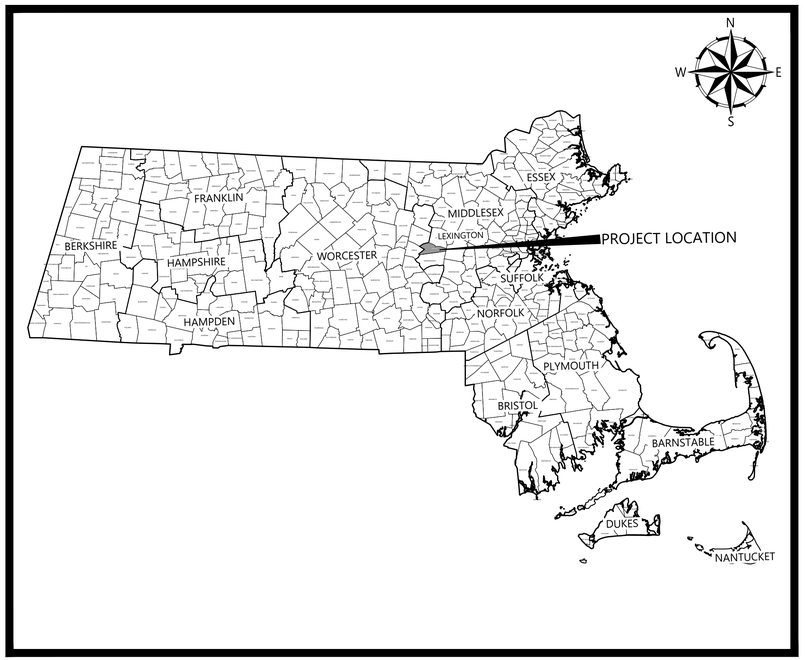
TOWN OF HUDSON
HUDSON, MASSACHUSETTS
BRIGHAM STREET CULVERT REPLACEMENT AND PARK STREET CULVERT MAINTENANCE- ISSUED FOR BID

ISSUED FOR BID

APRIL, 2024



PROJECT LOCATION MAP

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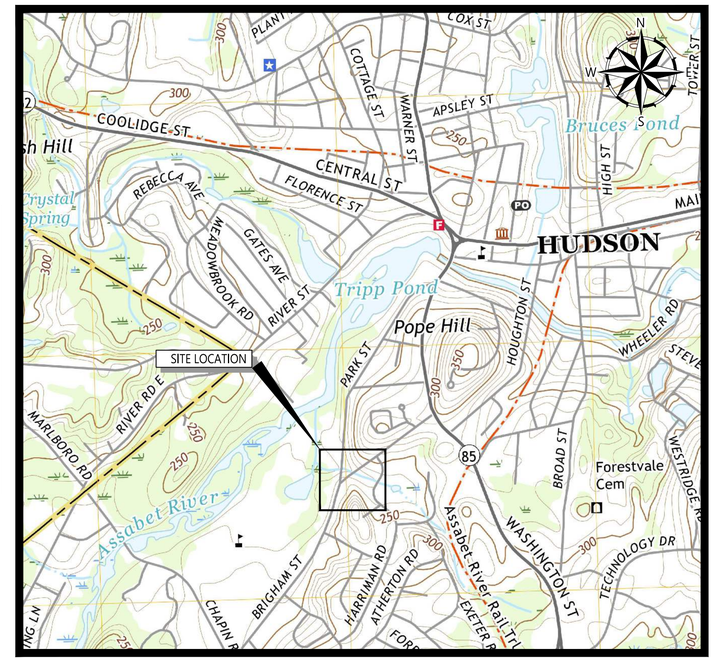

SITE LOCATION MAP

SOURCE: USGS TOPO QUADRANGLE

Woodard & Curran
40 Shattuck Road, Suite 110
Andover, Massachusetts 01810
866.702.6371 | www.woodardcurran.com

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PE SEAL:

COMMONWEALTH OF MASSACHUSETTS
KEVIN A. MCCAFFERY
No. 40778
REGISTERED PROFESSIONAL ENGINEER

ISSUED FOR BID

CLIENT INFO:
TOWN OF HUDSON
HUDSON, MASSACHUSETTS

BRIGHAM STREET CULVERT REPLACEMENT AND PARK STREET CULVERT MAINTENANCE- ISSUED FOR BID

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DRAWING TITLE:
GENERAL COVER SHEET

DRAWING NO:
G-000

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22x34

GENERAL NOTES:

1. THIS PLAN WAS PREPARED FROM AN ACTUAL ON THE GROUND FIELD SURVEY CONDUCTED BY WSP USA, INC. IN MARCH OF 2023, AS SHOWN ON A DRAWING TITLED "EXISTING CONDITIONS PLAN, PARK STREET & BRIGHAM STREET, HUDSON MASSACHUSETTS" PREPARED BY WSP USA, INC. DATED APRIL 10, 2023.
2. EXISTING CONDITIONS SURVEY WAS COMPLETED IN MARCH 2023 AND DOES NOT ACCURATELY REFLECT EXISTING CONDITIONS DUE TO RECENT STORM EVENTS AND FAILURE OF EXISTING CULVERT. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM A SITE VISIT PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION TO VERIFY EXISTING CONDITIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY EXISTING CONDITIONS.
3. CONTRACTOR SHALL INVESTIGATE EXISTING CONDITIONS AND FIELD VERIFY LOCATIONS, DEPTH, AND SIZE OF UTILITIES AND SUB-SURFACE STRUCTURES PRIOR TO CONSTRUCTION. NOT ALL UTILITY LOCATIONS ARE SHOWN ON THE DRAWINGS. CONTRACTOR SHALL CONDUCT A VIDEO WALK THROUGH PRIOR TO THE START OF THE PROJECT AND SHALL INCLUDE FOOTAGE OF THE STREET, SIDEWALK, AND FOUNDATION WALLS ABUTTING THE BANKS ON BOTH THE UPSTREAM AND DOWNSTREAM SECTIONS. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE, ARE BASED UPON A COMPILATION OF PLANS OF RECORD, AND DOES NOT WARRANTY NOR GUARANTEE THE LOCATION OF ALL UTILITIES DEPICTED OR NOT DEPICTED. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY CONFLICTS OR DISCREPANCIES WITH THE EXISTING AND PROPOSED UTILITY LOCATIONS.
4. THE HORIZONTAL DATUM SHOWN HEREON IS REFERENCED TO THE NORTH AMERICAN DATUM OF 1983, MASSACHUSETTS STATE PLANE MAINLAND COORDINATE SYSTEM AND WAS ESTABLISHED UTILIZING RTK GPS SURVEY TECHNIQUES.
5. THE VERTICAL DATUM SHOWN HEREON IS REFERENCED TO NAVD88 AND WAS ESTABLISHED ON SITE UTILIZING RTK GPS SURVEY TECHNIQUES.
6. THE SURVEYED PROPERTY IS SUBJECT BUT NOT LIMITED TO THE INFORMATION SHOWN HEREON. ALL INFORMATION THAT MAY AFFECT THE QUALITY OF THE TITLE TO BOTH THE SUBJECT AND ADJOINING PARCELS SHOULD BE VERIFIED BY AN ACCURATE AND CURRENT TITLE REPORT. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT TITLE REPORT.
7. ANY PROPERTY AND RIGHT-OF-WAY LOCATIONS THAT MAY BE SHOWN HEREON ARE APPROXIMATE AND DO NOT REPRESENT A PROPERTY BOUNDARY SURVEY.
8. WETLANDS WERE DELINEATED BY ECOTEC, INC. ENVIRONMENTAL CONSULTING SERVICES, AND LOCATED BY WSP USA, INC. IN MARCH OF 2023.
9. WOODARD & CURRAN ASSUMES NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN.
10. COORDINATE CONSTRUCTION ACTIVITY WITH UTILITY COMPANIES, EMERGENCY SERVICES AND TOWN. CONTRACTOR SHALL NOTIFY ALL UTILITIES PRIOR TO COMMENCING WORK, ALLOWING SUFFICIENT TIME TO LOCATE AND MARK THE LOCATION OF BURIED UTILITIES. CONTRACTOR SHALL CONTACT "DIG SAFE", TELEPHONE 811, PRIOR TO EXCAVATION.
11. RESTORE ALL AREAS DISTURBED BY CONTRACTOR'S OPERATIONS TO ORIGINAL FINISH (GRAVEL, PAVEMENT, GRASS, ETC.) UNLESS NOTED OTHERWISE ON THE PLANS. RESTORATION OF PAVED SURFACES, GRAVEL SURFACES, DRIVEWAYS, AND LAWNS DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE PERFORMED AT NO ADDITIONAL COST TO OWNER. ANY CURB DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE REPLACED IN KIND AND SHALL CONFORM TO TOWN OF HUDSON AND MASSACHUSETTS DOT SPECIFICATIONS AT NO ADDITIONAL COST TO OWNER. PAVEMENT RESTORATION ASSOCIATED WITHIN LIMITS OF CULVERT RESTORATION SHALL BE CONSIDERED FULL DEPTH RECONSTRUCTION.
12. ANY DAMAGE CAUSED DURING CONSTRUCTION TO PRIVATE PROPERTIES, INCLUDING BUT NOT LIMITED TO DRIVEWAYS, MAILBOXES, TREES, AND RETAINING WALLS MUST BE RESTORED TO PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO OWNER.
13. PROPERLY PROTECT AND DO NOT DISTURB PROPERTY IRONS AND MONUMENTS. IF DISTURBED, THE PROPERTY MONUMENT SHALL BE RESET AT THE CONTRACTOR'S EXPENSE BY A LICENSED LAND SURVEYOR ACCEPTABLE TO THE TOWN.
14. EXISTING FACILITIES (I.E. TREES, POLES, LIGHT POSTS, CATCH BASINS, STONE FROM CULVERT, ETC.) SHALL BE REMOVED AND PROTECTED DURING CONSTRUCTION. THE TOWN RETAINS RIGHT TO KEEP ANY AND ALL REMOVED FACILITIES. CONTRACTOR SHALL DISPOSE OF ANY REMOVED FACILITY AT THE REQUEST OF THE TOWN AT NO ADDITIONAL COST TO OWNER.
15. ALL TREES NOT NOTED TO BE REMOVED OR RELOCATED SHALL BE PROTECTED BY CONTRACTOR DURING CONSTRUCTION.
16. DO NOT PARK, IMPEDE ACCESS TO, OR STORE EQUIPMENT BEYOND LIMIT OF WORK, UNLESS PERMISSION HAS BEEN GRANTED IN WRITING BY TOWN AND/OR LAND OWNER.
17. RESTRICT ACCESS TO SITE THROUGH THE USE OF APPROPRIATE SIGNAGE, BARRIERS, FENCES, ETC. SITE SHALL BE LEFT WITH APPROPRIATE SAFETY MEASURES IN PLACE DURING NON-WORKING HOURS. SITE SAFETY IS THE RESPONSIBILITY OF CONTRACTOR, DURING BOTH WORKING AND NON-WORKING HOURS.
18. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY CONSTRUCTION PERMITS. PERMIT APPLICATIONS SHALL BE SUBMITTED WITH ADEQUATE TIME SO AS NOT TO DELAY CONSTRUCTION. CONTRACTOR SHALL OBTAIN A DRAIN LAYER LICENSE WITH THE TOWN OF HUDSON PRIOR TO SUBMITTING A PROPOSAL.
19. ALL WORK ASSOCIATED WITH THE PROJECT SHALL BE COMPLETED IN ACCORDANCE WITH THE TOWN OF HUDSON BYLAW AND LOCAL REGULATIONS AND MASSACHUSETTS DOT STANDARD SPECIFICATIONS.
20. UPON COMPLETION OF CONSTRUCTION, A COMPLETE SET OF "RECORD" DRAWINGS SHALL BE SUBMITTED TO THE TOWN ENGINEER. THESE DRAWINGS SHALL BE SUBMITTED IN BOTH DIGITAL AND HARD COPY FORMAT AS DEFINED IN THE SPECIFICATIONS PRIOR TO PAYMENT OF FINAL RETAINAGE.
21. PROTECTION OF EXISTING UTILITIES DURING CONSTRUCTION SHALL BE PROVIDED AT NO ADDITIONAL COST. IF EXISTING UTILITIES ARE DAMAGED OR TEMPORARY REMOVAL OR SHUTDOWN IS REQUIRED, CONTRACTOR IS TO PROVIDE TEMPORARY BYPASS OR TEMPORARY UTILITIES TO ENSURE CONTINUED SERVICE TO LOCAL RESIDENTS.
22. PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR SHALL ATTEND A PRE-CONSTRUCTION MEETING HELD AT THE PROJECT SITE WITH THE ENGINEER, OWNER, AND CONSERVATION OFFICE TO REVIEW THE CONSTRUCTION SCHEDULE AND SEQUENCING, ORDER OF CONDITIONS, STOCKPILE LOCATIONS AND CRITICAL ASPECTS OF THE PROJECT. NO SITE WORK OR CLEARING MAY OCCUR PRIOR TO THIS MEETING.
23. PRIOR TO THE START OF WORK, CONTRACTOR SHALL CONFIRM EXISTING WETLAND FLAGS ARE IN PLACE AND SHALL BE MAINTAINED DURING CONSTRUCTION. MISSING FLAGS SHALL BE RESET PRIOR TO CONSTRUCTION. AN AUTOCAD FILE OF THE WETLAND FLAG LOCATIONS SHALL BE PROVIDED FOR CONTRACTOR'S USE IN RESETTING WETLAND FLAGS.
24. NO EQUIPMENT IS TO CROSS OR ENTER WETLAND RESOURCE AREAS AT ANY TIME UNLESS THE LOCATION OF DISTURBANCE IS MARKED ON THE PLANS REFERENCED IN THE ORDER OF CONDITIONS AND FLAGGED IN THE FIELD.
25. ALL DISTURBED UPLAND AREAS SHALL BE BROUGHT TO FINAL GRADE AND SHALL BE PERMANENTLY STABILIZED WITHIN 30 DAYS AFTER DISTURBANCE. BARE GROUND AND DISTURBED AREAS THAT CANNOT BE PERMANENTLY VEGETATED WITHIN 30 DAYS SHALL BE TEMPORARY STABILIZED BY AN APPROVED METHOD. ALL COSTS MUST BE BORNE BY THE CONTRACTOR FOR ANY LAND SURVEYOR TASKS.
26. PRIOR TO PLANTING OR SEEDING RESTORATION AREA, A LICENSED SURVEYOR SHALL SURVEY FINAL GRADES TO ENSURE GRADES HAVE BEEN ACHIEVED AS SHOWN ON PLANS AT NO ADDITIONAL COST TO THE OWNER.
27. CONTRACTOR SHALL DEMARCATE CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE AREAS PRIOR TO CONSTRUCTION.
28. THE CONSTRUCTION SITE SHALL BE MAINTAINED IN CLEAN CONDITIONS AT ALL TIMES AND CONSTRUCTION REFUSE AND DEBRIS SHALL BE DISPOSED OF PROMPTLY AND IN A LEGAL MANNER.
29. STORING, SERVICING, OR CLEANING OF TRUCKS OR EQUIPMENT SHALL BE PERFORMED IN AN UPLAND AREA AT A HORIZONTAL DISTANCE GREATER THAN 100 FEET FROM THE WETLAND RESOURCE AREAS.
30. THE CONTRACTOR, SITE ENGINEER, OR OTHER INDIVIDUAL IN CHARGE OF WORK ON THE SITE SHALL HAVE A COPY OF THE ORDER OF CONDITIONS AT ALL TIMES
    BRIGHAM STREET: DEP FILE # XXX-XXXX
    PARK STREET: DEP FILE #: XXX-XXXX
31. THE CONTRACTOR SHALL CONDUCT STREET SWEEPING OF THE PROJECT AREA WEEKLY, OR MORE OFTEN AS NEEDED.
32. ALL FUELING SHALL TAKE PLACE ON HARD/PAVED SURFACES AND OUTSIDE THE 100-FOOT BORDERING VEGETATED WETLAND BUFFER. THE CONTRACTOR SHALL MAINTAIN A MINIMUM OF 2 SPILL KITS ON SITE AND HAVE A SPILL KIT WITHIN REACH DURING CONSTRUCTION.
33. CONSTRUCTION SEQUENCING:

33.A. INSTALL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES, INCLUDING COFFER DAM, TURBIDITY CURTAIN, AND SEDIMENT BARRIERS. EROSION CONTROL MEASURES AROUND STAGING AND STOCKPILED MATERIALS SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION. STAGING AND STOCKPILE AREAS SHALL BE LOCATED OUTSIDE OF JURISDICTIONAL WETLAND RESOURCE AREAS IF OCCURRING OUTSIDE OF THE PROJECT LIMITS.

33.B. SUPPORT EXISTING UTILITIES TO REMAIN WITHIN THE PROJECT AREA.

33.C. REMOVE AND DISPOSE OF EXISTING CULVERT STRUCTURE, AND OTHER ITEMS MARKED FOR REMOVAL AS SHOWN ON THE PROJECT PLANS.

33.D. INSTALL REPLACEMENT CULVERT, HEADWALLS, AND OTHER ITEMS AS SHOWN ON PROJECT PLANS.

33.E. REPAIR ANY TEMPORARY DISTURBANCE TO ADJACENT STREAM BED AS NECESSARY.

33.F. BACKFILL CULVERT.

33.G. STABILIZE SIDE SLOPES WITH EROSION CONTROL MATTING AND LOAM AND SEED ALL DISTURBED AREAS.

33.H. REMOVE TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES UPON VEGETATIVE STABILIZATION AND AUTHORIZATION FROM THE HUDSON CONSTERVATION COMMISSION.

LEGEND

ABBREVIATIONS

EXISTING

BC	BITUMINOUS CURB	SRW	STONE RETAINING WALL
BIT	BITUMINOUS PAVEMENT	CHW	CONCRETE HEAD WALL
CONC	CONCRETE PAVEMENT	SWL	SOLID WHITE LINE
BOMO	BOLT OVER MAIN OUTLET	SYL	SINGLE YELLOW LINE
LSA	LANDSCAPED AREA	CMP	CORRUGATED METAL PIPE
FFE	BASEMENT FLOOR ELEVATION	RCP	REINFORCED CONCRETE PIPE
SILL	FIRST FLOOR ELEVATION	CPP	CORRUGATED PLASTIC PIPE
CRW	CONCRETE RETAINING WALL		

RESOURCE AREA LEGEND

BORDERING LAND SUBJECT TO FLOODING (100-YEAR FLOOD ZONE, NO BASE FLOOD ELEVATION, DEFINED BY FEMA)	
BORDERING VEGETATED WETLAND	
EDGE OF PERENNIAL STREAM/ TOP OF BANK/ORDINARY HIGH WATER	
LAND UNDER WATER BODIES AND WATERWAYS/ STREAM	
SEDIMENT BARRIER	
COFFER DAM	CD CD CD
TURBIDITY CURTAIN	

EROSION CONTROL NOTES:

1. EROSION CONTROL DEVICES SHALL REMAIN IN PLACE, UNTIL ALL DISTURBED SURFACES HAVE BEEN STABILIZED WITH FINAL VEGETATION COVER OR THE COMMISSION HAS AUTHORIZED THEIR REMOVAL.
2. EROSION CONTROL MEASURES AND BARRIERS SHALL BE MONITORED DAILY AND MAINTAINED, OR REINFORCED AS NECESSARY TO ENSURE AND PREVENT EROSION AND SILTATION OF SOILS TO WETLAND RESOURCE AREAS. ADDITIONAL FILTER FABRIC AND STRAW WATTLES SHALL BE STORED ON SITE FOR EMERGENCY USE.
3. DURING ALL PHASES OF CONSTRUCTION, ALL DISTURBED OR EXPOSED AREAS OUTSIDE THE ROADWAY SHALL BE BROUGHT TO FINISHED GRADE AND EITHER A) LOAMED AND SEEDED FOR PERMANENT STABILIZATION, IN ACCORDANCE WITH U.S. SOIL CONSERVATION SERVICE PROCEDURES, OR B) STABILIZED IN ANOTHER WAY APPROVED BY THE COMMISSION. AREAS THAT CANNOT BE PERMANENTLY STABILIZED WITHIN 30 DAYS OF DISTURBANCE SHALL BE STABILIZED WITH STRAW, MULCH OR ANY OTHER PROTECTIVE COVERING AND/OR METHOD APPROVED BY THE U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE OR BY OTHER TEMPORARY MEASURES ACCEPTABLE TO THE COMMISSION.
4. AN ADEQUATE STOCKPILE OF EROSION AND SEDIMENTATION CONTROL MATERIALS SHALL BE ON SITE AT ALL TIMES FOR EMERGENCY OR ROUTINE REPLACEMENT.
5. ANY DAMAGE CAUSED AS A DIRECT RESULT OF CONSTRUCTION TO THE WETLAND RESOURCE AREAS SHALL BE REPAIRED, RESTORED AND/OR REPLACED. SEDIMENTATION OR EROSION SHALL BE CONSIDERED DAMAGE TO THE WETLAND RESOURCE AREAS. IF SEDIMENTATION REACHES THESE AREAS, THE CONSERVATION COMMISSION SHALL BE CONTACTED AND A PLAN FOR THE PROPOSED RESTORATION SHALL BE SUBMITTED FOR APPROVAL.
6. THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AT ALL TIMES.

6.A. OBSERVATIONS OF THE PROJECT FOR COMPLIANCE WITH THE SWPPP SHALL BE MADE BY THE ENGINEER AT LEAST ONCE A WEEK OR WITHIN 24 HOURS OF A STORM 0.25 INCHES OR GREATER;

6.B. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE CONTRACTOR AT LEAST ONCE A WEEK OR WITHIN 24 HOURS OF A STORM 0.25 INCHES OR GREATER;

6.C. A REPRESENTATIVE OF THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;

6.D. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT.

DEWATERING NOTES:

1. AT LEAST 1 WEEK PRIOR TO THE PRECONSTRUCTION CONFERENCE THE CONTRACTOR SHALL PROVIDE THE CONSERVATION OFFICE WITH A DEWATERING PLAN SPECIFIC TO EACH SITE. EACH DEWATERING PLAN MUST INCLUDE DETAILS AND SPECIFICATION ON THE PROPOSED COFFER DAM TO BE EMPLOYED.
2. INSTALL A DEWATERING SYSTEM AS NEEDED TO KEEP SUBGRADES DRY AND CONVEY SURFACE WATER AND GROUNDWATER AWAY FROM EXCAVATIONS. MAINTAIN UNTIL DEWATERING IS NO LONGER REQUIRED. PREVENT SURFACE WATER AND SUBSURFACE OR GROUNDWATER FROM FLOWING INTO EXCAVATIONS AND FROM FLOODING PROJECT SITE AND SURROUNDING AREA. DO NOT ALLOW WATER TO ACCUMULATE IN EXCAVATIONS. REMOVE WATER TO PREVENT SOFTENING OF FOUNDATION BOTTOMS, UNDERCUTTING FOUNDATIONS, AND SOIL CHANGES DETRIMENTAL TO STABILITY OF SUBGRADES AND FOUNDATIONS. PROVIDE AND MAINTAIN PUMPS, SUMPS, SUCTION AND DISCHARGE LINES, AND OTHER DEWATERING SYSTEMS NECESSARY TO CONVEY WATER AWAY FROM EXCAVATIONS. MAINTAIN BROOK FLOW AT ALL TIME DURING CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR MEANS AND METHODS. MEASURES DEPICTED ON THE CONTRACT DRAWING ARE THE MINIMUM REQUIRED.
3. ALL DEWATERING ACTIVITIES SHALL MEET LOCAL, STATE, AND FEDERAL REGULATIONS.
4. THE CONTRACTOR IS RESPONSIBLE FOR ALL LABOR AND EQUIPMENT REQUIRED TO PERFORM THE WORK INCLUDING BUT NOT LIMITED TO PROPER SHORING, DEWATERING EQUIPMENT, AND WATER TREATMENT EQUIPMENT IN ACCORDANCE WITH THE SPECIFICATIONS AND ALL LOCAL, STATE, AND FEDERAL REGULATIONS.
5. ALL IN-WATER WORK TO BE CONDUCTED IN ACCORDANCE WITH ANY APPLICABLE PERMIT CONDITIONS RELATED TO TIME OF YEAR RESTRICTIONS FROM THE US ARMY CORPS OF ENGINEERS, HUDSON CONSERVATION COMMISSION, AND/OR MASS DEP.
6. ALL DREDGING OPERATIONS SHALL BE CONDUCTED FROM UPLAND AREAS. ALL DREDGE SPOILS SHALL BE DEWATERED AND DISPOSED OF AT AN UPLAND LOCATION (OR OTHER APPROVED LOCATION).
7. THE REMOVAL OF MATERIAL FROM THE STREAM BOTTOM SHALL BE DONE IN SUCH A MANNER AS TO ENSURE THAT THE RECONFIGURED BOTTOM AREA WILL NOT IMPEDE OR OBSTRUCT FISH MIGRATION, OR INTERFERE WITH THE NATURAL FLOW OF THE STREAM.
8. DEWATERING ACTIVITIES SHALL BE MONITORED DAILY TO ENSURE THAT SEDIMENT LADEN WATER IS APPROPRIATELY SETTLED PRIOR TO DISCHARGE TOWARD THE RESOURCE AREAS. NO DISCHARGE OF WATER IS ALLOWED DIRECTLY INTO AN AREA SUBJECT TO JURISDICTION OF THE WETLANDS PROTECTION ACT. EMERGENCY DEWATERING REQUIREMENTS ARISE, THE APPLICATION SHALL SUBMIT A CONTINGENCY PLAN TO THE COMMISSION FOR APPROVAL WHICH PROVIDES FOR THE PUMPED WATER TO BE CONTAINED IN A SETTLING BASIN, TO REDUCE TURBIDITY TO DISCHARGE INTO A RESOURCE AREA.
9. BYPASS WATER AND RESIDUAL WATER SHALL BE COMPLETELY SEGREGATED.
10. HEATED OR SEDIMENT LADEN WATER SHALL NOT BE ALLOWED TO DIRECTLY ENTER THE STREAM.
11. CONTRACTOR TO FOLLOW MANUFACTURER'S OPERATION AND MAINTENANCE GUIDELINES FOR TURBIDITY CURTAINS.

SYMBOLS LEGEND

	EXISTING	PROPOSED
ABUTTERS LOT LINE		
RIGHT OF WAY LINE		
EASEMENT		
WOOD FENCE		
VINYL FENCE		
WOOD GUARDRAIL		
STONE WALL		
TREE LINE		
INTERMEDIATE CONTOURS	231	201
INDEX CONTOURS	230	200
CENTER OF STREAM BASELINE		
FIELD COLLECTED CROSS SECTIONS	XS3	
CONCRETE BOUND WITH DRILL HOLE	CBDH	
CONCRETE BOUND DRILL HOLE	CB	
FOUND IRON ROD	DH	
FOUND	IRF	
CATCH BASIN		
OUTFALL		
SEWER MANHOLE		
DRAIN MANHOLE		D
VALVE MARKED SEWER	V	
ELECTRIC BOX		
ELECTRIC METER	E	
GAS METER	G	
GAS VALVE		
WATER GATE		
WATER SHUT OFF		
FIRE HYDRANT		
GUY WIRE		
UTILITY POLE		
UTILITY POLE WITH LIGHT AND TRANSFORMER		
UTILITY POLE WITH TRANSFORMER		
DECIDUOUS TREE		
CONIFER TREE		
SIGN (SINGLE POSTED)		
BORING		
MAILBOX		
TEST PIT		
LIMIT OF WORK		LW
SAWCUT		
BITUMINOUS CURB		
BANK RESTORATION		
RIPRAP		
BITUMINOUS PAVEMENT		
EROSION CONTROL MATTING		

Woodard & Curran
40 Shattuck Road, Suite 110
Andover, Massachusetts 01810
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PE SEAL:

COMMONWEALTH OF MASSACHUSETTS
KEVIN A. MCCAFFERY
No. 40778
REGISTERED PROFESSIONAL ENGINEER

ISSUED FOR BID

CLIENT INFO:
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HUDSON, MASSACHUSETTS

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GENERAL
GENERAL NOTES, LEGENDS, ABBREVIATIONS AND KEY MAP

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G-001

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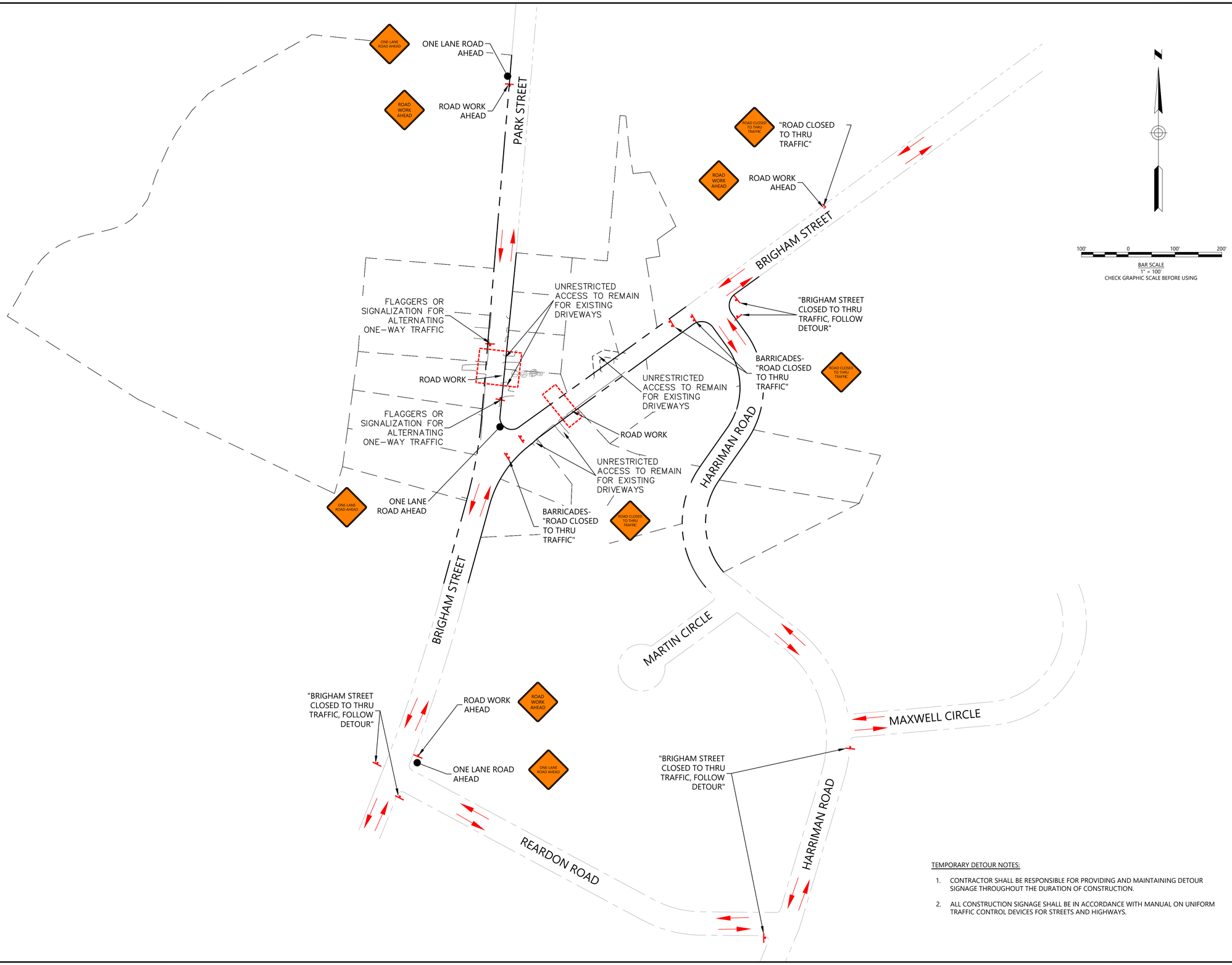

TEMPORARY DETOUR NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING DETOUR SIGNAGE THROUGHOUT THE DURATION OF CONSTRUCTION.
2. ALL CONSTRUCTION SIGNAGE SHALL BE IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS.

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40 Shattuck Road, Suite 110
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No. 46778
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DRAWING TITLE:
GENERAL TRAFFIC CONTROL PLAN

DRAWING NO:
G-002

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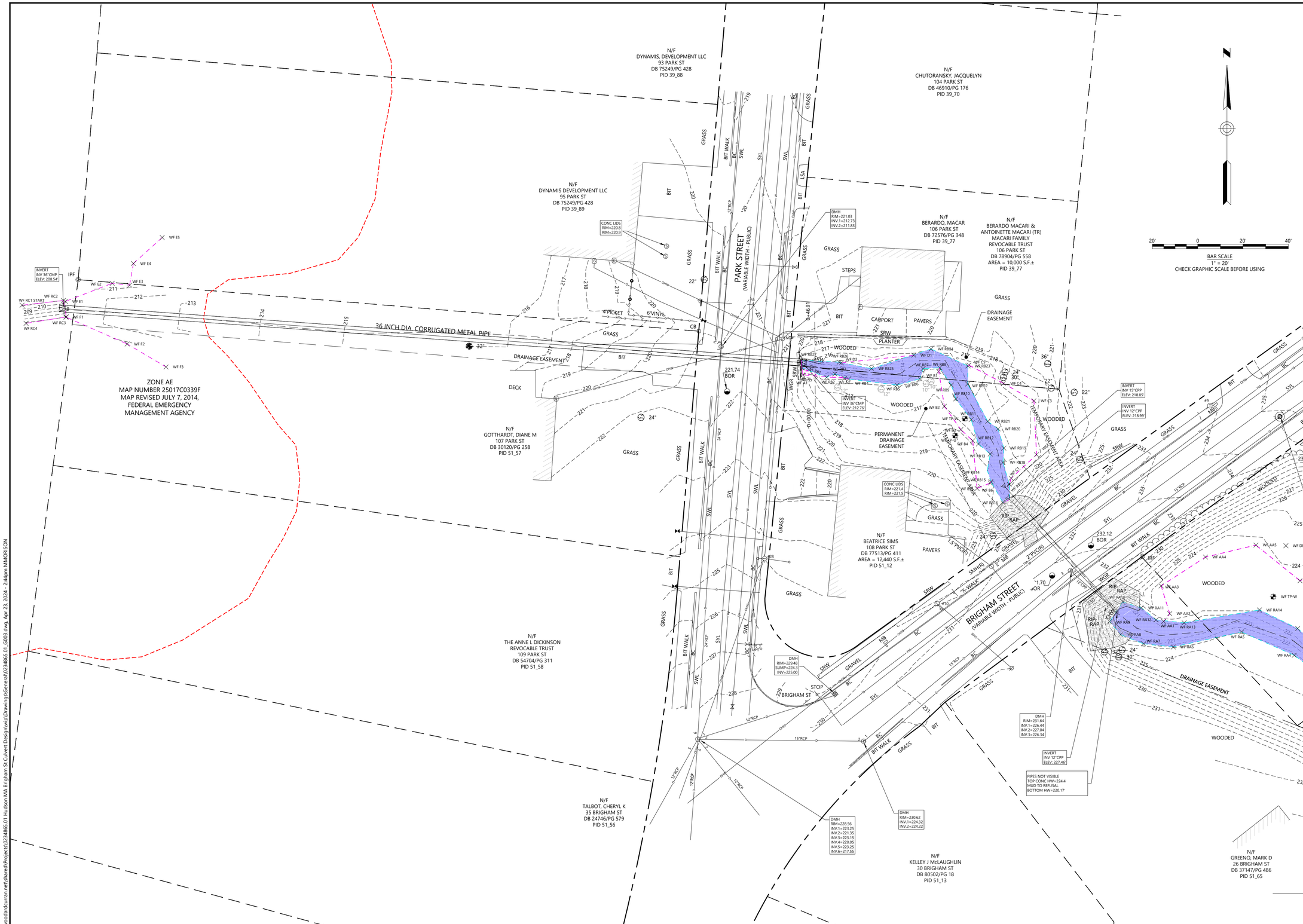

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DRAWING NO:
G-003

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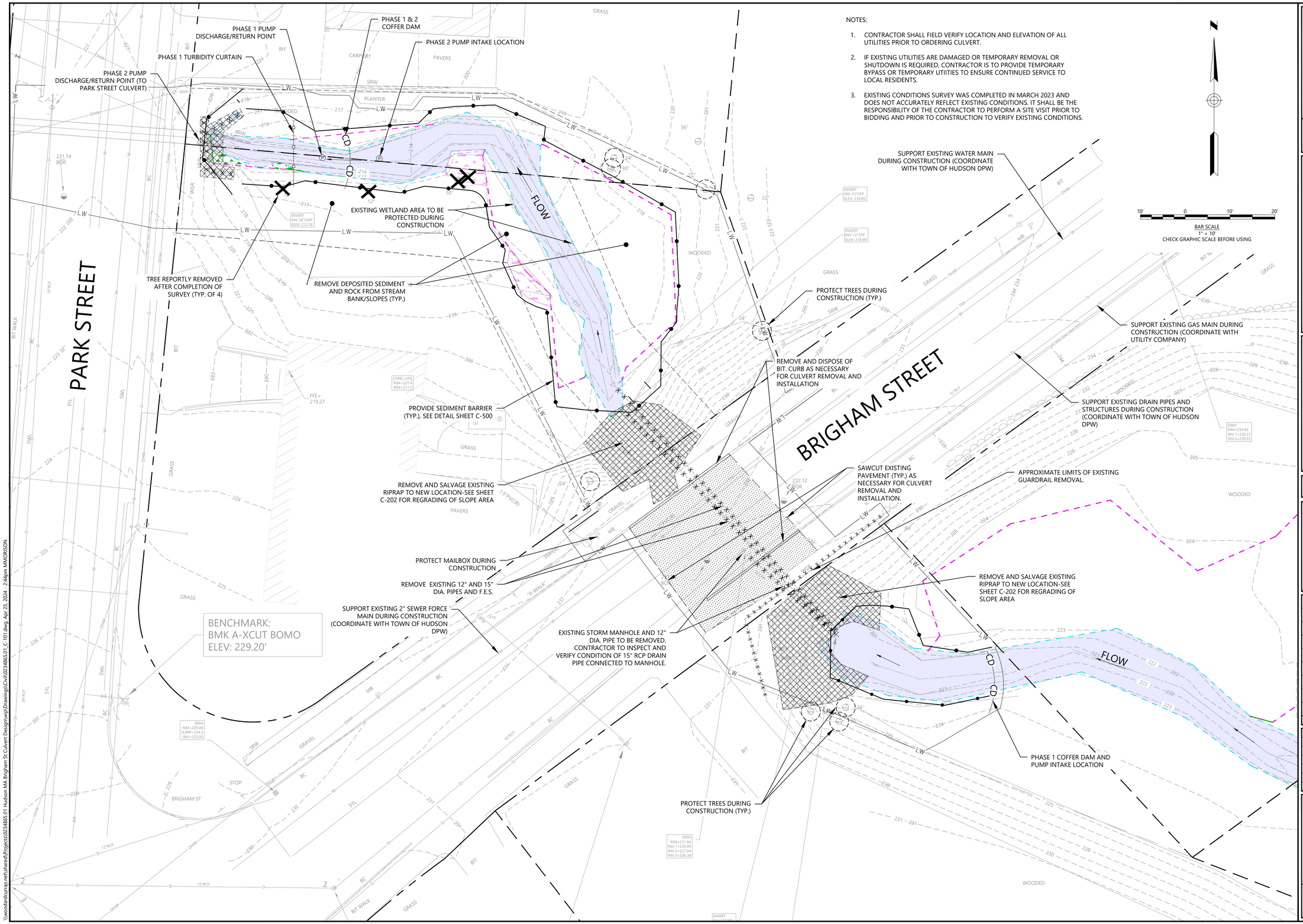
22x34

NOTES:

1. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO ORDERING CULVERT.
2. IF EXISTING UTILITIES ARE DAMAGED OR TEMPORARY REMOVAL OR SHUTDOWN IS REQUIRED, CONTRACTOR IS TO PROVIDE TEMPORARY BYPASS OR TEMPORARY UTIITIES TO ENSURE CONTINUED SERVICE TO LOCAL RESIDENTS.
3. EXISTING CONDITIONS SURVEY WAS COMPLETED IN MARCH 2023 AND DOES NOT ACCURATELY REFLECT EXISTING CONDITIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM A SITE VISIT PRIOR TO BIDDING AND PRIOR TO CONSTRUCTION TO VERIFY EXISTING CONDITIONS.



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COMMONWEALTH OF MASSACHUSETTS
KEVIN A. MCCAFFERY
NO. 40778
REGISTERED PROFESSIONAL ENGINEER

ISSUED FOR BID

CLIENT INFO:
TOWN OF HUDSON
HUDSON, MASSACHUSETTS

BRIGHAM STREET CULVERT REPLACEMENT AND PARK STREET CULVERT MAINTENANCE- ISSUED FOR BID

REV	MM/DD/YY	DESCRIPTION
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JOB NO:	0234865.01
DATE:	APRIL, 2024
SCALE:	1"=10'
DESIGNED BY:	KM
DRAWN BY:	MM
CHECKED BY:	CG
FILENAME:	0234865.01_C-101.dwg

DRAWING TITLE:
CIVIL
EROSION CONTROL & DEMOLITION PLAN

DRAWING NO:
C-101

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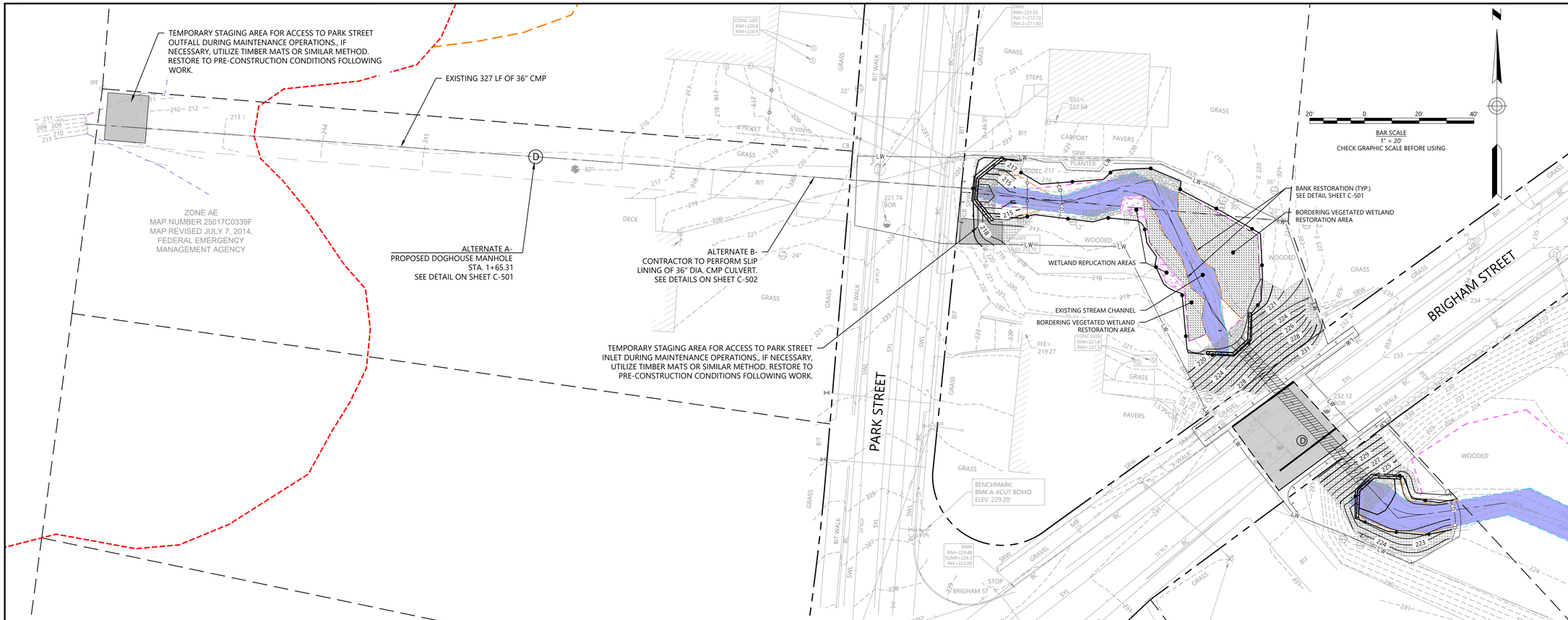

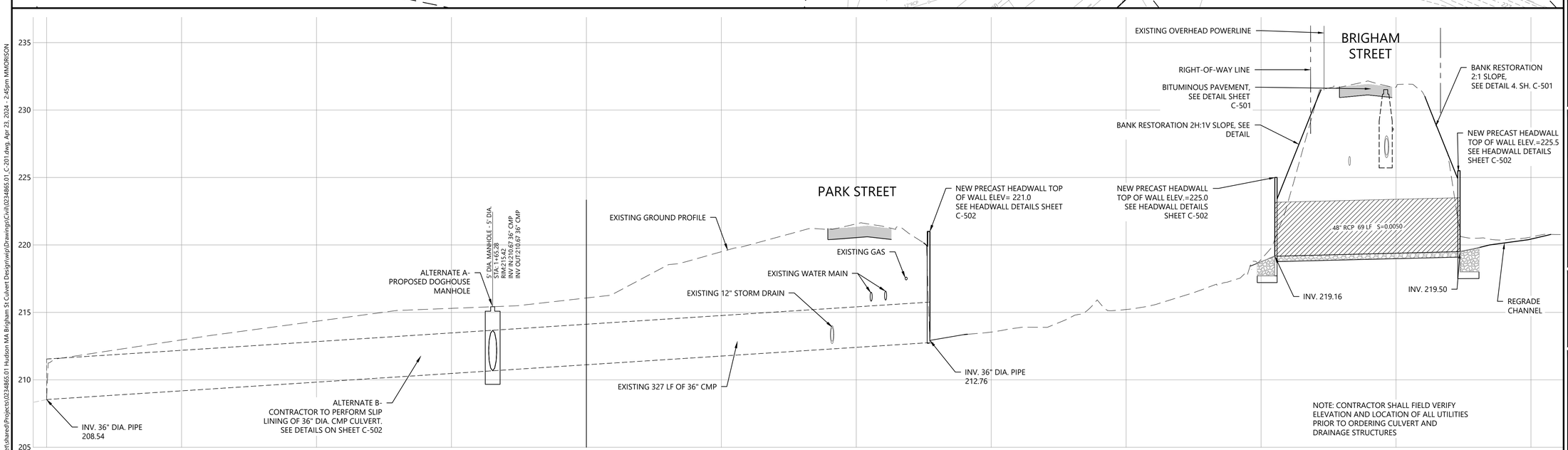

NOTE: CONTRACTOR SHALL FIELD VERIFY ELEVATION AND LOCATION OF ALL UTILITIES PRIOR TO ORDERING CULVERT AND DRAINAGE STRUCTURES

PROFILE STA. -0+05 TO STA. 5+78

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'

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CIVIL
OVERALL PLAN AND PROFILE

DRAWING NO:
C-201

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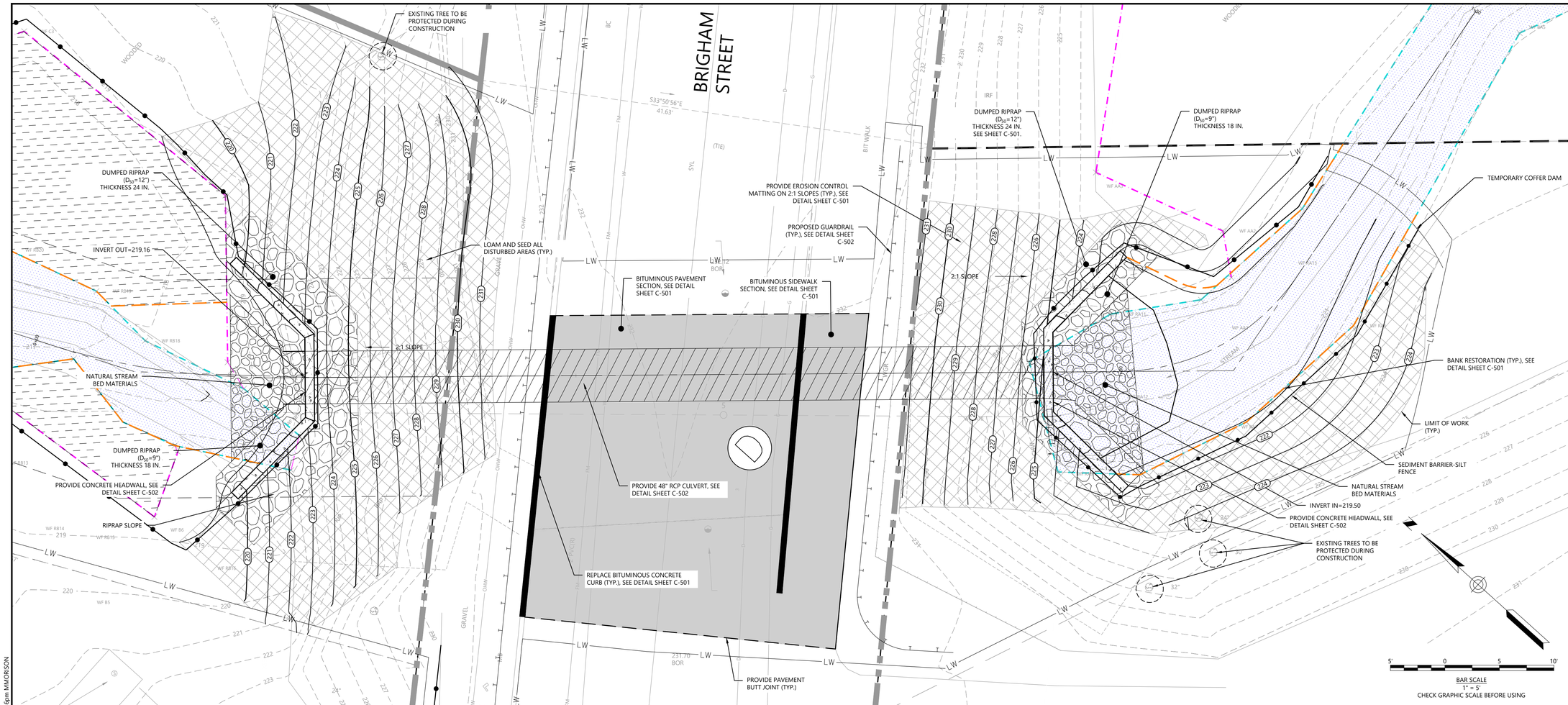

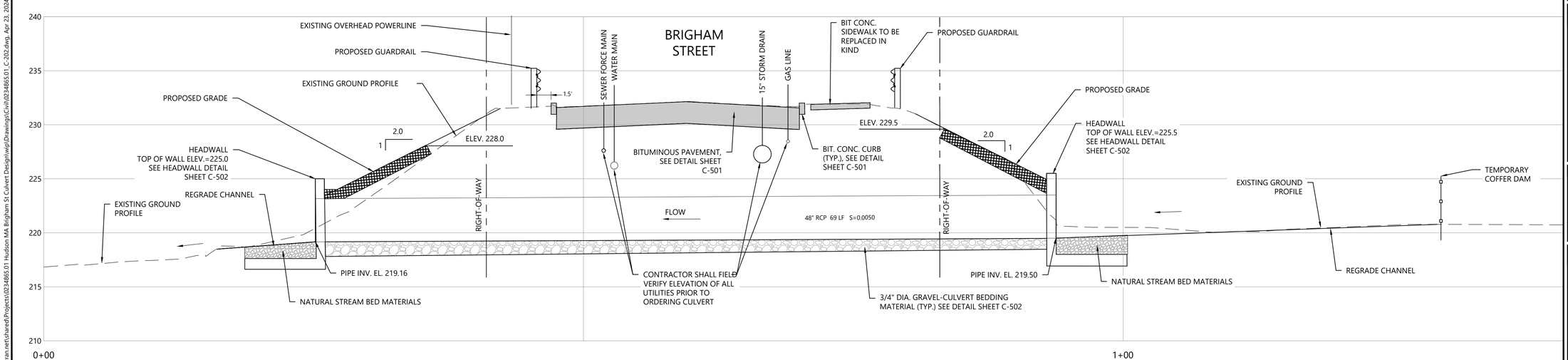

PROFILE STA. 0+00 TO STA. 1+50

HORIZONTAL SCALE: 1" = 5'
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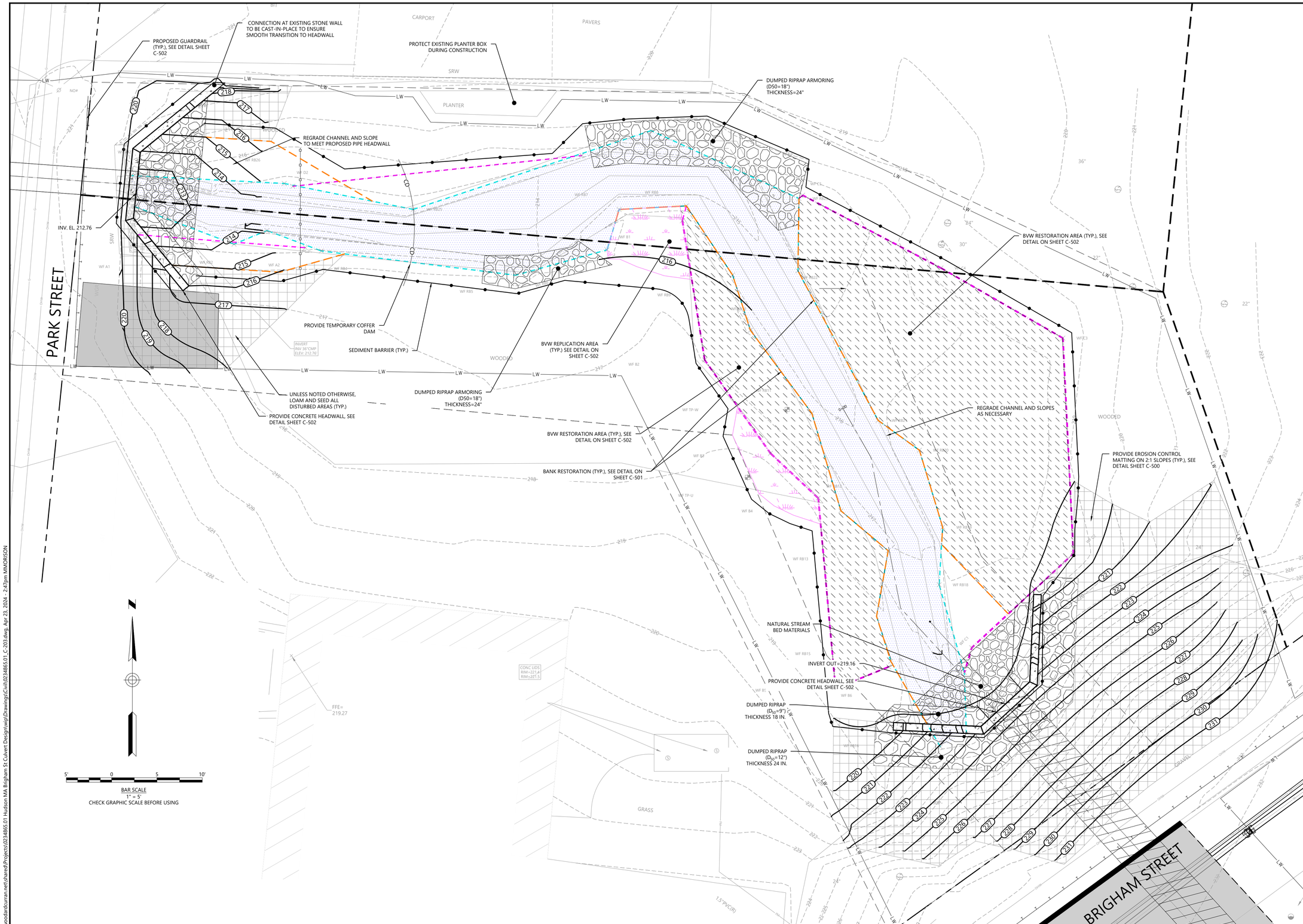

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PARK STREET HEADWALL AND RESTORATION PLAN

DRAWING NO:

C-203

22x34

EROSION AND SEDIMENT CONTROL NOTES

TEMPORARY EROSION CONTROL

MEASURE	DATES FOR USE	TIMING, ACTIVITY, AND LOCATION
SEDIMENTATION BARRIER	ALL	BEFORE SOIL DISTURBANCE, INSTALL DOWNHILL OF AREAS TO BE DISTURBED AND AROUND MATERIAL STOCKPILES.
UP-SLOPE DIVERSION	ALL	BEFORE SOIL DISTURBANCE, INSTALL UPHILL OF AREAS TO BE DISTURBED AND MATERIAL STOCKPILES.
CATCH BASIN PROTECTION	ALL	BEFORE SOIL OR PAVEMENT DISTURBANCE, INSTALL ACF ENVIRONMENTAL, INC. HIGH FLOW SILTSACK, SILTSAVER INLET FILTER. OR EQUAL, INSTALLED PER MANUFACTURER'S REQUIREMENTS.
DUST CONTROL	ALL	DURING DRY WEATHER, APPLY WATER AND CALCIUM CHLORIDE TO CONTROL DUST.
TEMPORARY SEEDING	APRIL 15 TO OCT. 15	SOIL STOCKPILES THAT ARE NOT COVERED AND DISTURBED AREAS THAT WILL NOT BE DISTURBED AGAIN WITHIN 14 DAYS. IF GRASS GROWTH PROVIDES LESS THAN 95% SOIL COVERAGE BY NOV. 1, APPLY MULCH AND ANCHOR WITH EROSION CONTROL BLANKET.
MULCH	APRIL 15 TO SEPT. 15	ON ALL AREAS OF EXPOSED SOIL PRIOR TO RAIN EVENTS APPLY 100-150 LBS (2.5 BALES) PER 1,000 SQ FT. BY MECHANICAL BLOWER.
WINTER MULCH	SEPT. 16 TO OCT. 31	ON ALL AREAS OF EXPOSED SOIL PRIOR TO PRECIPITATION APPLY 150 TO 170 LBS. MULCH (4 BALES) PER 1,000 SQ. FT. BY MECHANICAL BLOWER. EROSION CONTROL BLANKET MAY BE USED AS A SUBSTITUTE FOR WINTER MULCH.
	NOV. 1 TO APRIL 14	ON ALL AREAS OF EXPOSED SOIL, APPLY 150 TO 170 LBS. MULCH (4 BALES) PER 1,000 SQ. FT. AND ANCHOR WITH NETTING AT THE END OF EACH WORKING DAY. EROSION CONTROL BLANKET MAY BE USED AS A SUBSTITUTE FOR WINTER MULCH.
INSPECTIONS	UNTIL SITE IS PERMANENTLY STABILIZED	INSPECT THE EROSION AND SEDIMENTATION CONTROL MEASURES DAILY, AND AFTER RAINFALL OF HALF INCH OR GREATER IN A 24-HOUR PERIOD, AND MAINTAIN AND REPAIR AS NECESSARY.

PERMANENT EROSION CONTROL:

MEASURE	DATES FOR USE	TIMING, ACTIVITY, AND LOCATION
PAVEMENT - BASE COURSE - FINAL COURSE	WHEN NO FROST IS IN GROUND	INSTALL ONLY IN AREAS SHOWN ON THE PLAN, SHORTLY AFTER PAVEMENT BASE IS BROUGHT TO FINAL GRADE. INSTALL NEAR COMPLETION OF PROJECT.
PERMANENT SEEDING	APRIL 15 TO SEPT. 15	ON FINAL GRADE AREAS, WITHIN 7 DAYS OF GRADE PREPARATION, PREPARE TOPSOIL, FOLLOWED BY SEED AND MULCH APPLICATION.
DORMANT SEEDING	SEPT. 16 TO APRIL 15	ON FINAL GRADE AREAS, WITH PREPARED TOPSOIL. APPLY SEED AT DOUBLE THE SPECIFIED RATE ON BARE SOIL, AND FOLLOW WITH AN APPLICATION OF WINTER MULCH.
GROUND COVER, TREES, SHRUBS	APRIL 15 TO NOV. 1	INSTALL WITH FINAL LANDSCAPING.
PERMANENT MULCH	ALL	INSTALL WITH FINAL LANDSCAPING.

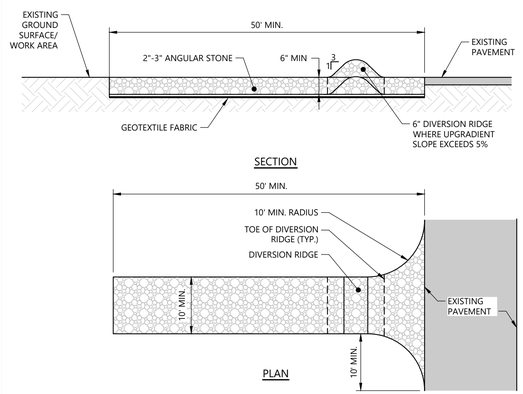
INSPECTIONS:

REGULAR INSPECTIONS OF ALL EROSION AND SEDIMENTATION CONTROLS SHALL BE MADE AT LEAST WEEKLY AND PRIOR TO AND FOLLOWING STORM EVENTS. MINIMUM INSPECTIONS SHALL BE MADE AS LISTED IN THE TABLE BELOW.

INSPECTED ITEM	LOOK FOR
MULCHED SURFACES	THIN MULCH OR INADEQUATE APPLICATION. WIND MOVEMENT.
SEEDED SURFACES	POOR SEED GERMINATION. LOSS OF MULCH. DEVELOPMENT OF RIVULETS.
SEDIMENT BARRIER	SEDIMENT BUILD-UP TO ONE HALF THE HEIGHT OF THE BARRIER. UNDERMINING OF THE BARRIER. SUPPORTING STAKES LOOSE, TOPPLED, OR UNMARKED. BREAKS IN BARRIER.
PERIMETER DIVERSION	DISCHARGE IS TO STABILIZED AREA. EROSION OR BREAKS IN BARRIER. SUPPORTING STAKES LOOSE, TOPPLED OR UNMARKED.
CATCH BASIN PROTECTION	SEDIMENT BUILD-UP AND STRUCTURE BLOCKAGES. SLOW FLOW/PONDING WATER. BREAKS IN FABRIC OR VOIDS IN BARRIER.
DEWATERING FILTER	BREAKS IN FABRIC OR SUPPORTING STRUCTURE. SLOW FLOW, INDICATING HIGH SEDIMENT BUILD-UP.
CONSTRUCTION ENTRANCE	SEDIMENTATION OF ROADWAYS. OFF-SITE DUST COMPLAINTS.

DEWATERING NOTES

1. LOCATE DISCHARGE SITE ON FLAT UPLAND AREAS AS FAR AWAY AS POSSIBLE FROM STREAMS, WETLANDS, OTHER RESOURCES AND POINTS OF CONCENTRATED FLOW.
2. NEVER DISCHARGE TO AREAS THAT ARE BARE OR NEWLY VEGETATED.
3. DIRT BAG MATERIAL BASED ON PARTICLE SIZE IN DIRTY WATER, I.E., FOR COARSE PARTICLES A WOVEN MATERIAL; FOR SILTS/CLAYS A NON-WOVEN MATERIAL.
4. DO NOT OVER PRESSURIZE DIRT BAG OR USE BEYOND CAPACITY.
5. CHANNELS DUG FOR DISCHARGING WATER FROM THE EXCAVATED AREA NEED TO BE STABLE. IF FLOW VELOCITIES CAUSE EROSION WITHIN THE CHANNEL THEN A DITCH LINING SHOULD BE USED.
6. BUCKETED WATER SHOULD BE DISCHARGED IN A STABLE MANNER TO THE SEDIMENT REMOVAL AREA. A SPLASH PAD OF RIPRAP UNDERLAIN WITH GEOTEXTILE MAY BE NECESSARY TO PREVENT SCOURING OF SOIL.
7. DEWATERING IN PERIODS OF INTENSE, HEAVY RAIN, WHEN THE INFILTRATIVE CAPACITY OF THE SOIL IS EXCEEDED, SHOULD BE AVOIDED.
8. INSTALL DIVERSION DITCHES OR BERMS TO MINIMIZE THE AMOUNT OF CLEAN STORMWATER RUNOFF ALLOWED INTO THE EXCAVATED AREA.
9. DURING THE ACTIVE DEWATERING PROCESS, INSPECTION OF THE DEWATERING FACILITY SHOULD BE REVIEWED FREQUENTLY. SPECIAL ATTENTION SHOULD BE PAID TO THE BUFFER AREA FOR ANY SIGN OF EROSION AND CONCENTRATION OF FLOW THAT MAY COMPROMISE THE BUFFER AREA. OBSERVE WHERE POSSIBLE THE VISUAL QUALITY OF THE EFFLUENT AND DETERMINE IF ADDITIONAL TREATMENT CAN BE PROVIDED.
10. EROSION CONTROL REQUIRED AROUND DEWATERING DISCHARGE SEDIMENT CONTROL DEVICE.

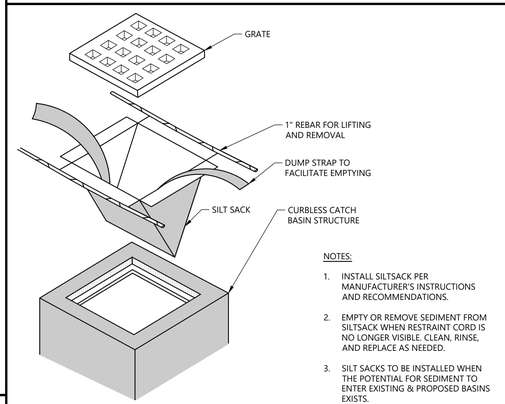


NOTES:

1. GRADE TOWARDS SEDIMENT BARRIER WHEN NECESSARY TO MANAGE FLOW.
2. INCREASE MINIMUM LENGTH TO 100' WHERE TRACKED SEDIMENTS CONTAIN LESS THAN 80% SAND OR AS NECESSARY FOR HEAVY CONSTRUCTION.

1 STABILIZED CONSTRUCTION ENTRANCE/EXIT

NOT TO SCALE

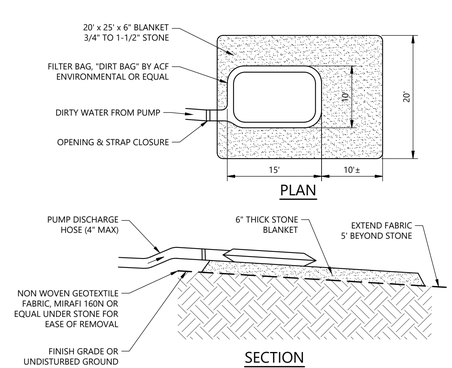


NOTES:

1. INSTALL SILTSACK PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
2. EMPTY OR REMOVE SEDIMENT FROM SILTSACK WHEN RESTRAINT CORD IS NO LONGER VISIBLE. CLEAN, RINSE, AND REPLACE AS NEEDED.
3. SILT SACKS TO BE INSTALLED WHEN THE POTENTIAL FOR SEDIMENT TO ENTER EXISTING & PROPOSED BASINS EXISTS.

2 SILTSACK - CURBLESS INLET

NOT TO SCALE



3 DEWATERING DISCHARGE SEDIMENT CONTROL DEVICE

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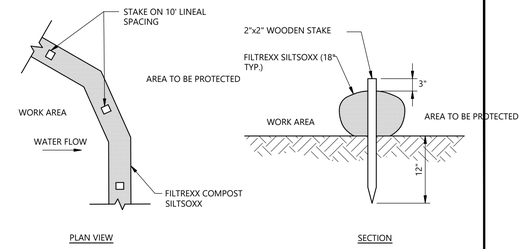

4 SEDIMENT BARRIER-SILTSOXX

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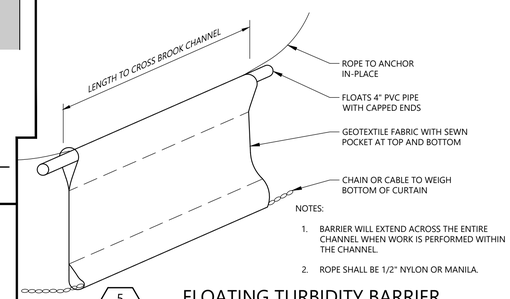
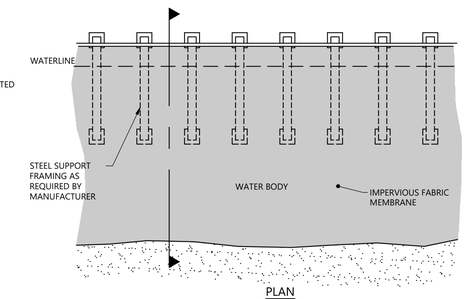


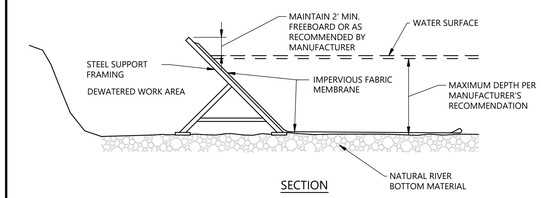
NOTES:

1. BARRIER WILL EXTEND ACROSS THE ENTIRE CHANNEL WHEN WORK IS PERFORMED WITHIN THE CHANNEL.
2. ROPE SHALL BE 1/2" NYLON OR MANILA.

5 FLOATING TURBIDITY BARRIER

NOT TO SCALE



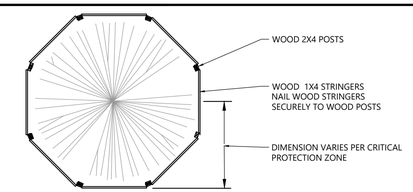


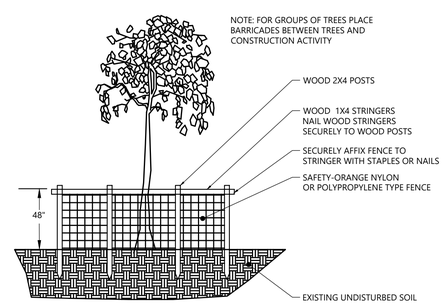
NOTE:

COFFERDAM DETAIL SHOWN FOR REFERENCE PURPOSES. CONTRACTOR SHALL PROVIDE DESIGN OF TEMPORARY COFFERDAMS, STAMPED BY A LICENSED PROFESSIONAL ENGINEER IN THE COMMONWEALTH OF MASSACHUSETTS.

7 TEMPORARY COFFER DAM DETAIL

NOT TO SCALE



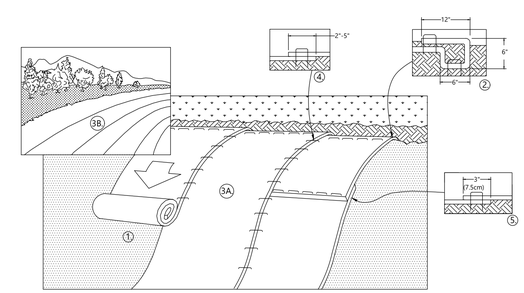


NOTES:

1. FOR GROUPS OF TREES; PLACE THE BARRICADES AT THE DRIPLINE AROUND THE GROUPS PERIMETER.
2. INSTALLATION OF TREE PROTECTION BARRICADES SHALL BE PERFORMED BEFORE ANY SITE DEVELOPMENT ACTIVITY TAKES PLACE.
3. THE TREE PROTECTION BARRICADES SHALL REMAIN IN PLACE THROUGHOUT THE CONSTRUCTION PHASE AND UNTIL ALL SITE DEVELOPMENT ACTIVITIES ARE FULLY COMPLETE.
4. ANY DAMAGE THAT MAY OCCUR TO THE BARRICADES SHALL BE REPAIRED OR REPLACED TO THE ORIGINAL SPECIFICATION WITHIN 24 HOURS OF THE DAMAGE OCCURRING.
5. THE AREA WITHIN THE TREE PROTECTION BARRICADES SHALL NOT BE USED FOR THE STORAGE OF ANY MATERIALS, SUPPLIES OR DEBRIS OR THE DISPOSAL OF ANY SOLID, LIQUID OR GASEOUS MATERIAL THAT COULD CAUSE HARM TO THE TREES.
6. ANY TREE SCHEDULED TO REMAIN IF DAMAGED DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

6 TREE PROTECTION DETAIL

NOT TO SCALE



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's). INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED AS WELL AS REMOVING ANY PROTRUDING ROCKS, STUMPS OR ROOTS. DURING THE GROWING SEASON (APRIL 15 - SEPTEMBER 15) USE RECP'S ON SLOPES HAVING A GRADE GREATER THAT 15%, OR ANYWHERE WHERE HAY MULCH HAS PROVEN TO BE INEFFECTIVE AT CONTROLLING SHEET EROSION. RECP'S ARE A MANUFACTURED COMBINATION OF MULCH AND NETTING DESIGNED TO PREVENT EROSION AND RETAIN SOIL MOISTURE. FOR OVER WINTER PROTECTION, APPLY RECP'S ON SLOPES STEEPER THAN AN 8% GRADE.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH (USE OF METAL STAPLES IS PROHIBITED). BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" - 5" OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE RECP's WIDTH. NOTE: *IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.
6. UNTIL GRASS HAS GOOD COVERAGE, INSPECT PERIODICALLY AND AFTER EACH RAINSTORM TO CHECK FOR EROSION. IMMEDIATELY REPAIR AND ADD MORE MULCH UNTIL GRASSES ARE FIRMLY ESTABLISHED. DO NOT MOW THE FIRST YEAR.
7. EROSION CONTROL MATTING AND GROUND FASTENERS SHALL BE 100% BIODEGRADABLE.

8 EROSION CONTROL MATTING

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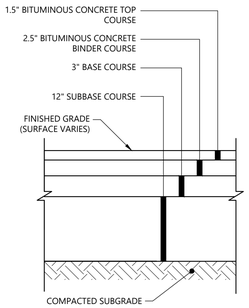
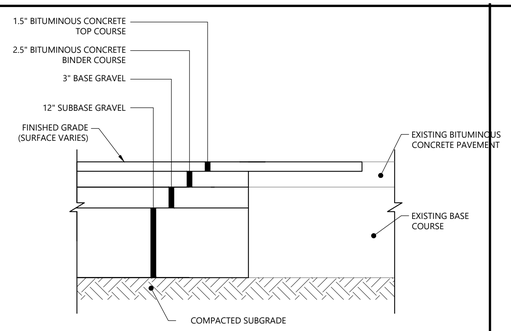


1 BITUMINOUS PAVEMENT SECTION

NOT TO SCALE



2 BITUMINOUS PAVEMENT BUTT JOINT

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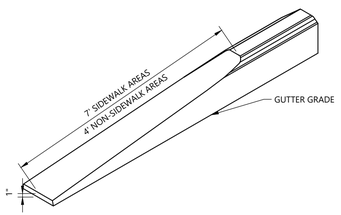
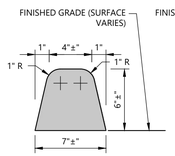
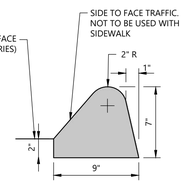


ISOMETRIC VIEW



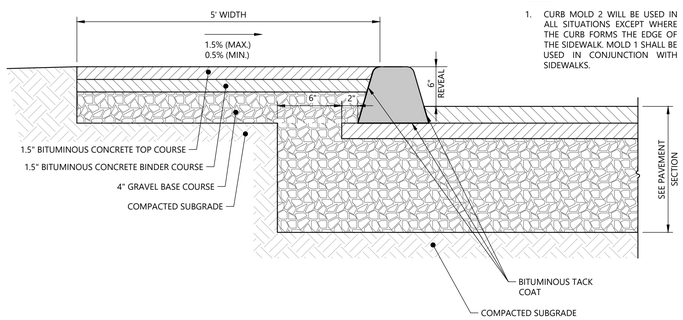
MOLD 1



MOLD 2

NOTES:

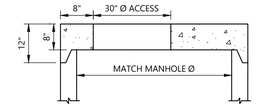
1. CURB MOLD 2 WILL BE USED IN ALL SITUATIONS EXCEPT WHERE THE CURB FORMS THE EDGE OF THE SIDEWALK. MOLD 1 SHALL BE USED IN CONJUNCTION WITH SIDEWALKS.



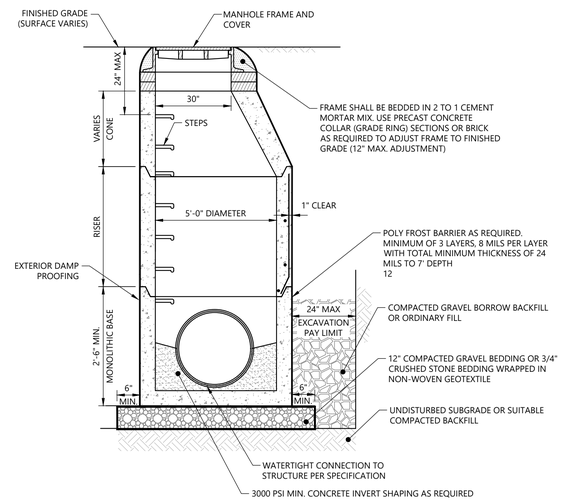
SECTION

3 BITUMINOUS PAVEMENT CURB W/ BIT. SIDEWALK

NOT TO SCALE



SHALLOW ALTERNATE TOP SLAB

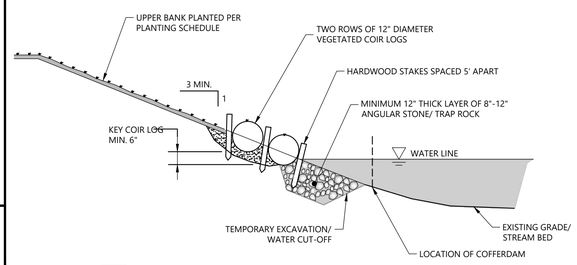


NOTES:

1. PRECAST CONCRETE STRUCTURES AND CASTINGS SHALL BE SUITABLE FOR HS-20 LOADINGS.
2. PRECAST CONCRETE STRUCTURES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
3. ALTERNATE TOP SLAB MAY BE USED AS DICTATED BY DESIGN AND/OR FIELD CONDITIONS.
4. MANHOLE FRAME AND GRATE(S) SHALL MEET MUNICIPAL AND STATE SPECIFICATIONS WHEN APPLICABLE.
6. JOINT SEALANT BETWEEN SECTIONS SHALL BE BUTYL RUBBER.
7. REFER TO PROJECT SPECIFICATIONS FOR MORE DRAINAGE MANHOLE INFORMATION.

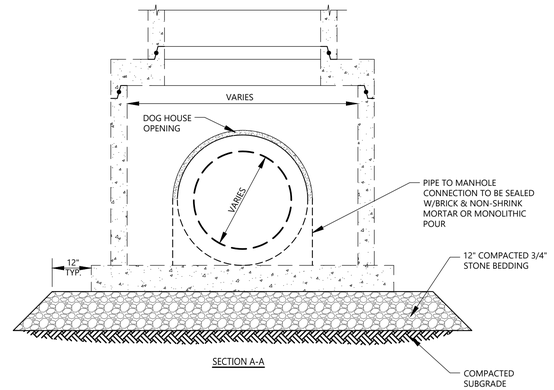
6 STORM DRAINAGE MANHOLE DETAIL

NOT TO SCALE

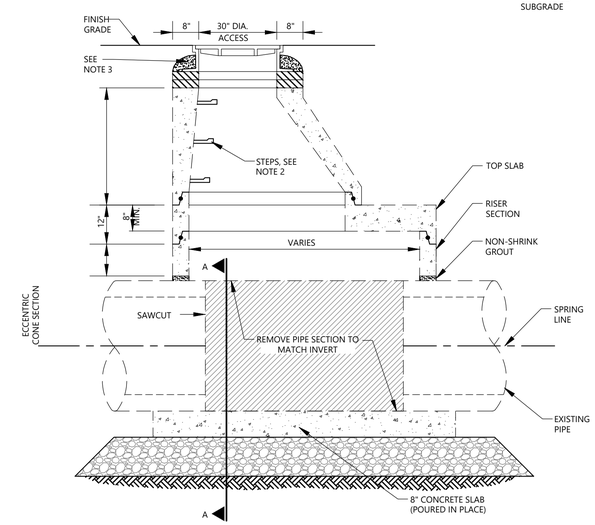


7 BANK RESTORATION DETAIL

NOT TO SCALE



SECTION A-A

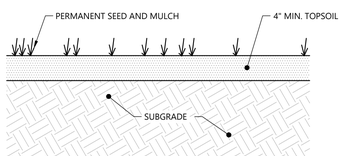


NOTES:

1. ALL SECTIONS SHALL BE DESIGNED FOR H-20 LOADING.
2. STEEL REINFORCED POLYPROPYLENE MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
3. CAST IRON MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR OR PRECAST CONCRETE RINGS: MAXIMUM 8" ADJUSTMENT.

8 DOGHOUSE MANHOLE DETAIL

NOT TO SCALE

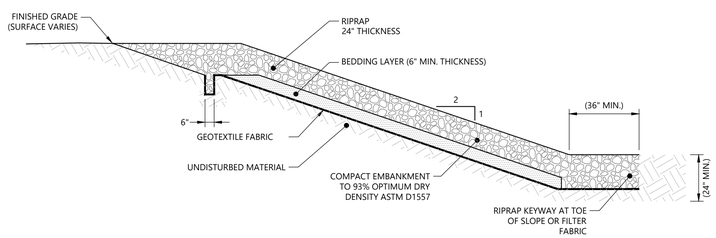


NOTES:

1. AVOID COMPACTION, UNLESS OTHERWISE NOTED ON PLANS.
2. TOPSOIL SHALL NOT BE DISTRIBUTED OVER PARTLY OR FULLY FROZEN, MUDDY, SNOWY, ICY OR EXCESSIVELY WET SURFACES.
3. SOD AND SEED MIXTURE(S) SHALL BE APPROPRIATE FOR GROWING SEASON, CLIMATE AND SOIL CONDITIONS, AND SURFACE USAGE. REFER TO STATE GUIDELINES.
4. SEED SHALL BE APPLIED AT RATES RECOMMENDED BY STATE GUIDELINES.
5. APPLY MULCH OVER SEEDED AREAS IN ACCORDANCE WITH STATE GUIDELINES.
6. INSTALL AND/OR REPAIR EROSION AND SEDIMENT CONTROL MEASURES BEFORE LAYING TOPSOIL. MAINTAIN EROSION CONTROL MEASURES DURING TOPSOILING.
7. MAXIMUM SLOPE TOPSOIL CAN BE USED IS 2:1.

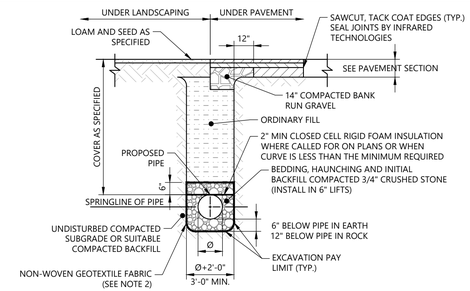
4 LOAM & SEED

NOT TO SCALE



5 RIPRAP SLOPE PROTECTION

NOT TO SCALE



NOTES:

1. BEDDING, HAUNCHING AND BACKFILL SHALL BE COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS.
2. NON-WOVEN GEOTEXTILE SHALL BE INSTALLED AS SHOWN WHEN FINE SANDS, SILT, CLAY OR ORGANIC MATERIALS ARE ENCOUNTERED AT THE TRENCH BOTTOM.

9 DRAINAGE PIPE TRENCH

NOT TO SCALE

Woodard & Curran
40 Shattuck Road, Suite 110
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TOWN OF HUDSON
HUDSON, MASSACHUSETTS

BRIGHAM STREET CULVERT REPLACEMENT AND PARK STREET CULVERT MAINTENANCE- ISSUED FOR BID

REV	MM/DD/YY	DESCRIPTION
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DATE:	APRIL, 2024
SCALE:	N/A
DESIGNED BY:	KM
DRAWN BY:	MM
CHECKED BY:	CG
FILENAME:	0234865.01_C50X.dwg

DRAWING TITLE:

DETAILS 2

DRAWING NO:

C-501

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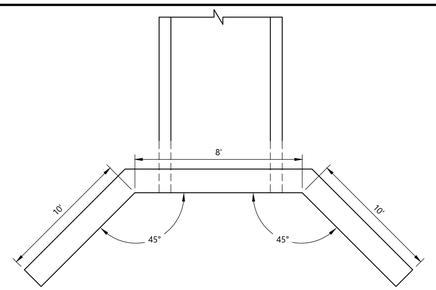
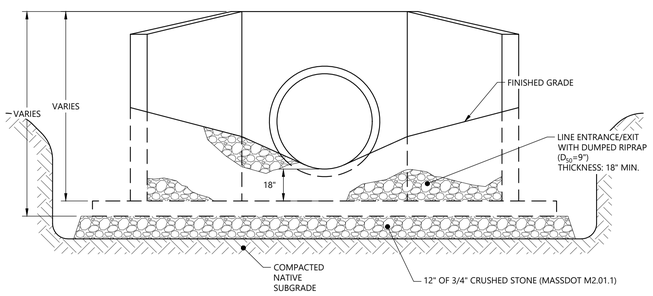


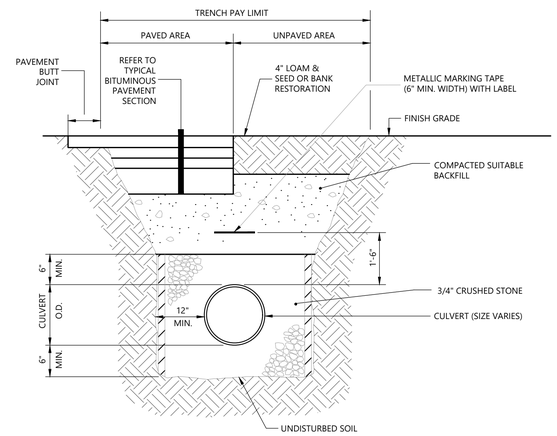
PLAN VIEW



ELEVATION

1 CONCRETE HEADWALL DETAIL

NOT TO SCALE

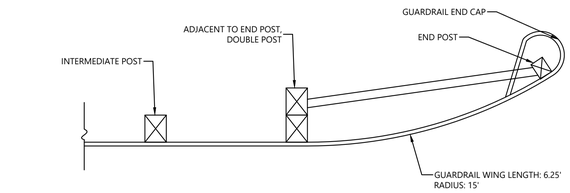


NOTES:

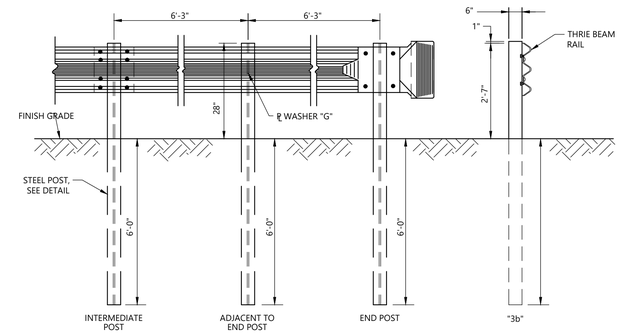
1. MAINTAIN UNIFORM TRENCH WIDTH TO 12" OVER PIPE.
2. SEE PAVEMENT DETAILS FOR PAVING AND PATCHING REQUIREMENTS.
3. IF EXCAVATION BELOW NORMAL GRADE IS REQUIRED, PROVIDE SHEETING 2' BELOW TRENCH BOTTOM. BACKFILL TRENCH FROM TRENCH BOTTOM TO NORMAL GRADE WITH COMPACTED GRAVEL (6" COMPACTED LIFTS).
4. A 2" RIGID INSULATION WILL BE REQUIRED IN AREAS WHERE LESS THAN 4'-0" OF COVER OVER TOP OF PIPE OR WHERE REQUIRED BY ENGINEER.

2 CULVERT TRENCH DETAIL

NOT TO SCALE



PLAN VIEW

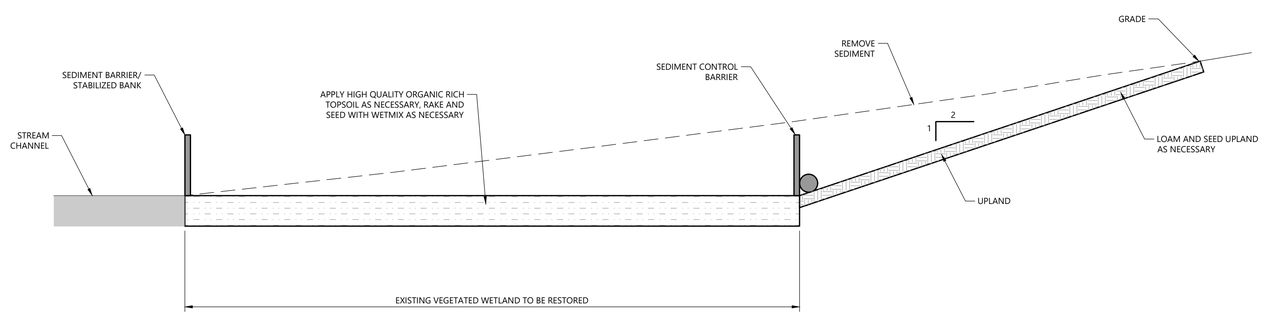


NOTES:

- ALL POST SPACING SHALL BE 6'-3" UNLESS OTHERWISE DIRECTED BY ENGINEER.
- GUARDRAIL SHALL MEET ALL MASSDOT SPECIFICATIONS
- ALL HOLES IN BEAM SHALL BE SHOP-PUNCHED BEFORE GALVANIZING.
- GUARD RAIL SHALL MEET NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) 350

3 GUARDRAIL DETAILS

NOT TO SCALE



4 VEGETATED WETLAND RESTORATION DETAIL

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DETAILS 3

DRAWING NO:

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