WETLAND REPLICATION AREA SPECIFICATIONS

PART 1 GENERAL

1.01 EXTENT OF WORK

A. THE WORK INCLUDES THE FURNISHING OF ALL PLANT, LABOR, EQUIPMENT, MATERIALS AND REQUIRED PROFESSIONAL SERVICES IN CONNECTION WITH THE PROTECTION, REPLICATION AND PROVISION OF SPECIFIC MITIGATION AND ENHANCEMENT MEASURES TO MINIMIZE AND COMPENSATE FOR IMPACTS TO WETLANDS.

B. IT SHALL BE THE RESPONSIBILITY OF THE APPLICANT TO RETAIN A BOTANIST, BIOLOGIST, WETLAND SCIENTIST OR OTHER INDIVIDUAL WITH QUALIFICATIONS AND A MINIMUM OF FIVE YEARS EXPERIENCE IN SIMILAR WETLAND REPLICATIONS, AND THOROUGHLY VERSED IN THE COMMONWEALTH OF MASSACHUSETTS WETLANDS PROTECTION ACT (MGL CHAPTER 131, SECTION 40) AND ALL OTHER RELEVANT REGULATIONS OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION. THE INDIVIDUAL HEREIN AFTER REFERRED TO AS "BOTANIST", SHALL BE APPROVED BY THE TOWN OF LITTLETON CONSERVATION COMMISSION.

PART 2 EXECUTION

2.01 GENERAL

A. THE APPLICANT SHALL PLAN AND EXECUTE OPERATIONS IN A MANNER MINIMIZING THE AMOUNT OF EXCAVATED AND EXPOSED FILL OR OTHER FOREIGN MATERIALS THAT MAY BE WASHED OR OTHERWISE CARRIED INTO THE REPLICATION AREAS.

2.02 EROSION/SEDIMENTATION CONTROL

A. THE APPLICANT SHALL INSTALL STRAW WATTLES AND/OR SILTATION FENCING AND UTILIZE EROSION/SEDIMENTATION CONTROL METHODS PRIOR TO THE COMMENCEMENT OF ANY WORK.

2.03 REPLICATION AREA PREPARATION

A. THE REPLICATION AREAS ARE TO BE CONSTRUCTED PRIOR TO THE COMMENCEMENT OF ANY SITE WORK. THIS WETLAND REPLICATION SHALL BE PERFORMED UNDER THE DIRECTION AND GUIDANCE OF A QUALIFIED BOTANIST AND AS SPECIFIED HEREIN.

B. THE REPLICATION AREAS SHALL HAVE FINISHED GRADES WHICH MEET THE EXISTING GRADES IN THE ADJACENT WETLAND AS SHOWN ON THIS SHEET.

C. BEFORE PLANTING THE REPLICATION AREAS, THE APPLICANT SHALL REMOVE ALL TREES, SHRUBS, STUMPS, AND SOD FROM THE REPLICATION AREAS. THESE ARE NOT TO BE STOCKPILED IN THE RESOURCE AREAS OR BUFFER ZONES WHILE AWAITING DISPOSITION.

D. DURING THE REMOVAL OF THE TREES, SHRUBS, STUMPS AND SOD, SOME OF THE SOILS (WITHIN THE REPLICATION AREAS) WILL LIKELY BE REMOVED DURING THE PROCESS. ADDITIONAL WETLAND SOILS SHALL BE PROVIDED IN QUANTITIES SUFFICIENT TO ESTABLISH GRADES AS SHOWN ON THE PREVIOUSLY REFERENCED PLANS. THE REPLACEMENT SOIL SHALL BE PURCHASED BY THE APPLICANT AT A 1:1 MIX OF PEAT TO LOAM.

D.1. THE REPLICATION AREAS SHALL BE EXCAVATED TO A DEPTH OF 8 TO 12 INCHES BELOW PROPOSED FINISH GRADES. THE REPLICATION AREAS ARE TO THEN BE BACKFILLED WITH A 1:1 MIXTURE OF LOAM TO PEAT.

D.2. THE WETLAND SOILS SHALL BE DEPOSITED IN THE REPLICATION AREAS IN A MANNER MINIMIZING TRAVEL AND SUBSEQUENT COMPACTION OF THE UNDERLYING MATERIAL AND REPLACEMENT WETLAND SOILS.

D.3. THE REPLICATION AREAS SHALL NOT HAVE FINISHED GRADING WHICH RESULTS IN A COMPLETELY FLAT TOPOGRAPHY. THE FINISH GRADING SHOULD RESULT IN A SHALLOW PIT AND MOUND TOPOGRAPHY THROUGHOUT THE REPLICATION AREAS.

E. ALL FILL MUST BE STOCKPILED BEYOND THE RESOURCE AREAS AND BUFFER ZONES. PRECAUTIONS SHALL BE TAKEN AS NECESSARY TO PREVENT EROSION OF THE STOCKPILED MATERIAL. BEFORE FILL IS PUT INTO PLACE, ALL TREES, BRUSH AND STUMPS SHALL BE REMOVED FROM THE AREAS TO BE FILLED. THESE ARE NOT TO BE STOCKPILED IN THE RESOURCE AREAS OR BUFFER ZONES WHILE AWAITING DISPOSITION.

F. DUE TO THE EXTREME SENSITIVITY OF THESE PARTICULAR WETLANDS, THE FINISHED GRADES MUST BE WITHIN TWELVE INCHES FROM THE GROUNDWATER TABLE.

G. ANY SIGNIFICANT FIELD CHANGES DEEMED NECESSARY TO ACHIEVE FINAL GRADING WITHIN TWELVE INCHES FROM THE GROUNDWATER TABLE MUST BE APPROVED BY THE BOTANIST (IN THE FIELD) AND REPORTED TO THE CONSERVATION COMMISSION IN THE WEEKLY REPORT.

H. THE OUTER EDGES OF THE REPLICATION AREAS SHALL BE REMADE TO PREVENT WATER DRAINING FROM THE REPLICATION AREAS.

I. UPON COMPLETION OF THE REPLICATION AREAS, SILTATION FENCE SHALL BE PLACED AROUND THE ENTIRE PERIMETER (OF THE REPLICATION AREAS) TO PROTECT THE REPLICATION AREAS DURING THE HUMMOCKY CONSTRUCTION.

J. AFTER REPLICATION CONSTRUCTION IS COMPLETED, NO FERTILIZER, LIMESTONE, SUPERPHOSPHATE, MULCH OR OTHER AMENDMENTS SHALL BE ADDED TO THE WETLAND SOILS.

PART 3 REMOVING, STORING AND REPLANTING OF EXISTING WETLAND TREES AND SHRUBS

A. IN ANY DISTURBED WETLAND (WITHIN PRACTICAL), THE APPLICANT MAY, AT HIS OPTION, DIG UP, STORE AND MAINTAIN EXISTING WETLAND TREES AND SHRUBS FOR USE IN THE REPLICATION AREAS. TREES SHALL BE A MINIMUM OF ONE INCH CALIPER AND SHRUBS SHALL BE THIRTY-SIX INCHES IN SPREAD OR HEIGHT. ALL PLANTS SHALL BE VIGOROUS AND WELL FORMED SPECIMENS. ALL PLANT MATERIALS DUG FOR THIS PURPOSE SHALL BE DUG BY HAND, HYDRAULIC TREE SPADE SPECIFICALLY DESIGNED FOR THIS PURPOSE OR OTHER SUITABLE EQUIPMENT OF SUFFICIENT SIZE TO REMOVE THE ROOTBALL. ROOTBALL SIZE SHALL BE THE MINIMUM SPECIFIED BY THE AMERICAN ASSOCIATION OF NURSERYMEN FOR EACH SPECIES. FOR HAND DUG PLANTS, A SUITABLE BURLAP OR OTHER WRAP OR CONTAINER SHALL BE PROVIDED TO KEEP THE ROOTBALL INTACT.

A.1. ALL PLANTS DUG FOR REUSE SHALL BE IMMEDIATELY MOVED TO A PROTECTIVE STORAGE AREA APPROVED BY THE BOTANIST. PLANTS SHALL BE SET UPRIGHT ON GRADE OR IN PREPARED HOLES AND GUYED AS NECESSARY. THE AREA OR HOLES SHALL BE BACKFILLED WITH SUITABLE TOPSOIL TO COVER THE ROOTBALLS ENTIRELY WHILEWELL TO PREVENT EROSION. ALL STORED VEGETATION SHALL BE MAINTAINED IN A RAMP CONDITION BY REGULAR WATERING. ALL HORTICULTURAL MEASURES REQUIRED FOR THE SURVIVAL OF COLLECTED PLANTINGS SHALL BE UTILIZED BY THE APPLICANT.

A.2. WITHIN THE REPLICATION AREAS HAVE BEEN CONSTRUCTED, STOCKPILED PLANTS SHALL BE REPLANTED IN LOCATIONS SPECIFIED AND APPROVED BY THE BOTANIST.

PART 4 WETLAND REPLICATION PLANTING

A. WETLAND PLANTING SHALL BE PERFORMED BETWEEN MARCH 1 AND OCTOBER 15 OR AS RECOMMENDED BY THE BOTANIST.

B. WETLAND PLANTINGS TYPE AND QUANTITY SHALL BE PER PROVIDED PLANT LIST. TREES SHALL BE PLANTED NO FARTHER APART THAN TWENTY-FIVE FEET ON CENTER AND SHRUBS PLANTED NO FARTHER APART THAN EIGHT FEET ON CENTER.

C. THE APPLICANT SHALL HAVE THE OPTION OF DIGGING, STORING AND REPLANTING EXISTING TREES AND SHRUBS PER PART 3 OF THIS SCHEDULE, OR ALTERNATIVELY, PROVIDING AND PLANTING NEW WETLAND SPECIES PURCHASED BY THE APPLICANT FROM NURSERY STOCK, AND APPROVED BY THE BOTANIST.

D. WETLAND PLANTING, IN THE REPLICATION AREAS, WILL BE PERFORMED IN A MANNER WHICH REPRODUCES THE PLACEMENT AND PROPORTIONS OF THE PLANT SPECIES THAT WERE FOUND IN THE ORIGINAL LOST WETLAND AREAS.

E. ALL WETLAND PLANTINGS WILL BE WATERED AT HAND, HOSE OR WELL BE REMOVED FROM THE TOP THIRD OF THE ROOTBALLS AND ROPES, TWINE AND WIRE BASKETS WILL BE COMPLETELY REMOVED FROM THE ROOTBALLS. COMPLETELY REMOVE ALL PLASTIC BURLAP, ROPE, TWINE AND WIRE BASKETS FROM THE REPLICATION AREAS. COMPLETELY REMOVE THE CONTAINERS FROM THE POTTED PLANTS WHILE KEEPING THE SOIL AROUND THE ROOTS UNDISTURBED.

F. AFTER PLANTINGS ARE COMPLETED, THE REPLICATION AREAS SHALL BE HAND RAKED TO ELIMINATE ANY DEPRESSIONS GREATER THAN FOUR INCHES IN DEPTH, WHICH MAY BE CREATED DURING DIGGING AND TO ELIMINATE COMPACTION OF THE SOILS AS MUCH AS POSSIBLE.

F.1. ONCE PLANTING IS COMPLETED, ALL DEBRIS COLLECTED FROM UPLAND AREAS OF THE PROPOSED SITE CONSTRUCTION SHALL BE SPREAD THROUGHOUT THE REPLICATION AREAS.

G. THE PLANT OF THIS SCHEDULE IS TO ENSURE THAT AT LEAST 75 PERCENT OF THE REPLICATION SUBAREA AREA IS RE-ESTABLISHED WITH INDIGENOUS WETLAND PLANT SPECIES WITHIN TWO GROWING SEASONS OF THEIR PLANTING. IN ACCORDANCE WITH THE MASSACHUSETTS DEP WETLANDS PROTECTION ACT REGULATIONS. PURPLE LOOSESTRIFE (LYTHRUM SALICARI) AND EUROPEAN BUCKTHORN (RHAMNUS FRANGULA) SHALL NOT BE PLANTED IN THE REPLICATION AREAS. IF AFTER 100 GROWING SEASON DAYS, IT IS EVIDENT IN THE OPINION OF THE BOTANIST THAT IT IS UNLIKELY THAT THE 75 PERCENT RE-ESTABLISHMENT REQUIREMENT WILL BE ACHIEVED, THE APPLICANT SHALL SUPPLEMENT THE PLANTINGS AS NECESSARY TO ACHIEVE THE REQUIRED COVERAGE. IF AFTER THE END OF TWO GROWING SEASONS, 75 PERCENT RE-ESTABLISHMENT HAS NOT BEEN ACHIEVED, THE APPLICANT SHALL PROVIDE AND PLANT HEALTHY WETLAND VEGETATION IN SUFFICIENT QUANTITIES TO ACHIEVE THE 75 PERCENT RE-ESTABLISHMENT.

PART 5 WETLAND REPLICATION MONITORING

A. THE TOWN OF AYER CONSERVATION COMMISSION WILL BE NOTIFIED 72 HOURS IN ADVANCE OF THE COMMENCEMENT OF THE WETLAND REPLICATION CONSTRUCTION.

B. ALL CONSTRUCTION AND PLANTING WILL BE OVERSEEN BY A QUALIFIED BOTANIST.

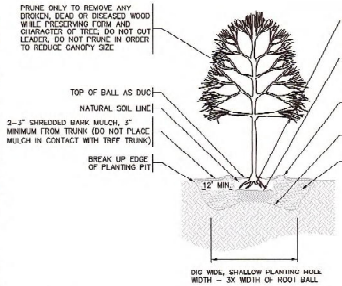
C. A BRIEF PROGRESS REPORT WILL BE PROVIDED TO THE TOWN OF AYER CONSERVATION COMMISSION AT THE END OF EACH WEEK UNTIL CONSTRUCTION AND PLANTING OF THE REPLICATION AREAS HAVE BEEN COMPLETED.

D. FOUR REPORTS, PREPARED BY A QUALIFIED BOTANIST, WILL BE SUBMITTED TO THE TOWN OF AYER CONSERVATION DURING THE FIRST YEAR. THESE REPORTS WILL BE SUBMITTED QUARTERLY. TWO REPORTS WILL BE PROVIDED TO THE TOWN OF AYER CONSERVATION COMMISSION ON MAY 1ST AND OCTOBER 1ST OF THE FOLLOWING YEAR.

E. EACH REPORT WILL INCLUDE AN OBSERVED SPECIES LIST, RELATIVE ABUNDANCE OF EACH SPECIES, PERCENT COVER OF UPLAND AND WETLAND SPECIES, THE VARIETY OF THE PLANTINGS AND PROPOSED REMEDIAL MEASURES TO ENSURE 75 PERCENT RE-ESTABLISHMENT WITHIN TWO GROWING SEASONS.

F. WHILE PERFORMING THE INSPECTION OF THE REPLICATION AREAS, ANY INVASIVE PLANTS SPECIES FOUND SHALL BE REMOVED. THE PLANT SPECIES, AND NUMBER OF PLANTS REMOVED, SHALL BE INCLUDED WITHIN THE MONITORING REPORTS.

G. IF THE REPLICATION AREAS DO NOT ACHIEVE THE REQUIRED 75 PERCENT COVERAGE WITHIN TWO GROWING SEASONS, THEN ADDITIONAL PLANTINGS WILL BE PROVIDED AS PER PART 4 SECTION C. THESE PLANTINGS WILL BE MONITORED FOR THE NEXT TWO GROWING SEASONS WITH REPORTS PROVIDED TO THE TOWN OF LITTLETON CONSERVATION COMMISSION ON MAY 1ST AND OCTOBER 1ST OF EACH YEAR IN ORDER TO ENSURE THE VIABILITY OF THESE LATE PLANTINGS.



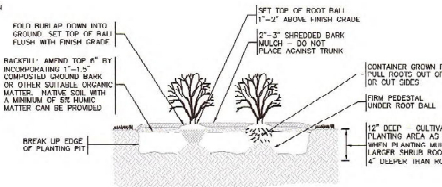
TREE PLANTING
NOT TO SCALE

NOTES:

1. CONTRACTOR TO VERIFY THAT ADEQUATE DRAINAGE EXISTS PRIOR TO PLANTING.
2. DO NOT WRAP TRUNK OF TREE.
3. STAKING OF TREES IS NOT RECOMMENDED, EXCEPT ON WINDY SITES OR FOR LARGE EVERGREEN TREES. IF STAKING IS DONE, FLEXIBLE STRAPS - NOT HOSE AND WIRE - SHOULD BE USED AND MUST BE REMOVED AT APPROPRIATE TIME.
4. ALL TREES SHALL CONFORM TO THE STANDARDS SET FORTH IN THE MOST RECENT AMERICAN STANDARDS FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN (A.A.N.).
5. TREES WITH ROOT FLARE COVERED BY MORE THAN 1.5" OF SOIL WILL BE REJECTED PRIOR TO INSTALLATION.

GENERAL STREET TREE NOTES:

1. PER TOWN OF LITTLETON RULES AND REGULATIONS GOVERNING THE SUBDIVISION OF LAND, ALL TREES SHALL BE A MINIMUM HEIGHT OF 12 FEET AT TIME OF PLANTING AND SUBJECT TO A ONE YEAR GUARANTEE.
2. EVERY EFFORT SHALL BE MADE TO MAKE USE OF THE EXISTING TREES ON SITE. THIS PLAN IS MEANT TO SUPPLEMENT EXISTING TREE LINES WHERE CONSTRUCTION OF THE ROAD REQUIRES REMOVAL OF TREES IN CERTAIN AREAS.



NOTES:

1. ALL SHRUBS MUST CONFORM TO THE STANDARDS SET FORTH IN THE MOST RECENT AMERICAN STANDARDS FOR NURSERY STOCK, PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN (A.A.N.)
2. SOIL ANALYSIS SHALL BE OBTAINED PRIOR TO PLANTING. SOIL SHALL BE AMENDED AS RECOMMENDED.
3. SELECT PREPARATION OF BEDS IS HIGHLY PREFERRED TO INDIVIDUALLY DUG HOLES.

SHRUB PLANTING
NOT TO SCALE

Plant List

STREET TREES

Symbol	No.	Botanical Name	Common Name	Size
AR	6	Acer x freemanii 'Jeffersred'	Autumn Blaze Maple	2.5"
TL	5	Tilia cordata 'Greenspire'	Littleleaf Linden	2.5" cal

SHRUBS

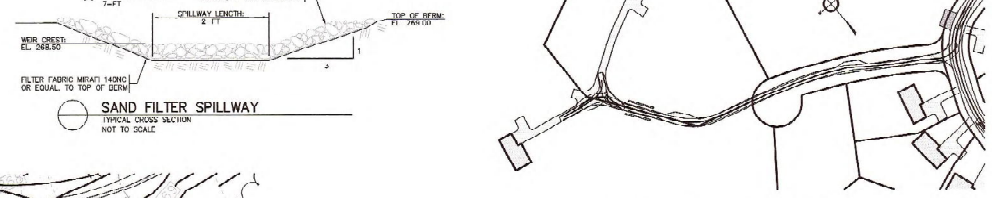
Symbol	No.	Botanical Name	Common Name	Size
RT	6	Cornus alba 'Baileyi'	Red Twigged Dogwood	15" - 18"
GS	6	Spiraea nipponica	Snowmound Spiraea	15" - 18"
DS	6	Potentilla fruticosa	Dahurian Buttercup	15" - 18"

GRASS

Symbol	No.	Botanical Name	Common Name	Size
SD	3	Hemerocallis 'stella dora	Stella Dora Daylily	1 Gal.
NF	5	Nepeta 'Frisian Walker'	Blue Catmint	1 Gal.

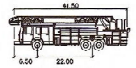
WETLAND REPLICATION PLANT LIST

Symbol	Botanical Name	Common Name	Size	Quantity	Condition
TREES					
AR	ACER RUBRUM	RED MAPLE	6'-8' HT.	16	B & B
SHRUBS					
VC	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	2'-3' HT.	18	CONT. GROWN
IV	ILEX VERTICILLATA	WINTERBERRY	2'-3' HT.	18	CONT. GROWN
WI	WITHERNIA DENTATUM	NORTHERN ARROWWOOD	3'-4' HT.	18	CONT. GROWN
HERBACIOUS PLANTS					
OC	OSMUNDA CINNAMOMICA	CINNAMON FERN	#1 POT	20	CONT. GROWN
OS	OSMUNDA SENSIBILIS	SENSITIVE FERN	#1 POT	20	CONT. GROWN
OR	OSMUNDA REGALIS	ROYAL FERN	#1 POT	20	CONT. GROWN



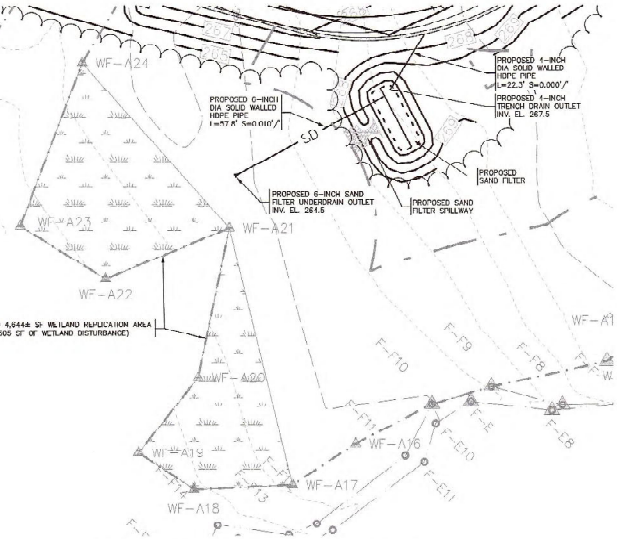
SAND FILTER SPILLWAY
TYPICAL CROSS SECTION
NOT TO SCALE

FIRE TRUCK TURNING MOVEMENT
ALFRED TRAIL
SCALE:1"=100'

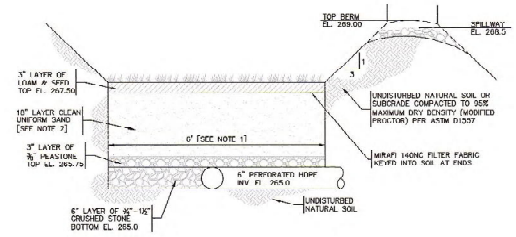


Ladder Truck

Width	: 8.00
Track	: 7.58 feet
Lock to Lock time	: 4.00
Steering Angle	: 45.0



SAND FILTER & WETLAND REPLICATION AREA
SCALE: 1" = 20'



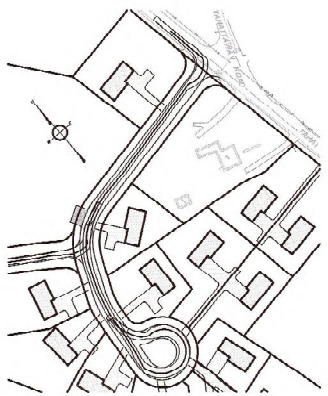
MATERIAL NOTES:

[1] SAND HEIGHT LENGTH: 30'

[2] SAND COMPONENT SHOULD BE UNIFORM GRAVELLY SAND THAT MEETS ASTM D 422. SAND MUST BE CLEAN, FREE OF STONES, ROOTS OR SIMILAR OBJECTS LARGER THAN 2 INCHES. PERFORM A SIEVE ANALYSIS ON A REPRESENTATIVE SAMPLE OF THE FILL. UP TO 4% BY WEIGHT OF THE FILL SAMPLE MAY BE RETAINED ON A #4 SIEVE. ALSO PERFORM A SIEVE ANALYSIS ON THE FRACTION OF THE FILL SAMPLE PASSING THE #4 SIEVE. SUCH ANALYSIS SHALL DEMONSTRATE THAT THE MATERIAL PASSING THE #4 SIEVE MEETS THE FOLLOWING GRADATION:

SIEVE	EFFECTIVE PARTICLE SIZE	PERCENT PASSING
#4	1.75 MM	100
#50	0.30 MM	10 TO 100
#100	0.15 MM	0 TO 20
#200	0.075 MM	0 TO 5

SAND FILTER
CROSS SECTION
NOT TO SCALE



FIRE TRUCK TURNING MOVEMENT
DENSE CIRCLE
SCALE:1"=100'

DRAWING ISSUED FOR:

☐ CONCEPT ☐ CONSTRUCTION

■ PERMIT ☐ CONSTRUCTION RECORD

THIS DRAWING MAY NOT SHOW CONSTRUCTION DETAILS AND SPECIFICATIONS FOR ALL PROPOSED IMPROVEMENTS. AND MAY NOT IDENTIFY ALL CONSTRUCTION WORK ITEMS/AREAS OF CONTRACTOR JURISDICTION

FOR 250 CMR 5.03(13), THE FOLLOWING ARE EXCLUDED FROM THE PROFESSIONAL ENGINEERS RESPONSIBILITY: ALL BOUNDARY INFORMATION, LOCATION OF EXISTING STRUCTURES, TREES, UTILITIES, TOPOGRAPHY OR SIMILAR FEATURES, DESIGN OF RETAINING WALLS, PROPRIETARY EQUIPMENT. SEE EXISTING CONDITION NOTES.

NO.	DATE	BY	APP	REVISION DESCRIPTION

GPR Engineering Solutions for Land & Structures

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DEFINITIVE RESIDENTIAL SUBDIVISION
OPEN SAPCE DEVELOPMENT

CONSTRUCTION DETAILS

HEALY CORNER
195 TAHATTAWAN ROAD
LITTLETON, MA

PREPARED FOR:
GLAVEY FAMILY TRUST
P.O. BOX 301
LITTLETON, MA 01460

DES. BY: MCI
CHK. BY: NMP
DATE: AUGUST 2019
JOB 171088
C9.4

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