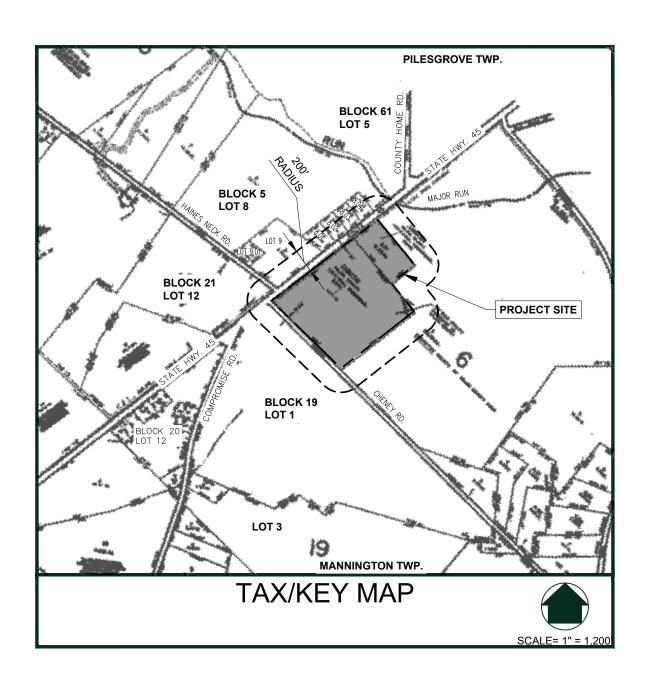
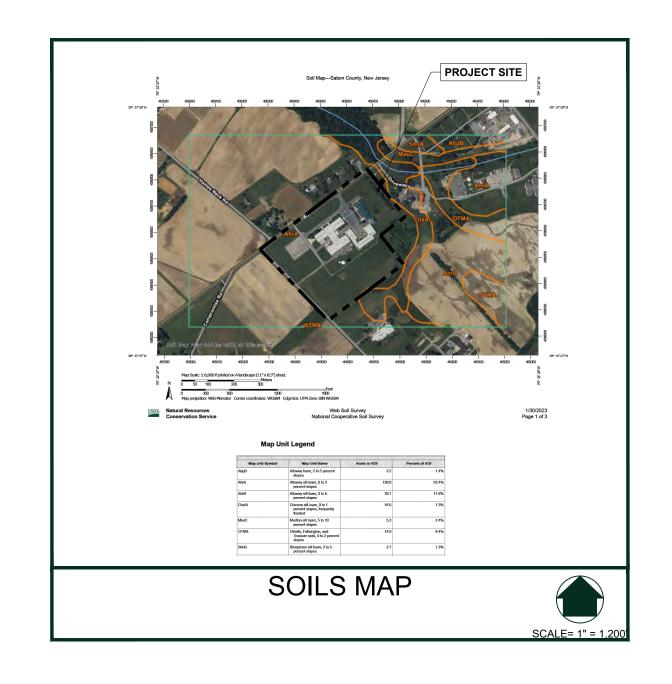
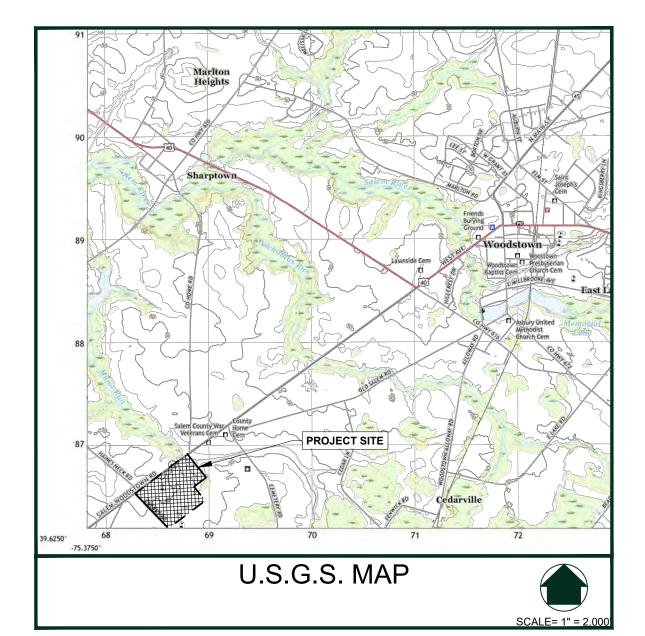
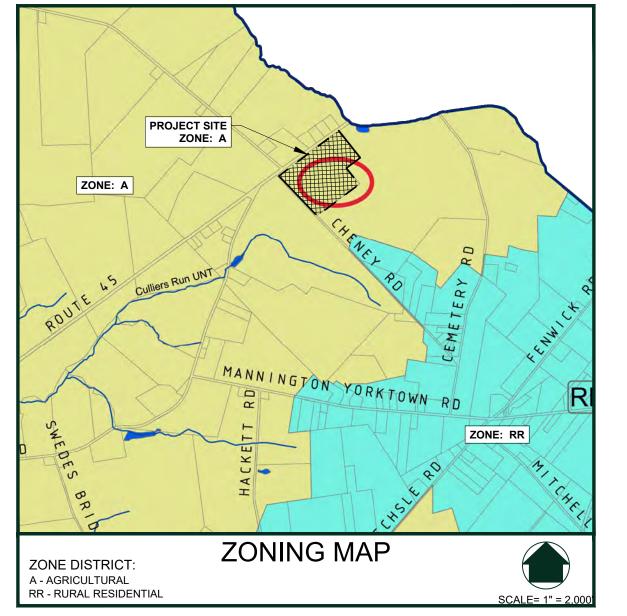
MANNINGTON TOWNSHIP, SALEM COUNTY, NEW JERSEY NOVEMBER 03, 2023









| ZONE; A- AGRICULTURAL MANNINGTON TWP., SALEM COUNTY, NEW JERSEY | | | | | |
|---|-------------------|---------------------|-----------|--|--|
| REQUIREMENTS | REQUIRED | EXISTING/PROPOSED * | STATUS | | |
| MINIMUM LOT AREA | 3 Ac. | 8.2 Ac. | NO CHANGE | | |
| MINIMUM LOT WIDTH | 250 FT. | > 250 FT. | NO CHANGE | | |
| MINIMUM LOT DEPTH | 350 FT. > 350 FT. | | NO CHANGE | | |
| PRINCIPAL STRUCTURE | | | | | |
| MIN. FRONT YARD SETBACK | 75 FT. | > 75 FT. | NO CHANGE | | |
| MIN. SIDE YARD SETBACK | 40 FT. | > 40 FT. | NO CHANGE | | |
| MIN. REAR YARD SETBACK | 60 FT. | > 60 FT. | NO CHANGE | | |
| MAX. BUILDING HEIGHT | 35 FT. | < 35 FT. | NO CHANGE | | |
| MAX. BUILDING COVERAGE | 10% | < 10% | CONFORMS | | |

< 15%

CONFORMS

| PARKING SCHEDULE | | | | |
|--------------------|----------|----------|-----------|--|
| | REQUIRED | EXISTING | PROPOSED | |
| HIGH SCHOOL | | | | |
| (10 PER CLASSROOM) | | 313 | 315 | |
| ADA TOTAL | 8 | 8 | NO CHANGE | |
| (301-400 SPACES) | | | | |
| VAN ACCESSIBLE | 2 | 2 | NO CHANGE | |

MAX. IMPERVIOUS COVERAGE

| Sheet List Table | | | |
|------------------|--|--|--|
| Sheet Number | Sheet Title | | |
| 1 | COVER | | |
| 2 | EXISTING CONDITIONS & DEMOLITION PLAN | | |
| 3 | SITE PLAN | | |
| 4 | PAVEMENT REPAIR PLAN | | |
| 5 | GRADING AND DRAINAGE PLAN | | |
| 6 | SOIL EROSION & SEDIMENT CONTROL PLAN | | |
| 7 | SOIL EROSION & SEDIMENT CONTROL NOTES- DETAILS | | |
| 8 | SOIL EROSION & SEDIMENT CONTROL NOTES | | |
| 9 | CONSTRUCTION DETAILS | | |

PREPARED FOR

SALEM COUNTY CAREER & TECHNICAL HIGH SCHOOL 880 NJ ROUTE 45 (SALEM WOODSTOWN ROAD) MANNINGTON TOWNSHIP, NJ 08098

PREPARED BY



ADAMS, REHMANN & HEGGAN ASSOCIATES, INC 215 BELLEVUE AVENUE PO BOX 579 HAMMONTON, NJ 08037-2019 TEL (609) 561-0482 FAX (609) 567-8909

GENERAL NOTES:

OWNER/APPLICANT: SALEM COUNTY BOARD FOR VOCATIONAL EDUCATION 880 ROUTE 45 WOODSTOWN, NJ, 08098 CONTACT: DR. JENNIFER BATES

- 1. THE SUBJECT PROPERTY IS KNOWN AS BLOCK 6, LOTS 1 & 2.01 IN THE TOWNSHIP OF MANNINGTON, 19. ALL VERTICAL SURFACES ADJACENT TO NEW PAVING (CURBS, GUTTERS, CASTINGS, ETC.) SHALL BE
- MARCH 2023, AND SUPPLEMENTAL GIS BOUNDARY INFORMATION WAS TAKEN FROM NJGEOWEB.
- 3. FOR REPAVING AND RESURFACING OF AREAS OUTSIDE THIS SET OF PLAN'S SCOPE OF WORK REFER TO PLAN SET TITLED "REPAVING AND RESURFACING PLANS, SALEM COUNTY CAREER & TECHNICAL
- 4. THE SALEM COUNTY BOARD FOR VOCATIONAL EDUCATION PROPOSES TO CONSTRUCT A +/- 1,508 SF WELDING BUILDING ADDITION AT THE REAR OF THE SCHOOL. ALSO INCLUDED IN THE SCOPE OF WORK: X 20 FT REINFORCED CONCRETE APRON AT THE AUTO SHOP OVERHEAD DOORS, CONCRETE APRONS AT THE BUILDING ADDITION DOOR OPENINGS, RESTRIPING AND RELATED RESTORATION INSIDE THI WELDING AREA COMPOUND FENCED AREA. ALTERNATE BID ITEMS INCLUDE: RESURFACING OF THE 24. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL CONSTRUCTION PERMITS RELATED OR SERVICE ROAD FROM THE WELDING COMPOUND PARKING AREA TO CHENEY ROAD. INCLUDING REPLACEMENT OF SPEED HUMPS, INSTALLATION OF SIGNS, AND ALL WORK ASSOCIATED WITH THE
- 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY TRAFFIC CONTROL AND SHALL OBTAIN THE 25. THE CONTRACTOR SHALL RESTORE THE SITE AND ADJACENT AREA, AT A MINIMUM, TO THEIR APPROVAL OF THE SCHOOL REGARDING CLOSURES AND TRAFFIC PATTERN CHANGES. SAFETY OF THE CORDONED OFF FROM ANY PEDESTRIAN OR VEHICLE TRAFFIC THROUGH CONSTRUCTION AREAS.
- 6. IT IS NOT ANTICIPATED THAT THERE WILL BE ANY CONCRETE CURB, CONCRETE SIDEWALK, OR ADA
- 7. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE CONTRACT DRAWINGS ARE APPROXIMATE BASED UPON VISIBLE FEATURES. DRAWINGS WHICH ARE A MATTER OF PUBLIC RECORD. AND UTILITY COMPANY MARK-UP PLANS. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE NEW JERSEY STATE ONE CALL SYSTEM (811) OR (1-800-272-1000) TO OBTAIN AND VERIFY THE LOCATION OF EXISTING PUBLIC UTILITIES PRIOR TO CONSTRUCTION. SEPARATE PAYMENT SHALL NOT BE MADE FOR ANY TEST PITS OR OTHER SUBSURFACE INVESTIGATIONS REQUIRED TO CONFIRM THE LOCATION, 28. CONTRACTOR SHALL CONTACT THE GAS COMPANY TO HAVE THEM RESET GAS VALVES PRIOR TO DEPTH OR SIZE OF THE EXISTING UTILITIES OR SERVICE CONNECTIONS.
- ANY EXISTING PROPERTY LINE MARKERS THAT ARE ENCOUNTERED DURING CONSTRUCTION ARE TO 29. SHOULD ANY DISCREPANCIES BE FOUND BETWEEN THE PLANS AND SPECIFICATIONS, SPECIFICATIONS BE PRESERVED BY THE CONTRACTOR. ANY PROPERTY MARKERS DISPLACED OR OTHERWISE DISTURBED AS A RESULT OF CONSTRUCTION ACTIVITIES SHALL BE RESET AT THE SOLE EXPENSE OF THE CONTRACTOR. ANY PROPERTY MARKER RESETTING SHALL BE PERFORMED BY A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF NEW JERSEY
- . THE CONTRACTOR IS RESPONSIBLE FOR RESTORING THE SITE TO A CLEAN, SAFE AND PASSABLE CONDITION AT THE END OF EACH WORK DAY. NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE FOR THE SAME. NO MATERIALS OR EQUIPMENT SHALL BE STAGED IN THE WORK ZONE OVERNIGHT UNLESS SPECIFICALLY PERMITTED BY THE OWNER, A STAGING AREA MAY BE PROVIDED AT THE DISCRETION OF THE OWNER, THE LOCATION OF WHICH SHALL BE IDENTIFIED AT THE
- 10. ALL WORK IS TO BE PERFORMED IN ACCORDANCE WITH THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, INCLUDING BUT NOT LIMITED TO, ADHERING TO ALL SOIL EROSION AND SEDIMENT CONTROL NOTES AND DETAILS.

11 CONTRACTOR SHALL NOTIFY LOCAL POLICE RESCUE SCHOOL TRANSPORT AND FIRE DEPARTMENTS. RELATING THE RECONSTRUCTION WORK FOR ALL LOCATIONS. THE CONTRACTOR SHALL ALSO PLACE ALL APPROPRIATE SAFETY AND CONSTRUCTION SIGNS, BARRICADES, ETC. AS REQUIRED TO ALLOW

- FOR THE SAFE AND ORDERLY DISTRIBUTION OF TRAFFIC 12. CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO UTILITIES AS A RESULT OF
- CONSTRUCTION ACTIVITIES AT NO ADDITIONAL COST TO THE SCHOOL.

15. CONTRACTOR SHALL NOTIFY ALL UTILITIES FOR LOCATIONS OF ALL UNDERGROUND PIPES, CONDUITS

- 13. ANY DAMAGE TO CURBS, SIDEWALKS, GRASS, ETC. MUST BE RETURNED TO "LIKE NEW" CONDITIONS.
- 14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKE OUT.
- ETC. PRIOR TO START OF ALL WORK. 16. CONTRACTOR SHALL MATCH ALL EXISTING SURFACES FLUSH TO ASSURE A SMOOTH TRANSITION.

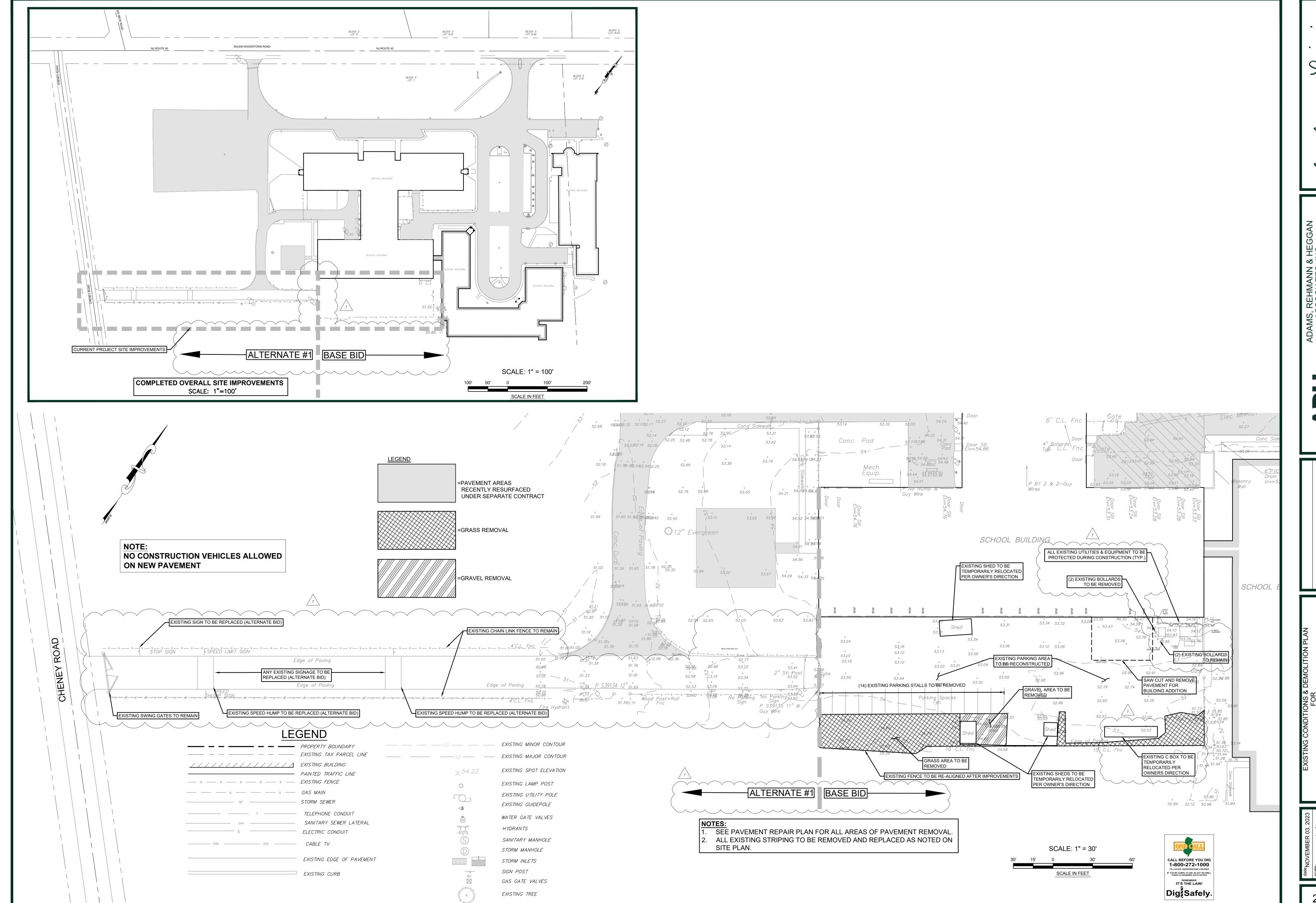
17. ALL AREAS TO BE PAVED SHALL BE THOROUGHLY ROLLED AND COMPACTED PRIOR TO INSTALLATION

CONSTRUCTION SPECIFICATION DATED 2019 AS AMENDED.

- 18. SPECIAL ATTENTION SHALL BE GIVEN TO ALL INTERSECTIONS TO ASSURE NO WATER (DRAINAGE) IS
- TACK COATED PRIOR TO PAVING.
- 2. TOPOGRAPHIC INFORMATION SHOWN HEREIN WAS COLLECTED IN FIELD BY ARH ASSOCIATES, IN 20. THE ENGINEER RESERVES THE RIGHT TO ADJUST FINAL GRADES PRIOR TO START OF PROJECT. 21. THE CONTRACTOR MUST ABIDE BY THE REQUIREMENTS SET FORTH IN THE STANDARD STATE
 - 22. ALL FILL SHALL BE PLACED IN 6" LIFTS AND THOROUGHLY COMPACTED TO THE SATISFACTION OF THE ENGINEER. IF BORROW FILL IS REQUIRED, IT SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
 - 23. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING HIS WORK AND THAT OF ALL OTHER CONTRACTORS ON THE PROJECT. ANY COSTS RELATED TO HIS COORDINATION SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS OF THE PROPOSAL
 - NECESSARY TO COMPLETE THE WORK FOR THE PROJECT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL WORK COMPLIES WITH FEDERAL, STATE AND LOCAL LAWS, ORDINANCES,
 - SHALL BE RESTORED, ALL FENCING DISTURBED DURING CONSTRUCTION SHALL BE RESTORED, AND ALL GRASSED AREAS DISTURBED DURING CONSTRUCTION SHALL BE TOPSOILED, SEEDED, AND 26. IT IS RECOMMENDED THAT THE PROSPECTIVE BIDDER VISIT THE SITE PRIOR TO BIDDING AND

PRE-EXISTING CONDITION; ALL PAVED AND CONCRETE AREAS DISTURBED DURING CONSTRUCTION

- ASCERTAIN FOR THEMSELVES THE EXISTING CONDITIONS TO DETERMINE THE DIFFICULTIES WHICH WILL BE ENCOUNTERED FOR A COMPLETE JOB. ALL COSTS SHALL BE INCLUDED WITHIN THE VARIOUS RELATED BID ITEMS OUTLINED IN THE PROJECT SPECIFICATIONS.
- 27. CONTRACTOR MUST MAINTAIN DRAINAGE FLOW THROUGHOUT CONSTRUCTION
- 30. CONCRETE WASHOUT STATION SHALL BE SUPPLIED ON SITE FOR THE DURATION OF TIME THAT
- CONCRETE WORK IS BEING COMPLETED AND ABLE TO HOLD ALL SOLIDS AND LIQUIDS THAT COME FROM A TYPICAL WASHOUT AFTER A POUR. CONCRETE WASHOUT SHALL NOT BE PERFORMED INTO SOIL, ONTO ASPHALT OR EXISTING CONCRETE OR INTO AN UNAPPROVED CONTAINER SUCH AS A BUCKET OR PLASTIC TRASH BAG.



CAROLYN A. FEIGIN
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ASSOCIA TES certificate of authorization NJ no. 24GA27973300, DE no. 2167

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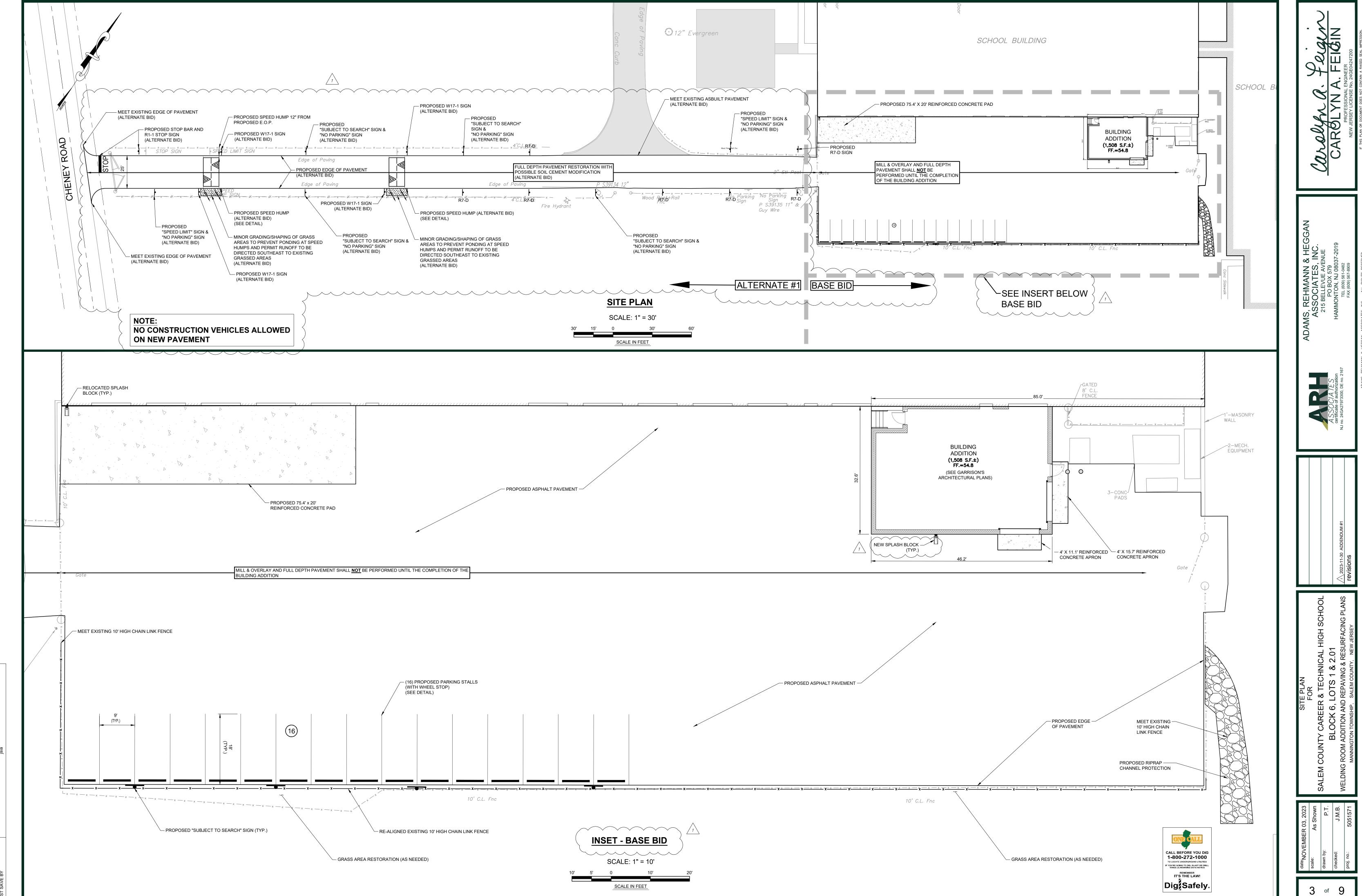
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2023-11-30 ADDENDUM #1

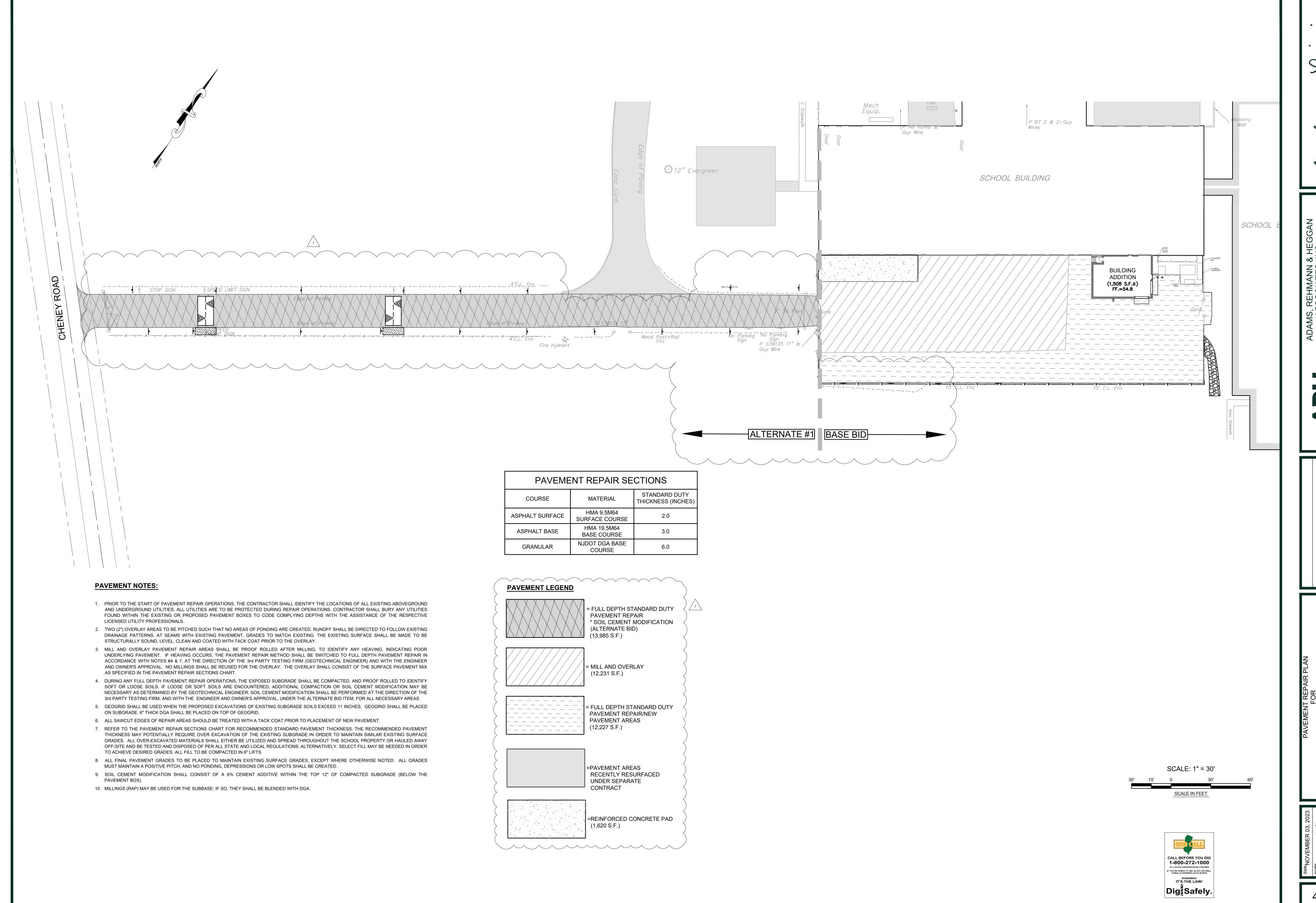
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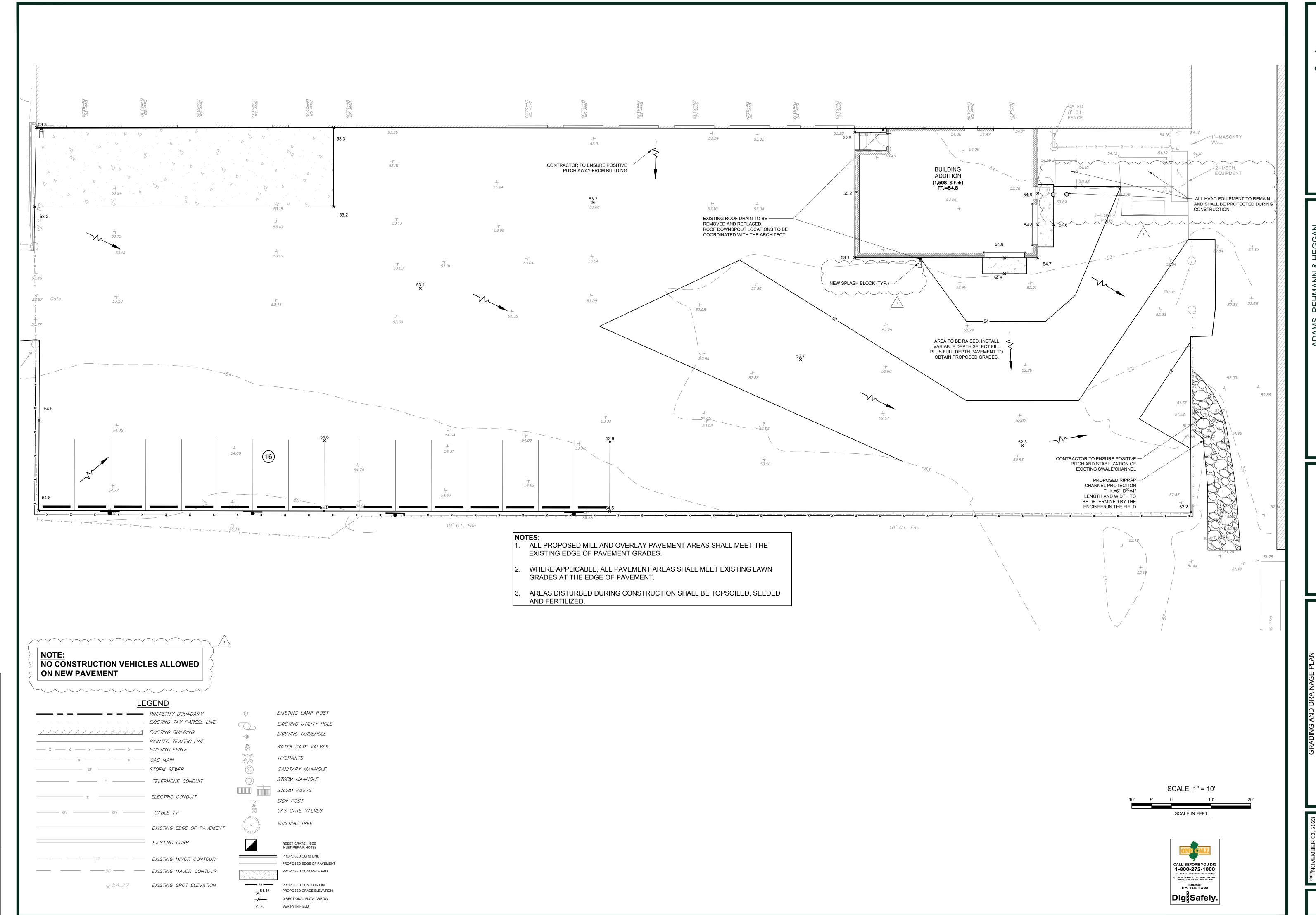
FOR
INTY CAREER & TECHNICAL HIGH SCHOOL
BLOCK 6, LOTS 1 & 2.01
IM ADDITION AND REPAVING & RESURFACING PLANS
INGTON TOWNSHIP, SALEM COUNTY, NEW JERSEY

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SALEM COUNT
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BLYN A. FEIGIN
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1-30 ADDENDUM#1

S. LOTS 1 & 2.01

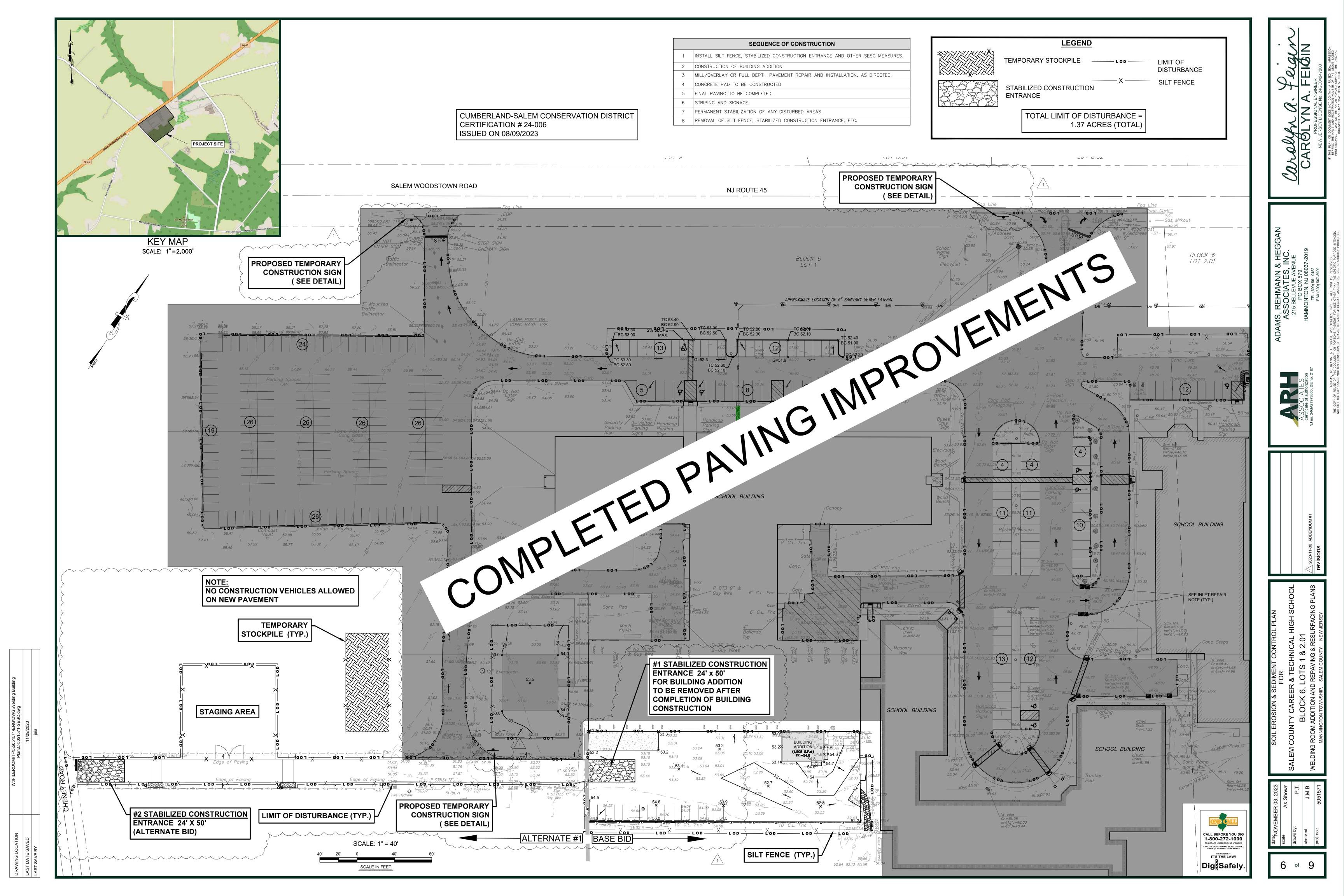
ND REPAVING & RESURFACING PLANS

SALEM COUNTY NEW JEDSEY

LEM COUNTY CAREER & TECHNICA
BLOCK 6, LOTS 1 & 2.0
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seked:
J.M.B.
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CUMBERLAND-SALEM SOIL EROSION AND SEDIMENT CONTROL NOTES:

- 1. ALL APPLICABLE EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE IN PLACE PRIOR TO ANY GRADING OPERATION AND/OR INSTALLATION OF PROPOSED STRUCTURES OR UTILITIES.
- 2. SOIL EROSION AND SEDIMENT CONTROL PRACTICES ON THE PLAN SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY.
- 3. ALL APPLICABLE EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE LEFT IN PLACE UNTIL CONSTRUCTION IS COMPLETED AND/OR THE AREA IS STABILIZED.
- 4. ANY DISTURBED AREA THAT WILL BE LEFT EXPOSED FOR MORE THAN SIXTY (60) DAYS AND NOT SUBJECT TO CONSTRUCTION TRAFFIC SHALL IMMEDIATELY RECEIVE A TEMPORARY SEEDING AND FERTILIZATION IN ACCORDANCE WITH THE NEW JERSEY STANDARDS AND APPLICATION RATES SHALL BE INCLUDED IN THE NARRATIVE. IF THE SEASON PROHIBITS TEMPORARY SEEDING, THE DISTURBED AREAS WILL BE MULCHED WITH SALT HAY OR EQUIVALENT AND ANCHORED IN ACCORDANCE WITH THE NEW JERSEY STANDARDS (I.E. PEG AND TWINE, MULCH MATTING OR LIQUID MULCH BINDER).
- 5. ALL CRITICAL AREAS SUBJECT TO EROSION WILL RECEIVE A TEMPORARY SEEDING IN COMBINATION WITH STRAW MULCH AT A RATE OF 2 TONS PER ACRE, ACCORDING TO THE NEW JERSEY STANDARDS IMMEDIATELY FOLLOWING
- 6. THE SITE SHALL AT ALL TIMES BE GRADED AND MAINTAINED SUCH THAT ALL STORMWATER RUNOFF IS DIVERTED TO SOIL EROSION AND SEDIMENT CONTROL FACILITIES.
- 7. ALL SOIL EROSION AND SEDIMENTATION STRUCTURES WILL BE INSPECTED AND MAINTAINED ON A REGULAR BASIS AND AFTER EVERY STORM EVENT.
- 8. SOIL STOCKPILES ARE NOT TO BE LOCATED WITHIN FIFTY (50) FEET OF A FLOODPLAIN, SLOPE, ROADWAY OR DRAINAGE FACILITY. THE BASE OF ALL STOCKPILES SHOULD BE PROTECTED BY A HAY BALE BARRIER OR SEDIMENT FENCE. PROPOSED LOCATIONS MUST BE DELINEATED ON THE PLAN.
- 9. A CRUSHED STONE, TIRE CLEANING PAD WILL BE INSTALLED WHEREVER A CONSTRUCTION ENTRANCE EXISTS. THE RIP-RAP PAD MUST BE 100 FEET IN LENGTH AND THE STONE MUST BE 1.5 - 4" IN SIZE, PLACED 12" THICK AND THE FULL WIDTH OF THE ENTRANCE. IT SHOULD BE UNDERLAIN WITH A SUITABLE SYNTHETIC FILTER FABRIC AND MAINTAINED. (THE STRUCTURE MUST BE DELINEATED AND DETAIL INCLUDED ON THE PLANS.)
- 10. IF A STONE CONSTRUCTION ENTRANCE IS TO BE USED AS AN EXIT ON TO A MAJOR HIGHWAY, A THIRTY (30) FOOT PAVED TRANSITION AREA SHALL BE INSTALLED.
- 11. ALL DRIVEWAYS MUST BE STABILIZED WITH 2 1/2" CRUSHED STONE OR SUBBASE PRIOR TO INDIVIDUAL LOT CONSTRUCTION.
- 12. PAVED ROADWAYS MUST BE KEPT CLEAN AT ALL TIMES.
- 13. ALL CATCH BASIN INLETS WILL BE PROTECTED DURING CONSTRUCTION (FILTER DETAILS APPEAR ON PLAN).
- 14. ALL STORM DRAINAGE OUTLETS WILL BE STABILIZED, AS REQUIRED, BEFORE THE DISCHARGE POINTS BECOME
- 15. ALL DEWATERING OPERATIONS MUST DISCHARGE DIRECTLY INTO A SEDIMENT FILTRATION DEVICE. THE SEDIMENT FILTER MUST BE CAPABLE OF FILTERING THE SEDIMENT AND BE PLACED SO AS NOT TO CAUSE EROSION OF THE DOWNSTREAM AREA. DETAILS AND MAINTENANCE OF THE DEVICE MUST BE INCLUDED ON THE PLANS. FIELD PLACEMENT AND USE OF THE STRUCTURE MUST BE APPROVED BY THE DISTRICT EROSION CONTROL INSPECTOR PRIOR TO COMMENCEMENT OF DEWATERING ACTIVITIES.
- 16. THE CUMBERLAND/SALEM SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED, IN WRITING, 72 HOURS PRIOR TO ANY LAND DISTURBANCE.
- 17. SOIL HAVING A PH OF 4.0 OR LESS OR CONTAINING IRON SULPHIDE MUST BE COVERED WITH A MINIMUM OF 12 INCHES OF SOIL HAVING A PH OF 5.0 OR MORE BEFORE SEEDBED PREPARATION.
- 18. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER TO PROVIDE CONFIRMATION OF LIME, FERTILIZER AND SEED APPLICATION RATES AT THE REQUEST OF THE CUMBERLAND/SALEM SOIL CONSERVATION DISTRICT.
- 19. NJSA 4:24-39, ET SEQ., REQUIRES THAT NO CERTIFICATE OF OCCUPANCY BE ISSUED BEFORE ALL THE PROVISIONS OF THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLAN HAVE BEEN COMPLIED WITH FOR PERMANENT MEASURES. ALL SITE WORK FOR THE PROJECT MUST BE COMPLETED PRIOR TO THE DISTRICT ISSUING A REPORT OF COMPLIANCE AS A PREREQUISITE TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY BY THE MUNICIPALITY.
- 20. NJSA 4:24-39, ET SEQ., REQUIRES THAT UPON PERMANENT SITE STABILIZATION AND COMPLETION OF CONSTRUCTION THE CONTRACTOR SHALL APPLY TO THE SOIL CONSERVATION DISTRICT FOR A FINAL COMPLIANCE INSPECTION TO CHECK THAT ALL THE PROVISIONS OF THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLAN HAVE BEEN COMPLIED WITH FOR PERMANENT MEASURES.
- 21. OFFSITE SEDIMENT DISTURBANCE MAY REQUIRE ADDITIONAL CONTROL MEASURES TO BE DETERMINED BY THE **EROSION CONTROL INSPECTOR.**
- 22. A COPY OF THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLAN MUST BE MAINTAINED ON THE PROJECT SITE DURING CONSTRUCTION.
- 23. ANY CONVEYANCE OF THIS PROJECT PRIOR TO ITS COMPLETION WILL TRANSFER FULL RESPONSIBILITY FOR COMPLIANCE WITH THE CERTIFIED PLAN TO ALL SUBSEQUENT OWNERS.
- 24. IMMEDIATELY AFTER THE COMPLETION OF STRIPPING AND STOCKPILING OF TOPSOIL. SEED THE STOCKPILE WITH ANNUAL RYE GRASS. STABILIZE TOPSOIL STOCKPILES WITH STRAW MULCH FOR PROTECTION IF THE SEASON DOES NOT PERMIT THE APPLICATION AND ESTABLISHMENT OF TEMPORARY SEEDING.
- 25. ANY CHANGES TO THE SITE PLAN WILL REQUIRE THE SUBMISSION OF A REVISED SOIL EROSION AND SEDIMENT CONTROL PLAN TO THE CUMERLAND/SALEM SOIL CONSERVATION DISTRICT. THE REVISED PLAN MUST BE IN ACCORDANCE WITH THE CURRENT NEW JERSEY STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL.
- 26. MAXIMUM SIDE SLOPES OF ALL EXPOSED SURFACES SHALL NOT BE CONSTRUCTED STEEPER THAN 3:1 UNLESS OTHERWISE APPROVED BY THE DISTRICT.
- 27. THE SOIL EROSION INSPECTOR MAY REQUIRE ADDITIONAL SOIL EROSION MEASURES TO BE INSTALLED, AS DIRECTED

DUST CONTROL METHODS:

THE FOLLOWING METHODS SHOULD BE CONSIDERED FOR CONTROLLING DUST:

MULCHES - SEE STANDARD OF STABILIZATION WITH MULCHES

<u>VEGETATIVE COVER</u> - SEE TEMPORARY AND PERMANENT VEGETATIVE COVER STANDARDS SPRAY-ON ADHESIVES - ON MINERAL SOILS (NOT EFFECTIVE ON MUCK SOILS). KEEP TRAFFIC OFF

| DUST CONTROL MATERIAL | | | | |
|---|--|-------------------|---------------------------|--|
| MATERIAL | WATER DILUTION | TYPE OF NOZZLE | APPLY GALLONS/ ACRE | |
| ANIONIC ASPHALT EMULSION | 7:1 | 1200 | | |
| LATEX EMULSION | 12.5:1 FINE SPRAY | | 235 | |
| RESIN IN WATER | 4:1 | FINE SPRAY | 300 | |
| POLYACRYLAMIDE (PAM)-SPRAY ON POLYACRYLAMIDE (PAM)-DRY SPREAD | APPLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS. MAY ALSO BE USED AS AN ADDITIVE TO SEDIMENT BASINS TO FLOCCULATE AND PRECIPITATE SUSPENDED COLLOIDS. | | | |
| ACIDULATED SOY BEAN SOAP STICK | NONE COARSE SPRAY 1200 | | | |

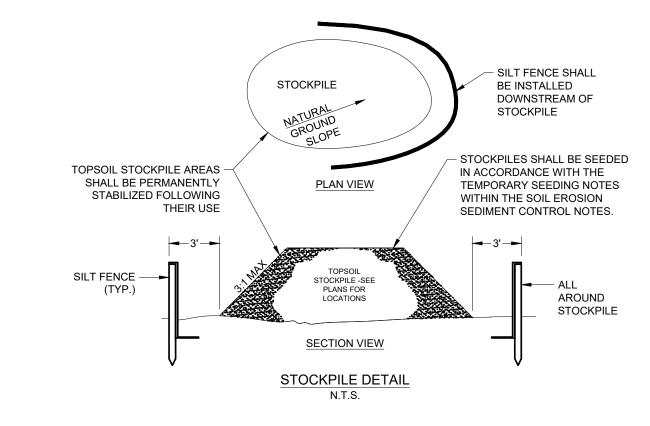
TILLAGE - TO ROUGHEN SURFACE AND BRING CLODS TO THE SURFACE. THIS IS A TEMPORARY EMERGENCY MEASURE WHICH SHOULD BE USED BEFORE SOIL BLOWING STARTS. BEGIN PLOWING ON WINDWARD SIDE OF SITE. CHISEL-TYPE PLOWS SPACED ABOUT 12 INCHES APART AND SPRING-TOOTHED HARROWS ARE EXAMPLES OF EQUIPMENT WHICH MAY PRODUCE THE

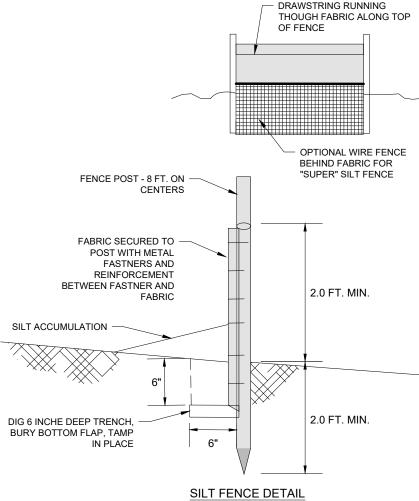
SPRINKLING - SITE IS SPRINKLED UNTIL THE SURFACE IS WET.

BARRIERS - SOLID BOARD FENCE, SNOW FENCES, BURLAP FENCES, CRATE WALLS, BALES OF HAY AND SIMILAR MATERIAL CAN BE USED TO CONTROL AIR CURRENTS AND SOIL BLOWING.

CALCIUM CHLORIDE - SHALL BE IN THE FORM OF LOOSE, DRY GRANULES OR FLAKES FINE ENOUGH TO FEED THROUGH COMMONLY USED SPREADERS AT A RATE THAT WILL KEEP SURFACE MOIST BUT NOT CAUSE POLLUTION OR PLANT DAMAGE. IF USED ON STEEPER SLOPES, THEN USE OTHER PRACTICES TO PREVENT WASHING INTO STREAMS OR ACCUMULATION AROUND PLANTS.

STONE - COVER SURFACE WITH CRUSHED STONE OR COARSE GRAVEL.





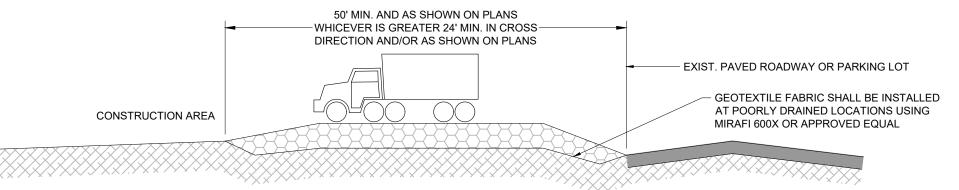
SILT FENCE REQUIREMENTS NOTES: FENCE POSTS SHALL BE SPACED 8 FEET CENTER-TO-CENTER OR CLOSER. THEY SHALL EXTEND TO AT LEAST 2 FEET INTO THE GROUND AND EXTEND AT LEAST 2 FEET ABOVE GROUND. POSTS SHALL BE CONSTRUCTED OF HARDWOOD WITH A MINIMUM DIAMETER THICKNESS OF 1-1/2 INCHES.

2. "SUPER" SILT FENCE- A METAL FENCE WITH 6 INCH OR SMALLER MESH OPENINGS AND AT LEAST 2 FEET HIGH MAY BE UTILIZED. FASTENED TO THE FENCE POSTS, TO PROVIDE REINFORCEMENT AND SUPPORT TO THE GEOTEXTILE FABRIC. POSTS MAY BE SPACED LESS THAN 8 FEET ON CENTER AND MAY BE CONSTRUCTED OF HEAVIER WOOD OR METAL AS NEEDED TO WITHSTAND HEAVIER SEDIMENT LOADING. THIS PRACTICE IS APPROPRIATE WHERE SPACE FOR OTHER PRACTICES IS LIMITED AND HEAVY SEDIMENT LOADING IS EXPECTED. "SUPER" SILT FENCE IS NOT TO BE USED N PLACE OF PROPERLY DESIGNED DIVERSIONS WHICH MAY BE NEEDED TO CONTROL SURFACE RUNOFF RATES AND 3. A GEOTEXTILE FABRIC, RECOMMENDED FOR SUCH USE BY MANUFACTURER. SHALL BE

BURIED AT LEAST 6 INCHES DEEP IN THE GROUND. THE FABRIC SHALL EXTEND AT LEAST 2 FEET ABOVE THE GROUND. THE FABRIC MUST BE SECURELY FASTENED TO THE POSTS USING A SYSTEM CONSISTING OF METAL FASTENERS (NAILS OR STAPLES) AND A HIGH STRENGTH REINFORCEMENT MATERIAL (NYLON WEBBING, GROMMETS, WASHERS ETC.) PLACED BETWEEN THE FASTENER AND THE GEOTEXTILE FABRIC. THE FASTENING SYSTEM SHALL RESIST TEARING AWAY FROM THE POST. THE FABRIC SHALL INCORPORATE A DRAWSTRING IN THE TOP PORTION OF THE FENCE FOR ADDED STRENGTH.

SILT FENCE MAINTENANCE NOTES. SEDIMENT SHALL BE REMOVED FROM THE UPSTREAM FACE OF THE BARRIER WHEN IT HAS REACHED A DEPTH OF $\frac{1}{2}$ THE BARRIER HEIGHT.

2. REPAIR OR REPLACE BARRIER (FABRIC, POSTS, BALES, ETC.) WHEN DAMAGED. 3. BARRIERS SHALL BE INSPECTED DAILY FOR SIGNS OF DETERIORATION AND SEDIMENT



STONE SIZE SHALL BE No. 2 OR 3 CRUSHED STONE AS DETERMINED BY ASTM C-33 NO. 2 STONE IS 1-1/2 TO 2-1/2 SHALL BE NOT LESS THAN SIX (6) INCHES.

THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING WITH ADDITIONAL STONE OR INCH STONE. NO. 3 STONE IS 1 TO 2 INCH STONE. THICKNESS ADDITIONAL LENGTH AS NEEDED ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.

STABILIZED CONSTRUCTION ENTRANCE DETAIL

Contact the local Soil Conservation District to determine the historical presence of high acid—producing soils in the vicinity of the proposed development site.).High acid—producing soils may be present in undisturbed soils at varying depths, including near the soil surface to excavation or deep disturbances. Its presence on a site may be significant or limited in the soil profile. High acid—producing soils are commonly black, dark brown, gray or greenish with silvery pyrite or marcasite nuggets or flakes. Alternatively, sandy soils or reddish, yellowish or light to medium brown soil materials are usually free of high

Limit the excavation area and exposure time when high acid-producing soils are encountered. 2. Topsoil stripped from the site shall be stored separately from temporarily stockpiled high acid producing soils. 3. Stockpiles of high acid—producing soil should be located on level land to minimize its movement, especially when this material has a high clay content.

Temporarily stockpiled high acid—producing soil material to be stored more than 48 hours should be covered with properly anchored, heavy grade sheets of polyethylene where possible. If not possible, stockpiles shall be covered with a minimum of 3 to 6 inches of wood chips to minimize erosion of the stockpile. Silt fence shall be installed at the toe of the slope to contain movement of the stockpiled material. Topsoil shall not be applied to the stockpiles to prevent topsoil contamination with high acid-producing soil. High acid—producing soils with a pH of 4.0 or less or containing iron sulfide (including borrow from cuts or dredged sediment) shall be ultimately placed or buried with limestone applied at the rate of 10 tons per acre (or 450 pounds per 1,000 square feet of surface area) and covered with a minimum of 12 inches of settled soil with a pH of 5.0 or

a. Areas where trees or shrubs are to be planted shall be covered with a minimum of 24 inches of soil with a pH of 5.0 b.Disposal area shall not be located within 24 inches if any surface of a slope or bank, such as berms, stream banks, ditches, and others, to prevent potential lateral leaching damages.
6. Equipment used for movement of high acid-producing soils should be cleaned at the end of each day to prevent spreading of high acid-producing soil materials to other parts of the site, into streams or stormwater conveyances, 7.Non-vegetative erosion control practices (stone tracking pads, strategically placed limestone check dam, sediment barrier, wood chips) should be installed to limit the movement of high acid-producing soils from, around, or off the 8. Following burial or removal of high acid-producing soil, topsoiling and seeding of the site (see Temporary Vegetative Cover for Soil Stabilization, Permanent Vegetative Cover and Soil Stabilization, and Topsoiling), monitoring must continue for a minimum of 6 months to ensure there is adequate stabilization and that no high acid—producing soil problems

emerge. If problems still exist, the affected area must be treated as indicated above to correct the problem. II. STANDARD FOR DUNE STABILIZATION A. This practice is applicable along ocean and bay shorelines where blowing sands and storm waters may cause erosion damage. Stay at least one hundred feet (horizontal distance) from mean high tide water line (MHT) R Methods and Materials: . Sand dunes form on barrier islands, shorelines exposed directly to the ocean, and inland sand deposits. The source of this wind born sand in the ocean or its bays. These parallel ridges of sand form perpendicular to prevailing winds and grow toward its source of sand. Periodic storm events and human activity continually alter their development and original configuration. Once developed, the sand dunes provide protection from moderate storms and tides. The

existence and maintenance of vegetation on dunes provides a network of root and foliage which holds unconsolidated sand in place. American beachgrass is the dominant, naturally occurring, vegetation of the frontal dunes of New Jersey. When beachgrass is established with structural resources and other dune species, a formidable well anchored storm barrier is established. Refer to the Standards for Soil Erosion and Sediment Control in New Jersey (7th Edition, January 2014) for additional information regarding vegetation stabilization and sand fencing. . STANDARD FOR MAINTAINING VEGETATION A. A preventative maintenance program anticipates requirements and accomplishes work when it can be done with least effort and expense to insure adequate cover.

B.Maintenance should occur on a regular basis, consistent with favorable plant growth, soil, and climatic conditions. This involves regular seasonal work for mowing, fertilizing, liming, watering, pruning, fire control, weed and pest control, reseeding, and timely repairs. C.The degree of preventative maintenance needed depends upon the type of vegetation and its proposed . Mowing is a recurring practice and its intensity depends upon the function of the ground cover. Oh high to

moderate (A to B) maintenance areas, such as lawns, certain recreation fields, and picnic areas, mowing will be frequent (2 to 7 day intervals) and typically at a height of 2.5 to 3 inches. Return clippings from mowing (mulching mower) to the turf to reduce the amount of fertilizer needed to maintain the turf by as much as 50%. Some turf mixtures can be managed as naturalized stands requiring only one (cool season mixtures) or two (warm season mixtures) mowings per year. Mowing of naturalized areas is typically done at heights no less than 4 inches and should not be done between April 1st and July 15th to avoid disturbing ground nesting birds. The large amount of clipping debris generated by mowing naturalized areas will need to be removed and/or dispersed so the vegetation is not smothered. Burning of naturalized areas is another procedure used to manage naturalized turfs. Low maintenance (D) areas may be left un-moved to permit natural succession. Incorporation of organic matter (for example, mature compost) into the soil will substantially reduce the need

mowed areas and those on sandy soils will require more frequent fertilization but at a lower nutrient rate 4.Lime requirement should be determined by soil testing every 2 or 3 years. Fertilization may increase the need for liming. Contact the local county extension office for details on soil testing and fertilization and pest control recommendations online at http://njaes.rutgers.edu/county/. Fertilization and additions of other soil amendments are not recommended for managing native vegetation. such as in the Pinelands National Reserve. See the Standard for Permanent Vegetative Stabilization for

3.Fertilizer and lime should be applied as needed to maintain a dense stand of desirable species. Frequently

specific requirements in the PNR. 6.Weed invasion may result from abusive mowing and from inadequate fertilizing and liming. Many newly established grasses will not survive if mowed at heights below 2.5 inches and an intervals greater than 7 days. Brush invasion is a common consequence of lack of mowing. The amount of weeds or brush that can be tolerated in any vegetated area depends upon the intended use of the land. Drainage ways are subject to rapid infestation by weed and woody plants. These should be controlled, since they often reduce drainage way efficiently. Control of weeds or brush is accomplished by using herbicides or

7.Fire hazard is greater where dry vegetation has accumulated. The taller the vegetation, the greater the 8.Prune trees and shrubs to remove dead or damaged branches. Remove undesirable or invasive plants to maintain integrity of the landscape and enhance quality of permanent vegetative cover.

V. STANDARD FOR PERMANENT VEGETATIVE COVER FOR SOIL STABILIZATION

PLANTING RATE | RECOMMENDED OPTIMUM SEEDING DATE (ZONE 6B) 8LBS/1000SF 8/15 TO 10/15

Methods and Materials: (Areas other than Pinelands National Reserve)

for cool season grasses.

a. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation. seeding, mulch application, and mulch anchoring. All grading should be done in accordance with Standard for Land Grading (see 7th Edition Manual). b. Immediately prior to seeding and topsoil application, the subsoil shall be evaluated for compaction in accordance with the Standard for Land Grading (see 7th Edition Manual). Topsoil shall be handled only when it is dry enough to work without damaging the soil structure. A uniform application to a depth of 5 inches (unsettled) is required on all sites. Topsoil shall be amended with organic matter, as needed, in accordance with the Standard for Topsoiling. Install needed erosion control practices or facilities such as diversions, grade—stabilization structures, channel stabilization measures, sediment basins, and waterways.

a. Uniformly apply ground limestone and fertilizer to topsoil which has been spread and firmed. according to soil test recommendations such as offered by Rutgers Co-operative Extension Soil sample mailers are available from the local Rutgers Cooperative Extension offices (http://njaes.rutgers.edu/county/). Fertilizer shall be applied at the rate of 500 pounds per acre or pounds per 1,000 square feet of 10-10-10 or equivalent with 50% water insoluble nitrogen unless a soil test indicates otherwise and incorporated into the surface 4 inches. If fertilizer is not ncorporated, apply one—half the rate described above during seedbed preparation and repeat another one—half rate application of the same fertilizer within 3 to 5 weeks after seeding b. Work lime and fertilizer into the topsoil as nearly as practical to a depth of 4 inches with a disc, spring—tooth harrow, or other suitable equipment. The final harrowing or disking operation should be on the general contour. Continue tillage until a reasonable uniform seedbed is prepared. High acid producing soil. Soils having a pH or less or containing iron sulfide shall be covered with a minimum of 12 inches of soil having a pH of 5 or more before initiating seedbed reparation. See

a. Select a mixture from Table 4-3 in the 7th Edition Manual or use a mixture recommended by Rutgers Cooperative Extension or Natural Resources Conservation Service which is approved by the Soil Conservation District. Seed germination shall have been tested within 12 months of the planting date. No seed shall be accepted with a germination test date more than 12 months old

Standard for Management of High Acid—Producing Soils for specific requirements.

unless retested. See applicable USDA Plant Hardiness Zone Map for New Jersey for planting dates. Seeding rates specified are required when a report of compliance is requested prior to actual establishment of permanent vegetation. Up to 50% reduction in rates may be used when permanent vegetation is established prior to a report of compliance inspection. These rates apply to all methods of seeding. Establishing permanent vegetation means 80% vegetative coverage with the specified seed mixture for the seeded area and mowed once. ii. Warm-season mixtures are grasses and legumes which maximize growth at high temperatures, generally 85°F and above. See

Table 4-3 mixtures 1 to 7. Planting rates for warm-season shall be the amount of Pure Live Seed (PLS) as determined by germination testing results. iii. Cool -season mixtures are grasses and legumes which maximize growth at temperatures below 85°F. Many grasses become active at 65°F. See Table 4-3, mixtures 8-20. Adjustment of planting rates to compensate for the amount of PLS is not required

b. Conventional Seeding is performed by applying seed uniformly by hand, cyclone (centrifugal) seeder, drop seeder, drill or cultipacker seeder. Except for drilled, hydroseeded or cultipacked seedings, seed shall be incorporated into the soil within 24 hours of seedbed preparation to a depth of ¼ to ½ inch, by raking or dragging. Depth of seed placement may be ¼ inch deeper on

c. After seeding, firming the soil with a corrugated roller will assure seed-to-soil contact, restore capillarity, and improve seedling emergence. This is the preferred method. When performed on the contour, sheet erosion will be minimized and water conservation on site will be maximized. d. Hydroseeding is a broadcast seeding method usually involving a truck, or trailer-mounted tank, with an agitation system and

hydraulic pump for mixing seed, water and fertilizer and spraying the mix onto the prepared seedbed. Mulch shall not be included in the tank with seed. Short-fibered mulch may be applied with a hydroseeder following seeding. (also see Section 4-Mulching below). Hydroseeding is not a preferred seeding method because seed and fertilizer are applied to the surface and not incorporated into the soil. When poor seed to soil contact occurs, there is a reduced seed germination and growth.

Mulching is required in all seeding. Mulch will protect against erosion before grass is established and will promote faster and earlier establishment. The existence of vegetation sufficient to control soil erosion shall be deemed compliance with this mulching requirement. a.Straw or Hay: Unrotted small grain straw, hay free of seeds, to be applied at the rate of 1.5 to 2 tons per acre (70 to 90 pounds per 1,000

square feet), except that where a crimper is used instead of a liquid mulch-binder (tackifying or adhesive agent), the rate of application is 3 tons per acre. Mulch chopper-blowers must not grind the mulch. Hay mulch is not recommended for establishing fine turf or lawns due to the presence of weed seed. Application: Spread mulch uniformly by hand or mechanically so that at least 85% of the soil surface is covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000 square feet sections and distribute 70 to 90 pounds within

Anchoring shall be accomplished immediately after placement to minimize loss by wind or water. This may be done by one of the following methods, depending upon the size of the area, steepness of slopes, and costs.

be driven before or after applying mulch. Secure mulch to soil surface by stretching twine between pegs in a criss-cross and a square pattern. Secure twine around each peg with two or more round turns. Mulch Nettings: Staple paper, jute, cotton or plastic nettings to the soil surface. Use a degradable netting in areas to be mowed. iii. Crimper (mulch anchoring coulter tool): A tractor- drawn implement, somewhat like a disc harrow, especially designed to push or cut some of the broadcast long fiber mulch 3 to 4 inches into the soil so as to anchor it and leave part standing upright. This technique is limited to areas traversable by a tractor, which must operate on the contour of slopes. Straw mulch rate must be 3

Peg and Twine: Drive 8 to 10 inch wooden pegs to within 2 to 3 inches of the soil surface every 4 feet in all directions. Stakes may

tons per acre. No tackifying or adhesive agent is required. iv. Liquid Mulch Binders: May be used to anchor salt hay, hay or straw mulch. (a) Applications should be heavier at edges where wind may catch the mulch, in valleys, and at crests of banks. The remainder of

(b) Use of the following: (1) Organic and Vegetable Based Binds - Naturally occurring, powder-based, hydrophilic materials when mixed with water formulates a gel and when applied to mulch under satisfactory curing conditions will form membraned networks of insoluble polymers. The vegetable gel shall be physiologically harmless and not result in phytotoxic effect or impede growth of turf grass. Use at rates and weather conditions as recommended by the manufacturer to anchor mulch materials. Many new products are available, some of which may need further evaluation for use in this state.

) Synthetic Binders: High polymer synthetic emulsion, miscible with water when diluted and, following application of mulch, drying and curing, shall no longer be soluble or dispersible in water. Binder shall be applied at rates recommended by the manufacturer and remain tacky until germination of grass. Note: All names given above are registered trade names. This does not constitute a recommendation of these products to b. Wood-fiber or paper-fiber mulch shall be made from wood, plant fibers or paper containing no growth or germination inhibiting materials, used at the rate of 1.500 pounds per acre (or as recommended by the product manufacturer) and may be applied by a hydroseeder. Mulch shall not be mixed in the tank with seed. Use is limited to flatter slopes and during optimum seeding periods in

c. Pelletized mulch - compressed and extruded paper and/or wood fiber product, which may contain co-polymers, tackifiers, fertilizers, and coloring agents. The dry pellets, when applied to a seeded area and watered, form a mulch mat. Pelletized mulch shall be applied in accordance with the manufacturer's recommendations. Mulch may be applied by hand or mechanical spreader at the rate of 60-75 lbs/1.000 square feet and activated with 0.2 to 0.4 inches of water. This material has been found to be beneficial for use on small lawn or renovation areas, seeded areas where weedseed free mulch is desired, or on sites where straw mulch and tackifier agent are not practical or desirable. Applying the full 0.2 to 0.4 inches of water after spreading pelletized mulch on the seed bed is

Irrigation (where feasible) If soil moisture is deficient, supply new seeding with adequate water (a minimum of 1/2 inch applied up to twice a day until vegetation is well established). This is especially true when seedings are made in abnormally dry or hot weather or on droughty sites.

extremely important for sufficient activation and expansion of the mulch to provide soil coverage.

Hardiness Zones

Range of average annual

and Hunterdon Counties

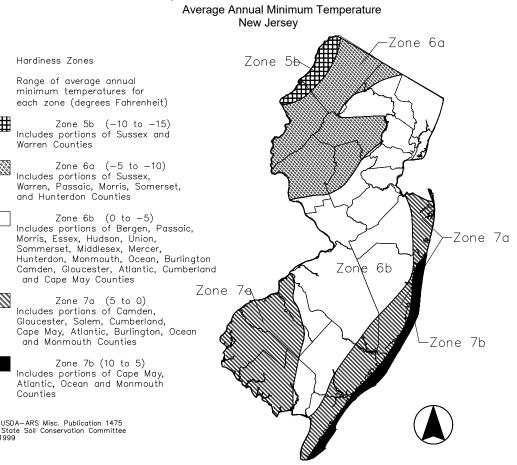
Counties

After USDA—ARS Misc. Publication 1475 NJDA State Soil Conservation Committee

Since soil organic matter content and slow release nitrogen fertilizer (water insoluble) are prescribed in Section 2A - Seedbed Preparation in this Standard, no follow-up of topdressing is mandatory. An exception may be made where gross nitrogen deficiency exists in the soil to the extent that turf failure may develop. In that instance, topdress with 10-10-10 or equivalent at 300 pounds per acre or 7 pounds per 1,000 square feet every 3 to 5 weeks until the gross nitrogen deficiency in the turf is ameliorated. ng Permanent Vegetative Stabilization

The quality of permanent vegetation rests with the contractor. The timing of seeding, preparing the seedbed, applying nutrients, mulch and other management are essential. The seed application rates in Table 4-3 are required when a Report of Compliance is requested prior to actual establishment of permanent vegetation. Up to 50% reduction in application rates may be used when permanen vegetation is established prior to requesting a Report of Compliance from the district. These rate apply to all methods of seeding. Establishing permanent vegetation means 80% vegetative cover (of the seeded species) and mowed once. Note this designation of mowed once does not guarantee the permanency of the turf should other maintenance factors be neglected or otherwise mismanaged

> Figure 4-1 USDA Plant Hardiness Zones Average Annual Minimum Temperature New Jersev



DATE (ZONE 6B) 8/15 TO 10/15 8LBS/1000SF

B. Methods and Materials - Pinelands National Reserve Due to the low fertility of native soils and other related factors, indigenous Pinelands vegetation can be relatively slow to re-colonize disturbed areas. Natural re-colonization by native plants is preferable however, where the intended land use permits or required native plant re-growth.

PLANTING RATE | RECOMMENDED OPTIMUM SEEDING

The following approaches shall be used for post-development soil stabilization in the Pinelands National Reserve (PNR) in areas where it is a desire for native plant materials to be used. These practices are limited to areas where slope is less than 2% which do not experience concentrated surface runoff Note: areas requiring traditional turf-type vegetation either by seeding or sodding shall be subject to the Standards for Topsoiling or Sodding and the prior portion of this Standard which detail methods for permanent vegetation stabilization. Table 4—4 in the 7th Edition Manual contains the required cool season turf mixture suitable for use in the PNR.

PNR A—Horizon soil shall be segregated and stockpiled separately to maintain seed and root stock remnants for re—vegetation efforts outlined below.

a. The reuse of stockpiled Pinelands A-Horizon soils to the depth found prior to construction (1.0"minimum) is required for all permanent stabilization efforts involving native plant materials. b.pH, organic matter, texture and cation exchange capacity (CEC) (as estimated by sum of cations, CECsum) of any non-native PNR soil shall be equal or less than that of the native soil on the project See Soil survey http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

for typical soil measurement for pH, texture, organic matter and CEC c.Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation seeding, mulch application and mulch anchoring. All grading shall be done in accordance with Standards for Land Grading (see 7th Edition Manual), including methods to alleviate soil compaction (the addition of compost for organic matter shall not exceed the in—situ composition). d.Sand fencing — Sand fencing (standard snow fence) may be used to address potential wind erosion on large sites (see Sand fencing, Dune Stabilization Standard). Sand fencing shall be used in combination with other permanent stabilization methods to prevent erosion.

2.Re-seeding with Pinelands Approved Seed Mixtures: a. Appropriate seed mixtures shall be selected from Table 4-4 in 7th Edition Manual. Seed shall be broadcast or drill seeded directly into the A-horizon soils. Mulch consistent with the Standard. 3.Re-establishment of Native Vegetation without seeding: a.In cases where it is desirable or required for native vegetation to be re-established by unassisted re—colonization, A—Horizon soils (without adding seeding) shall be protected from erosion by any of the following measures until native plant materials (seed and root stock preserved in A-Horizon soils and other native volunteer vegetation) re-colonize in the area: Unrotted small—grain straw, at 2.0 to 2.5 tons per acre, is spread uniformly at 90 to 115 pounds per

1,000 square feet and anchored with a mulch anchoring tool liquid mulch binders, or netting tie down ther suitable materials may be used if approved by the Soil Conservation District. The approved rates above have been met when the mulch covers the ground completely upon visual inspection. ii.Liaht layer (2 inches thick maximum) of wood chips (locally sourced from within the Pinelands National reserve if available). Unseeded, Type A (or greater) biodegradable erosion control blanket.

Combination of the above. v.Re-apply mulch materials as needed (to limit erosion) until an adequate cover of native plants is established. **This may be require several growing seasons to adequately establish native vegetation. A bond (estimate to be prepared by a NJ Licensed Engineer) may be required by the local Soil Conservation District to ensure the suitable establishment of native vegetation is accomplished. A Final Pertificate of Compliance shall not be issued to the overall project site until adequate, permanent vegetative cover is established

If natural re-colonization fails after 2 growing seasons, vegetative establishment will require the area to be mechanically seeded with a suitable mixture from Table 4-4 or otherwise replanted with live vegetation.of mowed once does not guarantee the permanency of the turf should other maintenance factors be neglected or otherwise mismanaged

V.STANDARD FOR STABILIZATION WITH MULCH ONLY

until germination of grass.

This practice is applicable to areas subject to erosion, where the season and other conditions many not be suitable for growing an erosion-resistant cover where stabilization is needed for a short period until more suitable protection can be applied. 3.Methods and Materials:

a. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, and mulch anchoring. All grading should be done in accordance with Standard for Land Grading (see 7th Edition Manual) b. Install needed erosion control practices or facilities such as diversions, grade stabilization structures hannel stabilization measures, sediment basins, and waterways. See Standards 11 through 42, in the 7th Edition Manual.

a. Unrotted small-grain straw, at 2.0 to 2.5 tons per acre, is spread uniformly at 90 to 115 pounds per 1,000 square feet and anchored with a mulch anchoring tool, liquid mulch binders, or netting tie down. Other suitable materials may be used if approved by the Soil Conservation District. The approved rate above have been met when the mulch covers the ground completely upon visual inspection, i.e. the soil cannot be seen below the mulch. b. Synthetic or organic soil stabilizers may be used under suitable conditions and in quantities as c. Wood-fiber or paper-fiber mulch at the rate of 1,500 pounds per acre (or according to the manufacturer's requirements) may be applied by a hydroseeder.

l. Mulch netting, such as paper jute, excelsior, cotton or plastic, may be used. e. Woodchips applied uniformly to a minimum depth of 2 inches may be used. Woodchips will not be used on areas where flowing water could wash them into an inlet and plug it. f. Gravel, crushed stone, or slag at the rate of 9 cubic yards per 1,000 sq. ft. applied uniformly to a minimum depth of 3 inches may be used. Size 2 or 3 (ASTM C-330 is recommended.

Should be accomplished immediately after placement of hay or straw mulch to minimize loss by wind or water. This may be done by one of the following methods, depending upon the size of the area and a. Peg and Twine — Drive 8 to 10 inch wooden pegs to within 2 to 3 inches of the soil surface every 4 eet in all directions. Stakes may be driven before or after applying mulch. Secure mulch to sc surface by stretching twine between pegs in a criss-cross and a square pattern. Secure twine around b. Mulch Nettinas — Staple paper, cotton, or plastic nettinas over mulch. Use dearadable nettina in areas to be mowed. Netting is usually available in rolls 4 feet wide and up to 300 feet long. c. Crimper Mulch Anchoring Coulter Tool — A tractor—drawn implement especially designed to punch and anchor mulch into the soil surface. This practice affords maximum erosion control, but its use is limited to those slopes upon which the tractor can operate safely. Soil penetration should be about 3

to 4 inches. On sloping land, the operation should be on the contour. . Applications should be heavier at edges where wind catches the mulch in valleys, and at crests of s. Remainder of area should be uniform in appearance.

ii. Use of the following: (a)Organic and Vegetable Based Binders - Naturally occurring, powder based, hydrophilic materials that mixed with water formulates a gel and when applied to mulch under satisfactory curing conditions will form membrane networks of insoluble polymers. The vegetable gel shall be physiologically harmless and not result in a phyto—toxic effect or impede growth of turfgrass Vegetable based gels shall be applied at rate and weather conditions recommended by the (b)Synthetic Binders — High polymer synthetic emulsion, miscible with water when diluted and following

application to mulch, drying and curing shall no longer be soluble or dispersible in water. It shall be applied at rates and weather conditions recommended by the manufacturer and remain tacky VI. STANDARD FOR PERMANENT STABILIZATION WITH SOD

On exposed soils that have a potential for causing off-site environmental damage where an immediate, permanent vegetative cover is desired. Water (rain or irrigation) is required for success; access to rrigation is essential during drought. B.Methods and Materials:

High Quality cultivated sod is preferred over native or pasture sod. Sod should be free of broadleaf weeds and undesirable coarse and fine weed grasses. Sod should be of uniform thickness, typically % inch, plus or minus ¼ inch, at time of cutting (excludes Sod should be vigorous and dense and be able to retain its own shape and weight when suspended vertically with a firm grasp from the upper 10 percent of the strip. Broken pads and rolls or torn and

uneven ends will not be acceptable. For droughty sites, a sod of turf—type tall fescue or turf—type tall fescue mixed with Kentucky bluegrass is preferred over a 100% Kentucky bluegrass sod. Although not widely available, a sod of fine fescue is also acceptable for droughty sites. nly moist, fresh, unheated sod should be used. Sod should be harvested, delivered, and installed within a period of 24 hours or less during summer months.

a. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding. mulch application, and mulch anchoring. All grading should be done in accordance with Standard for Land Grading (see 7th Edition Manual). b.Topsoil should be handled only when it is dry enough to work without damaging the soil structure. A

uniform application to a depth of 6 inches (unsettled) is required on all sites. See the Standard for opsoiling for topsoil and amendment requirements. c.Install needed erosion control practices or facilities such as diversions, grade stabilization structures, channel stabilization measures, sediment basins, and waterways. 2.Soil Preparation:

a.uniformly apply ground limestone, and fertilizer according to soil test recommendations such as offered by Rutgers Co-operative Extension. Soil sample mailers are available from the local Rutgers Cooperative Extension offices (http://njaes.rutgers.edu/county/). Fertilizer shall be applied at the rate of 500pounds per acrè or 11 pounds per 1,000 squaré feet using 10-10-10 or equivalent with 50% water insoluble nitrogen unless a soil test indicates otherwise and incorporated in to the surface 4 inches. I fertilizer is not incorporated, apply ½ the rate described above during seedbed preparation and repeat another ½ rate application of the same fertilizer within 3 to 5 weeks after seeding. Apply limestone at the rate of 2 tons/acre unless soil testing indicates otherwise. Calcium carbonate is the equivalent and standard for measuring the ability of liming materials to neutralize soil acidity and supply calcium and magnesium to grasses and legumes. Table 6-1 is a general guideline for limestone application rates.

TABLE 6-1 LIMESTONE1 APPLICATION RATE BY SOIL TEXTURE LAY, CLAY LOAM, AND HIGH ORGANIC SOIL NDY LOAM, LOAM, SILT LOAM 2 b. Work lime, and fertilizer into the topsoil as nearly as practical to a depth of 4 inches with a disc.

springtooth harrow, or other suitable equipment. The final harrowing or disking operation should be on the general contour. Continue tillage until a reasonably uniform, fine seedbed is prepared. c.Remove from the surface all objects that would prevent good sod to topsoil contact and remove all other debris, such as wire, cable, tree roots, pieces of concrete, clods, lumps, or other unsuitable material. d.Inspect site just before sodding. If traffic has left the soil compacted, the area must be re—tilled and firmed in accordance with the above. 3.Sod Placement:

a Sod strips should be laid on the contour, never up and down the slope, starting at the bottom of the slope and working up. On steep slopes, the use of ladders will facilitate the work and prevent damage to the sod. During periods of high temperature, lightly irrigate the soil immediately prior to paying the

b.Place sod strips with snug, even joints (seams) that are staggered. Open spaced invite erosion. c.Lightly roll or tamp sod immediately following placement to insure solid contact of root mat and soil surface.

Do not overlap sod. All joints should be butted tightly to prevent voids which would cause drying of d.On slopes greater than 3 to 1, secure sod to surface soil with wood pegs, wire staples biodegradable plastic spikes, or split shingles (8 to 10 inches long by %inch wide). e.Surface water cannot always be diverted from flowing over the face of the slope, but a capping strip of heavy jute or plastic netting, properly secured, along the crown of the slope and edges will provide extra protection against lifting and undercutting of sod. The same technique can be used to ancho

sod in water—carrying channels and other critical areas. Wire staples must be used to anchor netting f. Immediately following installation, sod should be watered until water penetrates the soil layer beneath sod to a depth of 1 inch. Maintain optimum water for at least two weeks.

a. Since soil organic matter and slow release nitrogen fertilizer (water insoluble) are prescribed in Sections 1 and 2 in this Standard, a follow—up topdressing is not mandatory, except where group nitrogen deficiency exists in the soil to the extent that turf failure may develop, topdressing shall then be applied. Topdress with 10—0—10 or equivalent at 400 pounds per acre or 7 pounds per 1,000 square feet every 3 to 5 weeks until the gross nitrogen deficiency in the turf is ameliorated.

VII. TEMPORARY VEGETATIVE COVER FOR SOIL STABILIZATION

A. Where Applicable: On exposed soils that have a potential for causing off—site environmental damage. B.Methods and Materials:

1. Site Preparation: a. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation seeding, mulch application, and mulch anchoring. All grading should be done in accordance with Standard for Land Grading (see 7th Edition Manual), PG. 19—1. b. Install needed erosion control practices or facilities such as diversions, grade stabilization structures channel stabilization measures, sediment basins, and waterways. See Standards 11 through 42 (see 7th Edition Manual). c. Immediately prior to seeding, the surface should be scarified 6" to 12" where there has been soil compaction. This practice is permissible only when there is no danger to underground utilities (cables, irrigation systems, etc.).

2 Seedbed Preparation: a. Apply ground limestone and fertilizer according to soil test recommendations such as offered by Rutgers Co-operative Extension. Soil sample mailers are available from the local Rutgers Cooperative Extension offices. Fertilizer shall be applied at the rate of 500 pounds per acre of 11 pounds per 1,000 square feet of 10-20-10 or equivalent with 50% water insoluble nitrogen unless a soil test indicates otherwise. Apply limestone at the rate of 2 tons/acre unless soil testing indicates otherwise Calcium carbonate is the equivalent and standard for measuring the ability of liming materials to neutralize soil acidity and supply calcium and magnesium to grasses and legumes. b. Work lime and fertilizer into the soil as nearly as practical to a depth of 4 inches with a disc, springtooth harrow, or other suitable equipment. The final harrowing or disking operation should be on the general contour. Continue tillage until a reasonable uniform seedbed is prepared. Inspect seedbed just before seeding. If traffic has left the soil compacted, the area must be retilled

in accordance with the above. d. Soils high in sulfides or having a pH of 4 or less refer to Standard for Management of High Acid Producing Soils, pg. 1-1

a. Select seed from recommendations in Table 7—2. TABLE 7-2

| TEMPORARY VEGETATIVE STABILIZATION GRASSES, SEEDING RATES, DATES & DEPTHS | | | | | | |
|---|-------------------------|---------------------|--|-----------------------|------------------------|--------------------------------|
| SEED SELECTIONS | SEEDING RATE 1 (pounds) | | OPTIMUM SEEDING DATE ² Based on Plant Hardiness Zone ³ | | | OPTIMUM SEED |
| | Per Acre | Per 1000 Sq. Ft. | ZONE 5b, 6s | ZONE 6b | ZONE 7a, b | DEPTH ⁴ (inches) |
| COOL SEASON GRASSES | | | | | | |
| .Spring Oats | 86 | 2.0 | 3/15-6/1 8/1-9/15 | 3/1-5/15 8/15-10/1 | 2/15-5/1 8/15-10/15 | 1.0 |
| .Winter Barley | 96 | 2.2 | 8/1-9/15 | 8/15-10/1 | 8/15-10/15 | 1.0 |
| .Annual Ryegrass | 100 | 1.0 | 3/15-6/1 8/1-9/15 | 3/15-6/1 8/1-9/15 | 2/15-5/1 8/15-10/15 | 0.5 |
| .Winter Cereal Rye | 112 | 2.8 | 8/1-11/1 | 8/1-11/15 | 8/1-12/15 | 1.0 |
| WARM SEASON GRASSES | | | | | | |
| .Pearl Millet | 20 | 0.5 | 6/1-8/1 | 5/15-8/15 | 5/1-9/1 | 1.0 |
| .Millet(German or Hungarian) | 30 | 0.7 | 6/1-8/1 | 5/15-8/15 | 5/1-9/1 | 1.0 |
| | | | | | | |

1. Seeding rate for warm season grass, selections 5-7 shall be adjusted to reflect the amount of Pure Line Seed (PLS) as determined by a germination test result. No adjustment is required for cool ?. May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.

ant Hardiness Zone (see figure 7-1, pg. 7-4) See 7th Edition Manual 4. Twice the depth for sandy soils. b.Conventional Seeding. Apply seed uniformly by hand, cyclone (centrifugal) seeder, drop seeder, drill or cultipacker

seeder. Except for drilled, hydroseeded or cultipacked seedings, seed shall be incorporated into the soil to a depth of $1\!\!4$ to $1\!\!2$ inch by raking or dragging. Depth of seed placement may be $1\!\!4$ inch deeper on coarse c. Hydroseeding is a broadcast seeding method usually involving a truck or trailer mounted tank, with an agitation system and hydraulic pump for mixing seed, water and fertilizer and spraying the mix onto the prepared seedbed. Mulch shall not be included in the tank with seed. Short fibered mulch may be applied with a hydroseeder following seeding (also see Section IV Mulching). Hydroseeding is not a preferred seeding method because seed and fertilizer are applied to the surface and not incorporated into the soil. Poor seed to soil contact occurs reducing seed germination and growth. Hydroseeding may be used for areas too steep for conventional equipment to traverse or too obstructed with rocks, stumps, etc.

d. After seeding, firming the soil with a corrugated roller will assure good seed—to—soil contact, restore capillarity, and improve seeding emergence. This is the preferred method. When performed on the contour, sheet erosion will be minimized and water conservation on site will be maximized. 4. Mulching

Mulching is required on all seeding. Mulch will insure against erosion before grass is established and will promote faster and earlier establishment. The existence of vegetation sufficient to control soil erosion shall be deemed acceptable with this mulching requirement.

a Straw or Hav. Unrotted small grain straw, hav free of seeds, to be applied at the rate of 1.5 to 2 tons per acre (70 to 90 pounds per 1,000 square feet), except that where a crimper is used instead of a liquid mulch-binde tackifying or adhesive agent), the rate of application is 3 tons per acre. Mulch chopper—blowers must no grind the mulch. Hay mulch is not recommended for establishing fine turf or lawns due to the presence of Application: Spread mulch uniformly by hand or mechanically so that at least 95% of the soil surface is covered For uniform distribution of hand—spread mulch, divide area into approximately 1,000 square feet sections and distribute 70 to 90 pounds within each section.

Anchoring shall be accomplished immediately after placement to minimize loss by wind or water. This may be

done by one of the following methods, depending upon the size of the area, steepness of slopes, and costs. and Twine: Drive 8 to 10 inch wooden pegs to within 2 to 3 inches of the soil surface every 4 feet in all directions. Stakes may be driven before or after applying mulch. Secure mulch to soil surface by stretching twine between pegs in a criss-cross and a square pattern. Secure twine around each peg with two or more ii. Mulch Nettings: Staple paper, jute, cotton or plastic nettings to the soil surface. Use a degradable netting in areas iii.Crimper (mulch anchoring coulter tool): A tractor— drawn implement, somewhat like a disc harrow, especially designed

to push or cut some of the broadcast long fiber mulch 3 to 4 inches into the soil so as to anchor it and leave part standing upright. This technique is limited to areas traversable by a tractor, which must operate on the contour of slopes. Straw mulch rate must be 3 tons per acre. No tackifying or adhesive agent is required. iv.Liquid Mulch Binders: May be used to anchor salt hay, hay or straw mulch. (a) Applications should be heavier at edges where wind may catch the mulch, in valleys, and at crests of panks. The remainder of the area should be uniform in appearance.

(b)Use of the following: (1) Organic and Vegetable Based Binds — Naturally occurring, powder—based, hydrophilic materials when mixed with water formulated a gel and when applied to mulch under satisfactory curing conditions will form membraned networks of insoluble polymers. The vegetable gel shall be physiologically harmless and not result in phytotoxic effect or impede growth of turf grass. Use at rates and weather conditions as ecommended by the manufacturer to anchor mulch materials. Many new products are available, some of which may need further evaluation for use in this state. (2) Synthetic Binders: High polymer synthetic emulsion, miscible with water when diluted and, following application of mulch, drying and curing, shall no longer be soluble or dispersible in water. Binder shall be applied at rates recommended by the manufacturer and remain tacky until germination of grass All names given above are registered trade names. This does not constitute a recommendation of

these products to the exclusion of other products. b.Wood—fiber or paper—fiber mulch shall be made from wood, plant fibers or paper containing no growth or germination inhibiting materials, used at the rate of 1,500 pounds per acre (or as recommended by the product manufacturer) and may be applied by a hydroseeder. Mulch shall not be mixed in the tank with seed. Use is limited to flatter slopes and during optimum seeding periods in spring and fall. c.Pelletized mulch — compressed and extruded paper and/or wood fiber product, which may contain co—polymers, tackifiers, fertilizers, and coloring agents. The dry pellets, when applied to a seeded area and watered, form a mulch mat. Pelletized mulch shall be applied in accordance with the manufacturer's recommendations. Mulch may be applied by hand or mechanical spreader at the rate of 60-75 lbs/1,000 square feet and activated with 0.2 to 0.4 inches of water. This material has been found to be beneficial for use on small lawn or renovation areas, seeded areas where weedseed free mulch is desired, or on sites where straw mulch and tackifier agent

are not practical or desirable. Applying the full 0.2 to 0.4 inches of water after spreading pelletized mulch c the seed bed is extremely important for sufficient activation and expansion of the mulch to provide soil VIII. STANDARD FOR TOPSOILING

<u>Definition</u> Topsoiling entails the distribution of suitable quality soil on areas to be vegetated.

Purpose

To improve the soil medium for plan establishment and maintenance <u>Water Quality Enhancement</u>

Growth and establishment of a vigorous vegetative cover is facilitated by topsoil, preventing soil loss by wind and rain offsite and into streams and other stormwater conveyances. Where Applicable

Topsoil shall be used where soils are to be disturbed and will be re-vegetated.

Methods and Materials 1. Materials

> a. Topsoil should be friable, loamy, free of debris, objectionable weeds and stones, and contain no toxic substance or adverse chemical or physical condition that may be harmful to plant growth. Soluble salts should not be excessive (conductivity less than 0.5 millimhos per centimeter. More than 0.5 millimhos may desiccate seedlings and adversely impact growth). Imported topsoil shall have a minimum organic matter content of 2.75 percent. Organic matter content may be raised by additives.

b. Topsoil substitute is a soil material which may have been amended with sand, silt, clay, organic matter, fertilizer or lime and has the appearance of topsoil. Topsoil substitutes may be utilized on sites with insufficient topsoil for establishing permanent vegetation. All topsoil substitute materials shall meet the requirements of topsoil noted above. Soil tests shall be performed to determine the component of sand, silt, clay, organic matter, soluble salts 2. Stripping and Stockpiling

a. Field exploration should be made to determine whether quantity and or quality of surface soil justifies stripping. b. Stripping shall be confined to the immediate construction area.

c. Where feasible, lime may be applied before stripping at a rate determined by soil tests to bring the soil pH to d. A 4-6 inch stripping depth is common, but may vary depending on the particular soil.

e. Stockpiles of topsoil should be situated so as to not obstruct natural drainage or cause off-site environmental f. Stockpiles should be vegetated in accordance with standards previously described herein; see standards for

Permanent or Temporary Vegetative Cover for Soil Stabilization. Weeds should not be allowed to grow on stockpiles. 3. Site Preparation a. Grade at the onset of the optimal seeding period so as to minimize the duration and area of exposure of

disturbed soil to erosion. Immediately proceed to establish vegetative cover in accordance with the specified seed mixture. Time is of the essence. b. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch

application and anchoring, and maintenance. See the Standard for Land Grading.

d. Prior to topsoiling, the subsoil shall be in compliance with the Standard for Land Grading.

laboratory facilities qualified to test soil samples for agronomic properties.

c. As guidance for ideal conditions, subsoil should be tested for lime requirement. Limestone, if needed, should be applied to bring soil to a pH of approximately 6.5 and incorporated into the soil as nearly as practical to a depth

e. Employ needed erosion control practices such as diversions, grade stabilization structures, channel stabilization measures, sedimentation basins, and waterways, See Standards 11 through 42. 4. Applying Topsoil

a. Topsoil should be handled only when it is dry enough to work without damaging soil structure; i.e., less than field capacity (see glossary). b. A uniform application to a depth of 5.0 inches, minimum of 4 inches, firmed in place is required. Alternative depths may be considered where special regulatory and/or industry design standards are appropriate such as aolf

for Management of High Acid Producing Soil. c. Pursuant to the requirements in Section 7 of the Standard for Permanent Vegetative Stabilization, the contractor is responsible to ensure that permanent vegetative cover becomes established on at least 80% of the soils to be stabilized with vegetation. Failure to achieve the minimum coverage may require additional work to be performed by the contractor to include some or all of the following: supplemental seeding, re-application of lime and fertilizers, and/or the addition of organic matter (i.e. compost) as a top dressing. Such additional measures shall be based on soil tests such as those offered by Rutgers Cooperative Extension Service or other approved

courses, sports fields, landfill capping, etc. Soils with a pH of 4.0 or less or containing iron sulfide shall be covered with a minimum depth of 12 inches of soil having a pH of 5.0 or more, in accordance with the Standard

IX. STANDARD FOR LAND GRADING <u>Definition</u>

Reshaping the ground surface by grading to planned elevations which are determined by topographic survey and layout.

The practice is for one or more of the following: Provide more suitable sites for land development; improve surface drainage and control erosion. Conditions Where Practice Applies

This practice is applicable where grading to planned elevations is practical and it is determined that grading is needed. Grading that involves the disturbances of vegetation over large areas shall be avoided. It may be necessary to provide for temporary stabilization of large areas. Water Quality Enhancement

Proper grading of disturbed sites will protect against soil loss from erosion, enhance establishment of permanent

vegetative cover and help to properly manage stormwater runoff all of which will reduce off site discharge of pollutants. The grading plan and installation shall be based upon adequate topographic surveys and investigations. The plan is to show the location, slope, cut, fill and finish elevation of the surface to be graded. The plan should also include auxiliary practices for safe disposal of runoff water, slope stabilization, erosion control and drainage. Facilities such as waterways,

itches, diversions, grade stabilization structures, retaining walls and subsurface drains should be included where Erosion control measures shall be designed and installed in accordance with the applicable standard contained herein The development and establishment of the plan shall include the following:

1. The cut face of earth excavations and fills shall be no steeper than the safe angle of repose for the materials encountered and flat enough for proper maintenance. 2. The permanently exposed faces of earth cuts and fills shall be vegetated or otherwise protected from erosion.

3. Provisions shall be made to safely conduct surface water to storm drains or suitable water courses and to prevent surface runoff from damaging cut faces and fill slopes. 4. Subsurface drainage is to be provided in areas having a high water table, to intercept seepage that would adversely affect slope stability, building foundations or create undesirable wetness. See Standard for Subsurface Drainage.

5. Adjoining property shall be protected from excavation and filling operations. 6. Fill shall not be placed adjacent to the back of a stream or channel, unless provisions are made to protect the hydraulic, biological, aesthetic and other environmental functions of the stream Soil Management and Preparation

Subgrade soils prior to the application of topsoil shall be free of excessive compaction to a depth of 6.0 inches to

enhance the establishment of permanent vegetative cover. This section of this Standard addresses the potential for excessive soil compaction in light of the intended land use, testing for excessive soil compaction where permanent vegetation is to be established and mitigation of excessive soil Due to use or setting, certain disturbed areas will not require compaction remediation including, but not limited to the

1. Within 20 feet of building foundations with basements, 12 feet from slab or crawl space construction. 2. Where soils or gravel surfaces will be required to support post—construction vehicular traffic loads such as roads, parking lots and driveways (including gravel surfaces), bicycle paths or pedestrian walkways (sidewalks, etc.)

3. Airports, railways or other transportation facilities 4. Areas requiring industry or government specified soil designs, including golf courses, landfills, wetland restoration, septic disposal fields, wet/lined ponds, etc.

5. Areas governed or regulated by other local, state or federal regulations which dictate soil conditions. 6. Brownfields (capped uses), urban development areas, in-fill areas, recycling yards, junk yards, quarries and

7. Slopes determined to be inappropriate for safe operation of equipment. 8. Portions of a site where no heavy equipment travel or other disturbance has taken place.

9. Areas receiving temporary vegetative stabilization in accordance with the Standard.

10. Where the area available for remediation practices is 500 square feet or less in size. 11. Locations containing shallow (close to the surface) bedrock conditions.

compaction whereupon only the excessively compacted areas would require compaction mitigation.

Soil compaction remediation or testing to prove remediation is not necessary will be required in areas where permanent vegetation is to be established that are not otherwise exempted above. Testing method shall be selected, and soil compaction testing shall be performed by, the contractor or other project owner's representative (e.g. engineer). A minimum of two (2) tests shall be performed for projects with an overall limit of disturbance of up to one (1) acre and at a rate of two (2) tests per acre of the overall limit of disturbance for larger areas which shall be evenly distributed over the area of disturbance subject to testing. Tests shall be performed in areas representative of the construction activity prevailing in the area. In the event this testing indicates compaction in excess of the maximum thresholds

indicated for the testing method, the contractor/owner shall have the option to perform compaction mitigation over the

entire disturbed area (excluding exempt areas) or to perform additional testing to establish the limits of excessive

Areas of the site which are subject to compaction testing and/or mitigation shall be graphically demoted on the certified

Soil compaction testing is not required if/when subsoil compaction remediation (Scarification/tillage (6" minimum depth) or similar) is proposed as part of the sequence of construction. Soil Test Method Options

This test shall be conducted with a firm wire (15-1/2 gauge steel wire - e.g. survey marker flag, straight wire stock,etc.), 18 to 21 inches in length, with 6" inches from one end visibly marked on the wire. Conduct wire flag test by olding the wire flag near the flag end and push it vertically into the soil at several different locations in the field to he lesser of a 6 inch depth or the depth at which it bends due to resistance in the soil. Record the depth at which it bends due to resistance in the soil. The wire should penetrate without bending or deforming at least 6" into the ground by hand, without the use of tools. If penetration fails and an obstruction is suspected (rocks, root, debris, ttc.) the test can be repeated in the same general area. If the test is successful the soil is not excessively compacted. If the wire is difficult to insert (wire bends or deforms prior to reaching 6 inches in depth) the soil may be excessively compacted and compaction mitigation or further testing via method 3 or 4 below is required, the choice of which is at the contractor/owner's discretion. 2. Handheld Soil Penetrometer Test Method

Rutgers Cooperative Extension, Implemented June 1, 2010, last revised February 28, 2011. A result of less than or equal 300 psi shall be considered passing. If the result is greater than 300 psi, the soil may be excessively compacted and compaction mitigation or further testing via method 3 or 4 below is required, the choice of which is at the contractor/owner's discretion. 3. Tube Bulk Density Test Method This test shall be certified by a New Jersey Licensed Professional Engineer utilizing only undisturbed samples reconstitution of the sample not permitted) collected utilizing the procedure for Soil Bulk Density Tests as described in

This test shall be conducted based on the Standard Operation Procedure (SOP) #RCE2010-001, prepared by the

the USDA NRCS Soil Quality Test Kit Guide, Section 1—4, July 2001. When the texture of the soil to be tested is a sand or loamy sand and lack of soil cohesion or the presence of large amounts of coarse fragments, roots or worm channels prevent the taking of undisturbed samples, this test shall not be used. Where the results of replicate tests differ by more than ten percent (10%), the samples shall be examined for the

i. Cracks, worn channels, large root channels or poor soil tube contact within the samples;

ii. Large pieces of gravel, roots or other foreign objects; iii.Smearing or compaction of the upper or lower surface of the samples

If any of the defects described in 3 (i-iii) above are found, the defective core(s) shall be discarded and the test repeated using a new replicate sample for each defective replicate sample. The bulk density (defined as the weight of dry soil per volume) results shall be compared with the Maximum Dry Bulk Densities in Table 19—1. A result of less than or equal to the applicable maximum bulk density shall be considered passing. If the result is greater than the maximum bulk density the soil shall be considered excessively compacted and compaction mitigation is required.

4. Nuclear Density Test Method

This test shall be certified by a New Jersey Licensed Professional Engineer and conducted by a nuclear gauge certified inspector pursuant to ASTM D6938. The bulk density measurement results shall be compared with the Maximum Dry Bulk Densities in Table 19–1. A result of less than or equal to the applicable maximum bulk density shall be considered passing. If the result is greater than the maximum bulk density the soil shall be considered excessively compacted and compaction mitigation is required.

Table 19-1* - Maximum Dry Bulk Densities (arams/cubic centimeter) by soil type

| SOIL TYPE / TEXTURE | BULK DENSITY (g/cc) | |
|---|------------------------|--|
| COARSE, MEDIUM AND FINE SANDS AND LOAMY SANDS | 1.80 | |
| VERY FINE SAND AND LOAMY VERY FINE SAND | 1.77 | |
| SANDY LOAM | 1.75 | |
| LOAM, SANDY CLAY LOAM | 1.70 | |
| CLAY LOAM | 1.65 | |
| SANDY CLAY | 1.60 | |
| SILT, SILT LOAM | 1.55 | |
| SILTY CLAY LOAM | 1.50 | |
| SILTY CLAY | 1.45 | |
| CLAY | 1.40 | |
| | · | |

*Source: USDA Natural Resource Conservation Service, Soil Quality Information Sheet, Soil Quality Resource

5. Additional testing methods which conform to ASTM standards and specifications, and which reduce a dry weight, soil bunk density measurement may be allowed subject to District approval. Procedures for Soil Compaction Mitigation

If subgrade soils are determined to be excessively compacted by testing, as identified above, procedures shall be used to itigate excessive soil compaction prior to placement of topsoil and establishment of permanent vegetative cover. Restoration of compacted soils shall be through deep scarification/tillage (6" minimum depth) where there is no danger o underground utilities (cables, irrigation systems, etc.) or in the alternative, another method as specified by a New Jersey Licensed Professional Engineer.

Installation Requirements

imber, logs, brush, rubbish, rocks, stumps and vegetative matter which will interfere with the grading operation or affect the planned stability or fill areas shall be removed and disposed of according to the plan Topsoil is to be stripped and stockpiled in amounts necessary to complete finish grading of all exposed areas requiring

detrimental to constructing stable fills. All structural fills shall be compacted as determined by structural engineering requirements for their intended purpose and as required to reduce slipping, erosion or excessive saturation. All disturbed areas shall be left with a neat and finished appearance and shall be protected from erosion. See Standards for Permanent Vegetative Cover for Soil Stabilization.

Trees to be retained shall be protected if necessary in accordance with the Standard for Tree Protection During

Fill material is to be free of brush, rubbish, timber, logs, vegetative matter and stumps in amounts that will be

X. STANDARD FOR TREE PROTECTION DURING CONSTRUCTION A. Where Applicable:

On new development sites with existing trees. B.Methods and Materials:

1.Reconnaissance should be performed before land clearing begins to identify dead and weak trees to be removed and healthy trees to remain, to create aesthetically pleasing development site with vegetation rather than the presence of dead or dying trees. Inventory the site and clearly mark the trees and stands of trees to be saved. Consider relocating streets, housed, or other structures if necessary and feasible. Once clearing begins and damage to the trees occurs, valuable specimens may be lost.

a. Characteristics of trees to be protected and saved. The following lists characteristics that should be evaluated before deciding to remove or protect a tree: Tree health is the overall condition of the tree. A tree of low vigor is more susceptible to damage by environmental changes than healthy trees and is more susceptible to insect and disease attacks. Indications of poor vigor include the dying of the tips of branches and entire limbs, small annual twig growth, stunted leaf size, sparse foliage, and poor foliage color. Avoid saving hollow or rotten trees,

trees cracked, split, leaning or crooked, oozing sap, or with broken tops. Use woodchips generated from removal of trees of poor health and spread them around the root zones to help protect the trees that remain. ii. Tree Aae Large, picturesque trees may be more aesthetically valuable than smaller, young trees, but also

require more extensive protection measures. If leaving an older tree, be sure it is sound and healthy. iii. Species (the right trees for the right locations) Many species of trees found in New Jersey woodlands are not suitable for shade tree used around buildings. Avoid protecting trees that are short-lived, brittle, have soft wood, messy leaves, fruit or are frequently attacked by insects and disease. Tree root systems which do not adapt well to cuts

and fills may not be suitable alternative. The following are severely affected by compacted construction fills: Aspen, Beech, Paper birch, Eastern red cedar, Black cherry, Dogwood, Katsura tree, inden. Paperbark maple. Sugar maple. Black oak. Pin oak. Red oak. White oak. Pines, and Tuliptree ee Table 9—1 in the 7th Edition Manual for a more complete list of construction impacts to iv. Resistant to insects and Diseases Avoid leaving trees in highly visible areas or specimens that are frequent targets of insects and

summer. The following are susceptible to insects (I) and disease (D): White Ash (D), Birch (Butternut (D), Crabapples (D), some Elms (D), Hawthorn (D), Hemlock (I), Linden (I), Sugar Maple (D), Mountain Ash (D), Sassafras (I), Scholartree (D), Redbud (D) v. Tree Aesthetics Choose trees that are aesthetically pleasing, exhibiting good shape and form. Avoid leaning, crooked,

diseases. American Elm. for example, could be lost due to Dutch Elm Disease. Wild Cherry, another

example, is a favorite host of the tent caterpillar, which causes defoliation of the trees in early

and misshapen trees. Occasionally, an odd-shaped tree or one of unusual form may add interest to

the landscape if strategically located. Be sure the tree is structurally sound and vigorous. vi. Spring and Autumn Coloration Species differ in fall color. Some are bright red, others orange and yellow. Other species exhibit no autumn color, such as walnut, locust, and sycamore.

Favor trees that are preferred by wildlife for food, cover, and nesting. A mixture of evergreens and hardwoods is beneficial. Evergreen trees are important for cover during the winter months. The hardwoods are more valuable for food. viii. Air Pollution Susceptibility Tree species vary greatly to susceptibility to air pollution. Symptoms vary from browning on the edges of the leaves and needles, to stunting of growth, to death of the tree. The following show olerance to urban stress and are less likely to present problems with sidewalks: Baldcypress,

Corktree, Amur maple, Kentucky coffee tree, Crabapple, Dawn redwood, Ginko (male), Goldenraintree, Hackberry, Hawthorn, Honeylocust, European hornbeam, Horsechestnut, Lindens, Oaks (excluding pin), Pear, Scholartree, Sourgum (tupelo), Sweet gum, Yews, Zelkova, ix. Species Longevity Favor trees whose life span is long, such as oak, beech, and tulip poplar. Short-lived trees; (Black

locust, Gray birch, Aspen) should be avoided for use as shade, lawn, or specimen trees. Although some short—lived trees have an attractive form of pleasing coloration in the spring or fall, such trees may not live for a long time and thus may not be worth preserving. b. Criteria for protecting remaining trees General mechanical damage — see Figure 9.3 in the 7th Edition Manual for correct root zone calculation

and placement of tree protection. ii. Box trees within 25 feet of a building site to prevent mechanical injury. Fencing or other barrier should be installed beyond the Critical Root Radius (See Figure 9.3). Tree root systems commonly extend well beyond the drip line. iii. Boards will not be nailed to trees during building operations.

iv. Feeder roots should not be cut in an area inside the Protected Root Zone (PRZ).
v. Damaged trunks or exposed roots should have damaged bark removed immediately and no paint shall be pplied. Exposed roots should be covered with topsoil immediately after excavation is complete. Roots shall be pruned to give a clean, sharp surface amenable to healing. Roots exposed during hot weather should be irrigated to prevent permanent tree injury. Care for serious injury should be prescribed by a professional forester or licensed tree expert. vi. Tree limb removal, where necessary, will be done as natural target pruning to remove the desired branch as close as possible to the branch collar. There should be NO flush cuts. Flush cuts destroy a major defense system of the tree. See Figure 9—1. No tree paint shall be applied. All cuts shall be made at the outside edge of the branch collar (fig. 9—1 and 9—2). Cuts made too far beyond the branch

collar may lead to excess sprouting, cracks and rot. Removal of a "V" crotch should be considered for free standing specimen trees 9see Figure 9-2_ to avoid future splitting damage. Note: For more specific data on certain tree characteristics by species, see Table 9.1. Tree Characteristics or consult with a Licensed Professional Tree Expert, Soil Conservation District or Rutgers Cooperative HMANN

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