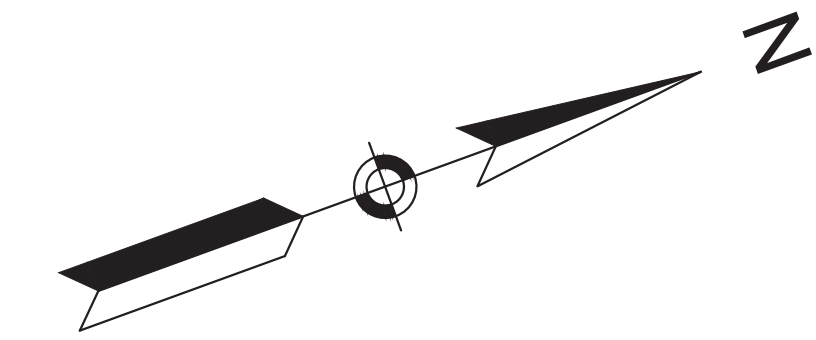


WILLARD STREET DRAINAGE IMPROVEMENTS

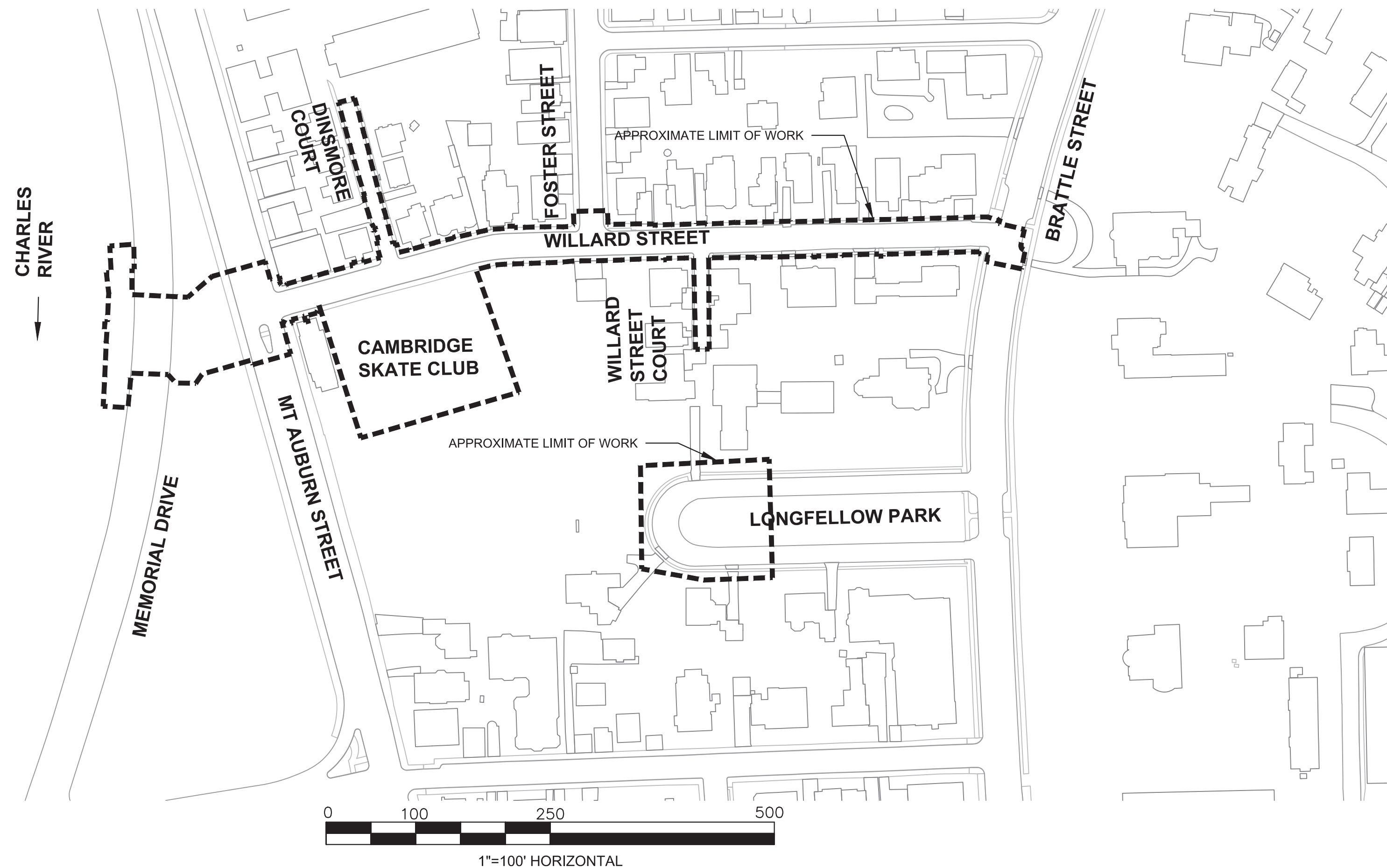
WILLARD STREET

50% DRAFT SUBMISSION



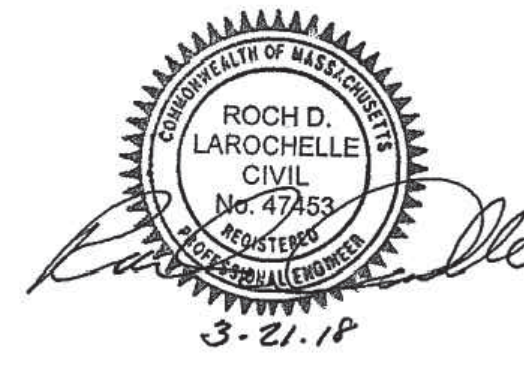
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PREPARED FOR:

CITY OF CAMBRIDGE
DEPARTMENT OF PUBLIC WORKS



MARCH 22, 2018

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GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		JERSEY BARRIER
		CATCH BASIN
		CATCH BASIN CURB INLET
		FLAG POLE
		GAS PUMP
		MAIL BOX
		POST SQUARE
		POST CIRCULAR
		WELL
		ELECTRIC HANDHOLE
		FENCE GATE POST
		GAS GATE
		BORING HOLE
		MONITORING WELL
		TEST PIT
		HYDRANT
		LIGHT POLE
		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
		MASSACHUSETTS HIGHWAY BOUND
		MONUMENT
		STONE BOUND
		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
		TROLLEY POLE OR GUY POLE
		TRANSMISSION POLE
		UTILITY POLE W/ FIREBOX
		UTILITY POLE WITH DOUBLE LIGHT
		UTILITY POLE W/ 1 LIGHT
		UTILITY POLE
		BUSH
		TREE
		STUMP
		SWAMP / MARSH
		WATER GATE
		PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
		CONTOURS (ON-THE-GROUND SURVEY DATA)
		CONTOURS (PHOTOGRAMMETRIC DATA)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
		CHAIN LINK OR METAL FENCE
		WOOD FENCE
		HAY BALES/SILT FENCE
		TREE LINE
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
		EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
		RAILROAD SIGNAL
		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
		MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
		MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
		LEGEND "ONLY" - WHITE
		STOP LINE
		CROSSWALK
		SOLID WHITE LINE
		SOLID YELLOW LINE
		BROKEN WHITE LINE
		BROKEN YELLOW LINE
		DOTTED WHITE LINE
		DOTTED YELLOW LINE
		DOTTED WHITE LINE EXTENSION
		DOTTED YELLOW LINE EXTENSION
		DOUBLE WHITE LINE
		DOUBLE YELLOW LINE

ABBREVIATIONS

GENERAL	
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MIN	MINIMUM
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY

ABBREVIATIONS (cont.)

GENERAL	
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL

CAB.	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY DON'T WALK
FDW	FLASHING DON'T WALK
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR AMBER
FYL	FLASHING AMBER LEFT ARROW
FYR	FLASHING AMBER RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PED	PEDESTRIAN
PTZ	PAN, TILE, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALK
Y	STEADY CIRCULAR AMBER
YL	STEADY AMBER LEFT ARROW

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Client	CITY OF CAMBRIDGE, MA			Sheet	G-2
Project	WILLARD STREET DRAINAGE IMPROVEMENTS PROJECT			Total Sheets	
Drawing	LEGEND AND ABBREVIATIONS			File No.	
No.	Description	Date	Checked by		
	REVISIONS		Approved by		

GENERAL NOTES

- CONTRACTOR SHALL FIELD VERIFY EXISTING SITE CONDITIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCING WORK.
- ALL UNDERGROUND UTILITIES ARE APPROXIMATE ONLY. CONTRACTOR SHALL FIELD VERIFY AND LOCATE ALL EXISTING UTILITIES, AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCING WORK.
- RIGHT-OF-WAY AND PROPERTY LINES SHOULD BE CONSIDERED APPROXIMATE IN LOCATION.
- THE CONTRACTOR SHALL NOTIFY, IN WRITING, ALL UTILITY COMPANIES AND GOVERNMENT AGENCIES PRIOR TO EXCAVATION WORK AND CALL "DIG-SAFE" AT 1-800-322-4844, PRIOR TO COMMENCING WORK.
- ALL FEES AND PERMITS SHALL BE PAID FOR BY THE CONTRACTOR.
- THE CONTRACTOR SHALL SECURE THE WORK AREA AT THE END OF EACH WORK DAY.
- CONTRACTOR SHALL RESTORE TO THEIR ORIGINAL CONDITION ANY AREAS ADJACENT TO AND OUTSIDE THE LIMIT OF WORK WHICH ARE DISTURBED DURING CONSTRUCTION, AT THE CONTRACTOR'S OWN EXPENSE.
- UTILITY SERVICES SHALL BE MAINTAINED AT ALL TIMES.
- CONTRACTOR SHALL SAWCUT ALL EDGES OF PAVING WHERE PAVEMENT IS TO BE REMOVED AND WHERE A NEW PAVEMENT IS TO ABUT EXISTING PAVEMENT.
- CONTRACTOR SHALL PROVIDE EXPANSION JOINTS IN CONCRETE WALKS WHERE WALKS ABUT BUILDING WALLS, AND WHERE NEW WALKS ABUT EXISTING WALKS.
- CONTRACTOR SHALL PROVIDE UNIFORM SLOPE BETWEEN SPOT GRADES AND CONTOURS.
- CONTRACTOR SHALL ADJUST ALL EXISTING CITY OWNED UTILITY CASTINGS WITHIN LIMIT OF WORK TO LINE AND GRADE, UNLESS OTHERWISE NOTED. CONTRACTOR SHALL COORDINATE THE ADJUSTMENT OF ALL OTHER PRIVATELY OWNED UTILITIES AND SHALL PROVIDE AT MINIMUM A ONE WEEK NOTICE OF WORK COMMENCING IN THE AREAS REQUIRING ADJUSTMENT.
- CONTRACTOR SHALL PROVIDE A STAKED LAYOUT ON SITE FOR ENGINEER'S REVIEW PRIOR TO COMMENCING WORK.
- LABELED DIMENSIONS SUPERSEDE SCALED DIMENSIONS FOR ALL LAYOUT WORK.
- AT ALL LOCATIONS, STATION AND OFFSETS ARE GIVEN TO REVEAL SIDE OF CURB OR EDGE OF PAVEMENT AS APPROPRIATE. IN THE CASE OF FLUSH CURB, STATION AND OFFSETS ARE GIVEN TO THE "UP STATION" EDGE OF CURB.
- ALL LINES ARE PARALLEL OR PERPENDICULAR UNLESS OTHERWISE INDICATED.
- THE LIMIT OF WORK SHALL BE AT THE PROPERTY LINES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- "DON'T DUMP" PLACARDS SHALL BE INSTALLED AT ALL EXISTING AND PROPOSED CATCH BASINS WHICH ARE ADJACENT TO SIDEWALKS RECONSTRUCTED UNDER THIS CONTRACT. PLACARDS WILL BE FURNISHED BY THE CITY AT NO COST TO THE CONTRACTOR.

ROADWAY NOTES

- WORK WITHIN PROJECT LIMITS SHALL MEET THE REQUIREMENTS OF THE CITY OF CAMBRIDGE DEPARTMENT OF PUBLIC WORKS.
- ALL PROPOSED WORK SHALL BE COMPLETED WITHIN THE EXISTING RIGHT OF WAY LIMITS AND BACK OF EXISTING SIDEWALK UNLESS OTHERWISE NOTED OR APPROVED BY THE ENGINEER.
- SEE DETAILS ON SHEETS RG-4, AND RG-5, FOR CURB INSTALLATION, PEDESTRIAN RAMP, DRIVEWAY, AND SIDEWALK CONSTRUCTION DETAILS.
- ALL VERTICAL GRANITE CURBING WITHIN WORK LIMITS SHALL BE REMOVED AND STORED FOR FUTURE RESET ON THE PROJECT, AS APPROVED BY THE ENGINEER. LOCATIONS FOR THE RESET CURBS SHALL BE APPROVED BY THE ENGINEER. ANY EXISTING GRANITE CURBS NOT RE-USED ON THE PROJECT SHALL BE SALVAGED AND DELIVERED TO A LOCATION DETERMINED BY THE CITY OF SOMERVILLE PUBLIC WORKS DEPARTMENT.
- CONTRACTOR SHALL ADJUST TREE PIT OPENINGS AS NECESSARY TO MAINTAIN A MINIMUM AREA OF 12 SF FOR EXISTING TREES. AT EXISTING TREES A MINIMUM OF 3'-0" WIDE SIDEWALK SHALL BE MAINTAINED BETWEEN TREE PIT AND BACK OF SIDEWALK UNLESS SHOWN OTHERWISE. FOR NEW OR REPLACED TREES A MINIMUM OF 4'-0" WIDE SIDEWALK SHALL BE MAINTAINED BETWEEN TREE PIT AND BACK OF SIDEWALK UNLESS SHOWN OTHERWISE. EXISTING TREE PITS THAT ARE LESS THAN 5 FEET IN LENGTH (PARALLEL TO CURB) SHALL BE ADJUSTED TO A MINIMUM LENGTH OF 5'-0".
- ALL EXISTING FEATURES AT BACK OF SIDEWALK SHALL REMAIN IN PLACE UNLESS OTHERWISE NOTED. DAMAGE OR DISLODGING OF EXISTING FEATURES AT BACK OF SIDEWALK SHALL BE REPAIRED/REPLACED AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL MATCH EXISTING GRADE AT THE LIMIT OF PROPOSED SIDEWALK AND ROADWAY WORK. THE JOINT BETWEEN EXISTING AND PROPOSED PAVEMENT SHALL BE TREATED WITH INFRARED PAVEMENT SEALANT AND HOT POURED RUBBERIZED ASPHALT SEALER.
- ALL EXISTING TREES AND SHRUBS SHALL BE RETAINED UNLESS OTHERWISE NOTED.
- ALL EXISTING POSTS, METERS, AND SIGNS SHALL BE REMOVED AND RESET UNLESS OTHERWISE DETERMINED BY THE CITY OF CAMBRIDGE PUBLIC WORKS DEPARTMENT.
- ALL PROPOSED SIGNS SHALL BE ERECTED IN ACCORDANCE WITH THE 2009 MUTCD AND LOCATED TO PROVIDE A MINIMUM LATERAL CLEARANCE OF 2' FROM EDGE OF PAVEMENT.
- ALL SITE FEATURES WHICH ARE TO BE DISPOSED OF, INCLUDING EXISTING PAVEMENT, SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS. DISPOSAL COSTS SHALL BE INCIDENTAL TO THE VARIOUS CONTRACT ITEMS WITH NO ADDITIONAL PAYMENT PROVIDED.
- ALL EXISTING FEATURES WHICH ARE "TO REMAIN" AND WHICH ARE DISTURBED BY THE CONTRACTOR SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE, INCLUDING BUT NOT LIMITED TO EXISTING CURB, SIDEWALK, ROADWAY LIGHTING, BOUNDS OR PROPERTY MARKERS, HYDRANTS AND UTILITIES.
- ALL RIMS, COVERS, GRATES AND OTHER CASTINGS OF EXISTING MUNICIPAL UTILITIES THAT ARE LOCATED WITHIN THE LIMIT OF WORK IN AREAS OF RECONSTRUCTED ROADWAY AND SIDEWALKS SHALL BE ADJUSTED TO MATCH FINAL GRADE. ALL PRIVATE UTILITY CASTINGS SHALL BE ADJUSTED OR REMOVED BY OTHERS. CASTINGS SHALL BE ADJUSTED MULTIPLE TIMES TO FACILITATE SEQUENCE OF WORK INCLUDING AT RAISED CROSSWALKS AND INTERSECTIONS.
- ALL BASELINE TIES FOR CURB CORNERS AND RADII ARE TO THE P.C.'S OR P.T.'S UNLESS OTHERWISE NOTED. WHERE PROPOSED GRANITE CURBING MEETS EXISTING CURBING OR EXISTING ROADWAY OR DRIVEWAY PAVEMENT EDGES, MINOR FIELD ADJUSTMENTS TO THE DESIGNATED STATION OF THE P.C. OR P.T. FOR THE PROPOSED CURBING AND ELEVATION MAY BE REQUIRED.
- ALL LENGTHS AND QUANTITIES SHOWN ON THE PLANS ARE FOR REFERENCE PURPOSES ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL QUANTITIES FOR BIDDING PURPOSES.

MAINTENANCE OF TRAFFIC

- WHEN WORKING WITHIN OR DIRECTLY ADJACENT TO EXISTING ROADWAYS, CITY OF SOMERVILLE POLICE OFFICERS MUST BE PRESENT TO DIRECT TRAFFIC AWAY FROM WORK ZONES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING, FOR REVIEW AND APPROVAL BY THE ENGINEER, DETAILED PLANS SHOWING THE MAINTENANCE OF TRAFFIC DURING CONSTRUCTION IN EXISTING ROADWAYS, USING REFLECTORIZED DRUMS, TEMPORARY CONCRETE BARRIERS, ARROW PANELS, VARIABLE MESSAGE SIGNS, AND TEMPORARY SIGNAGE AND MARKINGS. ALL TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE DESIGNED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). THE CONTRACTOR SHALL COORDINATE THE MAINTENANCE OF TRAFFIC OPERATIONS WITH THE SOMERVILLE TRANSPORTATION DEPARTMENT, AND WITH ANY ADJACENT CONSTRUCTION PROJECTS.
- ALL EXISTING PAVEMENT MARKINGS AND/OR SIGNAGE AFFECTED BY CONTRACTOR OPERATIONS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.

TRAFFIC NOTES

- ALL SIGNS SHALL HAVE A 2' MINIMUM CLEARANCE BETWEEN THE EDGE OF SIGN AND THE EDGE OF FINISHED PAVEMENT.
- ALL SIGNS SHALL HAVE A 7' MINIMUM VERTICAL CLEARANCE BETWEEN THE BOTTOM OF THE SIGN AND THE TOP OF THE FINISHED SIDEWALK GRADE.
- ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
- PROPOSED PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE 2009 MUTCD & MASSDOT CONSTRUCTION AND TRAFFIC STANDARD DETAILS, AS AMENDED.
- UNLESS OTHERWISE NOTED, ALL POSTS TO BE P-5.
- CONTRACTOR SHALL COORDINATE WITH MBTA FOR BUS ROUTE NUMBERS AND DETOURS, AND BE RESPONSIBLE FOR POSTING ALL ASSOCIATED SIGNAGE.
- REMOVE EXISTING CROSSWALKS AND STOPLINES WITHIN LIMITS OF PROPOSED WORK.

SURVEY NOTES

- EXISTING TOPOGRAPHIC AND SITE UTILITY INFORMATION IS BASED ON THE FOLLOWING SOURCES:
 - THE GROUND FIELD SURVEY WAS CONDUCTED BY SURVEYING AND MAPPING CONSULTANTS ON WILLARD STREET ON THE DATE OF OCTOBER 28, 2016.
 - THE HORIZONTAL DATUM SHOWN HEREON REFERENCES THE NORTH AMERICAN DATUM OF 1983, NAD83/2011 (EPOCH 2010.00), AS DERIVED FROM A POST PROCESSING SOLUTION FROM THE TRIMBLE BUSINESS CENTER RTX ADJUSTMENT USING THE PUBLISHED VALUE OF KeyNetGPS STATIONS CP01, NHUN, KP16 AND KP19.
 - THE VERTICAL DATUM SHOWN HEREON ARE REFERENCED TO THE CITY OF CAMBRIDGE VERTICAL DATUM BASED ON A CONVERSION FROM NAVD88 USING THE PUBLISHED DIFFERENCE OF 11.66'.

EROSION AND SEDIMENT CONTROL NOTES

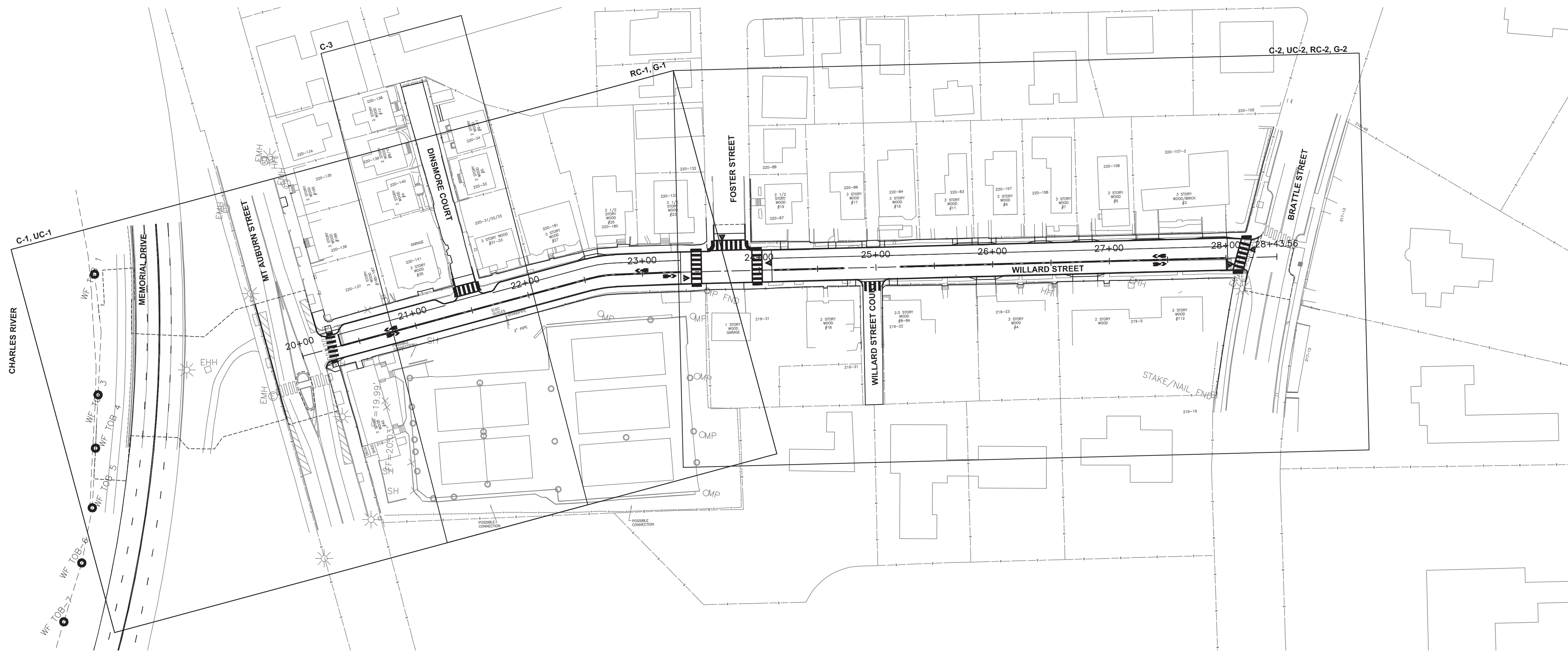
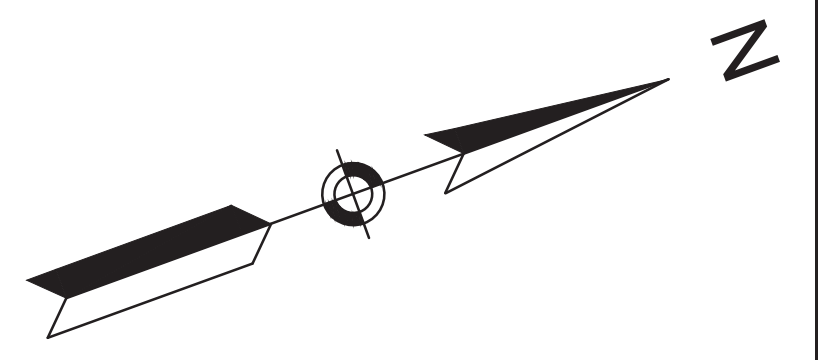
- SEE EROSION AND SEDIMENT CONTROL PLANS FOR EROSION CONTROL NOTES.

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						Scale	Client	Sheet
						Date	CITY OF CAMBRIDGE, MA	G-3
						Job No.	Project	Total Sheets
						Designed by		
						Drawn by	Drawing	File No.
						Checked by		
						Approved by		
				No.	Description	Date		
					REVISIONS			



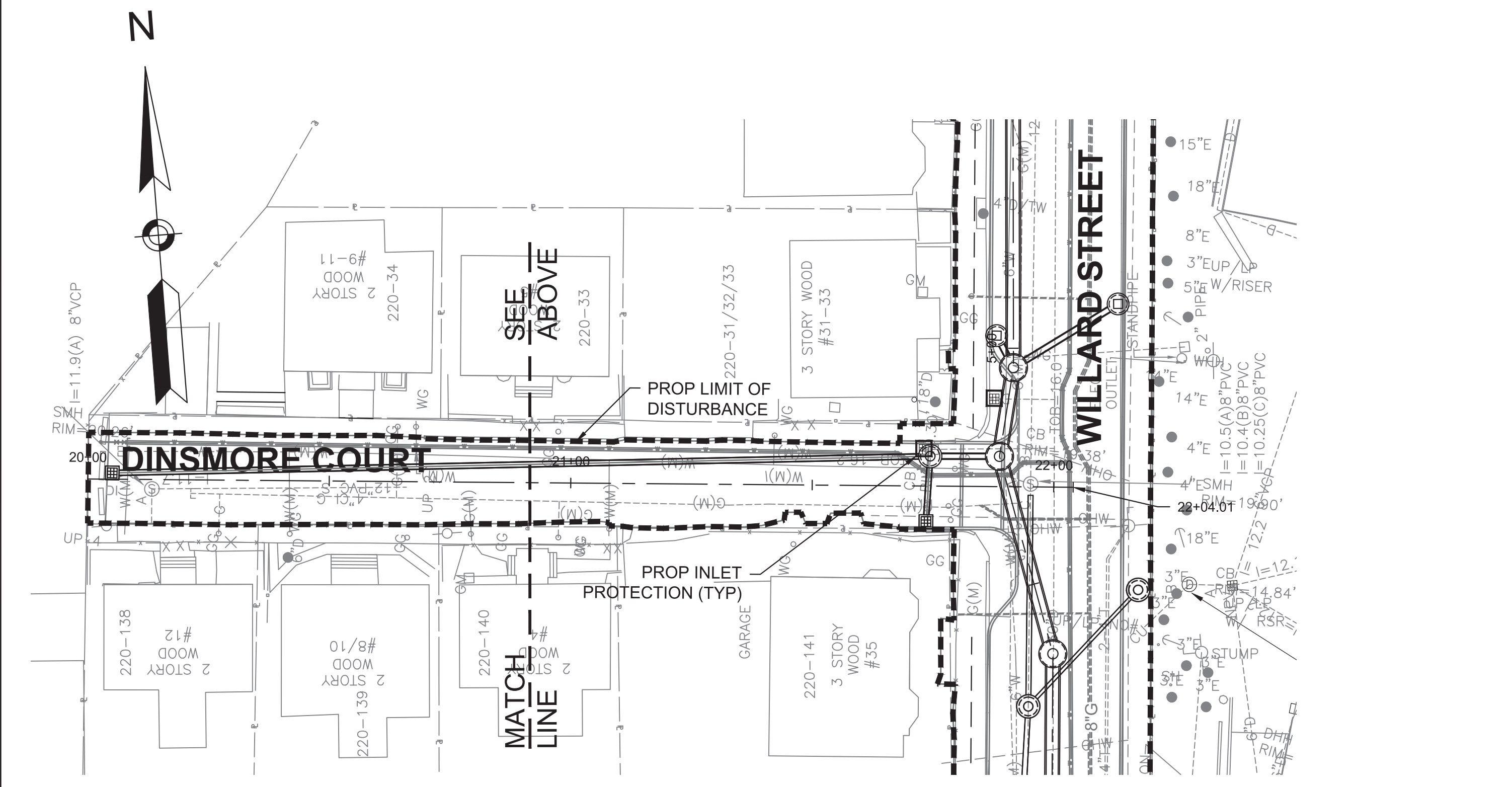
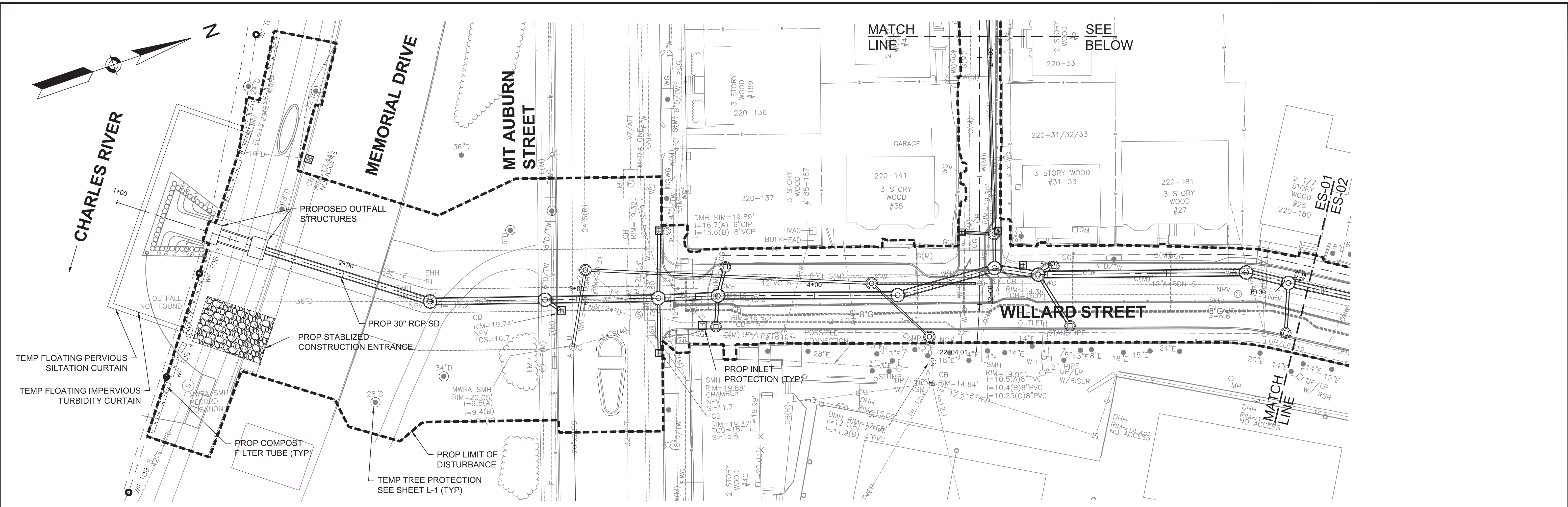
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			Drawn by
No.	Description	Date	Checked by
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Client	CITY OF CAMBRIDGE, MA	Sheet	G-4
Project	WILLARD STREET DRAINAGE IMPROVEMENTS PROJECT	Total Sheets	
Drawing	KEY PLAN	File No.	



EROSION AND SEDIMENT CONTROL NOTES

- FOR OUTFALL EROSION CONTROL PLAN SEE SHEET CO-1.
- FOR OUTFALL CONSTRUCTION SEQUENCING SEE SHEET CO-1.
- FOR TREE PROTECTION SEE SHEET L-1
- FOR BANK RESTORATION SEE SHEETS L-2, L-3
- PRIOR TO ANY LAND DISTURBANCE ACTIVITIES COMMENCING ON THE SITE, THE DEVELOPER SHALL PHYSICALLY MARK LIMITS OF NO LAND DISTURBANCE ON THE SITE WITH TAPE, SIGNS, OR ORANGE CONSTRUCTION FENCE, SO THAT WORKERS CAN SEE THE AREAS TO BE PROTECTED. THE PHYSICAL MARKERS SHALL REMAIN IN PLACE UNTIL A CERTIFICATE OF COMPLETION HAS BEEN ISSUED.
- APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO SOIL DISTURBANCE. MEASURES SHALL BE TAKEN TO CONTROL EROSION WITHIN THE PROJECT AREA. SEDIMENT IN RUNOFF WATER SHALL BE TRAPPED AND RETAINED WITHIN THE PROJECT AREA. WETLAND AREAS AND SURFACE WATERS SHALL BE PROTECTED FROM SEDIMENT.
- MINIMIZE TOTAL AREA OF DISTURBANCE AND PROTECT NATURAL FEATURES AND SOIL.
- THE CONTRACTOR SHALL SEQUENCE ALL ACTIVITIES TO MINIMIZE SIMULTANEOUS AREAS OF DISTURBANCE. MASS CLEARINGS AND GRADING OF THE ENTIRE SITE SHALL BE AVOIDED.
- MINIMIZE SOIL EROSION AND CONTROL SEDIMENTATION DURING CONSTRUCTION.
- DIVERT UNCONTAMINATED WATER AROUND DISTURBED AREAS.
- INSTALL AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND GOOD ENGINEERING PRACTICES OR THE 2008 EPA'S CONSTRUCTION GENERAL PERMIT.
- PROTECT AND MANAGE ON AND OFF-SITE MATERIAL STORAGE AREAS (OVERBURDEN AND STOCKPILES OF DIRT, BORROW AREAS, OR OTHER AREAS USED SOLELY BY THE PERMITTED PROJECT ARE CONSIDERED A PART OF THE PROJECT).
- COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS INCLUDING WASTE DISPOSAL, SANITARY SEWER OR SEPTIC SYSTEM REGULATIONS, AND AIR QUALITY REQUIREMENTS, INCLUDING DUST CONTROL.
- SEDIMENT SHALL BE REMOVED ONCE THE VOLUME REACHES 1/4 TO 1/2 THE HEIGHT OF THE EROSION CONTROL DEVICE. SEDIMENT SHALL BE REMOVED FROM SILT FENCE PRIOR TO REACHING THE LOAD-BEARING CAPACITY OF THE SILT FENCE WHICH MAY BE LOWER THAN 1/4 TO 1/2 THE HEIGHT.
- SEDIMENT FROM SEDIMENT TRAPS OR SEDIMENTATION PONDS SHALL BE REMOVED WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT.
- BMPS TO BE USED FOR INFILTRATION AFTER CONSTRUCTION SHALL NOT BE USED AS BMPS DURING CONSTRUCTION UNLESS OTHERWISE APPROVED BY THE BOARD. MANY INFILTRATION TECHNOLOGIES ARE NOT DESIGNED TO HANDLE THE HIGH CONCENTRATIONS OF SEDIMENTS TYPICALLY FOUND IN CONSTRUCTION RUNOFF, AND THUS MUST BE PROTECTED FROM CONSTRUCTION RELATED SEDIMENT LOADINGS.
- SOIL STOCKPILES MUST BE STABILIZED OR COVERED AT THE END OF EACH WORKDAY. STOCKPILE SIDE SLOPES SHALL NOT BE GREATER THAN 2:1. ALL STOCKPILES SHALL BE SURROUNDED BY SEDIMENT CONTROLS.
- FOR ACTIVE CONSTRUCTION AREAS SUCH AS BORROW OR STOCKPILE AREAS, ROADWAY IMPROVEMENTS AND AREAS WITHIN 50 FEET OF A BUILDING UNDER CONSTRUCTION, A PERIMETER SEDIMENT CONTROL SYSTEM SHALL BE INSTALLED AND MAINTAINED TO CONTAIN SOIL.
- A TRACKING PAD OR OTHER APPROVED STABILIZATION METHOD SHALL BE CONSTRUCTED AT ALL ENTRANCE/EXIST POINTS OF THE SITE TO REDUCE THE AMOUNT OF SOIL CARRIED ONTO ROADWAYS AND OFF THE SITE.
- ON THE CUT SIDE OF ROADS, DITCHES SHALL BE STABILIZED IMMEDIATELY WITH ROCK RIP-RAP OR OTHER NON-ERODIBLE LINERS, OR WHERE APPROPRIATE, VEGETATIVE MEASURES SUCH AS HYDROSEEDING OR JUTE MATTING.
- PERMANENT SEEDING SHALL BE UNDERTAKEN IN THE SPRING FROM MARCH THROUGH MAY, AND IN LATE SUMMER AND EARLY FALL FROM AUGUST TO OCTOBER 15. DURING THE PEAK SUMMER MONTHS AND IN THE FALL AFTER OCTOBER 15, WHEN SEEDING IS FOUND TO BE IMPRACTICAL, APPROPRIATE TEMPORARY STABILIZATION SHALL BE APPLIED. PERMANENT SEEDING MAY BE UNDERTAKEN DURING THE SUMMER IF PLANS PROVIDE FOR ADEQUATE MULCHING AND WATERING.
- ALL SLOPES STEEPER THAN 3:1 (H:V, 33.3%), AS WELL AS PERIMETER DIKES, SEDIMENT BASINS OR TRAPS, AND EMBANKMENTS MUST, UPON COMPLETION, BE IMMEDIATELY STABILIZED WITH SOD, SEED AND ANCHORED STRAW MULCH, OR OTHER APPROVED STABILIZATION MEASURES. AREAS OUTSIDE OF THE PERIMETER SEDIMENT CONTROL SYSTEM MUST NOT BE DISTURBED.
- TEMPORARY SEDIMENT TRAPPING DEVICES MUST NOT BE REMOVED UNTIL PERMANENT STABILIZATION IS ESTABLISHED IN ALL CONTRIBUTORY DRAINAGE AREAS.
- ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED AFTER FINAL SITE STABILIZATION. DISTURBED SOIL AREAS RESULTING FROM THE REMOVAL OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED WITHIN 30 DAYS OF REMOVAL.
- PROPERLY MANAGE ON-SITE CONSTRUCTION AND WASTE MATERIALS.
- PREVENT OFF-SITE VEHICLE TRACKING OF SEDIMENTS.
- DUST SHALL BE CONTROLLED AT THE SITE.
- ALL PREVIOUSLY DISTURBED LAND SHALL BE STABILIZED BY APPROVED METHODS AFTER 14 DAYS IF LEFT UNDISTURBED. THIS INCLUDES STOCKPILES, CONSTRUCTION ENTRANCES, GRADED AREAS AND OTHER CONSTRUCTION ACTIVITY RELATED CLEARING.
- IF WORK IS HALTED OVER WINTER MONTHS THE CONTRACTOR SHALL BE RESPONSIBLE FOR STABILIZING THE AREA THROUGH GROUND COVER.

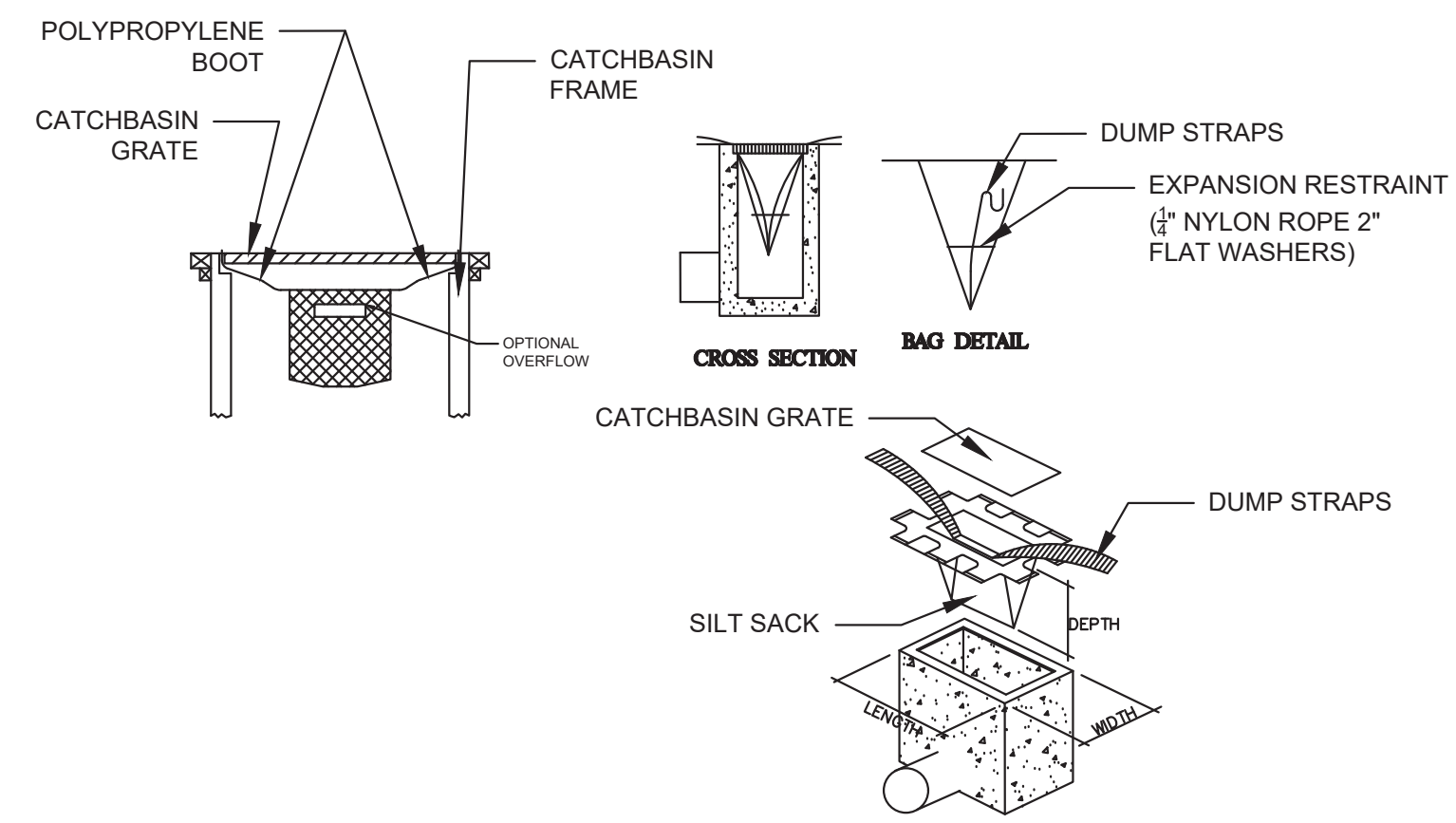
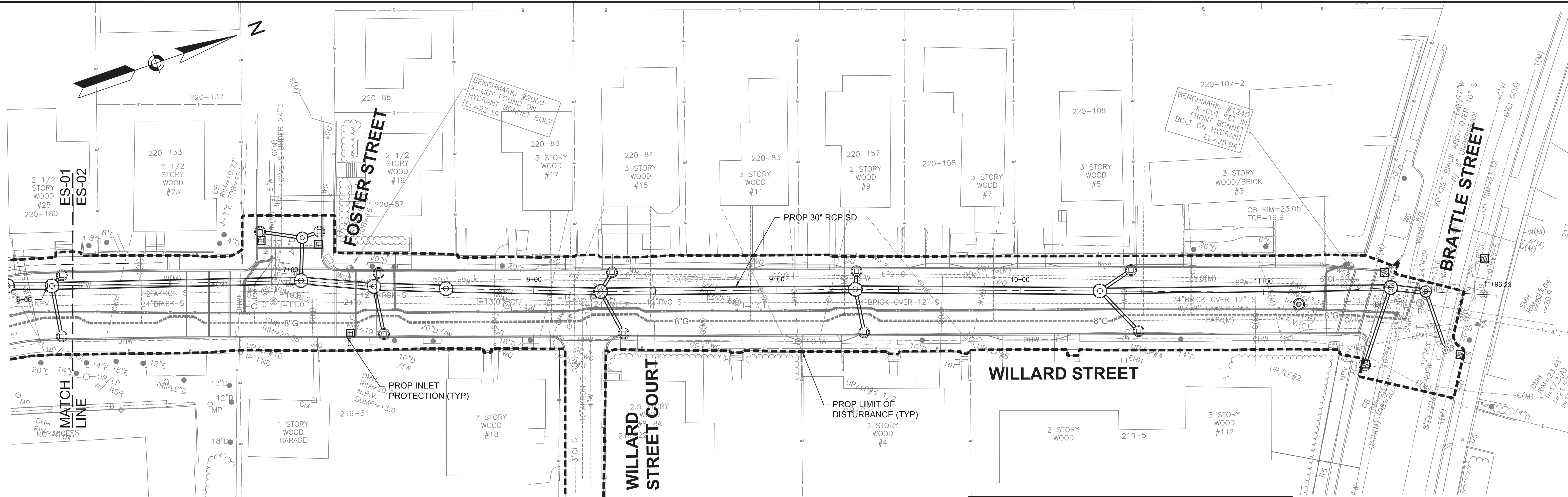
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(617) 357-7700

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Job No.	Project	Total Sheets
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Drawn by	Drawing	File No.
Checked by	EROSION AND SEDIMENT CONTROL PLAN - 1	
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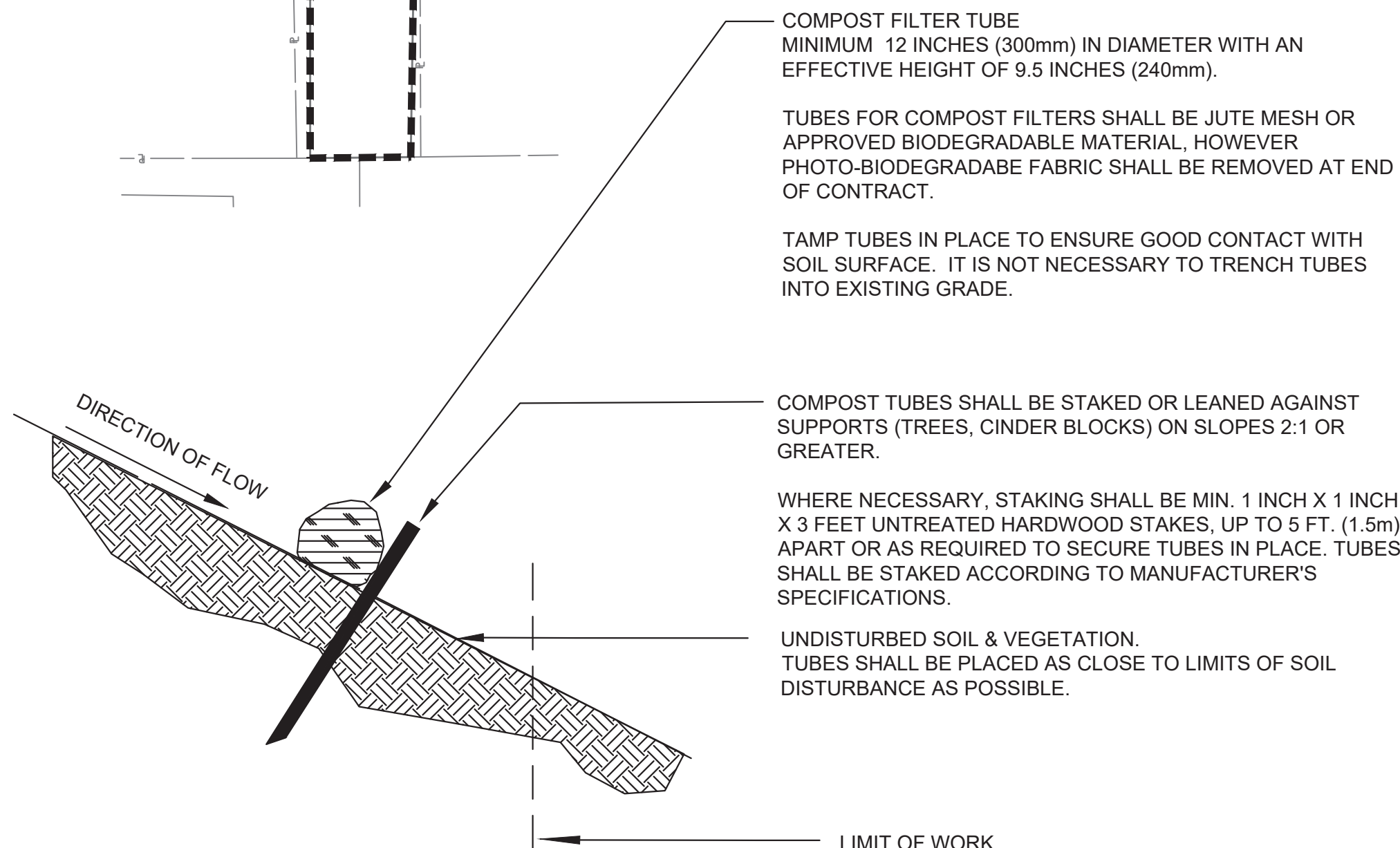


THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS SHEET, OVERLAND AND CONCENTRATED FLOWS (NOT GREATER THAN 1 CFS). THE METHOD CAN DRAIN FLAT AREA TO STEEP SLOPES. INLET CAPACITY WILL DECREASE WITH THIS METHOD AND CONTRACTOR SHALL EXPECT FLOODING TO OCCUR DURING HIGH FLOW EVENTS.

INSPECTION SCHEDULE SHALL COMPLY WITH THE 2008 EPA CONSTRUCTION GENERAL PERMIT.

MAINTENANCE SHALL OCCUR WHEN NECESSARY. SILT SACKS SHALL BE CLEANED ONCE THE BAG IS FILLED HALF WAY WITH DEBRIS. CONTRACTOR SHALL REMOVE SILT SACK AND PLACE NEW UNIT. DO NOT EMPTY SILT SACK CONTENTS INTO THE CATCHBASIN.

CATCH BASIN W/ SILT SACK INLET PROTECTION
NOT TO SCALE



COMPOST FILTER TUBE MINIMUM 12 INCHES (300mm) IN DIAMETER WITH AN EFFECTIVE HEIGHT OF 9.5 INCHES (240mm).

TUBES FOR COMPOST FILTERS SHALL BE JUTE MESH OR APPROVED BIODEGRADABLE MATERIAL, HOWEVER PHOTO-BIODEGRADABLE FABRIC SHALL BE REMOVED AT END OF CONTRACT.

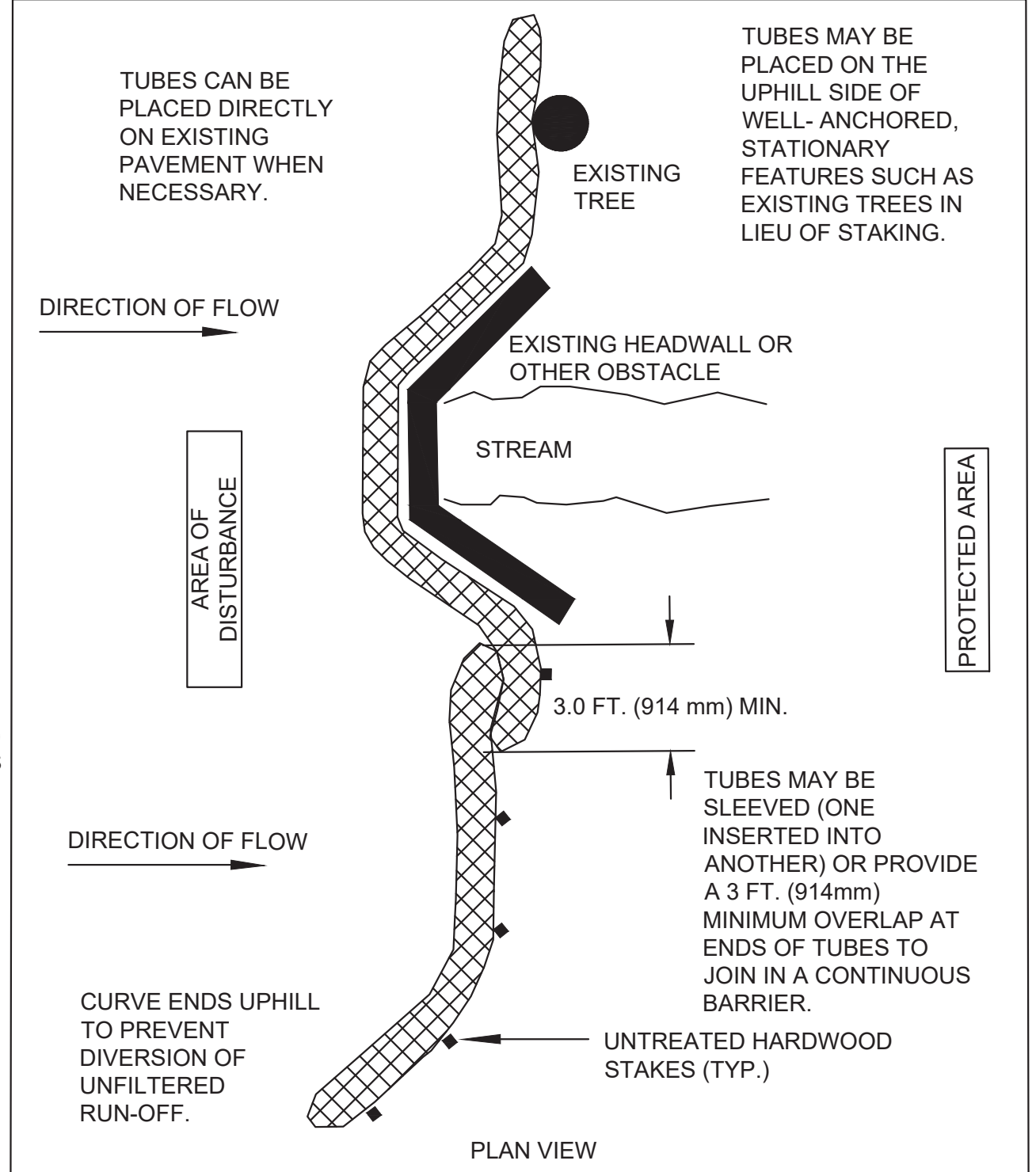
TAMP TUBES IN PLACE TO ENSURE GOOD CONTACT WITH SOIL SURFACE. IT IS NOT NECESSARY TO TRENCH TUBES INTO EXISTING GRADE.

COMPOST TUBES SHALL BE STAKED OR LEANED AGAINST SUPPORTS (TREES, CINDER BLOCKS) ON SLOPES 2:1 OR GREATER.

WHERE NECESSARY, STAKING SHALL BE MIN. 1 INCH X 1 INCH X 3 FEET UNTREATED HARDWOOD STAKES, UP TO 5 FT. (1.5m) APART OR AS REQUIRED TO SECURE TUBES IN PLACE. TUBES SHALL BE STAKED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

UNDISTURBED SOIL & VEGETATION. TUBES SHALL BE PLACED AS CLOSE TO LIMITS OF SOIL DISTURBANCE AS POSSIBLE.

COMPOST FILTER TUBE DETAIL
NOT TO SCALE



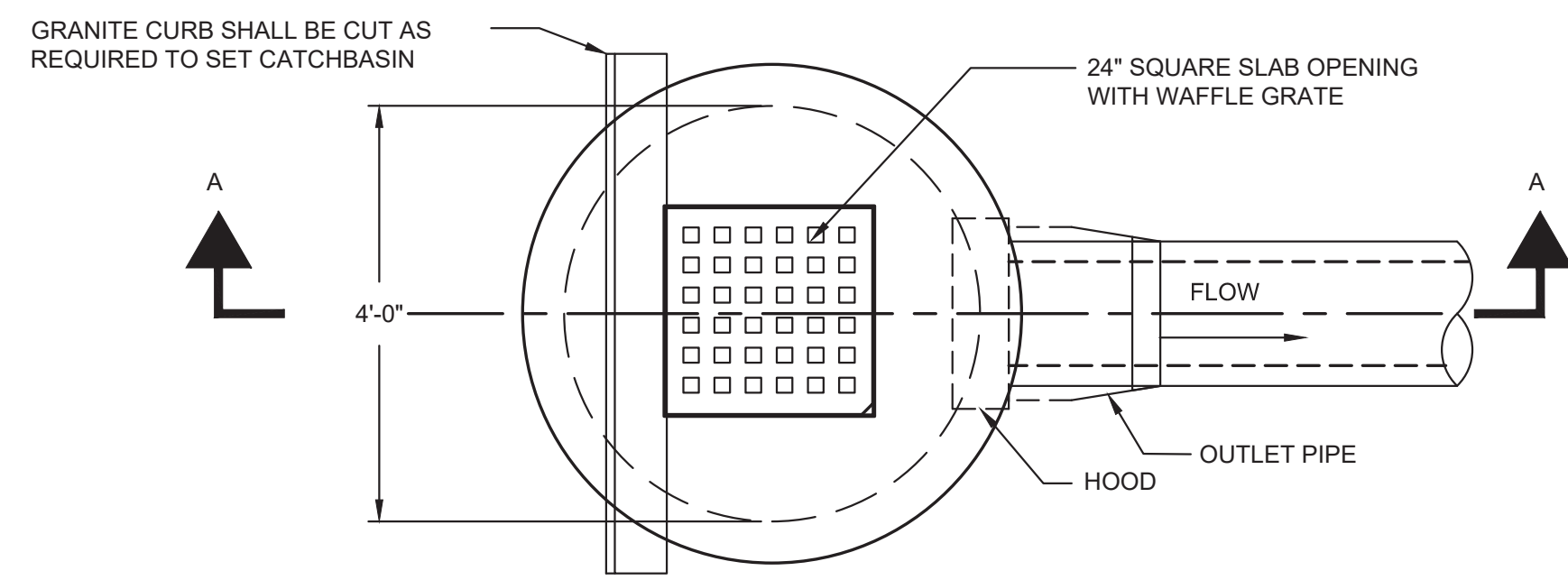
0 20 50 100
SCALE: 1" = 20'

- GENERAL NOTES:
- PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES (300mm) FOR SLOPES UP TO 50 FEET (15.24m) IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
 - INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
 - TUBE LOCATION MAY BE SHIFTED TO ADJUST TO LANDSCAPE FEATURES, BUT SHALL PROTECT UNDISTURBED AREA AND VEGETATION TO MAXIMUM EXTENT POSSIBLE.
 - DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
 - ADDITIONAL TUBES SHALL BE USED AT THE DIRECTION OF THE ENGINEER.
 - ADDITIONAL STAKING SHALL BE USED AT THE DIRECTION OF THE ENGINEER.

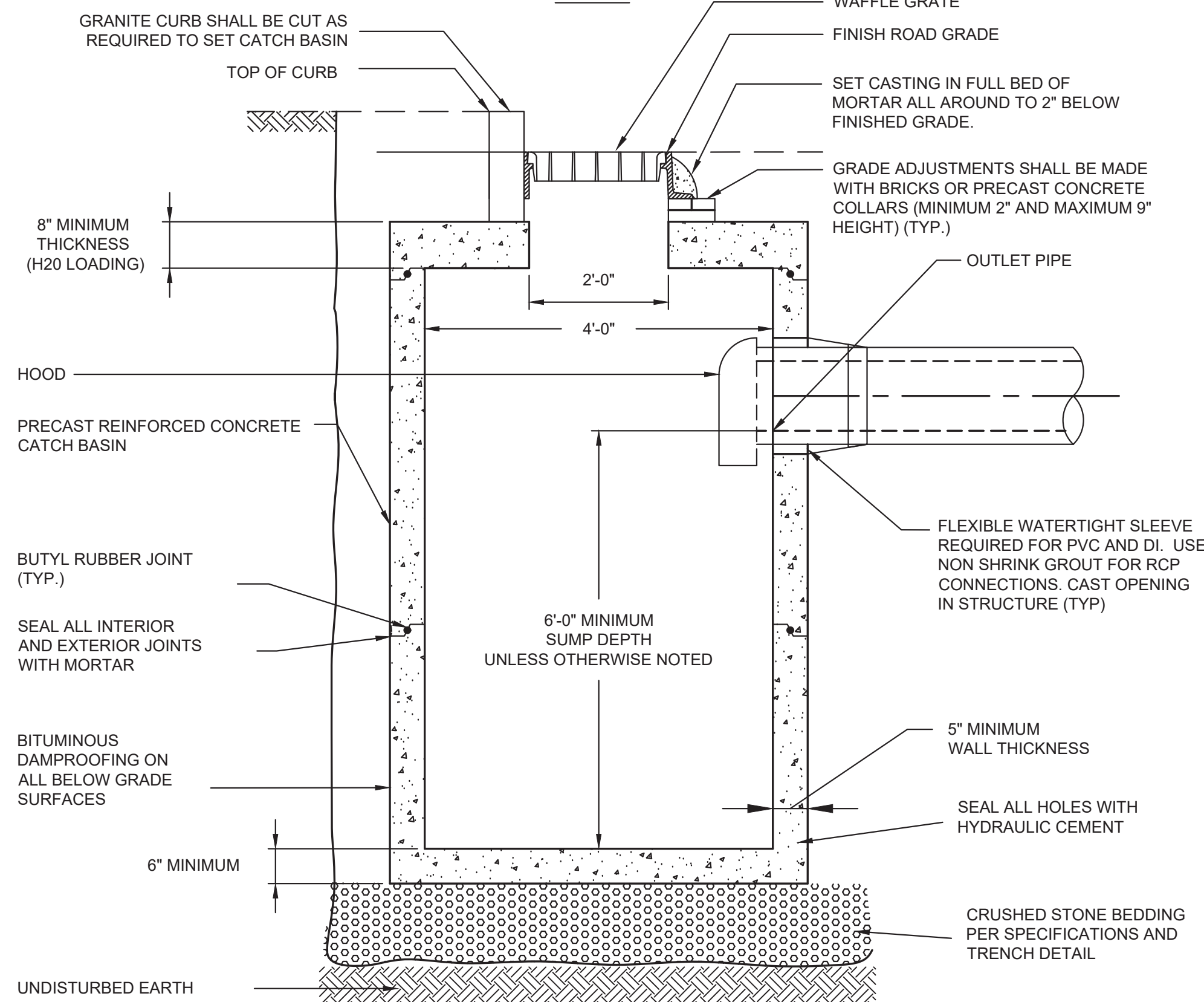
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PLAN

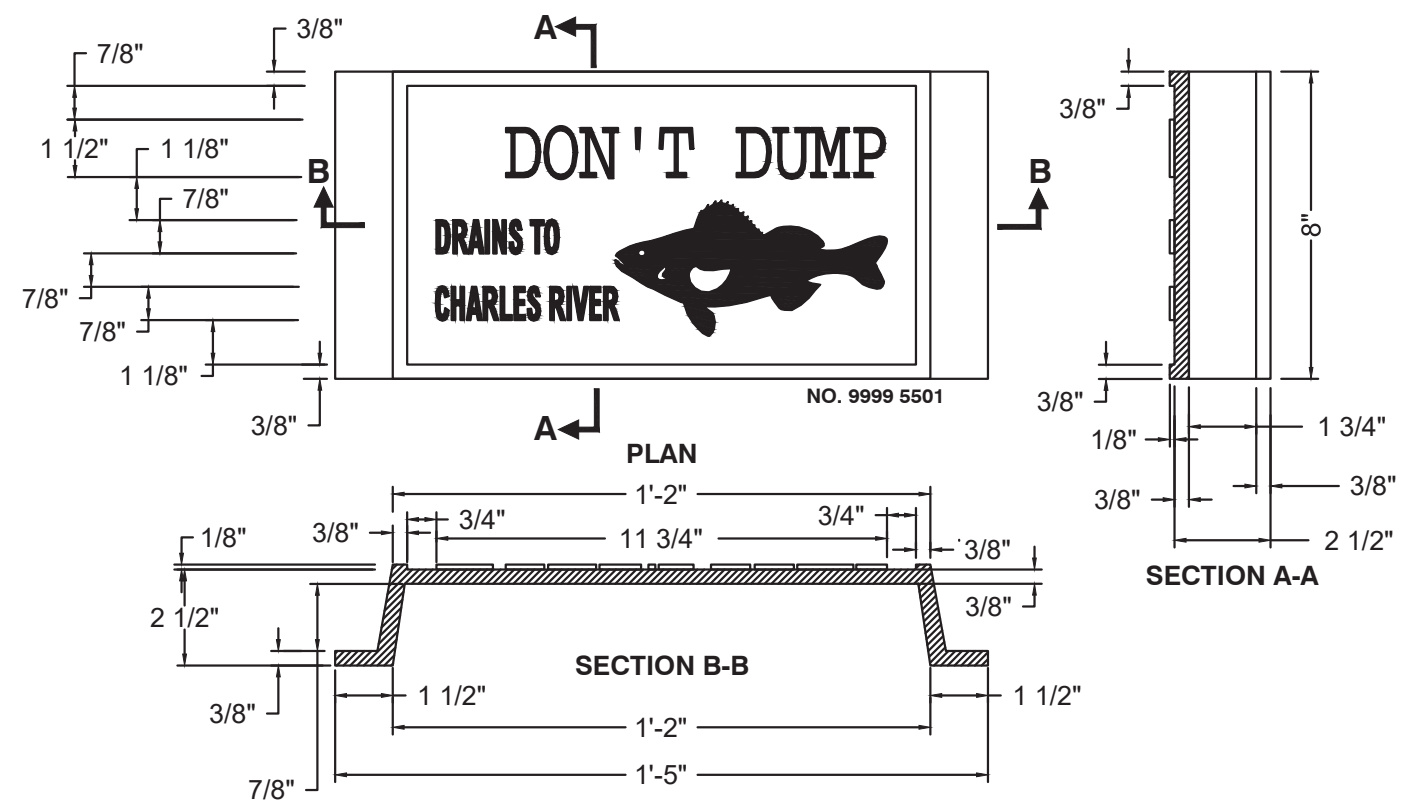


SECTION A-A

SINGLE GRATE CATCH BASIN

NTS

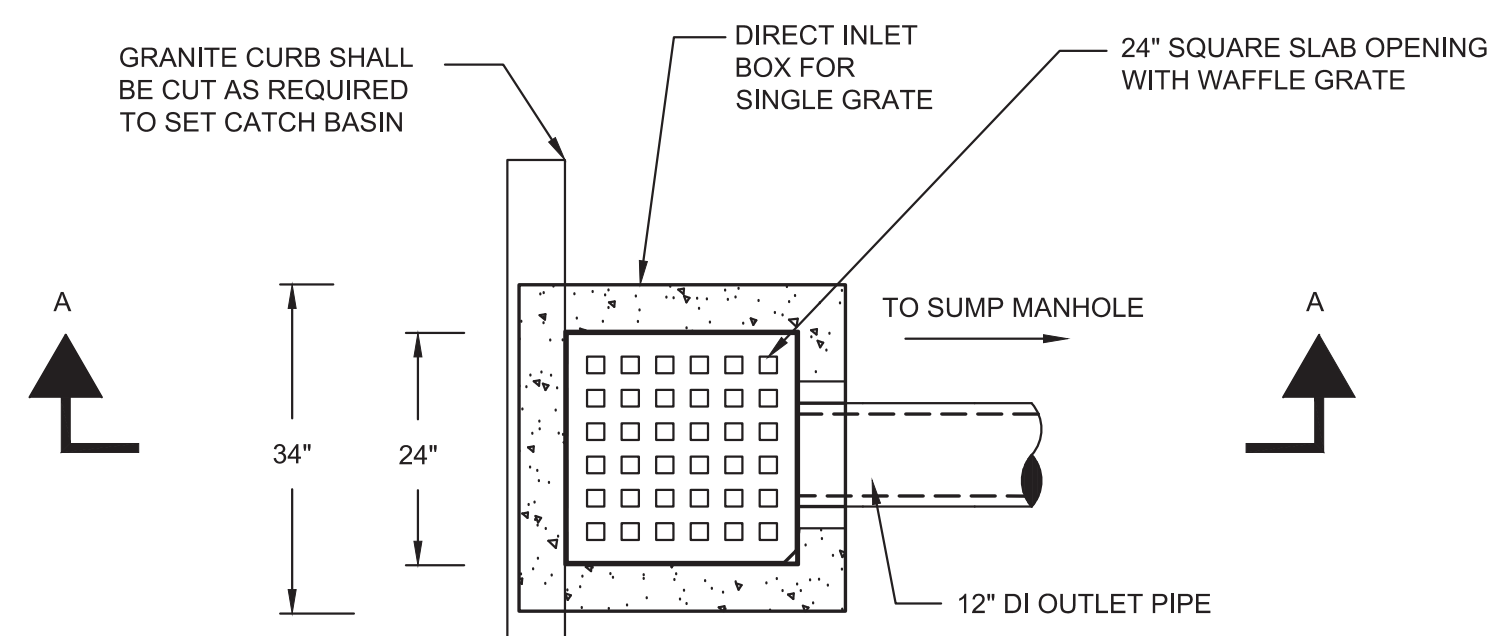
- GENERAL NOTES FOR CATCH BASINS:**
1. FACE OF PIPE SHALL NOT PROJECT MORE THAN 4-INCHES FROM FACE OF WALL CENTERLINE OF PIPE.
 2. FOR DESCRIPTION OF MATERIALS AND CONSTRUCTION METHOD, SEE SPECIFICATIONS.
 3. DESIGN PRECAST SECTIONS WITH FRAME AND GRATE FOR AASHTO H20 LOADING.
 4. GRATE OPENING CAN BE CENTERED OR OFFSET PERPENDICULAR TO THE CURB.
 5. FOR CATCH BASINS INSTALLED ADJUTING GRANITE CURBS, USE 3-FLANGED FRAMES.
 6. "DON'T DUMP" SIDEWALK MARKERS FURNISHED BY THE CITY SHALL BE INSTALLED ADJACENT TO ALL CATCH BASINS AND INLETS IN THE PROJECT AREA.



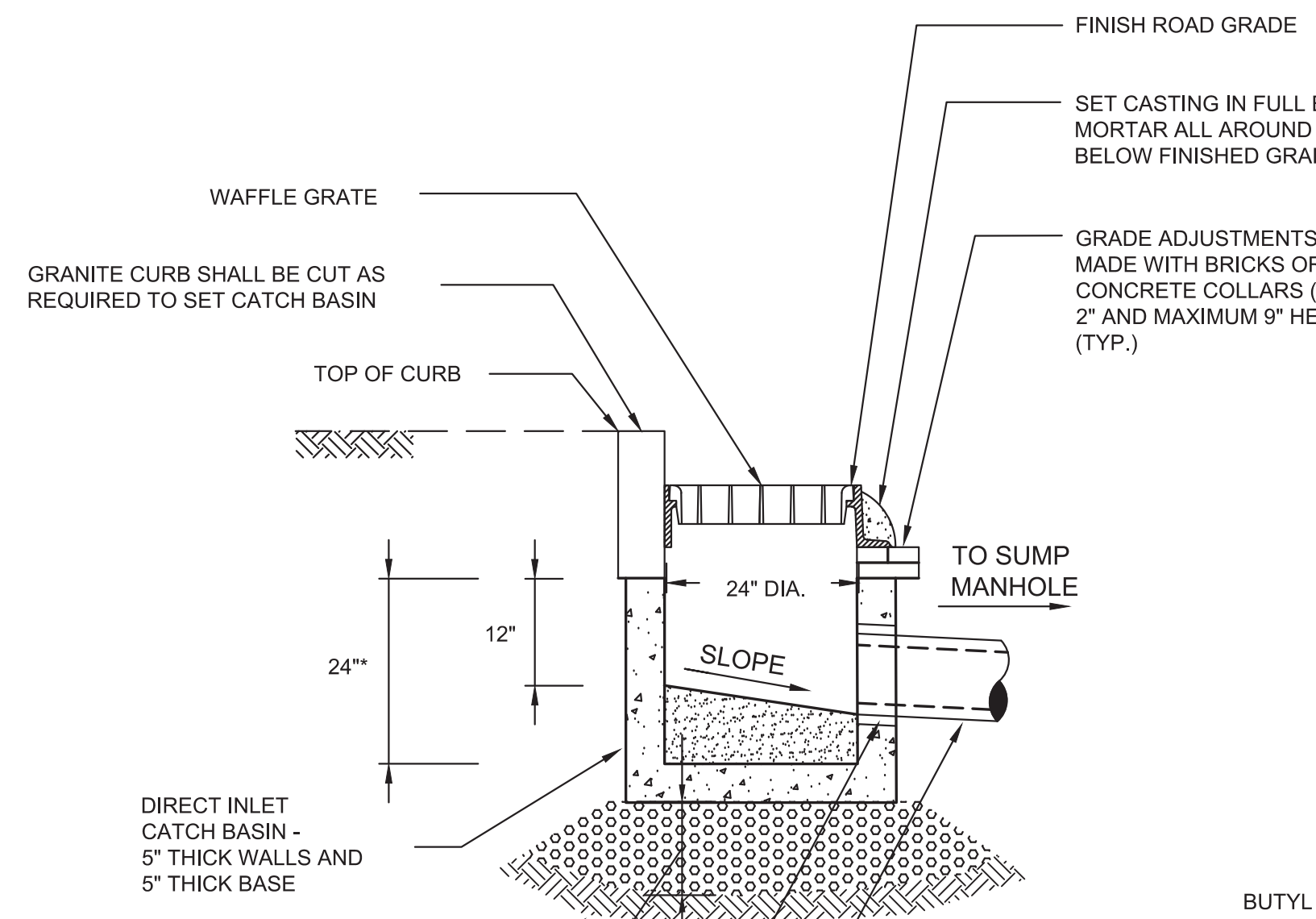
"DON'T DUMP" CATCH BASIN SIDEWALK MARKER*

NTS

*FURNISHED BY CITY



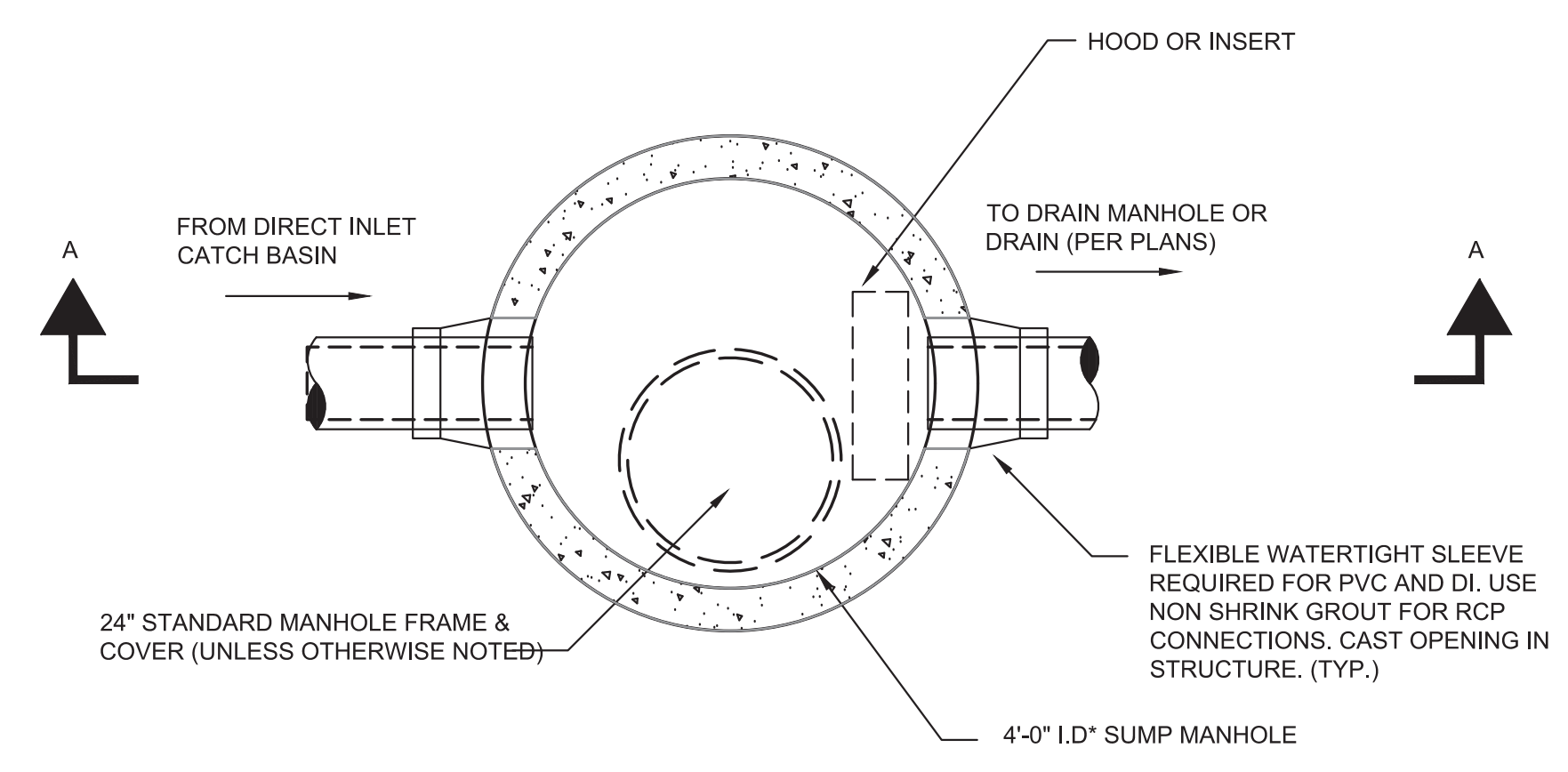
PLAN



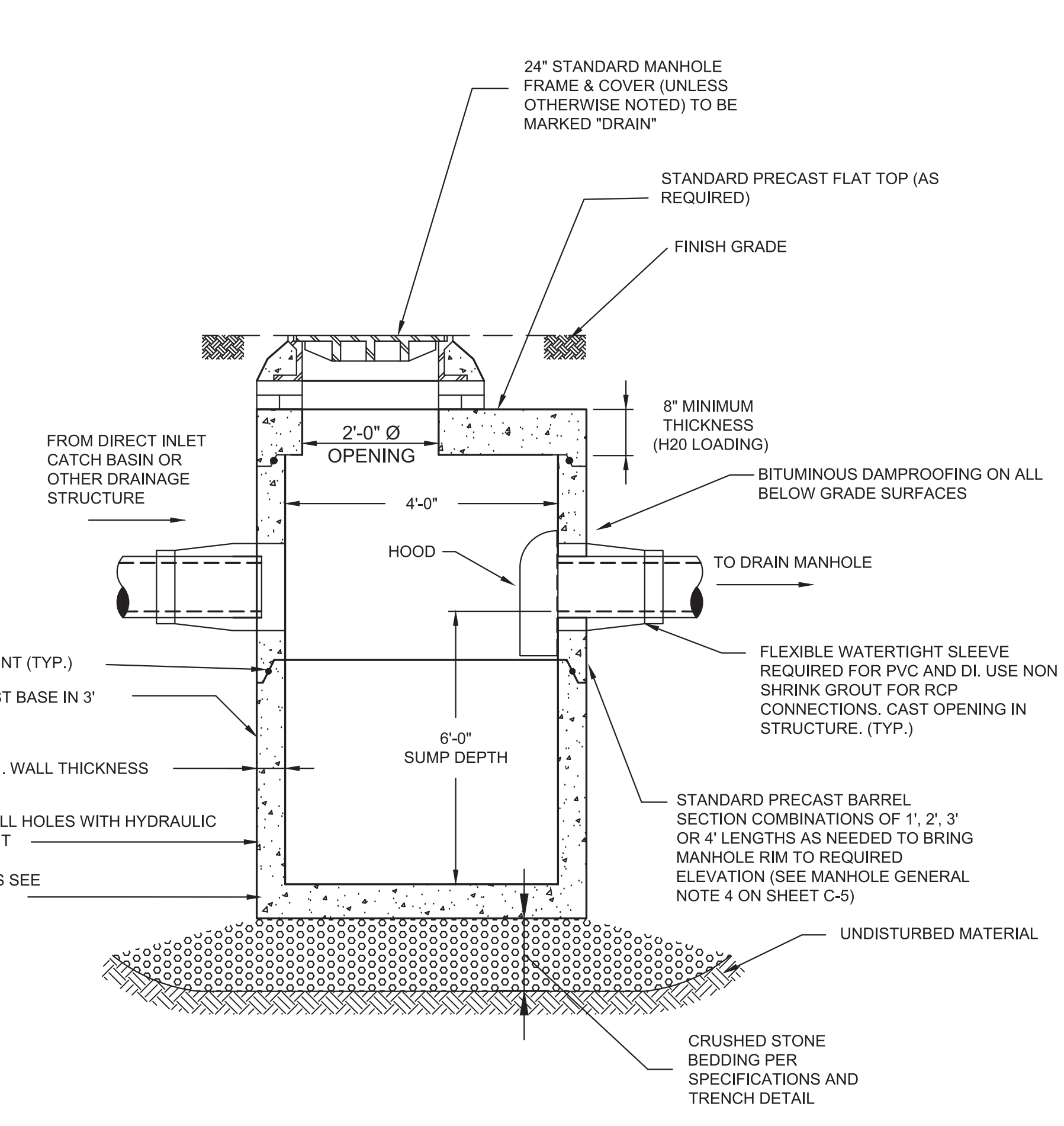
SECTION A-A

DIRECT INLET CATCH BASIN

NTS



PLAN



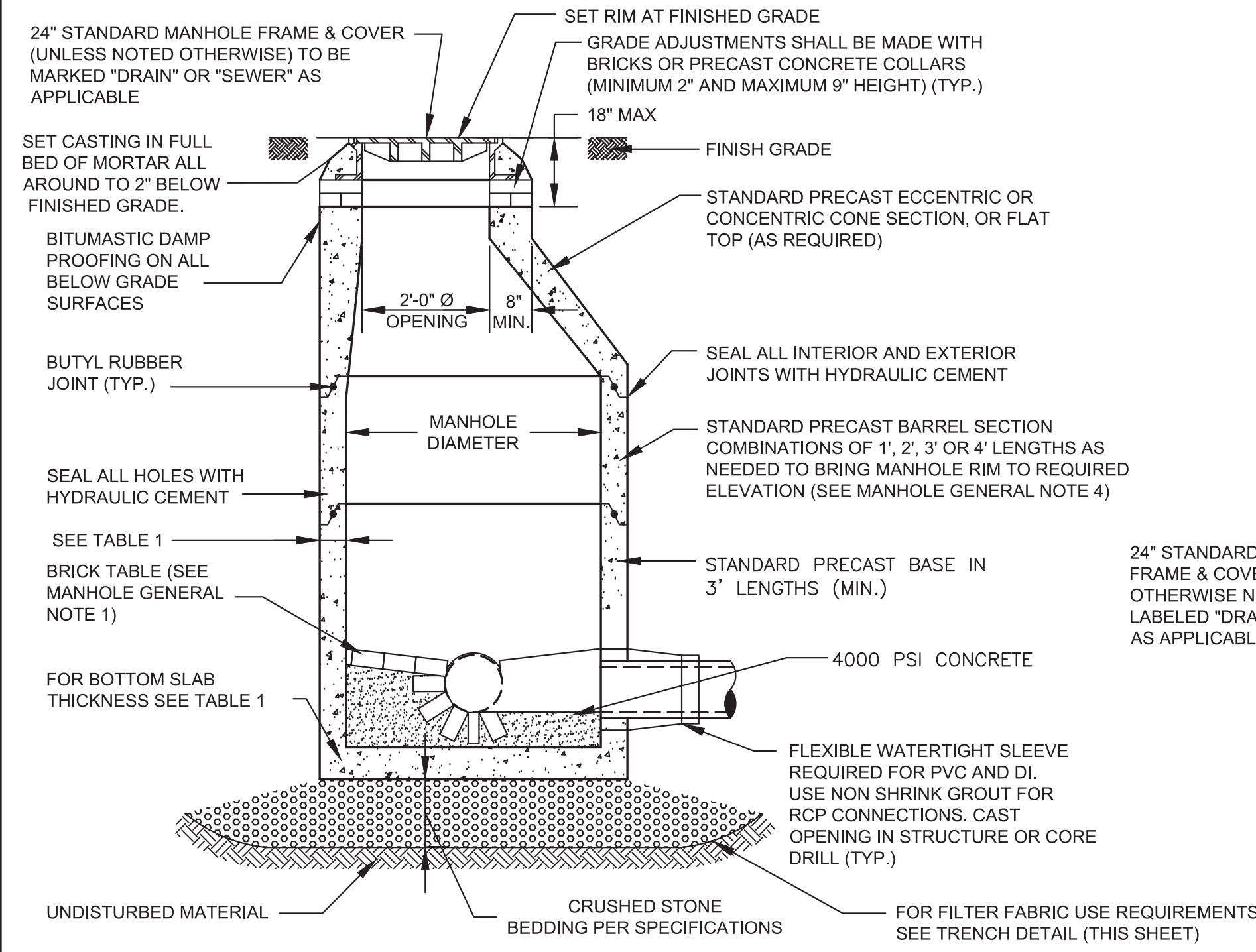
SECTION A-A

DRAIN MANHOLE DETAIL - 6 FOOT SUMP

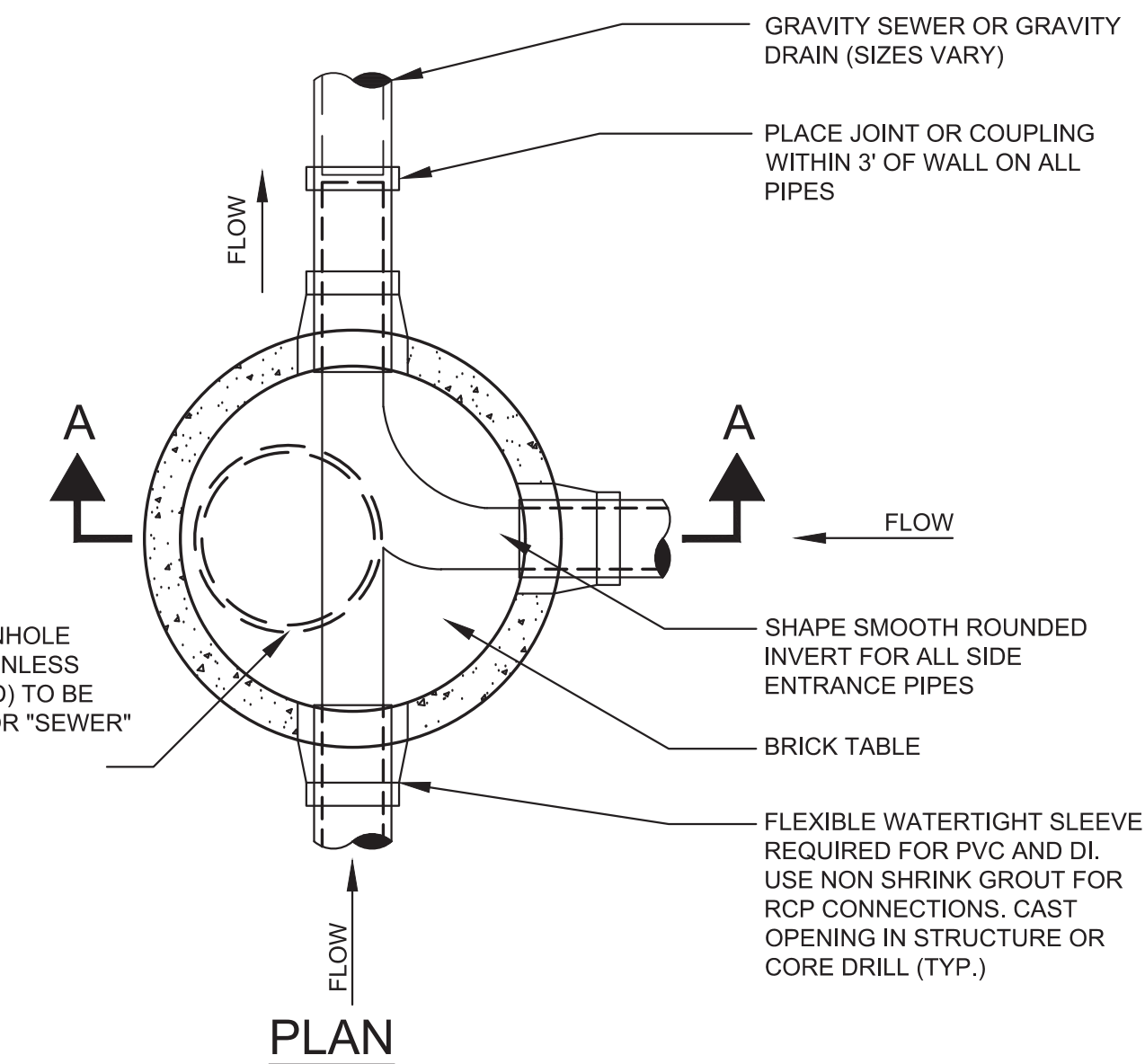
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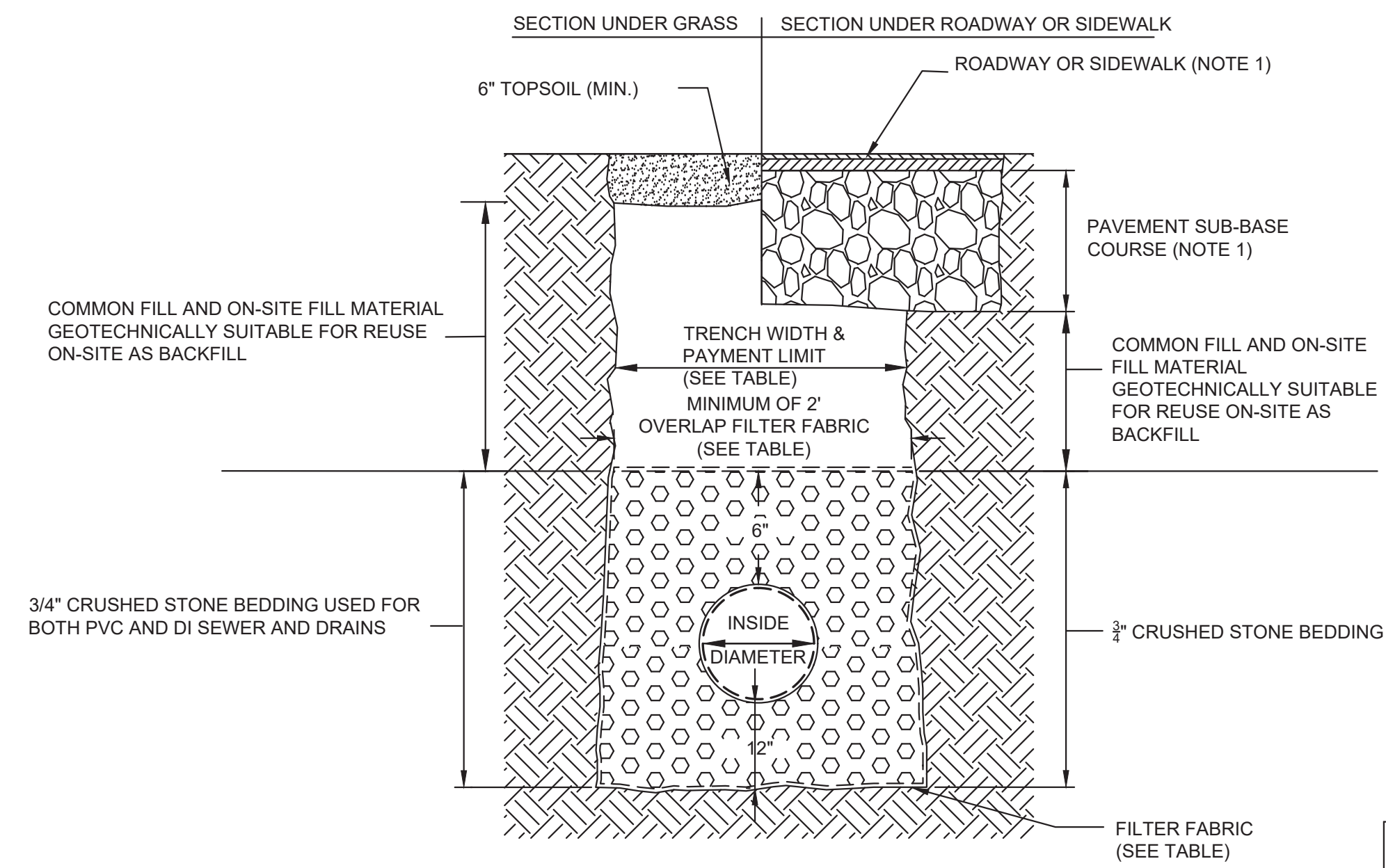
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	CIVIL CONSTRUCTION DETAILS - 1	



SECTION A-A
MANHOLE DETAIL
NTS



PLAN



TRENCH DETAIL FOR SEWER, DRAIN AND WATER PIPE
NTS

NOTES:
1. REFER TO APPROPRIATE DETAILS AND SPECIFICATIONS.
2. REFER TO "TRENCH PAY LIMIT TABLE FOR PIPES" FOR PAYMENT OF ALL ITEMS IN WHICH PAY TRENCH WIDTH IS A VARIABLE FOR CALCULATIONS OF QUANTITIES EXCEPT FOR TRENCH PAVEMENT
3. REFER TO TRENCH PAVEMENT DETAIL FOR PAVEMENT PAYMENT WIDTHS

TRENCH PAY LIMIT TABLE FOR PIPES

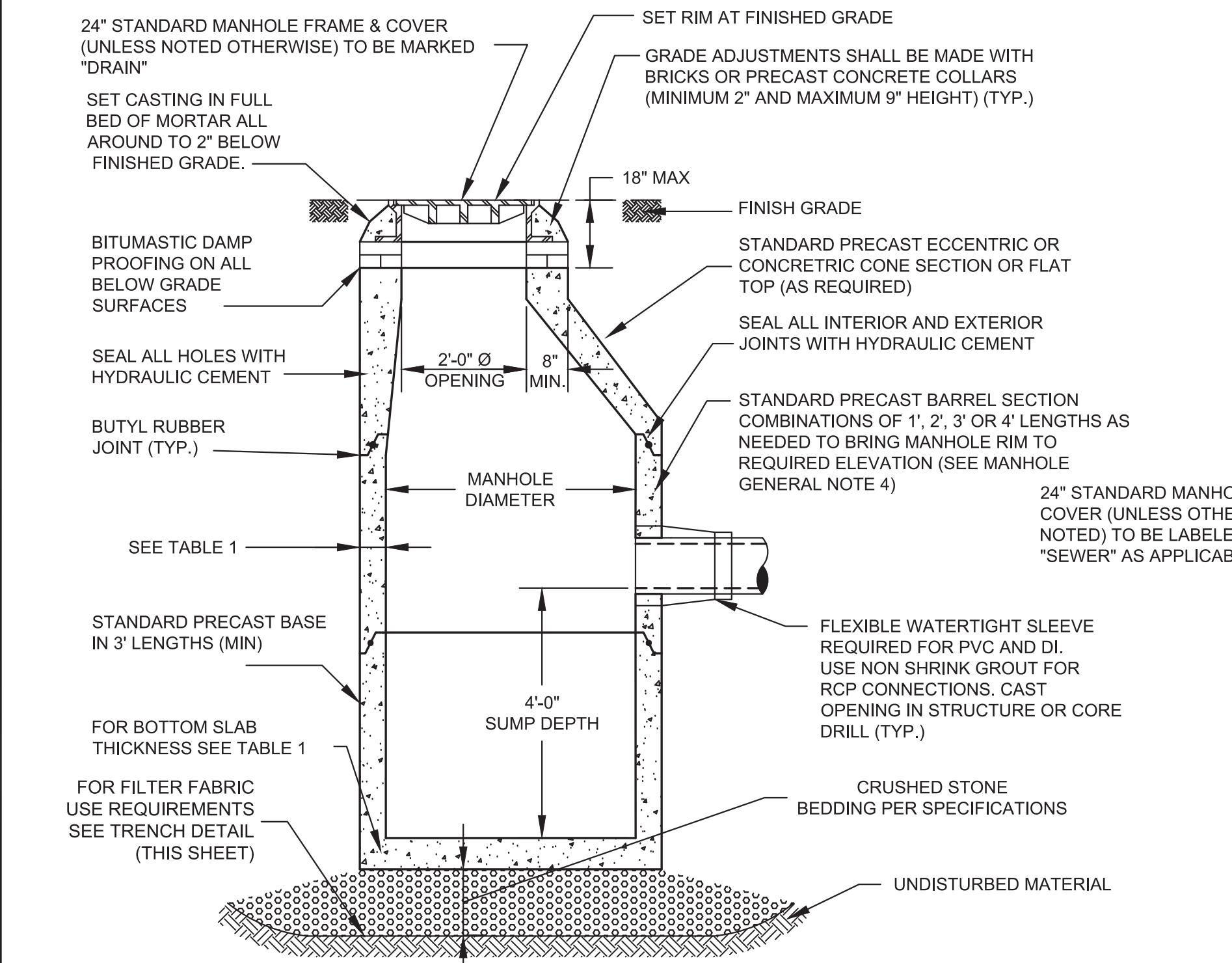
PIPE SIZE (DIA.)	MAX TRENCH WIDTH
LESS THAN 2"	2'-0"
2" TO 6"	3'-0"
8" TO 22"	4'-0"
24" & GREATER	I.D. + 2'-0"

I.D. = INSIDE DIMENSION

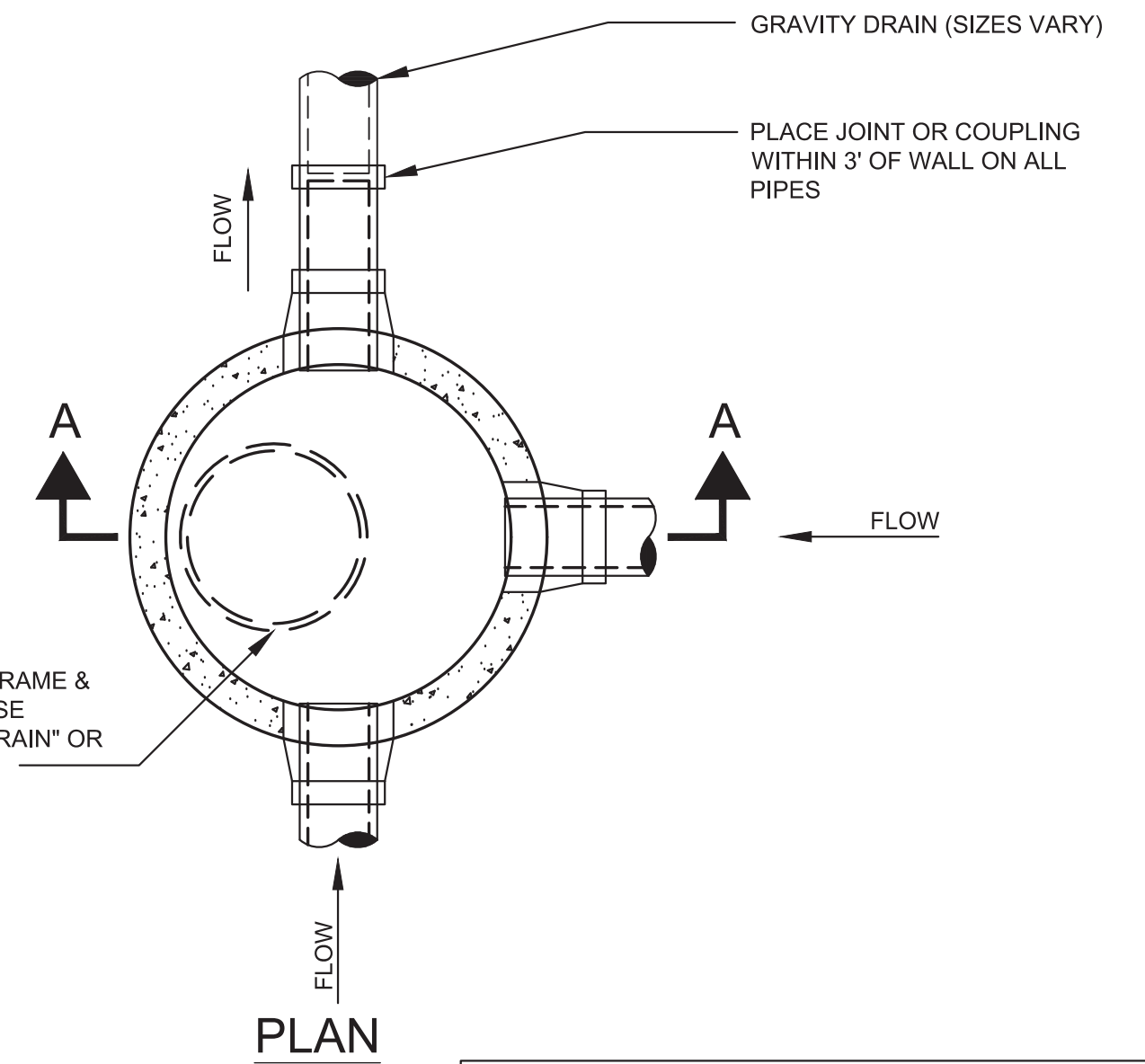
FOR TRENCHES GREATER THAN 5' DEEP ADD MAXIMUM 3' FOR TEMPORARY SUPPORT OF EXCAVATION

FILTER FABRIC USE

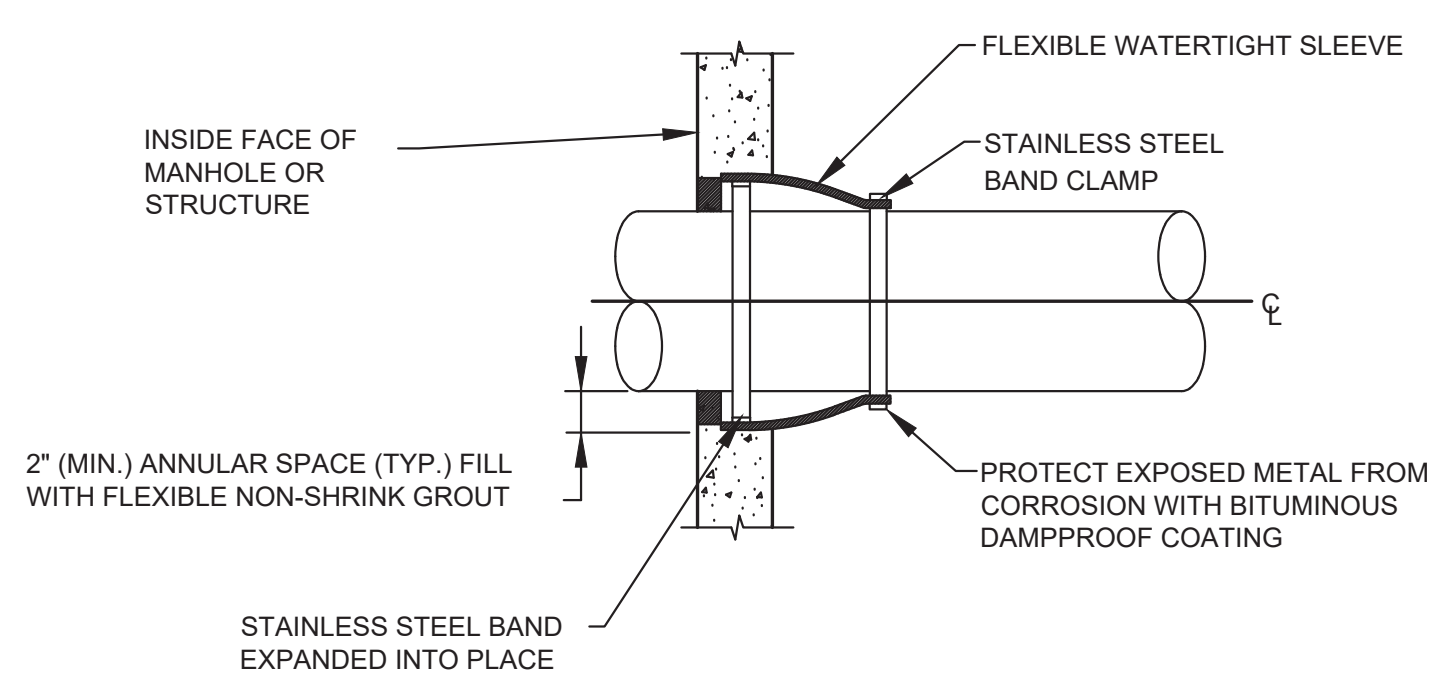
	SOIL TYPE	
	SILT OR CLAY	GRANULAR SOIL
ABOVE GROUND WATER	FILTER FABRIC NOT REQUIRED	FILTER FABRIC NOT REQUIRED
BELOW GROUND WATER	FILTER FABRIC REQUIRED	FILTER FABRIC NOT REQUIRED



SECTION A-A
DRAIN MANHOLE DETAIL - 4 FOOT SUMP
NTS



PLAN



FLEXIBLE SLEEVE CONNECTION DETAIL
NTS

NOTE:
1. PRECAST OPENING OR CORE DRILLED INTO EXISTING STRUCTURE. SIZE VARIES TO ACCOMMODATE EXTENSION BONNET FLANGE DIAMETER OR PIPE.

TABLE 1

MANHOLE DIAMETER	SIDE WALL MIN. THICKNESS	BOTTOM SLAB MIN. THICKNESS	MAX PIPE RCP DIAMETER	MAX PIPE DIAMETER DI/PVC
4'	5"	6"	24"	30"
5'	6"	8"	36"	42"
6'	6"	8"	48"	54"
8'	8"	8"	66"	72"
10'	10"	10"	72"	84"

* MAY VARY DEPENDING ON SIZE AND LOCATION OF ADDITIONAL PENETRATIONS OR RELATIONSHIP OF PENETRATIONS IN MANHOLE

WALL THICKNESS	MAX TRENCH WIDTH
LESS THAN 6"	I.D. + 5'-0"
6" TO 12"	I.D. + 6'-0"
13" TO 18"	I.D. + 7'-0"
19" & GREATER	I.D. + 6'-0"

I.D. = INSIDE DIMENSION
O.D. = OUTSIDE DIMENSION

FOR TRENCHES GREATER THAN 5' DEEP AND 3' FOR TEMPORARY SUPPORT OF EXCAVATION

MANHOLE GENERAL NOTES:

- INNER EDGE OF CONC. TABLE TO BE AT ELEV OF CROWN OF PIPE. TABLE TO SLOPE AT 8.3% TO INSIDE OF MANHOLE BASE.
- SEWER OR DRAIN MANHOLE DIAMETER SHALL BE 4', 5', 6' OR 8' AS SHOWN ON PLAN / PROFILE VIEWS
- DESIGN PRECAST AND CAST IN PLACE SECTIONS WITH FRAME AND COVER FOR AASHTO H20 LOADINGS.
- MANHOLES LARGER THAN 4' IN DIAMETER AT THE BASE SHALL BE REDUCED IN DIAMETER TO 4' AT THE NEXT RISER SECTION UNLESS NOTED OTHERWISE ON PLANS.

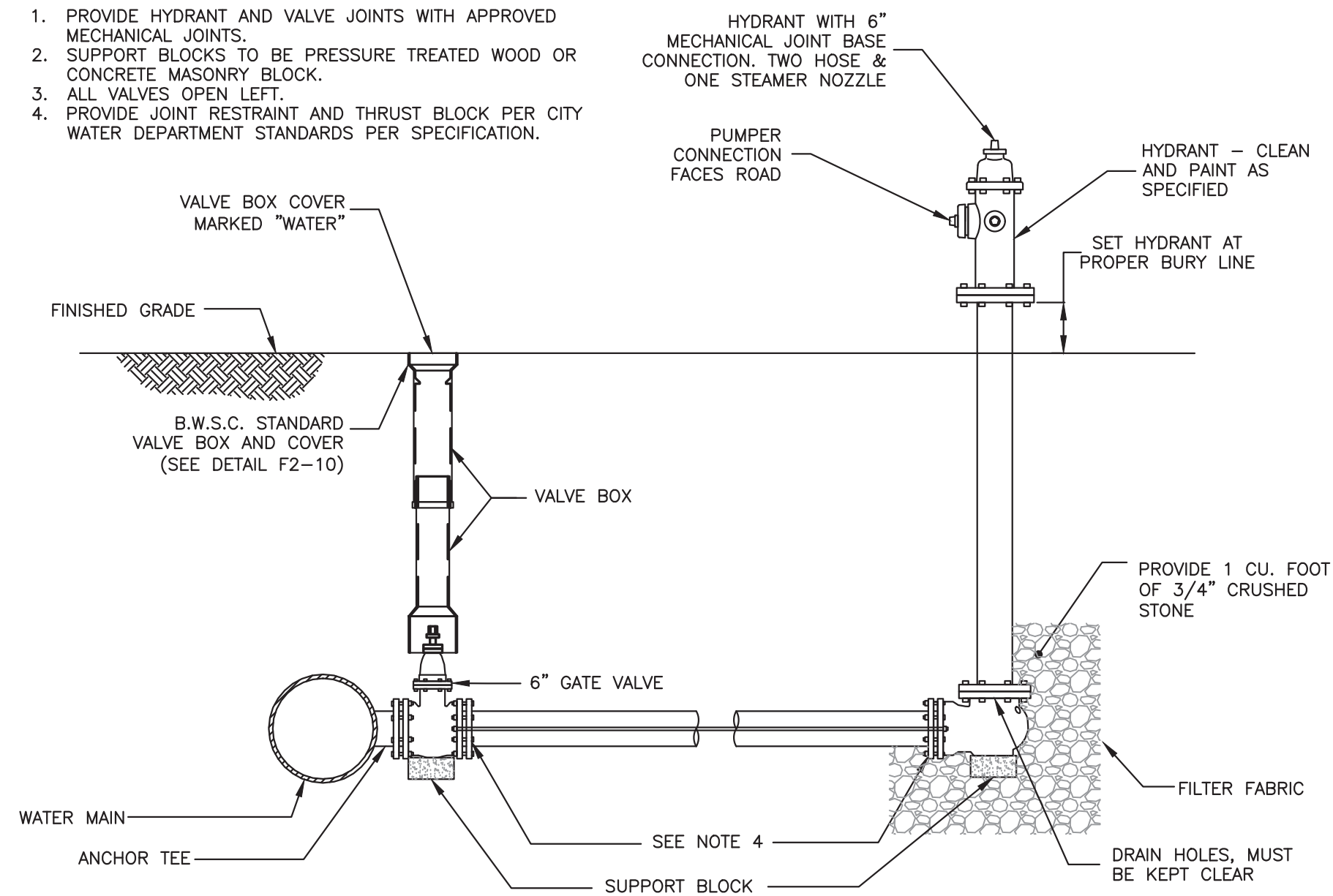
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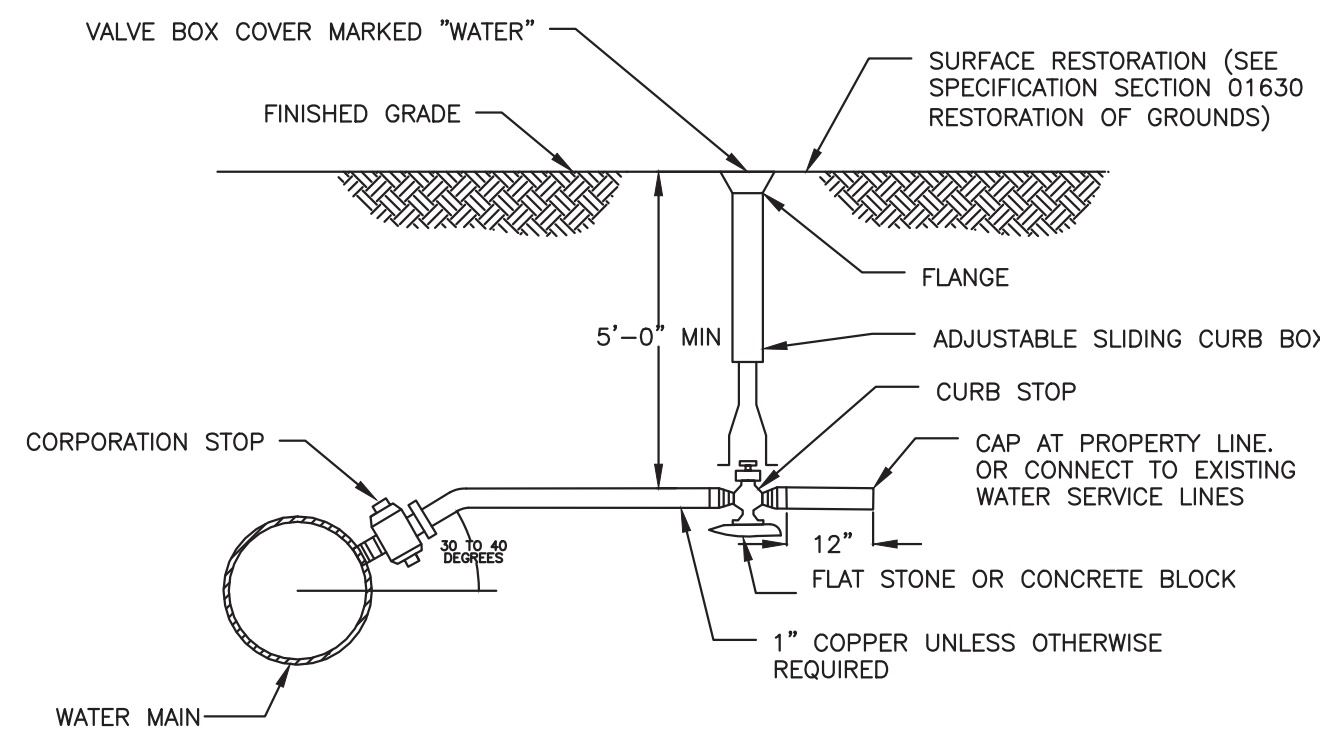
1. PROVIDE HYDRANT AND VALVE JOINTS WITH APPROVED MECHANICAL JOINTS.
2. SUPPORT BLOCKS TO BE PRESSURE TREATED WOOD OR CONCRETE MASONRY BLOCK.
3. ALL VALVES OPEN LEFT.
4. PROVIDE JOINT RESTRAINT AND THRUST BLOCK PER CITY WATER DEPARTMENT STANDARDS PER SPECIFICATION.



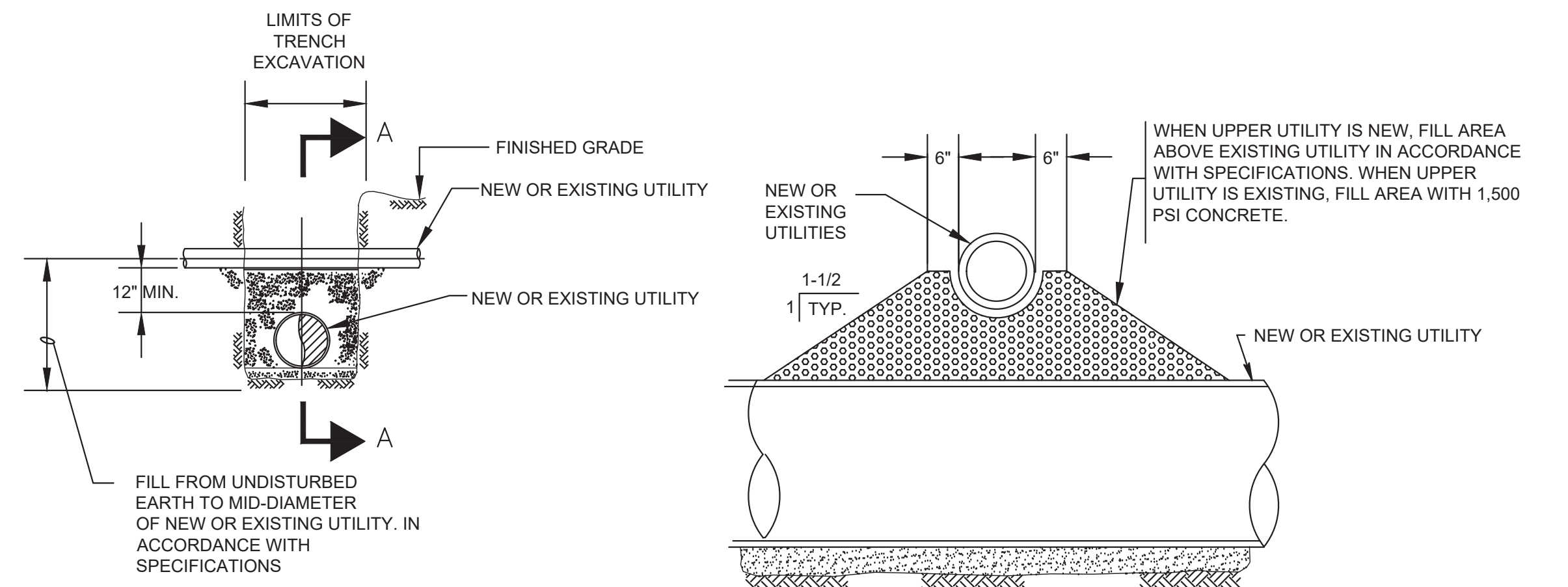
FIRE HYDRANT DETAIL
NTS

NOTES:

1. ANY WATER MAIN TO BE ENCASED IN CONCRETE FOR STRUCTURAL PURPOSES SHALL BE ENCASED WITHIN FLOWABLE FILL WITH 0% ASH CONTENT
2. ALL GATE VALVES SHALL BE RESILIENT SEATED AND "OPEN RIGHT"
3. ALL NEW WATER MAIN TO BE WRAPPED IN POLY >= 9 MIL. THICK (INCLUDING TAPPING SLEEVE VALVES, CORPORATIONS, TEES, ETC.)



NEW WATER SERVICE DETAILS
NTS



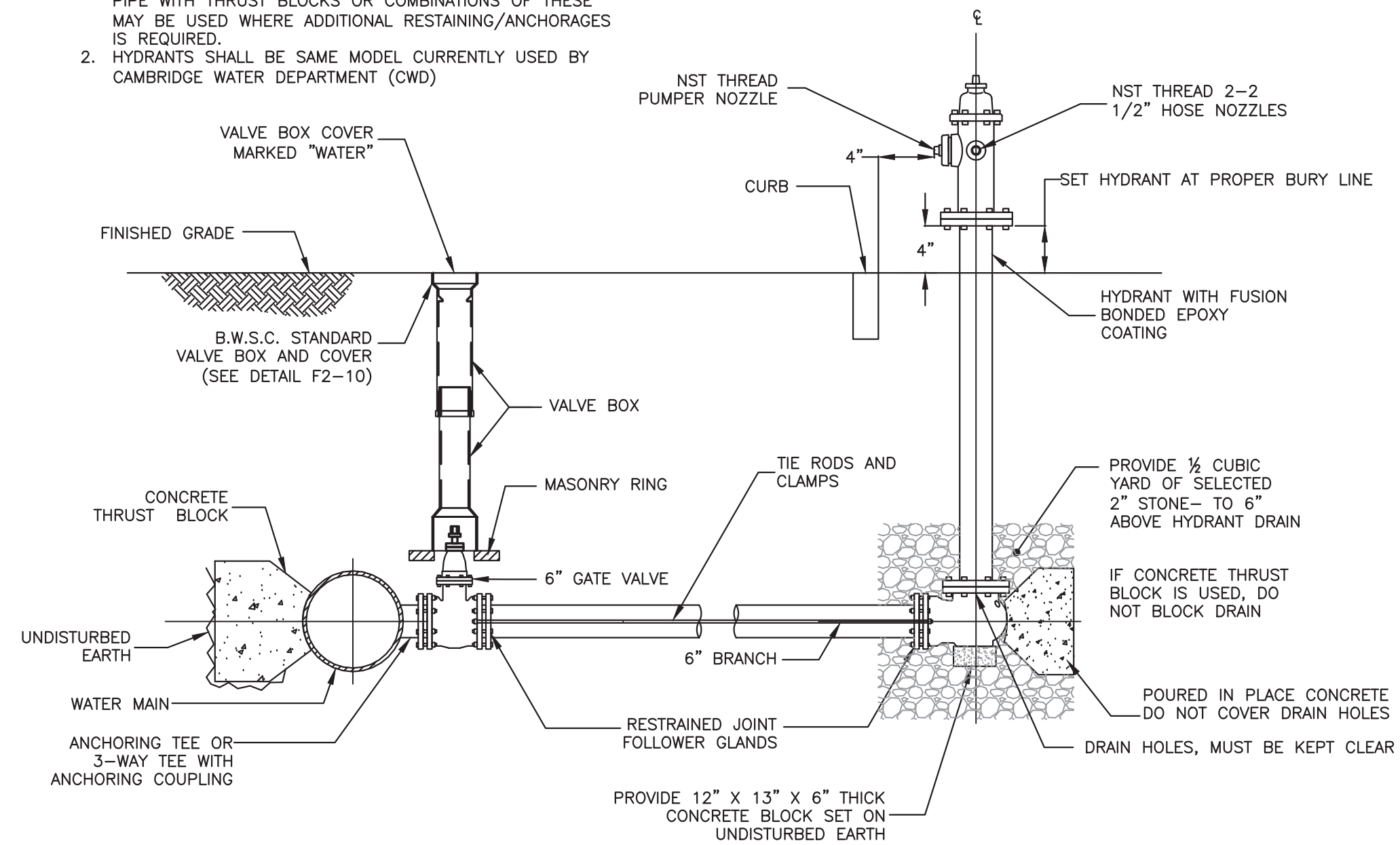
ELEVATION

SECTION A-A

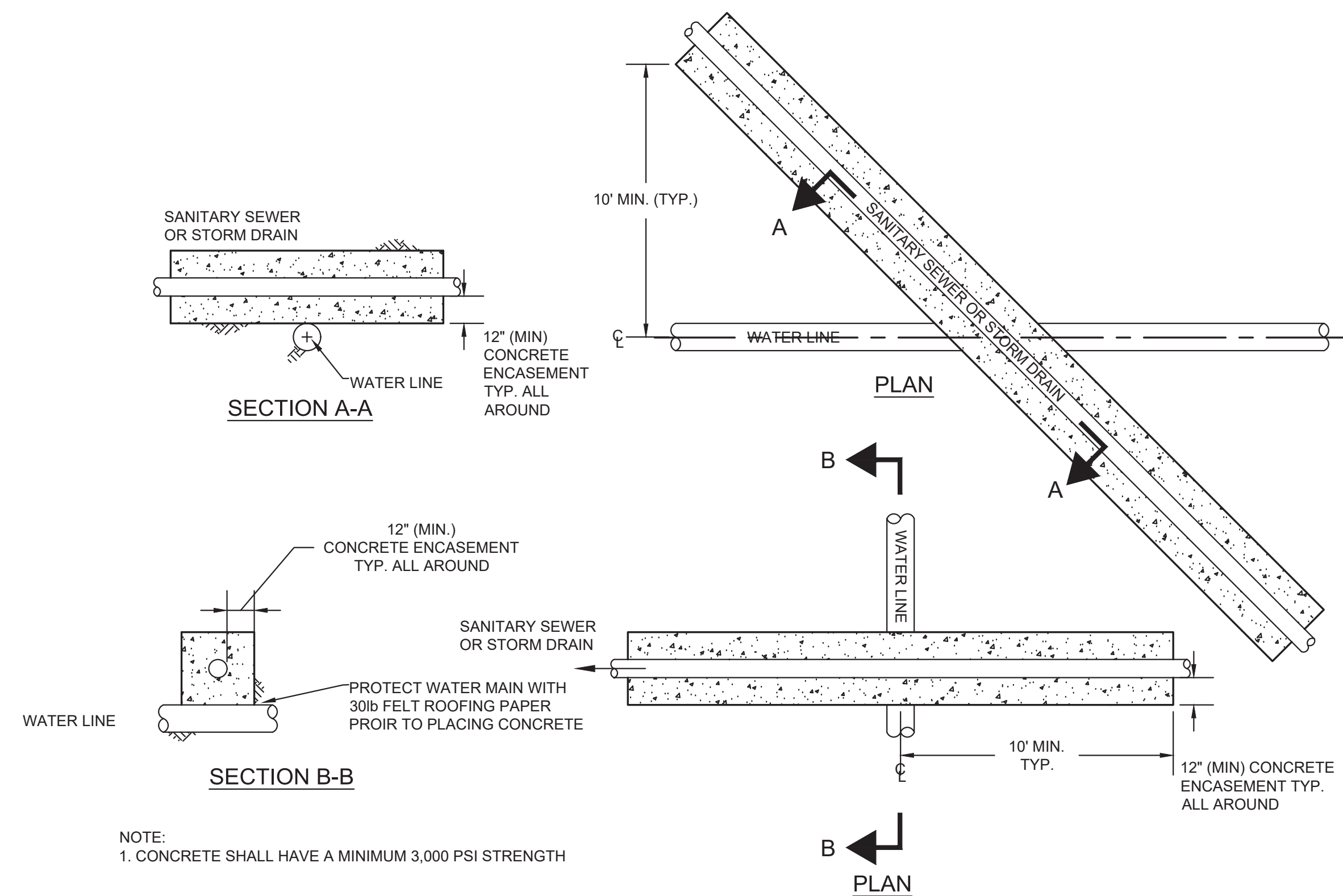
UTILITY CROSSING DETAIL
NTS

NOTES:

1. TIE RODS AND CLAMPS, RESTRAINED JOINTS, DUCTILE IRON PIPE WITH THRUST BLOCKS OR COMBINATIONS OF THESE MAY BE USED WHERE ADDITIONAL RESTAINING/ANCHORAGES IS REQUIRED.
2. HYDRANTS SHALL BE SAME MODEL CURRENTLY USED BY CAMBRIDGE WATER DEPARTMENT (CWD)



STORM DRAIN AND SANITARY SEWER CROSSING ABOVE WATER MAIN
NTS



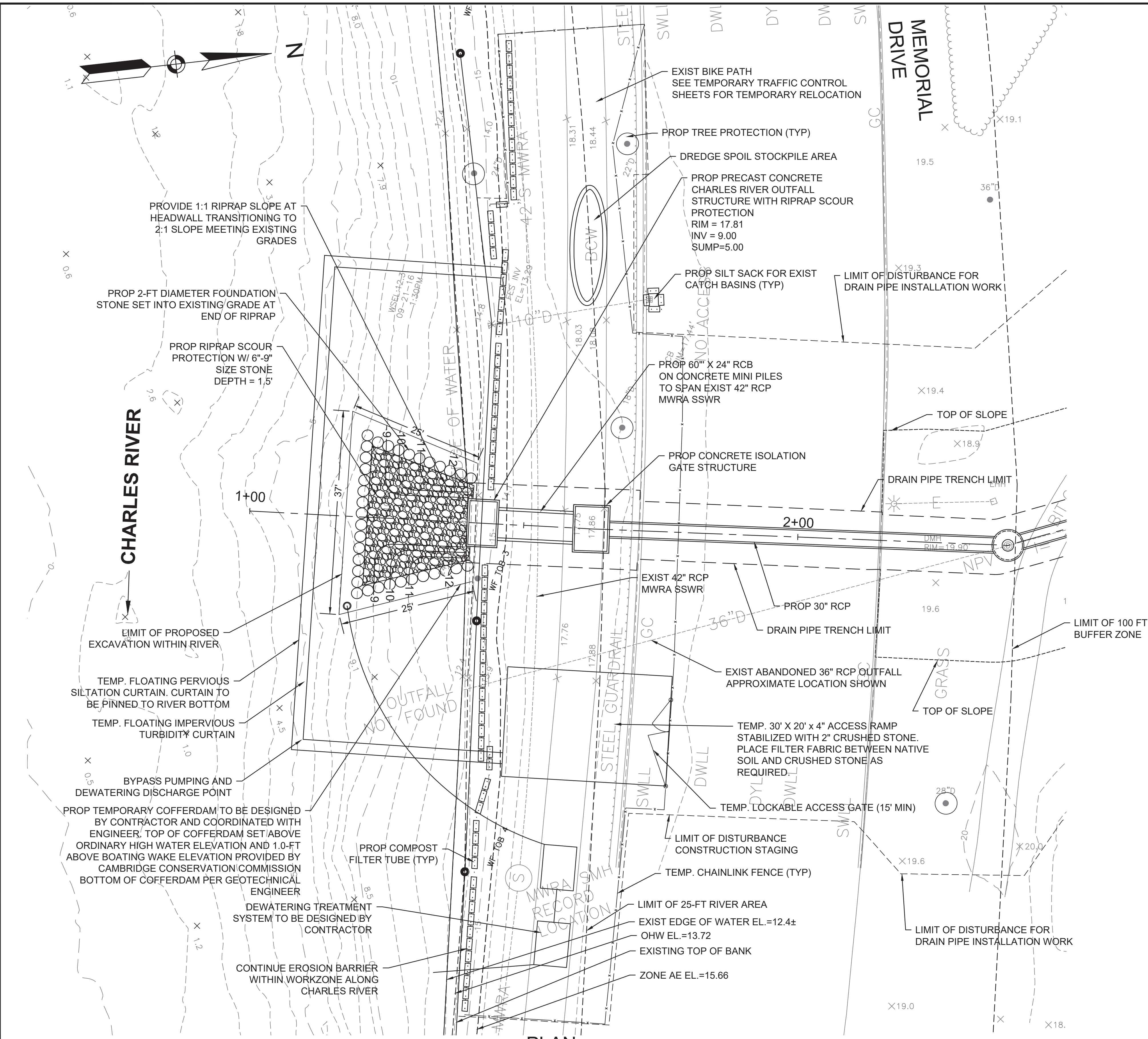
NOTE:
1. CONCRETE SHALL HAVE A MINIMUM 3,000 PSI STRENGTH

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	CIVIL CONSTRUCTION DETAILS - 3	



PLAN

SEQUENCE OF CONSTRUCTION

1. CHECK AND REPLACE AS NECESSARY WETLAND FLAGGING.
2. COMPOST FILTER TUBES SHALL BE PLACED AND STAKED AS REQUIRED. THE ENTIRE LIMITS OF CONSTRUCTION SHALL BE ISOLATED AND A LOCKED GATE SHALL BE STOCKPILED ONSITE AND BE AVAILABLE AT ALL TIMES. A SILT CURTAIN AND FLOATING BOOM SHALL BE POSITIONED AROUND THE SITE IN THE RIVER. CONTRACTOR MAINTAIN SPILL KIT ON-SITE.
3. THE EXISTING BIKE PATH SHALL BE DETOURED BETWEEN MEMORIAL DRIVE AT GERRY'S LANDING ROAD AND HAWTHORNE STREET. APPROPRIATE SIGNAGE AND PROTECTIONS SHALL BE PROVIDED TO DETOUR PEDESTRIAN AND BICYCLE TRAFFIC.
4. TEMPORARY DOUBLE FLOATING CURTAINS SHALL BE ERECTED IN THE CHARLES RIVER.
5. A TEMPORARY STEEL SHEETING COFFERDAM SHALL BE INSTALLED. THE AREA WITHIN THE UPSTREAM PORTION OF THE COFFERDAM SHALL BE FILLED WITH CRUSHED STONE OF A SUFFICIENT THICKNESS AS NEEDED TO CREATE A WORKING PAD FOR EQUIPMENT. A RAMP SHALL BE CONSTRUCTED OF CRUSHED STONE TO CREATE EQUIPMENT ACCESS TO THE INTERIOR OF THE COFFERDAM. TEMPORARY CUT AND FILL SHALL OCCUR WITHIN THE EMBANKMENT ADJACENT TO THE CHARLES RIVER AND RESTORED TO EXISTING GRADES UPON COMPLETION OF THE OUTFALL WORK.
6. INSTALL DEWATERING SYSTEM AND EXCAVATE WITHIN COFFERDAM TO REQUIRED SUBGRADES. DEWATERING PUMPS SHALL DISCHARGE TO THE RIVER WITHIN THE FLOATING CURTAINS AND BE OF SUFFICIENT CAPACITY TO MAINTAIN DRY CONDITIONS. ALL EXCESS DREDGED MATERIAL SHALL BE DISPOSED OFFSITE.
7. SUBGRADE CRUSHED STONE SHALL BE INSTALLED BEFORE PLACING PRECAST AND ANCILLARY MATERIALS.
8. PILES AND PILE CAPS SHALL BE INSTALLED ADJACENT TO THE EXISTING MWRA 42 INCH CONCRETE SEWER. THE MWRA SEWER SHALL BE PROTECTED AT ALL TIMES.
9. THE OUTFALL STRUCTURE, REINFORCED CONCRETE BOX, TRANSITION STRUCTURE, RIPRAP AND STONE STABILIZATION WITHIN THE COFFERDAM WILL BE INSTALLED. THE ENTIRE INSTALLATION DOWNSTREAM OF THE TRANSITION STRUCTURE SHALL BE COMPLETED, BACKFILLED, COMPACTED, AND THE DEWATERING OPERATION STOPPED BEFORE INSTALLATION OF THE STORM DRAIN PIPE UPSTREAM OF THE TRANSITION STRUCTURE.
10. THE COFFERDAM SHALL BE REMOVED. ONCE THE COFFERDAM IS REMOVED, RESTORE COMPOST FILTER TUBES.
11. THE STORM DRAIN PIPE UPSTREAM OF THE TRANSITION STRUCTURE SHALL BE INSTALLED USING TEMPORARY SUPPORT OF EXCAVATION WITH DEWATERING.
12. RESTORATIVE GRADING, TOPSOIL RESTORATION, PLANTING, AND SEEDING OF THE WORK ZONE WITHIN THE EMBANKMENT SHALL BE COMPLETED. REFER TO LANDSCAPE DESIGN FOR ADDITIONAL SURFACE IMPROVEMENTS.
13. THE BIKE PATH, CURBING, GRASS STRIP, AND GUARD RAIL SHALL BE RESTORED AFTER PIPE IS INSTALLED, BACKFILLED, AND COMPACTED.
14. THE STORM DRAIN PIPE AND MANHOLES ON MEMORIAL DRIVE AND MT AUBURN STREET SHALL BE INSTALLED, BACKFILLED, AND COMPACTED AND RESTORED WITH A PERMANENT ASPHALT PAVEMENT PATCH.
15. THE ENVIRONMENTAL CONTROLS (FLOATING CURTAINS, COMPOST FILTER TUBES AND SILT SACKS) SHALL REMAIN IN PLACE UNTIL THE CONSTRUCTION SITE IS STABILIZED. THE CONTRACTOR SHALL CHECK AND MAINTAIN THE ENVIRONMENTAL CONTROLS DAILY. UPON STABILIZATION AND GROWTH OF VEGETATED COVER, THE ENVIRONMENTAL CONTROLS SHALL BE REMOVED AND DISPOSED OFFSITE AT A SECURE FACILITY.

LIMIT OF WORK

1. LIMIT OF SUBSURFACE WORK IS APPROXIMATELY DEFINED BY THE TEMPORARY CHAINLINK FENCE, TEMPORARY FLOATING PERVIOUS SILTATION CURTAIN, AND 50 FEET ON EITHER SIDE OF THE CENTERLINE OF THE 30 INCH DIAMETER RCP DRAIN.
2. SEE SHEET C-1 FOR LIMIT OF PAVEMENT RESTORATION.



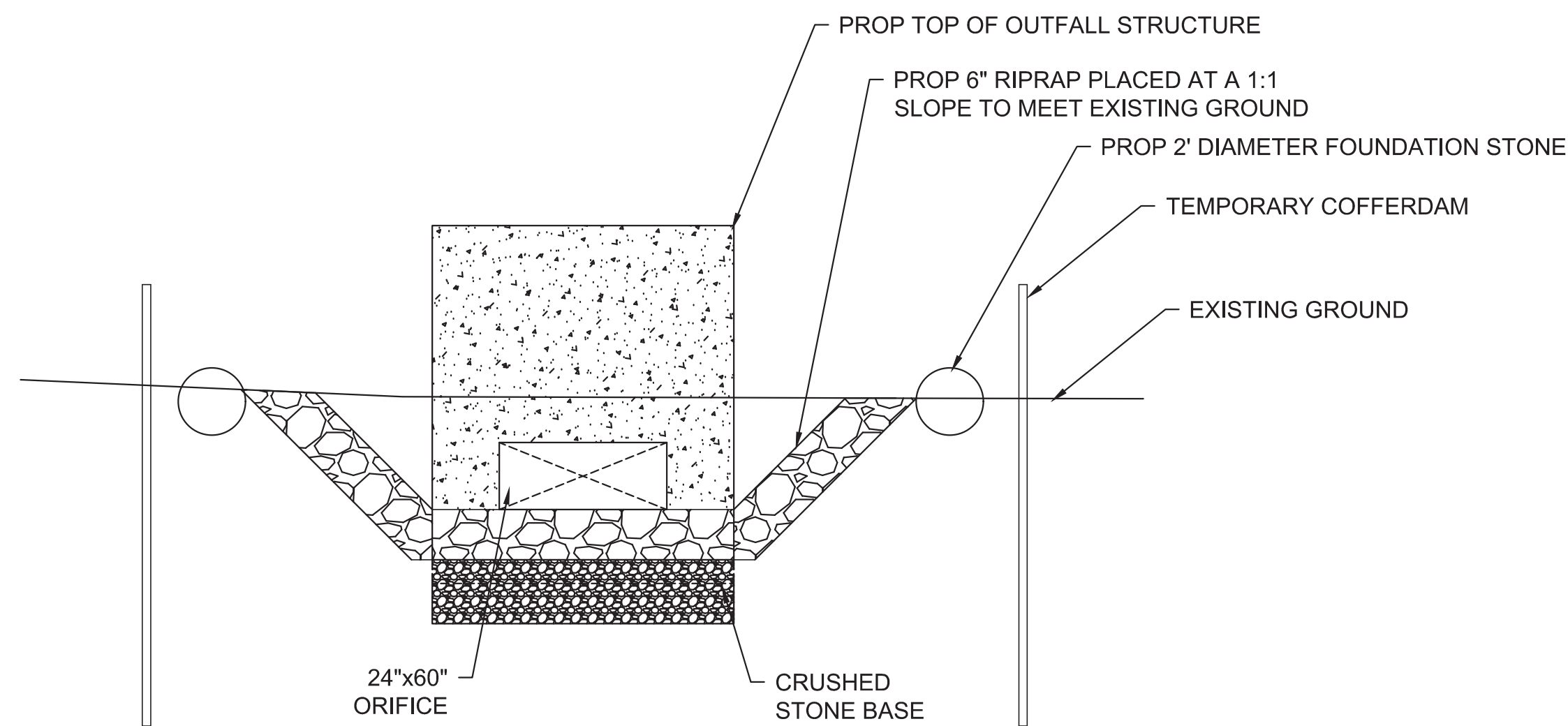
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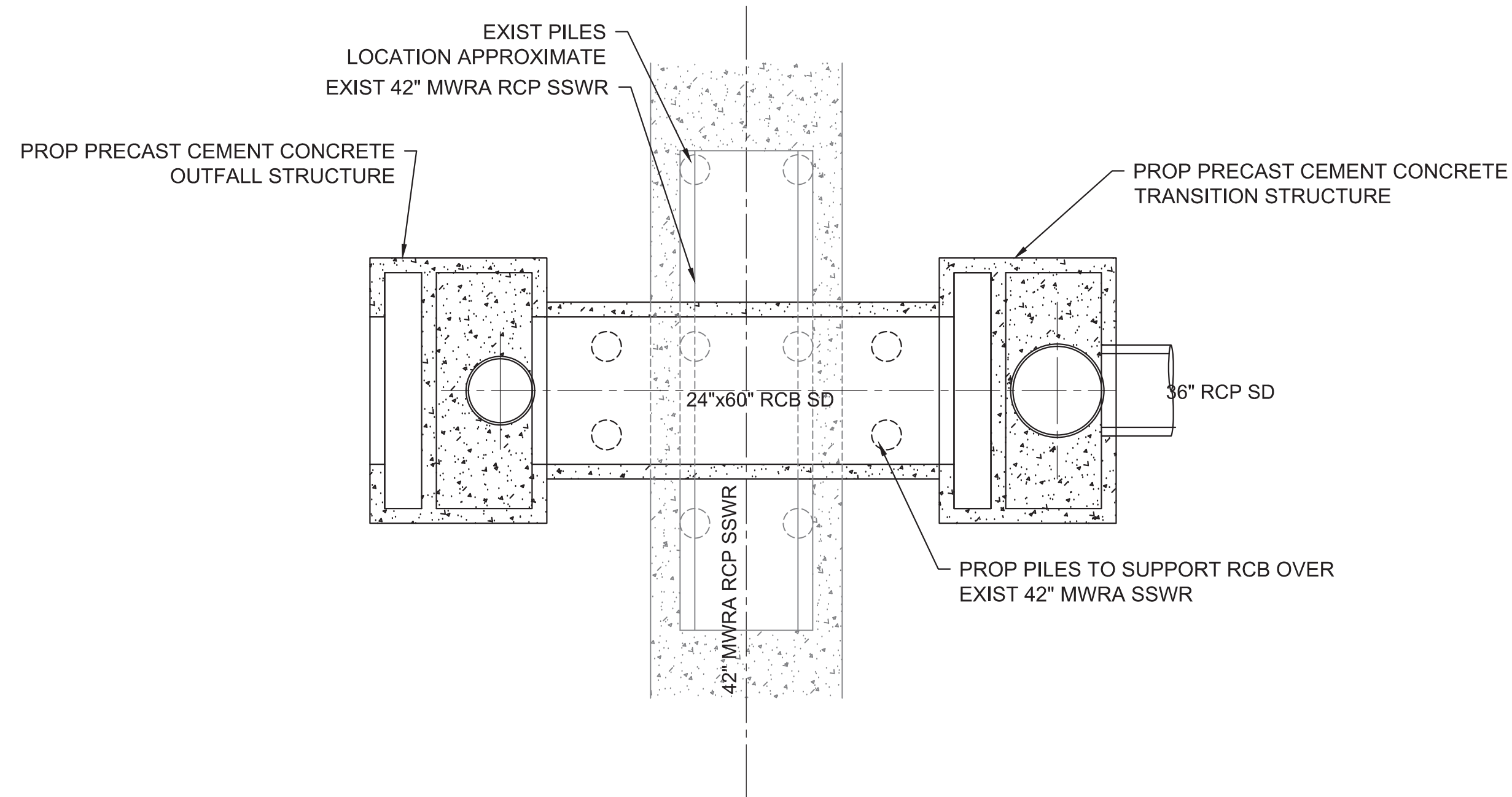
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BOSTON, MASSACHUSETTS 02110-2378
(617) 357-7700

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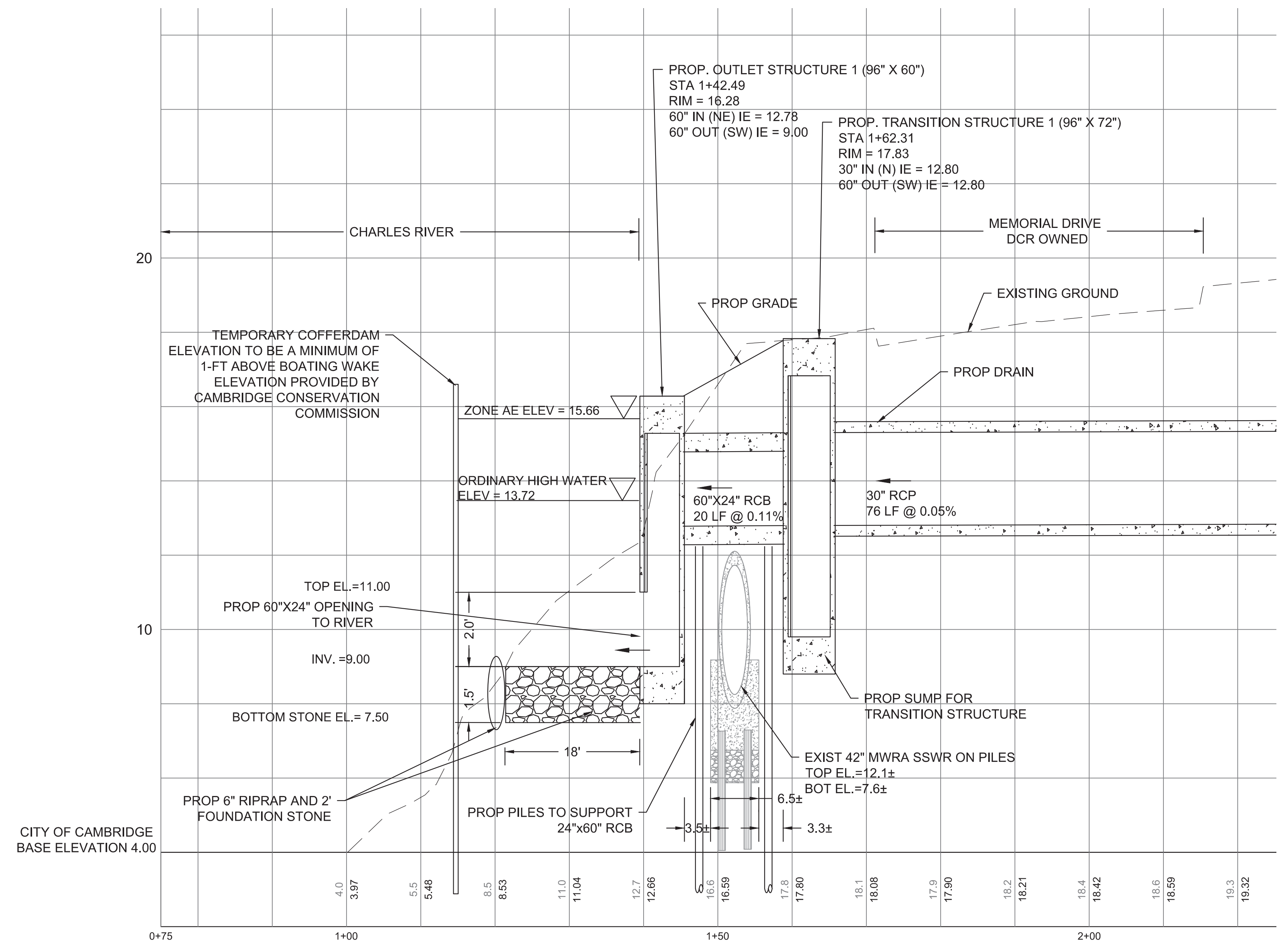
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		Drawing	CIVIL OUTFALL PLAN AND PROFILE		



SECTION OF OUTFALL
NTS



PLAN OF OUTFALL CROSSING 42" MWRA SSWR
NTS



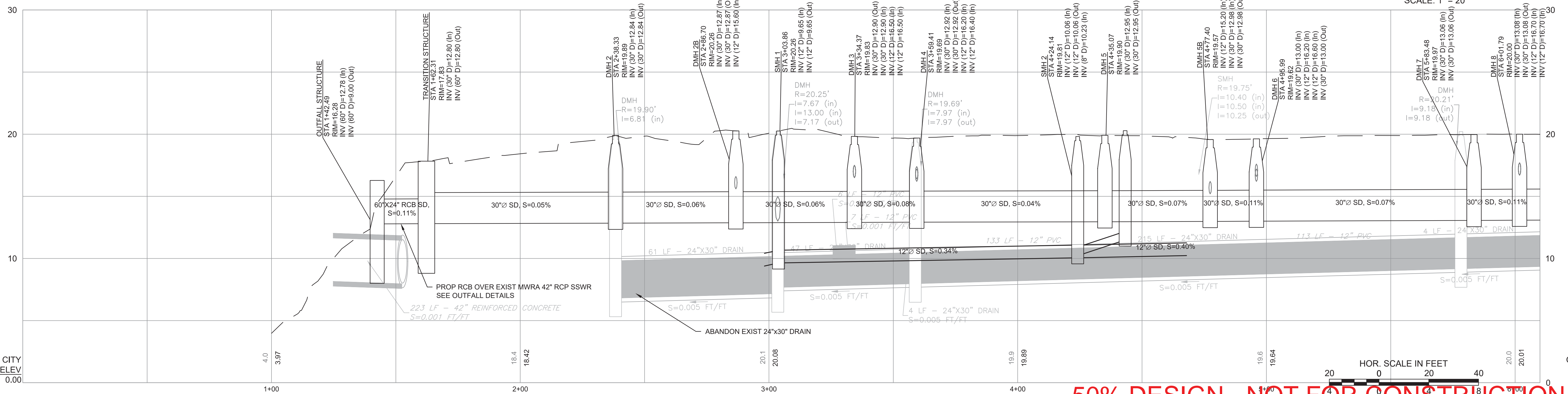
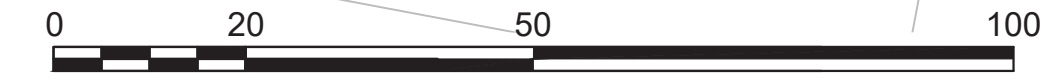
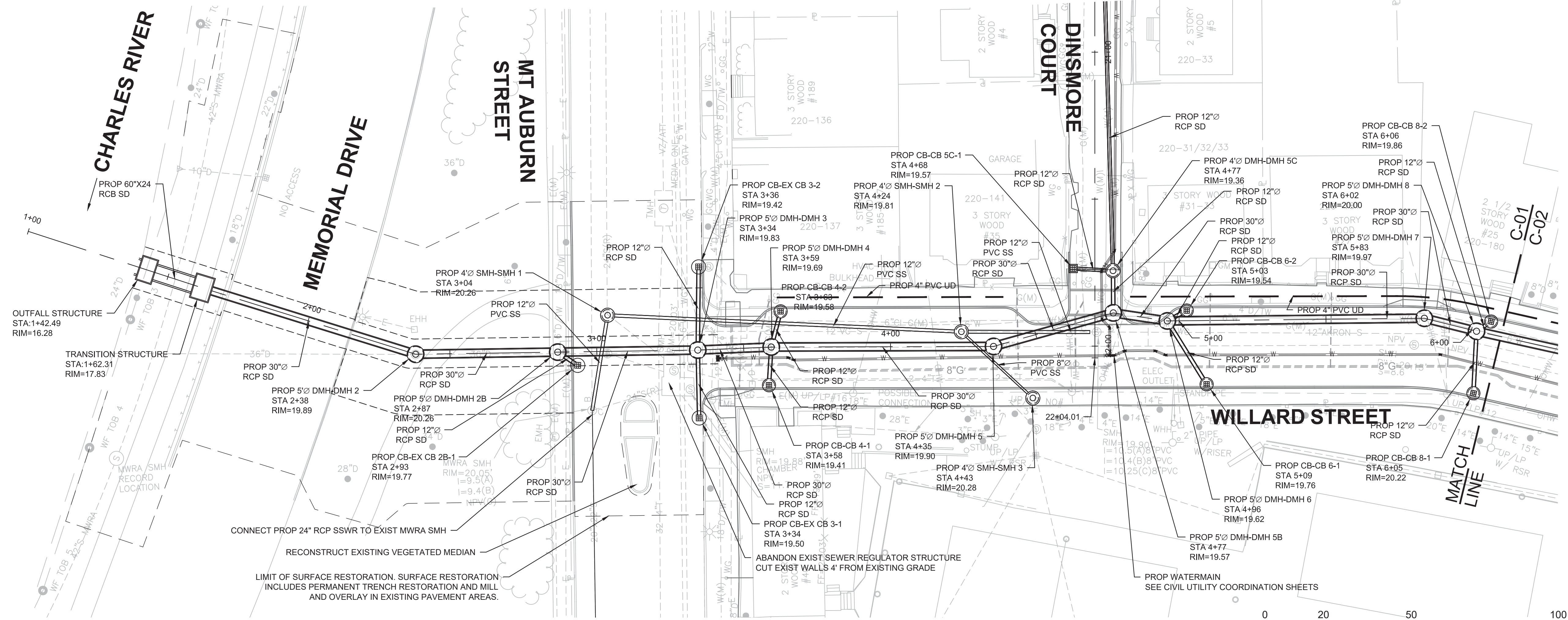
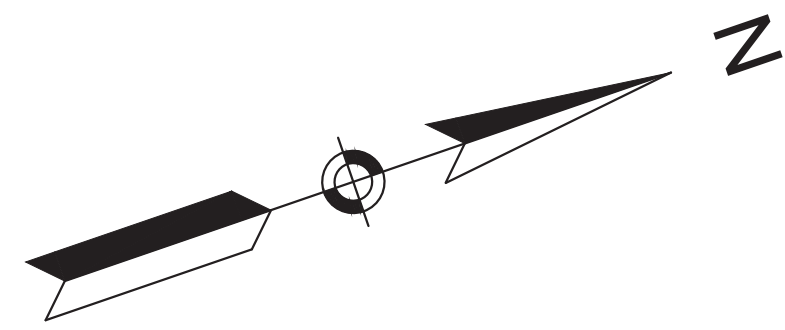
PROFILE
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HDR ENGINEERING, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MASSACHUSETTS 02110-2378
(617) 357-7700

No.	Description	Date	Checked by	Approved by
	REVISIONS			

Client	CITY OF CAMBRIDGE, MA	Sheet	CO-02
Project	WILLARD STREET DRAINAGE IMPROVEMENTS PROJECT	Total Sheets	
Drawing	CIVIL OUTFALL PROFILE	File No.	



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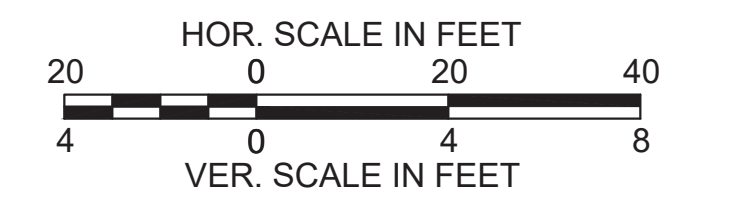
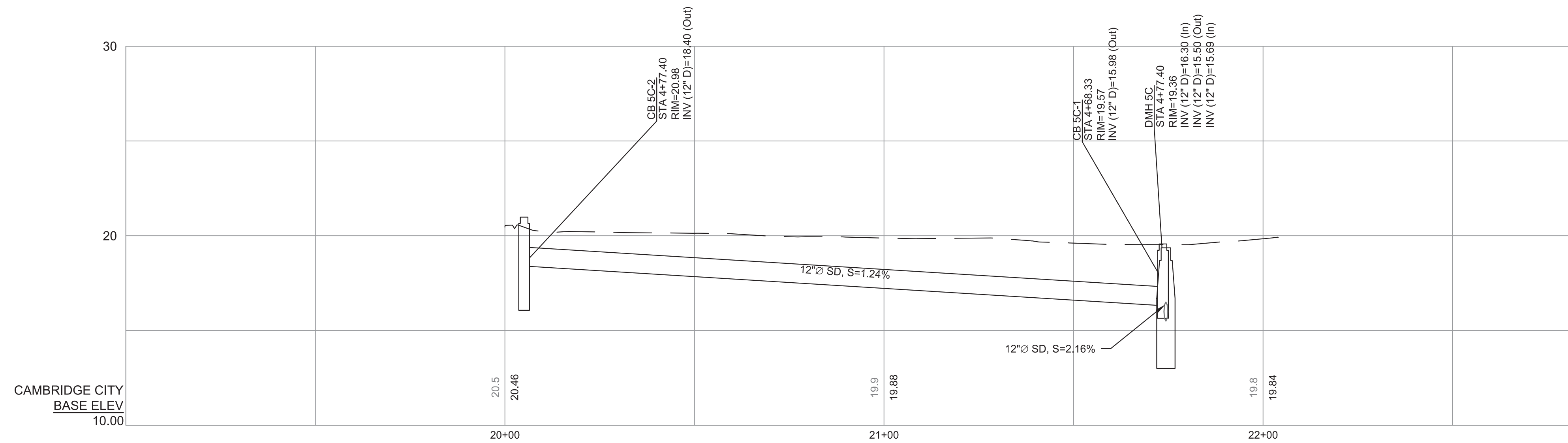
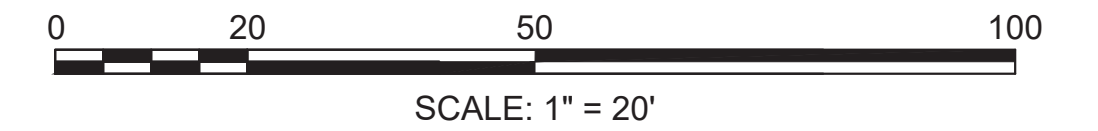
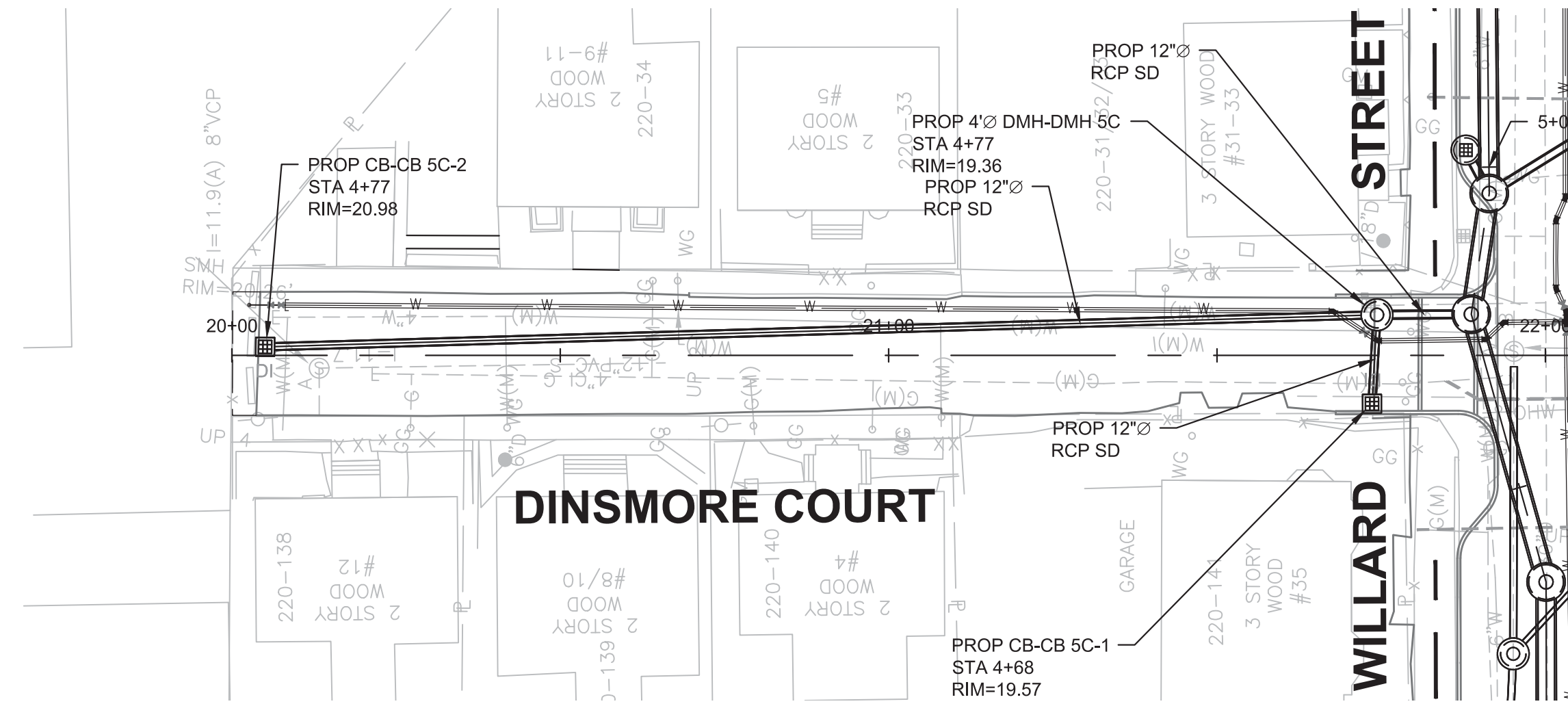
CAMBRIDGE CITY
BASE ELEV.
0.00



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BOSTON, MASSACHUSETTS 02110-2378
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No.	Description	Date	Checked by	Approved by
	REVISIONS			

Scale	CITY OF CAMBRIDGE, MA	Sheet	C-1
Date	WILLARD STREET	Total Sheets	
Job No.	DRAINAGE IMPROVEMENTS PROJECT	File No.	
Designed by	CIVIL CONSTRUCTION PLAN - 1		
Drawn by			
Checked by			
Approved by			



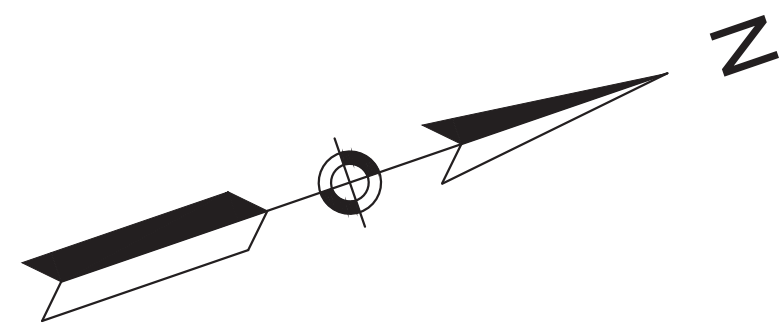
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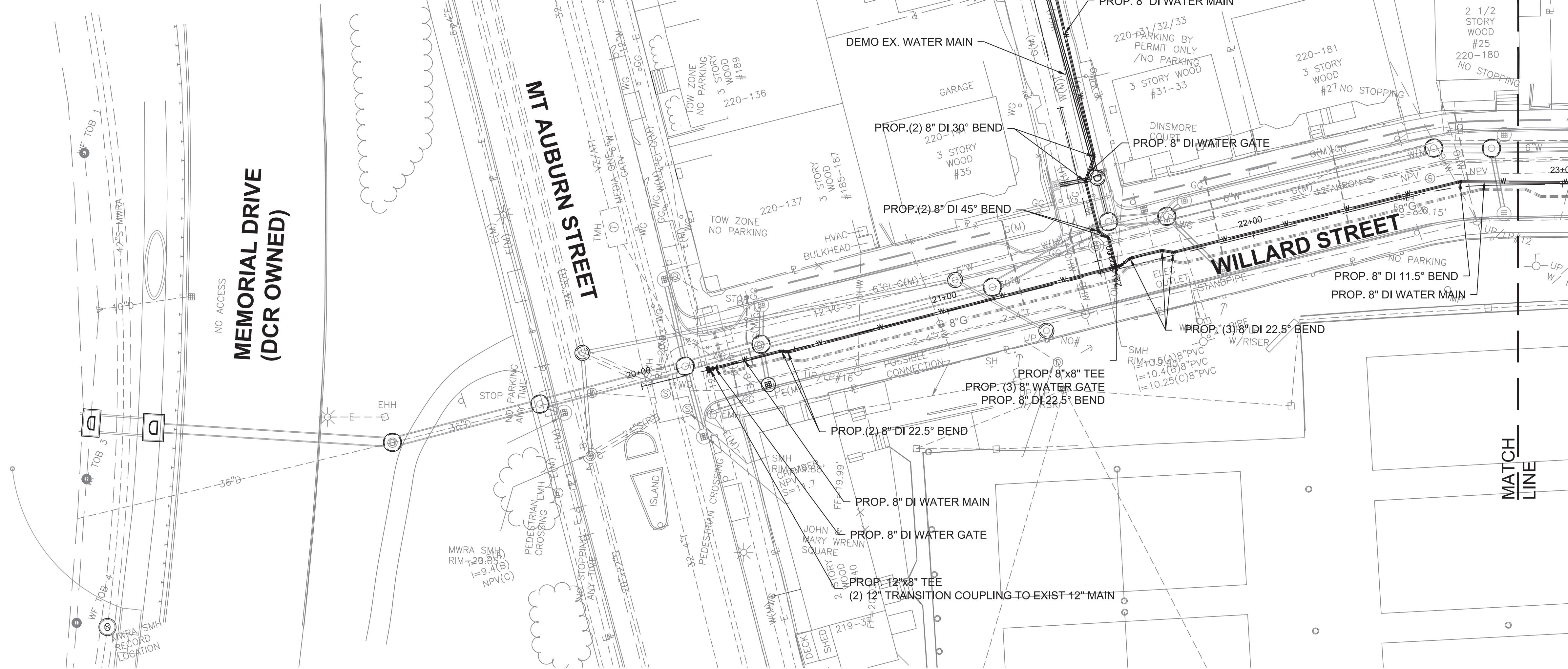
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Scale		
Date		
Job No.		
Designed by		
Drawn by		
No.	Description	Date
	REVISIONS	
Checked by		
Approved by		

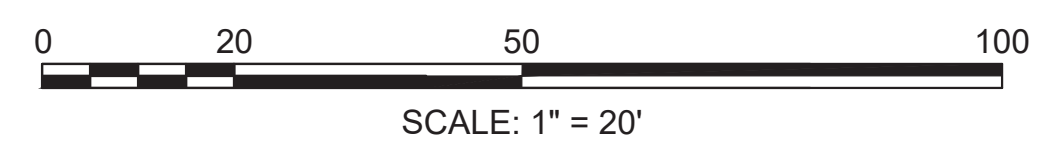
Client	CITY OF CAMBRIDGE, MA	Sheet	C-3
Project	WILLARD STREET DRAINAGE IMPROVEMENTS PROJECT	Total Sheets	
Drawing	CIVIL CONSTRUCTION PLAN - 3	File No.	



STREET #	SIZE	MATERIAL	DISPOSITION
40 WILLARD	2"	COPPER	CONNECT TO MAIN
35 WILLARD	1"	LEAD	REPLACE WITH 1" COPPER TO BLDG
31 - 33 WILLARD	3/4"	LEAD	REPLACE WITH 1" COPPER TO BLDG
4 DINSMORE	1"	COPPER	CONNECT TO MAIN
5 DINSMORE	3/4"	COPPER	REPLACE WITH 1" COPPER TO SERVICE BOX
8 - 10 DINSMORE	3/4"	LEAD	REPLACE WITH 1" COPPER TO BLDG
9 - 11 DINSMORE	1", 1"	COPPER	CONNECT TO MAIN
12 DINSMORE	3/4"	LEAD	REPLACE WITH 1" COPPER TO BLDG
27 WILLARD	3/4", 3/4"	LEAD	REPLACE WITH 1" COPPER TO BLDG
25 WILLARD	1"	LEAD	REPLACE WITH 1" COPPER TO BLDG



- NOTES:
- CONTRACTOR SHALL CONNECT EXISTING WATER SERVICES TO NEW WATER MAIN(S).
 - EXISTING LEAD SERVICES SHALL BE REMOVED AND REPLACED TO EXISTING BUILDINGS WITH 1" COPPER SERVICE. ALL EXISTING COPPER SERVICES LESS THAN 1" SHALL BE REMOVED AND REPLACED TO SIDEWALK SERVICE BOX WITH 1" COPPER SERVICE.
 - FOR WATER SERVICES GREATER THAN 1.5" IN SIZE, CONTRACTOR TO INSTALL GATE VALVE AT THE MAIN.
 - UNLESS OTHERWISE NOTED, WATER MAINS SHALL BE INSTALLED WITH MINIMUM 5.5' COVER FROM EXISTING GRADE FROM MT. AUBURN STREET TO BRATTLE STREET. WATER MAIN ELEVATIONS LISTED IN THE DRAWINGS REFER TO TOP OF WATER MAIN, UNLESS OTHERWISE INDICATED IN CONTRACT DRAWINGS OR APPROVED BY THE CAMBRIDGE WATER DEPARTMENT. WATER MAIN INSTALLED OUTSIDE RANGE OF 5'-7' COVER REQUIRES APPROVAL FROM CWO.
 - CONTRACTOR TO PROVIDE 1" CHLORINATION TAP AT ALL LOCATIONS WHERE PROP. WATER MAIN CONNECTS TO EXISTING WATER MAIN.
 - WATER GATES, BOXES, HYDRANTS SHALL BE INSTALLED TO EXISTING GRADE AND ADJUSTED TO FINAL GRADE ELEVATIONS DURING SURFACE RESTORATION WORK.
 - ALL NEW AND RELOCATED HYDRANTS TO BE FLOW TESTED IN COORDINATION WITH THE CWO AND PAINTED PER THE CWD SPECIFICATIONS. CONTRACTOR TO COORDINATE WITH CWO FOR PAINT SPECIFICATIONS/COLOR.
 - REFER TO ROADWAY SHEETS FOR FINAL GRADES. CONTRACTOR TO COORDINATE STRUCTURE ADJUSTMENT WITH NSTAR ELECTRIC, VERIZON, COMCAST, OR ANY OTHER UTILITY COMPANIES.
 - IN AREAS WHERE NEW OR RECENTLY INSTALLED GAS OR WATER ARE EXPOSED OR ADJACENT TO SEWER OR DRAIN TRENCH, SAND BACKFILLED SHALL BE IMMEDIATELY PLACED FOR UTILITY SUPPORT.
 - CONTRACTOR TO COORDINATE WITH UTILITY COMPANIES FOR PRIVATE UTILITIES THAT ARE REQUIRED TO BE LOWERED DUE TO THE GRADE CHANGE BETWEEN PROPOSED AND EXISTING ROADWAY.

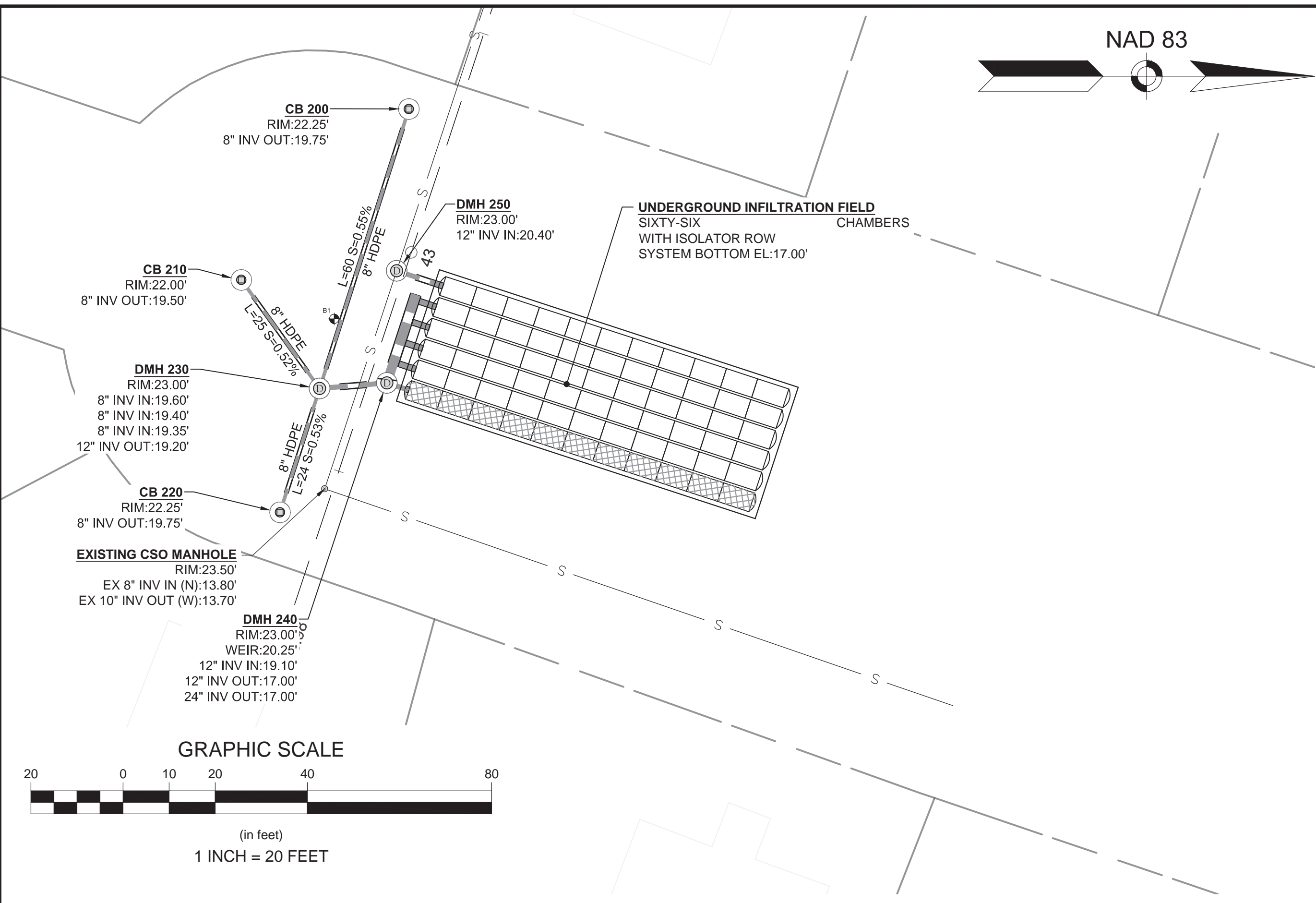


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 HDR ENGINEERING, INC.
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No.	Description	Date
	REVISIONS	

Scale	Client	Sheet
Date	CITY OF CAMBRIDGE, MA	UC-1
Job No.	Project	Total Sheets
Designed by	WILLARD STREET DRAINAGE IMPROVEMENTS PROJECT	
Drawn by		File No.
Checked by	UTILITY CONSTRUCTION SHEET - 1	
Approved by		



Subsurface Stormwater Management™

GENERAL NOTES

- STORMTECH LLC ("STORMTECH") REQUIRES INSTALLING CONTRACTORS TO USE AND UNDERSTAND STORMTECH'S LATEST INSTALLATION INSTRUCTIONS PRIOR TO BEGINNING SYSTEM INSTALLATION.
- OUR TECHNICAL SERVICES DEPARTMENT OFFERS INSTALLATION CONSULTATIONS TO INSTALLING CONTRACTORS. CONTACT OUR TECHNICAL SERVICES REPRESENTATIVE AT LEAST 30 DAYS PRIOR TO SYSTEM INSTALLATION TO ARRANGE A PRE-INSTALLATION CONSULTATION. OUR REPRESENTATIVES CAN THEN ANSWER QUESTIONS OR ADDRESS COMMENTS ON THE STORMTECH CHAMBER SYSTEM AND INFORM THE INSTALLING CONTRACTOR OF THE MINIMUM INSTALLATION REQUIREMENTS BEFORE BEGINNING THE SYSTEM'S CONSTRUCTION. CALL 1-888-892-2694 TO SPEAK TO A TECHNICAL SERVICE REPRESENTATIVE OR VISIT WWW.STORMTECH.COM TO RECEIVE A COPY OF OUR INSTALLATION INSTRUCTIONS.
- STORMTECH'S REQUIREMENTS FOR SYSTEMS WITH PAVEMENT DESIGN (ASPHALT, CONCRETE PAVERS, ETC.); MINIMUM COVER IS 18 INCHES NOT INCLUDING PAVEMENT. MAXIMUM COVER IS 96 INCHES INCLUDING PAVEMENT. FOR INSTALLATIONS THAT DO NOT INCLUDE PAVEMENT, WHERE RUTTING FROM VEHICLES MAY OCCUR, MINIMUM REQUIRED COVER IS 24 INCHES, MAXIMUM COVER IS 96 INCHES.
- THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE DESIGN ENGINEER.
- AASHTO M88 CLASS 2 NON-WOVEN GEOTEXTILE (FILTER FABRIC) MUST BE USED AS INDICATED IN THE PROJECT PLANS.
- STONE PLACEMENT BETWEEN CHAMBERS ROWS AND AROUND PERIMETER MUST FOLLOW INSTRUCTIONS AS INDICATED IN THE MOST CURRENT VERSION OF STORMTECH'S INSTALLATION INSTRUCTIONS.
- BACKFILLING OVER THE CHAMBERS MUST FOLLOW REQUIREMENTS AS INDICATED IN THE MOST CURRENT VERSION OF STORMTECH'S INSTALLATION INSTRUCTIONS.
- THE CONTRACTOR MUST REFER TO STORMTECH'S INSTALLATION INSTRUCTIONS FOR A TABLE OF ACCEPTABLE VEHICLE LOADS AT VARIOUS DEPTHS OF COVER. THIS INFORMATION IS ALSO AVAILABLE AT STORMTECH'S WEBSITE: WWW.STORMTECH.COM. THE CONTRACTOR IS RESPONSIBLE FOR PREVENTING VEHICLES THAT EXCEED STORMTECH'S REQUIREMENTS FROM TRAVELING ACROSS OR PARKING OVER THE STORMWATER SYSTEM. TEMPORARY FENCING, WARNING TAPE AND APPROPRIATELY LOCATED SIGNS ARE COMMONLY USED TO PREVENT UNAUTHORIZED VEHICLES FROM ENTERING SENSITIVE CONSTRUCTION AREAS.
- THE CONTRACTOR MUST APPLY EROSION AND SEDIMENT CONTROL MEASURES TO PROTECT THE STORMWATER SYSTEM DURING ALL PHASES OF SITE CONSTRUCTION PER LOCAL CODES AND DESIGN ENGINEER'S SPECIFICATIONS.
- STORMTECH PRODUCT WARRANTY IS LIMITED. SEE CURRENT PRODUCT WARRANTY FOR DETAILS. TO ACQUIRE A COPY CALL STORMTECH AT 1-888-892-2694 OR VISIT WWW.STORMTECH.COM.

NOMINAL CHAMBER SPECIFICATIONS
SIZE (W x H x INSTALLED LENGTH)
CHAMBER STORAGE
MINIMUM INSTALLED STORAGE
WEIGHT

51.0" x 30.0" x 85.4"
45.9 CUBIC FEET
74.9 CUBIC FEET
75 lbs.

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART#	STUB	A	B	C
SC740PE24B	Ø1150 (mm)	10.90" (277 mm)	18.50" (470 mm)	N/A
SC740PE24T	Ø1150 (mm)	10.90" (277 mm)	N/A	0.60" (15 mm)
SC740PE24B	Ø1200 (mm)	12.20" (310 mm)	16.50" (419 mm)	N/A
SC740PE24T	Ø1200 (mm)	12.20" (310 mm)	N/A	0.60" (15 mm)
SC740PE24B	Ø1250 (mm)	13.40" (340 mm)	14.50" (368 mm)	N/A
SC740PE24T	Ø1250 (mm)	13.40" (340 mm)	N/A	0.50" (13 mm)
SC740PE24B	Ø1300 (mm)	14.70" (373 mm)	12.20" (310 mm)	N/A
SC740PE24T	Ø1300 (mm)	14.70" (373 mm)	N/A	1.20" (30 mm)
SC740PE24B	Ø1375 (mm)	16.40" (417 mm)	9.00" (229 mm)	N/A
SC740PE24T	Ø1375 (mm)	16.40" (417 mm)	N/A	1.30" (33 mm)
SC740PE24B	Ø1450 (mm)	18.70" (475 mm)	5.00" (127 mm)	N/A
SC740PE24T	Ø1450 (mm)	18.70" (475 mm)	N/A	1.60" (41 mm)
SC740PE24B	Ø1600 (mm)	18.50" (470 mm)	N/A	0.10" (3 mm)

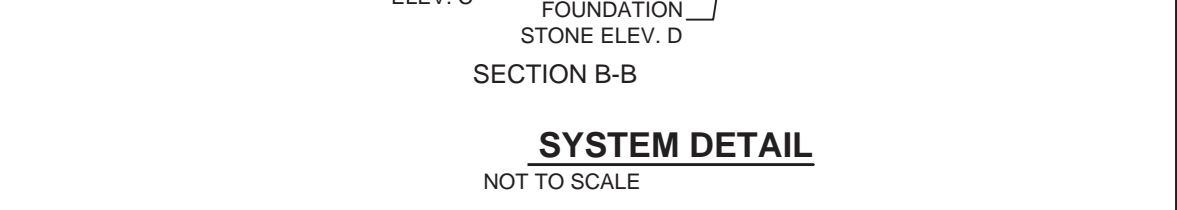
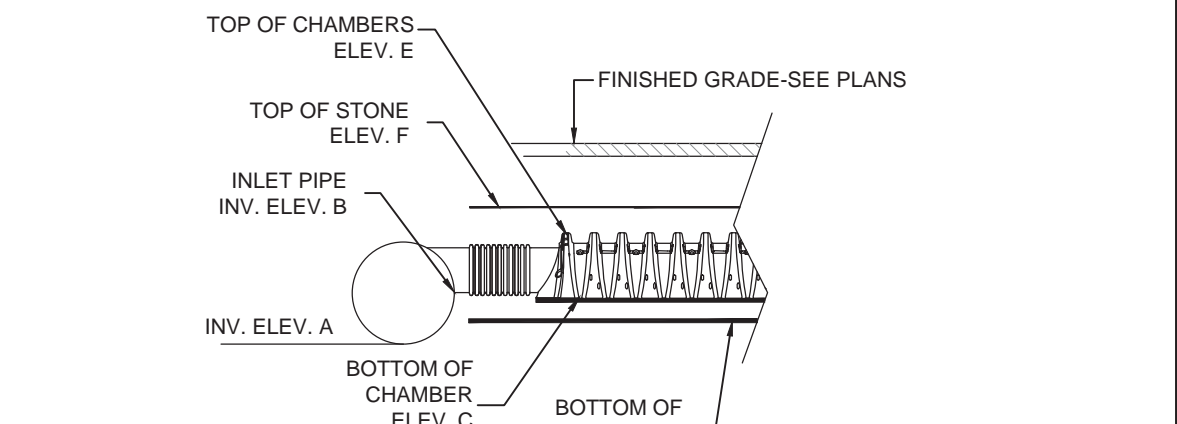
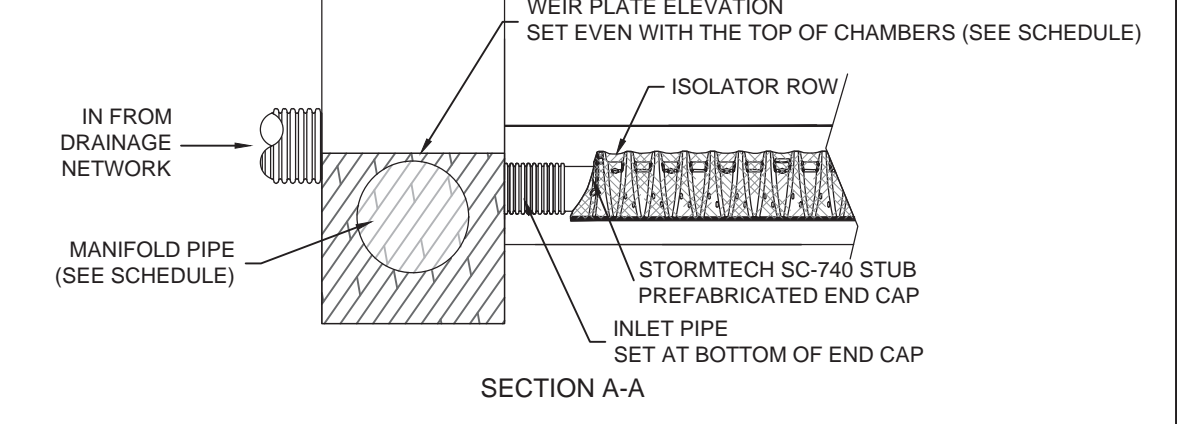
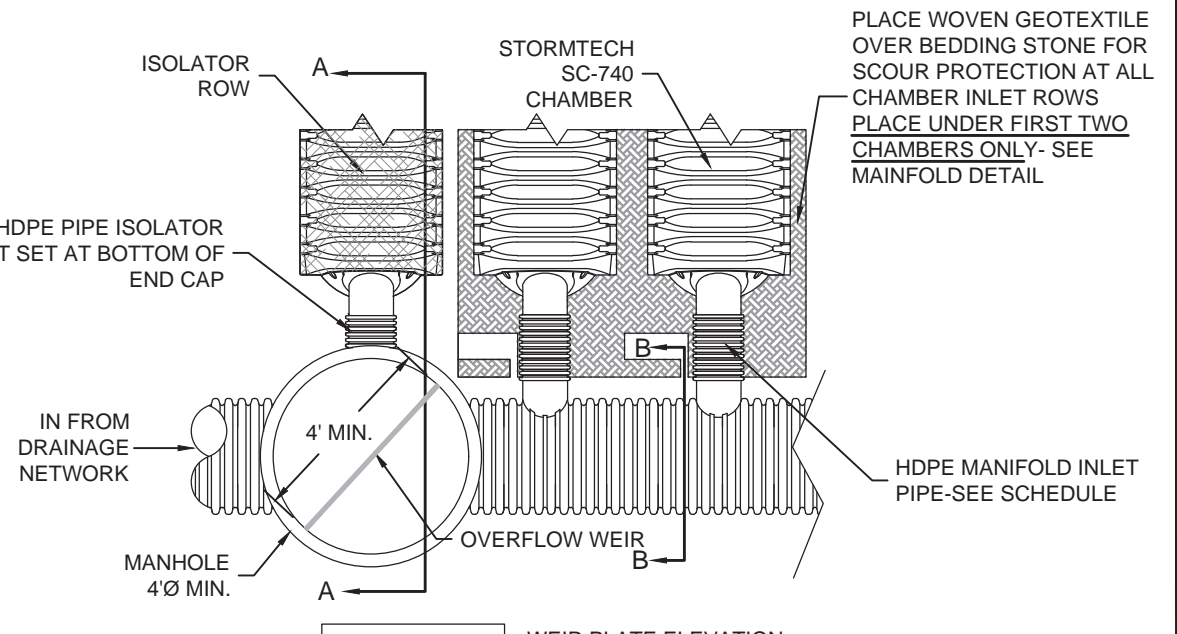
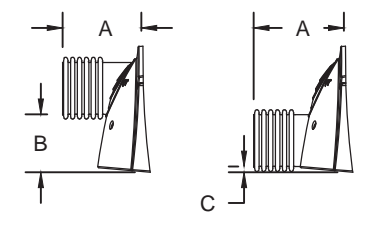
NOTE: ALL DIMENSIONS ARE NOMINAL

ALL STUBS, EXCEPT FOR THE SC740PE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

*FOR THE SC740PE24B THE 24" STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75". BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

TECHNICAL DETAILS

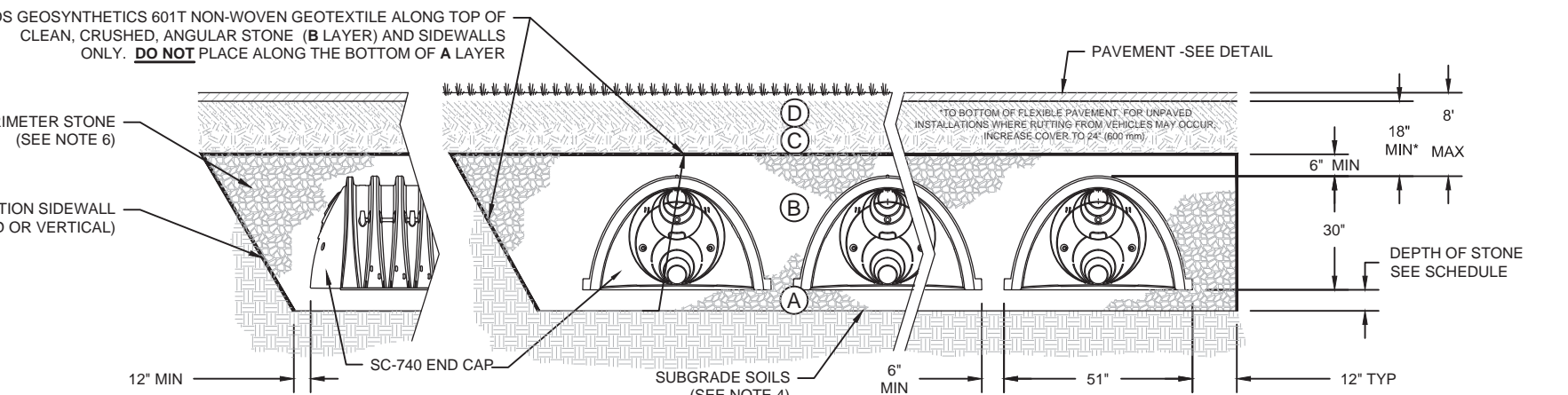
NOT TO SCALE



ACCEPTABLE FILL MATERIALS: CHAMBER SYSTEMS

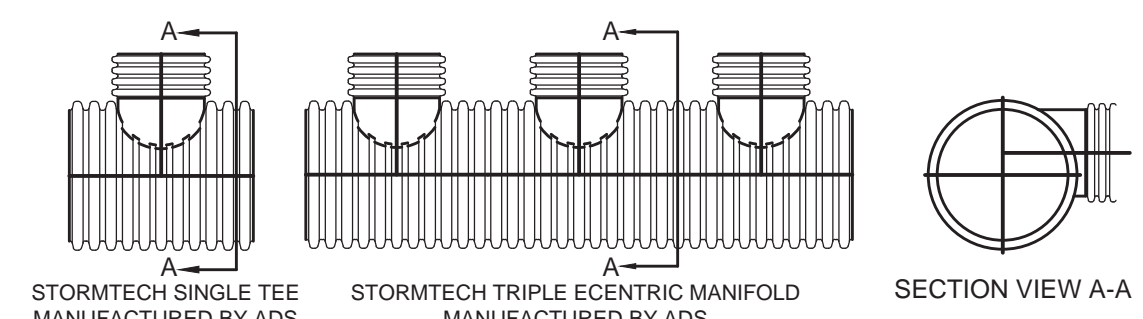
MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145 ¹ A-1, A-2, A-3 OR AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL-GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M41 ¹ 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 ¹ 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ¹

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) MAX LIFTS USING TWO FULL COVERS WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



CHAMBER TYPICAL CROSS SECTION

NOT TO SCALE



STUB SIZE	48"	42"	36"	30"	24"	18"	15"	12"	10"	8"	6"
12"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL
8"	-	-	-	-	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL
6"	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL	AVAIL

AVAIL - STANDARD HEADERS AVAILABLE
MANIFOLDS ARE DESIGNED TO BE COUPLED TO STORMTECH PREFABRICATED END CAPS. WHEN USING STANDARD END CAPS, CORRUGATE DPIPE UP TO 10 INCHES CAN BE INSERTED DIRECTLY INTO THE END CAP. FOR 12" INLET PIPES, A CORRUGATED TO SMOOTH PIPE ADAPTER IS REQUIRED.

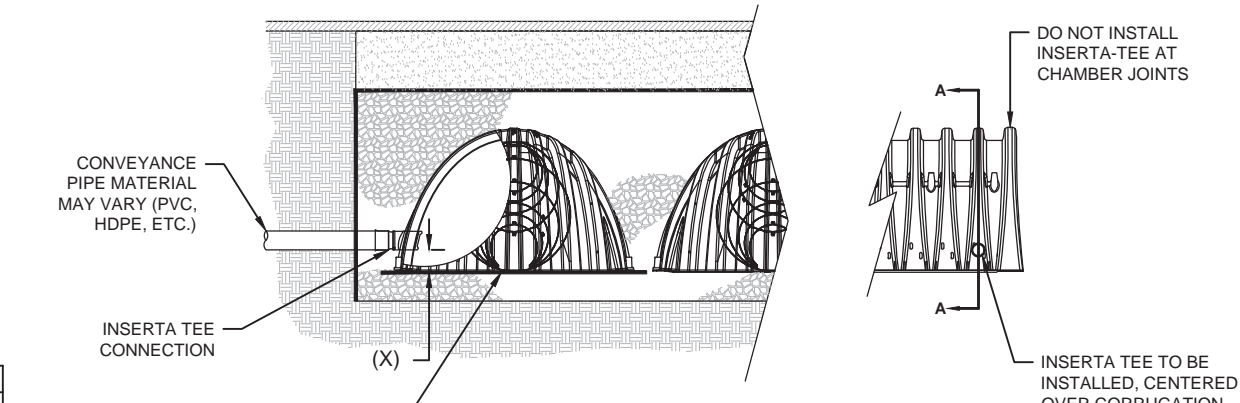
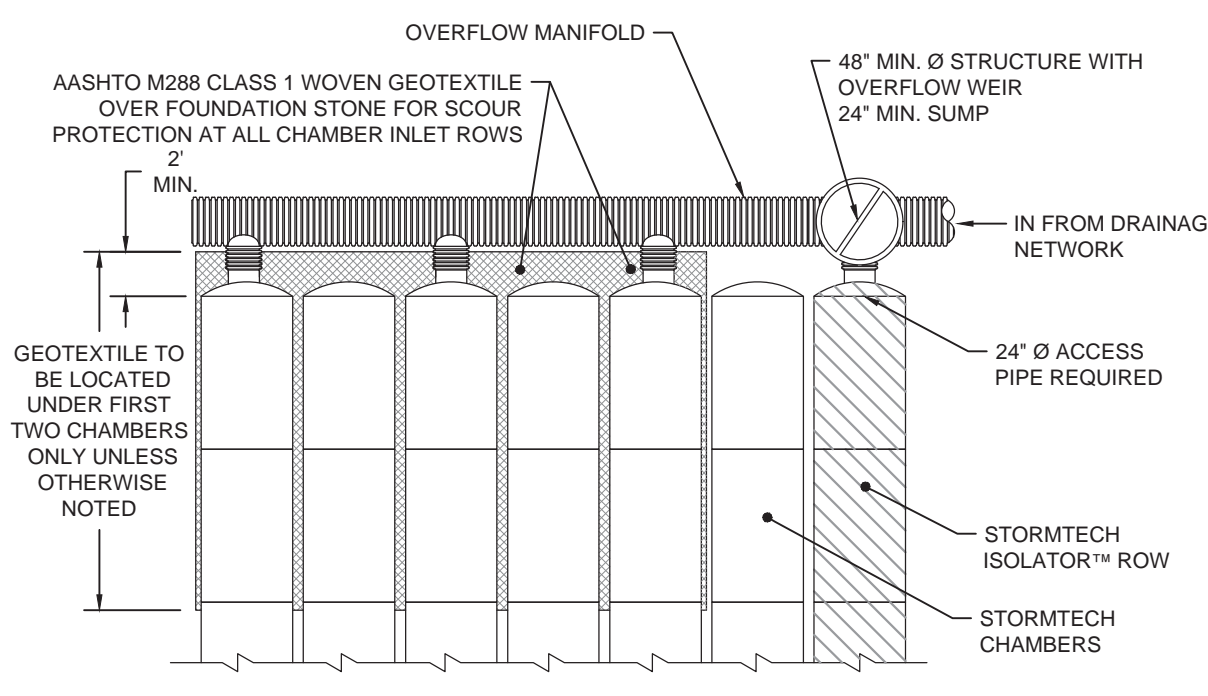
ADS MANIFOLD DETAIL

NOT TO SCALE



ISOLATOR ROW MANIFOLD DETAIL

NOT TO SCALE



INSERTA TEE SIDE CONNECTION DETAIL

NOT TO SCALE

CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3600	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)

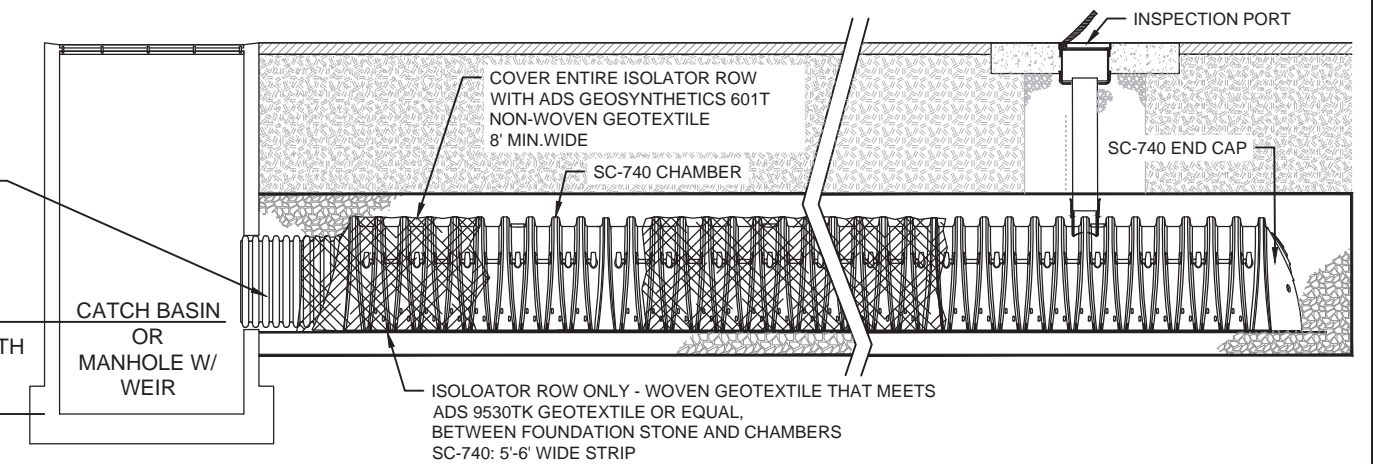
INSPECTION & MAINTENANCE

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

NOTES

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

STORMTECH OR APPROVED EQUAL TO BE INSTALLED BY THE CONTRACTOR. STORMTECH DEVICES SHOWN FOR THIS SUBMISSION.



ISOLATOR ROW DETAIL

NOT TO SCALE

FOR STORMTECH INFORMATION CALL 1-888-892-2694

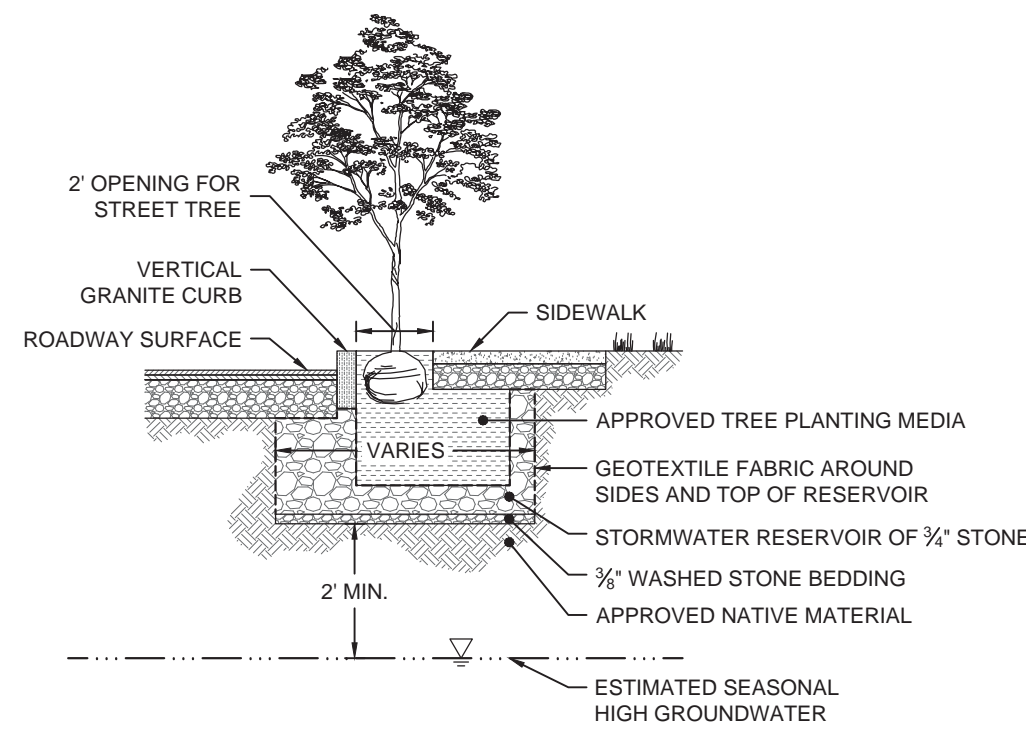
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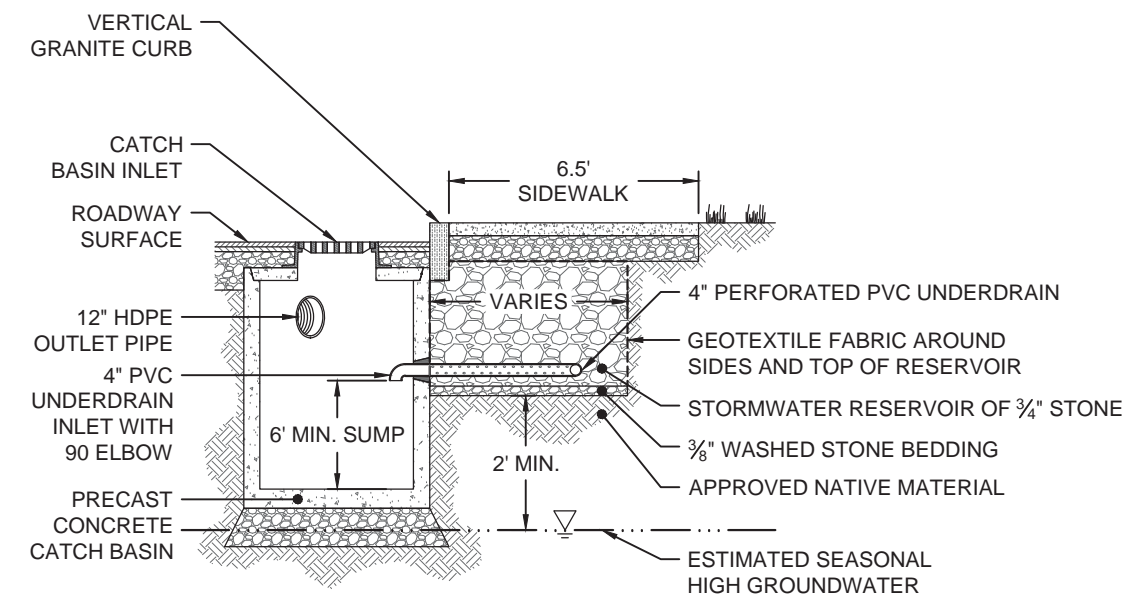
HDR ENGINEERING, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MASSACHUSETTS 02110-2378
(617) 357-7700

No.	Description	Date	Checked by	Approved by

Client	Scale	City of Cambridge, MA	Sheet	GI-2
Project	Date	Willard Street Drainage Improvement Project	Total Sheets	
	Job No.			
	Designed by			
	Drawn by			
	Date			
	Checked by			
	Approved by			

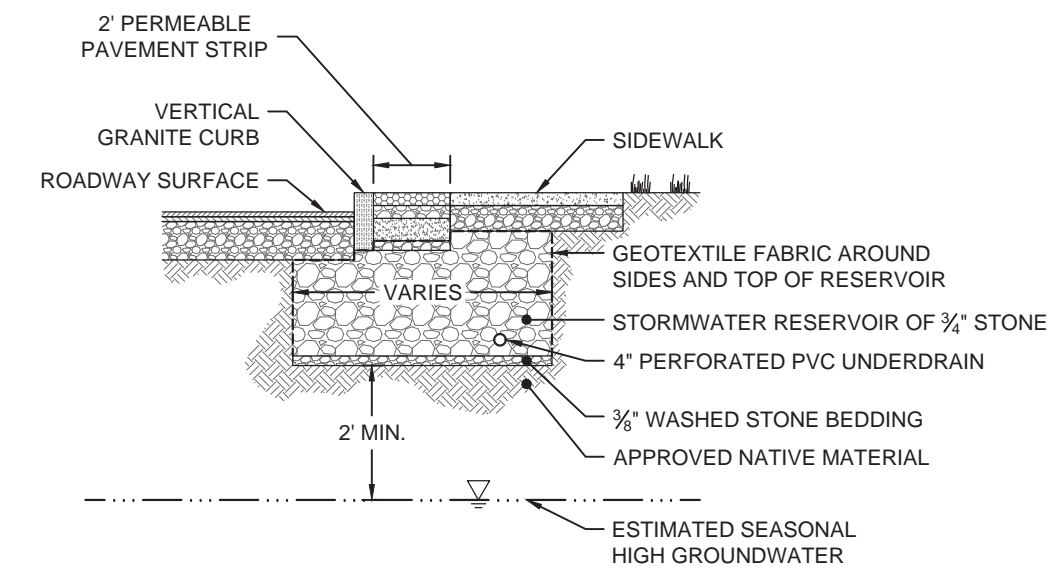


SIDEWALK TREE TRENCH TYPICAL SECTION
NOT TO SCALE

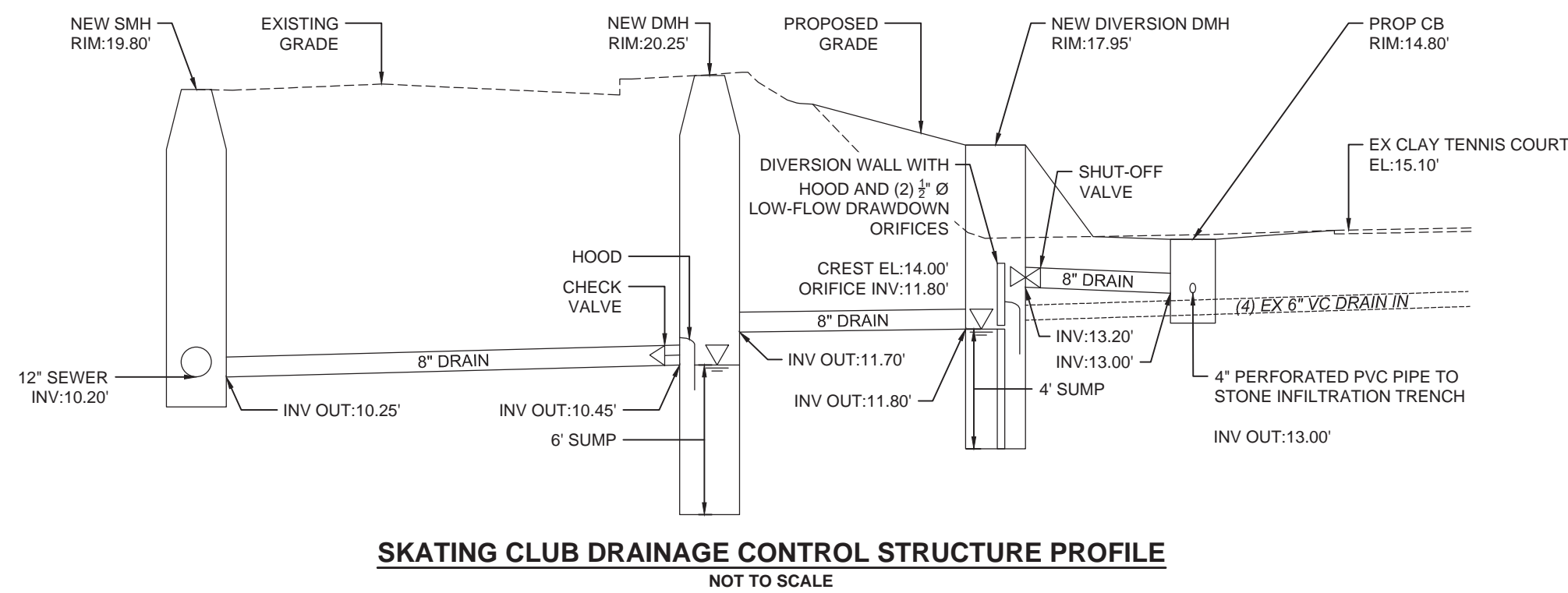


SUBSURFACE GRAVEL TRENCH CONTROL STRUCTURE SECTION
NOT TO SCALE

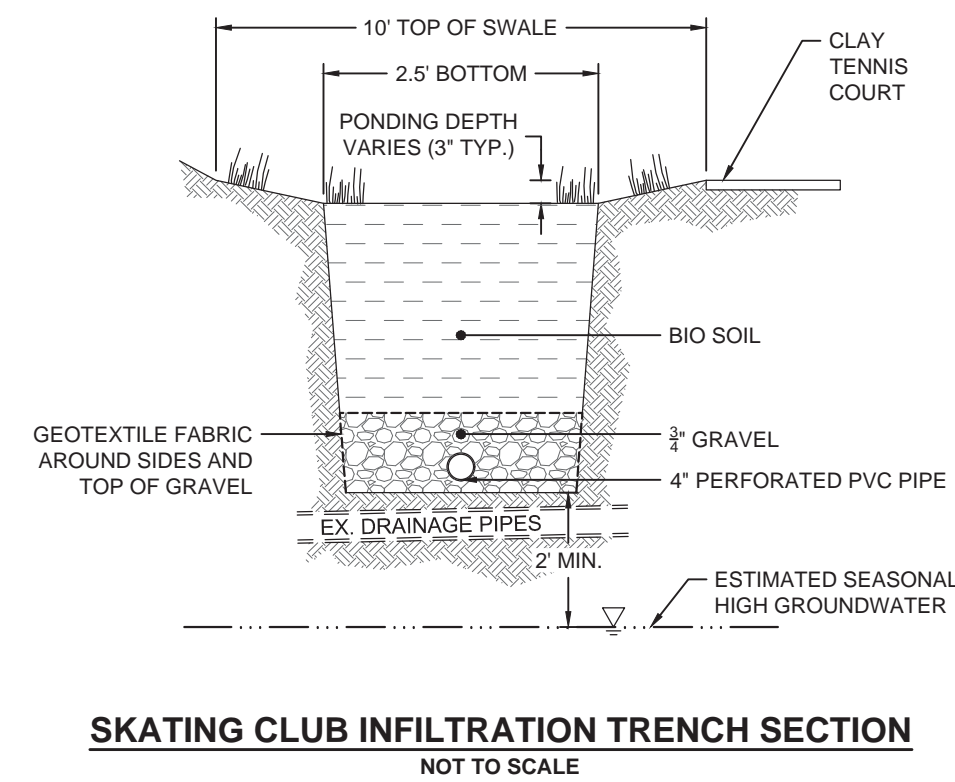
Green Infrastructure Schedule of Elevations				
BMP	CB RIM	GRAVEL BOTTOM	4" INV	12" INV
STT 1	19.58	15.50	16.00	17.05
STT 2	19.53	15.50	16.00	17.00
STT 3	19.86	15.75	16.25	17.35
UIT 1	20.37	16.90	17.40	17.85
UIT 2	21.23	17.75	18.25	18.70
UIT 3	22.13	18.65	19.15	19.60
UIT 4	23.01	19.55	20.05	20.50



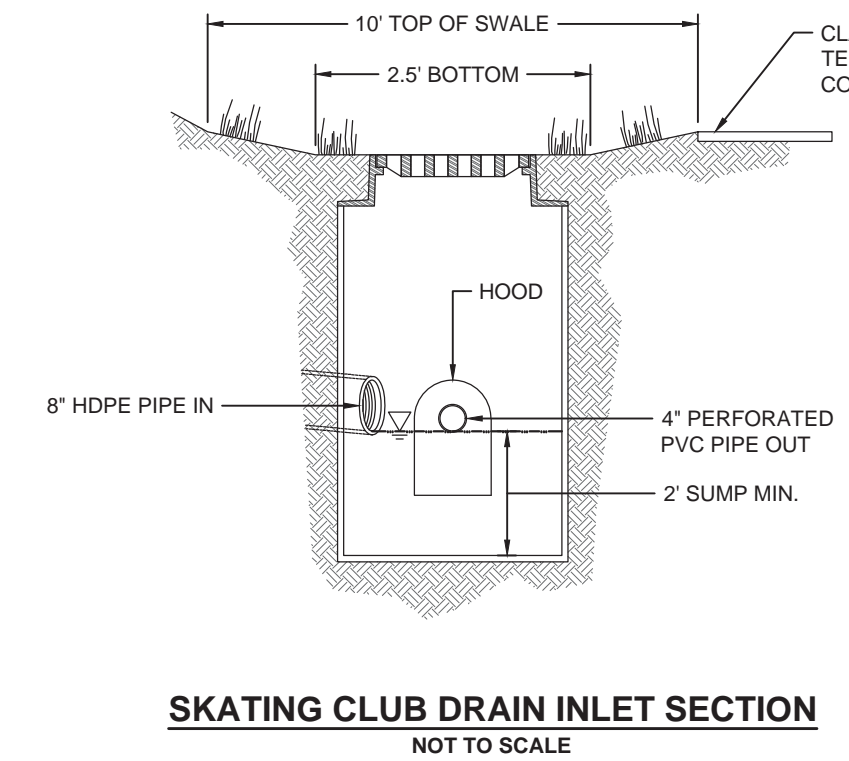
UNDERGROUND INFILTRATION TRENCH TYPICAL SECTION
NOT TO SCALE



SKATING CLUB DRAINAGE CONTROL STRUCTURE PROFILE
NOT TO SCALE



SKATING CLUB INFILTRATION TRENCH SECTION
NOT TO SCALE

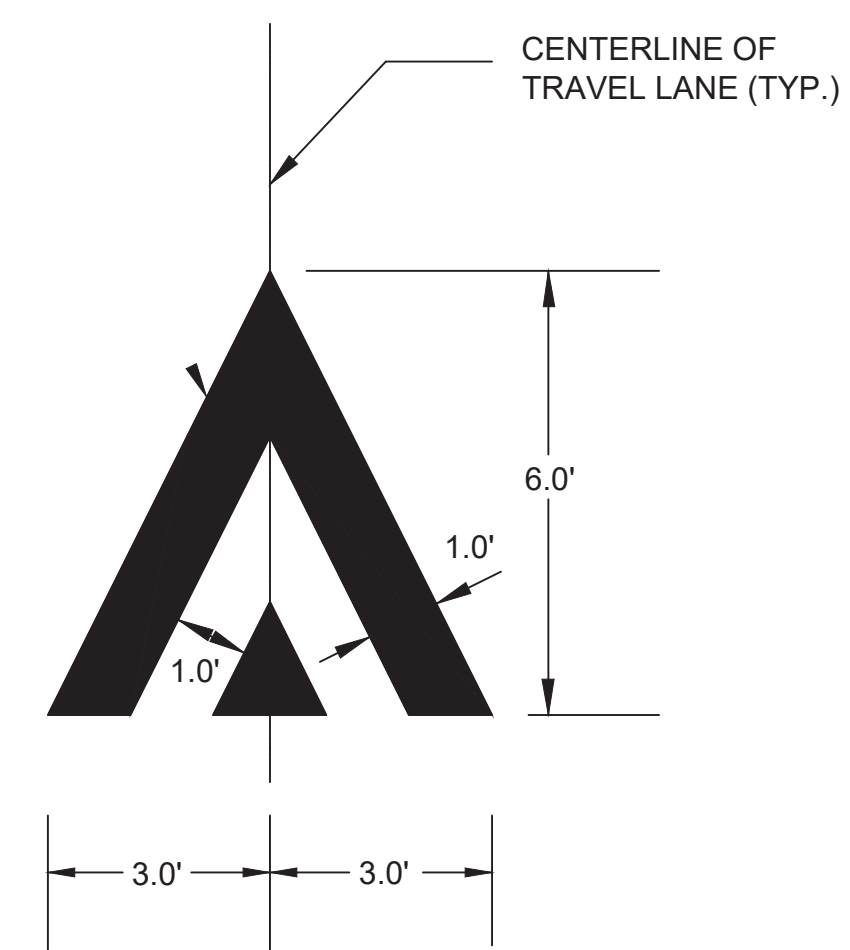


SKATING CLUB DRAIN INLET SECTION
NOT TO SCALE

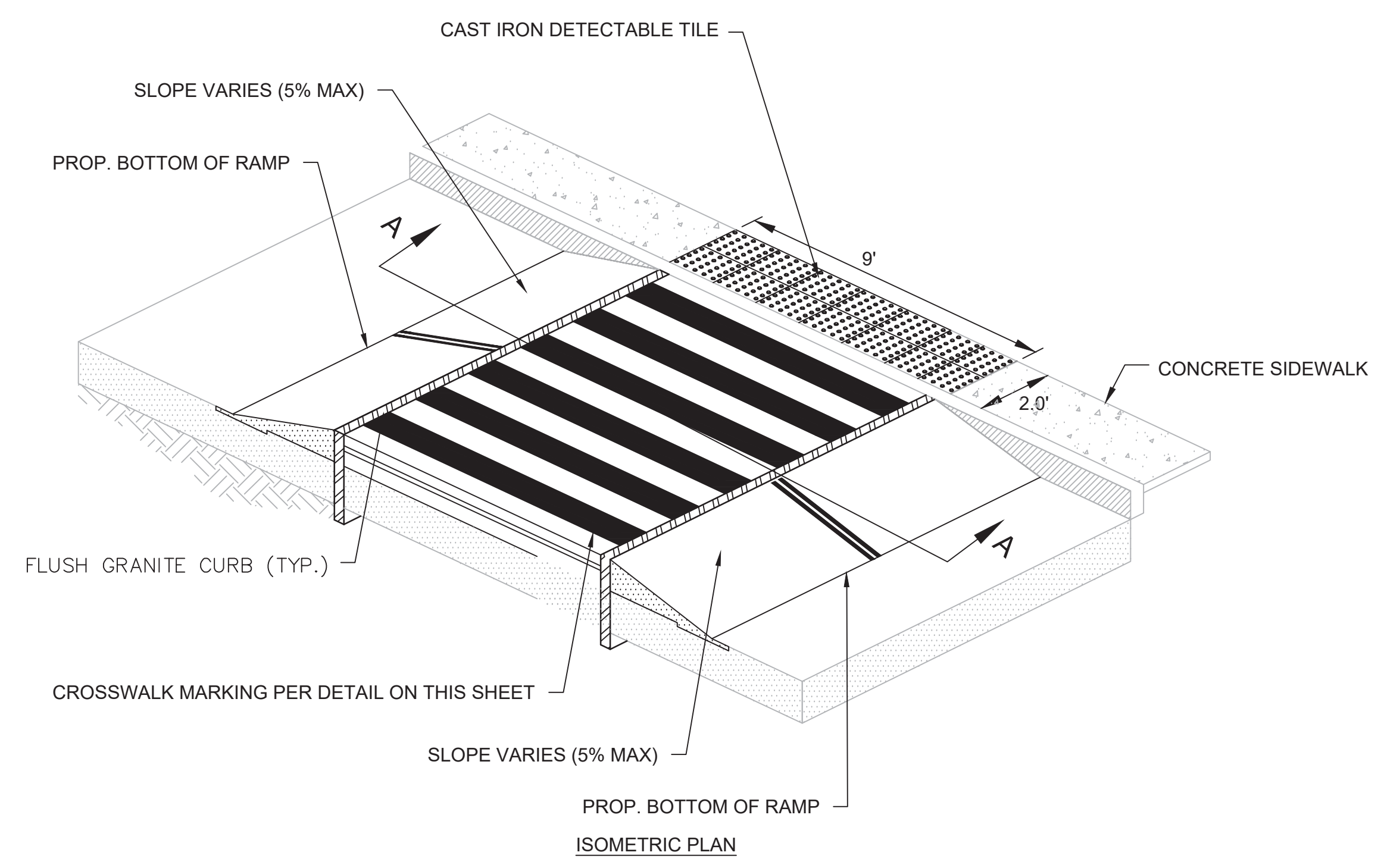
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No.	Description	Date	Checked by	Approved by
	REVISIONS			

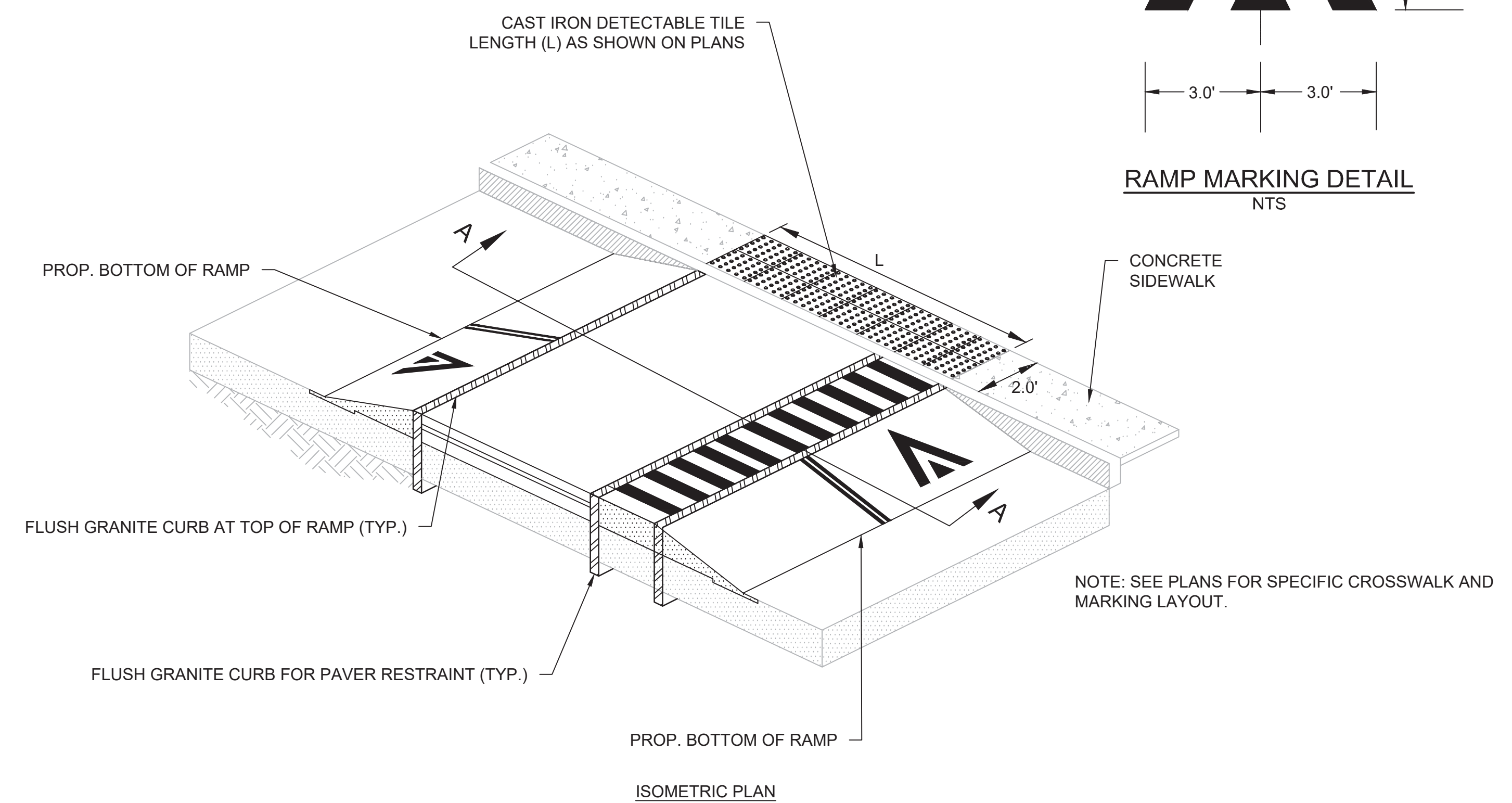
Client	CITY OF CAMBRIDGE, MA	Sheet	GI-3
Project	WILLARD STREET DRAINAGE IMPROVEMENT PROJECT	Total Sheets	
Drawing		File No.	



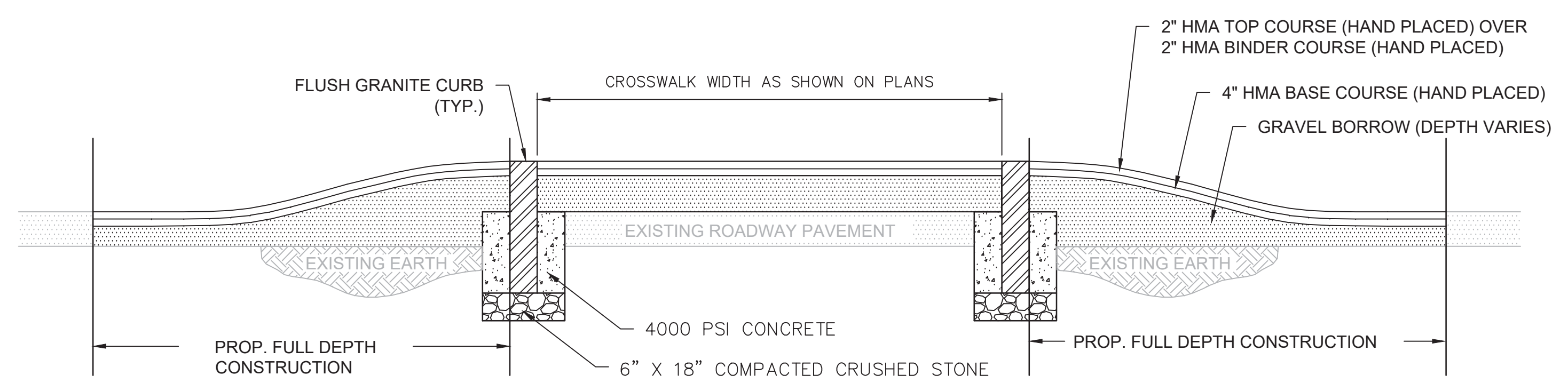
RAMP MARKING DETAIL
NTS



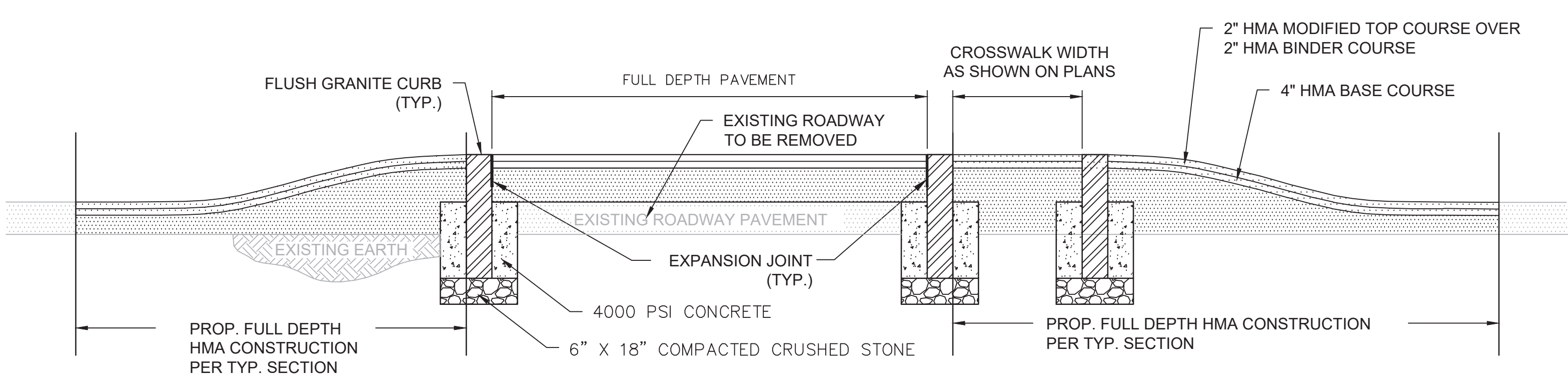
ISOMETRIC PLAN



ISOMETRIC PLAN



SECTION A-A
RAISED SIDE STREET TREATMENT
NTS



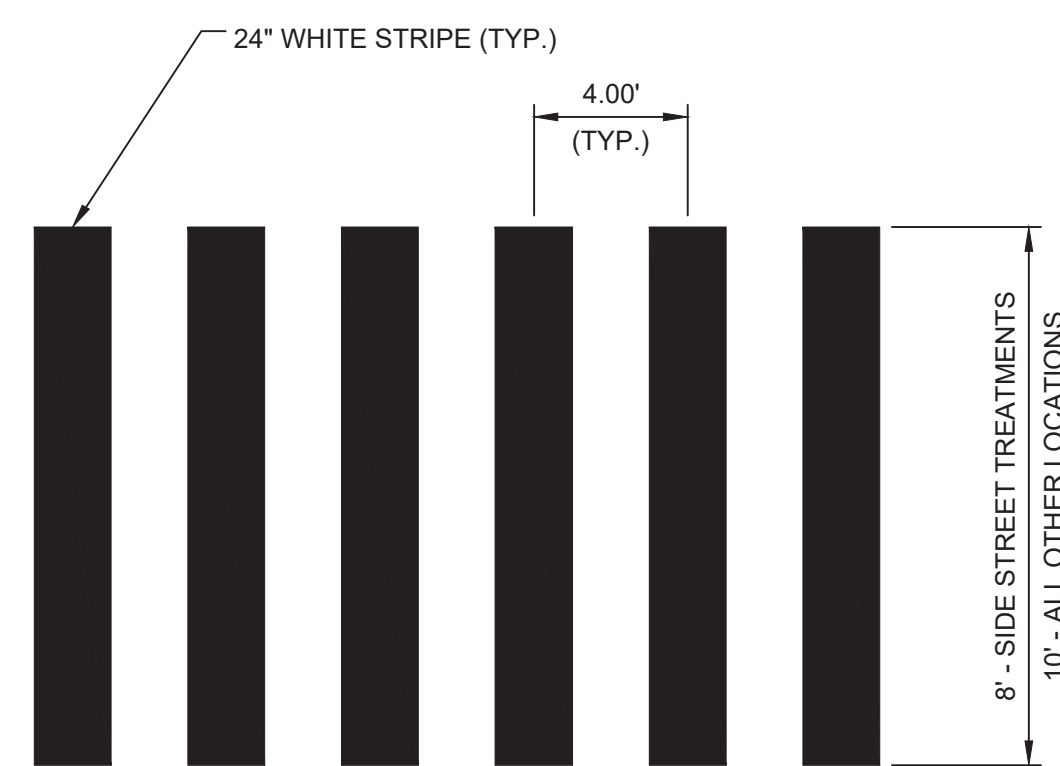
SECTION A-A
RAISED INTERSECTION WITH CROSSWALK DETAILS
(ONE CROSSWALK SHOWN - TWO CROSSWALKS SIMILAR)
NTS

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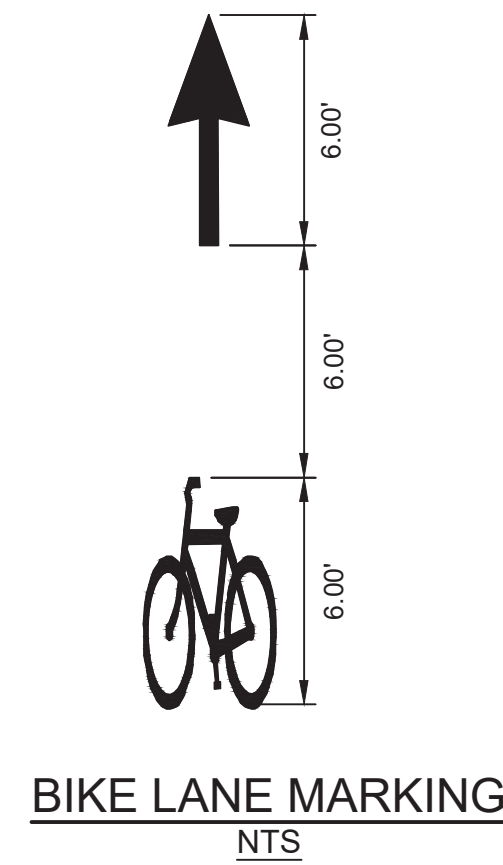


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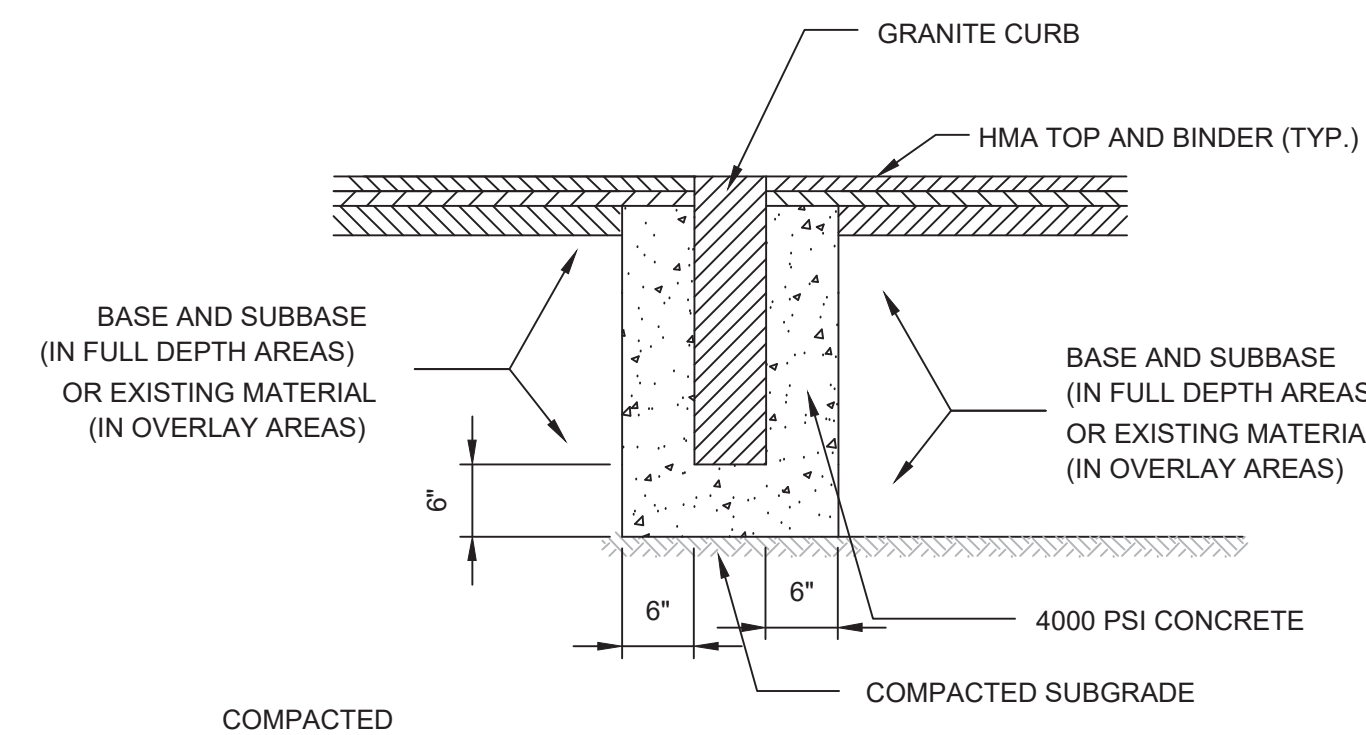
AS NOTED		Scale	Client	Sheet
AUGUST 2017		Date	CITY OF CAMBRIDGE, MA	RG-3
		Job No.	Project	Total Sheets
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		Drawn by	Drawing	File No.
No.	Description	Date	CONSTRUCTION DETAILS - 2	
	REVISIONS			
		Checked by		
		Approved by		



CROSSWALK MARKING
NTS

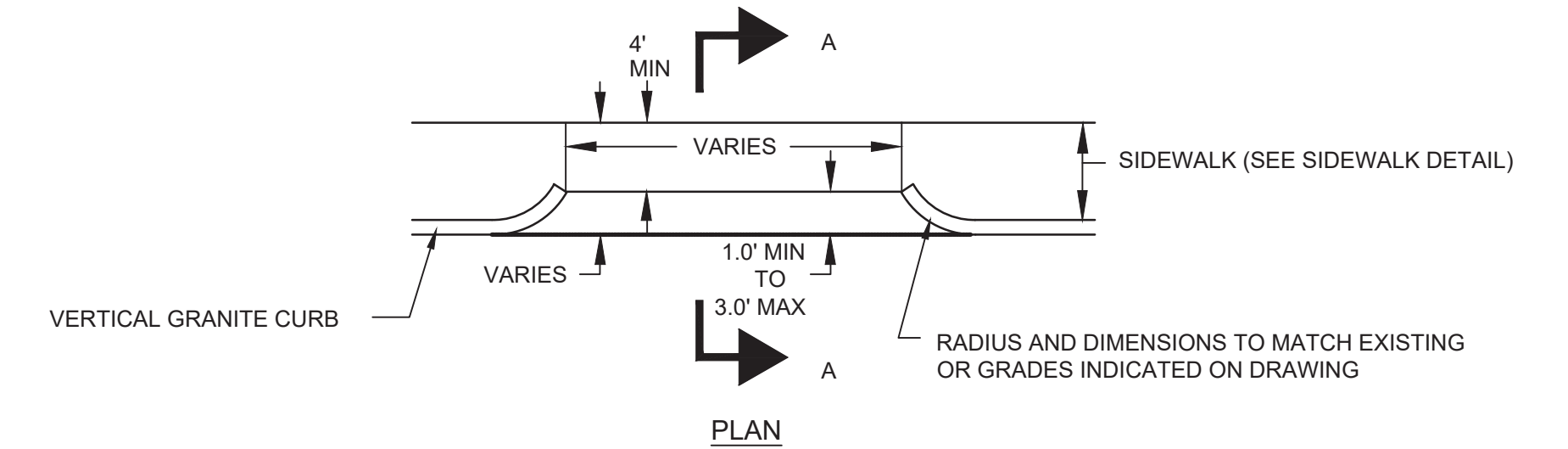
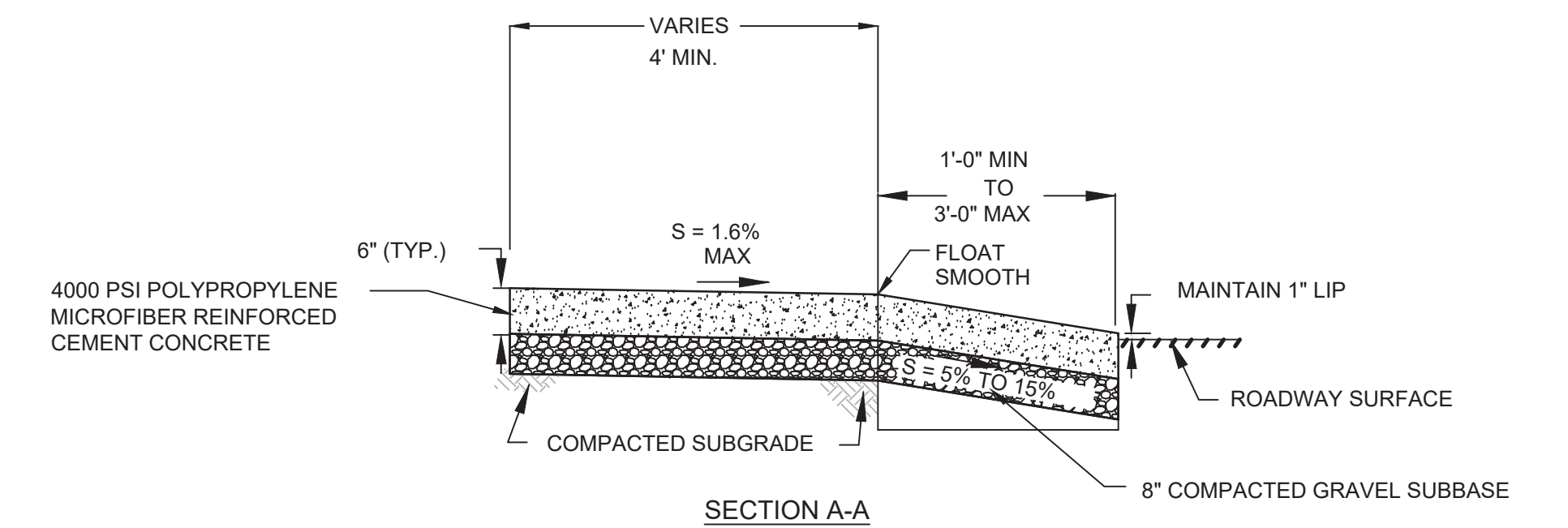


BIKE LANE MARKING
NTS

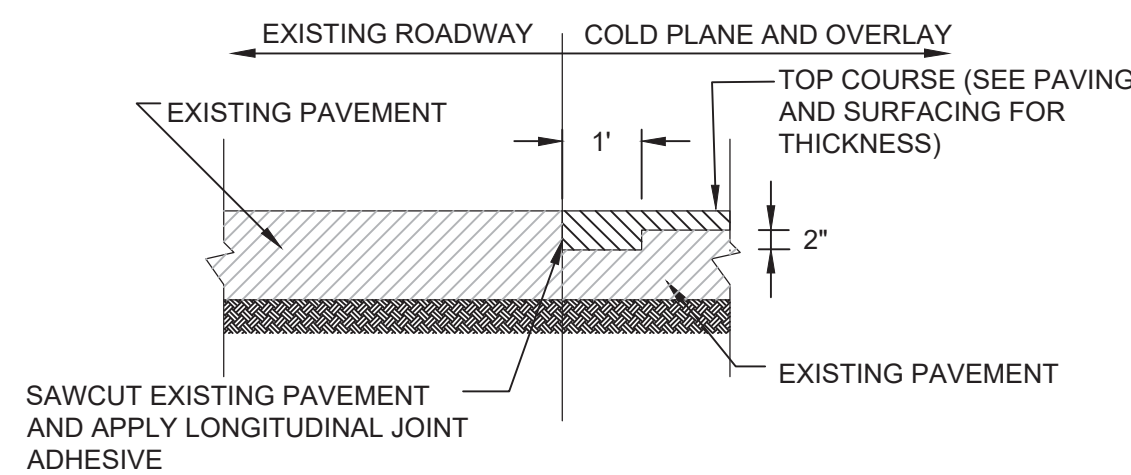


NOTE:
1. EXISTING MATERIAL SHALL BE USED IF DEEMED SUITABLE BY THE ENGINEER.

FLUSH GRANITE CURB INSTALLATION
NTS

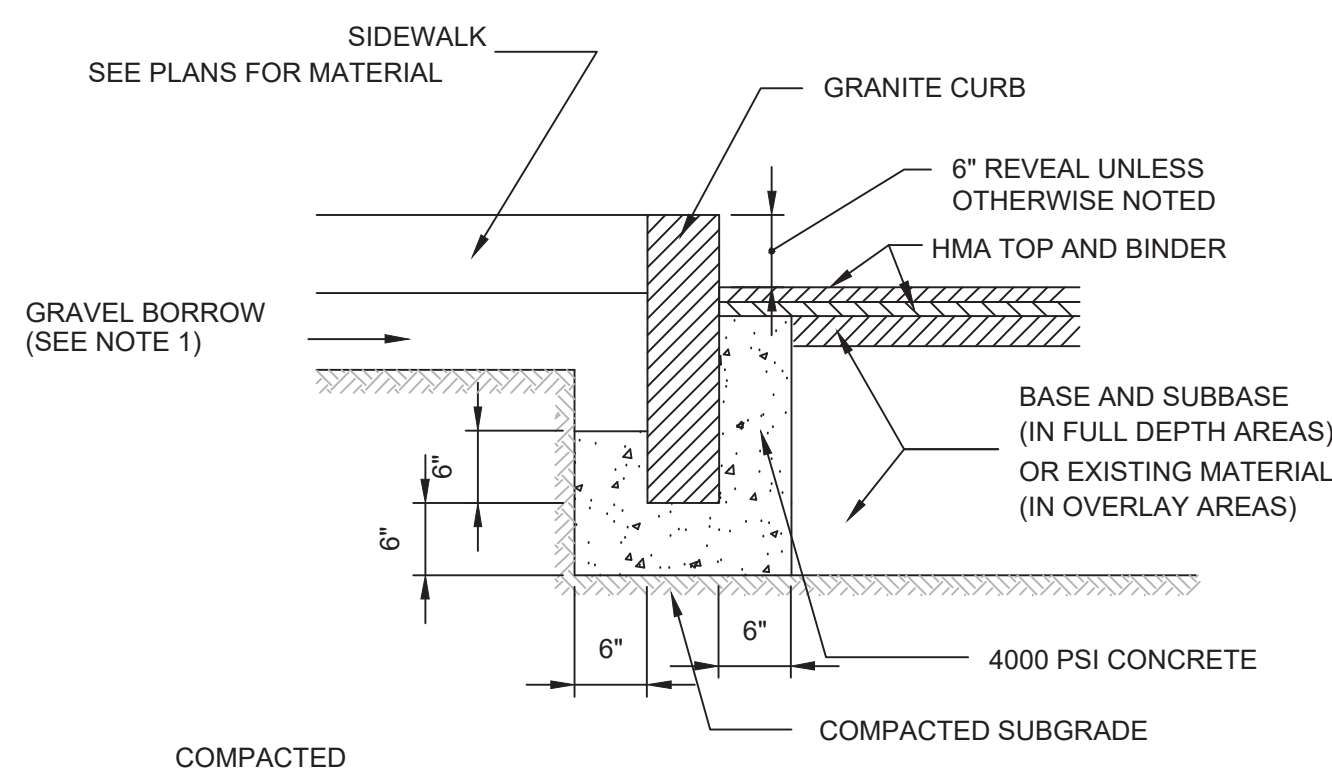


CONCRETE DRIVEWAY APRON
NTS



NOTES:
1. CLEAN ALL COLD PLANED SURFACES BEFORE APPLYING JOINT ADHESIVE AND FINAL PAVEMENT

MATCH EXISTING PAVEMENT - OVERLAY
NTS



NOTE:
1. EXISTING MATERIAL SHALL BE USED IF DEEMED SUITABLE BY THE ENGINEER.

GRANITE CURB INSTALLATION
NTS

PRUNE PER ISA STANDARDS. REMOVE DEAD & DAMAGED BRANCHES. TIE BRANCHES UP TO AVOID DAMAGE FROM CONSTRUCTION EQUIPMENT.

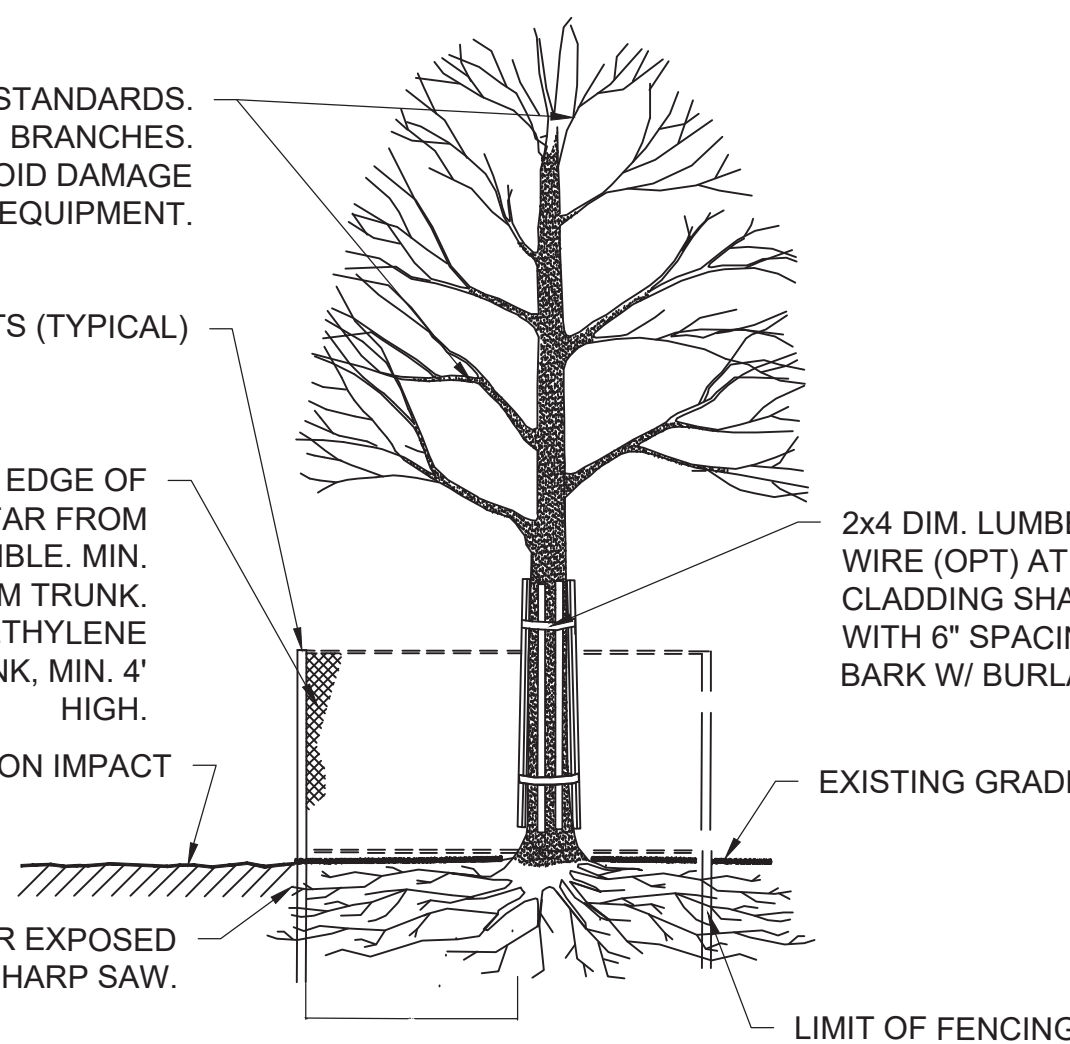
WOODEN OR STEEL POSTS (TYPICAL)

INSTALL FENCING AT EDGE OF DRIPLINE OR AS FAR FROM TRUNK AS POSSIBLE. MIN. DISTANCE IS 6" FROM TRUNK. MAY BE POLYETHYLENE FENCE OR CHAIN LINK, MIN. 4' HIGH.

2x4 DIM. LUMBER ATTACHED W/ METAL WIRE (OPT) AT 2 LOCATIONS (MIN.). CLADDING SHALL BE 8" HIGH WITH 6" SPACING OF BOARDS. WRAP BARK W/ BURLAP PRIOR TO ARMORING.

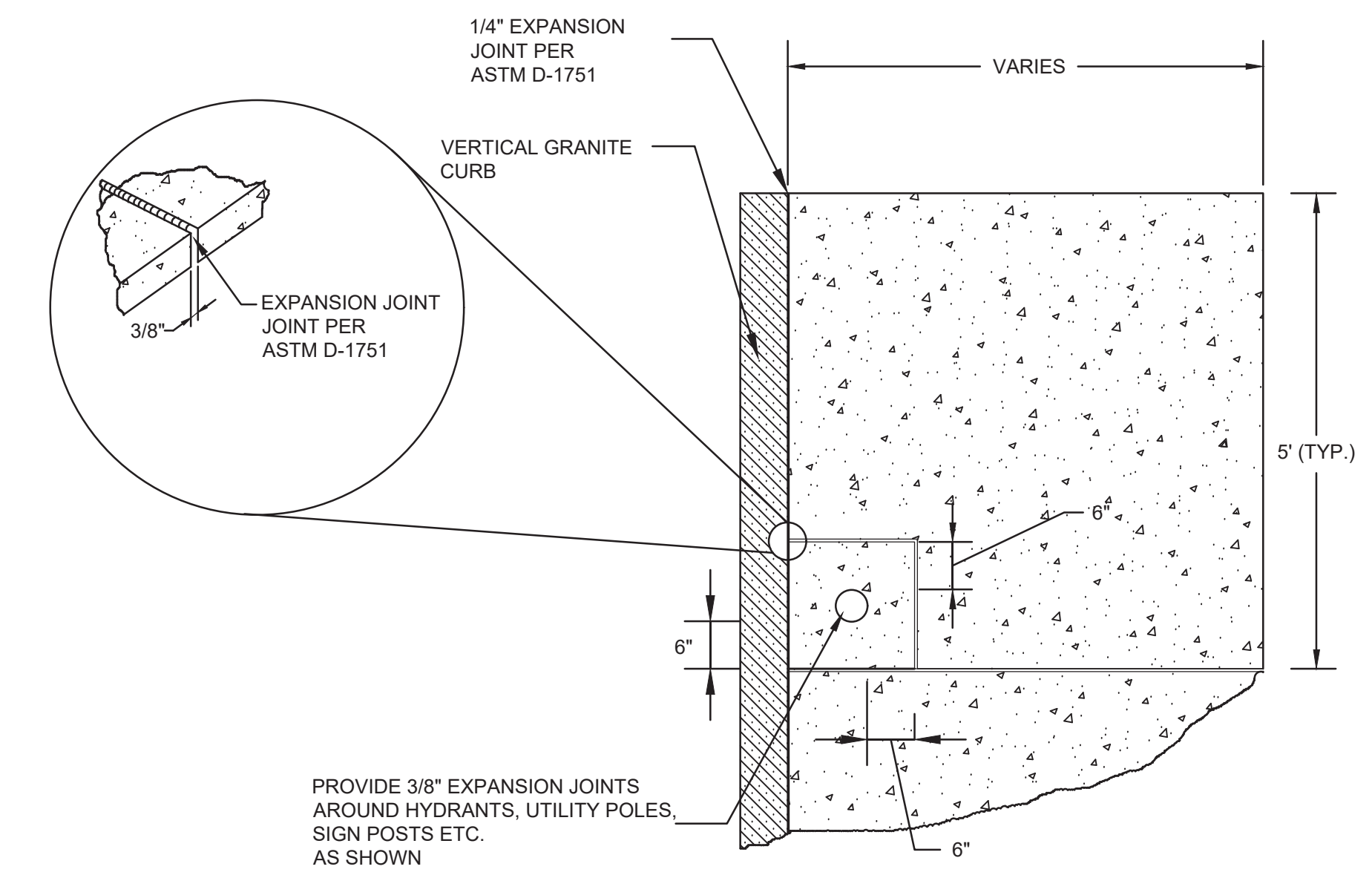
ZONE OF CONSTRUCTION IMPACT

PRUNE DAMAGED OR EXPOSED ROOTS WITH A SHARP SAW.



PROPOSED TREE PROTECTION
NOT TO SCALE

NOTES:
1. NO STORAGE OF EQUIPMENT OR STOCKPILING OF MATERIALS WITHIN DRIPLINE.
2. COORDINATE WITH LOCAL CITY ARBORIST ON PRUNING OR ROOT CUTTING.



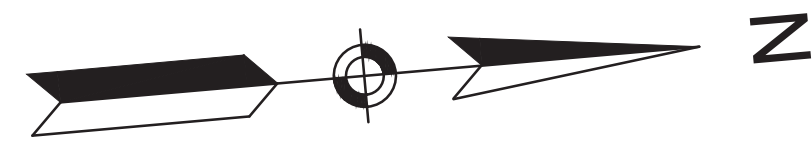
PROVIDE 3/8" EXPANSION JOINTS AROUND HYDRANTS, UTILITY POLES, SIGN POSTS ETC. AS SHOWN


SIDEWALK EXPANSION JOINT DETAIL
NTS

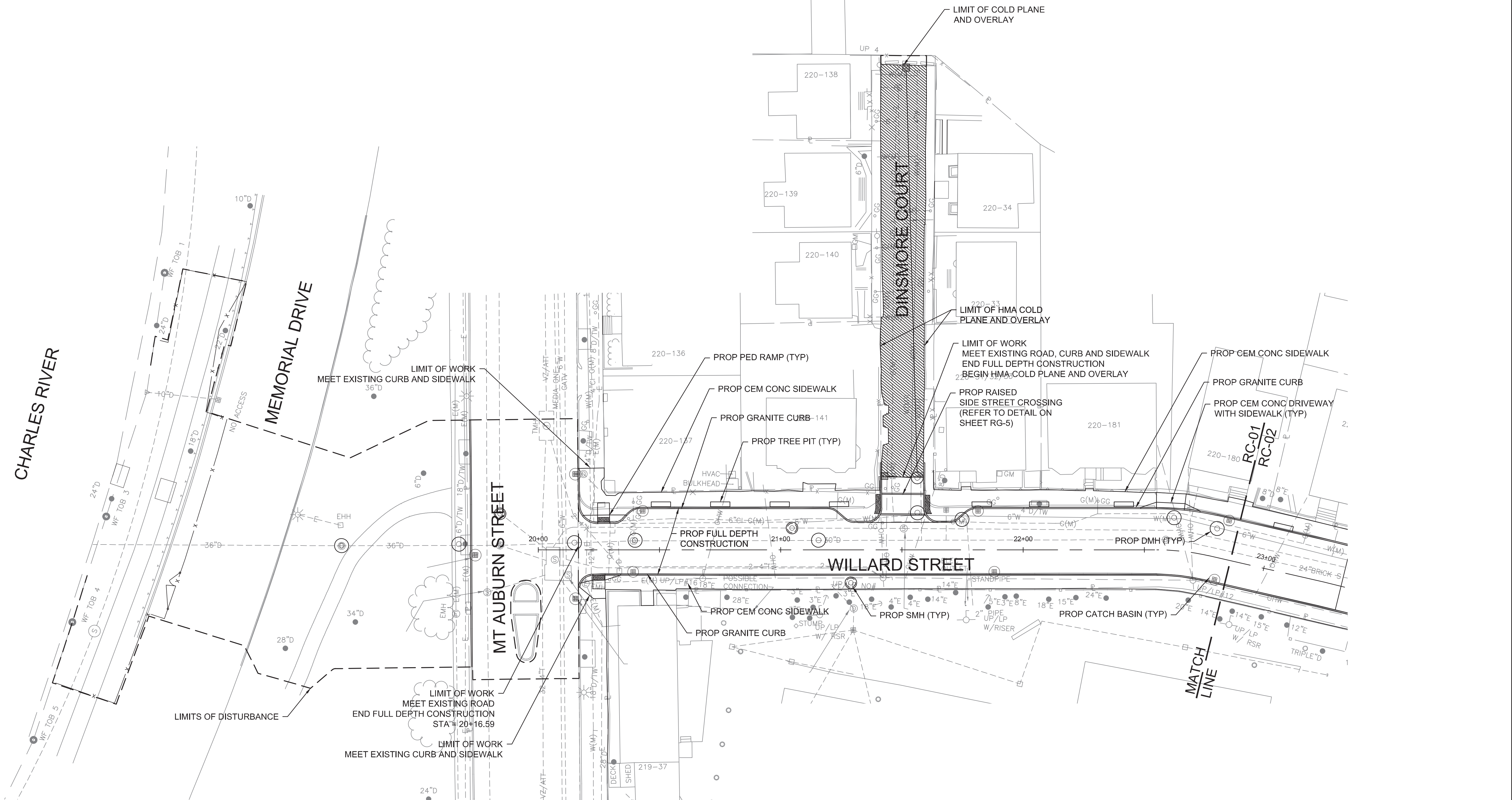
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AS NOTED	Scale	Client
AUGUST 2017	Date	CITY OF CAMBRIDGE, MA
	Job No.	Project
	Designed by	WILLARD STREET DRAINAGE IMPROVEMENTS PROJECT
	Drawn by	CONSTRUCTION DETAILS -1
No.	Description	Date
	REVISIONS	Checked by
		Approved by

Sheet	RG-2
Total Sheets	
File No.	



LEGEND
 HMA COLD PLANE AND OVERLAY



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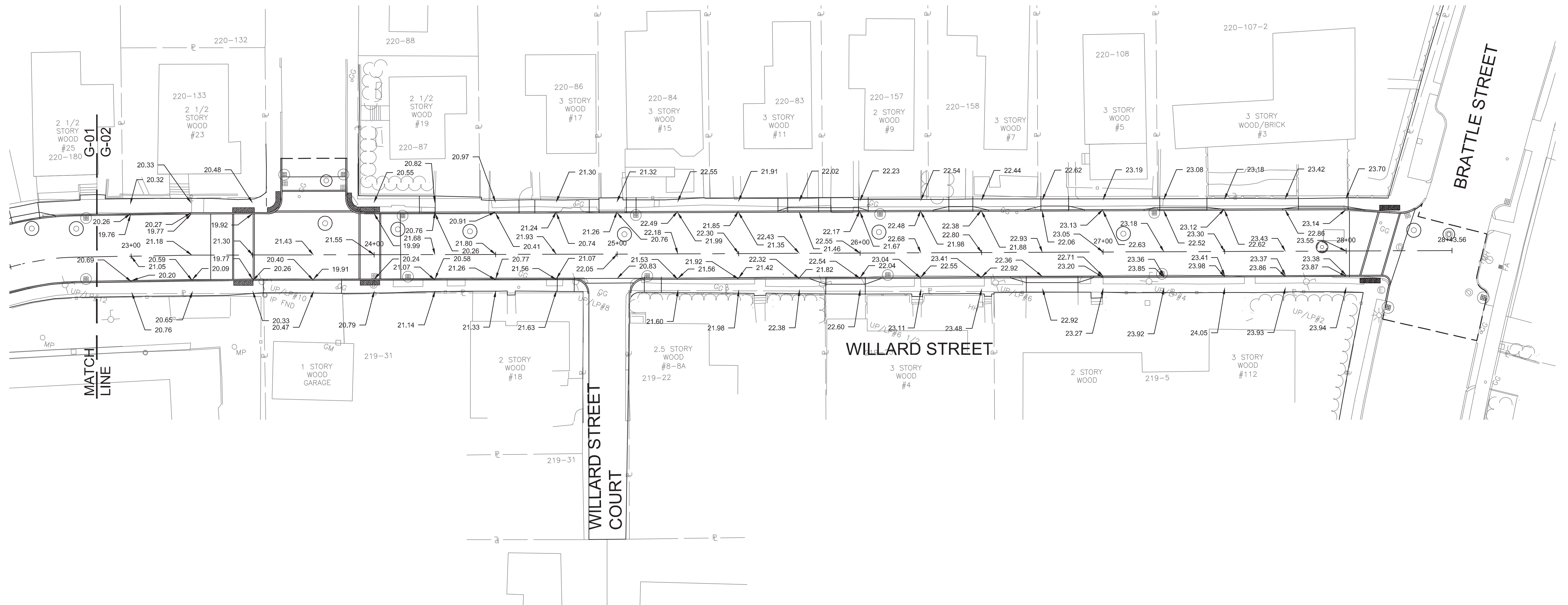
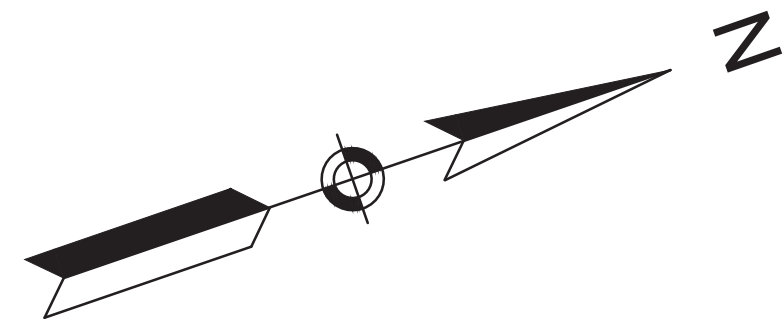


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Scale	
Date	
Job No.	
Designed by	
Drawn by	
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Approved by	

Client	CITY OF CAMBRIDGE, MA	Sheet	RC-01
Project	WILLARD STREET DRAINAGE IMPROVEMENTS PROJECT	Total Sheets	
Drawing	ROADWAY CONSTRUCTION PLAN - 1	File No.	



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No.	Description	Date

Scale	
Date	
Job No.	
Designed by	
Drawn by	
Checked by	
Approved by	

Client	CITY OF CAMBRIDGE, MA	Sheet	G-02
Project	WILLARD STREET DRAINAGE IMPROVEMENTS PROJECT	Total Sheets	
Drawing	GRADING PLAN - 2	File No.	



SITE PREPARATION & TREE PROTECTION LEGEND

SYM.	DESCRIPTION
	REMOVE PATH SURFACE MATERIALS TO ACCOMMODATE FULL DEPTH CONSTRUCTION OF NEW PAVEMENT.
	REMOVE TOP 6" OF SURFACE MATERIALS TO ACCOMMODATE FULL DEPTH CONSTRUCTION OF NEW LANDSCAPE AREAS. SCARIFY SOIL AREA AT INTERFACE BETWEEN NEW LAWN SOIL AND EXISTING SUBGRADE TO REMAIN.
	REMOVE MISC. GRASS / PLANTING SURFACE MATERIALS AND TOP 6" OF SOIL TO ACCOMMODATE FULL DEPTH CONSTRUCTION OF NEW LANDSCAPE AREAS.
	TREE PROTECTION FENCE, SEE 5 (LA-3)
	EXISTING TREE TO REMAIN.
	EXISTING TREE TO BE REMOVED

LAYOUT PLAN NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR A THOROUGH SITE EXAMINATION TO DETERMINE THE EXTENT OF SITE PREPARATION NECESSARY TO PREPARE THE SITE FOR CONSTRUCTION AND SHALL VERIFY ALL ITEMS TO BE REMOVED OR SALVAGED WITH THE ENGINEER & OWNER PRIOR TO BEGINNING WORK.
2. CARE SHALL BE TAKEN NOT TO DAMAGE ANY ITEMS DESIGNATED TO REMAIN OR DESIGNATED TO BE REMOVED AND SALVAGED; REPAIR OR REPLACEMENT OF DAMAGED ITEMS DESIGNATED TO REMAIN SHALL BE AT THE CONTRACTORS' EXPENSE.
3. DISPOSAL OF ITEMS DESIGNATED TO BE REMOVED SHALL CONFORM TO ALL APPLICABLE LAWS AND REGULATIONS. ALL SALVAGEABLE MATERIAL SHALL BE DELIVERED BY THE CONTRACTOR TO STORAGE AREAS ON SITE AS DESIGNATED BY THE OWNER. A PLAN INDICATING AREAS FOR STOCKPILING MATERIALS SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL PRIOR TO BEGINNING ANY WORK.
4. CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO EXCAVATION. REPORT ANY DISCREPANCIES IN WRITING TO THE ENGINEER AND RECEIVE INSTRUCTIONS PRIOR TO PROCEEDING.
5. CONTRACTOR SHALL BE RESPONSIBLE TO REPAIR ALL DAMAGE DUE TO CONSTRUCTION OPERATIONS INSIDE AND OUTSIDE OF THE LIMIT OF WORK LINE.
6. CONTRACTOR SHALL ERECT PROTECTIVE FENCING TO THE DIMENSIONS SHOWN TO PROTECT TREES ON SITE AS MARKED ON PLAN AND PER WRITTEN SPECIFICATIONS. EQUIPMENT OR MATERIALS MAY NOT BE STORED WITHIN THESE AREAS. NO EQUIPMENT MAY BE OPERATED WITHIN THESE AREAS WITHOUT FIRST NOTIFYING THE ENGINEER FOR DIRECTION AND APPROVAL. ALL TRENCHING WORK WITHIN DRIP LINE OF TREES SHALL BE APPROVED BY THE ENGINEER.
7. SEE CIVIL DRAWINGS FOR TEMPORARY FENCE LOCATIONS AND EROSION CONTROL.
8. SEE CIVIL DRAWINGS FOR PROPOSED UTILITIES.
9. SEE ENGINEERING DRAWINGS FOR LIMIT OF WORK, CONSTRUCTION FENCES, AND VEHICULAR AND PEDESTRIAN DETOURS DURING CONSTRUCTION.

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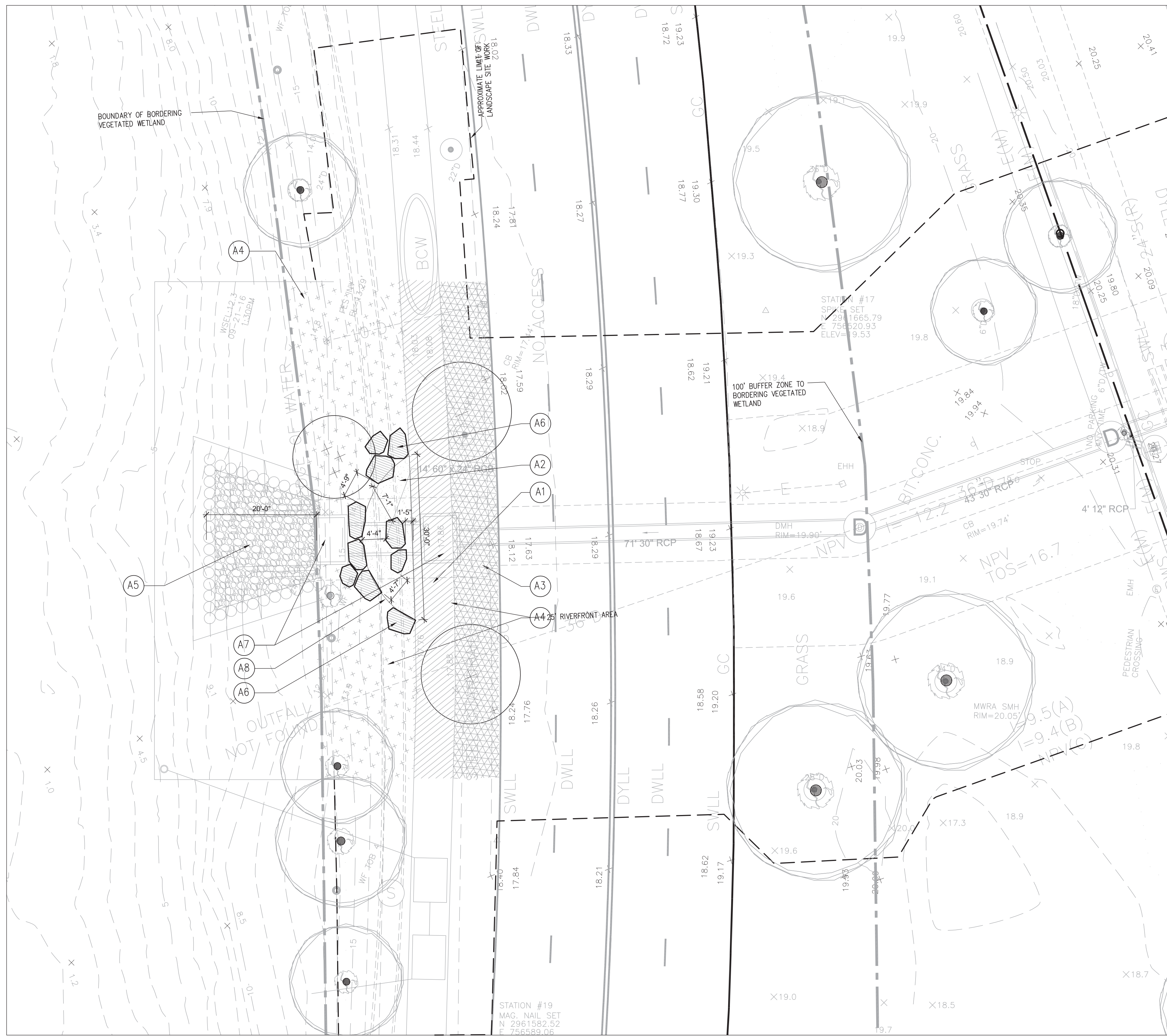


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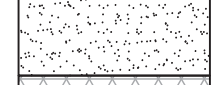
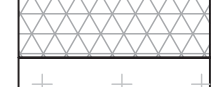






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Scale 1:10		Client CITY OF CAMBRIDGE, MA	Sheet L-1
Date 3/21/2018			
Job No.		Project WILLARD STREET DRAINAGE IMPROVEMENT PROJECT	Total Sheets
Designed by MAL/CS			
Drawn by MAL		Drawing SITE PREPARATION AND TREE PROTECTION PLAN	File No.
Checked by CS			
Approved by			
No.	Description	Date	
REVISIONS			



MATERIALS LEGEND

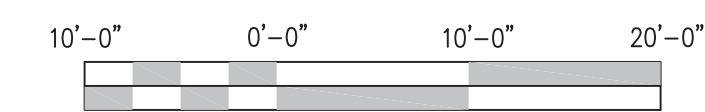
SYM.	DESCRIPTION
 A1	BITUMINOUS CONCRETE PAVING
 A2	FLEXI-PAVE
 A3	SEEDED LAWN AREA, SEE PLANTING PLAN
 A4	PLANTING AREA, SEE PLANTING AND GRADING PLAN
 A5	DIA. 18" - 24" RIP RAP STONE (100 LBS MIN.)
 A6	BOULDER, TYP.
 A7	CONCRETE PAD & MANHOLE, SEE CIVIL DRAWING
 A8	METAL EDGE
 B1	EXISTING GUARDRAIL, SEE CIVIL DRAWING

MATERIALS PLAN NOTES

1. MATERIALS PLAN PROVIDES MATERIAL DESCRIPTIONS AND DETAIL REFERENCES.
2. NEW POURED BIT. CONCRETE PAVING SHOULD MATCH COLOR AND TEXTURE OF THE EXISTING CONDITIONS ON SITE.
3. SEE L.1 SITE PREPARATION AND TREE PROTECTION PLAN AND SPECIFICATION FOR TREE PROTECTION.
4. CONTACT ENGINEER WHEN INSTALLING GROUND PLANE MATERIALS WITHIN TREE CANOPY OF EXISTING TREES TO REMAIN TO INSURE MINIMAL ROOT DISTURBANCE.

LAYOUT PLAN NOTES

1. PRIOR TO THE START OF ANY WORK, THE CONTRACTOR SHALL MEET WITH THE OWNER, ENGINEER TO REVIEW THE PROJECT SCOPE.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGE DUE TO CONSTRUCTION OPERATIONS INSIDE AND OUTSIDE OF THE LIMIT OF WORK LINE.
3. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATION. REPORT ANY DISCREPANCIES IN WRITING TO THE ENGINEER AND RECEIVE WRITTEN INSTRUCTIONS PRIOR TO PROCEEDING.
4. ANY ALTERATIONS TO THESE DRAWINGS MADE IN THE FIELD DURING CONSTRUCTION SHALL BE PROMPTLY REPORTED TO AND APPROVED BY THE ENGINEER BY THE CONTRACTOR AND RECORDED ON REPRODUCIBLE AS-BUILT DRAWINGS BY THE CONTRACTOR.
5. LINES ARE PARALLEL OR PERPENDICULAR TO LINES FROM WHICH THEY ARE MEASURED UNLESS OTHERWISE NOTED.
6. BIT. CONCRETE PAVING AND SEEDED LAWN AREAS SHALL MATCH EXISTING CONFIGURATIONS.
7. SEE CIVIL DRAWINGS FOR CONCRETE PAD, METAL FENCE, MANHOLE AND STONE EMBANKMENT LAYOUTS.



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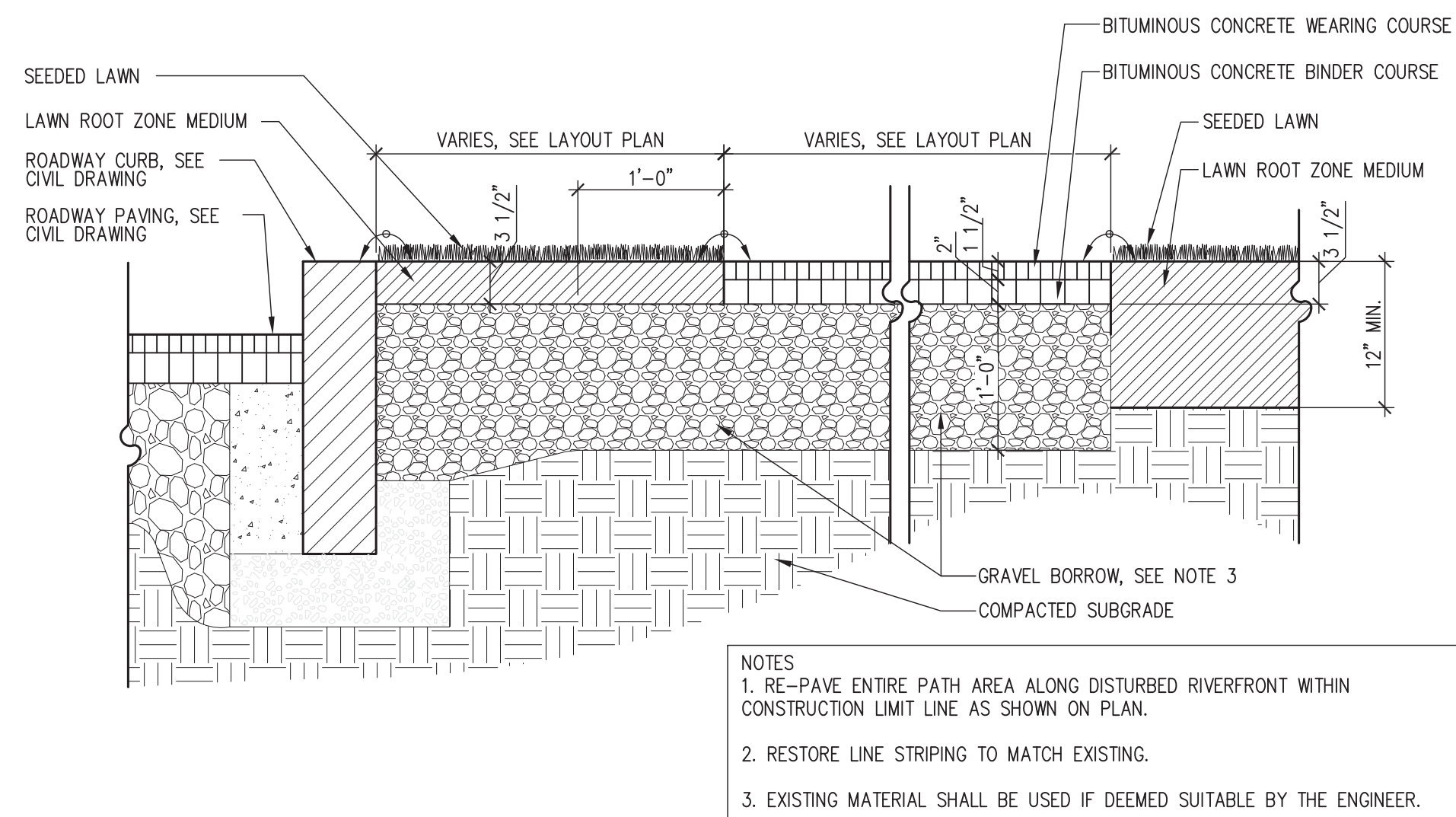
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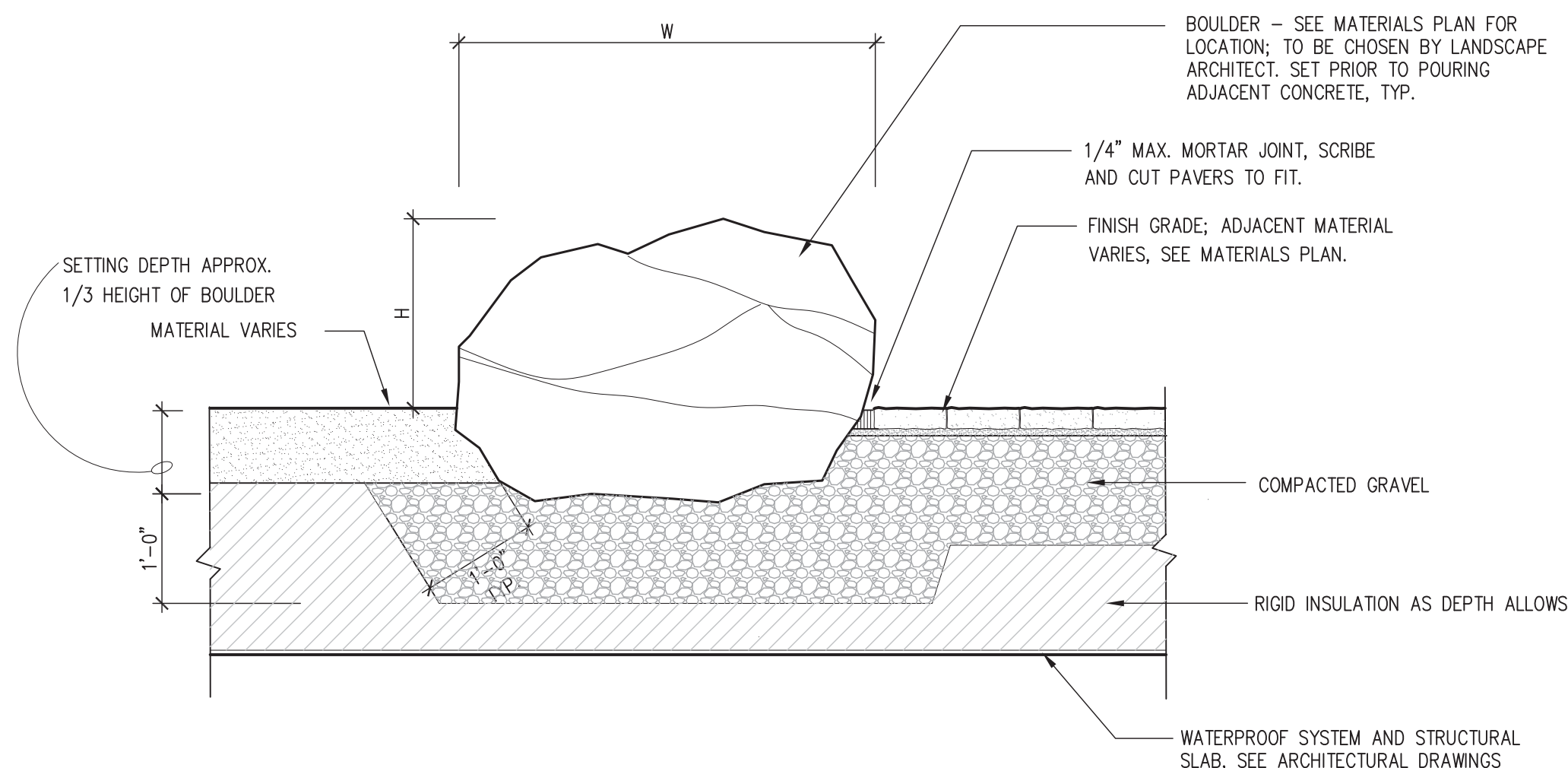
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Date	3/21/2018
Job No.	
Designed by	MAL/CS
Drawn by	MAL
Checked by	CS
Approved by	

Client	CITY OF CAMBRIDGE, MA	Sheet	L-2
Project	WILLARD STREET DRAINAGE IMPROVEMENT PROJECT	Total Sheets	
Drawing	MATERIALS AND LAYOUT PLAN	File No.	

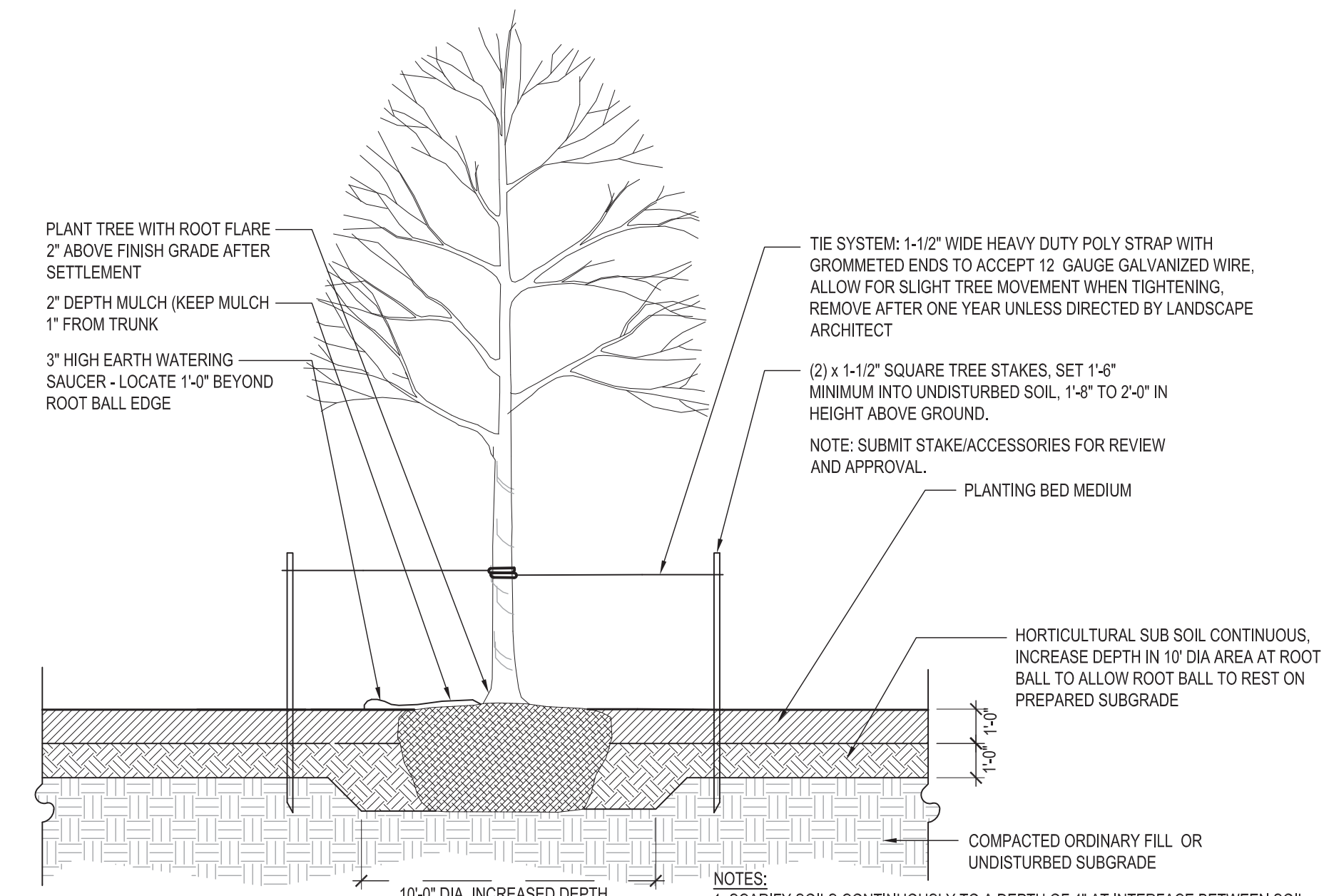


1 BITUMINOUS CONCRETE PAVEMENT PATHWAY – PEDESTRIAN
Scale: 1"=1'-0"

- NOTES:
 1. RE-PAVE ENTIRE PATH AREA ALONG DISTURBED RIVERFRONT WITHIN CONSTRUCTION LIMIT LINE AS SHOWN ON PLAN.
 2. RESTORE LINE STRIPING TO MATCH EXISTING.
 3. EXISTING MATERIAL SHALL BE USED IF DEEMED SUITABLE BY THE ENGINEER.

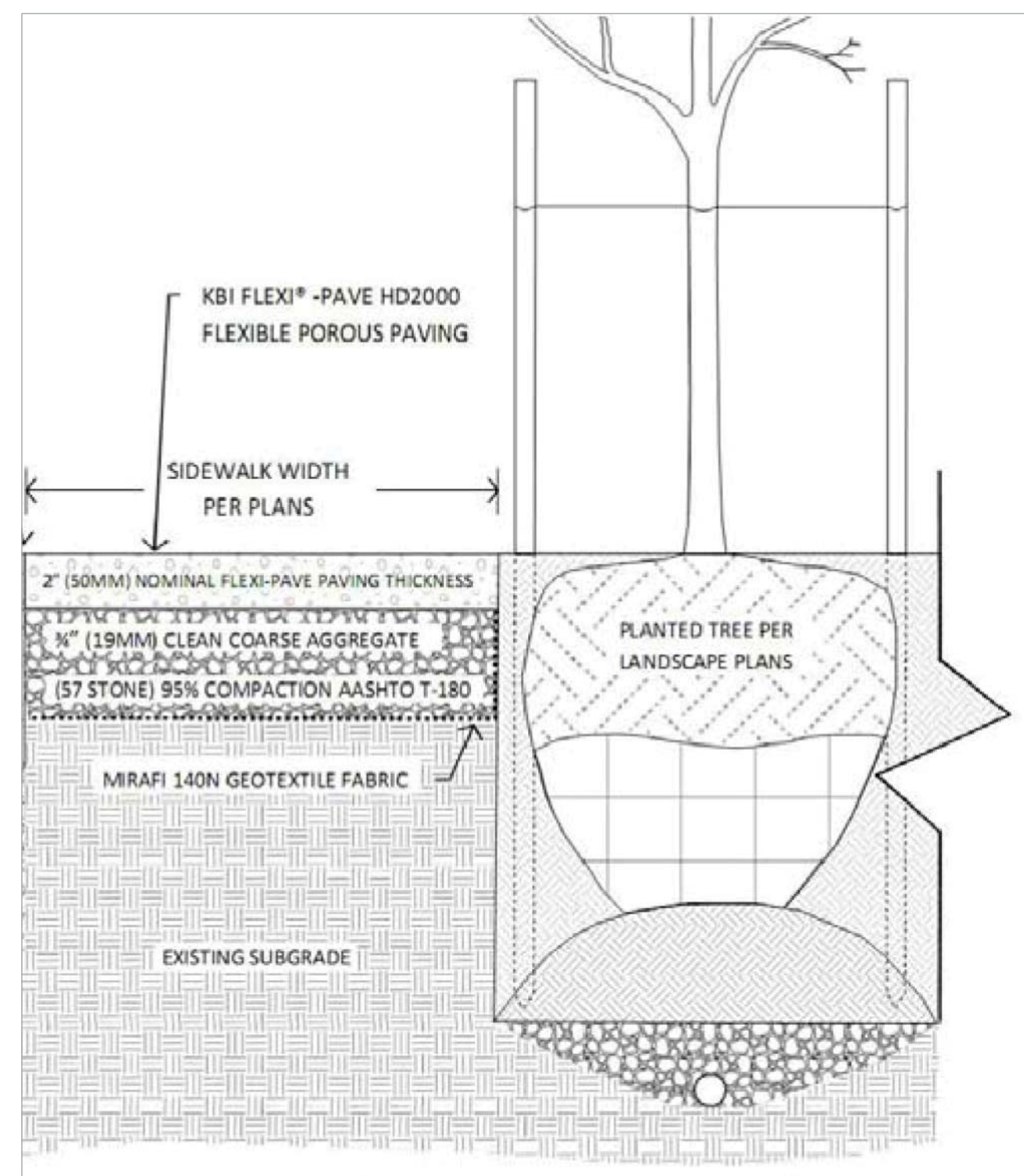


3 BOULDER
Scale: 3/4"=1'-0"

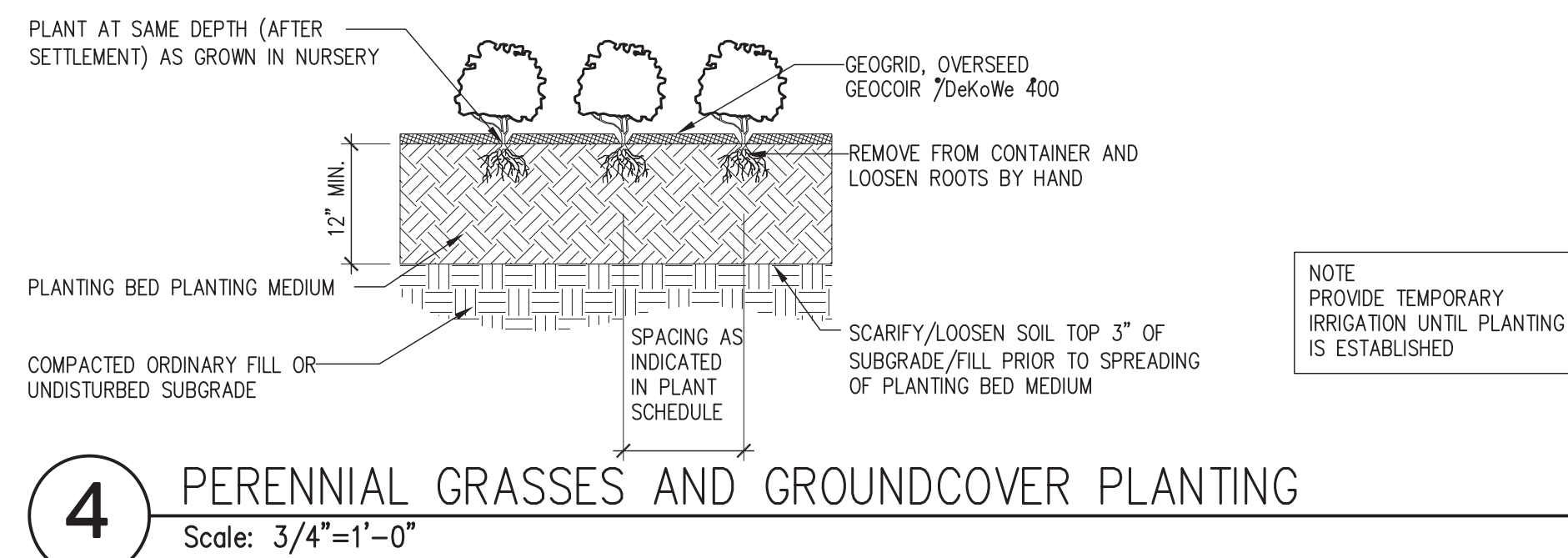


6 TREE PLANTING - PLANTING BED
Scale: 1/4"=1'-0"

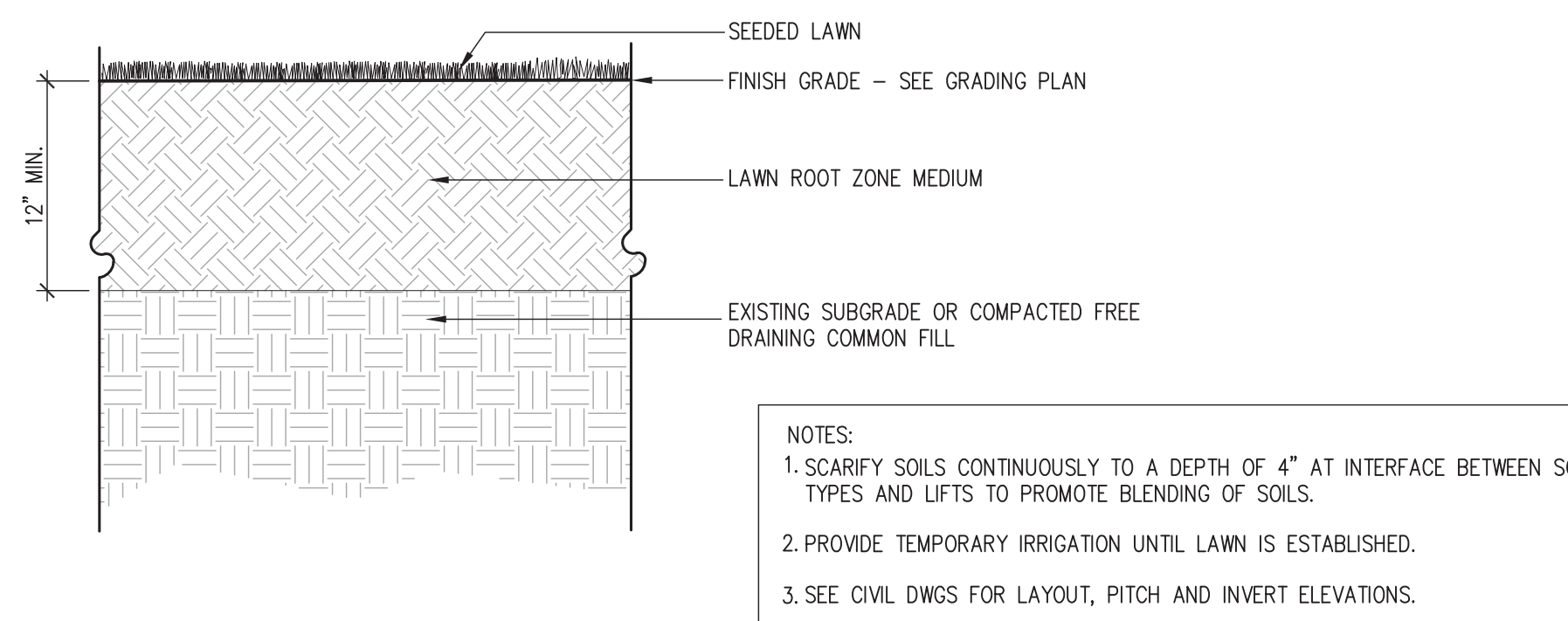
- NOTES:
 1. SCARIFY SOILS CONTINUOUSLY TO A DEPTH OF 4" AT INTERFACE BETWEEN SOIL TYPES AND LIFTS TO PROMOTE BLENDING OF SOILS
 2. TREE SHALL HAVE STRAIGHT TRUNK AND SINGLE LEADER. TREES WITH DOUBLE LEADER TRUNKS WILL NOT BE ACCEPTED.
 3. DO NOT CUT LEADER.
 4. SET TREE PLUMB.
 5. FLOOD SAUCER TWICE DURING FIRST 24 HOURS AFTER PLANTING.
 6. SYNTHETIC BURLAP IS UNACCEPTABLE.
 7. LOOSE OR CRACKED ROOTBALLS WILL NOT BE ACCEPTED FOR PLANTING
 8. REMOVE TOP 2/3 OF WIRE BASKETS AND BURLAP.



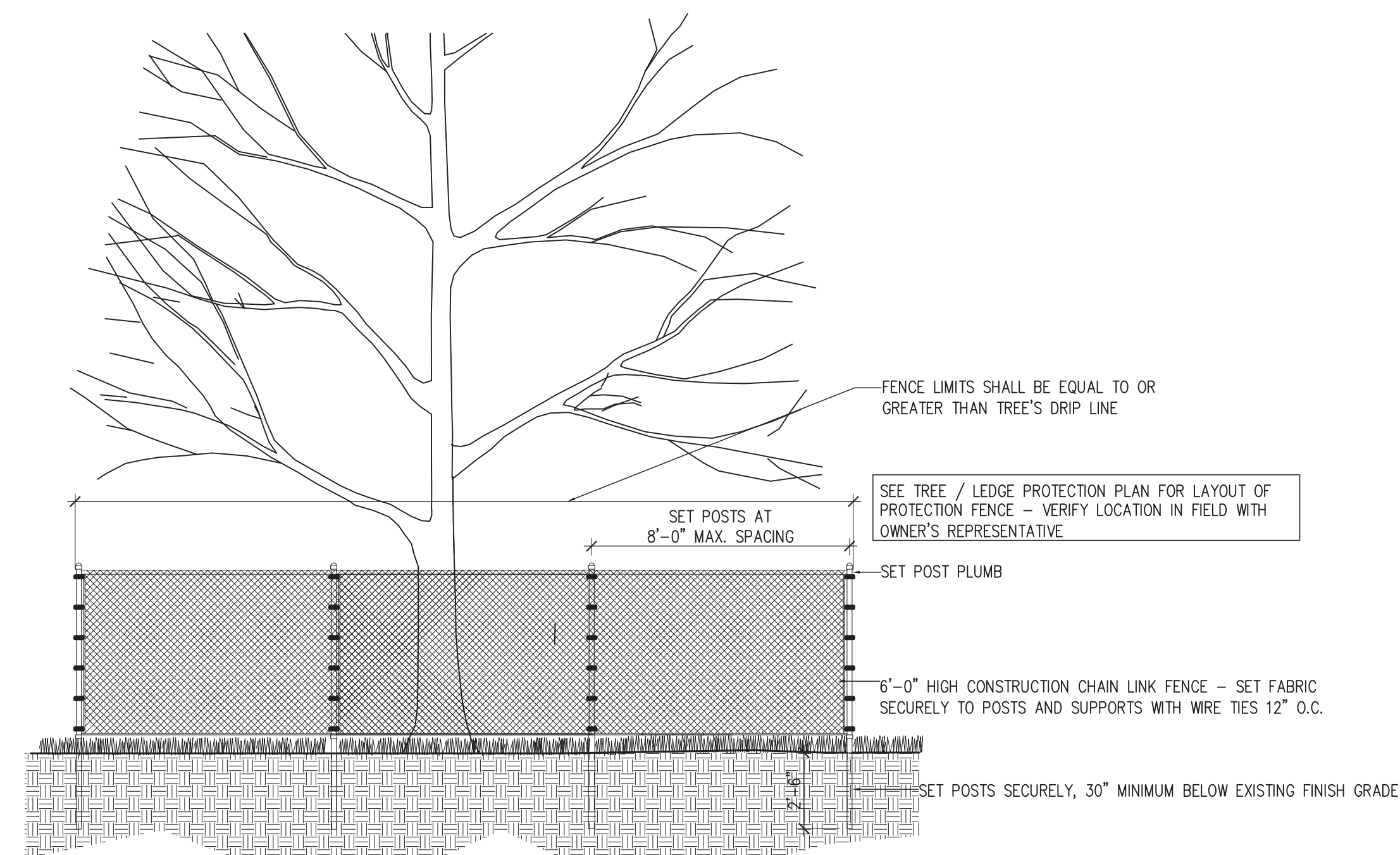
2 FLEXI-PAVE
Scale: 1"=1'-0"



4 PERENNIAL GRASSES AND GROUNDCOVER PLANTING
Scale: 3/4"=1'-0"



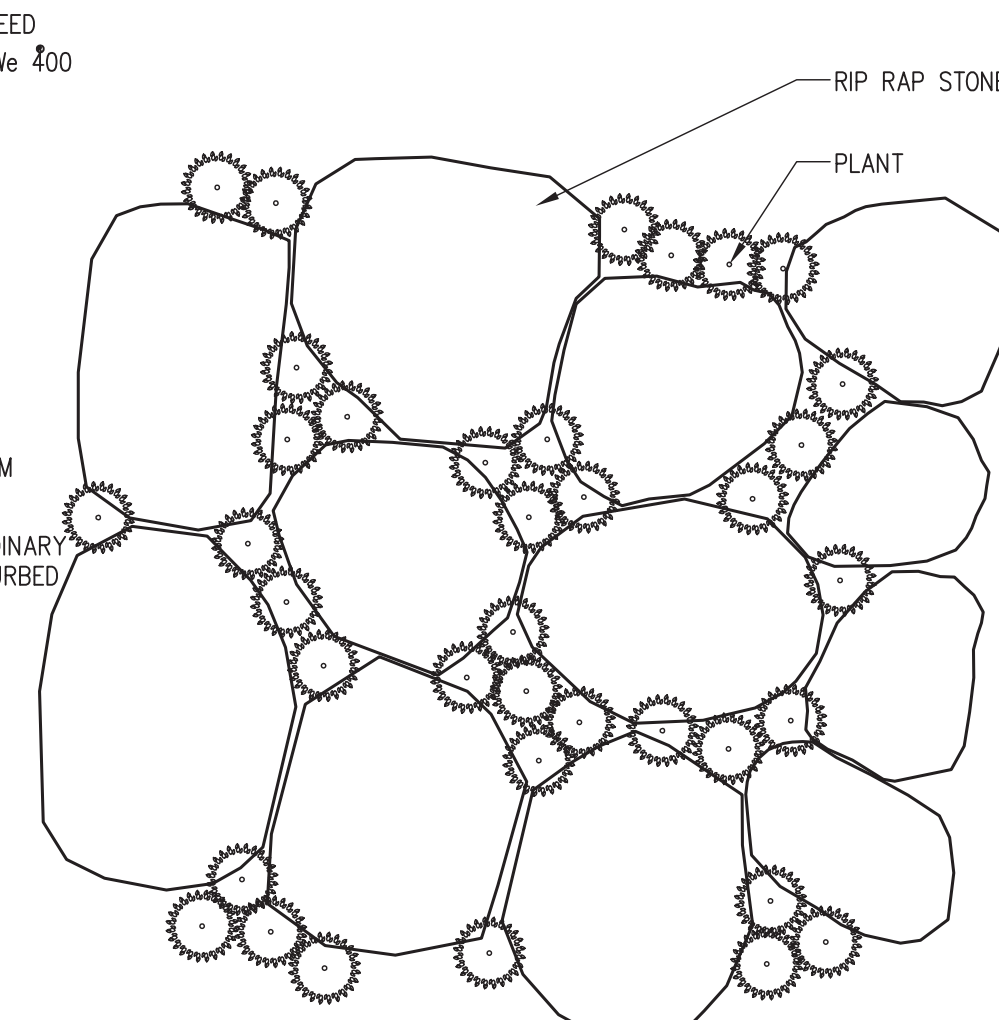
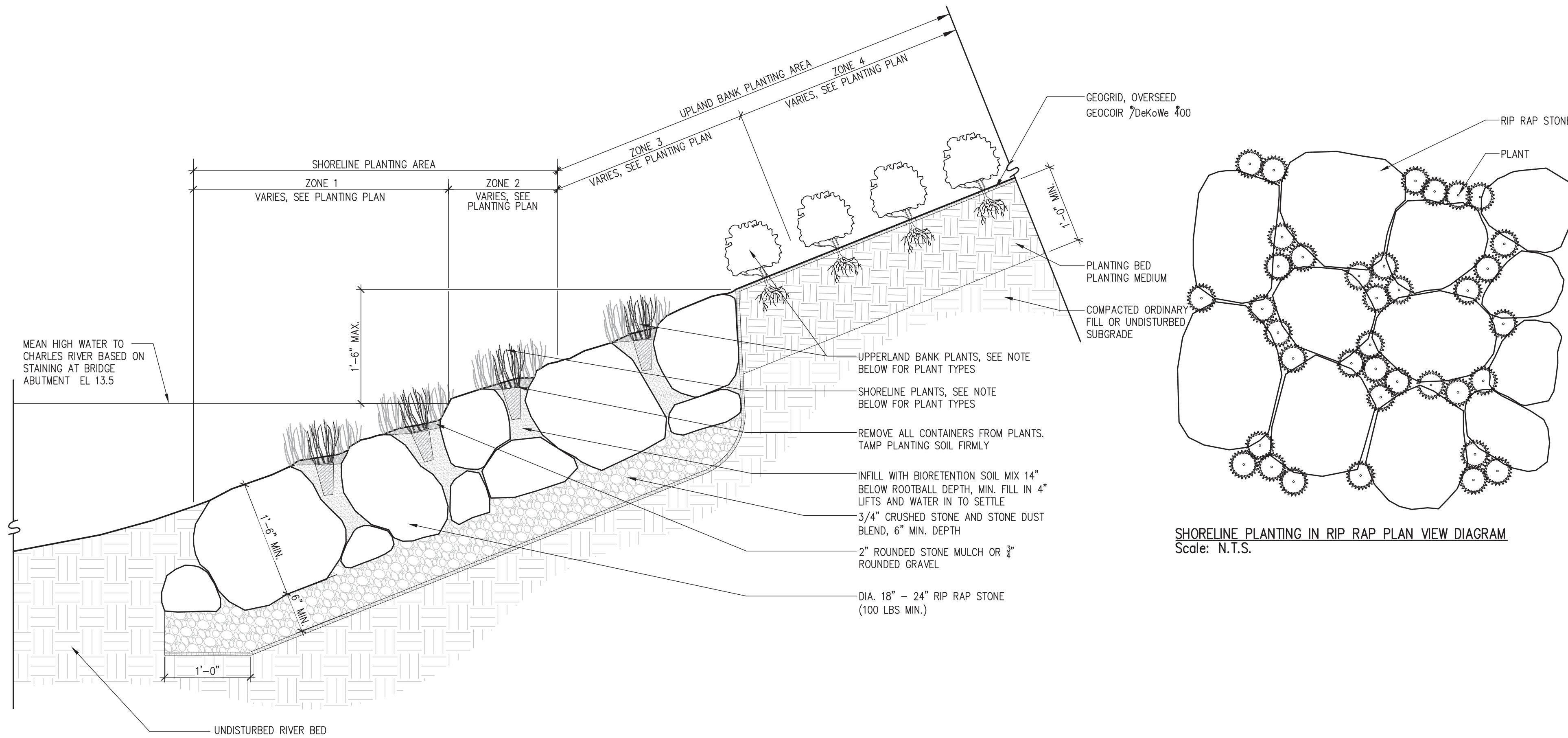
5 LAWN – SEEDDED
Scale: N.T.S.



7 TREE PROTECTION FENCE – TYPE A
Scale: 1/4"=1'-0"

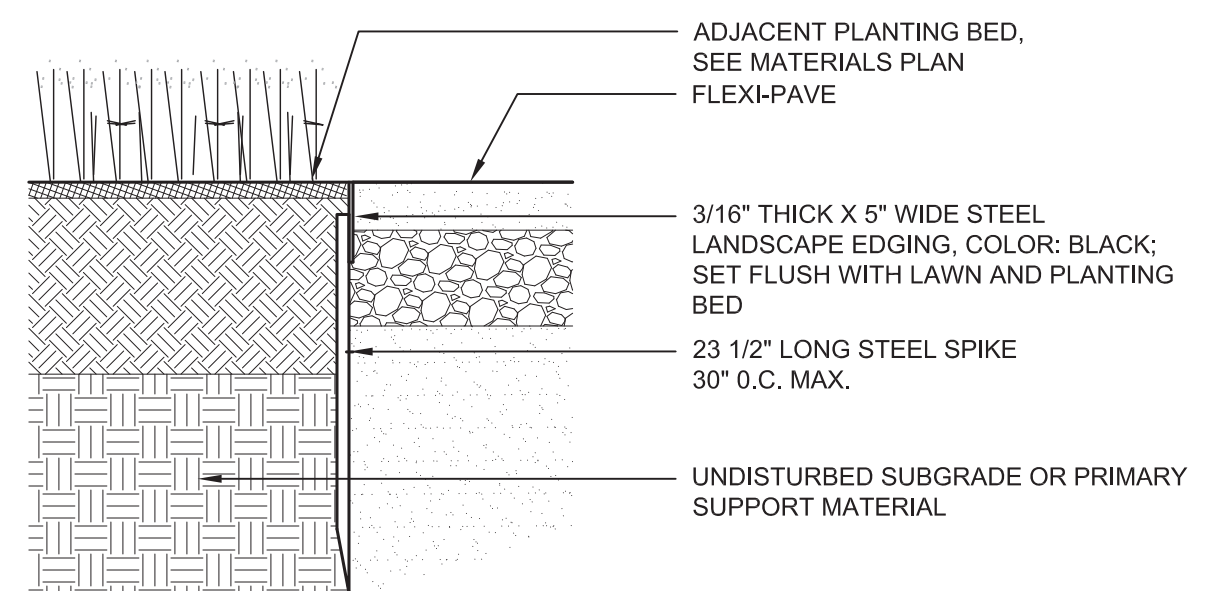
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Scale	1:10	Client	CITY OF CAMBRIDGE, MA	Sheet	L-4.0
Date	3/21/2018	Project	WILLARD STREET DRAINAGE IMPROVEMENT PROJECT	Total Sheets	
Job No.		Drawn by	MAL	File No.	
Designed by	MAL/CS	Checked by	CS		
Drawn by	MAL	Approved by			
No.	Description	Date			
	REVISIONS				



SHORELINE PLANTING IN RIP RAP PLAN VIEW DIAGRAM
Scale: N.T.S.

1 RIP RAP EDGE, SHORELINE PLANTING AND UPLAND BANK PLANTING DETAIL
Scale: 1"=1'-0"



2 METAL EDGING AT FLEXI-PAVE
Scale: 1"=1'-0"

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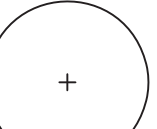
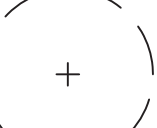
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			Job No.	
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			Drawn by	MAL
No.	Description	Date	Checked by	CS
	REVISIONS		Approved by	

Client	CITY OF CAMBRIDGE, MA	Sheet	L-4.2
Project	WILLARD STREET DRAINAGE IMPROVEMENT PROJECT	Total Sheets	
Drawing	LANDSCAPE DETAILS	File No.	

PLANT LIST:

QTY	SYM	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
TREES					
1	GL TR	Gleditsia triacanthos	Honey Locust	3"-3.5"Cal.	Speciman
4	LI ST	Liquidambar styraciflua	Sweet Gum	3"-3.5"Cal.	Speciman
2	NY SY	Nyssa sylvatica	Black Gum	3"-3.5"Cal.	Speciman

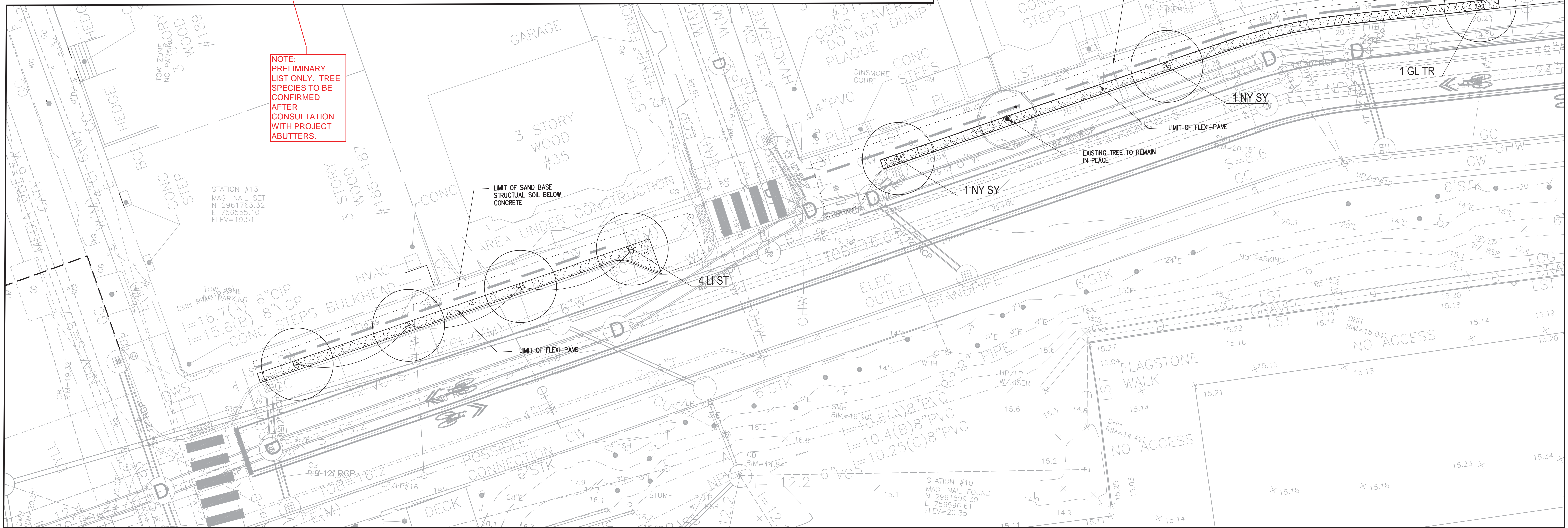
PLANTING LEGEND

SYM.	DESCRIPTION
	EXISTING TREE TO REMAIN.
	PROPOSED TREE
	PROPOSED TREE IN PRIVATE PROPERTY


GENERAL PLANTING NOTES

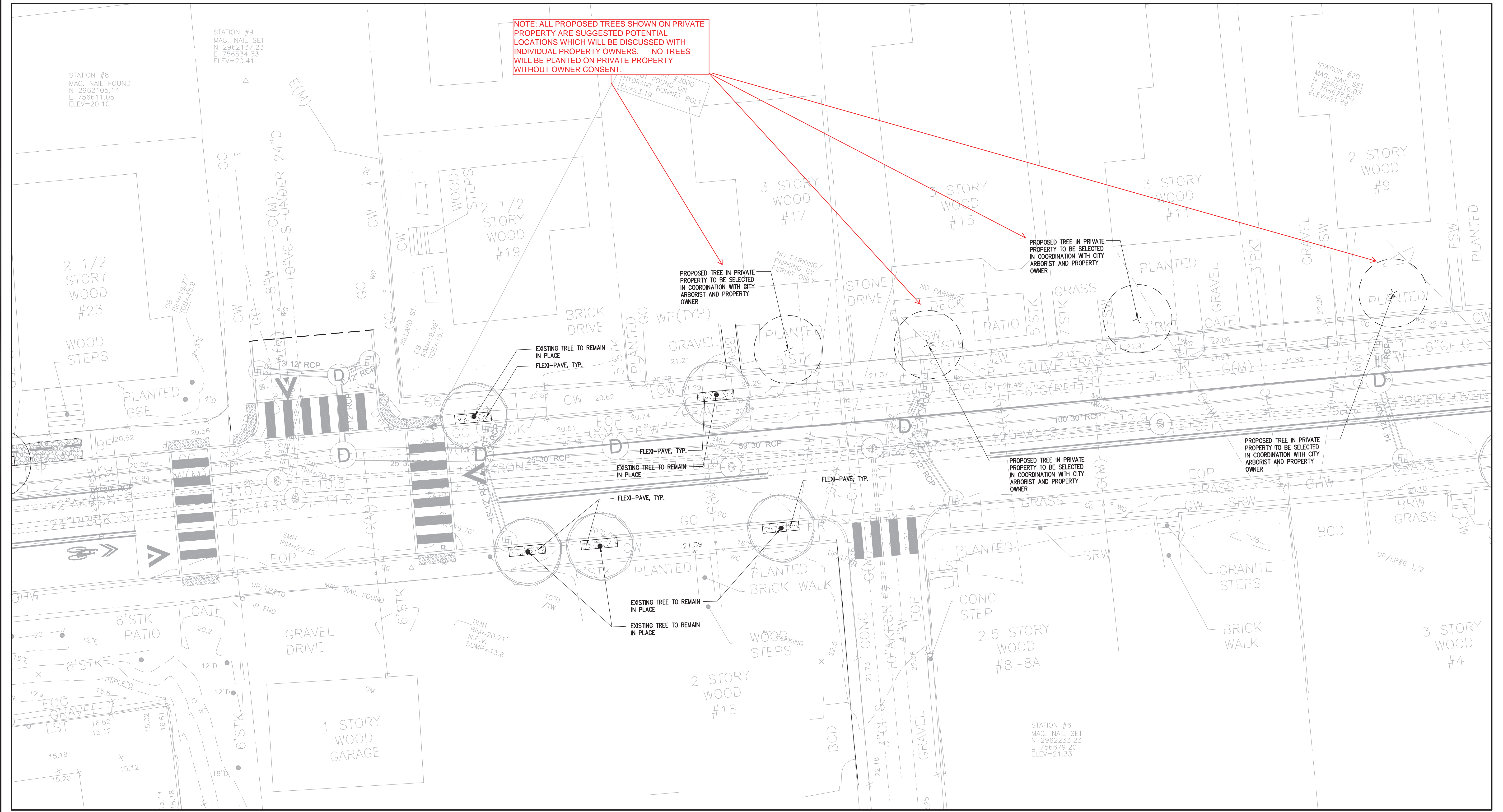
1. PLANTING AND RESTORATION SHALL BE FULLY COORDINATED WITH CITY OF CAMBRIDGE DPW DEPARTMENT OF URBAN FORESTRY, CONTRACTOR ARBORIST, AND ENGINEER.
2. ENGINEER TO APPROVE PLANT MATERIAL PRIOR TO DELIVERY TO SITE.
3. PLANT MATERIAL SHALL CONFORM TO "THE AMERICAN STANDARD FOR NURSERY STOCK", PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
4. NO SUBSTITUTIONS OF PLANT SPECIES WITHOUT ENGINEER'S WRITTEN APPROVAL.
5. SUBSTITUTIONS OF PLANT SPECIES SHALL BE A PLANT OF EQUIVALENT OVERALL FORM, HEIGHT AND BRANCHING HABIT, FLOWER, LEAF AND FRUIT, COLOR AND TIME OF BLOOM, AS APPROVED OF BY ENGINEER.
6. LOCATE AND VERIFY UTILITY LINE LOCATIONS PRIOR TO STAKING AND REPORT CONFLICT TO ENGINEER.
7. SITE PLANTING PREPARATION DEBRIS, GARBAGE, LUMPS OF CONCRETE, STEEL AND OTHER MATERIALS DELETERIOUS TO PLANT'S HEALTH AS DETERMINED BY ENGINEER SHALL BE REMOVED FROM ALL PLANTING AREAS.
8. ALL PROPOSED BED LINES, TREE, AND SHRUB LOCATIONS SHALL BE STAKED OR LAID OUT IN THEIR APPROXIMATE LOCATION BY THE CONTRACTOR PRIOR TO ENGINEER'S ARRIVAL ON SITE FOR LAYOUT AND PLANTING REVIEW. REFER TO LAYOUT AND PLANTING SHEETS FOR LAYOUT INFORMATION. THE CONTRACTOR SHALL ADJUST THE LOCATIONS AS REQUESTED BY THE ENGINEER TO ACCOUNT FOR SUBSURFACE UTILITIES AND ANY OTHER FIELD CONDITIONS. FINAL LOCATIONS OF ALL PLANT MATERIAL MUST BE APPROVED BY THE ENGINEER PRIOR TO PLANTING.
9. NO PLANTING TO BE INSTALLED BEFORE ACCEPTANCE OF ROUGH AND FINE GRADING BY ENGINEER.
10. WATER PLANTS THOROUGHLY AFTER INSTALLATION, A MINIMUM OF TWICE WITHIN THE FIRST 24 HOURS.
11. REPAIR DAMAGE DUE TO OPERATIONS INSIDE AND OUTSIDE OF LIMIT OF WORK
12. SEE DETAIL SHEET LA-3 FOR PLANTING DETAILS.

NOTE:
PRELIMINARY LIST ONLY. TREE SPECIES TO BE CONFIRMED AFTER CONSULTATION WITH PROJECT ABUTTERS.



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			Project	WILLARD STREET DRAINAGE IMPROVEMENT PROJECT	Total Sheets	
<p>No. Description Date</p>			Drawing	PLANTING PLAN	File No.	



NOTE: ALL PROPOSED TREES SHOWN ON PRIVATE PROPERTY ARE SUGGESTED POTENTIAL LOCATIONS WHICH WILL BE DISCUSSED WITH INDIVIDUAL PROPERTY OWNERS. NO TREES WILL BE PLANTED ON PRIVATE PROPERTY WITHOUT OWNER CONSENT.



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 BOSTON, MASSACHUSETTS 02110-2378
 (617) 357-7700

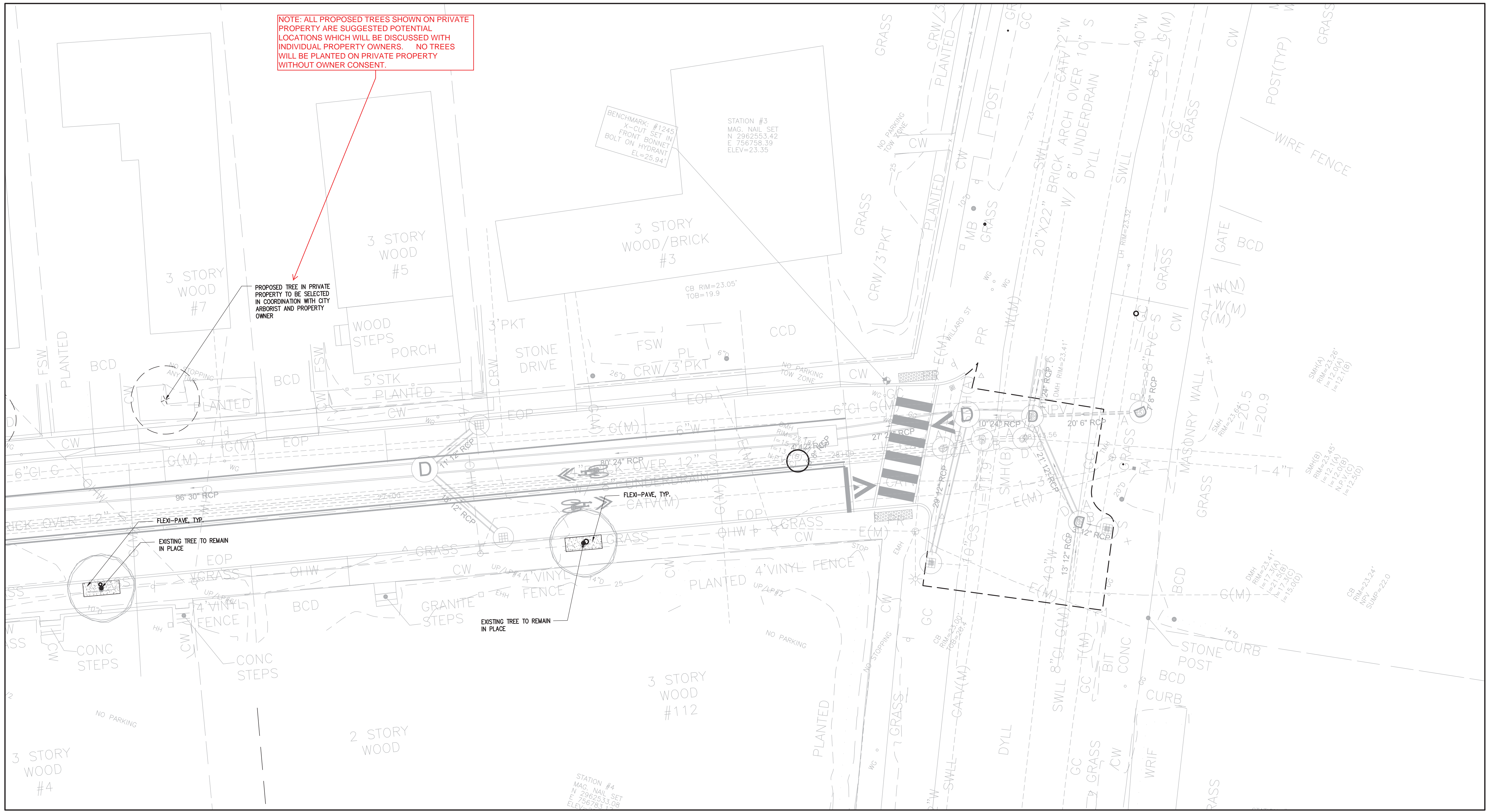
HALVORSON DESIGN PARTNERSHIP
 161 MASSACHUSETTS AVENUE, BOSTON MA 02115-3050
 (PHONE) 617.536.0380 (FAX) 617.536.0626
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Scale	1:10
Date	3/21/2018
Job No.	
Designed by	MAL/CS
Drawn by	MAL
Checked by	CS
Approved by	

Client	CITY OF CAMBRIDGE, MA	Sheet	L-5.1
Project	WILLARD STREET DRAINAGE IMPROVEMENT PROJECT	Total Sheets	
Drawing	PLANTING PLAN	File No.	

NOTE: ALL PROPOSED TREES SHOWN ON PRIVATE PROPERTY ARE SUGGESTED POTENTIAL LOCATIONS WHICH WILL BE DISCUSSED WITH INDIVIDUAL PROPERTY OWNERS. NO TREES WILL BE PLANTED ON PRIVATE PROPERTY WITHOUT OWNER CONSENT.



50% DESIGN - NOT FOR CONSTRUCTION

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Client	CITY OF CAMBRIDGE, MA
Project	WILLARD STREET DRAINAGE IMPROVEMENT PROJECT
Drawing	PLANTING PLAN

Sheet	L-5.2
Total Sheets	
File No.	