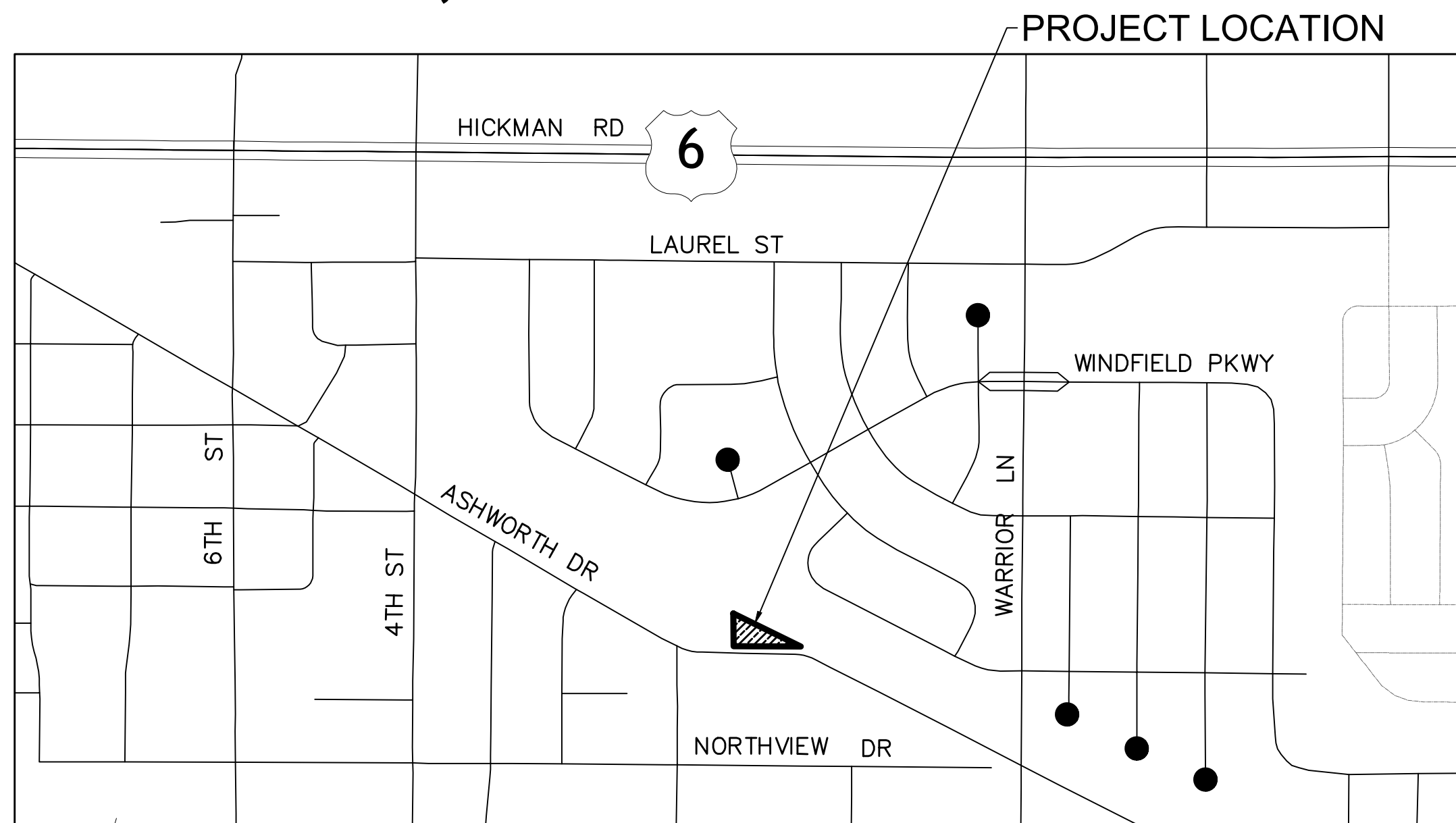


CITY OF WAUKEE HEART OF THE WARRIOR TRAIL TRAILSIDE IMPROVEMENTS WAUKEE, IOWA



SHIVEHATTERY
ARCHITECTURE + ENGINEERING
4125 Westown Pkwy, Suite 100 | West Des Moines, Iowa 50266
515.223.8104 | www.shive-hattery.com
Iowa | Illinois | Indiana | Nebraska | Wisconsin



SHEET INDEX

C000	COVER SHEET
C001	PROJECT QUANTITIES AND ESTIMATE REFERENCE
C002	NOTES, LEGEND, & SPECIFICATIONS
C101	SITE PLAN
C201	GRADING PLAN
C301	UTILITY PLAN
C401	EROSION CONTROL PLAN
C501 - C502	CONSTRUCTION DETAILS

ALL CONSTRUCTION SHALL CONFORM TO THE 2020 EDITION OF THE CITY OF WAUKEE STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND THE 2022 EDITION OF THE SUDAS STANDARD SPECIFICATIONS EXCEPT AS MODIFIED HEREIN. THE WAUKEE STANDARD SPECIFICATIONS SHALL GOVERN IN THE EVENT OF ANY DISCREPANCIES.

WHERE PUBLIC UTILITY FIXTURES ARE SHOWN AS EXISTING ON THE PLANS OR ENCOUNTERED WITHIN THE CONSTRUCTION AREA, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE OWNERS OF THOSE UTILITIES PRIOR TO THE BEGINNING OF ANY CONSTRUCTION. THE CONTRACTOR SHALL AFFORD ACCESS TO THESE FACILITIES FOR NECESSARY MODIFICATION OF SERVICES. UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS, AND THEREFORE THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH PRESENTLY IS NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERETO. NO CLAIMS FOR ADDITIONAL COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR FOR ANY INTERFERENCE OR DELAY CAUSED BY SUCH WORK.

PROJECT LOCATION
NTS

GENERAL INFORMATION

OWNER:	ENGINEER:
CITY OF WAUKEE PARKS AND RECREATION ATTN: MATT JERMIER 805 UNIVERSITY AVENUE WAUKEE, IOWA 50263 PHONE: (515) 978-0007	SHIVE-HATTERY, INC. ATTN: NATHAN HARDISTY 4125 WESTOWN PKWY, SUITE 100 WEST DES MOINES, IOWA 50266 PHONE: (515) 223-8104 NHARDISTY@SHIVE-HATTERY.COM

AREA SUMMARY
TOTAL SITE AREA = 37,317 SQUARE FEET = 0.86 ACRES
TOTAL CONSTRUCTION AREA = 20,383 SQUARE FEET = 0.47 ACRES

ZONING
R-2 ONE- AND TWO-FAMILY RESIDENTIAL DISTRICT

PROPOSED USE
PARK SPACE - TRAILHEAD PARKING LOT AND BUTTERFLY GARDENS

SETBACK REQUIREMENTS
FRONT YARD = 30 FEET
SIDE YARD = 15 FEET
REAR YARD = 40 FEET
PARKING SETBACK = 10 FEET

LEGAL DESCRIPTION
ALL THAT PART OF THE SOUTHEAST QUARTER (SE 1/4) OF THE NORTHEAST QUARTER (NE 1/4) LYING NORTH OF THE HIGHWAY AND SOUTH AND WEST OF THE RAILROAD IN SECTION THIRTY-THREE (33), TOWNSHIP SEVENTY-NINE (79) NORTH, RANGE TWENTY-SIX (26) WEST OF THE 5TH P.M., DALLAS COUNTY, IOWA

SITE ADDRESS
205 ASHWORTH DRIVE
WAUKEE, IA 50263



PARKING SUMMARY
SPACES REQUIRED = 0 SPACES
SPACES PROVIDED = 8 SPACES

ACCESSIBLE SPACES REQUIRED = 1 SPACE
ACCESSIBLE SPACES PROVIDED = 1 SPACE

LANDSCAPE SUMMARY
LANDSCAPE PLANTINGS ARE NOT INCLUDED IN THIS CONTRACT.

PLANTINGS WILL BE COMPLETED BY CITY OF WAUKEE AT A FUTURE DATE.

STORM WATER SUMMARY
ADDED IMPERVIOUS AREA = 8,475 SQUARE FEET

THE ADDED IMPERVIOUS AREA IS LESS THAN 10,000 SQUARE FEET, AS A RESULT THE PROJECT IS EXEMPTED FROM MEETING THE STORMWATER MANAGEMENT STANDARDS OF THE CITY OF WAUKEE SITE PLAN ORDINANCE (CITY OF WAUKEE STANDARD SPECIFICATIONS - DESIGN STANDARDS PARAGRAPH 4.3.3.5.5.1).

OPEN SPACE
PERVIOUS AREA PROPOSED = 29,892 SQUARE FEET
IMPERVIOUS AREA PROPOSED = 7,422 SQUARE FEET

OPEN SPACE PROPOSED = 80.1%
OPEN SPACE REQUIRED (R-2 ZONE) = N/A

GENERAL NOTES:

- THE LOCATIONS OF UTILITY MAINS, STRUCTURES AND SERVICE CONNECTIONS PLOTTED ON THE DRAWING ARE APPROXIMATE ONLY AND WERE OBTAINED FROM RECORDS MADE AVAILABLE TO SHIVE-HATTERY, INC. THERE MAY BE OTHER EXISTING UTILITY MAINS, STRUCTURES AND SERVICE CONNECTIONS NOT KNOWN TO SHIVE-HATTERY, INC. AND NOT SHOWN ON THIS DRAWING. THE UTILITY MAINS, STRUCTURES AND SERVICE CONNECTIONS SHALL BE THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR.
- NOTIFY UTILITY COMPANIES AND THE OWNER OF PROPOSED SCHEDULE PRIOR TO EACH STAGE OF CONSTRUCTION.
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES AT CRITICAL LOCATIONS TO VERIFY EXACT HORIZONTAL AND VERTICAL LOCATION.
- IOWA CODE 480, UNDERGROUND FACILITIES INFORMATION, REQUIRES VERBAL NOTICE TO IOWA ONE-CALL 1-800-292-8989, NOT LESS THAN 48 HOURS BEFORE EXCAVATING, EXCLUDING WEEKENDS AND HOLIDAYS.
- THE MEANS OF THE WORK AND THE SAFETY OF THE CONTRACTOR'S EMPLOYEES ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.
- NO WORK SHALL BE PERFORMED BEYOND THE PROJECT LIMITS WITHOUT PRIOR AUTHORIZATION FROM THE OWNER'S REPRESENTATIVE.
- PROTECT EXISTING UTILITIES DURING CONSTRUCTION.
- MAINTAIN POSITIVE DRAINAGE ON THE SITE THROUGHOUT THE PROJECT DURATION.
- SITE CLEAN-UP SHALL BE PERFORMED ON A DAILY BASIS. SIDEWALKS, PARKING LOTS, ROADWAYS, ETC. SHALL BE KEPT CLEAN AT ALL TIMES.
- ALL OPEN EXCAVATIONS SHALL BE PROTECTED.
- MINIMIZE DUST SPREADING FROM ALL WORK AND STAGING AREAS.
- REPAIR OR REPLACE DAMAGE TO EXISTING FACILITIES (CURBS, PAVEMENT, UTILITIES, ETC.) DESIGNATED TO REMAIN, AT NO ADDITIONAL EXPENSE TO OWNER.
- ALL SLOPES IN PAVEMENT SHALL BE UNIFORM TO AVOID PONDING.
- ALL DIMENSIONS TO BACK-OF-CURB UNLESS NOTED OTHERWISE.
- NO PONDING OF WATER WILL BE ACCEPTED ON ANY NEW PAVEMENT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY ANY AREAS OF EXISTING OR PROPOSED PAVEMENTS THAT HAVE POTENTIAL TO POND WATER AND MAKE ANY ADJUSTMENTS NECESSARY TO ENSURE THAT WATER WILL POSITIVELY DRAIN ACROSS THE PAVING.
- ALL PCC SHARED USE PATH PAVING INSTALLED AS PART OF THIS PROJECT SHALL BE INSTALLED TO MEET ALL CURRENT REQUIREMENTS FOR ACCESSIBLE PEDESTRIAN FACILITIES AS DETAILED IN SUDAS DESIGN MANUAL SECTION 12A-2. THESE REQUIREMENTS INCLUDE MAXIMUM CROSS SLOPE AND RUNNING SLOPE. CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO PAVING IF ANY OF THE PCC SHARED USE PATH PAVING SHOWN ON THESE PLANS CANNOT BE CONSTRUCTED TO MEET THE ACCESSIBILITY REQUIREMENTS.
- CONTOURS AND SPOT ELEVATIONS SHOWN ARE TO FINISHED GRADE.
- A JOINTING PLAN HAS NOT BEEN DEVELOPED FOR THIS WORK. CONTRACTOR TO DEVELOP JOINTING PLAN AND SUBMIT FOR APPROVAL. FOLLOW SUDAS AND CITY OF WAUKEE GUIDELINES AND SPECIFICATIONS.
- CONSTRUCTION NOT SPECIFICALLY DETAILED OR SPECIFIED WITHIN THE PLANS OR PROJECT SPECIFICATIONS SHALL CONFORM TO THE MOST RECENT EDITION OF THE IOWA STATEWIDE URBAN DESIGN SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND CITY OF WAUKEE STANDARD SPECIFICATIONS.

CIVIL ENGINEER

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT DESCRIBED BELOW WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

Signature: _____
NATHAN T. HARDISTY
22587
License Renewal Date is: DECEMBER 31, 2022
PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL:
ALL SHEETS

PRELIMINARY

HEART OF THE WARRIOR TRAIL
TRAILSIDE IMPROVEMENTS

PRELIMINARY
- NOT FOR
CONSTRUCTION

CITY 2ND REVIEW
ISSUE DATE: 10/25/2022

C000

PROJECT NUMBER: 2142202390

LEGEND:

EXISTING	DESCRIPTION	PROPOSED
	PROPERTY LINE	
	RIGHT-OF-WAY LINE	
	LOT LINE	
	ELECTRICAL - UNDERGROUND	
	ELECTRICAL - OVERHEAD	
	STORM SEWER	
	WATER SERVICE	
	GAS SERVICE	
	SANITARY SEWER	
	SANITARY FORCE MAIN	
	FIBER OPTIC LINE	
	PROJECT LIMITS	
	UTILITY DEMOLITION	
	STORM EASEMENT	
	SANITARY MANHOLE	
	STORM MANHOLE	
	STORM INTAKES	
	STORM OUTLET	
	SUBDRAIN CLEANOUT	
	FIRE HYDRANT	
	WATER VALVE	
	LIGHT FIXTURE	
	ELECTRIC TRANSFORMER	
	BOLLARD	
	TELEPHONE BOX	
	SIGNAGE	
	BUILDING	
	TREE	
	MINOR CONTOUR	
	MAJOR CONTOUR	
	7" P.C.C. PAVING	
	5" P.C.C. SIDEWALK	
	EROSION STONE	

GENERAL GRADING AND EROSION CONTROL NOTES:

- BEST MANAGEMENT PRACTICES (BMP'S) AND CONTROLS SHALL CONFORM TO FEDERAL, STATE, OR LOCAL REQUIREMENTS OR MANUAL OF PRACTICE, AS APPLICABLE. CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY PERMITTING AGENCY OR OWNER.
- CONTRACTOR SHALL MINIMIZE CLEARING AND GROUND DISTURBANCE TO THE MAXIMUM EXTENT PRACTICAL.
- ALL WASH WATER (CONCRETE TRUCKS, VEHICLE CLEANING, EQUIPMENT CLEANING, ETC.) SHALL BE DETAINED AND PROPERLY TREATED OR DISPOSED. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING SEWERS AND DRAINAGE WAYS FROM CONCRETE SLURRY GENERATED FROM WASHOUT, CUTTING, OR GRINDING OPERATIONS.
- SUFFICIENT OIL AND GREASE ABSORBING MATERIALS SHALL BE MAINTAINED ON SITE OR READILY AVAILABLE TO CONTAIN AND CLEAN-UP FUEL OR CHEMICAL SPILLS AND LEAKS.
- DUST ON THE SITE SHALL BE CONTROLLED. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION OPERATIONS IS PROHIBITED.
- RUBBISH, TRASH, GARBAGE, LITTER, OR OTHER SUCH MATERIALS SHALL BE DEPOSITED INTO SEALED CONTAINERS. MATERIALS SHALL BE PREVENTED FROM LEAVING THE PREMISES THROUGH THE ACTION OF WIND OR STORM WATER DISCHARGE INTO STORM SEWERS, DRAINAGE DITCHES, OR WATERS OF THE STATE.
- STABILIZATION OF DISTURBED AREAS MUST, AT A MINIMUM, BE INITIATED IMMEDIATELY WHENEVER ANY CLEARING, GRADING, EXCAVATING OR OTHER EARTH DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED ON ANY PORTION OF THE SITE OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS.
- ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLES ONTO ROADWAYS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.
- CONTRACTORS OR SUBCONTRACTORS WILL BE RESPONSIBLE FOR REMOVING SEDIMENT THAT MAY HAVE COLLECTED IN THE STORM SEWER DRAINAGE SYSTEMS IN CONJUNCTION WITH THE STABILIZATION OF THE SITE.
- SLOPES SHALL BE LEFT IN A ROUGHENED CONDITION DURING THE GRADING PHASE TO REDUCE RUNOFF VELOCITIES AND EROSION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING THE EROSION CONTROL MEASURES (SILT FENCES, WATTLES, INLET PROTECTION, ETC.) TO PREVENT EROSION.
- ALL STORM SEWER INTAKES THAT RECEIVE STORMWATER RUNOFF FROM DISTURBED AREAS SHALL BE PROVIDED WITH INLET PROTECTION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION, PERIODIC CHECKING AND REINSTALLATION OF EROSION AND SEDIMENTATION CONTROL MEASURES.
- THE ANTICIPATED DISTURBED AREA FOR THE PROJECT IS LESS THAN 1 ACRE. AS A RESULT, NPDES GENERAL PERMIT NO. 2 COVERAGE IS NOT ANTICIPATED TO BE REQUIRED. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES NECESSARY TO PROTECT AGAINST SILTATION, EROSION, AND DUST POLLUTION ON THE PROJECT SITE AND ANY OFFSITE BORROW OR DISPOSAL AREAS USED FOR THIS PROJECT. COMPLY WITH SOIL EROSION CONTROL REQUIREMENTS OF IOWA CODE, FEDERAL REGULATIONS, AND LOCAL ORDINANCES.

LANDSCAPE NOTES:

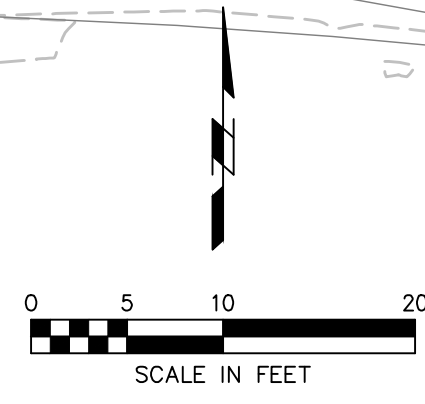
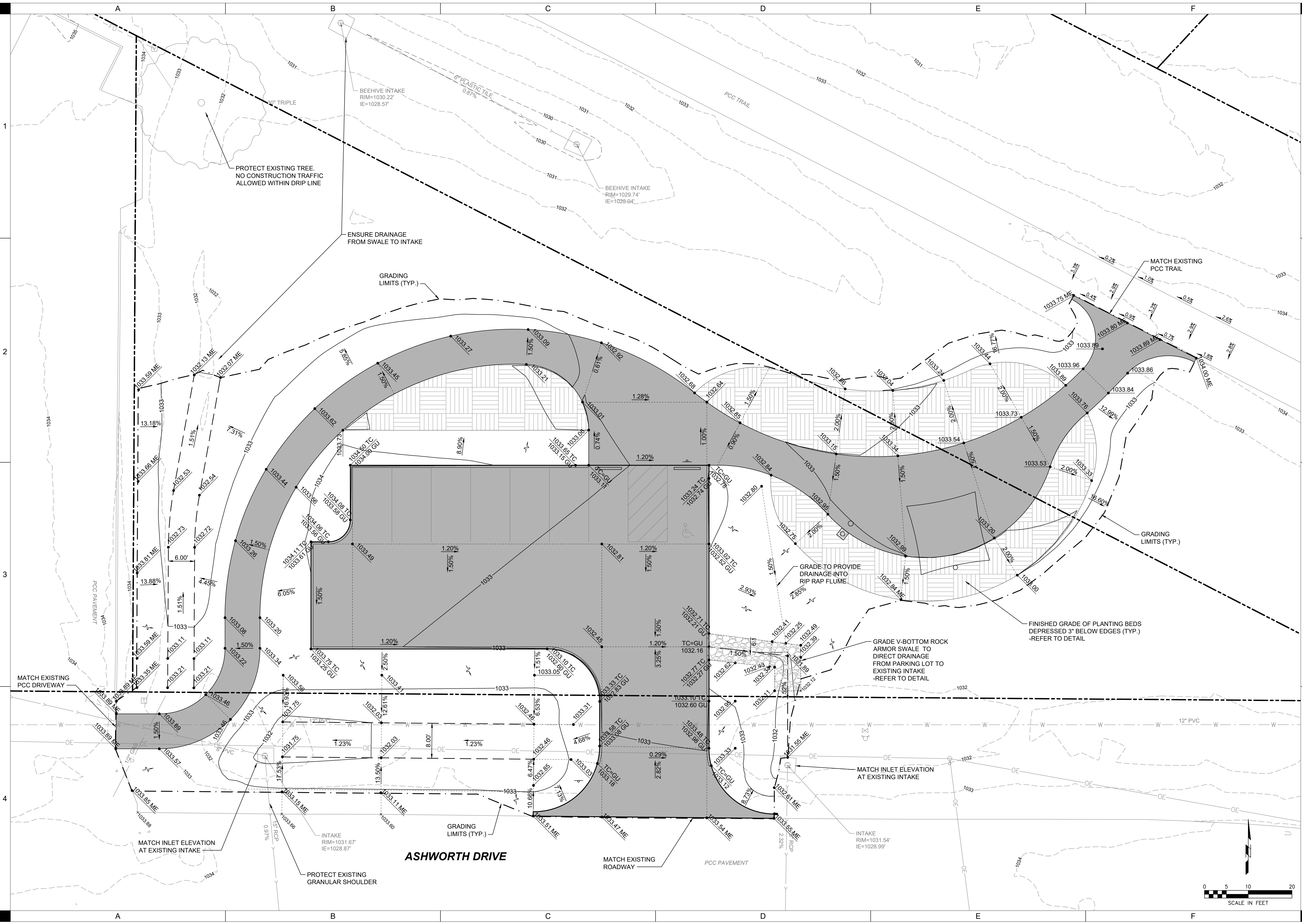
- ALL PLANT INSTALLATION AND RELATED WORK SHALL CONFORM TO CURRENT IOWA STATEWIDE URBAN DESIGN AND SPECIFICATIONS (SUDAS) DIVISION 9, SECTION 9030 - PLANT MATERIAL AND PLANTING, UNLESS OTHERWISE NOTED.
- ALL PLANTING WORK SHALL BE COORDINATED WITH THE WORK OF OTHER TRADES ON SITE.
- LOCATIONS OF ALL UTILITIES SHOWN ON THE PLANS ARE TAKEN FROM EXISTING RECORDS. THE EXACT LOCATION AND ELEVATION OF ALL UTILITIES MUST BE DETERMINED BY THE CONTRACTOR. IT SHALL BE THE DUTY OF THE CONTRACTOR TO ASCERTAIN WHETHER ANY ADDITIONAL UTILITIES OTHER THAN THOSE SHOWN ON THE PLAN MAY BE PRESENT.
- PROTECT ALL EXISTING AND NEW STRUCTURES AND UTILITY SERVICES DURING INSTALLATION OF ALL PLANT MATERIAL. IF CONFLICTS EXIST BETWEEN PROPOSED PLANTING LOCATIONS AND OTHER STRUCTURES AND UTILITIES, CONTRACTOR SHALL COORDINATE PLANTING ADJUSTMENTS WITH LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
- CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE DUE TO OPERATIONS INSIDE AND OUTSIDE OF THE CONTRACT LIMIT LINE. ANY AREAS OUTSIDE THE LIMIT OF WORK THAT ARE DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
- WOOD MULCH SHALL BE DOUBLE-SHREDDED HARDWOOD MULCH, PLACED TO A 3" TYPICAL DEPTH PER PLAN.
- PLANTING SOIL MIX SHALL CONSIST OF (1) PART LEAF-BASED ORGANIC COMPOST THOROUGHLY MIXED WITH (4) PARTS EXISTING OR IMPORTED LOAM TOPSOIL, PLACED TO A MINIMUM DEPTH OF 18".
- REPAIR ALL AREAS OF DISTURBANCE WITH TURF SEED WITH HYDROMULCH UNLESS NOTED OTHERWISE.
- THE CONTRACTOR SHALL REMOVE ALL CONSTRUCTION DEBRIS AND MATERIALS INJURIOUS TO PLANT GROWTH FROM PLANTING PITS AND BEDS PRIOR TO BACKFILLING WITH PLANTING SOIL MIX.
- THE CONTRACTOR SHALL PROVIDE A MECHANICAL SPADE-CUT EDGE AT THE PERIMETER OF MULCHED PLANTING BEDS PER PLAN.
- APPLY PRE-EMERGENT WEED PREVENTER TO PLANTING AREAS PRIOR TO MULCHING. TOP-DRESS PLANTING AREAS WITH DOUBLE-SHREDDED HARDWOOD MULCH TO A DEPTH OF 3".
- ALL SEED INSTALLATION AND RELATED WORK SHALL CONFORM TO CURRENT IOWA STATEWIDE URBAN DESIGN AND SPECIFICATIONS (SUDAS) DIVISION 9, SECTION 9010 - SEEDING, UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL PROVIDE ALL SUBMITTAL INFORMATION AS DESCRIBED IN SUDAS SECTION 9010 INCLUDING PROPOSED SEEDING METHODS AND SCHEDULE FOR REVIEW AND APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
- PREPARE TOPSOIL AND SEED BED IN CONFORMANCE WITH SUDAS SECTION 2010 - EARTHWORK, AND SECTION 9010.
- THE CONTRACTOR SHALL PROVIDE A 12 MONTH WARRANTY ON LOW MAINTENANCE LAWN MIX AS DESCRIBED IN SUDAS SECTION 9010.

SITE FURNISHINGS NOTES:

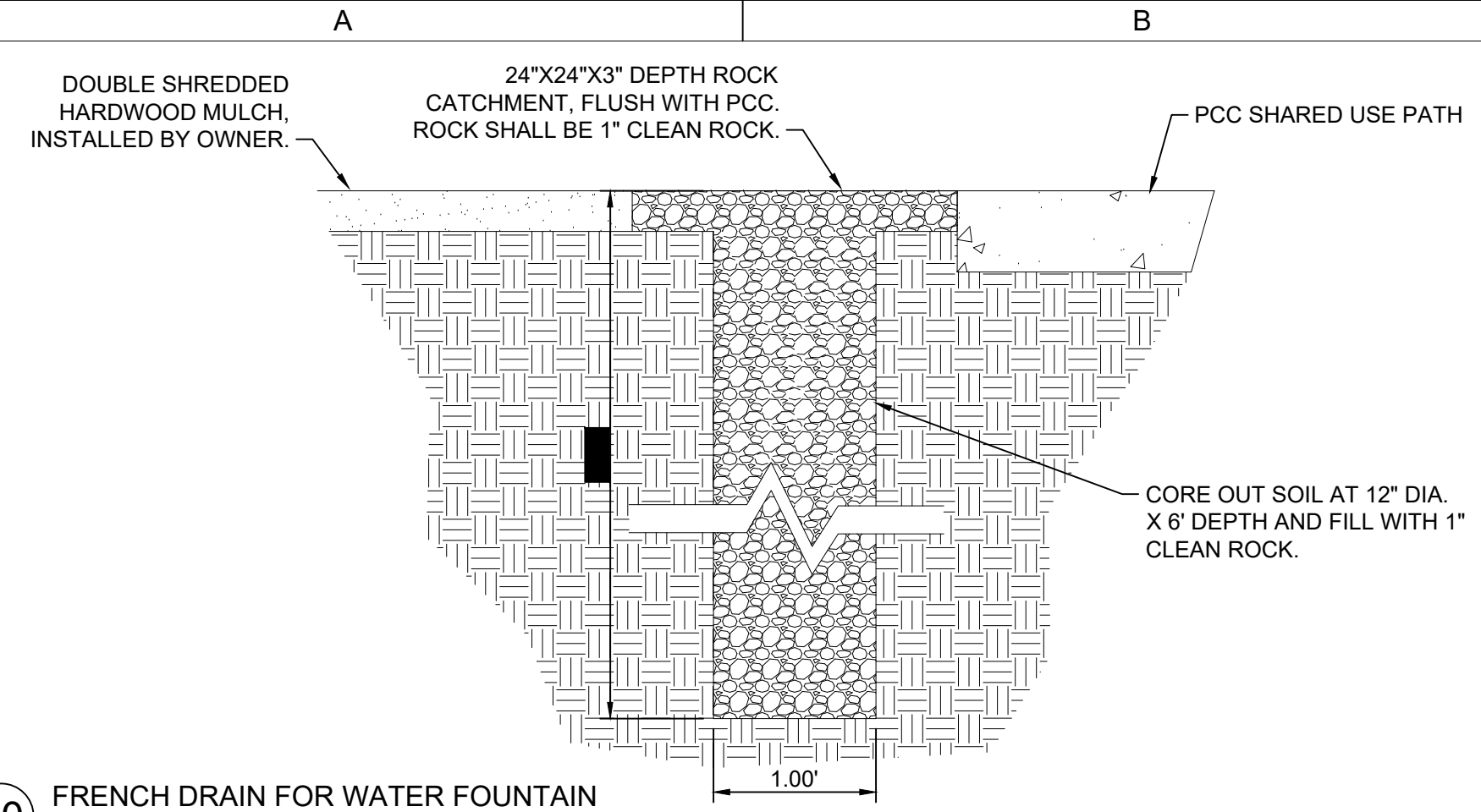
- SHADE STRUCTURE SHALL BE 16'X16' CANTILEVER UMBRELLA FABRIC SHADE STRUCTURE BY WATERLOO TARP AND TENT, OR APPROVED EQUAL. PROVIDE PHYSICAL SAMPLES FOR SUNSHADE MESH COLORS AND POWDER COAT COLORS TO LANDSCAPE ARCHITECT FOR APPROVAL. SHADE STRUCTURE SHALL REFLECT COMPLIANCE WITH CITY OF WAUKEE AMENDED WIND AND SNOW LOADS - 115 MPH WIND AND 30# GROUND SNOW. CONTRACTOR TO PROVIDE STAMPED STRUCTURAL DRAWINGS FOR STRUCTURAL FOOTING DESIGN.
- ANY OTHER SITE FURNISHINGS SHALL BE PROVIDED AND INSTALLED BY OWNER AT A FUTURE TIME.

DRAWN BY	OJA
APPROVED BY	NTH
ISSUED FOR	CITY 2ND REVIEW
ISSUE DATE	10/25/2022
PROJECT NUMBER	2142202390
FIELD BOOK	---

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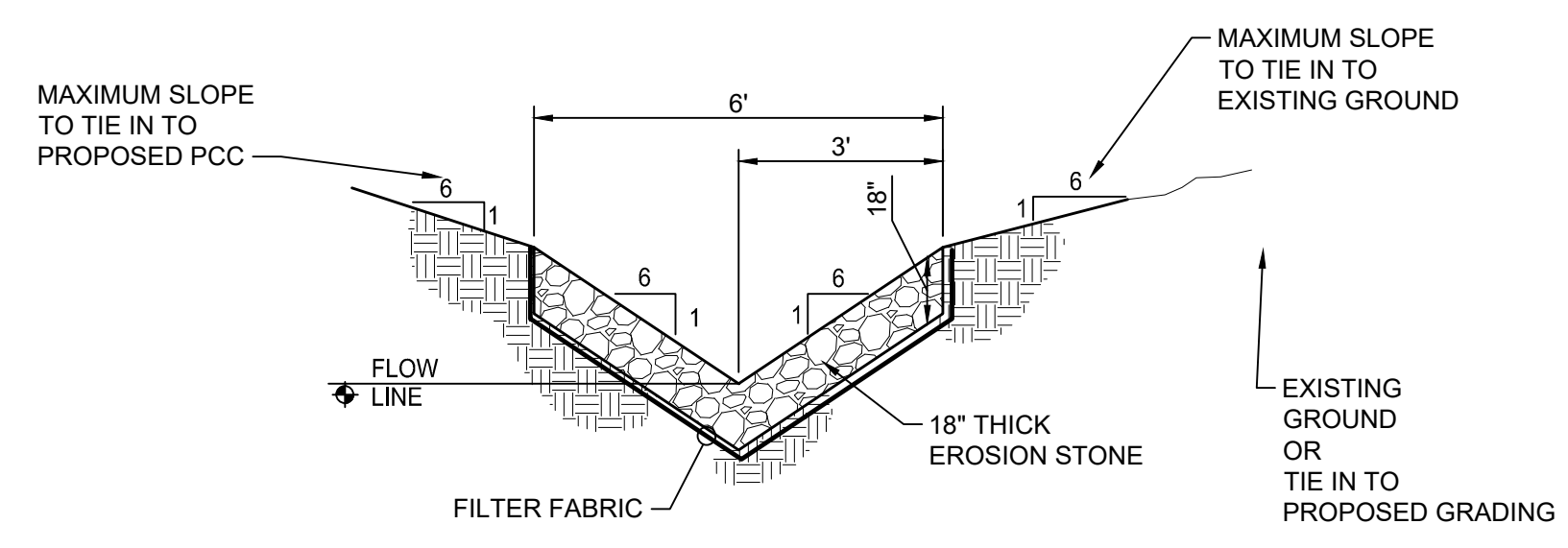


10 FRENCH DRAIN FOR WATER FOUNTAIN
NOT TO SCALE

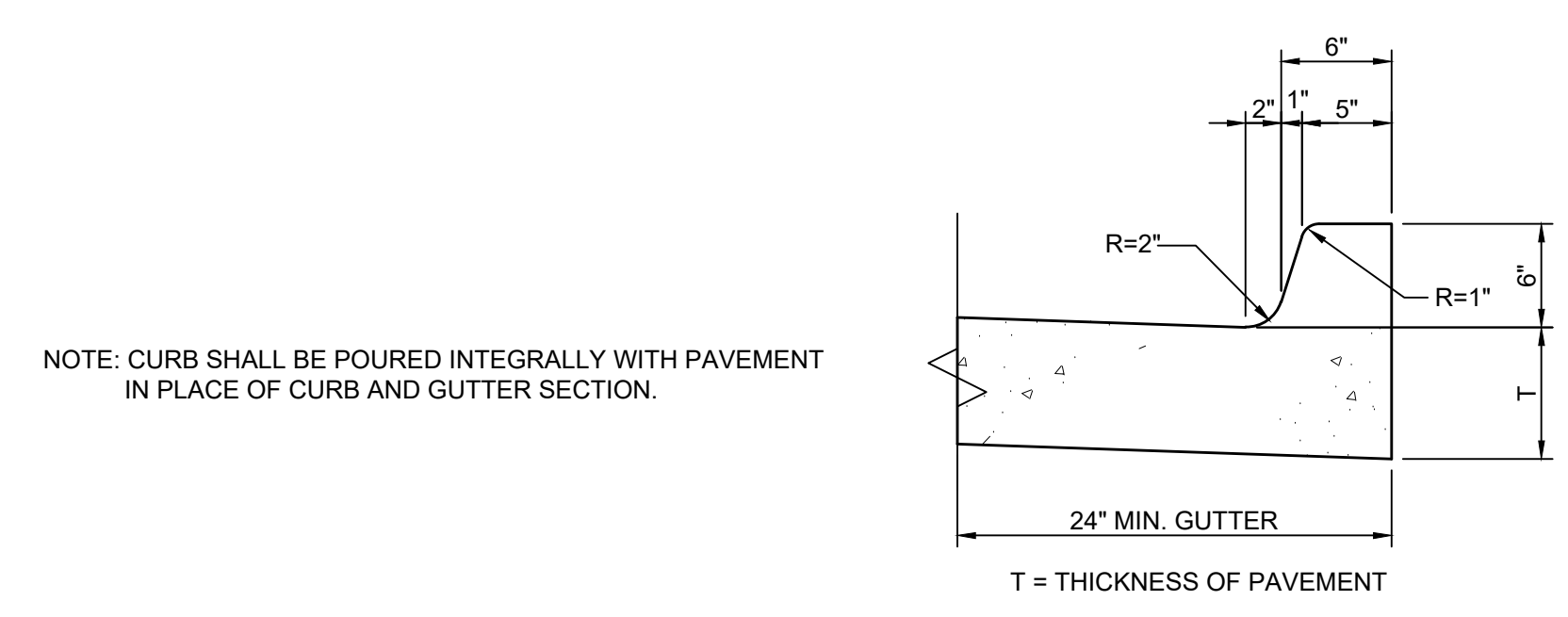


NOTE: CANTILEVER UMBRELLA SHADE STRUCTURE BY WATERLOO TARP AND TENT. IMAGE FOR REFERENCE ONLY. DESIGN AND INSTALL STRUCTURE PER MANUFACTURER'S SPECIFICATIONS. SHADE STRUCTURE SHALL REFLECT COMPLIANCE WITH CITY OF WAUKEE AMENDED WIND AND SNOW LOADS - 115 MPH WIND AND 30# GROUND SNOW. CONTRACTOR TO PROVIDE STAMPED STRUCTURAL DRAWINGS FOR STRUCTURAL FOOTING DESIGN.

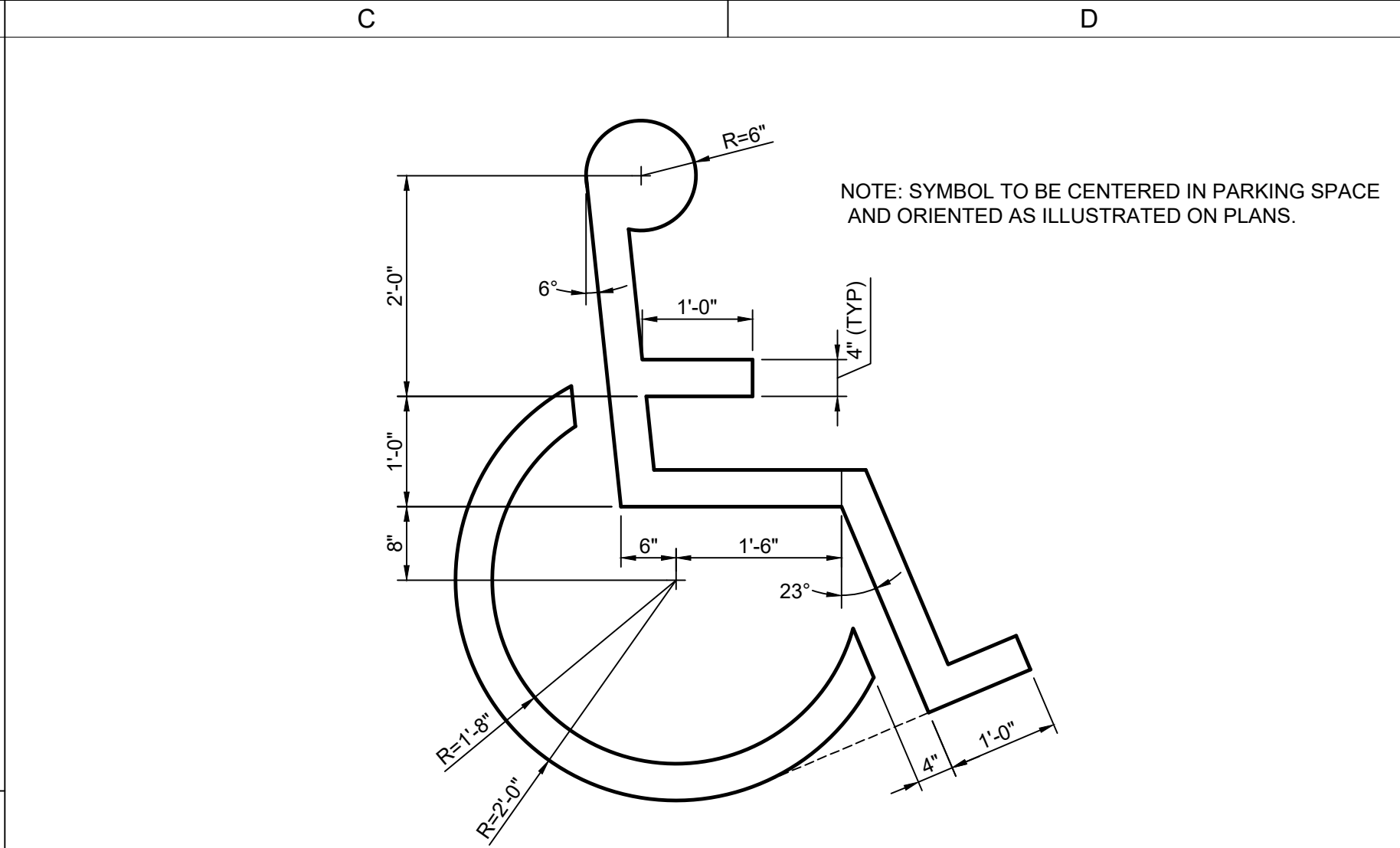
9 SHADE STRUCTURE
NOT TO SCALE



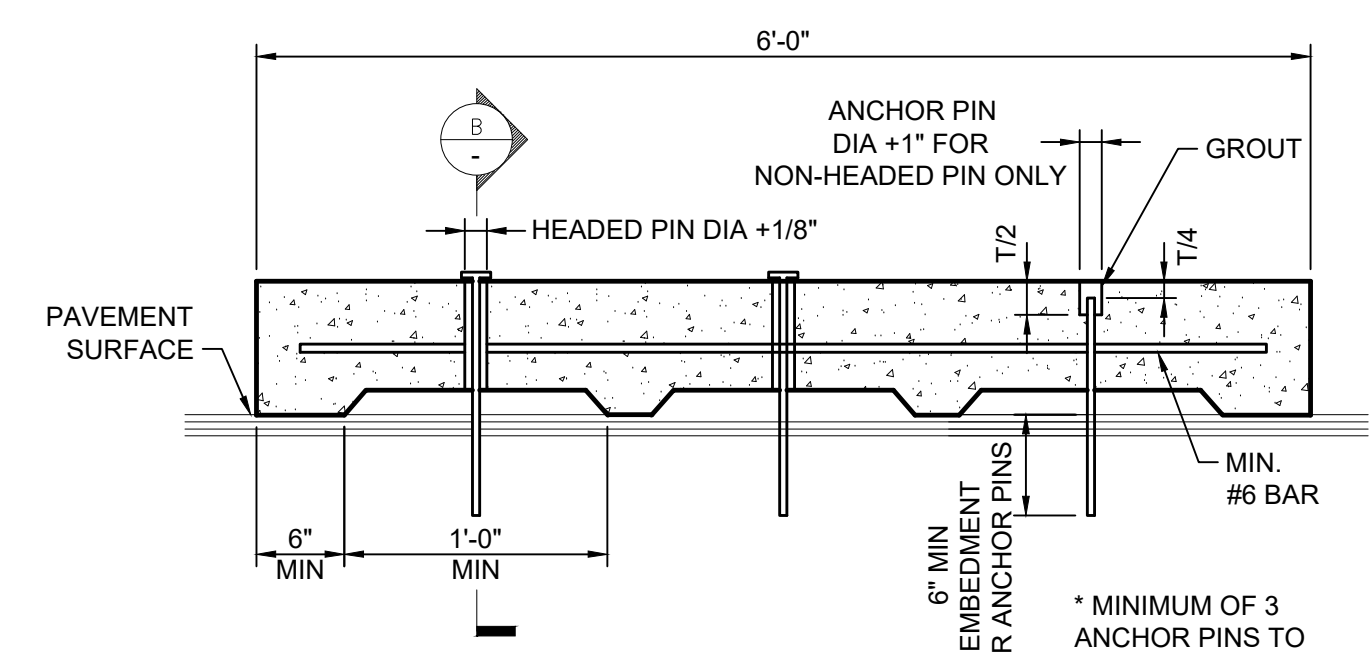
8 ROCK ARMORED SWALE
NOT TO SCALE



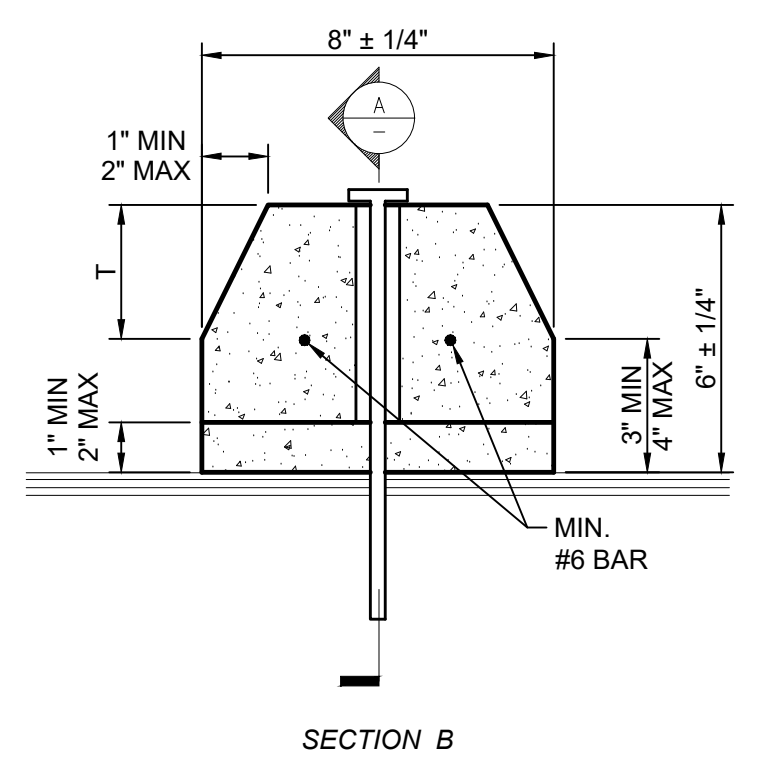
7 6-INCH STANDARD CURB
NOT TO SCALE



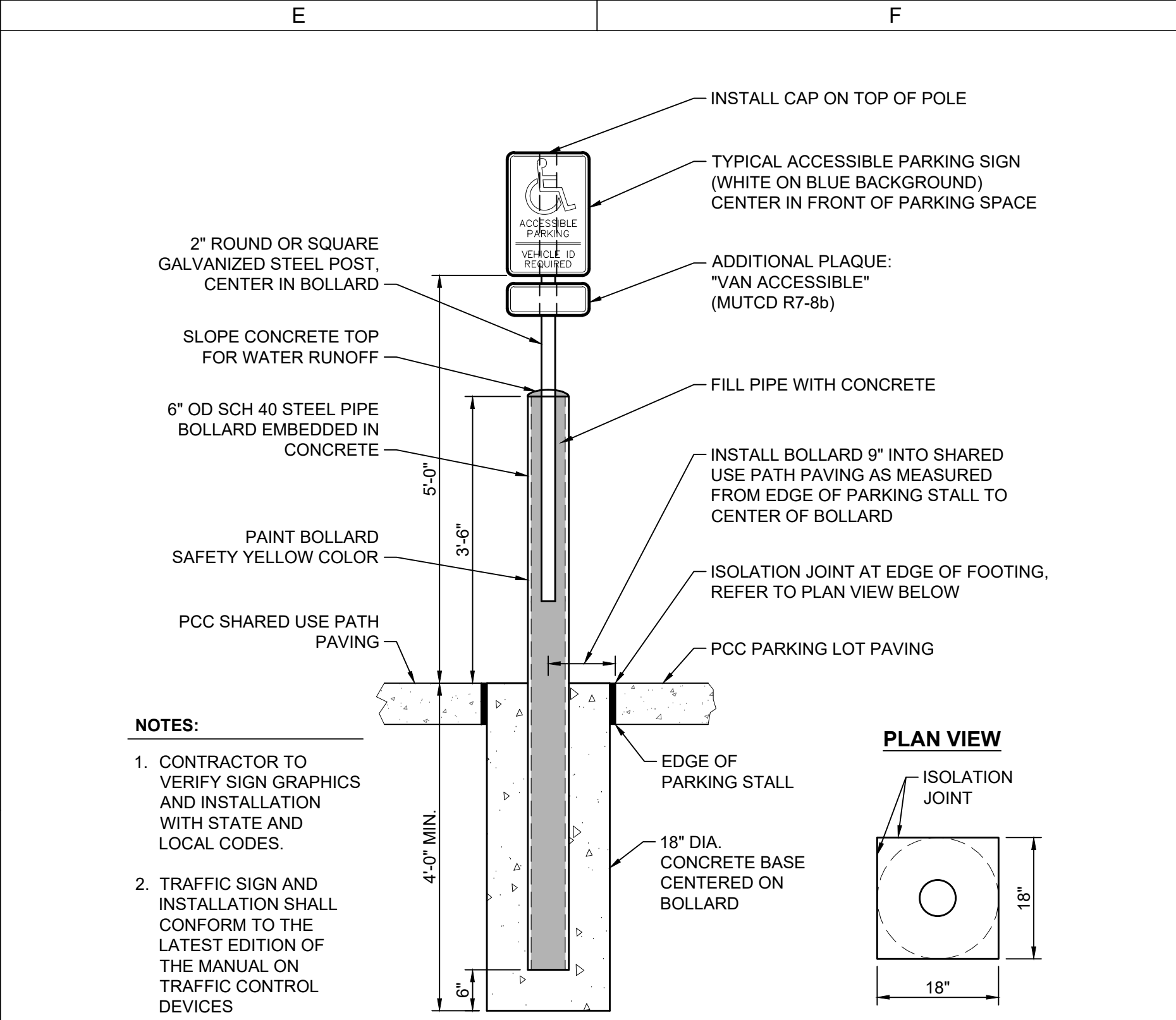
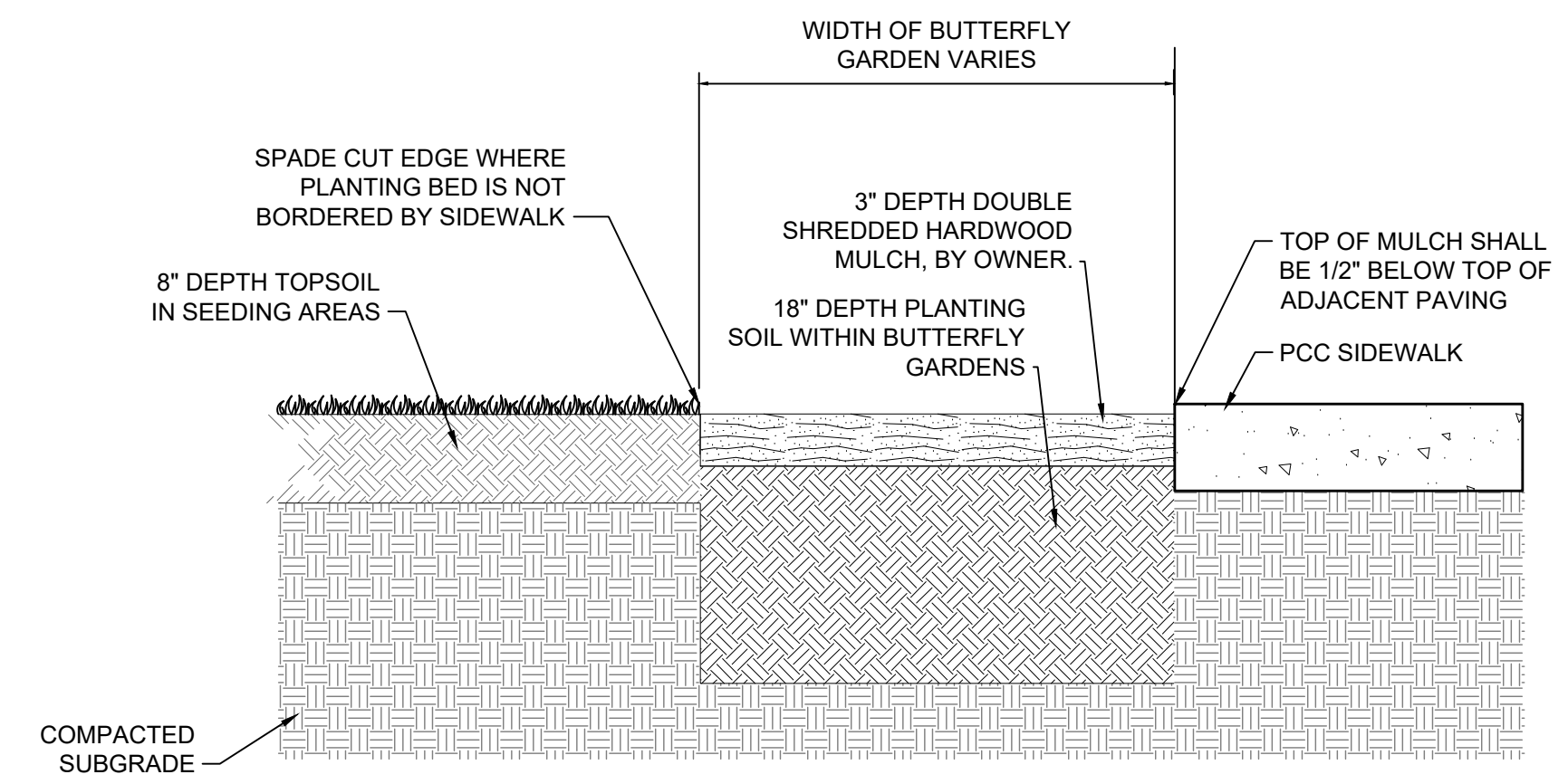
6 ACCESSIBLE PARKING SYMBOL
NOT TO SCALE



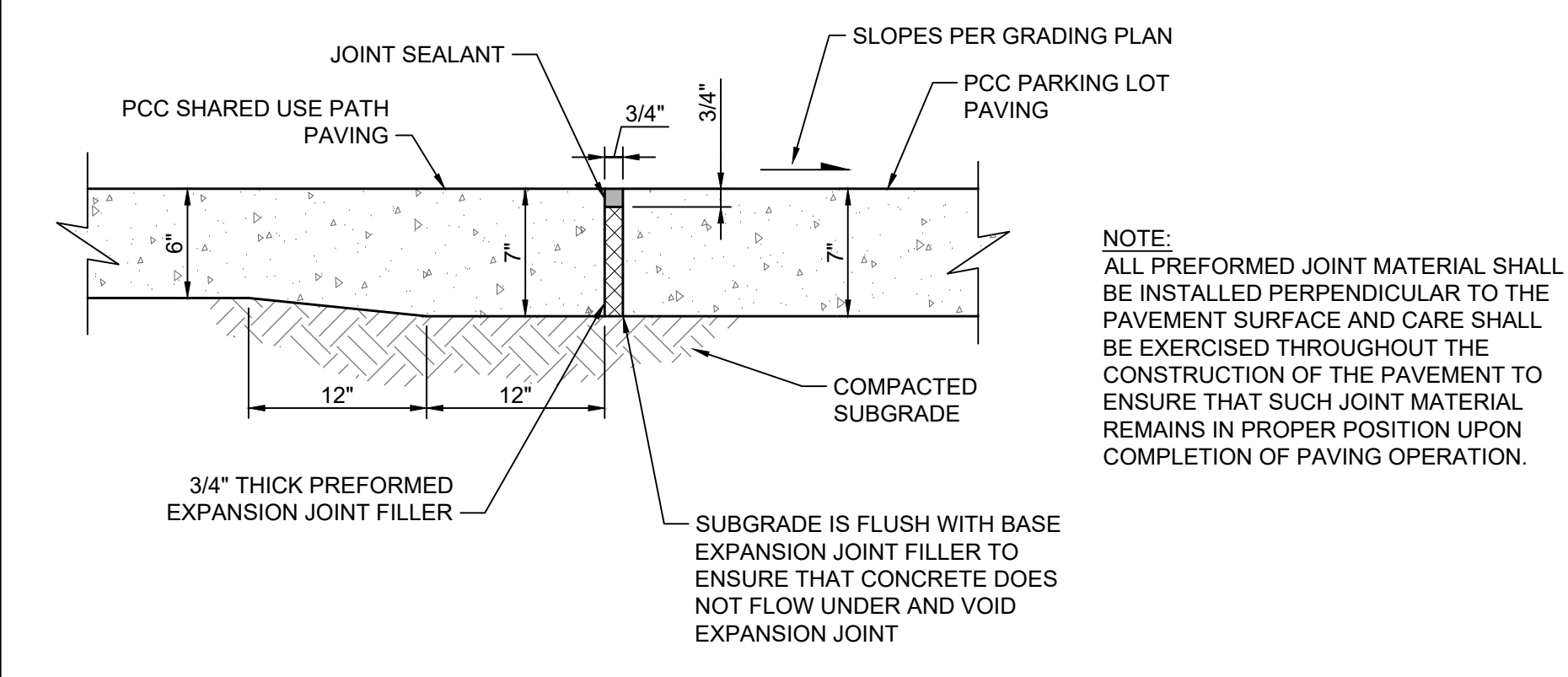
5 PCC WHEEL STOP
NOT TO SCALE



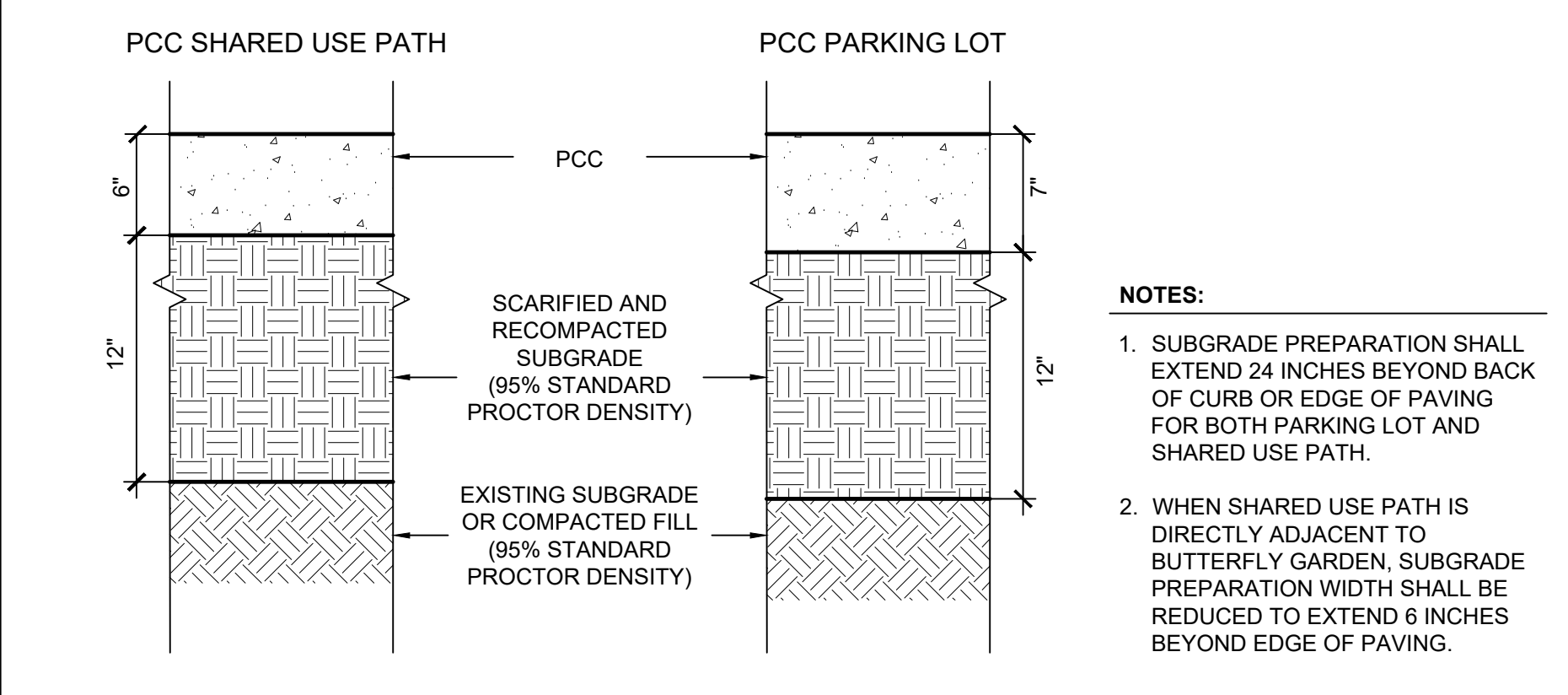
4 BUTTERFLY GARDEN SECTION
NOT TO SCALE



3 ACCESSIBLE PARKING SIGN AND BOLLARD
NOT TO SCALE



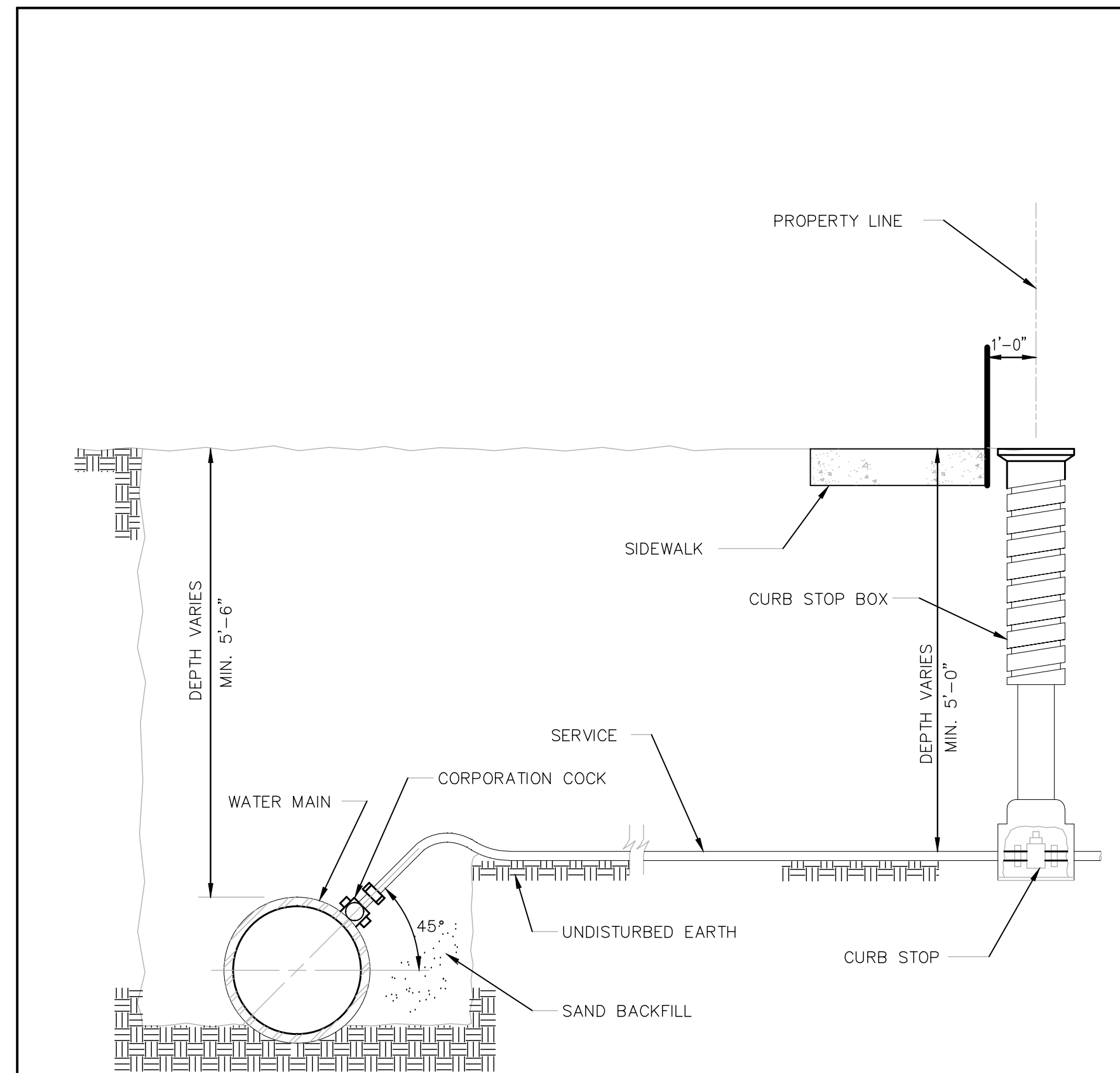
2 ISOLATION JOINT
NOT TO SCALE



1 PAVEMENT CROSS SECTIONS
NOT TO SCALE

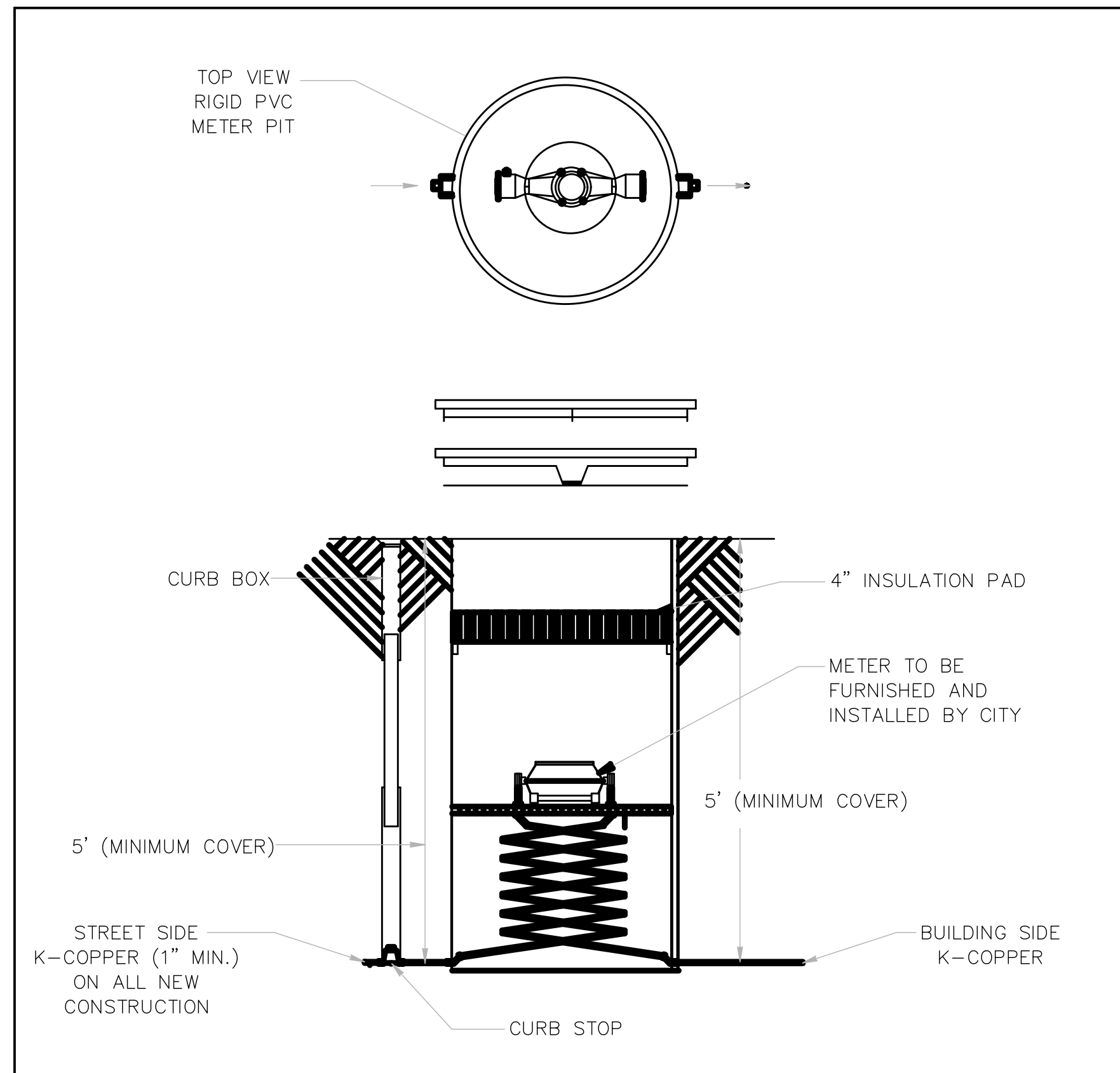
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NOTES:
 1. TERMINATE CURB STOP BOX ROD 1'-6" BELOW FINISHED GRADE.

CITY OF WAUKEE
 SERVICE CONNECTION
 STD.DWG.NO.32 REV.1



NOTE: METER BOX LOCATED AT PROPERTY LINE ON PRIVATE PROPERTY

CITY OF WAUKEE
 STANDARD METER PIT
 5/8", 3/4" & 1" METERS
 (FOR OFF ROAD USE ONLY)
 STD.DWG.NO.41

THRUST BLOCKING

STEP 1. MULTIPLY THE PRESSURE LEVEL DESIRED FOR TESTING BY THE APPROPRIATE VALUE SHOWN IN THE FOLLOWING TABLE:

PIPE SIZE	DEAD END OR TEE	90° ELBOW	45° ELBOW	22.5° ELBOW
1.5"	2.94	4.16	2.25	1.15
2"	4.56	6.45	3.50	1.78
2.5"	6.65	9.40	5.10	2.60
3"	9.80	13.9	7.51	3.82
3.5"	12.8	18.1	9.81	4.99
4"	16.2	23.0	12.4	6.31
5"	24.7	35.0	18.9	9.63
6"	34.8	49.2	26.7	13.6

BASED ON POUNDS PER PSI WORKING PRESSURE.

STEP 2. DETERMINE THE BEARING STRENGTH OF THE SOIL FROM THE TABLE BELOW:

SOILS AND SAFE BEARING LOADS LBS. SQ. FT.	BEARING STRENGTH OF SOILS
SOUND SHALE	10,000
CEMENTED GRAVEL AND SAND - DIFFICULT TO PICK	4,000
COARSE AND FINE COMPACT SAND	3,000
MEDIUM CLAY - CAN BE SPADED	2,000
SOFT CLAY	1,000
MUCK	0

STEP 3. DIVIDE THE TOTAL THRUST OBTAINED IN STEP 1 BY THE BEARING STRENGTH OF THE SOIL. THIS GIVES THE SQUARE FEET OF AREA NEEDED.

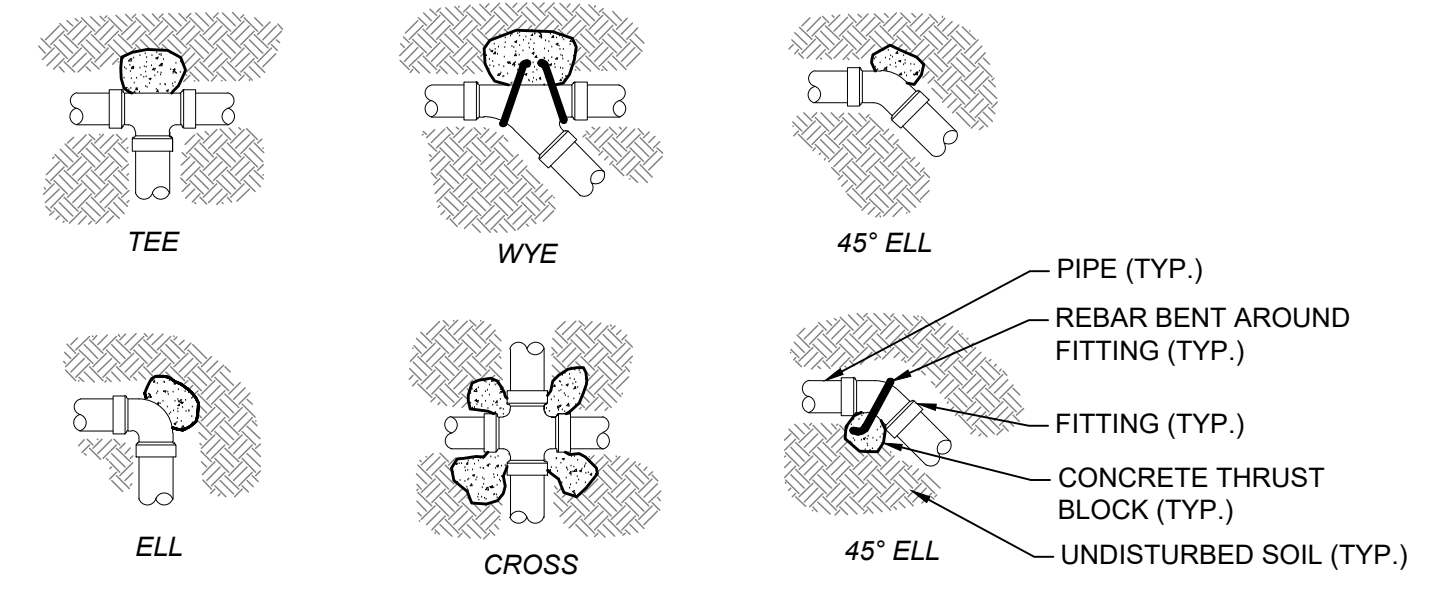
SIDE THRUST ON CURVES

AN OUTWARD PRESSURE EXISTS ON ALL DEFLECTIONS FROM A STRAIGHT LINE. GOOD SOIL, PROPERLY TAMPED, IS SUFFICIENT TO HOLD SIDE THRUST - UNLESS SOIL CONDITIONS ARE UNSTABLE. IN THAT CASE, TO ANCHOR AGAINST THIS SIDE THRUST, THE BLOCKING SHOULD BE PLACED AGAINST THE PIPE ON EACH SIDE OF THE COUPLING. DO NOT THRUST BLOCK THE COUPLING ITSELF.

PIPE SIZE	SIDE THRUST POUNDS PER DEGREE
1.5"	5.1
2"	7.9
2.5"	11.6
3"	17.1
3.5"	22.4
4"	28.3
5"	43.1
6"	60.8

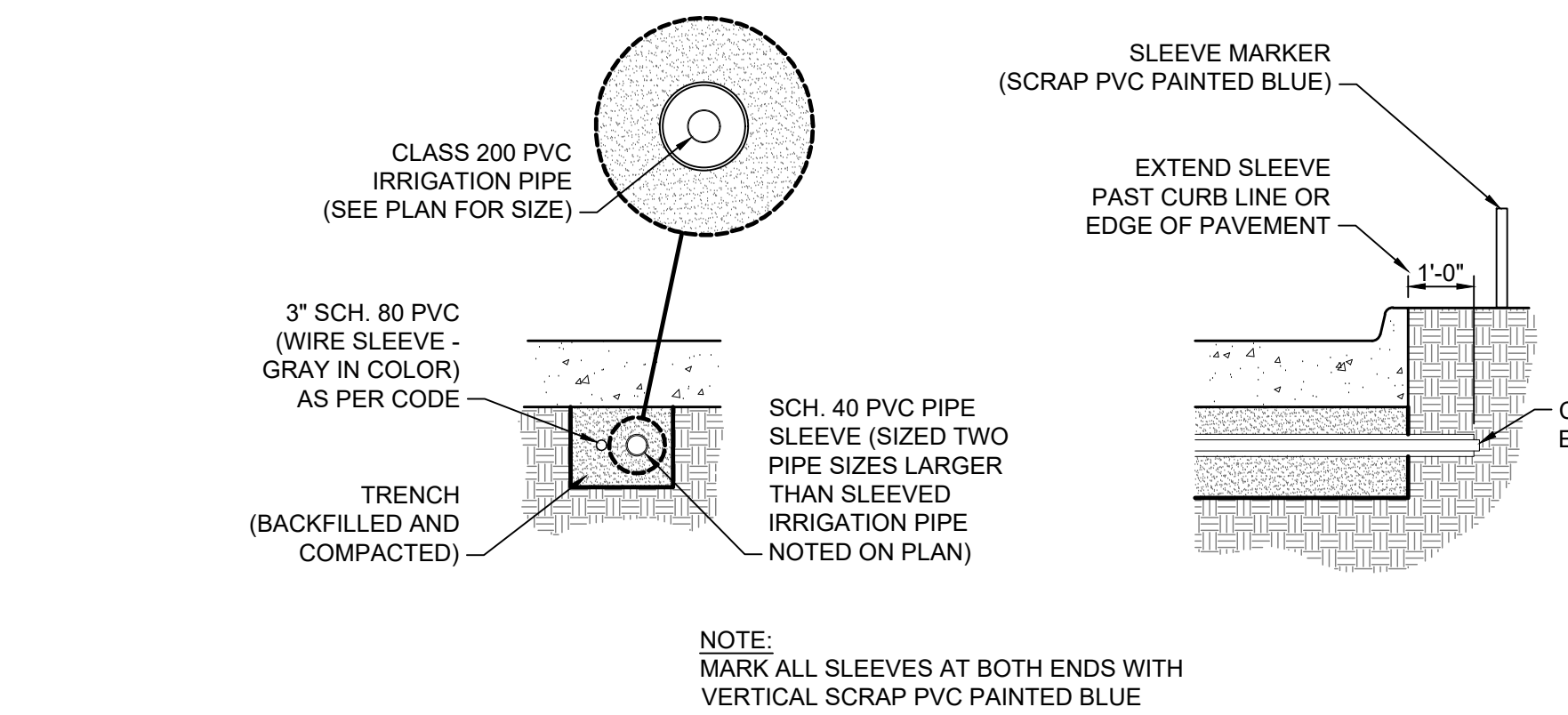
BASED ON SIDE THRUST PER 100 LBS/SQUARE INCH PRESSURE PER DEGREE OF DEFLECTION

NOTE: MULTIPLY SIDE THRUST POUNDS BY DEGREES OF DEFLECTION TIMES POUNDS OF PRESSURE DIVIDED BY 100 TO OBTAIN TOTAL SIDE THRUST IN POUNDS.



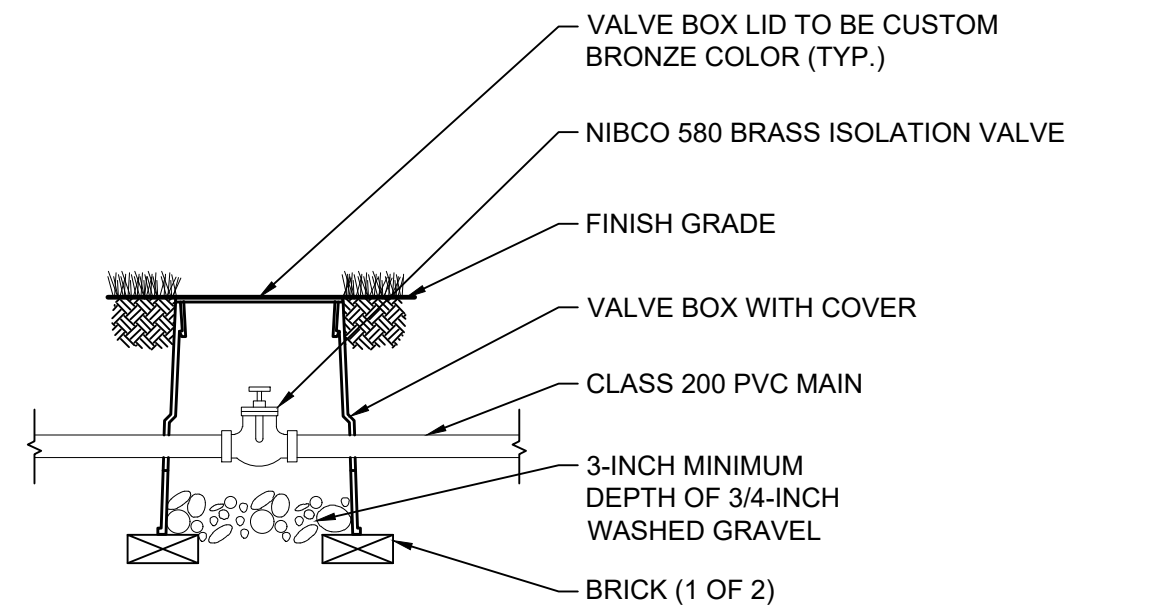
NOTE: ALL MAINLINE AND LATERAL CHANGE OF DIRECTION SHALL RECEIVE THRUST BLOCKING OR JOINT RESTRAINTS. - SEE THRUST BLOCKING TABLE FOR BEARING STRENGTH. FURTHERMORE ANY SOILS NOT STABLE FOR ADEQUATE THRUST BLOCKING, SAID FITTINGS MUST UTILIZE JOINT RESTRAINTS AT NO ADDITIONAL COST TO OWNER. IT IS ULTIMATELY THE CONTRACTOR'S RESPONSIBILITY TO INSTALL THE APPROPRIATE APPLICATION TO ENSURE THAT THE FITTING OR VALVE DOES NOT MOVE FROM AN OUTWARD DEFLECTION.

2 IRRIGATION - THRUST BLOCKS
 NOT TO SCALE

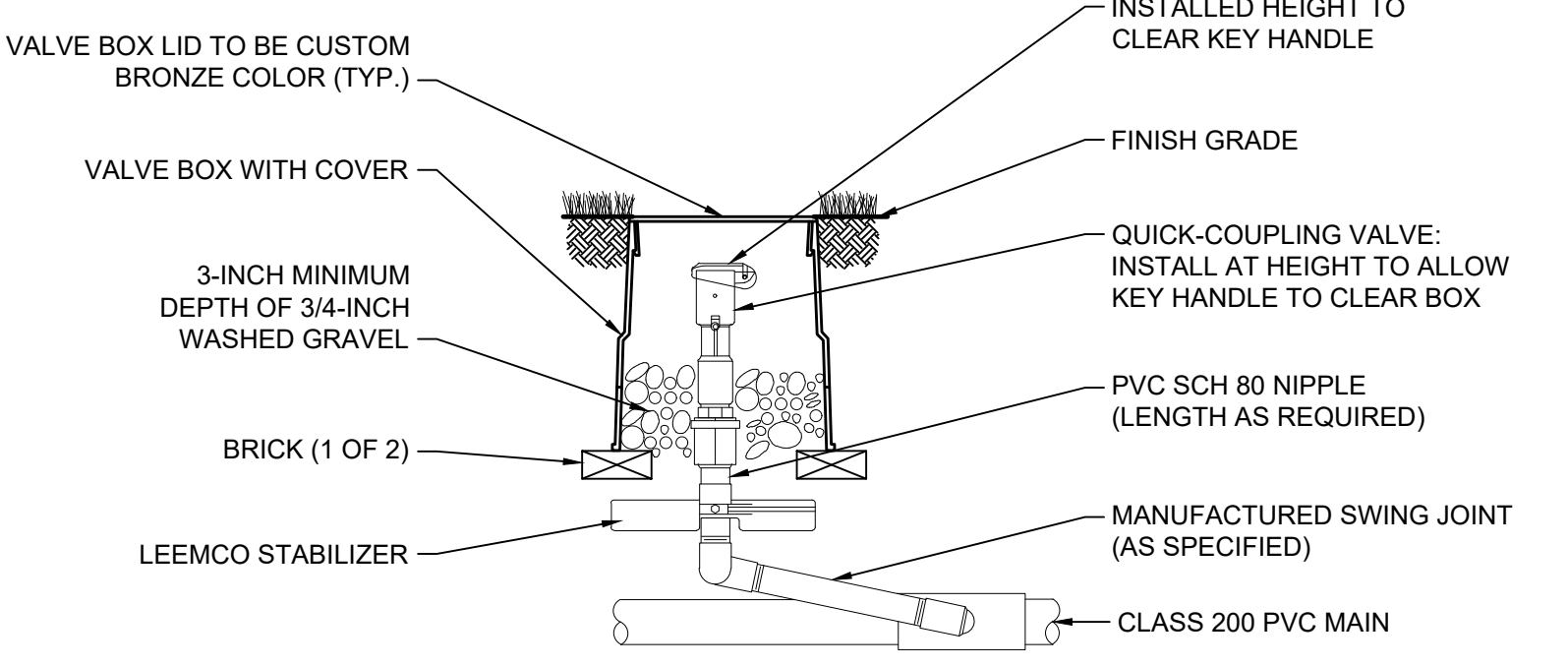


NOTE: MARK ALL SLEEVES AT BOTH ENDS WITH VERTICAL SCRAP PVC PAINTED BLUE

4 IRRIGATION - SLEEVE DETAIL
 NOT TO SCALE



3 IRRIGATION - ISOLATION VALVE WITH BOX
 NOT TO SCALE



NOTE: FURNISH FITTINGS AND PIPING NOMINALLY SIZED IDENTICAL TO NOMINAL QUICK-COUPLING VALVE INLET SIZE

1 IRRIGATION - QUICK-COUPLING VALVE WITH STABILIZER
 NOT TO SCALE

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APPROVED BY	NTH
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