LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL · MASSACHUSETTS

PRELIMINARY DESIGN DEVELOPMENT PLANS

JUNE 30, 2022

PREPARED FOR

CITY OF HAVERHILL
DEPT. OF PUBLIC WORKS
500 PRIMROSE STREET
HAVERHILL, MA 01830-2660

PREPARED BY

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SHEET INDEX

PROJECT TEAM

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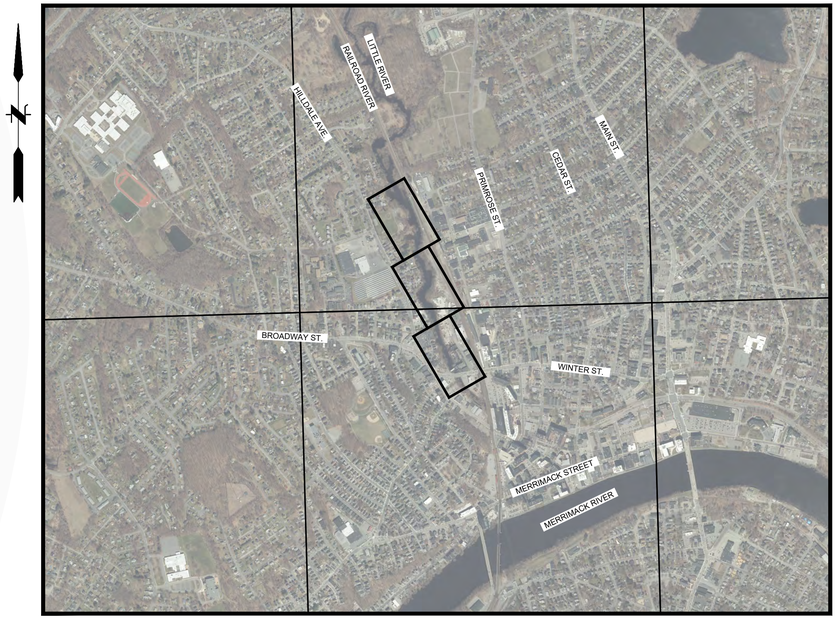

LOCATION MAP
SCALE: 1" = 1000'

PROJ. No.: 20170390.U30
DATE: JUNE 2022

GI-001

LEGEND

EXIST | PROP

- PROPERTY LINE/RIGHT-OF-WAY
- CENTERLINE
- LIMIT OF DISTURBANCE (LOD)
- EASEMENT
- BASELINE (10+00)
- GRAVEL ROAD
- EDGE OF PAVEMENT
- VERT. GRAN. CURB
- SAW CUT
- MATCH LINE (MATCH LINE SEE SHEET 2 OF 2)
- FEMA FLOODWAY
- 100-YEAR FLOOD ELEVATION
- 500-YEAR FLOOD ELEVATION
- WETLAND DELINEATION FLAG (A100)
- BANK/MEAN ANNUAL HIGH WATER
- BORDERING VEGETATED WETLANDS
- 25' NO DISTURBANCE ZONE
- 50' NO BUILD ZONE
- 100' BUFFER ZONE
- 200' RIVERFRONT AREA
- BASE CONDITION FLOW LIMITS / MEAN ANNUAL LOW WATER
- LITTLE RIVER DAM
- EDGE OF WATER
- BUFFER ZONE
- GUARD RAIL
- STOCKADE FENCE
- WIRE FENCE
- CHAIN LINK FENCE
- TREE LINE
- SHRUB LINE
- STONE WALL
- RETAINING WALL
- MINOR CONTOUR
- MAJOR CONTOUR
- BUILDING
- BOLLARD
- SIGN
- CONC. PAVEMENT
- NORMAL PAVEMENT
- HEAVY DUTY PAVEMENT
- ADA OR ACCESSIBLE RAMP
- HANDICAP PARKING
- VAN-ACCESSIBLE HANDICAP PARKING
- TOP OF SEDIMENT ELEVATION (DEPTH OF SEDIMENT) – APPROXIMATE FROM BOAT DEPTH MEASUREMENTS (21.25* (X.X'))
- TOP OF SEDIMENT ELEVATION (FROM FIELD SURVEY) (21.25 T)
- BOTTOM OF SEDIMENT ELEVATION (FROM FIELD SURVEY) (21.25 B)
- GROUND OR BOTTOM OF RIVER SPOT ELEVATION (FROM FIELD SURVEY) (x 21.25)
- SPOT ELEVATION w/LEADER (21.25)
- IRON PIPE
- DRILL HOLE
- IRON PIN (IP)
- MONUMENT
- CONTROL POINT
- WETLAND SEED MIX
- WETLAND SEED MIX AND LIVE STAKES
- CONSERVATION SEED MIX
- SEMI-SHADE SEED MIX
- SHOWY WILDFLOWER SEED MIX
- UPLAND/PARK SEED MIX

EXIST | PROP

- DRAIN/CSO LINE (D)
- SEWER LINE (S)
- OVERHEAD ELECTRIC, TELEPHONE & FIRE ALARM
- WATER LINE (W)
- GAS LINE (G)
- UNDERGROUND ELECTRIC (E)
- TELEPHONE LINE (T)
- CABLE TV (C)
- ELECTRIC, TELEPHONE & CABLE TV LINES (E/T/C)
- CATCH BASIN (CB)
- DOUBLE CATCH BASIN (DCB)
- DRAIN INLET (DI)
- DRAIN MANHOLE (DMH)
- HEADWALL
- SEWER MANHOLE (SMH)
- CLEAN OUT (CO)
- WATER MANHOLE
- WATER GATE (WG)
- FIRE HYDRANT
- WATER METER (WM)
- POST INDICATOR VALVE (PIV)
- WELL
- GAS GATE (GG)
- GAS METER (GM)
- ELECTRIC MANHOLE
- ELECTRIC BOX (EB)
- ELECTRIC METER (EM)
- TRANSFORMER
- LIGHT POST
- TELEPHONE MANHOLE
- TRAFFIC SIGNAL (TS)
- SIGNAL BOX
- FIRE ALARM CONTROL PANEL (FACP)
- FIRE ALARM BOX (FB)
- UTILITY POLE
- GUY POLE
- HAND HOLE (HH)
- PULL BOX (PB)
- SILT FENCE (SF)
- BIODEGRADABLE COIR ROLLS
- TEMPORARY COFFERDAM
- CONSTRUCTION ENTRANCE/ TEMPORARY HAUL ROAD
- STAGING AREA
- TEMPORARY GRAVEL WALKWAY
- GRAVEL WALKING TRAIL

LEGEND NOTE

SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SHOWN ON THE DRAWINGS TO SCALE OR TO THEIR ACTUAL DIMENSION OR LOCATION. COORDINATE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS, AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.

ABBREVIATIONS

GENERAL

APPROX	APPROXIMATE
BIT	BITUMINOUS PAVEMENT
BW	BOTTOM OF WALL
CC	CONCRETE CURB
CCB	CAPE CODE BERM
ELEV	ELEVATION
EXIST	EXISTING
GC	GRANITE CURB
MAX	MAXIMUM
MIN	MINIMUM
NTS	NOT TO SCALE
PCC	PRECAST CONCRETE CURB
PROP	PROPOSED
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
TOS	TOP OF SLOPE
TW	TOP OF WALL
TYP	TYPICAL
VGC	VERTICAL GRANITE CURB

UTILITY

CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
CPP	CORRUGATED POLYETHYLENE PIPE
DCB	DOUBLE CATCH BASIN
DI	DUCTILE IRON PIPE
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
HDPE	HIGH DENSITY POLYETHYLENE
HYD	HYDRANT
INV	INVERT ELEVATION
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
SMH	SEWER MANHOLE
TSV	TAPPING SLEEVE, VALVE AND BOX
UP	UTILITY POLE

MAP NOTES AND REFERENCES

1. REFERENCES:
   A. COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGES, 2022 EDITION, REVISIONS AND ALL CURRENT ADDENDA, ARE MADE A PART HEREOF, AS IF ATTACHED HERETO. ALL REFERENCES TO "STATE STANDARD SPECIFICATIONS" SHALL REFER TO THE LATEST EDITION OF THE COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES CONSTRUCTION.
   B. THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION CONSTRUCTION STANDARD DETAILS, 2017 EDITION, AND ALL CURRENT REVISIONS, ARE MADE A PART HEREOF, AS IF ATTACHED HERETO.
   C. THE MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS, 2013 EDITION, REVISIONS AND ALL CURRENT ADDENDA, ARE MADE A PART HEREOF, AS IF ATTACHED HERETO. ALL REFERENCES TO "SOIL EROSION AND SEDIMENT CONTROL HANDBOOK" SHALL REFER TO THE LATEST EDITION OF THE MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS.
2. EXISTING CONDITIONS:
   A. SURVEY: CONTOURS SHOWN ON THIS PLAN THAT ARE OUTSIDE OF THE RIVER AND CASHMAN PARK AREA ARE APPROXIMATE ONLY AND WERE OBTAINED FROM 2013–2014 USGS LIDAR DATA OBTAINED FROM NOAA'S ONLINE DATA ACCESS VIEWER. TOPOGRAPHY WITHIN CASHMAN PARK, BATHYMETRIC SPOT ELEVATIONS (WITHIN THE RIVER), AND SEDIMENT DEPTHS (WITHIN THE RIVER) WERE OBTAINED FROM THE FOLLOWING COMBINATION OF FIELD INVESTIGATIONS AND RESEARCH:
      A.A. ELEVATIONS SHOWN WITHIN RIVER WITH ASTERISKS ARE APPROXIMATE AND WERE OBTAINED ON NOVEMBER 6, 2020 AND ON NOVEMBER 17, 2020 FROM DEPTH MEASUREMENTS TAKEN BY BOAT BY FUSS & O'NEILL AND TG&B MARINE SERVICES, INC.
      A.B. ELEVATIONS IN RIVER AND AT WINTER STREET THAT DO NOT INCLUDE ASTERISKS WERE OBTAINED FROM ACTUAL FIELD SURVEY PERFORMED BY FUSS & O'NEILL IN FALL OF 2021 AND WINTER OF 2022. ELEVATION WITH 'T' DESIGNATION REFERS TO TOP OF SEDIMENT ELEVATION; ELEVATION WITH 'B' DESIGNATION REFERS TO BOTTOM OF SEDIMENT. ELEVATIONS THAT DO NOT HAVE ASTERISKS OR 'T' OR 'B' DESIGNATION WERE ALSO OBTAINED FROM ACTUAL FIELD SURVEY.
      A.C. ELEVATION AND WETLANDS DATA WITHIN CASHMAN PARK WAS OBTAINED FROM AN EXISTING CONDITIONS SURVEY PLAN OF CASHMAN PARK, DATED JUNE 1, 2017, AND PREPARED BY SMC SURVEYING AND MAPPING CONSULTANTS.
   B. TOPOGRAPHIC INFORMATION (CONTOURS), BUILDING FOOTPRINTS, EXISTING FEATURES SHOWN OUTSIDE OF THE PROJECT'S RIGHTS OF WAY ARE APPROXIMATE ONLY AND WERE OBTAINED FROM A COMBINATION OF 2013–2014 USGS CMGP LIDAR DATA (OBTAINED FROM NOAA'S ONLINE DATA ACCESS VIEWER) AND MASSGIS DATA LAYER.
   C. WETLAND FLAGGING ALONG LITTLE RIVER WITHIN THE DIRECT PROJECT LIMITS WAS PERFORMED BY FUSS & O'NEILL, INC. (MICHAEL SOARES, WETLAND SCIENTIST) ON SEPTEMBER 27, 2021 AND APRIL 29, 2022. THE WETLAND FLAGS WERE THEN LOCATED VIA SUB-METER GPS. DUE TO SPECIFIC SITE RESTRICTIONS OR SAFETY CONCERNS, IT WAS NOT POSSIBLE TO ACCESS AND FIELD-DELINEATE SOME SEGMENTS OF RIVERBANK AND BORDERING WETLANDS. IN LOCATIONS WHERE A TYPICAL FIELD DELINEATION OF THE BANK, LUWW, AND/OR BVW WAS NOT PRACTICABLE, BOUNDARIES OF RESOURCE AREAS BETWEEN FIELD DELINEATED SEGMENTS WERE COMPLETED IN GIS THROUGH A REVIEW OF AERIAL IMAGERY (2014–2021, SPRING AND SUMMER), FEDERAL AND STATE WETLANDS MAPPING (NATIONAL WETLANDS INVENTORY AND MASS DEP, RESPECTIVELY), AND 1-FOOT CONTOURS (DERIVED FROM 2013–2014 LIDAR). STATE-REGULATED RIVERFRONT AREA IS MEASURED HORIZONTALLY FROM BANK OF LITTLE RIVER, AND STATE-REGULATED BUFFER ZONE IS MEASURED HORIZONTALLY FROM THE BOUNDARIES OF BVW IDENTIFIED AT THE SITE.
   D. ASSESSOR'S PARCELS, WETLAND BOUNDARIES (UPSTREAM OF THE MBTA BRIDGE AND THE PROJECT'S LIMIT OF DIRECT IMPACTS), POTENTIAL & CERTIFIED VERNAL POOLS, SHOWN ON THESE PLANS ARE APPROXIMATE AND WERE OBTAINED FROM MASSACHUSETTS GEOGRAPHIC INFORMATION SYSTEM (MASSGIS).
3. FLOOD ZONE:
   A. SPECIAL FLOOD HAZARD AREAS (SFHAS), INCLUDING FLOODWAY INFORMATION, SHOWN ON THIS PLAN WERE INITIALLY OBTAINED FROM FEMA FLOOD INSURANCE RATE MAP (FIRM) PANEL NUMBER 25009C0089G WITH AN EFFECTIVE DATE OF JULY 19, 2018 AND FIRM PANEL NUMBERS 25009C0087F, 25009C0086F, AND 25009C0078F WITH AN EFFECTIVE DATE OF JULY 3, 2012 FOR ESSEX COUNTY, MASSACHUSETTS. THESE FLOOD HAZARD AREAS WERE THEN MODIFIED BASED ON THE RESULTS OF MORE DETAILED TOPOGRAPHY AND A PRE-CONDITIONS (OR PRE-DAM REMOVAL) HYDRAULIC ANALYSIS PERFORMED BY FUSS & O'NEILL USING HEC-RAS. IN ORDER TO ASSESS ANTICIPATED HYDRAULIC IMPACTS AS A RESULT OF THE PROPOSED REMOVAL OF THE DAM, A POST-CONDITIONS (OR POST-DAM REMOVAL) HYDRAULIC ANALYSIS WAS ALSO PERFORMED BY FUSS & O'NEILL USING HEC-RAS. THE MODIFIED PRE-CONDITIONS SPECIAL FLOOD AREA BOUNDARIES ARE REFLECTED ON THE EXISTING CONDITIONS PLANS. THE POST-CONDITIONS (OR POST-DAM REMOVAL) SPECIAL FLOOD AREA BOUNDARIES ARE REFLECTED ON THE SITE LAYOUT AND GRADING PLANS.
4. NATURAL HERITAGE DATA:

   THERE ARE NO NHESP PRIORITY HABITATS OF RARE SPECIES, ESTIMATED HABITATS OF RARE WILDLIFE, OR NATURAL COMMUNITIES LOCATED ALONG THE LITTLE RIVER. THERE ARE ALSO NO AREAS OF CRITICAL ENVIRONMENTAL CONCERN ALONG LITTLE RIVER. THERE ARE, HOWEVER, POTENTIAL VERNAL POOLS LOCATED ALONG LITTLE RIVER TO THE SOUTH OF THE RIVER'S CROSSING WITH I-495 AND NORTH OF THE RIVER'S RAILROAD BRIDGE CROSSING. THESE POTENTIAL VERNAL POOLS WERE OBTAINED FROM MASSGIS.
5. UTILITIES:

   UTILITIES SHOWN ON THIS PLAN WERE APPROXIMATED FROM FIELD OBSERVATIONS AND A COLLECTIVE REVIEW OF THE FOLLOWING DOCUMENTS: (1) WINTER STREET AND HALE STREET SEWER DIVERSION PLAN PREPARED BY METCALF & EDDY (DATED JULY 1937), (2) FLOOD PROTECTION SYSTEM IMPROVEMENT PLANS (CWSRF-3662, IFB020-13) PREPARED BY AECOM (DATED FEBRUARY 14, 2013), AND (3) INTEGRATED FINAL COMBINED SEWER OVERFLOW LONG-TERM CONTROL PLAN AND SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT PREPARED BY CDM SMITH (DATED FEBRUARY 2017).
6. ACTIVITY AND USE LIMITATION AREAS AND UNDERGROUND STORAGE TANKS:

   ALL PROPERTIES WHERE WORK IS PROPOSED DO NOT HAVE UNDERGROUND STORAGE TANKS. HOWEVER, PARCEL 516-304-1 (93 LAFAYETTE SQUARE) IS CONSIDERED AN AUL (ACTIVITY AND USE LIMITATION) PROPERTY.

GENERAL CONSTRUCTION AND COORDINATION REQUIREMENTS

1. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING STRUCTURES, AND THE PROPOSED LAYOUT OF THE RIVER CHANNEL IMPROVEMENTS WITH ITS RELATIONSHIP TO THE EXISTING SITE SURVEY. THE CONTRACTOR SHALL ALSO VERIFY ALL DIMENSIONS, SITE CONDITIONS, AND MATERIAL SPECIFICATIONS AND SHALL NOTIFY THE OWNER AND ENGINEER OF ANY ERRORS, OMISSIONS OR DISCREPANCIES BEFORE COMMENCING OR PROCEEDING WITH WORK.
2. THE CONTRACTOR SHALL TAKE FIELD MEASUREMENTS AS REQUIRED TO FIT THE WORK PROPERLY. RECHECK MEASUREMENTS BEFORE CONSTRUCTING EACH WORK ITEM. WHERE PORTIONS OF THE WORK ARE INDICATED TO FIT TO OTHER CONSTRUCTION, VERIFY DIMENSIONS OF OTHER CONSTRUCTION BY FIELD MEASUREMENTS BEFORE FABRICATION. COORDINATE FABRICATION SCHEDULE WITH CONSTRUCTION PROGRESS TO AVOID DELAYING THE WORK.
3. THE LOCATION OF EXISTING UTILITIES ARE APPROXIMATE, HAVE BEEN PLOTTED FROM THE LATEST AVAILABLE INFORMATION, AND MAY NOT BE ALL INCLUSIVE. THE CONTRACTOR SHALL CHECK AND VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES, BOTH OVERHEAD AND UNDERGROUND, AND "DIG-SAFE" MUST BE NOTIFIED PRIOR TO COMMENCING ANY CONSTRUCTION OPERATIONS. RESTORATION AND REPAIR OF DAMAGE TO EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR WITH NO ADDITIONAL COST TO THE OWNER. NO EXCAVATION SHALL COMMENCE UNTIL ALL INVOLVED UTILITY COMPANIES AND/OR TOWN WHOSE FACILITIES MIGHT BE AFFECTED BY ANY WORK TO BE PERFORMED BY THE CONTRACTOR ARE NOTIFIED AT LEAST 72 HOURS IN ADVANCE. RELOCATION OF ANY UTILITIES SHALL BE AT THE OWNERS EXPENSE AND COMPLETED WITH THE UTILITY WORK. THE OWNER SHALL BE NOTIFIED AS TO THE RELOCATIONS REQUIRED PRIOR TO THE START OF CONSTRUCTION.
4. DEVIATIONS OR CHANGES FROM THESE PLANS WILL NOT BE ALLOWED UNLESS APPROVED BY THE ENGINEER/CONTRACT OWNER.
5. THE CONTRACTOR SHALL MAKE EXPLORATORY EXCAVATIONS AND LOCATE ANY EXISTING UTILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS IF NECESSARY. HOWEVER, EXPLORATORY EXCAVATIONS AND OTHER ACTIVITIES INVOLVING SOIL DISTURBANCES WITHIN THE RIVER OR OTHER ADJACENT WATERCOURSES SHALL BE LIMITED TO THE LOW-FLOW PERIOD (I.E. THE PERIOD FROM JULY 1 TO OCTOBER 31 OF ANY CALENDAR YEAR).
6. THE EXISTENCE AND/OR LOCATION OF UTILITIES SHOWN ON THESE PLANS MAY BE ONLY APPROXIMATELY CORRECT AND THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN HEREON AND ANY OTHER EXISTING UTILITIES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING, AT HIS/HER EXPENSE, ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING, WITH MATCHING MATERIALS, ANY PAVEMENT, WALKS, CURBS, WALLS, FENCES, ETC., THAT MUST BE CUT OR THAT ARE DAMAGED DURING CONSTRUCTION.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL REMAINING NECESSARY PERMITS, INSPECTIONS, BONDS, ETC. AND OTHER APPROVAL RELATED ITEMS WITH THE LOCAL AND STATE/FEDERAL MUNICIPALITIES. NO CONSTRUCTION SHALL COMMENCE UNTIL SUCH PERMITS HAVE BEEN SECURED AND THE CONTRACTOR HAS SUPPLIED THE REQUIRED NOTICES.
9. WORK ON MBTA PROPERTY CAN ONLY BE UNDERTAKEN UPON RECEIPT OF A LICENSE FROM MBTA.
10. AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE SITE THROUGH THE ENTIRE PERIOD OF CONSTRUCTION WHEN WORK IS ACTIVELY OCCURING.
11. CONTRACTOR AGREES THAT HE/SHE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE CONTRACT OWNER (CITY OF HAVERHILL), PROPERTY OWNERS AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL AND ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM "THE SOLE NEGLIGENCE OF THE CONTRACT OWNER, PROPERTY OWNER OR THE ENGINEER."
12. PHOTOGRAPHS, VIDEOTAPING, AND SKETCHES (AS NECESSARY) MUST BE TAKEN OF ADJOINING CONSTRUCTION AND SITE IMPROVEMENTS WITHIN 200 FEET OF EXCAVATION LIMITS PRIOR TO EXCAVATION AND THE INSTALLATION OF EXCAVATION SUPPORT SYSTEMS. SUCH DOCUMENTATION SHALL ILLUSTRATE EXISTING SURFACES THAT MAY BE MISCONSTRUED AS DAMAGE CAUSED BY THIS PROJECT CONSTRUCTION OPERATIONS.
13. METHODS AND MATERIALS USED IN THE CONSTRUCTION OF IMPROVEMENTS FOR THIS PROJECT SHALL CONFORM TO THE CURRENT CONSTRUCTION STANDARDS AND SPECIFICATIONS OF THE CITY OF HAVERHILL AND THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION.
14. VERIFY SPACE REQUIREMENTS AND DIMENSIONS OF ITEMS SHOWN ON DRAWINGS. CHECK THE LOCATION, LEVEL AND GRADE, OF EVERY MAJOR ELEMENT AS THE WORK PROGRESSES.
15. ESTABLISH BENCHMARKS AND CONTROL POINTS IN ADDITION TO THOSE INDICATED TO SET LINES, GRADES, AND LEVELS AT EACH STAGE OF CONSTRUCTION. LOCATE THE WORK AND COMPONENTS OF THE WORK ACCURATELY, IN CORRECT ALIGNMENT AND ELEVATION, AS INDICATED BOUNDS OR MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR AT NO COST TO THE OWNER.
16. COMPLY WITH MANUFACTURERS' WRITTEN INSTRUCTIONS AND RECOMMENDATIONS FOR INSTALLING MATERIALS AND PRODUCTS. INSTALL PRODUCTS AT THE TIME AND UNDER CONDITIONS THAT WILL ENSURE THE BEST POSSIBLE RESULTS. MAINTAIN CONDITIONS REQUIRED FOR PRODUCT PERFORMANCE UNTIL SUBSTANTIAL COMPLETION.
17. USE PRODUCTS, CLEANERS, AND INSTALLATION MATERIALS THAT ARE NOT CONSIDERED HAZARDOUS.
18. CONTRACTOR SHALL IDENTIFY TREES TO BE REMOVED PRIOR TO CONSTRUCTION AND MARK THEM WITH CONSTRUCTION TAPE FOR REVIEW BY THE OWNER/ENGINEER. TREES AND OTHER EXISTING VEGETATION SHALL BE RETAINED WHEREVER FEASIBLE. CONTRACTOR SHALL NOT REMOVE TREES UNTIL REVIEWED AND APPROVED BY THE OWNER/ENGINEER.
19. THE CONTRACTOR SHALL RESTORE DISTURBED LANDSCAPE AREAS TO ORIGINAL CONDITION (I.E. SEEDED, SODDED, PLANTED), UNLESS OTHERWISE DIRECTED WITHIN CONTRACT DOCUMENTS.
20. ALL EXCESS EXCAVATED MATERIALS, EXCESS FILL, EXCESS CONSTRUCTION MATERIALS, DEBRIS, AND WASTE (INCLUDING IDENTIFIED CONTAMINATED SOILS WITHIN RIVER) SHALL BE REMOVED FROM THE SITE AND SHALL BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE LAWS.
21. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, FIRE HYDRANTS, AND UTILITIES WITHOUT APPROPRIATE PERMITS.
22. WORK IS RESTRICTED TO THE HOURS OF 7 AM TO 5 PM ON MONDAY THROUGH FRIDAY, EXCLUDING HOLIDAYS, UNLESS OTHERWISE APPROVED BY THE OWNER.
23. PRIOR TO CONSTRUCTION, ADDITIONAL CONSTRUCTION ACCESSES AND/OR CONSTRUCTION EASEMENTS NOT SHOWN ON THIS PLAN (AGREED UPON THROUGH COORDINATION BETWEEN CONTRACTOR AND PROPERTY OWNER) MUST BE GRANTED IN WRITING BY PROPERTY OWNERS.
24. STOP WORK IN THE VICINITY OF SUSPECTED CONTAMINATED SOIL, GROUNDWATER, OR OTHER MEDIA. IMMEDIATELY NOTIFY THE ENGINEER AND OWNER SO THAT APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN. RESUME WORK IN THE IMMEDIATE VICINITY ONLY UPON DIRECTION BY THE OWNER.

PROTECTION OF WORK REQUIREMENTS

1. THE WORK AND SITE SHALL BE PROTECTED AT ALL TIMES UNTIL FINAL ACCEPTANCE BY THE OWNER. CARE SHALL BE EXERCISED WHILE OPERATING EQUIPMENT ON, AND ADJACENT TO, THE WORK AREA. THE CONTRACTOR SHALL BE RESPONSIBLE TO ASSURE THE UTILIZED EQUIPMENT DOES NOT CAUSE DAMAGE TO EXISTING AND ADJACENT FEATURES NOT SCHEDULED FOR DEMOLITION OR REMOVAL.
2. ACCESS TO VARIOUS PORTIONS OF THE SITE SHALL BE UNDERTAKEN IN SUCH A MANNER THAT THE WORK AND SITE ARE PROTECTED AT ALL TIMES. ACCESS WAYS SHALL BE CONSTRUCTED, MAINTAINED, AND PROTECTED WITH SEDIMENT CONTROLS TO PREVENT DAMAGE FROM EROSION DURING MAJOR STORM EVENTS.
3. PLACEMENT AND COMPACTION OF FILL MATERIALS SHALL BE COMPLETED IN ACCORDANCE WITH THE PROJECT MANUAL AND IN SUCH A MANNER THAT THE WORK AND ADJACENT PROPERTIES ARE PROTECTED FROM DAMAGE AT ALL TIMES.
4. CONSTRUCT IN-RIVER IMPROVEMENTS AND MAINTAIN IN-RIVER WORK AREAS IN ACCORDANCE WITH THE PROJECT'S APPROVED WATER CONTROL & CONSTRUCTION SEQUENCING PLANS. IN THE EVENT THAT FLOOD FLOWS ARE EXPECTED TO EXCEED THE ELEVATIONS OF COFFERDAM SYSTEMS; PROTECT ANY NON-STABLE OR ERODIBLE IMPROVEMENTS USING APPROPRIATELY SIZED STONE RIPRAP MATERIAL (OR SIMILAR) AND REMOVE ALL EQUIPMENT AND PERSONNEL FROM IN-RIVER LOCATIONS.

EROSION AND SEDIMENT CONTROL

1. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES, INSTALL ALL EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON THE PLAN OR AS REQUIRED BY SITE CONDITIONS. ALL EROSION CONTROL DEVICES WILL BE MAINTAINED THROUGHOUT CONSTRUCTION.
2. DISTURBANCE OF SOIL SURFACES IS REGULATED BY STATE LAW AND LOCAL ORDINANCE. ALL WORK SHALL COMPLY WITH THESE EROSION AND SEDIMENT CONTROL NOTES AND OTHER PERMIT CONDITIONS TO PREVENT OR MINIMIZE SOIL EROSION AND SEDIMENTATION TO OFF-SITE AREAS.
3. THE CONTRACTOR SHALL COMPLY WITH THE LATEST EDITION OF THE "MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS" IN CONSTRUCTING THE EROSION AND SEDIMENT CONTROLS INDICATED ON THE PLANS. ALL EROSION AND SEDIMENT CONTROL MEASURES OR WORKS AND REHABILITATION MEASURES MUST CONFORM TO OR EXCEED THE SPECIFICATIONS OR STANDARDS SET OUT IN THIS DOCUMENT.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE TIMELY INSTALLATION, INSPECTION, MAINTENANCE, AND/OR REPLACEMENT OF ALL TEMPORARY AND PERMANENT EROSION CONTROL DEVICES SHOWN ON THESE PLANS TO ENSURE PROPER OPERATION THROUGHOUT THE LIFE OF THE PROJECT. REMOVE EROSION AND SEDIMENTATION CONTROLS AFTER STABLE VEGETATIVE GROWTH IS ESTABLISHED BY THE OWNER, ENGINEER OR LANDSCAPE ARCHITECT.
5. THE CONTRACTOR SHALL INSPECT EROSION AND SEDIMENT CONTROL DEVICES ON A WEEKLY BASIS, AFTER EACH STORM EVENT, AND AT LEAST DAILY DURING PROLONGED RAINFALL. CLEAN OUT ACCUMULATED SEDIMENT BEHIND CONTROLS. REPAIR OR REPLACE CONTROLS PROMPTLY AS NEEDED. REMOVE ACCUMULATED SEDIMENT FROM BEHIND PERIMETER CONTROLS (I.E. BIODEGRADABLE COIR ROLLS AND SILT FENCING) WHEN ONE-THIRD OF THE ORIGINAL HEIGHT OF THE CONTROLS BECOME FILLED WITH SEDIMENT. DISPOSE OF REMOVED SEDIMENT IN ON-SITE FILL AREAS OR LAWFULLY OFF-SITE.
6. TREES AND OTHER EXISTING VEGETATION NOT WITHIN THE LIMITS OF DISTURBANCE SHALL BE PROTECTED FROM DAMAGE. VEGETATED AREAS AND/OR TREES DAMAGED THAT ARE NOT PLANNED FOR REMOVAL SHALL BE RESTORED TO THEIR ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE CITY.
7. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CLEAN ROADS, CONTROL DUST, AND TAKE ALL NECESSARY MEASURES TO ENSURE THAT THE SITE AND ALL ADJACENT ROADS AND PARKING AREAS BE MAINTAINED IN A MUD- AND DUST-FREE CONDITION AT ALL TIMES THROUGHOUT THE LIFE OF THE CONTRACT. DUST CONTROL SHALL INCLUDE, BUT IS NOT LIMITED TO, WATER AND/OR CRUSHED STONE OR COARSE GRAVEL.
8. ALL PROPOSED TEMPORARY STONE CONSTRUCTION ENTRANCES SHALL BE CONSTRUCTED AS SHOWN ON THE PLANS AND DETAILS. ALL VEHICLE TRAFFIC ENTERING OR EXITING THE PROJECT SITE SHALL PASS OVER THE CONSTRUCTION ENTRANCES TO REDUCE THE TRACKING OR FLOWING OF SEDIMENT ONTO THE SURROUNDING ROADWAYS. ENTRANCES SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO THE SURROUNDING ROADWAYS. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO THE SURROUNDING ROADWAYS AND PARKING AREAS MUST BE REMOVED IMMEDIATELY. ADDITIONAL ENTRANCES FOR CONSTRUCTION PHASING SHALL BE INSTALLED AS REQUIRED TO PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO ROADWAYS.
9. THE CONTRACTOR SHALL INSTALL ALL PERIMETER SEDIMENT CONTROL BARRIERS (I.E. SILT FENCE) AS SHOWN ON THE PLANS. A SILT FENCE SHALL ALSO BE INSTALLED AROUND ANY SOIL STOCKPILE AREAS.
10. TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED IMMEDIATELY IN ANY DISTURBED AREAS THAT HAVE NOT YET REACHED FINISHED GRADE AND CONSTRUCTION IS NOT EXPECTED TO RESUME FOR MORE THAN 14 DAYS. TEMPORARY VEGETATIVE COVER SHALL CONSIST OF SHORT-TERM EROSION CONTROL SEED (SUBSECTION M6.03.1 OF THE MASSDOT STANDARD SPECIFICATIONS) FROM APRIL 1 TO JUNE 1 AND AUGUST 15 TO OCTOBER 15. MAY ALSO BE INSTALLED BETWEEN OCTOBER 15 TO MARCH 31 IF COVERED WITH TEMPORARY MULCHING. SEED AT A RATE OF 75 LBS/ACRE BY HAND.
11. PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED TO ALL DISTURBED AREAS THAT HAVE REACHED FINISHED GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS PERMANENTLY CEASED. RECOMMENDED PERMANENT SEEDING DATES ARE APRIL 1 TO JUNE 1 AND AUGUST 15 TO OCTOBER 15. REFER TO RESTORATION PLANS FOR PERMANENT VEGETATIVE COVER SEED MIXTURES AND APPLICATION RATES. ALL PLANTINGS AND SEED SHALL BE COVERED BY A ONE-YEAR WARRANTY PERIOD; RESEEDING/RE-PLANTING SHALL BE COMPLETED TO ENSURE STABLE VEGETATIVE COVER IS ESTABLISHED OVER ALL DISTURBED AREAS.
12. IF PERMANENT SEEDING CANNOT BE COMPLETED WITHIN 14 DAYS OF THE COMPLETION OF CONSTRUCTION OR WITHIN THE RECOMMENDED SEEDING DATES, TEMPORARY BIODEGRADABLE EROSION CONTROL BLANKETING (CONTAINING NO PLASTIC COMPONENTS) OR MULCHING SHALL BE SPREAD/INSTALLED OVER ALL DISTURBED AREAS TO PROTECT THE SITE UNTIL ARRIVAL OF THE NEXT RECOMMENDED SEEDING PERIOD. MULCHING OR BLANKETING SHOULD BE INSTALLED AS SOON AS POSSIBLE IF SEEDING IS INSTALLED BETWEEN OCTOBER 15 AND MARCH 31, BUT NOT MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS TEMPORARILY CEASED. IF PERMANENT SEEDING IS INSTALLED IN JULY AND AUGUST, APPLY WATER TO SEEDED AREAS ON A DAILY BASIS.
13. BLANKETING OR MULCHING MUST BE INSPECTED PERIODICALLY, IN PARTICULAR AFTER RAINSTORMS, TO CHECK FOR RILL EROSION. WHERE EROSION IS OBSERVED, ADDITIONAL MULCH MUST BE APPLIED OR BLANKETING REPAIRED OR REPLACED. INSPECTIONS SHALL TAKE PLACE UNTIL VEGETATION IS THOROUGHLY ESTABLISHED.
14. INSPECT PERMANENT TURF REINFORCEMENT MATTING AT LEAST ONCE A WEEK AND WITHIN 24 HOURS OF THE END OF A STORM WITH A RAINFALL AMOUNT OF 0.5 INCH OR GREATER FOR FAILURES UNTIL THE TURF HAS BECOME ESTABLISHED. MAT FAILURE HAS OCCURRED WHEN SOILS AND/OR SEED HAVE WASHED AWAY FROM BENEATH OR WITHIN THE MAT RESULTING IN A SOIL SURFACE THAT CAN BE EXPECTED TO CONTINUE TO ERODE OR WHEN THE MAT HAS BECOME DISLODGED FROM THE SOIL SURFACE. WHEN REPETITIVE FAILURES OCCUR AT THE SAME LOCATION, REVIEW CONDITIONS AND LIMITATIONS OF TURF REINFORCEMENT MATS AND DETERMINE IF ADDITIONAL CONTROLS, (E.G. DIVERSIONS, STONE BARRIERS) ARE NEEDED TO ENSURE SUCCESS. REPAIR MAT FAILURES WITHIN ONE WORK DAY. AFTER THE TURF HAS BECOME ESTABLISHED, INSPECT ANNUALLY OR AFTER MAJOR STORM EVENTS.
15. STORAGE AND DISPOSAL: MATERIALS WHICH COULD BE A POTENTIAL SOURCE OF STORMWATER POLLUTION SUCH AS GASOLINE, DIESEL FUEL, HYDRAULIC OIL, ETC., SHALL BE STORED AT THE END OF EACH DAY IN A STORAGE TRAILER OR COVERED LOCATION AND TAKEN OFF-SITE AND PROPERLY DISPOSED OF. ALL TYPES OF WASTE GENERATED AT THIS SITE SHALL BE DISPOSED OF IN A MANNER CONSISTENT WITH STATE LAW AND/OR REGULATIONS.
16. CONTROL OF ALLOWABLE NON-STORMWATER DISCHARGES: IF ALLOWABLE NON-STORM WATER DISCHARGES ARE OCCURRING AT THE SITE, SUCH DISCHARGES SHALL BE VISUALLY OBSERVED AND RECORDED AS OUTLINED BELOW. THE LIST OF EXPECTED SOURCES OF ALLOWABLE NON-STORM WATER DISCHARGES FOR THIS PROJECT ARE AS FOLLOWS: (1) DISCHARGE FROM VEHICLE WASHDOWN WHERE NO DETERGENTS ARE USED, (2) EXTERNAL BUILDING WASHDOWN WHERE NO DETERGENTS ARE USED, (3) THE USE OF WATER TO CONTROL DUST, (4) FIRE HYDRANT FLUSHINGS, (5) LAWN WATERING, (6) POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS, (8) IRRIGATION DRAINAGE, (9) PAVEMENT WASHWATERS WHERE SPILLS OR LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED (UNLESS ALL SPILLED MATERIALS HAVE BEEN REMOVED) AND WHERE NO DETERGENTS ARE USED, AND (10) FOUNDATION OR FOOTING DRAINS WHERE FLOWS ARE NOT CONTAMINATED WITH PROCESS SUCH AS SOLVENTS OR CONTAMINATED BY CONTACT WITH SOILS WHERE SPILLS OR LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAS OCCURRED.
17. CONCRETE WASHOUT AREAS AND VEHICLE/EQUIPMENT FUELING ACTIVITIES SHALL BE LIMITED TO UPLAND LOCATIONS WITHIN THE PROJECT LIMIT OF DISTURBANCE THAT ARE LOCATED WITHIN A PORTION OF THE TEMPORARY STAGING AND STORAGE AREAS THAT ARE AT LEAST 50 FEET OUTSIDE OF JURISDICTIONAL WETLANDS.
18. SPILL/LEAK PROTECTION AND RESPONSE: SPILL PREVENTION AND RESPONSE EQUIPMENT SHALL BE LOCATED ON ALL CONSTRUCTION EQUIPMENT OPERATED WITHIN THE PROJECT'S LIMIT OF DISTURBANCE. DEPLOY BOOMS AND OTHER CONTAINMENT/CLEANUP MEASURES IN THE EVENT OF A SPILL OR LEAK. NOTIFY LOCAL FIRE DEPT. AND MASSDEP IMMEDIATELY OF ANY SPILLS.

SPILL PREVENTION AND RESPONSE PROCEDURE

1. CONTROL OF ALLOWABLE NON-STORMWATER DISCHARGES: IF ALLOWABLE NON-STORM WATER DISCHARGES ARE OCCURRING AT THE SITE, SUCH DISCHARGES SHALL BE VISUALLY OBSERVED AND RECORDED AS OUTLINED BELOW AND IN ACCORDANCE WITH ALL APPLICABLE PERMITS AND AUTHORITIES HAVING JURISDICTION. THE LIST OF EXPECTED SOURCES OF ALLOWABLE NON-STORM WATER DISCHARGES FOR THIS PROJECT ARE AS FOLLOWS: (1) DISCHARGE FROM VEHICLE WASHDOWN WHERE NO DETERGENTS ARE USED, (2) FIRE HYDRANT FLUSHINGS, (3) WATER USED TO CONTROL DUST, (4) POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHINGS, (5) PAVEMENT WASH WATERS, (6) UNCONTAMINATED, NON-TURBID DISCHARGES OF GROUNDWATER OR SPRING WATER, AND (7) CONSTRUCTION DEWATERING WATER DISCHARGE.
2. ANY INCIDENT OF GROUNDWATER AND SURFACE WATER CONTAMINATION RESULTING FROM THE IMPROPER DISCHARGE OF POLLUTANTS TO THE RIVER SYSTEM SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER AS WELL AS ANY OTHER PARTIES DETERMINED TO BE RESPONSIBLE FOR THE CONTAMINATION. PURSUANT TO STATE LAWS AND REGULATIONS, THE REGULATING AGENCY MAY REQUIRE THE PROPERTY OWNER AND OTHER RESPONSIBLE PARTIES TO REMEDIATE ANY INCIDENTS THAT MAY ADVERSELY IMPACT GROUNDWATER QUALITY.
3. THE PROPERTY OWNER SHALL BE RESPONSIBLE TO REMEDIATE INCIDENTS THAT ADVERSELY IMPACT GROUNDWATER AND SURFACE WATER QUALITY.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

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SCALE:
HORZ.: 1"= 150'
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DATUM:
HORZ.: NAD83
VERT.: NAVD88
150 75 0 150
GRAPHIC SCALE

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CITY OF HAVERHILL

INDEX PLAN

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

GI-003

File: J:\DWG\P2017\0390\U30\DEP_NOI_Plans\Plan\20170390U30_IND01.dwg Layout: NOI UP GI-003 Plotted: 2023-03-08 11:33 AM Saved: 2023-03-08 11:32 AM User: cnauman
PC3: NONE STB/CTB: FO.STB
LAYER STATE:
MS VIEW:

MATCH LINE SEE SHEET CS-102

N/F
G&C CONCRETE CONSTRUCTION, INC.
#31 STEVENS STREET

200' RIVERFRONT AREA

307-2-6
N/F
SHAIN REALTY TRUST
STEVENS STREET

307-2-5
N/F
KENNEBEC REALTY TRUST
#265 WINTER STREET

4" G

STEVENS STREET

307-2-10
N/F
G&C CONCRETE CONSTRUCTION, INC.
#30 STEVENS STREET

100' BUFFER ZONE

50' NO BUILD ZONE

25' NO DISTURBANCE ZONE

307-2-9
N/F
SHAIN REALTY TRUST
#14 STEVENS STREET

WINTER STREET

307-2-01
N/F
HAFFNER REALTY TRUST
#284 WINTER STREET

PROPERTY CONTAINS
UST ID No. 5252

54" RCP OUTFALL
(NPDES 021H)

BENCHMARK 302

FORMER/ABANDONED
12' WIDE MILL
RACEWAY CHANNEL

16'Wx8'H STONE
MASONRY ARCH CULVERT

LITTLE RIVER

LITTLE RIVER DAM
SPILLWAY CREST EL.=18.6±

SCOUR HOLE

42" RCP OUTFALL (NPDES 038)
INV. 11.39

BENCHMARK 301

BIT. SIDEWALK AND
GRANITE CURB

21" OVERFLOW
(LR0934)

30'Wx14'H STONE
MASONRY ARCH CULVERT

AUL PROPERTY WITH
CLASS B2 RAO

516-305-10
N/F
MARIA MACEK ETAL
#17 HILLDALE AVENUE

516-305-9
N/F
CASMO REALTY TRUST
#7 HILLDALE AVENUE

516-305-17
N/F
SHAWN DUBUIS
#9 GRANVILLE COURT

516-305-16
N/F
IVAN
BALLESTER JR., ETAL
#7 GRANVILLE COURT

516-305-15
N/F
EDWARD G.
ALCANTARA
#5 GRANVILLE COURT

516-305-13
N/F
HELEN B.
TAYSUP LIFE
ESTATE
#8 GRANVILLE
STREET

516-305-12
N/F
PEDRO ALVARO
RONQUILLO

516-304-10
N/F
PETA REALTY TRUST
#9 GRANVILLE STREET

516-304-6
N/F
MAUREEN E. RYAN TRUST
#119 LAFAYETTE SQUARE

516-304-1
N/F
K BROTHERS, LLC
#89 LAFAYETTE SQUARE

516-304-5
N/F
OCP REALTY, LLC
#107 LAFAYETTE SQUARE

516-304-7
N/F
PETER J. PHANEUF
#123 LAFAYETTE SQUARE

516-304-8
N/F
133-135 LAFAYETTE
SQUARE, LLC
#135 LAFAYETTE SQUARE

516-304-6A
N/F
NEDCO 117, LLC
#117 LAFAYETTE
SQUARE

515-296-11
N/F
VICTOR VON VASTA REVOCABLE TRUST
#25 LAFAYETTE SQUARE

515-296-05
N/F
KENNETH M. SHEFF
#135 ESSEX STREET

GRANVILLE STREET

100' BUFFER ZONE

200' RIVERFRONT AREA

LEGEND:

FLOODWAY	FEMA FLOODWAY
100YR	100-YEAR FLOOD ELEVATION
500YR	500-YEAR FLOOD ELEVATION
ΔA100	WETLAND DELINEATION FLAG
	BANK/MEAN ANNUAL HIGH WATER
	BORDERING VEGETATED WETLANDS
	25' NO DISTURBANCE ZONE
	50' NO BUILD ZONE
	100' BUFFER ZONE
	200' RIVERFRONT AREA
	BASE CONDITION FLOW LIMITS / MEAN ANNUAL LOW WATER
	PARCEL BOUNDARY
D	DRAIN/CSO LINE
W	WATER LINE
G	GAS LINE
E/T	ELECTRIC/TELEPHONE LINE
	CATCH BASIN
	EXISTING GROUND OR BOTTOM OF RIVER CHANNEL CONTOUR
WG GG	WATER GATE / GAS GATE
	TREE LINE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

SEAL

SCALE:
HORZ.: 1"= 30'
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30 15 0 30
GRAPHIC SCALE

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CITY OF HAVERHILL

EXISTING CONDITIONS PLAN NO. 1

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

CS-101

File: J:\DWG\P2017\0390\U30\DEP_NOI_Plans\Plan\20170390U30_EXC01.dwg Layout: NOI UP CS-101 Plotted: 2023-03-08 12:35 PM Saved: 2023-03-08 12:10 PM User: cnauman
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CITY OF HAVERHILL

EXISTING CONDITIONS PLAN NO. 2

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

CS-102

File: J:\DWG\P2017\03390\U30\DEP_NOI_Plans\Plan\20170390U30_EXC01.dwg Layout: NOI UP CS-102 Plotted: 2023-03-08 12:35 PM Saved: 2023-03-08 12:10 PM User: cnauman
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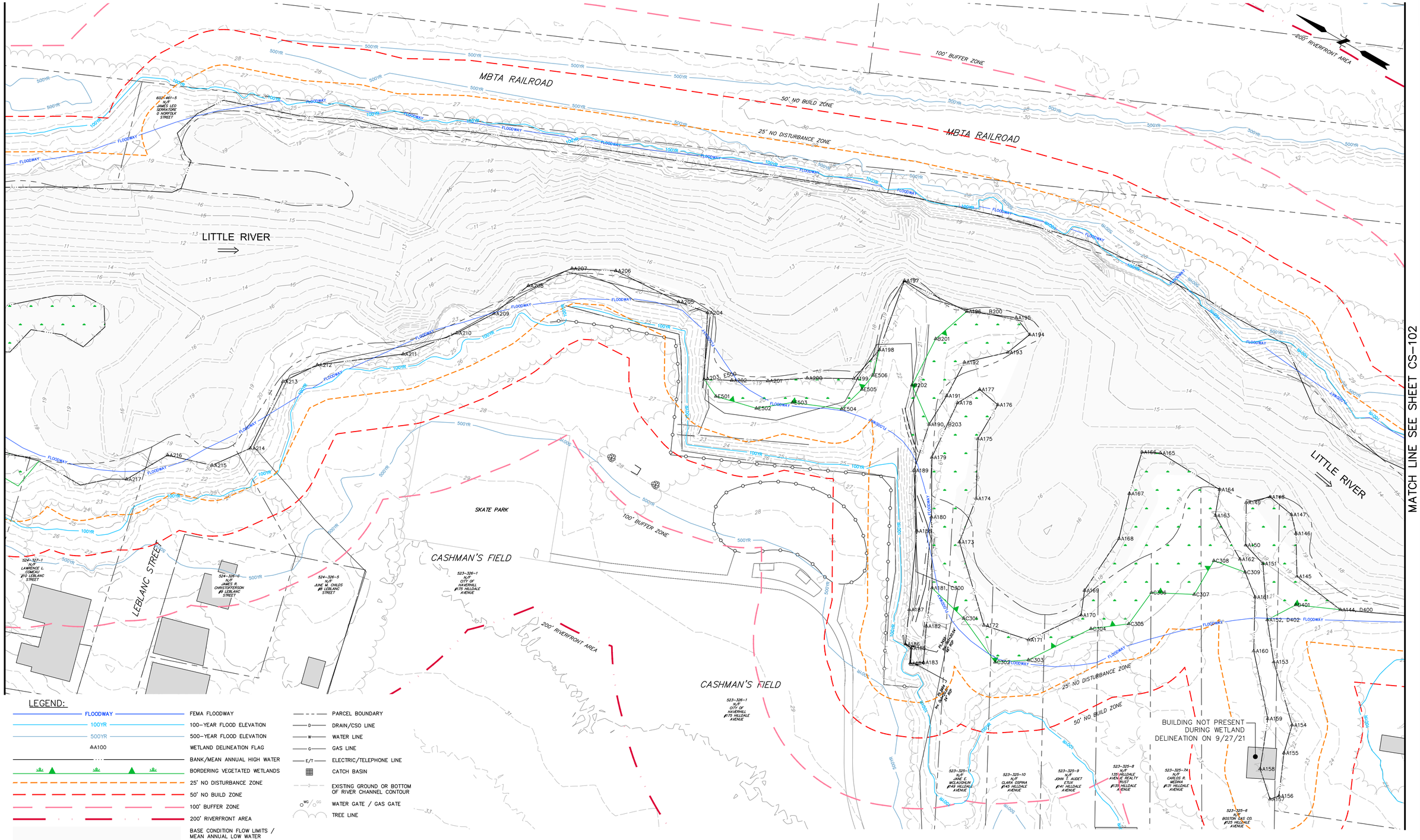

LEGEND:

- FLOODWAY — FEMA FLOODWAY
- 100YR — 100-YEAR FLOOD ELEVATION
- 500YR — 500-YEAR FLOOD ELEVATION
- AA100 — WETLAND DELINEATION FLAG
- BANK/MEAN ANNUAL HIGH WATER
- BORDERING VEGETATED WETLANDS
- 25' NO DISTURBANCE ZONE
- 50' NO BUILD ZONE
- 100' BUFFER ZONE
- 200' RIVERFRONT AREA
- BASE CONDITION FLOW LIMITS / MEAN ANNUAL LOW WATER
- PARCEL BOUNDARY
- D — DRAIN/CSO LINE
- W — WATER LINE
- G — GAS LINE
- E/T — ELECTRIC/TELEPHONE LINE
- CATCH BASIN
- EXISTING GROUND OR BOTTOM OF RIVER CHANNEL CONTOUR
- WG / GG — WATER GATE / GAS GATE
- TREE LINE

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CITY OF HAVERHILL

EXISTING CONDITIONS PLAN NO. 3

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

CS-103

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NOTES:

1. IMPLEMENT AND MAINTAIN CONSTRUCTION ACCESS STABILIZATION MEASURES THROUGHOUT CONSTRUCTION. REMOVE ALL SUCH MEASURES AND STABLIZE/RESTORE ALL DISTURBED AREAS FOLLOWING CONSTRUCTION.
2. SUCH MEASURES SHALL BE COMPLETED BY THE CONTRACTOR AND ACCEPTED BY THE ENGINEER PRIOR TO INITIATION OF CONSTRUCTION ACTIVITIES.

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CITY OF HAVERHILL

SITE PREPARATION AND
EROSION CONTROL PLAN NO. 1

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

CP-101

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CITY OF HAVERHILL

SITE PREPARATION AND
EROSION CONTROL PLAN NO. 2

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

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CITY OF HAVERHILL

SITE LAYOUT AND GRADING PLAN NO. 1

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

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CITY OF HAVERHILL

SITE LAYOUT AND GRADING PLAN NO. 2

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HAVERHILL MASSACHUSETTS

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DATE: JUNE 2022

CG-102

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SITE LAYOUT AND GRADING PLAN NO. 3

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HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

CG-103

NEW ENGLAND CONSERVATION/WILDLIFE MIX (CONSERVATION SEED MIX)

BOTANICAL NAME	COMMON NAME	IND.
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	FACW
SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	FACU
ANDROPOGON GERARDII	BIG BLUESTEM	FAC
FESTUCA RUBRA	RED FESCUE	FACU
PANICUM VIRGATUM	SWITCH GRASS	FAC
CHAMAECRISTA FASCICULATA	PARTRIDGE PEA	FACU
DESMODIUM CANADENSE	SHOWY TICK TREFOIL	FAC
SORGHASTRUM NUTANS	INDIAN GRASS	UPL
ASCLEPIAS TUBEROSA	BUTTERFLY MILKWEED	NI
BIDENS FRONDOSA	BEGGAR TICKS	FACW
RUDBECKIA HIRTA	BLACK EYED SUSAN	FACU
EUPATORIUM PURPUREUM	PURPLE JOE PYE WEED	FAC
ASTER PILOSUS	HEATH OR HAIRY ASTER	UPL
SOLIDAGO JUNCEA	EARLY GOLDENROD	NI

CONSERVATION SEED MIX
MIXTURE: CONSERVATION MIX
ANNUAL RYEGRASS (TEMPORARY COVER)
APPLICATION RATE: ANNUAL RYEGRASS = 25 LBS/ACRE
CONSERVATION SEED MIX = 25 LBS/ACRE

NEW ENGLAND SEMI-SHADE GRASS AND FORBS MIX (SEMI-SHADE SEED MIX)

BOTANICAL NAME	COMMON NAME	IND.
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	FACW
ELYMUS CANADENSIS	CANADA WILD RYE	FACU
FESTUCA RUBRA	RED FESCUE	FACU
CHAMAECRISTA FASCICULATA	PARTRIDGE PEA	FACU
LIATRIS SPICATA	SPIKED GAYFEATHER/MARSH BLAZING STAR	FAC
ONOCLEA SENSIBILIS	SENSITIVE FERN	FACW
ASTER PRENANTHOIDES	ZIGZAG ASTER	FAC
EUPATORIUM FISTULOSUM	HOLLOW-STEM JOE PYE WEED	FACW
EUPATORIUM PERFOLIATUM	BONESET	FACW
JUNCUS TENUIS	PATH RUSH	FAC

SEMI-SHADE SEED MIX
APPLICATION RATE: SEMI-SHADE SEED MIX = 30 LBS/ACRE

NEW ENGLAND SHOWY WILDFLOWER MIX (SHOWY WILDFLOWER SEED MIX)

BOTANICAL NAME	COMMON NAME	IND.
SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	FACU
CHAMAECRISTA FASCICULATA	PARTRIDGE PEA	FACU
SORGHASTRUM NUTANS	INDIAN GRASS	UPL
FESTUCA RUBRA	RED FESCUE	FACU
ELYMUS CANADENSIS	CANADA WILD RYE	FACU
ELYMUS RIPARIUS	RIVERBANK WILD RYE	FACW
HELIOPSIS HELIANTHOIDES	OX EYE SUNFLOWER	UPL
COREOPSIS LANCEOLATA	LANCE LEAVED COREOPSIS	FACU
RUDBEKIA HIRTA	BLACK EYED SUSAN	FACU
LIATRIS SPICATA	SPIKED GAYFEATHER/MARSH BALZING STAR	FAC
ASCLEPIAS SYRIACA	COMMON MILKWEED	FACU
VERONIA NOVEBORANCENSIS	NEW YORK IRONWEED	FACW
ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	FACW
EUPATORIUM PURPUREUM	PURPLE JOE PYE WEED	FAC
ASCLEPIAS TUBEROSA	BUTTERFLY MILKWEED	NI
SOLIDAGO JUNCEA	EARLY GOLDENROD	NI
EUPATORIUM PERFORLIATUM	BONESET	FACW

SHOW WILDFLOWER SEED MIX
APPLICATION RATE: SHOWY WILDFLOWER SEED MIX = 23 LBS/ACRE

UPLAND/PARK SEED MIX
MIXTURE: SHALL BE IN ACCORDANCE WITH SECTION M.6.03.0-1 OF THE MASSDOT STANDARD SPECIFICATIONS FOR FLAT LAWN GRASS AREAS AND M6.03.0-2 FOR SLOPED LAWN GRASS AREAS.
APPLICATION RATE: 25 LBS/ACRE

RESTORATION NOTES:

1. CONSTRUCTION ACCESS ROUTES AND STAGING AREAS WITHIN CASHMAN'S PARK AREA THAT WERE PREVIOUSLY MAINTAINED AS LAWN AREA SHALL BE COVERED WITH TOPSOIL PRIOR TO SEEDING. ALL SEED MIXES SHALL BE FREE OF INVASIVE NON-NATIVE PLANT SPECIES.
2. AREAS TO BE STABILIZED BETWEEN SEPTEMBER THROUGH NOVEMBER SHALL BE OVERSEEDED WITH WINTER RYE (SECALE CEREALE).
3. STABILIZATION OF DISTURBED AREAS SHALL BE IMPLEMENTED WITHIN 14 DAYS AFTER GRADING OR CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED.
4. RESTORATION AREAS SHALL BE MULCHED WITH STRAW FOLLOWING SEEDING.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

SEAL

SCALE:
HORZ.: 1"= 30'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
30 15 0 30
GRAPHIC SCALE

FUSS & O'NEILL
1550 MAIN STREET, SUITE 400
SPRINGFIELD, MA 01103
413.452.0445
www.fando.com

CITY OF HAVERHILL

RESTORATION PLAN NO. 1

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

CR-101

File: J:\DWG\P2017\0390\U30\DEP_NOI_Plans\Plan\20170390U30_RES01.dwg Layout: NOI UP CR-101 Plotted: 2023-03-08 11:41 AM Saved: 2023-03-08 11:30 AM User: cnauman
PC3: NONE STB/CTB: FO.STB
LAYER STATE:
MS VIEW:

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

SEAL

SCALE:
HORZ.: 1"= 30'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
30 15 0 30
GRAPHIC SCALE

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CITY OF HAVERHILL

RESTORATION PLAN NO. 2

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

CR-102

File: J:\DWG\P2017\0390\U30\DEP_NOI_Plans\Plan\20170390U30_RES01.dwg Layout: NOI UP CR-102 Plotted: 2023-03-08 11:41 AM Saved: 2023-03-08 11:30 AM User: cnauman
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LAYER STATE:
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MATCH LINE SEE SHEET CR-102

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No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

SEAL

SCALE:
HORZ.: 1"= 30'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
30 15 0 30
GRAPHIC SCALE

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CITY OF HAVERHILL

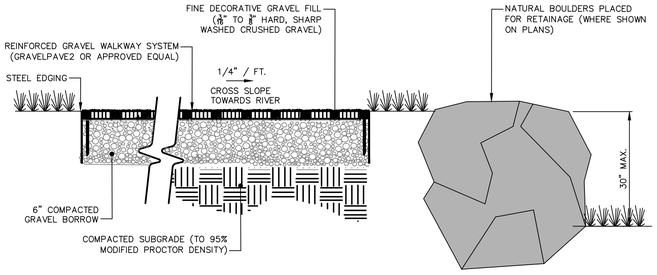
RESTORATION PLAN NO. 3

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

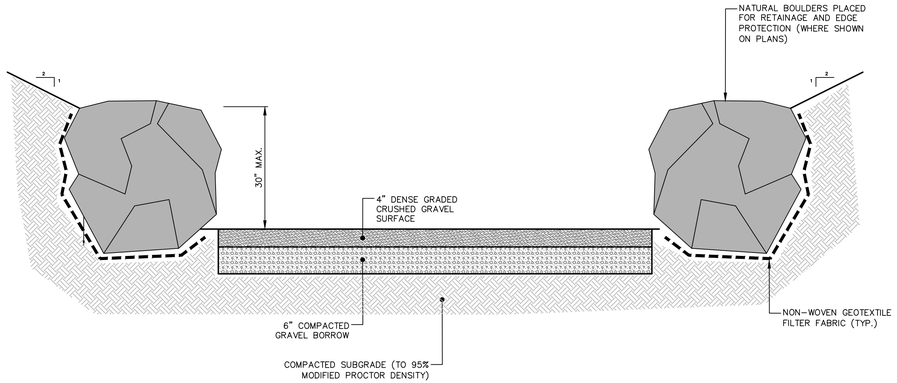
PROJ. No.: 20170390.U30
DATE: JUNE 2022

CR-103



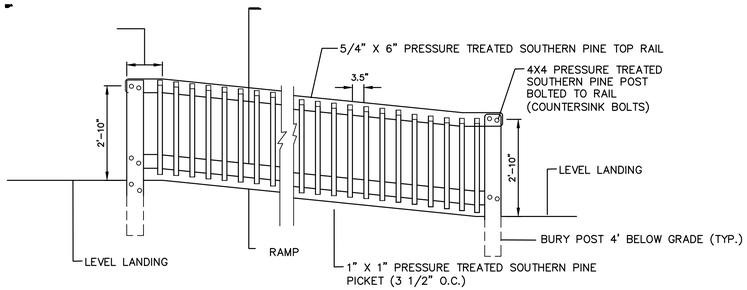
GRAVEL WALKWAY/ACCESS PATH (AT CASHMAN PARK)

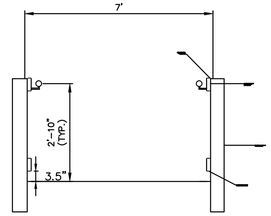
NOT TO SCALE



KAYAK/CANOE ACCESS PATH (AT CASHMAN PARK)

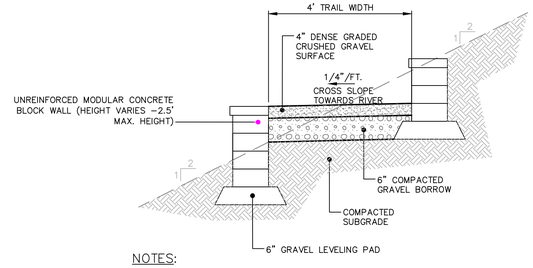
NOT TO SCALE





TIMBER HANDRAIL (AT KAYAK/CANOE ACCESS)

NOT TO SCALE

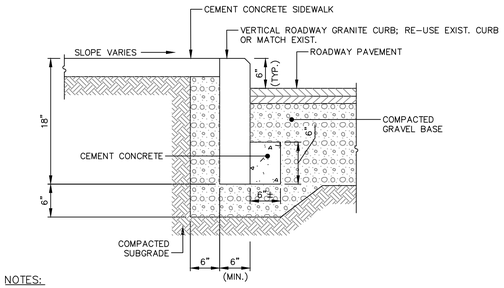


NOTES:

1. GRAVEL BORROW BASE COURSE SHALL CONSIST OF REUSED ON-SITE GRAVEL OR IMPORTED GRAVEL MEETING THE GRADATION REQUIREMENTS OF M.1.03 OF THE MASSDOT STANDARD SPECIFICATIONS.
2. DENSE GRADED CRUSHED GRAVEL SURFACE SHALL CONSIST OF GRAVEL SURFACE MATERIAL MEETING THE REQUIREMENTS OF M2.05.0 OF THE MASSDOT STANDARD SPECIFICATIONS.
3. ALIGNMENT OF TRAIL MAY VARY SLIGHTLY WITHIN LIMIT OF DISTURBANCE (AS FIELD DIRECTED BY ENGINEER) IN ORDER TO MINIMIZE TREE AND VEGETATION REMOVAL.

COMPACTED GRAVEL WALKING TRAIL

NOT TO SCALE

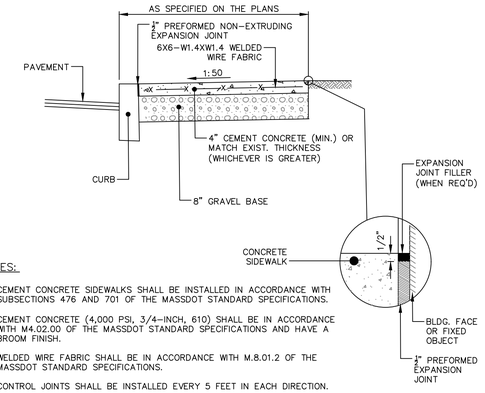


NOTES:

1. CURBING SHALL BE INSTALLED IN ACCORDANCE WITH SUBSECTION 501 OF THE MASSDOT STANDARD SPECIFICATIONS.
2. GRANITE CURB, GRANITE CURB INLETS, AND GRANITE CURB CORNERS SHALL BE IN ACCORDANCE WITH M9.04.1, M9.04.5, AND M9.04.6 OF THE MASSDOT STANDARD SPECIFICATIONS, RESPECTIVELY.
3. CEMENT CONCRETE (3,000 PSI, 3/4-INCH, 520) SHALL BE IN ACCORDANCE WITH M4.02.00 OF THE MASSDOT STANDARD SPECIFICATIONS AND INSTALLED IN ACCORDANCE WITH SUBSECTION 476 OF THE MASSDOT STANDARD SPECIFICATIONS.
4. MORTAR FOR CURBING JOINTS SHALL BE IN ACCORDANCE WITH M4.02.15 OF THE MASSDOT STANDARD SPECIFICATIONS.

VERTICAL ROADWAY GRANITE CURB

NOT TO SCALE

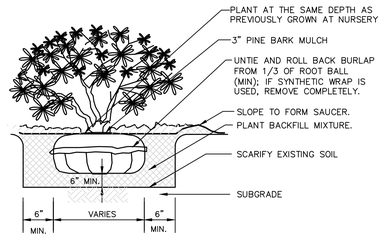


NOTES:

1. CEMENT CONCRETE SIDEWALKS SHALL BE INSTALLED IN ACCORDANCE WITH SUBSECTIONS 476 AND 701 OF THE MASSDOT STANDARD SPECIFICATIONS.
2. CEMENT CONCRETE (4,000 PSI, 3/4-INCH, 610) SHALL BE IN ACCORDANCE WITH M4.02.00 OF THE MASSDOT STANDARD SPECIFICATIONS AND HAVE A BROOM FINISH.
3. WELDED WIRE FABRIC SHALL BE IN ACCORDANCE WITH M.8.01.2 OF THE MASSDOT STANDARD SPECIFICATIONS.
4. CONTROL JOINTS SHALL BE INSTALLED EVERY 5 FEET IN EACH DIRECTION.
5. EXPANSION JOINTS SHALL BE INSTALLED EVERY 20 FEET IN EACH DIRECTION AT FOUNDATIONS AND WALLS IN IN A SQUARE PATTERN AROUND MANHOLE COVERS, HYDRANTS, SIGN POSTS AND UTILITY POLES. THE EXPANSION JOINT SHALL BE THE FULL DEPTH OF THE SIDEWALK AND FILLED WITH AN APPROVED TYPE OF PREMOLDED EXPANSION JOINT FILLER IN ACCORDANCE WITH M.9.14.0 OF THE MASSDOT STANDARD SPECIFICATIONS.

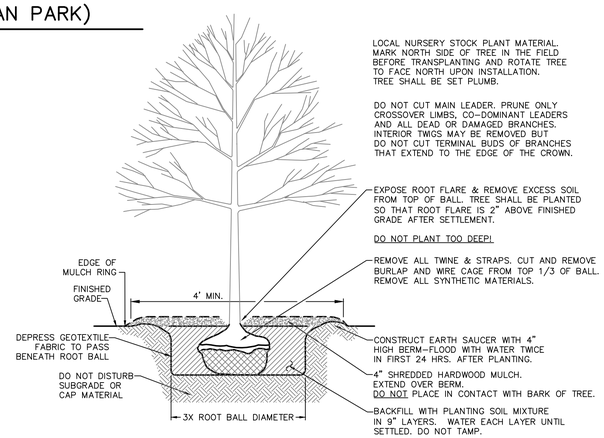
CEMENT CONCRETE SIDEWALK

NOT TO SCALE



SHRUB PLANTING

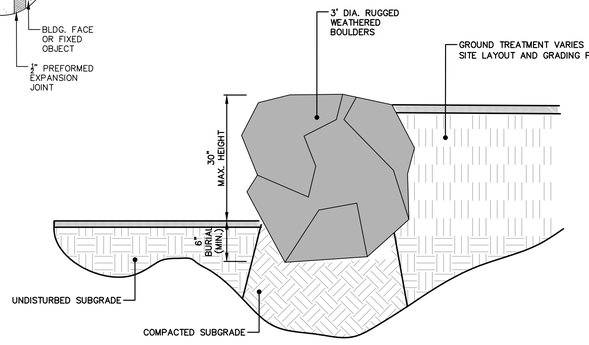
NOT TO SCALE



NOTES:
1. STAKES & GUYS SHALL NOT BE USED.
2. SPRAY WITH ANTIDESICCANT IN ACCORDANCE WITH MFG'S INSTRUCTIONS IF FOLIGAE IS PRESENT.

TREE PLANTING DETAIL

NOT TO SCALE



NATURAL BOULDER PLACEMENT (FOR RETAINAGE)

NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

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SCALE:
HORZ.: AS NOTED
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
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GRAPHIC SCALE

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CITY OF HAVERHILL

CONSTRUCTION DETAILS

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

CD-501

File: J:\DWG\P2017\0390\U30\DEP_NOI_Plans\Plan\20170390U30_DET01.dwg Layout: NOI UP CD-501 Plotted: 2023-03-08 12:40 PM Saved: 2023-03-08 12:22 PM User: cnauman
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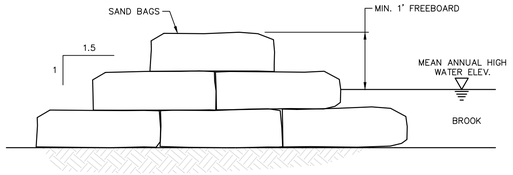
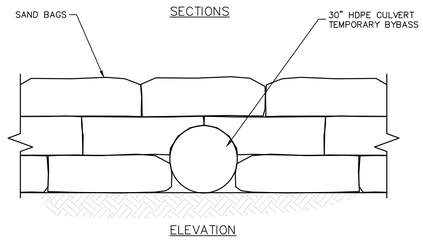
MS VIEW:



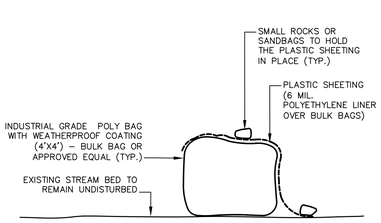


SECTIONS

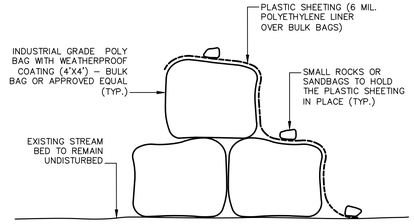
ELEVATION

TEMPORARY SMALL SANDBAG COFFERDAM

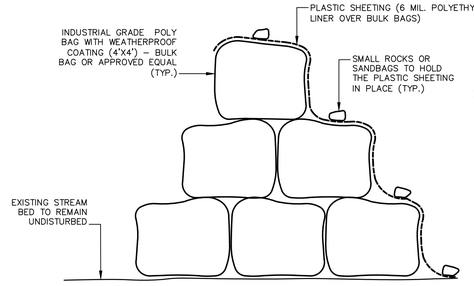
NOT TO SCALE



SINGLE STACK CONFIGURATION
(WATER DEPTH < 3')



DOUBLE STACK CONFIGURATION
(3'< WATER DEPTH > 6')



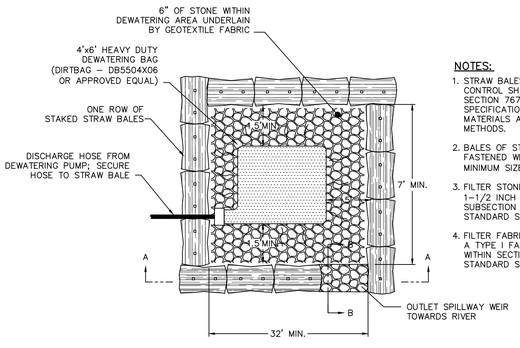
TRIPLE STACK CONFIGURATION
(6'< WATER DEPTH > 9')

WATER CONTROL NOTES:

1. TEMPORARY SANDBAGS SHALL CONSIST OF POLYPROPYLENE LARGE SANDBAGS, BULK BAGS OR APPROVED EQUAL, AND SHALL BE FILLED WITH SAND CONFORMING TO SUBSECTION M1.04.0 (TYPE B) OF THE MASSDOT STANDARD SPECIFICATIONS.
2. INSTALL DURING PERIOD OF LOW–FLOW IN BROOK. MONITOR WATER CONTROL SYSTEM DAILY. PROMPTLY CORRECT SEEPAGE, BREAKAGE, OR OTHER EVIDENCE OF MOVEMENT TO ENSURE THAT TEMPORARY COFFERDAM(S) AND WATER BYPASS CONVEYANCES REMAIN STABLE AND FUNCTIONING AS INTENDED.
3. MAINTAIN CRUSHED STONE STUMP AND PUMPS AS NECESSARY TO MAINTAIN DEWATERED CONDITIONS WITHIN COFFERDAMMED AREAS SUFFICIENT FOR COMPLETION OF WORK AND PLACEMENT PROPOSED MATERIALS UNDER SAFE, CONTROLLED CONDITIONS.
4. REMOVE ALL SANDBAGS, ACCUMULATED SEDIMENT, AND OTHER COFFERDAM MATERIALS AFTER IN–RIVER CONSTRUCTION IN RESPECTIVE PHASE IS COMPLETE

TEMPORARY LARGE SANDBAG COFFERDAM (BULK BAGS OR APPROVED EQUAL)

NOT TO SCALE



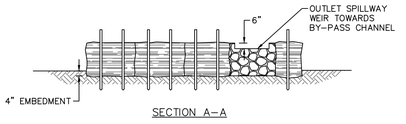
PLAN

NOTES:

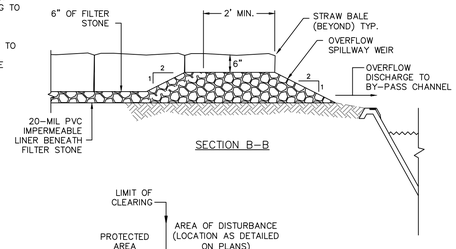
1. THE DEWATERING BAG, DIRTBAG® DB55 OR APPROVED EQUAL, SHALL BE HEAVY DUTY AND CONSIST OF A NONWOVEN BAG SEWN WITH A DOUBLE NEEDLE MATCHING USING A HIGH STRENGTH THREAD.
2. EACH DEWATERING BAG SHALL HAVE A FILL SPOUT LARGE ENOUGH TO ACCOMMODATE A 4–INCH DISCHARGE HOSE. THE BAG SHALL BE PROVIDED WITH STRAPS TO SECURE THE HOSE AND PREVENT PUMPED WATER FROM ESCAPING WITHOUT BEING FILTERED.
3. MAINTAIN DEWATERING BAG(S) AS NECESSARY TO EFFICIENTLY FILTER SEDIMENT OR PASS WATER AT A REASONABLE RATE. USE OF EXCESSIVE FLOW RATES OR OVERFILLING DIRTBAG® WITH SEDIMENT WILL CAUSE RUPTURES OF THE BAGS OR FAILURE OF THE HOSE ATTACHMENT STRAPS.
4. DISPOSE OF DEWATERING BAG AND CONTENTS AT OFF–SITE DISPOSAL FACILITY IN ACCORDANCE WITH THE APPROVED SOIL MANAGEMENT PLAN OR AS DIRECTED BY ENGINEER.
5. INSTALL DEWATERING BAG AND CRUSHED STONE BEDDING WITH A SLOPE SO INCOMING WATER FLOWS DOWNHILL THROUGH THE BAG WITHOUT CREATING MORE EROSION. STRAP THE NECK OF DEWATERING BAG TIGHTLY TO THE DISCHARGE HOSE.

NOTES:

1. STRAW BALES FOR EROSION CONTROL SHALL CONFORM TO SECTION 767 OF THE STANDARD SPECIFICATIONS INCLUDING MATERIALS AND CONSTRUCTION METHODS.
2. BALES OF STRAW SHALL BE FASTENED WITH WIRE AND HAVE A MINIMUM SIZE OF 1'x1.5'x3'.
3. FILTER STONE SHALL CONSIST OF 1–1/2 INCH STONE CONFORMING TO SUBSECTION M2.01.1 OF THE STANDARD SPECIFICATIONS.
4. FILTER FABRIC SHALL CONFORM TO A TYPE I FABRIC AS INCLUDED WITHIN SECTION M9.50.0 OF THE STANDARD SPECIFICATIONS.



SECTION A–A



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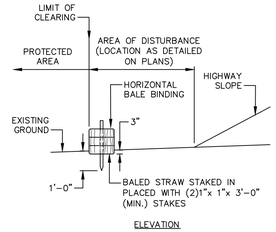

ELEVATION

TEMPORARY DEWATERING BASIN WITH FILTER BAG

NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

SEAL

SCALE:
HORZ.: AS NOTED
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
1 0 1
GRAPHIC SCALE

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CITY OF HAVERHILL

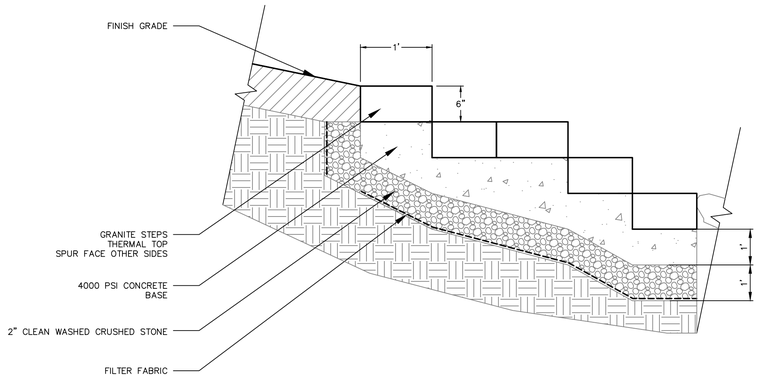
CONSTRUCTION DETAILS

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

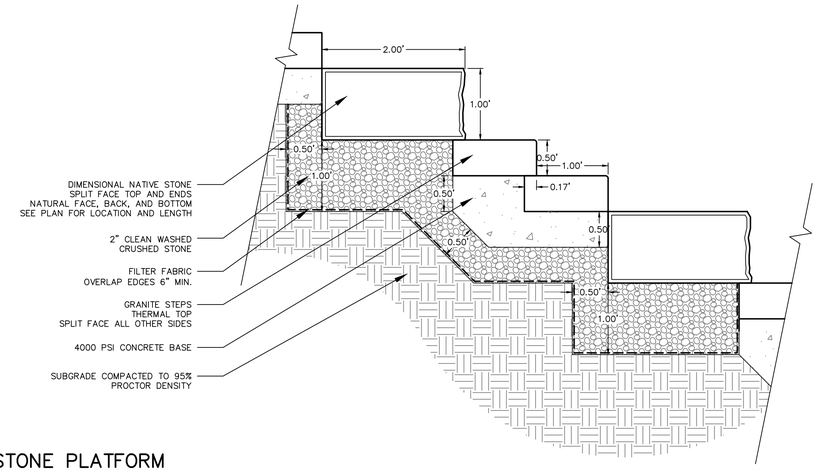
PROJ. No.: 20170390.U30
DATE: JUNE 2022

CD-502



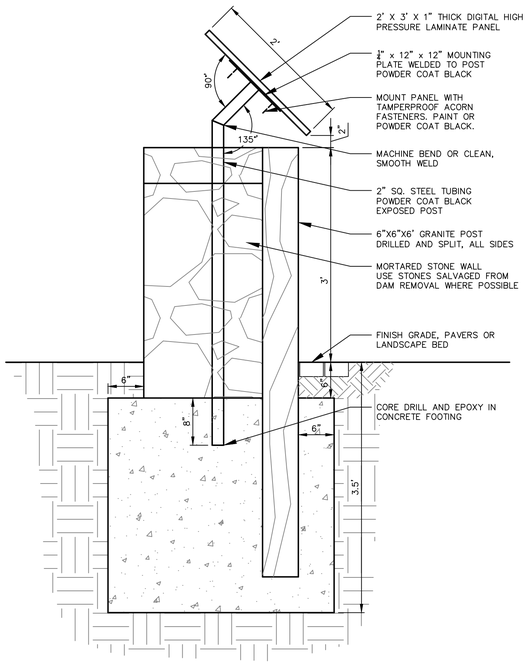
GRANITE STEPS

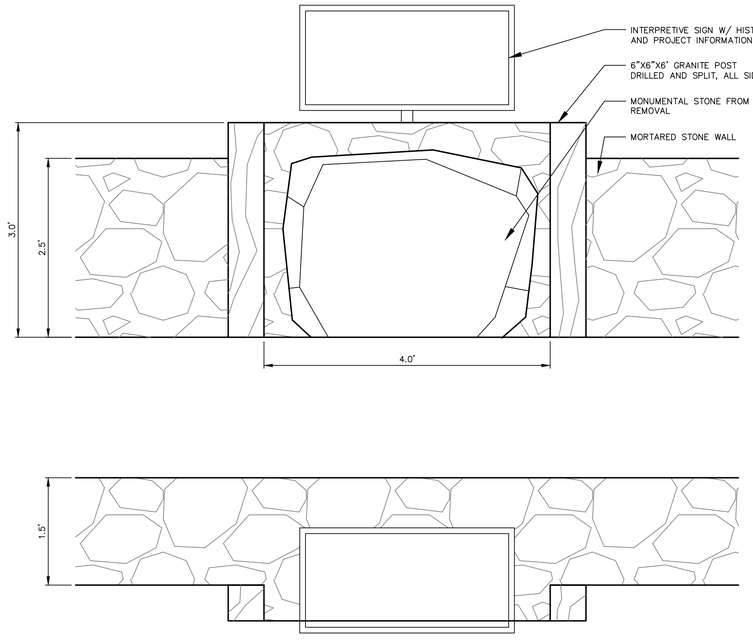
N.T.S.



STONE PLATFORM

N.T.S.

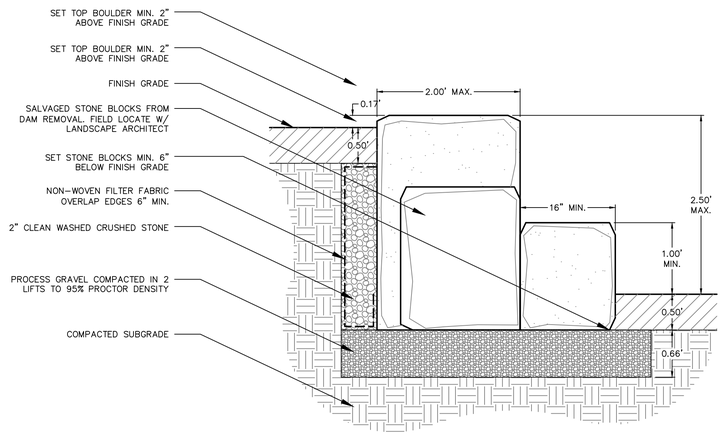




NOTES:
PROVIDE SHOP DRAWING BY SIGN MANUFACTURER FOR APPROVAL.

STONE WALL AND INTERPRETIVE SIGN

SCALE: NOT TO SCALE



STACKED SALVAGED STONE BLOCKS

N.T.S.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

SEAL

SCALE:
HORZ.: AS NOTED
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CITY OF HAVERHILL

CONSTRUCTION DETAILS

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

CD-503

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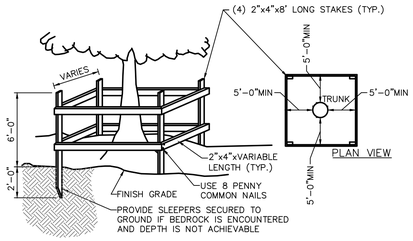
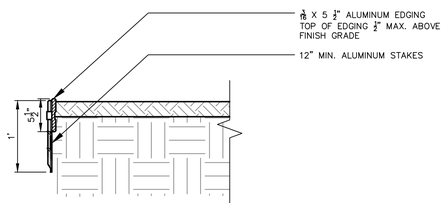


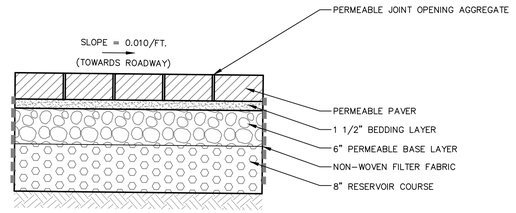
NOTES:
SEE LANDSCAPING PLAN FOR ADDITIONAL TREE PROTECTION NOTES.

TEMPORARY TREE PROTECTION
NOT TO SCALE



NOTES:
1. 16'-0" SECTIONS TO INCLUDE FIVE (5) 12" STAKES
2. 8'-0" SECTIONS TO INCLUDE THREE (3) 12" STAKES
3. COMPACT GRADES ADJACENT TO EDGING TO MINIMIZE SETTLING
4. CORNERS – CUT BASE OF EDGING HALF WAY AND FORM A CONTINUOUS CORNER.

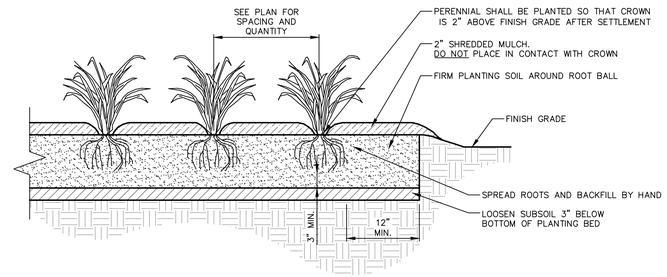
LANDSCAPE EDGING
SCALE: NOT TO SCALE



NOTES:

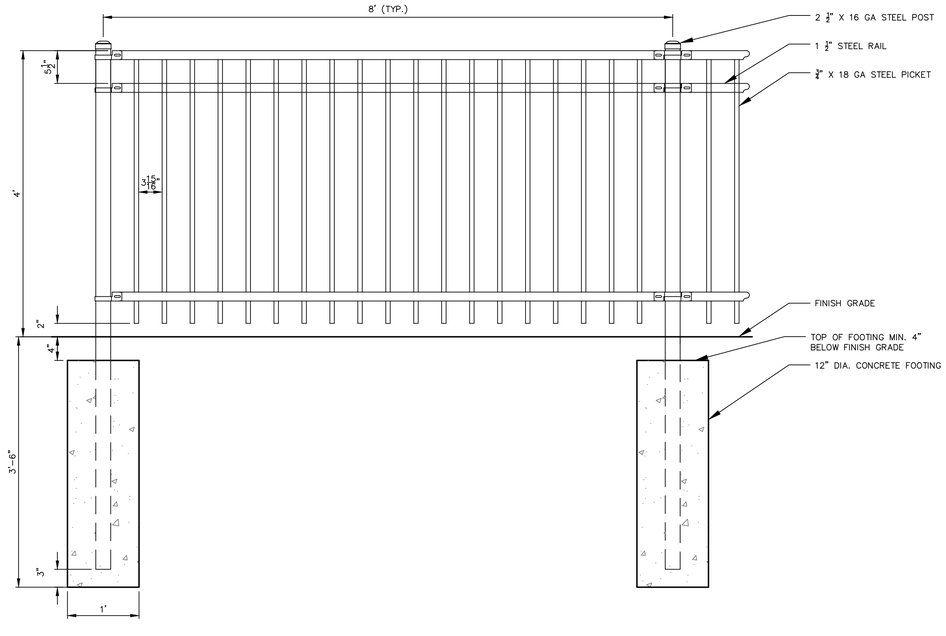
1. THICKNESS OF PERMEABLE CONCRETE PAVERS SHALL VARY BASED ON PRODUCT AND MANUFACTURER SELECTED.
2. THE MINIMUM THICKNESSES OF THE BEDDING LAYER, PERMEABLE BASE LAYER, AND RESERVOIR COURSE LAYER AS SPECIFIED ABOVE REPRESENT MINIMUM THICKNESSES AFTER COMPACTION.
3. PROTECT PERMEABLE PAVERS AND AGGREGATES FROM CONSTRUCTION VEHICLE TRAFFIC, RUNOFF FROM ADJACENT AREAS, AND SEDIMENTATION.

PERMEABLE PAVER SYSTEM
Scale: N.T.S.

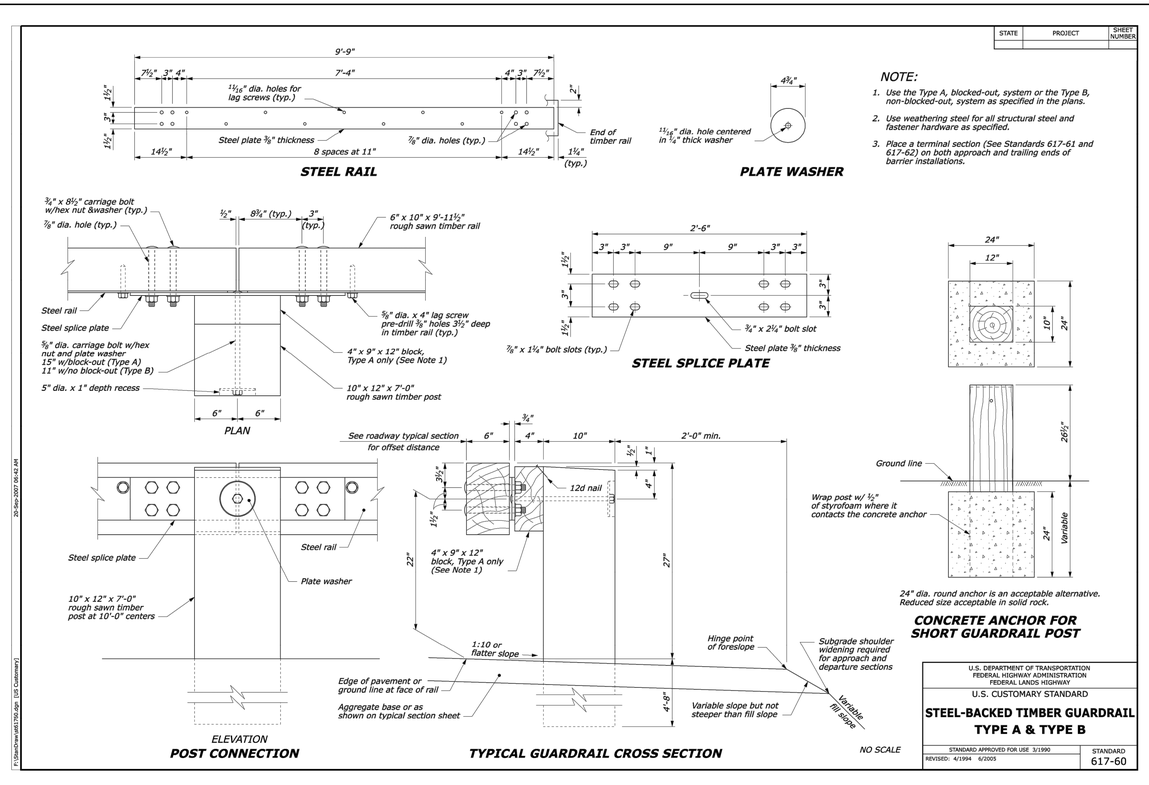


NOTES:
- SPADED PLANTING SOIL MIX SHALL BE PLACED 3" BELOW ROOT BALL AND BE MIXED WITH FERTILIZER. DO NOT COMPACT AFTER PLANTING.
- WATER THOROUGHLY AFTER PLANTING.
- PROVIDE WELL DRAINING SUBSOIL WHEN SOIL IS HEAVY OR COMPACTED.
- FOR CONTAINER GROWN PLANTS, USE FINGERS OR SMALL HAND TOOLS TO PULL THE ROOTS OUT OF THE OUTER LAYER OF POTTING SOIL; THEN CUT OR PULL APART ANY ROOTS CIRCLING THE PERIMETER OF THE CONTAINER.

PERENNIAL PLANT BED
Scale: N.T.S.



DECORATIVE FENCE
SCALE: NOT TO SCALE



NOTE:
1. Use the Type A, blocked-out, system or the Type B, non-blocked-out, system as specified in the plans.
2. Use weathering steel for all structural steel and fastener hardware as specified.
3. Place a terminal section (See Standards 617-61 and 617-62) on both approach and trailing ends of barrier installations.

STATE	PROJECT	SHEET NUMBER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD

STEEL-BACKED TIMBER GUARDRAIL
TYPE A & TYPE B

STANDARD APPROVED FOR USE 3/1990	STANDARD
REVISED: 4/1994 6/2005	617-60

STEEL BACKED TIMBER GUARDRAIL
NOT TO SCALE

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

SEAL

SCALE:
HORZ.: AS NOTED
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
1 0 1
GRAPHIC SCALE

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CITY OF HAVERHILL

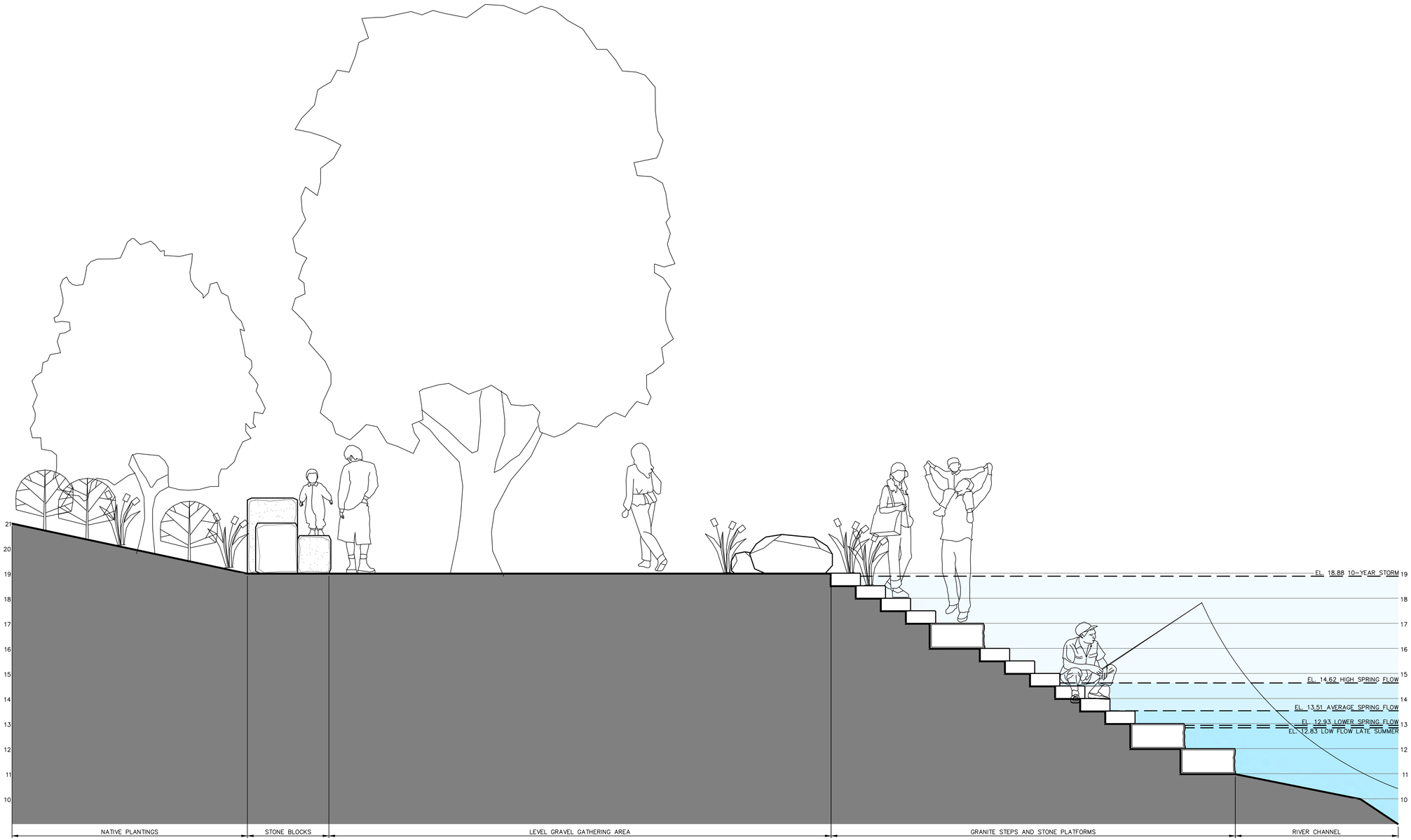
CONSTRUCTION DETAILS

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

CD-504



TYPICAL PROFILE OF CASHMAN'S PARK REINFORCED GRAVEL FISHING AREA, GRANITE STEPS, AND STONE PLATFORM

NOT TO SCALE

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MS VIEW: LAYER STATE: PC3: NONE STB/CTB: FO.STB

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

SEAL

SCALE:
HORZ.: AS NOTED
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
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GRAPHIC SCALE

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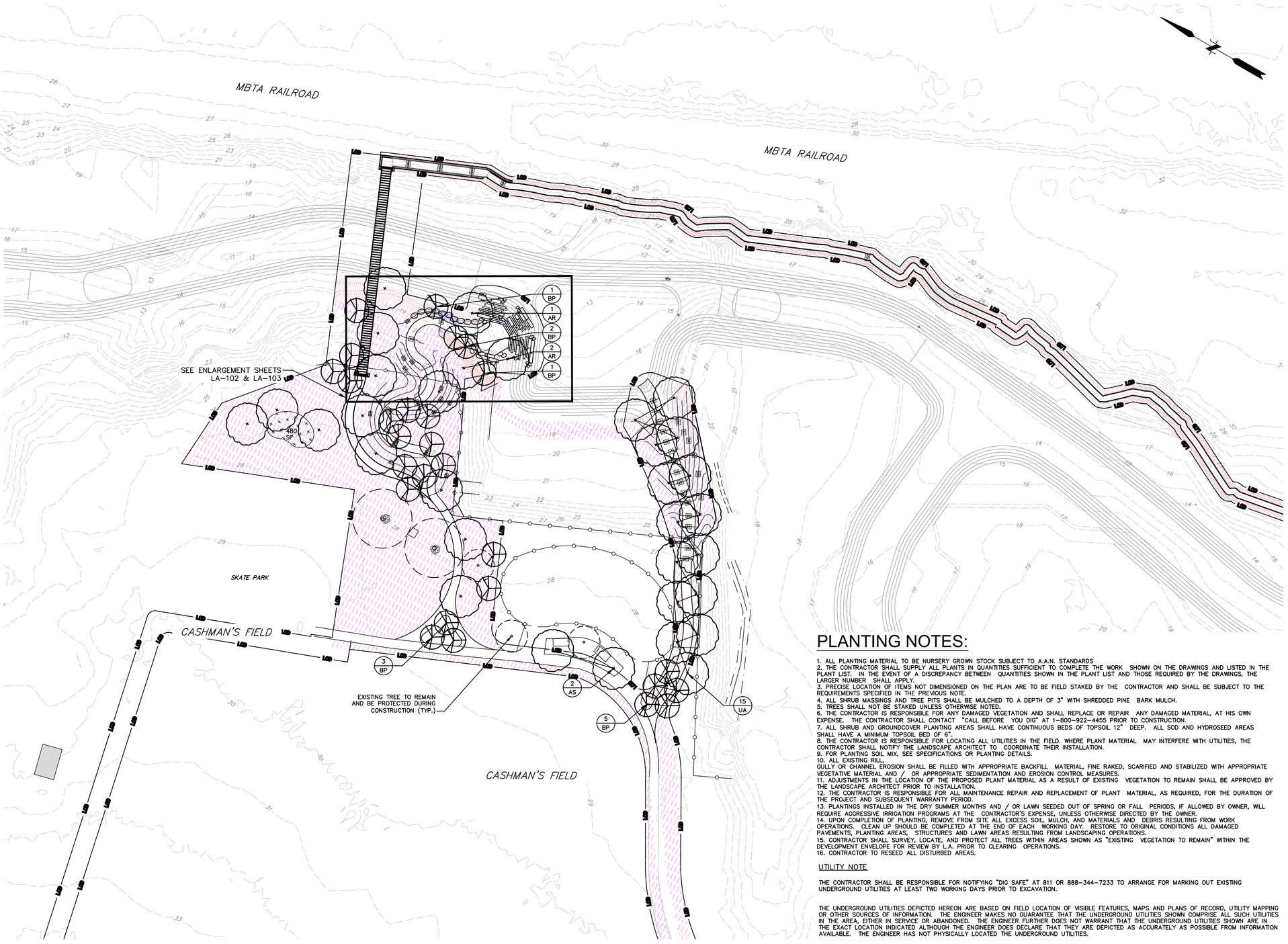
HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

CD-505



LEGEND:

LARGE SHADE TREE

UNLESS OTHERWISE NOTED ON LANDSCAPE PLAN, SELECT AT LEAST 2 OF THE FOLLOWING SPECIES IN EQUAL QUANTITIES
- AMERICAN SYCAMORE (PLATANUS OCCIDENTAILS, FACW)
- AMERICAN ELM (ULMUS AMERICANA, FACW)
- AMERICAN LARCH (LARIX LARCINA, FACW)
- BLACK CHERRY (PRUNUS SEROTINA, FACU)
- SILVER MAPLE (ACER SACCHARINUM, FACW)

UNLESS OTHERWISE NOTED ON LANDSCAPE PLAN, SELECT AT LEAST 2 OF THE FOLLOWING SPECIES IN EQUAL QUANTITIES
- RED MAPLE (ACER RUBRUM, FAC)
- YELLOW BIRCH (BETULA ALLEGHANIENSIS, FAC)
- BALSAM FIR (ABIES BALSAMEA, FAC)

ORNAMENTAL TREE

UNLESS OTHERWISE NOTED ON LANDSCAPE PLAN, SELECT AT LEAST 3 OF THE FOLLOWING SPECIES IN EQUAL QUANTITIES
- GRAY BIRCH (BETULA POPULIFOLIA, FAC)
- AMERICAN HORNBEAM (CARPINUS CAROLINIANA, FAC)
- ALTERNATE LEAF DOGWOOD (CORNUS ALTERNIFOLIA, FACU)
- SHADBUSH (AMELANCHIER LAEVIS, NI)

SHRUBS

SELECT AT LEAST 2 OF THE FOLLOWING SPECIES IN EQUAL QUANTITIES, PLANTED AT 6' O.C.
- BLACK CHOKEBERRY (ARONIA MELANOCARPA, FAC)
- SWEET PEPPERBUSH (CLETHRA ALNIFOLIA, FAC)
- GRAY DOGWOOD (CORNUS RACEMOSA, FAC)
- NANNYBERRY (VIBURNUM LENTAGO, FAC)
- SHEEP LAUREL (KALMIA ANGUSTIFOLIA, FAC)
- WITCH HAZEL (HAMAMELIS VIRGINIANA, FACU)

EXISTING TREE TO REMAN

PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	SIZE
	LARGE SHADE TREES		
AB	ABIES BALSAMEA	BALSAM FIR	6-7' HT.
AR	ACER RUBRUM	RED MAPLE	2"-2 ½" CAL.
AS	ACER SACHARINUM	SILVER MAPLE	2"-2 ½" CAL.
BA	BETULA ALLEGHANIENSIS	YELLOW BIRCH	2"-2 ½" CAL.
LL	LARIX LARCINA	AMERICAN LARCH	6-7' HT.
PO	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	2"-2 ½" CAL.
PS	PRUNUS SEROTINA	BLACK CHERRY	2"-2 ½" CAL.
UA	ULMUS AMERICANA	AMERICAN ELM	2"-2 ½" CAL.
	ORNAMENTAL TREES		
AL	AMELANCHIER LAEVIS	ALLEGHENY SERVICEBERRY	6-8' HT.
BP	BETULA POPULIFOLIA	GREY BIRCH	1"-1 ½" CAL.
CA	CORNUS ALTERNIFOLIA	PAGODA DOGWOOD	1"-1 ½" CAL.
CC	CARPINUS CAROLINIANA	AMERICAN HORNBEAM	1"-1 ½" CAL.
	SHRUBS		
AM	ARONIA MELANOCARPA	BLACK CHOKEBERRY	3 GAL.
CP	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	3 GAL.
CR	CORNUS RACEMOSA	GRAY DOGWOOD	3 GAL.
HV	HAMAMELIS VIRGINIANA	WITCH HAZEL	3 GAL.
KA	KALMIA ANGUSTIFOLIA	SHEEP LAUREL	3 GAL.
VL	VIBURNUM LENTAGO	NANNYBERRY	3 GAL.

PLANTING NOTES:

1. ALL PLANTING MATERIAL TO BE NURSERY GROWN STOCK SUBJECT TO A.A.N. STANDARDS
2. THE CONTRACTOR SHALL SUPPLY ALL PLANTS IN QUANTITIES SUFFICIENT TO COMPLETE THE WORK SHOWN ON THE DRAWINGS AND LISTED IN THE PLANT LIST. IN THE EVENT OF A DISCREPANCY BETWEEN QUANTITIES SHOWN IN THE PLANT LIST AND THOSE REQUIRED BY THE DRAWINGS, THE LARGER NUMBER SHALL APPLY.
3. PRECISE LOCATION OF ITEMS NOT DIMENSIONED ON THE PLAN ARE TO BE FIELD STAKED BY THE CONTRACTOR AND SHALL BE SUBJECT TO THE REQUIREMENTS SPECIFIED IN THE PREVIOUS NOTE.
4. ALL SHRUB MASSINGS AND TREE PITS SHALL BE MULCHED TO A DEPTH OF 3" WITH SHREDDED PINE BARK MULCH.
5. TREES SHALL NOT BE STAKED UNLESS OTHERWISE NOTED.
6. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGED VEGETATION AND SHALL REPLACE OR REPAIR ANY DAMAGED MATERIAL, AT HIS OWN EXPENSE. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT 1-800-922-4455 PRIOR TO CONSTRUCTION.
7. ALL SHRUB AND GROUNDCOVER PLANTING AREAS SHALL HAVE CONTINUOUS BEDS OF TOPSOIL 12" DEEP. ALL SOD AND HYDROSEED AREAS SHALL HAVE A MINIMUM TOPSOIL BED OF 6".
8. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES IN THE FIELD. WHERE PLANT MATERIAL MAY INTERFERE WITH UTILITIES, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT TO COORDINATE THEIR INSTALLATION.
9. FOR PLANTING SOIL MIX, SEE SPECIFICATIONS OR PLANTING DETAILS.
10. ALL EXISTING RILL, GULLY OR CHANNEL EROSION SHALL BE FILLED WITH APPROPRIATE BACKFILL MATERIAL, FINE RAKED, SCARIFIED AND STABILIZED WITH APPROPRIATE VEGETATIVE MATERIAL AND / OR APPROPRIATE SEDIMENTATION AND EROSION CONTROL MEASURES.
11. ADJUSTMENTS IN THE LOCATION OF THE PROPOSED PLANT MATERIAL AS A RESULT OF EXISTING VEGETATION TO REMAIN SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
12. THE CONTRACTOR IS RESPONSIBLE FOR ALL MAINTENANCE REPAIR AND REPLACEMENT OF PLANT MATERIAL, AS REQUIRED, FOR THE DURATION OF THE PROJECT AND SUBSEQUENT WARRANTY PERIOD.
13. PLANTINGS INSTALLED IN THE DRY SUMMER MONTHS AND / OR LAWN SEEDED OUT OF SPRING OR FALL PERIODS, IF ALLOWED BY OWNER, WILL REQUIRE AGGRESSIVE IRRIGATION PROGRAMS AT THE CONTRACTOR'S EXPENSE, UNLESS OTHERWISE DIRECTED BY THE OWNER.
14. UPON COMPLETION OF PLANTING, REMOVE FROM SITE ALL EXCESS SOIL, MULCH, AND MATERIALS AND DEBRIS RESULTING FROM WORK OPERATIONS. CLEAN UP SHOULD BE COMPLETED AT THE END OF EACH WORKING DAY. RESTORE TO ORIGINAL CONDITIONS ALL DAMAGED PAVEMENTS, PLANTING AREAS, STRUCTURES AND LAWN AREAS RESULTING FROM LANDSCAPING OPERATIONS.
15. CONTRACTOR SHALL SURVEY, LOCATE, AND PROTECT ALL TREES WITHIN AREAS SHOWN AS "EXISTING VEGETATION TO REMAIN" WITHIN THE DEVELOPMENT ENVELOPE FOR REVIEW BY L.A. PRIOR TO CLEARING OPERATIONS.
16. CONTRACTOR TO RESEED ALL DISTURBED AREAS.

UTILITY NOTE

THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING "DIG SAFE" AT 811 OR 888-344-7233 TO ARRANGE FOR MARKING OUT EXISTING UNDERGROUND UTILITIES AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATION.

THE UNDERGROUND UTILITIES DEPICTED HEREON ARE BASED ON FIELD LOCATION OF VISIBLE FEATURES, MAPS AND PLANS OF RECORD, UTILITY MAPPING OR OTHER SOURCES OF INFORMATION. THE ENGINEER MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE ENGINEER FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH THE ENGINEER DOES DECLARE THAT THEY ARE DEPICTED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE ENGINEER HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

SEAL

SCALE:
HORZ.: 1"= 30'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
60 30 0 60
GRAPHIC SCALE

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CITY OF HAVERHILL

LANDSCAPE AND PLANTING PLAN NO. 1

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

LA-101

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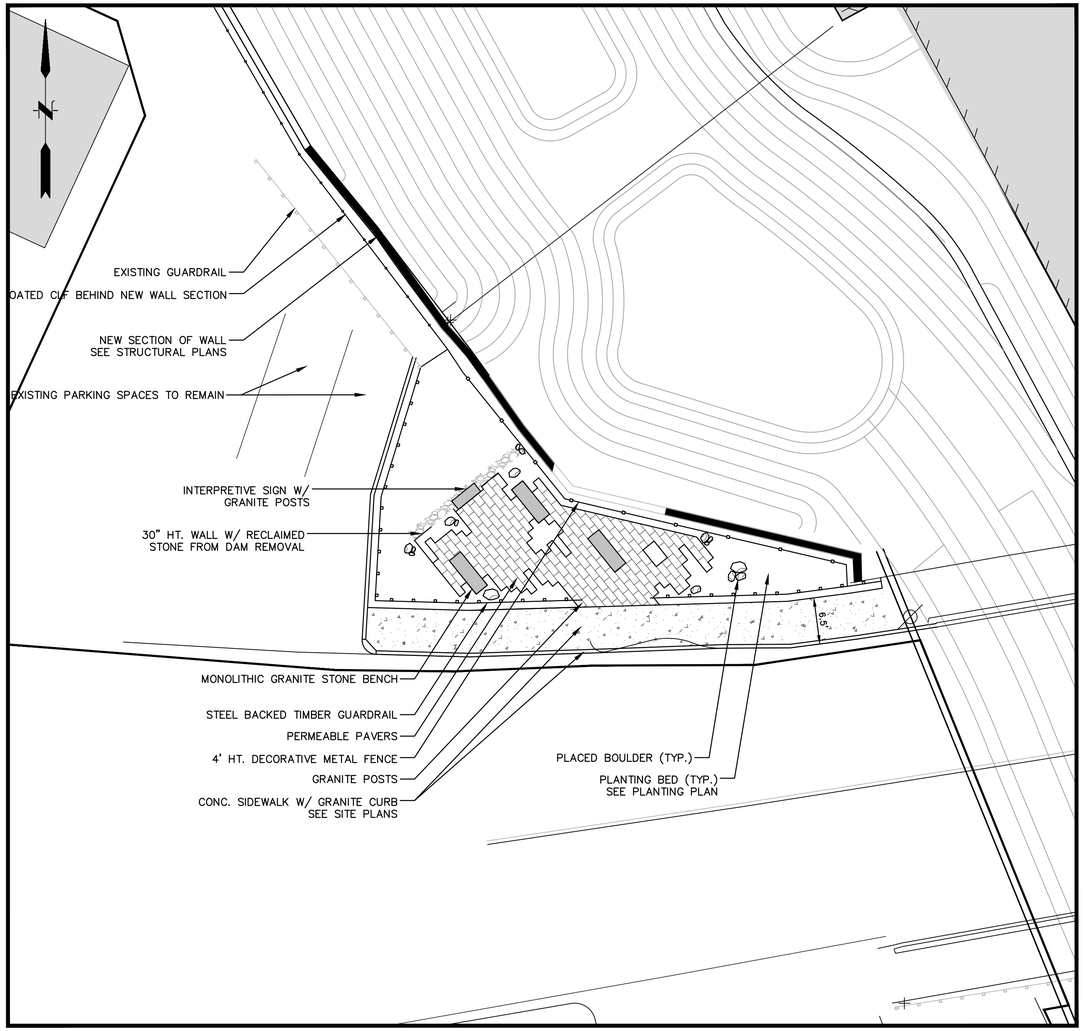
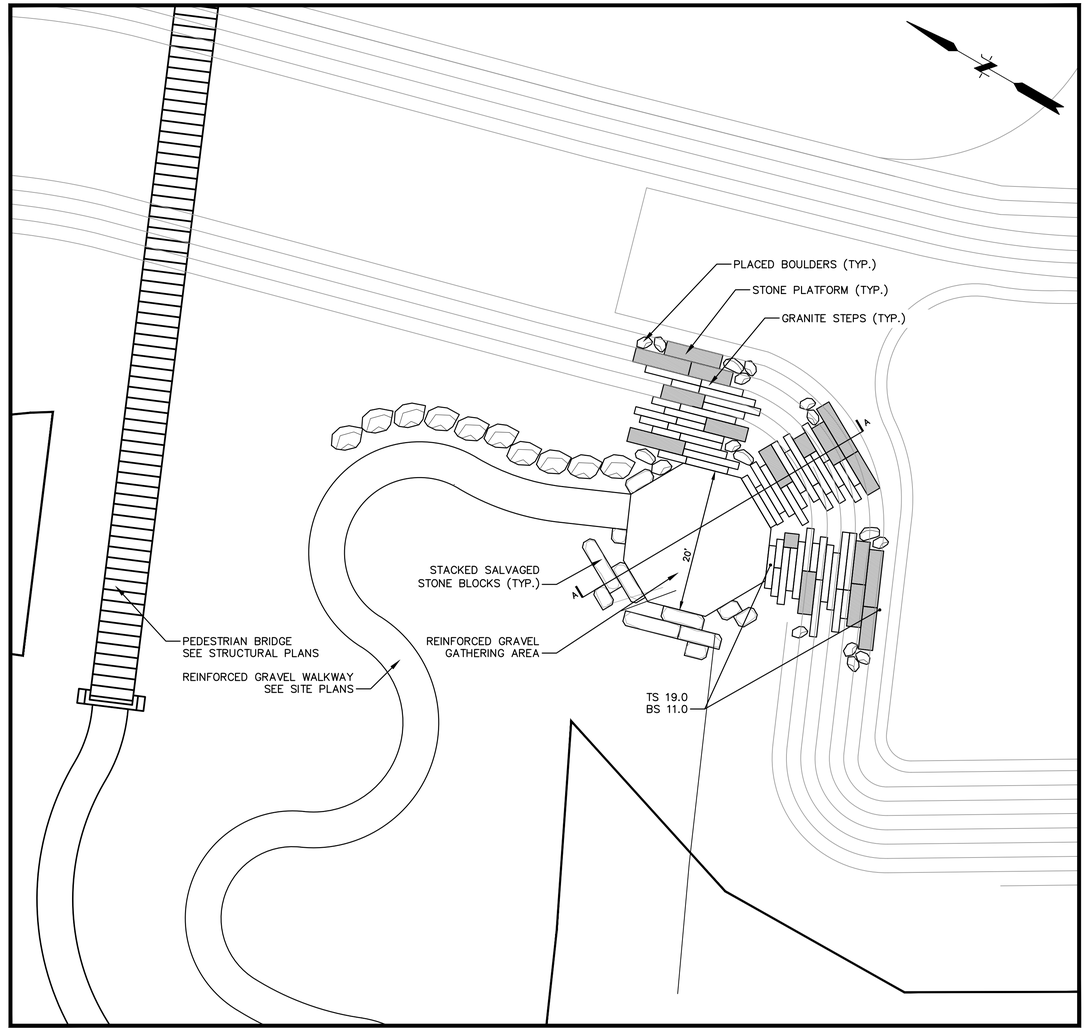


1 OVERLOOK - SITE PLAN ENLARGEMENT
SCALE: 1" = 10'



2 CASHMAN'S PARK - SITE PLAN ENLARGEMENT
SCALE: 1" = 10'

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

SEAL

SCALE:
HORZ.: 1"= 10'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
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GRAPHIC SCALE

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CITY OF HAVERHILL

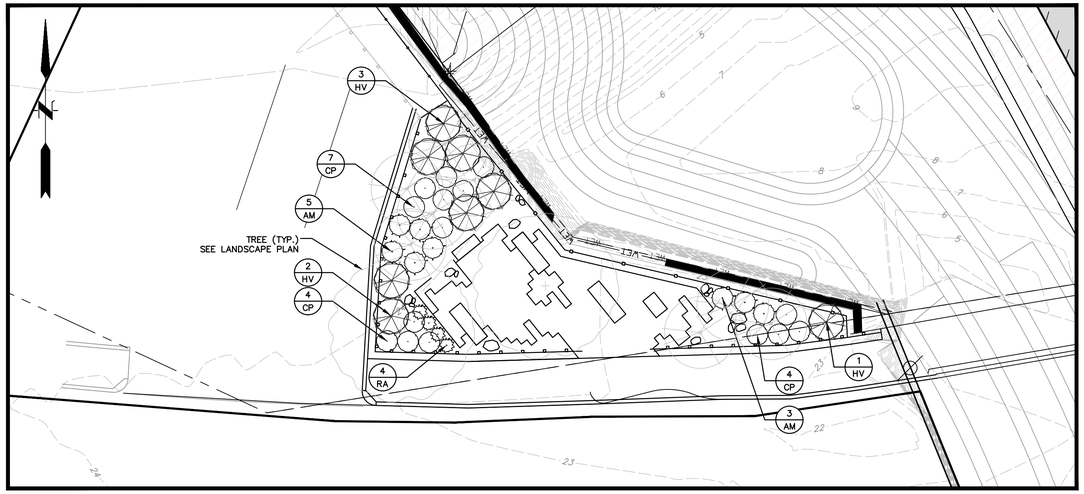
SITE PLAN ENLARGEMENTS

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

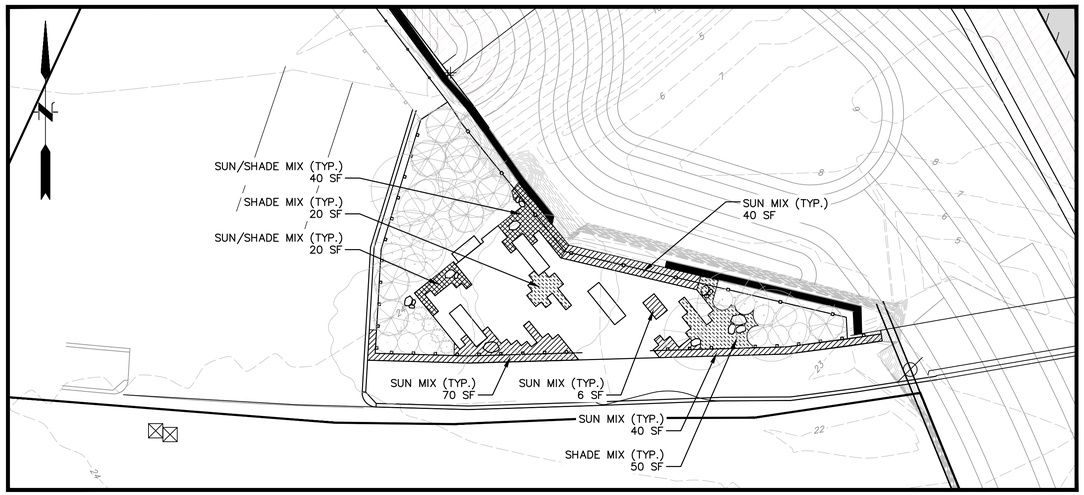
HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

LA-102



1 OVERLOOK - SHRUB PLANTING ENLARGEMENT
SCALE: 1" = 10'



2 OVERLOOK - PERENNIAL PLANTING ENLARGEMENT
SCALE: 1" = 10'

PLANT LIST

KEY	BOTANICAL NAME	COMMON NAME	QTY	SIZE
	SHRUBS			
AM	ARONIA MELANOCARPA	BLACK CHOKEBERRY	8	3 GAL.
CP	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	33	3 GAL.
HV	HAMAMELIS VIRGINIANA	WITCH HAZEL	16	5–6' HT.
IG	ILEX GLABRA	INKBERRY	5	5 GAL.
IV	ILEX VERTICILLATA 'RED SPRITE'	RED SPRITE WINTERBERRY	16	3 GAL.
RA	RHUS AROMATICA 'GRO LOW'	GRO LOW SUMAC	4	3 GAL.

SUN MIX

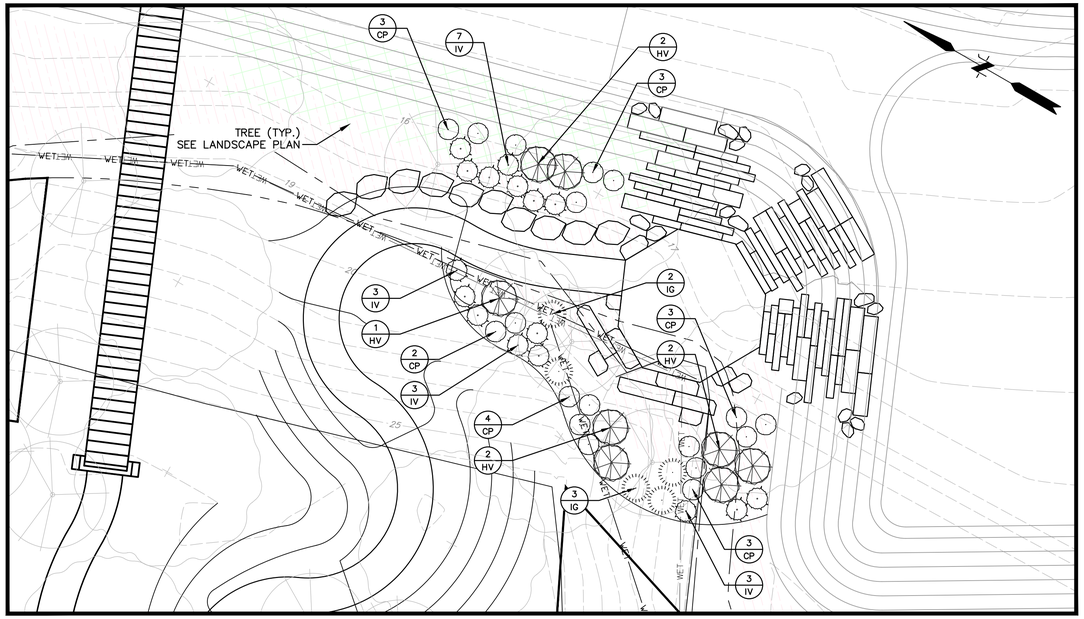
PLANT THE FOLLOWING SPECIES AT 18" O.C IN EQUAL QUANTITIES
–CAREX ROSEA (ROSY SEDGE)
–PANICUM VIRGATUM (SWITCHGRASS)
–ASTER NOVAE–ANGLIAE (NEW ENGLAND ASTER)
–ASCLEPIAS TUBEROSA (BUTTERFLY MILKWEED)

SHADE MIX

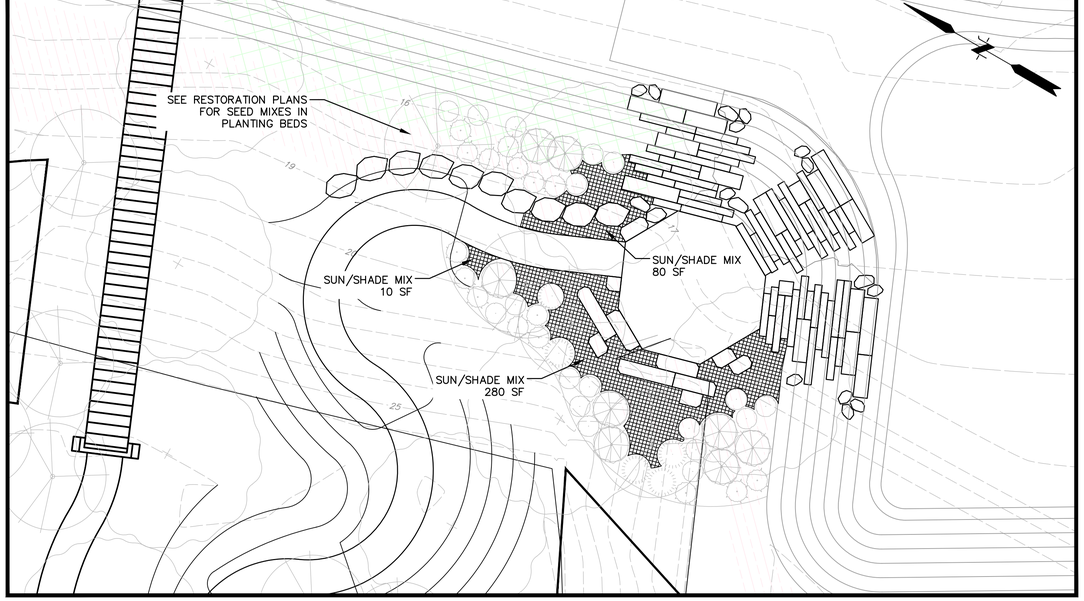
PLANT THE FOLLOWING SPECIES AT 18" O.C IN EQUAL QUANTITIES
–DENNSTAEDIA PUNCTLOBULA (HAY–SCENTED FERN)
–THELYPTERIS NOVEBORACENSIS (NEW YARD FARM)
–AQUILEGIA CANADENSIS (RED COLUMBINE)
–CAREX ROSEA (ROSY SEDGE)

SUN/SHADE MIX

PLANT THE FOLLOWING SPECIES AT 18" O.C IN EQUAL QUANTITIES
–DENNSTAEDIA PUNCTLOBULA (HAY–SCENTED FERN)
–ASTER NOVAE–ANGLIAE (NEW ENGLAND ASTER)
–ASCLEPIAS TUBEROSA (BUTTERFLY MILKWEED)
–CAREX ROSEA (ROSY SEDGE)



3 CASHMAN'S PARK - SHRUB PLANTING ENLARGEMENT
SCALE: 1" = 10'



4 CASHMAN'S PARK - PERENNIAL PLANTING ENLARGEMENT
SCALE: 1" = 10'

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

SEAL

SCALE:
HORZ.: 1"= 10'
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
10 5 0 10
GRAPHIC SCALE

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CITY OF HAVERHILL

PLANTING PLAN
ENLARGEMENTS

LITTLE RIVER COMMUNITY ACCESS IMPROVEMENTS

HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

LA-103

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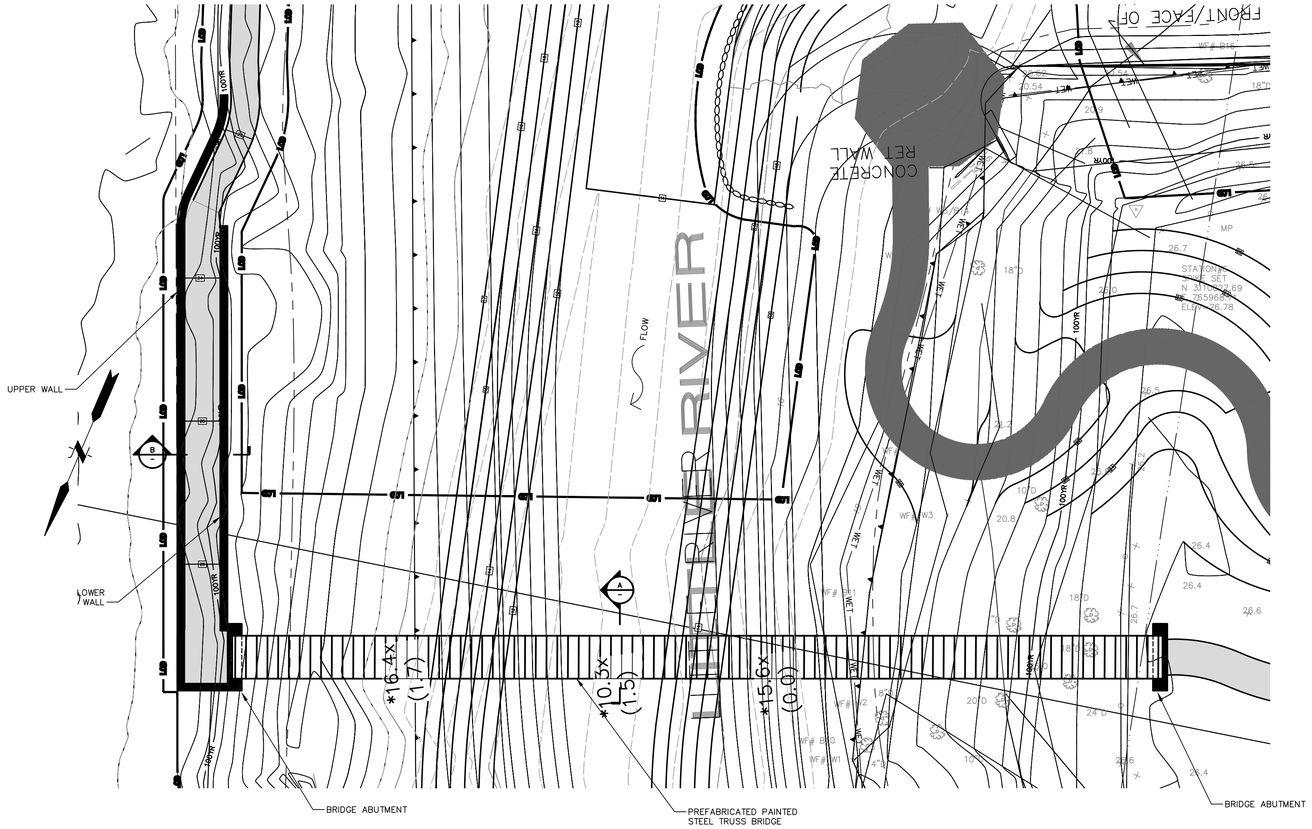
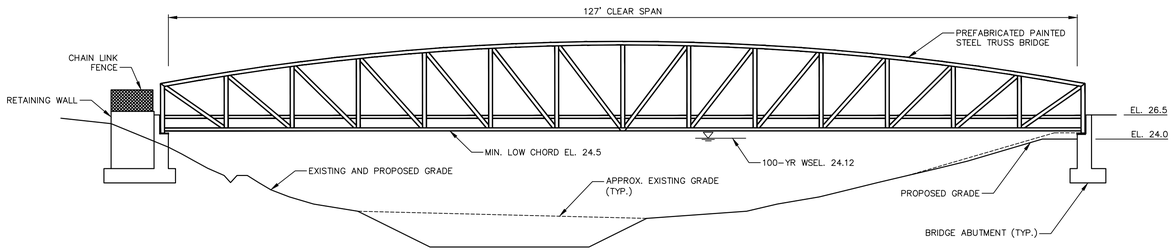
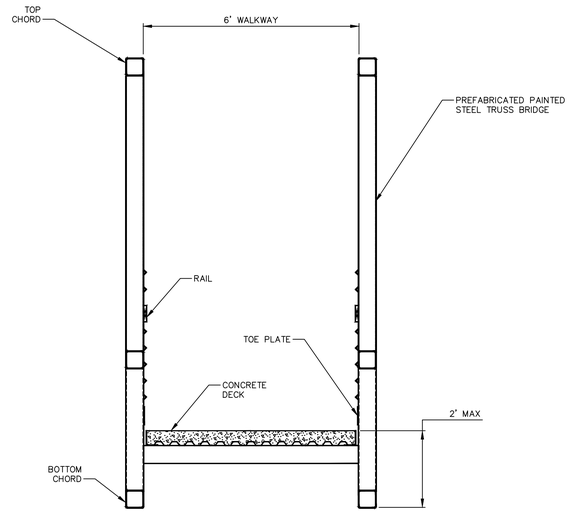


PLAN – PEDESTRIAN BRIDGE
SCALE: 1"=10'



PEDESTRIAN BRIDGE NORTH ELEVATION
SCALE: 1"=10'



SECTION A – BRIDGE SECTION
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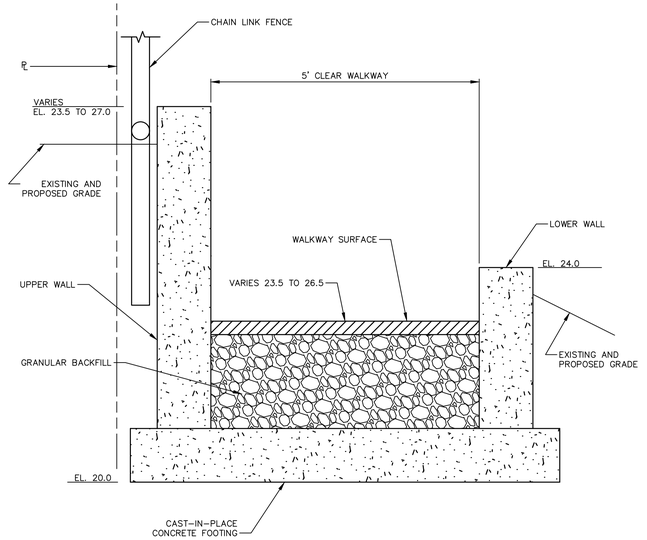

SECTION B – RETAINING WALL SECTION
SCALE: 3/4"=1'-0"

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SEAL

SEAL

SCALE:
HORZ.:
VERT.:
DATUM:
HORZ.: NAD83
VERT.: NAVD88
30 15 0 30
GRAPHIC SCALE

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PEDESTRIAN BRIDGE DETAILS

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HAVERHILL MASSACHUSETTS

PROJ. No.: 20170390.U30
DATE: JUNE 2022

S-101