

Wilmington Town Beach (Lake Raponda) Erosion Mitigation Project
Green Mountain Beach, Lake Raponda
Wilmington, Vermont
September 16, 2026

REQUEST FOR BIDS

Windham County Natural Resources Conservation District (WCNRCD), with financial assistance provided by the Mount Ascutney Regional Commission Enhancement Design and Implementation Block Grant, requests bids from qualified contractors to implement water quality improvements at the Green Mountain Beach in Wilmington, VT.. Details of the project are provided on the following pages and in the attached construction drawings prepared by DuBois&King, Inc.. A project timeline is provided below. Instructions for submission of the bid sheet are provided below.

Bidders are required to submit bids via email to WCNRCD at the email address listed below. **Emailed bid submissions must be received by 5:00 PM on October 9th, 2026.** Late bids will not be considered. DBE businesses are encouraged to submit proposals.

Bids should be clearly marked and submitted via email to Cory Ross at: ross.wcnrcd@gmail.com

Project Schedule:

September 16, 2006	Issued Invitation to Bid
September 24, 2026	Mandatory Pre-Bid Walkthrough
October 2, 2026, at 5:00 PM	Bids Due
October 9, 2026	Awards Announced
November 9, 2026	Construction Begins(tentative pending permits)
May 21, 2027 or earlier	Project Completion Date

A mandatory pre-bid site visit is scheduled for Thursday, September 24 at 10 AM. Further details about the site work will be provided during the walk-through. **RSVP for walkthrough required** to Andrea Haynes (email below). Following the pre-bid meeting questions about the scope of work should be emailed to Andrea Haynes at ahaynes@dubois-king.com

Wilmington Town Beach Erosion Mitigation Project - Request for Bids

Summary of Work:

This project consists of a variety of practices at the Green Mountain Beach on Lake Raponda to reduce erosion and protect water quality. Practices include grass pavers, infiltration steps, a bioswale, a dry-stacked stone walk, stone bridge, plunge pool, dry swale, check dam, benches and plantings. Please review the attached bid set designs and full specs for project details.

Project Timeline

All project components requiring in-lake work must be completed in the fall of 2027. No in-lake work is allowed in the spring. Remaining project components may be completed in the spring of 2027 if necessary. Project must be completed and the beach ready for public use by May 21, 2027. Project start is anticipated to be November 9, 2026 pending all permits being in hand. Selected contractor will be notified as soon as required permits are in hand. Alternate proposals that plan for in-lake work in the fall of 2027 (after October 11) may be considered if no suitable proposals on the preferred timeline are received.

Breakdown of Responsibilities:

Please review the attached full spec for a full list of contractor responsibilities. A Contractor bid sheet is provided on the following page.

Note: All imported materials will be purchased, delivered, and installed by the Contractor.

Bid Proposal Requirements:

Bids shall be submitted to ross.wcnrcd@gmail.com. The bid proposals shall detail the following:

- Confirmation that all elements of the scope of work and schedule as described above, and shown on the plans, can be met.
- A list of personnel and explanation of prior experience. Provide up to two examples of work on projects similar to this scope of work, and two client references.
- A not-to-exceed lump sum cost proposal. The lump sum proposal shall be supported by an itemized and detailed list of unit costs for materials and labor using the attached bid sheet.

Wilmington Town Beach Erosion Mitigation Project - Request for Bids

BID SHEET

Proposal Dated _____

Contractor Name _____

Contractor Signature* _____

***Commitment to Schedule**

In providing this bid proposal, Contractor acknowledges the **required completion date of May 21, 2027 for all aspects. If Contractor cannot meet this schedule, please provide an alternate proposed schedule.** Selected Contractor will be required to provide certificates of liability insurance and workers compensation coverage prior to starting work. Contractor acknowledges all conditions of attached bid full specs and attachments C and D (attached). Insurance requirements are as follows:

- Workers Compensation as required by law
- Automobile Liability Insurance covering liability arising out of any auto used in the course of this contract and providing coverage for bodily injury and property damage. Minimum coverage of at least \$300,000 per accident is required.
- Commercial General Liability Insurance that covers liability arising from premises, operations, independent contractors, products-completed operations, personal injury and advertising injury, and liability assumed under an insured contract, including tort liability of another assumed in a business contract. Limits of liability must be not less than \$1,000,000 for an occurrence. "Claims made" policies are not acceptable.
- Owner as an Additional Insured: All insurance policies required under this agreement (except workers compensation) must name the owner, owner's agents and owner's employees as an additional insured. This coverage must be primary.
- Certificates of Insurance: Before commencing work, the contractor must file completed W-9's, and certificates of insurance for each required policy with the district. Each certificate must establish that the required insurance coverages are in force, and provide that the district will be given 30-days written notice of any material change in, cancellation of , or intent not to renew any policy.

Project #230341

Lake Raponda Shoreline Erosion Control

Green Mountain Beach, Wilmington, VT

Technical Specifications

August 13, 2026

LIST OF DRAWING SHEETS

The drawings listed below accompanying this specification form a part of the contract.

<u>NO.</u>	<u>SHEET</u>	<u>TITLE</u>
1	G-1.0	TITLE SHEET
2	G-1.1	NOTES
3	L-1.0	EXISTING CONDITIONS AND DEMO
4	L-1.1	EROSION PREVENTION & SEDIMENT CONTROL
5	L-1.2	SITE PLAN
6	L-2.0	LAYOUT PLAN
7	L-3.0	PLANTING PLAN
8	L-5.0	DETAILS-EPSC
9	L-5.1	DETAILS
10	L-5.2	DETAILS
11	L-5.3	DETAILS
12	L-5.4	PLANTING DETAILS

LIST OF SPECIFICATIONS

<u>NO.</u>	<u>TITLE</u>
01 0000	GENERAL REQUIREMENTS
01 3323	ADMINISTRATIVE REQUIREMENTS
31 2200	SITE GRADING
31 2316	EXCAVATING & BACKFILLING
31 2500	EROSION CONTROL
32 3223	DRY STONE WALL
32 9113	SOIL PREPARATION
32 9211	RESTORATION OF SURFACES
32 9219	TOPSOILING & SEEDING
32 9300	PLANTS

SECTION 01 00 00
GENERAL REQUIREMENTS

PART 1 – GENERAL**1.1 GENERAL INTENTION**

- A. Contractor shall completely prepare site for landscape improvements, including demolition and removal of existing site elements, and furnish labor and materials and perform work for The Town of Wilmington, VT (Owner).

1.2 STATEMENT OF BID ITEMS

- A. **ITEM I, GENERAL CONSTRUCTION:** The General Contractor will be responsible for all facets of construction management and construction work and the management of subcontractors to facilitate a construction Project. Work includes general construction, alterations, planting, grading, drainage, necessary removal of existing structures and construction and certain other items.

1.3 COORDINATION

- A. Coordinate work and products meeting the requirements associated with all applicable specification sections and plans to produce a complete system, functional, and ready for the purpose intended.
- B. Pre-work Site Re-visit Requirements: Before starting work in a particular area, visit the worksite and carefully examine the areas to verify complexity, existing conditions and difficulties that will affect work including all work done under various specification sections. Commencement of work shall be construed as acceptance of the existing conditions and difficulties. No change to the contract price or schedule shall be allowed for work caused by unfamiliarity with the site conditions that are visible or readily construed by an experienced observer.
1. Coordinate the location of all work, equipment and components with all trades and equipment installers to prevent interferences and maintain proper use and access to all items and spaces. General Contractor is responsible for coordinating all equipment and components being installed with the placement location and dimension requirements. All work shall be coordinated with other trades to avoid conflicts and to obtain a neat, competent installation that will afford maximum accessibility for easy and proper operation, maintenance, service, and headroom. Disturbed or damaged work shall be replaced or repaired to new conditions. Any items determined to be in non-compliance shall be corrected by the Contractor at no additional expense to the Owner.

1.4 PRE-CONSTRUCTION CONFERENCE

Schedule a pre-construction meeting with the Design Professional and Owner Representative at least seven (7) days before beginning work to review any questions the Contractor may have regarding the work, administrative procedures during construction

and project work schedule.

1.4 OPERATIONS AND STORAGE AREAS

1. Contractor shall store all materials according to manufacturer's given conditions.
2. A dock is stored on Green Mountain Beach between Labor Day and Memorial Day. Contractor shall either work around or move the dock to an area where it will not be damaged by construction activities. The Contractor will be responsible for any damages to the dock and is expected to only move it in a way that prevents damage.
3. Keep public roads clear of construction materials, debris and standing construction equipment and vehicles.
4. Construction Fence: Green Mountain Beach will be closed to the public after Labor Day and the Contractor shall maintain a secure construction site. Before construction operations begin, Contractor shall provide a chain link construction fence, 1.8m (6 feet) minimum height around the construction area. No fabric for privacy screening is required.
5. Remove the fence only when directed by Design Professional or Owner.

1.5 ALTERATIONS

- A. Survey: Before any work is started, the Contractor shall make a thorough survey of the project area and shall note any discrepancies between drawings and existing conditions at site.
- B. Protection: Provide the following protective measures:
 1. Temporary tree protection fences as per Erosion and Sediment Control Plan and details.

1.6 PROTECTION OF EXISTING VEGETATION AND STRUCTURES

- A. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall not remove trees and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workers, the Contractor shall trim those limbs or branches with a clean cut under direction of Landscape Architect.
- B. The Contractor shall protect from damage, all existing improvements at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails

or refuses to repair the damage promptly, the Owner may have the necessary work performed and charge the cost to the Contractor.

- C. Refer to Section 31 2500 EROSION CONTROL for additional requirements on protecting vegetation, soils and the environment.

1.7 RESTORATION

- A. Restoration to the laydown area must be included in the mobilization cost. See Sections 32 9211 RESTORATION OF SURFACES and 32 9219 TOPSOIL AND SEEDING.

1.8 TEMPORARY TOILETS

- A. Provide at project sites under construction, (for use of all Contractor's workers) ample temporary sanitary toilet accommodations, meeting all OSHA requirements including sufficient quantity for number of employees and required cleaning schedule.

1.9 AVAILABILITY AND USE OF UTILITY SERVICES

- A. No public water is available on site for use by Contractor. Watering of new plantings must be completed by Contractor by bringing water onto site.

PART 3 – SUBMITTALS

3.1 AS-BUILT DOCUMENTATION

- A. The contractor shall maintain a full size set of red-line drawings which will be kept current during construction of the project, to include all contract changes, modifications, and clarifications. To ensure compliance, red-line drawings shall be made available for the Design Professional and/or Owner to review, as often as requested.
- B. Record Specifications: The Contractor shall maintain a copy of the original project specifications and any related documentation to be submitted thirty (30) days prior to the prefinal inspection. This shall include:
 - 1. A copy of the original project specifications.
 - 2. A copy of any RFI(s) completed and/or approved during the duration of the project.
 - 3. A copy of any substitution form(s) approved during the duration of the project.
 - 4. The full set of as-builts and red-line drawings for the entirety of the project, one (1) copy in physical form and one (1) copy in electronic PDF format.

END OF SECTION

SECTION 01 33 23
ADMINISTRATIVE REQUIREMENTS

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This specification defines the general requirements and procedures for submittals. A submittal is information submitted to the Landscape Architect/Engineer and Town of Wilmington (Owner) to review and to establish compliance with the contract documents.
- B. Detailed submittal requirements are found in the technical sections of the contract specifications and on the contract drawings.

1.2 DEFINITIONS

- A. Preconstruction Submittals: Submittals which are required prior to issuing contract notice to proceed or starting construction. For example, Certificates of insurance; Surety bonds; Site-specific safety plan; project schedule; Construction progress schedule; Schedule of values; Submittal register; List of proposed subcontractors.
- B. Shop Drawings: Drawings, diagrams, and schedules specifically prepared to illustrate some portion of the work. Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will be integrated and coordinated.
- C. Product Data: Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions, and brochures, which describe and illustrate size, physical appearance, and other characteristics of materials, systems, or equipment for some portion of the work. Samples of warranty language when the contract requires extended product warranties.
- D. Samples: Physical examples of materials, equipment, or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project. Field samples and mock-ups constructed to establish standards by which the ensuing work can be judged.
- E. Schedule: Generally, a table or spreadsheet listing where or in what application a material will be used.
- F. Design Data: Calculations, mix designs, analyses, delegated designs, or other data pertaining to a part of work.
- G. Test Reports: Report which includes findings of a test required to be performed by the Contractor on an actual portion of the work. Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

- H. Certificates: Document required of Contractor, or of a manufacturer, supplier, installer, or subcontractor through Contractor. The purpose is to document procedures, acceptability of methods, or personnel qualifications for a portion of the work.
- I. Manufacturer's Instructions: Pre-printed material describing installation of a product, system, or material, including special notices and MSDS concerning impedances, hazards, and safety precautions.
- J. Manufacturer's Field Reports: Documentation of the testing and verification actions taken by manufacturer's representative at the job site on a portion of the work, during or after installation, to confirm compliance with manufacturer's standards or instructions. The documentation must indicate whether the material, product, or system has passed or failed the test.
- K. Operation and Maintenance Data: Manufacturer data that is required to operate, maintain, troubleshoot, and repair equipment, including manufacturer's help, parts list, and product line documentation. This data shall be incorporated in an operations and maintenance manual.
- L. Closeout Submittals: Documentation necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings, warranty management plan, final documentation, and any other requirements specified in other sections. Also, submittal requirements necessary to properly close out a phase of construction on a multi-phase contract.

1.4 SUBMITTAL SCHEDULING

- A. Submittals are to be scheduled, submitted, reviewed, and approved prior to the acquisition of the material or equipment.
- B. Coordinate scheduling, sequencing, preparing, and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow time for potential resubmittal.
- C. No delay costs or time extensions will be allowed for time lost in late submittals or resubmittals.
- D. All submittals are required to be approved prior to the start of the specified work activity.
 - 1. The contractor shall not order any material until the submittal is approved by the Landscape Architect/Engineer and/or Owner.

1.5 SUBMITTAL PREPARATION

- A. Each submittal is to be complete and in sufficient detail to allow ready determination of compliance with contract requirements.
- B. All submittals shall include SDS sheets within the product data submittal as necessary.
- C. Collect required data for each specific material, product, unit of work, or system into a single submittal. Prominently mark choices, options, and portions applicable to the submittal. Partial submittals will not be accepted for expedition of construction effort. Submittal will be returned without review if incomplete.

- D. Submit submittals, shop drawings and product data grouped together in single packaged submittals including complete submittals, related systems, products and all accessories.
- E. The Contractor shall submit to the Landscape Architect/Engineer a Submittals List for review and acceptance. The Submittal phase shall not commence until this proposed list has been returned. The Contractor shall manage the overall Submittal process but the Owner reserves the right to request additional submittals at any point within the construction phase of the project.
- F. Refer to individual Specification sections and drawings for required submittals.
- G. Simple duplication of the contract drawings as a means to address coordination drawing requirements is not permitted and will be rejected. Prime Contractor is responsible to assure duplication is not permitted; actual scaled coordination drawings developed by the Contractors are required.
- H. Coordinated construction is the responsibility of the Contractor and requests for additional costs due to layout errors, conflicts, delays or schedule impacts due to lack of overall documented coordination is not permitted.
- I. Submit shop drawings for the following:
 - a) Handrails
- J. Submit shop drawings and product data grouped to include complete submittals or related systems, products, and accessories in a single submittal.
- K. Provide operation and maintenance manuals for any materials on project. Manuals will be submitted for review before Owner performs punch list. See paragraph 1.8.
- L. If available product data is incomplete, provide Contractor-prepared documentation to supplement product data and satisfy submittal requirements.
- M. Prior to submission, all irrelevant or unnecessary data shall be removed from the submittal to facilitate accuracy and timely processing. Submittals that contain the excessive amount of irrelevant or unnecessary data will be returned without review.
- N. Provide a transmittal form for each submittal with the following information:
 - 1. Project title, location and number.
 - 2. Date of the drawings and revisions.
 - 3. Name, address, and telephone number of subcontractor, supplier, manufacturer, and any other subcontractor associated with the submittal.
 - 4. Number of the specification section and/or sheet number of the contract drawings by which the submittal is required.
 - 5. When a resubmission, add alphabetic suffix on submittal description. For example, submittal 18 would become 18A, 18B, 18C, continually to indicate resubmissions.
 - 6. Product identification and location in project.

- O. The Contractor is responsible for reviewing and certifying that all submittals are in compliance with contract requirements before submitting to Owner for review. Proposed deviations from the contract requirements are to be clearly identified. All deviations submitted must include a side-by-side comparison of item being proposed against item specified. Failure to point out deviations will result in the Owner requiring removal and replacement of such work at the Contractor's expense.
- P. Any deviation from the specification will require a formal memo from the Contractor's subject matter expert (manufacturer, subcontractor) that proposed product/assembly meets the intent of the specification and why the specificity of the specification cannot be met.

1.6 SUBMITTAL FORMAT AND TRANSMISSION

- A. Provide submittals in electronic format, with the exception of material samples, submittals are to be a PDF as the electronic format, unless otherwise specified or directed by the Landscape Architect/Engineer.
- B. Compile the electronic submittal file as a single, complete document. Name the electronic submittal file specifically according to its contents.
- C. Electronic files must be of sufficient quality that all information is legible. Generate PDF files from original documents so that the text included in the PDF file is both searchable and can be copied.
- D. Provide electronic submittal documents, requests for information, photographs, daily logs, and any other construction documents through email to Owner.

1.7 SAMPLES

- A. Submit two (2) sets of physical samples showing range of variation, for each required item, or as per specification. Technical specification sections supersede this requirement if they are greater.
- B. Before submitting samples, the Contractor is to ensure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.
- C. The Owner reserves the right to disapprove any material or equipment which previously has proven unsatisfactory in service.
- D. Physical samples supplied may be requested back for use in the project after reviewed and approved.

1.8 OPERATION AND MAINTENANCE DATA

- A. Provide any available operations and maintenance data from manufacturer's and suppliers to Owner at completion of project.

1.10 REVIEW OF SUBMITTALS AND RFIs

- A. The Landscape Architect/Engineer and/or Owner will review all submittals for compliance with the technical requirements of the contract documents. Review will be only for conformance with the applicable codes, standards and contract requirements.

- B. Period of review for submittals begins when the Landscape Architect/Engineer receives submittal from the Contractor.
- C. Period of review for each resubmittal is the same as for initial submittal.
- D. Review period is fifteen (15) business days for submittals.
- E. Review period is ten (10) business days for RFIs.
- F. The Landscape Architect/Engineer will return submittals to the Contractor with the following notations:
 - 1. "Approved": authorizes the Contractor to proceed with the work covered.
 - 2. "Approved as noted": authorizes the Contractor to proceed with the work covered provided the Contractor incorporates the noted comments and makes the noted corrections.
 - 3. "Revise and resubmit": indicates noncompliance with the contract requirements or that submittal is incomplete. Resubmit within fifteen (15) days with appropriate changes and corrections. No work shall proceed for this item until resubmittal is approved.

1.11 APPROVED SUBMITTALS

- A. The approval of submittals is not to be construed as a complete check, and indicates only that the general method of construction, materials, detailing, and other information are satisfactory.
- B. Approval of a submittal does not relieve the Contractor of the responsibility for any error which may exist. The Contractor is responsible for fully complying with all contract requirements and the satisfactory construction of all work, including the need to check, confirm, and coordinate the work of all subcontractors for the project. Non-compliant material incorporated in the work will be removed and replaced at the Contractor's expense.
- C. After submittals have been approved, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.
- D. Retain a copy of all approved submittals at project site, including approved samples.

1.12 WITHHOLDING OF PAYMENT

- A. Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

END OF SECTION

**SECTION 31 2200
SITE GRADING****PART 1 - GENERAL****1.01 DESCRIPTION**

- A. Work covered by this Section includes site grading, filling, riprapping and the construction of berms.
- B. Related work specified elsewhere includes:

Excavating, Trenching & Backfilling	31 2316
Erosion Control	31 2500
Restoration of Surfaces	32 9211
Topsoil and Seeding	32 9219

1.02 QUALITY ASSURANCE

- A. When placing fill or constructing embankments, moisten or dry fill material to the proper moisture content as determined by ASTM D1557, Method C.

1.03 SUBMITTALS

- A. See Administrative Requirements for submittal procedures.
- B. Copies of all results of maximum density tests and field compaction density tests.
- C. Gradations of stone, gravel, and other materials proposed for use.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Delivery of borrow materials to the site or removal of spoil from the site shall be done in a manner which will not cause any nuisance or allow spillage of materials from the transporting vehicle.
- B. Store topsoil separately from all other excavated materials and preserve for reuse.
- C. Materials which are required to be stored shall be stored in an orderly manner and at a sufficient distance away from banks of excavations and trenches to avoid overloading and prevent slides or cave-ins. Do not store materials on, over or adjacent to structures or utilities which may collapse due to the added weight.
- D. Promptly remove materials not specified to be stored or reused.
- E. Obstruction of roads, driveways, sidewalks or interference with drainage along gutters, ditches or drainage channels with stored material is not permitted. If materials cannot be stored at the site to avoid such obstructions and interferences, they shall be stored away from the site and brought back when and as needed.

1.05 JOB CONDITIONS

- A. Keep ground surface well drained but avoid erosion. Do not place fill in water or over ice or snow.
- B. Filling with frozen materials or when materials already in place are frozen, is not permitted.

1.06 SCHEDULING AND SEQUENCING

- A. Schedule the Work with Landscape Architect/Engineer and afford them adequate time and space to make all required inspections.
- B. Schedule work and coordinate operations with the approved testing laboratory. If the laboratory cannot be available to perform required tests, grading and filling operations may have to be delayed in order to accomplish certain field tests.

PART 2 - PRODUCTS

2.01 FILL MATERIAL

- A. Unless otherwise specified or directed by Landscape Architect/Engineer, all fill material shall be Common Earth or Select Earth, as defined in Section 31 2316.
- B. To the extent it is available, fill material shall consist of approved on-site materials. When there is insufficient approved materials on-site, import approved additional material from off-site, at no additional cost to the Owner.

2.02 RIPRAP

- A. Stone for riprap shall be approved, rough, unhewn quarry stone, as nearly rectangular in section as practicable. The stones shall be hard, sound and resistant to the action of water and weathering. They shall be of a rock type other than serpentine rock containing the fibrous variety chrysotile (asbestos) and suitable in every respect for the purpose intended.
 - 1. Type II Rip Rap
 - A. Median Stone Size (D_{50}): 12 inches (50% of the stones by weight or volume exceed a 12-inch intermediate/longest dimension).
 - B. Stone Size Range: Individual stones vary in length from 2 inches to 36 inches.
 - C. Composition Percentage: At least 50% of the material must consist of stones with a longest dimension of 12 inches or greater.

2.04 CRUSHED GRAVEL FOR SUBBASE

- A. Shall follow VTrans specification 301.
- B. Shall be produced from natural gravels or crushed quarried rock and shall be reasonably free from silt, loam, clay or organic matter. It shall be obtained from VTrans approved sources and shall meet the following requirements:
 - a. Grading: Crushed Gravel for Subbase shall be uniformly graded from coarse to fine and shall meet the gradation requirements of Table 704.05A or Table 704.05B as determined in accordance with the requirements of AASHTO T 27 and AASHTO T 11

TABLE 704.05A – GRADATION OF SUBBASE OF CRUSHED GRAVEL, COARSE GRADED

<u>Sieve Designation</u>	<u>Percentage by Mass (Weight) Passing Square Mesh Sieves</u>
4 inch (100 mm)	95 – 100
No. 4 (4.75 mm)	25 – 50
No. 100 (0.150 mm)	0 – 12
No. 200 (0.075 mm)	0 – 6

TABLE 704.05B – GRADATION OF SUBBASE OF CRUSHED GRAVEL, FINE GRADED

<u>Sieve Designation</u>	<u>Percentage by Mass (Weight) Passing Square Mesh Sieves</u>
2 inch (50.0 mm)	100
1-1/2 inch (37.5 mm)	90 – 100
No. 4 (4.75 mm)	30 – 60
No. 100 (0.150 mm)	0 – 12
No. 200 (0.075 mm)	0 – 6

2.05 DENSE GRADED CRUSHED STONE FOR SUBBASE

- A. Dense graded Crushed Stone for Subbase shall consist of clean, hard, uniformly graded, crushed stone. It shall be sufficiently free from dirt, deleterious material, and pieces that are structurally weak and shall meet the following requirements:
- B. Source. This material shall be obtained from approved sources. The area from which this material is obtained shall be stripped and cleaned before blasting.
- C. Grading. Dense graded Crushed Stone for Subbase shall meet the gradation requirements of Table 704.06A as determined in accordance with the requirements of AASHTO T 27 and AASHTO T 11.

TABLE 704.06A – GRADATION OF DENSE GRADED CRUSHED STONE FOR SUBBASE

<u>Sieve Designation</u>	<u>Percentage by Mass (Weight) Passing Square Mesh Sieves</u>
3-1/2 inch (87.5 mm)	100
3 inch (75.0 mm)	90 – 100
2 inch (50.0 mm)	75 – 100
1 inch (25.0 mm)	50 – 80
1/2 inch (12.5 mm)	30 – 60
No. 4 (4.75 mm)	15 – 40
No. 200 (0.075 mm)	0 – 6

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify that all boundaries of temporary and permanent easements and property lines are clearly marked in the field and that the Work will not violate these boundaries.

- B. Verify that the clearing and grubbing operations have been completed.
- C. Ascertain and verify the locations and character of structures, underground lines and subsurface conditions and verify that the Work will not adversely affect them.
- D. Verify that grade stakes have been properly and accurately set.
- E. Do not begin operations until conditions are satisfactory.

3.02 STRIP AND STOCKPILE TOPSOIL

- A. Strip topsoil to its full depth within all areas to be excavated or graded and in areas to receive pavements, fills or embankments except where existing ground is to be left undisturbed.
- B. Store topsoil on-site, in storage piles. Keep topsoil separated from all other excavated materials and store free of roots and other undesirable materials.

3.03 DISPOSAL OF MATERIALS

- A. Use approved on-site materials to the extent they are available. Promptly dispose of any excess material, off-site.
- B. Remove from the site all unsuitable material. Do not store or stockpile unsuitable material at the Project site and do not incorporate into the Work.

3.04 SITE GRADING

- A. Rough grade the portions of the site which must be raised or lowered in order to properly execute the work under other Sections.
- B. Uniformly grade the site to the lines, grades and elevations shown on the Drawings. Finished surfaces shall be reasonably smooth, compacted and free from irregular surface changes. Unless otherwise specified, the finish shall be equivalent to that ordinarily obtainable from either blade grader or scraper operations.
- C. In unpaved areas, except those to be riprapped, lined or specially treated, smooth the surface sufficiently for application of topsoil. The finished topsoil subgrade shall not be more than 1" above or below the established grade, cross section, or detail.
- D. In unpaved areas, the finished grades shown on the Drawings include a layer of topsoil. The thickness of the topsoil is specified on the Drawings, or if not shown, as specified in Part 3 of Section 32 9219.

3.07 PREPARATION OF PAVEMENT SUBBASES

- A. Shape the entire subbase to the required line, grade or detail. Remove and dispose of all soft and unsuitable material and replace with an approved material. Remove and dispose of all boulders and ledge rock unless reused on site. Break off to a depth of not less than 6" below the subbase. Fill resulting depressions with an approved material.

- B. After rolling, the surface of the subbase shall not show any deviation in excess of 3/4" when tested with a 10' straight edge applied both parallel to and at right angles to the centerline of the area. The elevation of the finished subbase shall not vary more than 0.05' from the established grade and cross section.
- C. Do not disturb the finished subbase by traffic or other operations and protect and maintain in a satisfactory condition until the overlaying pavement is placed.

3.08 SUBBASE PROTECTION

- A. Keep the excavations shaped and well drained. Where ruts or erosion occur, add additional fill and reshape and recompact before placing paving materials.
- B. The storage or stockpiling of material on prepared subbases is not permitted.
- C. All subbases will be inspected by Landscape Architect/Engineer and paving materials shall not be placed prior to receipt of Landscape Architect/Engineer's approval. The placing of paving materials on a muddy, spongy, weaving or frozen subbase is not permitted.

3.09 DITCHES - SWALES

- A. Accurately cut ditches and swales to the required cross sections, grades, or details. Cut off all roots, stumps, rock and foreign matter, in the sides and bottoms of ditches and swales, to conform to the required slope, grade and shape.
- B. Maintain ditches and swales at all times so that they effectively drain. Refill, reshape and recompact where ruts or erosion occurs.

3.10 DUMPED RIPRAP

- A. Place riprap in a manner so as to produce a reasonably well graded mass of rock with the minimum practicable percentage of voids. The finished stone surface shall be free from objectionable pockets of smaller stones and clusters of larger stones.
- B. Placing stones in layers or dumping by methods likely to cause segregation of the various sizes is not permitted. Obtain the desired distribution of the various sized stones by selective loading, controlled dumping of successive loads or by other approved means.
- C. Completely fill voids with fine stone or gravel. Rearrange stones by mechanical equipment or by hand to the extent necessary to obtain a reasonably well graded distribution.
- D. The final stone surface shall not exceed 3", plus or minus, from the required grades and elevations. Leave riprap in a first stable mass.

END OF SECTION

SECTION 31 2316 EXCAVATING AND BACKFILLING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work covered by this Section includes excavating, trenching and backfilling for the installation of underground lines, structures and foundations.
- B. Related work specified elsewhere includes:
 Restoration of Surfaces 32 9211
- C. Definitions:
1. Earth - Clay, loam, sand, gravel, topsoil and other materials not classified as solid rock or loose rock.
 2. Common Earth - Clay, loam, sand, gravel, topsoil and similar materials which may contain some stones, pebbles, lumps and rock fragments up to 6" in largest dimension, but does not contain debris and frozen material.
 3. Select Earth - Sand, gravel and similar materials which may contain small amounts of stones, pebbles or lumps over 1" in largest dimension, but none over 2" in largest dimension, but does not contain clay, loam, organic material, debris and frozen material.
 4. Crushed Stone - Approved, imported aggregate, ASTM C33, Size 67 (3/4" - No. 4).

Gradation:	Passing 2" Sieve	=	100%
	Passing 1" Sieve	=	90-100%
	Passing 3/4" Sieve	=	0-30%
	Passing #4 Sieve	=	0-5%
 5. Select Fill - Consists of Select Earth, imported sand or other granular materials as approved by Engineer.
 6. Sand Bedding - Sand conforming to ASTM C33, Fine aggregate.

Gradation:	Passing #4 Sieve	=	100%
	Passing #200 Sieve	=	0-12%
 7. Earth Overburden - Earth overlying solid rock and in place during blasting operations or earth not classified as Select or Common Earth.
 8. Unstable Material - Debris, frozen materials, topsoil, quicksand and all wet, soft or loose material which does not provide sufficient bearing capacity to satisfactorily support pipes or other work.
 9. Unsuitable Material - Excavated material which does not meet requirements for backfilling purposes and includes solid and loose rock, earth overburden and unstable material.
 10. Topsoil - Surface layer of soil and sod suitable for use in seeding and planting and not containing debris, subsoil, stumps, roots, brush, stones, clay lumps and similar objects greater than 2" in largest dimension and material toxic to plant growth.

11. Solid Rock, Loose Rock, Common Excavation and Rock Excavation - Defined in Section 31 2316.26 – Rock Removal.
12. Common Excavations - Removal and disposition of all materials, except solid rock, which are encountered within the required widths and depths of excavations.
13. Paved Areas - The area which lies directly under a paved surface, whether it be asphalt, concrete, or other paving materials.
14. Bank Run Gravel - Satisfactorily graded, free draining, hard, durable stone and coarse sand reasonably free from silt, loam, clay and organic matter.

Gradation:	Passing 6" Sieve	=	95-100%
	Passing #4 Sieve	=	25-70%
	Passing #100 Sieve	=	5-20%
	Passing #200 Sieve	=	4-8%
	(Maximum size of 6")		

15. Screened Gravel - Uniformly graded, clean, hard, and durable particles free from an excess of soft, thin, elongated, laminated, or disintegrated pieces and be free from silt, loam, clay or organic matter.

Gradation:	Passing 2" Sieve	=	100%
	Passing 3/4" Sieve	=	90-100%
	Passing 3/8" Sieve	=	0-30%
	Passing #4 Sieve	=	0-5%

16. Crushed Gravel/Granular Fill - Uniformly graded and free of silt, loam, clay or organic matter.

Gradation:	Passing 2" Sieve	=	100%
	Passing #4 Sieve	=	40-70%
	Passing #100 Sieve	=	5-20%
	Passing #200 Sieve	=	4-8%
	(Max. 5% passing #200 sieve for material designated as "frost free")		

1.02 QUALITY ASSURANCE

- A. Unless otherwise specified, or approved by Landscape Architect/Engineer in writing, tunneling is not permitted.
- B. If trench widths are exceeded, redesign with stronger pipe, concrete cradles or other special installation procedures may be required and shall be provided where directed by the Engineer. All additional costs, including the cost of redesigns, shall be borne by Contractor.
- C. Moisten or dry backfill to the proper moisture content as determined in accordance with ASTM D1557, Method C.
- D. All subgrades shall be approved by Landscape Architect/Engineer before pipes or structures are installed or concrete is placed.

WCCD Lake Raponda Green Mountain Beach Shoreline Erosion Control

- E. Do not restrict access to any private road or driveway for more than one hour. Provide and maintain suitable temporary crossings over open ditches where required to meet this condition.
- F. When excavating in or adjacent to the traveled portion of highways, take whatever measures are necessary to protect the road surfaces from becoming undermined.

1.03 SUBMITTALS

- A. See Administrative Requirements for submittal procedures.
- B. Gradations of Stone Bedding, Stone Fill, Sand Bedding, Bank Run Gravel, Screened Gravel, and Crushed Gravel/Granular Fill.
- C. Gradations of other material proposed for use in the work.
- D. Certification from testing laboratory that crushed gravel under-drain material meets permeability requirements at required compaction.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Store topsoil separately from all other excavated materials on the site and preserve for reuse.
- B. Store excavated materials meeting the requirements for backfill in an orderly manner at a sufficient distance away from banks of excavations and trenches to avoid overloading and to prevent slides or cave-ins. Do not store materials on, over or adjacent to structures or utilities which may collapse or become damaged due to promptly and dispose of away from the site.
- C. Promptly remove materials not specified to be stored or reused.
- D. Obstruction of roads, driveways, sidewalks or interferences with drainage along gutters, ditches or drainage channels with stored material is not permitted. If materials cannot be stored at the site to avoid such obstructions and interferences, they shall be stored away from the site and brought back when and as needed.
- E. No construction activity, access, storage or other use shall take place beyond the construction easement boundaries. Landscape Architect/Engineer may require Contractor to install and maintain snow fences along the boundaries, where such boundaries could be violated.

1.05 JOB CONDITIONS

- A. Maintain excavations and trenches free of groundwater, sewage, stormwater, ice and snow during the progress of the Work and until the finished Work is safe from injury.
- B. Protect subgrades against freezing by means of insulated blankets, salt hay, or other methods.
- C. Backfilling with frozen materials or when materials already in place are frozen is not permitted.

PART 2 - PRODUCTS**2.01 MATERIALS**

WCCD Lake Raponda Green Mountain Beach Shoreline Erosion Control

- A. Backfill - General - To the extent suitable materials are available, backfill shall consist of excavated material. Where excavation does not provide sufficient approved material, import additional material from off-site.
- B. Backfill - Around Structures - In paved areas, Select Fill, or a better material when required by the Landscape Architect/Engineer, for the full depth. In un-paved areas, Select Fill for the full depth. Backfill materials shown on the Drawings take precedence over this paragraph.

PART 3 - EXECUTION**3.01 PREPARATION**

- A. Prior to Work of this Section, become thoroughly familiar with the site conditions and all portions of the Work covered by this Section.
- B. Verify that topsoil has been stripped to its full depth and stockpiled for subsequent reuse.
- C. Ascertain and verify the locations and character of structures, underground lines and subsurface conditions and verify that the work will not adversely affect them.

3.04 EXCAVATING

- A. Excavate for structures to the elevations indicated on the Drawings and extend a sufficient distance from foundation walls, piers and footings to provide adequate clearances for construction operations, including sheeting and bracing, if required, and for inspection purposes.
- B. Trim approximately the last four inches of foundation subgrades, in earth, by hand just prior to the placement of concrete or concrete reinforcement.

3.06 UNSTABLE MATERIALS

- A. Whenever the material encountered is, in Contractor's opinion, incapable of providing adequate support, he/she shall immediately notify the Landscape Architect/Engineer for verification.

3.07 DISPOSAL OF EXCAVATED MATERIALS

- A. Remove excess excavated materials and dispose off-site.
- B. Load and remove unsuitable materials and dispose off-site. The storing or stockpiling of unsuitable material is not permitted and such material shall be loaded directly from the excavation onto trucks.

3.08 PREPARATION FOR BACKFILLING

- A. Immediately prior to backfilling, remove all rubbish, debris, forms and similar materials from the excavation.

3.11 GRANULAR FILL UNDER SLABS & FOOTINGS

- A. Prior to placing granular fill, all organic material, topsoil, debris and any other deleterious material shall be removed.
- B. Place material in maximum 8" lifts and compacted to 95% of maximum density at optimum moisture content as determined by ASTM D1557, Modified Proctor.
- C. If the materials density tests less than 95%, corrective action and additional testing will be required. The additional testing and corrective action will be paid for by the Contractor.

3.15 ADJUST AND CLEAN

- A. Any trenches or excavations which have been backfilled and show any evidence of settlement or being improperly backfilled, or have been tested and failed, shall be re-excavated to the depth required for proper compaction and then properly refilled and compacted.

END OF SECTION

**SECTION 31 2500
EROSION CONTROL****PART 1 - GENERAL****1.01 DESCRIPTION**

- A. Work covered by this Section includes the control of erosion, siltation, and sedimentation.
- B. Related work specified elsewhere includes:

Site Grading	31 2200
Excavating, Trenching, and Backfilling	31 2316

1.02 PROJECT REQUIREMENTS

- A. Take every reasonable precaution and do whatever is necessary to avoid any erosion and to prevent silting of rivers, streams, lakes, reservoirs, impoundments, and drainage ditches and swales.
- B. The exposure of uncompleted cut slopes, embankments, trench excavations, and site graded areas shall be kept as short as possible. Initiate seeding and other erosion control measures on each segment as soon as reasonably possible.
- C. Should it become necessary to suspend construction for any length of time, shape all excavated and graded areas in such a manner that runoff will be intercepted and diverted to points where minimal erosion will occur. Provide and maintain temporary erosion and sediment control measures, such as berms, dikes, slope drains, silt stops, and sedimentation basins, until permanent drainage facilities or erosion control features have been completed and are operative.
- D. Fine material placed or exposed during the work shall be so handled and treated as to minimize the possibility of its reaching any surface waters. Use diversion channels, dikes, sediment traps, or any other effective control measures.
- E. Provide silt stops wherever erosion control measures may not be totally capable of controlling erosion, such as in drainage channels and where steep slopes may exist.
- F. Before water is allowed to flow in any ditch, swale, or channel, install the permanent erosion control measures in the waterway so that the waterway will be safe against erosion.
- G. Take special precautions in the use of construction equipment to minimize erosion. Do not leave wheel tracks where erosion might begin.
- H. Unless specifically required in the Contract Documents, the operation of mechanized equipment in watercourses is not permitted. Where work is required in watercourses, minimize the movement of equipment in the waters and remove falsework, pilings, debris, and other temporary work as soon as construction will allow.
- I. Wherever crossings of live streams are necessary, provide temporary culverts or bridges to allow equipment to cross them without fording them. Disturbance of lands and waters outside

the limits of construction is prohibited, except as may be found necessary and approved by Landscape Architect.

- J. The requirements of this Section also apply to Project related construction activities away from the Project site, such as at borrow pits, off-site storage areas, and haul and work roads.
- K. Mulching shall immediately follow the seeding operation on the same work day.
- L. Should any protective measures employed indicate any deficiencies or erosion taking place, immediately provide additional materials or employ different techniques to correct the situation and to prevent subsequent erosion.
- M. Continue erosion control measures until the permanent measures have been sufficiently established and are capable of controlling erosion on their own.
- N. Comply with all Federal, State, and Local laws, ordinances, rules, and regulations.

1.03 QUALITY CONTROL

- A. Provide at least one person who shall be present at all times during erosion control operations and who shall be thoroughly familiar with the types of materials being installed and the best methods for their installation and who shall direct all work performed under this Section.
- B. Material manufacturers and vendors shall be reputable, qualified firms regularly engaged in producing the required types of materials.
- C. Protect and maintain all areas disturbed by the Work, such that erosion is adequately controlled and silt and sediments are not allowed to flow into any watercourse, onto adjacent properties, or into storm drains.

PART 2 - PRODUCTS

2.01 STRAW MULCH

- A. General - Straw mulches shall be reasonably free from swamp grass, weeds, twigs, debris and other deleterious material, and free from rot, mold, primary noxious weed seeds, and rough or woody materials. Mulches containing mature seed of species which would volunteer and be detrimental to the permanent seeding, or would result in overseeding, or would produce growth which is aesthetically unpleasing, is not permitted.
- B. Straw Mulch - Threshed plant residue of oats, wheat, barley, rye, or rice from which grain has been removed. Apply at the rate of 2 to 3 tons/Ac., or at 1.5 tons/Ac. when a net or a mulch stabilizer is used with the mulch.

2.02 MATTING/BLANKETS

- A. Nomenclature - The various materials under this Paragraph are sometimes referred to as "matting" and "blankets". These words are interchangeably used throughout this Section, but the meanings shall be the same.

WCCD Lake Raponda Green Mountain Beach Shoreline Erosion Control

- B. Jute Matting - Undyed and unbleached jute yarn woven into a uniform open, plain weave mesh, furnished in rolled strips conforming to the following physical requirements:

Width - 48", plus or minus 1"
- 78 warp ends per width of cloth
- 41 weft ends per yard

Weight - 1.22-1.80 lbs./LY, plus or minus 5%

- C. Excelsior Matting - Uniform web of interlocking wood excelsior fibers with a backing of mulchnet fabric on one side only. The mulchnet shall be woven of either twisted paper chord or cotton cord. Excelsior matting shall be furnished in rolled strips and shall conform to the following physical requirements.

Width - 36", plus or minus 1"
Weight - 0.80 lbs/SY, plus or minus 5%

- D. Staples - No. 11 (or heavier) plain iron wire, made from at least 12" lengths of wire bent to form a "U" of 12" to 2" in width. Use longer staples for loose soils or where otherwise required.

2.03 SEED EROSION CONTROL

- A. For Temporary Control Use - annual or perennial ryegrass.
B. For Permanent Control - See Section TOPSOIL AND SEEDING.

2.05 SILT FENCES

- A. "Geofab Silt Fence" by Mercantile Development, Inc., "Mirafi 100X" by Celanese Fibers Marketing Co., or an approved equal.

PART 3 - EXECUTION

3.01 STRAW MULCHING

- A. Install straw mulch immediately after each area has been properly prepared. When permanent seed or seed for temporary erosion control is sown prior to placing the mulch, place mulch on seeded areas immediately after seeding. Landscape Architect may authorize the blowing of chopped mulch provided that 95% of the mulch fibers will be 6 inches or more in length and that it can be applied in such a manner that there will be a minimum amount of matting that would retard the growth of plants. Hay mulch should cover the ground enough to shade it, but the mulch should not be so thick that a person standing cannot see the ground through the mulch. Remove matted mulch or branches.
- B. Where mild winds may blow the mulch, or when ground slopes exceed 15%, or when otherwise required to maintain the mulch firmly in place, apply a system of pegs and strings, or temporary type netting to the mulch. Unless otherwise directed, remove the strings and netting prior to the acceptance of the Work.

- C. Where high winds exist, or heavy rainstorms are likely, or where ground surfaces are steep, or where other conditions require, apply temporary type netting over the mulch and take whatever measures are necessary to maintain the mulch firmly in place.
- D. Unless otherwise specified, the use of permanent type netting is not permitted without the prior approval of Landscape Architect.

3.02 MATTING/BLANKETS - GENERAL

- A. Prepare surfaces of ditches and slopes to conform to the grades, contours and cross sections shown on the Drawings and finish to a smooth and even condition with all debris, roots, stone, and lumps raked out and removed. Loosen the soil surface to permit bedding of the matting. Unless otherwise noted, place seed prior to the placement of the matting.
- B. Unroll matting parallel to the direction of flow of water and loosely drape, without folds or stretching, so that continuous ground contact is maintained.
- C. In ditches and swales, and on slopes, each upslope and each downslope end of each piece of matting shall be placed in a 6 inch trench, stapled at 12 inches on center, backfilled, and tamped. Similarly, bury edges of matting along the edges of catch basins and other structures. Landscape Architect may require that any other edge, exposed to more than normal flow of water, be buried in a similar fashion.
- D. Tightly secure matting to the soil by staples driven approximately vertically into the ground, flush with the surface of the matting. In driving the staples, take care not to form depressions or bulges in the surface of the matting.
- E. Decrease the specified spacing of staples when varying factors, such as the season of the year or the amount of water encountered or anticipated, requires additional anchoring.
- F. Refer to the following paragraphs for additional requirements on the placement and stapling of matting.

3.03 JUTE MATTING

- A. Where strips are laid parallel or meet, as in a tee, they shall be overlapped at least 4". Overlap ends at least 6", shingle fashion.
- B. Space check slots, built at right angles to the direction of flow of water, so that one check slot or one end occurs within each 50' of length of slope. Construct check slots by placing a tight fold of matting at least 6" vertically into the ground. These shall be tamped the same as the upslope ends.
- C. Press jute matting onto the ground with a light lawn roller or other satisfactory means.
- D. On slopes flatter than 4:1, place staples not more than 3' apart in three rows, for each strip, with one row along each edge and one row alternately spaced down the center. On grades 4:1 or steeper, place staples in the same three rows, but spaced 2'. On lapping edges, double the number of staples, with the spacing halved. Ends of matting and all required check slots shall

have staples placed every foot. Matting placed adjacent to boulders or other obstructions shall be stapled with no spaces between the staples.

- E. Spread additional seed over jute matting, particularly those locations disturbed by the building of slots.

3.04 EXCELSIOR MATTING

- A. Where strips of excelsior matting are laid end to end, butt the adjoining ends.
- B. When adjoining rolls of excelsior matting are laid parallel to one another, butt the matting snugly.
- C. On slopes flatter than 4:1, place staples not more than 3' apart in three rows, for each strip, with one row along each edge and one row alternately spaced down the center. On grades 4:1 or steeper, place staples in the same three rows, but spaced 2'. Ends of matting shall have staples placed every foot. Matting placed adjacent to boulders or other obstructions shall be stapled with no spaces between the staples.

3.05 EROSION CONTROL MULCHING BLANKET

- A. Where one roll ends and a second roll begins, the upslope piece shall be brought over the end of the downslope roll so that there is a 12" overlap, placed in a 4" deep trench, stapled at 12" on center, backfilled and tamped.
- B. On slopes where two or more widths of blanket are applied, the two edges shall be overlapped 4" and stapled at 12" intervals along the exposed edge of the lap joint.
- C. Staple the body of the blanket in a grid pattern with staples 3' on center, each way.

3.06 SEED FOR EROSION CONTROL

- A. Seeding for permanent erosion control shall be carried out in accordance with Section TOPSOIL AND SEEDING.
- B. Areas which will be regraded or otherwise disturbed later during construction may be ordered to be seeded with rye grass to obtain temporary control. The seed shall be sown at the rate of approximately one pound per 1,000 square feet, on the pure live seed basis.

3.07 SILT FENCES

- A. Provide silt fences, as required, for the temporary control of erosion and to stop silt and sediment from reaching surface waters, adjacent properties, or entering catch basins, or damaging the Work.
- B. Erect silt fences and bury bottom edge in accordance with the manufacturer's recommended installation instructions. Provide a sufficient length of fence to accommodate runoff without causing any flooding and to adequately store any silt, sediment, and debris reaching it. See drawings.
- C. Leave silt fences in place until permanent erosion control measures have stopped all erosion and siltation.

3.08 MAINTENANCE

- A. If any staples become loosened or raised, or if any matting becomes loose, torn, or undermined, or if any temporary erosion and sediment control measures are disturbed, repair them immediately.
- B. If seed is washed out before germination, repair any damage, re-fertilize, and reseed.
- C. Maintain mulched and matted areas, silt stops, and other temporary control measures until the permanent control measures are established and no further erosion is likely.

END OF SECTION

SECTION 32 3223**DRY STONE WALL****PART 1 - GENERAL****DESCRIPTION**

Work includes furnishing and installing a coursed dry stone retaining wall to be installed to the lines and grades designated on the project's final construction drawings or as directed by the Architect/Engineer. Included here are the standards of coursed dry stone wall construction, as they should be shown on the construction drawings.

1.02 RELATED SECTIONS

- A. Section 31 2316 – Excavation and Backfilling

1.03 DEFINITIONS:

- A. A Dry Stone Wall is a type of gravity wall. It is built without any mortar, and relies on the mass of the stones and the friction between them.
- B. Terminology for Dry Stone Walls as used in these specifications:
1. Footing: The prepared surface on which the wall is built
 2. Foundation Stones: Large Stones in the bottom of the wall, forming the first course.
 3. Lift: A portion of wall vertically above or below a course with through stones. The First Lift Starts on top of the foundation stones and goes up to the first course of through stones. The second lift is the next in height and so on. The number of lifts is determined by the height of the wall.
 4. Through Stones: Long stones used to tie the face of the wall back to the stones behind. Through stones are typically placed in level courses with a specified horizontal distance between them. The courses of through stones define the top and bottom of the lifts.
 5. Wall Stones: Stones seen in the face of the completed wall.
 6. Backing Stones: Stones used behind the face stones to add mass and structure to the wall.
 7. Pinning: Stones precisely placed to wedge wall stones in place.
 8. Hearting: Stones used to fill voids between wall stones, backing stones, and pinning stones.
 9. Cap Stones: Stones that make up the top course of the wall, covering the top of the final lift.
 10. Top of Wall Width: Is defined by the top of the Cap Stones
 11. Batter: Angle that the face of wall leans back. Typically described in a ratio of 'distance back' to 'height' such as 1:6.

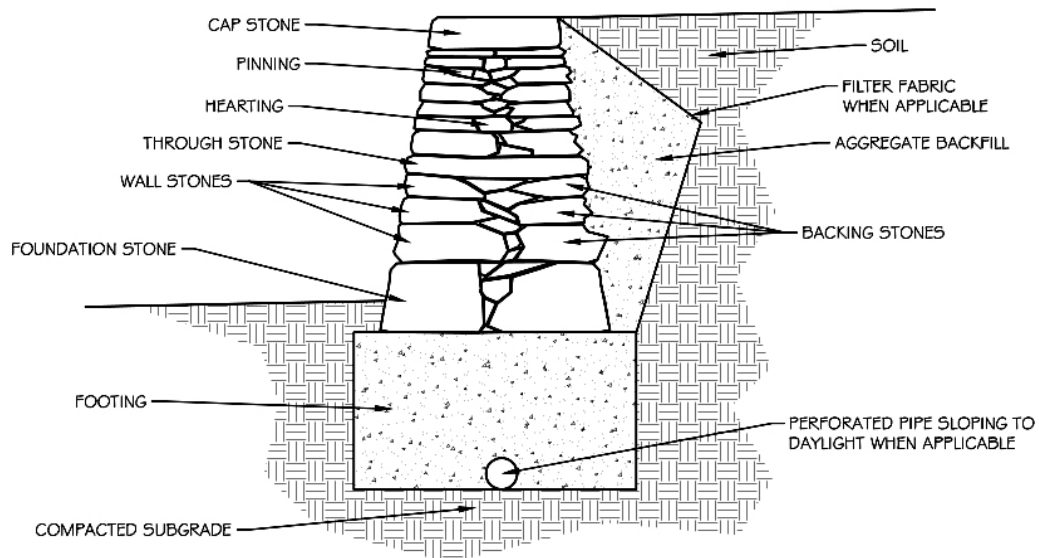


Fig. 1: Cross Section of Typical Dry Stone with Terminology for reference only, illustration is of a Retaining type wall. Terminology also applies for free standing walls in Project.

1.04 LAYOUT

- A. The batter of the exterior face of the wall should be as shown on the construction drawings. A vertical wall face is not acceptable.

1.05 CONTRACTOR REQUIREMENTS

- A. The General Contractor shall use certified wall builders (Waller) to place the Wall Stones in each lift. The entire structure must be built under the supervision and in the presence of the certified Waller(s).
 Certifications are acceptable from the following organizations:
 The Dry Stone Walling Association (DSWA), Great Britain
 Levels II, III, IV
 The Dry Stone Conservancy (DSC), Kentucky, USA
 Levels II, III

1.06 SUBMITTALS

- A. Certification: Waller certification documentation shall be submitted as part of the bid process.
- B. Work Documentation: Contractor/certified waller shall submit detailed photographic or video documentation of the project from start to completion. This report is to verify correct building techniques.
 Document to include the following points:
 - 1. Site before any work has begun

2. Prepared sub grade
3. Foundation Stone Placement
4. Completed First Lift
5. Through Stones Placement
6. Completed Second Lift
7. Completed Structure

D: Material Submittals: The contractor shall submit samples of stone to be used that will be long lasting, of suitable size and shape for the dimensions and style of wall. Examples are to be submitted a minimum of two weeks prior to start of construction. The material must be suitable meet BOTH the Wall Design Engineering specifications and the requirements of PART 2 of these specifications

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall check materials upon delivery to assure that specified type and grade of materials have been received.
- B. Contractor shall prevent excessive ice, mud, soil, clay, and like materials that may adhere, from coming into contact with the stones. Such materials, if present on the stones, must be removed prior to building.

PART 2 - MATERIALS

2.01 SELECTION OF STONE

- A. The building stone selected must provide adequate stones for all parts of the wall. Different types of stone, and/or stones from different sources may be used to achieve the necessary selection (provided all are approved).
- B. The following types of stones should be evident in appropriate quantities.
 1. Foundation Stones (largest stones)
 2. Through Stones (must have appropriate length and shape)
 3. Cap Stones (must have appropriate dimensions)
 4. Wall Stone and Backing Stones (may be further sorted by size)
 5. Pinning and Hearting (small stones and stone chips)

2.02 FOOTING MATERIAL

- A. Drainage aggregate shall be clean angular stone, allowing water to freely pass through.
- B. Material must be stable and firm when compacted.
- C. Commonly available crushed stone aggregate in the size range of $\frac{3}{4}$ " to $1\frac{1}{2}$ " is typically suitable, unless other specified by wall designer.
- D. In areas where the ground freezes water must easily pass through the footing material and have a place to drain to well away from the wall.
- E. In areas where the ground freezes water must easily pass through the footing material and have a place to drain to well away from the wall.

2.03 FOUNDATION STONE MATERIAL

- A. The foundation stones, as when placed in the wall, shall be at least 1/2 the width of the foundation. As per the grading of material, stones shall be the largest in the selection of building material.
- B. Stones are to be grouped by height, as when placed in the wall.

2.04 WALL STONES/FIRST LIFT MATERIAL

- A. A slight reduction in size from the foundation stones, ie: the next largest stones (excluding through stones, caps, or copes).
- B. Stones should be grouped by height, as when placed in the wall, so that in installation they will comprise horizontal courses.

2.05 PINNING AND HEARTING MATERIAL

- A. Stones of the size to fill gaps and voids between wall stones, backing stones and other elements of the wall.
- B. Stones should be the largest size that is possible to use to fill the gaps and voids
- C. Material that can be shoveled by hand is too small for pinning and hearting.

2.06 THROUGH STONES

- A. The length of these stones is determined by the width of the wall where they will be placed. The length of the stone must be equal to or greater than the width of the wall where it will be.
- B. Stones should be of a shape that will be possible to be structurally built upon, as when placed in the wall.

2.07 WALL STONES/ 2ND AND ADDITIONAL LIFTS

- A. A continued reduction in size of stones with each lift.
- B. Stones should be grouped by height, as when placed in the wall, so that in installation they will comprise horizontal courses.

2.08 CAP STONES

- A. These stones must be the full width of the wall at the top of the final lift.
- B. Cap stones must individually be significant in size and weight such that they are difficult to dislodge or move from placement.
- C. Stones must be of appropriate size and shape for the type or cap called for in the design.

2.09 BACK STONE MATERIAL

- A. Back stones shall be of appropriate size and shape to complete the thickness (depth) of

Dry Stone Wall

32 3223

August 13, 2026

each course of the wall.

- B. Back stones, of similar size to Foundation Stones, and all sizes of wall stones used will be needed.
- C. Material should be of similar hardness of the Wall Stone.

PART 3 – CONSTRUCTION

3.01 EXCAVATION

- A. Contractor shall excavate to the lines and grades shown on the project grading plans. Contractor shall take precautions to minimize over-excavation. Over-excavation shall be filled with compacted infill material, or as directed by the Engineer/Landscape Architect, at the Contractor's expense.
- B. Contractor shall verify location of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures are protected from the effects of wall excavation. Excavation support, if required, is the responsibility of the Contractor.

3.02 FOOTING

- A. Following the excavation, the subgrade soil shall be examined by the Owner's Engineer to assure actual foundation soil strength meets or exceeds the assumed design bearing strength. Soils not meeting the required strength shall be removed and replaced with infill soils, as directed by the Engineer/Landscape Architect.
- B. The subgrade soil shall be proof rolled and compacted to 95% standard Proctor density and inspected by Engineer/Landscape Architect prior to placement of footing material.
- C. The footing material shall be placed to the depth and width called for in the construction documents. It shall be proof rolled and compacted to 95% standard Proctor density and inspected by the Engineer/Landscape Architect prior to placement of Foundation Stones.
- D. If called for, drainage pipe and geosynthetic filter fabric shall be placed as required in the construction drawings.

3.03 SORTING BUILDING STONE MATERIAL

- A. The selected building stone should be sorted through. Similarly sized stones should be grouped together with attention to creating a safe and efficient work site. The following groups should be visible to the trained eye:
 - 1. Foundation Stones (largest stones)
 - 2. Through Stones (must have appropriate length and shape)
 - 3. Cap or Cope Stones (must have appropriate dimensions)
 - 4. Wall Stone and Backing Stones (may be further sorted by size)
 - 5. Pinning and Hearting (small stones and stone chips)

3.04 PREPARING TO BUILD

- A. The Contractor shall build the wall in the location shown on the project plans.
- B. The Contractor shall build the wall to the dimensions and grades shown on the project plans.
- C. The exterior face of the wall shall have no bulges or hollows
- D. String lines or other guides should be used to achieve a straight, even wall face and level courses.

3.05 BUILDING THE WALL**A. FOUNDATION STONES**

- 1. All stones shall be placed with their length into the wall structure (perpendicular to the face of the wall).
- 2. Stones should be placed so the joints near the face of the wall are tight. The wall stones should be in contact with the wall stones on either side.
- 3. Stones should be set level.
- 4. To the greatest extent possible, stones of the same height should be placed next to each other to form an even horizontal course.
- 5. The underside of the stone shall be free of voids and well packed with footing material
- 6. Stones shall be set so that the top edge of the face (portion of stone visible in completed wall) is in line with the plane of the wall.
- 7. Back stones of equivalent height and size to the foundation stones shall be placed behind the foundation stones. The length of each back stone shall be placed perpendicular to the face of the wall.
- 8. Pinning and hearting shall be carefully placed by hand to fill all voids and gaps between all foundation stones and back stones. Fewer larger pieces should be used rather than many small pieces.

B. WALL STONES – FIRST LIFT

- 1. All stones shall be placed with their length into the wall structure (perpendicular to the face of the wall).
- 2. Stones must span the vertical joints between stones in the course below. Each stone spanning a joint must have at least 1/3 of its width to either side of the joint, and must have contact with and bear weight on both wall stones below.
- 3. Wall stones should not be placed to sit on more than two wall stones in the course below.
- 4. Stones should be set level.
- 5. To the greatest extent possible, stones of the same height should be placed next to each other to form an even horizontal course.

WCCD Lake Raponda Green Mountain Beach Shoreline Erosion Control

6. Stones should be placed with so the joints near the face of the wall are tight. The wall stones should be in contact with the wall stones on either side.
7. Stones shall be set so that the farthest protrusion on the face of the stone is in line with the plan of the wall.
8. All stones shall be sound and free of cracks or defects that would interfere with the placement or performance of the stones.
9. Stones should be placed such that there is 3 to 4 points contact with the stone course below. At least two points of contact must be made near front face of the wall.
10. Back stones of equivalent height and size to the wall stones shall be placed behind the wall stones. The length of each back stone shall be placed perpendicular to the face of the wall.
11. Pinning and hearting shall be carefully placed by hand to fill all voids and gaps between all wall stones and back stones.
12. Lift height is determined to be whichever distance is greater: up to 30 inches or up to two courses.

C. THROUGH STONES

1. Through Stones are placed on the top of each Lift.
2. Shall be placed no farther apart horizontally than which ever is the greater distance: 3 ft. when measured center to center or two Wall stones between each Through Stones
3. Shall be tightly pinned and hearted beneath so there are no voids.
4. Shall be placed on the wall so they extend all the way through the wall.
5. Should be set so that the length of the stone is approximately perpendicular to the face of the wall.
6. Should be set level.
7. Through Stones must span the vertical joints between stones in the course below. Each stone spanning a joint must have at least 1/3 of its width to either side of the joint, and must have contact with and bear weight on both wall stones below.
8. Through Stones of successive lifts should be placed such that they are centered between the Through Stones on the previous lift.

D. WALL STONES/ 2ND AND ADDITIONAL LIFTS

- I. Shall follow all specifications in Section 3.04 B – (Wall Stones/First Lift)

E. PINNING AND HEARTING

1. Shall be placed by hand to the fill voids between other stones.
2. Shall not be placed (pushed in) from the front face of the wall.
3. Pinning stones shall be placed from the interior of the wall.

4. Each void should be placed with the fewer larger stones, rather than many small ones.
5. Shall be placed to securely wedge all other stones in the wall tightly together.
6. Shall not be placed so that downward force will push wall stones out of the wall.

F. CAP STONES

1. Shall be placed so they cover the full width of the top of the wall
2. Cap Stones should be placed so the vertical joints between the stones are not over vertical joints in the course below.
3. Cap Stones shall be placed so they do not tip or shift when weight is applied to the top.
4. Cap stones should be set so the top of the stones are even, creating a smooth top of the wall.
5. Cap stones should be set level (from the front to the back of the wall).
6. Voids below Cap Stones shall be tightly filled with pinning and hearting stones.
7. Cap Stones should not sit up on pinning stones at the face of the wall. The Cap Stones should make contact with the wall stones.

END OF SECTION 04600

SECTION 32 9113**SOIL PREPARATION****PART 1 –GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of contract, including general and supplementary conditions and Division I specifications, apply to work of this section.
- B. Related Specification Section
 - 1. Section 32 92919 – Topsoil and Seeding
 - 2. Section 32 9300 - Plants

1.2 SUMMARY

- A. The scope of work in this section includes, but is not limited to, the following:
 - 1. Prepare existing site soil subbase for placement of Planting Soil and landscape materials.
 - 2. Harvest and stockpile existing site soils suitable for use as Planting Soil
 - 3. Locate, purchase, deliver and install Imported Planting Soil and soil amendments.
 - 4. Locate, test, purchase, deliver and install Planting Soils for Stormwater Tree Trenches and Planting Soils for Rain Gardens
 - 5. Amend Planting Soils
 - 6. Fine grade Planting Soils.
 - 7. Clean up and disposal of all excess and surplus material.

1.3 REFERENCES:

- A. The following specifications and standards of the organizations and documents listed in this paragraph form a part of the Specification to the extent required by the references thereto. In the event that the requirements of the following referenced standards and specification conflict with this specification section the requirements of this specification shall prevail. In the event that the requirements of any of the following referenced standards and specifications conflict with each other the more stringent requirement shall prevail.
 - 1. ASTM: American Society of Testing Materials cited section numbers.
 - 2. U.S. Department of Agriculture, Natural Resources Conservation Service, 2003. National Soil Survey Handbook, title 430-VI. Available Online.
 - 3. US Composting Council www.compostingcouncil.org and http://compostingcouncil.org/admin/wp-content/plugins/wp-pdfupload/pdf/191/LandscapeArch_Specs.pdf.
 - 4. *Methods of Soil Analysis*, as published by the Soil Science Society of America (<http://www.soils.org/>).
 - 5. Urban Tree Foundation, Planting Details and Specifications, www.urbantree.org, 2014
 - 6. Up by Roots: healthy soils and trees in the built environment. 2008. J. Urban. International Society of Arboriculture, Champaign, IL.

1.4 VERIFICATION

- A. All scaled dimensions on the drawings are approximate. Before proceeding with any work, the Contractor shall carefully check and verify all dimensions and quantities, and shall immediately inform the Landscape Architect of any discrepancies between the information on the drawings and the actual conditions, refraining from doing any work in said areas until given approval to do so by the Landscape Architect.

1.5 PERMITS AND REGULATIONS

- A. The Contractor shall obtain and pay for all permits related to this section of the work unless previously excluded under provision of the contract or general conditions. The Contractor shall comply with all laws and ordinances bearing on the operation or conduct of the work as drawn and specified. If the Contractor observes that a conflict exists between permit requirements and the work outlined in the contract documents, the Contractor shall promptly notify the Landscape Architect in writing including a description of any necessary changes and changes to the contract price resulting from changes in the work.
- B. In case of conflict among any referenced standards or codes or among any referenced standards and codes and the specifications, the more restrictive standard shall apply or Landscape Architect shall determine which shall govern.

1.6 PROTECTION OF WORK, PROPERTY AND PERSON

- A. The Contractor shall adequately protect the work, adjacent property, and the public, and shall be responsible for any damages or injury due to the Contractor's actions.

1.7 CHANGES IN WORK

- A. The Landscape Architect may order changes in the work, and the contract sum adjusted accordingly. All such orders and adjustments plus claims by the Contractor for extra compensation must be made and approved in writing before executing the work involved.
- B. All changes in the work, notifications and contractor's request for information (RFI) shall conform to the contract general condition requirements.

1.8 CORRECTION OF WORK

- A. The Contractor shall re-execute any work that fails to conform to the requirements of the contract and shall remedy defects due to faulty materials or workmanship upon written notice from the Landscape Architect, at the soonest possible time that can be coordinated with other work and seasonal weather demands but not more than 180 (one hundred and eighty) days after notification.

1.9 DEFINITIONS

- A. Amendment: material added to Topsoil to produce final Planting Soil Mix, as specified. Amendments are classified as general soil amendments, fertilizers, biological, and pH amendments.
- B. Compacted soil: soil where the density of the soil is greater than the threshold for root

limiting and further defined in this specification.

- C. Compost: well decomposed stable organic material as defined by the US Composting Council and further defined in this specification.
- D. Saturated hydraulic conductivity (Ksat): The apparent rate at which soil water moves vertically through fully saturated soil under drained conditions (i.e., under the influence of a unit hydraulic gradient) and full saturation (i.e., unit saturated hydraulic gradient). Ksat is most often expressed as inches per hour.
- E. Existing Soil: Mineral soil existing at the locations of proposed planting after the majority of the construction within and around the planting site is completed and just prior to the start of work to prepare the planting area for soil modification and/or planting, and further defined in this specification.
- F. Fine grading: The final grading of the soil to achieve exact contours and positive drainage, often accomplished by hand rakes or drag rakes other suitable devices, and further defined in this specification, and further defined in this specification.
- G. Finished grade: surface or elevation of Planting Soil after final grading and 12 months of settlement of the soil, and further defined in this specification.
- H. Landscape Architect: The person or entity, appointed by the Owner to represent their interest in the review and approval of the work and to serve as the contracting authority with the Contractor. The Landscape Architect may appoint other persons to review and approve any aspects of the work.
- I. Planting Soil: Topsoil, or Planting Soil Mixes which are imported or existing at the site, or made from components that exist at the site, or are imported to the site; and further defined in this specification.
- J. Scarify: Loosening and roughening the surface of soil and sub soil prior to adding additional soil on top, and further defined in this specification.
- K. Soil Horizons: as defined in the USDA National Soil Survey Handbook
http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242.
- L. Soil Tilling: Loosening the surface of the soil to the depths specified with a rotary tine tilling machine, roto tiller, (or spade tiller), and further defined in this specification.
- M. Subgrade: surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing Planting Soil.
- N. Substantial Completion Acceptance: The date at the end of the Planting, Planting Soil, and Irrigation installation (if applicable) where the Landscape Architect accepts that all work in these sections is complete and the Warranty period has begun. This date may be different than the date of substantial completion for the other sections of the project, and further defined in this specification.
- O. Topsoil: naturally produced and harvested soil from the A horizon or upper layers or the soil as further defined in this specification.
- P. Undisturbed soil: Soils with the original A horizon intact that have not been graded or

compacted. Soils that have been farmed, subjected to fire or logged but not graded, and natural forested land will be considered as undisturbed.

1.10 SUBMITTALS

- A. Submit all submittals six (6) weeks prior to the start of the work of this section.
- B. Product data: For each type of manufactured product, submit manufacturers or supplier's product data and literature demonstrating that the product meets the specification requirements. Submit physical samples of these products.
- C. Lab reports and physical samples of planting soil and related materials
 - 1. For Compost, submit certified laboratory reports showing conformance with the required specification

1.11 OBSERVATION OF THE WORK

- A. The Landscape Architect may observe the work at any time. They may remove samples of materials for conformity to specifications. Rejected materials shall be immediately removed from the site and replaced at the Contractor's expense. The cost of testing materials not meeting specifications shall be paid by the Contractor.
- B. The Landscape Architect shall be informed of the progress of the work so the work may be observed at key times in the construction process. The Landscape Architect shall be afforded sufficient time to schedule visit to the site. Failure of the Landscape Architect to make field observations shall not relieve the Contractor from meeting all the requirements of this specification.

1.12 QUALITY ASSURANCE

- A. Installer Qualifications: The installer shall be a firm having at least 5 years of experience of a scope similar to that required for the work, including the preparation, mixing and installation of soil mixes to support planting. The installer of the work in Section: Planting, shall be the same firm installing the work in this section.
 - 1. The installer's crew shall be experienced in the installation of Planting Soil, plantings, and irrigation (where applicable) and interpretation of planting plans, soil installation plans, and irrigation plans (where applicable).
 - 2. Submit references of past projects and employee training certifications that support that the Contractors meet all of the above installer qualifications and applicable licensures.
- B. Soil testing laboratory qualifications: an independent laboratory, with the experience and capability to conduct the testing indicated
- C. All delivered and installed Planting Soil shall conform to the approved submittals sample color, texture and approved test analysis.
 - 1. The Landscape Architect may request the Contractor test samples of the delivered or installed soil to confirm the Planting Soil conforms to the approved material.
 - 2. All testing shall be performed by the same soil lab that performed the original Planting Soil testing.

3. All soil testing will be at the expense of the Contractor.
4. Testing results shall be within 10% plus or minus of the values measured in the approved Planting Soil Mixes.
5. Any Planting Soil that fails to meet the above criteria, if requested by the Landscape Architect, shall be removed and new soil installed.

1.13 SITE CONDITIONS

- A. It is the responsibility of the Contractor to be aware of surface and subsurface conditions, and to notify the Landscape Architect, in writing, of any circumstances that would negatively impact the health of plantings. Do not proceed with work until unsatisfactory conditions have been corrected.
 1. Should subsurface drainage or soil conditions be encountered which would be detrimental to growth or survival of plant material, the Contractor shall notify the Landscape Architect in writing, stating the conditions and submit a proposal covering cost of corrections. If the Contractor fails to notify the Landscape Architect of such conditions, they shall remain responsible for plant material under the warrantee clause of the specifications.
 2. This specification requires that all Planting Soil and Irrigation (if applicable) work be completed and accepted prior to the installation of any plants.

1.14 DELIVERY, STORAGE, AND HANDLING

- A. Weather: Do not mix, deliver, place or grade soils when frozen or with moisture above field capacity.
- B. Protect soil and soil stockpiles, including the stockpiles at the soil blender's yard, from wind, rain and washing that can erode soil or separate fines and coarse material, and contamination by chemicals, dust and debris that may be detrimental to plants or soil drainage. Cover stockpiles with plastic sheeting or fabric at the end of each workday.
- C. All manufactured packaged products and material shall be delivered to the site in unopened containers and stored in a dry enclosed space suitable for the material and meeting all environmental regulations. Biological additives shall be protected from extreme cold and heat. All products shall be freshly manufactured and dated for the year in which the products are to be used.
- D. Deliver all chemical amendments in original, unopened containers with original labels intact and legible, which state the guaranteed chemical analysis. Store all chemicals in a weather protected enclosure.
- E. Bulk material: Coordinate delivery and storage with Landscape Architect and confine materials to neat piles in areas acceptable to Landscape Architect.

PART 2 – MATERIALS

2.1 GEOTEXTILES

- A. Filter fabric shall be placed where indicated in the Drawings. The purpose of the fabric is to prevent comingling of cover materials, including aggregate base materials, with subgrade soil.

- B. Fabric shall be a needled non-woven polypropylene or polyester geotextile, satisfying the following requirements:
1. Permeable, needled non-woven polypropylene or polyester fabric
 - a. Unit Weight (ASTM D5261) $\geq 6.00 \text{ oz/yd}^2$
 - b. Permittivity (ASTM D4491) $\geq 0.70 \text{ sec}^{-1}$
 - c. Grab Tensile (ASTM D4632) $\geq 160 \text{ lbs}$

2.2 COMPOST

- A. Compost: Blended and ground leaf, wood and other plant based material, composted for a minimum of 9 months and at temperatures sufficient to break down all woody fibers, seeds and leaf structures, free of toxic material at levels that are harmful to plants or humans. Source material shall be yard waste trimmings blended with other plant or manure based material designed to produce Compost high in fungal material. Compost containing bio solids shall not be accepted. Minimum requirements are:
1. Salinity (EC @ 1:5 dilution) $\leq 4 \text{ mmhos/cm}$
 2. Residual Respiration Rate (TMECC 05.08, B) $\leq 3 \text{ mg CO}_2/\text{g TOM/d}$
 3. pH 6.0-8.0
 4. Organic matter $\geq 40\%$
 5. PAN (Plant-Available Nitrogen) $\geq 2.5 \text{ g/kg}$
 6. Total Nitrogen, as N $\geq 1\% (10\text{g/kg})$
 7. C:N ratio ≤ 25
 8. Ammonia, as N $\leq 0.05\%$
 9. Phosphorus, as P $\leq 0.5\% (5 \text{ g/kg})$
 10. Particle Size (screen) 90% passing 3/8"
 11. Trace Metals (US EPA Class A, 40CFR503.32(a)) PASS

2.3 CONCRETE SAND

- A. Clean, washed, sand, free of toxic materials
1. Coarse concrete sand, ASTM C-33 Fine Aggregate, with a Fines Modulus Index of 2.8 and 3.2 or as per grass pave system Manufacturer's recommendation.

2.4 LIME

- A. ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent

2.5 PLANTING SOILS

- A. Required Soil Properties
1. Minimum void ratio: 15%
 2. Texture: USDA loam, sandy clay loam or sandy loam with clay content between 15 and 25%. And a combined clay/silt content of no more than 55%. Furnish USDA textural classification.
 3. pH 5.5 – 7.0
 4. Organic matter (loss on ignition method) 2.0 - 5.0%
 5. Salinity (EC @ 1:5 dilution) $\leq 2 \text{ mmhos/cm}$
 6. Hydraulic conductivity (ASTM F1815) 1.0 - 3.0 in/hr
at 85% Proctor (ASTM D698)
 7. Trace Metals (US EPA Class A, 40CFR503.32(a)) PASS
- B. The Landscape Architect shall determine whether the soil chemistry and physical

properties are suitable for the selected plants, and whether amendment of the soil will be required to satisfy the requirements.

- C. Existing soils: Do not use existing soils that have soil organic matter and chemistry inconsistent with the planting plan, or that support a perched seasonal water table, or that exhibit evidence for a low permeable layer that may interfere with percolation (eg. mottled horizons)
- D. Blended planting soils may include suitable modified existing soils or blended artificial soils; typically mixtures of coarse sand, expanded shale, natural soils, and compost.
 - 1. Topsoil shall be salvaged and stockpiled on site. Imported topsoil is to be used only as necessary where salvaged soil quantity is insufficient. Imported topsoil shall NOT have been screened.
- E. Natural or existing soils used in preparing blended Planting Soils shall be managed in order to remove existing plants, root thatch, and non-soil debris.
- F. Soil tilling and loosening of existing soils must be completed at times when the soil moisture is below field capacity. Allow soil to drain for at least two days after a rain event more than 1 inch in 24 hours or long enough so that the soil does not make the hand muddy when squeezed.

2.6 INFILL SOIL MIX FOR GRASS PAVE

- A. As per grass pave Manufacturer's recommendations.

PART 3 –EXECUTION

3.1 SITE EXAMINATION

- A. Prior to installation of Planting Soil, examine site to confirm that existing conditions are satisfactory for the work of this section to proceed.
 - 1. Confirm that the subgrade is at the proper elevation and compacted as required.
 - 2. Confirm that the surface all areas to be filled with Planting Soil are free of construction debris, refuse, compressible or biodegradable materials, stones greater than 2 inches diameter, soil crusting films of silt or clay that reduces or stops drainage from the Planting Soil into the subsoil; and/or standing water. Remove unsuitable material from the site.
 - 3. Confirm that no adverse drainage conditions are present.
- B. If unsatisfactory conditions are encountered, notify the Landscape Architect immediately to determine corrective action before proceeding.

3.2 COORDINATION WITH PROJECT WORK

- A. The Contractor shall coordinate with all other work that may impact the completion of the work.
- B. Prior to the start of work, prepare a detailed schedule of the work for coordination with other trades.

3.3 SITE PREPARATION

- A. Excavate to the proposed subgrade. Maintain all required angles of repose of the adjacent materials sufficiently to prevent erosion of surrounding materials. Do not over excavate compacted subgrades of adjacent pavement or structures. Maintain a supporting 1:1 side slope of compacted subgrade material along the edges of all paving and structures where the bottom of the paving or structure is above the bottom elevation of the excavated planting area.
- B. Remove all construction debris and material including any construction materials from the subgrade. Remove compressible or biodegradable materials, stones greater than 2 inches diameter, soil crusting films of silt or clay that reduces or stops drainage from the Planting Soil into the subsoil; and/or standing water.
- C. Confirm that the subgrade is at the proper elevation and compacted as required. Subgrade elevations shall slope approximately parallel to the finished grade and/or toward the subsurface drain lines as shown on the drawings.
- D. In areas where Planting Soil is to be spread, confirm subgrade has been scarified.

3.4 PLANTING SOIL AND PLANTING SOIL MIX INSTALLATION

- A. Prior to installing any Planting Soil from stockpiles or Planting Soil Mixes blended off site, the Landscape Architect shall approve the condition of the subgrade and the previously installed subgrade preparation and the installation of subsurface drainage.
- B. In areas of soil installation above existing subsoil, scarify the subgrade material prior to installing Planting Soil.
 - 1. Scarify the subsoil of the subgrade to a depth of 3 – 6 inches with the teeth of the back hoe or loader bucket, tiller or other suitable device.
 - 2. Immediately install the Planting Soil. Protect the loosened area from traffic. DO NOT allow the loosened subgrade to become compacted.
 - 3. In the event that the loosened area becomes overly compacted, loosen the area again prior to installing the Planting Soil.
- C. Phase work such that equipment to deliver or grade soil does not have to operate over previously installed Planting Soil. Work in rows of lifts the width of the extension of the bucket on the loader. Install all lifts in one row before proceeding to the next. Work out from the furthest part of each bed from the soil delivery point to the edge of the each bed area.
- D. Installing soil with soil or mulch blowers or soil slingers shall not be permitted.
- E. Where travel over installed soil is unavoidable, limit paths of traffic to reduce the impact of compaction in Planting Soil. Each time equipment passes over the installed soil it shall reverse out of the area along the same path with the teeth of the bucket dropped to scarify the soil. Comply with Part 3.8 OVER-COMPACTION REDUCTION
- F. The depths and grades shown on the drawings are the final grades after settlement and shrinkage of the compost material. The Contractor shall install the Planting Soil at a higher level to anticipate this reduction of Planting Soil volume. A minimum settlement of approximately 10 - 15% of the soil depth is typical. All grade increases are assumed to be as measured prior to addition of surface Compost till layer, mulch, or sod.

3.5 INSTALLATION OF CHEMICAL ADDITIVES

- A. Following the installation of each soil and prior to fine grading and installation of the Compost till layer, apply chemical additives as recommended by the soil test, and appropriate to the soil and specific plants to be installed.
- B. Types, application rates and methods of application shall be approved by the Landscape Architect prior to any applications.

3.6 FINE GRADING

- A. The Landscape Architect shall approve all rough grading prior to the installation of Compost, fine grading, planting, and mulching.
- B. Grade the finish surface of all planted areas to meet the grades shown on the drawings, allowing the finished grades to remain higher (10 – 15% of depth of soil modification) than the grades on the grading plan, as defined in paragraph Planting Soil Installation, to anticipate settlement over the first year.
- C. Utilize hand equipment, small garden tractors with rakes, or small garden tractors with buckets with teeth for fine grading to keep surface rough without further compaction. Do not use the flat bottom of a loader bucket to fine grade, as it will cause the finished grade to become overly smooth and or slightly compressed.
- D. Provide for positive drainage from all areas toward the existing inlets, drainage structures and or the edges of planting beds. Adjust grades as directed to reflect actual constructed field conditions of paving, wall and inlet elevations. Notify the Landscape Architect in the event that conditions make it impossible to achieve positive drainage.
- E. Provide smooth, rounded transitions between slopes of different gradients and direction. Modify the grade so that the finish grade before adding mulch and after settlement is one or two inches below all paving surfaces or as directed by the drawings.
- F. Fill all dips and remove any bumps in the overall plane of the slope. The tolerance for dips and bumps in shrub and ground cover planting areas shall be a 2 inch deviation from the plane in 10 feet. The tolerance for dips and bumps in lawn areas shall be a 1 inch deviation from the plane in 10 feet.

3.7 CLEAN-UP

- A. During installation, keep the site free of trash and work area in an orderly condition at the end of each day. Remove trash and debris in containers from the site no less than once a week.
 - 1. Immediately clean up any spilled or tracked soil, fuel, oil, trash or debris deposited by the Contractor from all surfaces within the project or on public right of ways and neighboring property.
- B. Once installation is complete, wash all soil from pavements and other structures. Ensure that mulch is confined to planting beds and that all tags and flagging tape are removed from the site. The Landscape Architect seals are to remain on the trees and removed at the end of the warranty period.
 - 1. Make all repairs to grades, ruts, and damage to the work or other work at the site.

2. Remove and dispose of all excess Planting Soil, subsoil, mulch, plants, packaging, and other material brought to the site by the Contractor.

3.8 PLANTING SOIL AND MODIFIED EXISTING SOIL PROTECTION

- A. The Contractor shall protect installed and/or modified Planting Soil from damage including contamination and over compaction due to other soil installation, planting operations, and operations by other Contractors or trespassers. Maintain protection during installation until acceptance. Utilize fencing and matting as required or directed to protect the finished soil work. Treat, repair or replace damaged Planting Soil immediately.
- B. Loosen compacted Planting Soil and replace Planting Soil that has become contaminated as determined by the Landscape Architect. Planting Soil shall be loosened or replaced at no expense to the Owner.
 1. Till and restore grades to all soil that has been driven over or compacted during the installation of plants.
 2. Where modified existing soil has become contaminated and needs to be replaced, provide imported soil that is of similar composition, depth and density as the soil that was removed.

END OF SECTION

**SECTION 32 9211
RESTORATION OF SURFACES**

PART 1 GENERAL

1.01 DESCRIPTION

- A. Work covered by this Section includes the restoration of surfaces damaged or disturbed as a result of Contractor's operations.
- B. Related work specified elsewhere included:

Site Work

Division 31 and 32

1.02 QUALITY ASSURANCE

- A. Provide at least one person who shall be present at all times during this portion of Work and who is thoroughly familiar with the types of materials being installed and the best methods for their installation and who shall direct all work performed under this Section.
- B. Grades and surfaces shall be restored so as to be equal to or better than the original conditions which existed at the time they were damaged or disturbed, except as otherwise specified or shown on the Drawings.
- C. Restoration of surfaces under the jurisdiction of Village, Town, County, State or other public authorities or public utilities shall be in accordance with the requirements of such authorities. Ascertain these requirements, procure necessary permits, arrange for required inspections, and pay all fees, deposits and other charges which may be required by the authorities.
- D. Existing pavements and walks to be restored shall be replaced with new pavement equivalent to or superior to the existing in quality, thickness, bearing capacity and surface finish, except where otherwise specified.
- E. Replacement curbs shall have the same dimensions and cross-section as the existing adjoining curbs and the same texture, finish, and appearance.

1.03 SUBMITTALS

- A. See Administrative Requirements for submittal procedures.
- B. Submittals required are identical to those required under other Sections. If submittals have been made and approved under the other Sections, and are applicable to this Section, then a notification to this effect will be sufficient.

Restoration of Surfaces
329300 - 1
August 13, 2026

1.04 SCHEDULING

- A. It is the intent of this Section to restore all surfaces as soon as possible so as to cause the least amount of inconvenience to all people and animals, to provide an aesthetically pleasing construction site, to protect lives, to ensure safety, to avoid property damage and to provide for orderly and safe traffic conditions.
- B. Rough grade all areas to be seeded or planted within 48 hours after installation of the work; finish grade within one week after installation of the work, topsoil within three weeks after installation of the work and seed as soon as conditions are satisfactory. Replant trees, shrubs and other vegetation as soon as possible.
- C. Replace traffic and business signs as soon as possible, but no later than 24 hours after installation of the work.
- D. Replace all items as soon as possible, with special attention directed at those which control traffic, protect property and lives, are essential to a person's livelihood, create hazards when not in place, or are otherwise deemed essential.
- E. The phrase "after installation of the work" means after the installation of the work which necessitated the removal of an item or items.

1.05 MAINTENANCE AND GUARANTEE

- A. The maintenance and guarantee requirements of other applicable Sections are required under this Section.
- B. Maintain and care for all restoration work.
- C. Continually maintain all areas where pavement has been removed to provide a smooth surface by adding fill and grading daily, or more frequently when required.
- D. Provide dust control with water or calcium chloride as the conditions require.

PART 2 MATERIALS**2.01 MATERIALS**

- A. Public Property - Comply with the requirements of the authorities having jurisdiction over the materials being restored, and with the requirements of other Sections of the Specifications for new work. The more stringent requirements apply.

230341

WCCD Lake Raponda Green Mountain Beach Shoreline Erosion Control

- B. Water for dust control shall be reasonably clear and free of harmful amounts of oil, salt, acids, alkalies, sugar, organic matter or other substances injurious to the finished product, plant life, or the establishment of vegetation.
- C. Calcium chloride shall conform to the requirements of AASHTO M144. Either regular flake, Type 1, or concentrated flake, Type 2 may be used.

2.02 REUSE OF EXISTING MATERIALS

Curbs, walks, fences, walls, signs and other items which have been removed, knocked down, or displaced shall be replaced with existing materials when, in the opinion of Landscape Architect, such materials are in acceptable condition. Where such materials have been damaged, marred, broken, or are otherwise in an unacceptable condition, provide replacements of equal or better quality, appearance, size and type.

PART 3 EXECUTION

3.01 INSPECTION

- A. Carefully inspect the work installed under other Sections and verify that all such work is complete to the point where restoration of surfaces may properly commence and to insure against the unnecessary disturbance of restored surfaces at a later date.
- B. Verify schedule of work for conformance to allowable planting times.
- C. Do not begin restoration work until conditions are satisfactory.

3.02 GRASS AND LAWNS

- A. Comply with Section 32 9219 Topsoil and Seeding.

3.03 PLANTS AND REPLANTING

- A. As soon as possible after construction operations have moved ahead, replant plants, shrubs, trees, and other vegetation which was taken up in their original locations, provided that they survived and show indications of continued life.
- B. Replace with the same kind and size, any plantings, trees, shrubs or other vegetation that fails to survive the moving operation.

END OF SECTION

Restoration of Surfaces
329300 - 3
August 13, 2026

SECTION 32 9219

TOPSOIL AND SEEDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 DESCRIPTION

- A. Work covered by this Section includes providing topsoil, seeding, and fertilizing within approved limits as shown on the Drawings.
- B. Related work specified elsewhere includes:
 - a. Section 329219 -- Plants
 - b. Section 329113 -- Soil Preparation

1.3 QUALITY ASSURANCE

- A. Provide at least one person who shall be present at all times during the topsoiling and seeding operations and who shall be thoroughly familiar with the types of materials being installed and the best methods for their installation and who shall direct all work performed under this Section.
- B. Establish a good stand of grass of uniform color and density.
- C. Protect, maintain and care for all grassed areas.

1.4 SUBMITTALS

- A. See Administrative Requirements for submittal procedures.
- B. Proposed seed mixtures and manufacturer's recommended rate of application.
- C. Seed labels containing vendor's name, seed name, lot number, percentage of germination, seed purity, percentage of weed seed and percentage of inert materials.
- D. Fertilizer labels containing manufacturer's name, brand name, type, weight and guaranteed analysis.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Seeding shall be done during the following times, and then only when conditions are satisfactory:

Seeding: When the ground becomes workable in the Spring to June 1st., and between August 15th and October 1st.

1.6 GUARANTEE

- A. All work shall be guaranteed for a minimum of one year from the date of first acceptance of the Work or from the date when Landscape Architect or Owner Representative determines that Contractor has established a good, vigorous and healthy stand of grass of uniform color and density, whichever date is later.
- B. Final acceptance will be given by Owner after established grassed and sodded areas have been in place for one year in a vigorous and healthy condition.

PART 2 - MATERIALS**2.1 TOPSOIL**

Approved topsoil, as defined in Section 31 9113, obtained from excavation and grading work or, if insufficient material is available, it shall be imported.

2.2 SEED MIXTURES

- A. Grade A quality, fresh and recleaned and proven to produce satisfactory growth in the locality of the Project.
- B. In existing grass areas, mixtures shall be comparable to existing grasses and, when established, shall match as nearly as practicable the existing undisturbed grass.
- C. In existing lawn and areas requiring restoration, seed mixtures shall be:

<u>% by Weight Seed</u>	<u>Species</u>	<u>P.L.S.</u>	<u>Max. Weed</u>
60 - 70	Creeping Red Fescue	90%	0.5%
20 - 30	Kentucky Blue Grass	85%	0.5%
10	Perennial Rye Grass	85%	0.5%

P.L.S. = Purity times germination (U.S.D.A., Bulletin No. 480.)

PART 3 - EXECUTION**3.1 INSPECTION**

- A. Verify that all underground and above ground work has been completed to the point where topsoiling, seeding and/or sodding operations may properly commence without unnecessary disturbances at a later date.
- B. Do not commence work under this Section until conditions are satisfactory.
- C. Loosen all ground surfaces to a minimum depth of 2 inches to facilitate bonding of the topsoil to the subgrade. Use discs, spike-tooth harrows, or other approved means.
- D. Clean surface of subgrade of all stones, sticks and rubbish larger than 2 inches in size and all litter and detrimental materials.
- E. After spreading, break up large, stiff clods and hard lumps, and rake off all stones and rocks larger than 1 inch in size, roots, litter, foreign matter, poisonous materials, and other materials which may be detrimental to the Work. Dispose of all such materials off-site.

230341

WCCD Lake Raponda Green Mountain Beach Shoreline Erosion Control

- F. Remove all topsoil spilled on highways, shoulders, sidewalks, driveways and other surfaces for which topsoil is not specified or required.

3.4 FERTILIZING

- A. Uniformly spread fertilizer at the rate directed by Landscape Architect with a cyclone or broadcasting type spreader.

3.5 SEEDING

- A. Sow seed uniformly with a cyclone or broadcasting type spreader at a rate recommended by the seed vendor and as approved by Landscape Architect. The rate shall be based upon "new lawn" requirements and shall not be less than 5 pounds per 1,000 square feet.
- B. Sow seed when soils are moderately dry and when wind does not exceed five miles per hour.

3.6 ROLLING

- A. Where rolling is required, compact soil lightly with a lawnmower, immediately after seed is sown.

3.7 MULCHING - GENERAL

- A. In grass areas, use a mulch, matting, or a blanket to protect the seeded areas. Apply immediately after the seeding operation is completed on the same work day.
- B. In wooded areas, mulching is optional, except where it is required for erosion control.

3.8 MAINTENANCE

- A. Properly maintain all turfed areas by watering, cultivation, weeding, mowing, reseeding, filling eroded areas and other repairs and replacements until final acceptance of the Work.
- B. Reseed all areas where seed has failed to germinate and where seeded areas have been damaged by erosion, people, vehicular traffic or other causes.
- C. After sod has started to grow, resod any areas or portions failing to show life. Resod as often as necessary in order to establish a healthy, growing sod.

END OF SECTION

SECTION 329300**PLANTS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Shrubs, herbaceous perennials, and overseeding.
- B. Related Requirements:
 - 1. Section 329219 "Topsoil and Seeding" for seeded areas.
 - 2. Section 329113 "Soil Preparation"

1.3 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Balled and Burlapped Stock: Plants growing in field soil for at least 12 months prior to harvest, dug with firm, natural balls of earth in which they were grown, with a ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required] wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.
- C. Balled and Potted Stock: Plants growing in field soil for at least 12 months prior to harvest, dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required.
- D. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.
- E. Finish Grade: Elevation of finished surface of planting soil.
- F. Healthy: Plants that are growing in a condition that expresses leaf size, crown density, color; and with annual growth rates typical of the species and cultivar's horticultural description, adjusted for the planting site soil, drainage and weather conditions.
- G. Kinked root: A root within the root package that bends more than 90 degrees.

- H. Maintenance: Actions that preserve the health of plants after installation and as defined in this specification.
- I. Maintenance period: The time period, as defined in this specification, which the Contractor is to provide maintenance.
- J. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.
- K. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.
- L. Planting Area: Areas to be planted.
- M. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- N. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.
- O. Reasonable and reasonably: When used in this specification relative to plant quality, it is intended to mean that the conditions cited will not affect the establishment or long term stability, health or growth of the plant. This specification recognizes that it is not possible to produce plants free of all defects, but that some accepted industry protocols and standards result in plants unacceptable to this project. When reasonable or reasonably is used in relation to other issues such as weeds, diseases, insects, it shall mean at levels low enough that no treatment would be required when applying recognized Integrated Plant Management practices. This specification recognizes that some decisions cannot be totally based on measured findings and that professional judgment is required. In cases of differing opinion, the Owner's expert shall determine when conditions are judged as reasonable.
- P. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.
- Q. Stem Girdling Roots: Any root more than ¼ inch diameter currently touching the stem (trunk), or with the potential to touch the trunk, above the root collar approximately tangent to the trunk circumference or circling the trunk. Roots shall be considered as Stem Girdling that have, or are likely to have in the future, root to trunk bark contact.
- R. Substantial Planting-Completion Acceptance: The date at the end of the Planting, Planting Soil, and Irrigation installation where the Owner accepts that all Work in these sections is complete and the Warranty Period has begun. This date may be different than the date of substantial completion for the other Sections of the project.
- S. Spade harvested and transplanted: Field grown trees that are mechanically harvested and immediately transplanted to the final growing site without being removed from the digging machine.
- T. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 COORDINATION

- A. Coordination with Turf Areas: Plant shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.
 - 1. When planting shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.5 PRECONSTRUCTION MEETINGS

- A. Preconstruction Conference: Schedule a pre-construction meeting with the Landscape Architect at least seven days before beginning Work to review any questions the Contractor may have regarding the work, administrative procedures during construction and project work schedule. Conference may be in coordination with other Division 32 preinstallation meetings.

1.6 ACTION SUBMITTALS

- A. Soil Test: See Section Soil Preparation. Prior to the start of any planting activity, the Contractor shall have the existing soil tested by an approved soils testing laboratory. Copies of the soil test results shall be furnished to the Landscape Architect and Owner prior to any grading or planting.

1.7 INFORMATIONAL SUBMITTALS

- A. Plant Data
 - 1. Planting Schedule: Planting schedule showing dates for planting in each area of the project site.
 - 2. Plant Qualifications: Include quantities, sizes, quality, genus, species, variety of plants, indicating compliance with applicable requirements in ANSI Z60.1
 - 3. Plant List: Provide sources for plant materials. Include the names and locations of all proposed nurseries and the plants each will provide; estimated delivery dates, and length of time plants are to be stored at an off-site location.
 - 4. Plant Substitutions: Plant substitutions will be permitted only upon approval by the Landscape Architect.
- B. Qualification Data for Contractor
 - 1. List of similar projects completed by Contractor demonstrating Contractor's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of Owner's' contact persons.
 - 2. Employee training certifications reflecting that the Contractor meets all of the qualifications and applicable licensures per Part 1.9 Quality Assurance.
- C. Product certificates and literature, from manufacturer, describing all products required by this Section and complying with the following:
 - 1. Manufacturer's certified analysis of standard products.
 - 2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
 - 3. Provide submittal at least eight (8) weeks before the installation of plants.

- D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.
- E. Organic Soil Amendments. Testing results that show compliance with this specification.
- F. Sample Warranty: For workmanship and plant establishment guarantees.
- G. Maintenance Plan: In advance of planting trees or shrubs the Contractor shall submit to the Owner a post installation maintenance plan that outlines what maintenance practices the Contractor plans to incorporate to ensure the successful establishment of the planting. The plan shall be in accordance with those specifications listed above, and shall outline a schedule for the following:
 - 1. Pruning.
 - 2. Fertilizing.
 - 3. Watering.
 - 4. Weed Control.
 - 5. Rodent Damage.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.
- B. Workmanship and Plant Warranty.

1.9 QUALITY ASSURANCE

- A. Contractor Qualifications: A qualified landscape installation firm shall have at least five (5) years of successful experience of a scope similar to that required for this Project, including successful establishment of plants. The same firm shall install planting soil (where applicable) and plant material.
 - 1. Professional Membership: Contractor shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
 - 2. Contractor's Field Supervision: Contractor shall maintain, on the Project site, an experienced full-time supervisor, who can communicate in English with the Owner, when work is in progress. The Field Supervisor shall have a minimum of five (5) years of experience as a field supervisor installing plants of the quality and scale required for this Project and can communicate in English with the Owner.
 - 3. Contractor's crew shall have a minimum of three (3) years of experience in the installation of Planting Soil, Plantings, and Irrigation (where applicable) and in the interpretation of soil plans, planting plans, and irrigation plans.
 - 4. Personnel Certifications: Contractor's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:
 - a. Landscape Industry Certified Technician - Exterior
 - b. Landscape Industry Certified Interior
 - c. Landscape Industry Certified Horticultural Technician
 - 5. Pesticide Applicator: State licensed, commercial.
- B. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Shrubs: Measure with branches or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of shrub for height and spread; do not measure branches or roots tip to tip.
 2. Other Plants: Measure with stems, petioles, and foliage in their normal position.
- C. Plant Material Observation: Landscape Architect may observe plant material and Work at any time. Plants may be observed at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Landscape Architect also may observe shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work.
1. Rejected materials and plants shall be immediately removed from the Project site and replaced at the Contractor's expense.
 2. The cost of testing materials not meeting specifications shall be paid by the Contractor.
 3. Review or approval of any plant during the process of selection, delivery, installation and establishment shall not prevent that plant from later rejection in the event that the plant quality changes or previously existing defects become apparent that were not observed.
 4. Notify Landscape Architect of sources of planting materials seven days in advance of delivery to site.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials:

1. Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.
2. In accordance with the soil test recommendations (as applicable), fertilizer shall be in bags showing weight, analysis, and manufacturer's name.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

C. Plant Delivery and Care:

1. Each shrub or perennial, container of fertilizer or other construction material shall be labeled by grower or manufacturer as separate items.
2. Do not remove container-grown stock from containers before time of planting.
3. Plant identification labels shall be durable and waterproof. Labels shall be securely attached to plants, bundlers, or containers of plants and shall state the correct botanical plant name and size. Labels shall not be removed from the plants until final acceptance.
4. Do not prune shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

5. Handle planting stock by root ball. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
6. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.
7. Wrap shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.
8. Plant Storage: Shrubs and perennials not installed on the day of delivery to the site shall be stored and protected. Plants stored on the project site shall be protected from drying at all times, covering the balls or roots with moist woodchips, shredded bark, or other suitable heel-in material. Shrubs and perennials in containers may be stored on site for a maximum of seven days before planting and must be watered to maintain healthy moisture levels.
9. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in shade and keep moist.

1.11 FIELD CONDITIONS

A. Field Measurements and Conditions:

1. Verify all surface and sub-surface conditions, including actual grade elevations, drainage and soil conditions, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.
2. Notify the Landscape Architect/Owner in writing of any circumstances that would negatively impact the health of the plantings.
3. Do not proceed with the Work until unsatisfactory conditions have been corrected.
4. Perform Work to avoid any possible damage to underground utilities, using hand excavation where needed.
5. Utilities Identification: Prior to the start of any construction work performed, the Contractor shall ensure that all existing utilities within and surrounding the project site have been clearly marked.

B. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion Acceptance.

1. Shrubs and herbaceous perennials:
 - a. Spring Planting: May 1 – June 30.
 - b. Fall Planting: September 1 – October 31.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements. Do not install plants into saturated or frozen soils. Do not install plants during inclement weather, such as rain or snow or during extremely hot, cold, or windy conditions.

D. Planting Soil: The specification requires that all Planting Soil work be completed and accepted prior to the installation of any plants.

1.12 WORKMANSHIP AND PLANT WARRANTY

- A. Contractor's Warranty: Contractor shall provide a written Workmanship and Plant Warranty guaranteeing that the plant material shall be in a healthy condition at the time of expiration of the relevant Warranty Period and that Contractor shall repair or replace plantings, components, and accessories that fail in materials, workmanship, or growth within specified Warranty Period. Replacement plantings shall be installed immediately unless planting is required to occur in the succeeding planting season.
1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, removal or damage by a third party, vandalism or neglect by the Owner. Plants with more than 25% dieback shall be considered unsatisfactory.
 - b. Injury, dry roots, broken branches, or other damage prior to planting.
 - c. Structural failures including plantings falling or blowing over.
 - d. Faulty performance of tree stabilization.
 - e. Non-compliance with plant quality requirements stated in this Specification Section at the time of installation.
 - f. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - g. Soil integrity and drainage.
- B. Warranty Periods shall be determined by Plant Class, below, and shall start from the date of Substantial Completion Acceptance.
1. Shrubs: 24 months.
 2. Herbaceous Perennials: 12 months.
- C. When the Work is accepted in parts, the Warranty Periods shall extend from each of the partial Substantial Completion Acceptances to the terminal date of the last Warranty Period. Thus, all Warranty Periods for each class of plant warranty shall terminate at one time.
- D. Warranty shall include the following remedial actions as a minimum:
1. The Contractor shall bear all cost related to plant corrections.
 2. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
 3. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of Warranty Period.
 4. A limit of one replacement of each plant is required except for losses or replacements due to failure to comply with requirements. Replacements shall closely match adjacent specimens of the same species. Replacements shall be subject to all requirements stated in this specification. Promptly make all necessary repairs due to plant replacements at no extra cost to the Owner
 5. Provide extended warranty for period equal to original Warranty Period, for replaced plant material.
- E. End Of Warranty Final Acceptance

1. At the end of the Warranty Period, the Owner shall observe all warranted work, upon written request of the Contractor. The request shall be received at least ten (10) calendar days before the anticipated date for final observation.
2. End of Warranty Final Acceptance shall be given only when all the requirements of the Work under this specification have been met.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

- A. General: Furnish nursery-grown plants; properly labeled with scientific name and in accordance with the sizes and grades specified, that are true to color, shape, size, and growth habit relative to the genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, with normal root systems, stem and branch form that will not restrict normal growth and stability. Plants shall equal or exceed the measurement specified in the Plant List and be free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
1. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.
 2. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.
 3. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls; however:
 - a. Use of such plants shall not increase the contract price.
 - b. If a range of size is given, no plant shall be less than the minimum size and not less than 50% of the plants shall be as large as the maximum size specified. The measurements specified are the minimum and maximum size acceptable and are the measurements after pruning, where pruning is required.
 4. Plants shall be measured before pruning, with branches in normal position. Any necessary pruning shall be done at the time of planting.
 5. Requirements for the measurement, branching, grading, quality, balling, and burlapping of plants shall follow the code of standards currently recommended by the American Association of Nurserymen, Inc., in the American Standard for Nursery Stock, ANSI Z60.1, current edition. Root balls should be measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
 6. If formal arrangements or consecutive order of plants is indicated on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.
- B. Plant Quality Above the Soil Line
1. Plants shall not show signs of prolonged moisture stress or over watering as indicated by wilted, shriveled or dead leaves.
- C. Plant Quality Below the Soil Line
1. The root collar shall be within the upper 2 inches of the substrate/soil. Two structural roots shall reach the side of the root ball near the top surface of the root ball. The grower may request a modification to this requirement for species with roots that rapidly

- descend, provided that the grower removes all stem girdling roots above the structural roots across the top of the root ball.
2. The root system shall be free of stem girdling roots over the root collar or kinked roots from nursery production practices.
 3. At time of observations and delivery, the root ball shall be moist throughout. Roots shall not show signs of excess soil moisture conditions as indicated by stunted, discolored, distorted, or dead roots.
- D. Balled and Burlapped Plants: Shall be field grown and have balls of earth of sufficient diameter to be in accordance with the size of the plant, of sufficient depth to include an adequate root system, and shall be properly balled, burlapped, and secured.
1. Shrubs shall be dug for a minimum of four (4) weeks and a maximum of fifty-two (52) weeks prior to shipping, allowing sufficient time for hardening off.
 2. Trees stored out of the ground shall be placed in a holding area protected for weather extremes with the root ball protected by covering with mulch of straw and irrigated sufficiently to keep moisture in the root ball above the wilt point and below saturation.

2.2 FERTILIZERS

- A. Organic Soil Amendments: All areas to receive new plant material may require an organic soil amendment to increase organic content and water retention. If native topsoil has an organic matter content below 4% it should be amended in-place after grading activities are completed to effectively create a satisfactory topsoil horizon. See Section 32 9113 Soil Preparation for soil testing requirements.
1. Organic soil amendment will be spread and incorporated into the native topsoil in order to raise the organic content of the soil to a minimum of four percent (4%) and a maximum of six percent (6%). Contractor will allow for additional depth of the organic soil amendment to bring all grades to the required finished grades as per the grading plans.
 2. Organic Soil Amendment shall be dark brown or black in color and capable of enhancing plant growth. Ninety-eight percent (98%) of the material should pass a one inch (1") screen. There shall be no admixture of refuse (i.e. noticeable inert contamination) or other materials toxic to plant growth.
 3. Acceptable types of Organic Soil Amendments include, well rotted manure, various mature composts, and commercially available combinations thereof. Acceptable compost may be derived from natural organic sources such as food or animal residuals, yard trimmings, or biosolids. Organic Soil Amendment shall be free of all woody fibers, seeds, and leaf structures, plastic and other petroleum products, and free of toxic and non-organic matter. Unacceptable sole sources of organic matter include untreated sludge from wastewater treatment plants, fresh manure, sawdust, peat moss, and immature composts.
 4. Organic Soil Amendment shall conform to the following minimum material requirements:

Test Parameter Acceptable Ranges:

1. Organic Matter 27% to 80%

2. pH 6-8.0
3. Ash 16% maximum
4. Nitrogen 0.4%-3.5%
5. Phosphorus 0.2%-1.5%
6. Potassium 0.4%-1.5%
7. C:N Ratio 25-30:1
8. CEC 50-150 meq/100 g
9. Heavy Metals- Less than max. limits established by EPA 503
10. Inert Contents < 1% by weight
11. Water-Holding Capacity 150-200%

2.3 GRADING AND TOPSOIL

- A. The Contractor shall furnish all grading and topsoil as required by the Grading Plan and in accordance with Section 312000 Earth Moving.

2.4 MULCHES

- A. Mulch shall be free from deleterious materials and shall be stored as to prevent inclusion of foreign material.
- B. Organic mulch materials shall be one of the following, provide depths as per drawings:
 1. Wood based products consisting of shredded bark around shrubs and perennial beds.
 2. Straw for seeded areas shall be stalks from oats, wheat, rye, barley, or rice that are free from seeds, noxious weeds, mold or other objectionable material. Straw shall be in an air-dry condition and suitable for placing with blower equipment.
 3. Wood cellulose fiber mulch for use with hydraulic application (Hydro mulch) with fertilizer shall consist of specially prepared wood cellulose fiber, processed to contain no growth or germination-inhibiting factors, and dyed an appropriate color to facilitate visual metering of the application of materials. Do not apply any turfgrass seed in this type mixture. On an air-dry weight basis, the wood cellulose fiber shall contain a maximum of 12 percent moisture, plus or minus three percent at the time of manufacture. The pH range shall be from 3.5 to 5.0. The wood cellulose fiber shall be manufactured so that:
 - a. After addition and agitation in slurry tanks with fertilizers, water, and other approved additives, the fibers in the material will become uniformly suspended to form homogenous slurry.
 - b. When hydraulically sprayed on the ground, the material will form a blotter like cover.

- c. The cover will allow the absorption of moisture and allow rainfall or applied water to percolate to the underlying soil.

2.5 HERBICIDES

- A. Non-Selective herbicide shall be glyphosate. Use only with prior written permission from both Owner and Landscape Architect.
- B. The spraying of all herbicides must be done in accordance with the Owner's Chemical Spraying Program.

2.6 PESTICIDES

- A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.
- B. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.7 MISCELLANEOUS PRODUCTS

- A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive plants, for compliance with requirements and conditions affecting installation and performance of the Work.
 - 1. Verify that no waste or debris developed by other trades and no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid have been deposited in soil within a planting area. Report discrepancies to the Owner Representative before beginning any installation.
 - 2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
 - 3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - 4. Uniformly moisten excessively dry soil that is not workable or which is dusty.
- B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.
- B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Grading
 - 1. Prior to commencing any finished grading, the Contractor shall notify the Owner Representative allowing enough time for a thorough inspection of the subgrade.
 - 2. Perform all finished grading necessary to bring site to required finished elevations indicated on the grading plan and to allow for positive drainage.
- D. Planting Soil
 - 1. Examine surface grades and soil conditions to confirm that the requirements of Section 31 2200 Site Grading have been completed.
 - 2. Notify the Landscape Architect in writing of any unsatisfactory conditions.
- E. Topsoil
 - 1. Topsoil shall not be placed when the subgrade is frozen, excessively wet, or extremely dry, and no topsoil shall be handled when in a frozen or muddy condition.
 - 2. After completion of topsoil placing and approval of finish grading by the Owner Representative, remove any excess topsoil from the site and deliver to location determined by the Owner Representative.
 - 3. Leave finish graded area clean, well raked, and ready for planting
- F. Plant Layout
 - 1. Lay out plants at locations with Landscape Architect present
 - 2. Any alterations to the planned planting layout must be approved by the Landscape Architect and the Owner Representative.

3.3 PLANTING AREA ESTABLISHMENT

- A. General Preparation
 - 1. All unwanted vegetation shall be completely removed and hauled off site to ensure that planting beds are completely weed-free.
 - 2. No plants are to be planted when the ground is frozen or during days of extreme heat (>80 degrees), unless approved by Landscape Architect or Owner Representative.
 - 3. Contractor shall inform the Landscape Architect if any of the following invasive species are observed in planting areas that have been cleared as they can regenerate from roots and may require herbicide application:
 - a. Japanese Knotweed (*Fallopia japonica*)
 - b. Tree of Heaven (*Ailanthus altissima*)
 - c. Canada Thistle (*Cirsium arvense*)
 - d. Autumn Olive (*Eleagnus umbellata*)
 - e. Common Buckthorn (*Rhamnus cathartica*)
 - f. Garlic mustard (*Alliaria petiolata*)
 - g. Mugwort (*Artemisia vulgaris*)
 - h. Common Reed (*Phragmites australis*)

B. Planting Soil

1. Prepare planting area for soil placement and mix planting soil according to Section 31 2200 Site Grading.
2. Placing Planting Soil: Place and mix planting soil in-place over exposed subgrade.
3. Protect soil from compaction during the work. Till to a depth of six (6) inches all soil that has been driven over during plant installation.

C. Grading: Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.**D. Application of Mycorrhizal Fungi:** At time directed by Landscape Architect, broadcast dry product uniformly over prepared soil at application rate according to manufacturer's written recommendations.**3.4 EXCAVATION FOR SHRUBS****A. Planting Pits and Trenches:** Excavate circular planting pits.

1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
2. Excavate approximately three times as wide as ball diameter for balled and burlapped and container-grown stock.
3. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
4. Do not excavate deeper than depth of the root ball, measured after any root ball modification from the root flare to the bottom of the root ball. Leave sufficient undisturbed soil at base of pit to support plantings. All construction debris such as plaster, concrete, stone, brick, wood, or other deleterious materials shall be removed.
5. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
6. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
7. Maintain supervision of excavations during working hours.
8. Keep excavations covered or otherwise protected when unattended by Contractor's personnel.

B. Backfill Soil: Subsoil and topsoil removed from excavations may be used as backfill soil unless otherwise indicated.

1. Use specified backfill medium around the roots, filling the hole about two thirds full, and firm the soil around the root ball and/or roots.
2. Water the plant well immediately after backfilling to insure proper settling of soil around the roots. Allow the water to soak down and fill the remainder of the hole with loose soil without further packing or tamping. A mound of soil shall be formed around the edge of each tree pit to form a shallow saucer.

- C. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to shrubs or perennials are encountered in excavations.
 - 1. Hardpan Layer: Drill 6-inch- (150-mm-) diameter holes, 24 inches (600 mm) apart, into free-draining strata or to a depth of 10 feet (3 m), whichever is less, and backfill with free-draining material.
 - 2. If an impervious, hard pan layer remains in the bottom of the pit after excavation the Landscape Architect or Owner Representative shall be notified prior to any additional planting activities to inspect the excavation and develop an alternate course of action.
- D. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in shrub planting pits.
- E. Fill excavations with water and allow to percolate away before positioning shrubs.

3.5 SHRUB PLANTING

- A. Inspection:
 - 1. The plant shall be set in its planting pit in such a manner that allows the bottom of the trunk flare to set 1 inch above finished grade. Note: the top of the rootball is not necessarily the bottom of the trunk flare.
 - 2. At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
- B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
- C. Balled and Burlapped Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
 - 1. Backfill: Planting soil, or as indicated
 - 2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets completely. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 3. Backfill around root ball in layers, hand tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. A mound of soil shall be formed around the edge of each tree pit to form a shallow saucer.
 - 4. Continue backfilling process. Water again after placing and tamping final layer of soil.
 - 5. Once the plant is set in its planting pit and at proper grade in relation to the surrounding soil, the Contractor shall remove all wire, twine and burlap or other deleterious material
- D. Container-Grown Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
 - 1. Backfill: Planting soil, or as indicated
 - 2. Carefully remove root ball from container without damaging root ball or plant, and inspect the root ball thoroughly for circling or girdling roots. Shave to remove all circling, girdling, descending and matted roots within the root ball above the top of the structural roots. Use suitable tools to make clean cuts on the roots. Shaving shall remove a minimum of one inch of root map or up to two inches as required to remove all root segments.

3. Remove all substrate at the bottom of the root ball that does not contain roots
 4. Score the root ball to discourage girdling and to promote growth of feeder roots.
 5. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. A mound of soil shall be formed around the edge of each tree pit to form a shallow saucer.
 6. Continue backfilling process. Water again after placing and tamping final layer of soil.
- E. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6 SHRUB PRUNING

- A. Prune shrubs according to standard professional horticultural and arboricultural practices. Remove only injured, dying, or dead branches from shrubs at time of planting and prune to retain natural character. Do not prune for shape.
- B. Except for plants specified as multi-stemmed or as otherwise instructed by the Owner Representative, preserve or create a central leader.
- C. Remove and replace excessively pruned or malformed stock resulting from improper pruning that occurred in the nursery or after.
- D. Pruning shall be done with clean, sharp tools.
- E. Do not apply pruning paint or sealants to wounds.

3.7 HERBACEOUS PERENNIAL PLANTING

- A. Set out and space herbaceous perennials as indicated in even rows with triangular spacing.
- B. Schedule the planting to occur prior to application of the mulch. If the bed is already mulched, pull the mulch from around the hole and plant into the soil. Do not plant the root system in the mulch. Pull mulch back so it is not on the root ball surface.
- C. Use planting soil for backfill.
- D. Assure that soil moisture is within the required levels prior to planting.
- E. Assure that soil grades in beds are smooth and as shown on the plans.
- F. Plants shall be planted in even, triangularly spaced rows, at the intervals called out for on the drawings, unless otherwise noted.
- G. Dig planting holes sufficiently large enough to insert the root system without deforming roots and to allow the spreading of roots. Set the top of the root system at the grade of the planting soil.
- H. For container grown perennials and grasses, loosen and straighten out roots especially if rootbound.

- I. For rooted cutting plants supplied in flats, plant each in a manner that minimally disturbs the root system but to a depth not less than two nodes.
- J. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water. Press soil to bring the root system in contact with the soil. Spread any excess soil around in the spaces between the plants.
- K. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.
- L. Apply mulch to the bed being sure not to cover the tops of the plants with or the tops of the root ball with mulch.
- M. Thoroughly water each planting area as soon as the planting is completed. Apply additional water to keep the soil moisture at the required levels. Do not overwater; take care not to cover plant crowns with wet soil.

3.8 PLANTING BED FINISHING

- A. After planting, smooth out all grades between plants before mulching.
- B. Separate the edges of planting beds and lawn areas with a smooth, formed edge cut into the turf with the bed mulch level slightly lower, 1 and 2 inches, than the adjacent turf sod or as directed by Landscape Architect or the Owner Representative. Bed edge lines shall be as depicted on the Drawings.

3.9 WATERING

- A. No on site water source is available, Contractor shall source water and shall facilitate watering as follows:
 - 1. Provide Owner with a temporary watering plan for new plantings that shall include:
 - a. Schedule, and manners with which the Contractor anticipates watering.
 - b. Method for temporary watering system to respond to varying seasonal, and soil conditions to maintain adequate, but not excessive moisture.
 - 2. Contractor shall be fully responsible to ensure that adequate water is provided to all plants from the point of installation until the date of Substantial Completion Acceptance. The Contractor shall adjust the automatic watering system, if available, and apply additional or adjust for less water using hoses as required.
 - 3. Hand water root balls of all plants to assure that the root balls have moisture above wilt point and below field capacity. Test the moisture content in each root ball and the soil outside the root ball to determine the water content.
 - 4. The Contractor shall water in a manner that encourages even distribution of moisture over the entire root ball, and to a depth of 30 inches.
 - 5. Watering shall continue until the end of the first growing season, and as needed in dry weather thereafter, until end of the Warranty Period and final acceptance by the Owner.

3.10 PLANT MAINTENANCE

- A. Crew: All Work shall be undertaken by trained planting crews under the supervision of a foreman with a minimum of 5 years' experience supervising commercial plant maintenance crews.

- B. General: During the project Work period and Warranty Period maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.
- C. Watering: Provide all water required to keep soil within and around the root balls at optimum moisture content for plant growth.
 - 1. Maintain all watering systems and equipment and keep them operational.
 - 2. Monitor soil moisture to provide sufficient water. Check soil moisture and root ball moisture with a soil moisture meter on a regular basis and record moisture readings. Do not over water.
- D. Soil Nutrient Levels: Take a minimum of 4 soil samples from around the site in the spring and fall and have them tested by an accredited agricultural soil testing lab for chemical composition of plant required nutrients, pH, salt and % organic matter. Test results shall include laboratory recommendations for nutrient applications. Apply fertilizers at rates recommended by the soil test.
- E. Testing: Make any other soil test and/or plant tissue test that may be indicated by plant conditions that may not be related to soil nutrient levels such as soil contaminated by other chemicals or lack of chemical uptake by the plant.
- F. Plant Pruning: Remove cross over branching, shorten or remove developing co dominant leaders, dead wood and winter-damaged branches. Unless directed by the Owner, do not shear plants or make heading cuts.
- G. Restore Plants: Maintain all plants in a plumb position throughout the Warranty Period. Straighten all trees that move out of plumb including those not staked. Plants to be straightened shall be excavated
- H. Infill Soil: Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- I. Guying and Staking: Maintain plant guys in a taught position. Remove tree guys and staking after the first full growing season unless directed by Owner.
- J. Weed Control: Keep all beds free of weeds. Hand-remove all weeds and any plants that do not appear on the planting plan. Chemical weed control is permitted only with the approval of the Owner. Schedule weeding as needed but not less than 12 times per year.
- K. Trash Removal: Remove all trash and debris from all planting beds and maintain the beds in a neat and tidy appearance. The number of trash and debris removal visits shall be no less than 12 times per year and may coincide with other maintenance visits.
- L. Plant Replacement: Replace all plants that are defective as defined in the warranty provisions, as soon as the plant decline is obvious and in suitable weather and season for planting as outlined in above sections. Plants that become defective during the maintenance period shall be covered and replaced under the warranty provisions.
- M. Mulch: Refresh mulch once a year to maintain complete coverage but do not over mulch. At no time shall the overall mulch thickness be greater than 3 inches. Do not apply mulch within 6 inches of the trunks or stems of any plants. Replacement mulch shall meet the requirements of the original approved material. Mulch shall be no more than one inch on top of the root ball surface.

N. Maintenance Protocols

1. Assure that hoses, watering equipment and other maintenance equipment do not block paths or create tripping hazards. Use standard safety warning barriers and other procedures to maintain the site in a safe manner for visitors at all times.
2. All workers shall wear required safety equipment and apparel appropriate for the tasks being undertaken.
3. The Contractor shall not store maintenance equipment at the site at times when they are not in use unless authorized in writing by the Owner Representative.
4. Maintenance vehicles shall not park on the site including walks and lawn areas at any time without the Owner Representative's written permission.

3.11 PESTICIDE AND FERTILIZER APPLICATION

- A. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents. The Owner must approve in advance the use of all chemical pesticide applications.
- B. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- C. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.
- D. All chemical and fertilizer applications shall be made by licensed applicators for the type of chemicals to be used. All work and chemical use shall comply with all applicable local, provincial and federal requirements.
 1. No spraying of herbicides, insecticides, fungicides, nematocides, fumigants, or other chemicals shall be done without first submitting a spray program to the Owner.
 2. Application of herbicides shall only be permitted by licensed applicators. Applicators should follow all notification requirements of the Owner and consult any State environmental regulations prior to application.

3.12 REPAIR AND REPLACEMENT

- A. General: Repair or replace existing trees and other plants that are damaged by construction operations, in a manner approved by Landscape Architect.
 1. Submit details of proposed pruning and repairs.
 2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
 3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Landscape Architect.

3.13 CLEANING AND PROTECTION

- A. During planting, keep the site free of trash; keep adjacent paving and construction clean and work area in an orderly condition. Remove trash and debris in containers from the site no less

than once a week. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

- B. Immediately clean up any spilled or tracked soil, fuel, oil, trash or debris deposited by the Contractor from all surfaces within the project or on public right of ways and neighboring property.
- C. Once installation is complete, wash all soil from pavements and other structures. Ensure that mulch is confined to planting beds and that all tags and flagging tape are removed from the site. The seals are to remain on the trees and removed at the end of the Warranty Period.
- D. Make all repairs to grades, ruts, and damage by the Contractor to the Work or to other work at the site.
- E. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.
- F. After installation and before Substantial Planting-Completion Acceptance, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.
- G. The Contractor shall protect planting and related Work and other site work from damage due to planting operations, operations by other Contractors or trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings immediately.
- H. Damage done by the Contractor, or any of their sub-contractors to existing or installed plants, or any other parts of the Work or existing features to remain, including roots, trunk or branches of large existing trees, soil, paving, utilities, lighting, irrigation, other finished Work and surfaces including those on adjacent property, shall be cleaned, repaired or replaced by the Contractor at no expense to the Owner. The Owner shall determine when such cleaning, replacement or repair is satisfactory.

3.14 MAINTENANCE SERVICE

- A. Maintenance Service for Shrubs: Provide maintenance by skilled employees of Contractor and in compliance with this Section, Part 3.13, Plant Maintenance. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than the duration of the relevant Warranty Period, as referenced in this Section, Part 1.12, Workmanship and Plant Warranty.
- B. Maintenance Service for Perennials: Provide maintenance by skilled employees of Contractor and in compliance with this Section, Part 3.13, Plant Maintenance. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than the relevant Warranty Period, as referenced in this Section, Part 1.12, Workmanship and Plant Warranty.

END OF SECTION

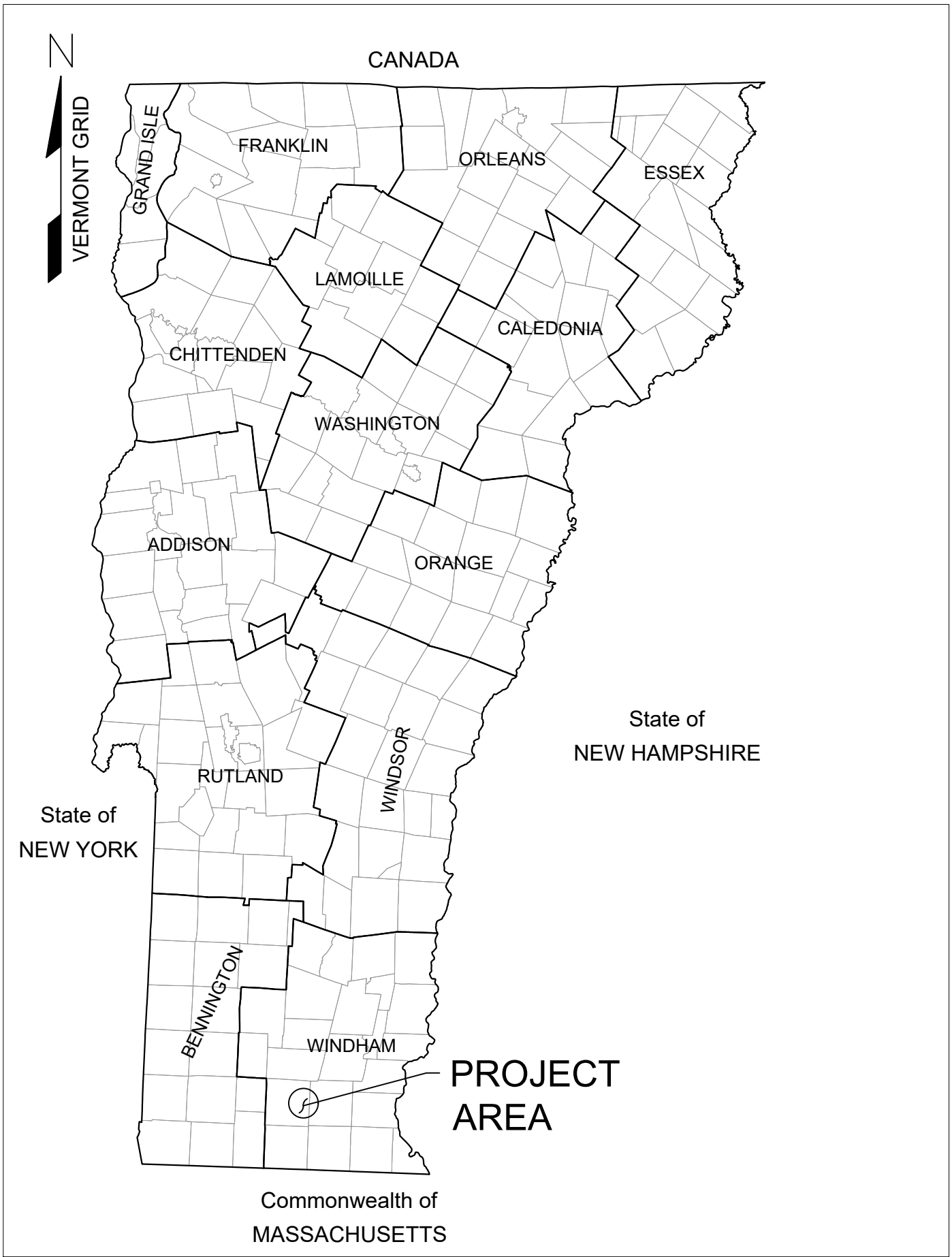
WINDHAM COUNTY NATURAL RESOURCES CONSERVATION DISTRICT

WILMINGTON, VERMONT
COUNTY OF WINDHAM

LAKE RAPONDA SHORELINE EROSION CONTROL,
GREEN MOUNTAIN BEACH
BID SET

PROJECT LOCATION: PROJECT SITE IS LOCATED AT GREEN MOUNTAIN BEACH ON THE EASTERN SHORE OF LAKE RAPONDA, WILMINGTON, VT

PROJECT DESCRIPTION: CONSTRUCTION OF NEW INFILTRATION PRACTICES, DRY STACKED WALLS, SEATING, VEGETATION, AND IMPROVEMENTS TO EXISTING SITE PLANTED AREAS



LOCATION MAP
NOT TO SCALE



PROJECT LOCATION MAP
NOT TO SCALE

SHEET INDEX	
Sheet Number	Sheet Title
G-1.0	TITLE SHEET
G-1.1	NOTES
L-1.0	EXISTING CONDITIONS & DEMO
L-1.1	EROSION PREVENTION & SEDIMENT CONTROL PLAN
L-1.2	SITE PLAN
L-2.0	LAYOUT PLAN
L-3.0	PLANTING PLAN
L-5.0	DETAILS-EPSC
L-5.1	DETAILS
L-5.2	DETAILS
L-5.3	DETAILS
L-5.4	PLANTING DETAILS

NOT FOR
CONSTRUCTION
PRELIMINARY
PLANS

REVISIONS		BY	DATE	NUMBER
REVISION DESCRIPTION				

CLIENT NAME
WINDHAM COUNTY
NATURAL
RESOURCES
CONSERVATION
DISTRICT

PROJECT NAME
LAKE RAPONDA
SHORELINE
EROSION CONTROL
90% DESIGN

GREEN MOUNTAIN
BEACH
WILMINGTON, VT

SHEET TITLE

TITLE SHEET

D&K PROJECT # 230341P1	PROJ. ENG. CJR
---------------------------	-------------------

DRAWN BY KAC	CHECKED BY ANH
-----------------	-------------------

DATE 8/13/2026

SHEET NUMBER G-1.0

SHEET: 1 of 12

I:\2\230341_WCDD Lake Raponda Shoreline Erosion Control\Drawings\Landscape\230341P1_WCDD Lake Raponda_CD.dwg 8/13/2026 5:05 PM

GENERAL NOTES

GENERAL CONDITIONS

1. SITE WORK SHALL BE CONSTRUCTED FROM A COMPLETE SET OF PLANS. THE ENGINEER/ LANDSCAPE ARCHITECT IS TO BE NOTIFIED OF ANY CONFLICT WITHIN THIS PLAN SET. A SET OF CONSTRUCTION PLANS SHALL BE ON SITE AND IN GOOD CONDITION AT ALL TIMES DURING CONSTRUCTION ACTIVITIES.
2. CONTRACTOR IS TO VERIFY ALL INDICATED CONDITIONS AND DIMENSIONS IN THE FIELD BEFORE COMMENCING ANY FABRICATION, ORDERING OF MATERIAL, OR PERFORMING ANY WORK. NOTIFY THE ENGINEER/LANDSCAPE ARCHITECT OF ANY CONDITIONS OR DIMENSIONS THAT WOULD PREVENT OR HAMPER THE PERFORMANCE OF THE WORK IN ACCORDANCE WITH THE CONTRACT DRAWINGS.
3. THE PHRASES “REMOVE AND REPLACE” OR “REMOVE AND INSTALL” SHALL MEAN REMOVE EXISTING MATERIALS AND REPLACE WITH NEW MATERIALS AS NOTED ON THE DRAWINGS AND/OR SPECIFIED.
4. CONTRACTOR PARKING AND STAGING AT PROJECT SITE SHALL BE COORDINATED WITH THE OWNER.
5. CONTRACTOR SHALL PREVENT EXCESSIVE ICE, MUD, SOIL, CLAY, AND LIKE MATERIALS THAT MAY ADHERE, FROM COMING INTO CONTACT WITH THE STONES FOR WALLS. SUCH MATERIALS, IF PRESENT ON THE STONES, MUST BE REMOVED PRIOR TO BUILDING.
6. THE LATEST VTRANS STANDARD SPECIFICATIONS SHALL BE UTILIZED FOR THIS PROJECT WHERE APPLICABLE.
7. EXCESS MATERIALS LEFT AFTER THE COMPLETION OF CONSTRUCTION MAY BE REMOVED OR BECOME PROPERTY OF OWNER, AT OWNER’S DISCRETION.

EXISTING INFORMATION

1. PROPERTY LINES WERE OBTAINED FROM VERMONT CENTER FOR GEOGRAPHICAL INFORMATION AND ARE INCLUDED FOR ILLUSTRATIVE PURPOSES ONLY. NO BOUNDARY SURVEY WAS COMPLETED AS PART OF THIS PROJECT.
2. CONTOUR LINES ARE BASED ON LIDAR FROM VCGI, NO TOPOGRAPHIC SURVEY WAS COMPLETED AS PART OF THIS PROJECT.

CODES & PERMITS

1. THE CONTRACTOR IS RESPONSIBLE FOR BEING FAMILIAR WITH THE REQUIREMENTS OF THE PERMITS FOR COMPLIANCE DURING CONSTRUCTION. THE CONTRACTOR SHALL MAINTAIN A COPY OF THE PERMITS ON SITE DURING ALL CONSTRUCTION ACTIVITIES.
2. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING ALL WORK IN STRICT ACCORDANCE WITH ALL MUNICIPAL, STATE, & FEDERAL ORDINANCES, CODES, RULES, AND LAWS HAVING JURISDICTION. THE CONTRACTOR SHALL NOT PROCEED WITH ANY WORK WHICH DOES NOT COMPLY COMPLETELY WITH ALL MUNICIPAL, STATE, & FEDERAL ORDINANCES, CODES, RULES, AND LAWS HAVING JURISDICTION.

SITE MAINTENANCE

1. ALL AREAS OUTSIDE THE LIMITS OF CONSTRUCTION WHICH ARE DAMAGED BY THE CONTRACTOR SHALL BE RESTORED TO THEIR ORIGINAL CONDITION TO THE SATISFACTION OF THE ENGINEER/LANDSCAPE ARCHITECT.
2. UPON COMPLETION OF THE WORK, REMOVE ALL DEBRIS, EQUIPMENT AND UNUSED MATERIALS FROM PROJECT AREA AND RESTORE TO ITS ORIGINAL CONDITION, AS APPROVED BY THE ENGINEER/ LANDSCAPE ARCHITECT.

GRADING

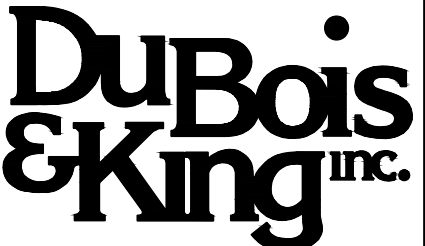
1. ANY EXCESS MATERIAL TO BE DISPOSED OF OFF SITE SHALL BE REMOVED AT NO ADDITIONAL COST UNLESS OTHERWISE APPROVED IN ADVANCE BY THE ENGINEER/ LANDSCAPE ARCHITECT. MATERIAL SHALL BE DISPOSED OF IN AN APPROVED LOCATION AWAY FROM WETLANDS, FLOODPLAIN, OR OTHER SENSITIVE AREAS.
2. ALL REMOVED TOPSOIL SHALL BE SCREENED AND STOCKPILED FOR FUTURE REUSE. CONTRACTOR SHALL NOT MIX ANY WOODY VEGETATION, TREE STUMPS, ROOTS OR OTHER NON–SUITABLE MATERIAL WITH THE STOCKPILED TOPSOIL.

EROSION CONTROL

1. CONTRACTOR SHALL CONSTRUCT TEMPORARY AND PERMANENT EROSION PREVENTION AND SEDIMENTATION CONTROL (EPSC) FACILITIES PRIOR TO THE COMMENCEMENT OF EARTHWORK OPERATIONS. EPSC MEASURES SHALL INCLUDE, BUT ARE NOT LIMITED TO, ITEMS IDENTIFIED WITHIN THIS PLAN SET OR WITHIN THE VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION (VTDEC) BEST MANAGEMENT PRACTICES (BMPs) FOR EROSION CONTROL. SEE EPSC.
2. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN EPSC DEVICES THROUGHOUT THE PROJECT SITE FOR THE DURATION OF THE CONSTRUCTION. THE CONTRACTOR SHALL (DAILY OR AS REQUIRED BASIS) INSPECT AND RECORD FINDINGS OF ALL EPSC DEVICES TO ENSURE THAT ALL ITEMS ARE IN SATISFACTORY CONDITION. IN THE EVENT THAT SAID ITEMS ARE DETERMINED TO BE IN UNSATISFACTORY CONDITION, THE CONTRACTOR SHALL RECORD THE UNSATISFACTORY ISSUE, THE DATE OF THE UNSATISFACTORY FINDING, THE APPROPRIATE CORRECTIVE MEASURE AND THE DATE THE CORRECTIVE MEASURE WAS COMPLETED.
3. ALL DISTURBED AREAS SHALL NOT BE LEFT BARE FOR MORE THAN 30 DAYS, SHALL BE STABILIZED IN A MANNER TO MITIGATE EROSION OR SEDIMENTATION FROM EXITING THE LIMIT OF WORK AND SHALL BE RESTORED IN–KIND UPON COMPLETION OF THE PROJECT. THE MAXIMUM AREA ALLOWED TO BE DISTURBED AND LEFT UNSTABILIZED IS TWO ACRES PER DRAINAGE AREA.
4. ALL SLOPES GREATER THAN 1V:3H SHALL BE PROTECTED FROM EROSION WITH APPROPRIATE SLOPE STABILIZATION CONTROL MEASURES PRIOR TO LOAMING, SEEDING AND MULCHING WITHIN 72 HOURS OF COMPLETION. CONTRACTOR SHALL MAINTAIN EROSION CONTROL PROTECTION UNTIL VEGETATION GROWTH HAS BEEN ESTABLISHED. ALL SLOPE STABILIZATION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER’S RECOMMENDATION AND VERMONT BEST MANAGEMENT PRACTICES.
5. THE CONTRACTOR SHALL NOT PLACE PERMANENT PLANTING AND SEEDING PRIOR TO MAY 1ST NOR AFTER OCTOBER 1ST. TEMPORARY SEEDING WITH WINTER RYE MAY BE USED OUTSIDE OF THIS PERIOD.
6. ALL WORK MUST BE DONE IN A MANNER WHICH MINIMIZES THE POTENTIAL FOR THE DISCHARGE OF SEDIMENT–LADEN WATER. CONTRACTOR IS RESPONSIBLE FOR DIVERTING, PUMPING, OR OTHERWISE CONTROLLING WATER AS NECESSARY.

TYPICAL ABBREVIATIONS:

ASTM = AMERICAN SOCIETY OF TESTING MATERIALS
B = BORING
BIT = BITUMINOUS
BM = BENCH MARK
BMP = BEST MANAGEMENT PRACTICE
CB = CATCH BASIN
CF = CUBIC FEET, OR CONSTRUCTION FENCE
CFS = CUBIC FEET PER SECOND
CMP = CORRUGATED METAL PIPE
CY = CUBIC YARD
DWL = DOWEL
ELEV = ELEVATION
EPSC = EROSION PREVENTION AND SEDIMENT CONTROL
EW = EACH WAY
EX = EXISTING
FE = FLANGED END
FT = FOOT, FEET
HDPE = HIGH DENSITY POLYETHYLENE
HYD = HYDRANT
ID = INSIDE DIAMETER
IN = INCH
INV = INVERT
LF = LINEAR FEET, LINEAL FEET
MAX = MAXIMUM
MIN = MINIMUM
NTS = NOT TO SCALE
OD = OUTSIDE DIAMETER
OHT&P = OVERHEAD TELEPHONE & POWER
PCA = PORTLAND CEMENT ASSOCIATION
PL = PROPERTY LINE
PVC = POLYVINYLCHLORIDE
S = SEWER
SD = STORM DRAIN
SMH = SEWER MANHOLE
SY = SQUARE YARDS
T = TELEPHONE
TBM = TEMPORARY BENCHMARK
TYP = TYPICAL
UGT&P = UNDERGROUND TELEPHONE & POWER
UP = UTILITY POLE
VIF = VERIFY IN FIELD
VT DEC = VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION



www.dubois-king.com
© Copyright 2026 DuBois & King inc.

NOT FOR
CONSTRUCTION
PRELIMINARY
PLANS

REVISIONS	BY	DATE	NUMBER	REVISION DESCRIPTION										

CLIENT NAME
WINDHAM COUNTY
NATURAL
RESOURCES
CONSERVATION
DISTRICT

PROJECT NAME
LAKE RAPONDA
SHORELINE
EROSION CONTROL
90% DESIGN

GREEN MOUNTAIN
BEACH
WILMINGTON, VT

SHEET TITLE

NOTES

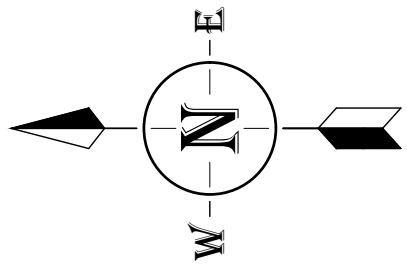
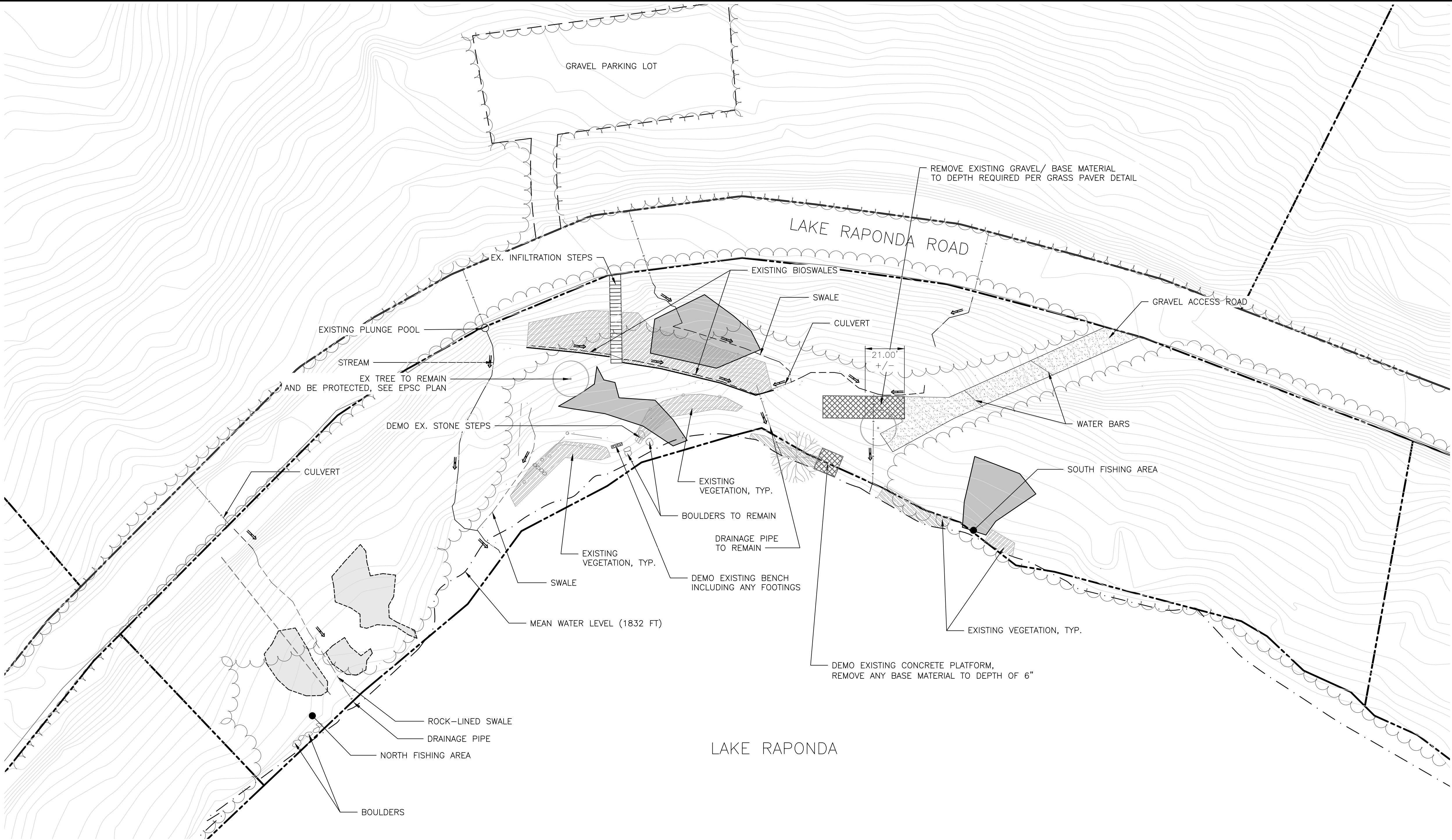
D&K PROJECT # 230341P1	PROJ. ENG. CJR
---------------------------	-------------------

DRAWN BY KAC	CHECKED BY ANH
-----------------	-------------------

DATE 8/13/2026

SHEET NUMBER G-1.1
SHEET: 2 of 12

I:\2\230341 WCD Lake Raponda Shoreline Erosion Control\Drawings\Landscape\230341P1_WCD Lake Raponda_CD.dwg 8/13/2026 5:05 PM



**NOT FOR
CONSTRUCTION
PRELIMINARY
PLANS**

REVISIONS			
NUMBER	DATE	REVISION DESCRIPTION	BY

CLIENT NAME
WINDHAM COUNTY
NATURAL
RESOURCES
CONSERVATION
DISTRICT

PROJECT NAME
LAKE RAPONDA
SHORELINE
EROSION CONTROL
90% DESIGN

GREEN MOUNTAIN
BEACH
WILMINGTON, VT

SHEET TITLE

EXISTING
CONDITIONS &
DEMO

D&K PROJECT #
230341P1

PROJ. ENG.
CJR

DRAWN BY
KAC

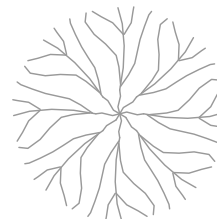
CHECKED BY
ANH

DATE
8/13/2026

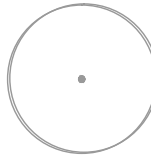
SHEET NUMBER
L-1.0

SHEET: 3 of 12

LEGEND	
	PROPERTY LINE
	EXISTING CONTOUR
	STORM DRAIN/CULVERT PIPE
	MEAN WATER LEVEL
	STREAM CENTERLINE
	SWALE CENTERLINE
	TREE LINE
	FENCE
	GRAVEL ROAD
	DELINEATED WETLANDS
	INFERRED WETLANDS
	PROTECTED VEGETATION
	DEMO



EX. EVERGREEN TREE

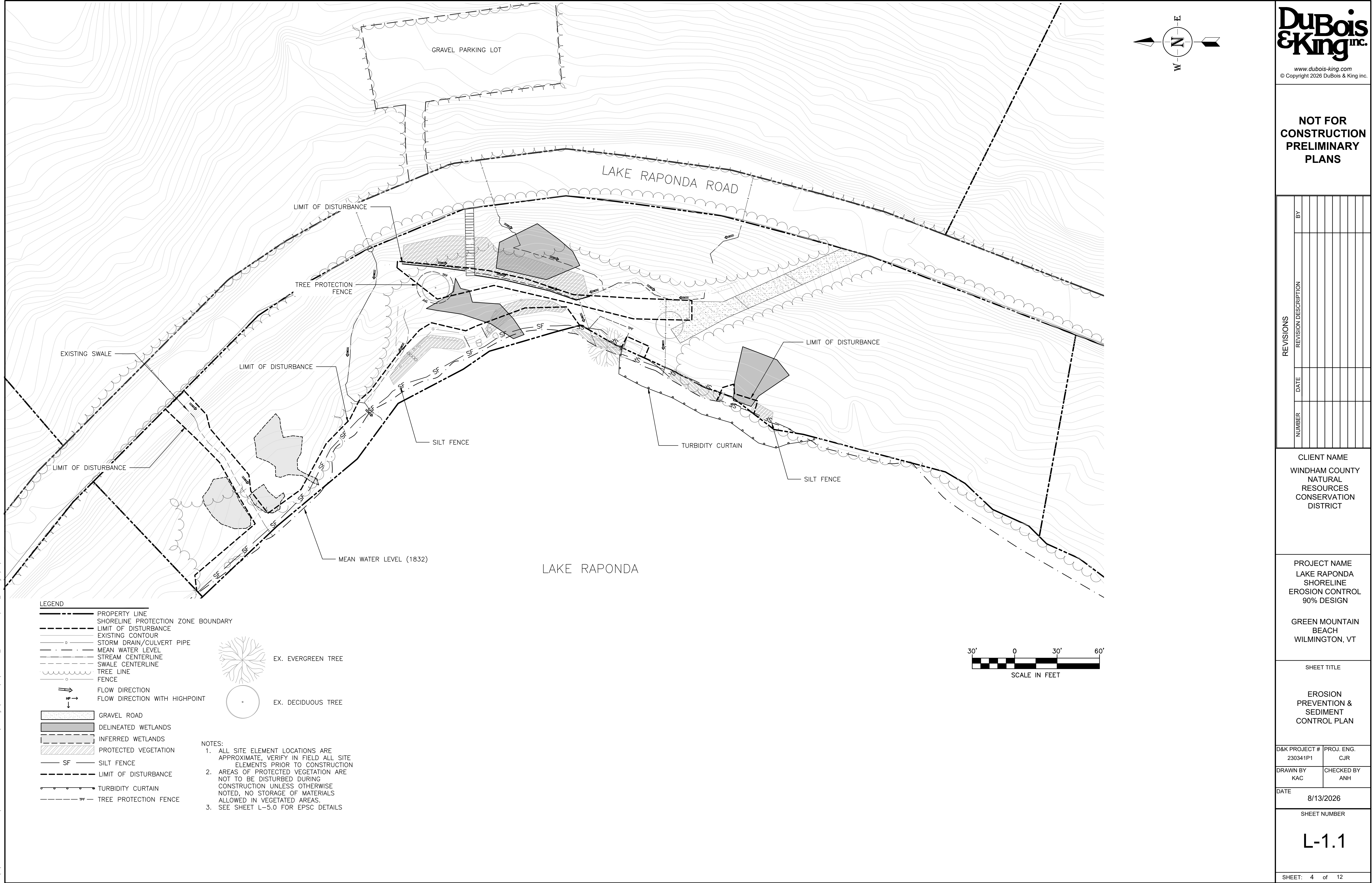


EX. DECIDUOUS TREE

- NOTES:
1. ALL SITE ELEMENT LOCATIONS ARE APPROXIMATE, VERIFY IN FIELD ALL SITE ELEMENTS PRIOR TO CONSTRUCTION
 2. AREAS OF PROTECTED VEGETATION ARE NOT TO BE DISTURBED DURING CONSTRUCTION UNLESS OTHERWISE NOTED, NO STORAGE OF MATERIALS ALLOWED IN VEGETATED AREAS.



I:\2\230341 WCCD Lake Raponda Shoreline Erosion Control\Drawings\Landscape\230341P1_WCCD Lake Raponda_CD.dwg 8/13/2026 5:05 PM



DuBois & King inc.

www.dubois-king.com

© Copyright 2026 DuBois & King inc.

NOT FOR CONSTRUCTION PRELIMINARY PLANS

REVISIONS	
BY	REVISION DESCRIPTION

CLIENT NAME

WINDHAM COUNTY NATURAL RESOURCES CONSERVATION DISTRICT

PROJECT NAME

LAKE RAPONDA SHORELINE EROSION CONTROL 90% DESIGN

GREEN MOUNTAIN BEACH

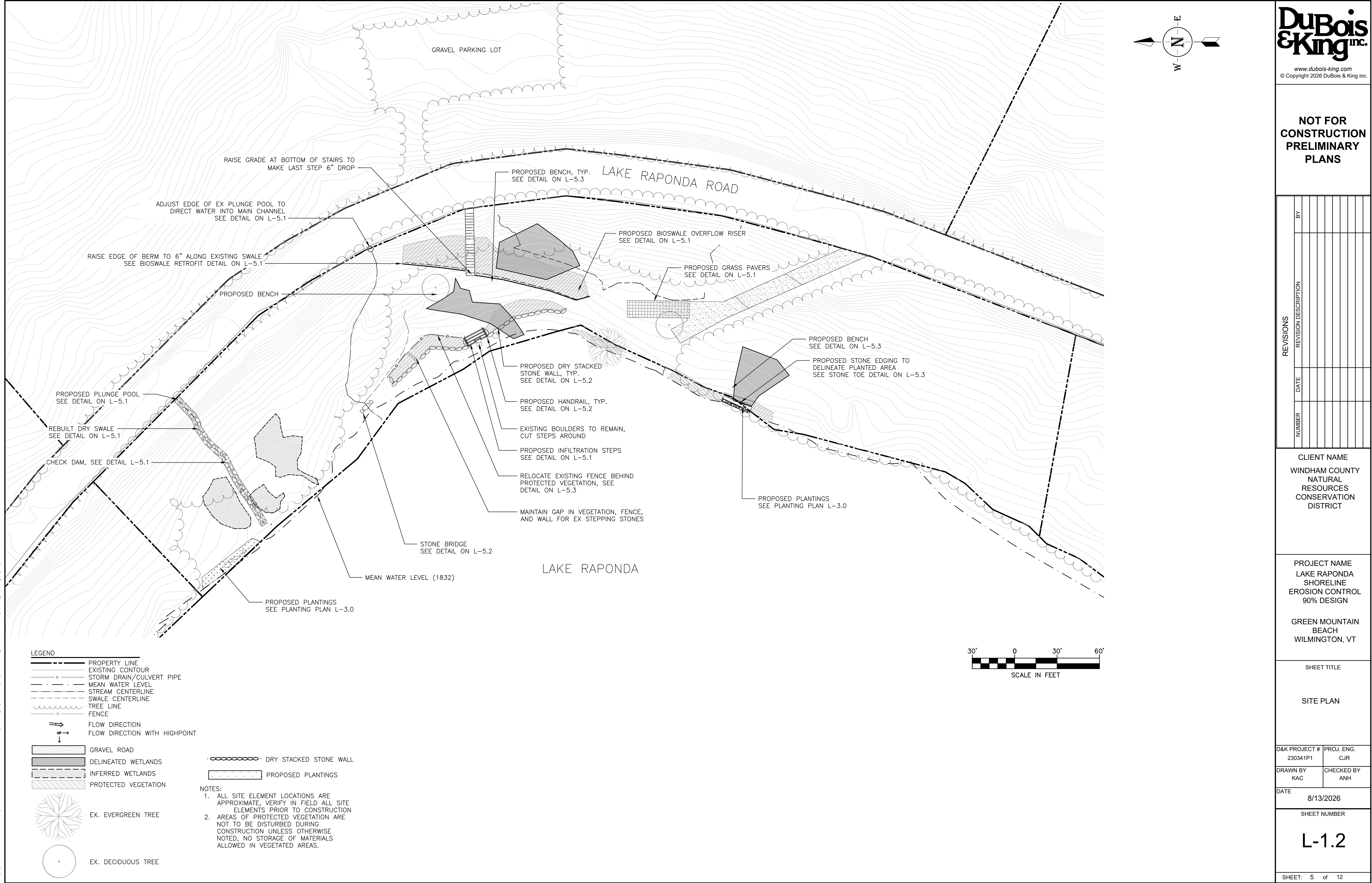
WILMINGTON, VT

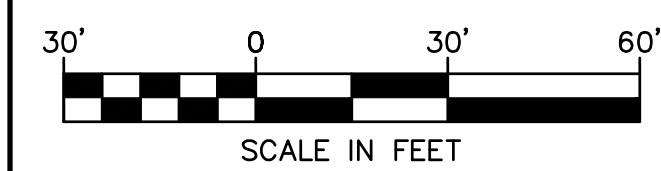
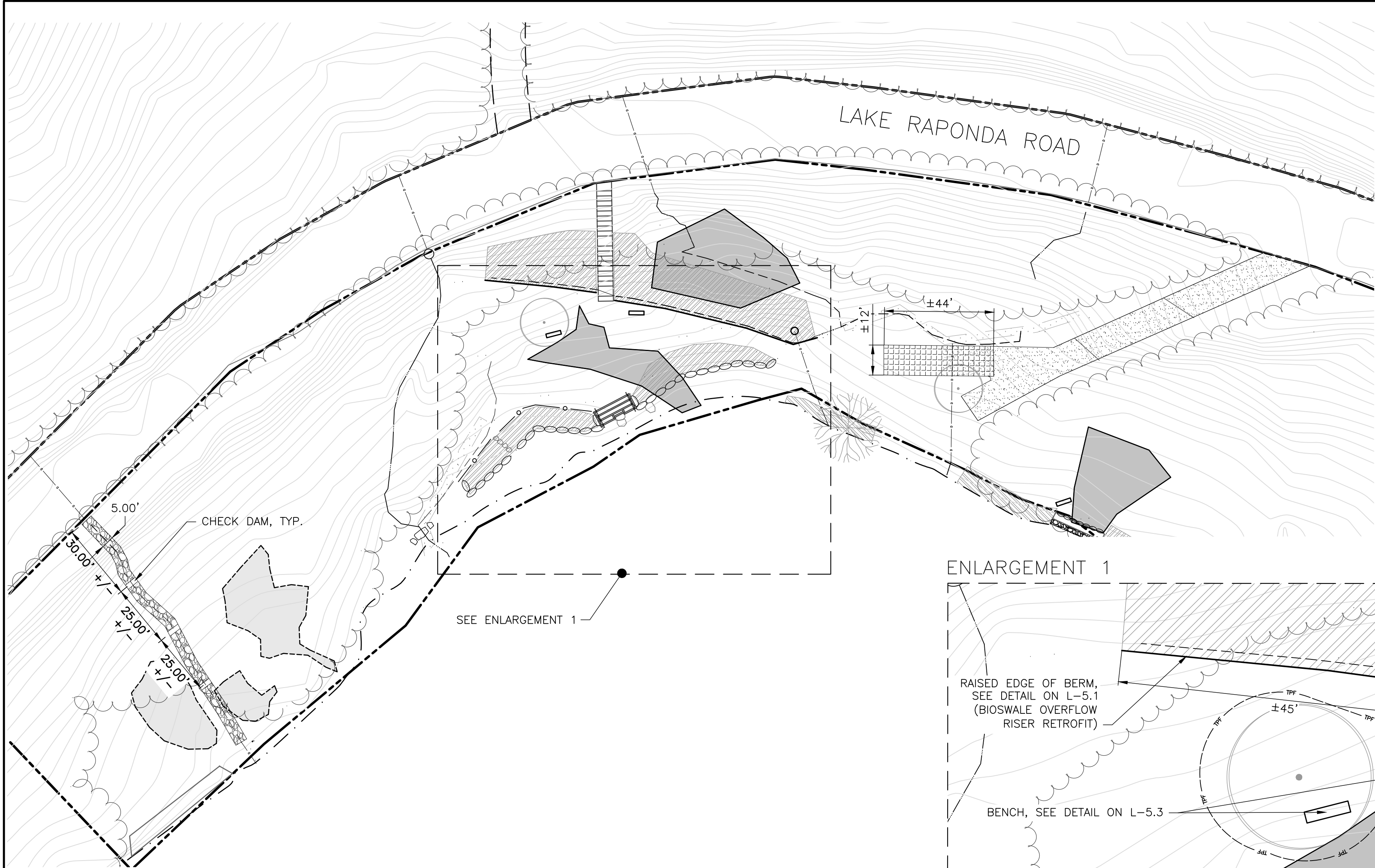
SHEET TITLE

EROSION PREVENTION & SEDIMENT CONTROL PLAN

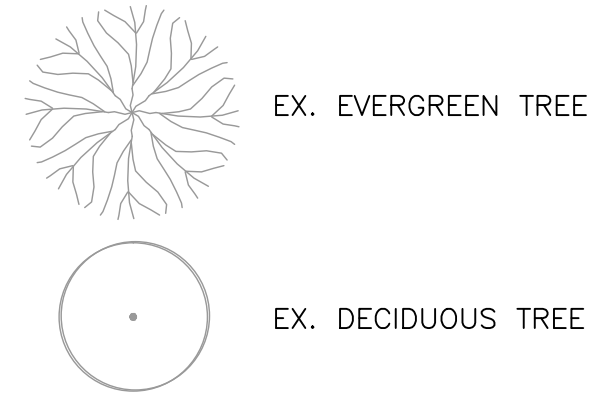
D&K PROJECT #	PROJ. ENG.
230341P1	CJR
DRAWN BY	CHECKED BY
KAC	ANH
DATE	
8/13/2026	
SHEET NUMBER	
L-1.1	
SHEET: 4 of 12	

I:\2\230341 WCD Lake Raponda Shoreline Erosion Control\Drawings\Landscape\230341P1_WCD Lake Raponda_CD.dwg 8/13/2026 5:06 PM





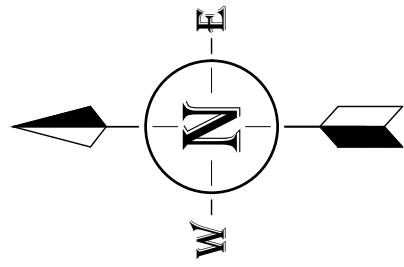
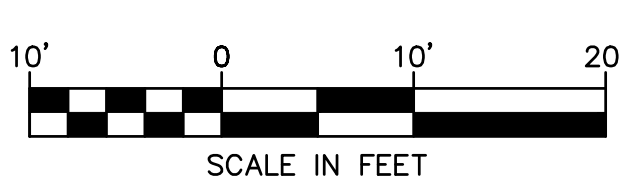
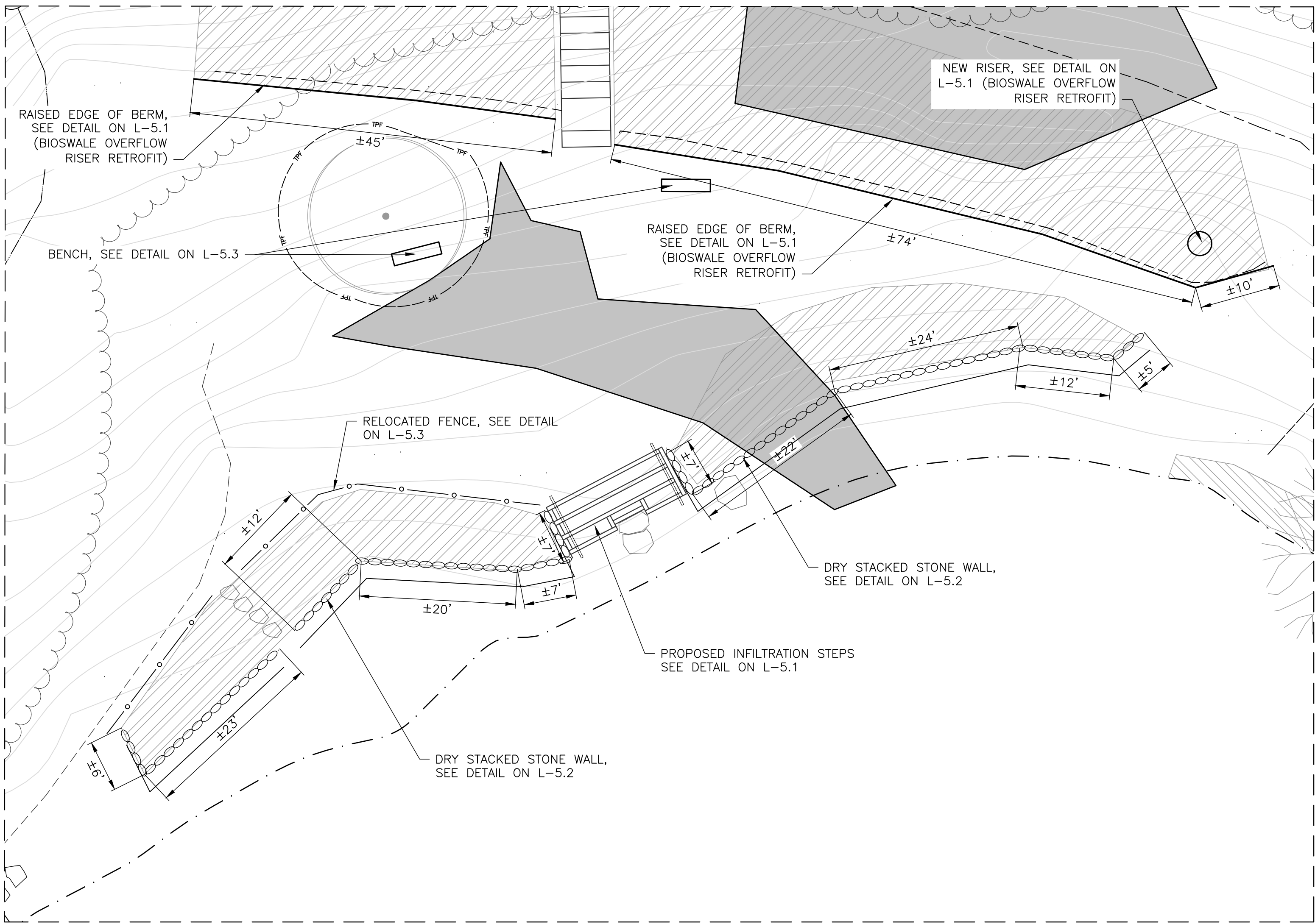
- LEGEND**
- PROPERTY LINE
 - EXISTING CONTOUR
 - STORM DRAIN/CULVERT PIPE
 - MEAN WATER LEVEL
 - STREAM CENTERLINE
 - SWALE CENTERLINE
 - TREE LINE
 - FENCE
 - FLOW DIRECTION
 - FLOW DIRECTION WITH HIGHPOINT
 - GRAVEL ROAD
 - DELINEATED WETLANDS
 - INFERRED WETLANDS
 - PROTECTED VEGETATION



- NOTES:**
- ALL SITE ELEMENT LOCATIONS ARE APPROXIMATE. VERIFY IN FIELD ALL SITE ELEMENTS PRIOR TO CONSTRUCTION.
 - AREAS OF PROTECTED VEGETATION ARE NOT TO BE DISTURBED DURING CONSTRUCTION UNLESS OTHERWISE NOTED. NO STORAGE OF MATERIALS ALLOWED IN VEGETATED AREAS.
 - CONTRACTOR TO STAKE PROPOSED ELEMENTS IN FIELD AND GET APPROVAL FROM THE LANDSCAPE ARCHITECT BEFORE INSTALLATION.

- DRY STACKED STONE WALL
- PROPOSED PLANTINGS

ENLARGEMENT 1



**NOT FOR
CONSTRUCTION
PRELIMINARY
PLANS**

REVISIONS	REVISION DESCRIPTION	DATE	BY

CLIENT NAME
WINDHAM COUNTY
NATURAL
RESOURCES
CONSERVATION
DISTRICT

PROJECT NAME
LAKE RAPONDA
SHORELINE
EROSION CONTROL
90% DESIGN

**GREEN MOUNTAIN
BEACH
WILMINGTON, VT**

SHEET TITLE

LAYOUT PLAN

D&K PROJECT #
230341P1

PROJ. ENG.
CJR

DRAWN BY
KAC

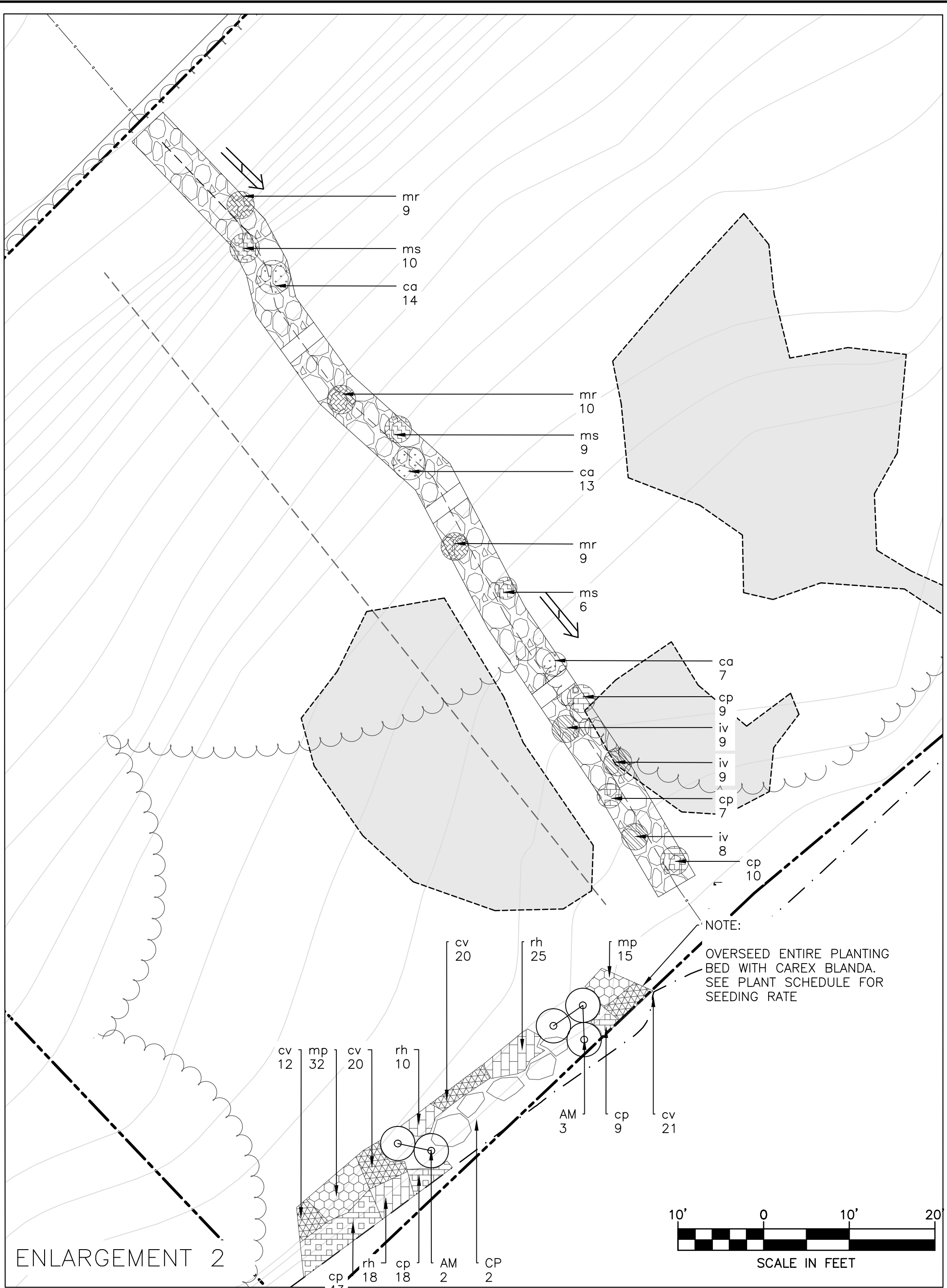
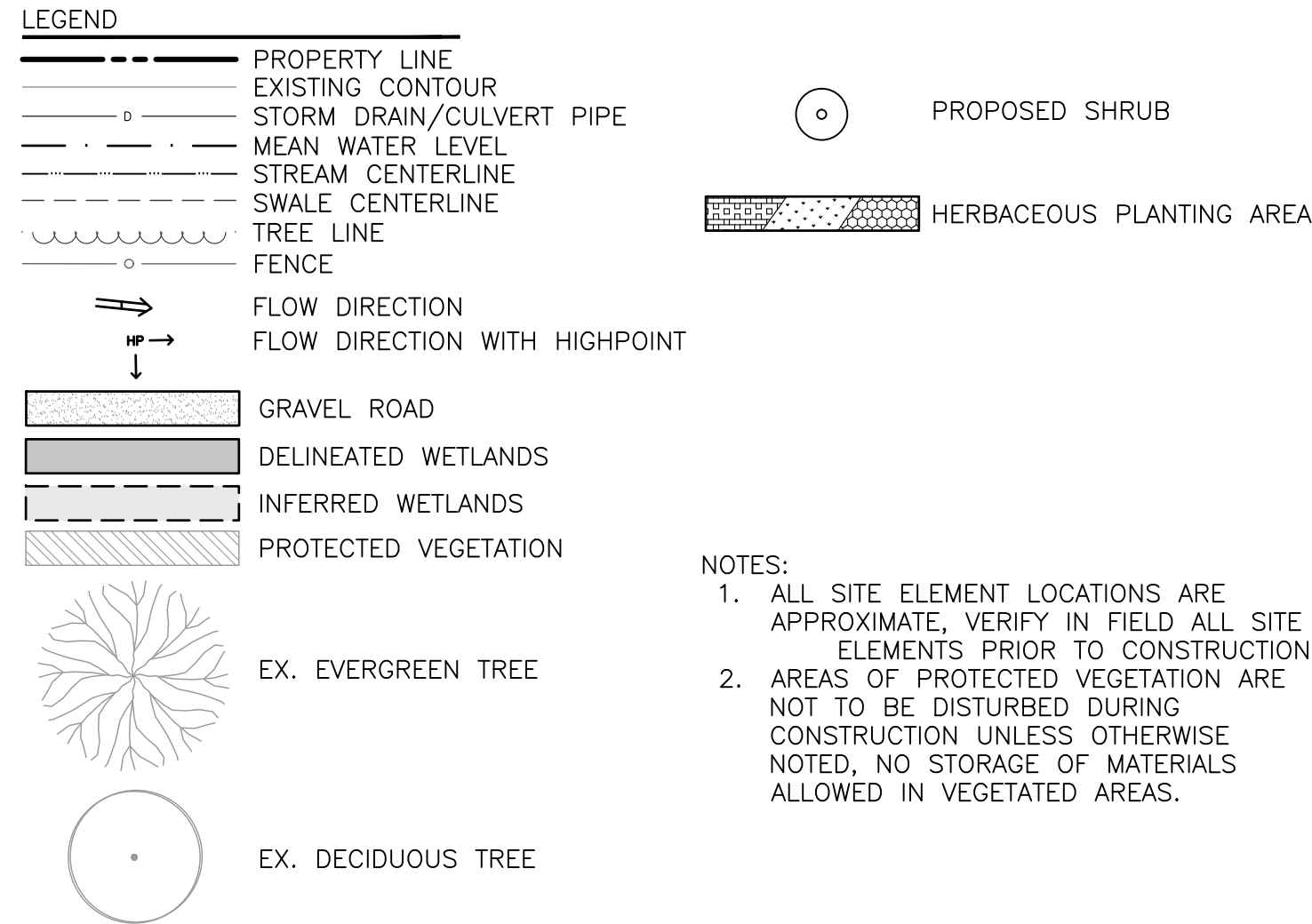
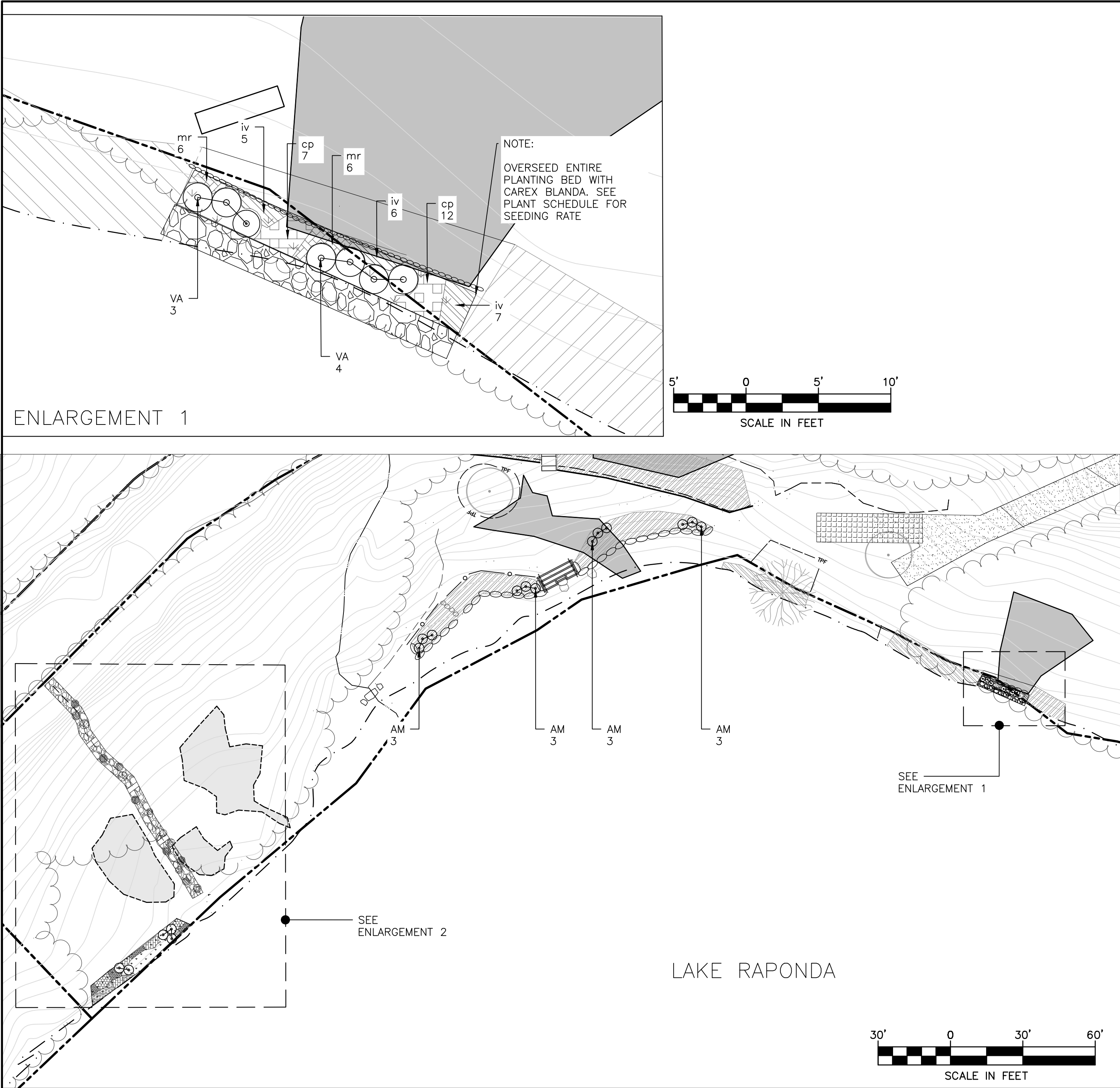
CHECKED BY
ANH

DATE
8/13/2026

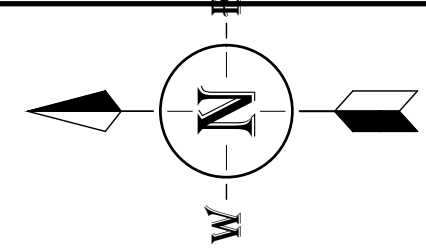
SHEET NUMBER

L-2.0

I:\2\230341 WCCD Lake Raponda Shoreline Erosion Control\Drawings\Landscape\230341P1_WCCD Lake Raponda_CD.dwg 8/13/2026 5:06 PM



PLANT SCHEDULE						
KEY	QTY	BOTANICAL NAME	BOTANICAL NAME	SIZE	ROOT	REMARKS
SHRUBS						
AM	17	Aronia melanocarpa 'Low Scape'	Black Chokeberry	5 gal.	Cont.	4' O.C.
VA	7	Vaccinium angustifolium	Lowbush Blueberry	5 gal.	Cont.	5' O.C.
HERBACEOUS PLANTINGS						
ca	34	Carex appalachia	Appalachian Sedge	quart pot	Cont.	12" O.C.
cv	73	Carex vulpinoidea	Fox Sedge	quart pot	Cont.	12" O.C.
cp	115	Catha palustris	Marsh Marigold	quart pot	Cont.	12" O.C.
iv	44	Iris versicolor	Blueflag Iris	quart pot	Cont.	12" O.C.
ms	25	Matteuccia struthiopteris	Ostrich Fern	quart pot	Cont.	12" O.C.
mr	40	Mitchella repens	Partridgeberry	quart pot	Cont.	12" O.C.
mp	47	Mondarda punctata	Spotted Bee Balm	quart pot	Cont.	12" O.C.
rh	53	Ruellia humilis	Wild Petunia	quart pot	Cont.	12" O.C.
MISC. ITEMS/SEED MIXES						
SEEDING RATE		BOTANICAL NAME	BOTANICAL NAME	SEEDING AREA		
2 oz per 1,000 sq feet		Carex blanda	Eastern Woodland Sedge	330 sqft	seed in fall or winter or cold stratify for spring planting	



DuBois & King inc.
www.dubois-king.com
© Copyright 2026 DuBois & King inc.

NOT FOR CONSTRUCTION PRELIMINARY PLANS

REVISIONS	BY					
	REVISION DESCRIPTION					
	NUMBER	DATE				

CLIENT NAME
WINDHAM COUNTY NATURAL RESOURCES CONSERVATION DISTRICT

PROJECT NAME
LAKE RAPONDA SHORELINE EROSION CONTROL 90% DESIGN

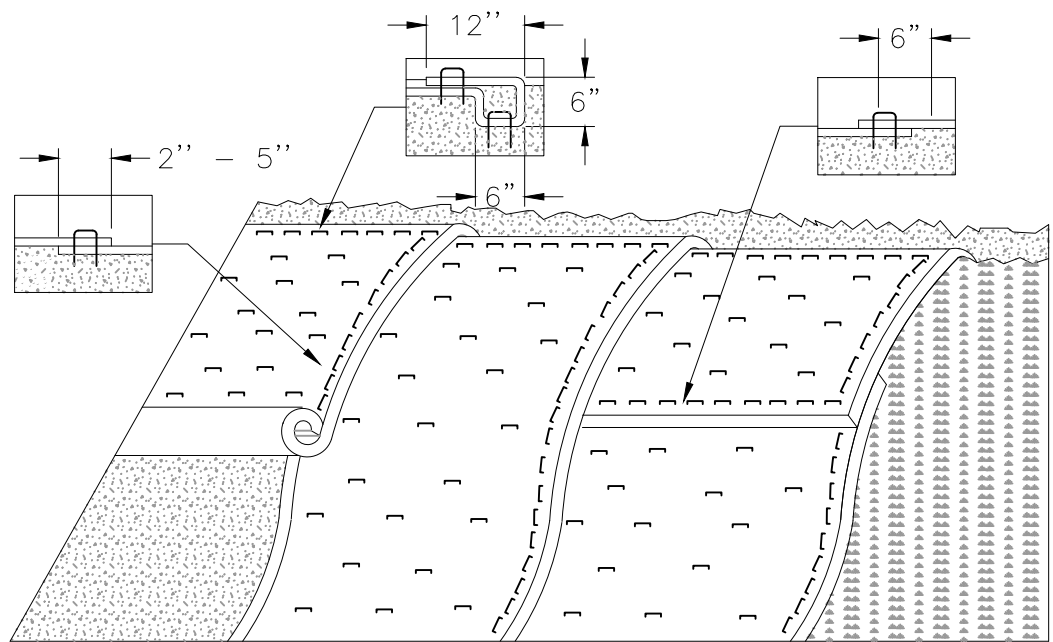
GREEN MOUNTAIN BEACH
WILMINGTON, VT

SHEET TITLE

PLANTING PLAN

D&K PROJECT # 230341P1	PROJ. ENG. CJR
DRAWN BY KAC	CHECKED BY ANH
DATE 8/13/2026	
SHEET NUMBER L-3.0	
SHEET: 7 of 12	

I:\A\230341_WCSD_Lake Raponda Shoreline Erosion Control\Drawings\Landscape\230341EP1_WCSD_Lake Raponda_CO-Details.dwg 8/13/2026 5:06 PM



EROSION PREVENTION FOR SIDE SLOPES
NOT TO SCALE

APPLICATION NOTES:

A. THE PURPOSE OF MATTING ON SIDE SLOPES IS TO REDUCE EROSION AND AID THE ESTABLISHMENT OF VEGETATION

B. EROSION CONTROL MATTING SHALL BE USED FOR THE FOLLOWING REASONS:

- * SIDE SLOPES > 3:1 (H:V)
- * AREAS WHERE SEED AND MULCH WILL NOT STAY IN PLACE ALONE
- * WHERE SEEDING IS OUTSIDE THE GROWING SEASON.

GENERAL NOTES:

1. GRADE AND SMOOTH THE SLOPE TO PROVIDE GOOD MATTING TO SOIL SURFACE CONTACT.
2. APPLY FERTILIZER, LIME, AND SEED PRIOR TO PLACING MATTING.
3. ANCHOR MATTING AS SHOWN, UTILIZING ANCHOR STAPLES. STAPLE PLACEMENT SHALL BE DETERMINED BY THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
4. UNROLL MATTING VERTICALLY DOWN SLOPE IN THE DIRECTION OF WATER FLOW.
5. OVERLAP UPPER MATTING OVER LOWER MATTING AS SHOWN.
6. OVERLAP ADJACENT MATTING AS SHOWN.
7. CUT EXCESS MATTING AT END OF SLOPE AND ANCHOR THE END.
8. EROSION CONTROL MATTING SHALL BE 100% BIODEGRADABLE.
9. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS MINIMUM AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.
10. MATTING SHALL BE REPAIRED AND RESTAPLED AS NECESSARY TO ENSURE PROPER FUNCTION.
11. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE INSTALLATION, INSPECTION AND MAINTENANCE OF ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES.

WINTER CONSTRUCTION

SITE CONSTRUCTION MAY CONTINUE THROUGH THE WINTER MONTHS ON THIS PROJECT. IT IS IMPERATIVE THAT ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES BE IN PLACE AND FUNCTIONING TO ENSURE THEIR EFFECTIVENESS THROUGH THE WINTER AND SPRING SEASON. WINTER IN VERMONT CAN DIMINISH THE EFFECTIVENESS OF CONTROLS AND PREDISPOSE A SITE TO SEVERE EROSION AND SEDIMENTATION. DISTURBED AND BARE SOIL THAT IS WELL-FROZEN IS QUITE RESISTANT TO EROSION. HOWEVER, SEVERE EROSION OCCURS DURING THE MIDWINTER AND SPRING THAWS WHEN MELTING SNOW, THAWING SOILS AND HEAVY RAINS PRODUCE INTENSE RUNOFF OVER SATURATED UNSTABLE SOILS. FOR THESE REASONS, SOIL DISTURBANCES SHALL BE STABILIZED BY PRIOR TO THE START OF THE WINTER CONSTRUCTION SEASON (OCTOBER, 15TH). ALL EARTHWORK CONTINUING DURING THE WINTER CONSTRUCTION SEASON SHALL BE STABILIZED IN ACCORDANCE WITH THE STATE OF VERMONT EROSION PREVENTION AND SEDIMENT CONTROL REQUIREMENTS FOR WINTER CONSTRUCTION.

INSPECTION AND MAINTENANCE

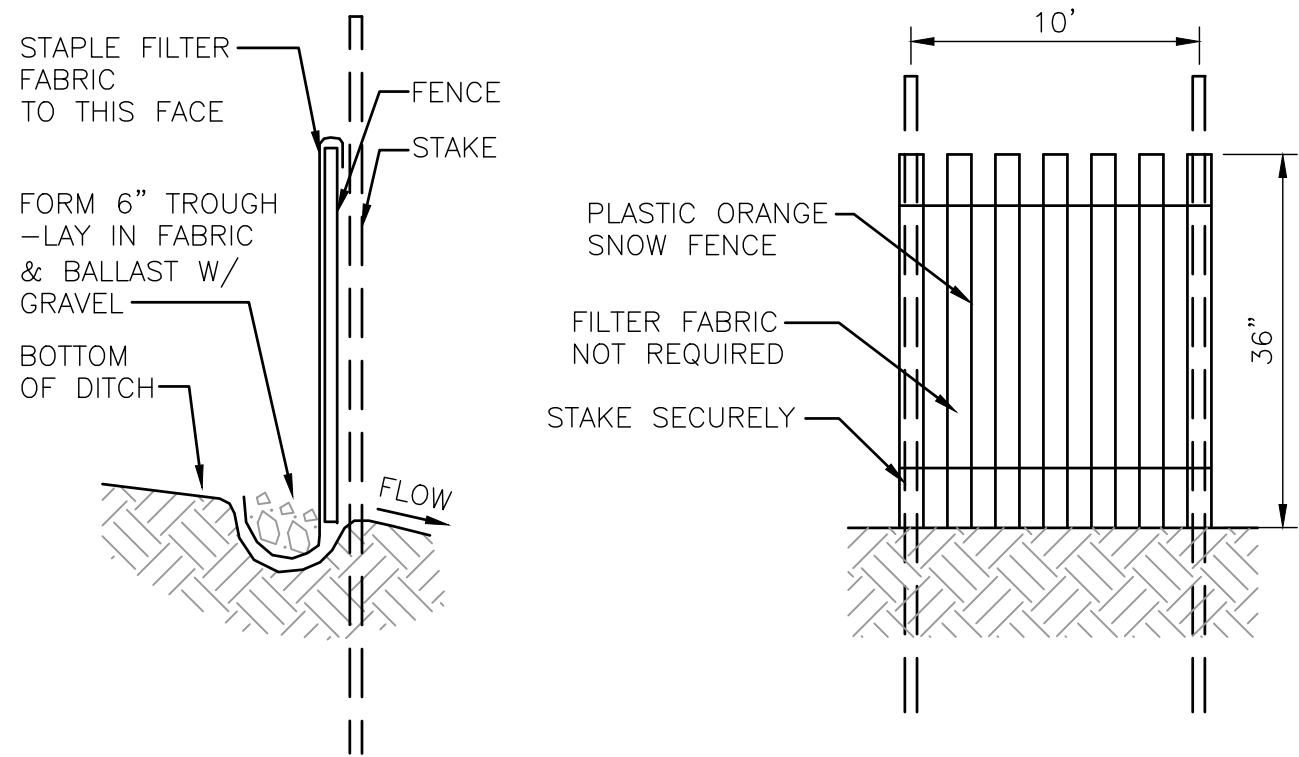
INSPECT EROSION PREVENTION AND SEDIMENT CONTROL MEASURES MORE FREQUENTLY IN THE WINTER AND SPRING THAN IN THE SUMMER. PAY CAREFUL ATTENTION TO WEATHER PREDICTIONS. WATCH FOR PREDICTED THAWS OR HEAVY RAINS. BEFORE SUCH EVENTS, CHECK ALL CONTROL MEASURES TO BE SURE THAT STRUCTURES WILL MANAGE THE POTENTIALLY HEAVY AND INTENSE RUNOFF AND SEDIMENT. PRACTICALLY CONSTANT MAINTENANCE OF CRITICAL CONTROL MEASURES MAY BE NECESSARY DURING THE WINTER AND EARLY SPRING TO PREVENT FAILURE OR OVERLOADING OF CONTROL MEASURES. BE PREPARED TO QUICKLY INSTALL A SECOND LINE OF DEFENSE IF PROBLEMS OCCUR. BE PREPARED TO DEVOTE A SUBSTANTIAL AMOUNT OF TIME, EQUIPMENT AND MANPOWER TO EROSION PREVENTION AND SEDIMENT CONTROL.

FOLLOW-UP

AS EARLY AS IS PRACTICAL, AT THE BEGINNING OF THE NEXT GROWING SEASON, INSTALL PERMANENT VEGETATIVE CONTROLS AS SPECIFIED IN THIS EPSC PLAN.

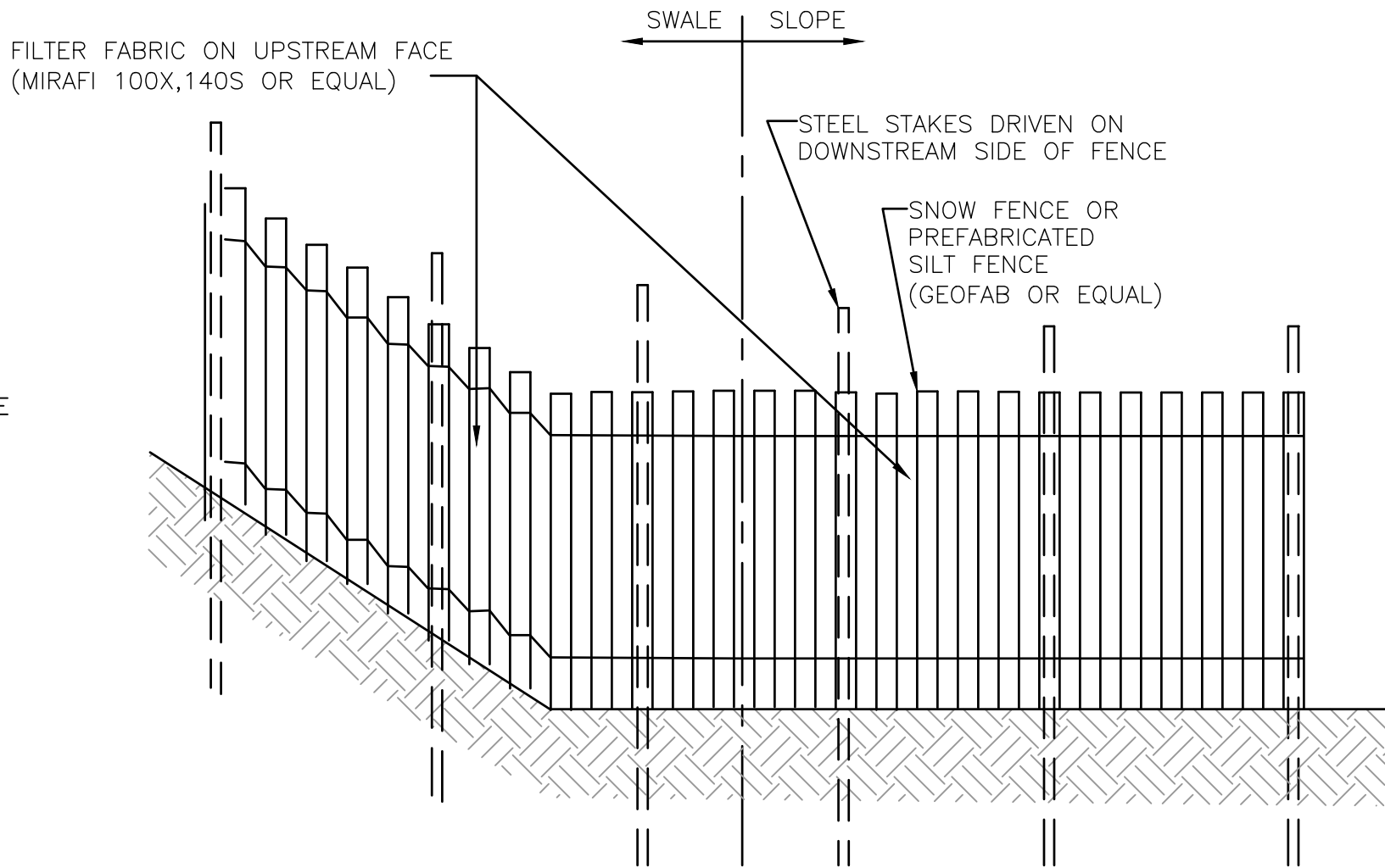
DEWATERING PROCEDURE

DEWATERING WILL BE ACCOMPLISHED BY PLACEMENT OF CRUSHED STONE FILLED SUMPS IN LOW AREAS OF THE EXCAVATION. WATER WILL BE PUMPED FROM THESE SUMPS THROUGH A SEDIMENTATION DEVICE AND DISCHARGE INTO THE SUBSURFACE STORMWATER SYSTEM. THE DETAILS OF DEWATERING, INCLUDING THE NUMBER AND LOCATION OF SUMPS; THE TYPE, NUMBER AND LOCATION OF THE SEDIMENTATION DEVICE(S) AND THE ASSOCIATED DISCHARGE POINTS AND OPERATING PROCEDURES WILL DEPEND ON THE CONDITIONS ENCOUNTERED DURING CONSTRUCTION, AS WELL AS THE SEASONAL WEATHER CONDITIONS. A PLAN WHICH DETAILS THE DEWATERING SYSTEM AND PROCEDURES WILL BE PROVIDED FOR REVIEW AND APPROVAL BY THE ON-SITE COORDINATOR PRIOR TO ITS IMPLEMENTATION.



SILT FENCE SECTION
NOT TO SCALE

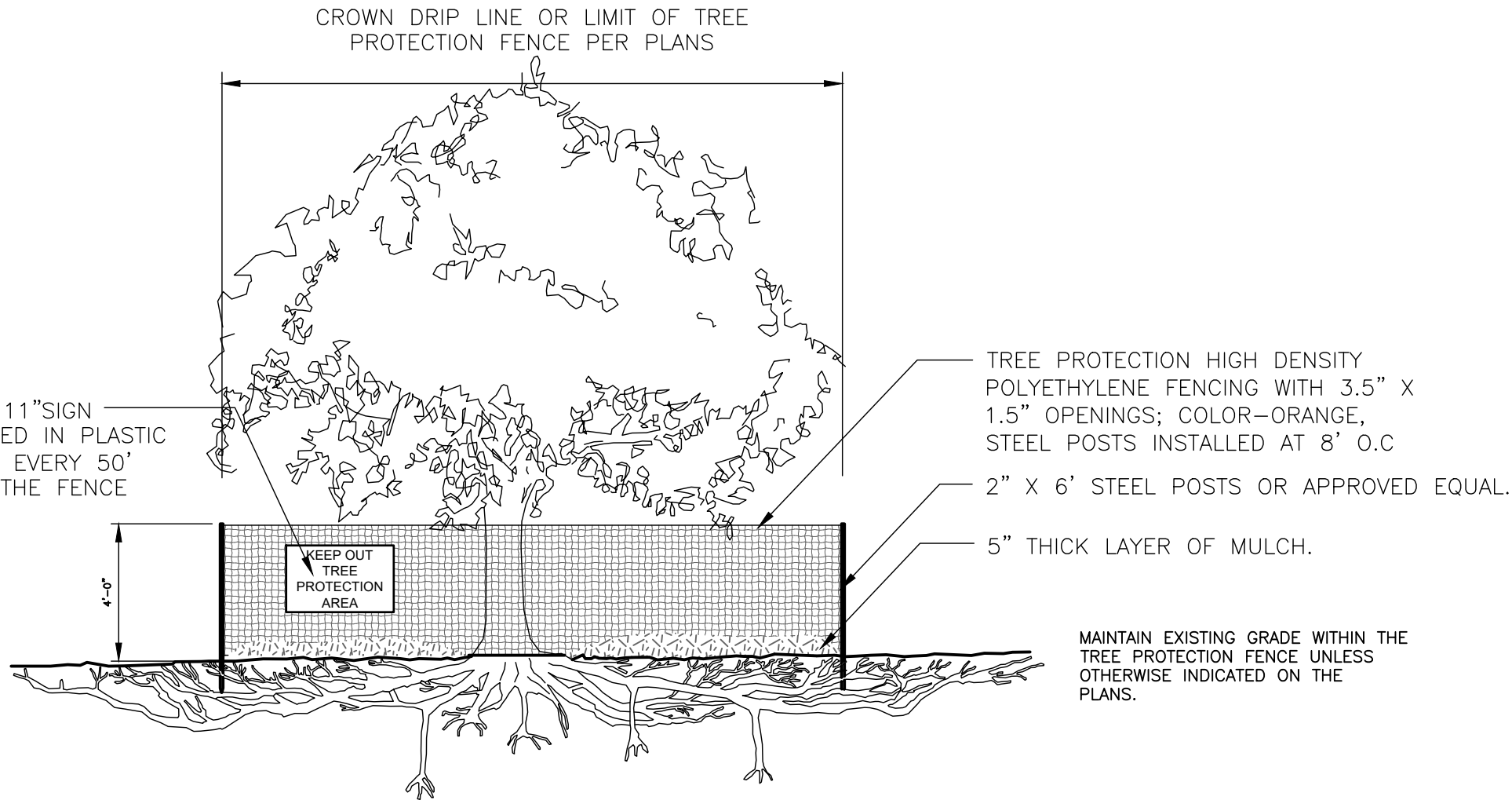
ISOLATION FENCE
NOT TO SCALE



SILT FENCE SECTION
NOT TO SCALE

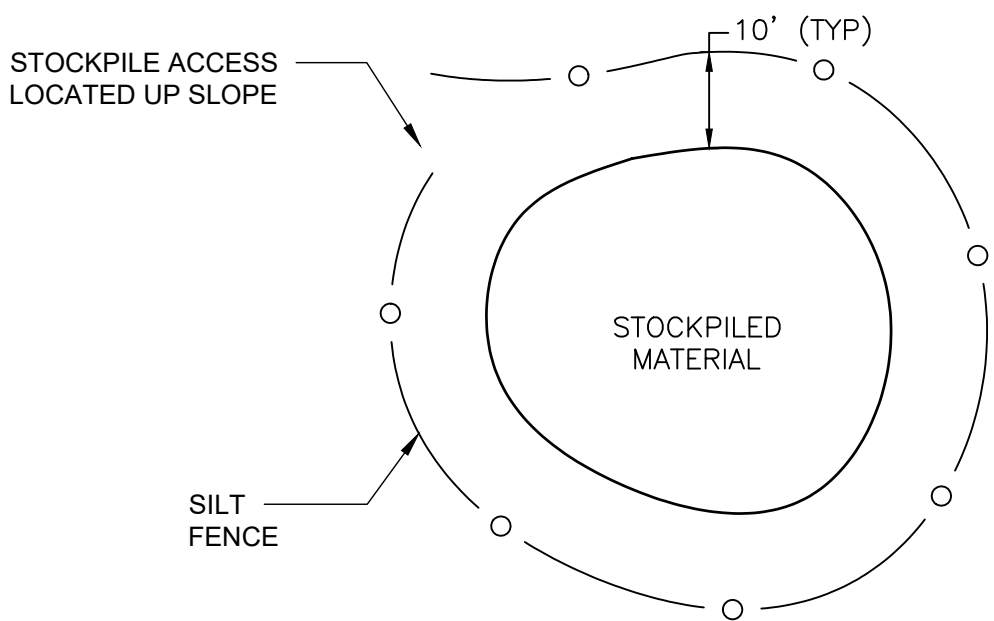
EROSION CONTROL SCHEDULE	
FOR SITE CONDITIONS	USE TYPE
AREAS FLATTER THAN 1:5 (20%)	STRAW MULCH
AREAS 1:5 (20%) OR STEEPER	MATTING/BLANKETS
ALL DISTURBED AREAS	SEED AND SOD
ACROSS SLOPES AROUND CATCH BASINS AROUND STOCK PILE AND BORROW AREAS TOES OF SLOPE ALONG STREAMS AND WATER BODIES AS SHOWN ON DRAWINGS	SILT FENCES
ACROSS SLOPES AROUND CATCH BASINS IN DRAINAGE DITCHES 9% SLOPE OR LESS - PLACE 100 FT. APART 10% TO 19% - PLACE 50 FT. APART 20% OR GREATER - PLACE 25 FT. APART AS SHOWN ON DRAWINGS	CHECK DAMS
IN DITCHES PRIOR TO DISCHARGE TO BODIES OF WATER AS SHOWN ON DRAWINGS	SEDIMENT BASINS
STABILIZED CONST. ENTRANCE AS SHOWN ON DRAWINGS	STABILIZED CONST. ENTRANCE

EROSION CONTROL SCHEDULE
NOT TO SCALE



- NOTES:
1. SEE SPECIFICATIONS FOR ADDITIONAL TREE PROTECTION REQUIREMENTS.
 2. IF THERE IS NO EXISTING IRRIGATION, SEE SPECIFICATIONS FOR WATERING REQUIREMENTS.
 3. ANY REQUIRED PRUNING SHALL BE DONE BY AN APPROVED ARBORIST.
 4. NO EQUIPMENT SHALL OPERATE INSIDE THE PROTECTIVE FENCING, INCLUDING DURING FENCE INSTALLATION AND REMOVAL.
 5. SEE EPSC AND LANDSCAPE PLANS FOR ANY MODIFICATIONS WITHIN THE TREE PROTECTION AREA.
 6. EXPOSED ROOTS TO BE WRAPPED IN BURLAP AND KEPT MOIST TO AVOID SUNLIGHT AND DEHYDRATION WHILE BEING EXPOSED. REMOVE BURLAP BEFORE RE-BURYING EXPOSED ROOTS.
 7. ROOTS GREATER THAN 2 INCHES IN DIAMETER THAT CAN NOT BE PRESERVED TO BE CUT CLEAN BY AN APPROVED PROFESSIONAL.

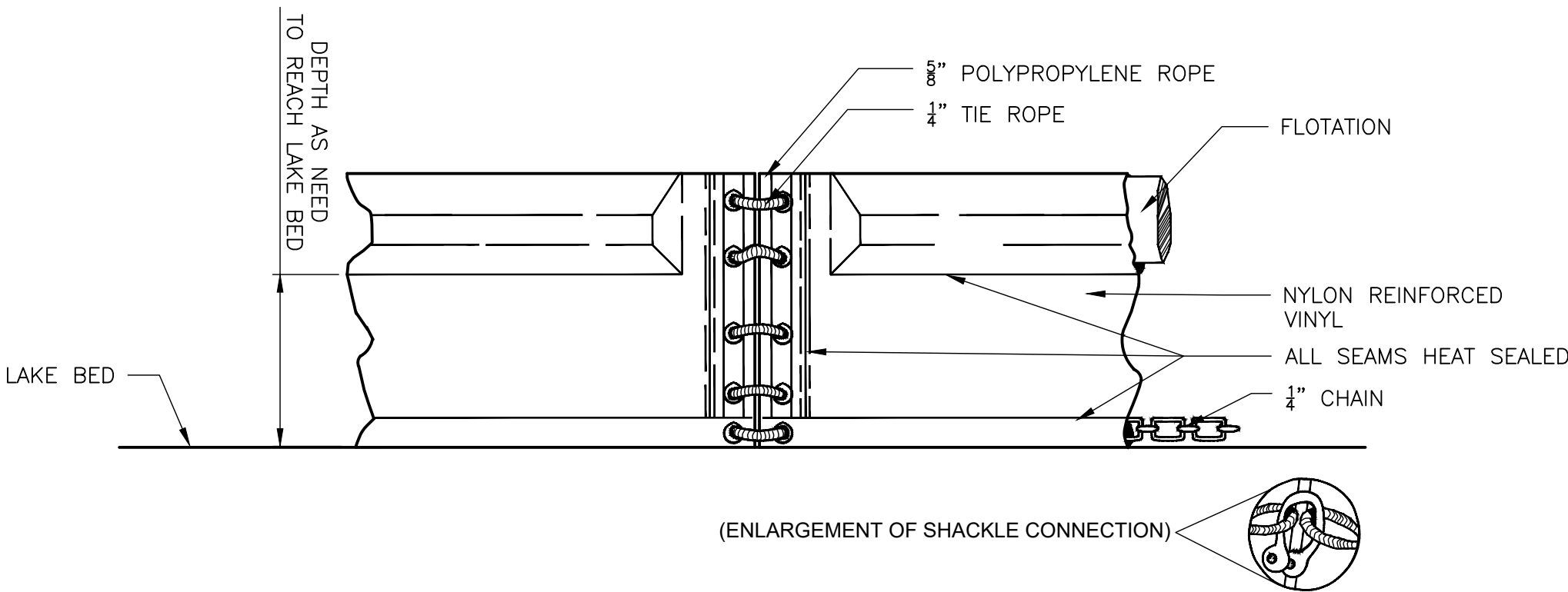
TREE PROTECTION AREA
NOT TO SCALE



NOTES:

1. ALL AREAS NOT TO BE WORKED FOR 14 DAYS OR MORE SHALL BE TEMPORARILY STABILIZED WITH MULCH, MATTING, OR OTHER MEASURES SUITABLE TO THE LOCATION.

STOCKPILE AREA ISOLATION DETAIL
NOT TO SCALE



NOTES:

1. TURBIDITY CURTAIN MUST BE INSTALLED PRIOR TO WORK IN LAKE BED.
2. SEE PLAN FOR TURBIDITY CURTAIN LAYOUT

TURBIDITY CURTAIN DETAIL
NOT TO SCALE

NOT FOR CONSTRUCTION PRELIMINARY PLANS

REVISIONS	BY								
	REVISION DESCRIPTION								
	DATE								
	NUMBER								

CLIENT NAME
WINDHAM COUNTY
NATURAL
RESOURCES
CONSERVATION
DISTRICT

PROJECT NAME
LAKE RAPONDA
SHORELINE
EROSION CONTROL
90% DESIGN

GREEN MOUNTAIN
BEACH
WILMINGTON, VT

SHEET TITLE

DETAILS-EPSC

D&K PROJECT #
230341P1

PROJ. ENG.
CJR

DRAWN BY
KAC

CHECKED BY
ANH

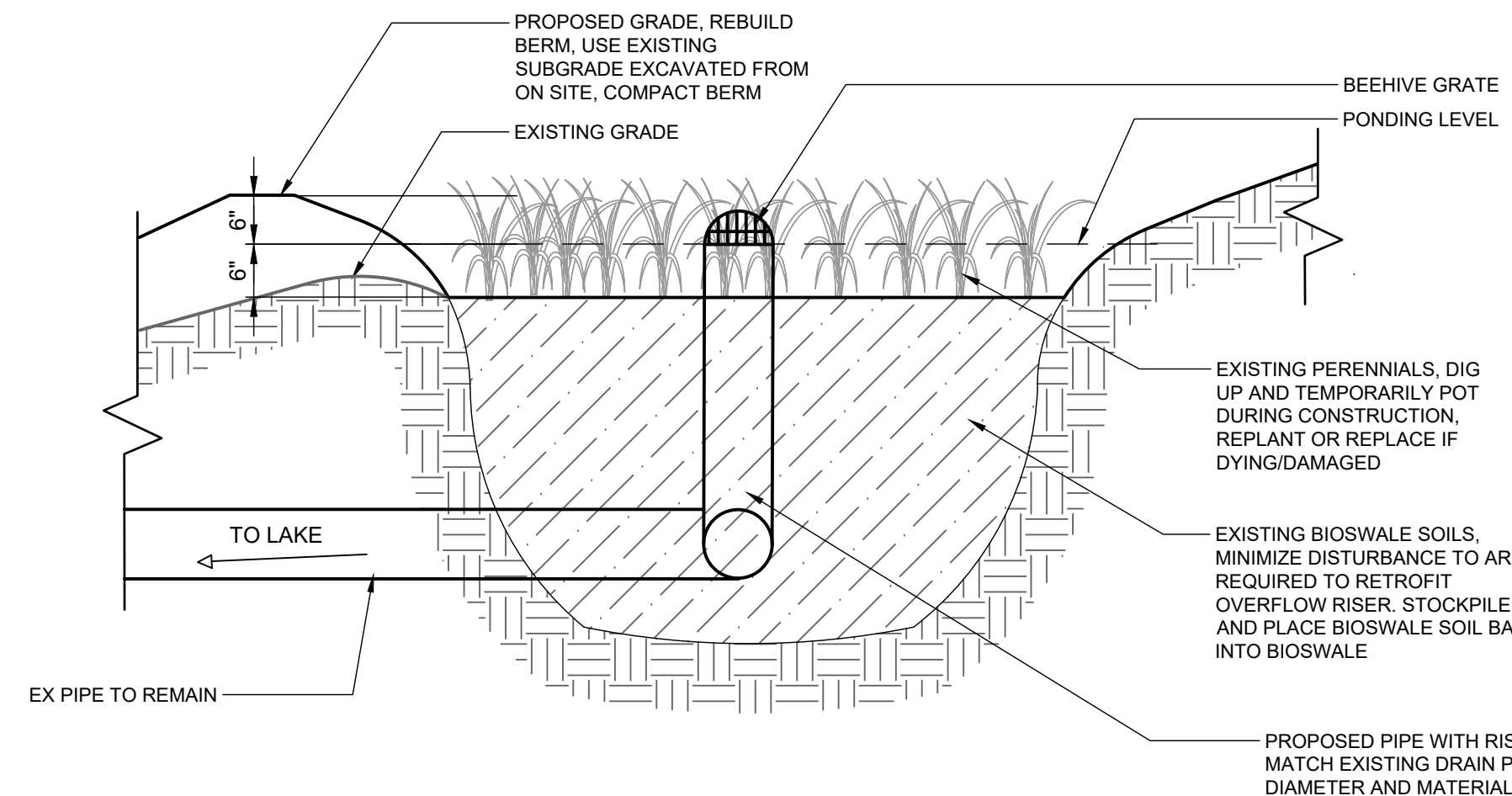
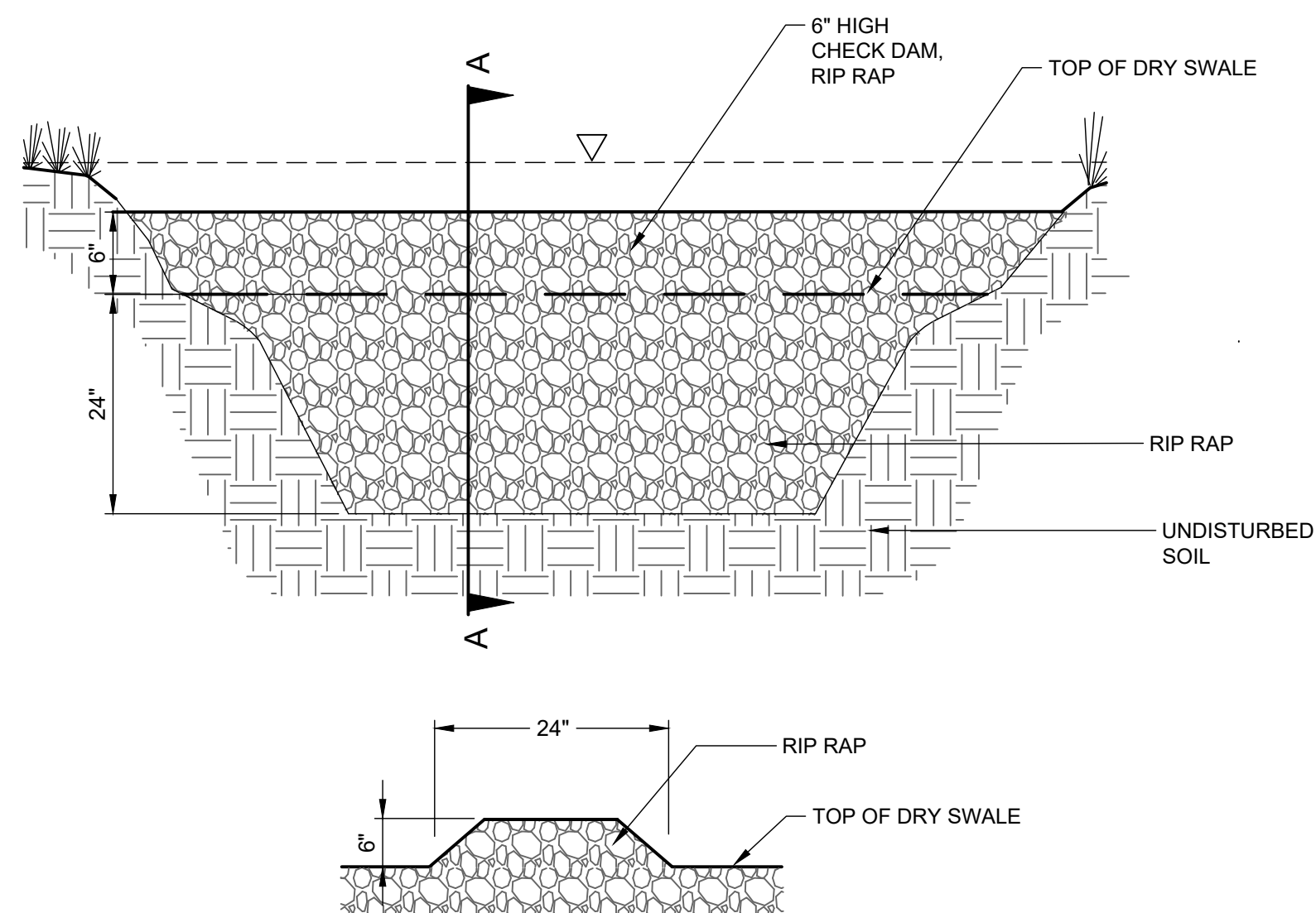
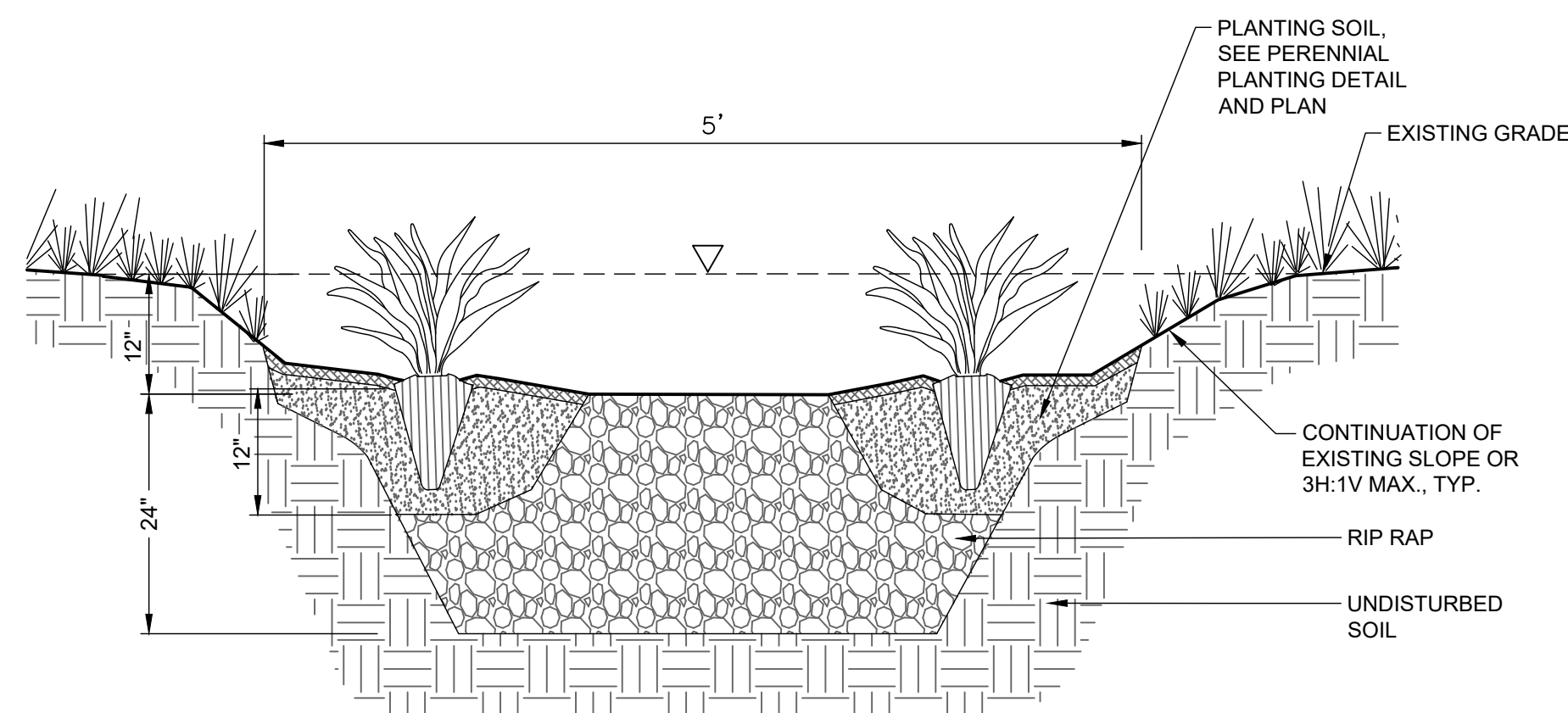
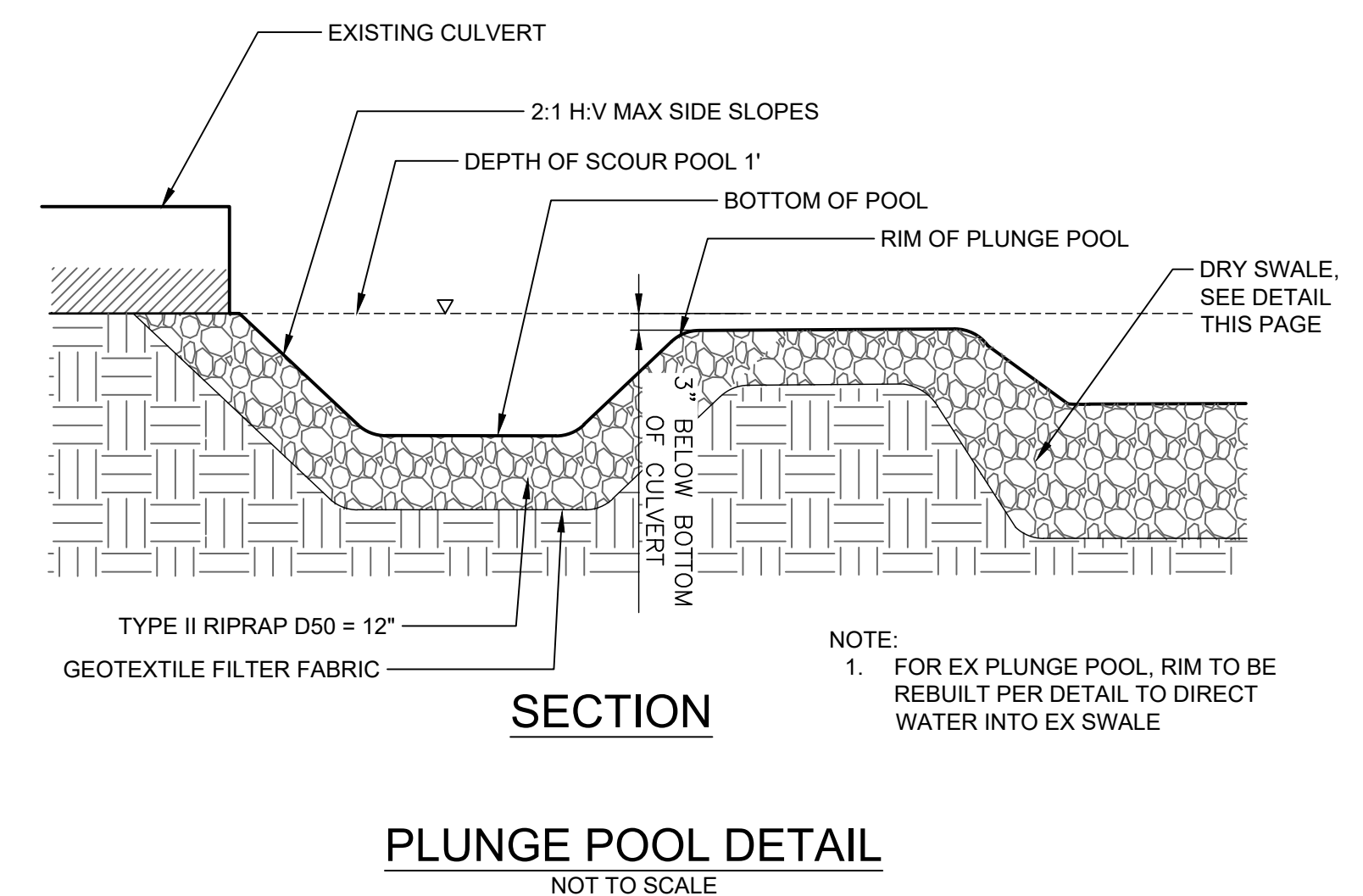
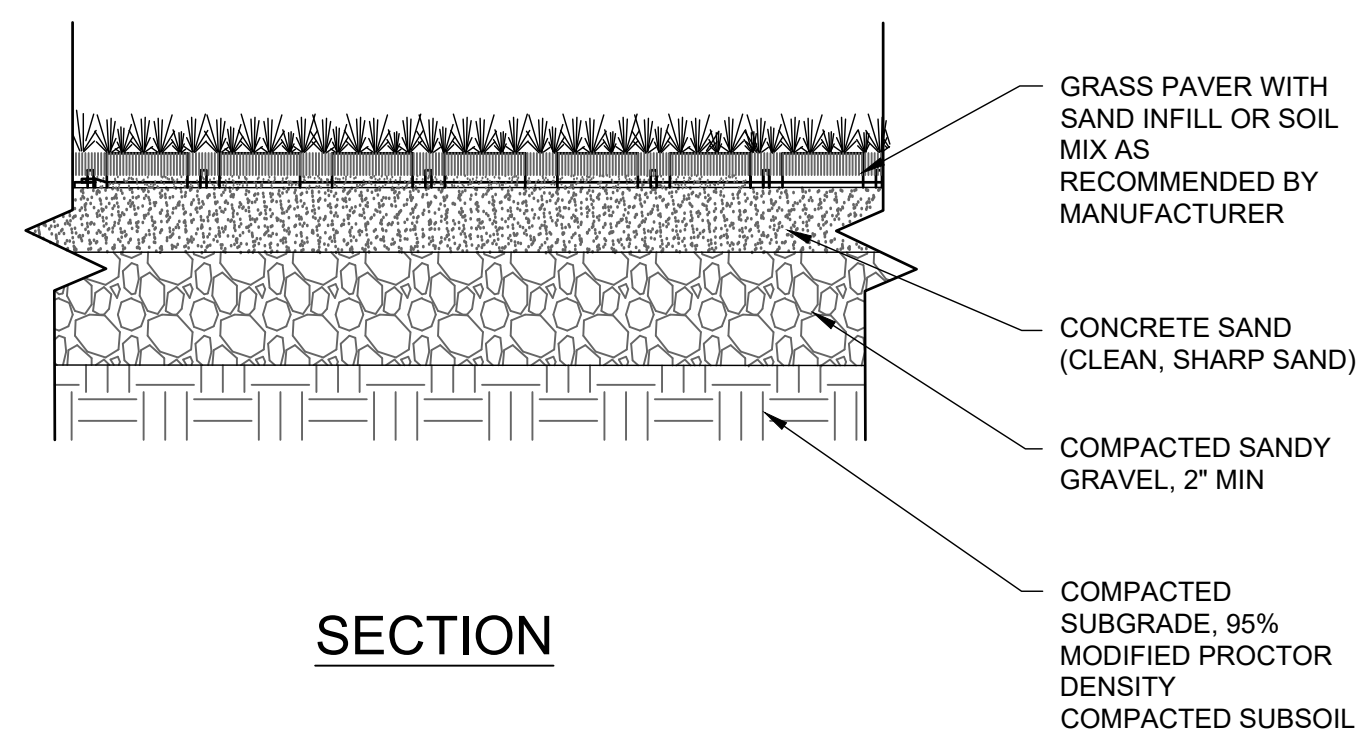
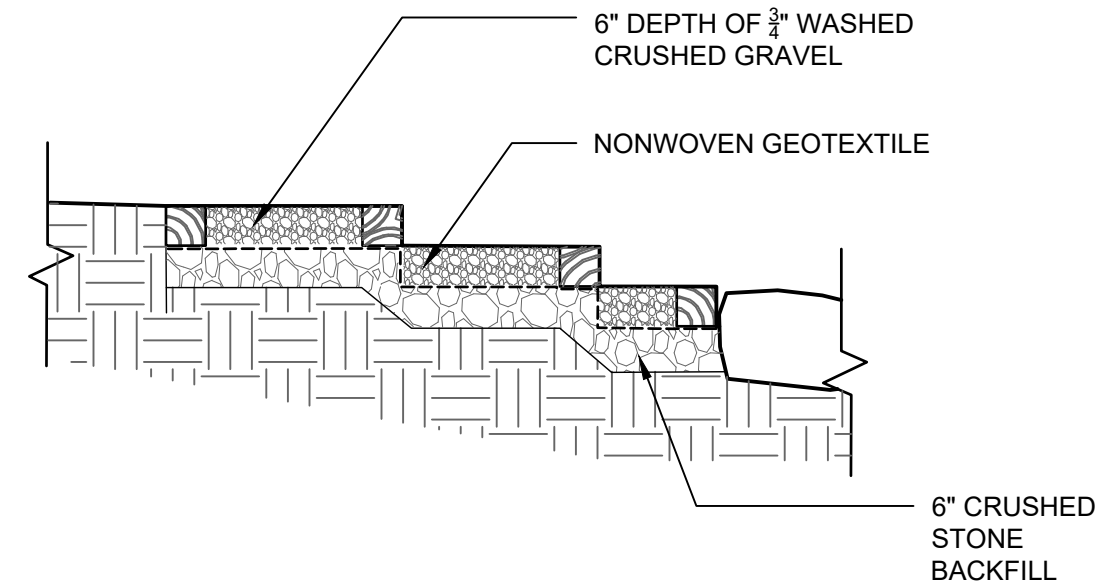
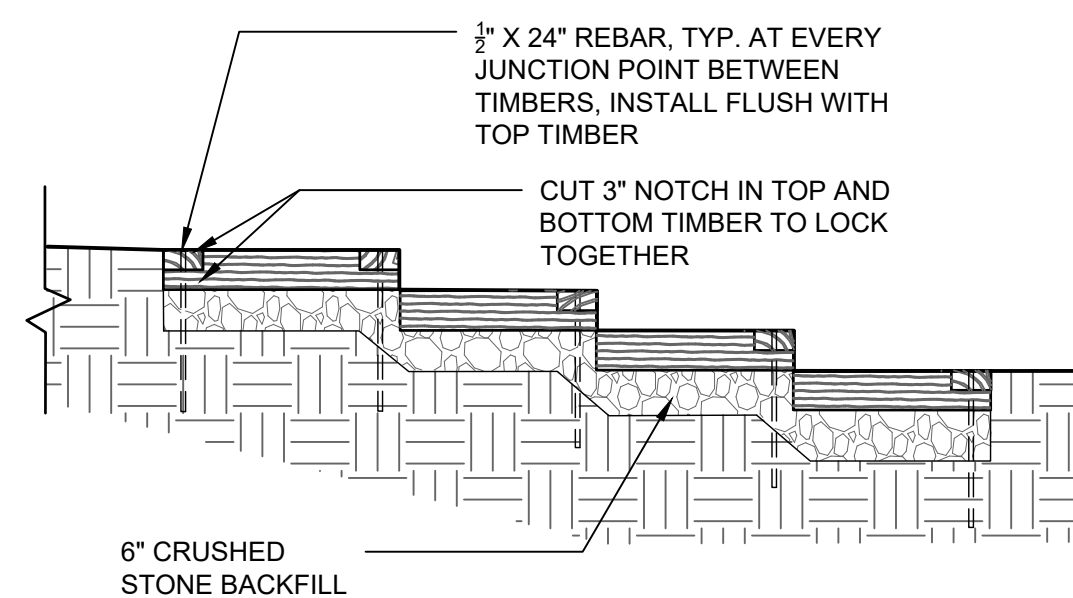
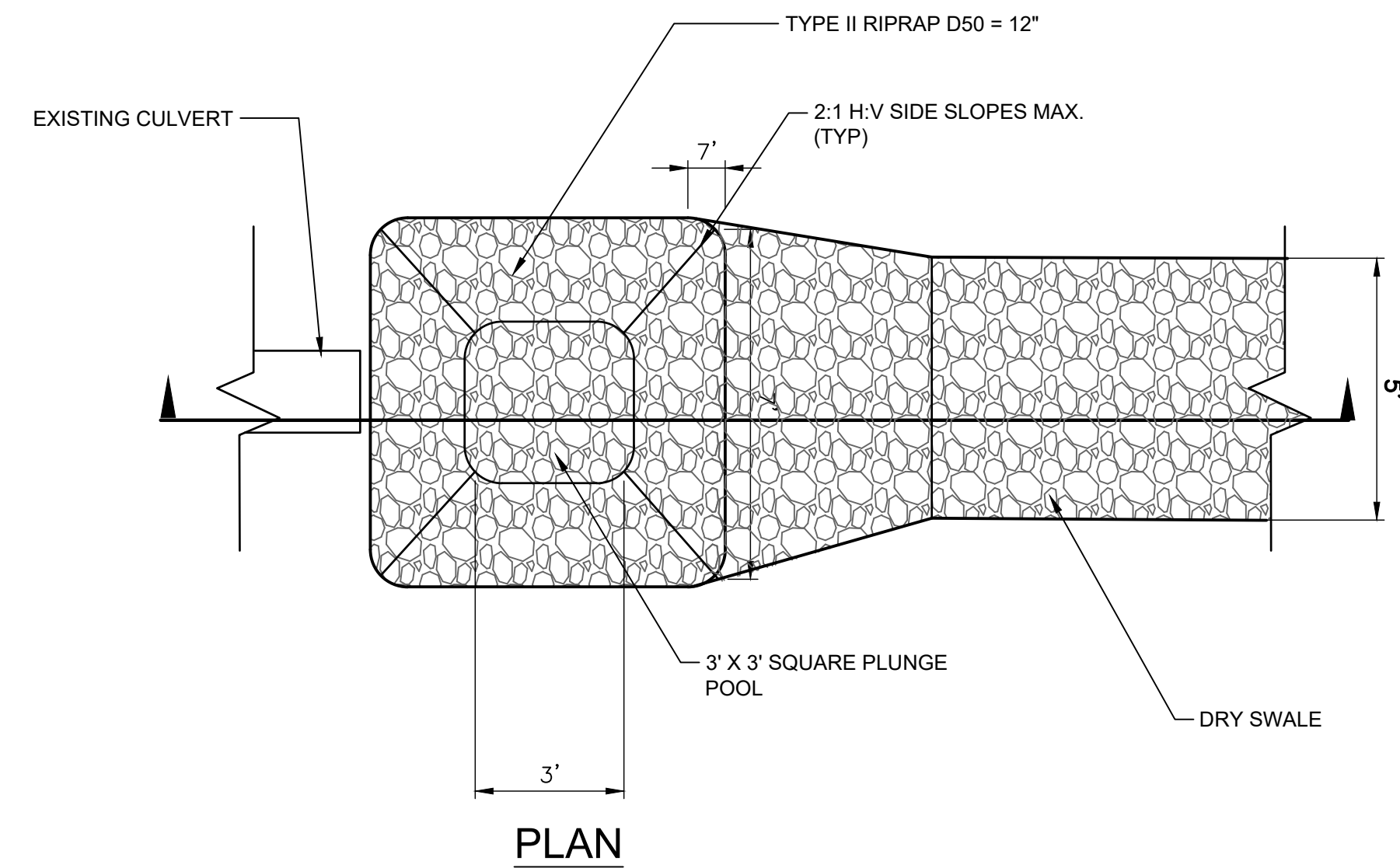
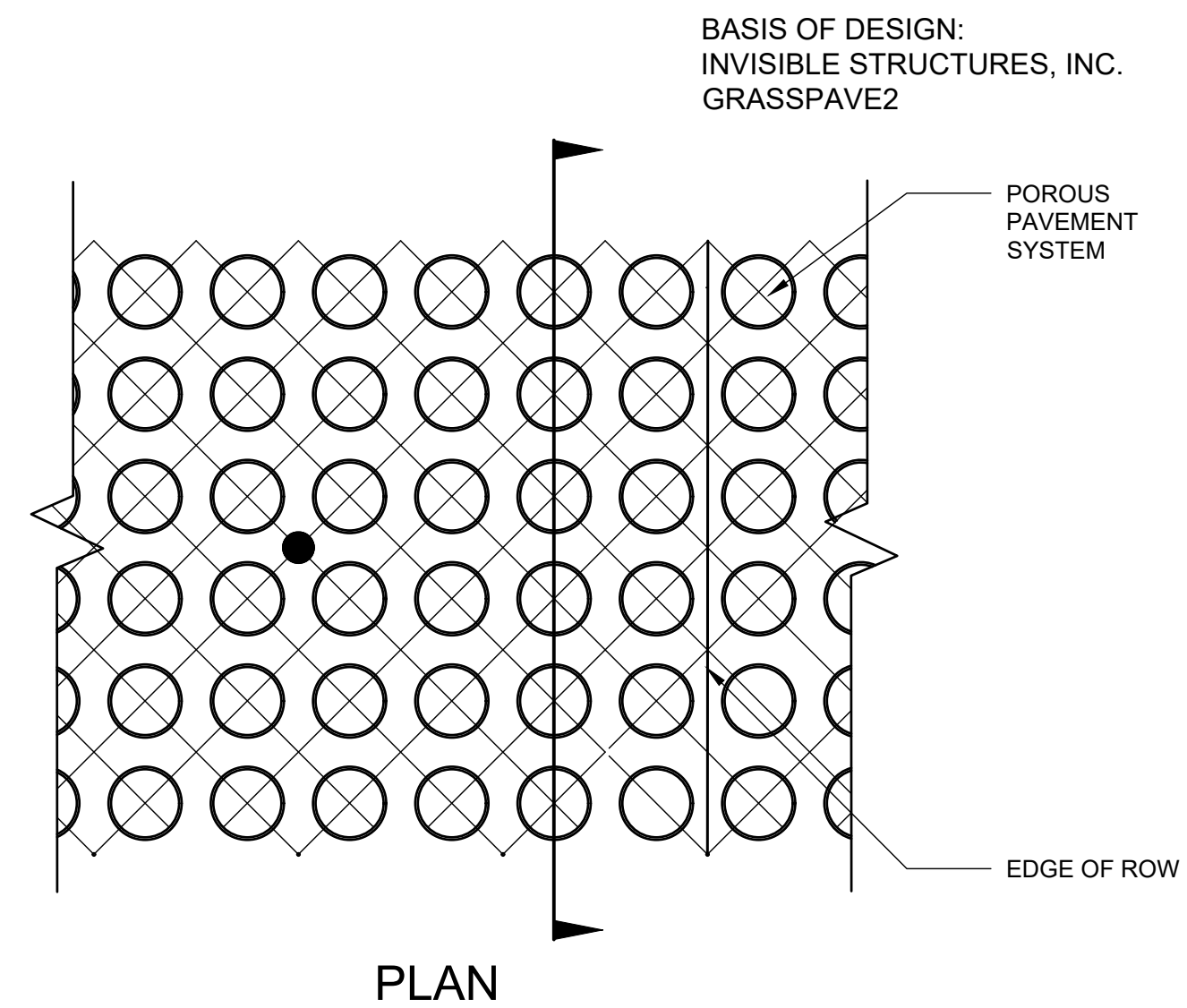
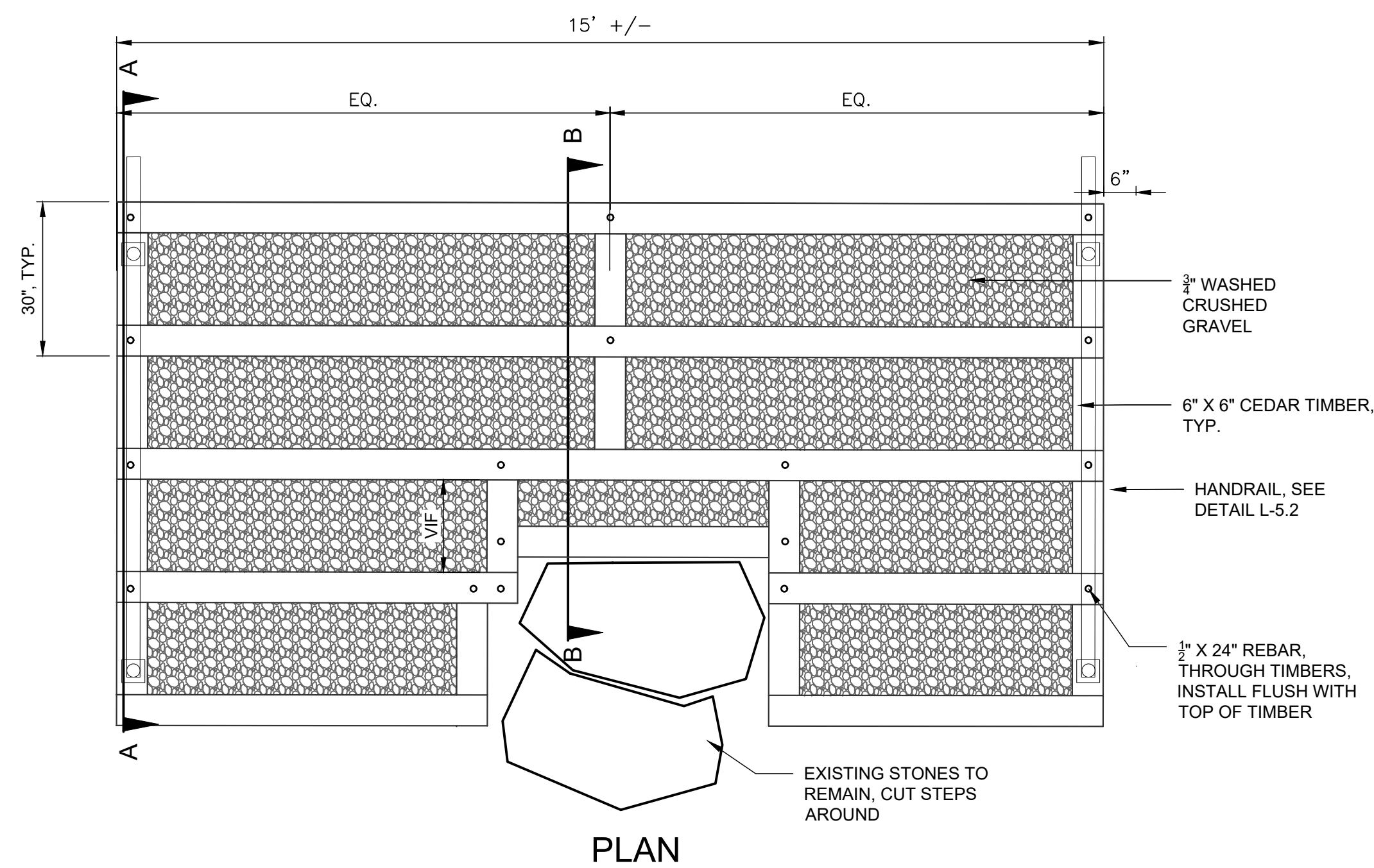
DATE

8/13/2026

SHEET NUMBER

L-5.0

SHEET: 8 of 12



NOTE:

1. REMOVE EXISTING RIP RAP AND STOCK PILE.
2. DIG SWALE TO SPECIFIED DEPTH AND REPLACE RIP RAP, ADD ADDITIONAL RIP RAP TO MEET SPECIFIED HEIGHT AS NEEDED.
3. ADDED RIPRAP TO BE TYPE II D50 = 12"

**DuBois
& King inc.**

www.dubois-king.com
© Copyright 2026 DuBois & King inc.

**NOT FOR
CONSTRUCTION
PRELIMINARY
PLANS**

[illegible]

CLIENT NAME
WINDHAM COUNTY
NATURAL
RESOURCES
CONSERVATION
DISTRICT

PROJECT NAME
LAKE RAPONDA
SHORELINE
EROSION CONTROL
90% DESIGN

GREEN MOUNTAIN
BEACH
WILMINGTON, VT

HEET TITLE

DETAILS

D&K PROJECT #	PROJ. ENG.
230341P1	CJR

ROJ. ENG.
CJR

DRAWN BY

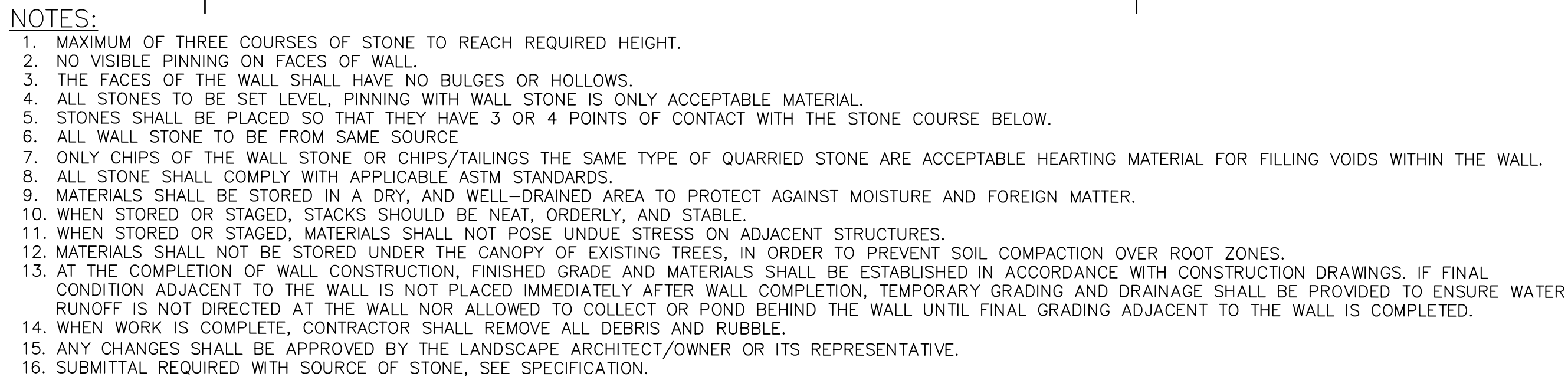
CHECKED BY _____

DATE 8/13/2026

SHEET NUMBER

L-5.1

SHEET: 9 of 12



The drawing consists of two views: a Plan view (top) and a Section view (bottom).

PLAN View: Shows the top-down layout of the bridge. It features a central bridge structure flanked by support stones and stepping stones. The bridge is 24" wide, with a 24" wide support stone on each side. The bridge is constructed with 1/2" rebar. The bridge is supported by bridge support stones. The bridge is 24" wide, with a 24" wide support stone on each side. The bridge is constructed with 1/2" rebar. The bridge is supported by bridge support stones. The bridge is 24" wide, with a 24" wide support stone on each side. The bridge is constructed with 1/2" rebar. The bridge is supported by bridge support stones.

SECTION View: Shows the cross-section of the bridge. It illustrates the bridge structure, support stones, and stepping stones. The bridge is 6" high, with a 6" high support stone on each side. The bridge is constructed with 1/2" rebar. The bridge is supported by bridge support stones. The bridge is 6" high, with a 6" high support stone on each side. The bridge is constructed with 1/2" rebar. The bridge is supported by bridge support stones. The bridge is 6" high, with a 6" high support stone on each side. The bridge is constructed with 1/2" rebar. The bridge is supported by bridge support stones.

Labels:

- BRIDGE
- STREAM
- 1/2" REBAR
- 24" +/-
- BRIDGE SUPPORT
- STEPPING STONE
- SUPPORT STONE
- PLAN
- STONE BRIDGE, SALVAGED FROM SITE (IF AVAILABLE)
- 1/2" REBAR
- BRIDGE SUPPORT STONE, SALVAGED FROM SITE (IF AVAILABLE)
- STEPPING STONE, SALVAGED FROM SITE (IF AVAILABLE)
- EXISTING GRADE
- SUPPORT STONES SALVAGED FROM SITE (IF AVAILABLE). 5" MIN. THICKNESS, EXTEND MIN. OF 1' BEYOND STEPPING STONES AND BRIDGE SUPPORT STONES
- COMPACTED SUBGRADE
- SECTION
- MIN. 2" COVER, TYP.
- 6" +/-
- 6" +/-
- 6" +/-
- EMBED MIN. 3"

NOTE:

1. ALL STONES SHOULD HAVE A MINIMUM OF THREE POINTS OF CONTACT AND NOT MOVE, ROCK, OR TILT.

The image contains two technical drawings of a handrail assembly, labeled 'FRONT SECTION' and 'SIDE SECTION'.

FRONT SECTION: This drawing shows a cross-section of the handrail. It features a 'POWDERCOATED ALUMINUM HANDRAIL' with a '1 1/2" DIAMETER TOP RAIL'. The handrail is mounted on an 'ALUMINUM PLATE WITH LAG BOLTS' which is secured to a concrete wall. 'INFILTRATION STEPS, SEE DETAIL L-5.1' are indicated at the base of the plate.

SIDE SECTION: This drawing shows a side view of the handrail. It shows the 'POWDERCOATED ALUMINUM HANDRAIL' and 'ALUMINUM PLATE WITH LAG BOLTS' mounted on a concrete wall. The drawing includes dimensions: a vertical height of '3'' from the wall to the top rail, and a horizontal distance of '1'' from the wall to the center of the top rail. 'INFILTRATION STEPS, SEE DETAIL L-5.1' are also indicated.

NOTES:

1. SHOP DRAWINGS REQUIRED.
2. ALL RAILING COMPONENTS SHALL BE FABRICATED FROM EXTRUDED ALUMINUM ALLOY 6061-T6 OR 6063-T5 UNLESS OTHERWISE NOTED.
3. PREP FOR METAL OR GALVANIZED METAL PER MANUFACTURER'S INSTRUCTIONS; PREP. PRIME, AND PAINT WITH TWO COATS OF HIGH PERFORMANCE ALKYL URETHANE ENAMEL, HP-2210.
4. COLOR SHALL BE AS SELECTED BY LANDSCAPE ARCHITECT FROM MANUFACTURER'S FULL RANGE OF COLORS.
5. FINISH SHALL MEET AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION AAMA 2604 OR 2605 PERFORMANCE
6. FABRICATE RAILING ASSEMBLIES IN SHOP TO GREATEST EXTENT POSSIBLE TO MINIMIZE FIELD WELDING AND CUTTING.
7. PROVIDE SMOOTH, UNIFORM JOINTS WITH NO VISIBLE FASTENERS UNLESS NOTED.
8. ALL MATERIAL TO BE CLEAN, DEGREASED AND FREE OF IMPURITIES.
9. ANY CHANGES SHALL BE APPROVED BY THE OWNER OR ITS REPRESENTATIVE.

[illegible]

CLIENT NAME
WINDHAM COUNTY
NATURAL
RESOURCES
CONSERVATION
DISTRICT

PROJECT NAME
LAKE RAPONDA
SHORELINE
EROSION CONTROL
90% DESIGN

GREEN MOUNTAIN
BEACH
WILMINGTON, VT

SHEET TITLE

DETAILS

Q&K PROJECT # 230341P1	PROJ. ENG. CJR
DRAWN BY KAC	CHECKED BY ANH

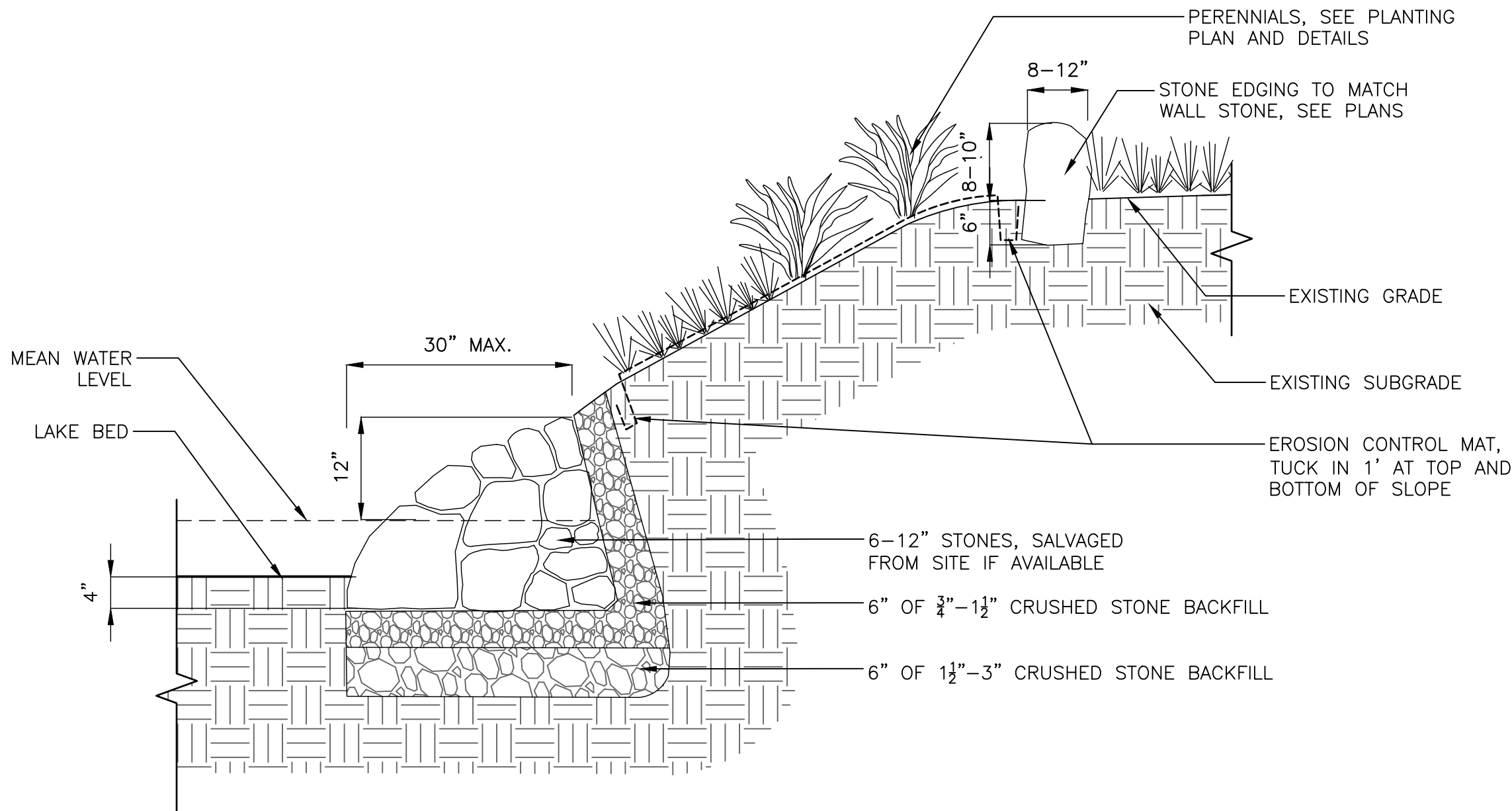
DATE 8/13/2026

SHEET NUMBER

L-5.2

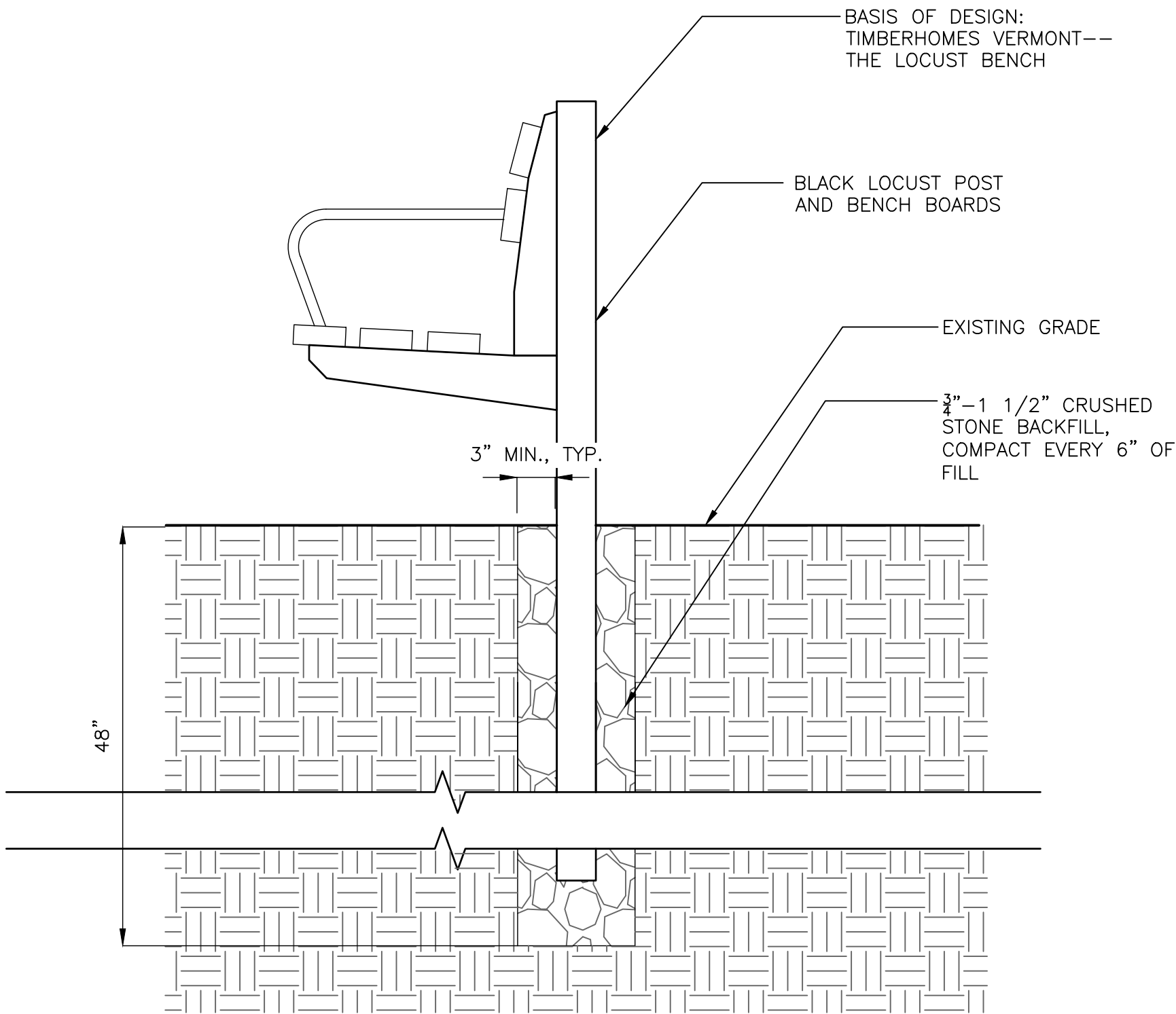
SHEET: 10 of 12

I:\2\230341 WCCD Lake Raponda Shoreline Erosion Control\Drawings\Landscape\230341P1_WCCD Lake Raponda_CD-Details.dwg 8/13/2026 5:06 PM

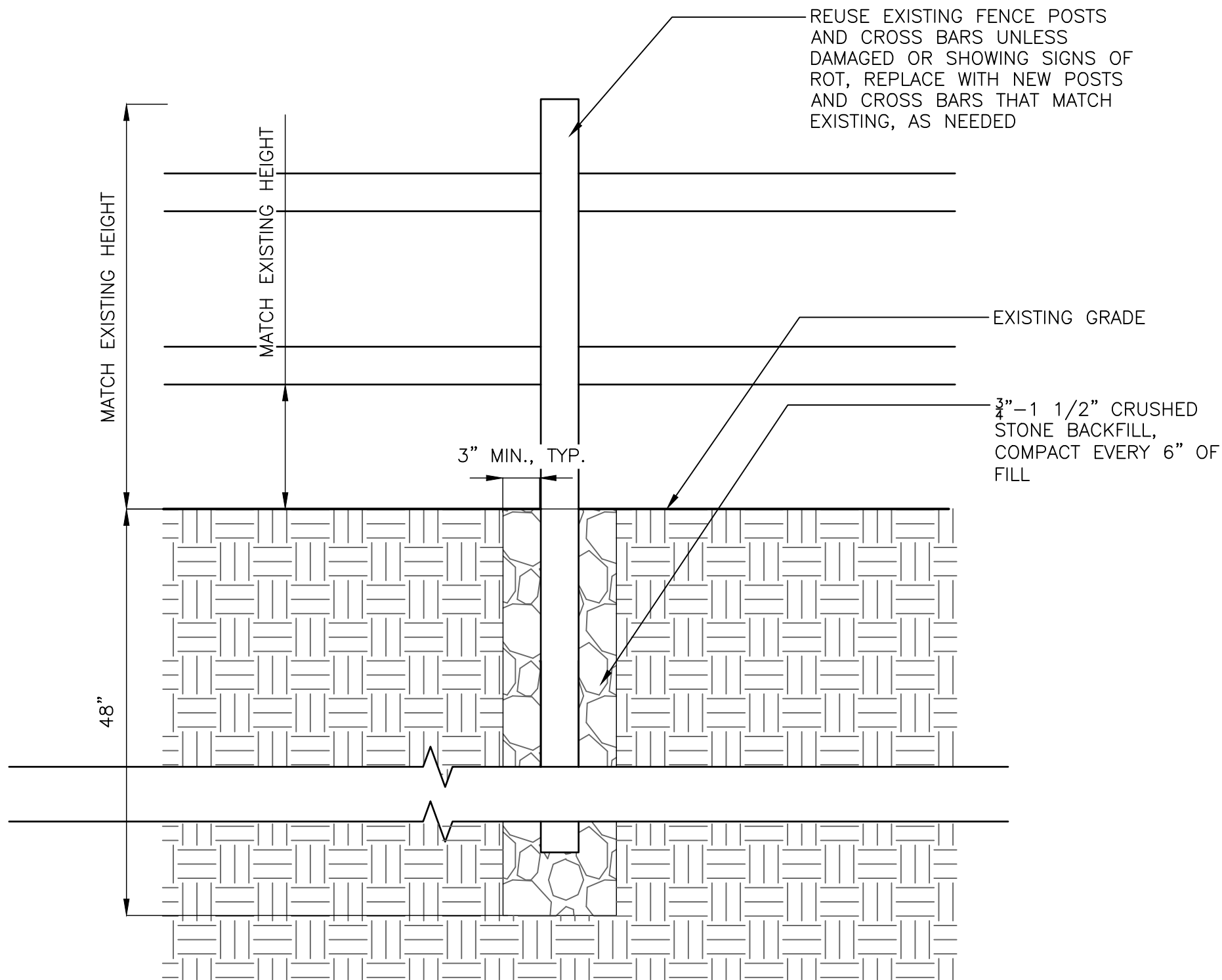


- NOTE:
1. NO WORK IN WATER MAY BE STARTED PRIOR TO INSTALLATION OF TURBIDITY CURTAIN
 2. SALVAGED STONES MAY NOT BE REMOVED FROM EXISTING SHORELINE STABILIZATION STONES, SALVAGED STONES MAY BE FROM EXCAVATION ONLY.

STONE TOE DETAIL
NOT TO SCALE



BENCH EMBEDMENT DETAIL
NOT TO SCALE



RELOCATED FENCE DETAIL
NOT TO SCALE

NOT FOR
CONSTRUCTION
PRELIMINARY
PLANS

REVISIONS				
NUMBER	DATE	REVISION DESCRIPTION	BY	

CLIENT NAME
WINDHAM COUNTY
NATURAL
RESOURCES
CONSERVATION
DISTRICT

PROJECT NAME
LAKE RAPONDA
SHORELINE
EROSION CONTROL
90% DESIGN

GREEN MOUNTAIN
BEACH
WILMINGTON, VT

SHEET TITLE

DETAILS

D&K PROJECT #
230341P1

PROJ. ENG.
CJR

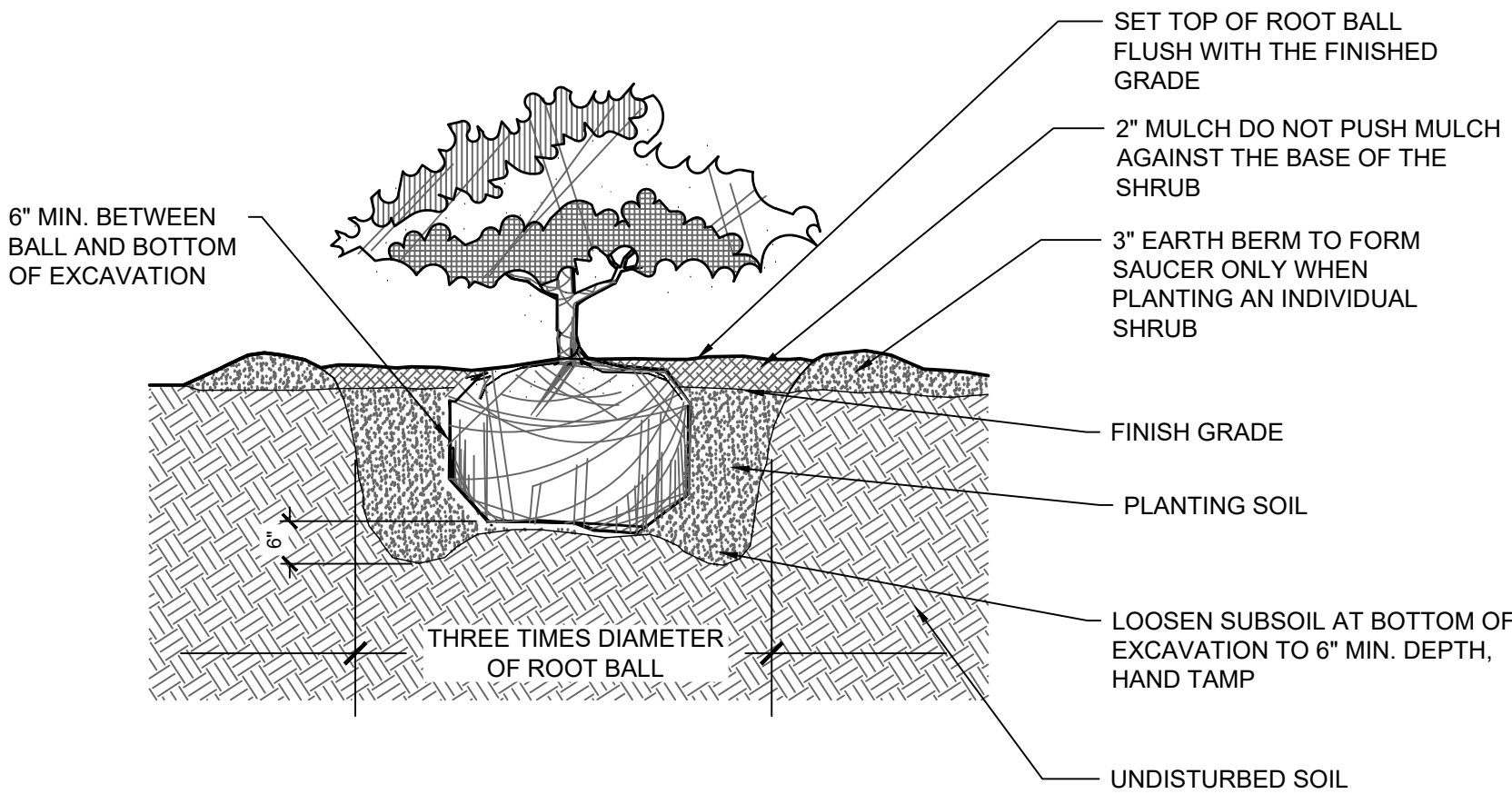
DRAWN BY
KAC

CHECKED BY
ANH

DATE
8/13/2026

SHEET NUMBER
L-5.3

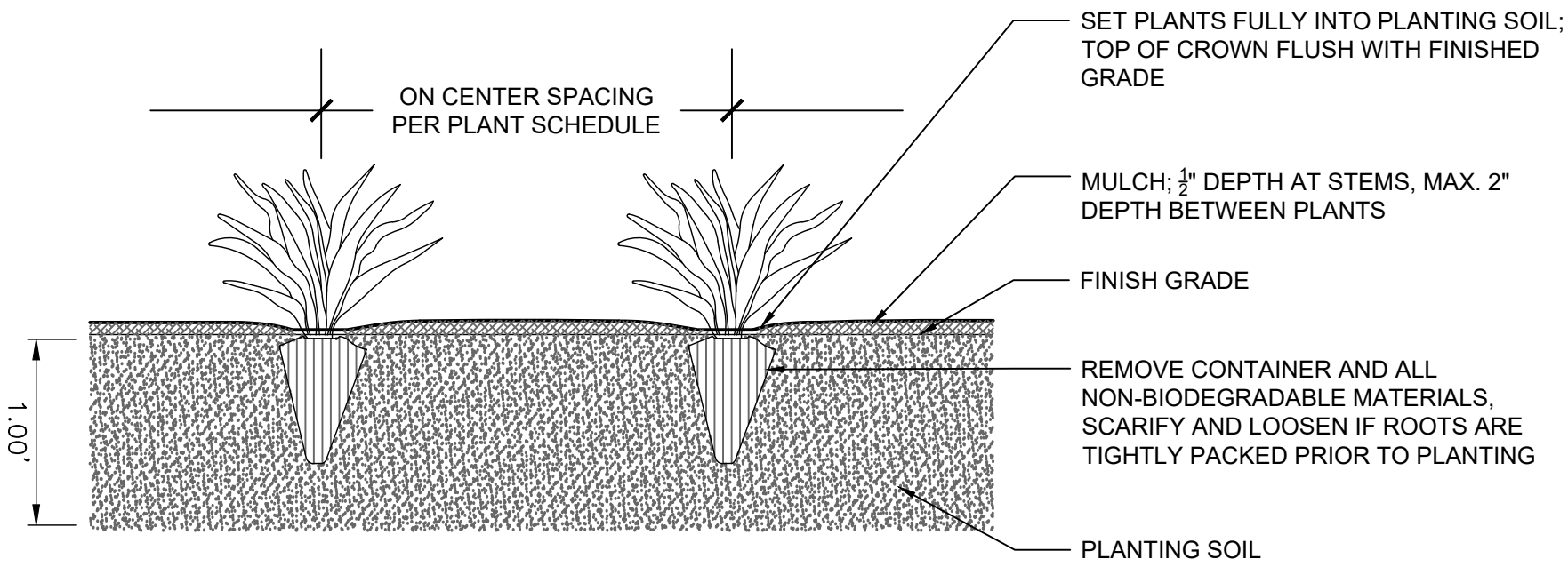
SHEET: 11 of 12



NOTES:

1. FOR CONTAINER SHRUBS, COMPLETELY REMOVE ALL OF NON-BIODEGRADABLE CONTAINER AND SCARIFY ROOTBALL.
2. FOR B&B, CUT AND REMOVE BURLAP AND METAL CAGE IF PRESENT. FOR CONTAINER, REMOVE CONTAINER.
3. SCARIFY ROOTBALL PRIOR TO PLANTING.
4. LIMIT DISTURBANCE TO THE MINIMUM REQUIRED TO ADD NEW PLANTINGS, REMOVE EXISTING PLANTS WITH ROOTS AND TEMPORARILY POT AND REPLANT IMMEDIATELY AFTER NEW PLANTING IS INSTALLED.

SHRUB PLANTING DETAIL
NOT TO SCALE



PERENNIAL PLANTING DETAIL
NOT TO SCALE

**NOT FOR
CONSTRUCTION
PRELIMINARY
PLANS**

REVISIONS		BY							
REVISION DESCRIPTION									
NUMBER	DATE								

CLIENT NAME WINDHAM COUNTY NATURAL RESOURCES CONSERVATION DISTRICT	
PROJECT NAME LAKE RAPONDA SHORELINE EROSION CONTROL 90% DESIGN GREEN MOUNTAIN BEACH WILMINGTON, VT	
SHEET TITLE PLANTING DETAILS	
D&K PROJECT # 230341P1	PROJ. ENG. CJR
DRAWN BY KAC	CHECKED BY ANH
DATE 8/13/2026	
SHEET NUMBER L-5.4	
SHEET: 12 of 12	

ATTACHMENT C
STANDARD STATE PROVISIONS FOR SUBCONTRACTS And SUBGRANTS
Revised October 1, 2024

1. **(10) False Claims Act:** Any liability to the State under the Vermont False Claims Act (32 V.S.A. § 630 et seq.) shall not be limited notwithstanding any agreement of the State to otherwise limit PARTY's liability.
2. **(11) Whistleblower Protections:** The PARTY shall not discriminate against or retaliate against one of its employees or agents for disclosing information concerning a violation of law, fraud, waste, abuse of authority or acts threatening health or safety, including but not limited to allegations concerning the False Claims Act. Further, the PARTY shall not require such employees or agents to forego monetary awards as a result of such disclosures, nor should they be required to report misconduct to the PARTY or its agents prior to reporting to any governmental entity and/or the public.
3. **(12) Use and Protection of State Information:**
 - A. As between the State and PARTY, "State Data" includes all data received, obtained, or generated by the PARTY in connection with performance under this Agreement. PARTY acknowledges that certain State Data to which the PARTY may have access may contain information that is deemed confidential by the State, or which is otherwise confidential by law, rule, or practice, or otherwise exempt from disclosure under the State of Vermont Access to Public Records Act, 1 V.S.A. § 315 et seq. ("Confidential State Data").
 - B. With respect to State Data, PARTY shall:
 - i. take reasonable precautions for its protection;
 - ii. not rent, sell, publish, share, or otherwise appropriate it; and
 - iii. upon termination of this Agreement for any reason, PARTY shall dispose of or retain State Data if and to the extent required by this Agreement, law, or regulation, or otherwise requested in writing by the State.
 - C. With respect to Confidential State Data, PARTY shall:
 - i. strictly maintain its confidentiality;
 - ii. not collect, access, use, or disclose it except as necessary to provide services to the State under this Agreement;
 - iii. provide at a minimum the same care to avoid disclosure or unauthorized use as it provides to protect its own similar confidential and proprietary information;
 - iv. implement and maintain administrative, technical, and physical safeguards and controls to protect against any anticipated threats or hazards or unauthorized access or use;
 - v. promptly notify the State of any request or demand by any court, governmental agency or other person asserting a demand or request for Confidential State Data so that the State may seek an appropriate protective order; and
 - vi. upon termination of this Agreement for any reason, and except as necessary to comply with subsection B.iii above in this section, return or destroy all Confidential State Data remaining in its possession or control.
 - D. If PARTY is provided or accesses, creates, collects, processes, receives, stores, or transmits Confidential State Data in any electronic form or media, PARTY shall utilize:
 - i. industry-standard firewall protection;
 - ii. multi-factor authentication controls;
 - iii. encryption of electronic Confidential State Data while in transit and at rest;
 - iv. measures to ensure that the State Data shall not be altered without the prior written consent of the State;

- v. measures to protect against destruction, loss, or damage of State Data due to potential environmental hazards, such as fire and water damage;
- vi. training to implement the information security measures; and
- vii. monitoring of the security of any portions of the PARTY's systems that are used in the provision of the services against intrusion.

E. No Confidential State Data received, obtained, or generated by the PARTY in connection with performance under this Agreement shall be processed, transmitted, stored, or transferred by any means outside the United States, except with the express written permission of the State.

F. PARTY shall notify the State within twenty-four hours after becoming aware of any unauthorized destruction, loss, alteration, disclosure of, or access to, any State Data.

G. State of Vermont Cybersecurity Standard Update: PARTY confirms that all products and services provided to or for the use of the State under this Agreement shall be in compliance with State of Vermont Cybersecurity Standard Update in effect at the time of incorporation of this Attachment C into this Agreement. The State of Vermont Cybersecurity Standard Update prohibits the use of certain branded products in State information systems or any vendor system, and a copy is available at: <https://digitalservices.vermont.gov/cybersecurity/cybersecurity-standards-and-directives>

H. In addition to the requirements of this Section 12, PARTY shall comply with any additional requirements regarding the protection of data that may be included in this Agreement or required by law or regulation.

4. **(14) Fair Employment Practices and Americans with Disabilities Act:** PARTY agrees to comply with the requirement of 21 V.S.A. Chapter 5, Subchapter 6, relating to fair employment practices, to the full extent applicable. PARTY shall also ensure, to the full extent required by the Americans with Disabilities Act of 1990, as amended, that qualified individuals with disabilities receive equitable access to the services, programs, and activities provided by the PARTY under this Agreement.
5. **(16) Taxes Due to the State:** PARTY certifies under the pains and penalties of perjury that, as of the date this Agreement is signed, the PARTY is in good standing with respect to, or in full compliance with, a plan to pay any and all taxes due the State of Vermont.
6. **(18) Child Support:** Only applicable if the PARTY is a natural person, not a corporation or partnership.) PARTY states that, as of the date this Agreement is signed, PARTY is not under an obligation to pay child support or is in good standing with respect to or in full compliance with a plan to pay any and all child support payable under a support order. PARTY makes this statement with regard to support owed to any and all children residing in Vermont. In addition, if the PARTY is a resident of Vermont, PARTY makes this statement with regard to support owed to any and all children residing in any other state or territory of the United States.
7. **(19) Sub-Agreements:** Party shall not assign, subcontract, or subgrant the performance of this Agreement or any portion thereof to any other Party without the prior written approval of the State. Party shall be responsible and liable to the State for all acts or omissions of subcontractors and any other person performing work under this Agreement pursuant to an agreement with Party or any subcontractor.

In the case this Agreement is a contract with a total cost in excess of \$250,000, the Party shall provide to the State a list of all proposed subcontractors and subcontractors' subcontractors, together with the identity of those subcontractors' workers compensation insurance providers, and additional required or requested information, as

applicable, in accordance with Section 32 of The Vermont Recovery and Reinvestment Act of 2009 (Act No. 54), as amended by Section 17 of Act No. 142 (2010) and by Section 6 of Act No. 50 (2011).

8. **(20) No Gifts or Gratuities:** PARTY shall not give title or possession of anything of substantial value (including property, currency, travel and/or education programs) to any officer or employee of the State during the term of this Agreement.
9. **(22) Certification Regarding Debarment:** PARTY certifies under pains and penalties of perjury that, as of the date that this Agreement is signed, neither PARTY nor PARTY's principals (officers, directors, owners, or partners) are presently debarred, suspended, proposed for debarment, declared ineligible or excluded from participation in Federal programs, or programs supported in whole or in part by Federal funds. PARTY further certifies under pains and penalties of perjury that, as of the date that this Agreement is signed, PARTY is not presently debarred, suspended, nor named on the State's debarment list at: <https://bgs.vermont.gov/purchasing-contracting/debarment>
10. **(30) State Facilities:** If the State makes space available to the PARTY in any State facility during the term of this Agreement for purposes of the PARTY's performance under this Agreement, the PARTY shall only use the space in accordance with all policies and procedures governing access to and use of State facilities which shall be made available upon request. State facilities will be made available to PARTY on an "AS IS, WHERE IS" basis, with no warranties whatsoever.
11. **(32A) Requirements Pertaining Only to State-Funded Grants:**
 - A. **Certification Regarding Use of State Funds:** If PARTY is an employer and this Agreement is a State-funded grant in excess of \$1,001, PARTY certifies that none of these State funds will be used to interfere with or restrain the exercise of PARTY's employee's rights with respect to unionization.

Attachment D

Other Grant Provisions for Clean Water Initiative Program Grants & Contracts

Of the listed Provisions under this Attachment, the following specific provisions must be included in all sub agreements and subsequent subcontracts:

- Section 13 (“Professional Liability Insurance”);
- E.O. 02-22 (Russian Goods Provision);

Many contracts can be fully described using the materials described in the preceding attachments. In some cases, however, agencies will want to add specially tailored provisions not available on preprinted forms or in the main contract itself. In addition, when contracting for professional services, agencies will be required (absent an appropriate waiver) to include a professional liability insurance provision.

Provisions REQUIRED in all contracts:

1. In accordance with Executive Order No. 02-22, signed on March 3, 2022 by Governor Phil Scott, the State is required to secure your certification that no Russian-sourced goods or services provided or produced by Russian entities are being provided to the State of Vermont under this Contract. In signing this contract, you are providing this certification to the State.

Attachment D of the contract “Other Provisions” should be used for this purpose as suggested below:

1. **Audit of federal sub-recipient:** Under current interpretations of federal law, contractor will be considered a “sub- recipient” subject to the federal single audit act. Contractor will comply with audit requirements contained in Circular A-128/ Circular A110 and/or other applicable circulars of the U.S. Office of Management and Budget. The cost of such an audit will be borne by the contractor/is included in the payment provisions of this contract. **Comment:** Current federal law defines a “sub-recipient” of federal money as an organization that receives federal assistance from a recipient (the agency) to carry out a program. Such sub-recipients are subject to federal audit requirements. However, if a contract is a “procurement contract to buy goods or services,” then the contractor is not a sub-recipient and is not subject to federal audit requirements. Most services contracts should be exempt from federal audit requirements for this reason. Agency officials should consult federal officials about whether the language above should be included in a particular contract.
2. **Compliance with other laws:** The Contractor agrees to comply with the requirements of all applicable federal or state statutory or regulatory provisions, and agrees further to include a similar provision in any and all subcontracts. **Comment:** Use this clause to refer to any statutory or regulatory provisions that must by law, Contract condition or otherwise, be included in the wording of the contract. This may include in particular cases the provisions of the Federal Rehabilitation Act of 1973 (Sec. 504), as amended; the Age Discrimination Act of 1975; and the Civil Rights Act of 1964.
3. **Confidentiality:** Sometimes agencies have legitimate needs to protect confidential information. The RFP can require contractors to maintain confidentiality, although the contract ultimately should duplicate this requirement. Conversely, bidders sometimes want to know how the State will treat the bidder’s proprietary information. The RFP should state whether such information will be returned or

retained by the agency.

4. **Contractors' liens:** Contractor will discharge any and all contractors' or mechanics' liens imposed on property of the State through the actions of subcontractors. **Comment:** On occasion a subcontractor may do some work to State property that could be construed by the subcontractor to give rise to a lien against the property. While artisans' (mechanics') liens cannot be enforced against State property (See 12 V.S.A. § 5601(a)), it is nevertheless best practice to require the contractor to correct the matter and thereby avoid litigation.
5. **Cost of materials:** Contractor will not buy materials and resell to the State at a profit.
6. **Identity of workers:** The Contractor will assign the following individuals [list individuals] to the services to be performed under the provisions of this contract, and these individuals shall be considered essential to performance. Should any of the individuals become unavailable during the period of performance, the State shall have the right to approve any proposed successors, or, at its option, to cancel the remainder of the contract.
7. **Individually identifying information:** Contractor must not use or disclose any individually identifying information that pursuant to this contract is disclosed by the State to the contractor, created by the contractor on behalf of the State, or used by the contractor for any purpose other than to complete the work specifications of this Contract unless such use or disclosure is required by law, or when contractor obtains permission in writing from the State to use or disclose the information and this written permission is in accordance with federal and state law.
8. **Legal services:** Contractor will be providing legal services under this contract. Contractor agrees that during the term of the contract he or she will not represent anyone in a matter, proceeding, or lawsuit against the State of Vermont or any of its agencies or instrumentalities. After termination of this contract, contractor also agrees that he or she will not represent anyone in a matter, proceeding, or lawsuit substantially related to this contract.
9. **Owner's protective liability insurance:** The contractor shall carry liability insurance protecting the State and the contractor from all claims because of bodily injury or death and property damage, arising out of the work performed under the contract. The liability insurance shall be in an amount not less than \$1,000,000 and a certificate of insurance shall be furnished to the State before commencement of work. **Comment:** Owners Protective Liability Insurance should be utilized when a contractor's business involves work at multiple job sites (not necessarily all for the State) and it is unclear whether the contractor would have adequate insurance coverage in the event of multiple occurrences at different sites. For example, contracts with large construction companies should include such a clause.
10. **Ownership of equipment:** Any equipment purchased by or furnished to the contractor by the State under this contract is provided on a loan basis only and remains the property of the State.
11. **Performance bond:** The contractor shall, prior to commencing work under this contract, furnish to the State a payment and performance bond from a reputable insurance company licensed to do business in the State of Vermont, guaranteeing the satisfactory completion of the contract by the contractor and payment of all subcontractors, suppliers and employees. **Comment:** Performance Bonds have limited application in contracts for services. This clause provides protection against failure of the contractor to perform adequately under the contract or distribute funds to subcontractors or suppliers. Since the cost of the bond will increase the State's cost, the clause should only be used on larger contracts or where there are significant concerns about a contractor's financial or other abilities. If a contractor is expected to handle large sums of money as agent for the State, the term

“surety bond” should be substituted for “payment and performance bond.”

- 12. Prior approval/review of releases:** Any notices, information pamphlets, press releases, research reports, or similar other publications prepared and released in written or oral form by the contractor under this contract shall be approved/reviewed by the State prior to release. **Comment:** All material published in connection with activities performed under State contract should be reviewed and approved by the appropriate official before release. When academic freedom becomes an issue, agency review but not agency approval may be appropriate.
- 13. Professional liability insurance:** Before commencing work on this contract and throughout the term of this contract, contractor shall procure and maintain professional liability insurance for any and all services performed under this contract with minimum coverage per occurrence and provide verification of current insurance coverage to Contract Holder. **Comment:** Professionals with whom the State contracts, such as lawyers, architects, engineers, and health care providers, must be required to maintain professional liability insurance in sufficient amounts to protect the State’s interest from the consequences of negligence. The Director of Risk Management will determine the minimum amount appropriate for different classes of professionals.
- 14. Progress reports:** The contractor shall submit progress reports to the State (or Contract Holder) according to ATTACHMENT A. Each report shall describe the status of the contractor’s performance and project status since the preceding report and the progress expected to be made in the next successive period. Each report shall describe contractor activities by reference to the work specifications contained in Attachment A of this contract and shall include a statement of work hours expended, expenses incurred, bills submitted, and payments made. This provides information for interim evaluation of the contractor’s work and assists in detecting difficulties that may lead to necessary modification or cancellation of the contract.