

SITE DATA

- 1. OWNER /DEVELOPER LAKEWOOD MANOR BAPTIST RETIREMENT COMMUNITY INC.
2. ARCHITECT SFCS 305 SOUTH JEFFERSON STREET
3. ENGINEER TIMMONS GROUP 4701 OWENS WAY, SUITE 900
4. GPIN #(S) 732-744-7564, 733-745-8147, 733-746-2622, 734-744-4554
5. ADDRESS 1900 LAUDERDALE DRIVE, RICHMOND, VA 23238
6. ACREAGE TOTAL ACREAGE: 168.368 ACRES
7. ZONING C-1, R-6C, A-1
8. PROPOSED USE 1 STORY, SINGLE FAMILY COTTAGES
9. PREVIOUS APPROVAL A. POD # 062-75, 093-82, 104-94, 066-99, 050-04, 2017-00235, 2017-00183, 2020-00233
10. UTILITIES COUNTY WATER, COUNTY SEWER, WELL, SEPTIC, OTHER

- 11. PARKING SCHEDULE A. # SPACES REQUIRED 19
B. BASIS FOR PARKING CALCULATIONS 1 PARKING SPACE PER COTTAGE
C. # SPACES PROVIDED 49 PROPOSED PARKING SPACES
D. # ACCESSIBLE SPACES PROVIDED N/A
E. INTERIOR GREENSPACE CALCULATIONS 162SF/SPACEx14SPACES

- 12. SPECIAL FLOOD HAZARD AREA INFORMATION SPECIAL FLOOD HAZARD AREA (FLOODPLAIN) YES NO

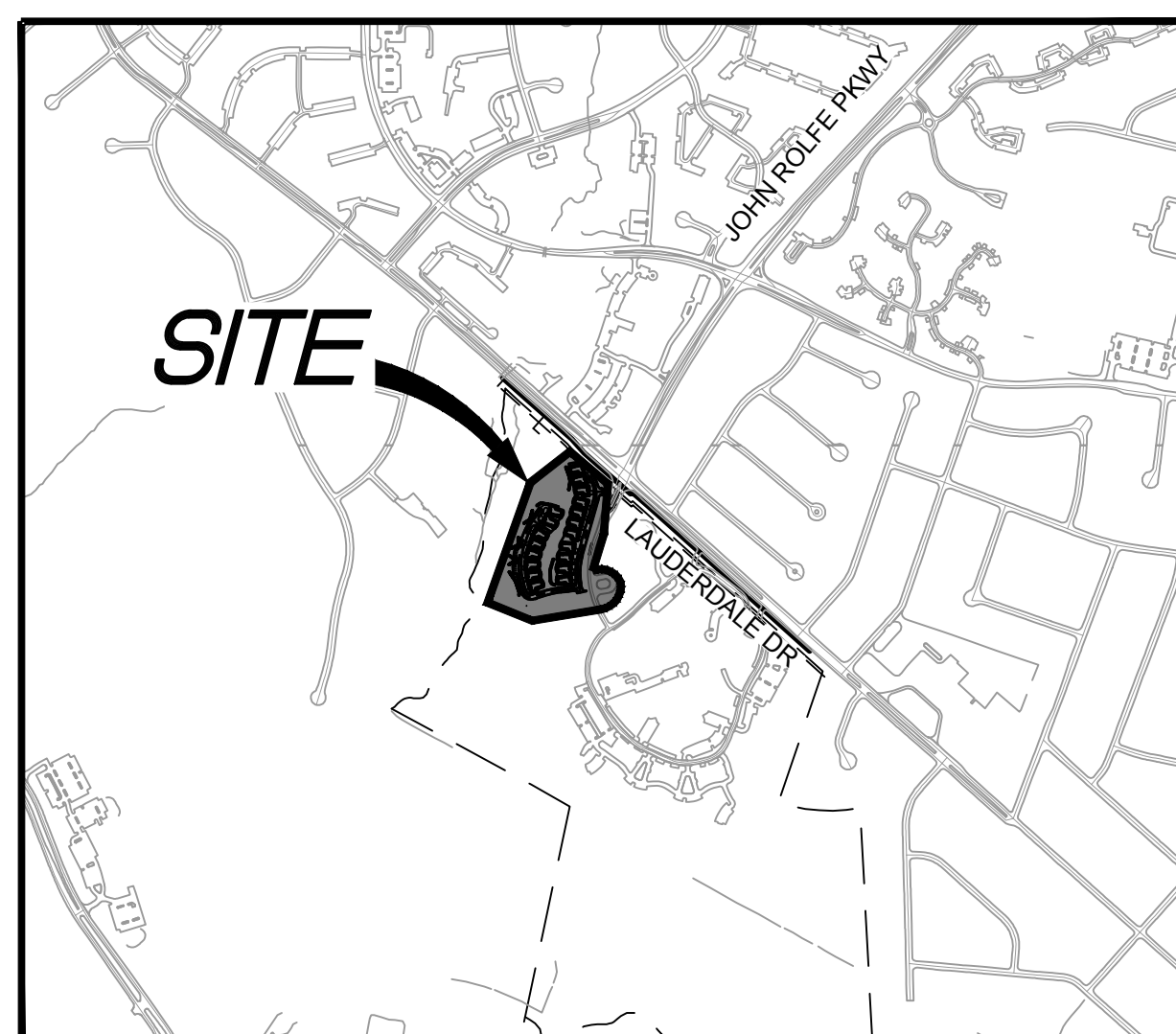
- 13. BUILDING INFORMATION A. SQ. FOOTAGE OF BUILDING 2,973 (PER COTTAGE)
B. NUMBER OF STORIES 1
C. NUMBER OF UNITS 19
D. CONSTRUCTION TYPE CLASS 1 (FRAME)
E. SPRINKLERED YES NO
F. USE GROUP(S) N/A
G. MEDICAL OFFICE YES NO

- 14. TREE CANOPY CALCULATIONS MINIMUM TEN PERCENT (10%) TREE COVERAGE FOR R-6C
GROSS SITE AREA (LOD) = 281,640 SF
BUILDING AREA = 56,487 SF
PARKING AREA = 2,268 SF
EASEMENT AREA = 35,386 SF
ADJUSTED SITE GROSS AREA = 187,499 SF
MINIMUM TREE COVER REQUIRED = 18,750 SF
PRESERVED VEGETATION COVER = 0 SF
10-YEAR GROWTH FACTOR (x1.25) = 0 SF
ADJUSTED REQUIRED TREE COVER = 18,750 SF
PROPOSED TREE COVER = TBD

- 15. PROJECT STATUS THE PROJECT IS OVER AN ACRE OF DISTURBANCE; THEREFORE A VSPM GENERAL PERMIT AND SWPPP ARE REQUIRED.
HYDROLOGIC UNIT CODE (VA HU6): JM84

PLAN OF DEVELOPMENT AND UTILITY PLAN FOR LAKEWOOD MANOR - COTTAGES - PHASE 2

TUCKAHOE DISTRICT HENRICO COUNTY, VA



VICINITY MAP

SCALE: 1" = 1,000'

NOVEMBER 16, 2020

Sheet List Table

Table with 2 columns: Sheet Number, Sheet Title. Lists sheets from C0.1 (COVER SHEET) to A1.0 (FULL MASTER PLAN).

UTILITY QUANTITIES table with columns for WATER (PUBLIC and PRIVATE) and SANITARY SEWER (PRIVATE).

TRAFFIC IMPACT STUDY table with columns for DOES NOT and DOES REQUIRE SUBMISSION OF A TRAFFIC STUDY.

EROSION CONTROL QUANTITIES (FOR BOND PURPOSES ONLY) table listing various erosion control measures and their quantities.

TOPOGRAPHY table with columns for SOURCE, SURVEY DATE, and RESPONSIBLE PARTY.

EXCEPTIONS GRANTED table with columns for DATE, DEPT(S), and DESCRIPTION.

QUALITY ASSURANCE STATEMENT: A QUALITY CONTROL AND ASSURANCE REVIEW HAS BEEN PERFORMED ON THIS DOCUMENT IN ACCORDANCE WITH THE TIMMONS GROUP QUALITY PLAN.

ENGINEER'S CERTIFICATION: TO THE BEST OF MY KNOWLEDGE, THIS PLAN SATISFIES ALL ZONING CODE REQUIREMENTS, CONDITIONS OF APPROVAL, AND PROFFERS.

RECEIVING CHANNEL NOTES: 1. PROJECT LAT/LONG: N37°36'33" LAT W77°38'08" LONG

IN ACCORDANCE WITH SEC. 10-36 OF THE CODE OF THE COUNTY OF HENRICO, I HEREBY CERTIFY THAT I AM THE RESPONSIBLE LAND DISTURBER FOR THIS PROJECT AND THAT I HAVE A VALID CERTIFICATION FROM THE STATE OF VIRGINIA.

SIGNATURE and DATE fields for the engineer.

REVISIONS TO APPROVED PLANS table with columns for NO., DATE, and DESCRIPTION.

PLANNING DEPARTMENT APPROVAL BLOCK

APPROVED BY THE COUNTY OF HENRICO BOARD OF SUPERVISORS

DATE COUNTY MANAGER

APPROVED BY: THE HENRICO COUNTY PLANNING COMMISSION

APPROVED BY: THE HENRICO COUNTY PLANNING DEPARTMENT

P.C. DATE ACTING SECRETARY DATE COUNTY PLANNER PRINCIPAL PLANNER DIRECTOR

THIS APPROVAL ENCOMPASSES ONLY THOSE REVISIONS NOTED IN THE LETTER OF APPROVAL. AS INDICATED IN RED

10 DAY EXPEDITED SIGNATURE PROCESS

DEPARTMENT OF PUBLIC UTILITIES POD APPROVAL

FOR WATER AND SANITARY SEWER ONLY, SUBJECT TO COUNTY SPECIFICATIONS.

APPROVED BY: DATE:

APPROVAL FOR WATER AND SEWER EXPIRES:

THESE PLANS ARE NOT APPROVED FOR WATER AND SANITARY SEWER CONSTRUCTION UNTIL THIS BLOCK IS SIGNED.

NOTE: WATER AND SEWER SYSTEMS FOR THIS PROJECT WILL BE ACCEPTED AND WATER METERS WILL BE SET AFTER ADJACENT UTILITIES TO WHICH THEY CONNECT HAVE BEEN ACCEPTED BY THE COUNTY FOR OPERATION.

D.P.U. #

DEPARTMENT OF PUBLIC WORKS APPROVAL BLOCK

DIRECTOR OF PUBLIC WORKS

DATE DESIGN ENGINEER

DATE ENVIRONMENTAL ENGINEER

DATE SENIOR ENGINEER

DATE TRAFFIC ENGINEER

DATE ENVIRONMENTAL INSPECTOR

AS INDICATED IN RED

D.P.W. #

DISTRIBUTION BY DPW:

PUBLIC UTILITIES (5) ENGINEER

PERMIT CENTER FIRE

EASTERN GOVERNMENT CENTER

THIS DRAWING PREPARED AT THE TRI-CITIES OFFICE 4701 Owens Way, Suite 900 | Prince George, VA 23875

YOUR VISION ACHIEVED THROUGH OURS. DATE 11/16/2020

D. ELLIS

J. WALL

K. HALPAUS

SCALE AS NOTED

AS NOTED

COVER SHEET

LAKWOOD MANOR - COTTAGES - PHASE 2

TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA

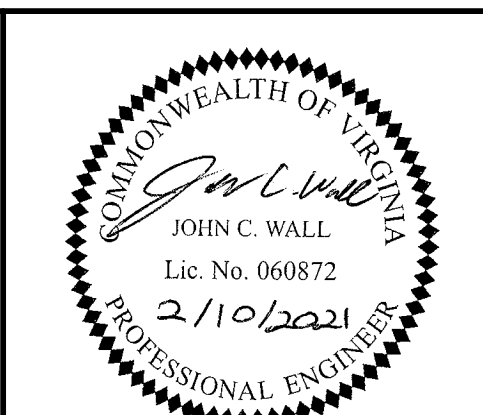
COVER SHEET

JOB NO. 46579

SHEET NO. C0.1

P.O.D. # 2020-00486

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.



THIS DRAWING PREPARED AT THE  
**TRI-CITIES OFFICE**  
 4701 Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-541-1060 FAX 804-486-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020	PLANNING COMMISSION SUBMITTAL
2/10/2021	REVISIONS PER COUNTY COMMENTS

DATE: 11/16/2020  
 DRAWN BY: D. ELLIS  
 DESIGNED BY: J. WALL  
 CHECKED BY: K. HALPAUS  
 SCALE: 1" = 100'

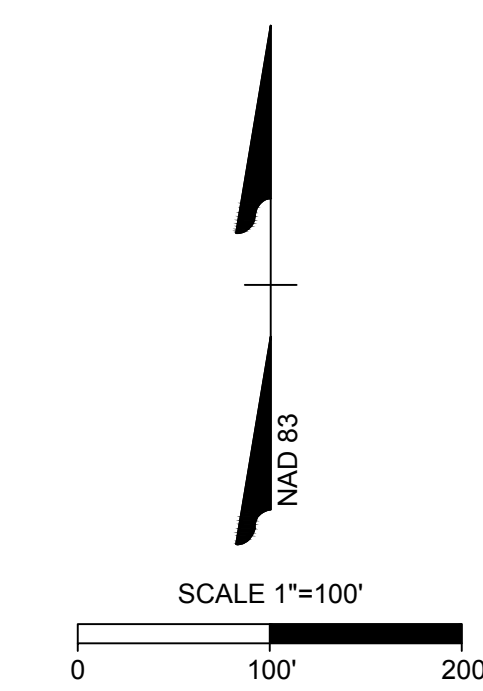
**TIMMONS GROUP**

**LAKWOOD MANOR - COTTAGES - PHASE 2**  
 TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA

OVERALL PLAN

JOB NO. 46579  
 SHEET NO. C1.0

**NOTE:**  
 PARKING LOT AND ACCESS ARE NOT PART OF THIS APPROVAL

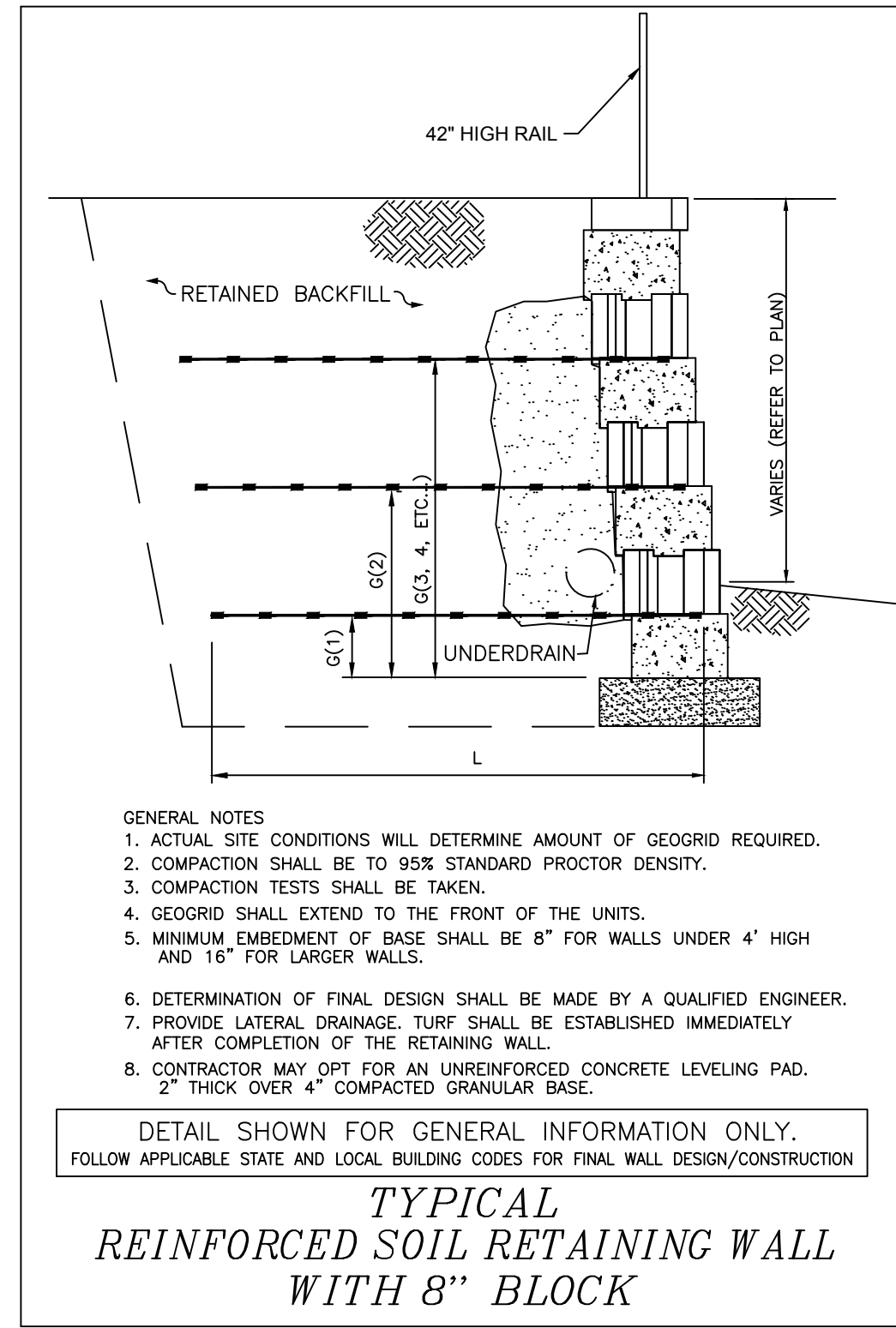
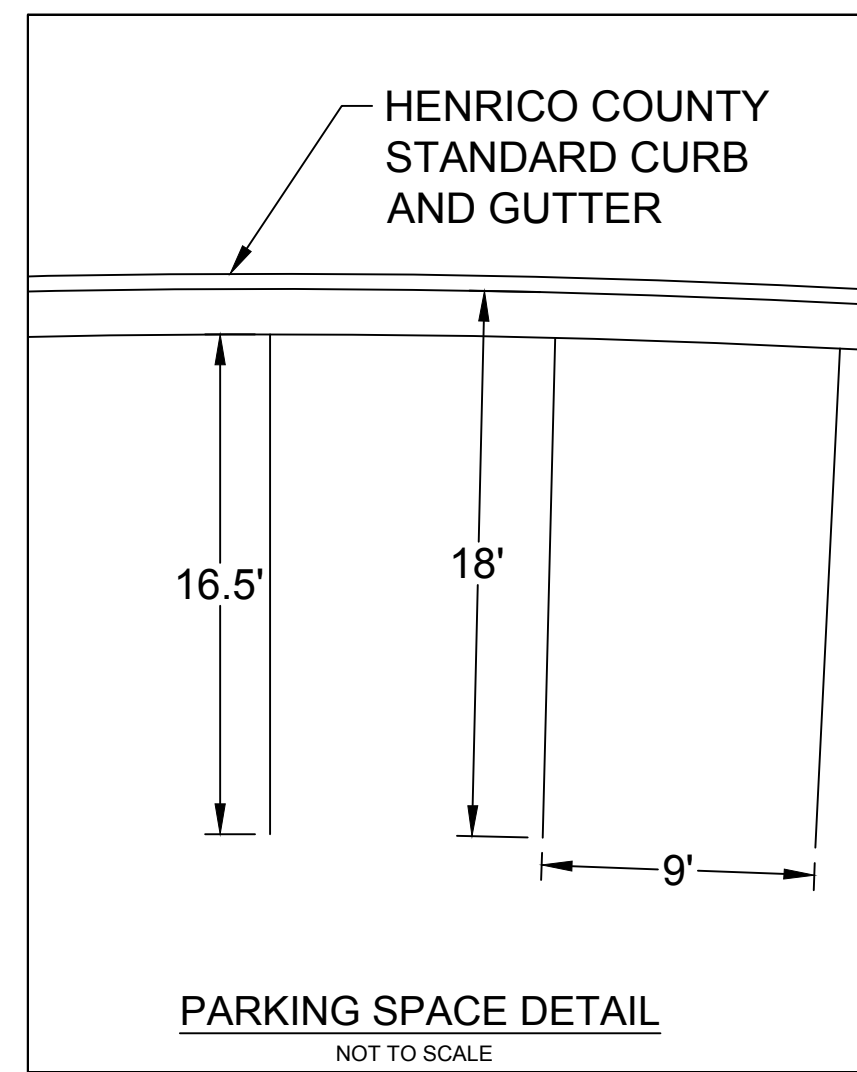
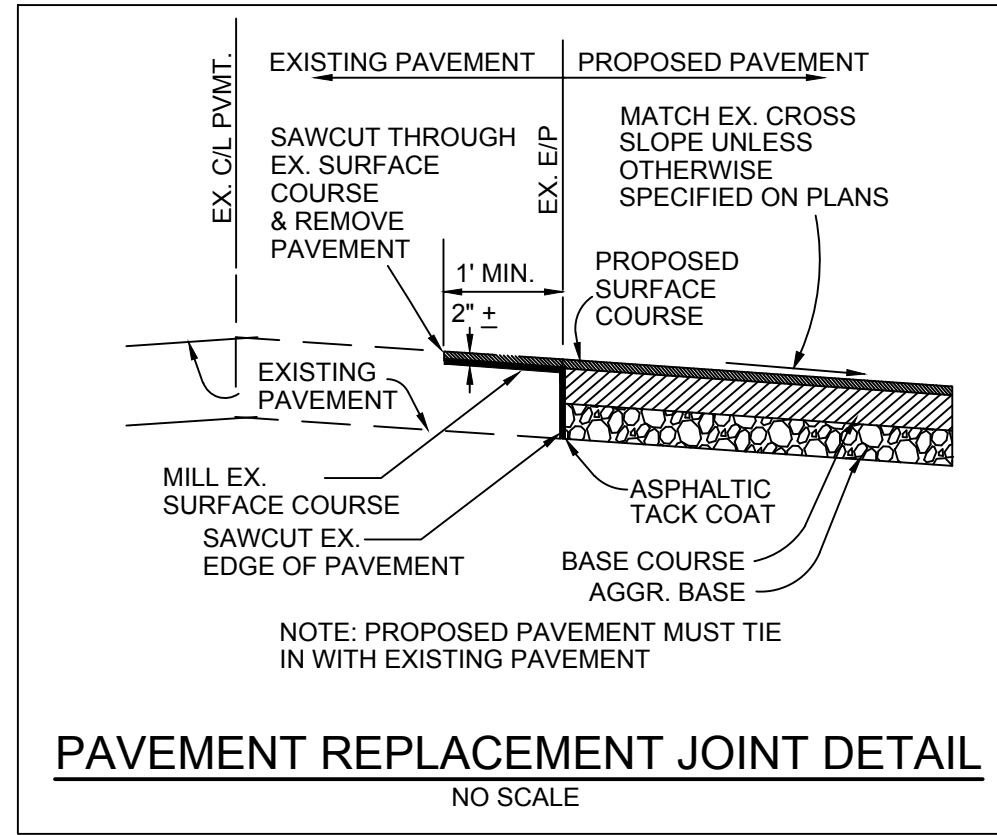


S:\10646579-Lakewood\_Cottages\DWG\Sheet\CD\46579-C1-D\DWG.dwg | Printed on 2/16/2021 12:12 PM | by: D.J. Ellis

P.O.D. #2020-00486

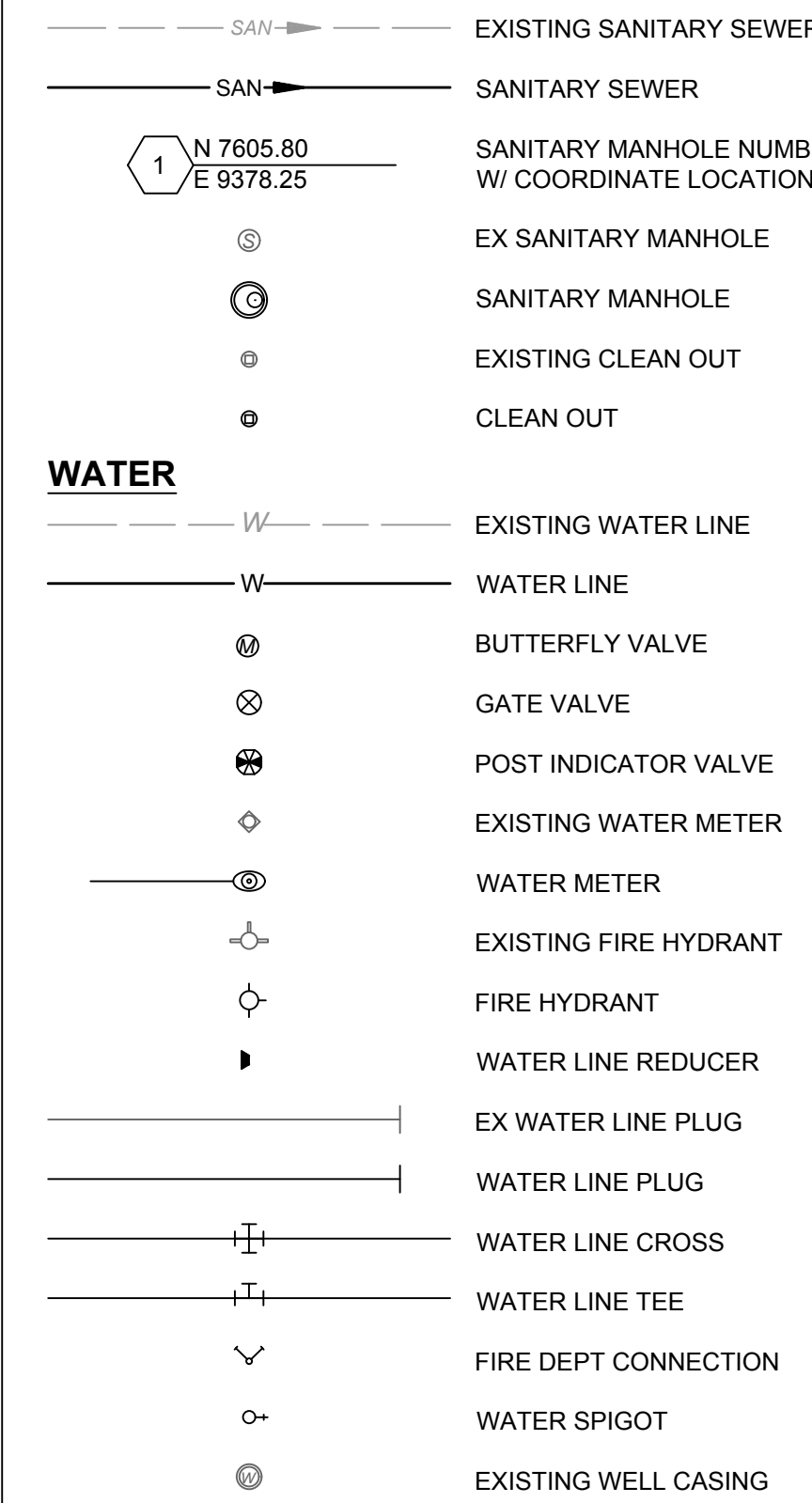
**GENERAL CONSTRUCTION NOTES:**

- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO BEGINNING CONSTRUCTION, AND IMMEDIATELY NOTIFY THE ENGINEER OF ANY DIFFERENCES FOUND.
- THE CONTRACTOR SHALL SCHEDULE AND ATTEND A PRE-CONSTRUCTION MEETING WITH THE OWNER, OWNER'S AGENT, AND ENGINEER PRIOR TO BEGINNING CONSTRUCTION.
- THE CONTRACTOR WILL FURNISH ALL SURVEYING AND STAKING FOR CONSTRUCTION TO ASSURE PROPER LOCATION OF PROJECT COMPONENTS. ALL SURVEYING AND STAKING SHALL BE PERFORMED BY A CERTIFIED LAND SURVEYOR.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PRESERVE ALL EXISTING PROPERTY MARKERS. IF DISTURBED, REPLACEMENT MUST BE BY A CERTIFIED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
- ALL CLEARING LIMITS SHALL BE ADEQUATELY MARKED FOR APPROVAL BY OWNER'S AGENT BEFORE CLEARING IS TO BEGIN. CERTAIN TREES MAY BE MARKED AS REQUIRING TREE PROTECTION. THE CONTRACTOR SHALL FENCE THESE TREES WITH SAFETY FENCE TO LIMITS OF DRIP LINE.
- THE CONTRACTOR SHALL KEEP WORK AREAS FREE OF DEBRIS AND HAZARDOUS MATERIAL TO THE SATISFACTION OF THE OWNER'S AGENT.
- THE CONTRACTOR SHALL COORDINATE STORAGE OF MATERIALS, PARKING OF VEHICLES, AND RESTRICTIONS OF WORK WITH THE OWNER'S AGENT.
- THE CONTRACTOR SHALL COORDINATE WITH THE LOCAL UTILITY COMPANIES PRIOR TO CONSTRUCTING PORTIONS OF WORK IMMEDIATELY ADJACENT TO UTILITY STRUCTURES. THE COSTS OF POLE AND/OR OTHER STRUCTURE STABILIZATION DURING WORK SHALL BE BORNE BY THE CONTRACTOR.
- ALL WORK SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE OWNER'S AGENT.
- ITEMS DESIGNATED TO BE DEMOLISHED SHALL BE REMOVED COMPLETELY. REMNANTS MAY BE BURNED/BURIED AND OTHERWISE DISPOSED OF ON SITE ONLY UPON APPROVAL BY OWNER'S AGENT AND LOCAL AUTHORITIES.
- THE CONTRACTOR SHALL CALL "MISS UTILITY" OF CENTRAL VIRGINIA AT (800) 552-7001 AT LEAST 48 HOURS PRIOR TO THE START OF ANY EXCAVATION. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL VERIFY LOCATION AND ELEVATIONS OF ALL UNDERGROUND UTILITIES SHOWN ON PLANS IN AREA OF CONSTRUCTION. IF THERE APPEARS TO BE A CONFLICT, AND UPON DISCOVERY OF ANY UTILITY NOT SHOWN ON THE PLAN, IMMEDIATELY NOTIFY THE ENGINEER. CONTRACTOR SHALL PROVIDE OWNER'S AGENT WITH COPY OF CLEARED "MISS UTILITY" TICKET.
- THE CONTRACTOR SHALL PAY FOR AND OBTAIN ALL NECESSARY CONSTRUCTION PERMITS AND DELIVER COPIES TO THE OWNER'S AGENT AT THE PRE-CONSTRUCTION MEETING.
- VERTICAL DATUM IS BASED ON MEAN SEA LEVEL (USC & GS DATUM). HORIZONTAL CONTROLS ARE BASED ON VIRGINIA STATE PLANE COORDINATE GRID, SOUTH ZONE, NORTH AMERICAN DATUM OF 1983 (NAD 83).
- ALL STRUCTURAL FILL OR EMBANKMENT MATERIAL SHALL HAVE A MINIMUM CBR VALUE OF TEN (10).
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES AND REQUIREMENTS FOR ACCESSIBILITY OF DISABLED PERSONS.

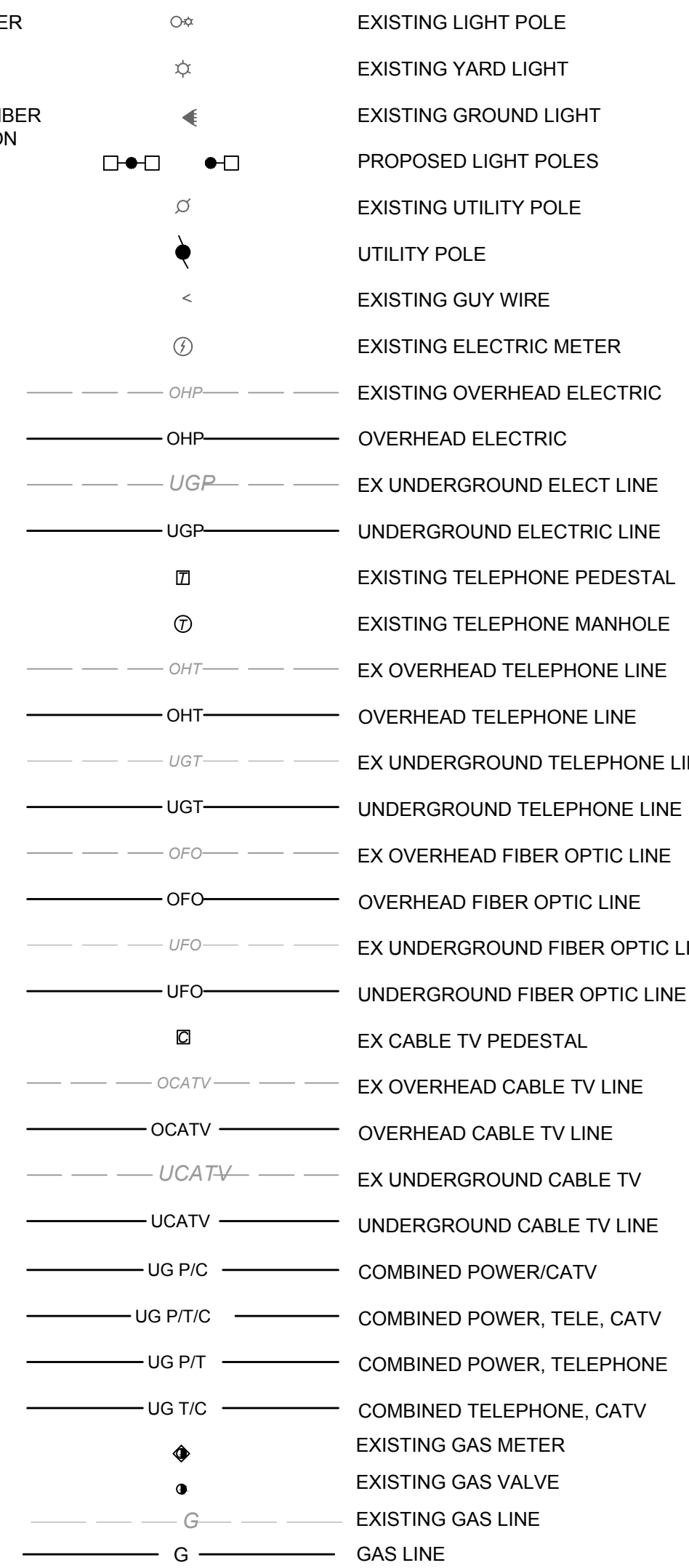


NOTE: PLAN APPROVAL DOES NOT INCLUDE APPROVAL OF THE RETAINING WALL DESIGN. CONTACT THE DEPARTMENT OF BUILDING INSPECTIONS FOR APPROVAL REQUIREMENTS OF THE RETAINING WALL. BUILDING INSPECTIONS WILL DETERMINE THE RETAINING WALL DESIGN APPROVAL.

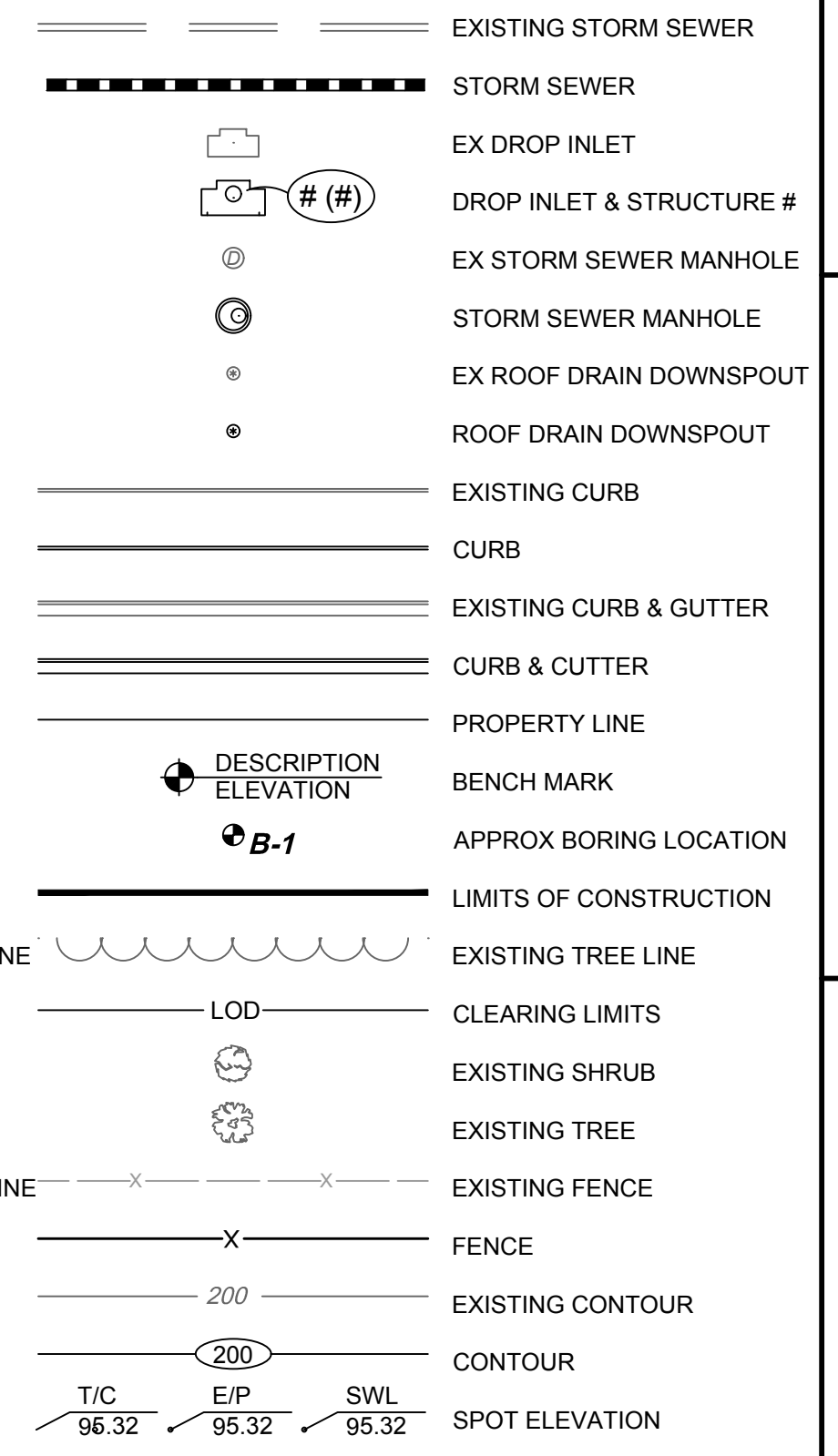
**SEWER**



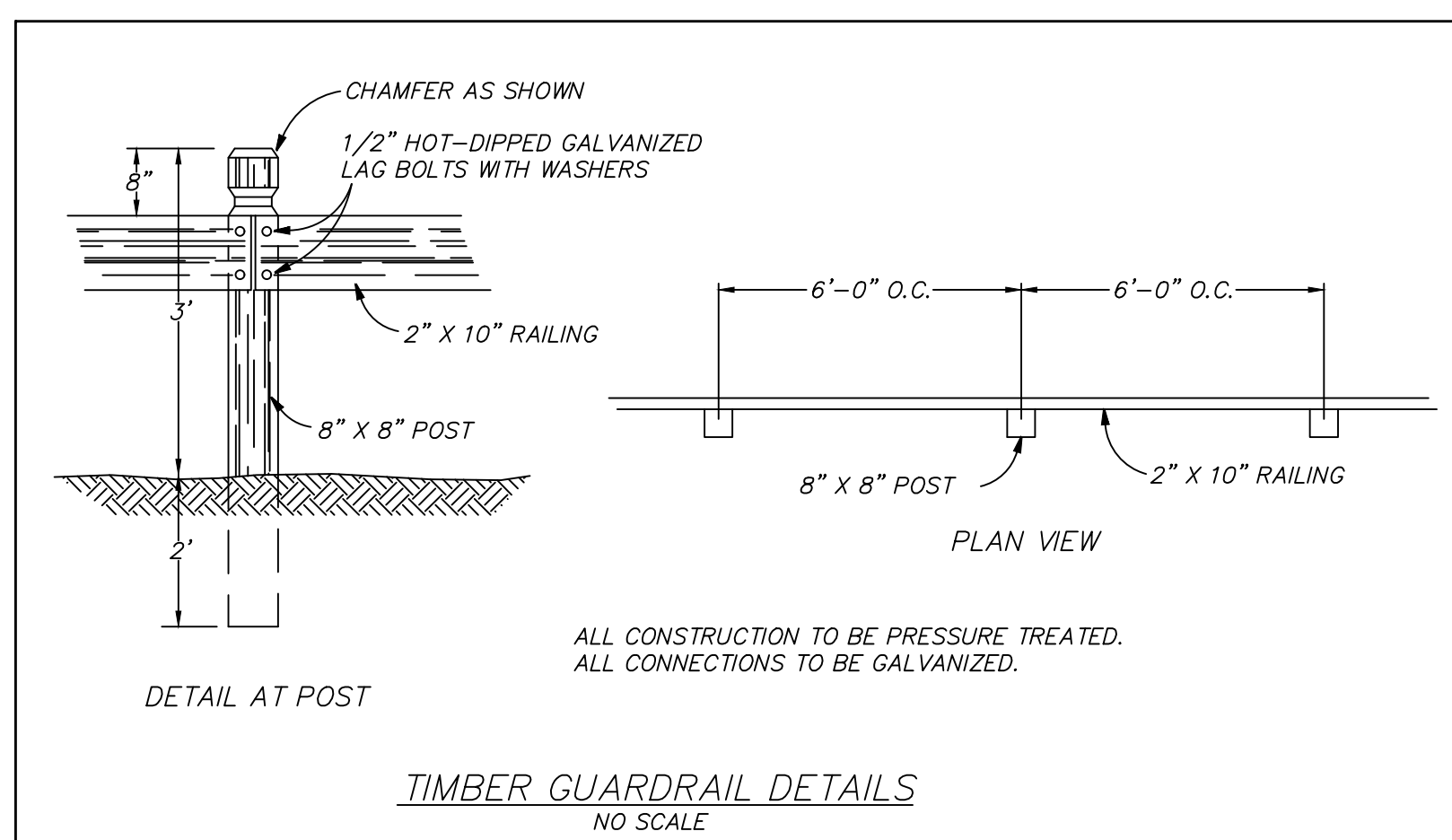
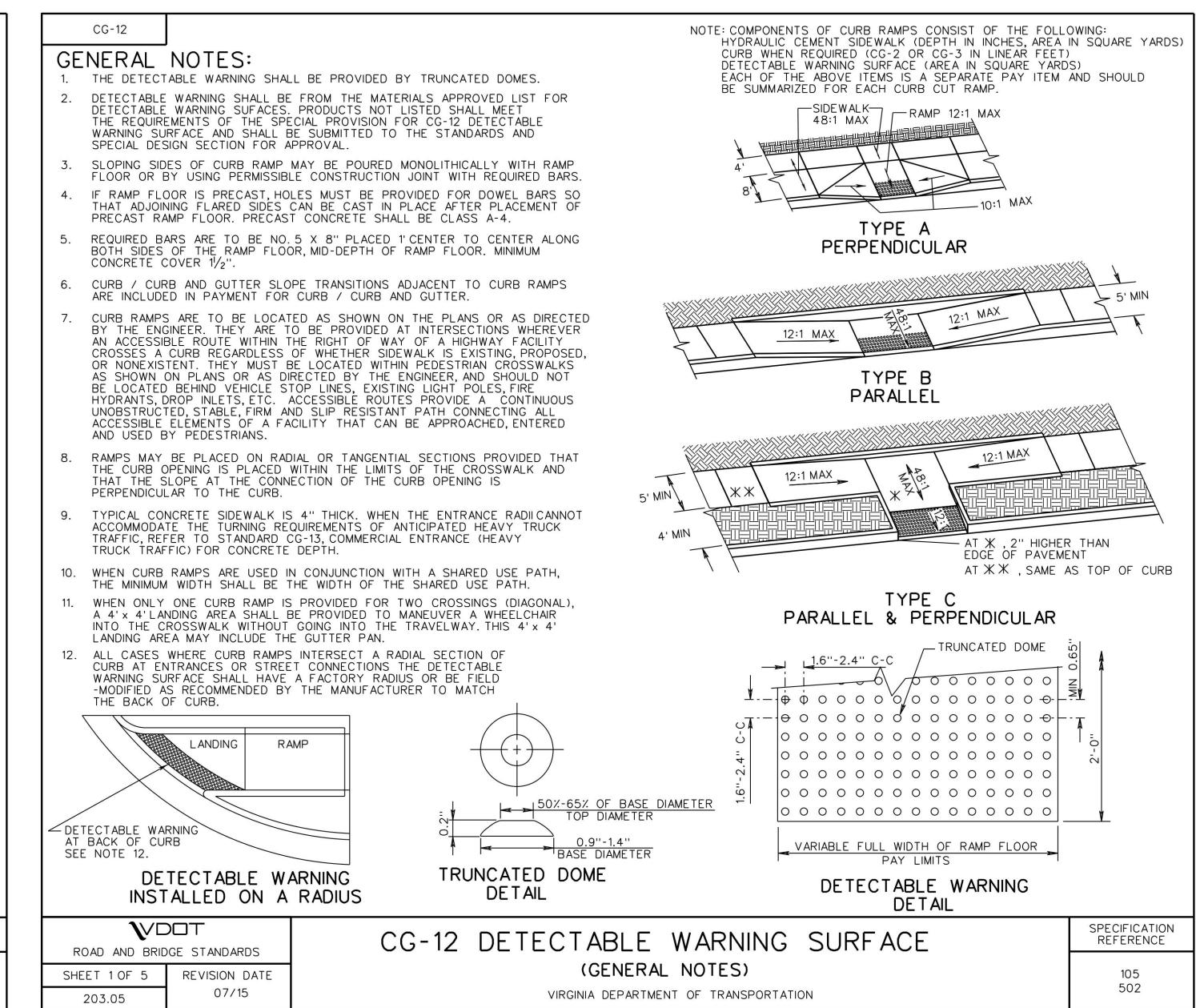
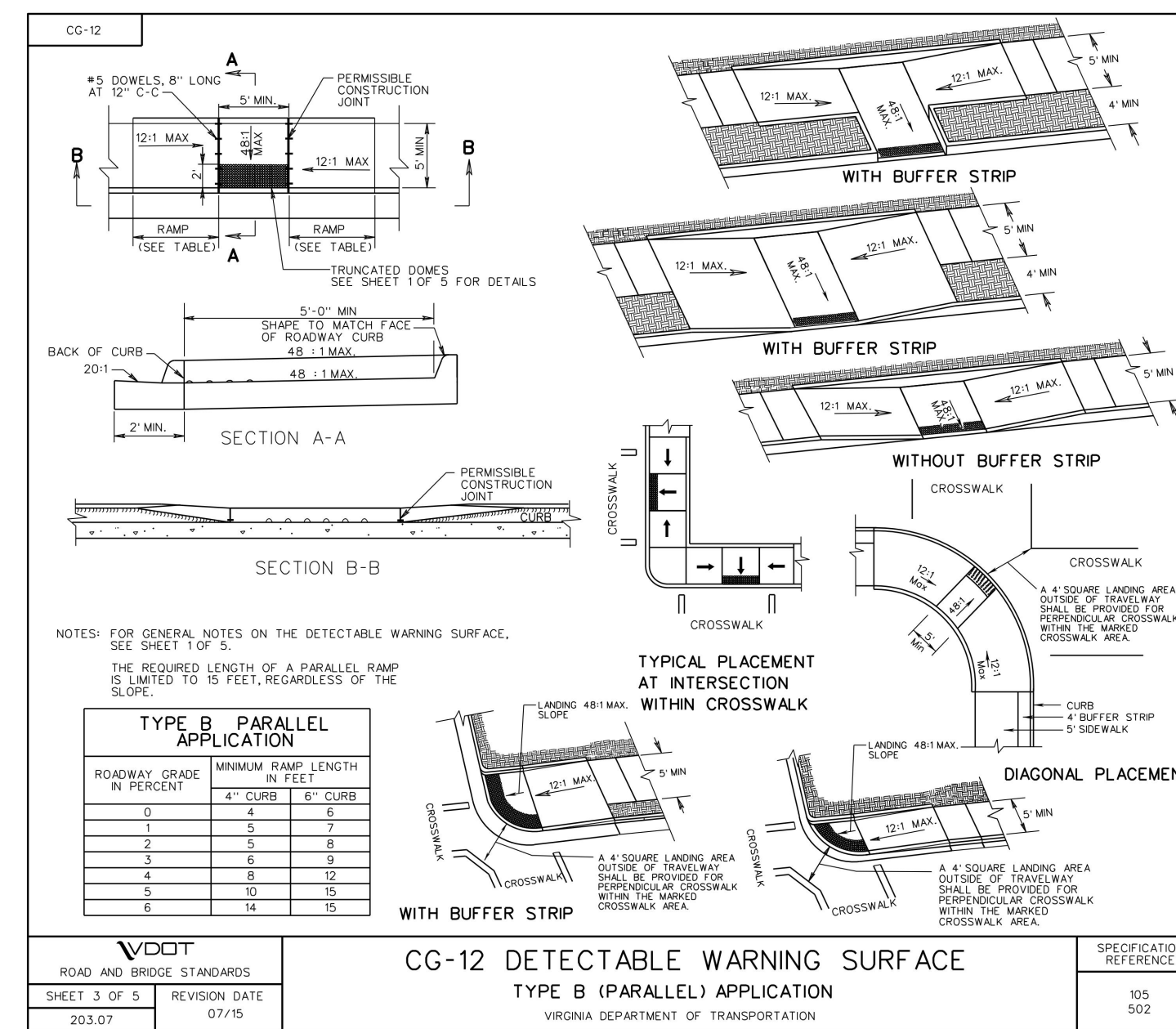
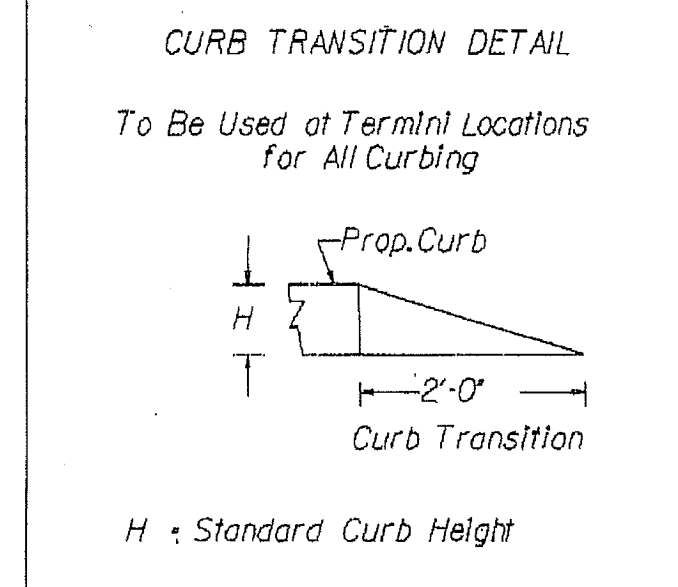
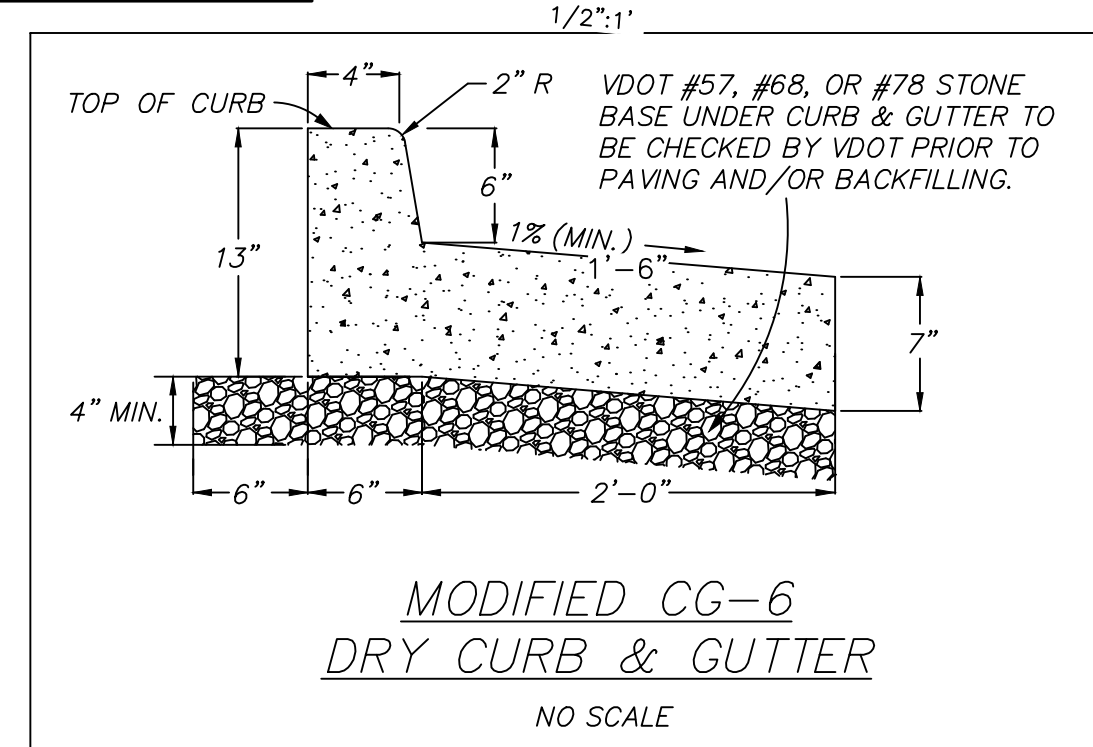
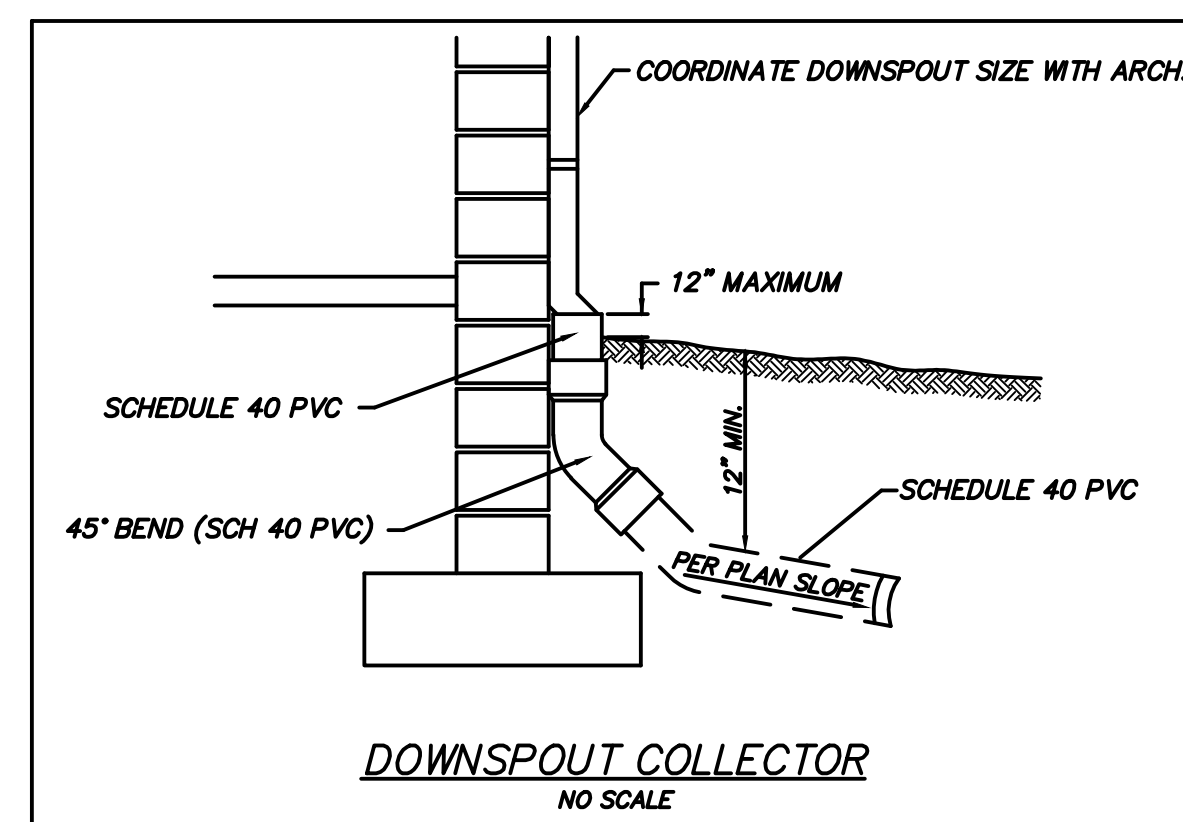
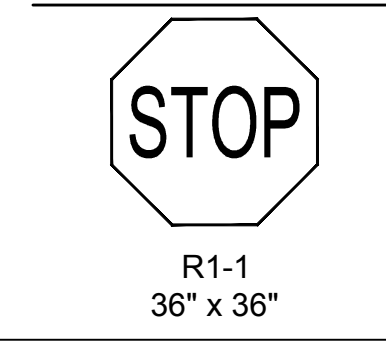
**MISCELLANEOUS UTILITIES**



**SITE**



**SIGN LEGEND**



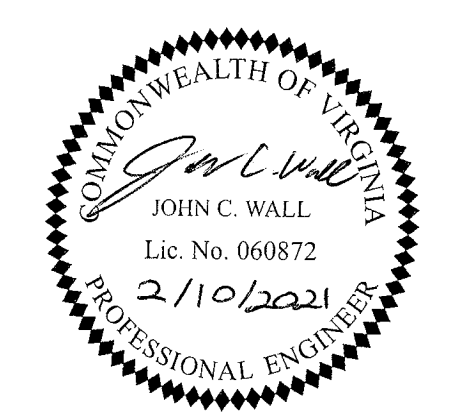
**Fire Lane Guideline**

- The establishment of fire lanes allows the Division of Fire access to a building. The need for such designation arises from building design, complex layout, and the possibility of vehicles parking in needed access way in case of an emergency. With this in mind, the projected need and final decision of the Fire Marshal, or his designee, may vary between occupancies and/or locations. These specifications are primarily for occupancies with curb and sidewalk adjacent to the building. Other building arrangements may require different guidelines to establish and maintain fire lanes.
- Legislative Authorization:** In accordance with §503.3 of the Statewide Fire Prevention Code, adopted by reference by the Board of Supervisors on January 11, 1995, authorization was granted to establish fire lanes.
- Guidelines for Fire Lane Designation:** The Fire Chief, or his duly authorized designee requires the owner, lessee, or occupant of any private or public traffic way to provide and maintain regulatory signs and/or pavement markings of an approved type to notify operators of motor vehicles of the boundaries of fire lanes and the restrictions related thereto. These fire lanes shall be at least twenty (20) feet in width, and the route of these fire lanes shall be marked with posted signs. A combination of curb markings, and/or pavement markings may be used with the approval of the fire official.

- Specifications:** A single sign mounted on a single post with a double directional arrow. These signs shall be posted no more than fifty (50) feet from the beginning or end of a fire lane and at intervals of one hundred (100) feet or less. All signs are to be mounted seven (7) feet from bottom of the sign to top of the grade. All signs are to be installed on a forty-five (45) degree angle to the movement of traffic, regardless of a one-way lane. Where signs are not practical, The Fire Marshal's Office may approve "No Parking" and "Fire Lane" to be painted on the pavement at intervals of one hundred (100) feet or less using yellow reflective paint.
- When dictated by the Fire Marshal, the one hundred (100) feet sign spacing interval may be decreased due to site characteristics.
- The Fire Marshal's Office may also require that yellow reflective paint four (4) inches wide be placed along either the edge of the gutter pan or the edge of pavement, or on the curbs, thereby designating the boundaries of the fire lane.



**Fire Lane Sign**  
 Sign Dimension is 12" wide x 24" tall  
 Aluminum sign with reflective vinyl applied  
 Red and white with arrow outlined in black  
 Corners are cut at a 1.5" radius



THIS DRAWING PREPARED AT THE  
**TRI-CITIES OFFICE**  
 470 Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-541-0600 FAX 804-456-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE: 11/16/2020  
 DRAWN BY: D. ELLIS  
 DESIGNED BY: J. WALL  
 CHECKED BY: K. HALPAUS

SCALE: NONE

**TIMMONS GROUP**

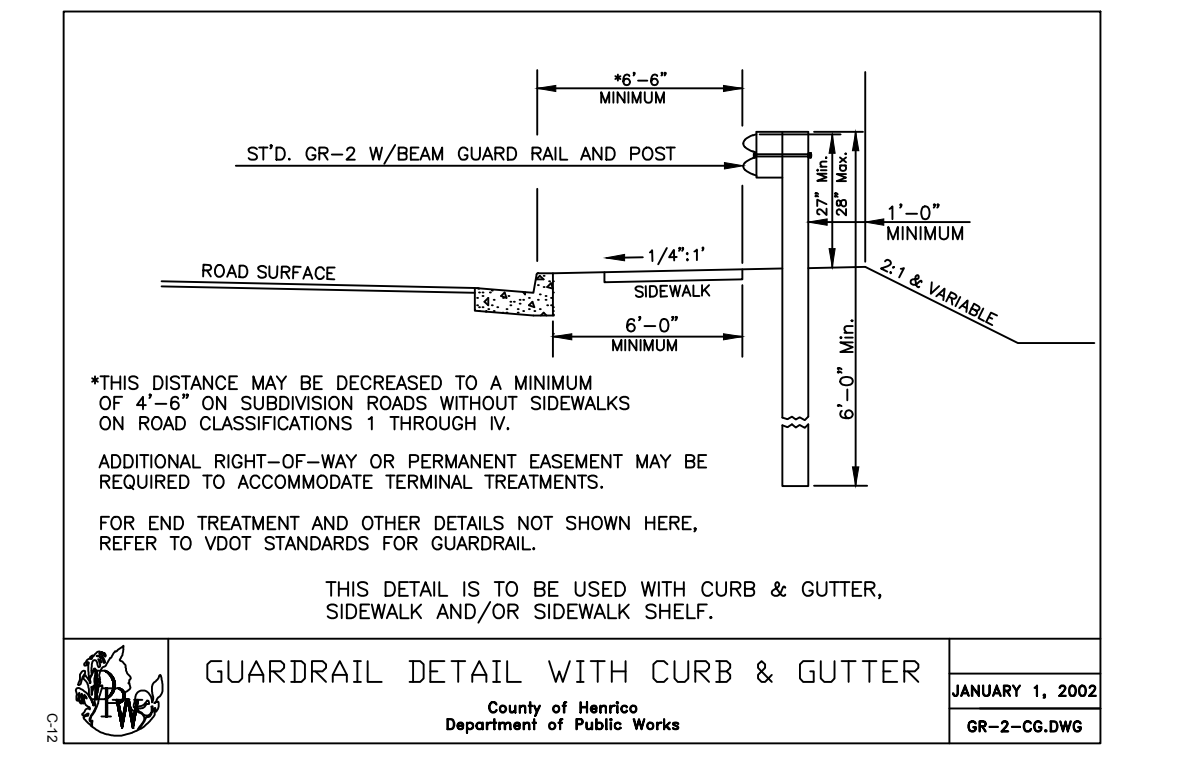
**LAKEWOOD MANOR - COTTAGES - PHASE 2**  
 TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA

JOB NO. 46579  
 SHEET NO. C1.1

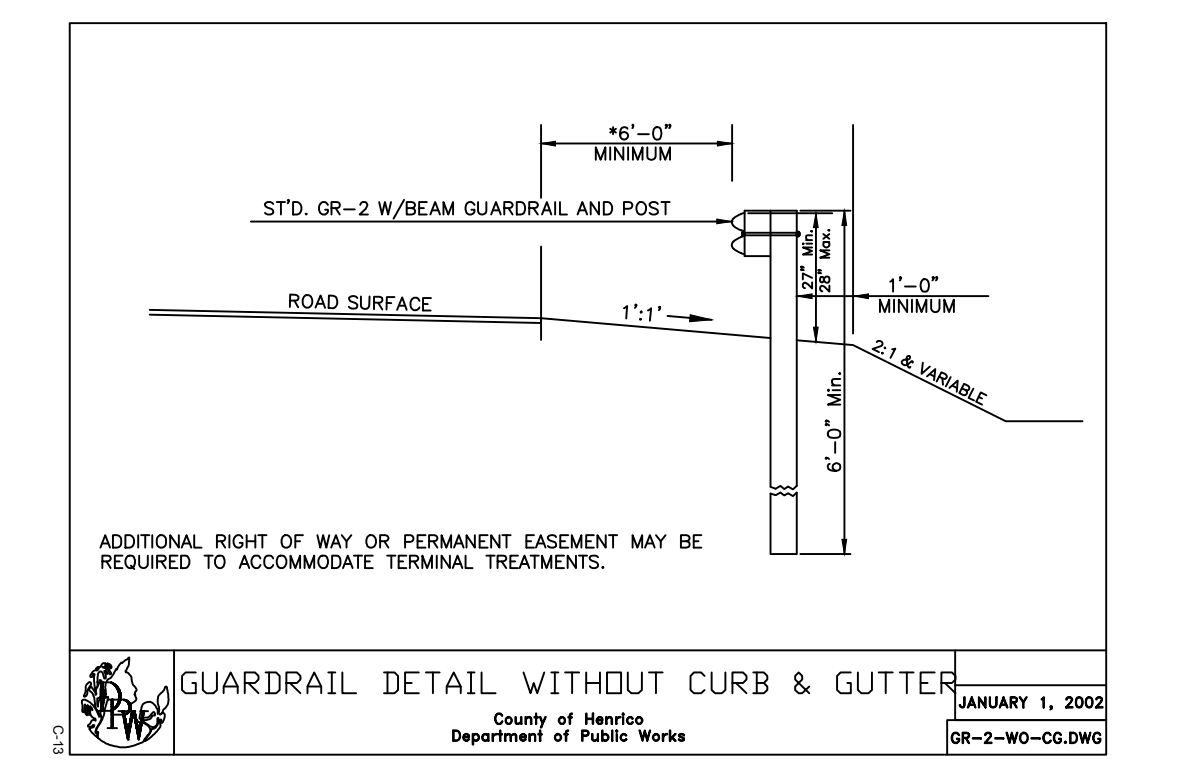
County Of Henrico  
 Department of Public Works

STANDARD CONSTRUCTION NOTES AND DETAILS

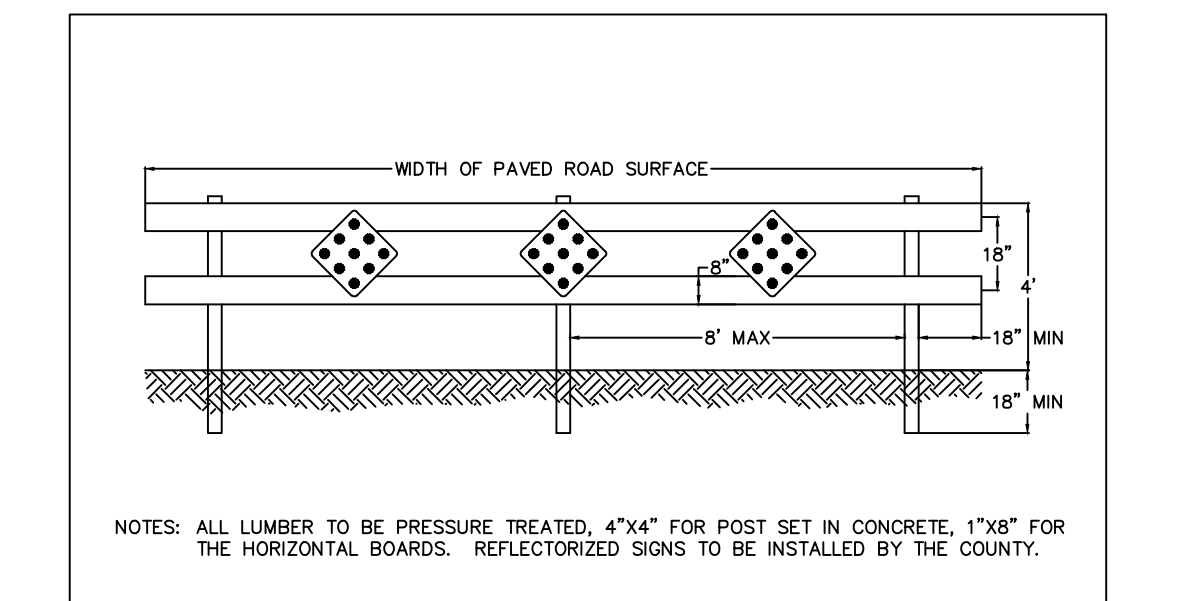
REFER TO HENRICO COUNTY  
 DESIGN MANUAL FOR ADDITIONAL DETAILS



GUARDRAIL DETAIL WITH CURB & GUTTER  
 County of Henrico  
 Department of Public Works  
 JANUARY 1, 2002  
 GR-2-CG.DWG



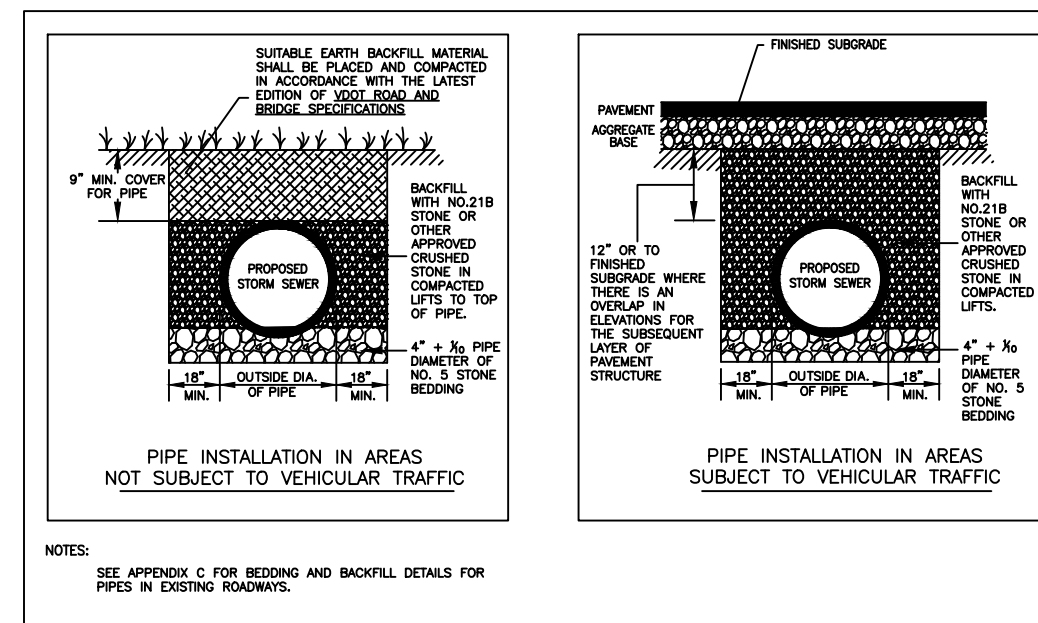
GUARDRAIL DETAIL WITHOUT CURB & GUTTER  
 County of Henrico  
 Department of Public Works  
 JANUARY 1, 2002  
 GR-2-WO-CG.DWG



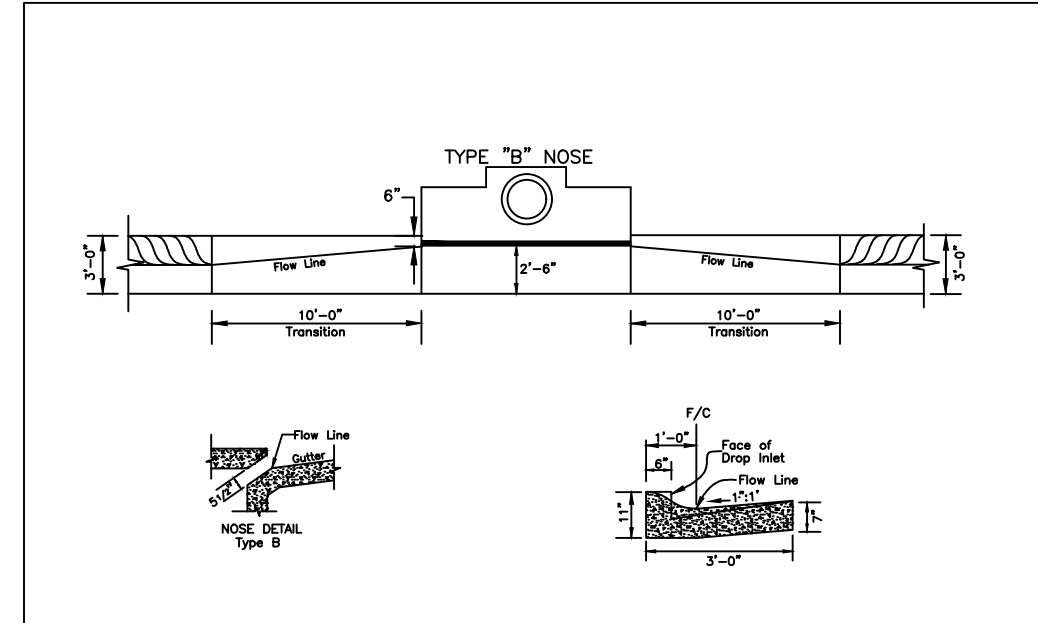
END OF ROAD BARRICADE  
 County of Henrico  
 Department of Public Works  
 JANUARY 1, 2002  
 BARRICADE2.DWG



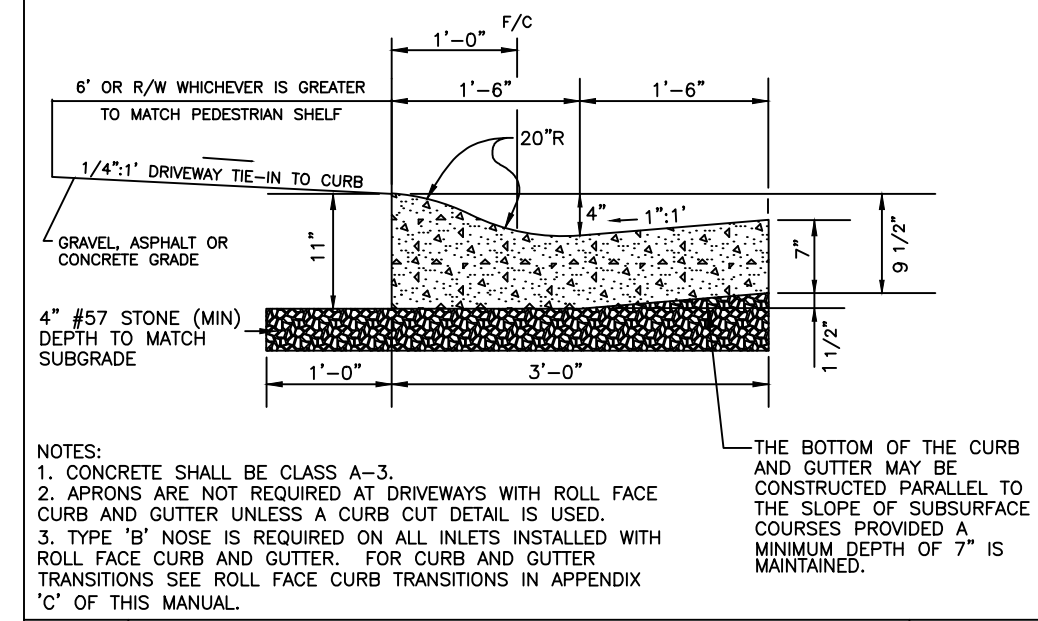
ROAD EXTENSION SIGN  
 County of Henrico  
 Department of Public Works  
 REVISED 6/1/04  
 JANUARY 1, 2002  
 ROAD\_EXTNSI\_SIGN.DWG



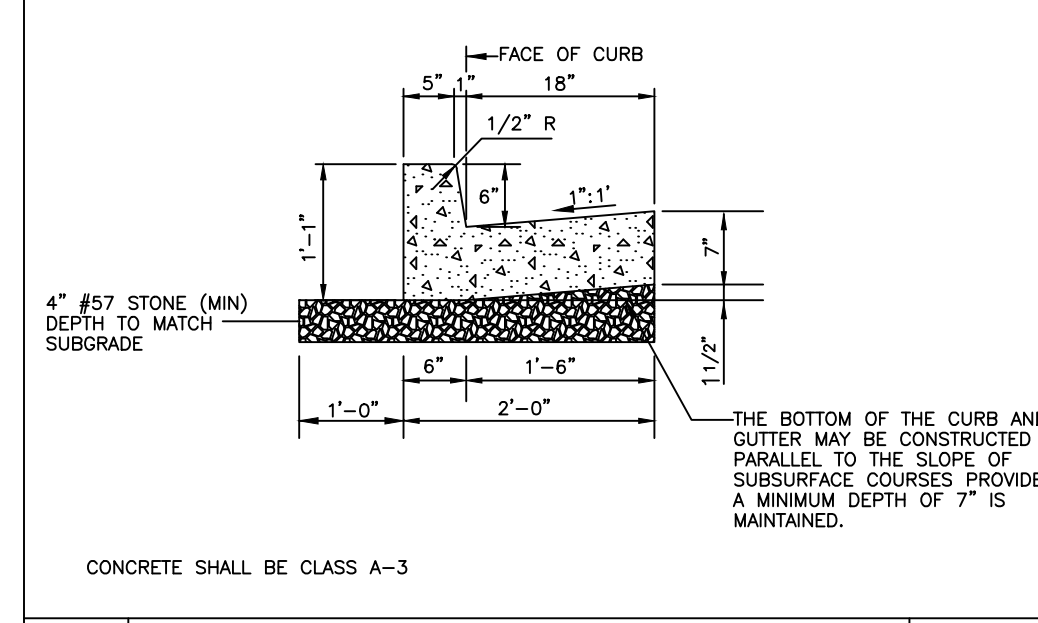
PIPE BEDDING & BACKFILL  
 (For New Development or New Road Construction)  
 County of Henrico  
 Department of Public Works  
 REVISED 6/1/04  
 JANUARY 1, 2002  
 PIPE-BEDDING.DWG



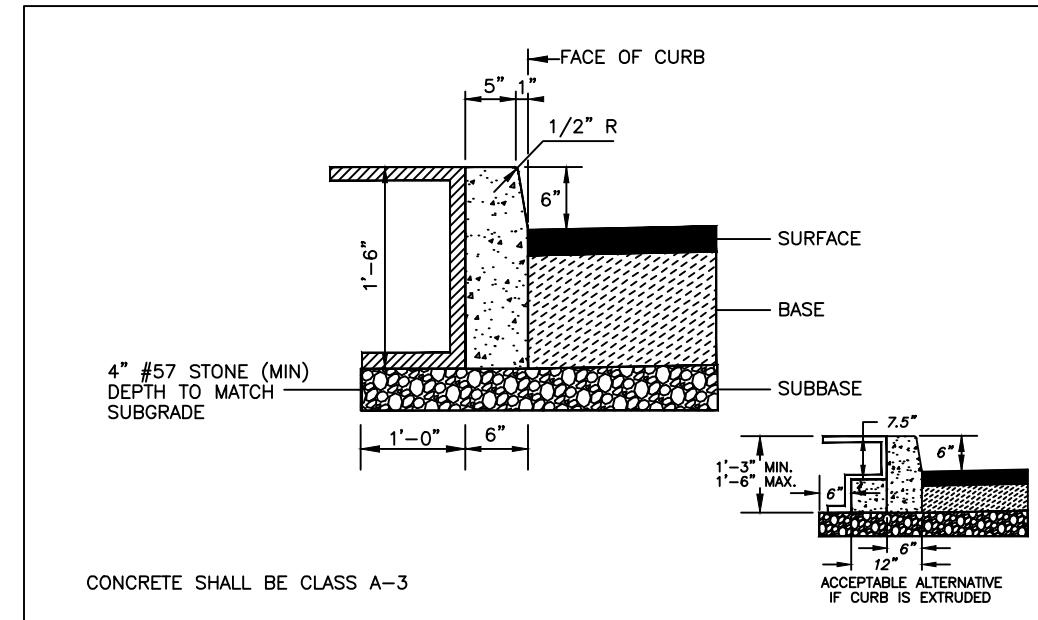
ROLL FACE CURB TRANSITIONS  
 County of Henrico  
 Department of Public Works  
 REVISED 6/1/04  
 JANUARY 1, 2002  
 RFCGS-0-TRANS.DWG



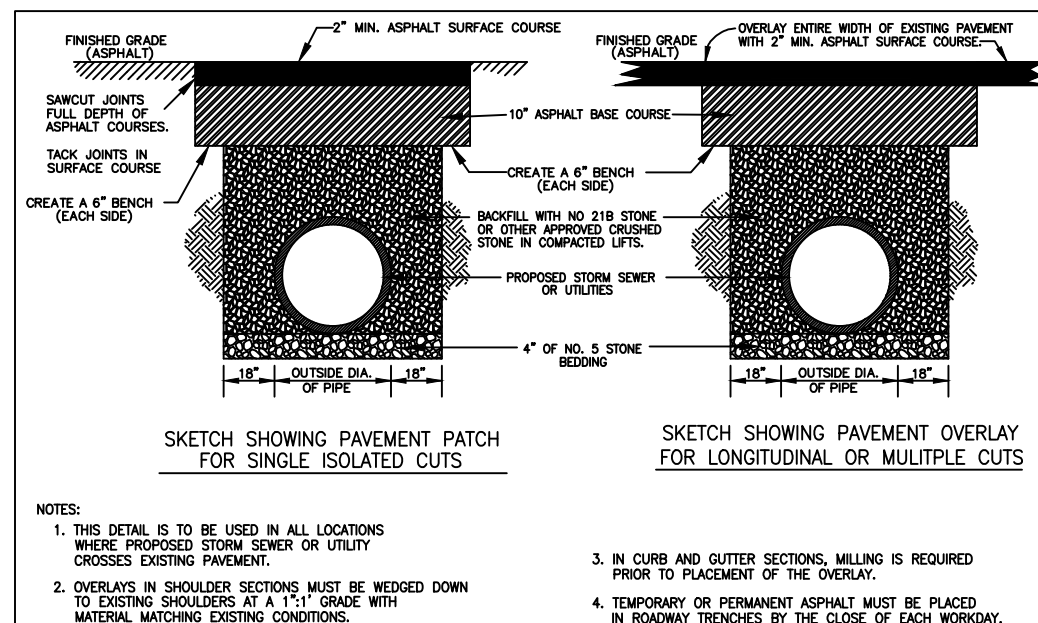
ROLL FACE CURB AND GUTTER  
 County of Henrico  
 Department of Public Works  
 REVISED 6/1/04  
 JANUARY 1, 2002  
 RFCGS.DWG



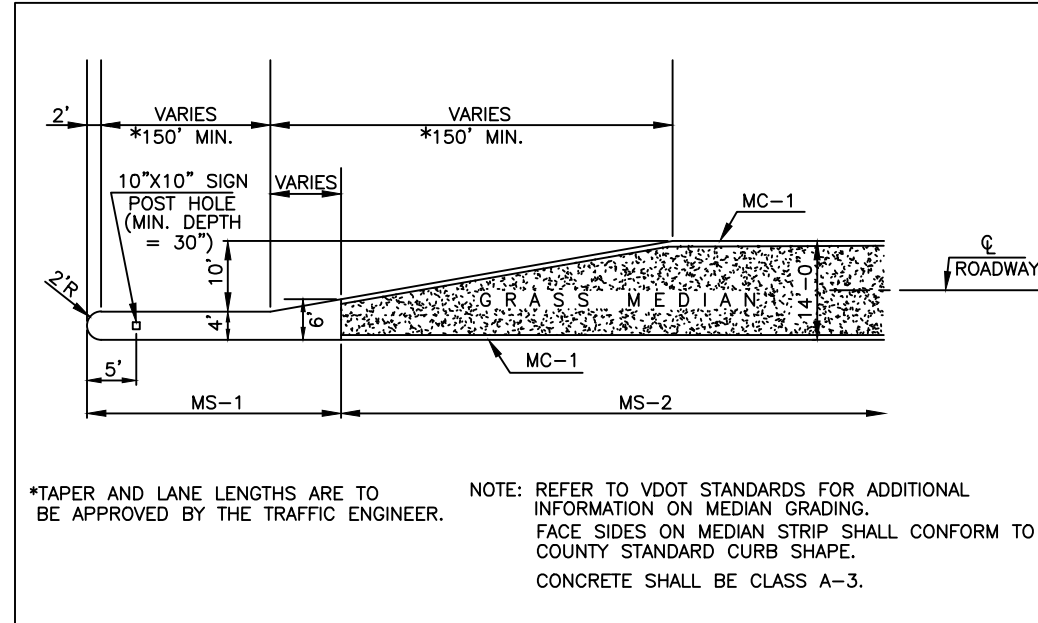
CURB AND GUTTER  
 County of Henrico  
 Department of Public Works  
 JANUARY 1, 2002  
 HSCG.DWG



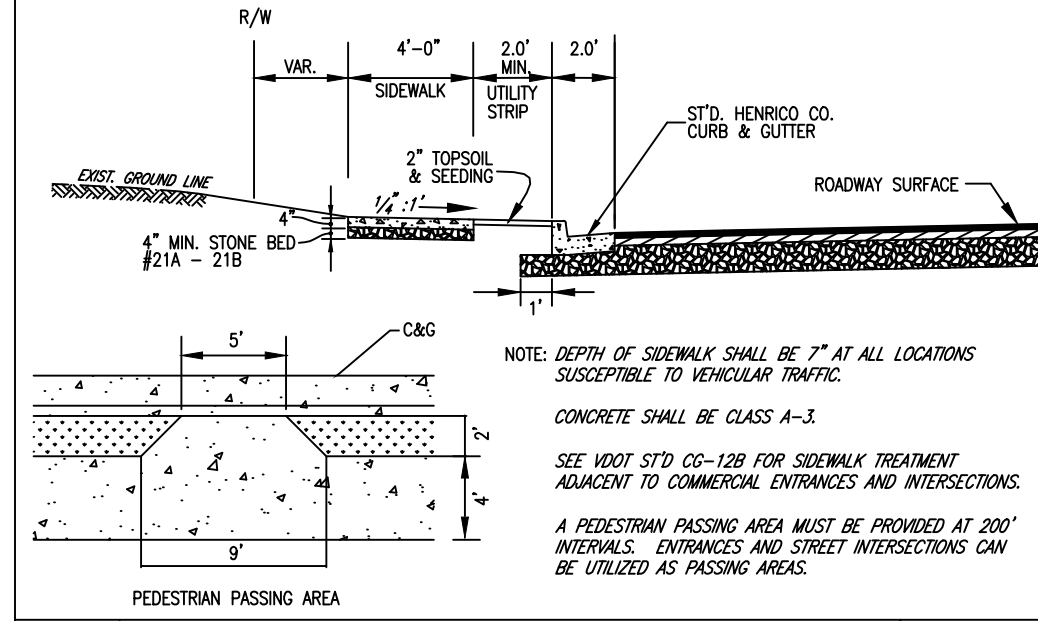
INDEPENDENT CURB  
 County of Henrico  
 Department of Public Works  
 REVISED 6/1/04  
 JANUARY 1, 2002  
 HSCG-2.DWG



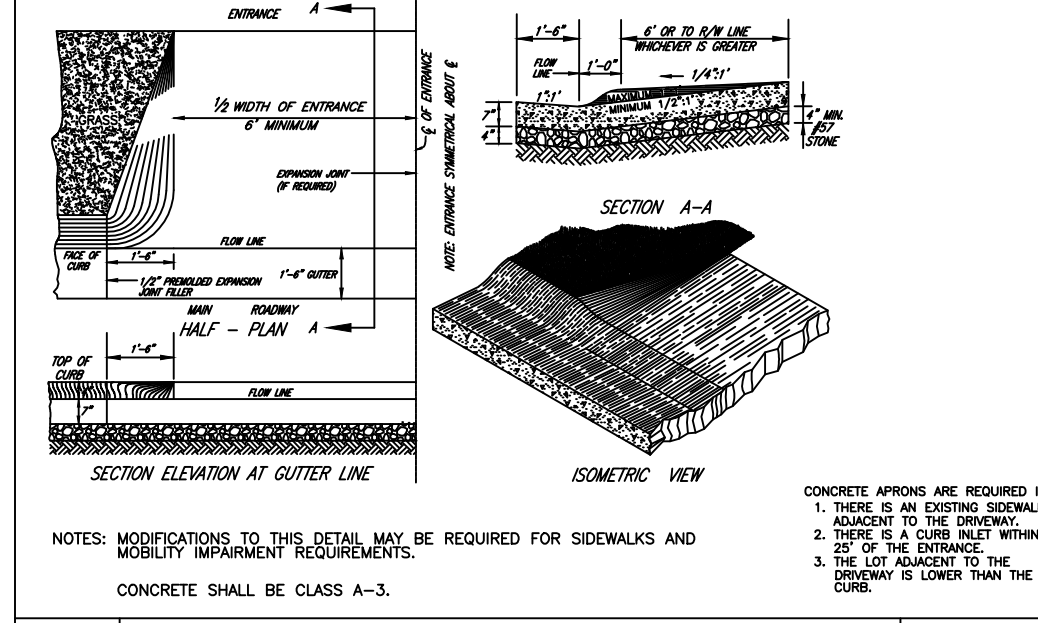
PAVEMENT REPLACEMENT FOR PIPE TRENCH  
 County of Henrico  
 Department of Public Works  
 REVISED 5-18-2011  
 JANUARY 1, 2002  
 PVRPLAS.DWG



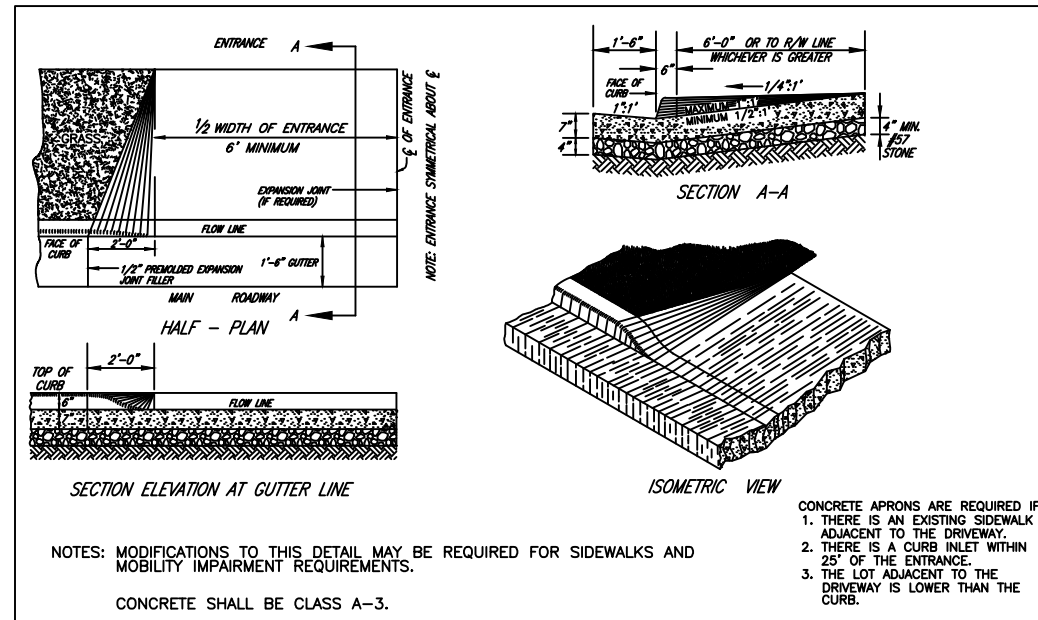
RAISED 14' MEDIAN W/LEFT TURN LANE DETAIL  
 County of Henrico  
 Department of Public Works  
 JANUARY 1, 2002  
 MED-14-DWG



SIDEWALK DETAIL  
 County of Henrico  
 Department of Public Works  
 JANUARY 1, 2002  
 SIDEWALK.DWG



STANDARD ENTRANCE APRON  
 (FOR ROLL FACE CURB & GUTTER)  
 County of Henrico  
 Department of Public Works  
 JANUARY 1, 2002  
 ENTR-WOSM-RFOD.DWG



STANDARD ENTRANCE APRON  
 (FOR RESIDENTIAL USE ONLY)  
 County of Henrico  
 Department of Public Works  
 JANUARY 1, 2002  
 ENTR-WOSM-RD.DWG

- ### DRAINAGE
- All storm sewer within the County right-of-way and easements must be ASTM C-76, Class III or better, reinforced concrete pipe with sealed joints in accordance with VDOT specifications.
  - Precast drop inlets are not permitted at locations where the grade of the adjacent curb and gutter is less than 1.5%. Precast drop inlets with flat inverts are not permitted in sag locations when the total length of the required throat opening exceeds six (6) feet.
  - All storm sewer within a County easement or right-of-way must have a minimum of four (4) inches of aggregate bedding material and must be backfilled in accordance with the detail on this sheet.
  - All drop inlets must have Type B noses.
  - Drop inlets on grade must be poured with the throat on the same grade as the adjoining curb and gutter.
  - #4 x 8" dowels must be placed at approximately 12" c-c in all areas adjacent to abutting concrete to prevent settlement.
  - When using non-concrete pipe for private areas, the connection to the structure in the County easement or right-of-way must be concrete. Non-concrete pipe must terminate in a concrete structure and continue concrete to the point where it ties into the County easement or right-of-way. All manholes and inlets must be concrete.
  - UD-4 underdrains are required along the entire length of all proposed roads and/or road widening within the public right-of-way unless waived by the Director of Public Works.
  - Irrigation is not permitted in the shoulder area within the County right-of-way unless specifically approved by the County Engineer.
  - UD-1 underdrains are required on all vertical sags.
  - UD-2 underdrains are required in all raised grass medians and islands within the public right-of-way.
  - The outlet end of all underdrains must terminate in drainage structures or daylight out of fill slopes with a standard EW-12 endwall placed at the outlet end of the underdrain.

- ### GRADING
- The subgrade area shall be scarified to a depth of eight inches for a minimum of two feet beyond the proposed edges of the pavement on both sides (or from the curb and gutter) and compacted to a density of not less than 95 percent.
  - When materials which are unsuitable for foundation, subgrade, or other roadway purposes occur within the roadway limits, such materials must be excavated below the grade shown on the plans as directed by the geotechnical engineer or as approved by the Henrico County Construction Engineer and the areas must be backfilled with suitable material.
  - All solid rock or boulders found in the roadway shall be excavated to the full roadway width to a depth of one foot below subgrade and then backfilled to the proper grade with suitable materials.
  - A six (6) feet wide pedestrian shelf is required behind all curb and gutter in the County right-of-way. The shelf must be cleared/constructed at the time of road construction, including the relocation of all power poles and other above ground obstacles.
  - All graded islands must be graded to 1/4" rise to minimize sight distance problems.
  - All areas to be filled within the buildable area (ponds, sediment basins, sediment traps, wetlands, etc.) must be backfilled with structural fill and compacted to 95% compaction.
  - All grading shown on lots must be done prior to building permit issuance.
  - The design and construction of basins must be in compliance with the general requirements for dams in the Virginia Stormwater Management Program Manual. A geotechnical engineer must certify that the construction compaction requirements have been achieved. BMPs for subdivisions will not be accepted for County maintenance until the geotechnical certification is provided and accepted by the Department of Public Works.

- ### SURVEY
- All roadways must be cleared in the area of proposed construction prior to requesting staking from the County.
  - All utility poles, fire hydrants, and other above ground obstacles located within the public right-of-way and in conflict with the proposed sidewalk shelf, curb and gutter, and/or the pavement widening shall be relocated at the developer's expense prior to Henrico County staking the curb and gutter.
  - This plan approval establishes the curb and gutter and storm sewer/inlet elevations along the public right-of-way. These elevations (located within the existing County right-of-way) shall be staked by Henrico County upon written request being made to the County Engineer or by calling 501-4619. The County reserves the right to modify the proposed grades, if necessary.
  - Prior to requesting County stakeout, all appropriate information necessary for stakeout must be provided to the Henrico County Survey Department.
  - Right-of-way and baseline information must be established in the field and clearly tied to monuments/benchmarks prior to requesting stakeout by the County.

WHERE CONFLICTS EXIST, THE NOTES AND DETAILS ON THIS SHEET SUPERCEDE THE CURRENT VERSION OF THE HENRICO COUNTY DESIGN MANUAL.

### GENERAL NOTES

- All construction and materials shall be in accordance with the current Virginia Department of Transportation Road and Bridge Specifications, Virginia Department of Transportation Road and Bridge Standards, and Henrico County Specifications and Standards where applicable.
- Incidental concrete must be Class A3 in accordance with VDOT specifications.
- A permit must be secured from the Henrico County Department of Public Works before any work is performed within an existing County right-of-way or easement.
- The Department of Public Works must be notified at least 24 hours prior to beginning any construction work.
- The contractor shall notify the Henrico County Department of Public Utilities prior to doing any utility work.
- The location of existing utilities, as shown, is approximate. The contractor shall verify the location of existing utilities prior to any construction work.
- A permit must be obtained from the Virginia Department of Transportation for any work performed within the State right-of-way.
- The contractor shall notify "Miss Utility" at 1-800-552-7001 prior to any construction work in this area.
- When it appears that the proposed work may have some impact to adjacent private or commercial properties, the applicant must inform the property owners of the proposed work and keep them apprised of time schedules, delays, impacts, changes in pedestrian and vehicle access or traffic patterns, and final restoration plans.
- When a temporary cul-de-sac is no longer required due to a road extension, the developer of the road being extended is responsible for removing the temporary cul-de-sac and extending the road and property components (curb and gutter, gravel driveways, paved driveways, sidewalks, mailboxes, etc.) to the new road section and re-grading areas to finished contours acceptable to the adjacent property owners and to Henrico County.
- No driveway access points shall be allowed within the radius of a public road intersection.
- When driveways are located within roll face curb and gutter, transitions to a drop inlet, curb cuts and aprons are required.
- Prior to the issuance of any building permits, all signs and barricades for dead end stub roads must be in place.

### CURB AND GUTTER

- All curb and gutter and storm sewer/inlets located within the existing County right-of-way shall be staked by the County upon written request being made to the County Engineer or by calling 501-4619.
- All curb and gutter shall be Henrico County standard curb and gutter, except as noted.
- This plan establishes curb and gutter elevations along the public right-of-way. The County reserves the right to modify the proposed grades, if necessary.
- All curb and gutter in the County right-of-way must be wet curb and gutter. The use of dry curb and gutter is prohibited in the County right-of-way.
- The transition from standard six (6) inch curb to roll-faced curb shall be at intersections at the point of curvature (PC) of curb returns.
- Where sidewalks are present or proposed, all driveways must be concrete from the back of curb to at least the rear of the sidewalk.
- Class 57 stone must be placed under all curb and gutter and must extend one foot beyond the back of the curb.
- CG-12's must be installed at curb returns where there is existing or proposed sidewalks. In locations where there is no sidewalk being proposed, the curb must be depressed for the future location of a CG-12.

### CONDITIONS FOR GUARDRAIL

- Guardrail is typically required on sections of roadway when any of the following conditions exist within the clear zone:
- A roadside parallel embankment (fill slope) of 3:1 or steeper and a depth of four feet or more.
  - A water hazard with a depth of two feet or more.
  - A ditch section with a depth of three feet or more (as measured from the near edge of pavement).
  - A fixed object (such as a culvert, pipe, headwall, retaining wall, bridge pier, or abutment).
  - Other hazards as determined by the Traffic Engineer.
  - Additional right-of-way or permanent easements may be required to accommodate the guardrail in its entirety.
- All guardrail must be approved by the Department of Public Works and shown on the plans, including any necessary details, type, and lengths of rail.

### PAVEMENT

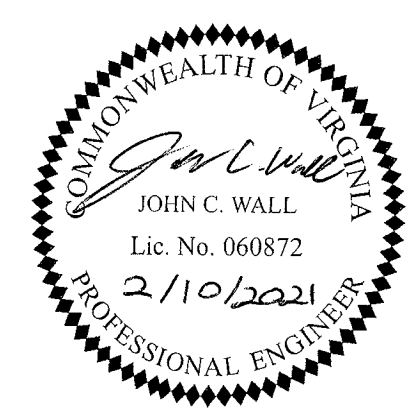
- The pavement section is subject to change based on soil conditions at the time of construction, as determined by the Construction Engineer for Henrico County.
- Any necessary pavement widening between the existing pavement and the proposed improvements is the responsibility of the developer.
- All medians for turn lanes must be VDOT Std. MS-1. For turn lanes being constructed on existing roads, the old median must be removed entirely and the solid raised median poured on the asphalt base course in accordance with the standards for MS-1 Median. Standard MS-1A or variations of the same will not be permitted.
- Pavement sections for through lanes and turn lanes must be the same as the existing pavement section. These turn lanes must have underdrains.
- No pavement open cuts are allowed on existing County maintained roads unless specifically approved by the Construction Engineer for Henrico County.
- If utility connections are located outside of the pavement and right-of-way, no pavement disturbance is required and all utility crossings must be bored.
- Soil tests and CBR information, with an appropriate pavement design, must be performed and made available to the Construction Engineer prior to subgrade approval.

TIMMONS GROUP

LAKWOOD MANOR - COTTAGES - PHASE 2  
 LUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
 HENRICO COUNTY NOTES AND DETAILS

JOB NO.  
 46579  
 SHEET NO.  
 C1.2

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced, in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.



**MINIMUM STANDARDS FOR EROSION AND SEDIMENT CONTROL**

- MS-1** Any area that has reached final grade must receive temporary or permanent soil stabilization within seven days. Areas not at final grade that will remain dormant longer than 30 days must have temporary soil stabilization within seven days. Areas that will be dormant longer than one year must have permanent soil stabilization.
- MS-2** All soil stockpiles and borrow areas must be stabilized or protected with sediment trapping measures. Temporary protection and permanent stabilization shall be applied to all on-site soil stockpiles and borrow areas and soil intentionally transported from the project site.
- MS-3** Permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, mature enough to survive, and will inhibit erosion.
- MS-4** Sediment basins and traps, and perimeter ESC measures intended to trap sediment must be constructed as a first step in any land-disturbing activity and shall be made functional before upslope land disturbance takes place.
- MS-5** Stabilization measures shall be applied to earthen structures such as dams, dikes, and diversions immediately upon installation.
- MS-6** Sediment basin and trap design information. \*\*
- MS-7** Cut and fill slopes must be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected.
- MS-8** Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume, or slope drain structure.
- MS-9** Whenever water seeps from a slope face, adequate drainage or other protection must be provided.
- MS-10** Inlet protection is required for all storm inlets that will be made operable during construction
- MS-11** Before newly constructed storm water conveyance systems are made operational, adequate outlet protection and any required channel lining must be installed in both the conveyance channel and receiving channel.
- MS-12** When work in a live watercourse is performed, precautions must be taken to minimize encroachment, control sediment transport, and stabilize the work area to the greatest extent during construction. Non-erodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used if armored by non-erodible cover materials.
- MS-13** When a live watercourse must be crossed by construction vehicles more than twice in any six-month period, a temporary vehicular stream crossing constructed of non-erodible material must be provided.
- MS-14** All applicable federal, state, and local regulations related to working in or crossing live watercourses must be met.
- MS-15** The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed.
- MS-16** Underground utility lines shall be installed in accordance with the following standards in additions to other applicable criteria:
  - a. No more than 500 linear feet of trench may be opened at one time.
  - b. Excavated material shall be placed on the uphill side of trenches.
  - c. Effluent from dewatering operations shall be filtered or passed through an approved sediment trapping device, or both, and discharged so that it does not adversely affect flowing streams or off-site property.
  - d. Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.
  - e. Re-stabilization shall be accomplished in accordance with these regulations.
  - f. Comply with all applicable safety regulations.
- MS-17** Construction entrances are required at all access points to the construction site. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This applies to individual development lots as well as to larger land-disturbing activities.
- MS-18** All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the local program authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures must be permanently stabilized to prevent further erosion and sedimentation.
- MS-19** Adequate outfall information \*\*
  - \*\* MS-6 and MS-19 deal with the design aspects of the plan. For further information, please consult the latest edition of the Virginia Erosion and Sediment Control Handbook. Also, refer to the sediment basin/trap design tables and the adequate outfall table located on the "Erosion and Sediment Control - Standard Details/Calcs." sheet.

**UTILITY NOTES**

- Any variance to the above listed minimum standards must be requested and approved in writing.
- All excavated material is to be placed on the uphill side of trench.
- All storm and sanitary sewer lines not in streets are to be mulched and seeded within 7 days after backfill. No more than 500 feet of trench is to be open at one time.
- Construction access roads shall be located on the uphill side of the trench or over the trench whenever possible.
- All construction discharge water shall be adequately filtered to remove silt prior to discharge into waterways and wetlands.
- Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.
- All work must be in compliance with applicable safety regulations.
- All stream crossings and stream diversions require approval from the Environmental Engineer prior to any instream work (see STREAM CROSSINGS / DIVERSIONS / WORK IN STREAMS).

**SILT FENCE NOTES**

- Silt fence and filter fabric must be entrenched.
- Posts for silt fences shall be either 2-inch diameter oak, 4-inch diameter pine or 1.33 pounds per linear foot steel. Posts will be a minimum of 5 feet in length. Steel posts shall have projections for fastening wire to them.
- Wire fence reinforcement for silt fences using standard strength filter cloth shall be a minimum of 42 inches in height, a minimum of 14 gauge and shall have a maximum mesh spacing of 6 inches.
- Post shall be spaced a maximum of 10 feet apart at the barrier location and driven securely into the ground (min. of 12 inches) when extra strength fabric is used. Without the wire support fence, post spacing shall not exceed 6 feet.
- When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the post.
- Sediment must be removed when deposits reach approximately one-half the height of the barrier.
- Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform with the existing grade, prepared, and seeded.
- Under no circumstances should silt fence be installed in live streams.
- Silt fence shall be removed upon completion of the project.

**STREAM CROSSINGS / DIVERSIONS / WORK IN STREAMS**

- When a live watercourse must be crossed by construction vehicles or temporarily diverted, a plan/sketch showing appropriate details of the crossing/diversion must be submitted for approval to Henrico County's Environmental Engineer prior to any work involving the stream. The plan shall include but is not limited to: all pipes, mats, channel details, erosion control devices, sequence for construction, etc. Guidelines for pipe diameters can be found in table 3.24-A of the Virginia Erosion and Sediment Control Handbook. Channel liners will be in accordance with Section 3.25 of the Handbook.
- No motorized equipment will at any time be within a waterway unless supported by flotation equipment or a temporary construction pad composed of clean non-erodible material (rocks, rip-rap, mats).
- Clearing and grubbing of wetland areas will be kept to a minimum. All wetlands temporarily disturbed during construction will be restored to their original elevation, by removing excess material, grading and seeding with a wetland seed mix. In no case shall wetland areas be reseeded with any species of fescue.
- The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse has been completed.

**BMP INSPECTIONS / CERTIFICATIONS**

- Inspections of proposed BMPs must be conducted at two phases of construction – "rough grading" and "final conformance". County staff, the Developer or his/her representative, and the Developer's engineer should be present at the inspections.
- The Developer or his/her representative is responsible for notifying the Environmental Inspector at the appropriate times during construction when the inspections should occur. Failure to request the inspections may result in delay of final acceptance of the BMP. Three inches of topsoil is required for areas of the BMP that will be stabilized with vegetation.

**RESPONSIBLE LAND DISTURBER (RLD) POLICY**

- As a prerequisite to engaging in the land-disturbing activities shown on this plan, the individual responsible for carrying out the plan and holding a certificate of competence shall be identified (the RLD).
- The RLD will:
  - Attend the Pre-Construction meeting and sign the approved plans,
  - Inspect the ESC measures periodically at least once every two weeks, or within 48 hours of any runoff producing storm event,
  - For projects with site area of 1 acre or greater, submit inspection reports using a standard form supplied by the County to the Environmental Inspector listing all deficiencies or stating no deficiencies were found, and
  - Coordinate the implementation and maintenance of all erosion and sediment control measures in accordance with the approved plan.

**MOSQUITO CONTROL NOTES**

- All construction sites and erosion and sediment control measures must be inspected and maintained to eliminate or minimize areas that promote mosquito breeding. Remove or empty all containers and trapped water in tarps. Fill and grade tire ruts or other imperfections in grade. Any standing water that remains for FIVE (5) days or more must be treated with an appropriate larvicide, including water in sediment basins and traps.
- When a mosquito breeding area is found, removal or treatment of the area is required immediately. Inspection and treatment questions may be directed to Henrico County at (804) 501-7333. Other pesticide application questions should be directed to the Virginia Department of Agricultural & Consumer Services (VDACS) at (804) 371-6560.

**GENERAL EROSION AND SEDIMENT CONTROL NOTES**

- Henrico County's Environmental Inspector (804-727-8328) must be contacted at least 48 hours prior to any land disturbing activity.
- All activities on the site must comply with Chapter 10 of the Henrico County Code.
- All erosion and sediment control (ESC) measures must be placed prior to, or as the first step in grading. The preliminary limits of disturbance must be the minimum necessary to allow installation of the ESC measures and should include all areas necessary for installing the initial ESC measures, including stockpiles, borrow areas, staging areas, etc. Disturbance outside of the preliminary limits of land disturbance may not occur until the Environmental Inspector has approved the ESC measure installation.
- If additional ESC devices are found necessary during construction, they must be installed as directed by the Environmental Inspector for Henrico County.
- Unless otherwise approved by the Environmental Engineer, all runoff must drain to a sediment basin or trap during all phases of construction.
- All ESC devices must be installed and maintained in accordance with the latest version of the Virginia Erosion and Sediment Control Handbook and the Virginia Erosion and Sediment Control Regulations.
- A construction entrance must be constructed and properly maintained in accordance with Std. & Spec. 3.05 – Construction Entrance, in the latest version of the Virginia Erosion and Sediment Control Handbook. If mud tracking becomes a problem, the Environmental Inspector will require additional measures (i.e. wash rack).
- If dust becomes a problem during construction, a water truck will be required on-site at all times, and dust must be controlled in accordance with Std. & Spec. 3.39 – Dust Control, in the latest version of the Virginia Erosion and Sediment Control Handbook.
- Dewatering of footings, excavated trenches, sediment basins/traps, etc. must be done in accordance with Std. & Spec. 3.26 – Dewatering Structure, in the latest version of the Virginia Erosion and Sediment Control Handbook. The Environmental Inspector must approve the method prior to beginning dewatering.
- All temporary stockpile locations must be shown on the plan. Stockpiles may remain in place one year from the final plan approval date, unless the Director of Public Works grants an extension in response to a written request.

**SEEDING NOTES**

- All stabilization/seeding will be accomplished in accordance with the Virginia Erosion and Sedimentation Control Handbook.
- Any disturbed area not paved, sodded, or built upon, will have a vegetative cover prior to final inspection, and in the opinion of the Environmental Engineer will be mature enough to control soil erosion satisfactorily and survive severe weather conditions.
- Stream diversion areas, waterways, banks, and related areas will be seeded and mulched immediately after work in watercourse is completed. In no case shall wetland areas be reseeded with any species of fescue.
- Winterization – any disturbed area not paved, sodded, or built upon by October 15 is to be seeded and mulched on that date unless waived by the Environmental Engineer.

**RESOURCE PROTECTION AREAS, STREAM PROTECTION AREAS, WETLANDS, AND WATERS OF THE U.S.**

- Permanent or temporary soil stabilization shall be applied to denuded areas within seven (7) days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven (7) days to denuded areas that may not be at final grade, but will remain dormant for longer than thirty (30) days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year.
- Electric power, telephone, and gas supply trenches must be compacted, seeded, and mulched within 7 days after backfill.
- All temporary earth berms, diversions, and silt dams are to be mulched and seeded for vegetative cover immediately after grading. Straw or hay mulch is required. The same applies to all stockpiles, on site as well as soil (intentionally) transported from the project site.
- Nutrients shall be applied in accordance with manufacturer's recommendations or an approved nutrient management plan and shall not be applied during rainfall events.
- Prior to beginning any land disturbing activity, all Resource Protection Areas (RPAs), Stream Protection Areas (SPAs), wetlands, and Waters of the U.S. (WOUS) not permitted for impact shall be delineated for protection with orange safety fence or non-tearable yellow and black barricade tape. This includes, but is not limited to, clearing limits associated with roadways, utilities, and buildings.
- Additional restoration or replanting may be required for RPAs, SPAs, wetlands, and WOUS disturbed during construction.

**ENVIRONMENTAL SITE ASSESSMENT INFORMATION**

- Plans must accurately show all RPA, SPA, and RMA features.
- RESOURCE PROTECTION AREAS (RPA):**
  - Is there a tributary stream located on the parcel?  YES  NO
  - Are there any tidal wetlands present on the parcel?  YES  NO
  - Are there any non-tidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams?  YES  NO
  - Are there any tidal shores on the parcel?  YES  NO
  - Does the site lie within 100 feet of any of the above site characteristics designated as Resource Protection Areas (RPAs)?  YES  NO
- If the answer to any of the above questions is "YES", the parcel contains a Resource Protection Area (RPA).
- RESOURCE MANAGEMENT AREAS (RMA):**
  - Are there any special flood hazard areas (100-year floodplain) located on the parcel?  YES  NO
  - Are highly erodible soils, including steep slopes, present on the parcel and contiguous to any of the above RPA features?  YES  NO
  - Does the parcel contain any highly permeable soils contiguous to an RPA?  YES  NO
  - Does any portion of the parcel lie within 100 feet of a Resource Protection Area?  YES  NO
  - Does the entire site (outside of the RPA) lie within a Resource Management Area?  YES  NO
- STREAM PROTECTION AREAS (SPA):**
  - Is there any non-perennial stream with greater than 100 acres of contributing drainage area located on the parcel?  YES  NO
  - Does any of the site lie within 50 feet of the stream bank of a SPA stream?  YES  NO
- OTHER ENVIRONMENTAL SITE INFORMATION:**
  - Are there any wetlands/waters of the United States located on the parcel?  YES  NO
  - Is development or land disturbance proposed in any wetlands/waters of the United States?  YES  NO

Parcels containing RPAs/RMAs/SPAs must satisfy all requirements of the Henrico County Code applicable to development within Chesapeake Bay Preservation Areas. Land disturbance in wetlands and/or waters of the United States requires either a Evidence of U.S. Army Corps of Engineers/Virginia Department of Environmental Quality (DEC) permits or a certification from a principal in the engineering firm that the proposed wetland impacts are authorized by law.

I hereby certify that the above information is based on a field visit at (project name) LAKWOOD COTTAGES performed on NOVEMBER 16, 2020 and that I have reviewed all maps and other documentation deemed necessary to certify the accuracy of this information.

*Kathleen Halpaus, PE*  
 Signature  
**KATHLEEN HALPAUS, P.E.**  
 Name (please print)  
**NOVEMBER 16, 2020**  
 Date  
 My Virginia License or Certificate Number is: 45244

**ACKNOWLEDGMENTS**

- I hereby acknowledge that prior to any land disturbing activity, all buffer areas and wetlands as defined in the Henrico County code shall be conspicuously flagged or otherwise identified and not disturbed unless authorized by law, and that the applicant shall notify the Engineering and Environmental Services Division (EESD) upon completion of flagging. (Contact the EESD at 727-8328 to arrange a pre-construction meeting to verify the limits of flagging.)
- I hereby certify that no more land is being disturbed than is necessary to provide for the desired development use.
- I hereby certify that all erosion and sediment control measures shall be maintained, and the owner and/or agent will inspect the erosion and sediment control measures at least once every two week period, and within 48 hours following rainstorm events during construction to ensure compliance with the approved plan. Records of self-inspection shall be maintained on the site and available for review by County Inspectors.
- I hereby acknowledge that the U.S. Army Corps of Engineers and/or Virginia Department of Environmental Quality may have additional jurisdiction over wetlands not regulated by Henrico County.
- I hereby acknowledge that a Virginia Pollutant Discharge Elimination System (VPDES) permit application [including a Virginia Stormwater Management Program (VSMP) permit application], if required, has been made for land disturbing activities of 2,500 square feet or greater.

Signature (Owner/Developer): *John Paul Cook*  
 Name (please print): John Paul Cook  
 Date: 11/11/2020

THIS DRAWING PREPARED AT THE **TRU-CITIES OFFICE**  
 4701 Owens Way, Suite 900 | Prince George, VA 23895  
 TEL 804-541-1600 FAX 804-484-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020	PLANNING COMMISSION SUBMITTAL
2/10/2021	REVISIONS PER COUNTY COMMENTS

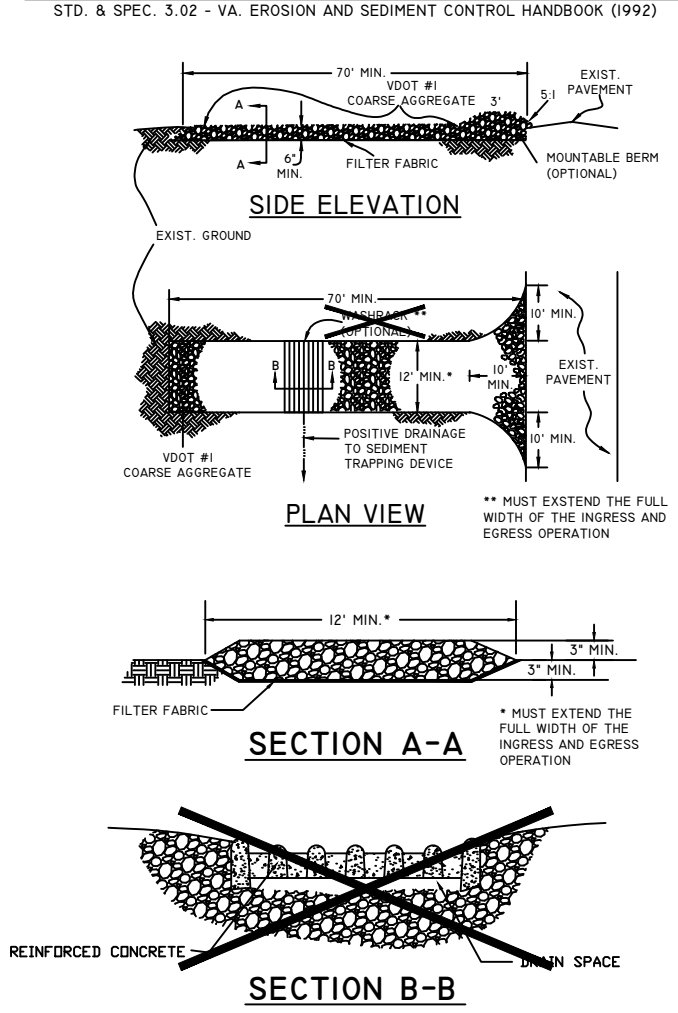
DATE	11/16/2020
DRAWN BY	D. ELLIS
DESIGNED BY	J. WALL
CHECKED BY	K. HALPAUS
SCALE	NONE

**TIMMONS GROUP . . .**

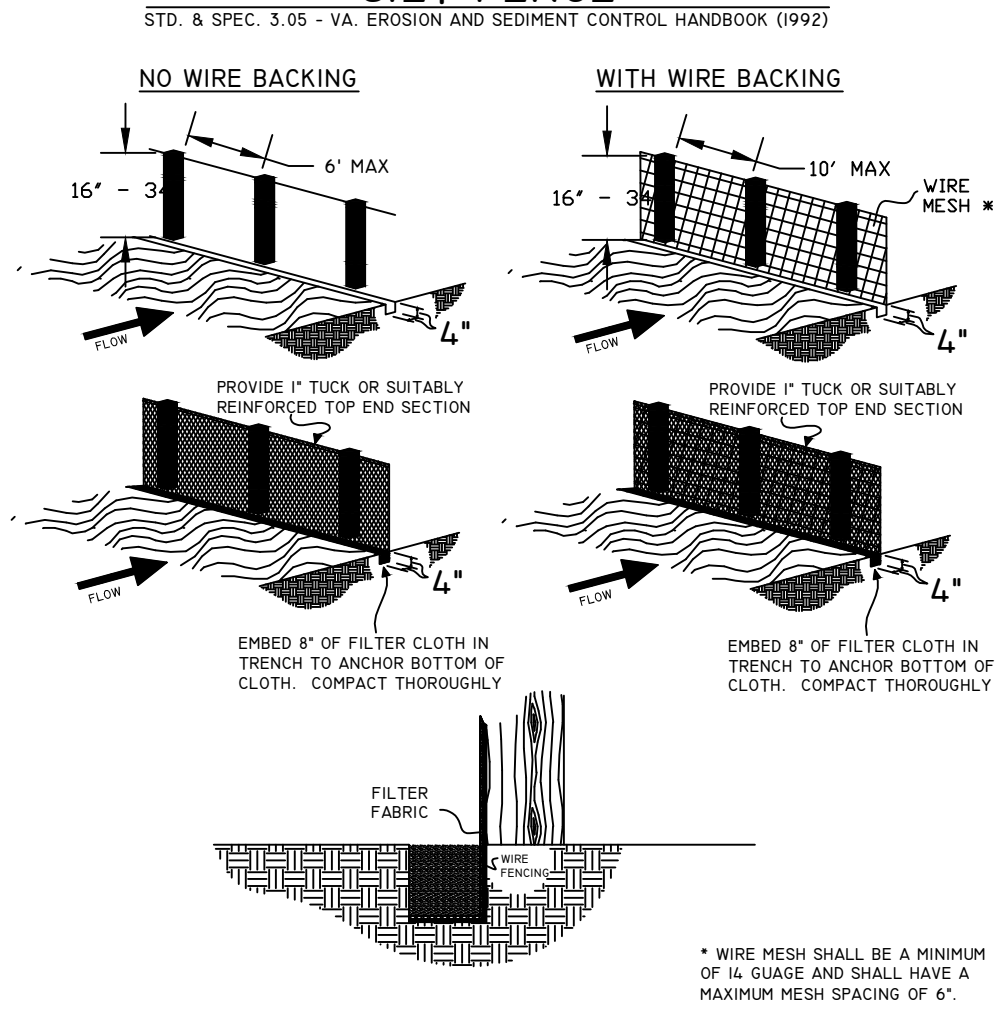
**LAKWOOD MANOR - COTTAGES - PHASE 2**  
 LUCKVAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
 HENRICO COUNTY NOTES AND DETAILS

JOB NO.	46579
SHEET NO.	C1.3

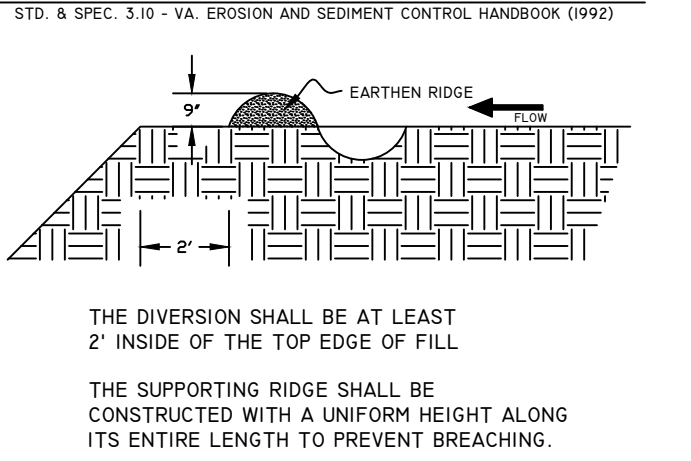
**STONE CONSTRUCTION ENTRANCE**



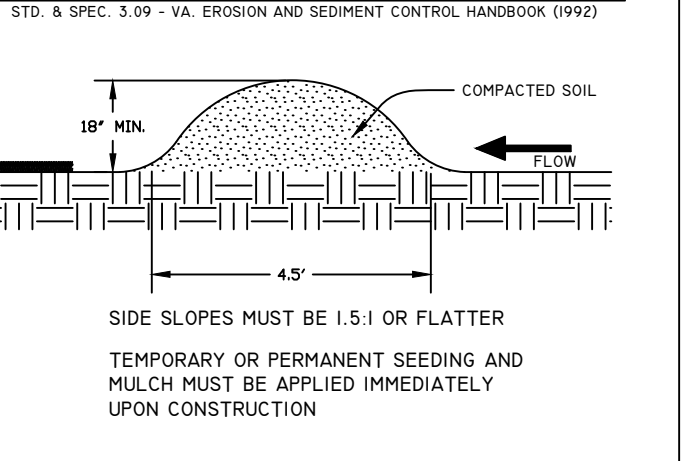
**SILT FENCE**



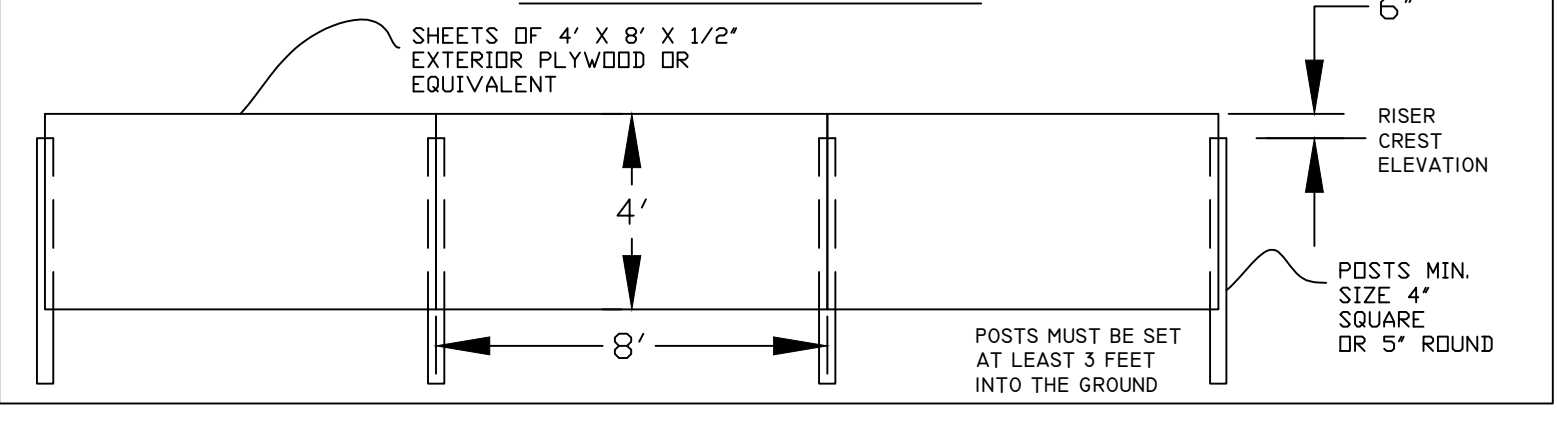
**TEMPORARY FILL DIVERSION**



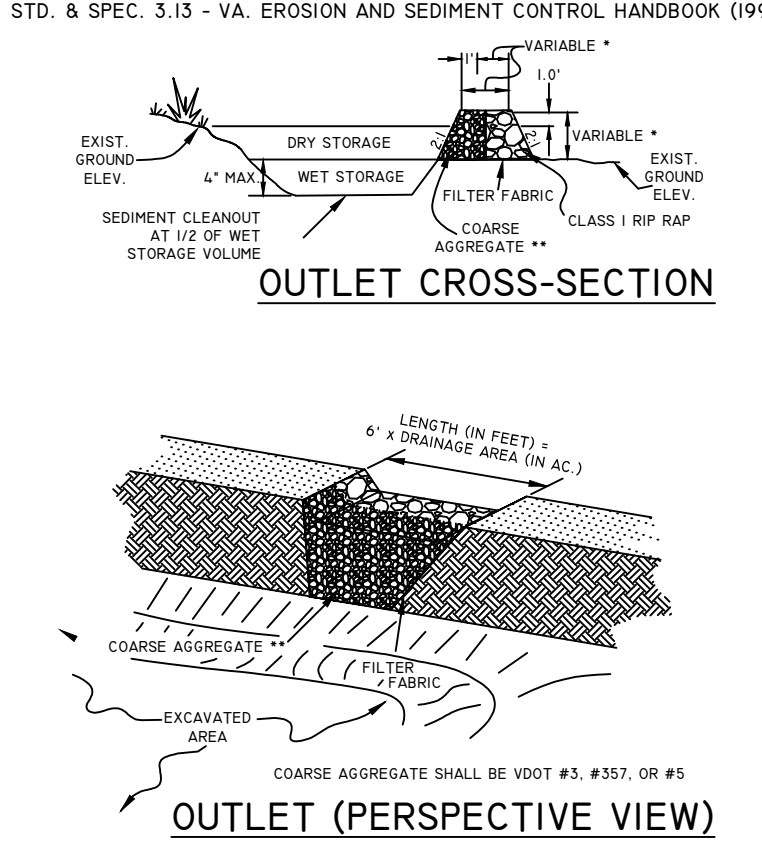
**TEMPORARY DIVERSION DIKE**



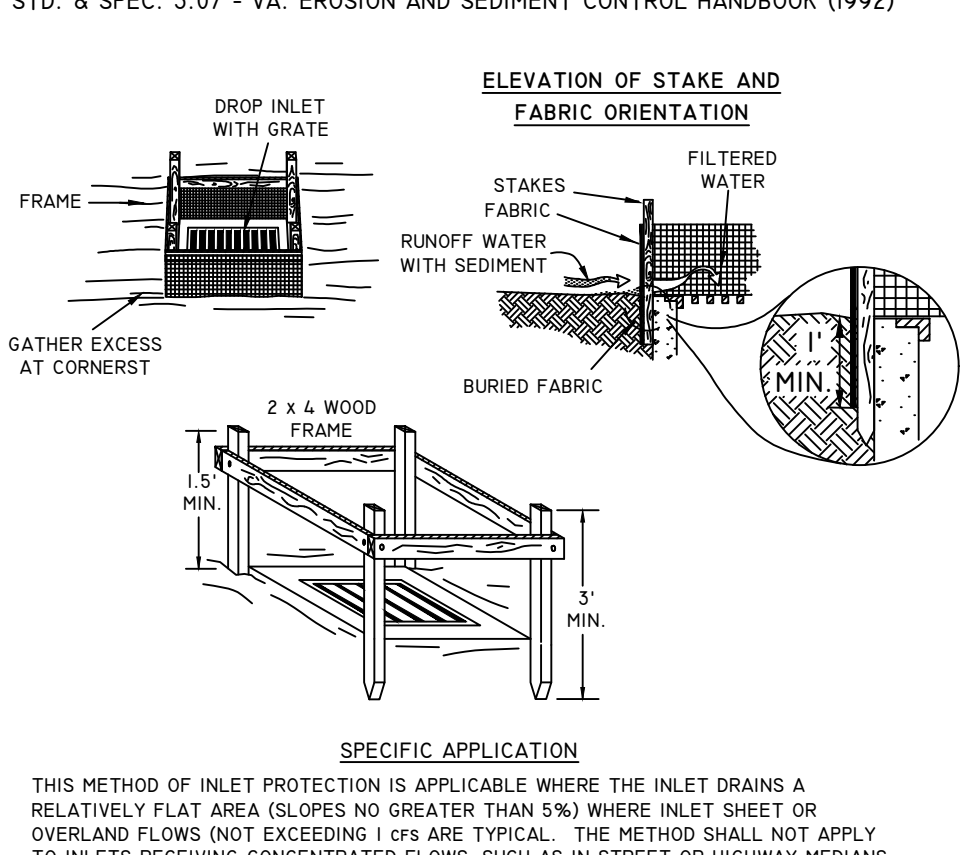
**BAFFLE DETAIL**



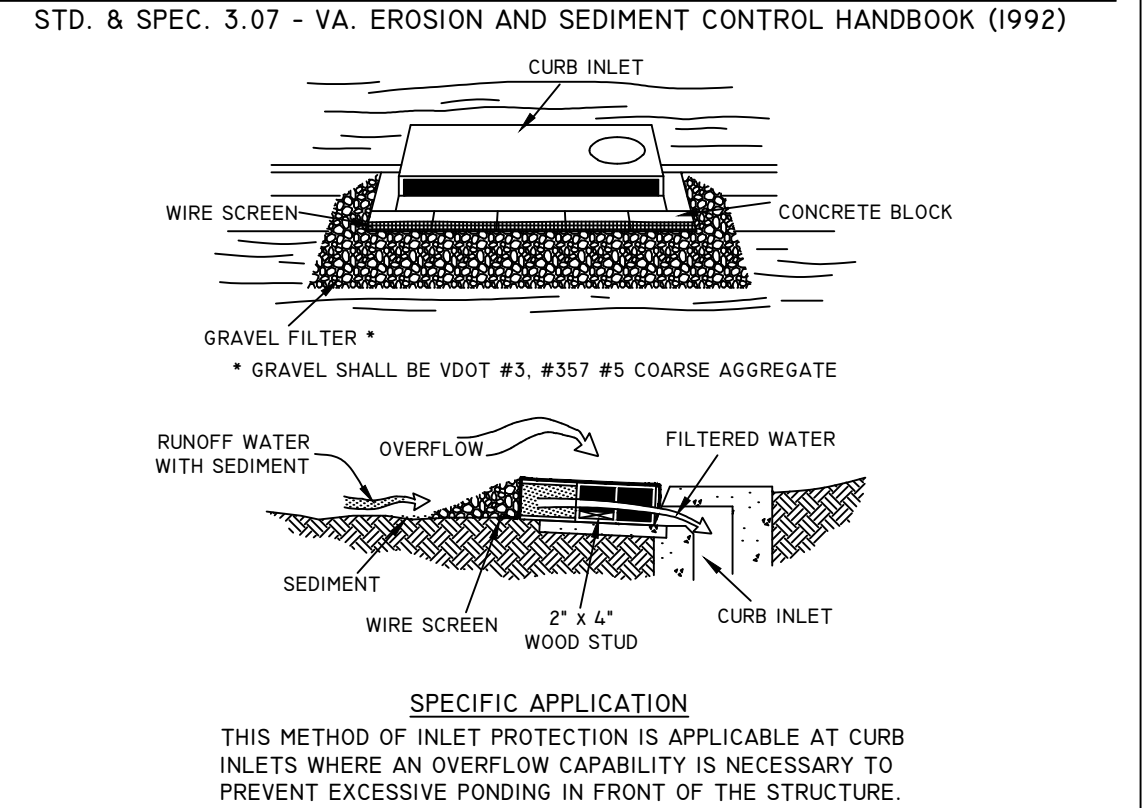
**TEMPORARY SEDIMENT TRAP**



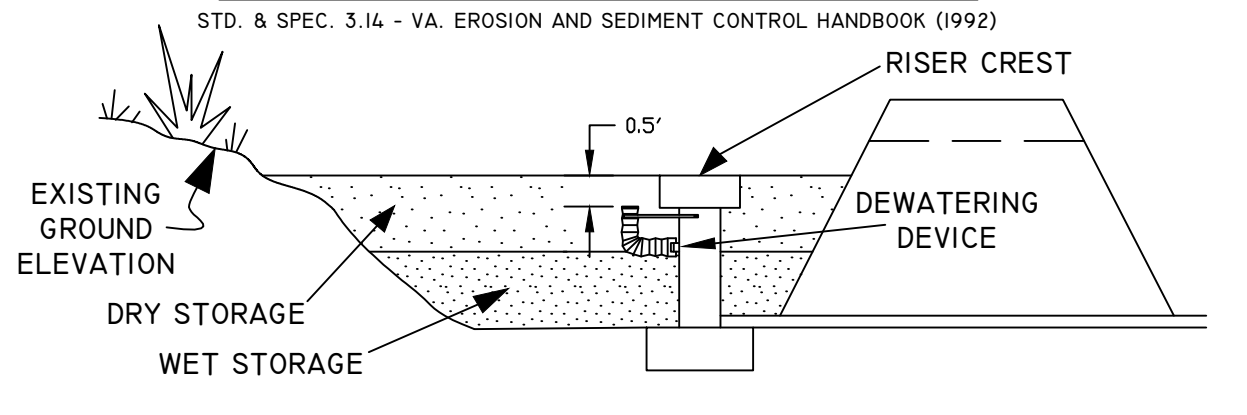
**SILT FENCE DROP INLET PROTECTION**



**BLOCK AND GRAVEL CURB INLET SEDIMENT FILTER**



**TEMPORARY SEDIMENT BASIN**



**SEDIMENT TRAPS**

Trap #	Drainage Area (Acres)	Wet Storage			Dry Storage			Bottom Elevation	Top of Basin Elevation	Top of Basin Width	Dimensions (L x W)	
		Volume Required (Cu. Yd.)	Volume Provided (Cu. Yd.)	Elevation	Volume Required (Cu. Yd.)	Volume Provided (Cu. Yd.)	Elevation					
1	2.75	184	224	144	184	186	145	16.5	142	145.5	3	SEE PLAN

**SEDIMENT TRAP 1 STAGE/STORAGE TABLE:**

ELEV	AREA (SF)
142	2577
143	3022
144	3497
145	5240

TEMPORARY SEDIMENT TRAP CLEANOUT ELEVATION = 143.00

**SEDIMENT BASINS**

Basin #	Drainage Area (Acres)	Wet Storage			Dry Storage			Bottom Elevation	Riser Crest Elevation	Riser Diameter	Dewatering Device Elevation	Dewatering Device Diameter	25-Yr. Storm Elevation	Emergency Spillway Elevation	Anti-Vortex Device Diameter	Top of Dam Elevation	Top of Dam Width	BAFFLE			BARREL	
		Volume Required (Cu. Yd.)	Volume Provided (Cu. Yd.)	Elevation	Volume Required (Cu. Yd.)	Volume Provided (Cu. Yd.)	Elevation											Flowlength to Width Ratio	Baffle Length	Top of Baffle	Pipe Length	Pipe Diameter
1	8.50	570	579	570	746	141	147	36"	144.25	7"	148	N/A	54"	150	8'	2.1	N/A	N/A	88'	30"	144.25	144

**50/10 DETENTION SUMMARY**

	Q (CFS)	AREA (ACRES)	C	I	C ADJ. FACTOR
Q <sub>10</sub> PRE-DEVELOPMENT (A)					
Q <sub>50</sub> POST-DEVELOPMENT (ON-SITE BYPASS) (B)					
Q <sub>50</sub> POST-DEVELOPMENT (OFF-SITE THROUGH PROJECT) (C)					
Q <sub>50</sub> ALLOWABLE (A - B + C)					
Q <sub>50</sub> FROM BASIN/PIPE (ROUTED)					

**OUTFALL ADEQUACY FOR SEDIMENT BASINS/TRAPS**

In accordance with Minimum Standard 19 of the Virginia Erosion and Sediment Control Regulations, all sediment basins and traps must discharge directly into an adequate outfall. Adequacy of off-site receiving channels or pipes must be verified by addressing one of the following Adequacy Situations:

- The drainage area from the project at the discharge point is less than or equal to one percent of the total drainage area at the discharge point and the 10-year storm is contained within the channel banks (Project Drainage Area and Total Drainage Area are required).
- Natural channels must be analyzed to demonstrate that (1) the 10-year storm will not overtop the channel banks and (2) the 2-year storm will not cause erosion of the channel bed and banks (Q<sub>capacity</sub>, Q<sub>10</sub>, V<sub>allowable</sub>, and V<sub>2</sub> are required), except Q<sub>capacity</sub> and Q<sub>10</sub> are not applicable if the channel is in the 100-year floodplain, RPA, SPA.
- Man-made channels must be analyzed to demonstrate that (1) the 10-year storm will not overtop the channel banks and (2) the 2-year storm will not cause erosion of the channel bed or banks (Q<sub>capacity</sub>, Q<sub>10</sub>, V<sub>allowable</sub>, and V<sub>2</sub> are required).
- Pipes and storm sewer systems must be analyzed to demonstrate that the 10-year storm will be contained within the system (Q<sub>capacity</sub>, Q<sub>10</sub>, and Hydraulic Grade Line calculations are required).

OR

Runoff is discharged through an energy dissipator at the limits of the 100-year floodplain, RPA buffer, or SPA buffer.

Discharge Point	Adequacy Situation	Project Drainage Area	Total Drainage Area	Q <sub>capacity</sub>	Q <sub>10</sub>	V <sub>allowable</sub>	V <sub>2</sub>	Cross-section, Profile, and Calculations Shown on Sheet (s)
SB1	E	3.29	8.50					
ST1	E	2.75	2.75					

Discharge Point = Unique identifier for the discharge point  
 Project Drainage Area = the drainage area of the project that drains to the discharge point in acres  
 Q<sub>capacity</sub> = the carrying capacity of the channel or pipe in CFS  
 V<sub>allowable</sub> = the maximum velocity (in FPS) that the channel lining can withstand without eroding  
 V<sub>2</sub> = the velocity at the discharge point for the 2-year storm in FPS  
 Adequacy Situation - either A, B, C, D, or E as described above  
 Total Drainage Area = the total drainage area to the discharge point in acres  
 Q<sub>10</sub> = the peak discharge at the discharge point for the 10-year storm in CFS  
 Generally, scaled channel cross-sections must be provided every fifty (50) feet and at the most constricted locations of all outfall channels for a minimum of 150 feet of profile.

**CHANNEL PROTECTION COMPLIANCE SUMMARY TABLE**

Discharge Point	Conditions within Limits of Analysis	Applicable Channel Protection Criteria														
		Criteria A (EX 36" 3-12)				Criteria B Project consistent with design of restored system	Criteria C									
		Q <sub>2</sub>	Q <sub>cap</sub>	V <sub>2</sub>	V <sub>allowable</sub>		Q <sub>developed</sub>	RV <sub>developed</sub>	IF	Q <sub>pre-developed</sub>	RV <sub>pre-developed</sub>	Q <sub>developed</sub> x RV <sub>developed</sub>	IF x Q <sub>pre-developed</sub> x RV <sub>pre-developed</sub>			
LEVEL SPREADER 1	<input checked="" type="checkbox"/> Manmade Restored <input type="checkbox"/> Natural	SHEET FLOW TO OPEN SPACE	CONSERVED		<input type="checkbox"/> YES											
LEVEL SPREADER 2	<input checked="" type="checkbox"/> Manmade Restored <input type="checkbox"/> Natural	SHEET FLOW TO OPEN SPACE	CONSERVED		<input type="checkbox"/> YES											

**Channel Protection Criteria**

- The stormwater conveyance system conveys the post-development peak flow rate from the two-year 24-hour storm event without causing erosion of the system (V<sub>2</sub> must be shown to be non-erosive)
- The development project, in combination with other stormwater runoff, is consistent with the design parameters of the restored stormwater conveyance and the restored stormwater conveyance system is functioning as designed
- The discharge from the development satisfies the Energy Balance requirement  
 $(Q_{developed} \times RV_{developed}) \leq IF \times (Q_{pre-developed} \times RV_{pre-developed})$   
 where:  
 Q<sub>developed</sub> = the peak flow rate of runoff from the developed site  
 RV<sub>developed</sub> = an improvement factor (0.8 for sites > 1 acre, 0.9 for sites ≤ 1 acre)  
 IF = the peak flow rate of runoff from the pre-developed site  
 Q<sub>pre-developed</sub> = the volume of runoff from the site based on pre-developed conditions  
 RV<sub>pre-developed</sub> = the volume of runoff from the site based on pre-developed conditions

**FLOOD PROTECTION COMPLIANCE SUMMARY TABLE**

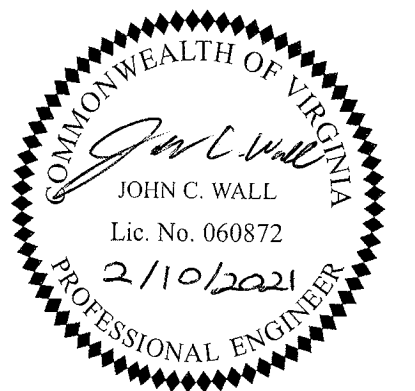
Discharge Point	Conditions within Limits of Analysis	APPLICABLE FLOOD PROTECTION CRITERIA				
		Criteria A		Criteria B		
		Q <sub>10-post</sub>	Q <sub>capacity</sub>	Q <sub>10-post</sub> (Required for Criteria B.1 and B.2)	Q <sub>capacity</sub> (Required for Criteria B.1)	Q <sub>10-pre-developed</sub> (Required for Criteria B.2)
LEVEL SPREADER 1	<input checked="" type="checkbox"/> No Localized Flooding <input type="checkbox"/> Existing Localized Flooding	SHEET FLOW TO OPEN SPACE	CONSERVED			
LEVEL SPREADER 2	<input checked="" type="checkbox"/> No Localized Flooding <input type="checkbox"/> Existing Localized Flooding	SHEET FLOW TO OPEN SPACE	CONSERVED			

**Flood Protection Criteria**

- Where localized flooding does not currently exist, the 10-year 24-hour storm event must be confined to the most restrictive stormwater conveyance system within the limits of analysis.
- Where localized flooding exists within the limits of analysis, the 10-year 24-hour storm event must:
  - be confined within the most restrictive stormwater conveyance system within the limits of analysis (detention or downstream improvements may be provided to meet this criterion), or
  - be released at a rate that is less than the pre-development peak flow rate from the 10-year 24-hour storm event.

**EROSION AND SEDIMENT CONTROL - STANDARD DETAILS/CALCS.**

**COUNTY OF HENRICO DEPARTMENT OF PUBLIC WORKS**



THIS DRAWING PREPARED AT THE  
**TRI-CITIES OFFICE**  
 470 Owens Way, Suite 900 | Prince George, VA 23895  
 TEL 804-541-1600 FAX 804-456-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE: 12/17/2020  
 DRAWN BY: D. ELLIS  
 DESIGNED BY: J. WALL  
 CHECKED BY: K. HALPAUS  
 SCALE: NONE

**TIMMONS GROUP**

**LAKWOOD MANOR - COTTAGES - PHASE 2**  
 TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
 HENRICO COUNTY NOTES AND DETAILS

JOB NO. 46579  
 SHEET NO. C1.4

P.O.D. #2020-00486

PURPOSE

4VAC50-60-54 of the Virginia Stormwater Management Program (VSMP) Permit Regulations requires that Stormwater Pollution Prevention Plan (SWPPP) be developed for all regulated land disturbing activities.

The plan for implementing pollution prevention measures during construction activities developed on this sheet must be implemented and updated as necessary.

OTHER REFERENCED PLANS

SWPPP requirements may be fulfilled by incorporating, by reference, other plans. All plans incorporated by reference become enforceable under the VSMP Permit Regulations and General Permit VAR10 for Discharges of Stormwater from Construction Activities.

Table with 2 columns: Independent Plans Incorporated by Reference, Date Approved. Rows include Stormwater Management Plans, Spill Prevention, Control, and Countermeasure Plans, Off-Site Stockpile, Off-Site Borrow Area.

POTENTIAL POLLUTANT SOURCES

The following sources of potential pollutants must be addressed in the Pollution Prevention Plan. Various controls and/or measures designed to prevent and/or minimize pollutants in stormwater discharges from the project site must be applied to the sources found on the site.

LEAKS, SPILLS, AND OTHER RELEASES

- The operator(s) shall ensure procedures are in place to prevent and respond to all leaks, spills and other releases of pollutants.
The operator(s) shall ensure all leaks, spills and other releases of pollutant are contained and cleaned immediately upon discovery.

Table with 3 columns: Date, Shown on Plan Sheet #s, Location. Includes Approved Plan C2.2 and Revisions to Locations.

- The operator(s) shall notify the Department of Environmental Quality of leaks, spills, and other releases that discharge to or have the potential to discharge to surface waters immediately upon discovery of the discharge but in no case later than 24 after the discovery.

Contact information for Virginia Department of Environmental Quality and Henrico County Department of Public Works.

EQUIPMENT / VEHICLE WASHING

- Washing must be conducted in a dedicated area that is located to maximize the distance from storm drain inlets, ditches, waterbodies or wetlands but no less than 50 feet from those features.

Table with 4 columns: Activity, Location of Dedicated Area(s), Shown on Plan Sheet #s, Water Source Location. Includes Wheel Wash and Other Wash Areas.

VEHICLE FUELING AND MAINTENANCE

- Conduct regular maintenance in a dedicated area that is located to maximize the distance from storm drain inlets, ditches, waterbodies or wetlands but no less than 50 feet from those features.

Table with 3 columns: Date, Shown on Plan Sheet #s, Location of Dedicated Area(s). Includes Approved Plan C2.2 and Revisions to Locations.

- If mobile fueling will be used, the fueling must be done in an area that is located to maximize the distance from storm drain inlets, ditches, waterbodies or wetlands but no less than 50 feet from those features.

DISCHARGE FROM STORAGE, HANDLING, AND DISPOSAL OF CONSTRUCTION PRODUCTS, MATERIALS, AND WASTE

- Storage of construction products, materials, and waste is to be conducted in dedicated areas.
The dedicated area must be located to maximize the distance from storm drain inlets, ditches, waterbodies or wetlands but no less than 50 feet from those features.

Table with 4 columns: Date, Shown on Plan Sheet #s, Location(s) of Dedicated Area(s) for storage of construction products and materials, Operator(s) Initials.

Table with 4 columns: Date, Shown on Plan Sheet #s, Location(s) of Dedicated Area(s) for waste from construction products and materials, Operator(s) Initials.

- Follow all federal, state, and local requirements that apply to the use, handling and disposal of pesticides, herbicides, and fertilizers.

DISCHARGES FROM OTHER POTENTIAL POLLUTANT SOURCES

Table with 2 columns: Other Potential Pollutant Sources, Location(s) of Potential Pollutant Sources. Includes NOT APPLICABLE.

- Above ground oil storage tanks with a storage capacity exceeding 1,320 gallons and have a reasonable expectation of a discharge into or upon Waters of the United States are required to have a Spill Prevention Control and Countermeasure (SPCC) Plan.

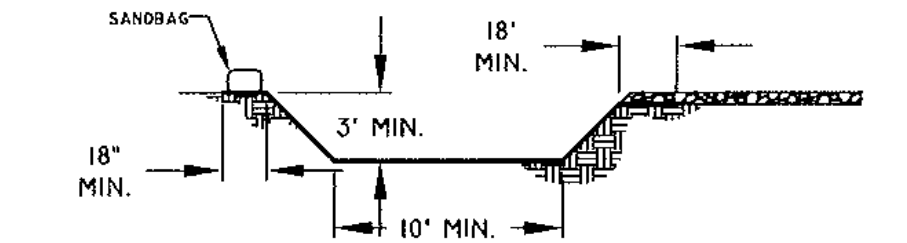
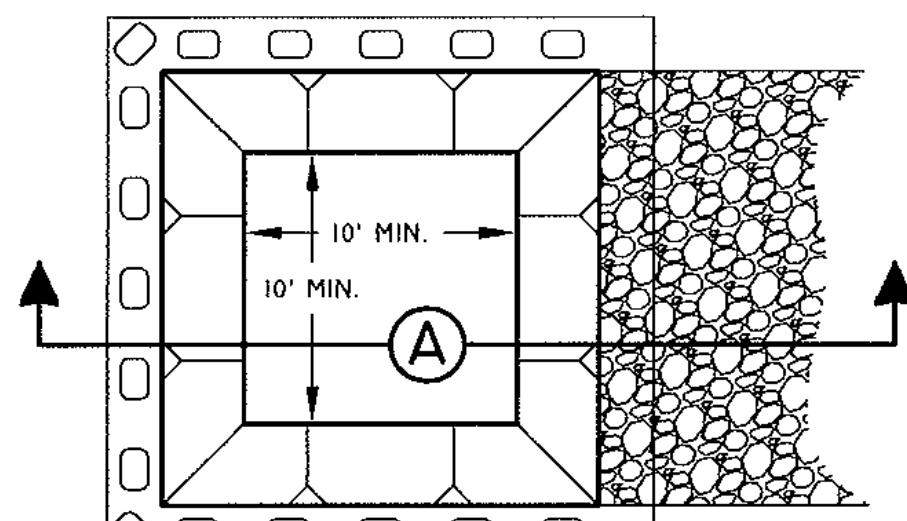
DISCHARGES FROM CONCRETE RELATED WASH ACTIVITIES

- Concrete trucks are not allowed to wash out or discharge surplus concrete or drum wash water on site except in a dedicated area(s) that is located to prevent discharge to storm drain inlets, ditches, waterbodies or wetlands but no less than 50 feet from those features.

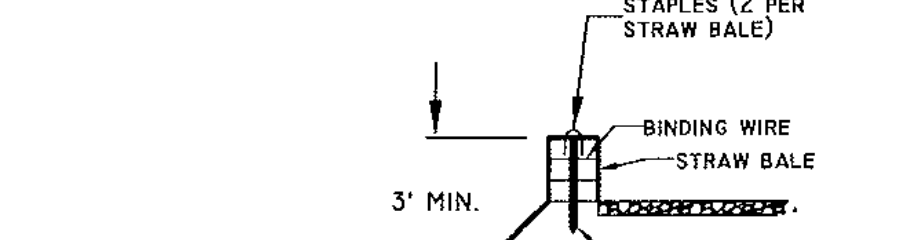
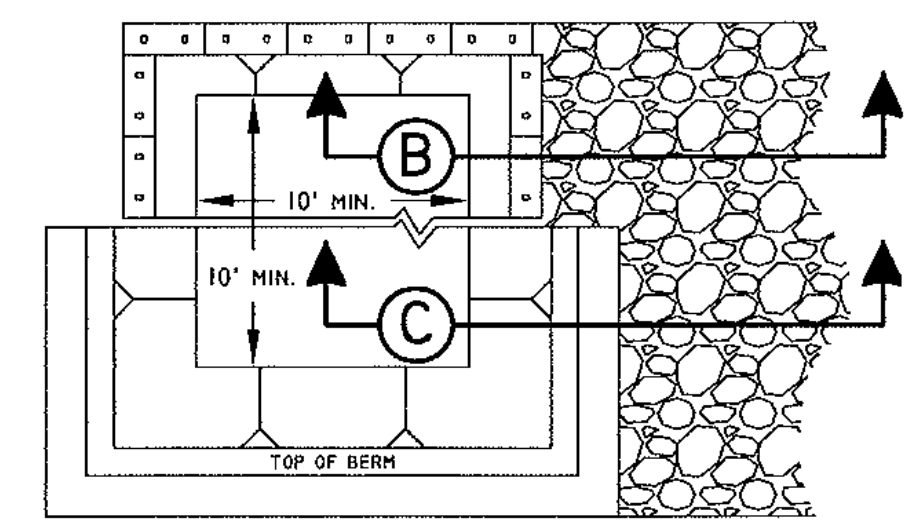
Table with 3 columns: Date, Shown on Plan Sheet #s, Location of Dedicated Area(s). Includes Approved Plan C2.2 and Revisions to Locations.

- Facilities must be cleaned, or new facilities constructed, once the washout area is two-thirds (2/3) full.

BELOW GRADE CONCRETE WASHOUT AREA



ABOVE GRADE CONCRETE WASHOUT AREA



CONCRETE WASHOUT AREA NOTES

- The facility must be lined with 10 mil plastic lining that is free from holes, tears, or other defects that might compromise the material's impermeability.

DISCHARGES OF SOAPS, DETERGENTS, SOLVENTS, AND WASH WATER FROM CONSTRUCTION ACTIVITIES SUCH AS CLEANUP OF STUCCO, PAINT, FORM RELEASE OILS, AND CURING COMPOUNDS

- Washing activities associated with construction activities other than vehicle and equipment washing, such as clean up of stucco, paint, form release oils, and curing compounds are to be conducted in a dedicated area.

Table with 3 columns: Date, Shown on Plan Sheet #s, Location(s) of Dedicated Area(s). Includes Approved Plan C2.2 and Revisions to Locations.

- The dedicated area must be covered (e.g., plastic sheeting, temporary roof, etc.) to prevent contact with stormwater.

DISCHARGES OF HAZARDOUS, TOXIC, AND SANITARY WASTE

- Storage and disposal of hazardous, toxic and sanitary wastes are to be conducted in dedicated areas.

Table with 4 columns: Date, Shown on Plan Sheet #s, Location(s) of Dedicated Area(s) for storage and disposal of hazardous and toxic wastes, Operator(s) Initials.

Table with 4 columns: Date, Shown on Plan Sheet #s, Location(s) of Dedicated Area(s) for portable toilets, Operator(s) Initials.

- Consult with local waste management authorities or private firms about the requirements for disposing of hazardous materials and/or soils that may be contaminated with hazardous materials.

SWPPP MODIFICATIONS AND REVISIONS

The operator(s) shall ensure the SWPPP is modified and/or revised to reflect:

- Changes in qualified personnel; delegated authorities or other personnel required as a condition of the General Construction Permit;

Modifications/revisions to the SWPPP shall include additional or modified control measures to address the identified deficiencies.

If the necessary modifications/revisions require approval by the Administrator or DEQ, the modifications/revisions must be implemented no later than seven (7) calendar days following approval.

If the necessary modifications/revisions do not require approval by the Administrator, the modifications/revisions must be implemented prior to the next anticipated storm event or as soon as practicable.

SWPPP UPDATES

The operator(s) shall update the SWPPP to include:

- A record of dates when 1) major grading activities occur, 2) construction activities temporarily or permanently cease on a portion of the site, and 3) stabilization measures are initiated;

The operator(s) shall update the SWPPP no later than seven (7) days following any of the situations identified above.

OPERATOR INSPECTIONS

The operator(s) identified below shall provide for inspections of the permitted land-disturbing activities by the qualified personnel identified below.

- at least once every four (4) business days; or
at least once every five (5) business days and no later than 48 hours following any measurable storm event.

Where areas are in a stabilized condition or runoff is unlikely due to winter conditions, the inspection frequency may be reduced to once every 30 days while these conditions exist.

The operator(s) shall provide for inspections of the permitted land-disturbing activity to ensure implementation and continued maintenance of all requirements of the Stormwater Pollution Prevention Plan (Erosion and Sediment Control Plan, Stormwater Management Plan, Pollution Prevention Plan, TMDL requirements, etc.).

Records of the required inspections must be maintained and included in the SWPPP binder. The qualified personnel are encouraged to use the Operator Inspection form provided in the SWPPP binder to document the required inspections.

ACKNOWLEDGEMENTS

I certify under penalty of law that the qualified personnel identified below:

- has been designated by the Operator to conduct inspections of the permitted site;

Table with 2 columns: Name (print), Phone. Includes a note: Additional information is located in Tab 6 of the SWPPP Binder.

As the Operator(s) or Delegated Authority, I/we understand that prior to initiating land disturbance, the potential pollutant sources, appropriate control measures, and all responsible parties (operator, qualified inspection personnel, contractors, etc.) required as a condition of the General Construction Permit (GCP) and the Stormwater Pollution Prevention Plan (SWPPP) must be identified.

I/we shall take all reasonable steps to minimize or prevent any discharge in violation of the SWPPP and/or GCP.

I/we understand that I/we are ultimately responsible for compliance with all conditions and requirements of the SWPPP and GCP and for ensuring all contractors and subcontractors on the permitted site are aware of the conditions and requirements of the SWPPP and GCP.

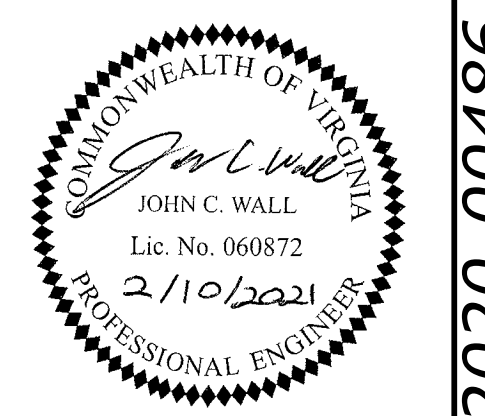
I/we shall comply with all conditions and requirements of the SWPPP and shall at all times properly operate and maintain all measures and control (and related appurtenances) which are installed or used to achieve compliance with the conditions of the GCP.

I/we shall take all reasonable steps to minimize or prevent any discharge in violation of the SWPPP and/or GCP.

I/we understand that if it determined by the Department of Environmental Quality (DEQ) in consultation with the State Water Control Board at any time that stormwater discharges are causing, have reasonable potential to cause, or contribute to and excursion above any applicable water quality standard, the DEQ may, in consultation with the Administrator, take appropriate enforcement action and require:

- Modification of control measures to adequately address water quality concerns;

Table with 3 columns: Name (print), Signature, Date. Includes a note: Additional contact information can be found in the SWPPP Binder.



THIS DRAWING PREPARED AT THE TRI-CITIES OFFICE 4701 Owens Way, Suite 900 | Prince George, VA 22975 TEL 604-541-0600 FAX 604-458-1511 www.timmons.com

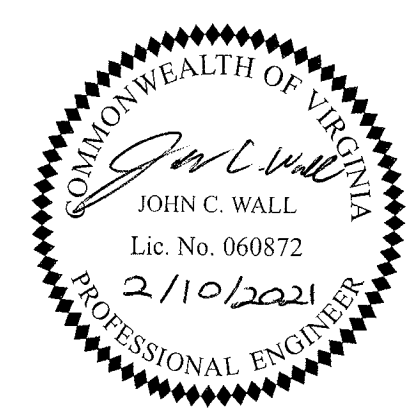
YOUR VISION ACHIEVED THROUGH OURS. REVISION DESCRIPTION: PLANNING COMMISSION SUBMITTAL REVISIONS PER COUNTY COMMENTS. DATE: 12/17/2020, 2/10/2021.

DATE: 11/16/2020. DRAWN BY: D. ELLIS. DESIGNED BY: J. WALL. CHECKED BY: K. HALPAUS. SCALE: NONE.

TIMMONS GROUP logo and project information: LAKEWOOD MANOR - COTTAGES - PHASE 2, LUCKYHOE DISTRICT - HENRICO COUNTY - VIRGINIA, HENRICO COUNTY NOTES AND DETAILS. JOB NO. 46579, SHEET NO. C1.5.







THIS DRAWING PREPARED AT THE  
**TRI-CITIES OFFICE**  
 470 E. Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-541-0600 FAX 804-456-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE: 11/16/2020  
 DRAWN BY: D. ELLIS  
 DESIGNED BY: J. WALL  
 CHECKED BY: K. HALPASY  
 SCALE: NONE

**TIMMONS GROUP**

**LAKWOOD MANOR - COTTAGES - PHASE 2**  
 LUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
 UTILITY NOTES AND DETAILS

JOB NO. 46579  
 SHEET NO. C1.7

P.O.D. #2020-00486

COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES

**STANDARD HOUSE CONNECTION**

**DITCH CROSSING**

**"TEE" BRANCH CONNECTION WITH 45° BEND**

**SITE INSPECTION PORT (S.I.P.) NOTES:**

- S.I.P. SHALL BE INSTALLED ± 3' OF PROPERTY LINE ON ALL HOUSE CONNECTIONS.
- OWNER MAY HAVE UTILITY CONTRACTOR INSTALL S.I.P.'S. THEY MUST BE INSTALLED PRIOR TO TENTATIVE ACCEPTANCE BY THE COUNTY.
- OWNER MAY HAVE PLUMBING CONTRACTOR INSTALL S.I.P.'S. THEY MUST BE INSPECTED BY THE COUNTY PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY.

REVISIONS 06/20/2014	HOUSE CONNECTION DETAILS	DRWG. NO. D-180
-------------------------	--------------------------	--------------------

COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES

**20" ROUND PLASTIC METER BOX SIMILAR TO OLDCASTLE PLASTIC METER BOX HW-0020B**

**NOTES:**

- ALL WATER METERS TO BE FURNISHED & INSTALLED BY THE COUNTY.
- ALL METERSETTERS PROVIDED FOR 5/8" AND 1" METERS SHALL HAVE REMOVABLE PACK JOINTS SUITABLE FOR COPPER PIPE.
- ALL METERSETTERS SHALL HAVE SADDLE NUTS, PADLOCK WINGS, AND SHALL BE SIMILAR TO FORD OR MUELLER.

REVISIONS 06/20/2014	STANDARD METER BOX INSTALLATION FOR 5/8" AND 1" METERS	DRWG. NO. D-525
-------------------------	--	--------------------

COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES

**TYPICAL DPW ROAD SECTION WITH CURB AND GUTTER AND WITHOUT SIDEWALK**

**TYPICAL DPW ROAD SECTION WITH CURB AND GUTTER AND WITH SIDEWALK**

**NOTES:**

- WATER METER MAY BE INSTALLED BETWEEN CURB AND SIDEWALK IF THE DISTANCE IS 3' OR MORE.
- ALL METER BOXES SHALL BE WITHIN THE RIGHT-OF-WAY OR EASEMENT.
- SERVICE SIZES SHALL BE ONE SIZE LARGER THAN THE METER.
- SEE NOTES ON DWG D-520-3.

REVISIONS 06/20/2014	WATER SERVICE INSTALLATION DETAILS FOR 5/8" AND 1" METERS	DRWG. NO. D-520-1
-------------------------	---	----------------------

COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES

**NOTES:**

- SEE "TYPICAL RESIDENTIAL WATER METER LOCATIONS" D-510 FOR HORIZONTAL PLACEMENT OF METER BOXES AND EASEMENT DETAILS.
- METER BOXES INSTALLED OUTSIDE THE RIGHT-OF-WAY SHALL BE INSTALLED INSIDE A PERMANENT DPW UTILITY EASEMENT.
- THE SERVICE LINE BETWEEN THE MAIN AND THE METER WILL BE ONE CONTINUOUS PIECE OF PIPE. (NO JOINTS WILL BE PERMITTED.)
- METER BOXES SHALL NOT BE INSTALLED IN ROAD DITCHES.
- METER BOXES SHALL NOT BE INSTALLED IN ROAD SHOULDERS.
- METER BOXES SHALL NOT BE INSTALLED IN DRIVEWAYS, ROADS, OR ENTRANCES UNLESS TRAFFIC RATED METER BOX, TOP, AND LID ARE USED. THE METER BOX, TOP, AND LID MUST BE APPROVED BY DPW PRIOR TO INSTALLATION.
- MINIMUM DEPTH OF COVER OVER WATER SERVICE SHALL BE 36" EXCEPT AS SHOWN AT METER BOX ENTRANCE IN DWG D-525.
- WATER SERVICE WILL CROSS OVER STORM SEWER PIPES WITH A MINIMUM OF 6" CLEARANCE BETWEEN PIPES.

**STANDARD SERVICE CONNECTION**

REVISIONS 06/20/2014	WATER SERVICE INSTALLATION DETAILS FOR 5/8" AND 1" METERS	DRWG. NO. D-520-3
-------------------------	---	----------------------

COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES

**TYPICAL FIRE HYDRANT DETAIL**

**NOTES:**

- USE RESTRAINED JOINTS ON GATE VALVE, FIRE HYDRANT, AND PIPING.
- DUCTILE IRON PIPE IS REQUIRED FOR ALL FIRE HYDRANT, AND PIPING.
- HYDRANTS SHALL BE LOCATED A MINIMUM DISTANCE OF 50' FROM ALL STRUCTURES.
- KEEP WEEP HOLE CLEAR TO ALLOW PROPER DRAINAGE.

REVISIONS 06/20/2014	TYPICAL FIRE HYDRANT DETAIL	DRWG. NO. D-495-1
-------------------------	-----------------------------	----------------------

COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES

**4 1/4" PUMPER NOZZLE  
NUMBER PER HYDRANT: 1**

**2 1/2" HOSE NOZZLE  
NUMBER PER HYDRANT: 2**

**THREAD DATA:**

4 THREADS PER 1" 250° PITCH RIGHT HAND A.N. FORM

8 THREADS PER 1" 125° PITCH RIGHT HAND A.N. FORM

REVISIONS 06/20/2014	CITY OF RICHMOND FIRE HYDRANT NOZZLE THREADS	DRWG. NO. D-495-2
-------------------------	--	----------------------

COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES

**TEE** **PLUGGED CROSS** **WYE** **PLUG OR CAP**

**BEND** **PLUGGED CROSS** **TEE**

**NOTES:**

- CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
- KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES.
- BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN ON THIS STANDARD DETAIL.

BEARING AREA OF THRUST BLOCKS IN SQ. FT.						
FITTING SIZE	TEE, WYE PLUG OR CAP	90° BEND PLUGGED CROSS	TEE PLUGGED ON RUN	45° BEND	22 1/2' BEND	11 1/4' BEND
6	2.1	3.0	4.3	3.0	2.0	---
8	3.8	5.3	7.6	5.4	2.9	2.0
10	5.9	8.4	11.8	8.4	4.6	2.4
12	8.5	12.0	17.0	12.0	6.8	3.4
14	11.5	16.3	23.0	16.3	8.9	4.6
16	15.0	21.3	30.0	21.3	11.6	6.0
18	19.0	27.0	38.0	27.0	14.6	7.6
20	23.5	33.3	47.0	33.3	18.1	9.4
24	34.0	48.0	68.0	48.0	26.2	13.6

**NOTES:**

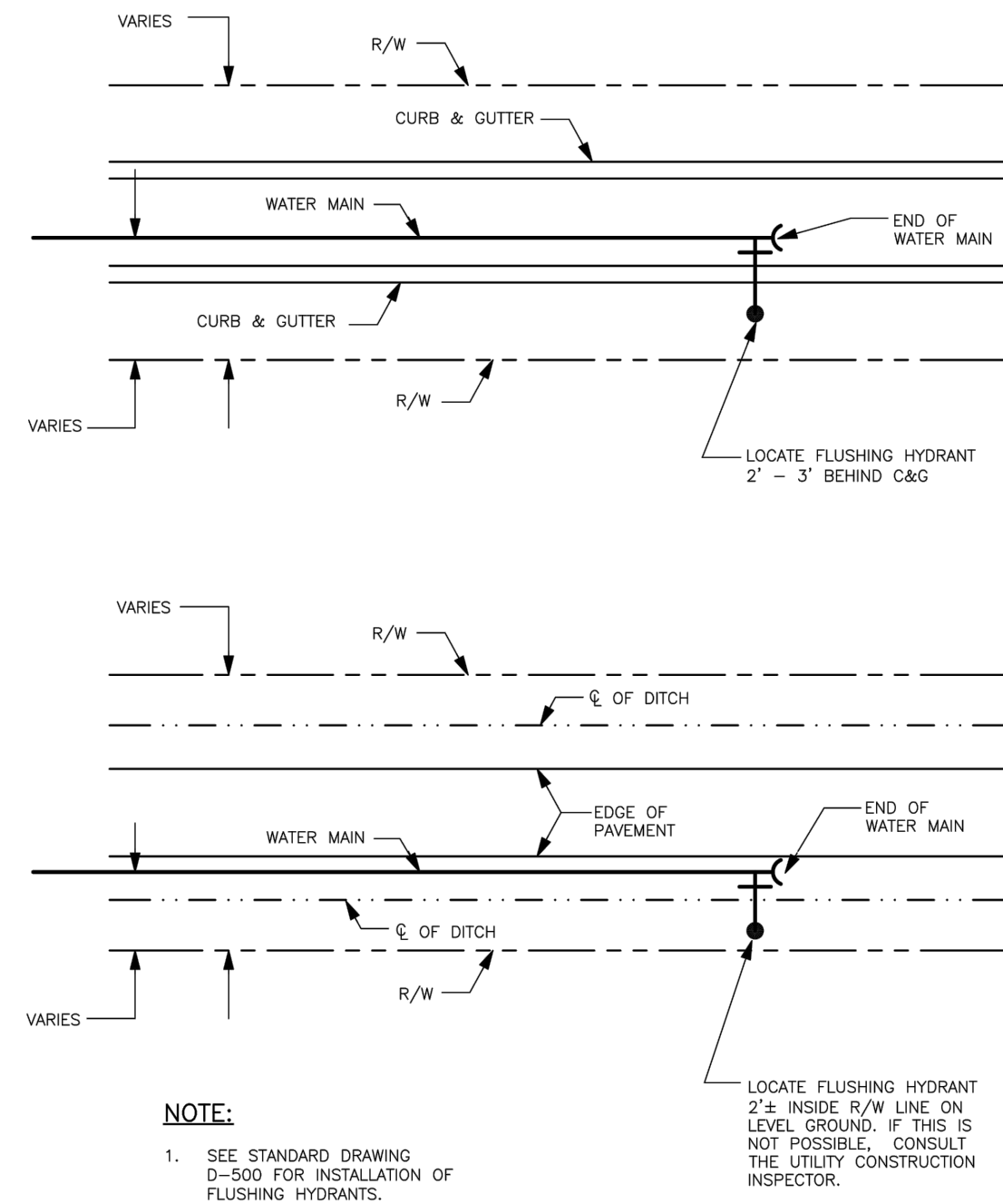
- ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 200 P.S.I. AND AN ALLOWABLE SOIL BEARING STRESS OF 3,500 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION:  
 BEARING AREA = (TEST PRESSURE/200) X (3500/SOIL BEARING STRESS) X (TABLE VALUE)
- CONCRETE SHALL BE A-3 CONC. MEETING REQUIREMENTS OF ASTM C94.

SIZE OF FITTING	MIN. C.Y. - CONC. FOR BLOCKING
3" - 8"	3/4
10" - 12"	1 1/2
16" - 24"	2

REVISIONS 06/20/2014	THRUST BLOCKING DETAILS	DRWG. NO. D-700
-------------------------	-------------------------	--------------------

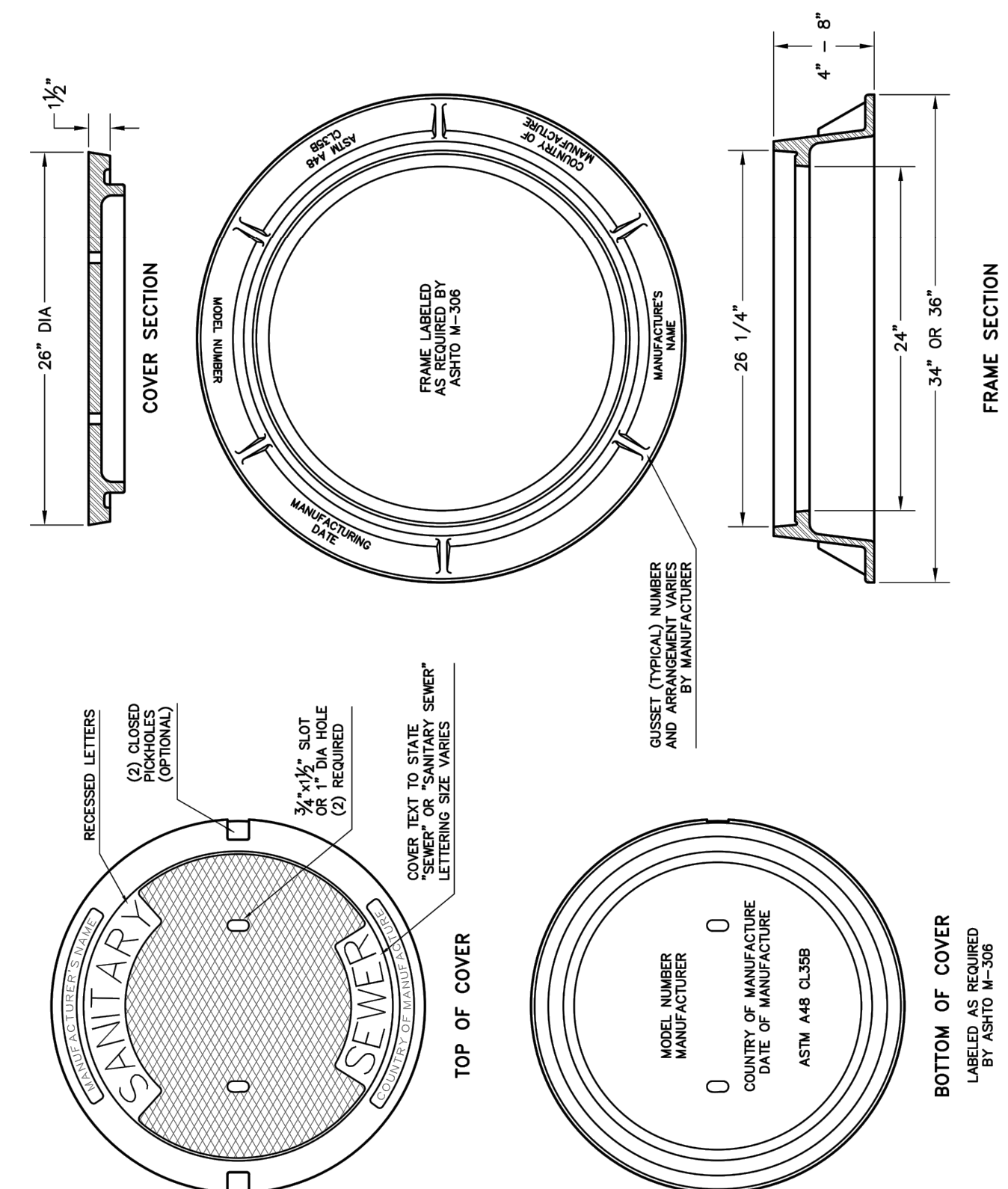
S:\10646579-Lakewood\_Cottages\DWG\Sheet\CD\46579-C1.7-UNT.DWG | Printed on 2/9/2021 4:31 PM | DWG: DJ.Ellis

COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES



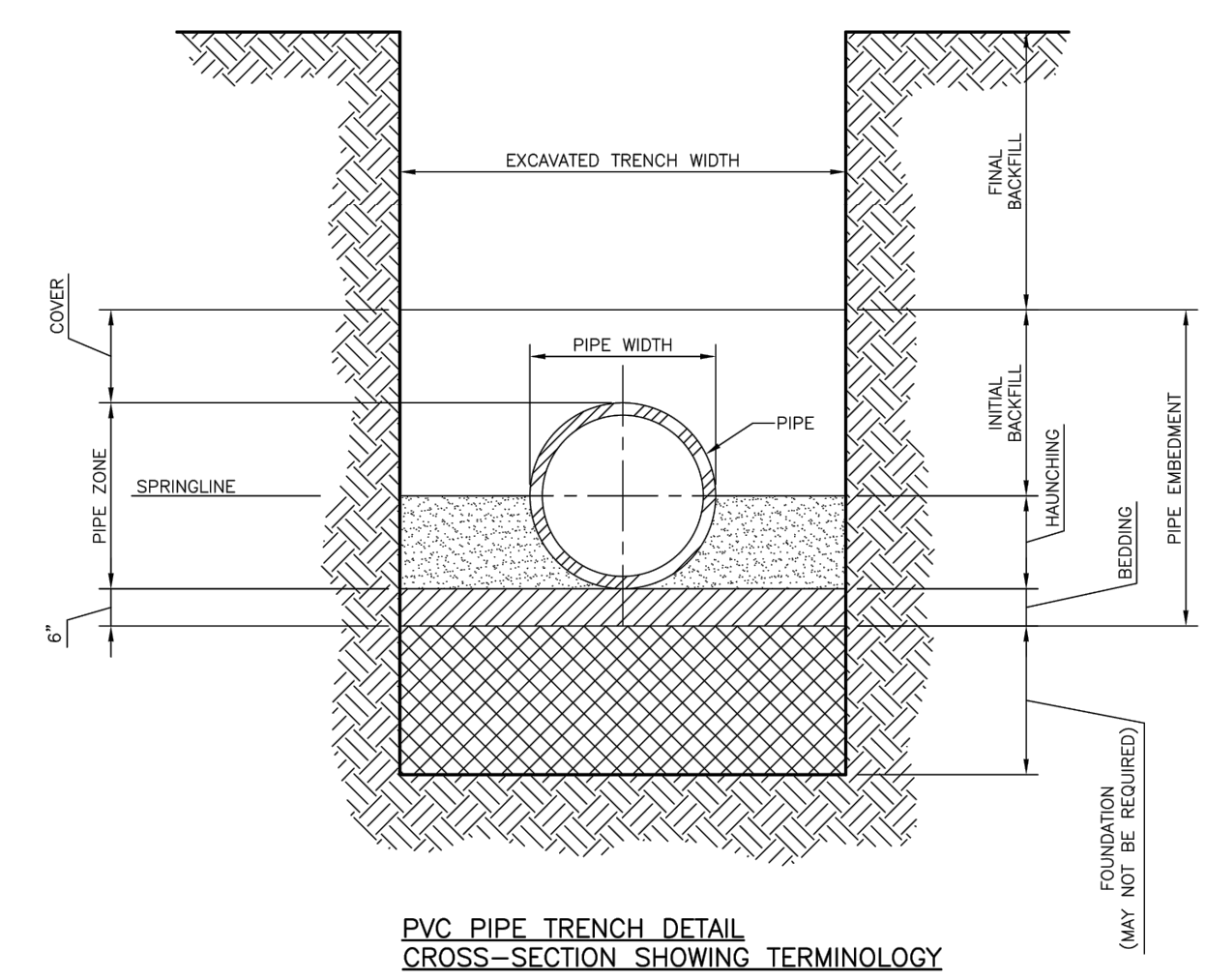
REVISIONS 06/20/2014 TYPICAL FLUSHING HYDRANT LOCATION ON THROUGH STREET DRWG. NO. D-505-2

COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES



REVISIONS 06/20/2014 STANDARD MANHOLE FRAME & COVER DRWG. NO. D-150

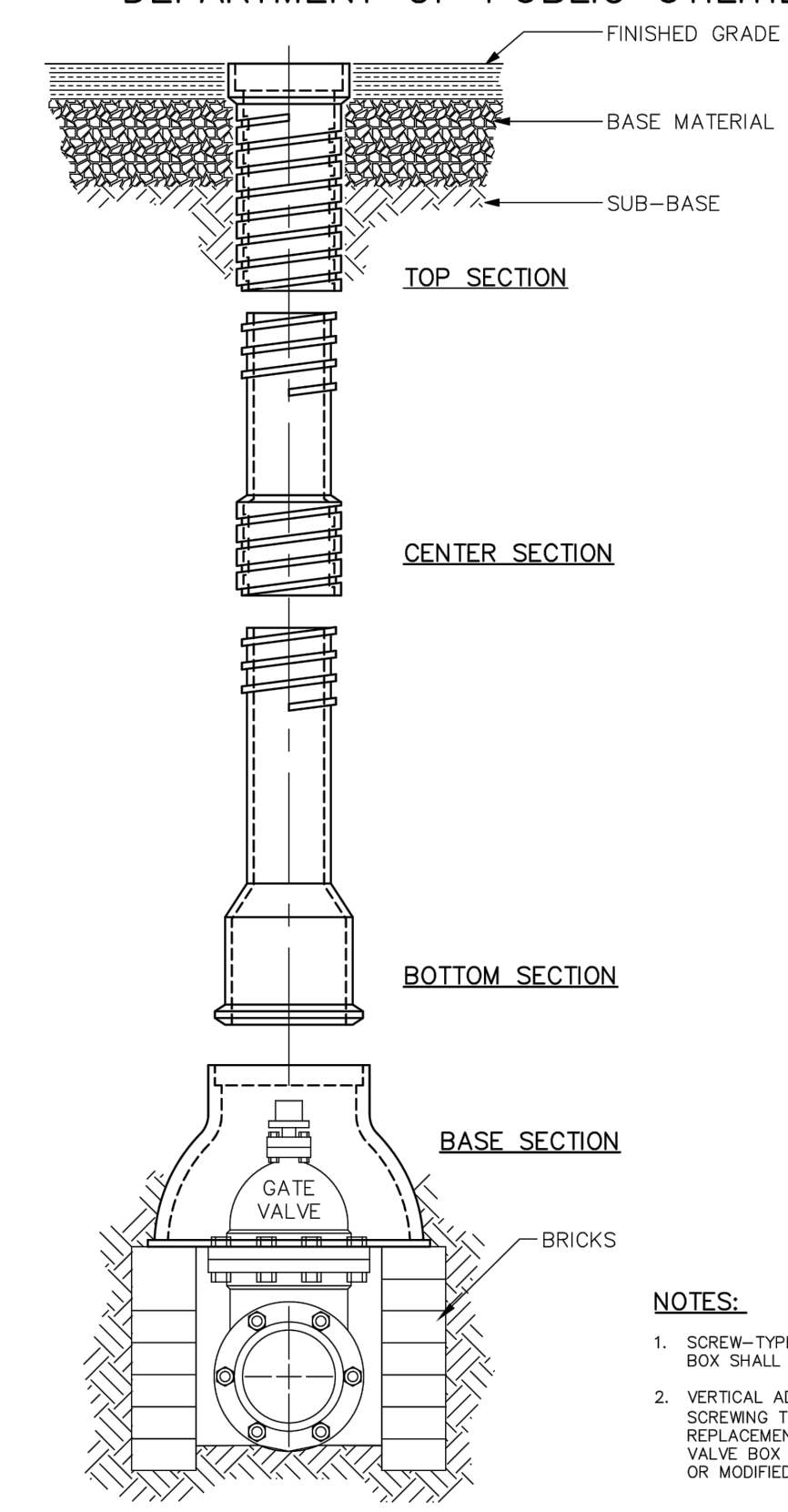
COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES



**NOTE:**  
1. IN GENERAL BEDDING AND HAUNCHING SHALL BE FREE FLOWING GRANULAR MATERIALS ADEQUATELY COMPACTED. IN THE EVENT THAT SUBSOILS ARE DEEMED INADEQUATE THE DESIGN ENGINEER MAY REQUIRE IMPORTED FOUNDATION MATERIAL SUCH AS #57 STONE. THE MINIMUM TRENCH WIDTH SHALL CONFORM TO TABLE 710.1 LOCATED ON DRAWING D-710-2.

REVISIONS 06/20/2014 PVC PIPE TRENCH BEDDING DRWG. NO. D-710-1

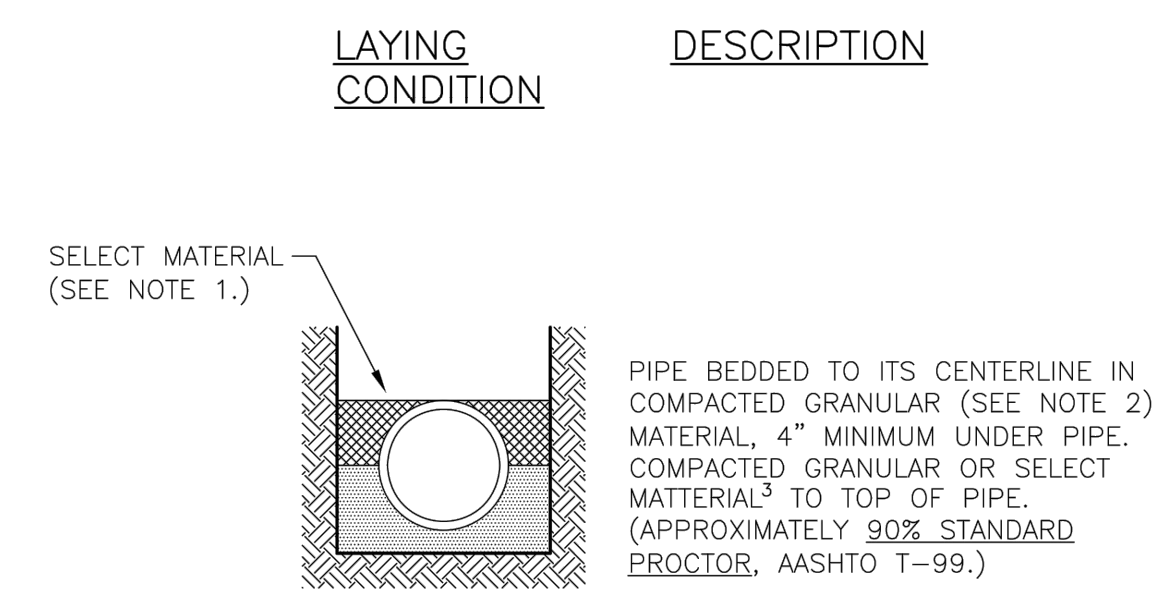
COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES



**NOTES:**  
1. SCREW-TYPE ADJUSTABLE VALVE BOX SHALL BE CAST IRON.  
2. VERTICAL ADJUSTMENT MADE BY SCREWING TOP SECTION AND/OR REPLACEMENT OF CENTER SECTION. VALVE BOX LID SHALL NOT BE CUT OR MODIFIED.

REVISIONS 06/20/2014 VALVE BOX SCREW TYPE ADJUSTABLE DRWG. NO. D-475

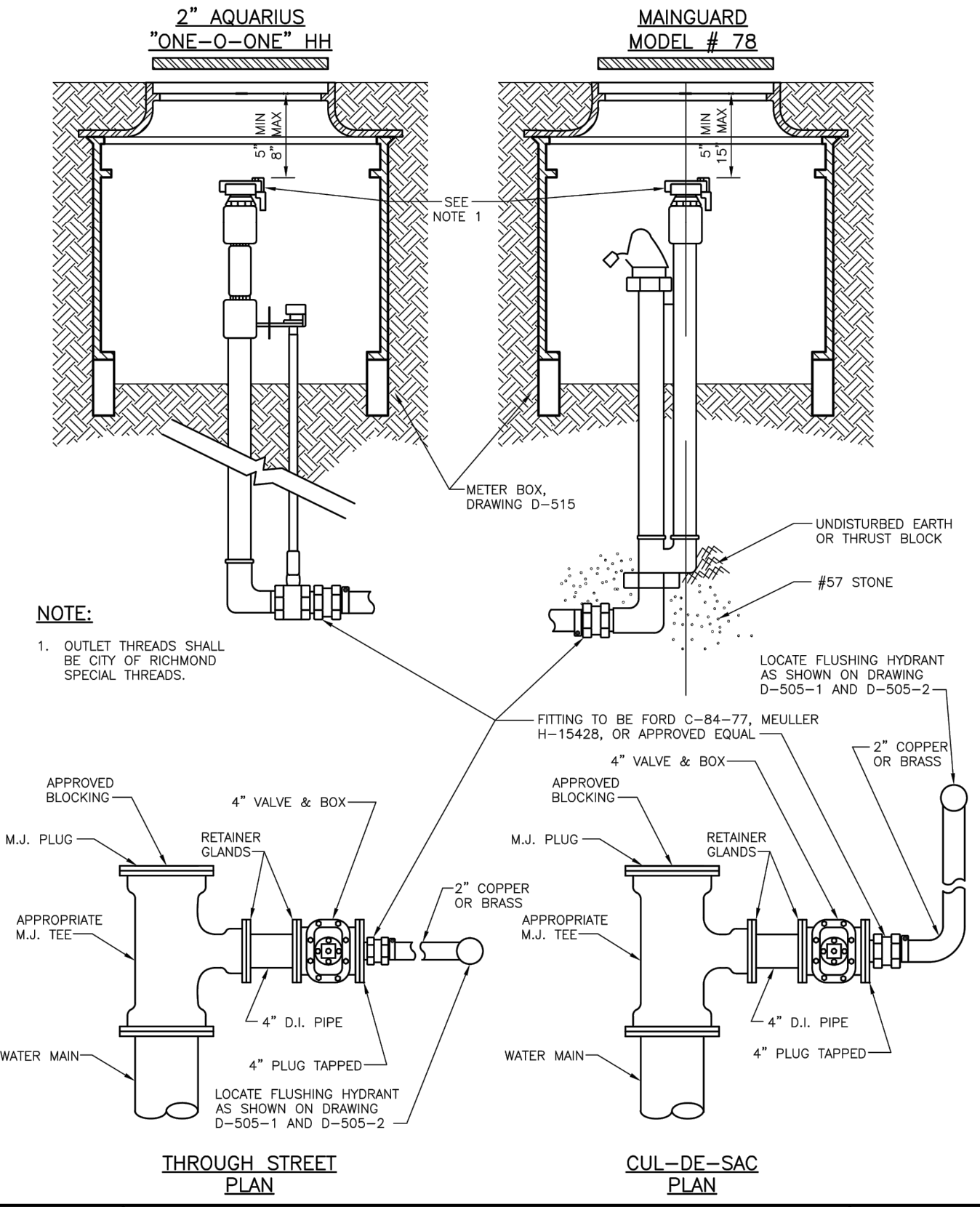
COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES



**NOTES:**  
1. "SELECT MATERIAL" IS DEFINED AS NATIVE SOIL EXCAVATED FROM THE TRENCH, FREE OF ROCKS, FOREIGN MATERIAL AND FROZEN EARTH.  
2. GRANULAR MATERIALS ARE DEFINED PER AASHTO SOIL CLASSIFICATION SYSTEM (ASTM D3282) OR THE UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487), WITH THE EXCEPTION THAT GRAVEL BEDDING/BACKFILL ADJACENT TO THE PIPE IS LIMITED TO 2" MAXIMUM PARTICLE SIZE PER ANSI/AWWA C600.

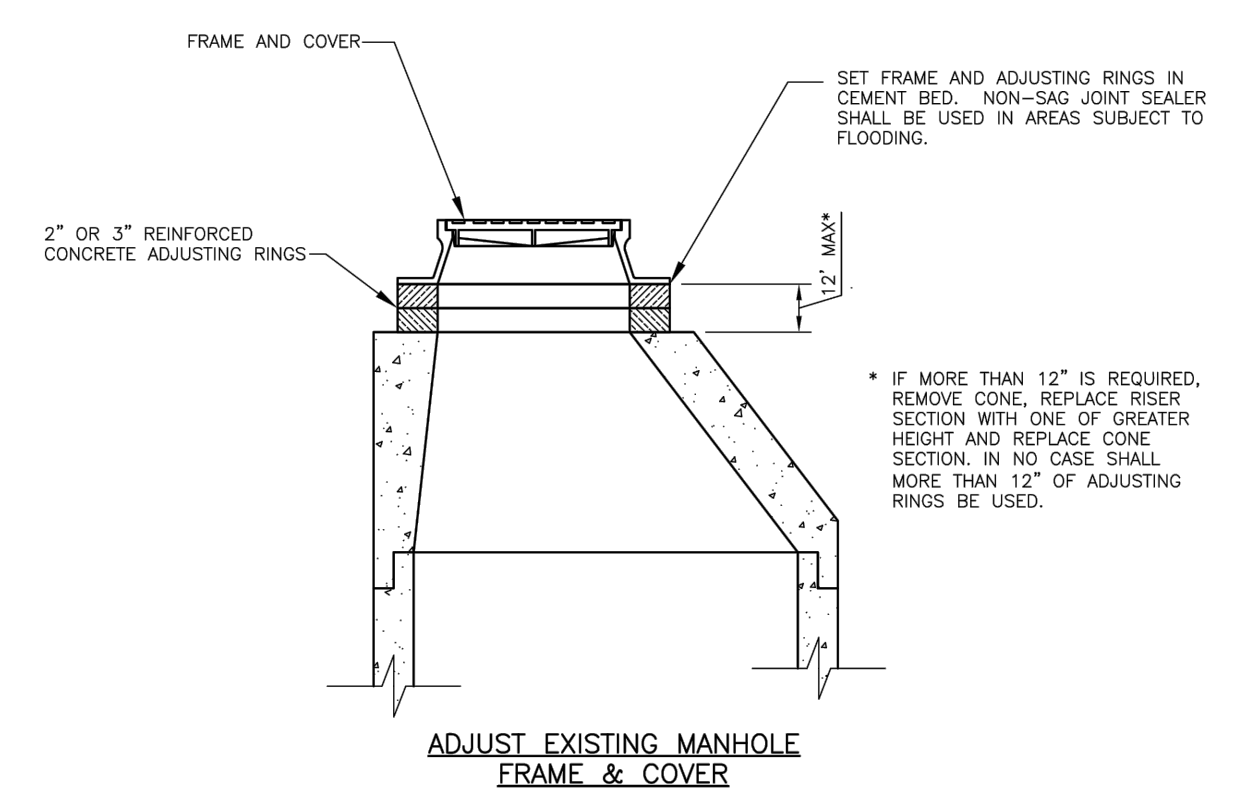
REVISIONS 06/20/2014 DUCTILE IRON PIPE TRENCH BEDDING DRWG. NO. D-730

COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES



REVISIONS 06/20/2014 FLUSHING HYDRANT DRWG. NO. D-500

COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES



REVISIONS 06/20/2014 ADJUST EXISTING MANHOLE FRAME & COVER DRWG. NO. D-165

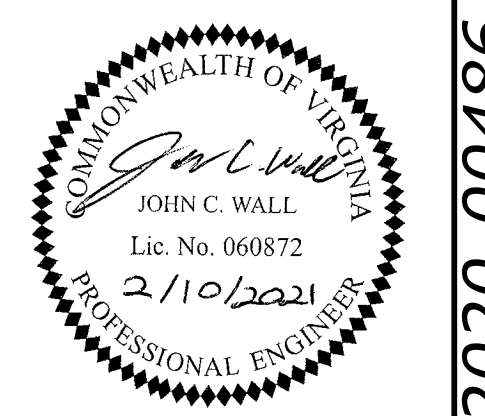
COUNTY OF HENRICO  
DEPARTMENT OF PUBLIC UTILITIES

TABLE 710.1  
MINIMUM NARROW TRENCH WIDTH

NOMINAL PIPE SIZE	MINIMUM TRENCH WIDTH			
	INCHES	MM	NO OF PIPE DIAMETERS (O.D.)	INCHES
4	100	4.3	18	455
6	150	2.9	18	455
8	200	2.9	24	610
10	250	2.5	26	660
12	300	2.4	30	760
15	380	2.0	30	760
18	475	1.8	32	815
21	560	1.6	34	865
24	630	1.5	36	915
27	710	1.5	40	1020
30	762	1.4	42	1067
33	838	1.4	45	1143
36	915	1.4	48	1219
42	1067	1.4	54	1372
48	1219	1.3	60	1524

**NOTE:**  
1. MINIMUM TRENCH WIDTHS ARE INTENDED TO PROVIDE ADEQUATE SPACING BETWEEN PIPE AND TRENCH WALL FOR PROPER PLACING AND COMPACTION OF HAUNCHING MATERIAL.

REVISIONS 06/20/2014 PVC PIPE TRENCH BEDDING DRWG. NO. D-710-2



THIS DRAWING PREPARED AT THE  
**TRI-CITIES OFFICE**  
4701 Owens Way, Suite 900 | Prince George, VA 23875  
TEL 804-541-1660 FAX 804-486-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020	PLANNING COMMISSION SUBMITTAL
2/10/2021	REVISIONS PER COUNTY COMMENTS

DATE 11/16/2020  
DRAWN BY D. ELLIS  
DESIGNED BY J. WALL  
CHECKED BY K. HALPAUS  
SCALE NONE

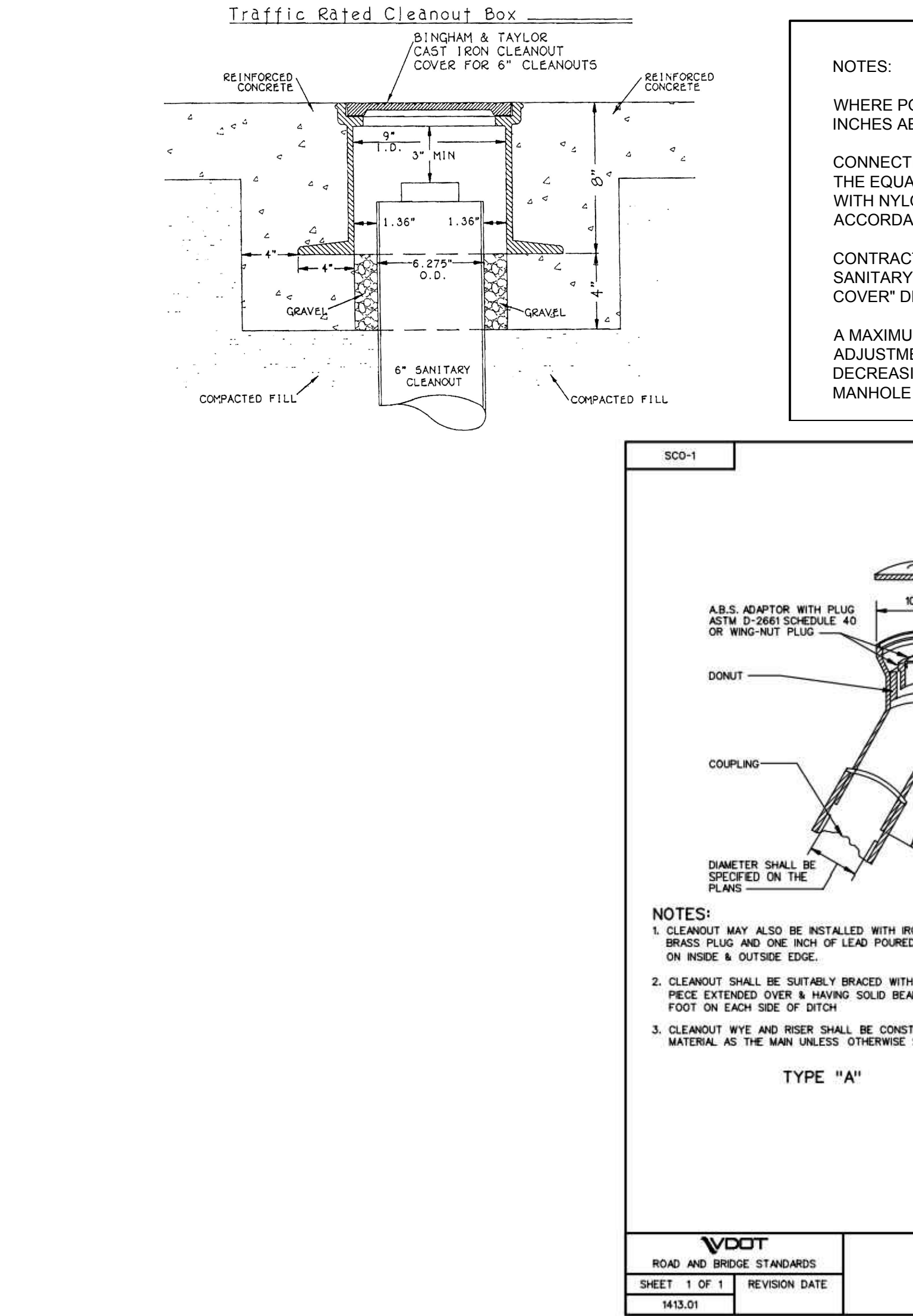
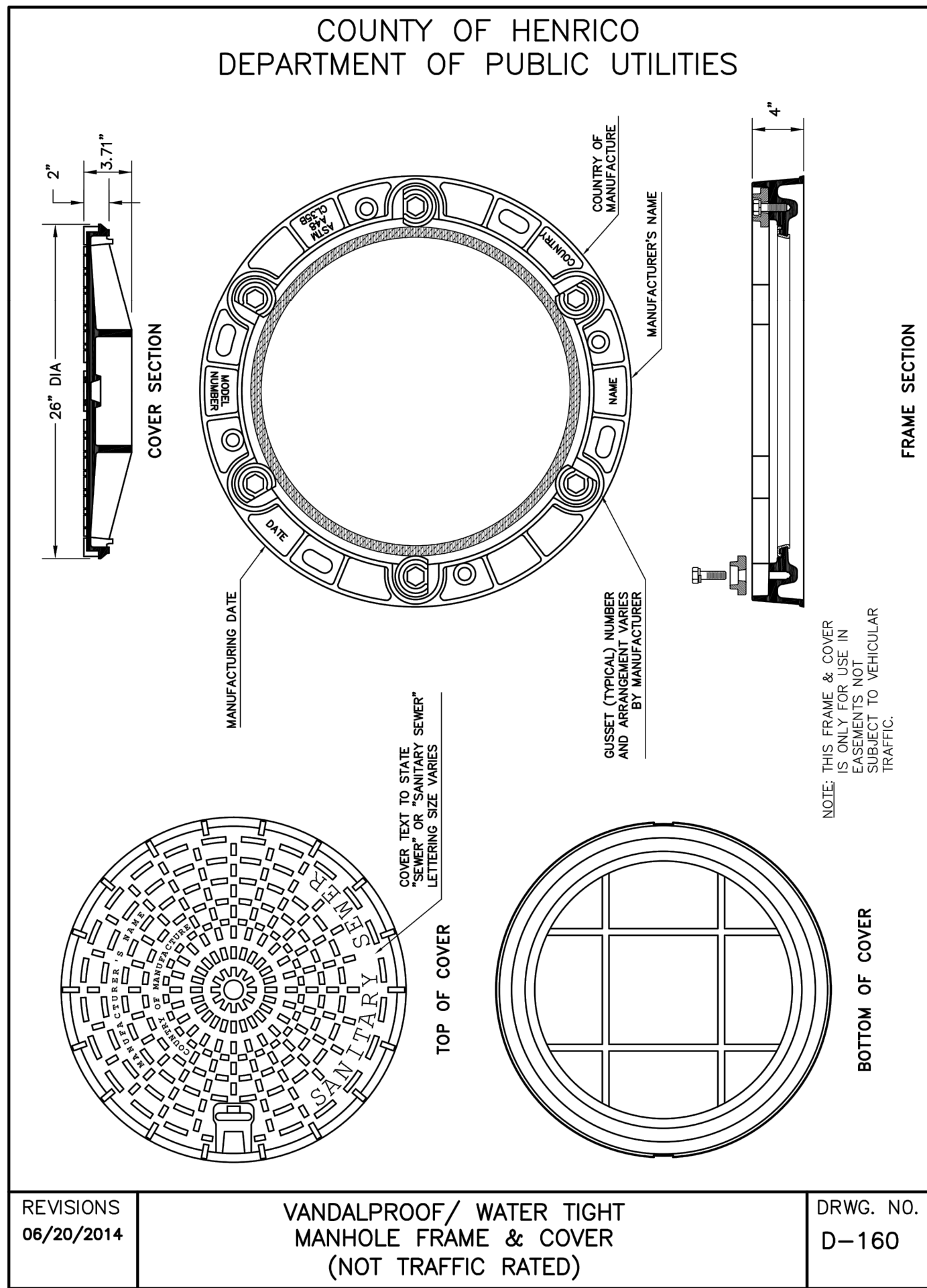
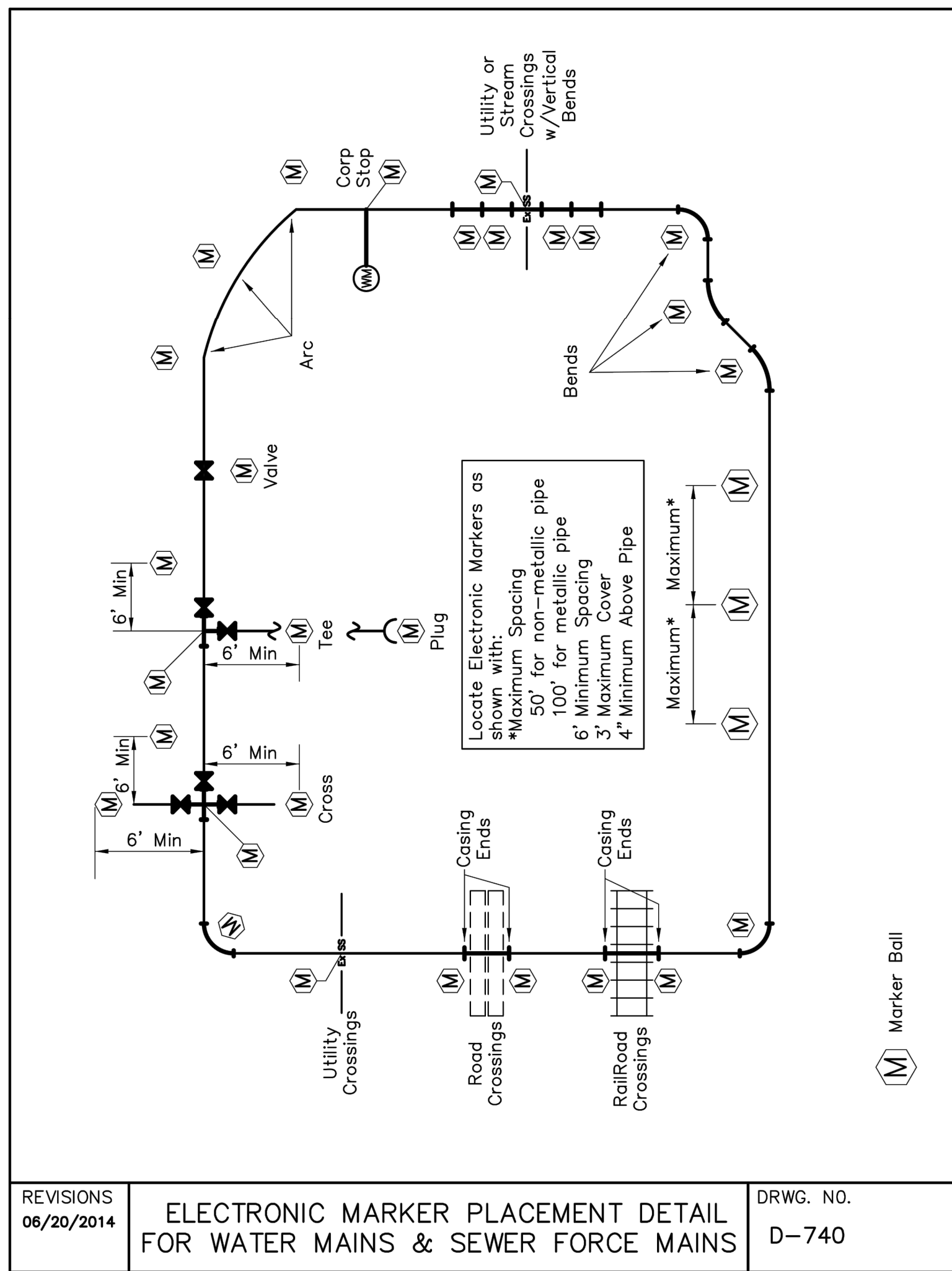
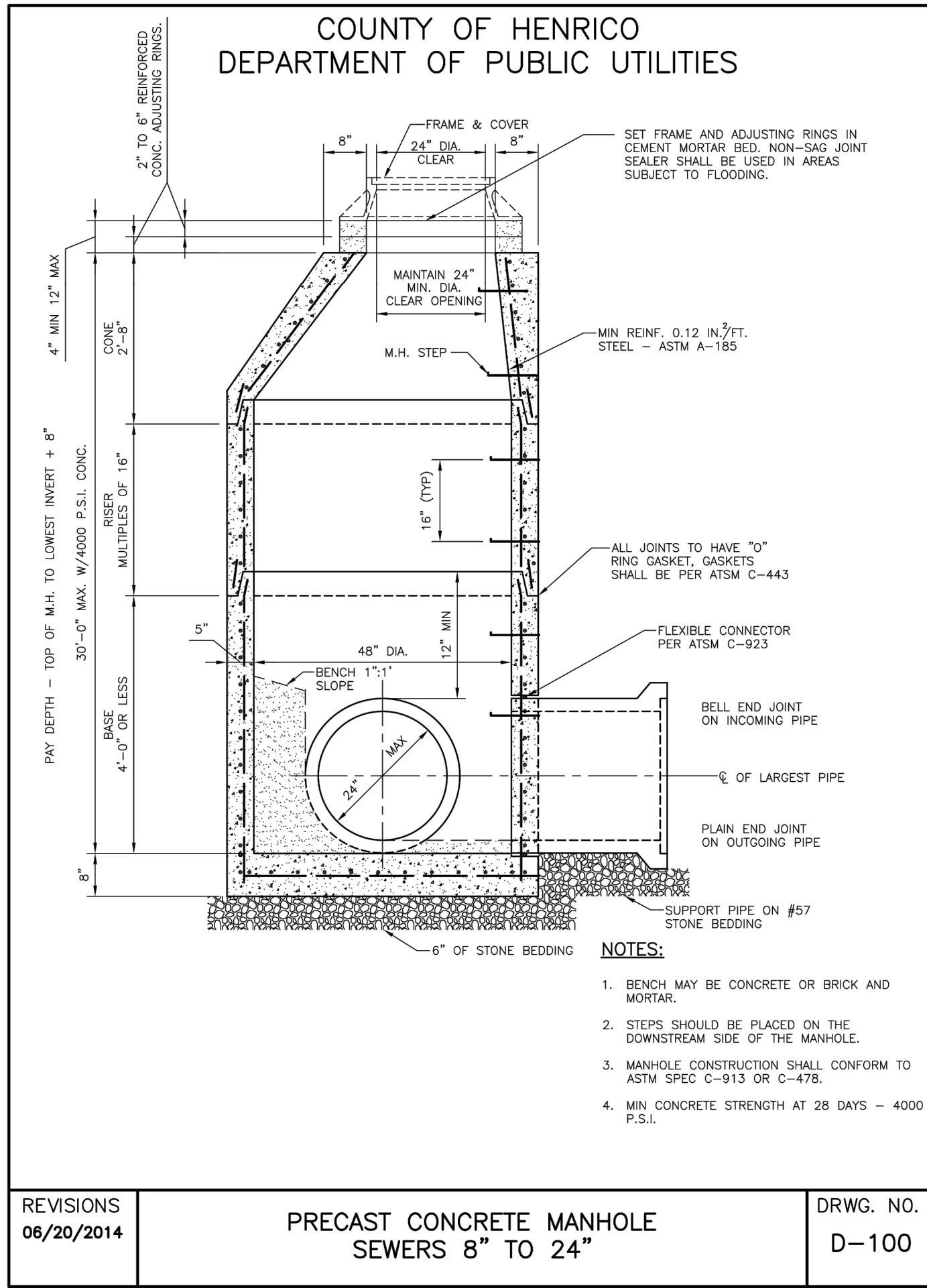
**TIMMONS GROUP**

LAKEMOOD MANOR - COTTAGES - PHASE 2  
TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
UTILITY NOTES AND DETAILS

JOB NO. 46579  
SHEET NO. C1.8

P.O.D. #2020-00486

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.



**MATERIAL NOTES**

**Sanitary Sewer Line**

- PVC plastic pipe shall meet requirements of ASTM D-3034 type PSM SDR-35 for sizes 4-inch through 15-inch and ASTM F-679 for pipe sized 18-inch through 27-inch with elastomeric gasket joints meeting requirements of ASTM D3212.
- Ductile iron pipe (D.I.) shall meet the requirements of AWWA C-151 for the pressure and thickness classes shown on the Drawings. Pipe shall have a cement-mortar lining and an asphaltic seal coat. Thickness classes shall meet the requirements of AWWA C-150, Class 50.
- Pipe bedding for gravity sewer lines shall be in accordance with D-710-1, D-710-2, D-720, or D-730 as required for the pipe material.

**Water Line**

- PVC plastic pipe shall meet the requirement of AWWA C900, Table 2, (Cast Iron OD) Class 150 except that all connections shall be made using elastomeric gasket joints. No PVC pipe larger than 8" shall be used for water lines.
- Ductile iron pipe shall be AWWA C-151 for pressure and thickness class shown on the Drawings. Thickness classes shall meet the requirements of AWWA C-150. All pipe shall have a cement-mortar lining on the interior and an asphaltic seal coat on the exterior. Minimum thickness shall be Class 52 for 12-inch and smaller, and Class 51 for 16-inch and larger.
- Pipe bedding for pressure lines shall be in accordance with D-710-1, D-710-2, D-720, or D-730 as required for the pipe material.

**FLOW TEST RESULTS**

AVAILABLE FLOW IN THE 8" WATER LINE AT 1900 LAUDERDALE DRIVE, AT THE EXISTING FLOWMETER #WHY007196:

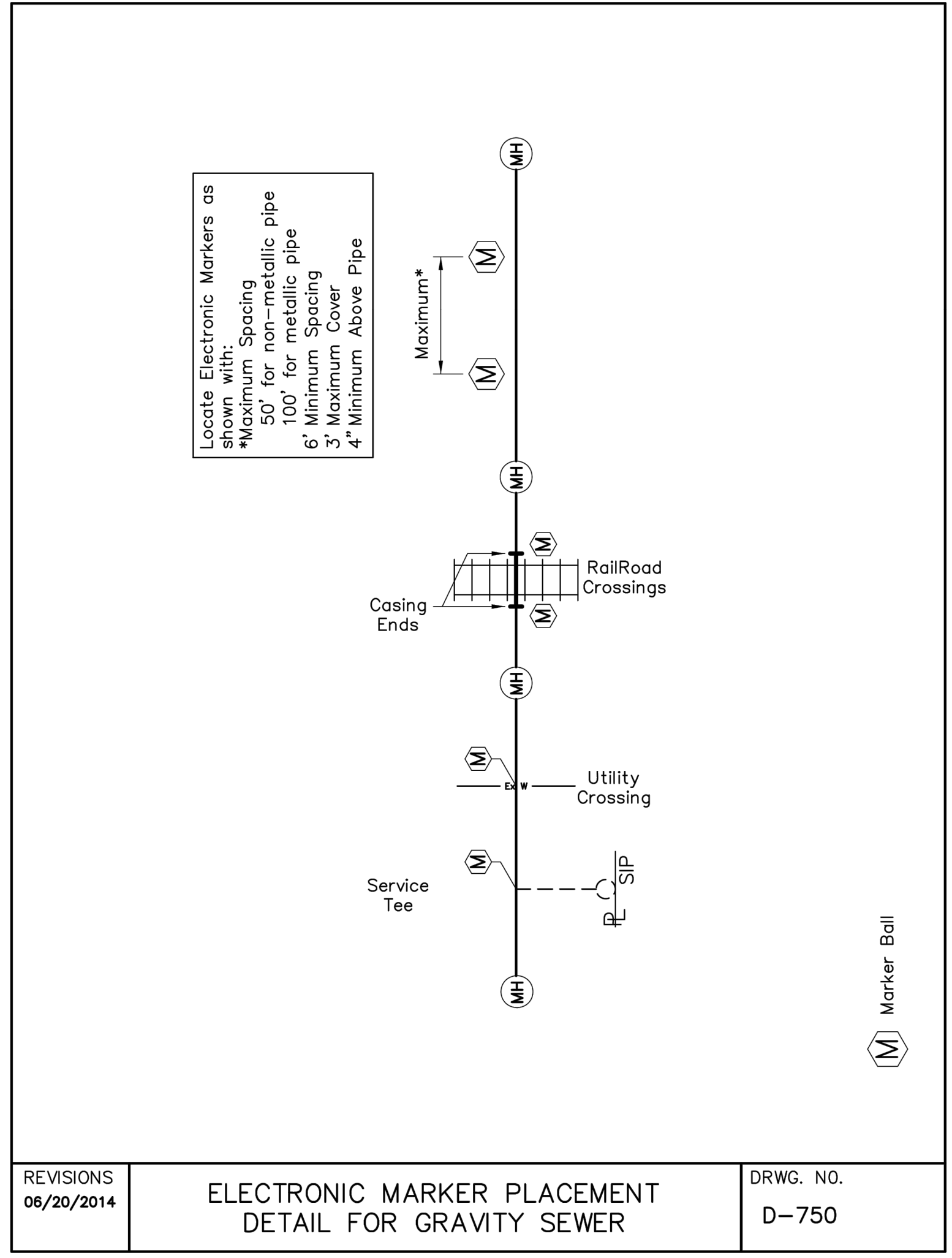
77 PSI STATIC AT ELEVATION 166  
71 PSI @ 1000 GPM  
65 PSI @ 1500 GPM  
58 PSI @ 2000 GPM

**NOTE:**

- ELECTRONIC MARKERS (BALL TYPE) SHALL BE INSTALLED ON ALL WATER MAINS AND SEWER GRAVITY MAINS IN ACCORDANCE WITH SPECIFICATION 2.2.05N AND 4.2.02E OF THE 2014 DPU DESIGN AND CONSTRUCTION STANDARDS.

**WATER AND SEWER NOTES**

- All construction materials and installation shall conform to the latest edition of "Standards, Department of Public Utilities" (DPU), County of Henrico, Virginia.
- Contractor shall be responsible for notifying the DPU Construction Division to schedule a pre-construction meeting at least 48 hours prior to starting any work on this project. Contractor shall obtain all necessary permits.
- Contractor shall include in applicable bid price, cost of locating and uncovering all sewer manholes and valve boxes after completion of all paving and to adjust them to the final road grades. Contractor shall also be responsible for cleaning out sewer mains for final inspection, if necessary.
- Existing utilities across or along the line of the proposed work are shown only in an approximate location on the plans. Contractor shall, on his own initiative and no additional cost, locate all underground lines and structures as necessary. Contractor shall call "Miss Utility" at 811 prior to construction. Contractor will be responsible for any damage to underground lines or structures.
- Datum for all elevations shown is National Geodetic Survey NAVD 88.
- Minimum cover over top of water pipe must be 3.50 feet.
- Service saddles must be used on water connections to PVC mains less than 6" in diameter.
- Fire hydrants shall be installed in accordance with DPU Standard Drawing D-495-1 and D-495-2.
- Engineer shall certify that unpaved streets are to subgrade prior to Contractor installing water system. Curb and gutter, if required, shall be installed prior to acceptance of water system by County.
- No structures or planting of trees shall be permitted in utility easements.
- Vandal proof/watertight covers shall be used on all manholes in easements and in flood plains. The manhole covers shall be in accordance with DPU Standard Drawings D-150, D-155, and D-160.
- Final Acceptance by County shall not be made until all work shown on approved utility plans is completed including paving, grading, and all required adjustments.
- A Wetlands Permit may be required from the U.S. Army Corps of Engineers for this project. For information concerning such requirement, contact the Corps at (804) 462-5382.
- DPU will inspect all water and sanitary sewer mains, connections, and appurtenances thereto, as shown on the approved utility plans, located within dedicated easements and/or Public Rights-of-Way. Furthermore, DPU will inspect all private sewer mains through the last manhole. All other lines to be installed on site to serve roof drainage, water supply, and sanitary sewers shall be approved by the Department of Building Inspections prior to installation and shall be inspected by Building Inspections before covering.
- Concurrent inspections by Building Inspections and DPU will be performed for the following: Mainline backflow preventers; monitoring manholes; grease traps; exclusion meters; irrigation meters. DPU will inspect to insure that the proper type facility, as shown on the approved utility plans, has been installed and tested in accordance with DPU Standards.



**TIMMONS GROUP**

**LAKWOOD MANOR - COTTAGES - PHASE 2**  
TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA

**UTILITY NOTES AND DETAILS**

THIS DRAWING PREPARED AT THE  
**TRICITIES OFFICE**  
4701 Owens Way, Suite 900 | Prince George, VA 23875  
TEL 804-541-1660 FAX 804-458-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020	PLANNING COMMISSION SUBMITTAL
2/10/2021	REVISIONS PER COUNTY COMMENTS

DATE: 11/16/2020

DRAWN BY: D. ELLIS

DESIGNED BY: J. WALL

CHECKED BY: K. HALPAUS

SCALE: NONE

JOB NO. 46579

SHEET NO. C1.9

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.

**P.O.D. #2020-00486**

S:\10046579-Lakewood\_Cottages\DWG\SheetCD\46579-C1.10.WVAE.dwg | Printed on 21/10/2021 2:18 PM | by DJ.Ellis



COMMONWEALTH OF VIRGINIA  
COUNTY OF HENRICO

TERRELL HUGHES, P.E.  
DIRECTOR OF PUBLIC WORKS  
COUNTY ENGINEER  
(804) 501-4393

October 27, 2020

Mr. Jason Mullins, P.E.  
TIMMONS GROUP  
1001 Boulders Parkway, Suite 300  
Richmond, Virginia 23225

RE: Lakewood Manor Satellite Parking - POD2020-00233 - Sidewalk Waiver Request

Dear Mr. Mullins:

Reference is made to your letter dated September 30, 2020 concerning the above-referenced project.

We have reviewed your request for a waiver of the County policy regarding sidewalk along Lauderdale Drive for the proposed Satellite Parking at Lakewood Manor. The Public Works Design Manual Section 2-25 Sidewalk states that a sidewalk shall be constructed on one side of all collector and arterial roadways located within one mile of an existing school.

With your latest plan, your request is to waive this requirement for a sidewalk on the Lakewood Manor side of Lauderdale Drive as a sidewalk exists today on the other side that serves the area. As Carver Elementary School is within one mile of said property and; confirming site conditions, an adequate sidewalk does exist along the northern side of Lauderdale Drive, this waiver request can be supported and approved.

With this letter, your request for a waiver requiring sidewalk along your frontage of Lauderdale Drive is granted. This approval is tied to your latest site plan submitted to the County for POD2020-00233.

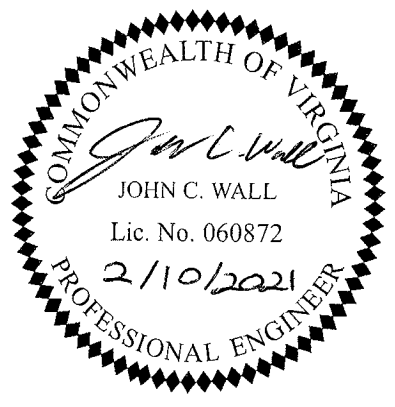
Should you have any questions or require additional information, please contact this office.

Sincerely yours,

Terrell Hughes, P.E.  
Director of Public Works

pc: Gary DuVal, Traffic Engineering  
Brandon House, Traffic Engineering

P.O. BOX 90775/HENRICO, VIRGINIA 23273-0775  
FAX (804) 501-7470



THIS DRAWING PREPARED AT THE  
**TRI-CITIES OFFICE**  
470 Owens Way, Suite 900 | Prince George, VA 23875  
TEL 804-541-1600 FAX 804-486-1311 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020	PLANNING COMMISSION SUBMITTAL
2/10/2021	REVISIONS PER COUNTY COMMENTS

DATE  
11/16/2020

DRAWN BY  
D. ELLIS

DESIGNED BY  
J. WALL

CHECKED BY  
K. HALPAUS

SCALE  
NONE

**TIMMONS GROUP**

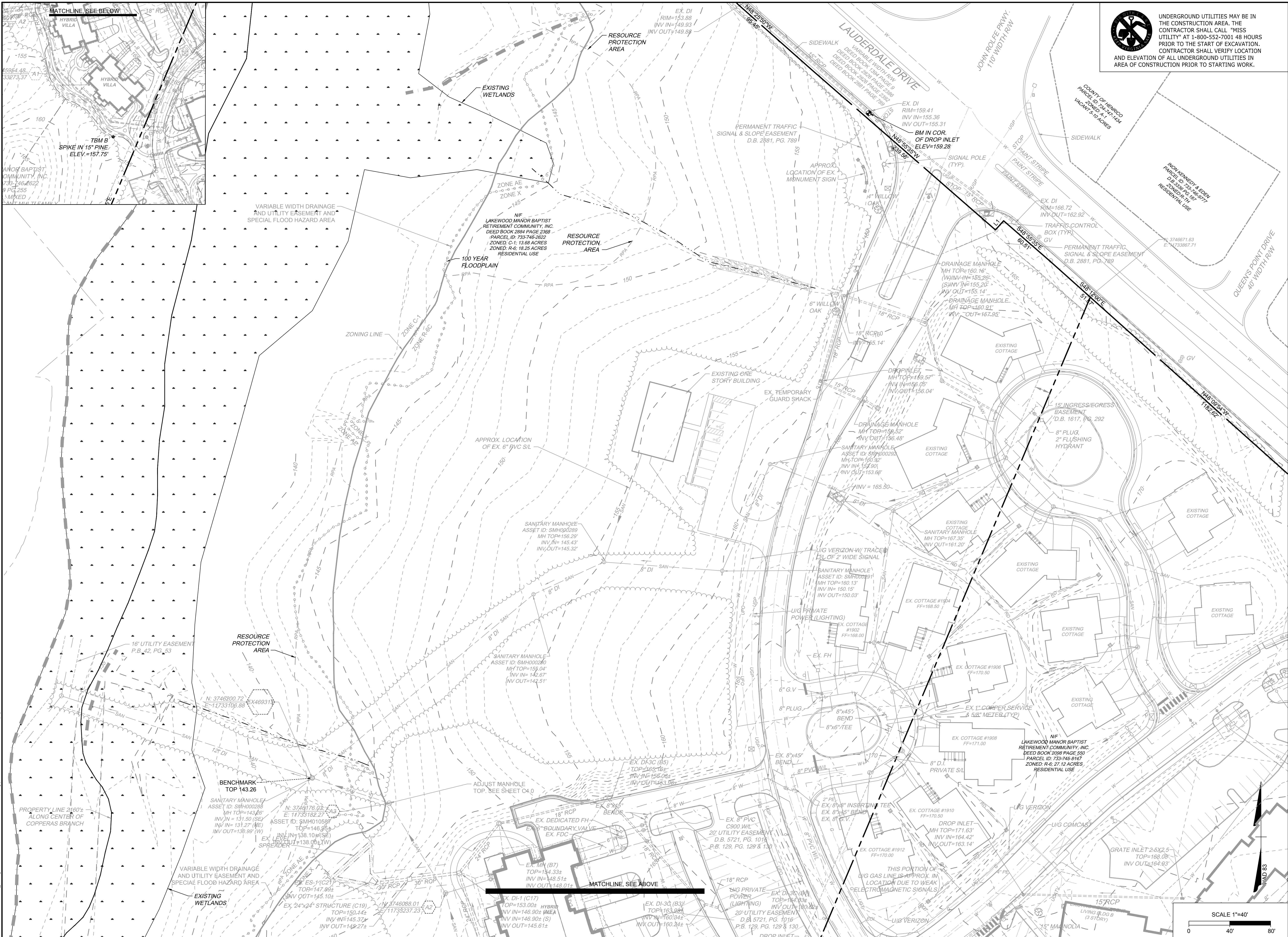
**LAKWOOD MANOR - COTTAGES - PHASE 2**  
TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
**WAIVERS AND EXCEPTIONS**


JOB NO.  
46579

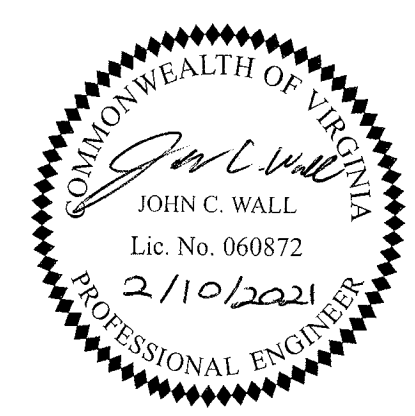
SHEET NO.  
C1.10

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.

P.O.D. #2020-00486




 UNDERGROUND UTILITIES MAY BE IN THE CONSTRUCTION AREA. THE CONTRACTOR SHALL CALL "MISS UTILITY" AT 1-800-552-7001 48 HOURS PRIOR TO THE START OF EXCAVATION. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES IN AREA OF CONSTRUCTION PRIOR TO STARTING WORK.



THIS DRAWING PREPARED AT THE  
**TRI-CITIES OFFICE**  
 470 Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-541-1600 FAX 804-456-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.  
 DATE: 12/17/2020  
 PLANNING COMMISSION SUBMITTAL: 2/10/2021  
 REVISIONS PER COUNTY COMMENTS:

DATE: 11/16/2020  
 DRAWN BY: D. ELLIS  
 DESIGNED BY: J. WALL  
 CHECKED BY: K. ALPAUS  
 SCALE: 1" = 40'

# TIMMONS GROUP

**LAKEWOOD MANOR - COTTAGES - PHASE 2**  
 TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
**EXISTING CONDITIONS**

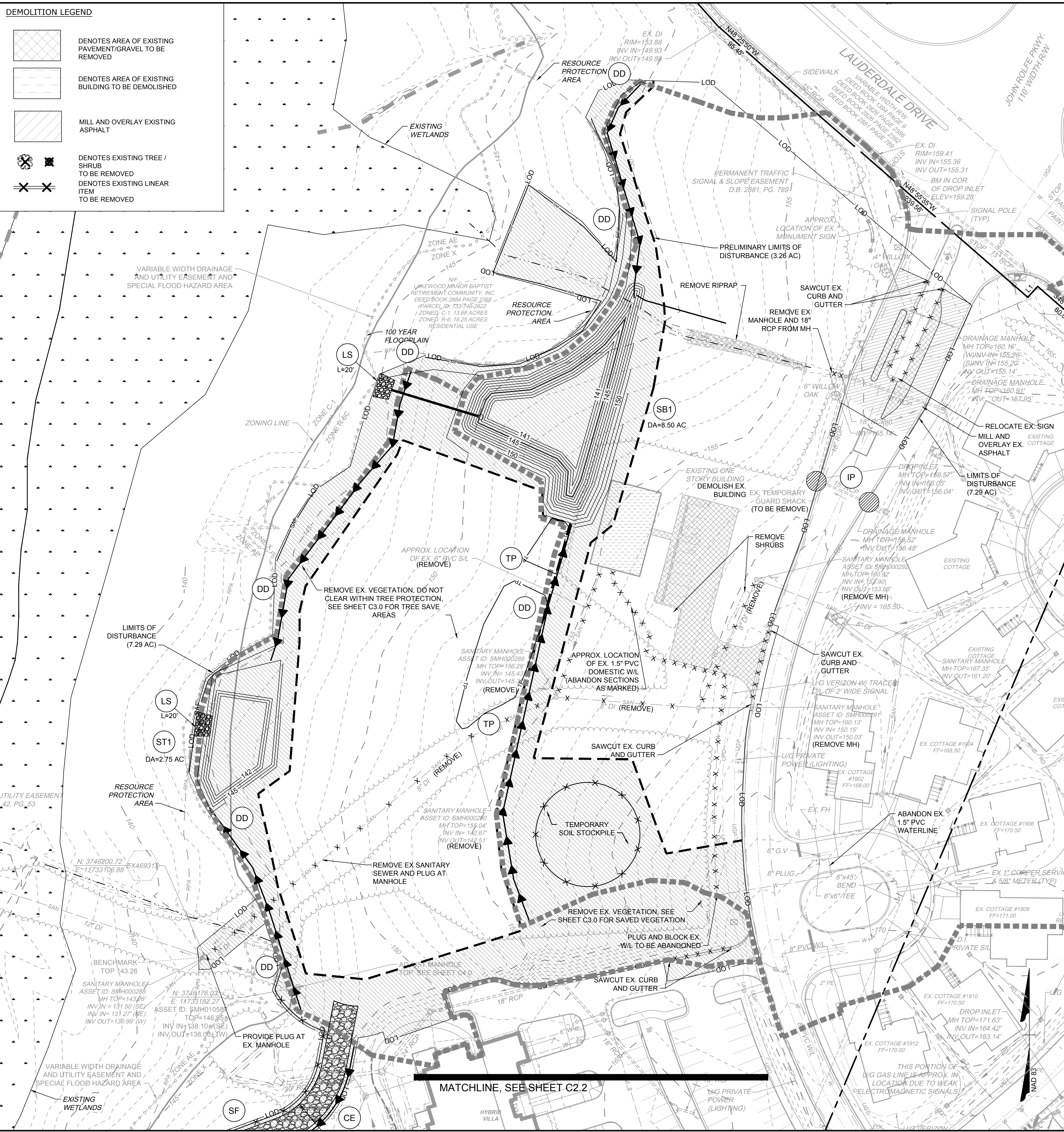
JOB NO. 46579  
 SHEET NO. C2.0

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.

P.O.D. #2020-00486

**DEMOLITION LEGEND**

	DENOTES AREA OF EXISTING PAVEMENT/GRAVEL TO BE REMOVED
	DENOTES AREA OF EXISTING BUILDING TO BE DEMOLISHED
	MILL AND OVERLAY EXISTING ASPHALT
	DENOTES EXISTING TREE / SHRUB TO BE REMOVED
	DENOTES EXISTING LINEAR ITEM TO BE REMOVED



- PHASE I SEQUENCE OF CONSTRUCTION**
1. THE CONTRACTOR IS RESPONSIBLE FOR ARRANGING A MEETING WITH THE OWNER, HENRICO COUNTY ENVIRONMENTAL INSPECTOR, AND NOTIFYING THE HENRICO COUNTY DEPARTMENT OF PUBLIC WORKS 48 HOURS PRIOR TO ANY LAND DISTURBING ACTIVITIES. IF CONSTRUCTION DOES NOT COMMENCE FOR 180 DAYS FOLLOWING THE PRE-CONSTRUCTION MEETING OR IF THE PROJECT IS DORMANT FOR 180 DAYS DURING THE CONSTRUCTION PHASE, A NEW PRE-CONSTRUCTION MEETING IS REQUIRED BEFORE CONSTRUCTION CAN RE-START.
  2. ORANGE SAFETY FENCE IS REQUIRED AT THE LIMITS OF THE RPA BUFFER SHOWN ON THIS SHEET. THE FENCE ALSO MUST BE INSTALLED AROUND THE LIMITS OF DISTURBANCE FOR ALL ENCROACHMENTS/IMPACTS WITHIN THE RPA BUFFER. THE ORANGE SAFETY FENCE AND TREE PROTECTION TAPE SHOULD BE INSTALLED PRIOR TO THE PRE-CONSTRUCTION MEETING.
  3. A PRE-CONSTRUCTION MEETING WITH THE ENVIRONMENTAL INSPECTOR MUST OCCUR PRIOR TO ANY LAND DISTURBANCE ON THE SITE.
  4. THE SITE MUST BE REGISTERED AND A LAND DISTURBANCE PERMIT MUST BE ISSUED PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. A COPY OF THE REGISTRATION STATEMENT MUST BE KEPT ON-SITE FOR THE DURATION OF CONSTRUCTION.
  5. CONTRACTOR TO COORDINATE WORK AROUND EXISTING UTILITIES WITH THE CORRESPONDING UTILITY COMPANIES.
  6. ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE CURRENT EDITION OF THE VESIC HANDBOOK AND VIRGINIA EROSION AND SEDIMENT CONTROL REGULATION 9VAC25-840.
  7. ALL MATERIAL HAULED OFF-SITE SHALL BE TAKEN TO AN AUTHORIZED SITE WITH AN ACTIVE ESC PLAN.
  8. START CLEARING, GRUBBING AND DEMOLITION AS NEEDED IN ORDER TO INSTALL PHASE 1 EROSION CONTROL MEASURES. WORK SHALL BE LIMITED TO THE PRELIMINARY LIMITS OF DISTURBANCE.
  9. INSTALL CONSTRUCTION ENTRANCE.
  10. INSTALL PERIMETER EROSION CONTROL MEASURES INCLUDING SILT FENCING, INLET PROTECTION, AND TREE PROTECTION AS PER PLAN.
  11. INSTALL DIVERSION DIKES, TEMPORARY SEDIMENT TRAP AND TEMPORARY SEDIMENT BASIN.
  12. ALL DIVERSIONS, SEDIMENT TRAPS, SEDIMENT BASINS, AND STOCKPILES MUST BE SEEDED AND MULCHED IMMEDIATELY UPON CONSTRUCTION.
  13. THE CONTRACTOR SHALL INSPECT ALL E&S CONTROL MEASURES AND REPAIR / REPLACE IF NECESSARY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES DEEMED NECESSARY BY THE DEPARTMENT OF PUBLIC WORKS.
  14. NO LAND DISTURBANCE OUTSIDE PRELIMINARY LIMITS OF DISTURBANCE SHALL TAKE PLACE UNTIL AUTHORIZED BY THE HENRICO COUNTY ENVIRONMENTAL INSPECTOR.
  15. PROCEED WITH DEMOLITION AND REMOVAL OF EXISTING SITE FEATURES AS INDICATED ON THIS SHEET.
  16. ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
  17. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.
  18. ANY SOIL STOCKPILES ARE TO BE SURROUNDED BY SILT FENCE AND SEEDED FOR STABILIZATION IF TO BE LEFT UNDISTURBED FOR MORE THAN 7 DAYS.
  19. NO EROSION AND SEDIMENT CONTROLS CAN BE REMOVED WITHOUT APPROVAL OF THE ENVIRONMENTAL INSPECTOR FOR THE PROJECT.
  20. CONTRACTOR TO PROVIDE ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES DOWNSTREAM IF DEEMED NECESSARY.
  21. IF CONSTRUCTION DOES NOT COMMENCE FOR 180 DAYS FOLLOWING THE PRE-CONSTRUCTION MEETING OR IF THE PROJECT IS DORMANT FOR 180 DAYS DURING THE CONSTRUCTION PHASE, A NEW PRE-CONSTRUCTION MEETING IS REQUIRED BEFORE CONSTRUCTION CAN RE-START.

**DEMOLITION NOTES:**  
 ALL ITEMS IN BOLD PRINT TO BE DEMOLISHED OR REMOVED AS INDICATED ON THIS PLAN SHEET AND SHALL BE EXCAVATED ACCORDING TO THE GRADING PLAN AND PAVEMENT DETAILS.

CONTRACTOR WILL TAKE MEASURES NECESSARY TO PROTECT EXISTING UTILITIES AND OTHER REMAINING STRUCTURES DURING DEMOLITION AND CONSTRUCTION PHASES.

ASPHALT, CONCRETE, AND OTHER DEBRIS SHALL BE DISPOSED OF AT AN APPROVED LANDFILL LOCATION OR AS DIRECTED BY OWNER.

ALL PHASE I ESC MEASURES WILL BE INSTALLED AND APPROVED BY THE ENVIRONMENTAL INSPECTOR PRIOR TO START OF DEMOLITION WORK.

**NOTES:**  
 NO DEMOLITION WORK MAY BE PERFORMED UNTIL ALL INITIAL E&S CONTROLS HAVE BEEN INSTALLED.

ALL WATER AND SANITARY SEWER IS TO BE ABANDONED CONSISTENT WITH DPU SPEC. 1.4.01C AND 10.3.10.

THE CONTRACTOR PERFORMING ANY WORK ON THE FIRE PROTECTION SYSTEM OR THE WATER MAINS THAT PROVIDE THE WATER SUPPLY TO THE FIRE PROTECTION SYSTEM OR THE DEDICATED FIRE HYDRANT MUST NOTIFY THE HENRICO FIRE MARSHAL'S OFFICE PRIOR TO ANY IMPAIRMENT TO THESE SYSTEMS. THE EFFECTED PROPERTY MUST BE PLACED ON A "FIRE WATCH" ACCORDING TO THE VIRGINIA STATEWIDE FIRE PREVENTION CODE AND THE PROCEDURES IDENTIFIED BY THE HENRICO FIRE MARSHAL'S OFFICE.

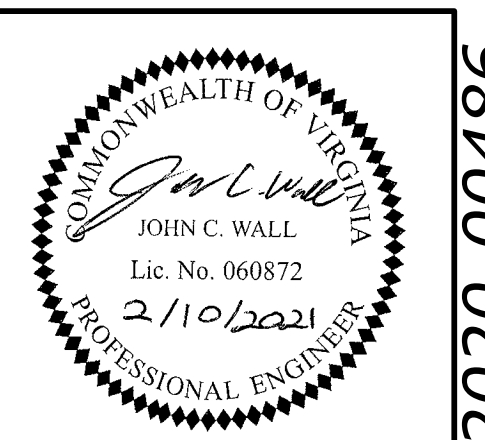
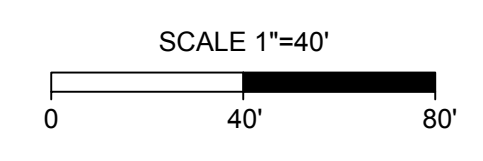
CONTRACTOR SHALL NOTIFY DPU INSPECTOR OF A DISCONNECTION SCHEDULE SO THAT DPU METERING STAFF CAN READ THE METER AND TURN OFF THE SERVICE PRIOR TO DISCONNECTION AND DPU INSPECTOR CAN VERIFY THE WORK.

THE EXISTING WATER METER AND FIRE HYDRANT TO BE REMOVED MUST BE RETURNED TO HENRICO DPU OPERATION DIVISION.

PROTECT ALL EXISTING UTILITIES AND MAINTAIN MINIMUM COVER AT ALL TIMES DURING CONSTRUCTION AND EXISTING VALVES WILL BE FLUSHED TO GRADE.

EROSION CONTROL LEGEND			
LABEL	SYMBOL	STD. NAME	SPEC.#
CE		CONSTRUCTION ENTRANCE	3.02
SF		SILT FENCE	3.05-2
SSF		SUPER SILT FENCE	3.05-1
IP		STORM DRAIN INLET PROTECTION	3.07
CIP		CULVERT INLET PROTECTION	3.08
DD		TEMPORARY DIVERSION DIKE	3.09
ST		TEMPORARY SEDIMENT TRAP	3.13
TS		TEMPORARY CULVERT CROSSING	3.24
TS		TEMPORARY SEEDING	3.31
B/M		SOIL STABILIZATION BLANKETS AND MATTING	3.36 (EC-2)
TP		TREE PRESERVATION AND PROTECTION	3.38
NA		ORANGE SAFETY FENCE	N/A
NA		PRELIMINARY LIMITS OF DISTURBANCE	N/A
NA		LIMITS OF DISTURBANCE	N/A

**ENTRANCE NOTE:** THE CONTRACTOR SHALL MAINTAIN ADEQUATE INGRESS AND EGRESS THROUGH THE ENTRANCE THROUGHOUT CONSTRUCTION, INCLUDING DURING ENTRANCE IMPROVEMENTS. A MINIMUM 10' WIDE DRIVE AISLE IN EACH DIRECTION SHALL BE MAINTAINED AND IMPACTS TO LAUDERDALE DRIVE SHALL BE MINIMIZED.



THIS DRAWING PREPARED AT THE  
**TRI-CITIES OFFICE**  
 470 Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-541-0600 FAX 804-436-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020	PLANNING COMMISSION SUBMITTAL
2/10/2021	REVISIONS PER COUNTY COMMENTS

DATE: 11/16/2020  
 DRAWN BY: D. ELLIS  
 DESIGNED BY: J. WALL  
 CHECKED BY: K. HALPAUS

SCALE: 1" = 40'

**TIMMONS GROUP**

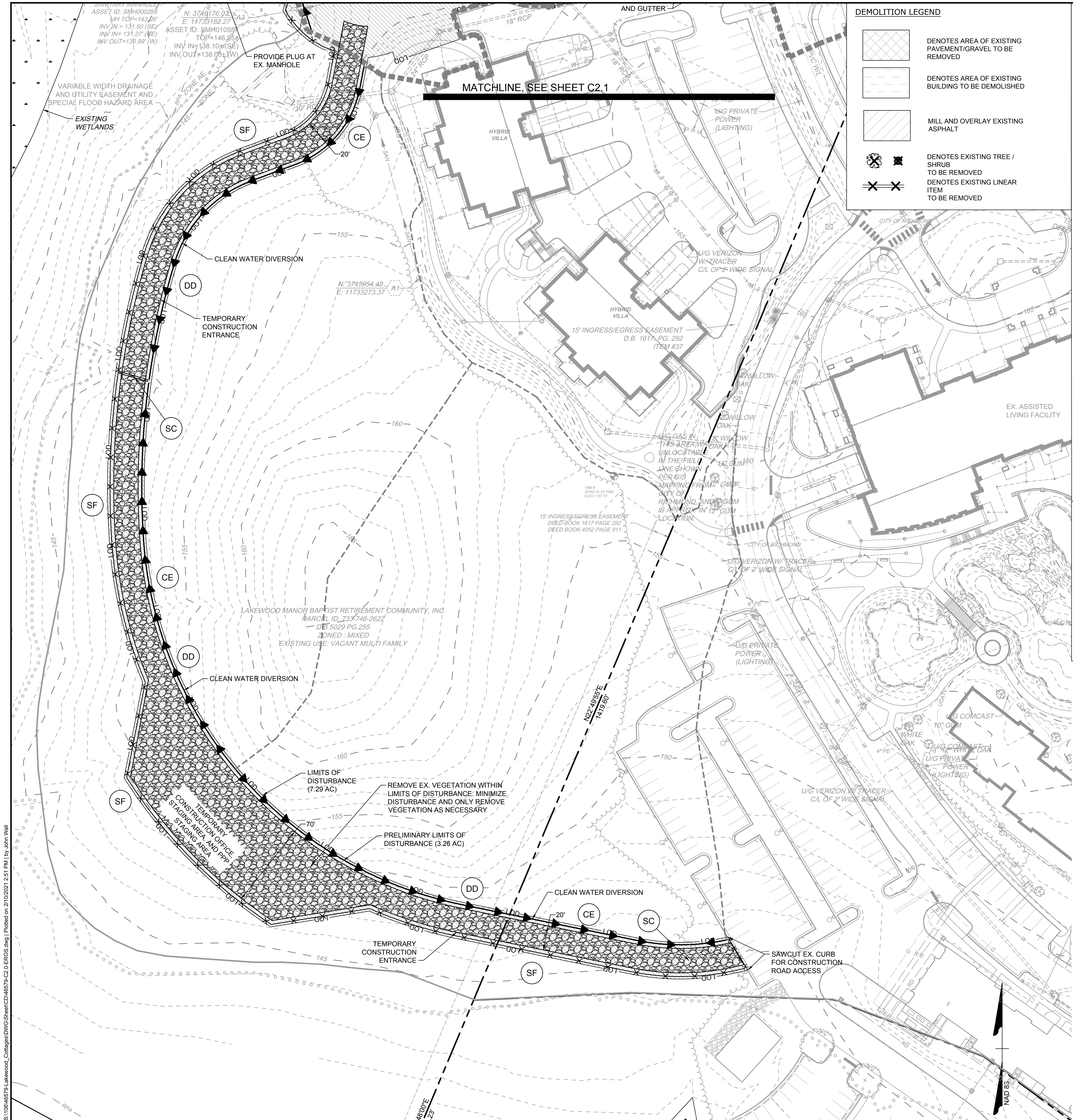
**LAKEWOOD MANOR - COTTAGES - PHASE 2**  
 LUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA

**DEMOLITION AND PHASE I EROSION AND SEDIMENT CONTROL PLAN**

JOB NO. 46579  
 SHEET NO. C2.1

P.O.D. #2020-00486

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.



**DEMOLITION LEGEND**

	DENOTES AREA OF EXISTING PAVEMENT/GRAVEL TO BE REMOVED
	DENOTES AREA OF EXISTING BUILDING TO BE DEMOLISHED
	MILL AND OVERLAY EXISTING ASPHALT
	DENOTES EXISTING TREE / SHRUB TO BE REMOVED
	DENOTES EXISTING LINEAR ITEM TO BE REMOVED

- PHASE I SEQUENCE OF CONSTRUCTION**
- THE CONTRACTOR IS RESPONSIBLE FOR ARRANGING A MEETING WITH THE OWNER, HENRICO COUNTY ENVIRONMENTAL INSPECTOR, AND NOTIFYING THE HENRICO COUNTY DEPARTMENT OF PUBLIC WORKS 48 HOURS PRIOR TO ANY LAND DISTURBING ACTIVITIES. IF CONSTRUCTION DOES NOT COMMENCE FOR 180 DAYS FOLLOWING THE PRE-CONSTRUCTION MEETING OR IF THE PROJECT IS DORMANT FOR 180 DAYS DURING THE CONSTRUCTION PHASE, A NEW PRE-CONSTRUCTION MEETING IS REQUIRED BEFORE CONSTRUCTION CAN RE-START.
  - ORANGE SAFETY FENCE IS REQUIRED AT THE LIMITS OF THE RPA BUFFER SHOWN ON THIS SHEET. THE FENCE ALSO MUST BE INSTALLED AROUND THE LIMITS OF DISTURBANCE FOR ALL ENCROACHMENTS/IMPACTS WITHIN THE RPA BUFFER. THE ORANGE SAFETY FENCE AND TREE PROTECTION TAPE SHOULD BE INSTALLED PRIOR TO THE PRE-CONSTRUCTION MEETING.
  - A PRE-CONSTRUCTION MEETING WITH THE ENVIRONMENTAL INSPECTOR MUST OCCUR PRIOR TO ANY LAND DISTURBANCE ON THE SITE.
  - THE SITE MUST BE REGISTERED AND A LAND DISTURBANCE PERMIT MUST BE ISSUED PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. A COPY OF THE REGISTRATION STATEMENT MUST BE KEPT ON-SITE FOR THE DURATION OF CONSTRUCTION.
  - CONTRACTOR TO COORDINATE WORK AROUND EXISTING UTILITIES WITH THE CORRESPONDING UTILITY COMPANIES.
  - ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED AND MAINTAINED ACCORDING TO MINIMUM STANDARDS AND SPECIFICATIONS OF THE CURRENT EDITION OF THE VESC HANDBOOK AND VIRGINIA EROSION AND SEDIMENT CONTROL REGULATION 9VAC25-840.
  - ALL MATERIAL HAULED OFF-SITE SHALL BE TAKEN TO AN AUTHORIZED SITE WITH AN ACTIVE ESC PLAN.
  - START CLEARING, GRUBBING AND DEMOLITION AS NEEDED IN ORDER TO INSTALL PHASE 1 EROSION CONTROL MEASURES. WORK SHALL BE LIMITED TO THE PRELIMINARY LIMITS OF DISTURBANCE
  - INSTALL CONSTRUCTION ENTRANCE.
  - INSTALL PERIMETER EROSION CONTROL MEASURES INCLUDING SILT FENCING, INLET PROTECTION, AND TREE PROTECTION AS PER PLAN.
  - INSTALL DIVERSION DIKES, TEMPORARY SEDIMENT TRAP AND TEMPORARY SEDIMENT BASIN.
  - ALL DIVERSIONS, SEDIMENT TRAPS, SEDIMENT BASINS, AND STOCKPILES MUST BE SEEDED AND MULCHED IMMEDIATELY UPON CONSTRUCTION.
  - THE CONTRACTOR SHALL INSPECT ALL E&S CONTROL MEASURES AND REPAIR / REPLACE IF NECESSARY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES DEEMED NECESSARY BY THE DEPARTMENT OF PUBLIC WORKS.
  - NO LAND DISTURBANCE OUTSIDE PRELIMINARY LIMITS OF DISTURBANCE SHALL TAKE PLACE UNTIL AUTHORIZED BY THE HENRICO COUNTY ENVIRONMENTAL INSPECTOR.
  - PROCEED WITH DEMOLITION AND REMOVAL OF EXISTING SITE FEATURES AS INDICATED ON THIS SHEET.
  - ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
  - THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL MEASURES PERIODICALLY AND AFTER EACH RUNOFF PRODUCING RAINFALL EVENT. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.
  - ANY SOIL STOCKPILES ARE TO BE SURROUNDED BY SILT FENCE AND SEEDED FOR STABILIZATION IF TO BE LEFT UNDISTURBED FOR MORE THAN 7 DAYS.
  - NO EROSION AND SEDIMENT CONTROLS CAN BE REMOVED WITHOUT APPROVAL OF THE ENVIRONMENTAL INSPECTOR FOR THE PROJECT.
  - CONTRACTOR TO PROVIDE ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES DOWNSTREAM IF DEEMED NECESSARY.
  - IF CONSTRUCTION DOES NOT COMMENCE FOR 180 DAYS FOLLOWING THE PRE-CONSTRUCTION MEETING OR IF THE PROJECT IS DORMANT FOR 180 DAYS DURING THE CONSTRUCTION PHASE, A NEW PRE-CONSTRUCTION MEETING IS REQUIRED BEFORE CONSTRUCTION CAN RE-START.

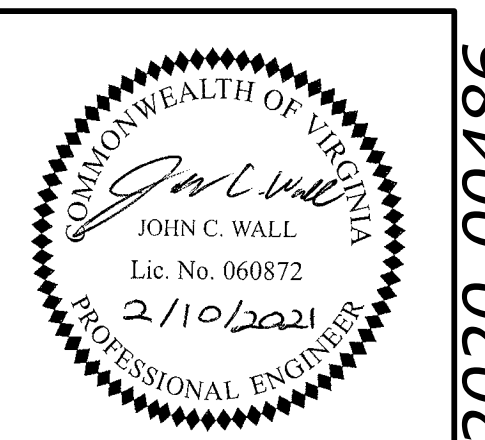
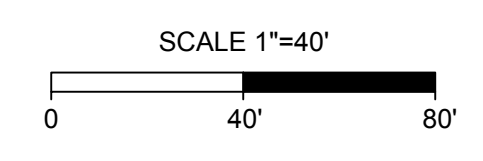
**DEMOLITION NOTES:**  
 ALL ITEMS IN BOLD PRINT TO BE DEMOLISHED OR REMOVED AS INDICATED ON THIS PLAN SHEET AND SHALL BE EXCAVATED ACCORDING TO THE GRADING PLAN AND PAVEMENT DETAILS.  
 CONTRACTOR WILL TAKE MEASURES NECESSARY TO PROTECT EXISTING UTILITIES AND OTHER REMAINING STRUCTURES DURING DEMOLITION AND CONSTRUCTION PHASES.  
 ASPHALT, CONCRETE, AND OTHER DEBRIS SHALL BE DISPOSED OF AT AN APPROVED LANDFILL LOCATION OR AS DIRECTED BY OWNER.  
 ALL PHASE I ESC MEASURES WILL BE INSTALLED AND APPROVED BY THE ENVIRONMENTAL INSPECTOR PRIOR TO START OF DEMOLITION WORK.

**EROSION CONTROL LEGEND**

LABEL	SYMBOL	STD. NAME	SPEC.#
CE		CONSTRUCTION ENTRANCE	3.02
SF		SILT FENCE	3.05-2
SSF		SUPER SILT FENCE	3.05-1
IP		STORM DRAIN INLET PROTECTION	3.07
CIP		CULVERT INLET PROTECTION	3.08
DD		TEMPORARY DIVERSION DIKE	3.09
ST		TEMPORARY SEDIMENT TRAP	3.13
TS		TEMPORARY CULVERT CROSSING	3.24
TS		TEMPORARY SEEDING	3.31
B/M		SOIL STABILIZATION BLANKETS AND MATTING	3.36 (EC-2)
TP		TREE PRESERVATION AND PROTECTION	3.38
NA		ORANGE SAFETY FENCE	N/A
NA		PRELIMINARY LIMITS OF DISTURBANCE	N/A
NA		LIMITS OF DISTURBANCE	N/A

**PAVEMENT SECTIONS LEGEND**

DESCRIPTION	HATCH PATTERN	PAVEMENT SECTION
GRAVEL ACCESS		8" VDOT #1 COARSE AGGREGATE COMPACTED SUBGRADE



THIS DRAWING PREPARED AT THE  
**TRICITIES OFFICE**  
 470 Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-541-0600 FAX 804-456-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020	PLANNING COMMISSION SUBMITTAL
2/10/2021	REVISIONS PER COUNTY COMMENTS

DATE: 11/16/2020  
 DRAWN BY: D. ELLIS  
 DESIGNED BY: J. WALL  
 CHECKED BY: K. HALPAUS  
 SCALE: 1" = 40'

**TIMMONS GROUP**

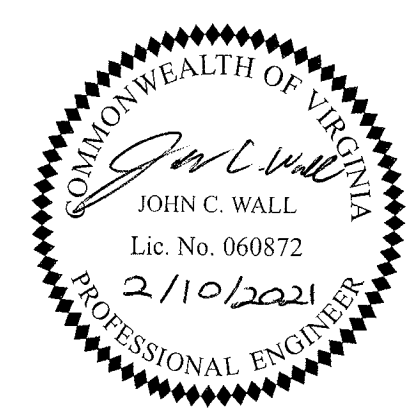
**LAKWOOD MANOR - COTTAGES - PHASE 2**  
 LUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA

**DEMOLITION AND PHASE I EROSION AND SEDIMENT CONTROL PLAN**

JOB NO. 46579  
 SHEET NO. C2.2

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.

P.O.D. #2020-00486



THIS DRAWING PREPARED AT THE  
**TRICITIES OFFICE**  
 4701 Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-541-1600 FAX 804-456-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE 11/16/2020  
 DRAWN BY D. ELLIS  
 DESIGNED BY J. WALL  
 CHECKED BY K. HALPAUS  
 SCALE 1" = 40'

**TIMMONS GROUP**

**LAKEWOOD MANOR - COTTAGES - PHASE 2**  
 TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA

JOB NO. 46579  
 SHEET NO. C3.0

P.O.D. #2020-00486

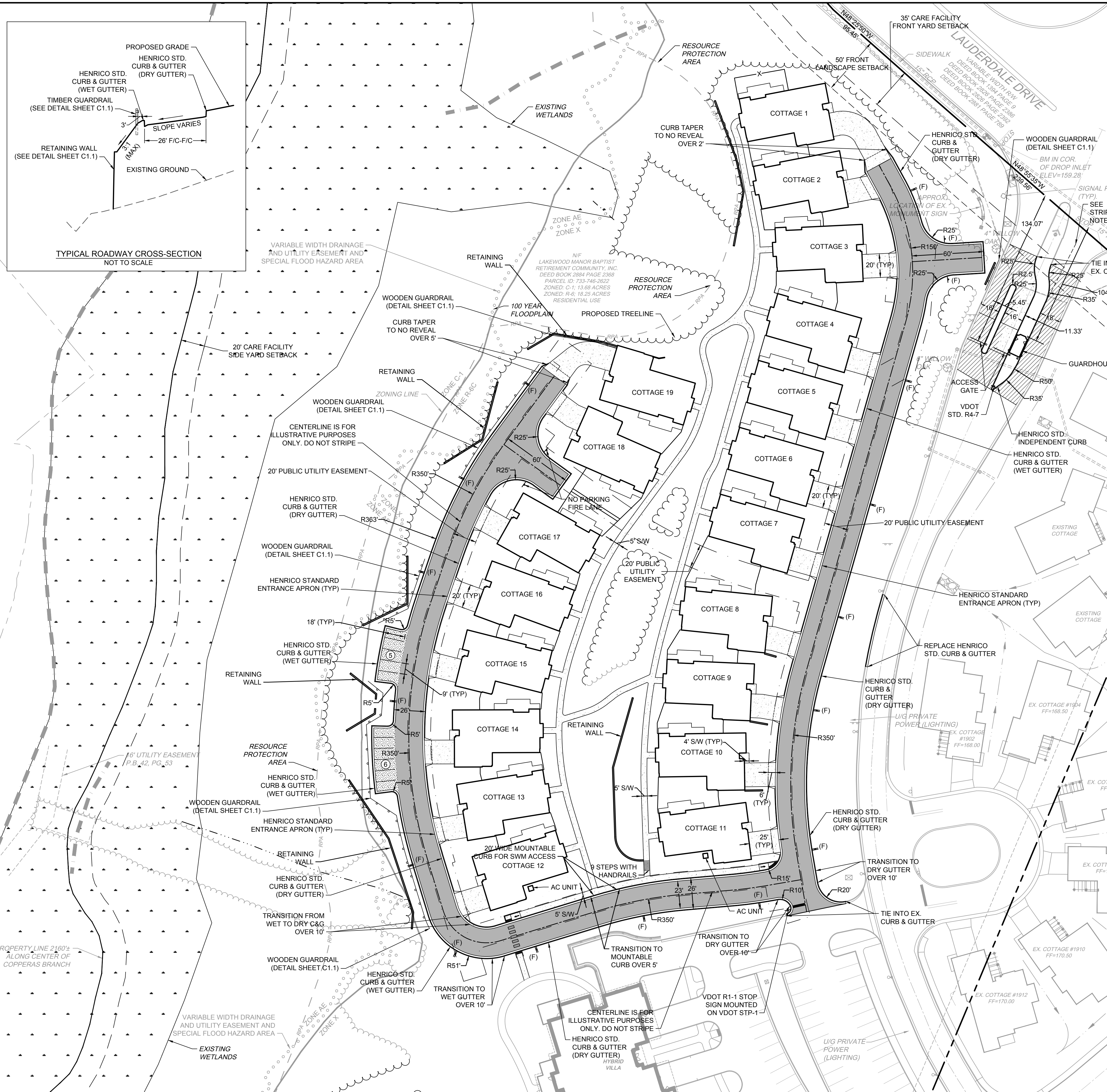
DESCRIPTION	HATCH PATTERN	PAVEMENT SECTION
HEAVY DUTY ASPHALT	[Hatch Pattern]	1.5" VDOT SM-9.5 A 3" VDOT BM-25 8" 21-B STONE COMPACTED SUBGRADE
LIGHT DUTY ASPHALT	[Hatch Pattern]	2" VDOT SM-9.5 A 6" 21-B STONE COMPACTED SUBGRADE
SIDEWALK/ CONCRETE PAVEMENT	[Hatch Pattern]	4" CLASS-A3 CONCRETE 4" 21-B STONE COMPACTED SUBGRADE
PAVEMENT REPLACEMENT	[Hatch Pattern]	SEE PAVEMENT REPLACEMENT DETAIL ON SHEET C1.2

- PAVEMENT DESIGN NOTES:**
- PRIVATE ROADS, COMMON DRIVES AND PARKING AREAS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE PAVEMENT DESIGN STANDARDS AND SPECIFICATIONS OF THE DEPARTMENT OF PUBLIC WORKS AND SECTION 24-30.2 OF THE ZONING CODE.
  - PAVEMENT DESIGN SHALL HAVE A MINIMUM CROSS-SECTION OF TWO (2) INCHES OF ASPHALT AND SIX (6) INCHES OF AGGREGATE BASE MATERIAL, AND PLACED ON A WELL COMPACTED SUB-BASE HAVING A CBR (CALIFORNIA BEARING RATIO) OF NOT LESS THAN TEN (10), OR SUCH EQUIVALENT DESIGN PREPARED BY A PROFESSIONAL ENGINEER IN ACCORDANCE WITH COUNTY STANDARDS AND APPROVED BY THE COUNTY ENGINEER.
  - MATERIAL AND CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH COUNTY STANDARDS AND SPECIFICATIONS, UNLESS THE PLANS SPECIFY STRICTER STANDARDS.
  - A PROFESSIONAL ENGINEER SHALL MONITOR AND SUPERVISE THE MATERIALS USED AND THE CONSTRUCTION OF ALL ROADS AND RELATED IMPROVEMENTS.
  - PRIOR TO ISSUANCE OF THE LAST CERTIFICATE OF OCCUPANCY, A PROFESSIONAL ENGINEER MUST CERTIFY THAT THE ROADS HAVE BEEN DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH COUNTY STANDARDS.

- NOTES:**
- ALL SIDEWALKS AND HANDICAP ACCESS RAMPS SHALL MEET ADA REQUIREMENTS. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN DESIGN INFORMATION AND ADA REQUIREMENTS PRIOR TO CONSTRUCTION.
  - ADA ACCESSIBLE ROUTE SHALL HAVE A 5.0% MAXIMUM LONGITUDINAL SLOPE AND A 2.0% MAXIMUM CROSS SLOPE (EXCLUDING RAMPS).
  - A TRAFFIC SIGNAL EXISTS AT THE INTERSECTION OF LAUERDALE DR AND JOHN ROLFE PKWY. THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING SIGNAL SHOP AT (804)727-8303 WITH ANY QUESTIONS PERTAINING TO THE SIGNAL. A MISS UTILITY TICKET SHALL BE CALLED INTO THE FIELD TO LOCATE TRAFFIC CONTROL EQUIPMENT AND CABLES AT LEAST 72 HOURS PRIOR TO BEGINNING WORK ON OR ADJACENT TO THE RIGHT-OF-WAY WITHIN 500 FEET OF THE INTERSECTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF REPAIR OR REPLACEMENT OF ANY DAMAGED TRAFFIC CONTROL EQUIPMENT.
  - THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL STOP SIGNS, DIRECTIONAL SIGNS, AND STRIPING SHOWN ON THE PLANS.
- STRIPING NOTES:**
- CONTRACTOR SHALL TIE ALL PROPOSED PAVEMENT MARKING TO EXISTING MARKINGS AT THE PROJECT LIMITS.
  - ALL LINES SHALL BE THERMOPLASTIC TYP. I, CLASS B PAVEMENT MARKINGS.
  - THE DASHED STRIPING SHOWN AT THE APPROACH TO THE TRAFFIC SIGNAL AT LAUERDALE DRIVE IS 4" WIDE SINGLE DASHED WHITE LINE MINI-SKIPS @ 2' LONG AND 6" GAPS.
  - EXISTING STRIPING AT THE APPROACH TO THE TRAFFIC SIGNAL AT LAUERDALE DRIVE IS TO REMAIN. CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACEMENT OF ANY DAMAGED MARKING.

**SIGNAGE LEGEND**

(F)	DOUBLE SIDED FIRE LANE SIGN. SEE DETAILS SHEETS C1.1
-----	--



S:\10046579-Lakewood\_Cottages\DWG\Sheet\C3.0-SITE.dwg | Printed on 2/10/2021 12:48 PM | Dr. John Wall



**DISCLAIMER NOTE:**  
 UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND OR OVERHEAD UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES OR DISCREPANCIES.



UNDERGROUND UTILITIES MAY BE IN THE CONSTRUCTION AREA. THE CONTRACTOR SHALL CALL "MISS UTILITY" AT 811 AT LEAST 48 HOURS PRIOR TO THE START OF EXCAVATION. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES IN AREA OF CONSTRUCTION PRIOR TO STARTING WORK.

NF  
 COUNTY OF HENRICO  
 PARCEL ID: 731-745-9122  
 D.B. 1626, PG. 388

MATCHLINE, SEE BELOW

D.B. 5721, PG. 1016  
 P.B. 129, PG. 129 & 130  
 DROP INLET  
 TOP=165.96'  
 INV IN=161.81'  
 INV OUT=161.58'

U/G VERIZON  
 W/ TRACER  
 C/L OF 2" WIDE SIGNAL

HYBRID VILLA  
 15' INGRESS/EGRESS EASEMENT  
 D.B. 1617, PG. 292  
 ITEM #37

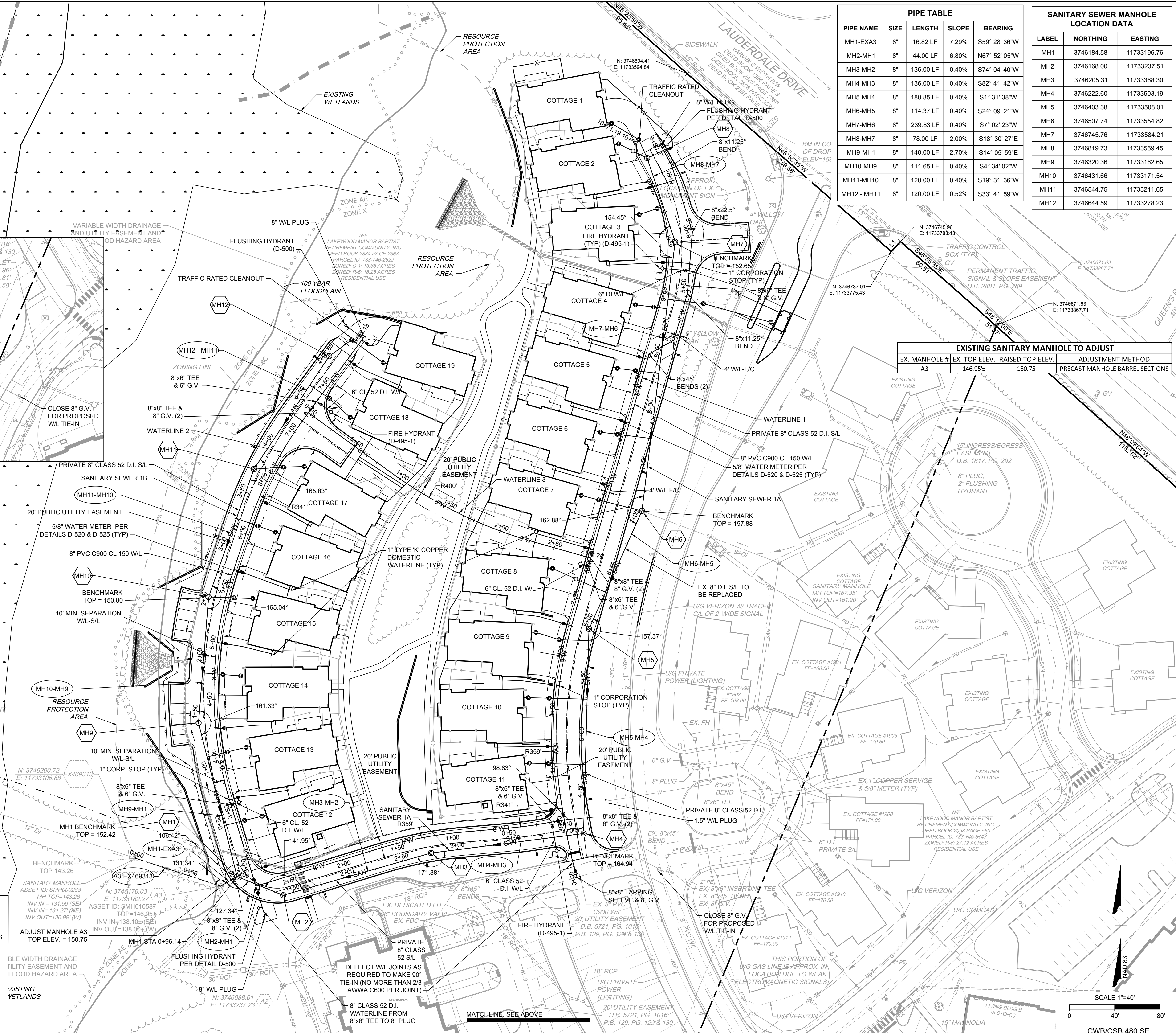
CLOSE 8" G.V.  
 FOR PROPOSED  
 WL TIE-IN

**WATERLINE CONSTRUCTION SEQUENCE**

- COORDINATE WITH THE OWNER TO NOTIFY RESIDENTS OF WATER SHUTDOWN. THE OWNER WILL COORDINATE WITH THE NECESSARY REGULATING AGENCIES REGARDING SHUTDOWN FROM A HEALTHCARE RELATED EVENT. COORDINATE WATER SHUT-OFF WITH FIRE MARSHAL AND DPU CONSTRUCTION & OPERATION.
- SHUT DOWN EXISTING WATERLINE BY CLOSING VALVES SHOWN ON THIS SHEET.
- ONCE EXISTING WATERLINE HAS BEEN SHUT DOWN, RELIEVE RESIDUAL LINE PRESSURE AT HYDRANT OR BLOW-OFF. AFTER PUMPING/DRAINING WATERS TO BE INSTALLED 8"x8" TAPPING SLEEVE AND 8" GATE VALVE AS INDICATED ON THIS SHEET.
- DISINFECT AND TEST IN ACCORDANCE WITH HENRICO COUNTY DPU STANDARDS.

**NOTES:**

- ALL GATE VALVES ARE TO BE LOCATED ON THE PAVEMENT AND NOT ON THE GUTTER PAN.
- WHERE POSSIBLE IN UNPAVED AREAS, MANHOLE CASTINGS SHALL BE APPROXIMATELY 12" ABOVE FINAL GRADE USING APPROPRIATE COVERS (I.E. - VANDALPROOF, WATERTIGHT).
- ADEQUATE MINIMUM COVER SHALL BE MAINTAINED OVER ALL EXISTING UTILITIES AT ALL TIMES DURING CONSTRUCTION AND THAT EXISTING VALVE BOXES WILL BE MADE FLUSH WITH FINAL GRADE.
- CONNECTIONS TO EXISTING MANHOLES WITHOUT STUBS OR BRICKED-UP OPENINGS SHALL BE THE EQUAL OF EITHER KOR-N-SEAL WITH STAINLESS STEEL EXPANDER RING OR PRESS-SEAL WITH NYLON EXPANDER SLEEVE INSTALLED BY CORE DRILLING MANHOLE AND IN STRICT ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
- SANITARY SEWER LATERALS FROM COTTAGES TO 8" SANITARY SEWER MAIN SHALL BE 4" PVC @ 2.08% MINIMUM PER DETAIL D-180.
- ALL CLEANOUT RIMS SHALL BE FLUSH WITH FINISHED GRADE.



**PIPE TABLE**

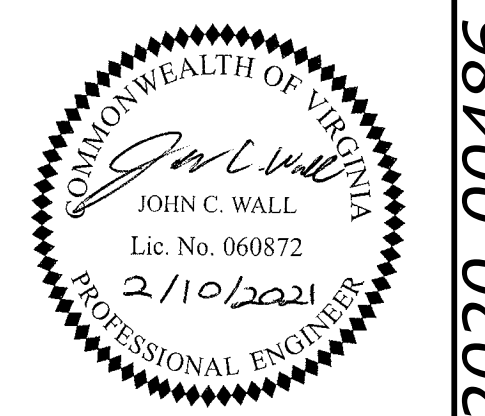
PIPE NAME	SIZE	LENGTH	SLOPE	BEARING
MH1-EXA3	8"	16.82 LF	7.29%	S59° 28' 36"W
MH2-MH1	8"	44.00 LF	6.80%	N67° 52' 05"W
MH3-MH2	8"	136.00 LF	0.40%	S74° 04' 40"W
MH4-MH3	8"	136.00 LF	0.40%	S82° 41' 42"W
MH5-MH4	8"	180.85 LF	0.40%	S1° 31' 38"W
MH6-MH5	8"	114.37 LF	0.40%	S24° 09' 21"W
MH7-MH6	8"	239.83 LF	0.40%	S7° 02' 23"W
MH8-MH7	8"	78.00 LF	2.00%	S18° 30' 27"E
MH9-MH8	8"	140.00 LF	2.70%	S14° 05' 59"E
MH10-MH9	8"	111.65 LF	0.40%	S4° 34' 02"W
MH11-MH10	8"	120.00 LF	0.40%	S19° 31' 36"W
MH12-MH11	8"	120.00 LF	0.52%	S33° 41' 59"W

**SANITARY SEWER MANHOLE LOCATION DATA**

LABEL	NORTHING	EASTING
MH1	3746184.58	11733196.76
MH2	3746168.00	11733237.51
MH3	3746205.31	11733368.30
MH4	3746222.60	11733503.19
MH5	3746403.38	11733508.01
MH6	3746507.74	11733554.82
MH7	3746745.76	11733584.21
MH8	3746819.73	11733559.45
MH9	3746320.36	11733162.65
MH10	3746431.66	11733171.54
MH11	3746544.75	11733211.65
MH12	3746644.59	11733278.23

**EXISTING SANITARY MANHOLE TO ADJUST**

EX. MANHOLE #	EX. TOP ELEV.	RAISED TOP ELEV.	ADJUSTMENT METHOD
A3	146.95'	150.75'	PRECAST MANHOLE BARREL SECTIONS



THIS DRAWING PREPARED AT THE  
**TRICITIES OFFICE**  
 4701 Owens Way, Suite 900 | Prince George, VA 22975  
 TEL 804-541-1600 FAX 804-458-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020 <td>PLANNING COMMISSION SUBMITTAL</td>	PLANNING COMMISSION SUBMITTAL
2/10/2021 <td>REVISIONS PER COUNTY COMMENTS</td>	REVISIONS PER COUNTY COMMENTS

DATE: 11/16/2020  
 DRAWN BY: D. ELLIS  
 DESIGNED BY: J. WALL  
 CHECKED BY: K. HALPAUS  
 SCALE: 1" = 40'

**TIMMONS GROUP**

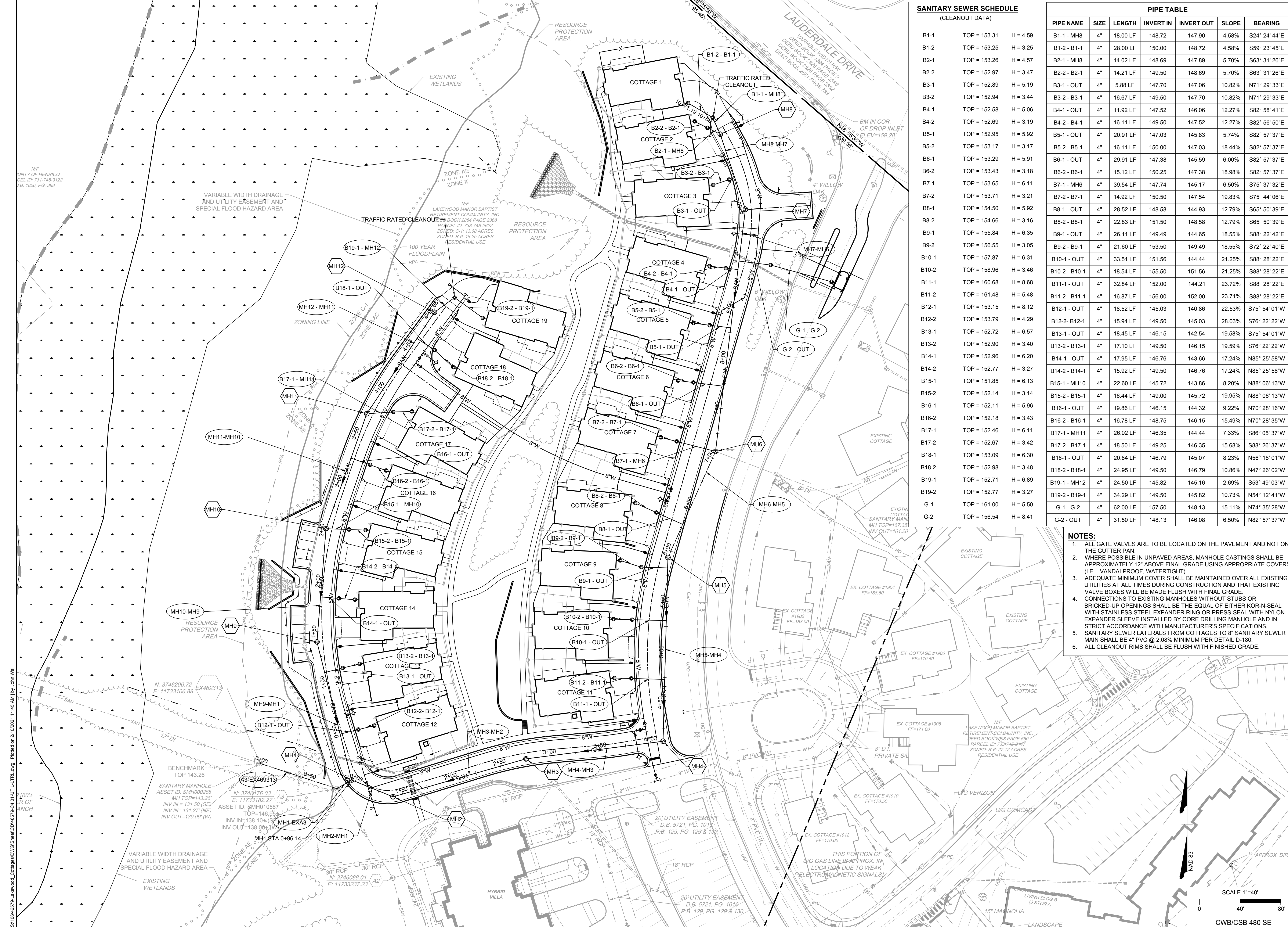
**LAKWOOD MANOR - COTTAGES - PHASE 2**  
 TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
 UTILITY PLAN

JOB NO. 46579  
 SHEET NO. C4.0

Scale: 0 40' 80'  
 CWB/CSB 480 SE

P.O.D. #2020-00486

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.



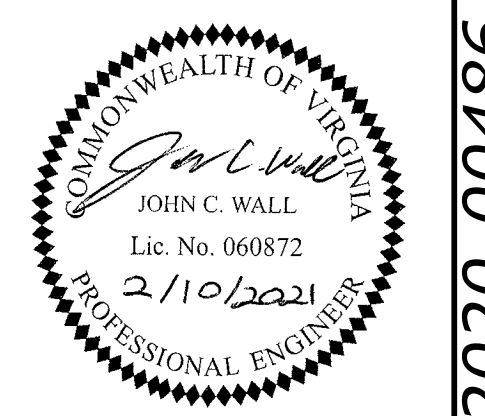
**SANITARY SEWER SCHEDULE**  
(CLEANOUT DATA)

B1-1	TOP = 153.31	H = 4.59
B1-2	TOP = 153.25	H = 3.25
B2-1	TOP = 153.26	H = 4.57
B2-2	TOP = 152.97	H = 3.47
B3-1	TOP = 152.89	H = 5.19
B3-2	TOP = 152.94	H = 3.44
B4-1	TOP = 152.58	H = 5.06
B4-2	TOP = 152.69	H = 3.19
B5-1	TOP = 152.95	H = 5.92
B5-2	TOP = 153.17	H = 3.17
B6-1	TOP = 153.29	H = 5.91
B6-2	TOP = 153.43	H = 3.18
B7-1	TOP = 153.65	H = 6.11
B7-2	TOP = 153.71	H = 3.21
B8-1	TOP = 154.50	H = 5.92
B8-2	TOP = 154.66	H = 3.16
B9-1	TOP = 155.84	H = 6.35
B9-2	TOP = 156.55	H = 3.05
B10-1	TOP = 157.87	H = 6.31
B10-2	TOP = 158.96	H = 3.46
B11-1	TOP = 160.68	H = 8.68
B11-2	TOP = 161.48	H = 5.48
B12-1	TOP = 153.15	H = 8.12
B12-2	TOP = 153.79	H = 4.29
B13-1	TOP = 152.72	H = 6.57
B13-2	TOP = 152.90	H = 3.40
B14-1	TOP = 152.96	H = 6.20
B14-2	TOP = 152.77	H = 3.27
B15-1	TOP = 151.85	H = 6.13
B15-2	TOP = 152.14	H = 3.14
B16-1	TOP = 152.11	H = 5.96
B16-2	TOP = 152.18	H = 3.43
B17-1	TOP = 152.46	H = 6.11
B17-2	TOP = 152.67	H = 3.42
B18-1	TOP = 153.09	H = 6.30
B18-2	TOP = 152.98	H = 3.48
B19-1	TOP = 152.71	H = 6.89
B19-2	TOP = 152.77	H = 3.27
G-1	TOP = 161.00	H = 5.50
G-2	TOP = 156.54	H = 8.41

**PIPE TABLE**

PIPE NAME	SIZE	LENGTH	INVERT IN	INVERT OUT	SLOPE	BEARING
B1-1 - MH8	4"	18.00 LF	148.72	147.90	4.58%	S24° 2' 44"E
B1-2 - B1-1	4"	28.00 LF	150.00	148.72	4.58%	S59° 23' 45"E
B2-1 - MH8	4"	14.02 LF	148.69	147.89	5.70%	S63° 31' 26"E
B2-2 - B2-1	4"	14.21 LF	149.50	148.69	5.70%	S63° 31' 26"E
B3-1 - OUT	4"	5.88 LF	147.70	147.06	10.82%	N71° 29' 33"E
B3-2 - B3-1	4"	16.67 LF	149.50	147.70	10.82%	N71° 29' 33"E
B4-1 - OUT	4"	11.92 LF	147.52	146.06	12.27%	S82° 58' 41"E
B4-2 - B4-1	4"	16.11 LF	149.50	147.52	12.27%	S82° 58' 41"E
B5-1 - OUT	4"	20.91 LF	147.03	145.83	5.74%	S82° 57' 37"E
B5-2 - B5-1	4"	16.11 LF	150.00	147.03	18.44%	S82° 57' 37"E
B6-1 - OUT	4"	29.91 LF	147.38	145.59	6.00%	S82° 57' 37"E
B6-2 - B6-1	4"	15.12 LF	150.25	147.38	18.98%	S82° 57' 37"E
B7-1 - MH6	4"	39.54 LF	147.74	145.17	6.50%	S75° 37' 32"E
B7-2 - B7-1	4"	14.92 LF	150.50	147.54	19.83%	S75° 44' 06"E
B8-1 - OUT	4"	28.52 LF	148.58	144.93	12.79%	S65° 50' 39"E
B8-2 - B8-1	4"	22.83 LF	151.50	148.58	12.79%	S65° 50' 39"E
B9-1 - OUT	4"	26.11 LF	149.49	144.65	18.55%	S88° 22' 42"E
B9-2 - B9-1	4"	21.60 LF	153.50	149.49	18.55%	S72° 22' 40"E
B10-1 - OUT	4"	33.51 LF	151.56	144.44	21.25%	S88° 28' 22"E
B10-2 - B10-1	4"	18.54 LF	155.50	151.56	21.25%	S88° 28' 22"E
B11-1 - OUT	4"	32.84 LF	152.00	144.21	23.72%	S88° 28' 22"E
B11-2 - B11-1	4"	16.87 LF	156.00	152.00	23.71%	S88° 28' 22"E
B12-1 - OUT	4"	18.52 LF	145.03	140.86	22.53%	S75° 54' 01"W
B12-2 - B12-1	4"	15.94 LF	149.50	145.03	28.03%	S76° 22' 22"W
B13-1 - OUT	4"	18.45 LF	146.15	142.54	19.58%	S75° 54' 01"W
B13-2 - B13-1	4"	17.10 LF	149.50	146.15	19.59%	S76° 22' 22"W
B14-1 - OUT	4"	17.95 LF	146.76	143.66	17.24%	N85° 25' 58"W
B14-2 - B14-1	4"	15.92 LF	149.50	146.76	17.24%	N85° 25' 58"W
B15-1 - MH10	4"	22.60 LF	145.72	143.86	8.20%	N88° 06' 13"W
B15-2 - B15-1	4"	16.44 LF	149.00	145.72	19.95%	N88° 06' 13"W
B16-1 - OUT	4"	19.86 LF	146.15	144.32	9.22%	N70° 28' 16"W
B16-2 - B16-1	4"	16.78 LF	148.75	146.15	15.49%	N70° 28' 35"W
B17-1 - MH11	4"	26.02 LF	146.35	144.44	7.33%	S86° 05' 37"W
B17-2 - B17-1	4"	18.50 LF	149.25	146.35	15.68%	S88° 26' 37"W
B18-1 - OUT	4"	20.84 LF	146.79	145.07	8.23%	N56° 18' 01"W
B18-2 - B18-1	4"	24.95 LF	149.50	146.79	10.86%	N47° 26' 02"W
B19-1 - MH12	4"	24.50 LF	145.82	145.16	2.69%	S53° 49' 03"W
B19-2 - B19-1	4"	34.29 LF	149.50	145.82	10.73%	N54° 12' 41"W
G-1 - G-2	4"	62.00 LF	157.50	148.13	15.11%	N74° 35' 28"W
G-2 - OUT	4"	31.50 LF	148.13	146.08	6.50%	N82° 57' 37"W

- NOTES:**
1. ALL GATE VALVES ARE TO BE LOCATED ON THE PAVEMENT AND NOT ON THE GUTTER PAN.
  2. WHERE POSSIBLE IN UNPAVED AREAS, MANHOLE CASTINGS SHALL BE APPROXIMATELY 12" ABOVE FINAL GRADE USING APPROPRIATE COVERS (I.E. - VANDALPROOF, WATERTIGHT).
  3. ADEQUATE MINIMUM COVER SHALL BE MAINTAINED OVER ALL EXISTING UTILITIES AT ALL TIMES DURING CONSTRUCTION AND THAT EXISTING VALVE BOXES WILL BE MADE FLUSH WITH FINAL GRADE.
  4. CONNECTIONS TO EXISTING MANHOLES WITHOUT STUBS OR BRICKED-UP OPENINGS SHALL BE THE EQUAL OF EITHER KOR-N-SEAL WITH STAINLESS STEEL EXPANDER RING OR PRESS-SEAL WITH NYLON EXPANDER SLEEVE INSTALLED BY CORE DRILLING MANHOLE AND IN STRICT ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
  5. SANITARY SEWER LATERALS FROM COTTAGES TO 8" SANITARY SEWER MAIN SHALL BE 4" PVC @ 2.08% MINIMUM PER DETAIL D-180.
  6. ALL CLEANOUT RIMS SHALL BE FLUSH WITH FINISHED GRADE.



THIS DRAWING PREPARED AT THE  
**TRICITIES OFFICE**  
4701 Owens Way, Suite 900 | Prince George, VA 23895  
TEL 804-541-1600 FAX 804-456-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020	PLANNING COMMISSION SUBMITTAL
2/10/2021	REVISIONS PER COUNTY COMMENTS

DATE: 11/16/2020  
DRAWN BY: D. ELLIS  
DESIGNED BY: J. WALL  
CHECKED BY: K. LAUBAUS

SCALE: 1" = 40'

**TIMMONS GROUP**

**LAKEWOOD MANOR - COTTAGES - PHASE 2**  
TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
SANITARY SEWER LATERAL PLAN

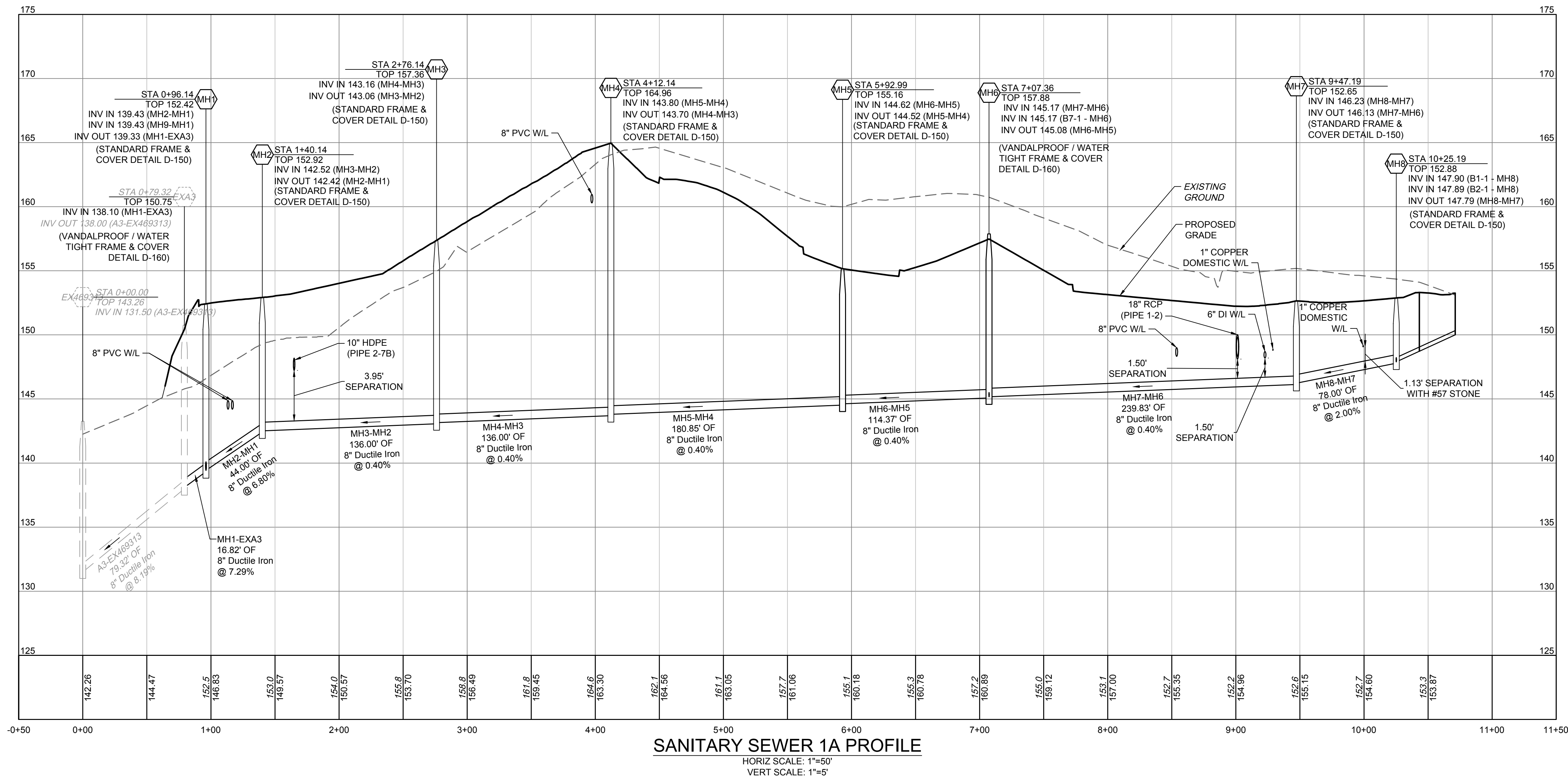
JOB NO. 46579  
SHEET NO. C4.01

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.

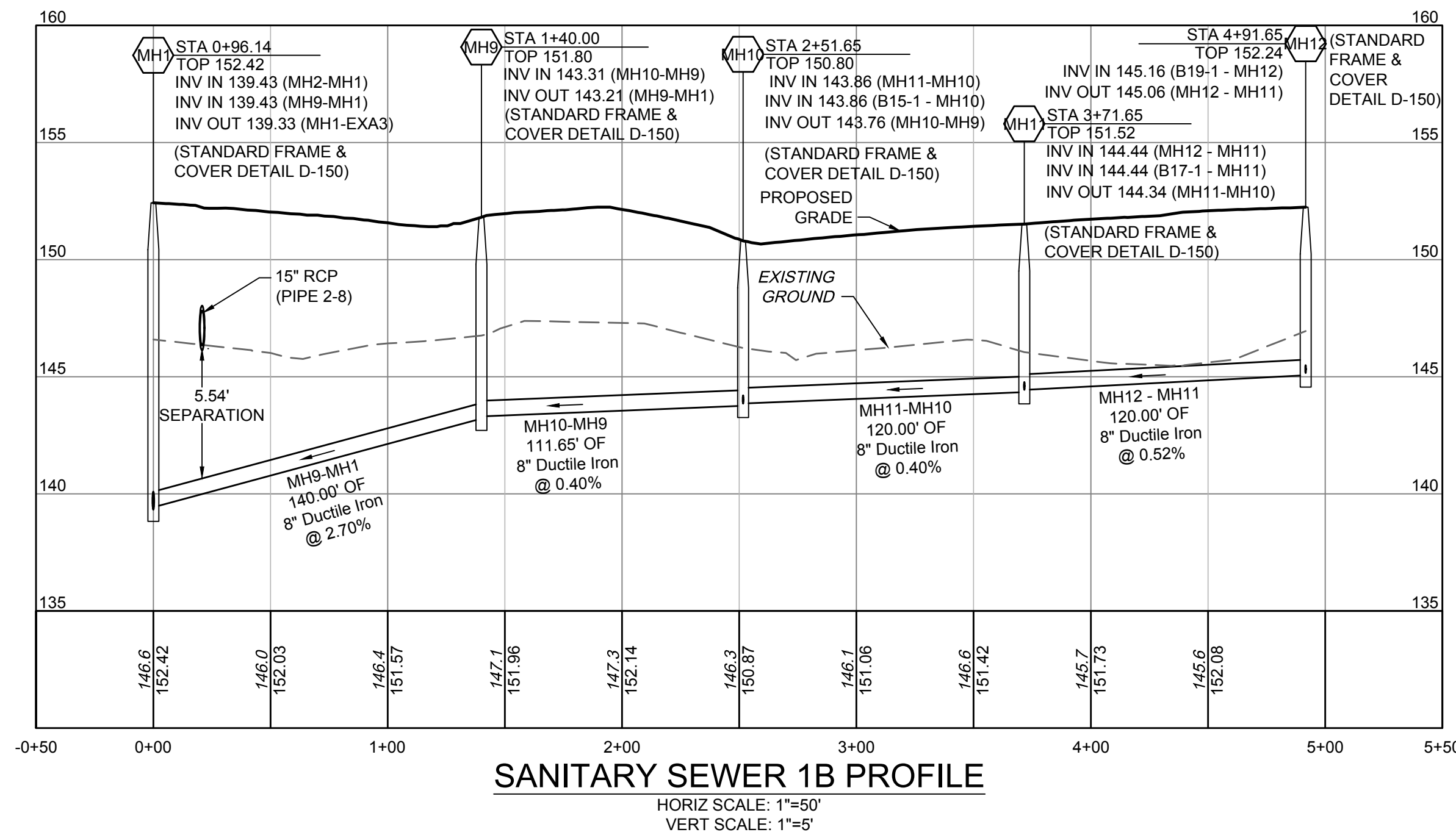
P.O.D. #2020-00486

S:\10046579-Lakewood\_Cottages\DWG\Sheet\C4.01-UTL-LTR.dwg | Plotted on 2/10/2021 11:45 AM by John Wall

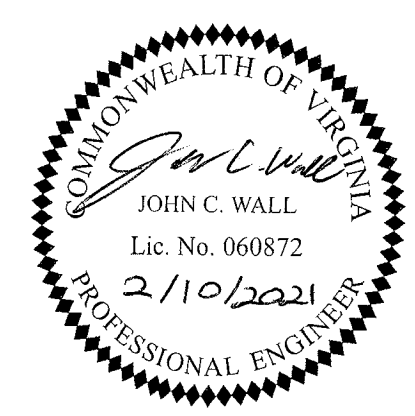
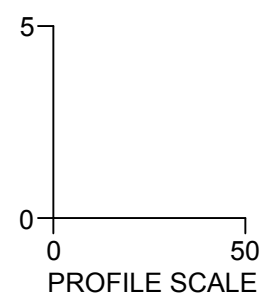
S:\10646579-Lakewood\_Cottages\DWG\Sheet\CD\46579-C4-1-UTPR.dwg | Printed on 2/10/2021 2:14 PM | by John Wall



**SANITARY SEWER 1A PROFILE**  
 HORIZ SCALE: 1"=50'  
 VERT SCALE: 1"=5'



**SANITARY SEWER 1B PROFILE**  
 HORIZ SCALE: 1"=50'  
 VERT SCALE: 1"=5'



THIS DRAWING PREPARED AT THE  
**TIMMONS OFFICE**  
 4701 Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-541-0600 FAX 804-486-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	12/17/2020
DATE	11/16/2020
DRAWN BY	D. ELLIS
DESIGNED BY	J. WALL
CHECKED BY	K. HALPAUS
SCALE	H: 1" = 50' V: 1" = 5'

REVISION DESCRIPTION  
 PLANNING COMMISSION SUBMITTAL  
 REVISIONS PER COUNTY COMMENTS

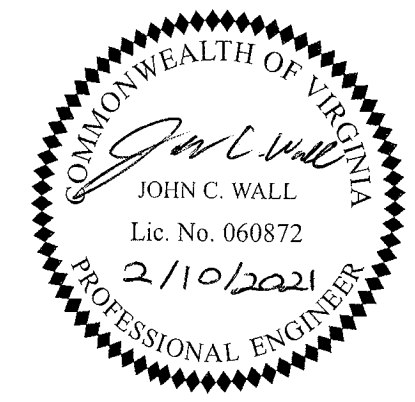
**TIMMONS GROUP**

**LAKWOOD MANOR - COTTAGES - PHASE 2**  
 TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
**SANITARY SEWER PROFILES**

JOB NO.	46579
SHEET NO.	C4.1

P.O.D. #2020-00486

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.



THIS DRAWING PREPARED AT THE  
**TRI-CITIES OFFICE**  
 4701 Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-541-0600 FAX 804-486-1311 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

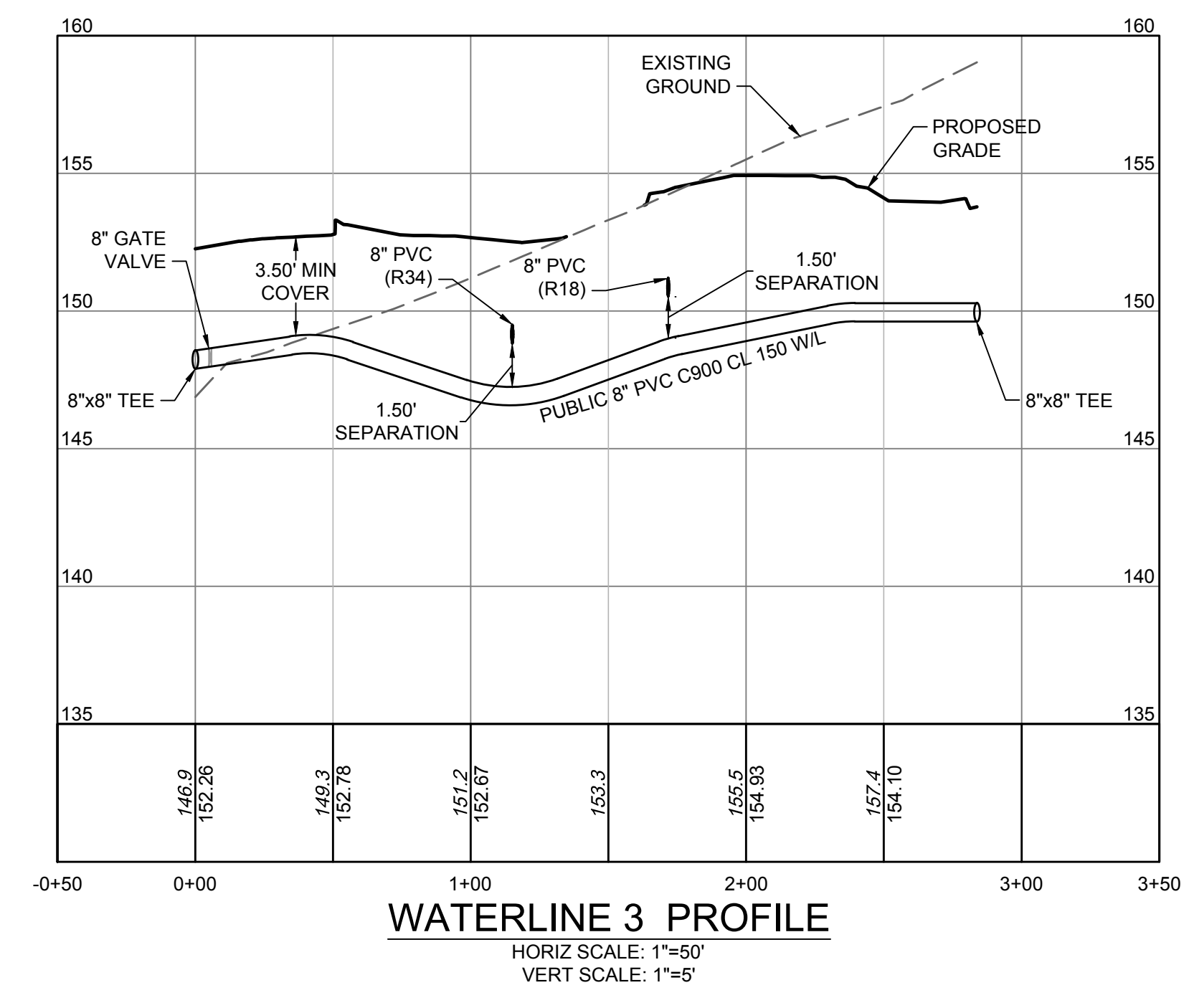
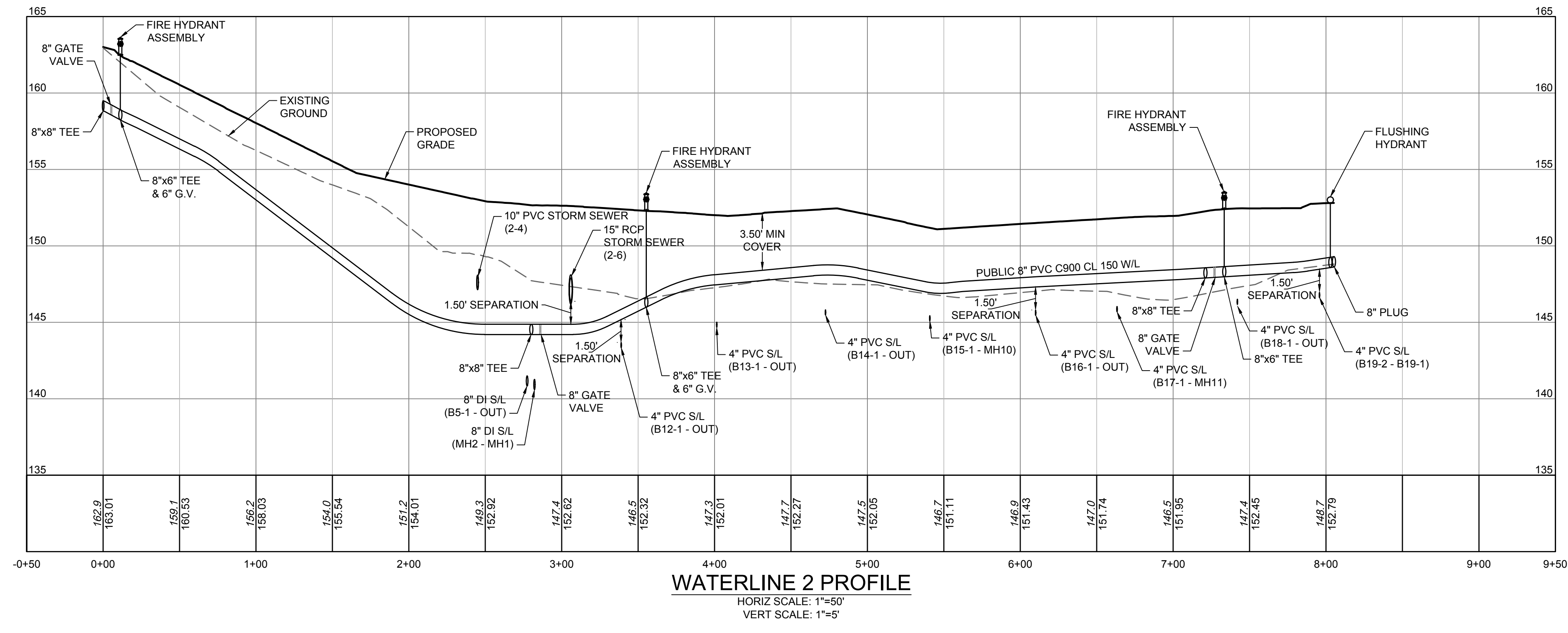
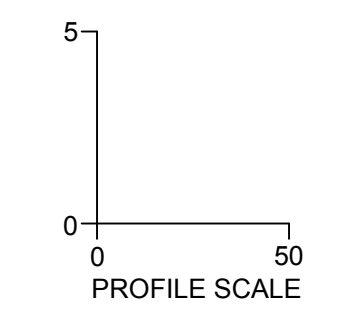
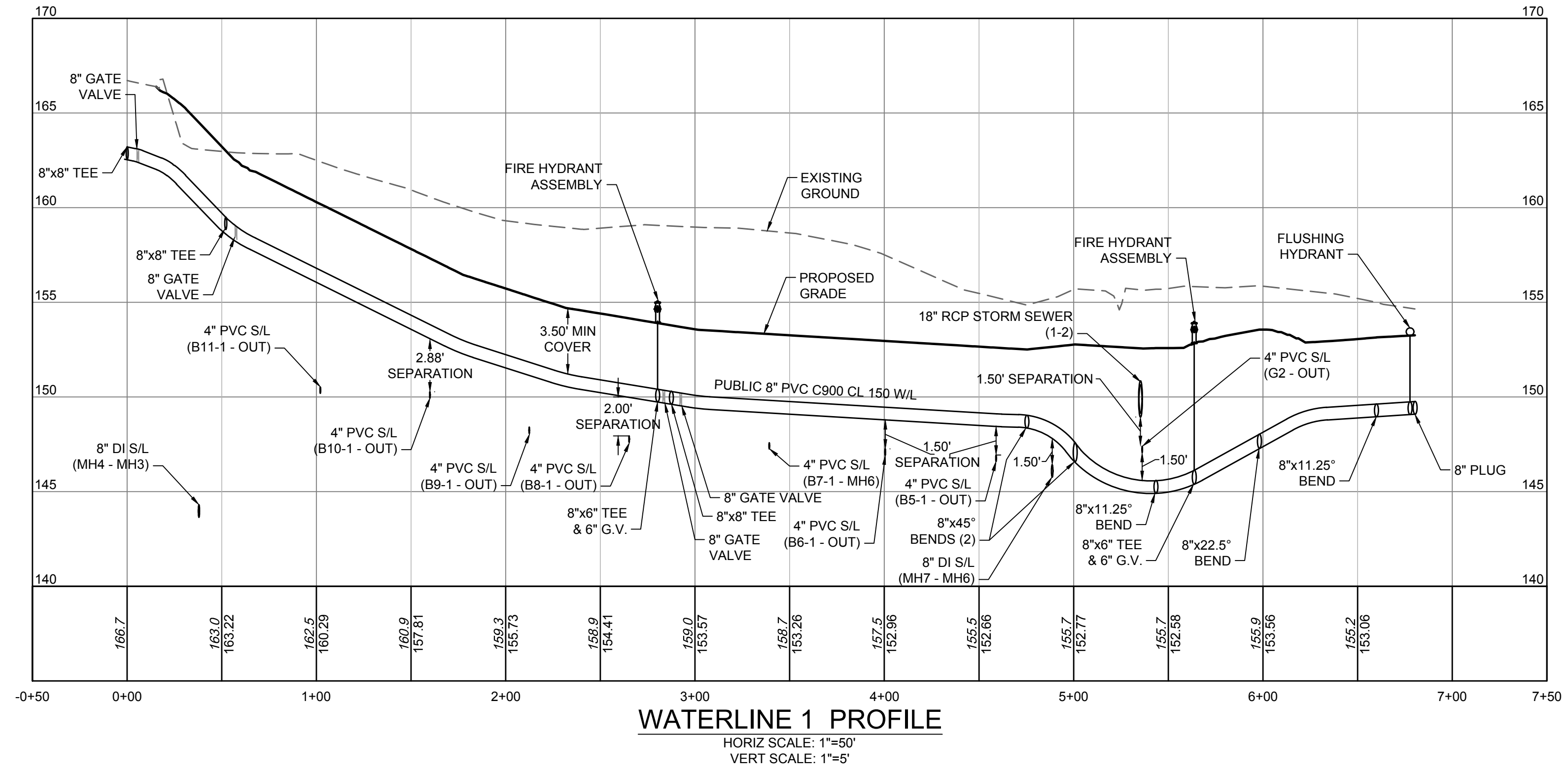
DATE  
 11/16/2020  
 DRAWN BY  
 D. ELLIS  
 DESIGNED BY  
 J. WALL  
 CHECKED BY  
 K. HALPAUS  
 SCALE  
 H: 1" = 50'  
 V: 1" = 5'

**TIMMONS GROUP**

**LAKWOOD MANOR - COTTAGES - PHASE 2**  
 TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
 WATERLINE PROFILES

JOB NO.  
**46579**  
 SHEET NO.  
**C4.2**

P.O.D. #2020-00486



S:\10646579-Lakewood\_Cottages\DWG\Sheet\C4.2\UTPR.dwg | Printed on 2/10/2021 2:14 PM | by John Wall

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.

**STORM DRAIN SCHEDULE**

- ALL PIPES ARE MEASURED FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE.
- VDOT STANDARD ST-1 STEPS REQUIRED ON ALL CONCRETE STRUCTURES 4' TALL OR HIGHER.
- VDOT STANDARD IS-1 INVERT SHAPING IS RESTRICTED TO PIPE DIAMETERS 30" OR LESS.
- ALL STORM SEWER PIPES SHALL BE A MINIMUM CLASS III RCP UNLESS OTHERWISE NOTED.
- BOOT CONNECTORS REQUIRED FOR ALL PLASTIC PIPE CONNECTIONS INTO CONCRETE STORM STRUCTURES.
- THE ROOF / LANDSCAPE DRAINAGE SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH THE CURRENT EDITION OF THE INTERNATIONAL PLUMBING CODE.

- (1-1) MH-1, TOP = 160.16, H = 9.00'
- (1-2) 65.03 L.F. 18" RCP @ 5.07%  
INV. IN = 151.16, INV. OUT = 147.86
- (1-3) DI-3C 10 ft Throat, TOP = 152.50, H = 5.64'
- (1-4) 110.00 L.F. 30" RCP @ 0.50%  
INV. IN = 146.86, INV. OUT = 146.31
- (1-5) MH-1, TOP = 152.66, H = 6.45'
- (1-6) 52.00 L.F. 30" RCP @ 0.50%  
INV. IN = 146.21, INV. OUT = 145.95
- (ES-1 (1)) ES-1 for 30" Pipe, TOP = 148.74, H = 2.79'

- (2-1) MH-1, TOP = 154.93, H = 7.84'
- (2-2) 80.00 L.F. 18" RCP @ 0.50%  
INV. IN = 147.09, INV. OUT = 146.69
- (2-3) NYLOPLAST 12" PEDESTRIAN GRATE,  
TOP = 150.50, H = 3.09'
- (2-4) 50.00 L.F. 10" @ 0.50%  
INV. IN = 147.41, INV. OUT = 147.16
- (2-5) DI-3B 8 ft Throat, TOP = 153.25, H = 6.66'
- (2-6) 63.73 L.F. 18" RCP @ 0.50%  
INV. IN = 146.59, INV. OUT = 146.27
- (2-7) DI-2B 10 ft Throat, TOP = 152.34, H = 6.17'
- (2-8) 86.00 L.F. 18" RCP @ 0.50%  
INV. IN = 146.17, INV. OUT = 145.74
- (2-9) DI-2C 10 ft Throat, TOP = 151.36, H = 5.72'
- (2-10) 26.00 L.F. 18" RCP @ 0.50%  
INV. IN = 145.64, INV. OUT = 145.51
- (2-11) MH-1, TOP = 151.45, H = 6.04'
- (2-12) 58.00 L.F. 18" RCP @ 0.50%  
INV. IN = 145.41, INV. OUT = 145.12
- (2-13) DI-2B 8 ft Throat, TOP = 151.43, H = 5.57'
- (2-14) 54.00 L.F. 15" RCP @ 0.50%  
INV. IN = 145.86, INV. OUT = 145.59
- (2-15) DI-2C 8 ft Throat, TOP = 150.87, H = 5.38'
- (2-16) 74.00 L.F. 15" RCP @ 0.50%  
INV. IN = 145.49, INV. OUT = 145.12
- (2-17) MH-1, TOP = 152.06, H = 7.44'
- (2-18) 10.46 L.F. 24" RCP @ 0.50%  
INV. IN = 144.62, INV. OUT = 144.57
- (EW-1) EW-1 for 24" Pipe, TOP = 147.57, H = 3.00'



**NOTES:**

- ALL MATERIAL SHALL BE DEPOSITED AND COMPACTED IN ACCORDANCE WITH THE VIRGINIA STATEWIDE BUILDING CODE AND GEOTECHNICAL GUIDELINES ESTABLISHED BY A PROFESSIONAL ENGINEER. A DETAILED ENGINEERING REPORT SHALL BE SUBMITTED FOR REVIEW AND APPROVAL BY THE BUILDING OFFICIAL PRIOR TO THE ISSUANCE OF A BUILDING PERMIT.
- NO CROSS CONNECTIONS SHALL BE MADE BETWEEN SANITARY SEWER AND STORM SEWER SYSTEMS. NO CONNECTIONS (I.E. FLOOR DRAINS) ARE ALLOWED FROM INSIDE THE BUILDING TO THE STORM SEWER SYSTEM.
- THERE SHALL BE A MAXIMUM OF A 0.05' DROP AT ALL BUILDING ENTRANCES.
- THE THREE DOWNSPOUTS AT THE DRIVEWAY SIDE OF THE COTTAGES SHALL HAVE A SPLASH BLOCK. THE REMAINING COTTAGE DOWNSPOUTS ARE TO BE PIPED UNDERGROUND AS SHOWN ON THIS SHEET.
- THE ROOF/LANDSCAPE DRAINAGE SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH THE CURRENT EDITION OF THE INTERNATIONAL PLUMBING CODE.
- THE 20" WIDE STORMWATER ACCESS PATH SHALL NOT CONTAIN ANY OBSTACLES OR VEGETATION THAT WOULD PREVENT ACCESS OF MAINTENANCE EQUIPMENT.

**DISCLAIMER NOTE:**  
UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND OR OVERHEAD UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES OR DISCREPANCIES.

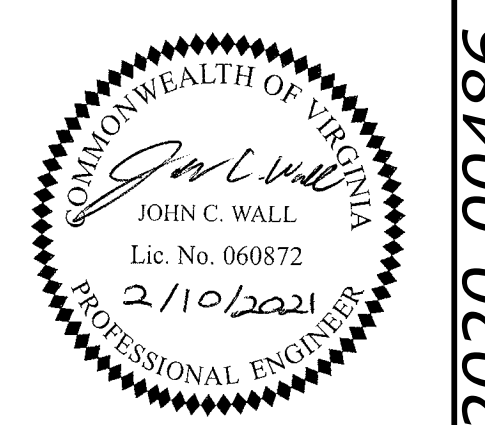
**THE CONTRACTOR(S) SHALL CONTACT VIRGINIA 811 AT 1-800-552-7001 FOR ASSISTANCE IN LOCATING EXISTING UTILITIES. CALL AT LEAST 48 HOURS PRIOR TO ANY DIGGING.**

**ADA NOTE:**  
ALL SIDEWALKS AND HANDICAP ACCESS RAMPS SHALL MEET ADA REQUIREMENTS. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN DESIGN INFORMATION AND ADA REQUIREMENTS PRIOR TO CONSTRUCTION.

GRADING LEGEND	
(---)	EXISTING CONTOURS
(---)	PROPOSED CONTOURS

STORM SEWER LEGEND	
(---)	STRUCTURE NUMBER
(---)	STORM SEWER SERIES



THIS DRAWING PREPARED AT THE  
**TRICITIES OFFICE**  
4701 Owens Way, Suite 900 | Prince George, VA 22957  
TEL 804-541-1660 | FAX 804-456-1511 | www.timmons.com

DATE	REVISION DESCRIPTION
12/17/2020	PLANNING COMMISSION SUBMITTAL
2/10/2021	REVISIONS PER COUNTY COMMENTS

DATE	11/16/2020
DRAWN BY	D. ELLIS
DESIGNED BY	J. WALL
CHECKED BY	K. HALPAUS
SCALE	1" = 40'

**TIMMONS GROUP**

**LAKEWOOD MANOR - COTTAGES - PHASE 2**  
TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
GRADING PLAN

JOB NO.	46579
SHEET NO.	C5.0

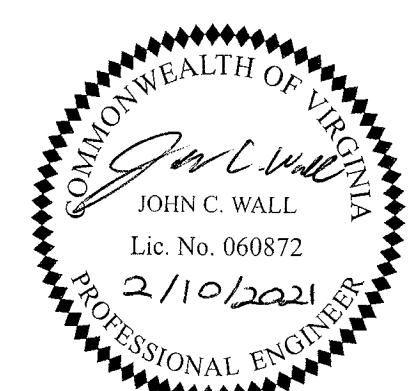
P.O.D. #2020-00486



STORM STRUCTURE TABLE			
STRUCTURE #	TOP	STRUCTURE HEIGHT	DESCRIPTION
R1	152.42	3.60'	6" Cleanout
R3	153.03	4.36'	6" Cleanout
R5	152.91	4.35'	6" Cleanout
R7	152.43	4.14'	6" Cleanout
R9	152.00	3.91'	NYLOPLAST 12" PEDESTRIAN GRATE
R11	159.38	3.04'	6" Cleanout
R13	160.94	4.93'	6" Cleanout
R15	158.13	4.47'	6" Cleanout
R17	155.97	4.81'	6" Cleanout
R19	154.29	4.10'	6" Cleanout
R21	153.72	4.09'	6" Cleanout
R23	153.42	4.56'	6" Cleanout
R25	152.97	4.70'	6" Cleanout
R27	151.50	1.91'	NYLOPLAST 12" PEDESTRIAN GRATE
R29	152.44	2.96'	6" Cleanout
R31	152.50	3.27'	NYLOPLAST 12" PEDESTRIAN GRATE
R33	152.68	3.78'	6" Cleanout
R35	152.00	3.24'	NYLOPLAST 12" PEDESTRIAN GRATE
R37	151.50	2.99'	NYLOPLAST 12" PEDESTRIAN GRATE
R39	151.50	3.25'	NYLOPLAST 12" PEDESTRIAN GRATE
R41	151.75	3.76'	NYLOPLAST 15" PEDESTRIAN GRATE
R43	152.25	4.50'	NYLOPLAST 15" PEDESTRIAN GRATE
R45	152.25	4.75'	NYLOPLAST 15" PEDESTRIAN GRATE

STORM PIPE TABLE							
PIPE #	DIA	FROM - TO	UPSTREAM INVERT	DOWNSTREAM INVERT	SLOPE	LENGTH	DESCRIPTION
R2	8"	R1 - R3	148.82	148.67	0.50%	30.68 LF	8" PVC
R4	8"	R3 - R5	148.67	148.56	0.50%	22.75 LF	8" PVC
R6	8"	R5 - R7	148.56	148.29	0.50%	53.17 LF	8" PVC
R8	8"	R7 - R9	148.29	148.09	0.50%	40.16 LF	8" PVC
R10	10"	R9 - 1-5	148.09	148.04	0.50%	10.87 LF	10" PVC
R12	8"	R11 - R13	156.34	156.01	0.50%	65.39 LF	8" PVC
R14	8"	R13 - R15	156.01	153.66	3.50%	67.14 LF	8" PVC
R16	8"	R15 - R17	153.66	151.16	4.00%	62.53 LF	8" PVC
R18	8"	R17 - R19	151.62	150.36	1.50%	84.00 LF	8" PVC
R20	10"	R19 - R21	150.19	149.63	1.00%	56.00 LF	10" PVC
R22	10"	R21 - R23	149.63	149.03	1.00%	60.00 LF	10" PVC
R24	12"	R23 - R25	148.86	148.28	1.00%	58.00 LF	12" PVC
R26	12"	R25 - 1-5	148.28	147.71	1.00%	56.74 LF	12" PVC
R28	8"	R27 - R29	149.59	149.48	0.50%	22.00 LF	8" PVC
R30	8"	R29 - R31	149.48	149.23	0.50%	50.00 LF	8" PVC
R32	8"	R31 - R33	149.23	148.90	0.50%	66.00 LF	8" PVC
R34	8"	R33 - R35	148.90	148.76	0.50%	29.00 LF	8" PVC
R36	10"	R35 - R37	148.76	148.51	0.50%	51.00 LF	10" PVC
R38	12"	R37 - R39	148.51	148.25	0.50%	52.00 LF	12" PVC
R40	12"	R39 - R41	148.25	147.99	0.50%	52.00 LF	12" PVC
R42	15"	R41 - R43	147.99	147.75	0.50%	48.00 LF	15" PVC
R44	15"	R43 - R45	147.75	147.50	0.50%	50.00 LF	15" PVC
R46	15"	R45 - 2-1	147.50	147.19	0.50%	62.01 LF	15" PVC

**NOTE:**  
 1. THE THREE DOWNSPOUTS AT THE DRIVEWAY SIDE OF THE COTTAGES SHALL HAVE A SPLASH BLOCK. THE REMAINING COTTAGE DOWNSPOUTS ARE TO BE PIPED UNDERGROUND AS SHOWN ON THIS SHEET.  
 2. THE ROOF/LANDSCAPE DRAINAGE SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH THE CURRENT EDITION OF THE INTERNATIONAL PLUMBING CODE.



THIS DRAWING PREPARED AT THE  
**TRICITIES OFFICE**  
 470 Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-541-0600 FAX 804-436-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE: 11/16/2020  
 DRAWN BY: D. ELLIS  
 DESIGNED BY: J. WALL  
 CHECKED BY: K. HALPAUS  
 SCALE: 1" = 40'

# TIMMONS GROUP

**LAKEWOOD MANOR - COTTAGES - PHASE 2**  
 TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
 ROOF DRAIN PIPE PLAN

JOB NO. 46579  
 SHEET NO. C5.01

P.O.D. #2020-00486



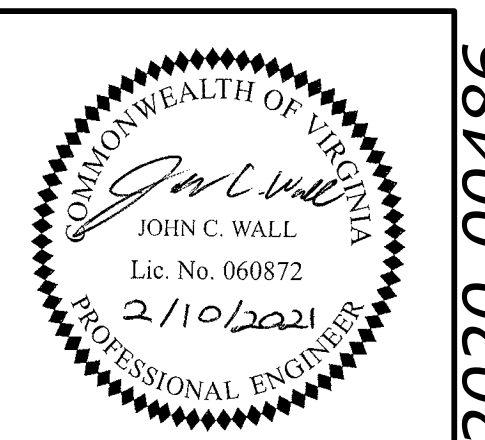
**DISCLAIMER NOTE:**  
 UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND OR OVERHEAD UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION. CONTRACTOR TO NOTIFY ENGINEER OF ANY CHANGES OR DISCREPANCIES.

THE CONTRACTOR(S) SHALL CONTACT VIRGINIA 811 AT 1-800-552-7001 FOR ASSISTANCE IN LOCATING EXISTING UTILITIES. CALL AT LEAST 48 HOURS PRIOR TO ANY DIGGING.

**ADA NOTE:**  
 ALL SIDEWALKS AND HANDICAP ACCESS RAMPS SHALL MEET ADA REQUIREMENTS. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN DESIGN INFORMATION AND ADA REQUIREMENTS PRIOR TO CONSTRUCTION.

**GRADING LEGEND**

× 31.66	EXISTING SPOT GRADE
× E/C	EXISTING EDGE OF CONCRETE
× 34.25	EXISTING EDGE OF PAVEMENT
× E/P	EXISTING EDGE OF PAVEMENT
× 34.25	PROPOSED SPOT GRADE
× 34.25	PROPOSED TOP OF CURB
× TC	PROPOSED TOP OF WALL
× TW	PROPOSED TOP OF WALL
× 34.25	PROPOSED BOTTOM OF WALL
× SWK	PROPOSED SIDEWALK GRADE
× 34.25	PROPOSED SIDEWALK GRADE



THIS DRAWING PREPARED AT THE  
**TTC-CITIES OFFICE**  
 4701 Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-541-1600 FAX 804-456-1511 www.ttcimmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020 <td>PLANNING COMMISSION SUBMITTAL</td>	PLANNING COMMISSION SUBMITTAL
2/10/2021 <td>REVISIONS PER COUNTY COMMENTS</td>	REVISIONS PER COUNTY COMMENTS

DATE	11/16/2020
DRAWN BY	D. ELLIS
DESIGNED BY	J. WALL
CHECKED BY	K. HALPAUS
SCALE	1" = 40'

**TIMMONS GROUP**

**LAKWOOD MANOR - COTTAGES - PHASE 2**  
 TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA

**SPOT SHOT PLAN**

JOB NO. 46579  
 SHEET NO. C5.1

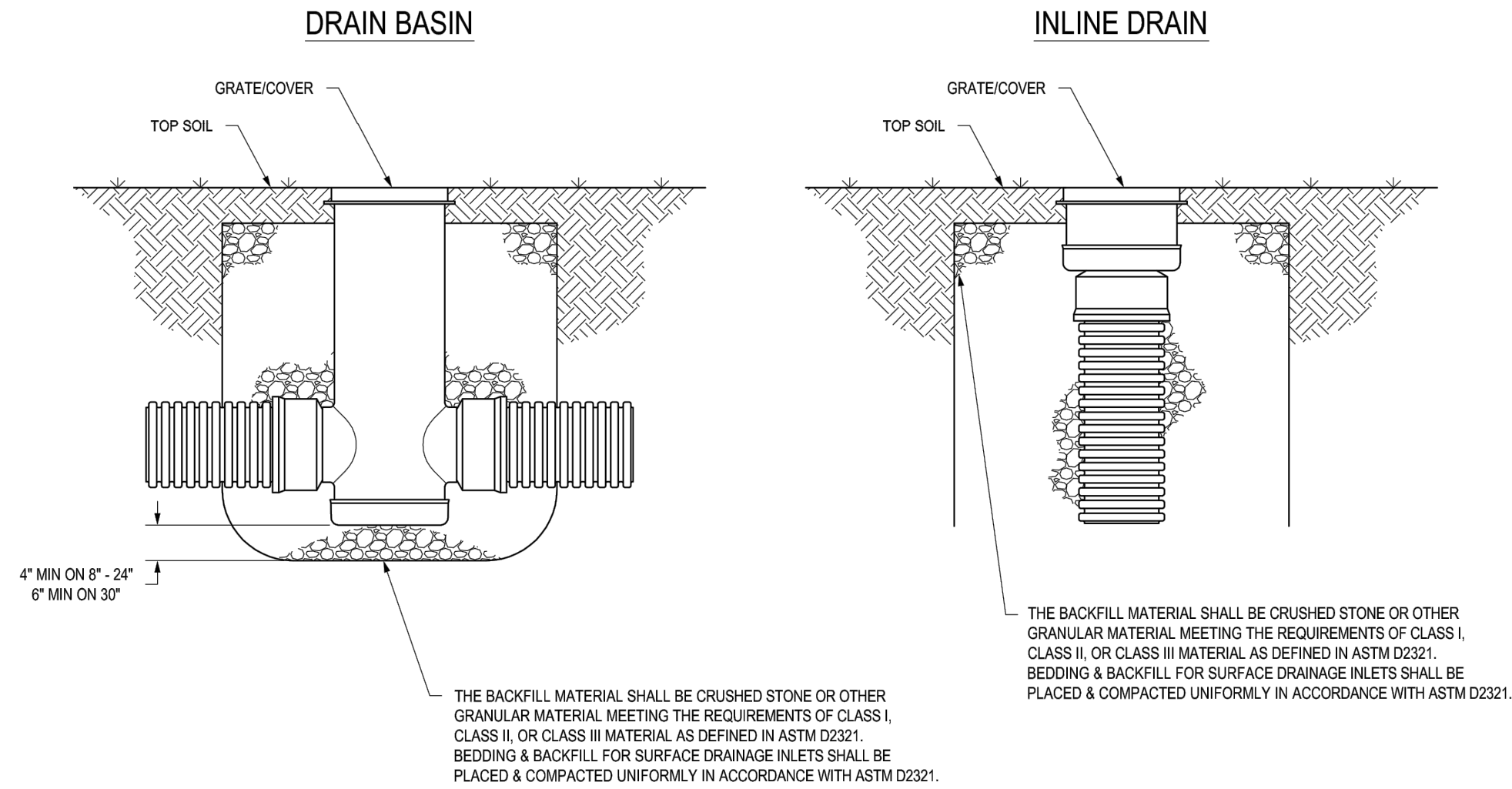
THIS PLAN AND ASSOCIATED DOCUMENTS ARE THE EXCLUSIVE PROPERTY OF TIMMONS GROUP AND MAY NOT BE REPRODUCED IN WHOLE OR IN PART AND SHALL NOT BE USED FOR ANY PURPOSES WHATSOEVER, INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION, BIDDING, AND/OR CONSTRUCTION STAKING WITHOUT THE EXPRESS WRITTEN CONSENT OF TIMMONS GROUP.

NF  
 COUNTY OF HENRICO  
 PARCEL ID: 731-745-9122  
 D.B. 1826, PG. 388

S:\10046579-Lakewood\_Cottages\DWG\Sheet\C5 (GRAD.dwg) | Printed on 2/10/2021 11:15 AM | by John Wall

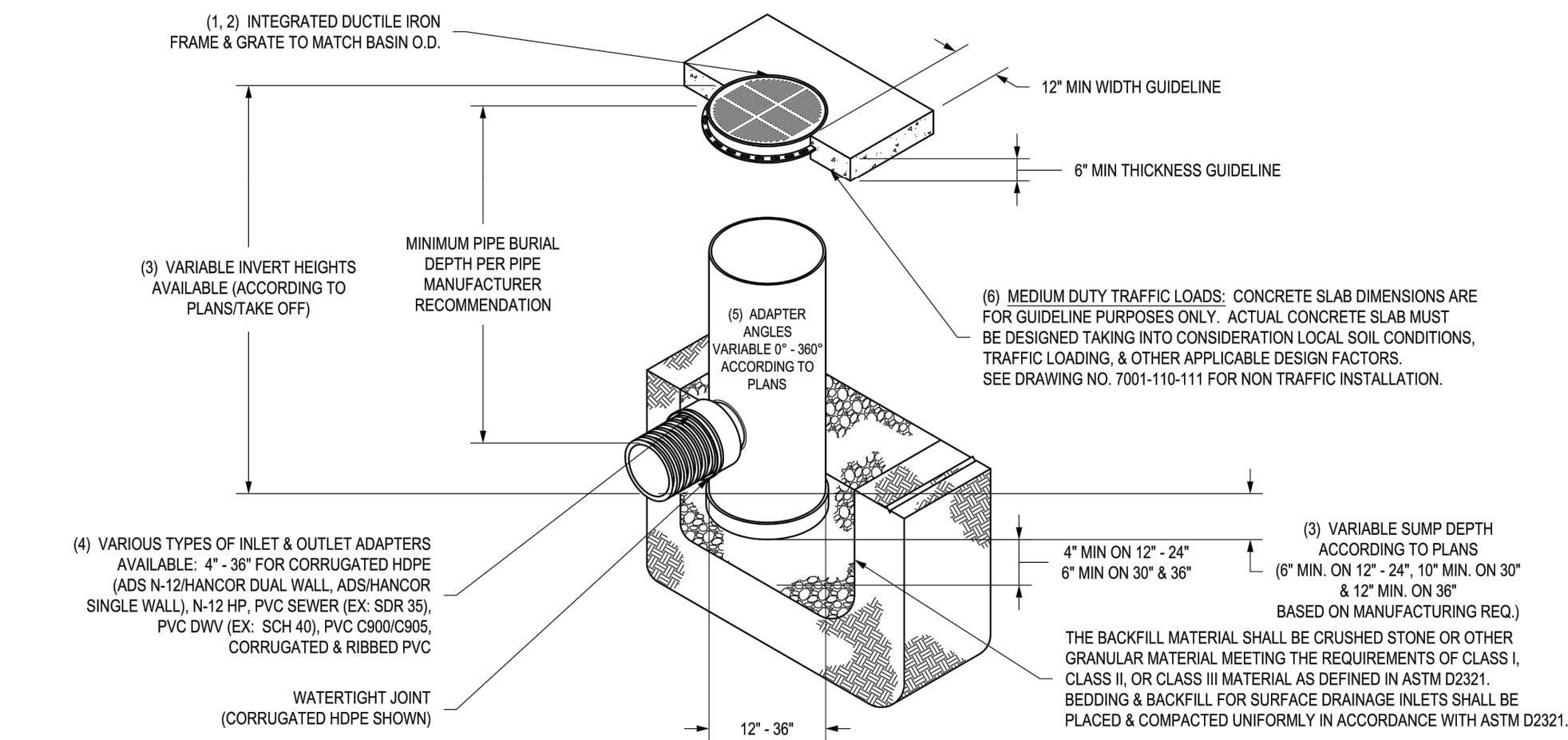
P.O.D. #2020-00486

NON TRAFFIC INSTALLATION

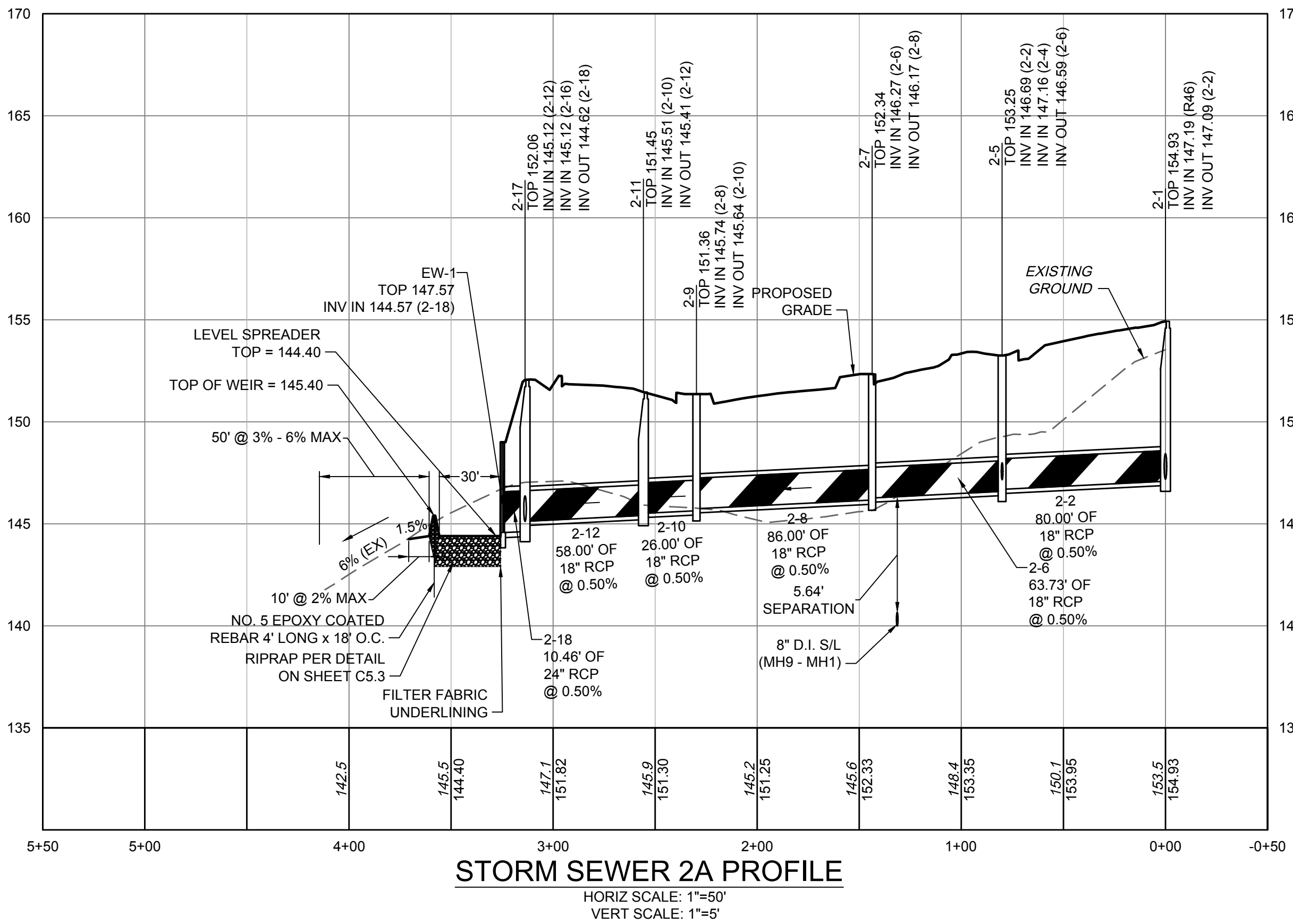


THIS PRINT DISCLOSES SUBJECT MATTER IN WHICH NYLOPLAST HAS PROPRIETARY RIGHTS. THE RECEIPT OR POSSESSION OF THIS PRINT DOES NOT CONFER, TRANSFER, OR LICENSE THE USE OF THE DESIGN OR TECHNICAL INFORMATION SHOWN HEREIN. REPRODUCTION OF THIS PRINT OR ANY INFORMATION CONTAINED HEREIN, OR MANUFACTURE OF ANY ARTICLE HEREFROM, FOR THE DISCLOSURE TO OTHERS IS FORBIDDEN, EXCEPT BY SPECIFIC WRITTEN PERMISSION FROM NYLOPLAST. ©2013 NYLOPLAST		DRAWN BY: CJA DATE: 9-30-09 REVISOR: NMH DATE: 03-11-16 DWG SIZE: A SCALE: 1:25 SHEET: 1 OF 1 DWG NO.: 7001-116-111 REV: E	3130 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2490 www.nyloplast-us.com <b>Nyloplast</b> TITLE: DRAIN BASIN & INLINE DRAIN NON TRAFFIC INSTALLATION
--	--	--	--

NYLOPLAST DRAIN BASIN WITH PEDESTRIAN GRATE

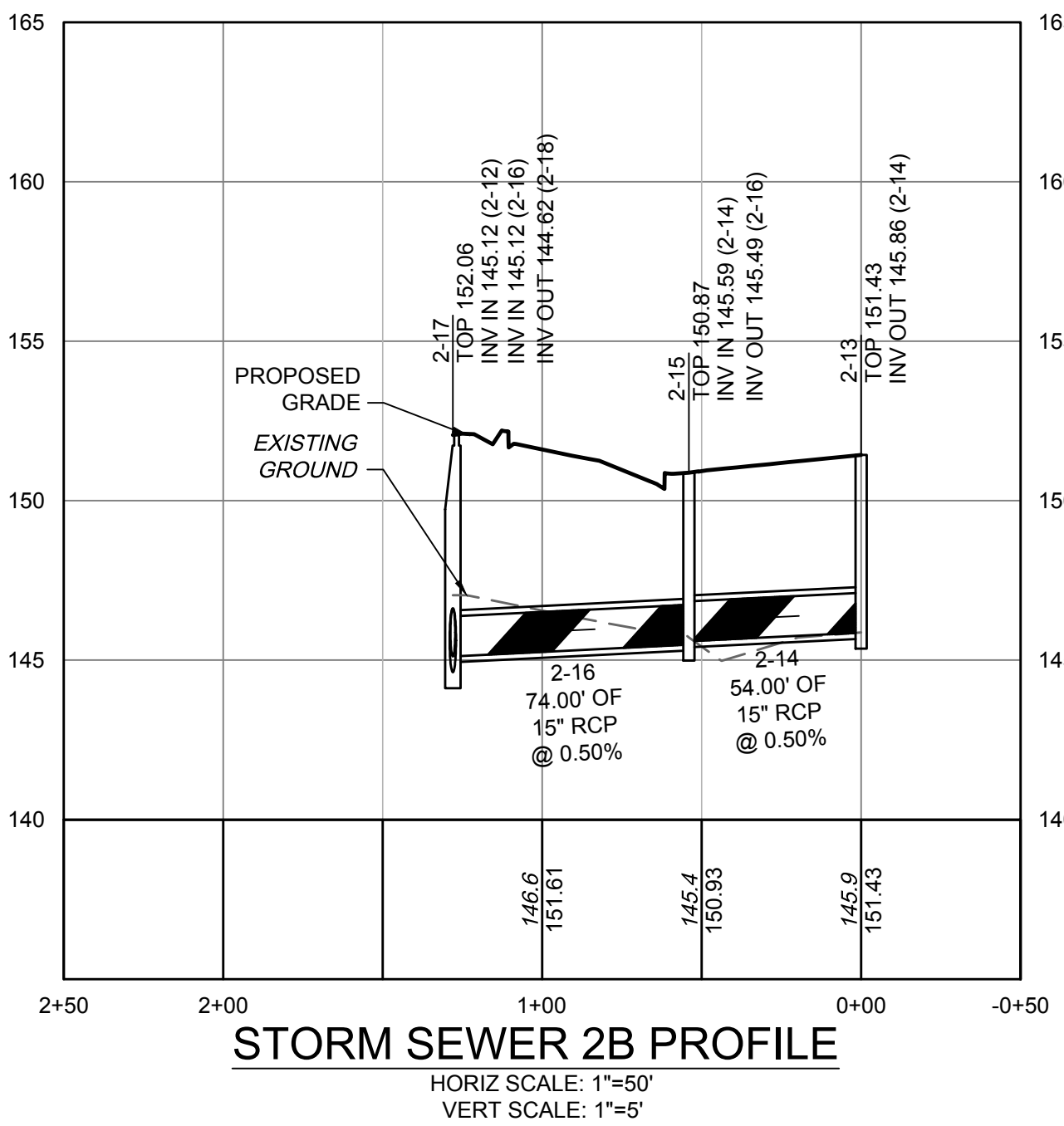


1 - 12" - 30" PEDESTRIAN GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-06. 2 - 12" - 30" FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-06. 3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-085. 4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D2321 FOR CORRUGATED HDPE (ADS N-12 HANCOR DUAL WALL, ADS HANCOR SINGLE WALL), N-12 HP, PVC SEWER (EX. SDR 35), N-12 HP, & PVC SEWER (4" - 30"). 5 - ADAPTERS CAN BE MOUNTED 0° TO 360° TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012. 6 - 12" - 24" PEDESTRIAN GRATES SHALL MEET H-10 LOAD RATING. 30" PEDESTRIAN GRATE SHALL MEET H-20 LOAD RATING (SEE DRAWING NO. 7001-110-144 FOR H-20 TRAFFIC LOAD GUIDELINES).		DRAWN BY: EBC DATE: 4-20-07 REVISOR: NMH DATE: 06-12-18 DWG SIZE: A SCALE: 1:40 SHEET: 1 OF 1 DWG NO.: 7001-116-283 REV: E	3130 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2490 www.nyloplast-us.com <b>Nyloplast</b> TITLE: DRAIN BASIN WITH PEDESTRIAN GRATE QUICK SPEC INSTALLATION DETAIL
---	--	--	---



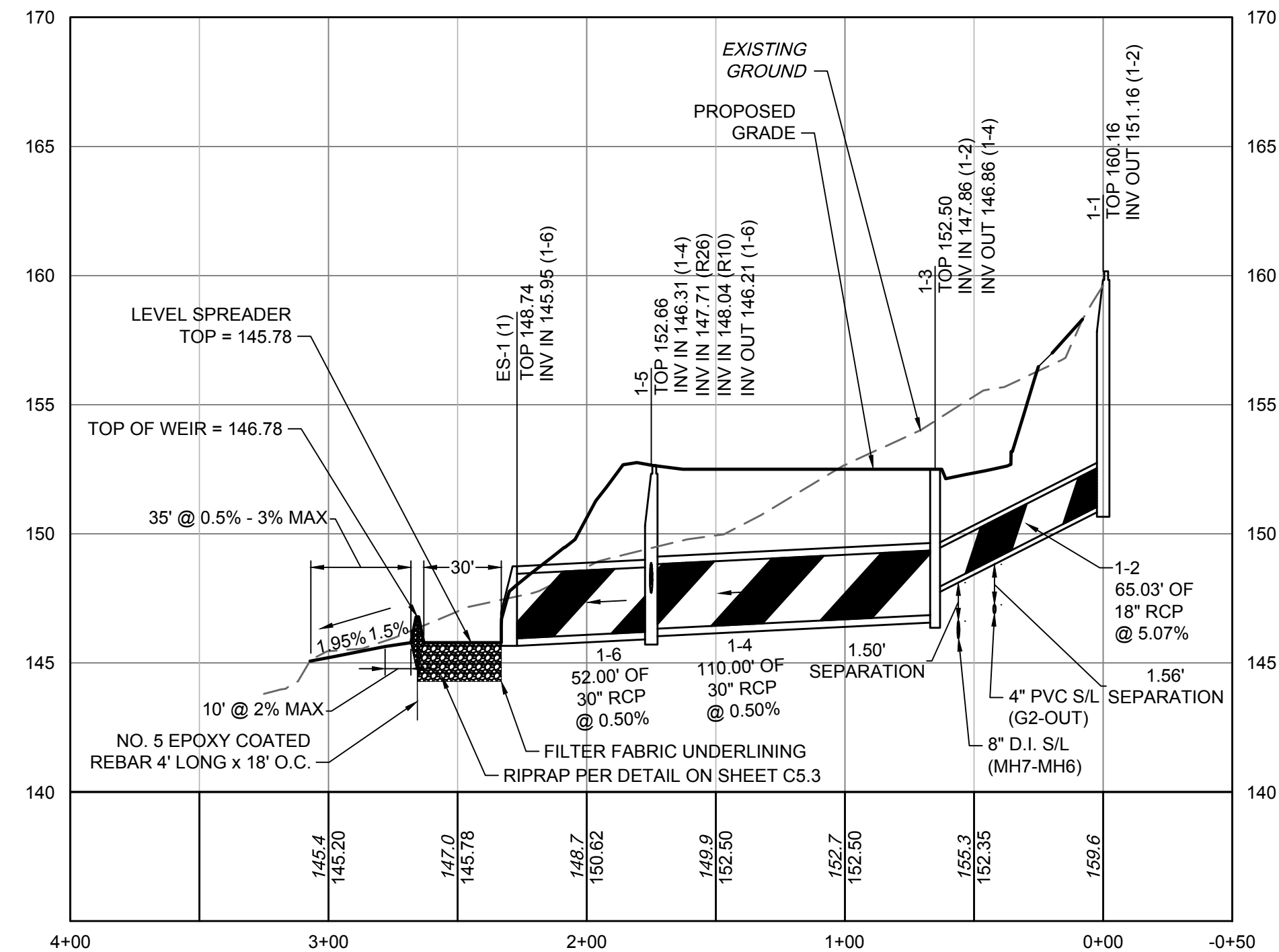
STORM SEWER 2A PROFILE

HORIZ SCALE: 1"=50'  
VERT SCALE: 1"=5'



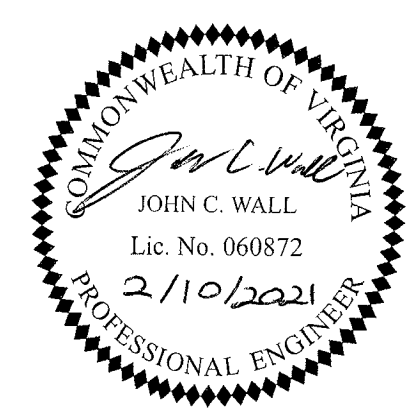
STORM SEWER 2B PROFILE

HORIZ SCALE: 1"=50'  
VERT SCALE: 1"=5'



STORM SEWER 1 PROFILE

HORIZ SCALE: 1"=50'  
VERT SCALE: 1"=5'



THIS DRAWING PREPARED AT THE  
**TRI-CITIES OFFICE**  
 4701 Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-541-1600 FAX 804-458-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	12/17/2020
DRAWN BY	D. ELLIS
DESIGNED BY	J. WALL
CHECKED BY	K. HALPAUS
SCALE	H: 1" = 50' V: 1" = 5'

**TIMMONS GROUP**

LAKEMOOD MANOR - COTTAGES - PHASE 2  
 TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA

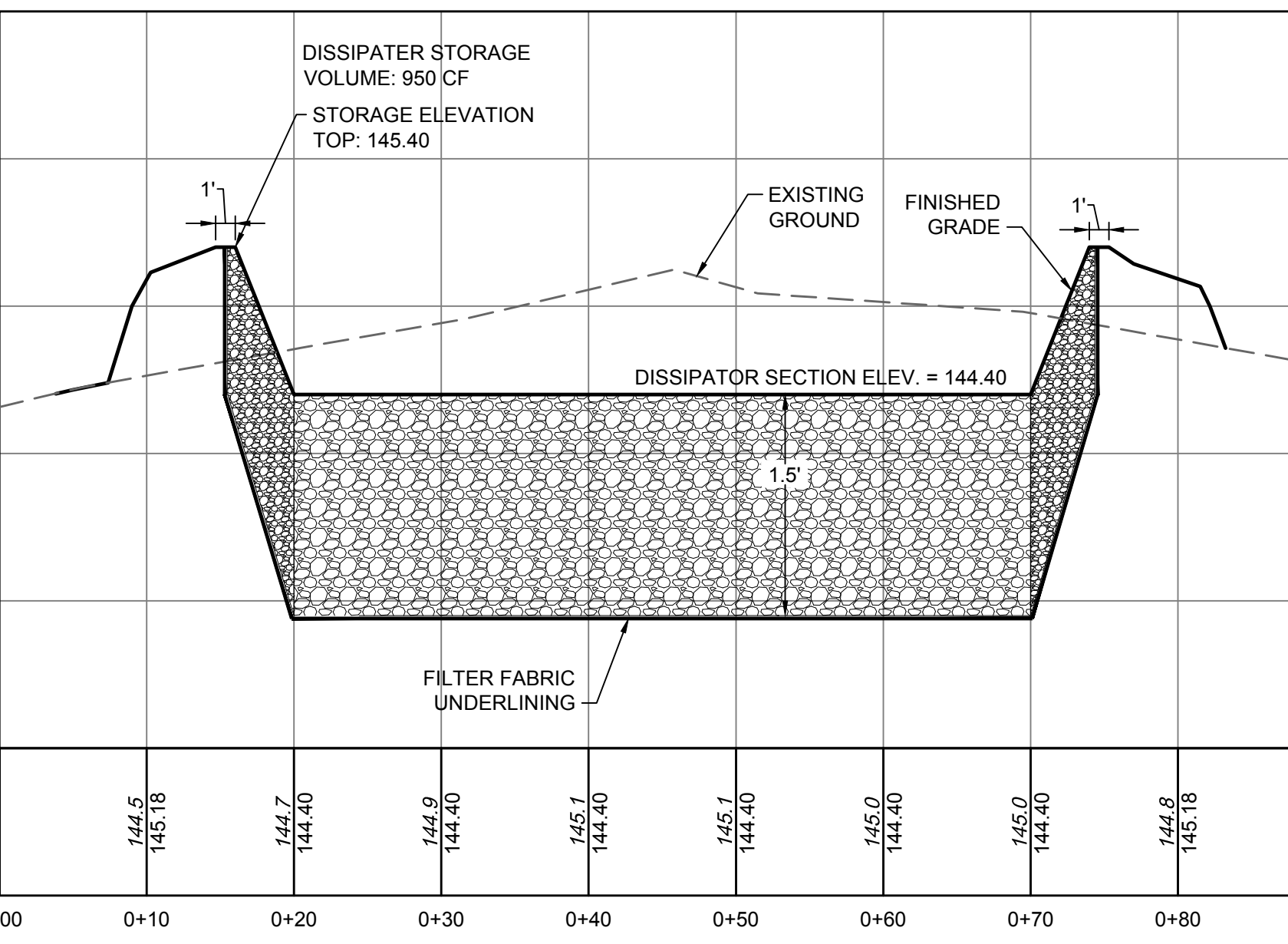
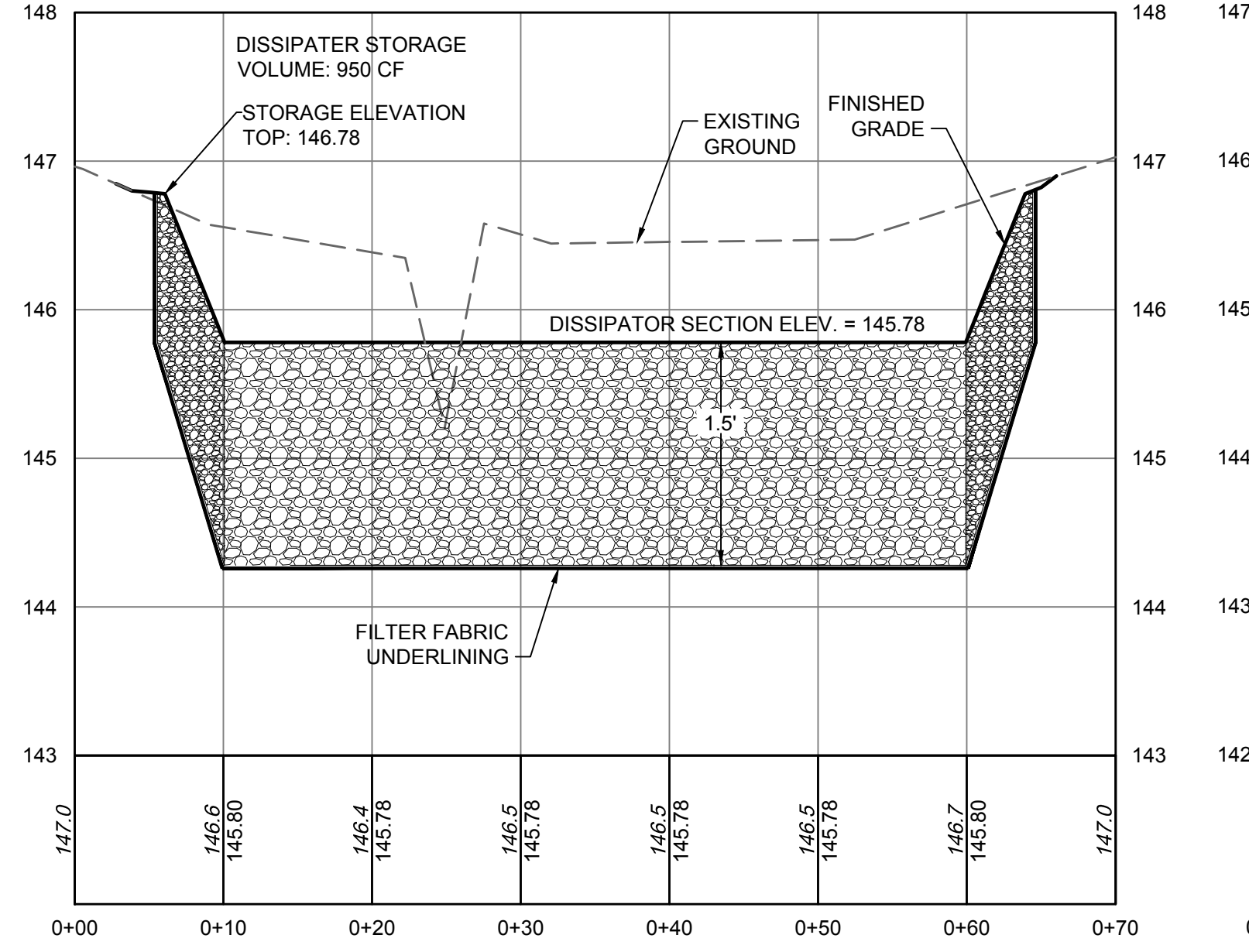
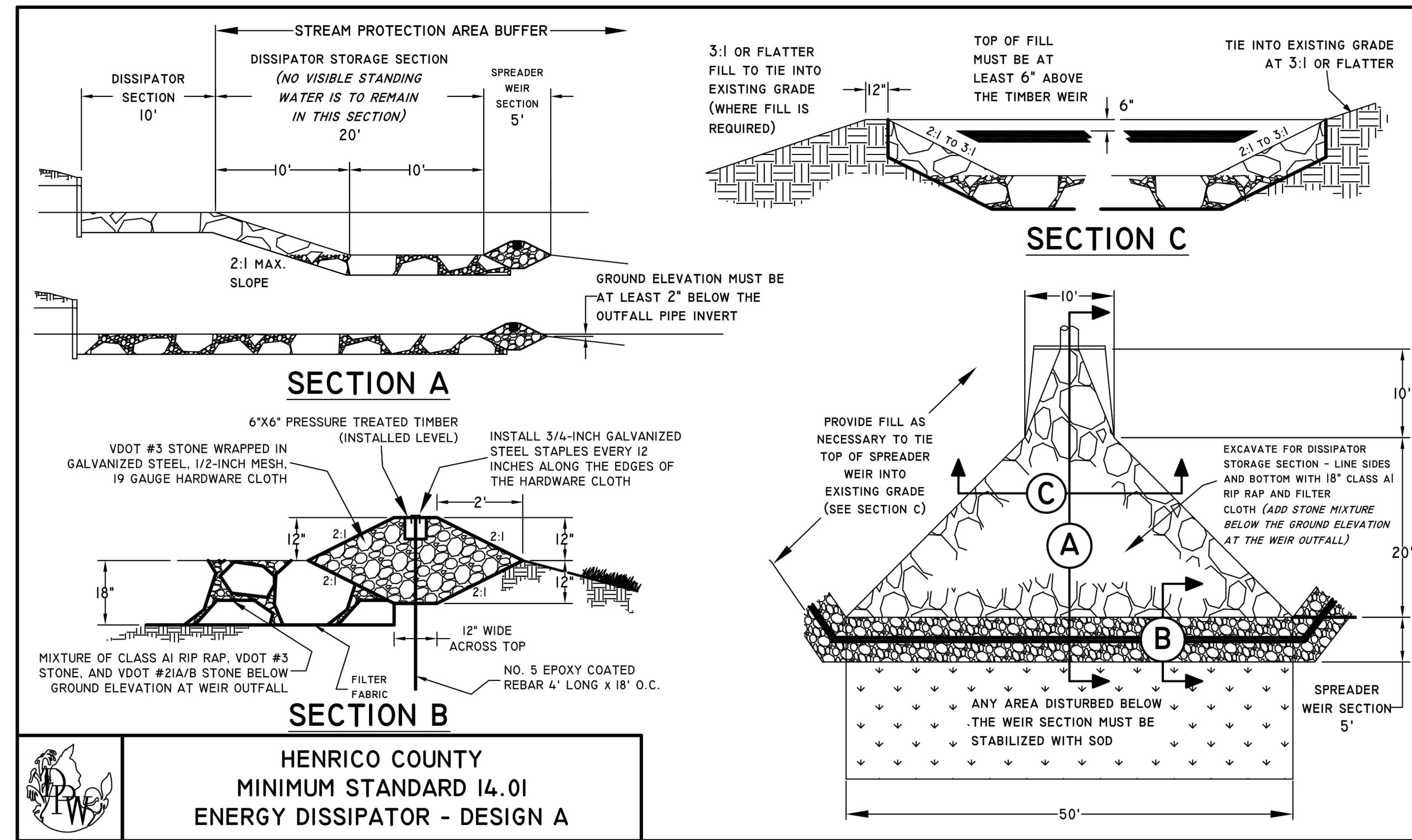
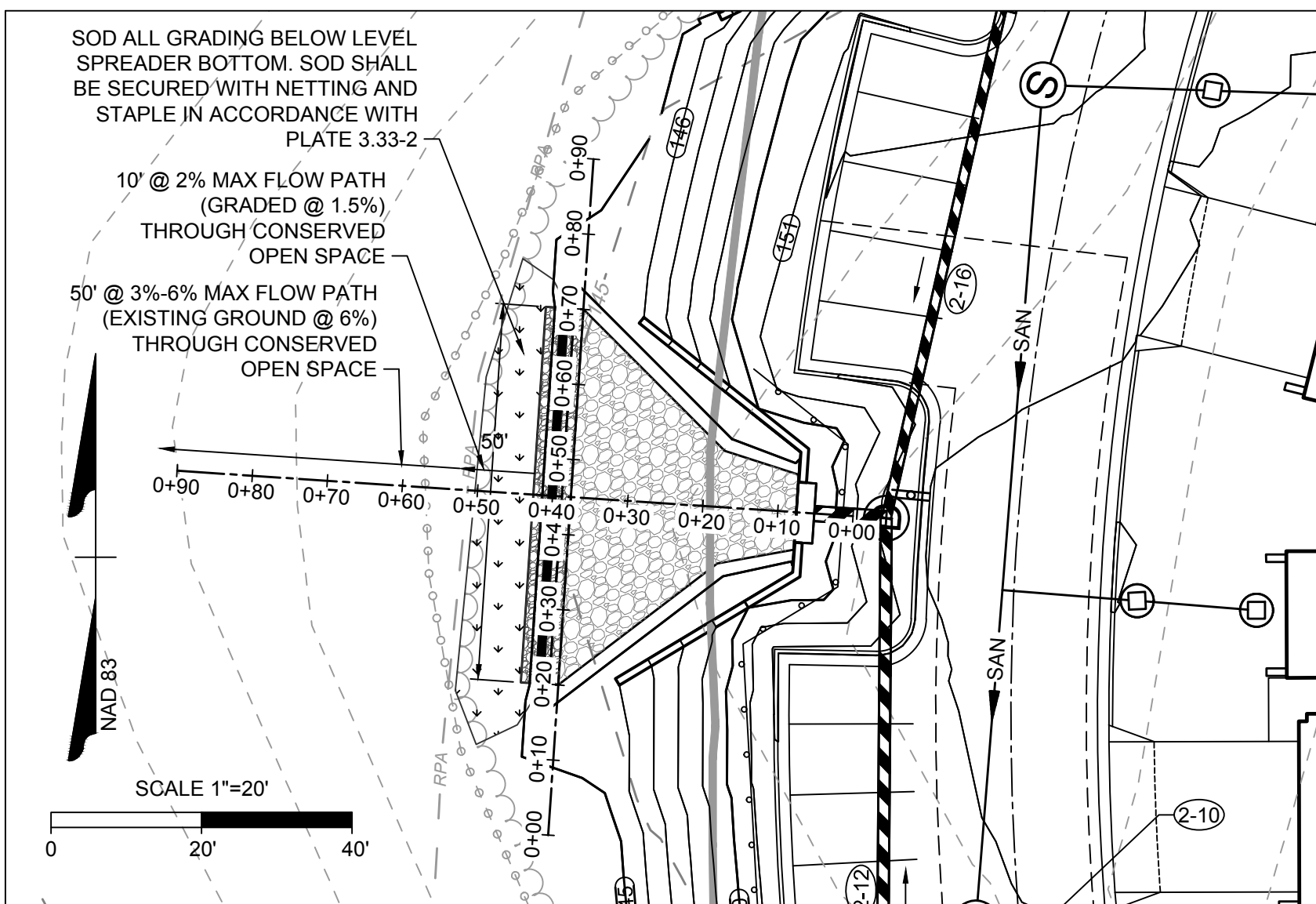
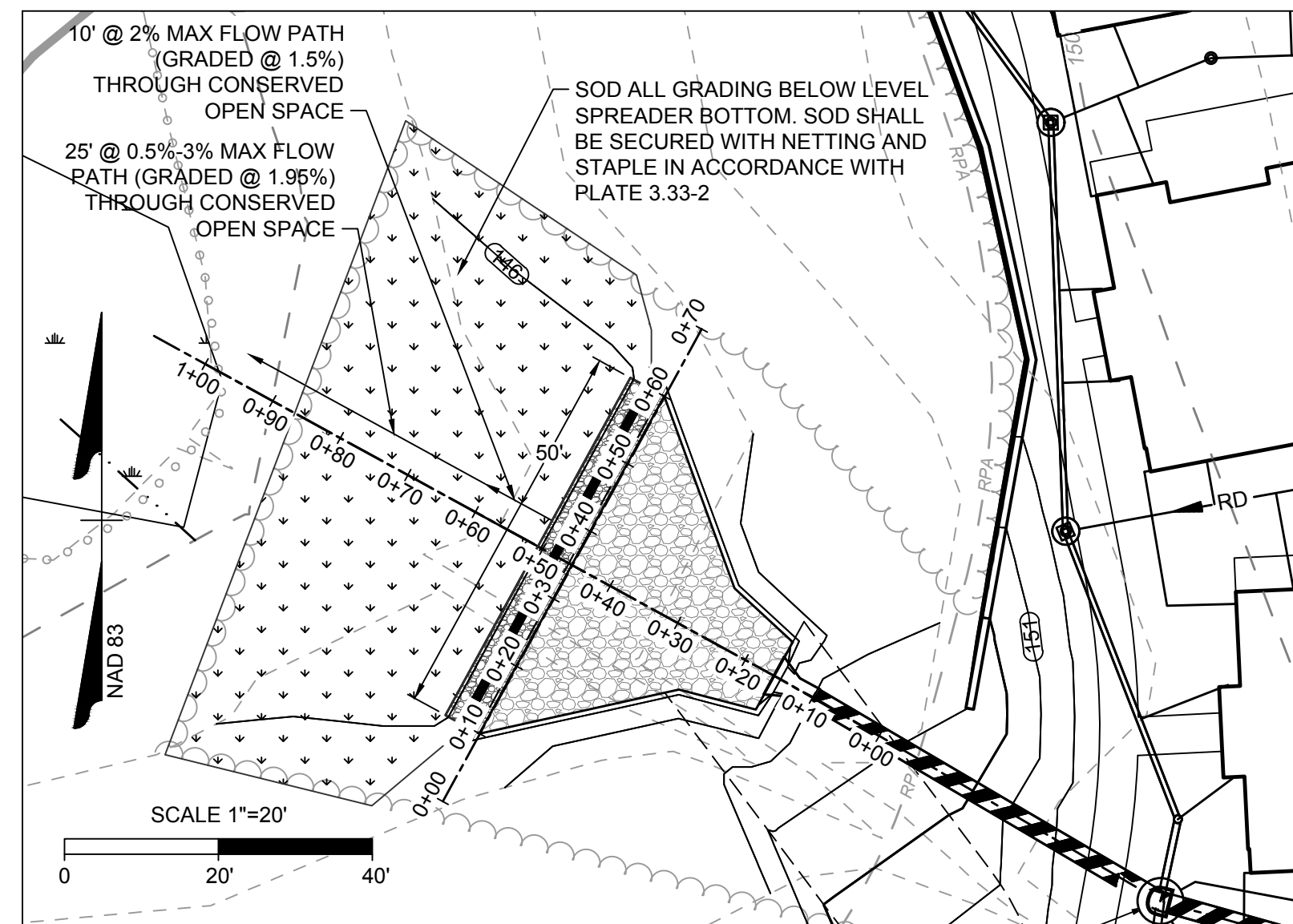
STORM SEWER PROFILES

JOB NO. 46579  
 SHEET NO. C5.2

P.O.D. #2020-00486

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.



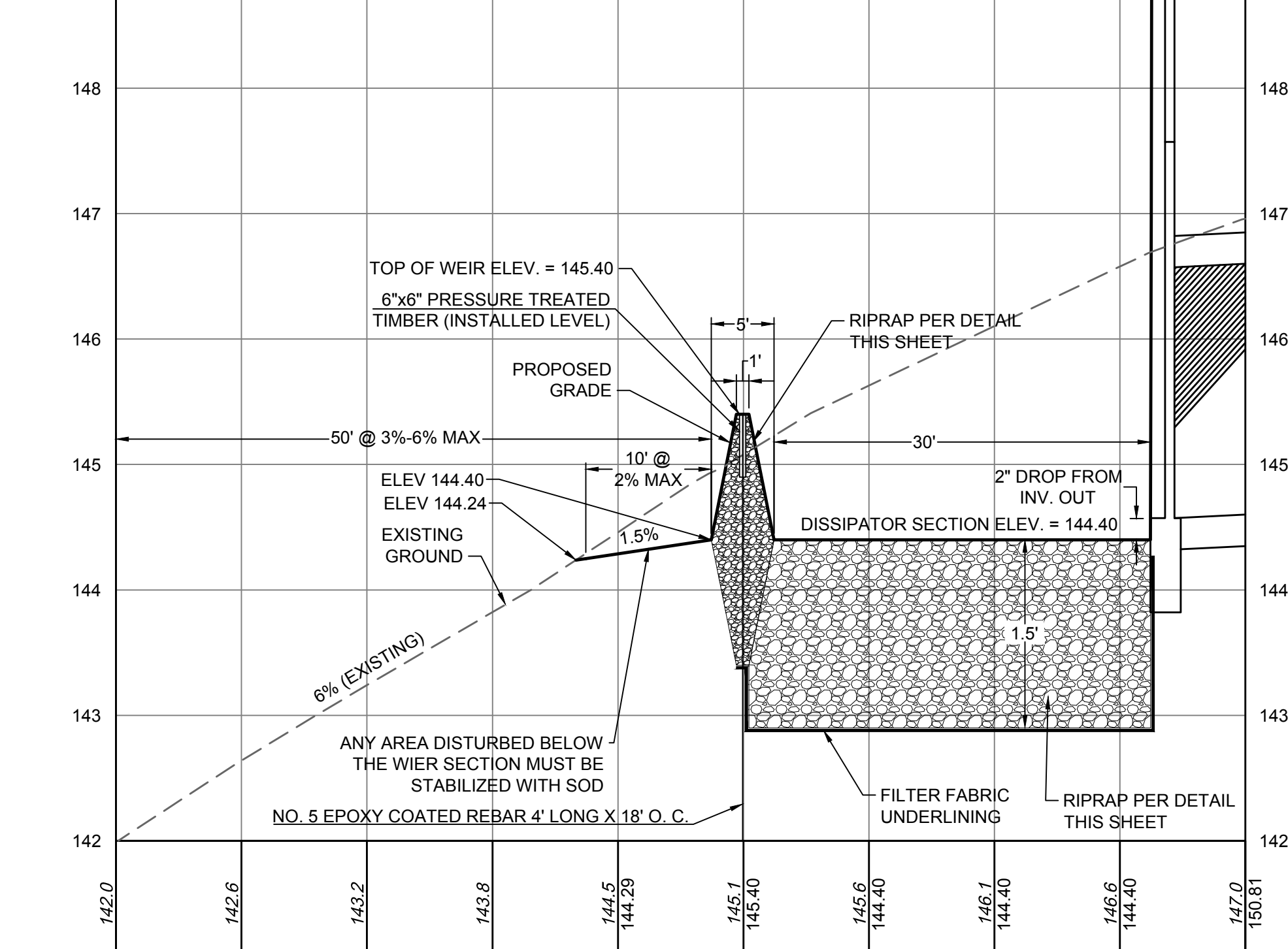
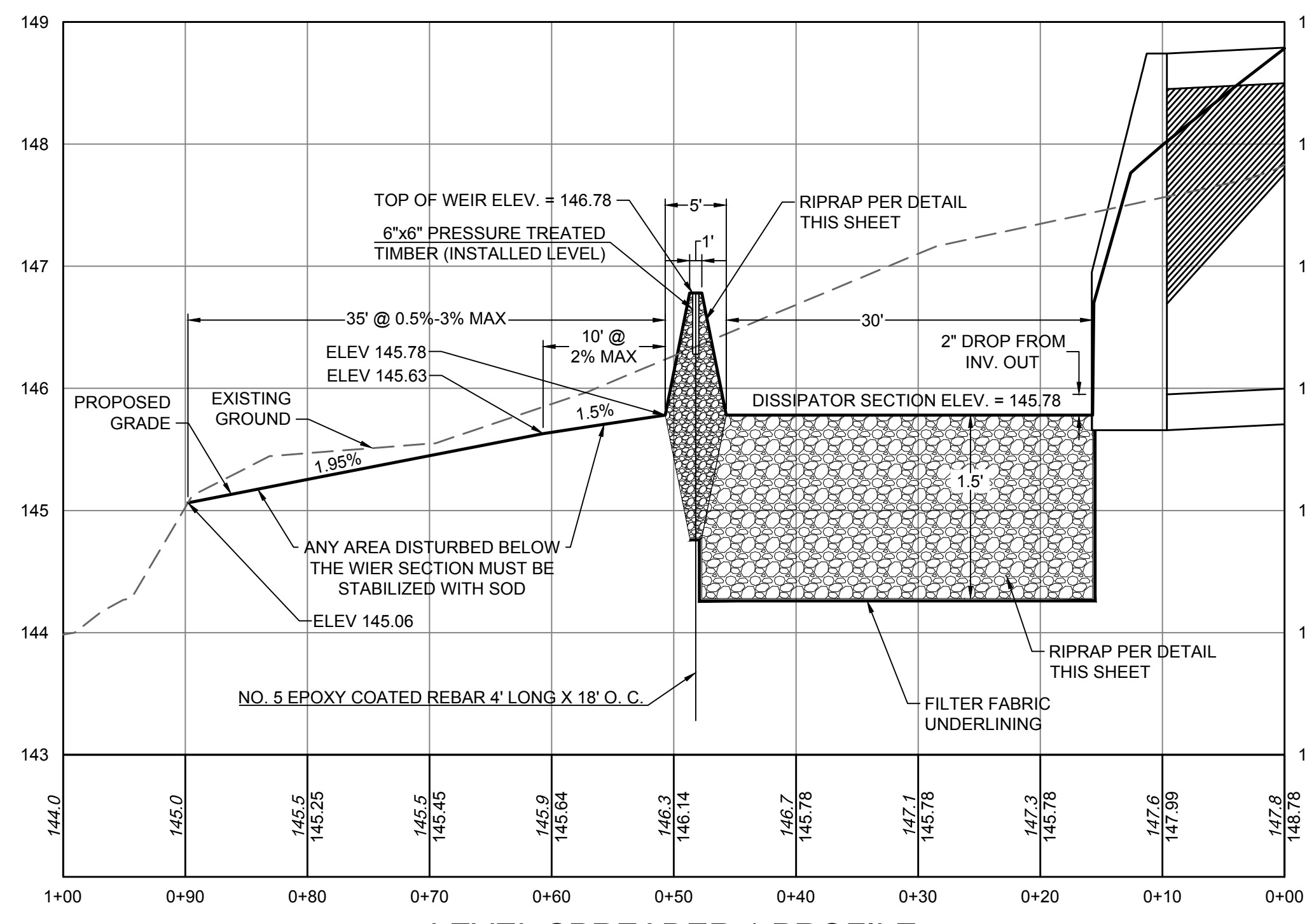


**HENRICO COUNTY  
MINIMUM STANDARD 14.01  
ENERGY DISSIPATOR - DESIGN A**

- LEVEL SPREADER NOTES:**
- LEVEL SPREADER IS DESIGNED AND SHALL BE BUILT IN ACCORDANCE WITH HENRICO COUNTY DESIGN STANDARD 14.01 - ENERGY DISSIPATOR. SEE DETAIL ON THIS SHEET.
  - THE SIDES AND BOTTOM OF THE PLUNGE POOL EXCAVATION SHALL BE LINED WITH FILTER FABRIC UNDERLINING AND CLASS A1 RIP RAP IN ACCORDANCE WITH THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK, THIRD EDITION, 1992. STATE MINIMUM STANDARDS AND SPECIFICATIONS NUMBER 3.19.
  - THE SPREADER WEIR SECTION MUST BE CONSTRUCTED BY EXCAVATING A TRENCH TO THE DEPTH AND CONFIGURATION SHOWN, LAYING DOWN HARDWARE CLOTH AND BACKFILLING WITH VDOT NO. 3 AGGREGATE. THE HARDWARE CLOTH SHALL BE GALVANIZED STEEL 1/2 INCH MESH, 19 GAUGE AND SHALL BE WRAPPED AROUND THE AGGREGATE AND TIMBER AS SHOWN. THE EDGES MUST BE STAPLED TO THE TOP OF THE TIMBER EVERY 12" WITH 3/4 INCH GALVANIZED STEEL STAPLES.
  - SWM FACILITY HAS BEEN DESIGNED IN ACCORDANCE WITH SECTION 9.4.2 (SHEET FLOW TO CONSERVED OPEN SPACE) OF THE HENRICO COUNTY ENVIRONMENTAL COMPLIANCE MANUAL.

**LEVEL SPREADER 1 CROSS-SECTION**  
HORIZ SCALE: 1"=10'  
VERT SCALE: 1"=1'

**LEVEL SPREADER 2 CROSS-SECTION**  
HORIZ SCALE: 1"=10'  
VERT SCALE: 1"=1'



**LEVEL SPREADER 1 PROFILE**  
HORIZ SCALE: 1"=10'  
VERT SCALE: 1"=1'

**LEVEL SPREADER 2 PROFILE**  
HORIZ SCALE: 1"=10'  
VERT SCALE: 1"=1'

**SECTION 9. MAINTENANCE**

**9.1. MAINTENANCE AGREEMENTS**

SECTION 4 VAC 50-60-124 OF THE REGULATIONS SPECIFIES THE CIRCUMSTANCES UNDER WHICH A MAINTENANCE AGREEMENT MUST BE EXECUTED BETWEEN THE OWNER AND THE LOCAL PROGRAM. THIS SECTION SETS FORTH INSPECTION REQUIREMENTS, COMPLIANCE PROCEDURES IF MAINTENANCE IS NEGLECTED, NOTIFICATION OF THE LOCAL PROGRAM UPON TRANSFER OF OWNERSHIP, AND RIGHT-OF-ENTRY FOR LOCAL PROGRAM PERSONNEL.

ALL VEGETATED FILTER STRIPS MUST BE COVERED BY A DRAINAGE EASEMENT TO ALLOW INSPECTION AND MAINTENANCE. IF THE FILTER AREA IS A NATURAL CONSERVED OPEN SPACE, IT MUST BE PROTECTED BY A PERPETUAL EASEMENT OR DEED RESTRICTION THAT ASSIGNS THE RESPONSIBLE PARTY TO ENSURE THAT NO FUTURE DEVELOPMENT, DISTURBANCE OR CLEARING MAY OCCUR WITHIN THE AREA, EXCEPT AS STIPULATED IN THE VEGETATION MAINTENANCE PLAN.

IF THE VEGETATED FILTER STRIP IS LOCATED ON A RESIDENTIAL PRIVATE LOT, THE EXISTENCE AND PURPOSE OF THE FILTER STRIP SHALL BE NOTED ON THE DEED OF RECORD. HOMEOWNERS WILL NEED TO BE PROVIDED A SIMPLE DOCUMENT THAT EXPLAINS THE PURPOSE OF THE FILTER STRIP AND ROUTINE MAINTENANCE NEEDS. A DEED RESTRICTION OR OTHER MECHANISM ENFORCEABLE BY THE QUALIFYING LOCAL PROGRAM MUST BE IN PLACE TO HELP ENSURE THAT FILTER STRIPS ARE MAINTAINED AND CONSERVED OPEN SPACE AREAS ARE NOT CONVERTED OR DISTURBED. THE MECHANISM SHOULD, IF POSSIBLE, GRANT AUTHORITY FOR LOCAL AGENCIES TO ACCESS THE PROPERTY FOR INSPECTION OR CORRECTIVE ACTION.

**9.2. MAINTENANCE INSPECTIONS**

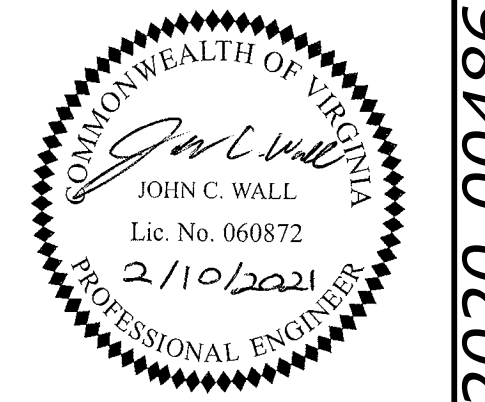
ANNUAL INSPECTIONS ARE USED TO TRIGGER MAINTENANCE OPERATIONS SUCH AS SEDIMENT REMOVAL, SPOT RE-VEGETATION AND LEVEL SPREADER REPAIR. IDEALLY, INSPECTIONS SHOULD BE CONDUCTED IN THE NON-GROWING SEASON WHEN IT IS EASIER TO SEE THE FLOW PATH. EXAMPLE MAINTENANCE INSPECTION CHECKLISTS FOR SHEET FLOW TO A FILTER STRIP OR CONSERVED OPEN SPACE AREAS CAN BE ACCESSED IN APPENDIX C OF CHAPTER 9 OF THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK OR AT THE CENTER FOR WATERSHED PROTECTION'S WEBSITE.

**INSPECTORS SHOULD CHECK TO ENSURE THAT:**

- FLOWS THROUGH THE RIPRAP PLUNGE POOL DO NOT SHORT-CIRCUIT THE OVERFLOW CONTROL SECTION;
- THE TIMBER WEIR REMAINS IN PLACE AND DOES NOT GET DAMAGED;
- DEBRIS AND SEDIMENT DOES NOT BUILD UP AT THE TOP OF THE WEIR OR WITHIN THE RIPRAP PLUNGE POOL;
- FOOT OR VEHICULAR TRAFFIC DOES NOT COMPROMISE THE RIPRAP DISSIPATOR;
- SCOUR AND EROSION DO NOT OCCUR WITHIN RIPRAP DISSIPATOR;
- SEDIMENTS ARE CLEANED OUT OF LEVEL SPREADER FOREBAYS;
- STORMWATER RUNOFF EXITING THE LEVEL SPREADER DO NOT CONCENTRATE OR CREATE A CHANNEL IN THE GROUND; AND
- THE AREA DISTURBED BELOW THE WEIR SECTION REMAINS STABILIZED WITH SOD

**9.1. ONGOING MAINTENANCE**

ONCE ESTABLISHED, VEGETATED FILTER STRIPS AND THE SOD AREA HAVE MINIMAL MAINTENANCE NEEDS OUTSIDE OF THE SPRING CLEAN UP, REGULAR MOWING, REPAIR OF CHECK DAMS AND OTHER MEASURES TO MAINTAIN THE HYDRAULIC EFFICIENCY OF THE STRIP AND A DENSE, HEALTHY GRASS COVER. VEGETATED FILTER STRIPS THAT CONSIST OF GRASS/TURF COVER SHOULD BE MOWED AT LEAST TWICE A YEAR TO PREVENT WOODY GROWTH.



THIS DRAWING PREPARED AT THE  
**TRICITIES OFFICE**  
4701 Owens Way, Suite 900 | Prince George, VA 23875  
TEL 804-541-1000 FAX 804-436-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020	PLANNING COMMISSION SUBMITTAL
2/10/2021	REVISIONS PER COUNTY COMMENTS

DATE: 11/16/2020  
DRAWN BY: D. ELLIS  
DESIGNED BY: J. WALL  
CHECKED BY: K. HALPAUS  
SCALE: AS SHOWN

**TIMMONS GROUP**

**LAKEMOOD MANOR - COTTAGES - PHASE 2**  
LUCKYHOLE DISTRICT - HENRICO COUNTY - VIRGINIA

**STORMWATER MANAGEMENT NOTES AND DETAILS**

JOB NO. 46579  
SHEET NO. C5.3

P.O.D. #2020-00486

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced, in whole or in part, and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.

Storm Sewer 1  
STORM SEWER DESIGN COMPUTATIONS

PROJECT: Lakewood Cottages  
COUNTY: Henrico

Designed by: JCW  
Checked by: KNH

STORM FREQUENCY 2 Year

Table with columns: PIPE NO, FROM POINT REFERENCE, TO POINT REFERENCE, DRAIN AREA, RUNOFF COEFF, CA, TOTAL INLET TIME, RAIN FALL, RUNOFF Q, INVERT ELEVATIONS, LENGTH, SLOPE, SIZE, SHAPE, Capacity, Friction Slope, VEL, FLOW TIME, REMARKS.

HYDRAULIC GRADE LINE ANALYSIS

INCIDENCE PROBABILITY 2 Year

Table with columns: INLET OR JUNCTION, WATER SURFACE ELEV., DIA. PIPE, DESIGN DISCH, LENGTH, FRICTION SLOPE, FRICTION LOSS, JUNCTION LOSS, Ht, 1.3 Ht, 0.5 Ht, FINAL H, Inlet Water Surface Elevation, Rim Elev, Comments.

Table with columns: R9, R7, R5, R3, R1

Table with columns: 1-3, 1-1

Storm Sewer 1  
STORM SEWER DESIGN COMPUTATIONS

PROJECT: Lakewood Cottages  
COUNTY: Henrico

Designed by: JCW  
Checked by: KNH

STORM FREQUENCY 10 Year

Table with columns: PIPE NO, FROM POINT REFERENCE, TO POINT REFERENCE, DRAIN AREA, RUNOFF COEFF, CA, TOTAL INLET TIME, RAIN FALL, RUNOFF Q, INVERT ELEVATIONS, LENGTH, SLOPE, SIZE, SHAPE, Capacity, Friction Slope, VEL, FLOW TIME, REMARKS.

HYDRAULIC GRADE LINE ANALYSIS

INCIDENCE PROBABILITY 10 Year

Table with columns: INLET OR JUNCTION, WATER SURFACE ELEV., DIA. PIPE, DESIGN DISCH, LENGTH, FRICTION SLOPE, FRICTION LOSS, JUNCTION LOSS, Ht, 1.3 Ht, 0.5 Ht, FINAL H, Inlet Water Surface Elevation, Rim Elev, Comments.

Table with columns: R9, R7, R5, R3, R1

Table with columns: 1-3, 1-1

Storm Sewer 1  
STORM SEWER DESIGN COMPUTATIONS

PROJECT: Lakewood Cottages  
COUNTY: Henrico

Designed by: JCW  
Checked by: KNH

STORM FREQUENCY 100 Year

Table with columns: PIPE NO, FROM POINT REFERENCE, TO POINT REFERENCE, DRAIN AREA, RUNOFF COEFF, CA, TOTAL INLET TIME, RAIN FALL, RUNOFF Q, INVERT ELEVATIONS, LENGTH, SLOPE, SIZE, SHAPE, Capacity, Friction Slope, VEL, FLOW TIME, REMARKS.

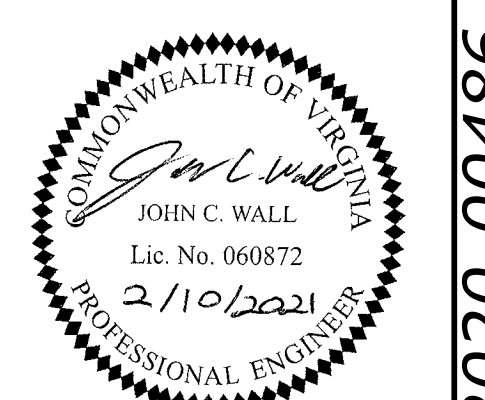
HYDRAULIC GRADE LINE ANALYSIS

INCIDENCE PROBABILITY 100 Year

Table with columns: INLET OR JUNCTION, WATER SURFACE ELEV., DIA. PIPE, DESIGN DISCH, LENGTH, FRICTION SLOPE, FRICTION LOSS, JUNCTION LOSS, Ht, 1.3 Ht, 0.5 Ht, FINAL H, Inlet Water Surface Elevation, Rim Elev, Comments.

Table with columns: R9, R7, R5, R3, R1

Table with columns: 1-3, 1-1



THIS DRAWING PREPARED AT THE TIMMONS OFFICE  
4701 Owens Way, Suite 900 | Prince George, VA 22975  
TEL 604-541-1600 FAX 604-456-1511 www.timmons.com

REVISION DESCRIPTION  
DATE 12/17/2020  
PLANNING COMMISSION SUBMITTAL  
2/10/2021  
REVISIONS PER COUNTY COMMENTS

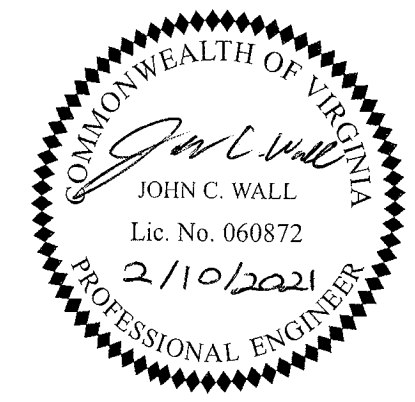
DATE 11/16/2020  
DRAWN BY D. ELLIS  
DESIGNED BY J. WALL  
CHECKED BY J. JOHNSON  
SCALE NONE

TIMMONS GROUP  
LAKEWOOD MANOR - COTTAGES - PHASE 2  
LUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
STORMWATER MANAGEMENT CALCULATIONS  
JOB NO. 46579  
SHEET NO. C5.4

P.O.D. # 2020-00486

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.





THIS DRAWING PREPARED AT THE  
**TRI-CITIES OFFICE**  
 4701 Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-341-1600 FAX 804-486-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE  
11/16/2020  
 DRAWN BY  
D. ELLIS  
 DESIGNED BY  
J. WALL  
 CHECKED BY  
D. JOHNSON  
 SCALE  
NONE

**TIMMONS GROUP**  
 LAKEWOOD MANOR - COTTAGES - PHASE 2  
 LUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
 STORMWATER MANAGEMENT CALCULATIONS  
 JOB NO.  
46579  
 SHEET NO.  
C5.6

P.O.D. #2020-00486

DA: Level Spreader 1  
 C-factor Area  
 Grass/Trees 0.30 4.42 1.33  
 Roof/Pvmt 0.90 3.90 3.51

Area Total C-factor  
 8.32 0.58

Tc:  
 Overland:  
 Length = 100 ft  
 Slope = 1.25 %  
 c-factor = 0.30  
 tc = 11.9 minutes

Concentrated:  
 Length = 851 ft  
 H = 26.0 ft  
 tc = 5.6 minutes  
 Tc = 17.6 minutes

I<sub>2</sub> = 3.30 Q<sub>2</sub> = 16.0 cfs  
 I<sub>10</sub> = 4.42 Q<sub>10</sub> = 21.4 cfs  
 I<sub>25</sub> = 4.93 Q<sub>25</sub> = 23.8 cfs  
 I<sub>50</sub> = 5.42 Q<sub>50</sub> = 26.2 cfs  
 I<sub>100</sub> = 5.67 Q<sub>100</sub> = 27.4 cfs

DA: Level Spreader 2  
 C-factor Area  
 Grass/Trees 0.30 1.20 0.36  
 Roof/Pvmt 0.90 1.45 1.31

Area Total C-factor  
 2.65 0.63

Tc:  
 Overland:  
 Length = 65 ft  
 Slope = 4.50 %  
 c-factor = 0.30  
 tc = 7.8 minutes

Concentrated:  
 Length = 603 ft  
 H = 7.0 ft  
 tc = 6.3 minutes  
 Tc = 14.1 minutes

I<sub>2</sub> = 3.67 Q<sub>2</sub> = 6.1 cfs  
 I<sub>10</sub> = 4.89 Q<sub>10</sub> = 8.1 cfs  
 I<sub>25</sub> = 5.43 Q<sub>25</sub> = 9.0 cfs  
 I<sub>50</sub> = 5.95 Q<sub>50</sub> = 9.9 cfs  
 I<sub>100</sub> = 6.22 Q<sub>100</sub> = 10.4 cfs

**STORM SEWER INLET CALCULATIONS**

Curb Inlets on Sag															
Label	Solve For	Discharge (ft <sup>3</sup> /s)	Spread (ft)	Gutter Width (ft)	Gutter Cross Slope (ft/ft)	Road Cross Slope (ft/ft)	Curb Opening Length	Opening Height (ft)	Curb Throat Type	Local Depression (in)	Local Depression Width (ft)	Throat Incline Angle (degrees)	Depth (ft)	Gutter Depression (ft)	Total Depression (ft)
1-3	Spread	4.25	6.9	1.5	0.083	0.04	10	0.5	Horizontal	1.5	18	90	4.1	0.8	2.3

Curb Inlets on Grade																						
Label	Efficiency (%)	Curb Opening Length (ft)	Local Depression (in)	Local Depression Width (in)	Discharge (cfs)	Slope (ft/ft)	Gutter Width (ft)	Gutter Cross Slope (ft/ft)	Road Cross Slope (ft/ft)	Manning Coefficient	Intercepted Flow (cfs)	Bypass Flow (cfs)	Spread (ft)	Depth (in)	Flow Area (ft <sup>2</sup> )	Gutter Depression (in)	Total Depression (in)	Velocity (ft/s)	Equivalent Cross Slope (ft/ft)	Length Factor	Total Interception Length (ft)	
2-5	100	8	1.5	18	0.77	0.048	1.5	0.083	0.04	0.016	0.77	0	2.5	2	0.2	0.8	2.3	4.41	0.16	1.032	7.8	
2-7	100	8	1.5	18	0.3	0.025	1.5	0.083	0.04	0.016	0.3	0	1.7	1.6	0.1	0.8	2.3	2.84	0.167	1.911	4.2	

Combination Inlets on Grade																																
Label	Solve For	Discharge (cfs)	Slope (ft/ft)	Grate Width (ft)	Gutter Cross Slope	Road Cross Slope (ft/ft)	Manning Coefficient	Local Depression (in)	Local Depression Width (in)	Efficiency (%)	Gutter Width (ft)	Grate Length (ft)	Grate Type	Clogging (%)	Curb Opening Length (ft)	Intercepted Flow (cfs)	Bypass Flow (cfs)	Spread (ft)	Depth (in)	Flow Area (ft <sup>2</sup> )	Gutter Depression (in)	Total Depression (in)	Velocity (ft/s)	Splash Over Velocity (ft/s)	Frontal Flow Factor	Side Flow Factor	Grate Flow Ratio	Equivalent Cross Slope (ft/ft)	Active Grate Length (ft)	Length Factor	Total Interception Length (ft)	Grate Flow Option
2-13	Efficiency	0.98	0.01	1.5	0.083	0.028	0.016	1.5	18	100	1.5	2	P-50 mm (P-1-7/8")	50	8	0.98	0	5.1	2.7	0.4	1	2.5	2.28	5.66	1	0.041	0.716	0.127	1	1.138	6.2	Exclude None

Combination Inlets on Sag																						
Label	Solve For	Discharge (cfs)	Spread (ft)	Gutter Width (ft)	Gutter Cross Slope (ft/ft)	Road Cross Slope (ft/ft)	Local Depression (in)	Local Depression Width (in)	Grate Width (ft)	Grate Length (ft)	Grate Type	Clogging (%)	Curb Opening Length (ft)	Opening Height (ft)	Curb Throat Type	Throat Incline Angle (degrees)	Depth (in)	Gutter Depression (in)	Total Depression (in)	Open Grate Area (ft <sup>2</sup> )	Active Grate Weir Length (ft)	Calculation Option
2-9	Spread	0.84	4.5	1.5	0.083	0.015	1.5	18	1.5	2	P-50 mm (P-1-7/8")	50	10	0.5	Horizontal	90	2	1.2	2.7	1.4	3.5	Use Both
2-15	Spread	0.72	1.9	1.5	0.083	0.04	1.5	18	1.5	2	P-50 mm (P-1-7/8")	50	8	0.5	Horizontal	90	1.7	0.8	2.3	1.4	3.5	Use Both

S:\10646579-Lakewood\_Cottages\DWG\Sheet\C5.6-CALC.dwg | Plotted on 2/10/2021 12:29 PM | by John Wall

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.

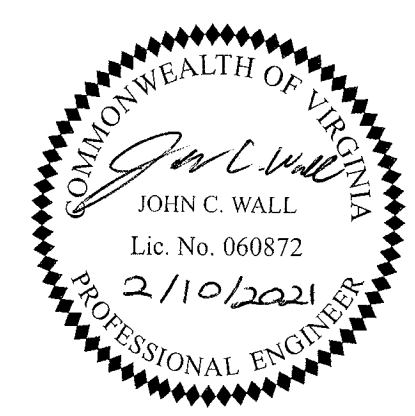
PHASE II SEQUENCE OF CONSTRUCTION:

- ONCE ALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES ARE INSTALLED AND PERMISSION IS GRANTED BY THE HENRICO COUNTY INSPECTOR, CLEAR AND GRUB SITE TO FINAL LIMITS OF CONSTRUCTION AS SHOWN ON THIS SHEET.
- BEGIN GRADING AND STORM SEWER INSTALLATION. ENSURE POSITIVE DRAINAGE TO SEDIMENT CONTROL MEASURES DURING ALL PHASES OF CONSTRUCTION. IN ORDER TO MAINTAIN DRAINAGE TO THE SEDIMENT BASIN, INSTALL THE UPSTREAM 8 LF OF PIPE 1-6. ALL STRUCTURES DOWNSTREAM SHALL BE INSTALLED ONCE ALL AREAS UPSTREAM OF SEDIMENT BASIN 1 HAVE BEEN STABILIZED AND THE COUNTY INSPECTOR HAS APPROVED REMOVAL OF THE SEDIMENT BASIN. IN ORDER TO MAINTAIN DRAINAGE TO THE SEDIMENT TRAP, INSTALL ALL STRUCTURES UPSTREAM OF AND INCLUDING PIPE 2-14 AND INSTALL THE UPSTREAM 32 LF OF PIPE 2-12 AND ALL PIPES AND STRUCTURES UPSTREAM. ALL STRUCTURES DOWNSTREAM OF PIPES 2-12 AND 2-14 SHALL BE INSTALLED ONCE ALL UPSTREAM AREAS ARE STABILIZED AND THE COUNTY INSPECTOR HAS APPROVED REMOVAL OF THE SEDIMENT TRAP. INSTALL INLET PROTECTION ON NEW INLETS AS THEY ARE SET IN PLACE.
- BEGIN UTILITY AND COTTAGES CONSTRUCTION.
- BEGIN INSTALLATION OF CURB AND GUTTER.
- THE SEDIMENT TRAPS CAN BE REMOVED ONCE THE SITE IS STABILIZED ENOUGH AND PERMISSION IS GRANTED BY THE HENRICO COUNTY INSPECTOR.
- INSTALL THE LEVEL SPREADER AND RIPRAP DISSIPATOR.
  - PRE-CONSTRUCTION MEETING WITH THE CONTRACTOR DESIGNATED TO INSTALL THE SHEET FLOW PRACTICE HAS BEEN CONDUCTED. THE COUNTY SHOULD BE INVOLVED IN THE LEVEL SPREADER INSPECTIONS.
  - IMPERVIOUS COVER HAS BEEN CONSTRUCTED/INSTALLED AND AREA IS FREE OF CONSTRUCTION EQUIPMENT, VEHICLES, MATERIAL STORAGE, ETC.
  - ALL PERVIOUS AREAS OF THE CONTRIBUTING DRAINAGE AREAS HAVE BEEN ADEQUATELY STABILIZED AND EROSION CONTROL MEASURES HAVE BEEN REMOVED.
  - AREA OF THE CONSERVED OPEN SPACE HAS BEEN CLEARLY MARKED AND PROTECTED FROM CONSTRUCTION TRAFFIC WITH ADEQUATE SIGNAGE AND FENCING, AND IS IN GOOD CONDITION (UNDISTURBED - OTHER THAN FOR PRUNING OR OTHER VEGETATION MANAGEMENT NEEDS).
  - AREA OF THE CONSERVED OPEN SPACE HAS BEEN CLEARLY MARKED AND PROTECTED FROM CONSTRUCTION RUNOFF AND SEDIMENT WITH APPROPRIATE SEDIMENT CONTROL MEASURES (SUPER SILT FENCE, BERMS, ETC.).
  - STORMWATER HAS BEEN DIVERTED FOR THE CONSTRUCTION OF THE INFLOW (LEVEL SPREADER OR GRAVEL DIAPHRAGM).
  - ANY LIGHT GRADING REQUIRED TO ESTABLISH THE UPPER BOUNDARY OF THE CONSERVED OPEN SPACE HAS BEEN PERFORMED WITH LIGHT EQUIPMENT AND MINIMAL IMPACT TO THE EXISTING VEGETATION.
  - CONSTRUCTION OF ENGINEERED LEVEL SPREADER FOR CONCENTRATED INFLOW OR A GRAVEL DIAPHRAGM OR OTHER PRETREATMENT MEASURE FOR SHEET FLOW HAS BEEN COMPLETED AND THE AREA STABILIZED AS NEEDED.
  - STORMWATER RUNOFF DIRECTED INTO CONSERVED OPEN SPACE AFTER THE AREA AT THE UPPER BOUNDARY HAS BEEN STABILIZED.
  - ALL EROSION AND SEDIMENT CONTROL PRACTICES HAVE BEEN REMOVED.
  - FOLLOW-UP INSPECTION AND AS-BUILT SURVEY/CERTIFICATION HAS BEEN SCHEDULED.
  - GPS COORDINATES HAVE BEEN DOCUMENTED FOR ALL CONSERVED OPEN SPACES ON THE PARCEL.
- FOLLOWING EACH SIGNIFICANT STORM EVENT, PERFORM INSPECTION OF ALL PERIMETER CONTROLS AND MAINTAIN ALL EROSION AND SEDIMENT MEASURES BY REMOVING ACCUMULATED SEDIMENT AS DIRECTED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK OR BY THE HENRICO COUNTY ENVIRONMENTAL INSPECTOR.
- APPLY PERMANENT OR TEMPORARY SOIL STABILIZATION WITHIN SEVEN DAYS AFTER FINAL GRADE IS ACHIEVED ON ANY PORTION OF THE SITE. TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO ANY DENUDEED AREAS THAT MAY BE AT FINAL GRADE BUT WILL REMAIN DORMANT FOR LONGER THAN THIRTY DAYS. THE SEEDED AREAS SHALL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE RESEEDING AS NEEDED. TOPSOIL AND SEEDING SHALL MEET THE REQUIREMENTS OF THE COASTAL PLAIN AREA AS SET FORTH IN THE LATEST EDITION OF THE VIRGINIA EROSION AND SEDIMENT CONTROL HANDBOOK (STANDARDS AND SPECIFICATIONS 3.30-3.32). CONTRACTOR SHALL PROVIDE TO OWNER SUBMITTALS FOR THE GRASS SEED MIXTURES USED, AS WELL AS TOPSOIL TESTING REPORTS.
- ALL DISTURBED AREAS ARE TO DRAIN TO APPROVED SEDIMENT CONTROL MEASURES AT ALL TIMES DURING LAND DISTURBING ACTIVITIES AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
- DO NOT REMOVE ANY EROSION AND SEDIMENT CONTROL MEASURES UNTIL ALL CONTRIBUTING AREAS HAVE BEEN PERMANENTLY STABILIZED AND WITHOUT APPROVAL FROM THE HENRICO COUNTY ENVIRONMENTAL INSPECTOR.
- ALL MATERIAL HAUL OFF-SITE SHALL BE TAKEN TO AN AUTHORIZED SITE WITH AN ACTIVE ESC PLAN.

- A GEOTECHNICAL CERTIFICATION MUST BE PROVIDED PRIOR TO THE ENVIRONMENTAL COMPLIANCE BOND RELEASE STATING THAT CONSTRUCTION COMPACTION REQUIREMENTS HAVE BEEN ACHIEVED.
- A CONSTRUCTION RECORD DRAWING AND CERTIFICATION THAT THE TWO LEVEL SPREADERS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS MUST BE SUBMITTED TO HENRICO COUNTY. THE CONSTRUCTION RECORD DRAWING MUST BE APPROVED PRIOR TO THE ENVIRONMENTAL COMPLIANCE BOND RELEASE.

LABEL	SYMBOL	STD. NAME	SPEC.#
CE	[Symbol]	CONSTRUCTION ENTRANCE	3.02
SF	[Symbol]	SILT FENCE	3.05
IP	[Symbol]	STORM DRAIN INLET PROTECTION	3.07
DD	[Symbol]	TEMPORARY DIVERSION DIKE	3.09
ST	[Symbol]	TEMPORARY SEDIMENT TRAP	3.13
PS	[Symbol]	PERMANENT SEEDING	3.32
B/M	[Symbol]	SOIL STABILIZATION BLANKETS AND MATTING (EC-3)	3.36
TP	[Symbol]	TREE PRESERVATION AND PROTECTION	3.38
N/A	[Symbol]	ORANGE SAFETY FENCE	N/A
N/A	[Symbol]	LIMITS OF DISTURBANCE	N/A

HYDROLOGY LEGEND	
[Symbol]	MINOR PROPOSED DRAINAGE DIVIDE
[Symbol]	MINOR PROPOSED DRAINAGE DATA



THIS DRAWING PREPARED AT THE  
**TRICITIES OFFICE**  
 4701 Owens Way, Suite 900 | Prince George, VA 23895  
 TEL 804-541-0600 FAX 804-456-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020	PLANNING COMMISSION SUBMITTAL
2/10/2021	REVISIONS PER COUNTY COMMENTS

DATE	11/16/2020
DRAWN BY	D. ELLIS
DESIGNED BY	J. WALL
CHECKED BY	K. HALPAUS
SCALE	1" = 40'

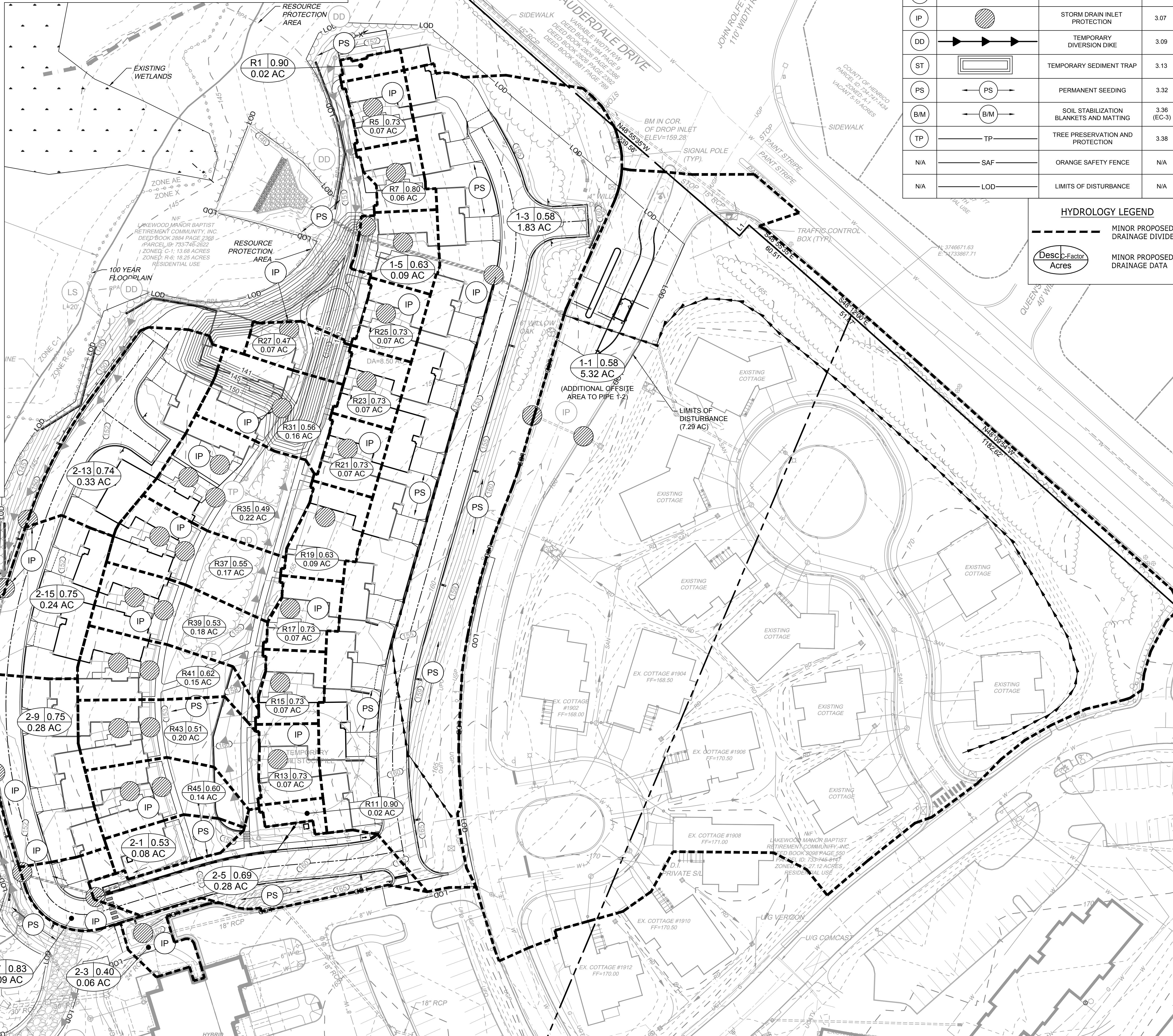
# TIMMONS GROUP

**LAKWOOD MANOR - COTTAGES - PHASE 2**  
 LUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
 MINOR HYDROLOGY AND PHASE II E&S PLAN

JOB NO.	46579
SHEET NO.	C6.0

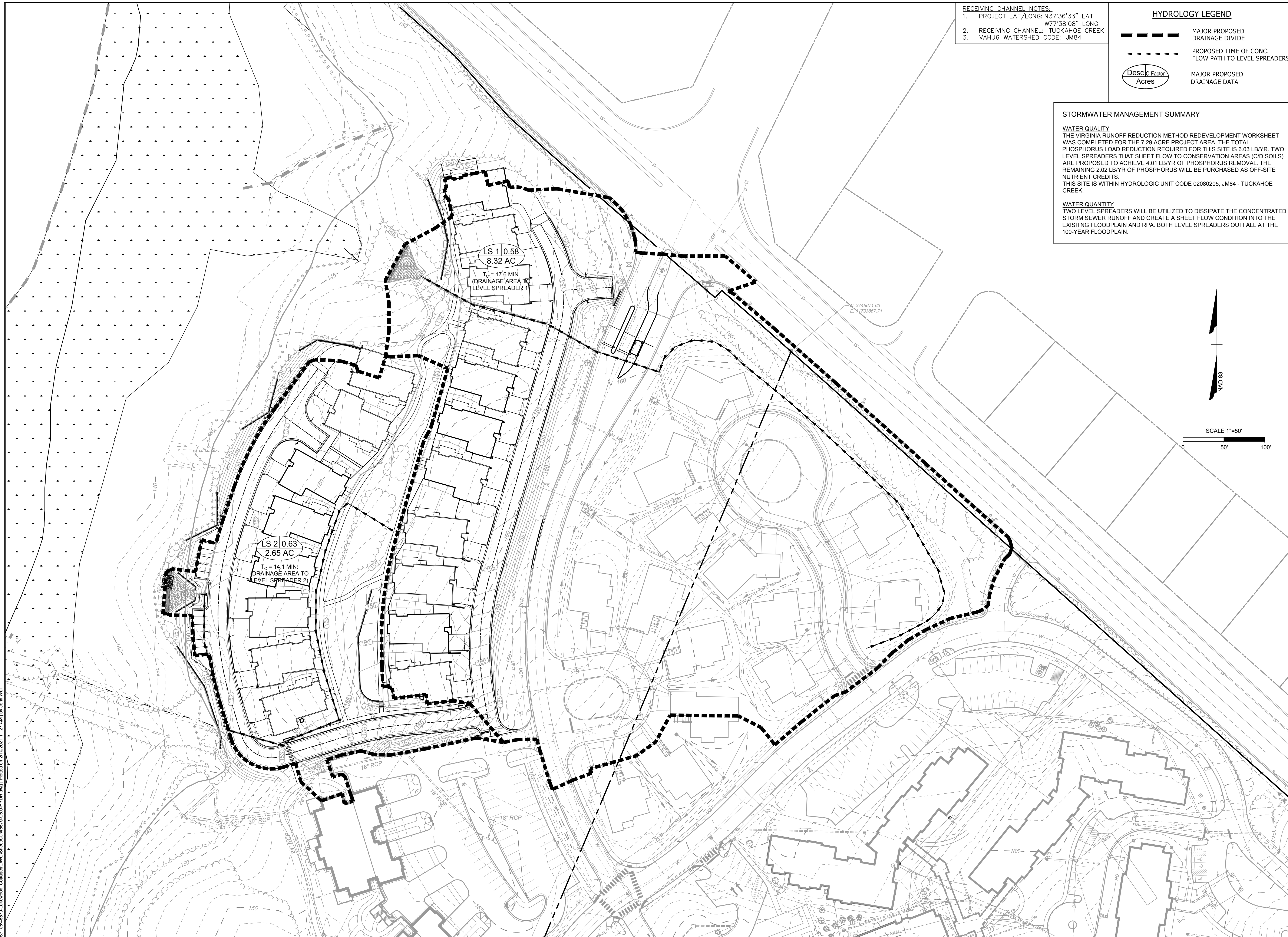
These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.

P.O.D. #2020-00486



S:\10046579-Lakewood\_Cottages\DWG\Sheet\C6.0-HYDR.dwg | Printed on 2/10/2021 2:53 PM | by DJ.Ellis

S:\1064679-Lakewood\_Cottages\DWG\Sheet\CD\46579-02.dwg (HYDR.dwg) [Printed on 2/10/2021 11:27 AM] by John Wall



RECEIVING CHANNEL NOTES:  
1. PROJECT LAT/LONG: N37°36'33" LAT  
W77°38'08" LONG  
2. RECEIVING CHANNEL: TUCKAHOE CREEK  
3. VAHUE WATERSHED CODE: JM84

**HYDROLOGY LEGEND**

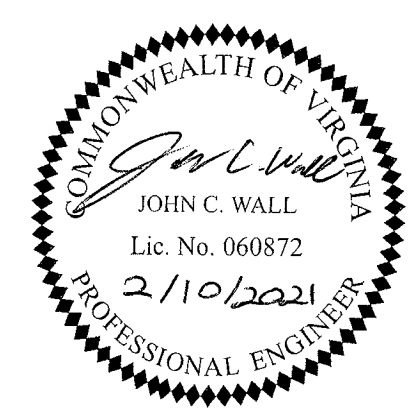
- MAJOR PROPOSED DRAINAGE DIVIDE
- PROPOSED TIME OF CONC. FLOW PATH TO LEVEL SPREADERS
- MAJOR PROPOSED DRAINAGE DATA

Desc. Factor Acres

**STORMWATER MANAGEMENT SUMMARY**

**WATER QUALITY**  
THE VIRGINIA RUNOFF REDUCTION METHOD REDEVELOPMENT WORKSHEET WAS COMPLETED FOR THE 7.29 ACRE PROJECT AREA. THE TOTAL PHOSPHORUS LOAD REDUCTION REQUIRED FOR THIS SITE IS 6.03 LB/YR. TWO LEVEL SPREADERS THAT SHEET FLOW TO CONSERVATION AREAS (C/D SOILS) ARE PROPOSED TO ACHIEVE 4.01 LB/YR OF PHOSPHORUS REMOVAL. THE REMAINING 2.02 LB/YR OF PHOSPHORUS WILL BE PURCHASED AS OFF-SITE NUTRIENT CREDITS. THIS SITE IS WITHIN HYDROLOGIC UNIT CODE 02080205, JM84 - TUCKAHOE CREEK.

**WATER QUANTITY**  
TWO LEVEL SPREADERS WILL BE UTILIZED TO DISSIPATE THE CONCENTRATED STORM SEWER RUNOFF AND CREATE A SHEET FLOW CONDITION INTO THE EXISTING FLOODPLAIN AND RPA. BOTH LEVEL SPREADERS OUTFALL AT THE 100-YEAR FLOODPLAIN.



THIS DRAWING PREPARED AT THE TRI-CITIES OFFICE  
4701 Owens Way, Suite 900 | Prince George, VA 23875  
TEL 804-541-1660 FAX 804-456-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

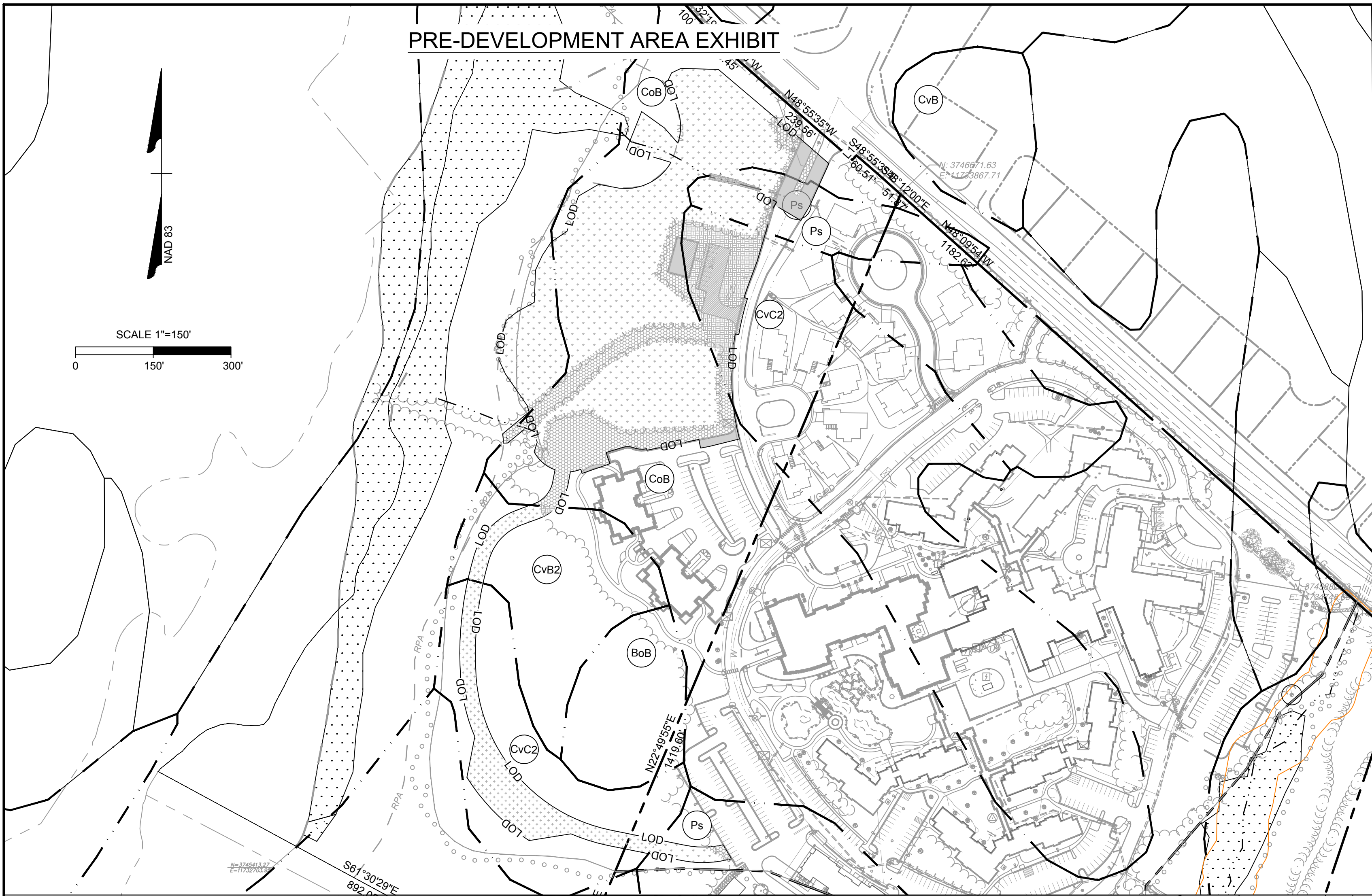
DATE 11/16/2020  
DRAWN BY D. ELLIS  
DESIGNED BY J. WALL  
CHECKED BY K. HALPAUS  
SCALE 1" = 50'

**TIMMONS GROUP**

**LAKWOOD MANOR - COTTAGES - PHASE 2**  
TUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
MAJOR HYDROLOGY PLAN

JOB NO. 46579  
SHEET NO. C6.1

P.O.D. #2020-00486



**SITE DATA**

APPLICABLE AREA = 7.29 AC  
 PRE-DEVELOPMENT MANAGED TURF AREA = 1.70 AC  
 PRE-DEVELOPMENT PERCENT MANAGED TURF = 23.32%  
 PRE-DEVELOPMENT IMPERVIOUS AREA = 0.46 AC  
 PRE-DEVELOPMENT PERCENT IMPERVIOUS = 6.31%  
 PRE-DEVELOPMENT FORESTED AREA = 5.13 AC  
 PRE-DEVELOPMENT PERCENT FORESTED = 70.37%  
 POST-DEVELOPMENT MANAGED TURF AREA = 4.19 AC  
 POST-DEVELOPMENT PERCENT MANAGED TURF = 57.48%  
 POST-DEVELOPMENT IMPERVIOUS AREA = 3.10 AC  
 POST-DEVELOPMENT PERCENT IMPERVIOUS = 42.52%  
 POST-DEVELOPMENT FORESTED AREA = 0 AC  
 POST-DEVELOPMENT PERCENT FORESTED = 0%

TOTAL PHOSPHORUS LOAD REDUCTION REQUIRED IS 6.03 LB/YR. 4.01 LB/YR WILL BE TREATED ONSITE THROUGH THE USE OF SHEETFLOW TO CONSERVATION AREA, C/D SOILS THE REMAINING 2.02 LB/YR WILL BE PURCHASED AS OFF-SITE NUTRIENT CREDITS.

- EXISTING FORESTED C AREA = 0.96 AC (13.17%)
- EXISTING IMPERVIOUS C AREA = 0.20 AC (2.74%)
- EXISTING MANAGED TURF C AREA = 0.45 AC (6.17%)
- EXISTING FORESTED D AREA = 4.17 AC (57.20%)
- EXISTING IMPERVIOUS D AREA = 0.26 (3.57%)
- EXISTING MANAGED TURF D AREA = 1.25 AC (17.15%)
- PROPOSED IMPERVIOUS C AREA = 0.35 AC (4.80%)
- PROPOSED MANAGED TURF C AREA = 1.26 AC (17.28%)
- PROPOSED IMPERVIOUS D AREA = 2.75 AC (37.72%)
- PROPOSED MANAGED TURF D AREA = 2.93 AC (40.19%)
- ONSITE DRAINAGE AREA TO LEVEL SPREADERS  
 LEVEL SPREADER 1 = 3.06 AC  
 LEVEL SPREADER 2 = 2.59 AC

**HYDROLOGY & SOILS LEGEND**

SOIL DIVIDE  
 SOIL MAP UNIT SYMBOL  
 41

LABEL	ERODABILITY	PERMEABILITY	DEPTH	SOIL TYPE
Cg	VERY HIGH	POORLY DRAINED	0-12 INCHES TO WATER TABLE	D
CoB	NEGLIGIBLE	SOMEWHAT POORLY DRAINED	12-18 INCHES TO WATER TABLE	D
CvB2	HIGH	MODERATELY WELL DRAINED	18-30 INCHES TO WATER TABLE	C
CvC2	HIGH	MODERATELY WELL DRAINED	18-30 INCHES TO WATER TABLE	C
Ps	VERY HIGH	POORLY DRAINED	0-12 INCHES TO WATER TABLE	D

NOTE: THE SOURCE OF THE SOILS MAP AND SOIL SERIES DESCRIPTIONS IS FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE.

**DEQ Virginia Runoff Reduction Method Re-Development Compliance Spt**

2011 BMP Standards and Specifications | 2013 Draft BMP Standards and Specifications

Project Name: **Lakewood Cottages**  
 Date: **2/10/2021**  
 Linear Development Project? **No**

**Site Information**

**Post-Development Project (Treatment Volume and Loads)**

Enter Total Disturbed Area (acres) → **7.29**

Maximum reduction required: **20%**  
 The site's net increase in impervious cover (acres) is: **2.64**  
 Post-Development TP Load Reduction for Site (lb/yr): **6.03**

**Pre-Development Land Cover (acres)**

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested			0.96	4.17	5.13
Managed Turf (acres) -- disturbed, graded for yards or other turf to be			0.45	1.25	1.70
Impervious Cover (acres)			0.20	0.26	0.46
<b>Totals</b>					<b>7.29</b>

**Post-Development Land Cover (acres)**

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested					0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be			1.26	2.93	4.19
Impervious Cover (acres)			0.35	2.75	3.10
<b>Area Check</b>	<b>OK.</b>	<b>OK.</b>	<b>OK.</b>	<b>OK.</b>	<b>7.29</b>

**Site Results (Water Quality Compliance)**

Area Checks	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	AREA CHECK
FOREST/OPEN SPACE (ac)	0.00	0.00	0.00	0.00	0.00	OK.
IMPERVIOUS COVER (ac)	3.03	0.00	0.00	0.00	0.00	OK.
IMPERVIOUS COVER TREATED (ac)	3.03	0.00	0.00	0.00	0.00	OK.
MANAGED TURF AREA (ac)	2.62	0.00	0.00	0.00	0.00	OK.
MANAGED TURF AREA TREATED (ac)	2.62	0.00	0.00	0.00	0.00	OK.
<b>AREA CHECK</b>	<b>OK.</b>	<b>OK.</b>	<b>OK.</b>	<b>OK.</b>	<b>OK.</b>	

Site Treatment Volume (ft<sup>3</sup>) **14,356**

**Runoff Reduction Volume and TP By Drainage Area**

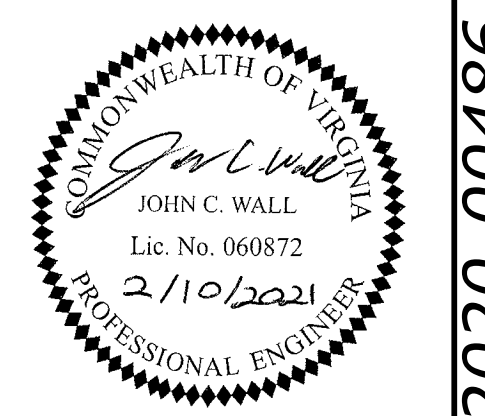
	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	TOTAL
RUNOFF REDUCTION VOLUME ACHIEVED (ft <sup>3</sup> )	6,393	0	0	0	0	6,393
TP LOAD AVAILABLE FOR REMOVAL (lb/yr)	8.03	0.00	0.00	0.00	0.00	8.03
TP LOAD REDUCTION ACHIEVED (lb/yr)	4.01	0.00	0.00	0.00	0.00	4.01
TP LOAD REMAINING (lb/yr)	4.02	0.00	0.00	0.00	0.00	4.02
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	28.70	0.00	0.00	0.00	0.00	28.70

**Total Phosphorus**

FINAL POST-DEVELOPMENT TP LOAD (lb/yr) **9.02**  
 TP LOAD REDUCTION REQUIRED (lb/yr) **6.03**  
 TP LOAD REDUCTION ACHIEVED (lb/yr) **4.01**  
 TP LOAD REMAINING (lb/yr) **5.01**  
 REMAINING TP LOAD REDUCTION REQUIRED (lb/yr): **2.02**

**Total Nitrogen (For Information Purposes)**

POST-DEVELOPMENT LOAD (lb/yr) **64.52**  
 NITROGEN LOAD REDUCTION ACHIEVED (lb/yr) **28.70**  
 REMAINING POST-DEVELOPMENT NITROGEN LOAD (lb/yr) **35.82**



THIS DRAWING PREPARED AT THE  
**TRI-CITIES OFFICE**  
 4701 Owens Way, Suite 900 | Prince George, VA 22875  
 TEL 804-541-1600 FAX 804-436-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020 <td>PLANNING COMMISSION SUBMITTAL</td>	PLANNING COMMISSION SUBMITTAL
2/10/2021 <td>REVISIONS PER COUNTY COMMENTS</td>	REVISIONS PER COUNTY COMMENTS

DATE: 11/16/2020  
 DRAWN BY: D. ELLIS  
 DESIGNED BY: J. WALL  
 CHECKED BY: K. HALPAUS  
 SCALE: 1" = 150'

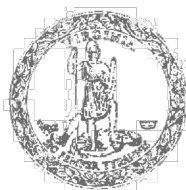
**TIMMONS GROUP**

**LAKWOOD MANOR - COTTAGES - PHASE 2**  
 LUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
 WATER QUALITY ANALYSIS PLAN

JOB NO. **46579**  
 SHEET NO. **C7.0**

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.

P.O.D. #2020-00486



Commonwealth of Virginia
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

1111 E. Main Street, Suite 1400, Richmond, Virginia 23219
P.O. Box 1105, Richmond, Virginia 23218
(800) 592-5482
www.deq.virginia.gov

Matthew J. Strickler
Secretary of Natural Resources

David K. Fayler
Director
(804) 698-4000

December 30, 2019

NONPOINT NUTRIENT CREDIT GENERATION CERTIFICATION
Certificate No. James-057

- 1. Project Name: Amphyll Nutrient Bank
2. Sponsor: Amphyll Nutrient Bank, LLC
3. Authorized Nutrient Credit Broker: Amphyll Nutrient Bank, LLC
4. Transmitted Electronically: jveyff@verizon.net
5. Location of Project Site: Approximately 0.5 miles southeast of Amphyll Road in Cumberland County, Virginia, adjacent to the James River (HUC 02080205).

6. Project Description:

The Sponsor (Amphyll Nutrient Bank, LLC) has initiated a land use conversion on approximately 39.19 acres of crop fields in accordance with the Nutrient Reduction Implementation Plan (NRIP) for the Amphyll Nutrient Bank (ANB) dated June 17, 2019.

The nutrient reductions resulting from this activity will generate nonpoint source credits transferable to those entities requiring credits in accordance with the Chesapeake Bay Watershed Nutrient Credit Exchange Program (VA Code § 62.1-44.19:15 et seq). These credits are also transferable in accordance with the Virginia stormwater offset program (VA Code § 62.1-44.15:35) and the Virginia Soil and Water Conservation Board's Guidance Document on Stormwater Nonpoint Nutrient Offsets approved on July 23, 2009, to those regulated entities qualifying for nutrient credits.

7. Findings:

NONPOINT NUTRIENT CREDIT GENERATION CERTIFICATION
Amphyll Nutrient Bank
December 30, 2019
Page 2 of 2

A site visit conducted November 20, 2018, found the 39.19-acre conversion area suitable for inclusion in the nutrient bank program. A follow-up visit on April 9, 2019, found the entire conversion area had been planted with loblolly pines at a density of 549 stems/acre. A 35-foot grass buffer along perennial streams, a planned home site, and existing forested areas were excluded from the credit generating area. A second follow-up inspection performed on December 5, 2019, found the seedlings were in good condition and expected to survive.

DEQ requires land conversion activities to be protected through an enforceable land use restriction during the life of a credit transfer. A Declaration of Restrictive Covenants on the property was recorded on August 15, 2019.

The bank sponsor requested the 25% credit release alternative included in the proposed regulation on the Certification of Nonpoint Source Nutrient Credits (9VAC25-900). This alternative is available for properties taken out of agricultural production prior to planting and/or survival of trees is established. The ANB was authorized to transfer 25% of the credits generated, 53.69 pounds of nitrogen and 11.95 pounds of phosphorus, on September 9, 2019.

Accordingly, the ANB is authorized to transfer the remaining 75% of credits, 161.07 pounds of nitrogen and 35.86 pounds of phosphorus, for sale. In the event that follow up inspections document that this condition is not being met, up to 75% of the credits initially released may be recalled by DEQ.

Future thinning of the stand is allowed with the condition that a tree basal area of 30 square feet per acre is maintained at a breast height of 4.5 feet. DEQ shall be notified at least 90 days prior to thinning. Future timber harvesting shall adhere to best management practice as set forth by the Virginia Department of Forestry and comply with applicable local, state, and federal laws. A copy of the timbering plan shall be submitted to DEQ at least 90 days prior to the activity.

Monitoring reports shall be submitted by July 1, summarizing plot sampling methodology, woody stem density, percent of invasive species, and any corrective actions needed to achieve 400 stems per acre and less than 5% invasive species stems. Affidavits of credit sales and the most current credit transfer ledgers shall be provided to DEQ within 30 days of credit transfer.

8. Agency Contact: Sara Felker, 804-698-4023

9. Approval by:

Melanie D. Davenport
Department of Environmental Quality
Water Permitting Division Director

Signature: Melanie D. Davenport

Date: Dec. 30, 2019



February 9, 2021

John Wall
TIMMONS GROUP
4701 Owens Way, Suite 900
Prince George, VA 23875

Eco-Cap, LLC - Amphyll Nutrient Bank - Availability Letter

Project Reference: Lakewood Cottages

This letter is to confirm the availability of Nutrient Credits sufficient to meet your project requirements at the Amphyll Nutrient Bank located in Cumberland County, Virginia HUC Code 02080205. The Amphyll Bank received its full release of Nutrient Credits on December 30th of 2019 with a release of 47.81 lbs. The nutrient reductions resulting from this activity generated nonpoint source Nutrient "Credits" which are transferable to those entities requiring nutrient reductions in accordance with the Chesapeake Bay Watershed Nutrient Credit Exchange Program (VA Code § 62.1-44.19:14) and the Virginia Stormwater Credit Program (VA Code § 62.1-44.15:35).

Currently the facility has 20.30 pounds of Credits available and will be able to meet your removal requirement of up to 2.02 Credits.

Feel free to contact me if you require further assistance.

Casey J. Jensen

Casey J. Jensen
President
Eco-Cap, LLC

Credit Sales Manager
Amphyll Nutrient Bank

Phone: (804) 836-6636 Email: ecocapva@gmail.com Website: ecocapva.us

VIRGINIA RUNOFF REDUCTION METHOD WORKSHEET SUMMARY

DEQ Virginia Runoff Reduction Method Re-Development Compliance Spreadsheet - Version 3.0

BMP Design Specifications List 2013 Draft Sds & Specs

Site Summary

Table with 2 columns: Category, Value. Total Rainfall (in): 43. Total Disturbed Acreage: 7.29.

Site Land Cover Summary

Table with 6 columns: Land Cover Type, A soils, B soils, C soils, D soils, Totals, % of Total. Categories include Forest/Open, Managed Turf, and Impervious Cover.

Post-ReDevelopment Land Cover (acres)

Table with 6 columns: Land Cover Type, A soils, B soils, C soils, D soils, Totals, % of Total. Categories include Forest/Open, Managed Turf, and Impervious Cover.

Site Tv and Land Cover Nutrient Loads

Table with 5 columns: Site Feature, Final Post-Development Load (lb/acre/yr), Post-ReDevelopment, Post-Development (New Impervious), Adjusted Pre-ReDevelopment. Features include Site Rv, Treatment Volume, and TP Load.

Table with 3 columns: Pre-ReDevelopment TP Load, Final Post-Development TP Load, Post-ReDevelopment TP Load.

Table with 3 columns: Total TP Load Reduction Required (lb/yr), 6.03, 1.39, 4.64.

Table with 2 columns: Final Post-Development Load (Post-ReDevelopment & New Impervious), 64.52. Pre-ReDevelopment, 17.87.

Site Compliance Summary

Table with 2 columns: Maximum % Reduction Required Below Pre-ReDevelopment Load, 20%.

\* Note: % Reduction will reduce post development TP load to less than or equal to baseline load of 1.91 lb/yr (0.41 lb/acre/yr) (Required reduction for Post-ReDev. = Post-ReDev TP load - baseline load of 1.9055 lb/yr; baseline load = site area x 0.41 lb/acre/yr)

Summary Print table with 2 columns: Metric, Value. Total Runoff Volume Reduction (in^3), 6,393. Total TP Load Reduction Achieved (lb/yr), 4.01. Total TN Load Reduction Achieved (lb/yr), 28.70.

Summary Print

\*Reduction below new development load limitation not required

Drainage Area Summary

Table with 6 columns: Drainage Area (D.A. A-E), Total. Categories include Forest/Open, Managed Turf, and Impervious Cover.

Drainage Area Compliance Summary

Table with 6 columns: Drainage Area (D.A. A-E), Total. Categories include TP Load Reduced and TN Load Reduced.

Drainage Area A Summary

Land Cover Summary

Table with 5 columns: Land Cover Type, A Soils, B Soils, C Soils, D Soils, Total, % of Total. Categories include Forest/Open, Managed Turf, and Impervious Cover.

BMP Selections

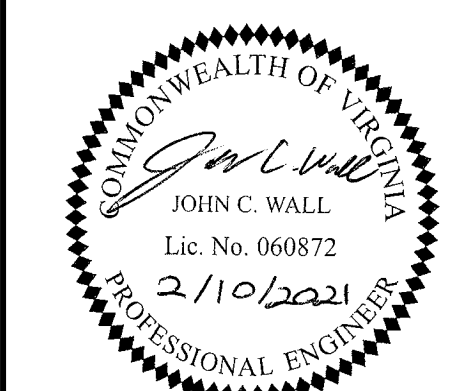
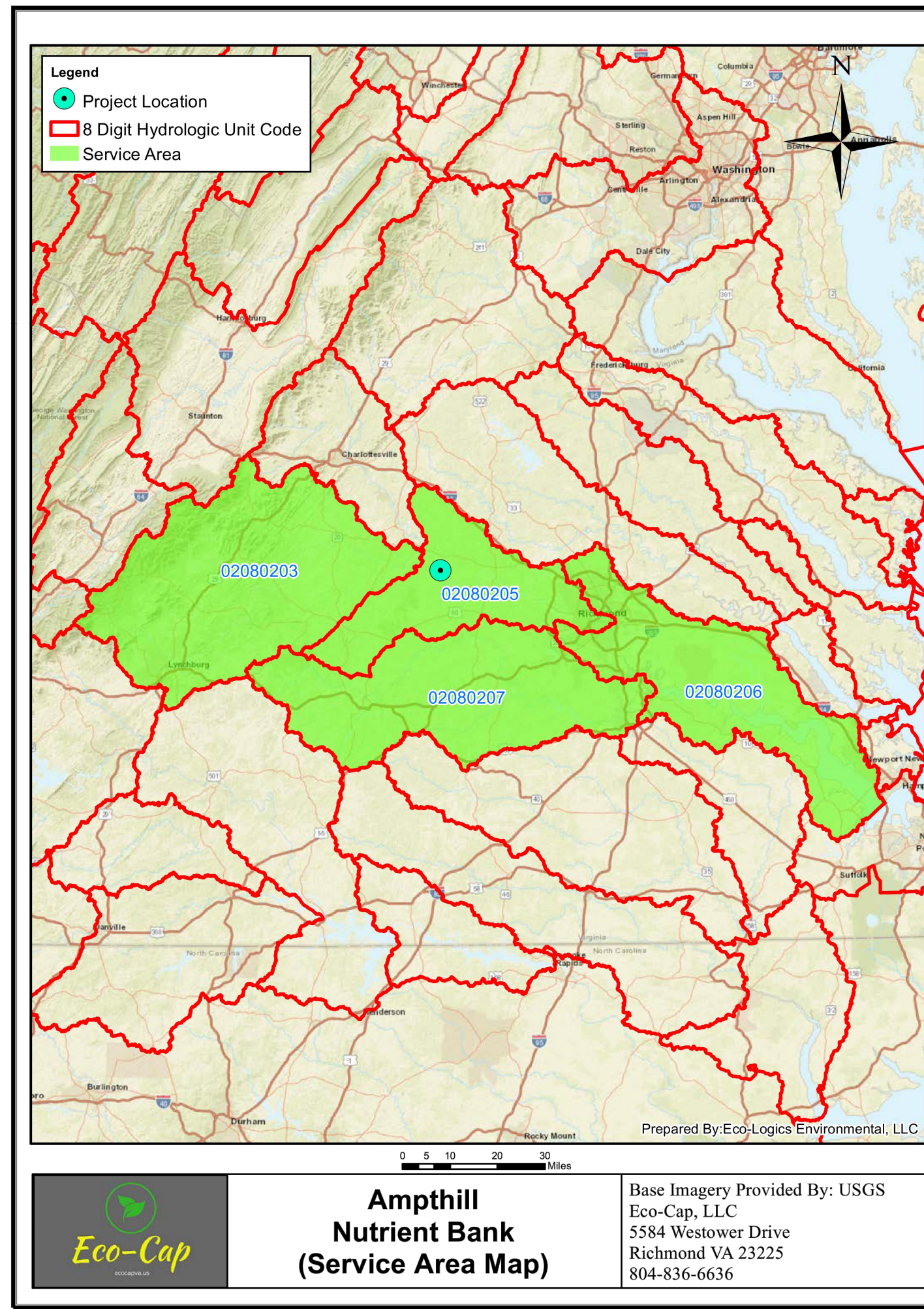
Table with 8 columns: Practice, Managed Turf Credit Area, Impervious Cover Credit Area, BMP Treatment Volume, TP Load from Upstream Practices, Untreated TP Load to Practice, TP Removed, TP Remaining, Downstream Treatment to be Employed.

Table with 2 columns: Metric, Value. Total Impervious Cover Treated (acres), 3.03. Total Turf Area Treated (acres), 2.62. Total TP Load Reduction Achieved in D.A. (lb/yr), 4.01. Total TN Load Reduction Achieved in D.A. (lb/yr), 28.70.

Runoff Volume and CN Calculations

Table with 4 columns: Target Rainfall Event (in), 1-year storm, 2-year storm, 10-year storm. Values: 0.00, 0.00, 0.00.

Runoff Volume and CN Calculations table with 7 columns: Drainage Areas (RV & CN, Drainage Area A, Drainage Area B, Drainage Area C, Drainage Area D, Drainage Area E), 1-year return period, 2-year return period, 10-year return period.



THIS DRAWING PREPARED AT THE TIMMONS GROUP OFFICE 4701 Owens Way, Suite 900 Prince George, VA 23875

YOUR VISION ACHIEVED THROUGH OURS. REVISION DESCRIPTION: PLANNING COMMISSION SUBMITTAL REVISIONS PER COUNTY COMMENTS. DATE: 12/17/2020, 2/10/2021.

DATE: 11/16/2020. DRAWN BY: D. ELLIS. DESIGNED BY: J. WALL. CHECKED BY: D. JOHNSON. SCALE: NONE.

TIMMONS GROUP logo and contact information for Lakewood Manor - Cottages - Phase 2, including address, phone, and website.

S:\10046879-Lakewood\_Cottages\DWG\SHEET\CD\6579-C7-1-VQA.dwg | Plotted on 2/10/2021 11:47 AM | by John Wall

P.O.D. #2020-00486



VIRGINIA LAND RECORD COVER SHEET  
FORM A - COVER SHEET CONTENT

Instrument Date: 8/15/2019  
Instrument Type: REST  
Number of Parcels: 1  
Number of Pages: 1  
City: CUMBERLAND

TAX EXEMPT? VIRGINIA/FEDERAL LAW  
Grantor: [ ]  
Grantee: [ ]

Consideration: \$0.00  
Existing Debt: \$0.00  
Actual Value/Assumed: \$0.00

PRIOR INSTRUMENT UNDER § 58.1-803(D):  
Original Principal: \$0.00  
Fair Market Value Increase: \$0.00  
Original Book Number: Original Page Number: Original Instrument Number:

Prior Recording At: [ ] City: [ ] County: Percentage In This Jurisdiction: 100%

BUSINESS / NAME  
Grantor: [X] WILLIAM R. IVEY AND JANE P. IVEY REVOCABLE TRUST  
Grantee: [ ]

Grantor: [X] WILLIAM R. IVEY AND JANE P. IVEY REVOCABLE TRUST  
Grantee: [ ]

GRANTEE ADDRESS  
Name: WILLIAM R. IVEY AND JANE P. IVEY REVOCABLE TRUST  
Address: 2710 WEST CARY ST  
City: RICHMOND State: VA Zip Code: 23220

Book Number: Page Number: Instrument Number:  
Parcel Identification Number (PIN): 13-A-5 Tax Map Number: 13-A-5

Short Property Description:

Current Property Address:  
City: CUMBERLAND State: VA Zip Code: 23040

Instrument Prepared By: WILLIAM R. IVEY Recording Paid By: WILLIAM R. IVEY  
Recording Returned To: WILLIAM R. IVEY  
Address: 2710 WEST CARY ST  
City: RICHMOND State: VA Zip Code: 23220



FORM CC-1570 Rev. 7/15 Page 1 of 1 Cover Sheet A  
§§ 17.1-223, 17.1-227.1, 17.1-249

Copyright © 2014 Office of the Executive Secretary, Supreme Court of Virginia. All rights reserved.

DEED INSTRUMENT  
NO. 19000926

EXHIBIT 12

Restrictive Covenant

DECLARATION OF RESTRICTIONS

THIS DECLARATION OF RESTRICTIVE COVENANTS, is made this 15 day of August, 2019  
By William R. Ivey, trustee for The William R. Ivey and Jane P. Ivey Revocable Trust.

WHEREAS, The William R. Ivey and Jane P. Ivey Revocable Trust, (the "Owner") is the owner of those certain tracts or parcels of real property consisting of 90.578 acres located in Cumberland County, Virginia, represented as one (1) parcel in as Tax Map 13-A-5 (90.578 acres), and recorded in Deed Book 224, page(s) 641-643 (the "Property").

WHEREAS, Owner desires to be party to and comply with the respective conditions and terms of the Amphill Nutrient Bank, LLC "Amphill Nutrient Bank" Nutrient Reduction Implementation Plan (the "Nutrient Reduction Implementation Plan") by imposing this Declaration of Restrictions upon those areas of the Property shown in Exhibit attached hereto and in the Nutrient Reduction Implementation Plan as "Land Conversion Areas" currently consisting of agricultural lands converted to forested conditions for the purpose of generating and transferring nutrient credits.

WHEREAS, Owner desires to impose on said Land Conversion Areas a Declaration of Restrictions expressing intent to preserve the Land Conversion Areas, consisting of a total of 39.19 acres, as shown in the area marked "Crops to Trees" in Exhibit 8 Map 14 attached hereto and as described in the Nutrient Reduction Implementation Plan for such period of time as to match the duration of nutrient credit generation and transference by Amphill Nutrient Bank, LLC on behalf of the Owner of the Property. The Owner desires to comply with the respective conditions and terms of the Nutrient Reduction Implementation Plan by imposing this Declaration of Restrictions on the Land Conversion Areas located on the Property. These Restrictions are imposed by the Owner freely and voluntarily in order to provide operational and nutrient credits per the terms of the Nutrient Reduction Implementation Plan.

NOW THEREFORE THIS DECLARATION WITNESSETH: That for and in consideration of One Dollar (\$1.00) cash in hand paid and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Owner does hereby declare, covenant and agree, for itself and its successors and assigns, that the Land Conversion Areas as shown in Exhibit 7 Map 14 and the Nutrient Reduction Implementation Plan and in any future amendments to the Plan shall be hereafter held, leased, transferred, and sold subject to the following conditions and restrictions which shall run with the land and be binding on all parties and persons claiming under them for any and all years nutrient credits are generated or transferred by Amphill Nutrient Bank, LLC.

Prepared by: William R. Ivey  
Returned to: William R. Ivey

Declaration of Restrictions  
Amphill Nutrient Bank  
Cumberland County, VA

1

Covenants and Restrictions:

A. The Land Conversion Areas shall be preserved for a length of time to match the duration of nutrient credit generation and transfer according to the terms of the Nutrient Reduction Implementation Plan by prohibiting the following activities:

- 1. Destruction or alteration of the Land Conversion Areas except:
(a) Alteration necessary to construct the Land Conversion Areas and associated improvements proposed to be built by Amphill Nutrient Bank, LLC or its successors, and/or assigns;
(b) Alteration necessary to implement the terms of the Nutrient Reduction Implementation Plan and ensure the success of the planned nutrient reductions and associated nutrient credits and in conjunction with the construction, reconstruction, enhancement or maintenance of the Land Conversion Areas;
(c) Alteration to construct structures such as walkways, boardwalks, foot trails, wildlife observation or management structures, benches, observation decks, picnic tables, fence posts and, ecological, biological, hydrological or chemical monitoring, observation or management equipment including, without limitation, monitoring wells, water control weirs or interpretive stations, or other structures provided that such facilities are constructed and maintained in accordance with all applicable federal and states laws;
(d) Addition of signs constructed in public right of ways by or on behalf of the Virginia Department of Transportation or other governmental agencies;
(e) Removal of vegetation (where not precluded by federal or state law) when conducted for (i) removal of noxious or invasive plants or (ii) limited aesthetic modifications not involving clearing or removal of trees or limbs greater than three (3) inches in caliber unless dead, dying or diseased;
(f) Planting of native species of plants by hand for aesthetic landscaping or screening purposes;
(g) Alteration authorized by the Nutrient Reduction Implementation Plan and other activities pursuant to all applicable laws, regulations and guidance governing the generation and trading of nutrient credits within the Commonwealth of Virginia;
(h) Alteration as reasonably necessary to comply with state or federal law or appropriate court order;
(i) Maintenance and use of existing trails and access roads crossing the Land Conversion Areas as long as activities do not negatively affect the associated nutrient reductions;

Declaration of Restrictions  
Amphill Nutrient Bank  
Cumberland County, VA

2

(j) Subsistence livestock for personal use will be limited to domestically raised animals on privately held portions of the Property outside the Land Conversion Areas. Any domestic livestock will be fenced from the Land Conversion Areas and access to stream watering locations or paddock crossing will be restricted to limited access points.

- 2. Construction, maintenance or placement of any structures or fills including but not limited to buildings, and mobile homes, other than those, which currently exist;
3. Ditching, draining, diking, damming, filling, excavating, grading, plowing, flooding/ponding, mining, drilling, placing of trash and yard debris or removing/adding topsoil, sand, or other materials (except as may be necessary on a case-by-case basis) other than any authorized under the Nutrient Reduction Implementation Plan;
4. Permitting livestock to graze, inhabit or otherwise enter the Land Conversion Areas place into this Declaration of Restrictions;
5. Harvesting, cutting, logging, and pruning of trees and plants, or using fertilizers and spraying with biocides other than what is authorized by the Nutrient Reduction Implementation Plan (except as may be necessary on a case-by-case basis).

B. The Trust hereby grants operational and nutrient credit transfer rights for the Land Conversion Areas under the terms of the Nutrient Reduction Implementation Plan to Amphill Nutrient Bank, LLC. Amphill Nutrient Bank, LLC agrees to manage said Land Conversion Areas according to the terms of this Declaration of Restrictions and the Amphill Nutrient Bank Nutrient Reduction Implementation Plan.

Amendment:

The covenants contained herein shall not hereafter be altered in any respect without the express written approval and consent of the Owner or its successor in interest and Amphill Nutrient Bank, LLC. After recording, the Owner or its successor may vacate or modify this Declaration by providing a document signed by Amphill Nutrient Bank, LLC, and the Owner or its successor in interest. For portions of the Land Conversion Areas for which nutrient credits are not currently being generated and transferred: the Owner or its successor in interest may amend or vacate this Declaration by providing a document signed by the Owner or its successor and Amphill Nutrient Bank, LLC provided the amendment or vacation of this Declaration does not negatively affect the areas within the Land Conversion Areas that continue to generate and transfer nutrient credits.

Additionally, the Declarant or its successor in interest does specifically reserve the right to seek approval from DEQ for the release or modification of the Land Conversion Areas by purchasing credits from an approved nutrient bank to offset any credits purchased from Amphill Nutrient Bank. Such approval shall not unreasonably be withheld.

Declaration of Restrictions  
Amphill Nutrient Bank  
Cumberland County, VA

3

WITNESS the following signature the day and year first above written.

BY: William R. Ivey, President  
Officer / General Partner

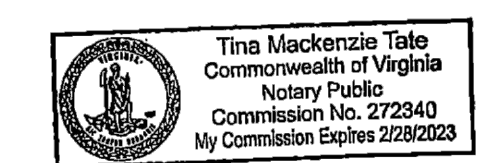
BY: [Signature]  
TITLE: President

Commonwealth of Virginia, County of Cumberland to wit:

I, Tina Mackenzie Tate, a notary public for the state and city aforesaid, do certify that William Ready Ivey, whose name was signed on 8/15/19, 2019 in his capacity on that date to the foregoing document has acknowledged said document and signature before me in the city aforesaid.

Given under my hand and notarial seal this 15 day of August, 2019.

[Signature]  
Notary Public

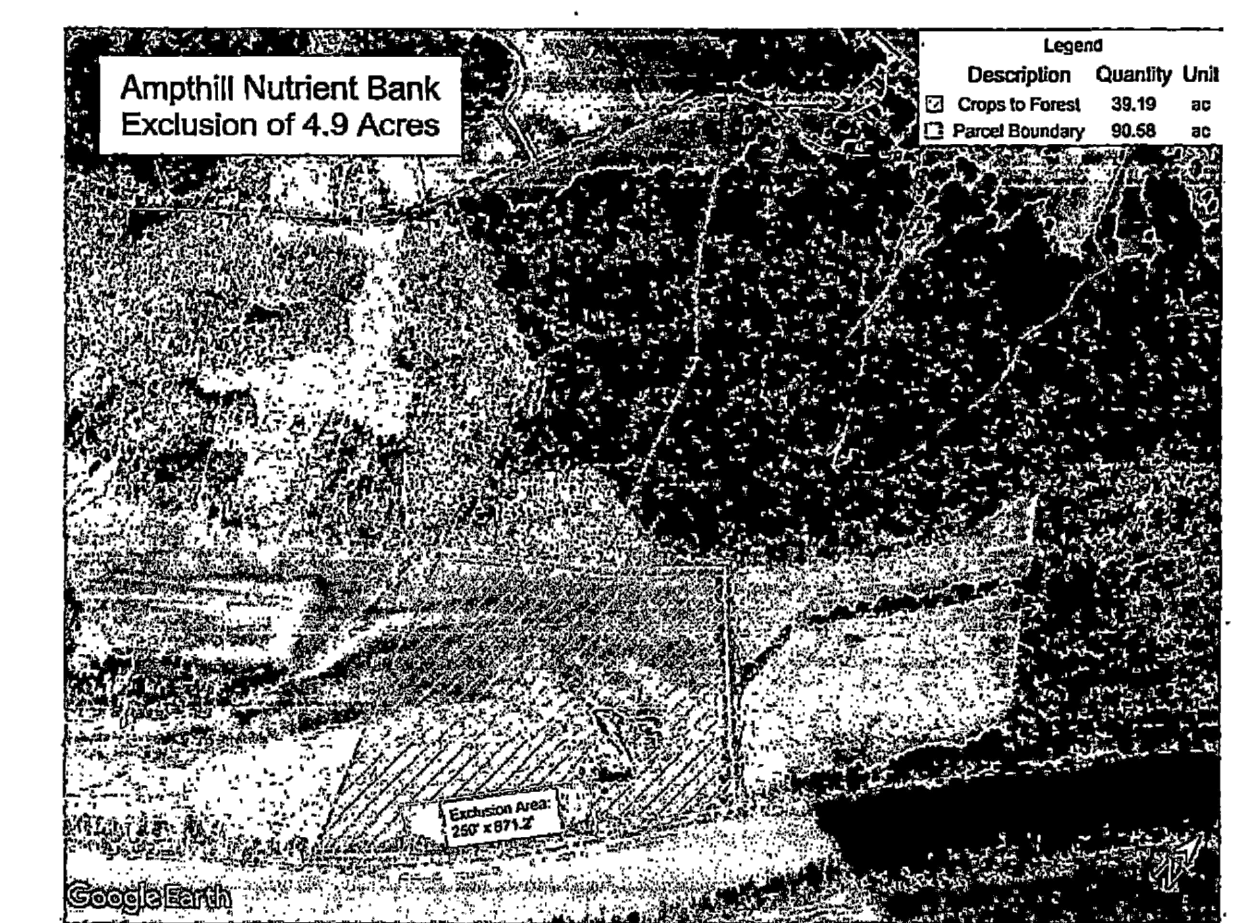


My commission expires

Declaration of Restrictions  
Amphill Nutrient Bank  
Cumberland County, VA

5

39.19 Acres  
Crops to Forest Conversion Area  
Placed Under Restrictive Covenant

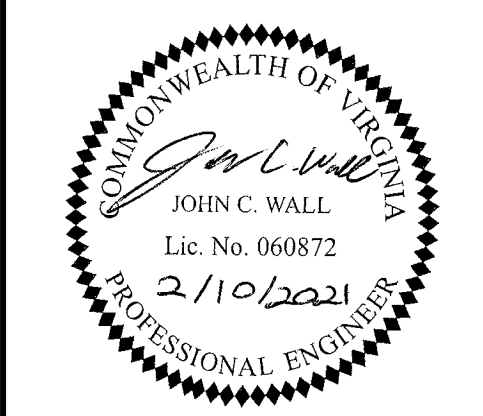


Exclusion Area of 4.9 Acres Created: (250' x 871.2')  
Staked out, then verified by State Forester Matt Hall. 4.9 acres verified by his GPS.

MAILED/DELIVERED TO:  
William Ivey

6

INSTRUMENT 19000926  
RECORDED IN THE CLERK'S OFFICE OF  
CUMBERLAND COUNTY CIRCUIT COURT ON  
AUGUST 15, 2019 AT 11:45 AM  
DEIRDRE D. MARTIN, CLERK  
RECORDED BY: KLF



THIS DRAWING PREPARED AT THE  
TRI-CITIES OFFICE  
4701 Owens Way, Suite 900 | Prince George, VA 23875  
TEL 804-541-1600 FAX 804-486-1511 www.timmons.com

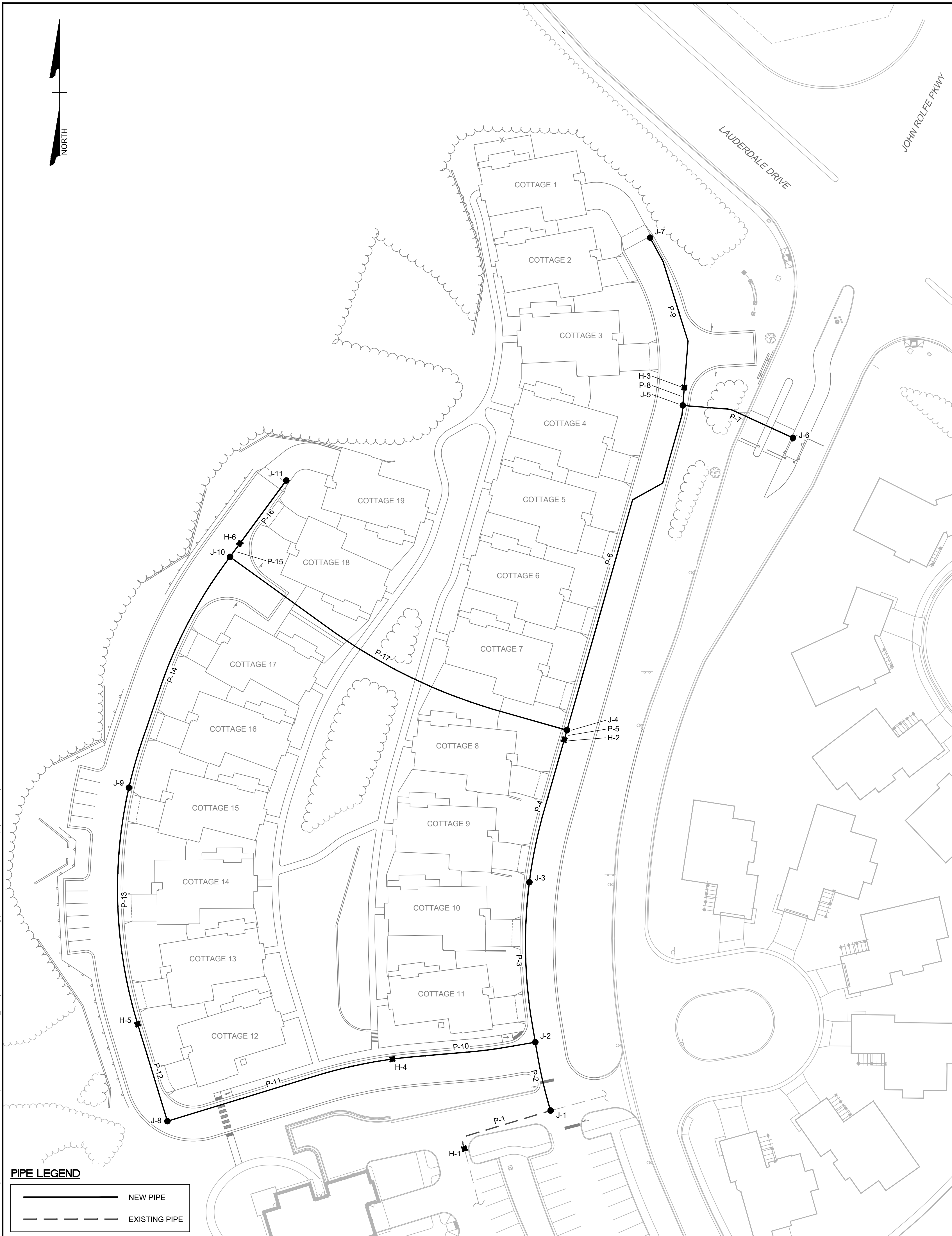
YOUR VISION ACHIEVED THROUGH OURS.  
DATE: 12/17/2020  
PLANNING COMMISSION SUBMITTAL: 2/10/2021  
REVISIONS PER COUNTY COMMENTS:

DATE: 11/16/2020  
DRAWN BY: D. ELLIS  
DESIGNED BY: J. WALL  
CHECKED BY: D. JOHNSON  
SCALE: NONE

TIMMONS GROUP  
LAKEWOOD MANOR - COTTAGES - PHASE 2  
LUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
STORMWATER QUALITY INFORMATION  
JOB NO. 46579  
SHEET NO. C7.2

P.O.D. #2020-00486  
These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.

K:\2021 - Utilities\Projects\Water Models for Other Groups\Henrico\46579\WMDL.dwg | Plotted on 1/28/2021 1:20 PM | by Scott Harvey



**PIPE LEGEND**

	NEW PIPE
	EXISTING PIPE

**DESIGN CRITERIA**

- FLOW INFORMATION WAS OBTAINED FROM A FLOW TEST PERFORMED BY TIMMONS GROUP AND RICHMOND DEPARTMENT OF PUBLIC UTILITIES ON 11/18/2020. THE FLOW TEST NODE (H-1) IS THE EXISTING HYDRANT LOCATED ON THE EXISTING 12 INCH WATERLINE AT THE INTERSECTION OF JANKE ROAD AND GERMAN SCHOOL ROAD. THE AVAILABLE FLOW IS PROVIDED IN THE TABLE BELOW.
- | FLOW (GPM) | RESIDUAL PRESSURE (PSI) |
|------------|-------------------------|
| 0          | 77                      |
| 1,000      | 71                      |
| 1,500      | 65                      |
| 2,000      | 58                      |
- SYSTEM FLOW IS REPRESENTED AT H-1 IN THE INCLUDED WATER MODEL LAYOUT.
  - THIS WATER MODEL WAS PERFORMED TO EVALUATE AVAILABLE PRESSURE AND FLOW BASED ON THE INCLUDED WATER MODEL LAYOUT AND FLOW DEMAND CRITERIA.
  - ALL WATERLINES WERE MODELED WITH A HAZEN-WILLIAMS ROUGHNESS COEFFICIENT OF 120.
  - THE WATER MODEL LAYOUT IS BASED ON INFORMATION (SURVEY, GRADING AND SITE LAYOUT) PROVIDED BY TIMMONS GROUP.
  - THE PROPOSED SYSTEM MUST MEET THE FOLLOWING MINIMUM RESIDUAL PRESSURE REQUIREMENTS
    - MINIMUM OF 45 PSI FOR THE AVERAGE DAILY AND MAXIMUM DAILY DEMAND SCENARIOS.
    - MINIMUM RESIDUAL PRESSURE OF 20 PSI FOR THE PEAK HOURLY DEMAND SCENARIO AND ALL FIRE SCENARIOS.

**FLOW DEMAND CRITERIA**

- AVERAGE DAILY DEMAND:
  - COTTAGES
    - FLOW FACTOR = 300 GPD / UNIT
    - DURATION = 24 HOURS
    - AVERAGE DAILY DEMAND = 0.21 GPM / UNIT
    - J-3 = 4 UNITS
    - J-5 = 4 UNITS
    - J-7 = 3 UNITS
    - J-9 = 6 UNITS
    - J-11 = 2 UNITS
  - GUARD HOUSE
    - AVERAGE DAILY DEMAND = 2 GPM (ASSUMED) AT J-6
    - BASED ON INFORMATION PROVIDED, THE GUARD HOUSE HAS A SINGLE TANK TYPE FIXTURE BATHROOM FACILITY.
- MAXIMUM DAILY DEMAND = AVERAGE DAILY DEMAND X 1.75
- PEAK HOURLY DEMAND = AVERAGE DAILY DEMAND X 2.75
- ISO DEMAND = 1,500 GPM (PER COTTAGE)
  - HYDRANTS SELECTED BASED PROXIMITY TO COTTAGES AND LOWEST RESIDUAL PRESSURES DURING FIRE FLOW SCENARIO.
  - DEMAND IS BASED ON ISO CALCULATION FORM ON SHEET C1.9.
    - COTTAGES 1-7
      - H-2 = 500 GPM
      - H-3 = 1,000 GPM
    - COTTAGES 8-11
      - H-2 = 500 GPM
      - H-4 = 1,000 GPM
    - COTTAGES 12-19
      - H-5 = 500 GPM
      - H-6 = 1,000 GPM

**CONCLUSION**

- BASED ON THE INFORMATION PROVIDED, THE PROPOSED SYSTEM IS ADEQUATE TO MEET THE MINIMUM RESIDUAL PRESSURE REQUIREMENTS WHILE PROVIDING THE REQUIRED FLOWS FOR DOMESTIC AND FIRE SCENARIOS.
- PRESSURES IN THE SYSTEM EXCEED 80 PSI. PRESSURE REDUCING VALVES MAY BE REQUIRED PER UNIFORM STATEWIDE BUILDING CODE.
- THE RESULTS PRESENTED ARE BASED UPON INFORMATION GATHERED AT THE TIME OF THIS ANALYSIS. THE VARIABILITY OF THE WATER SYSTEM DUE TO CHANGES IN USAGE, DEMAND, OPERATING CONDITIONS, AND LAYOUT PRECLUDES GUARANTEE THAT EXPECTATIONS REGARDING AVAILABLE PRESSURES AND FLOWS WILL BE EXACTING.
- IT IS ASSUMED THAT THE OFF-SITE WATER SYSTEM HAS ADEQUATE OPERATIONAL AND PERMIT CAPACITY.

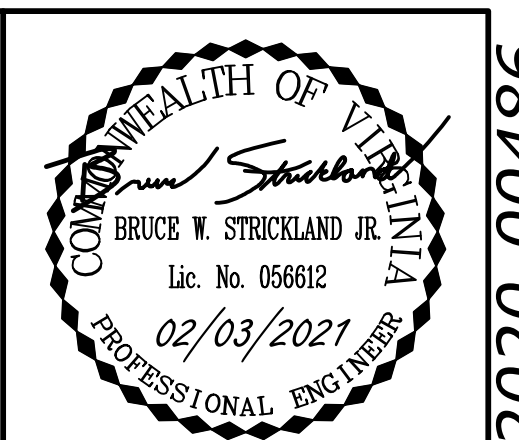
**RESIDUAL PRESSURE RESULTS (PSI)**

FLOW SCENARIO	JUNCTIONS											HYDRANTS					
	J-1	J-2	J-3	J-4	J-5	J-6	J-7	J-8	J-9	J-10	J-11	H-1	H-2	H-3	H-4	H-5	H-6
STATIC	166.7	163.0	156.8	153.8	152.6	161.0	153.3	152.7	151.3	152.3	152.8	165.9	153.9	152.8	157.7	152.3	152.4
AVERAGE DAILY DEMAND (ADD)	76.6	78.2	80.9	82.2	82.7	79.1	82.4	82.7	83.3	82.9	82.6	77.0	82.1	82.6	80.5	82.8	82.8
MAXIMUM DAILY DEMAND (MDD)	76.6	78.2	80.9	82.2	82.7	78.5	82.4	82.7	83.2	82.9	82.6	77.0	82.1	82.6	80.5	82.8	82.8
PEAK HOURLY DEMAND (PHD)	76.6	78.2	80.9	82.2	82.7	77.8	82.4	82.7	83.2	82.8	82.6	77.0	82.1	82.6	80.5	82.8	82.8
MDD + ISO DEMAND - COTTAGES 1-7	63.1	63.7	65.2	65.4	63.5	59.3	63.1	67.5	67.5	66.7	66.5	64.9	65.4	63.2	65.7	67.5	66.6
MDD + ISO DEMAND - COTTAGES 8-11	63.1	63.7	66.0	66.9	67.4	63.2	67.1	67.3	67.9	67.5	67.3	64.9	66.8	67.3	65.1	67.5	67.5
MDD + ISO DEMAND - COTTAGES 12-19	63.1	63.7	65.8	66.5	67.0	62.6	66.7	66.5	66.4	65.8	65.5	64.9	66.5	66.9	65.3	66.2	65.6
MDD + FIRE FLOW*	-	-	-	-	-	-	-	-	-	-	-	70.7	73.6	71.5	72.5	74.1	73.7
MINIMUM PRESSURE DURING FIRE FLOW	-	-	-	-	-	-	-	-	-	-	-	70.4	69.7	67.5	69.7	69.7	69.7
NODE OF MINIMUM PRESSURE	-	-	-	-	-	-	-	-	-	-	-	J-1	J-1	J-6	J-1	J-1	J-1

\*FIRE FLOW = 1,000 GPM AT EACH HYDRANT, FLOWED NON-SIMULTANEOUSLY, AT SYSTEM MINIMUM RESIDUAL PRESSURE LIMIT OF 20 PSI.

**PIPE REPORT**

LABEL	LENGTH (FT)	DIA (IN.)
P-1	76	8
P-2	52	8
P-3	110	8
P-4	109	8
P-5	7	8
P-6	263	8
P-7	86	1
P-8	13	8
P-9	117	8
P-10	107	8
P-11	173	8
P-12	75	8
P-13	178	8
P-14	188	8
P-15	12	8
P-16	58	8
P-17	284	8



THIS DRAWING PREPARED AT THE  
**TRI-CITIES OFFICE**  
 4701 Owens Way, Suite 900 | Prince George, VA 23875  
 TEL 804-541-1600 FAX 804-486-1511 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION
12/17/2020	PLANNING COMMISSION SUBMITTAL
02/03/2021	COUNTY COMMENTS

DATE: 11/16/2020  
 DRAWN BY: S. HARVEY  
 DESIGNED BY: S. HARVEY  
 CHECKED BY: B. STRICKLAND  
 SCALE: N.T.S.

**TIMMONS GROUP**

**LAKWOOD MANOR - COTTAGES - PHASE 2**  
 LUCKAHOE DISTRICT - HENRICO COUNTY - VIRGINIA  
 WATER SYSTEM HYDRAULIC ANALYSIS

JOB NO. 46579  
 SHEET NO. WM1.0

These plans and associated documents are the exclusive property of TIMMONS GROUP and may not be reproduced in whole or in part and shall not be used for any purpose whatsoever, inclusive, but not limited to construction, bidding, and/or construction staking without the express written consent of TIMMONS GROUP.

P.O.D. #2020-00486



### RESIDENT UNIT COUNTS

Maximum Zoning Allowance:  
 60 COTTAGES  
 450 OTHER INDEPENDENT LIVING  
 240 ASSISTED LIVING  
 750 TOTAL

Current Unit Counts:  
 14 COTTAGES  
 294 OTHER INDEPENDENT LIVING  
 60 ASSISTED LIVING  
 15 MEMORY CARE  
 96 HEALTH CARE  
 501 TOTAL

Proposed Unit Counts in Masterplan:  
 19 COTTAGES ADDED  
 66 OTHER INDEPENDENT LIVING ADDED

**Total Units when Masterplan is complete:**  
 33 COTTAGES  
 360 OTHER INDEPENDENT LIVING  
 60 ASSISTED LIVING  
 15 MEMORY CARE  
 96 HEALTH CARE  
 564 TOTAL

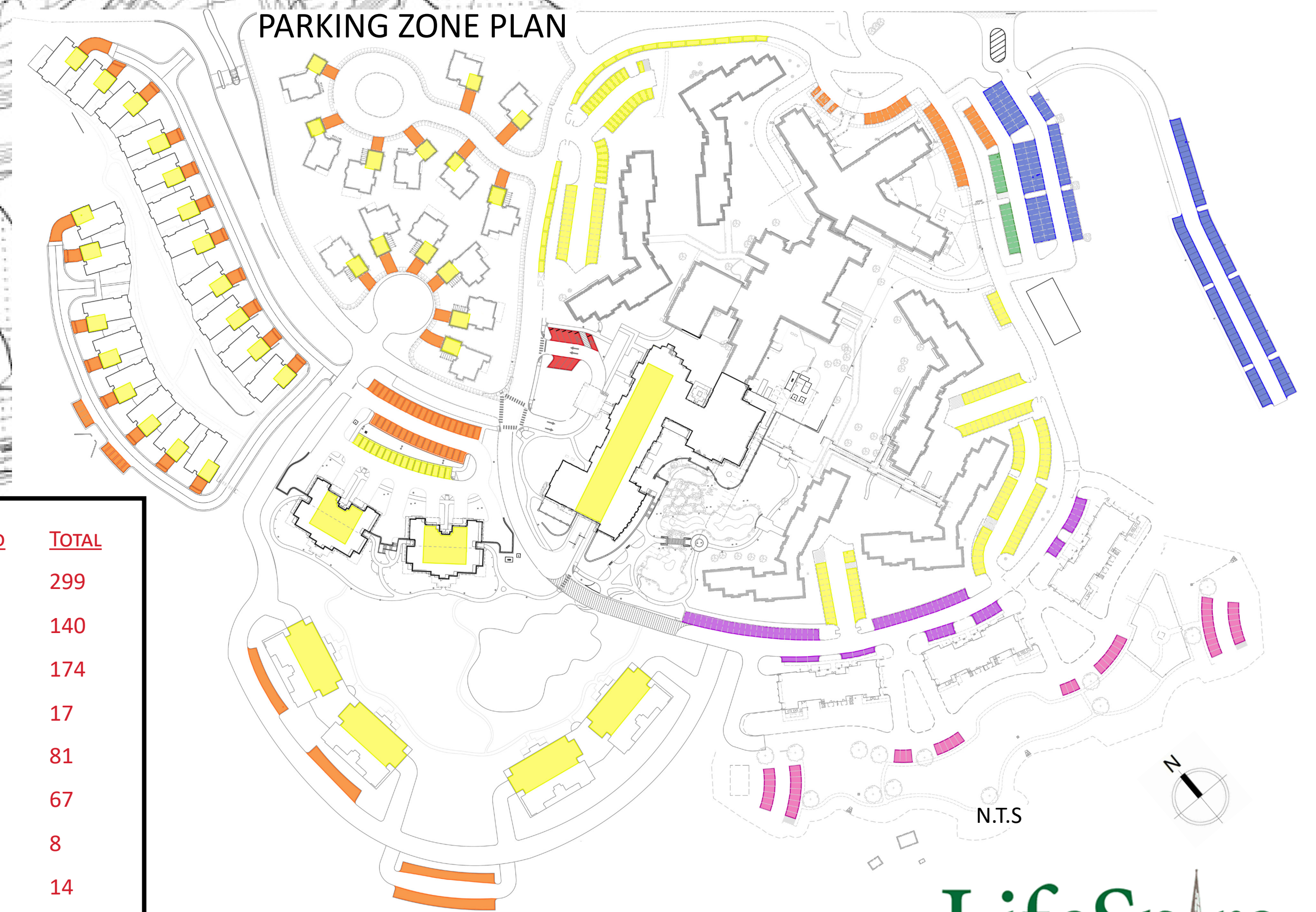
### PARKING COUNTS

Current Parking Counts:  
 617 TOTAL

Proposed Parking to be added as part of the Masterplan:  
 84 PARKING SPOTS IN NEW EMPLOYEE PARKING  
 66 UNDERBUILDING PARKING FOR NEW HYBRID HOMES  
 88 SURFACE VISITOR PARKING ADDED BY NEW COTTAGES AND NEW HYBRID HOMES  
 38 GARAGE PARKING SPOTS FOR NEW COTTAGES  
 93 TO BE REMOVED FOR CONSTRUCTION OF NEW HYBRID HOMES

**183 TOTAL PARKING SPACES TO BE ADDED**

**Parking Spots When Masterplan is Complete:**  
**800 TOTAL**



### Key

	EXISTING	ADDED	TOTAL
-Resident Only	195	104	299
-Resident & Guest	52	88	140
-Lakewood Staff	90	84	174
-Resident, Staff, & Guests	17	0	17
-Unrestricted	174	-93	81
-Resident, Guests, & Contractors	67	0	67
-Marketing & Guests	8	0	8
-No Parking	14	0	14

### Security Protocol

Resident and visitor entrance:

- All residents and visitors will enter through this entrance
- Two Lane Entrance/One Lane Exit
- Two arm entrance/One arm exit
- Call box and camera on the pedestal closest to the Guardhouse
- Staffed from 6am- 10pm
- 10pm – 6am remote access only to the Concierge via callbox
- Emergency response vehicles will enter through Resident/Visitor entrance
- Henrico Fire Department will have remote access (Programmed on HFD radio)

Employees and Vendor entrance

- All employees and vendors will enter at this entrance
- One lane entrance/One lane exit
- Call box and camera on the entrance pedestal
- One arm entrance/One arm exit