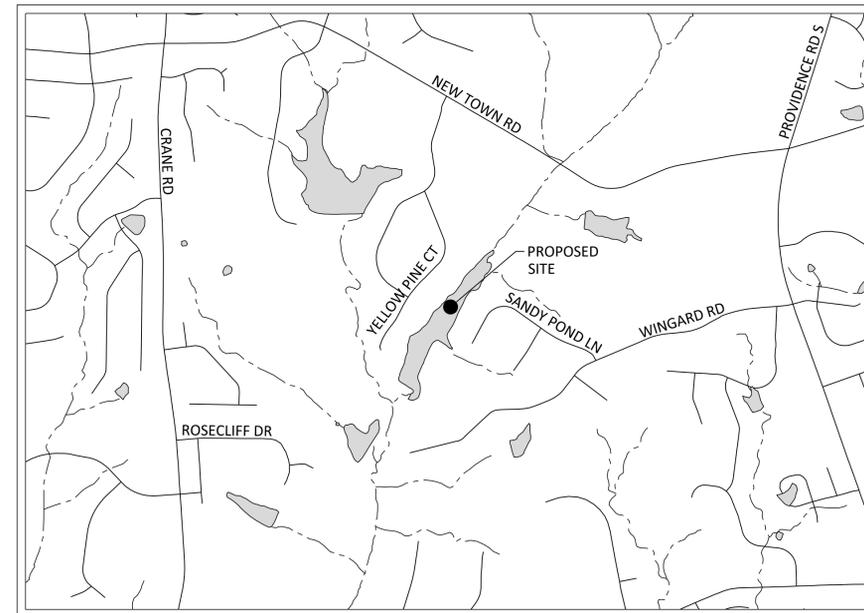


UNION COUNTY SOIL & WATER CONSERVATION DISTRICT  
UNION COUNTY, NORTH CAROLINA

WALDEN POND SEDIMENT REMOVAL PROJECT  
OCTOBER 2024



VICINITY MAP  
NTS

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704.438.2535



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Date: 10/1/2024  
Sheet C-0

**GENERAL NOTES**

1. THESE GENERAL NOTES ARE INTENDED TO DIRECT THE CONTRACTOR TO CERTAIN KEY ASPECTS OF THIS PROJECT. DETAILED INFORMATION CONCERNING THE SCOPE OF WORK, CONSTRUCTION SEQUENCE, TECHNICAL SPECIFICATIONS, AND OTHER MATTERS ARE CONTAINED IN THE PROJECT MANUAL.
2. CONSTRUCTION DRAWINGS DEPICT A COMBINATION OF AVAILABLE GIS INFORMATION AND SITE OBSERVATION. NO GROUND SURVEY HAS BEEN COMPLETED FOR DESIGN OF THE PROJECT. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCY BETWEEN THE GROUND SURVEY, SUBSURFACE CONDITIONS, AND ACTUAL FIELD CONDITIONS. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL SUBSURFACE UTILITIES. CHANGES OR DEVIATIONS FROM THE PLANS WILL BE REPORTED TO THE ENGINEER, AND RECORDED BY THE CONTRACTOR IN THE RECORD DRAWINGS THAT ARE REQUIRED AS PART OF THIS CONTRACT.
3. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NCDOT STANDARD DETAILS MANUAL AND 2018 STANDARD SPECIFICATIONS AND PROVISIONS OR LATEST VERSION THERE OF.
4. DISTURBANCE OF 401/404 JURISDICTIONAL AREAS HAVE BEEN PERMITTED UNDER NATIONWIDE PERMIT 3(B). ALL 401/404 CONDITIONS NOTED IN WATER QUALITY GENERAL CERTIFICATION NO. 4239 SHALL BE FOLLOWED.

**PROJECT EROSION CONTROL NOTES**

1. PROJECT IS LOCATED IN THE CATAWBA RIVER BASIN AND SIX MILE CREEK WATERSHED.
2. CONTRACTOR SHALL NOT DISTURB ANY AREAS OUTSIDE OF THOSE SHOWN ON PLANS.
3. THE PROJECT SHALL COMPLY WITH EROSION AND SEDIMENT CONTROL PERMIT ISSUED BY NC DEQ FOR PROJECT.
4. CONTRACTOR SHALL PREVENT EROSION OF SOIL AND SEDIMENTATION ON THE SITE AND ON ADJACENT PROPERTY RESULTING FROM HIS CONSTRUCTION ACTIVITIES. EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN ON EC SHEETS SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY LAND DISTURBING ACTIVITIES. THE CONTRACTOR SHALL MAINTAIN EROSION CONTROL MEASURES UNTIL THE COMPLETION OF CONSTRUCTION AND APPROVAL BY THE ENGINEER TO REMOVE.
5. CONTRACTOR SHALL TAKE ALL REASONABLE MEASURES TO PREVENT TRACKING MUD/SOIL ON ACTIVE ROADWAYS. ANY MUD/SOIL TRACKED ON ROADWAYS SHALL BE CLEANED DAILY.
6. EROSION CONTROL MEASURES WILL BE INSPECTED DAILY BY THE CONTRACTOR. EROSION CONTROL MEASURES IN NEED OF REPAIR WILL BE REPAIRED BY THE CONTRACTOR PRIOR TO CONTINUING WITH THE PROJECT WORK.
7. IF EROSION CONTROL MEASURES, IN ADDITION TO THOSE SPECIFIED AND REQUIRED ON THE DRAWINGS, ARE REQUIRED BY THE ENGINEER DUE TO THE ACTION OR PROCESSES OF THE CONTRACTOR, ALL COST SHALL BE AT THE CONTRACTOR'S EXPENSE AND AT NO ADDITIONAL COST TO THE OWNER.
8. PER NPDES NCG01, GROUND STABILIZATION ON PERIMETER AREAS AND SLOPES GREATER THAN 3:1 SHALL BE COMPLETED IN 7 DAYS. GROUND STABILIZATION ON ALL OTHER AREAS SHALL BE COMPLETED IN 14 DAYS. SEEDING SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS OR AS DIRECTED BY PLANS.
9. A PERMANENT VEGETATIVE COVER SUFFICIENT TO RESTRAIN ACCELERATED EROSION SHALL BE ESTABLISHED ON ALL DISTURBED AREAS. TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED DURING ALL TIMES OF THE YEAR NOT SUITABLE FOR THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER. ANY TEMPORARY SEEDING THAT THE INSPECTOR DETERMINES AS FAILING WILL BE RE-SEEDED UPON NOTIFICATION OF THE CONTRACTOR.
10. AT THE COMPLETION OF THE WORK OR AT SUCH TIME AS THE ENGINEER, OWNER, AND STATE REGULATORY AGENCY DETERMINE THAT ADEQUATE PERMANENT EROSION CONTROL MEASURES HAVE BEEN ESTABLISHED, THE CONTRACTOR SHALL REMOVE THE EROSION CONTROL MEASURES AND DISPOSE THEM OFF SITE.
11. ANY ON SITE STOCKPILING IS TO BE COORDINATED AND APPROVED BY THE ENGINEER. THE STOCKPILE SHALL BE STABILIZED PER NPDES NCG01. GROUND STABILIZATION ON PERIMETER AREAS AND SLOPES GREATER THAN 3:1 SHALL BE COMPLETED IN 7 DAYS. GROUND STABILIZATION ON ALL OTHER AREAS SHALL BE COMPLETED IN 14 DAYS. SEEDING SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS OR AS DIRECTED BY PLANS. ASPHALT TACKIFIER SHALL NOT BE USED FOR ANCHORING STRAW.
12. ANY OFF-SITE BORROW AND WASTE REQUIRED FOR THIS PROJECT MUST COME FROM A SITE WITH AN APPROVED EROSION CONTROL PLAN, A SITE REGULATED UNDER THE MINING ACT OF 1971, OR A LANDFILL REGULATED BY THE DIVISION OF SOLID WASTE MANAGEMENT. TRASH/DEBRIS FROM DEMOLITION ACTIVITIES OR GENERATED BY ANY ACTIVITIES ON SITE MUST BE DISPOSED OF AT A FACILITY REGULATED BY THE DIVISION OF SOLID WASTE MANAGEMENT OR PER DIVISION OF SOLID WASTE MANAGEMENT OR DIVISION OF WATER RESOURCES RULES AND REGULATIONS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ACCESS ROAD IS SUFFICIENTLY STABLE AT ALL TIMES DURING CONSTRUCTION TO PREVENT RUTTING OF THE DRIVE AND TRACKING OF MUD BEYOND THE PROJECT LIMITS. IF THE CONTRACTOR DOES NOTE MUD OUTSIDE OF THE PROJECT LIMITS, THEY SHALL IMMEDIATELY CLEAN UP THE SITE AND MAKE NECESSARY IMPROVEMENTS.

**PROJECT CONSTRUCTION SEQUENCE**

1. UPON RECEIVING THE NOTICE TO PROCEED FROM THE OWNER, THE CONTRACTOR SHALL NOTIFY NCDOT AND NC DEQ THAT CONSTRUCTION ACTIVITIES ARE SCHEDULED TO BEGIN. SCHEDULE MEETINGS AS REQUIRED PER THE PERMIT WITH THE APPROPRIATE STAFF AT EACH AGENCY.
2. AT THE DIRECTION OF NC DEQ, PROCEED WITH INSTALLATION OF PRELIMINARY EROSION AND SEDIMENT CONTROL MEASURES. INSTALL REQUIRED EROSION AND SEDIMENT CONTROL AS PER NCDEQ PERMIT.
3. CONSULT QUALIFIED LAKE MANAGEMENT CONTRACTOR REGARDING PRESERVATION OF AQUATIC LIFE AND HABITAT DURING DEWATERING OPERATIONS & LOWERED WATER SURFACE LEVEL CONDITIONS.
4. LOWER AND MAINTAIN WATER SURFACE TO 4FT BELOW SPILLWAY USING EITHER SIPHON OR PUMPS AND/OR SIPHON HOSES AND SEDIMENT BAGS. LOWER ELEVATION, NO MORE THAN ONE VERTICAL FOOT PER DAY.
5. CONTINUE DEWATERING AS NECESSARY.
6. WALK PROJECT AREA WITH OWNER/ENGINEER TO CONFIRM REQUIRED TREE REMOVAL. PERFORM SELECTIVE TREE REMOVAL.
6. COMPLETE REQUIRED BATHYMETRIC SURVEY OF AREA TO BE DREDGED.
7. BEGIN DREDGING. ENSURE THAT ALL TRUCKS ARE CLEAR OF MUD UPON LEAVING SITE AND NO SEEPAGE OF DREDGE MATERIALS FROM TRUCKS IS PRESENT.
8. COMPLETE DREDGING.
9. RECONSTRUCT EXISTING RIP RAP DITCH AND ALL OTHER DISTURBED AREAS ON RESIDENTS PROPERTIES.
10. FILL SCOUR HOLE WITH COMPACTED SOIL AND ARMOR EMBANKMENT. INSTALL RIP RAP DISSIPATOR APRON AT 18" HDPE STORM PIPE.
11. INSTALL AND ESTABLISH PERMANENT VEGETATIVE COVER FOR ALL DISTURBED AREAS. INSTALL STRAW MATTING ON ALL SLOPES 3:1 OR GREATER.
12. COMPLETE FINAL WALKTHROUGH WITH OWNER.

**LEGEND**

BUILDING	
CURB & GUTTER	
DRAINAGE EASEMENT	
EDGE OF ROADWAY	
EXISTING FIRE HYDRANT	
EXISTING IRON PIN	
EXISTING WATER VALVE	
EXISTING WATER MAIN	
EXISTING SANITARY SEWER	
EXIST. SAN. SEWER MANHOLE STRUCTURE	
EXISTING GAS MAIN	
FENCE	
FIBER OPTIC LINE	
GAS STRUCTURE	
UNIDENTIFIED POST	
UNIDENTIFIED STRUCTURE	
GUARD RAIL	
MARSH, POND, WETLAND OR LAKE	
OVERHEAD ELECTRIC	
PIERS	
POWER POLE/GUY WIRE	
PROPERTY LINE	
RIP RAP	
ROAD/STREET AND RAILROAD R/W	
SEDIMENT FENCE (SILT FENCE)	
SEDIMENT FENCE OUTLET	
SIDEWALK	
STREET SIGN (LABEL TYPE)	
STORM DRAIN/CATCH BASIN, YARD AND DROP INLET	
TOWER LINE	
TREE & BUSH	
UNDERGROUND CABLE	
UNDERGROUND ELECTRIC	
UNDERGROUND TELEPHONE	
RAILROAD	
TREE LINE	
BRUSH LINE	
SUBSURFACE INVESTIGATION	
PERMANENT ACCESS EASEMENT	
PERMANENT PIPED/AT-GRADE STREAM CROSSING	
PERMANENT UTILITY EASEMENT	
TEMPORARY CONSTRUCTION EASEMENT	
TEMPORARY CONSTRUCTION ENTRANCE	
TEMPORARY STREAM CROSSING	
SEWER EASEMENT	
GAS EASEMENT	
15' STREAM BUFFER	
INLET PROTECTION	

**WILDLIFE REMOVAL**

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH AN APPROVED POND OR LAKE MANAGEMENT CONTRACTOR EXPERIENCED IN AQUATIC WILDLIFE REMOVAL TO TRANSFER ALL AQUATIC LIFE AS NECESSARY PRIOR TO COMMENCEMENT OF POND DEWATERING OPERATIONS. THE COORDINATION SHALL INCLUDE LOWERING THE PERMANENT POOL AS RECOMMENDED BY THE AQUATIC WILDLIFE REMOVAL CONTRACTOR. THE AQUATIC WILDLIFE REMOVAL CONTRACTOR SHALL BE RESPONSIBLE FOR TRANSFERRING THE AQUATIC LIFE AND FOR MAKING RECOMMENDATIONS CONCERNING THE AQUATIC LIFE.

**FLOODPLAIN NOTES**

1. ALL WORK SHALL CONFORM TO THE FLOODPLAIN PERMIT ISSUED BY UNION COUNTY.
2. ALL DISTURBED AREAS SHALL BE RETURNED TO ORIGINAL GRADE WITHIN THE FLOODPLAIN. ALL EXCESS MATERIAL SHALL BE REMOVED FROM FLOODPLAIN AND RESTORED SURFACES SHALL MATCH EXISTING CONTOURS.
3. EQUIPMENT IN THE FLOODWAY SHALL BE RESTRICTED TO ONLY THAT NECESSARY TO COMPLETE THE DREDGING ACTIVITIES. ALL OTHER EQUIPMENT NOT ACTIVELY USED IN THE CONSTRUCTION SHALL REMAIN OUTSIDE OF THE FLOODWAY LIMITS.
4. EQUIPMENT IS TO BE EVACUATED FROM THE SITE AND PLACED OUTSIDE THE FLOODPLAIN DURING POTENTIAL FLOOD EVENTS.
5. ALL MECHANICAL EQUIPMENT OPERATED NEAR THE STREAM SHALL BE INSPECTED AND MAINTAINED REGULARLY TO PREVENT CONTAMINATION OF THE STREAM WATERS FROM FUEL, LUBRICANTS, HYDRAULIC FLUIDS OR OTHER TOXIC MATERIALS. FUELING, LUBRICATION AND GENERAL EQUIPMENT MAINTENANCE SHALL BE PERFORMED IN A MANNER TO PREVENT CONTAMINATION OF SURFACE WATERS BY FUELS AND OILS.
6. PETROLEUM SPILLS OF 25 GALLONS OR MORE, OR ANY SPILL THAT CAUSES A SHEEN ON SURFACE WATERS REGARDLESS OF ANY AMOUNT OCCURRING WITHIN 100-FEET OF SURFACE WATERS SHALL BE REPORTED IN ACCORDANCE WITH 143-215.85(B).

PREPARED BY:  
  
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UNION COUNTY SOIL & WATER CONSERVATION DISTRICT  
 UNION COUNTY, NORTH CAROLINA  
 WALDEN POND SEDIMENT REMOVAL PROJECT  
 GENERAL NOTES

Apprvd.	
Date:	10/3/2024
Chkd:	SMM
Drwn:	KAW
Scale:	
Project No.:	TBD
Sheet:	C-1

Apprvd:	
Date:	10/3/2024
Chkd:	SMM
Drawn:	KAW
Scale:	
Project No.:	TBD
Sheet:	C-2

**PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING**

**SECTION A: SELF-INSPECTION**

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those unattended days (are this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&S Measures	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the measures inspected. 2. Date and time of the inspection. 3. Name of the person performing the inspection. 4. Indication of whether the measures were operating properly. 5. Description of maintenance needs for the measure. 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDCs)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the discharge outfall inspected. 2. Date and time of the inspection. 3. Name of the person performing the inspection. 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration. 5. Indicators of visible sediment leaving the site. 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits. 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item (2)(a) of this permit.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&S measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

**PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING**

**SECTION B: RECORDKEEPING**

**1. E&S Plan Documentation**

The approved E&S plan as well as any approved deviation shall be kept on the site. The approved E&S plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&S plan shall be kept on site and available for inspection at all times during normal business hours.

Item to Document	Documentation Requirements
(a) Each E&S measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&S plan.	Initial and date each E&S measure on a copy of the approved E&S plan or complete, date and sign an inspection report that lists each E&S measure shown on the approved E&S plan. This documentation is required upon the initial installation of the E&S measures or if the E&S measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&S plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&S plan.	Initial and date a copy of the approved E&S plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&S measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&S measures.	Initial and date a copy of the approved E&S plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

**2. Additional Documentation to be kept on Site**

In addition to the E&S plan documents above, the following items shall be kept on the site and available for inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

- This General Permit as well as the Certificate of Coverage, after it is received.
- Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

**3. Documentation to be Retained for Three Years**

All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

**PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING**

**SECTION C: REPORTING**

**1. Occurrences that Must be Reported**

Permittees shall report the following occurrences:

- Visible sediment deposition in a stream or wetland.
- Oil spills if:
  - They are 25 gallons or more,
  - They are less than 25 gallons but cannot be cleaned up within 24 hours,
  - They cause sheen on surface waters (regardless of volume), or
  - They are within 100 feet of surface waters (regardless of volume).
- Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 113.7) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.
- Anticipated bypasses and unanticipated bypasses.
- Noncompliance with the conditions of this permit that may endanger health or the environment.

**2. Reporting Timeframes and Other Requirements**

After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Department's Environmental Emergency Center personnel at (800) 858-0568.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	<ul style="list-style-type: none"> <li>Within 24 hours, an oral or electronic notification.</li> <li>Within 7 calendar days, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis.</li> <li>If the stream is named on the NC 303(b) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.</li> </ul>
(b) Oil spills and release of hazardous substances per Item 1(b) (c) above	<ul style="list-style-type: none"> <li>Within 24 hours, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.</li> </ul>
(c) Anticipated bypasses (40 CFR 122.41(m)(3))	<ul style="list-style-type: none"> <li>A report at least ten days before the date of the bypass, if possible. The report shall include an evaluation of the anticipated quality and effect of the bypass.</li> </ul>
(d) Unanticipated bypasses (40 CFR 122.41(m)(3))	<ul style="list-style-type: none"> <li>Within 24 hours, an oral or electronic notification.</li> <li>Within 7 calendar days, a report that includes an evaluation of the quality and effect of the bypass.</li> </ul>
(e) Noncompliance with the conditions of this permit that may endanger health or the environment (40 CFR 122.41(j)(7))	<ul style="list-style-type: none"> <li>Within 24 hours, an oral or electronic notification.</li> <li>Within 7 calendar days, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. (40 CFR 122.41(j)(6)).</li> <li>Division staff may waive the requirement for a written report on a case-by-case basis.</li> </ul>

**PART II, SECTION G, ITEM (4) DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT**

Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is not feasible. The circumstances in which it is not feasible to withdraw water from the surface shall be rare (for example, times with extended cold weather). Non-surface withdrawals from sediment basins shall be allowed only when all of the following criteria have been met:

- The E&S plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur. The non-surface withdrawal shall not commence until the E&S plan authority has approved these items.
- The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit.
- Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin. Examples of appropriate controls include properly sited, designed and maintained dewatering tanks, weir tanks, and filtration systems.
- Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above.
- Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and
- Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.

**NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING** EFFECTIVE: 04/01/19

**GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT**

Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

**SECTION E: GROUND STABILIZATION**

Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed. -7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones
(d) Slopes 3:1 to 4:1	14	-7 days for Falls Lake Watershed -10 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope
(e) Areas with slopes flatter than 4:1	14	

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

**GROUND STABILIZATION SPECIFICATION**

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
<ul style="list-style-type: none"> <li>Temporary grass seed covered with straw or other mulches and tackifiers</li> <li>Hydroseeding</li> <li>Roller erosion control products with or without temporary grass seed</li> <li>Appropriately applied straw or other mulch</li> <li>Plastic sheeting</li> </ul>	<ul style="list-style-type: none"> <li>Permanent grass seed covered with straw or other mulches and tackifiers</li> <li>Geotextile fabrics such as permanent soil reinforcement matting</li> <li>Hydroseeding</li> <li>Shrubs or other permanent plantings covered with mulch</li> <li>Uniform and evenly distributed ground cover sufficient to restrain erosion</li> <li>Structural methods such as concrete, asphalt or retaining walls</li> <li>Roller erosion control products with grass seed</li> </ul>

**POLYACRYLAMIDES (PAMS) AND FLOCCULANTS**

- Select flocculants that are appropriate for the soils being exposed during construction, selecting from the NC DWR List of Approved PAMS/Flocculants.
- Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
- Apply flocculants at the concentrations specified in the NC DWR List of Approved PAMS/Flocculants and in accordance with the manufacturer's instructions.
- Provide ponding area for containment of treated Stormwater before discharging offsite.
- Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

**EQUIPMENT AND VEHICLE MAINTENANCE**

- Maintain vehicles and equipment to prevent discharge of fluids.
- Provide drip pans under any stored equipment.
- Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
- Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
- Remove leaking vehicles and construction equipment from service until the problem has been corrected.
- Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

**LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE**

- Never bury or burn waste. Place litter and debris in approved waste containers.
- Provide a sufficient number and size of waste containers (e.g. dumpster, trash receptacle) on site to contain construction and domestic wastes.
- Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
- Locate waste containers in areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
- Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
- Anchor all lightweight items in waste containers during times of high winds.
- Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
- Dispose waste off-site at an approved disposal facility.
- On business days, clean up and dispose of waste in designated waste containers.

**PAINT AND OTHER LIQUID WASTE**

- Do not dump paint and other liquid waste into storm drains, streams or wetlands.
- Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
- Contain liquid wastes in a controlled area.
- Containment must be labeled, sized and placed appropriately for the needs of site.
- Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

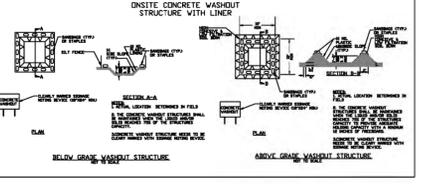
**PORTABLE TOILETS**

- Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
- Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
- Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

**EARTHEN STOCKPILE MANAGEMENT**

- Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
- Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
- Provide stable stone access point when feasible.
- Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.

**ON-SITE CONCRETE WASHOUT STRUCTURE WITH LINER**



**CONCRETE WASHOUTS**

- Do not discharge concrete or cement slurry from the site.
- Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
- Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within 10' perimeter silt fence.
- Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
- Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
- Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
- Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
- Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
- Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
- At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

**HERBICIDES, PESTICIDES AND RODENTICIDES**

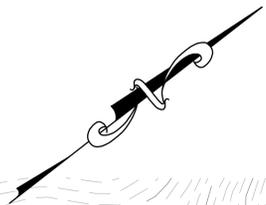
- Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
- Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
- Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
- Do not stockpile these materials onsite.

**HAZARDOUS AND TOXIC WASTE**

- Create designated hazardous waste collection areas on-site.
- Place hazardous waste containers under cover or in secondary containment.
- Do not store hazardous chemicals, drums or bagged materials directly on the ground.

**NCG01 GROUND STABILIZATION AND MATERIALS HANDLING** EFFECTIVE: 04/01/19

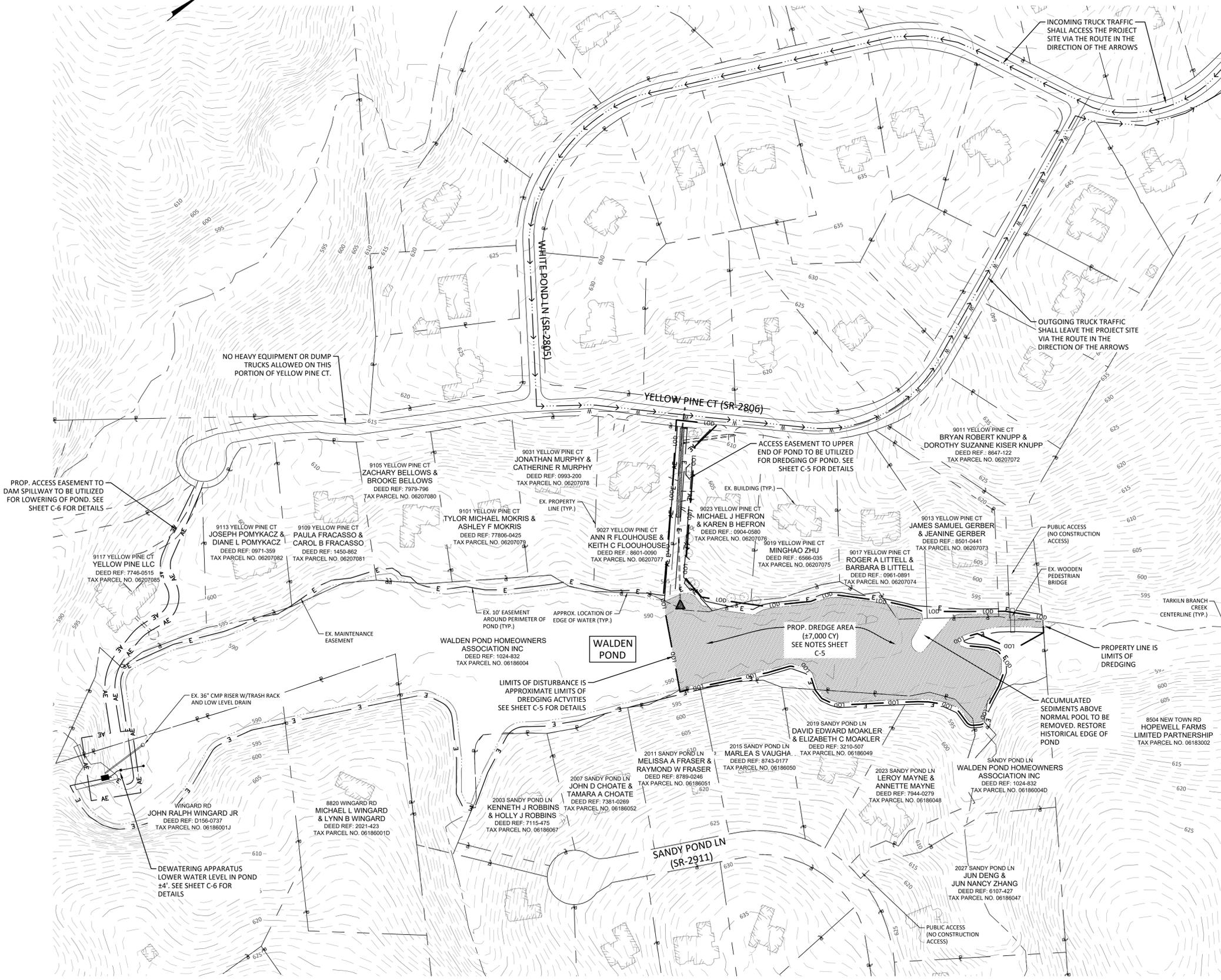




EROSION & SEDIMENT CONTROL LEGEND:	
TEMPORARY SILT FENCE	
STABILIZED CONSTRUCTION ENTRANCE	
TEMPORARY TREE PROTECTION	

PREPARED BY:  
 Cavell & Dorn Engineering, PLLC  
 6730 Freedom Drive  
 Charlotte, NC 28214  
 704-919-1900  
 License No. P-0601

**UNION COUNTY SOIL & WATER CONSERVATION DISTRICT**  
**UNION COUNTY, NORTH CAROLINA**  
**WALDEN POND SEDIMENT REMOVAL PROJECT**  
**OVERALL SITE PLAN**



**PROJECT NOTES**

**POND DREDGING AND DEWATERING**  
 INTENT OF PROJECT IS TO REMOVE ALL SEDIMENTS IN THE PROJECT AREA AND RESTORE HISTORICAL POND BOTTOM. ALL ACCUMULATED SEDIMENTS, ABOVE AND BELOW WATER LEVEL SHALL BE REMOVED AND DISPOSED OFF-SITE. SEDIMENT LEVELS VARY THROUGHOUT THE POND.  
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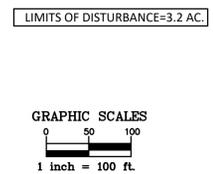
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Date:	10/3/2024
Chkd:	SMM
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Scale:	1"=100'
Project No.:	TBD
Sheet:	C-4



LIMITS OF DISTURBANCE=3.2 AC.

**EROSION & SEDIMENT CONTROL LEGEND:**

- TEMPORARY SILT FENCE
- STABILIZED CONSTRUCTION ENTRANCE
- TEMPORARY TREE PROTECTION

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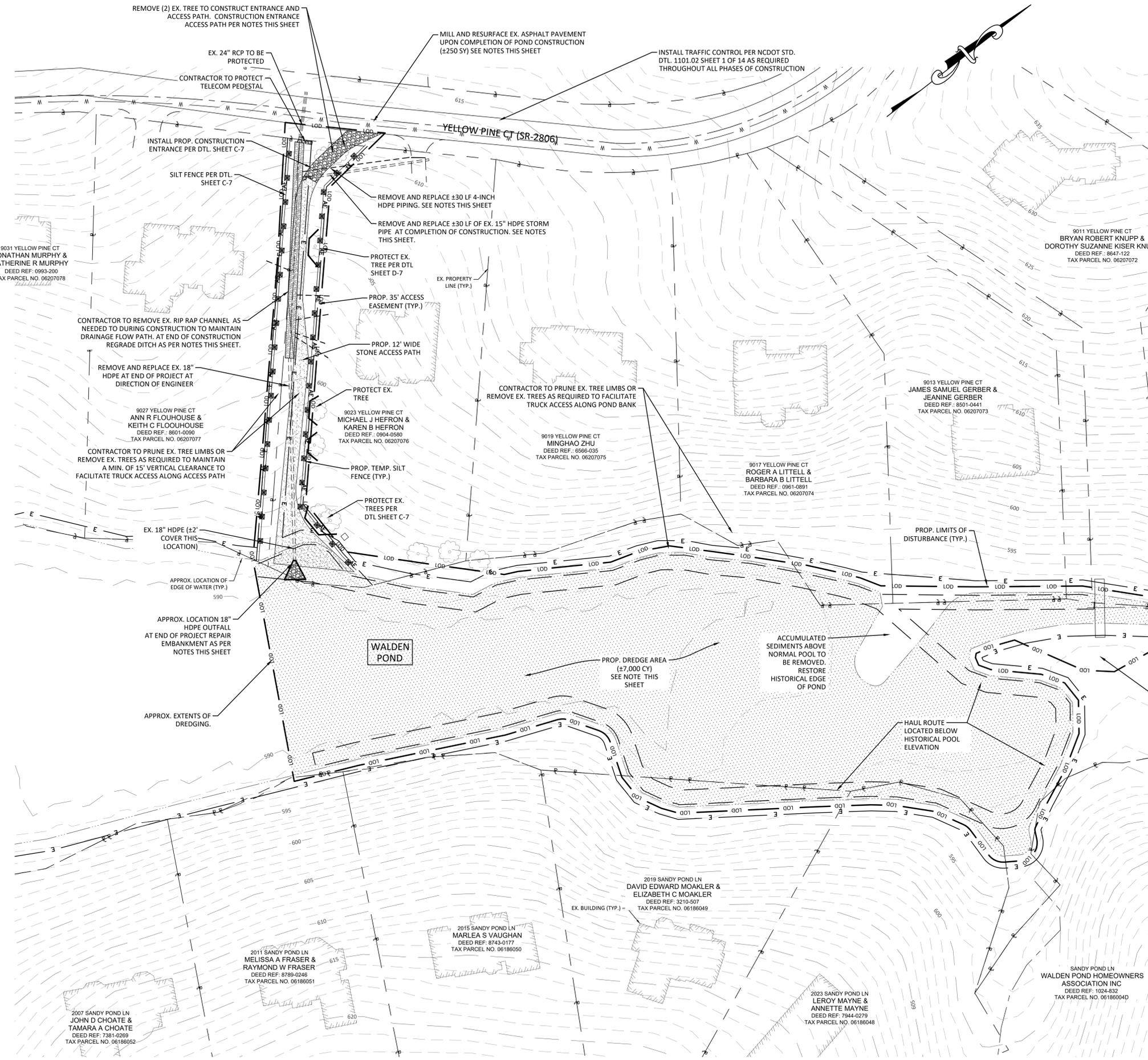
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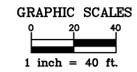
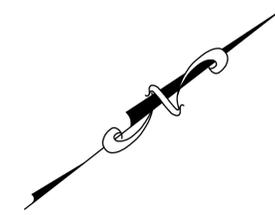
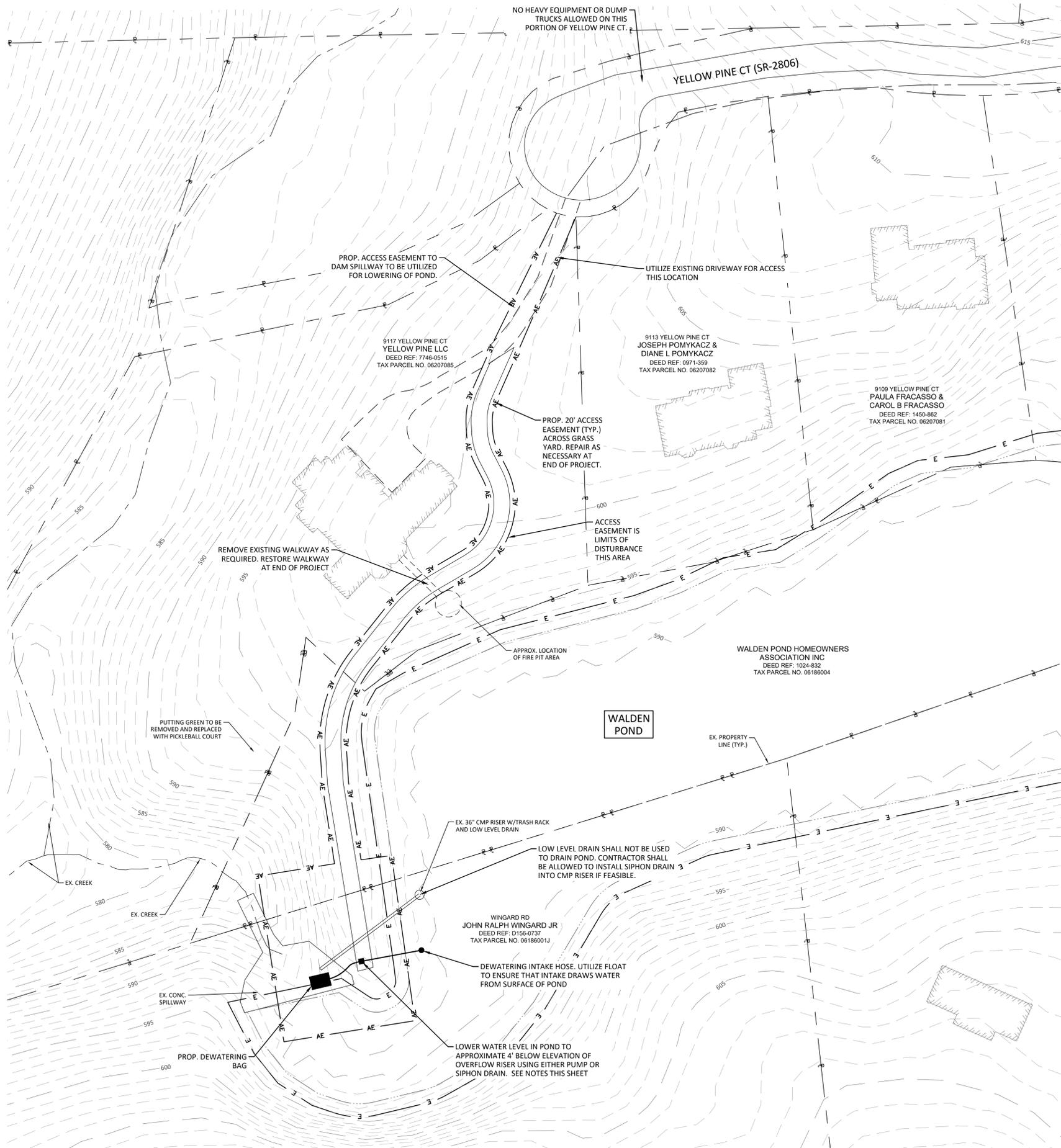
UNION COUNTY SOIL & WATER CONSERVATION DISTRICT  
 UNION COUNTY, NORTH CAROLINA  
 WALDEN POND SEDIMENT REMOVAL PROJECT  
 DETAILED DREDGE PLAN (UPSTREAM END OF POND)

Apprvd.	
Date:	10/3/2024
Chkd:	SMM
Drwn:	KAW
Scale:	1"=40'
Project No.:	TBD
Sheet:	C-5

PREPARED BY:

Cavel & Dorn Engineering, PLLC  
 6730 Freedom Drive  
 Charlotte, NC 28214  
 704-919-1900  
 License No. P-0601

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**EROSION & SEDIMENT CONTROL LEGEND:**

TEMPORARY SILT FENCE	
STABILIZED CONSTRUCTION ENTRANCE	
TEMPORARY TREE PROTECTION	

LIMITS OF DISTURBANCE=3.2 AC.

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PREPARED BY:

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UNION COUNTY SOIL & WATER CONSERVATION DISTRICT  
 UNION COUNTY, NORTH CAROLINA  
 WALDEN POND SEDIMENT REMOVAL PROJECT  
 DETAILED DREDGE PLAN (DOWNSTREAM END OF POND)


Apprvd:	
Date:	10/3/2024
Chkd:	SMM
Drwn:	KAW
Scale:	1"=40'
Project No.:	TBD
Sheet:	C-6



DATE: \_\_\_\_\_ PAGE: \_\_\_\_\_

**Construction:**

- Clear the entrance and exit area of all vegetation, roots, and other objectionable material and prepare grade it.
- Place the gravel to the specific grade and dimensions shown on the plans, and smooth it.
- Provide drainage to carry water to a sediment trap or other suitable outlet.
- Use geotextile fabrics in order to improve stability of the foundation in locations subject to seepage or high water table.

**Maintenance:**

- Inspect all measures at least weekly and after each rainfall of 1.0 inch or greater. Make any required repairs immediately.
- Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site. This may require periodic topdressing with 2-inch stone.
- Sediment on roadways is to be removed immediately by broom and shovel, either by manual or mechanical means, and not to be washed off where it has the potential to enter a stream, drainage way or storm drain system.

Effective Date: 9/1/2023  
In accordance with the 2013 Design Manual Updates

**TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT**

DATE: \_\_\_\_\_ PAGE: \_\_\_\_\_

**TEMPORARY SEEDING RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING**

Seeding Mixture Species	Rate (lb/acre)
Rye (grain)	120
Annual lespedeza (Kobe in Piedmont and Coastal Plain, Korean in Mountains)	50
Only annual lespedeza when duration of temporary cover is not to extend beyond June.	

**Seeding Dates**  
Mountains—Above 2500 feet: Feb. 15 - May 15  
Below 2500 feet: Feb. 1 - May 1  
Piedmont—Jan. 1 - May 1  
Coastal Plain—Dec. 1 - Apr. 15

**Mulch**  
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

**Maintenance**  
Referitize if growth is not fully adequate. Reseed, referitize and mulch immediately following erosion or other damage.

**SEED BED PREPARATION:**  
LIMING- Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the rate of 1-1½ tons/acre on coarse-textured soils and 2-3 tons/acre on fine-textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4-6 inches of soil. Soils with a pH of 6 or higher need not be limed.

**FERTILIZER-** Base application rates on soil tests. When these are not possible, apply a 10-10-10 grade fertilizer at 700 - 1,000 lb/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.

**SURFACE ROUGHENING-** If recent tillage operations have resulted in a loose surface additional roughening may not be required, except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by raking, harrowing, or other suitable methods for fine grading. The finished grade shall be a smooth even soil surface with a loosen uniformly fine texture. All ridges and depressions shall be removed and filled to provide the approved surface drainage. Planting is to be done immediately after finished grades are obtained and seedbed preparation is completed.

Effective Date: 9/1/2023  
In accordance with the 2013 Design Manual Updates

**TEMPORARY SEEDING**

DATE: \_\_\_\_\_ PAGE: \_\_\_\_\_

**NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING**

SEEDING MIXTURE Species	Rate
Centipede	5 lbs/acre
Indian Woodrats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

**NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR SUMMER**

SEEDING MIXTURE Species	Rate
Hard Fescue	15 lbs/acre
Switchgrass	2.5-3.5 lbs/acre*
Indian Grass	8-7 lbs/acre*
Big Bluestem	5-7 lbs/acre*
Indian Woodrats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

**SEEDING DATES**  
Coastal or Eastern Piedmont for Centipede- Sept. 1 - May 1  
Coastal and Piedmont for Indian Woodrats and Virginia Wild Rye- Feb 15 - April 1  
Mountains for Indian Woodrats and Virginia Wild Rye- March 1 - April 15

**Maintenance:**  
Significant maintenance may be required to obtain desired cover.

**SEED BED PREPARATION:**  
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**NOTES:**

- Permanent seeding, sodding or other means of stabilization are required when all construction work is completed according to the PDSES timeframes table.
- A North Carolina Department of Agriculture soil test (or equal) is highly recommended to be obtained for all areas to be seeded, sprigged, sodded or planted.
- Use a seeding mix that will produce fast-growing nurse crops and includes non-invasive species that will eventually provide a permanent groundcover. Soil blankets may be used in lieu of nurse crops. Mat, tack or crimp mulch, as needed to stabilize seeded areas until root establishment. Mulch must cover at least 80% of the soil surface.
- Ground cover shall be maintained until permanent vegetation is established and stable against accelerated erosion.

Effective Date: 9/1/2023  
In accordance with the 2013 Design Manual Updates

**PERMANENT SEEDING**

DATE: \_\_\_\_\_ PAGE: \_\_\_\_\_

**Mulching Materials and Application Rates**

Material	Rate Per Acre	Quality	Notes
Straw	1-2 tons	Dry, unchopped, unweathered, avoid weeds.	Should come from wheat or oats; spread by hand or machine; must be tacked down.
Wood Chips	5-6 tons	Air dry	Treat with 12 lbs nitrogen. Apply with mulch blower, chip handle, or by hand. Not for use in fire turf.
Wood Fiber	0.5-1 tons	Also referred to as wood cellulose. May be hydrosoiled. Do not use in hot, dry weather.	Apply with mulch blower, chip handle, or by hand. Do not use asphalt tack.
Bark	35 cubic yards	Air dry, shredded or hammer-milled, or chips.	Apply with mulch blower or by hand. Not for use in fire turf.
Corn Stalks	4-6 tons	Cut or shredded in 4-8 inch lengths.	Apply with mulch blower or by hand. Not for use in fire turf.
Seriecia Lespedeza seed-bearing stems	1-3 tons	Green or dry; should contain mature seed.	Apply with mulch blower or by hand. Not for use in fire turf.

**Chemical Stabilizers\*\***

Material	Rate	Notes
Aquatain Aerospray	Follow Manufacturer's specifications	Not beneficial to plant growth
Corasil AK	Follow Manufacturer's specifications	Not beneficial to plant growth
Terra Tack	Follow Manufacturer's specifications	Not beneficial to plant growth
Genacryl 743 M-145	Follow Manufacturer's specifications	Not beneficial to plant growth

**Notes:**

- Select material based on site and practice requirements, availability of material, labor and equipment.
- Before mulching, complete grading, install sediment control practices, and prepare the seedbed. Apply seed before mulching except when seed is applied as part of a hydroseeder slurry containing wood fiber mulch or a hydroseeder slurry is applied over straw.
- APPLICATION OF ORGANIC MULCH
  - Sprinkle mulch uniformly by hand, or with a mulch blower.
  - When spreading straw mulch by hand, divide the area to be mulched into sections of approximately 1,000 ft<sup>2</sup>, and place 70-90 lb of straw (1 1/2 to 2 bales) in each section to facilitate uniform distribution.
  - After spreading, no more than 25% of the ground surface should be visible.
  - In hydroseeding operations a green dye, added to the slurry, assures a uniform application.
- ANCHORING ORGANIC MULCH
  - Straw must be anchored immediately after spreading.
  - A tractor-drawn implement designed to punch mulch into the soil or a mulch anchoring tool provides maximum erosion control with straw. A regular farm disk, weighted and set nearly straight, may substitute, but will not do a job comparable to the mulch anchoring tool. The disk should not be sharp enough to cut the straw. These methods are limited to slopes no steeper than 3:1, where equipment can operate safely.
  - Application of liquid mulch binders and tackifiers should be heaviest at the edges of areas and at crests of ridges and banks, to resist winds. Binder should be applied uniformly to the rest of the area. Binders may be applied after mulch is spread or may be sprayed into the mulch as it is being blown onto the soil. Applying straw and binder together is the most effective method.
  - Emulsified asphalt should be applied at 0.10 gallons per square yard (10 gal/1,000 ft<sup>2</sup>). Heavier applications cause straw to "perch" over ribs. Use Rapet setting (RS or CRS) designated asphalt in traffic areas to prevent unbound asphalt from being poked up on shoes and causing damage to rags, clothes, etc.
  - Synthetic binders may be used as recommended by the manufacturer.
  - Lightweight plastic, cotton, jute, wire or paper nets may be stapled over the mulch according to the manufacturer's recommendations.
  - For small areas where other methods cannot be used, peg and twine anchoring can be used. Drive 8-10 inch wooden pegs within 3 inches of the soil surface, every 4 feet in all directions. Stakes can be driven before or after straw is spread. Secure mulch by stapling twine between pegs in a cross-cross-within-a-square pattern. Turn twine two or more times around each peg.
  - Rye Grass may be used to anchor mulch in flat plantings, and German Millet in springs. Broadcast at 15 lb/acre before applying mulch.
1. May be effective for soil stabilization if used between May 1 and June 15, or Sept. 15 and Oct. 15, provided that they are used on slopes no steeper than 4:1, and that proper seedbed preparation has been accomplished, including surface roughening where required.
2. Chemical mulches cannot be used to bind other mulches, or with wood fiber in a hydroseeded slurry at any time. Follow the manufacturer's recommendations for application.

**FIBERGLASS ROVING**

1. Spread roving uniformly over the area at a rate of 0.25 to 0.35 bly/ft<sup>2</sup>. Anchor with asphalt immediately after application, at a rate of 0.5 to 0.75 gal/ft<sup>2</sup>.
2. As a channel lining, and at other sites of concentrated flow, the roving mat must be further anchored to prevent undermining. It may be secured with stakes placed at intervals no greater than 10 feet along the drainage way, and randomly throughout its width, but not more than 10 feet apart.
3. If an option to staking, the roving can be buried to a depth of 5 inches at the up-slope end and at intervals of 50 feet along the length of the channel.

**NETS AND MATS**

1. Nets alone generally provide little moisture conservation benefits and only limited erosion protection. Therefore, typically use in conjunction with other methods.
2. Except when wood fiber slurry is used, netting should always be installed over the mulch. Wood fiber may be sprayed on top of an installed net.
3. Mats, including "weeder" (wool fiber) blankets, are considered protective mulches and may be used alone.
4. Place the matting in firm contact with the soil, and staple securely.

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**MULCHING**

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**PIPE OUTLET TO FLAT AREA NO WELL-DEFINED CHANNEL**

**PIPE OUTLET TO WELL-DEFINED CHANNEL**

**Notes:**

1. Compact any fill required in the subgrade to the density of the surrounding undisturbed soil. Low areas in the subgrade on undisturbed soil may also be filled by increasing the riprap thickness.
2. The riprap and gravel filter must conform to the specified grading limits shown on the plans.
3. Filter cloth, when used, must meet design requirements, and be properly protected from punching or tearing during installation. Repair any damage by removing the riprap and placing another piece over the damaged area. If the damage is extensive, replace the entire filter cloth.
4. All connecting joints should overlap so the top layer is above the downstream layer a minimum of 1 foot.
5. The minimum thickness of the riprap should be 1.5 times the maximum stone diameter but not less than 6".
6. Riprap may be field stone or rough quarry stone. It should be hard, angular, highly weather-resistant and well graded.
7. Construct the apron on zero grade with no overfill at the end. Make the top of the riprap at the downstream end level with the receiving area or slightly below it.
8. Ensure that the apron is properly aligned with the receiving stream and preferably straight throughout its length. If a curve is needed, place in the upper section of the apron.

**MAINTENANCE:**

1. Inspect outlet structures at least weekly and after rainfall of 1.0 inch or greater.
2. Check outlets for erosion around or below riprap and if stones have been dislodged. Make repairs immediately to prevent further damage.

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**OUTLET STABILIZATION STRUCTURE**

DATE: \_\_\_\_\_ PAGE: \_\_\_\_\_

**Subgrade Preparation:**

1. Prepare the subgrade for riprap and filter to the required lines and grades shown on the plans.
2. Compact any fill required in the subgrade to a density approximating that of the surrounding undisturbed material or overfill depressions with riprap.
3. Remove brush, trees, stumps, and other objectionable material.

**Sand and Gravel Filter Blanket:**

1. Place the filter blanket immediately after the ground foundation is prepared.
2. When using gravel, spread filter stone in a uniform layer to the specified depth.
3. When more than one layer of filter material is used, spread the layers with minimal mixing.

**Synthetic Filter Fabric:**

1. Place the cloth filter directly on the prepared foundation.
2. Overlap the edges by at least 12 inches, and space anchor pins every 3 feet along the overlap.
3. Bury the upstream end of the cloth a minimum of 12 inches below ground and bury the lower end of the cloth or over lap with the next section as required.
4. If damage occurs while placing riprap, remove the riprap, and repair the sheet by adding another layer of filter material with a minimum overlap of 12 inches around the damaged area. If damage is extensive, remove and replace the entire sheet.
5. If placing large stones or machine placing is difficult, a 4 inch layer of fine gravel or sand may be needed to protect the filter cloth.

**Stone Placement:**

1. Placement of riprap should follow immediately after placement of the filter.
2. Place so that riprap forms a dense, well-graded mass of stone with a minimum of voids.
3. Place to its full thickness in one operation.
4. Do not place by dumping through chutes or other methods that cause segregation of stone sizes.
5. Take care not to dislodge underlying base or filter when placing stone.
6. The toe of the riprap slope should be keyed to a stable foundation at its base.
7. The toe should be excavated to a depth about 1.5 times the design thickness of the riprap and extend horizontally from the slope, as shown above.
8. Hand placing may be necessary to achieve the proper distribution of stone sizes to produce a relatively smooth, uniform surface.

**Size of Riprap stones**

Weight (lb)	Mean Spherical Diameter (ft)	Length (ft)	Rectangular Shape Width/Height (ft)
50	0.8	1.4	0.5
100	1.1	1.8	0.6
150	1.3	2.0	0.7
300	1.6	2.6	0.9
500	1.9	3.0	1.0
1000	2.2	3.7	1.3
1500	2.6	4.7	1.5
2000	2.8	5.4	1.8
4000	3.6	6.0	2.0
6000	4.0	6.9	2.3
8000	4.5	7.6	2.5
20,000	6.1	10.0	3.3

**Sizes for Riprap and Erosion Control Stone Specified by NCDOT**

Riprap Class	Class 2	Class A	Class B
5-200 lb	25-250 lb	2'-6"	5'-15"

**Notes:**

- 30% shall weigh a minimum of 60 lbs each
- 60% shall weigh a minimum of 100 lbs each
- No more than 10% shall weigh less than 10 lbs each
- No more than 5% shall weigh less than 50 lbs each
- 10% tolerance top and bottom sizes
- Equally distributed, no gradation specified
- Equally distributed, no gradation specified

Riprap should be a well-graded mixture with 50% by weight larger than the specified design size. Diameter of the largest stone size in the mix should be 1.5 times the  $d_{15}$  size with smaller sizes grading down to 1 inch.

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**RIP RAP**

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**Channel Lining Thickness**

Material	Minimum Thickness
Concrete	4 inches
Rock Riprap	1.5 times maximum stone diameter
Flagstone	4 inches including mortar

**V-SHAPED RIPRAP CHANNEL**

**TRAPEZOIDAL RIPRAP CHANNEL**

**PARABOLIC-SHAPED RIPRAP CHANNEL**

**Notes:**

1. Clear the foundation area of trees, stumps, roots, loose rock, and other objectionable material.
2. Excavate the cross section to the lines and grades of the foundation of the liner as shown on the plans. Bring over-excavated areas to grade by increasing the thickness of the liner or by backfilling with moist soil compacted to the density of the surrounding material.
3. Concrete linings:
  - Place concrete linings to the thickness shown on the plans and finish them in a workmanlike manner.
  - Take adequate precautions to protect freshly placed concrete from extreme temperatures to ensure proper curing.
  - Ensure that subgrade is moist when concrete is poured.
  - Install foundation drains or weep holes where needed to protect against uplift and piping.
  - Provide transverse (contraction) joints to control cracking at approximately 20-foot intervals.
  - Install expansion joints at intervals not to exceed 100 feet.
4. Rock riprap linings should be installed per the standards and specifications outlined on following sheets.
5. Place filters, bedding's, and foundation drains to line and grade in the manner specified. Place filter and bedding materials immediately after slope preparation.
6. For synthetic filter fabrics, overlap the downstream edge by at least 12 inches with the upstream edge which is buried a minimum 12 inches in a trench. Space anchor pins every 3 feet along the overlap.
7. Spread granular materials in a uniform layer. When more than one gradation is required, spread the layers so there is minimal mixing.
8. Filter material should consist of a least 3 inches of material on all sides of the drain pipe. The drain pipe conduit should be a minimum of 4 inches in diameter.
9. Perform all channel construction to keep erosion and water pollution to a minimum. Immediately vegetate all disturbed areas or otherwise protect them against soil erosion.

**MAINTENANCE:**

1. Inspect channels at least weekly and after each rainfall of 1.0 inch or greater and make repairs promptly. Give special attention to the outlet and inlet sections and other points where concentrated flow enters.
2. Carefully check stability at road crossings, looking for indication of piping, scour holes, or bank failures. Make any repairs immediately.
3. Maintain all vegetation adjacent to the channel in a healthy, vigorous condition.

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**RIPRAP AND PAVED CHANNELS**

DATE: \_\_\_\_\_ PAGE: \_\_\_\_\_

**Notes:**

1. Construct the sediment barrier of standard strength or extra strength synthetic filter fabric.
2. Ensure that the height of the sediment fence does not exceed 24 inches above the ground. (Higher fences may impound volumes of water sufficient to cause failure of the structure)
3. Construct the filter fabric from a continuous roll out to the length of the barrier to avoid joints. When joints are necessary, securely fasten the filter cloth only at a support post with 4 feet minimum overlap to the next post.
4. Support standard strength filter fabric by wire mesh fastened securely to the upslope side of the fence. Post to the bottom of the trench. Fasten the wire reinforcement, then fabric on the upslope side of the fence post. Wire or plastic zip ties should have a minimum 50 pound tensile strength.
5. When a wire mesh support fence is used, space posts a maximum of 8 feet apart. Supports should be driven securely into the ground a minimum of 24 inches. Wire mesh should be a minimum 14-gauge with 6 inch mesh spacing.
6. Extra strength filter fabric with 6 foot post spacing does not require a wire mesh support fence. Securely fasten the filter fabric directly to posts. Wire or plastic zip ties should have a minimum of 50 pound tensile strength.
7. Excavate the trench approximately 4 inches wide and 8 inches deep along the proposed line of the posts and upslope from the barrier.
8. Place 12 inches of fabric along the bottom and side of the trench.
9. Backfill the trench with soil placed over the filter fabric and compact. Thorough compaction of the backfill is critical to all fence performance.
10. Do not attach filter fabric to existing trees.
11. Do not place across ditches, streams, or any other areas of concentrated flow.

**Max. Slope Length and Slope for Which Sediment Fence is Applicable**

Slope	Slope Length (ft)	Max. Area (ft <sup>2</sup> )
<2%	100	10,000
2 to 5%	75	7,500
5 to 10%	60	5,000
10 to 20%	25	2,500
>20%	15	1,500

**Maintenance:**

1. Inspect all measures at least weekly and after each rainfall of 1.0 inch or greater. Make any required repairs immediately.
2. Should the fabric of a sediment fence collapse, tear, decompose, or become ineffective, replace it promptly.
3. Remove sediment deposits as necessary to provide adequate storage volume for the next rain and reduce pressure on the fence. Take care to avoid undermining the fence during cleanouts.
4. Remove all fencing materials and unstable sediment deposits and bring the area to grade and stabilize it after the contributing drainage area has been properly stabilized.

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**SEDIMENT FENCE**

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**Notes:**

1. Placement of riprap should follow immediately after placement of the filter.
2. Place so that riprap forms a dense, well-graded mass of stone with a minimum of voids.
3. Place to its full thickness in one operation.
4. Do not place by dumping through chutes or other methods that cause segregation of stone sizes.
5. Take care not to dislodge underlying base or filter when placing stone.
6. The toe of the riprap slope should be keyed to a stable foundation at its base.
7. The toe should be excavated to a depth about 1.5 times the design thickness of the riprap and extend horizontally from the slope, as shown above.
8. Hand placing may be necessary to achieve the proper distribution of stone sizes to produce a relatively smooth, uniform surface.

**Tree Protection Detail 7-A**

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**TREE PROTECTION DETAIL 7-A**

APPROVED BY:

DATE:	10/3/2024
CHKD:	SMM
DRWN:	KAW
SCALE:	N/A
PROJECT NO.:	TBD
SHEET:	C-7