3



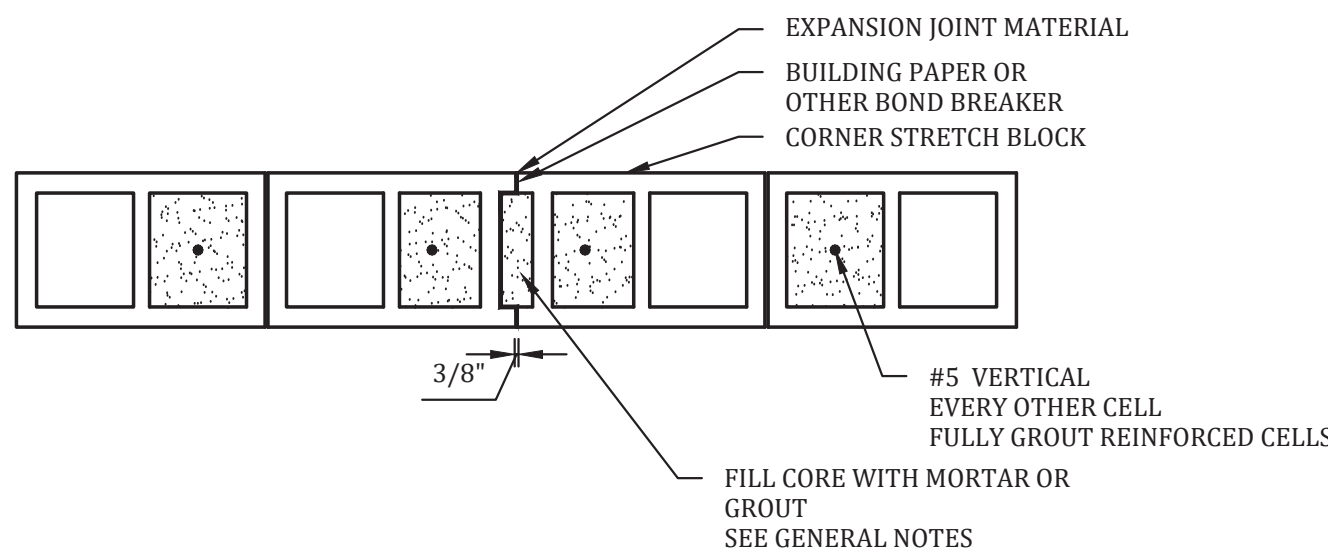
NOTE: CONTROL JOINTS SHALL BE LOCATED AT OR NEAR PIERS. ALL STEEL IN SCREEN WALL SHALL BE DISCONTINUOUS ACROSS CONTROL JOINTS

6 SW1 EXPANSION/CONTRACTION JOINT DETAIL - 25' O.C. MAX ELEVATION VIEW N.T.S.

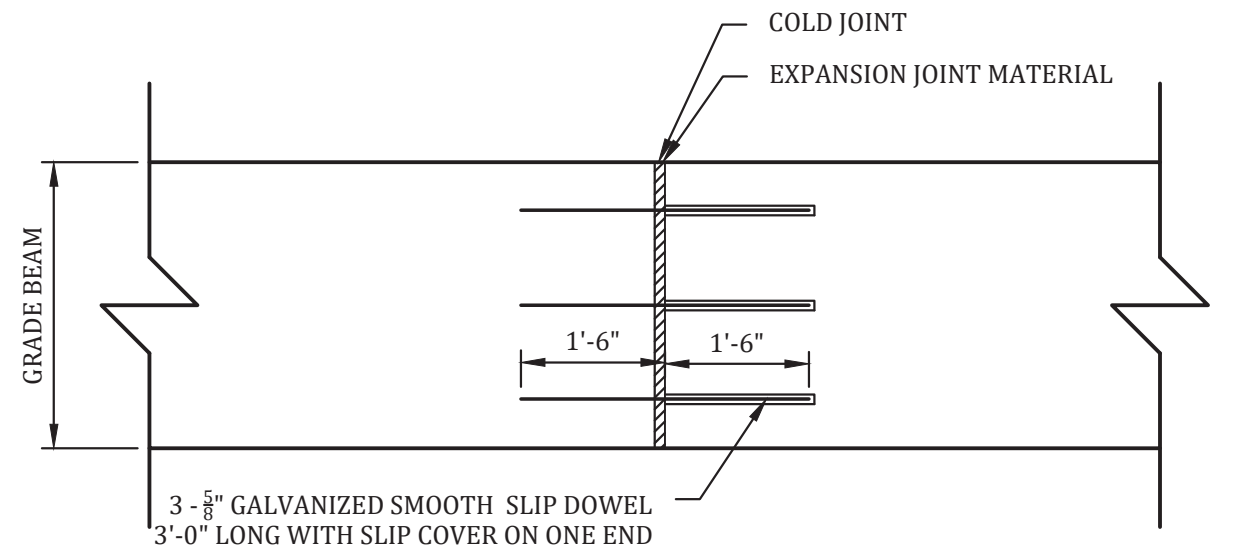


NOTE: CONSTRUCTION JOINTS SHALL BE LOCATED AT OR NEAR PIERS. ALL STEEL IN SCREEN WALL & GRADE BEAM SHALL BE DISCONTINUOUS ACROSS CONTROL JOINTS. GRADE BEAMS SHALL BE SLIP DOWELED AS SHOWN IN 9/SW1

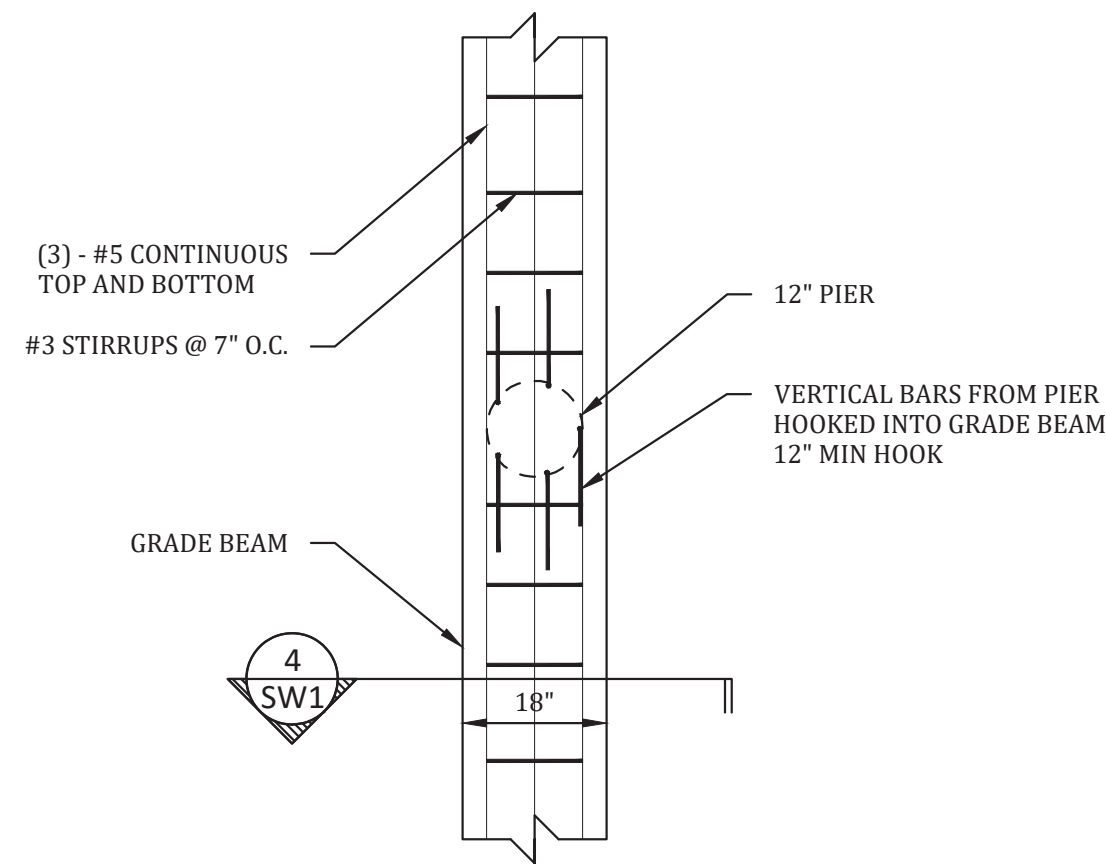
7 SW1 CONSTRUCTION JOINT DETAIL - 100' O.C. MAX ELEVATION VIEW N.T.S.



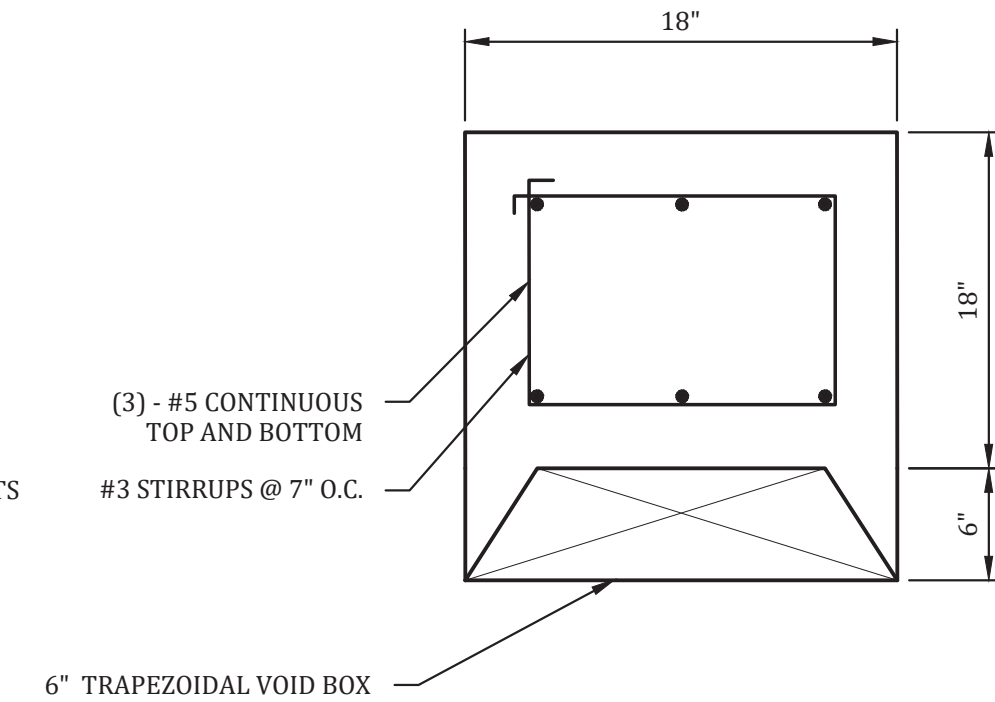
8 SW1 EXPANSION/CONTRACTION JOINT DETAIL CROSS SECTION N.T.S.



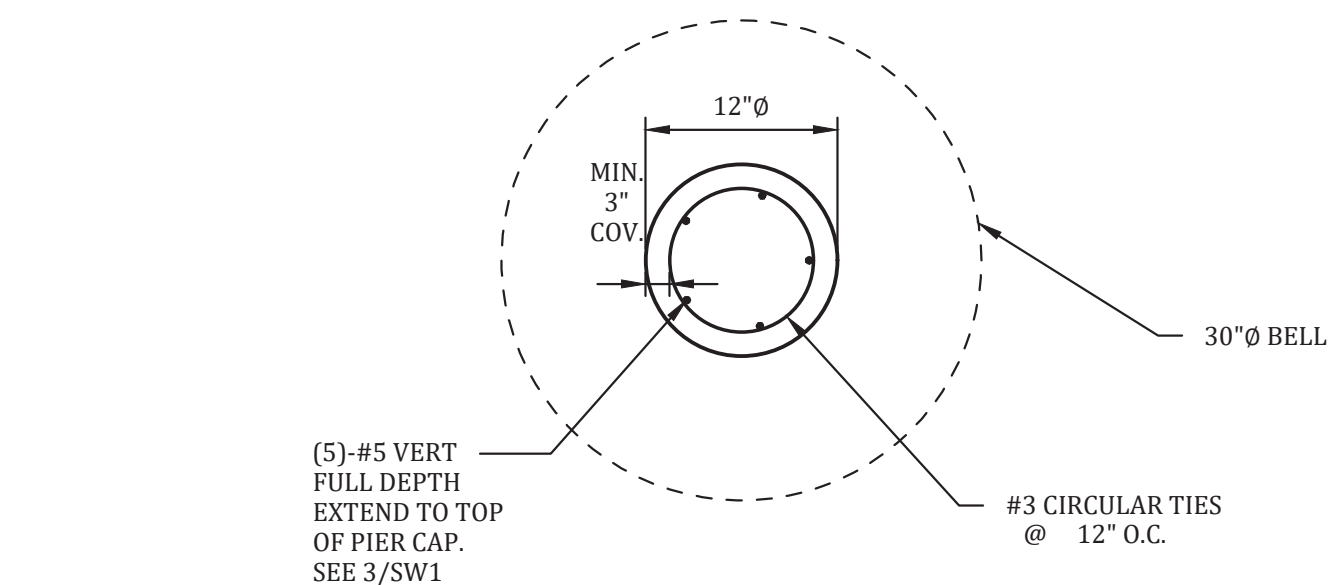
9 SW1 SLIP DOWEL DETAIL - AT CONTROL JOINT IN BEAM N.T.S.



3 SW1 GRADE BEAM / PIER INTERACTION PLAN VIEW N.T.S.

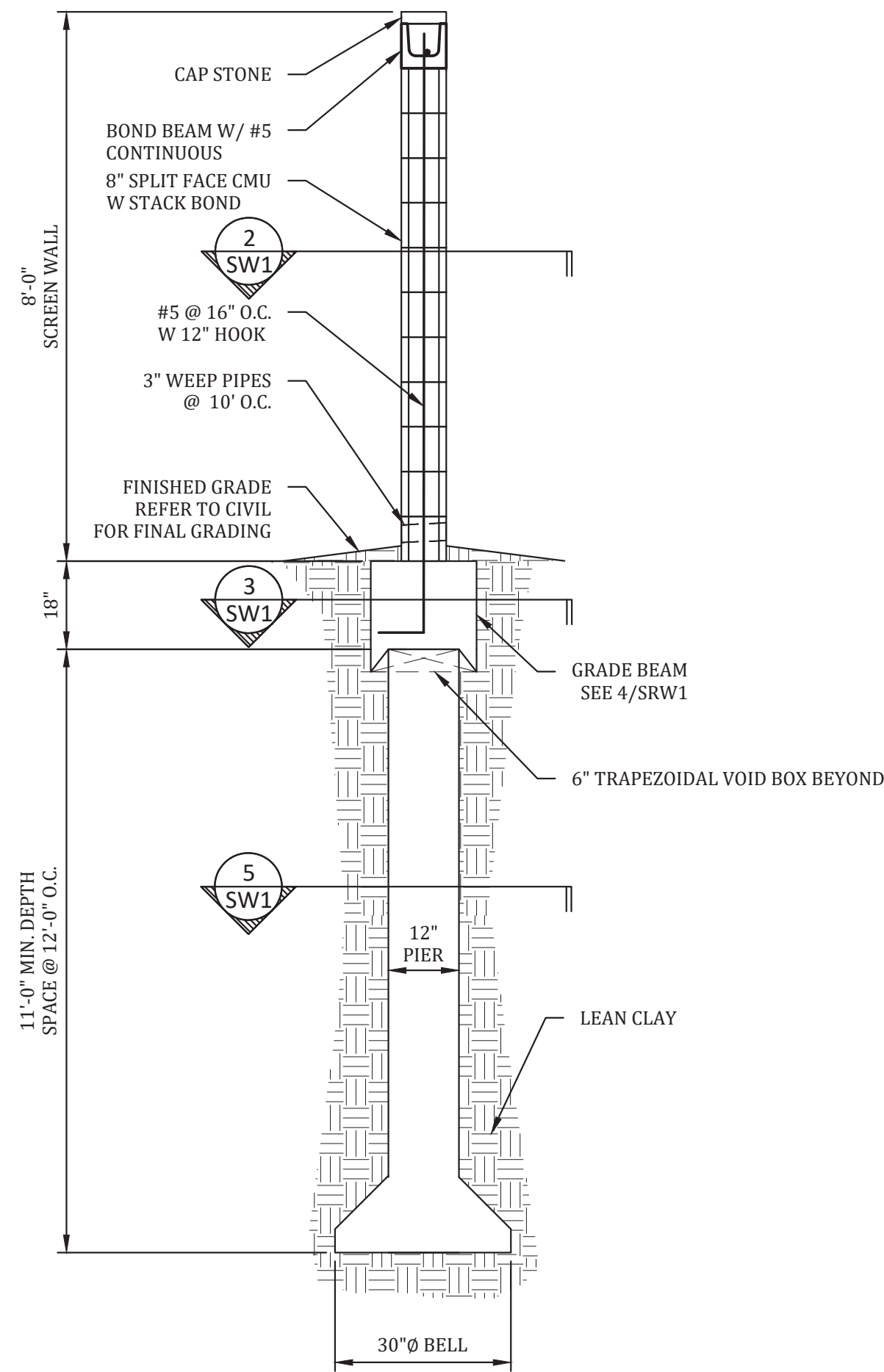


4 SW1 GRADE BEAM - CROSS SECTION N.T.S.

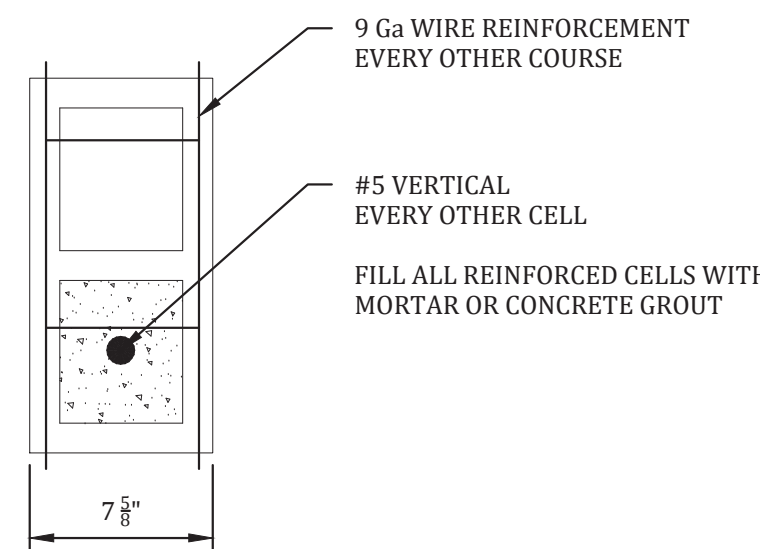


5 SW1 12"Ø PIER WITH 30"Ø BELL - CROSS SECTION N.T.S.

NOTE: INTENT IS TO MATCH ADJACENT PROPERTY AESTHETICS
COORDINATE WITH OWNER/ARCHITECT



1 SW1 PIER SUPPORTED 8' TALL SCREEN WALL - CROSS SECTION N.T.S.



2 SW1 SCREEN WALL - CROSS SECTION 8" CMU N.T.S.

GENERAL NOTES

1. Design

1.1. Design Codes

International Building Code, 2021 Edition
ACI 318-19

1.2. Geotechnical Report

Firm: ECS SOUTHWEST, LLP
Report No. 17-6451 Dated: JANUARY 16, 2024
Allowable Bearing Capacity 2500 psf

1.3. Design Parameters

Wind Parameters:

Exposure: C
Ultimate Design Wind Speed: 115 MPH (3 Second Gust)

Pier Design Parameters:

Allowable End Bearing: Clay 5,000 psf

Skin Friction: N/A

2. Materials

Concrete

- Concrete shall have a minimum compressive strength (f'_c) of 3000 psi with a 5" slump.
- The use of workability admixtures and air entrainment in the concrete mix designs is permitted and encouraged.
- The use of calcium chloride admixtures in the concrete is not permitted.
- Adding water to the concrete at the site is not permitted.
- Hard rock aggregate of 3/4" max shall be used in concrete. Unless noted otherwise.
- Provide the concrete mix designs for the hardscape features to Falkofske Engineering, Inc. for review prior to construction. Also provide recent (within the last 6 months) compressive test results of the mix designs for review by Falkofske Engineering, Inc.
- Provide concrete test cylinders for every 50 yards of concrete placed, or for any concrete placed on any given day. Make 6 test cylinders, test one at 7 days, one at 14 days, three at 28 days, and hold the 6th cylinder in reserve for 56 days if necessary. Provide all concrete compressive test results to Falkofske Engineering, Inc. for final review.

Concrete Reinforcement

- All concrete steel reinforcement #4 and larger shall be new billet steel conforming to ASTM A-615, Grade 60 with $f_y = 60$ ksi.
- Stirrups, ties, and other reinforcement #3 in size may be grade 40 with $f_y = 40$ ksi
- All reinforcement shall be free of rust and deleterious materials.

Masonry Stone - Hardscape Features

Face stone shall be selected by the owner/architect.

Brick - Hardscape Features

All brick shall conform to ASTM C216 or C62, grade SW with a minimum compressive strength of 3,000psi.

Mortar - Hardscape Features

All mortar shall conform to ASTM C270, Type S with the following proportions:

- 1 part Type 1 Portland Cement conforming to ASTM C150.
- 1/2 part Masons Lime, Type S, Conforming to ASTM C207.
- 4 1/2 parts loose, damp sand conforming to ASTM C144.

Reinforcement - Hardscape Features

- All horizontal reinforcement in the masonry structures shall be 9 gauge, galvanized wire with a minimum yield stress $F_y = 60$ ksi, conforming to ASTM 153-82 (hot dip galvanized), and fabricated as shown on plans.
- All vertical reinforcement shall be rebar. See Concrete Reinforcement section above.

3. Construction

Pier Construction

- Provide steel centralizers to center the steel in the pier hole, and use chairs to hold steel off the ground in the bottom of the pier hole.
- Concrete may free fall during placement, as long as the concrete is centered in the pier and does not damage the steel cage.
- Piers may be "Standard Drilled" or "Auger Cast In Place".
- Pier holes and construction shall be inspected by Falkofske Engineering, Inc. to insure piers are bearing in proper stratum. Remove all loose material prior to placing concrete. For any given pier, excavation, placement of steel, and concreting should be completed within the same work day.

Hardscape Construction

- Type S mortar shall be used to fill column and cavities
- All brick courses shall have full head and bed joints and the mortar shall be wet enough to promote a strong bond with the brick. Re-tempering the mortar for workability is allowed.
- Raked joints are not allowed. Joints shall be concave tooled with a minimum 5/8" cover on the horizontal joint reinforcement.
- All brick wall construction shall be in accordance with the "Recommended Practice for Engineering Brick Masonry" by the Brick Institute of America.

Concrete Construction

- Insure proper vibration of concrete around reinforcement.
- Provide chair support for all rebar 4'-0" max spacing.

***Contractor Note: Before proceeding with any work or ordering of materials, the contractor and/or subcontractor shall verify all measurements, location of building components, and their interrelationship at the building site for their correctness.**

4. Inspections

- Inspections are to be as required by the local Building Department.
- Pier holes and construction shall be inspected by Falkofske Engineering, Inc. to insure piers are bearing in proper stratum. Remove all loose material prior to placing concrete. For any given pier, excavation, placement of steel, and concreting should be completed within the same work day.
- Falkofske Engineering shall be called at least 24 hours prior to construction to conduct pre pour inspection of all concrete structures. This includes inspection of reinforcement size and placement, dimensions, footings, and insuring piers are bearing in proper stratum.
- Falkofske Engineering shall be called to review the build up construction of the hardscape features.

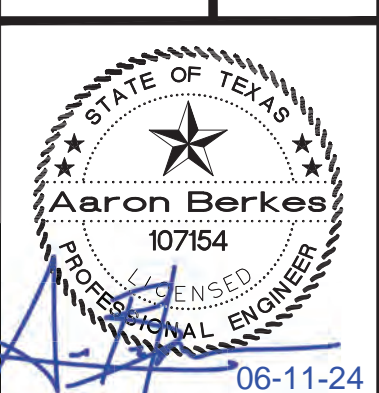
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SW1