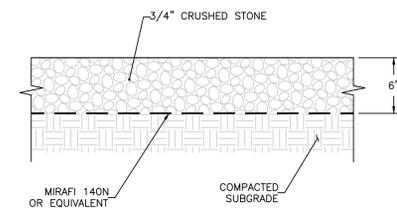
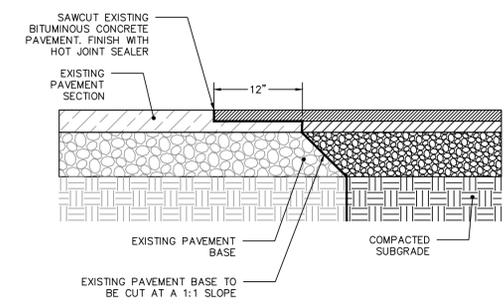


- NOTES:**
1. PAVING COURSES SHALL BE CONSTRUCTED IN LAYERS NOT LESS THAN 1.5 INCHES THICK AND NO MORE THAN 3 INCHES THICK PER LIFT.
  2. ALL AREAS TO BE PAVED SHALL BE PROOFROLLED WITH AT LEAST 6 PASSES OF A SMOOTH ROLLER HAVING A MINIMUM STATIC DRUM WEIGHT OF 10 TONS. ANY SOFT AREAS SHALL BE REMOVED AND REPLACED WITH CLEAN, GRANULAR, FREE-DRAINING SOIL. FILL SHALL BE PLACED IN LOOSE LIFTS NOT TO EXCEED 12-INCHES AND SHALL BE COMPACTED TO AT LEAST 95% OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557.
  3. PAVEMENT CLASSES REFER TO MASSACHUSETTS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION (MDOT SS) M.3.11.0 PROCESSED AGGREGATE REFER TO M2.01.07 OR M1.03.1

**1 ASPHALT PAVEMENT SECTION**  
N.T.S.

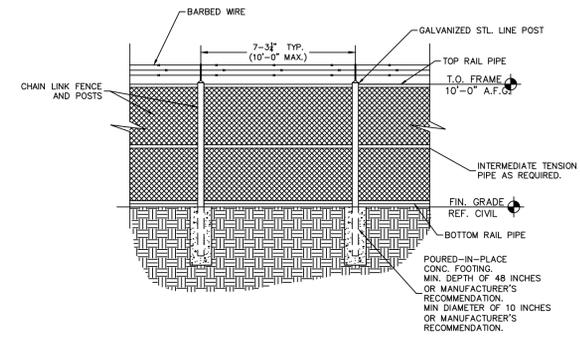


**2 CRUSHED STONE SECTION**  
N.T.S.



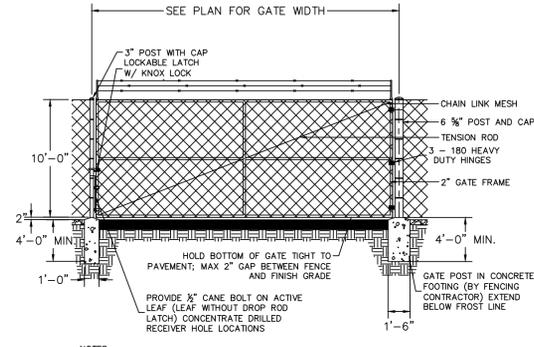
- NOTES:**
1. CONTRACTOR TO INSTALL TACK COAT ON ALL BUTT EDGES OF EXISTING PAVEMENT

**3 SAWCUT PAVEMENT SECTION**  
N.T.S.



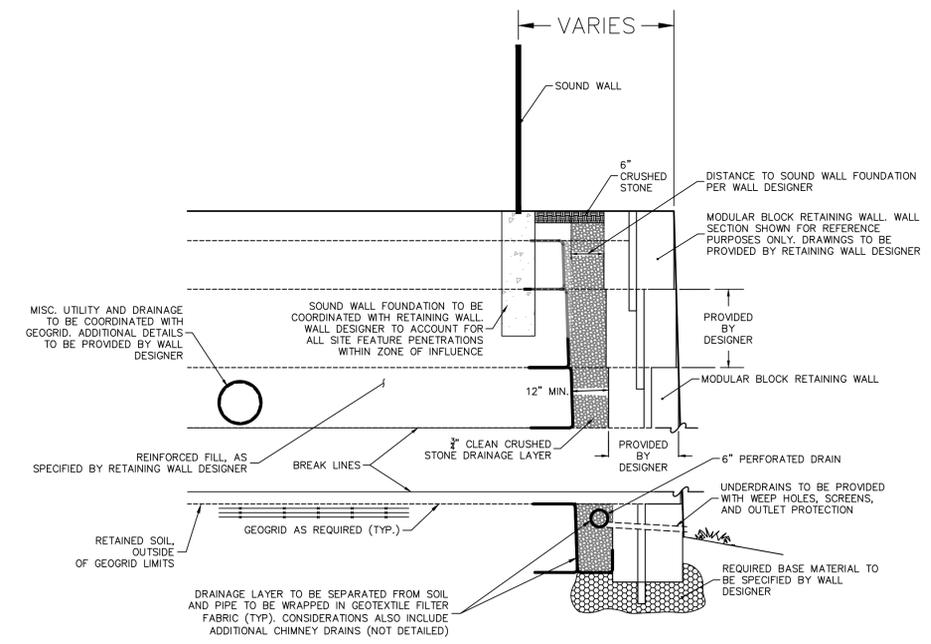
- NOTES:**
1. FENCE AND POSTS TO BE GALVANIZED. PROVIDE BLACK PRIVACY SLATS FOR WEST FENCE ONLY.

**4 10 FT TALL CHAIN LINK SECURITY FENCE WITH BARBED WIRE**  
N.T.S.



- NOTES:**
1. POSTS AND MESH TO BE GALVANIZED. PROVIDE BLACK PRIVACY SLATS FOR WEST FENCE ONLY.

**5 CHAIN LINK SWING GATE**  
N.T.S.



- NOTE:**
1. DETAIL IS SHOWN FOR GENERAL CONCEPT OF A GEOGRID REINFORCED MODULAR BLOCK RETAINING WALL.
  2. ALL MODULAR BLOCK RETAINING WALLS THREE FEET OR GREATER IN EXPOSED HEIGHT MUST BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER, MUST BE BASED ON SITE SPECIFIC PROJECT LOADING CONDITIONS (SURCHARGE, ETC.), ARE SUBJECT TO BUILDING CODE AND LOCAL BUILDING PERMITS.
  3. MODULAR BLOCK RETAINING WALL SHOWN FOR REFERENCE PURPOSES ONLY. DRAWINGS TO BE PROVIDED BY RETAINING WALL DESIGNER.
  4. SUBGRADE TO BE PREPARED IN ACCORDANCE WITH CONSTRUCTION DOCUMENTS PRIOR TO WALL CONSTRUCTION AND FILL PLACEMENT.
  5. REQUIREMENTS FOR WALL BASE MATERIAL, FILL MATERIAL, AND WALL AND GEOGRID TO BE PROVIDED BY THE RETAINING WALL DESIGNER.
  6. RETAINING WALL DESIGNER IS RESPONSIBLE FOR INTERNAL STABILITY ANALYSIS, EXTERNAL STABILITY ANALYSIS, AND ESTABLISHING A DESIGN GROUNDWATER ELEVATION FOR THE WALL BASED ON PROPOSED CONSTRUCTION ACTIVITIES, SITE INFILTRATION, AND DRAINAGE.
  7. INSPECTIONS ARE TO BE CONDUCTED IN ACCORDANCE WITH PROJECT DOCUMENTS AND THE SCHEDULE OF SPECIAL INSPECTIONS TO INCLUDE SUBGRADE, BACKFILL, GEOGRID, BLOCK TYPE, AND DRAINAGE.

**6 TYPICAL RETAINING WALL SECTION (FOR REFERENCE ONLY)**  
N.T.S.

**NOT FOR CONSTRUCTION**

| Date      | Description | No. |
|-----------|-------------|-----|
| REVISIONS |             |     |

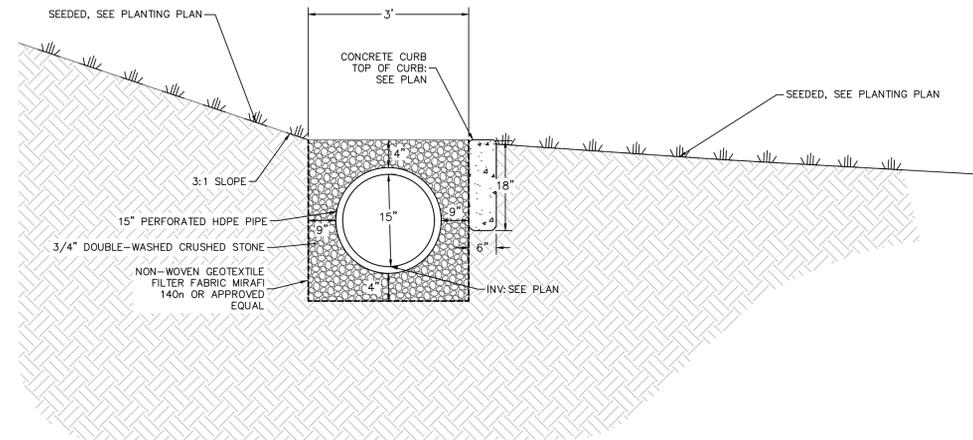
**LANGAN**  
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Project **HILLMAN ENERGY CENTER BATTERY ENERGY STORAGE SYSTEM**  
TEWKSBURY  
MIDDLESEX COUNTY MASSACHUSETTS

Drawing Title  
**SITE DETAILS II**

|                                 |                             |
|---------------------------------|-----------------------------|
| Project No.<br><b>151043401</b> | Drawing No.<br><b>CS502</b> |
| Date<br><b>03/26/2025</b>       |                             |
| Drawn By<br><b>JED/MPG</b>      |                             |
| Checked By<br><b>HH</b>         |                             |

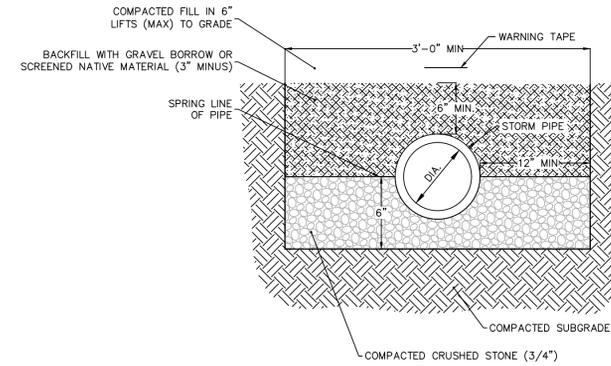




1

**LEVEL SPREADER WITH PERFORATED PIPE SECTION**

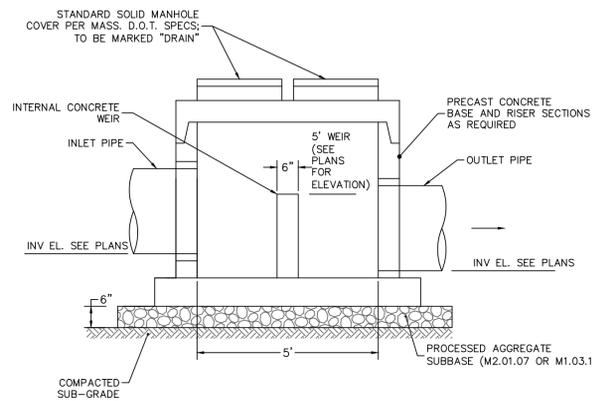
N.T.S.



2

**STORM PIPE BEDDING**

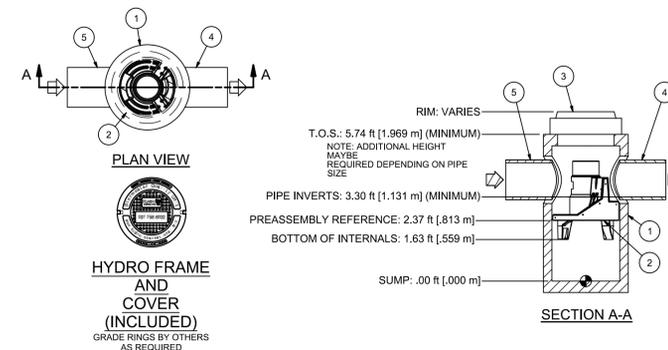
N.T.S.



3

**OUTLET CONTROL STRUCTURE**

N.T.S.



4

**WATER QUALITY UNIT (WQU - FIRST DEFENSE 3-FT DIAMETER)**

N.T.S. - PROVIDED BY HYDRO INTERNATIONAL

| Date       | Description                | No. |
|------------|----------------------------|-----|
| 11/05/2025 | UDPATE 30% DESIGN DRAWINGS | 1   |

REVISIONS

**LANGAN**

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Project **HILLMAN ENERGY  
CENTER BATTERY  
ENERGY STORAGE  
SYSTEM**  
TEWKSBURY

MIDDLESEX COUNTY MASSACHUSETTS

Drawing Title

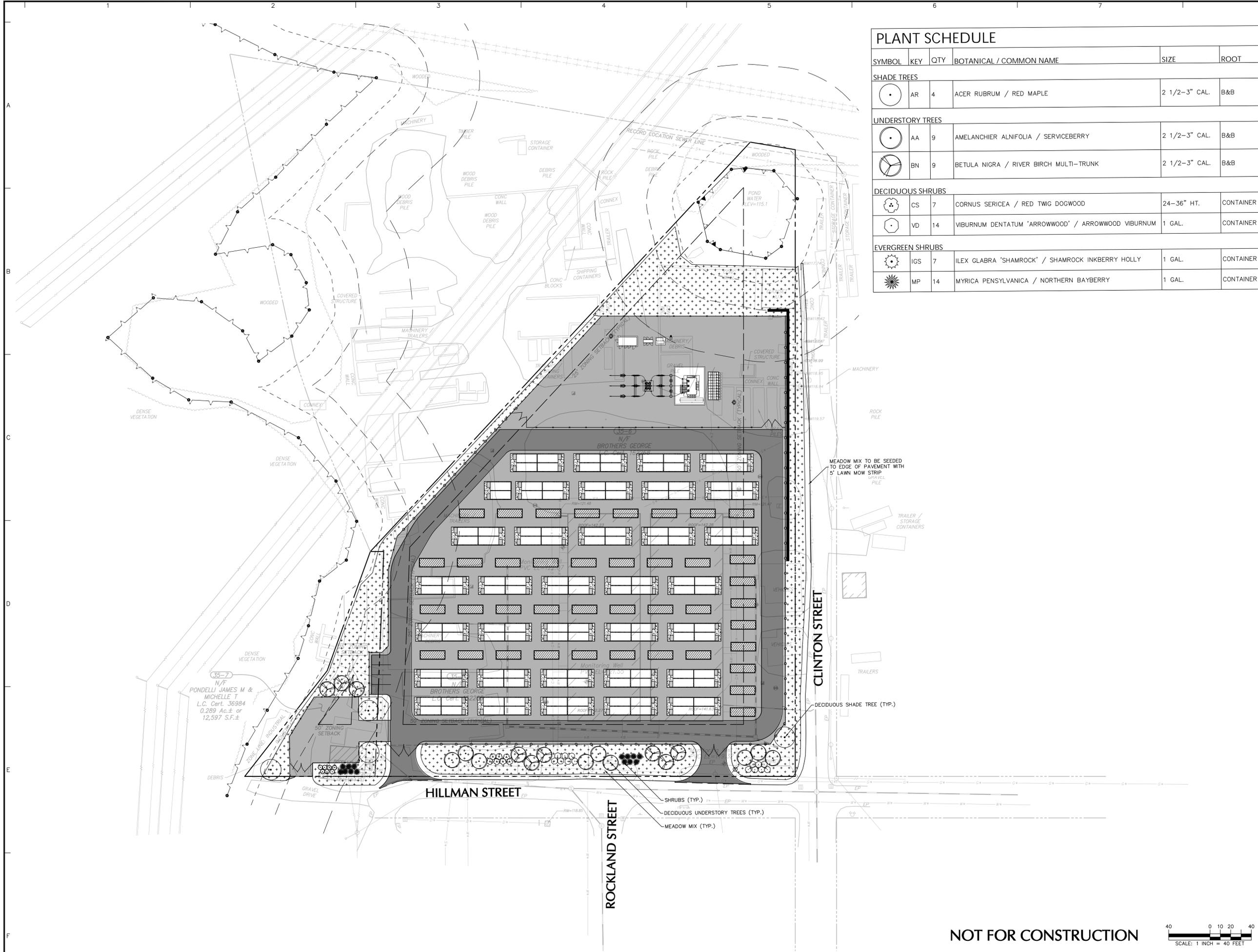
**SITE DETAILS IV**

|                                 |                             |
|---------------------------------|-----------------------------|
| Project No.<br><b>151043401</b> | Drawing No.<br><b>CS504</b> |
| Date<br><b>03/26/2025</b>       |                             |
| Drawn By<br><b>JED/MPG</b>      |                             |
| Checked By<br><b>HH</b>         |                             |
|                                 |                             |

**NOT FOR CONSTRUCTION**

### PLANT SCHEDULE

| SYMBOL                  | KEY | QTY | BOTANICAL / COMMON NAME                            | SIZE          | ROOT      |
|-------------------------|-----|-----|--|---------------|-----------|
| <b>SHADE TREES</b>      |     |     |  |               |           |
|                         | AR  | 4   | ACER RUBRUM / RED MAPLE                            | 2 1/2-3" CAL. | B&B       |
| <b>UNDERSTORY TREES</b> |     |     |  |               |           |
|                         | AA  | 9   | AMELANCHIER ALNIFOLIA / SERVICEBERRY               | 2 1/2-3" CAL. | B&B       |
|                         | BN  | 9   | BETULA NIGRA / RIVER BIRCH MULTI-TRUNK             | 2 1/2-3" CAL. | B&B       |
| <b>DECIDUOUS SHRUBS</b> |     |     |  |               |           |
|                         | CS  | 7   | CORNUS SERICEA / RED TWIG DOGWOOD                  | 24-36" HT.    | CONTAINER |
|                         | VD  | 14  | VIBURNUM DENTATUM 'ARROWWOOD' / ARROWWOOD VIBURNUM | 1 GAL.        | CONTAINER |
| <b>EVERGREEN SHRUBS</b> |     |     |  |               |           |
|                         | IGS | 7   | ILEX GLABRA 'SHAMROCK' / SHAMROCK INKBERRY HOLLY   | 1 GAL.        | CONTAINER |
|                         | MP  | 14  | MYRICA PENNSYLVANICA / NORTHERN BAYBERRY           | 1 GAL.        | CONTAINER |



| 11/05/2025 | UDPATE 30% DESIGN DRAWINGS | 1   |
|------------|----------------------------|-----|
| Date       | Description                | No. |

REVISIONS

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Project **HILLMAN ENERGY  
CENTER BATTERY  
ENERGY STORAGE  
SYSTEM**  
TEWKSBURY  
MIDDLESEX COUNTY MASSACHUSETTS

Drawing Title  
**LANDSCAPING  
PLANTING PLAN**

|                                 |                             |
|---------------------------------|-----------------------------|
| Project No.<br><b>151043401</b> | Drawing No.<br><b>LP101</b> |
| Date<br><b>03/26/2025</b>       |                             |
| Drawn By<br><b>SH</b>           |                             |
| Checked By<br><b>AS</b>         |                             |

NOT FOR CONSTRUCTION



Project No. 151043401

## GENERAL LANDSCAPE PLANTING NOTES

- INVOICES FOR ALL PLANTING WITHIN WETLAND AND WETLAND BUFFER SHALL BE PROVIDED AND APPROVED BY CONSERVATION COMMISSION PRIOR TO INSTALLATION.
- NAMES OF PLANTS AS DESCRIBED ON THIS PLAN CONFORM TO THOSE GIVEN IN "STANDARDIZED PLANT NAMES" 1942 EDITION, PREPARED BY THE AMERICAN JOINT COMMITTEE ON HORTICULTURAL NOMENCLATURE. NAMES OF PLANT VARIETIES NOT INCLUDED THEREIN CONFORM TO NAMES GENERALLY ACCEPTED IN NURSERY TRADE.
- ALL EXPOSED GROUND SURFACES THAT ARE NOT PAVED WITHIN THE CONTRACT LIMIT LINE, AND THAT ARE NOT COVERED BY LANDSCAPE PLANTING OR SEEDING AS SPECIFIED, SHALL BE COVERED BY A NATURAL MULCH THAT WILL PREVENT SOIL EROSION AND THE EMANATION OF DUST.
- NO PLANT SHALL BE PUT INTO THE GROUND BEFORE ROUGH GRADING HAS BEEN COMPLETED AND APPROVED BY THE PROJECT LANDSCAPE ARCHITECT OR PROJECT ENGINEER.
- STANDARDS FOR TYPE, SPREAD, HEIGHT, ROOT BALL AND QUALITY OF NEW PLANT MATERIAL SHALL BE IN ACCORDANCE WITH GUIDELINES AS SET FORTH IN THE "AMERICAN STANDARD FOR NURSERY STOCK", PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERMEN. PLANT MATERIAL SHALL HAVE NORMAL HABIT OF GROWTH AND BE HEALTHY, VIGOROUS, AND FREE FROM DISEASES AND INSECT INFESTATION.
- NEW PLANT MATERIAL SHALL BE NURSERY GROWN UNLESS SPECIFIED OTHERWISE. ALL PLANTS SHALL BE SET PLUMB AND SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS THE PLANT'S ORIGINAL GRADE BEFORE DIGGING. PLANT MATERIAL OF THE SAME SPECIES AND SPECIFIED AS THE SAME SIZE SHOULD BE SIMILAR IN SHAPE, COLOR, AND HABIT. THE LANDSCAPE ARCHITECT HAS THE RIGHT TO REJECT PLANT MATERIAL THAT DOES NOT CONFORM TO THE TYPICAL OR SPECIFIED HABIT OF THAT SPECIES.
- THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UNDERGROUND UTILITY AND SEWER LINES PRIOR TO THE START OF EXCAVATION ACTIVITIES. NOTIFY THE PROJECT ENGINEER AND OWNER IMMEDIATELY OF ANY CONFLICTS WITH PROPOSED PLANTING LOCATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE.
- THE CONTRACTOR SHALL NOT MAKE SUBSTITUTIONS. IF THE SPECIFIED LANDSCAPE MATERIAL IS NOT OBTAINABLE, THE CONTRACTOR SHALL SUBMIT PROOF OF UNAVAILABILITY TO THE LANDSCAPE ARCHITECT AND OWNER, TOGETHER WITH A WRITTEN PROPOSAL FOR USE OF AN EQUIVALENT MATERIAL.
- LANDSCAPE CONTRACTOR TO STAKE OUT PLANTING LOCATIONS, FOR REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT AND/OR OWNER BEFORE PLANTING WORK BEGINS. THE LANDSCAPE ARCHITECT AND/OR OWNER SHALL DIRECT THE CONTRACTOR IN THE FINAL PLACEMENT OF ALL PLANT MATERIAL AND LOCATION OF PLANTING BEDS TO ENSURE COMPLIANCE WITH DESIGN INTENT UNLESS OTHERWISE INSTRUCTED.
- THE LANDSCAPE ARCHITECT MAY REVIEW PLANT MATERIALS AT THE SITE, BEFORE PLANTING, FOR COMPLIANCE WITH REQUIREMENTS FOR GENUS, SPECIES, VARIETY, SIZE, AND QUALITY. THE LANDSCAPE ARCHITECT RETAINS THE RIGHT TO FURTHER REVIEW PLANT MATERIALS FOR SIZE AND CONDITION OF BALLS AND ROOT SYSTEM, INSECTS, INJURIES, AND LATENT DEFECTS, AND TO REJECT UNSATISFACTORY OR DEFECTIVE MATERIAL AT ANY TIME DURING PROGRESS OF THE PROJECT. THE CONTRACTOR SHALL REMOVE REJECTED PLANT MATERIALS IMMEDIATELY FROM PROJECT SITE AS DIRECTED BY THE LANDSCAPE ARCHITECT OR OWNER.
- DELIVERY, STORAGE, AND HANDLING
  - PACKAGED MATERIALS SHALL BE DELIVERED IN CONTAINERS SHOWING WEIGHT, ANALYSIS, AND NAME OF MANUFACTURER. MATERIALS SHALL BE PROTECTED FROM DETERIORATION DURING DELIVERY, AND WHILE STORED AT SITE.
  - TREES AND SHRUBS: THE CONTRACTOR SHALL PROVIDE TREES AND SHRUBS DUG FOR THE GROWING SEASON FOR WHICH THEY WILL BE PLANTED. DO NOT PRUNE PRIOR TO DELIVERY UNLESS OTHERWISE DIRECTED BY THE LANDSCAPE ARCHITECT. DO NOT BEND OR BEND-TIE TREES OR SHRUBS IN SUCH A MANNER AS TO DAMAGE BARK, BREAK BRANCHES, OR DESTROY NATURAL SHAPE. PROVIDE PROTECTIVE COVERING DURING TRANSIT. DO NOT DROP BRALLED AND BURGLAPPED OR CONTAINER GROWN PLANTS.
  - ALL PLANTS SHALL BE BALLED AND BURGLAPPED OR CONTAINER GROWN AS SPECIFIED. NO CONTAINER GROWN STOCK WILL BE ACCEPTED IF IT IS ROOT BOUND. ALL ROOTBALL WRAPPING AND BRIDGING MATERIAL MADE OF SYNTHETICS OR PLASTICS SHALL BE REMOVED FROM THE TOP OF THE BALL AT THE TIME OF PLANTING. THE PLANT IS SHIPPED WITH A WIRE BASKET AROUND THE ROOT BALL, THE WIRE BASKET SHALL BE CUT AND FOLDED DOWN 6 INCHES INTO THE PLANTING HOLE. THE CONTAINER GROWN STOCK, THE CONTAINER SHALL BE REMOVED AND THE ROOT BALL SHALL BE CUT THROUGH THE SURFACE IN TWO LOCATIONS.
  - THE CONTRACTOR SHALL HAVE TREES AND SHRUBS DELIVERED TO SITE AFTER PREPARATIONS FOR PLANTING HAVE BEEN COMPLETED AND PLANT IMMEDIATELY IF PLANTING IS DELAYED MORE THAN 6 HOURS AFTER DELIVERY. THE CONTRACTOR SHALL SET TREES AND SHRUBS IN SHADE, PROTECT FROM WEATHER AND MECHANICAL DAMAGE AND KEEP ROOTS MOIST WITH COVERING WITH MULCH, BURLAP OR OTHER ACCEPTABLE MEANS OF RETAINING MOISTURE.
- ALL LANDSCAPED AREAS TO BE CLEARED OF ROCKS, STUMPS, TRASH AND OTHER UNSIGHTLY DEBRIS. ALL FINE GRADED AREAS SHOULD BE HAND RAKED SMOOTH ELIMINATING ANY CLUMPS AND AND UNEVEN SURFACES PRIOR TO PLANTING OR MULCHING.
- ALL PLANT MATERIAL SHALL BE INSTALLED AS PER DETAILS, NOTES AND CONTRACT SPECIFICATIONS. THE LANDSCAPE ARCHITECT MAY REVIEW INSTALLATION AND MAINTENANCE PROCEDURES.
- NEW PLANT MATERIAL SHALL BE GUARANTEED TO BE ALIVE AND IN VIGOROUS GROWING CONDITION FOR A PERIOD OF TWO YEARS FOLLOWING ACCEPTANCE BY THE OWNER. PLANT MATERIAL FOUND TO BE UNHEALTHY, DYING OR DEAD DURING THIS PERIOD, SHALL BE REMOVED AND REPLACED IN KIND BY THE CONTRACTOR AT NO EXPENSE TO THE OWNER.
- THE CONTRACTOR SHALL KEEP AREA CLEAN DURING DELIVERY AND INSTALLATION OF PLANT MATERIALS. REMOVE AND DISPOSE OF ANY ACCUMULATED DEBRIS OR UNUSED MATERIALS. REPAIR DAMAGE TO ADJACENT AREAS CAUSED BY LANDSCAPE INSTALLATION OPERATIONS.
- ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24-HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL THEN BE WATERED WEEKLY OR AS REQUIRED BY SITE AND WEATHER CONDITIONS TO MAINTAIN MOISTURE AND HEALTHY PLANT GROWTH.
- THE BACKFILL MIXTURE AND SOIL MIXES TO BE INSTALLED PER THE SPECIFICATIONS.
- AFTER PLANT IS PLACED IN TREE PIT LOCATION, ALL TWINE HOLDING ROOT BALL TOGETHER SHOULD BE COMPLETELY REMOVED AND THE BURLAP SHOULD BE PULLED DOWN SO 1/2 OF THE ROOT BALL IS EXPOSED. SYNTHETIC BURLAP SHOULD BE COMPLETELY REMOVED AFTER INSTALLATION.
- MULCH SHOULD NOT BE PILED UP AROUND THE TRUNK OF ANY PLANT MATERIAL. NO MULCH OR TOPSOIL SHOULD BE TOUCHING THE BASE OF THE TRUNK ABOVE THE ROOT COLLAR.
- ALL FENCE INSTALLATION SHALL BE COMPLETED PRIOR TO COMMENCEMENT OF ANY LANDSCAPE PLANTING, LAWN AND GRASSES, OR IRRIGATION WORK.
- FOR ANY DISCREPANCIES BETWEEN THE PLANT SCHEDULE AND PLANTING PLAN THE GRAPHIC QUANTITY SHOWN SHALL GOVERN.
- PLANT MATERIALS SHALL NOT BE PLANTED UNTIL THE FINISHED GRADING HAS BEEN COMPLETED.
- ALL PLANT INSTALLATIONS SHALL BE COMPLETED EITHER BETWEEN APRIL 1 - JUNE 15 OR AUGUST 15 - NOVEMBER 1, UNLESS OTHERWISE DIRECTED BY THE PROJECT LANDSCAPE ARCHITECT. SEE LAWN SEEDING DATES IN SEEDING NOTES.

## LANDSCAPE MAINTENANCE NOTES

- MAINTENANCE OPERATIONS BEFORE APPROVAL**
  - PLANT CARE SHALL BEGIN IMMEDIATELY AFTER EACH PLANT IS SATISFACTORILY INSTALLED AND SHALL CONTINUE THROUGHOUT THE LIFE OF THE CONTRACT UNTIL FINAL ACCEPTANCE OF THE PROJECT.
  - CARE SHALL INCLUDE, BUT NOT BE LIMITED TO, REPLACING MULCH THAT HAS BEEN DISPLACED BY EROSION OR OTHER MEANS, REPAIRING AND RESHAPING WATER RINGS OR SAUCERS, MAINTAINING STAKES AND GUYS AS ORIGINALLY INSTALLED, WATERING WHEN NEEDED OR DIRECTED, AND PERFORMING ANY OTHER WORK REQUIRED TO KEEP THE PLANTS IN A HEALTHY CONDITION.
  - CONTRACTOR SHALL REMOVE AND REPLACE ALL DEAD, DEFECTIVE AND/OR REJECTED PLANTS AS REQUIRED BEFORE FINAL ACCEPTANCE.
- MAINTENANCE DURING CONSTRUCTION**
  - MAINTENANCE SHALL BEGIN IMMEDIATELY AFTER PLANTING. PLANTS SHALL BE WATERED, MULCHED, WEEDED, PRUNED, SPRAYED, FERTILIZED, CULTIVATED, AND OTHERWISE MAINTAINED AND PROTECTED UNTIL PROVISIONAL ACCEPTANCE. SETTLED PLANTS SHALL BE RESET TO PROPER GRADE AND POSITION. PLANTING SAUCER RESTORED AND DEAD MATERIAL REMOVED. STAKES AND WIRES SHALL BE TIGHTENED AND REPAIRED. DEFECTIVE WORK SHALL BE CORRECTED AS SOON AS POSSIBLE AFTER IT BECOMES APPARENT AND WEATHER AND SEASON PERMIT.
  - IF A SUBSTANTIAL NUMBER OF PLANTS ARE SICKLY OR DEAD AT THE TIME OF INSPECTION, ACCEPTANCE SHALL NOT BE GRANTED AND THE CONTRACTOR'S RESPONSIBILITY FOR MAINTENANCE OF ALL PLANTS SHALL BE EXTENDED FROM THE TIME REPLACEMENTS ARE MADE OR EXISTING PLANTS ARE DEEMED ACCEPTABLE BY THE LANDSCAPE ARCHITECT.
  - ALL REPLACEMENTS SHALL BE PLANTS OF THE SAME KIND AND SIZE SPECIFIED ON THE PLANT LIST OR THAT WHICH WAS TO REMAIN OR BE REPLACED. THEY SHALL BE FURNISHED AND PLANTED AS SPECIFIED. THE COST SHALL BE BORNE BY THE CONTRACTOR. REPLACEMENTS RESULTING FROM REMOVAL, LOSS, OR DAMAGE DUE TO OCCUPANCY OF THE PROJECT IN ANY PART VANDALISM, PHYSICAL DAMAGE BY ANIMALS, VEHICLES, ETC., AND LOSSES DUE TO CURTAILMENT OF WATER BY LOCAL AUTHORITIES SHALL BE APPROVED AND PAID FOR BY THE OWNER.
  - PLANTS SHALL BE GUARANTEED FOR A PERIOD OF TWO YEARS AFTER INSPECTION AND PROVISIONAL ACCEPTANCE.
  - AT THE END OF THE ESTABLISHMENT PERIOD, INSPECTION SHALL BE MADE AGAIN. ANY PLANT REQUIRED UNDER THIS CONTRACT THAT IS DEAD OR UNSATISFACTORY TO THE LANDSCAPE ARCHITECT OR OWNER SHALL BE REMOVED FROM THE SITE AND REPLACED DURING THE NORMAL PLANTING SEASON.
- LAWN MAINTENANCE**
  - BEGIN MAINTENANCE IMMEDIATELY AFTER EACH PORTION OF LAWN IS PLANTED AND CONTINUE FOR 8 WEEKS AFTER ALL LAWN PLANTING IS COMPLETED.
  - WATER TO KEEP SURFACE SOIL MOIST. REPAIR WASHED OUT AREAS BY FILLING WITH TOPSOIL, LIMING, FERTILIZING AND RE-SEEDING. MOW TO 2 1/2 - 3 INCHES AFTER GRASS REACHES 3 1/2 INCHES IN HEIGHT, AND MOW FREQUENTLY ENOUGH TO KEEP GRASS FROM EXCEEDING 3 1/2 INCHES. WEED BY LOCAL SPOT APPLICATION OF SELECTIVE HERBICIDE ONLY AFTER GRASS IS WELL-ESTABLISHED.

## PLANTING SOIL SPECIFICATIONS

- PLANTING SOIL, ALTERNATELY MAY BE REFERRED TO AS TOPSOIL, SHOULD BE FRIABLE, FERTILE, WELL DRAINED, FREE OF DEBRIS, TONS, TRASH AND STONES OVER 1/2" DIA., IT SHOULD HAVE A HIGH ORGANIC CONTENT SUITABLE TO SUSTAIN HEALTHY PLANT GROWTH AND SHOULD LOOK AESTHETICALLY PLEASING HAVING NO NOXIOUS ODOORS.
- PLANTING SOIL**
  - REUSE SURFACE SOILS STOCKPILED ON SITE, VERIFYING COMPLIANCE WITH PLANTING SOIL AND TOPSOIL CRITERIA IN THIS SPECIFICATION THROUGH TESTING. CLEAN SURFACE SOIL OF ALL ROOTS, PLANTS, SOIL, AND GRAVEL OVER 1" IN DIAMETER AND DELETERIOUS MATERIAL. ON-SITE SOILS ARE TO BE USED FOR PROPOSED PLANTING. THE CONTRACTOR SHALL DEMONSTRATE, THROUGH SOIL TESTING, THAT ON-SITE SOILS MEET THE SAME CRITERIA AS INDICATED IN NOTES PLANS AND SPECIFICATIONS.
  - SUPPLEMENT WITH IMPORTED OR MANUFACTURED TOPSOIL FROM OFF SITE SOURCES WHEN TOPSOIL AND PLANTING SOIL QUANTITIES ARE INSUFFICIENT. OBTAIN SOIL DISPLACED FROM NATURALLY WELL-DRAINED SITES WHERE TOPSOIL OCCURS AT LEAST 4" DEEP. DO NOT OBTAIN FROM AGRICULTURAL, LAND, BOGS, MARSHES OR CONTAMINATED SITES.
  - CONTRACTOR SHALL TEST SOILS AND FURNISH SAMPLES UPON REQUEST. PACKAGED MATERIALS SHALL BE UNOPENED BAGS OR CONTAINERS, EACH BEARING A NAME, GUARANTEE, AND TRADEMARK OF THE PRODUCER. MATERIAL COMPOSITION, MANUFACTURER'S CERTIFIED ANALYSIS, AND THE WEIGHT OF THE MATERIALS, SOIL OR AMENDMENT MATERIALS SHALL BE STORED ON SITE TEMPORARILY IN STOCKPILES PRIOR TO PLACEMENT AND SHALL BE PROTECTED FROM INTRUSION OF CONTAMINANTS AND EROSION. AFTER MIXING, SOIL MATERIALS SHALL BE COVERED WITH A TARP/AULIN UNTIL TIME OF ACTUAL USE.
  - ALL PLANTING SOILS SHALL BE SUBMITTED FOR TESTING TO THE STATE COOPERATIVE EXTENSION SERVICE, OR APPROVED EQUAL, PRIOR TO DELIVERY TO THE SITE. CONTRACTOR SHALL FURNISH SOIL SAMPLES AND SOIL TEST RESULTS TO LANDSCAPE ARCHITECT OR OWNER AT A RATE OF ONE SAMPLE PER 500 CUBIC YARDS TO ENSURE CONSISTENCY ACROSS THE TOTAL VOLUME OF PLANTING SOIL REQUIRED. TEST RESULTS SHALL EVALUATE FOR ALL CRITERIA LISTED IN THIS SPECIFICATION. IF TESTING AGENCY DETERMINES THAT THE SOILS ARE DEFICIENT IN ANY MANNER AND MAY BE CORRECTED BY ADDING AMENDMENTS, THE CONTRACTOR SHALL FOLLOW STATED RECOMMENDATIONS FOR SOIL IMPROVEMENT AND FURNISH SUBMITTALS FOR ALL AMENDMENTS PRIOR TO DELIVERY OF SOIL TO THE PROJECT SITE.
- THE FOLLOWING TESTING SHOULD BE PERFORMED AND RESULTS GIVEN TO THE LANDSCAPE ARCHITECT FOR APPROVAL BEFORE INSTALLATION:
  - PARTICLE SIZE ANALYSIS - LOAMY SAND, 60-70% SAND, 25-40% SILT, AND 5-15% CLAY.
  - FERTILITY ANALYSIS: pH (5.5-6.5), SOLUBLE SALTS (LESS THAN 2 MMHO/CM), NITRATE, PHOSPHATE, POTASSIUM, CALCIUM AND MAGNESIUM.
  - ORGANIC MATTER CONTENT: 2.5-5% IN NATIVE SOILS; UP TO 10% IN AMENDED SOILS.
  - TOXIC SUBSTANCE ANALYSIS.
  - MATERIAL DRAINAGE RATE: 60% PASSING IN 2 MINUTES, 40% RETAINED.
  - NOT MORE THAN 1% OF MATERIAL SHALL BE RETAINED BY A #4 SIEVE.
- SOIL AMENDMENT FOR PLANT MATERIAL**
  - IF SOIL ORGANIC CONTENT IS INADEQUATE, SOIL SHALL BE AMENDED WITH COMPOST OR ACCEPTABLE, WEED FREE, ORGANIC MATTER. ORGANIC AMENDMENT SHALL BE WELL COMPOSTED, PH RANGE OF 4.5-8, MOISTURE CONTENT 35-55% BY WEIGHT, 100% PASSING THROUGH 1" SIEVE, SOLUBLE SALT CONTENT LESS THAN 0.5 MMS/CM; MEETING ALL APPLICABLE ENVIRONMENTAL CRITERIA FOR CLEAN FILL.
  - ORGANIC MATTER AS A SOIL AMENDMENT: LEAF MULD WITH 60-80% ORGANIC CONTENT BY WEIGHT, SHREDED LEAF LITTER, COMPOSTED FOR A MINIMUM OF 1 YR. SHOULD BE FREE OF DEBRIS, STONES OVER 1/2", WOOD CHIPS OVER 1".
- SOIL IN BEDS AND PLANTING ISLANDS OTHER THAN BACKFILL MATERIAL AND TOPSOIL, SHOULD BE FRIABLE, WELL DRAINED, AND FREE OF DEBRIS, INCLUDING STONES AND TRASH.
- AMENDMENTS FOR BACK FILL IN TREE AND SHRUB PITS**
  - GROUND LIMESTONE (WITH A MIN. OF 88% OF CALCIUM AND MAGNESIUM CARBONATES) USED PENDING RESULTS OF SOIL ANALYSIS.
    - BRING pH LEVELS TO 5.5 MIN. TO 6.5 FOR NON-ERICACEOUS PLANTS
    - BRING pH LEVELS TO 4.5 MIN. TO 5.5 FOR ERICACEOUS PLANTS
  - TERRA-SORB BY "PLANT HEALTH CARE" 800-421-9051 (SEE MANUFACTURER RECOMMENDATIONS) USED IN PLANTER BACKFILL MIXTURE WITH TREES AND SHRUBS.
  - MYCOR-RSOT SAVER BY "PLANT HEALTH CARE" 800-421-9051 (SEE MANUFACTURER RECOMMENDATIONS) USED IN BACKFILL MIXTURE WITH TREES.
- WHERE PLANTING AREAS ARE PROPOSED FOR FORMER PAVED OR GRAVEL AREAS, BEDS SHALL BE EXCAVATED TO A MINIMUM 30" DEPTH AND, AT A MINIMUM, BE BACKFILLED WITH BOTTOM LAYER OF SANDY LOAM (ORGANIC CONTENT LESS THAN 2%) OVER WHICH TOPSOIL AND PLANTING SOILS WILL BE PLACED AT DEPTHS INDICATED IN PLANS, DETAILS AND NOTES.
- CLEAN SOIL FILL IN LANDSCAPE AREAS**
  - LANDSCAPE FILL MATERIAL, BELOW PLANTING SOILS, SHALL HAVE THE PHYSICAL PROPERTIES OF A SANDY LOAM WITH AN ORGANIC CONTENT OF LESS THAN 2% AND A PH BETWEEN 5 - 7.
- SOIL PLACEMENT**
  - CONTRACTOR TO PROVIDE SIX INCHES (6") MINIMUM DEPTH PLANTING SOIL LAYER IN LAWN AREAS, TWELVE INCHES (12") MINIMUM DEPTH PLANTING SOIL LAYER IN GROUNDCOVER AND PERENNIAL AREAS, EIGHTEEN INCHES (18") MINIMUM DEPTH PLANTING SOIL LAYER IN SHRUB AREAS, AND THIRTY-SIX INCHES (36") MINIMUM DEPTH PLANTING SOIL LAYER IN TREE PLANTING AREAS.
  - SCARIFY AND/OR TILL COMPACTED SUBSOILS TO A MINIMUM DEPTH OF 6 INCHES. THOROUGHLY MIX A 6 INCH DEPTH LAYER OF PLANTING SOIL INTO THE SUBSOIL PRIOR TO PLACING PLANTING SOIL AT THE DEPTHS INDICATED ABOVE. PLANTING SOIL SHALL BE PLACED IN 12"-18" LIFTS AND WATER THOROUGHLY BEFORE INSTALLING NEXT LIFT. REPEAT UNTIL DEPTHS AND FINISH GRADES HAVE BEEN ACHIEVED. NO SOILS SHALL BE PLACED IN A FROZEN OR MUDDY CONDITION.
  - PLANTING SOIL PRESENT AT THE SITE, IF ANY, MAY BE USED TO SUPPLEMENT TOTAL AMOUNT REQUIRED. CONTRACTOR TO FURNISH AN ANALYSIS OF ON-SITE PLANTING SOIL UTILIZED IN ALL PLANTING AREAS.
- SOIL CONDITIONING**
  - ADJUST pH AND NUTRIENT LEVELS AS REQUIRED TO ENSURE AN ACCEPTABLE GROWING MEDIUM. LOWER pH USING SULFURIC ACID. SUBFUR FURFUR, PEAT MOSS OR COPPER SULFATE SHOULD NOT BE USED. ORGANIC MATTER AS A SOIL AMENDMENT MATERIAL WILL ONLY BE USED PENDING RESULTS OF SOIL ANALYSIS. PROVIDE WITH MINIMUM 88% CALCIUM AND MAGNESIUM CARBONATE. MIXTURE SHALL HAVE TOTAL 100% PASSING THE 10 MESH SIEVE, MINIMUM 60% PASSING 20 MESH SIEVE, AND MINIMUM 60% PASSING 100 MESH SIEVE.
- ALL DEBRIS EXPOSED FROM EXCAVATION AND CULTIVATION SHALL BE DISPOSED OF AT THE CONTRACTOR'S EXPENSE.
- SOIL MODIFICATIONS (PENDING RESULTS OF SOIL ANALYSIS)**
  - THOROUGHLY TILL ORGANIC MATTER (LEAF COMPOST) INTO THE TOP 6 TO 12 IN. OF MOST PLANTING SOILS TO IMPROVE THE SOIL'S ABILITY TO RETAIN WATER AND NUTRIENTS. ALL PRODUCTS SHOULD BE COMPOSTED TO A DARK COLOR AND BE FREE OF PIECES WITH IDENTIFIABLE LEAF OR WOOD STRUCTURE. AVOID MATERIAL WITH A pH HIGHER THAN 7.0. PEAT MOSS MAY NOT BE USED AS ORGANIC MATTER AMENDMENT.
  - MODIFY HEAVY CLAY OR SILT (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) AND/OR GYPSUM. COARSE SAND MAY BE USED IF ENOUGH IS ADDED TO BRING THE SAND CONTENT TO MORE THAN 60% OF THE TOTAL MIX. IMPROVE DRAINAGE IN HEAVY SOILS BY PLANTING OR RAISED MOUNDS OR BEDS AND INCLUDING SUBSURFACE DRAINAGE LINES.
  - MODIFY EXTREMELY SANDY SOILS (MORE THAN 85% SAND) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDED CLAY LOAM UP TO 30% OF THE TOTAL MIX.

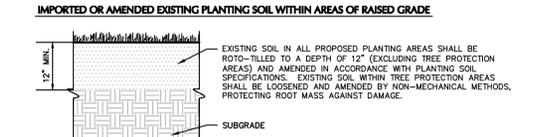
- IMPORTED OR AMENDED EXISTING PLANTING SOIL WITHIN AREAS OF RAISED GRADE**
  - 6" IMPORTED PLANTING SOIL (OR AMENDED EXISTING PLANTING SOIL) SHALL BE ROTO-TILLED INTO SUBGRADE TO A DEPTH OF 12".
  - PRIOR TO PLACEMENT OF 6" DEPTH PLANTING SOIL LAYER, THE CONTRACTOR SHALL APPLY 3" OF COMPOST AND ROTO-TILL INTO SUBGRADE TO A MIN. DEPTH OF 12".
  - SUBGRADE WITHIN 2'-6" OF FINISH GRADE IN PLANTING AREAS SHALL CONSIST OF FREE DRAINING SANDY SOIL FILL.
  - EXISTING SOIL PREVIOUSLY STRIPPED FROM FORMER LANDSCAPE AREAS CAN BE USED FOR PLANTING SOIL UPON APPROVAL BY THE PROJECT LANDSCAPE ARCHITECT. CONTRACTOR SHALL REFER TO PLANTING SOIL SPECIFICATIONS FOR REQUIRED SUBMITTALS.
- EXISTING SOIL IN ALL PROPOSED PLANTING AREAS SHALL BE ROTO-TILLED TO A DEPTH OF 12" (EXCLUDING TREE PROTECTION AREAS) AND AMENDED IN ACCORDANCE WITH PLANTING SOIL SPECIFICATIONS. EXISTING SOIL WITHIN TREE PROTECTION AREAS SHALL BE LOOSEND AND AMENDED BY NON-MECHANICAL METHODS, PROTECTING ROOT MASS AGAINST DAMAGE.**
- AMENDED EXISTING PLANTING SOIL WITHIN AREAS OF UNCHANGED OR CUT GRADE**

## LAWN SEED MIX:

- LAWN SEED MIX:** LESCO GRASS SEED - ALL PRO TRANSITION MIX (3 TURF-TYPE TALL-FESCUE GRASSES)
- NOTES:
  - SEED RATE:
    - NEW ESTABLISHMENT: SEED AT A RATE OF 6-8 LBS/1000 SQ FT
    - RENOVATION: 20-50% EXISTING COVER: 5-7 LBS/1000 SQ FT
    - 50-75% EXISTING COVER: 4-6 LBS/1000 SQ FT
- GENERAL SEED NOTES:**
  - FINAL SEED MIXTURES, RATES, AND SPECIES TO BE DETERMINED BASED ON PROJECT LANDSCAPE ARCHITECT REVIEW.
  - SEEDING SHALL TAKE PLACE IN THE SPRING (APRIL 1 TO JUNE 15) OR THE FALL (SEPTEMBER 1 TO OCTOBER 15).
  - ELIMINATE UNWANTED VEGETATION PRIOR TO SEEDING USING A NON-SELECTIVE HERBICIDE PER MANUFACTURER'S SPECIFICATIONS.
  - IT IS RECOMMENDED THAT CONTRACTOR INSTALL SEED MIXTURE USING A NO-TILL TRUAX-TYPE DRILL SEEDER WHERE APPLICABLE.
  - THERE MUST BE CONTINUOUS SOIL MOISTURE FOR 4-6 WEEKS TO ALLOW FOR PROPER GERMINATION.

## GENERAL NOTE:

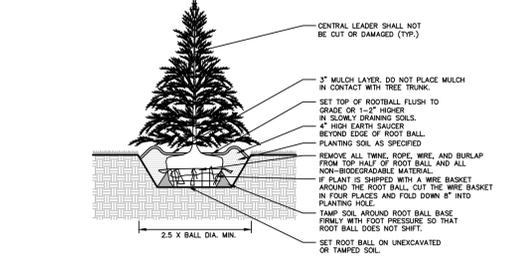
- DUE TO GENERAL CONSTRUCTION ACTIVITIES AND ADJACENT SITE COMPACTION REQUIREMENTS, SUBGRADE SOILS WITHIN PROPOSED PLANTING AREAS TEND TO BECOME HIGHLY COMPACTED. IN ORDER TO CREATE A HEALTHY GROWTH MEDIUM TO ALLOW PROPOSED PLANTINGS TO ESTABLISH A ROBUST ROOT MASS, THIS SUBGRADE SOIL MUST UNDERGO A RESTORATION PROCESS. IN ADDITION, IMPORTED OR AMENDED EXISTING SOILS SHALL BE MIXED WITH SUBGRADE SOILS WHERE THEY MEET IN ORDER TO CREATE A TRANSITIONAL GRADIENT TO ALLOW FOR PROPER DRAINAGE.



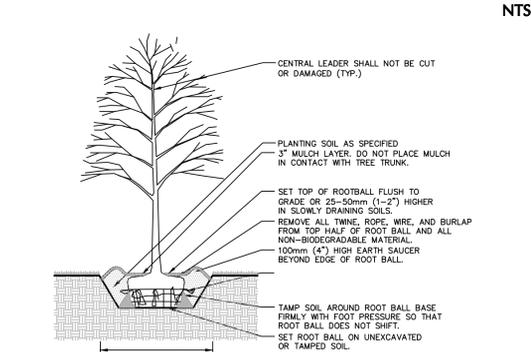
- CONTRACTOR IS RESPONSIBLE TO SEND SAMPLES OF EXISTING SOILS INTENDED FOR USE IN PLANTING AREAS (1 PER 500 CY) TO TESTING LABORATORY OR UNIVERSITY COOPERATIVE EXTENSION FOR TESTING. ALL TESTING COSTS ARE AT THE CONTRACTOR'S EXPENSE.
- RECYCLED CRUSHED CONCRETE AND ASPHALT MILLINGS SHALL NOT BE PLACED WITHIN 2'-6" OF FINISH GRADE IN PROPOSED LANDSCAPE AREAS.
- IMPORTED FILL SHALL CONTAIN NO CONTAMINATION IN EXCESS OF THE PROJECT STATE ENVIRONMENTAL REVIEW AGENCY STANDARDS AND MEET THE ENVIRONMENTAL REQUIREMENTS FOR THE PROJECT, IF APPLICABLE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION OF COMPLIANCE PRIOR TO DELIVERY OF ANY FILL TO THE SITE.
- CONTRACTOR TO LIGHTLY COMPACT ALL PLACED PLANTING SOILS AND RAISE GRADES ACCORDINGLY TO ALLOW FOR FUTURE SETTLEMENT OF PLANTING SOILS (TYP.).
- NO STONES, WOOD CHIPS, OR DEBRIS LARGER THAN 1/2" SHALL BE ACCEPTABLE WITHIN PLANTING AREAS.

## PLANTING SOIL

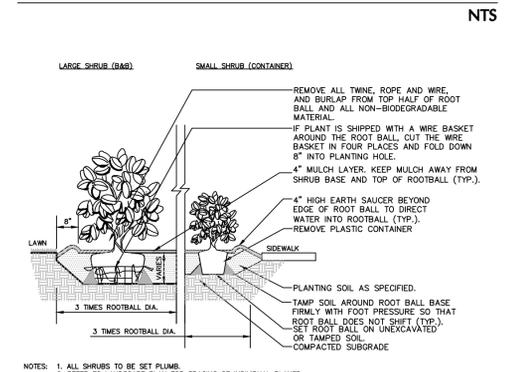
- IMPORTED OR AMENDED EXISTING PLANTING SOIL WITHIN AREAS OF UNCHANGED OR CUT GRADE**
  - EXISTING SOIL IN ALL PROPOSED PLANTING AREAS SHALL BE ROTO-TILLED TO A DEPTH OF 12" (EXCLUDING TREE PROTECTION AREAS) AND AMENDED IN ACCORDANCE WITH PLANTING SOIL SPECIFICATIONS. EXISTING SOIL WITHIN TREE PROTECTION AREAS SHALL BE LOOSEND AND AMENDED BY NON-MECHANICAL METHODS, PROTECTING ROOT MASS AGAINST DAMAGE.
  - SUBGRADE



## EVERGREEN TREE PLANTING



## DECIDUOUS TREE PLANTING



- NOTES: 1. ALL SHRUBS TO BE SET PLUMB.  
2. REFER TO LANDSCAPE PLAN FOR SPACING OF INDIVIDUAL PLANTS.  
3. REMOVE ALL WIRE, PLASTIC, TAGS OR SYNTHETIC MATERIAL FROM PLANTS PRIOR TO PLANTING.

## SHRUB PLANTING



## MEADOW SEED NOTES

| MEADOW SEED MIX - ERNST NATIVE UPLAND WILDLIFE FORAGE & COVER MEADOW MIX) |                                      |                              |
|---|--------------------------------------|------------------------------|
| 34.9%   | ANDROPOGON GERARDII, 'NAGARA'        | BIG BLUESTEM, 'NAGARA'       |
| 27.0%   | PANICUM VIRGATUM, 'CAVE-IN-ROCK'     | SWITCHGRASS, 'CAVE-IN-ROCK'  |
| 21.0%   | ELVIVUS VIRGINICUS, 'MADISON'        | VIRGINIA WILDFE, 'MADISON'   |
| 9.0%  | SORCHASTRUM NUTANS, 'TOMAHAWK'       | INDIANGRASS, 'TOMAHAWK'      |
| 3.0%  | RUIBECKIA HIRTA, PA ECOTYPE          | BLACKYED SUSAN, PA ECOTYPE   |
| 2.0%  | CHAMAECRISTA FASCICULATA, PA ECOTYPE | PARTRIDGE PEA, PA ECOTYPE    |
| 1.5%  | HELIOPSIS HELIANTHOIDES, PA ECOTYPE  | OXEYE SUNFLOWER, PA ECOTYPE  |
| 1.0%  | COREOPSIS TINCTORIA                  | PLAINS COREOPSIS             |
| 0.4%  | DESMODIUM CANADENSE, PA ECOTYPE      | SHOWY TICKTRELLO, PA ECOTYPE |
| 0.1%  | ASCLEPIAS SYRIACA                    | COMMON MILKWEED              |
| 0.1%  | MONARDIA FISTULOSA, PA ECOTYPE       | WILD BERGAMOT, PA ECOTYPE    |

- NOTES:  
SEEDS AT A RATE OF 20 LB/ACRE OF 100% PURE LIVE SEED.

## MEADOW SEED MIX NOTES

- GENERAL SEEDING NOTES:**
  - FINAL SEED MIXTURES, RATES & SPECIES TO BE DETERMINED BASED ON SCD REVIEW.
  - SEEDING SHALL TAKE PLACE IN THE SPRING (APRIL 1 TO JUNE 15) OR THE FALL (SEPTEMBER 1 TO OCTOBER 15).
  - ELIMINATE UNWANTED VEGETATION PRIOR TO SEEDING USING A NON-SELECTIVE HERBICIDE PER MANUFACTURER'S SPECIFICATIONS. CONTRACTOR TO ENSURE HERBICIDE IS INDICATED FOR USE AROUND WATER BODIES.
  - IT IS RECOMMENDED THAT CONTRACTOR INSTALL SEED MIXTURE USING A NO-TILL TRUAX-TYPE DRILL WHERE APPLICABLE.
  - THERE MUST BE CONTINUOUS SOIL MOISTURE FOR 4-6 WEEKS TO ALLOW PROPER GERMINATION.
- WEED CONTROL / MAINTENANCE**
  - DURING THE ESTABLISHMENT YEAR, CONTRACTOR SHALL MOW SEEDING IF WEED HEIGHT EXCEEDS MEADOW MIX HEIGHT. MOW AT A HEIGHT OF 8" TO 10". DO NOT MOW CLOSE. AS SOON AS THE MEADOW MIX IS WELL ESTABLISHED, THE MEADOW MIX SHALL BE MOWED ONLY ONCE ANNUALLY. ANNUAL MAINTENANCE SHOULD BE DONE IN LATE WINTER DURING THE MONTH OF MARCH.
  - MOW IN DETENTION BASIN AND WETLAND TRANSITION AREAS DURING DRYER SITE CONDITIONS WHEN SOIL DISTURBANCE WILL NOT OCCUR. MAINTENANCE FOR DETENTION BASIN AND WETLAND TRANSITION AREAS SHALL OCCUR DURING LATE SUMMER (JULY 15 - AUGUST 15) WHEN THE WATER TABLE IS USUALLY AT ITS LOWEST POINT OF THE YEAR. DO NOT MOW IN DETENTION BASIN, WETLAND OR WETLAND TRANSITION AREAS AFTER ESTABLISHMENT OF MEADOW MIX.
  - IN THE EVENT THAT INVASIVE SPECIES ARE PRESENT AFTER THE ESTABLISHMENT PERIOD, MEADOW AREAS ARE TO BE TRIMMED TO A HEIGHT OF 8". ANY TRIMMING SHOULD CEASE BY MID-SEPTEMBER.

| Date      | Description | No. |
|-----------|-------------|-----|
| REVISIONS |             |     |

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Project **HILLMAN ENERGY  
CENTER BATTERY  
ENERGY STORAGE  
SYSTEM**  
Tewksbury  
MIDDLESEX COUNTY MASSACHUSETTS

Drawing Title

# PLANTING NOTES AND DETAILS

|             |             |
|-------------|-------------|
| Project No. | Drawing No. |
| 151043401   | LP501       |
| Date        |             |
| 03/26/2025  |             |
| Drawn By    |             |
| SH          |             |
| Checked By  |             |
| AS          |             |

NOT FOR CONSTRUCTION

**SITE LIGHTING SCHEDULE**

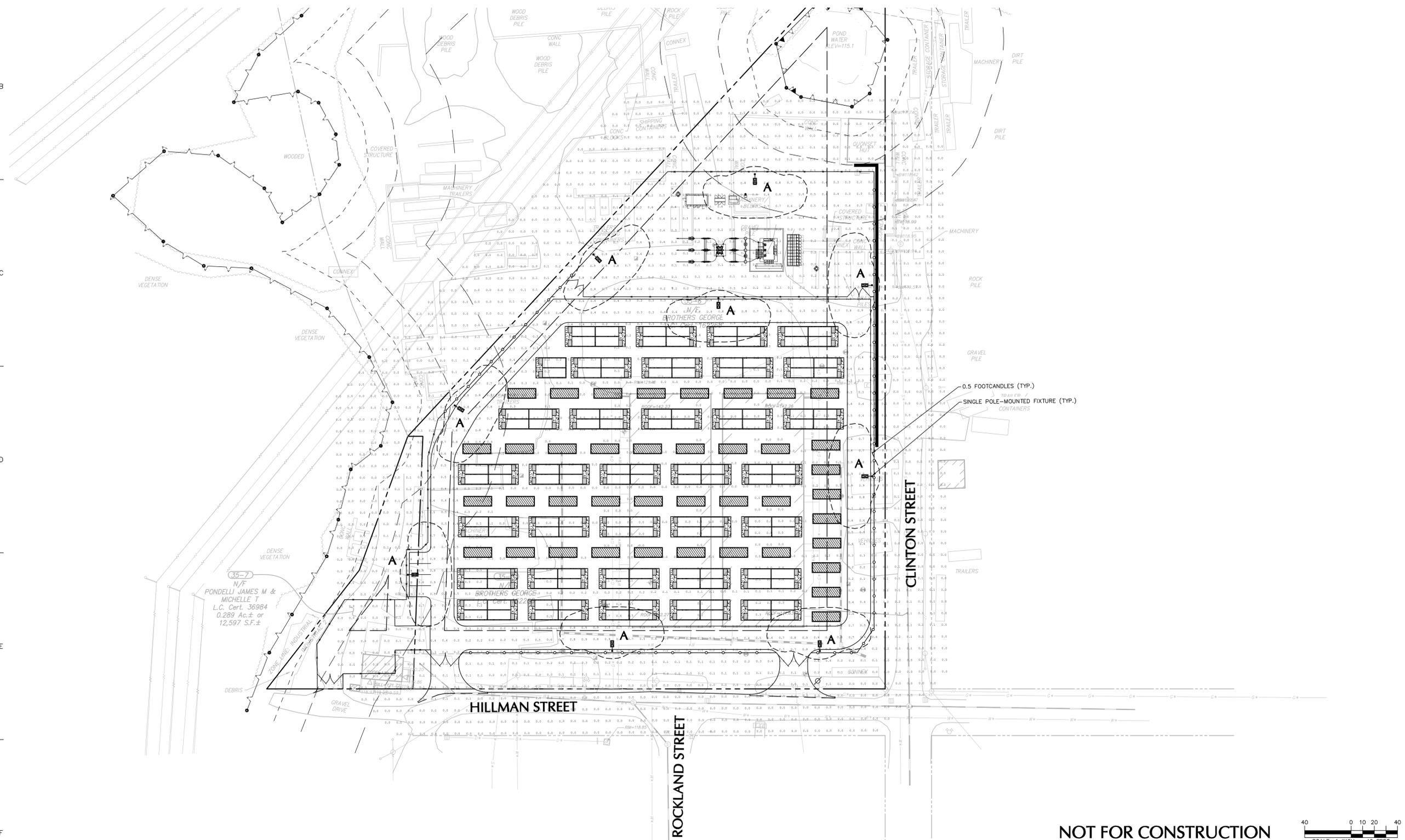
| SYMBOL | KEY | QTY. | FIXTURE MANUFACTURER | FIXTURE MODEL | FIXTURE DESCRIPTION                       | FIXTURE MOUNTING HEIGHT | LAMP    | COLOR TEMPERATURE | OPTICS  | LUMENS | LLF  | FIXTURE CATALOGUE NO.         | POLE MANUFACTURER | POLE DESCRIPTION                       | POLE LENGTH | POLE CATALOGUE NO.           | NOTES  |
|--------|-----|------|----------------------|---------------|---|-------------------------|---------|-------------------|---------|--------|------|-------------------------------|-------------------|--|-------------|------------------------------|--|
| ⌘      | A   | 9    | LITHONIA             | DSX1          | SINGLE POLE-MOUNTED FIXTURE, COLOR: BLACK | 25'-0"                  | 51W LED | 3000K             | TYPE II | 7,203  | 0.90 | DSX1-LED-P1-30K-80-CRI-12M-HS | LITHONIA          | ROUND TAPERED STEEL POLE, COLOR: BLACK | 22'-0"      | RTS-25-6-6B-DM19AS-V0-DB LXD | POLE TO BE FACTORY CUT TO LENGTH OF 22', MOUNTED ON 3' HT. EXPOSED CONCRETE BASE |

NOTE:  
1. REFER TO ELECTRICAL DRAWINGS FOR SITE LIGHTING VOLTAGES.  
2. ALL POLES WITH 25' MOUNTING HEIGHT OR GREATER TO RECEIVE FACTORY-INSTALLED VIBRATION DAMPENERS.

**STATISTICS**

| DESCRIPTION | AVG.  | MAX.  | MIN.  | MAX./MIN. | AVG./MIN. |
|-------------|-------|-------|-------|-----------|-----------|
| DRIVEWAY    | 0.5fc | 0.9fc | 0.2fc | 4.5:1     | 2.0:1     |

NOTE: LIGHT PHOTOMETRY AND CALCULATIONS FOR EXISTING AND ADJACENT LIGHTING TO REMAIN ARE NOT INCLUDED IN THE ABOVE STATISTICS.



| 11/05/2025 | UDPATE 30% DESIGN DRAWINGS | 1   |
|------------|----------------------------|-----|
| Date       | Description                | No. |

REVISIONS

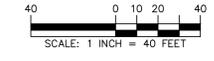
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Project **HILLMAN ENERGY CENTER BATTERY ENERGY STORAGE SYSTEM**  
TEWKSBURY  
MIDDLESEX COUNTY MASSACHUSETTS  
Drawing Title

**SITE LIGHTING PLAN**

|                                 |                             |
|---------------------------------|-----------------------------|
| Project No.<br><b>151043401</b> | Drawing No.<br><b>LL101</b> |
| Date<br><b>03/26/2025</b>       |                             |
| Drawn By<br><b>SH</b>           |                             |
| Checked By<br><b>AS</b>         |                             |

NOT FOR CONSTRUCTION



**LIGHTING NOTES:**

**GENERAL**

1. POINT-BY-POINT CALCULATIONS PROVIDED WITHIN HAVE BEEN PREPARED IN ACCORDANCE TO IESNA STANDARDS AND IN CONSIDERATION OF THE VARIABLES WITHIN THESE NOTES AND SITE LIGHTING SCHEDULE. THE VALUES SHOWN ON THE PLANS ARE NOT AN INDICATION OF THE INITIAL LIGHT INTENSITIES OF THE LAMPS. THESE VALUES ARE AN APPROXIMATION OF THE MAINTAINED INTENSITIES DELIVERED TO THE GROUND PLANE USING INDUSTRY STANDARD LIGHT LOSS FACTORS (LLF) WHICH COVER LAMP DEGRADATION AND NATURAL BUILDUP/DIRT DEGRADATION ON THE FIXTURE LENS. THE LIGHTING PLAN IS DESIGNED WITH AN INDUSTRY STANDARD LLF IN ACCORDANCE WITH GUIDANCE AS PROVIDED BY IESNA. MINOR VARIATIONS IN TOPOGRAPHY, PHYSICAL OBSTRUCTIONS, AMBIENT OR ADJACENT LIGHT SOURCES AND/OR OTHER POTENTIAL IMPACTS HAVE NOT BEEN INCLUDED IN THESE CALCULATIONS. THEREFORE, AS-BUILT LIGHT INTENSITIES MAY VARY, IN EITHER DIRECTION, FROM WHAT IS EXPLICITLY PORTRAYED WITHIN THESE DRAWINGS. NO GUARANTEE OF LIGHT LEVELS IS EXPRESSED OR IMPLIED BY THE POINT BY POINT CALCULATIONS SHOWN ON THESE PLANS.

2. LIGHT LEVEL POINT SPACING IS 10 FT. LEFT TO RIGHT AND 10 FT. TOP TO BOTTOM. POINT BY POINT CALCULATIONS ARE BASED ON THE LIGHT LOSS FACTOR AS STATED IN THE LIGHTING SCHEDULE.

**COMPLIANCE**

3. ALL SITE LIGHTING RELATED WORK AND MATERIALS SHALL COMPLY WITH CITY, COUNTY, AND OTHER APPLICABLE GOVERNING AUTHORITY REQUIREMENTS.

4. LIGHTING LAYOUT COMPLIES WITH THE ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IESNA) SAFETY STANDARDS FOR LIGHT LEVELS.

**COORDINATION**

5. CONTRACTOR TO COORDINATE POWER SOURCE WITH LIGHT FIXTURES TO ENSURE ALL SITE LIGHTING IS OPERATING EFFECTIVELY, EFFICIENTLY AND SAFELY.

6. REFER TO ELECTRIFICATION PLAN FOR PROVIDING ADEQUATE POWER FOR SITE LIGHTING.

7. CONTRACTOR TO COORDINATE LOCATION OF EASEMENTS, UNDERGROUND UTILITIES AND DRAINAGE BEFORE DRILLING POLE BASES.

8. INSTALLATION OF ALL LIGHTING FIXTURES, POLES, FOOTINGS, AND FEEDER CABLE TO BE COORDINATED WITH ALL SITE WORK TRADES TO AVOID CONFLICT WITH FINISHED AND PROPOSED WORK.

9. CONTRACTOR TO COORDINATE INSTALLATION OF UNDERGROUND FEEDER CABLE FOR EXTERIOR LIGHTING WITH EXISTING AND PROPOSED UTILITIES, SITE DRAINAGE SYSTEMS, AND PAVING. CONTRACTOR SHALL PROMPTLY NOTIFY THE OWNER'S REPRESENTATIVE SHOULD ANY UTILITIES, NOT SHOWN ON THE PLANS, BE FOUND DURING EXCAVATIONS.

**POLES AND FOOTINGS**

10. PROVIDE A CONCRETE BASE FOR EACH LIGHT POLE AT THE LOCATIONS INDICATED ON THE CONSTRUCTION DRAWINGS AND/OR IN ACCORDANCE WITH PROJECT PLANS AND SPECIFICATIONS RELATING DIRECTLY TO CAST-IN-PLACE CONCRETE. THE USE OF ALTERNATE LIGHTING FOUNDATIONS, SUCH AS PRECAST, MAY CHANGE THE SIZING AND REINFORCEMENT REQUIREMENTS FROM THOSE SHOWN ON THESE PLANS. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO ORDERING ANY SUBSTITUTED PRODUCTS.

11. CONTRACTOR SHALL EXAMINE AND VERIFY THAT SOIL CONDITIONS ARE SUITABLE TO SUPPORT LOADS EXERTED UPON THE FOUNDATIONS DURING EXCAVATION. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY UNSATISFACTORY CONDITIONS.

12. POLE FOUNDATIONS SHALL NOT BE POURED IF FREE STANDING WATER IS PRESENT IN EXCAVATED AREA.

13. ALL POLES 25 FT OR GREATER SHALL BE EQUIPPED WITH FACTORY INSTALLED VIBRATION DAMPENERS.

**WALL MOUNTED FIXTURES**

14. CONTRACTOR TO COORDINATE INSTALLATION OF ALL THE WALL MOUNTED FIXTURES AND ELECTRICAL CONNECTIONS TO SITE STRUCTURE(S) WITH BUILDING MEP, ARCHITECT, AND/OR OWNER.

15. INSTALLATION AND ELECTRICAL CONNECTIONS FOR WALL MOUNTED FIXTURES TO BE COORDINATED WITH ARCHITECTURAL, STRUCTURAL, UTILITY AND SITE PLANS AND TO BE IN ACCORDANCE WITH ALL APPLICABLE CODES.

**ADJUSTMENT AND INSPECTION**

16. CONTRACTOR TO OPERATE EACH LUMINAIRE AFTER INSTALLATION AND CONNECTION. INSPECT FOR IMPROPER CONNECTIONS AND OPERATION.

17. CONTRACTOR TO AIM AND ADJUST ALL LUMINAIRES TO PROVIDE ILLUMINATION LEVELS AND DISTRIBUTION AS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS DIRECTED BY THE LANDSCAPE ARCHITECT AND/OR OWNER.

18. CONTRACTOR TO CONFIRM THAT LIGHT FIXTURES, TILT ANGLE AND AIMING MATCH SPECIFICATIONS ON THE PLANS.

**REQUIREMENTS FOR ALTERNATES**

19. ALL LIGHTING SUBSTITUTIONS MUST BE MADE WITHIN 14 DAYS PRIOR TO THE BID DATE TO PROVIDE AMPLE TIME FOR REVIEW AND TO ISSUE AN ADDENDUM INCORPORATING THE SUBSTITUTION WITH THE FOLLOWING REQUIREMENTS:

- A. ANY SUBSTITUTION TO LIGHTING FIXTURES, POLES, ETC. MUST BE APPROVED BY THE OWNER, ENGINEER AND TENANTS. ANY COST ASSOCIATED WITH REVIEW AND/OR APPROVAL OF THE SUBSTITUTIONS SHALL BE ENTIRELY BORNE BY THE CONTRACTOR
- B. COMPUTER PREPARED PHOTOMETRIC LAYOUT OF THE PROPOSED LIGHTED AREA WHICH INDICATES, BY ISOPHOTOCANDELE, THE SYSTEM'S PERFORMANCE.
- C. A PHOTOMETRIC REPORT FROM A NATIONAL INDEPENDENT TESTING LABORATORY WITH REPORT NUMBER, DATE, FIXTURE CATALOG NUMBER, LUMINAIRE AND LAMP SPECIFICATIONS, IES CALCULATIONS, POINT BY POINT FOOT CANDLE PLAN, STATISTIC ZONES SHOWING AVERAGE, MAXIMUM, MINIMUM AND UNIFORMITY RATIOS, SUMMARY, ISOLUX PLOT, AND CATALOGUE CUTS. CATALOGUE CUTS MUST IDENTIFY OPTICS, LAMP TYPE, DISTRIBUTION TYPE, REFLECTOR, LENS, BALLASTS, WATTAGE, VOLTAGE, FINISH HOUSING DESCRIPTION AND ALL OTHER PERTINENT INFORMATION.
- D. POLE MANUFACTURER ASHOTO CALCULATIONS INDICATING THE POLE AND ANCHOR BOLTS BEING SUBMITTED ARE CAPABLE OF SUPPORTING THE POLE AND FIXTURE SYSTEMS BEING UTILIZED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- E. THE UNDERWRITERS LABORATORY LISTING AND FILE NUMBER FOR THE SPECIFIC FIXTURE(S) TO BE UTILIZED.
- F. A COLOR PHOTOGRAPH THAT CLEARLY SHOWS THE REPLACEMENT FIXTURE POLE MOUNTED, THE FIXTURE'S COLOR, FINISH, AND PHYSICAL CHARACTERISTICS.

20. CONTRACTOR TO CONFIRM THAT LIGHT FIXTURES, TILT ANGLE AND AIMING MATCH SPECIFICATIONS ON THE PLANS.

21. CONTRACTOR TO COORDINATE INSTALLATION OF ALL THE WALL MOUNTED FIXTURES AND ELECTRICAL CONNECTIONS TO SITE STRUCTURE(S) WITH BUILDING MEP, ARCHITECT, AND/OR OWNER.

22. CONTRACTOR TO COORDINATE LOCATION OF EASEMENTS, UNDERGROUND UTILITIES AND DRAINAGE BEFORE DRILLING POLE BASES.

23. CONTRACTOR TO COORDINATE POWER SOURCE WITH LIGHT FIXTURES TO ENSURE ALL SITE LIGHTING IS OPERATING EFFECTIVELY, EFFICIENTLY AND SAFELY.

24. REFER TO ELECTRIFICATION PLAN FOR PROVIDING ADEQUATE POWER FOR SITE LIGHTING.

25. CONTRACTOR TO COORDINATE LOCATION OF EASEMENTS, UNDERGROUND UTILITIES AND DRAINAGE BEFORE DRILLING POLE BASES.

26. INSTALLATION OF ALL LIGHTING FIXTURES, POLES, FOOTINGS, AND FEEDER CABLE TO BE COORDINATED WITH ALL SITE WORK TRADES TO AVOID CONFLICT WITH FINISHED AND PROPOSED WORK.

27. CONTRACTOR TO COORDINATE INSTALLATION OF UNDERGROUND FEEDER CABLE FOR EXTERIOR LIGHTING WITH EXISTING AND PROPOSED UTILITIES, SITE DRAINAGE SYSTEMS, AND PAVING. CONTRACTOR SHALL PROMPTLY NOTIFY THE OWNER'S REPRESENTATIVE SHOULD ANY UTILITIES, NOT SHOWN ON THE PLANS, BE FOUND DURING EXCAVATIONS.

28. POLE FOUNDATIONS SHALL NOT BE POURED IF FREE STANDING WATER IS PRESENT IN EXCAVATED AREA.

29. ALL POLES 25 FT OR GREATER SHALL BE EQUIPPED WITH FACTORY INSTALLED VIBRATION DAMPENERS.

30. CONTRACTOR TO COORDINATE INSTALLATION OF ALL THE WALL MOUNTED FIXTURES AND ELECTRICAL CONNECTIONS TO SITE STRUCTURE(S) WITH BUILDING MEP, ARCHITECT, AND/OR OWNER.

31. INSTALLATION AND ELECTRICAL CONNECTIONS FOR WALL MOUNTED FIXTURES TO BE COORDINATED WITH ARCHITECTURAL, STRUCTURAL, UTILITY AND SITE PLANS AND TO BE IN ACCORDANCE WITH ALL APPLICABLE CODES.

32. CONTRACTOR TO OPERATE EACH LUMINAIRE AFTER INSTALLATION AND CONNECTION. INSPECT FOR IMPROPER CONNECTIONS AND OPERATION.

33. CONTRACTOR TO AIM AND ADJUST ALL LUMINAIRES TO PROVIDE ILLUMINATION LEVELS AND DISTRIBUTION AS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS DIRECTED BY THE LANDSCAPE ARCHITECT AND/OR OWNER.

34. CONTRACTOR TO CONFIRM THAT LIGHT FIXTURES, TILT ANGLE AND AIMING MATCH SPECIFICATIONS ON THE PLANS.

35. CONTRACTOR TO COORDINATE INSTALLATION OF ALL THE WALL MOUNTED FIXTURES AND ELECTRICAL CONNECTIONS TO SITE STRUCTURE(S) WITH BUILDING MEP, ARCHITECT, AND/OR OWNER.

36. CONTRACTOR TO COORDINATE LOCATION OF EASEMENTS, UNDERGROUND UTILITIES AND DRAINAGE BEFORE DRILLING POLE BASES.

37. CONTRACTOR TO COORDINATE POWER SOURCE WITH LIGHT FIXTURES TO ENSURE ALL SITE LIGHTING IS OPERATING EFFECTIVELY, EFFICIENTLY AND SAFELY.

38. REFER TO ELECTRIFICATION PLAN FOR PROVIDING ADEQUATE POWER FOR SITE LIGHTING.

39. CONTRACTOR TO COORDINATE LOCATION OF EASEMENTS, UNDERGROUND UTILITIES AND DRAINAGE BEFORE DRILLING POLE BASES.

40. INSTALLATION OF ALL LIGHTING FIXTURES, POLES, FOOTINGS, AND FEEDER CABLE TO BE COORDINATED WITH ALL SITE WORK TRADES TO AVOID CONFLICT WITH FINISHED AND PROPOSED WORK.

41. CONTRACTOR TO COORDINATE INSTALLATION OF UNDERGROUND FEEDER CABLE FOR EXTERIOR LIGHTING WITH EXISTING AND PROPOSED UTILITIES, SITE DRAINAGE SYSTEMS, AND PAVING. CONTRACTOR SHALL PROMPTLY NOTIFY THE OWNER'S REPRESENTATIVE SHOULD ANY UTILITIES, NOT SHOWN ON THE PLANS, BE FOUND DURING EXCAVATIONS.

42. POLE FOUNDATIONS SHALL NOT BE POURED IF FREE STANDING WATER IS PRESENT IN EXCAVATED AREA.

43. ALL POLES 25 FT OR GREATER SHALL BE EQUIPPED WITH FACTORY INSTALLED VIBRATION DAMPENERS.

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45. INSTALLATION AND ELECTRICAL CONNECTIONS FOR WALL MOUNTED FIXTURES TO BE COORDINATED WITH ARCHITECTURAL, STRUCTURAL, UTILITY AND SITE PLANS AND TO BE IN ACCORDANCE WITH ALL APPLICABLE CODES.

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48. CONTRACTOR TO CONFIRM THAT LIGHT FIXTURES, TILT ANGLE AND AIMING MATCH SPECIFICATIONS ON THE PLANS.

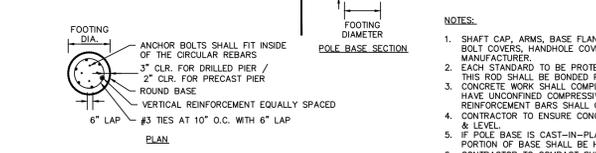
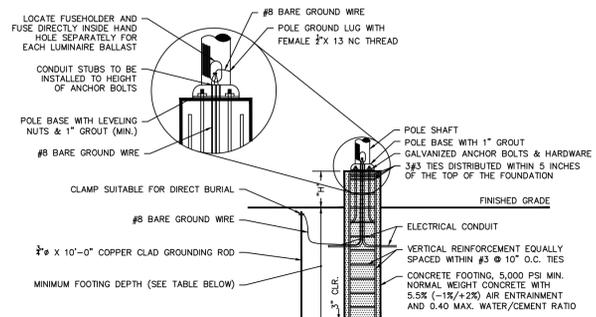
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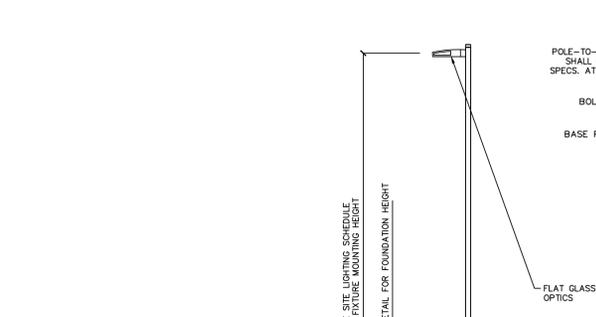
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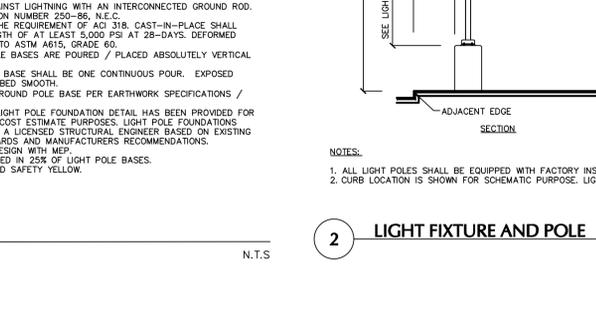


| FIXTURE TYPE | MOUNTING HEIGHT | FOOTING DEPTH | FOOTING DIAMETER | EXPOSED HEIGHT 'H' | VERTICAL REINFORCEMENT |
|--------------|-----------------|---------------|------------------|--------------------|------------------------|
| A            | 25'             | 4'-6"         | 2'-0"            | 3'-0"              | 6#5 BARS               |

1 LIGHT FIXTURE BASE N.T.S.



3 FIXTURE 'A' N.T.S.



4 LIGHT POLE - FIXTURE 'A' N.T.S.

**D-Series Size 1 LED Area Luminaire**

Specifications:

- ETC: 5.68 ft
- Length: 32.71"
- Width: 14.26"
- Height H1: 1.88"
- Height H2: 2.22"
- Weight: 28 lbs

**LITHONIA LIGHTING**

**FEATURES & SPECIFICATIONS**

**DESCRIPTION** - High performance, compact, enclosed quality luminaire with a minimum price of \$1,000 per luminaire and includes 10' pipe (10' length) and 1" pipe (10' length). See on one page information with a full specification and luminaire photo on page 10. See on one page information with a full specification and luminaire photo on page 10.

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3 FIXTURE 'A' N.T.S.

4 LIGHT POLE - FIXTURE 'A' N.T.S.

| Date      | Description | No. |
|-----------|-------------|-----|
| REVISIONS |             |     |

**LANGAN**  
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Project **HILLMAN ENERGY CENTER BATTERY ENERGY STORAGE SYSTEM**  
TEWKSBURY  
MIDDLESEX COUNTY MASSACHUSETTS  
Drawing Title

# LIGHTING NOTES AND DETAILS

|             |            |              |
|-------------|------------|--------------|
| Project No. | 151043401  | <b>LL501</b> |
| Date        | 03/26/2025 |              |
| Drawn By    | SH         |              |
| Checked By  | AS         |              |

NOT FOR CONSTRUCTION