VILLAGE OF MARVIN

10004 New Town Road | Marvin, NC | 28173 | Tel: (704) 843-1680 | Fax: (704) 843-1660 | www.marvinnc.org

PLANNING BOARD MEETING MINUTES

December 21, 2021 – 6pm
Village Hall, 10004 New Town Road
Regular Meeting (Virtual Meeting)

AGENDA ITEMS

1. **Call to Order**
   Chairman Jones called the meeting to order at 6:02pm.

2. **Determine Quorum**
   Chairman Jones determined a quorum was present.
   Present: Chairman Jones, Malinda Daniel, Michael Lavelle
   Present Virtually via Webex: Vice-Chair Cates, Richard Holzberg, Ken Marino, Councilman Marcolese *(Council Liaison)*
   Absent: Kent Renner
   Staff Present: Hunter Nestor, Austin W. Yow

3. **Adoption of the Agenda**
   MOTION: Malinda Daniel moved to adopt the agenda as presented. Michael Lavelle seconded the motion.
   VOTE: The motion passed unanimously, 6-0.

4. **Adoption of the Minutes for: 11/16/21**
   MOTION: Michael Lavelle moved to adopt the minutes as presented. Malinda Daniel seconded the motion.
   VOTE: The motion passed unanimously, 6-0.

5. **Public Comment Period**
   No comments were given.

ITEMS OF DISCUSSION

TIME STAMP 2:15

1. **Perform the Function of the Design Review Board to Discuss and Consider Approval of the Marvin Efird Park Monument Sign**
   Hunter Nestor, Planning & Zoning Administrator, explained that the Village will be installing a new monument sign for Marvin Efird Park. The Board asked why no rendering was provided. Mr. Nestor explained that the sign is almost identical to the current sign mounted to the fence at the park. He added that the PR&G Board approved a design early in 2021 and that other staff ordered the sign months ago. Mr. Nestor stated that an Eagle Scout has volunteered to build a frame for a sign and that an example was included in the packet. He explained that the frame will not have a concrete base, but rather gravel or river rock.

   The Board agreed by consensus that the submitted package was not sufficient to warrant a recommendation.

   MOTION: Malinda Daniel moved to table the discussion until a revised package is submitted. Vice-Chair Cates seconded the motion.
   VOTE: The motion passed unanimously, 6-0.

TIME STAMP 19:05

2. **Discuss and Consider Recommendation of the Estates at Marvin Branch Preliminary Plat and Construction Plans** *(See attached, Item 2, which is included as a reference in these minutes).*
   The Board asked questions regarding the reduced viewshed buffer request that the Village Council previously granted. Mr. Nestor explained that Jones Homes has submitted the preliminary plat and construction plans for the "Estates at Marvin Branch" subdivision. He added that no changes have been made since the submittal of the sketch plan and that the Village Engineer has

already reviewed the proposal. He explained that the Engineer is working with the applicant on a stormwater issue, but other than that the plans are fully compliant.

MOTION: Chairman Jones moved to recommend approval of the Estates at Marvin Branch preliminary plat and construction plans as presented, contingent upon final engineer review. Michael Lavelle seconded the motion.
VOTE: The motion passed unanimously, 6-0.

TIME STAMP 40:40

3. **Discuss and Consider Recommendation of the Heritage at Marvin Subdivision Sketch Plan** *(See attached, Item 3, which is included as a reference in these minutes).*
Mr. Nestor explained that Jones Homes has submitted a proposal for a 29-lot conservation-style subdivision, of which 14.86 acres is proposed for conservation lands. He added that the lots are compliant with the Village's ordinances. He clarified that the developer, Jones Homes, has not held their legally required public input meeting yet; therefore, the Planning Board does not have to make a recommendation yet. He noted that after the public input meeting is held, the developer could amend their proposal. The Board asked various questions regarding the submission, revising the proposal, the Marvin Heritage District, and the extension of water and sewer lines.

The Board agreed by consensus to withhold a recommendation until the public input meeting is held.

TIME STAMP 1:12:25

4. **Discussion of Future Text Amendments - Small Wireless Facilities Zoning Language, Sign Ordinance, Subdivision Ordinance, Tree Ordinance, Land Use Plan Recommendations/Goals**
Mr. Nestor explained that he plans to begin having the Board provide recommendations as to how staff needs to propose new ordinances and text amendments based on the goals outlined in the Village's Land Use Plan. He expressed the desire to have the Board participate in helping to clean up and revise the Village's ordinances, many of which are outdated and confusing.

AGENDA ITEMS

TIME STAMP 1:29:50

1. **Review of Action Items**
   - Mr. Nestor will inform the Village that its monument sign submittal must be revised based on the Board's discussion.
   - Mr. Nestor will prepare the Board for future text amendment discussions.

TIME STAMP 1:32:10

2. **Board Member Comments**
Chairman Jones: He reflected on how productive 2021 has been for the Village.
Vice-Chair Cates: She wished everyone Happy Holidays.
Richard Holzberg: He wished everyone a great holiday season. He thanked staff for their hard work.
Michael Lavelle: He wished everyone a Merry Christmas and a Happy New Year.
Ken Marino: He concurred with Richard's comments.
Councilman Marcolese: He apologized for joining late. He wished everyone a Merry Christmas.

ADJOURNMENT

MOTION: Vice-Chair Cates moved to adjourn the meeting at 7:36pm. Malinda Daniel seconded the motion.
VOTE: The motion passed unanimously, 6-0.

Adopted: 1-18-2022

Kelly Cates 1/18/22
Kelly Cates, Planning Board Vice-Chair
Village of Marvin

VILLAGE OF MARVIN SEAL N.C.

Austin W. Yow
Austin W. Yow
Village Clerk & Assistant to the Manager

Item 2.

VILLAGE OF MARVIN

10004 New Town Road | Marvin, NC | 28173 | Tel: (704) 843-1680 | Fax: (704) 843-1660 | www.marvinnc.org

DATE: December 15, 2021

TO: Planning Board

FROM: Hunter Nestor, Planner and Zoning Administrator

SUBJECT: Discuss and Consider Recommendation of The Estates at Marvin Branch Preliminary Plat and Construction Plans

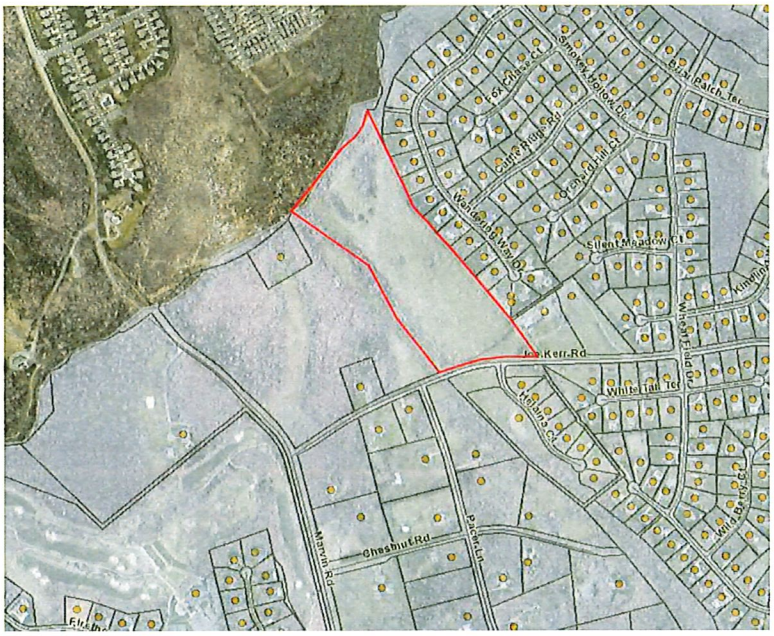
Actions Requested

Staff request the Planning Board review and discuss The Estates at Marvin Branch Preliminary Plat and Construction Plans. The Village Council is holding the Public Hearing on this submission on January 11th, 2022 and will discuss and consider approval at this meeting. A Public Hearing is required to approve the Preliminary Plat and Construction Plans for the Rural Subdivision.

Background

Jones Homes USA has submitted their preliminary plat and construction plans for the Estates at Marvin Branch.

LOCATION:
The subject property is a 28.48 acre property on Joe Kerr Road, across from Elysian Fields/Helaina Court, and adjacent to Wandering Way Drive in Marvin Creek. It is just ¼-mile east of Marvin Road, and bordered by the Marvin Branch to the west and Six-Mile Creek to the north.



VILLAGE OF MARVIN

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Analysis

	Existing Land Use	Zoning Designations
Subject Property	Vacant, Field	R-Marvin Residential
North	Residential/Wetland (Ardrey Chase)	R-3 Charlotte-Mecklenburg
South	Residential/Unbuilt (Elysian Fields)	R-Marvin Residential
East	Residential (Marvin Creek)	R-Marvin Residential
West	Residential/Farm (Brantley Farm)	R-Marvin Residential

General: The subdivision application is for 16 homes on 28.48 acres, yielding a density of 0.56 units/acre. There is 37% conservation area, and the subdivision is designed per the conservation/large tract standards in §151.081. This allows 20% of the lots to be at least 25,000 s.f. and the remaining lots to be at least 30,000 s.f.

Greenways: A greenway easement will connect the future Six-Mile Creek greenway to the north, the Marvin Creek Sidewalk if desired by their HOA, and the Elysian Fields Green way to the south. There will be a sidewalk in front of all houses.

Tree Preservation: There is near-zero tree disturbance as the property is currently a pasture. A tree perimeter exists on site which will not be disturbed, and less than 10 trees would need to be removed in the middle area if any. Trees must be planted around Lot 16 to seclude it from view and maintain the minimum tree density of the perimeter buffer (1 tree per 2,500 s.f. i.e. 1 tree per 100 linear feet of the 25' wide buffer). With the intended tree planting, mitigation will be more than satisfied.

Lot Characteristics: The lot characteristics are as follows:

- 50' front yad setback
- 20' side yard setback
- 75' rear yard buffer
- On the east side, the 25' tree perimeter buffer is incorporated into the properties as permitted in §93.22(C)(3). On the west and north, the buffer is outside the lots, at the edge of the property.
- Lot sizes ranging from 29,662 s.f. to 39,903 s.f. with 1/16 lots being between 25,000 – 30,000 s.f. (6%)
- 130' minimum lot width at building front
- 50' minimum road frontage

Drainage: There will be no underground pipes, as the natural property grading lends itself to drainage sheet-flow into the creek and branch. In addition, the development is less than 24% impervious surface, so stormwater detention facilities are not required.

Water and Sewer: This development will utilize Union County Water and Sewer. The sewer will flow into Mecklenburg County, thus avoiding the current sewer capacity issues in Union County.

Viewshed: Council approved the requested exemption to reduce the viewshed buffer to 85' on the east side of the main cul-de-sac while having a 285' viewshed on the west side during the June 8th 2021 meeting. This request is allowable through the subdivision process with a proven hardship per §151.081(E)(1)(a). Elysian Fields was designed in the same way, with an 85' buffer on the east side of the road and a greater-than minimum viewshed on the west side of the road. The developer of Elysian Fields petitioned to the council the hardship that the 200' DEQ buffer reduced the buildability on the west side, and was granted that exemption. Lots 15 and 16, which would lie in the reduced viewshed must be sheltered from view of the neighbors and road per the same ordinance above.

Other agency notes (Plans will be sent out to outside agency for review):

NCDOT: May require a right turn lane west bound on Joe Kerr Road
Union County Public Schools: The subdivision would add approximately 16 schoolkids Pre-K -12
NC DEQ: 200' buffer on both North and West borders are satisfied

Public Involvement Meeting: Approximately 9 people attended each of the on-site portion and the Village Hall portion on May 5, 2021. Questions posed included tree preservation, rear buffers on the side adjacent to Marvin Creek, greenway alignments, road curvature, house model information, traffic, and school impact. Most residents were satisfied to the answers to their questions. Some comments caused revisions to the plans, most significantly a revision to the road alignment to allow an increase in rear buffer from 40' to 75' on all lots.

Sketch Plan: The Village Council discussed and unanimously approved the sketch plan for the Estates at Marvin Branch Subdivision during the June 8th, 2021 meeting, as presented with the recommendations of the Planning Board: to keep the boulders, to not disturb the trees in the buffer, to plant trees to increase density and around lots with insufficient screening; and to include supplemental screening on lot 16. This also included the reduced viewshed buffer.

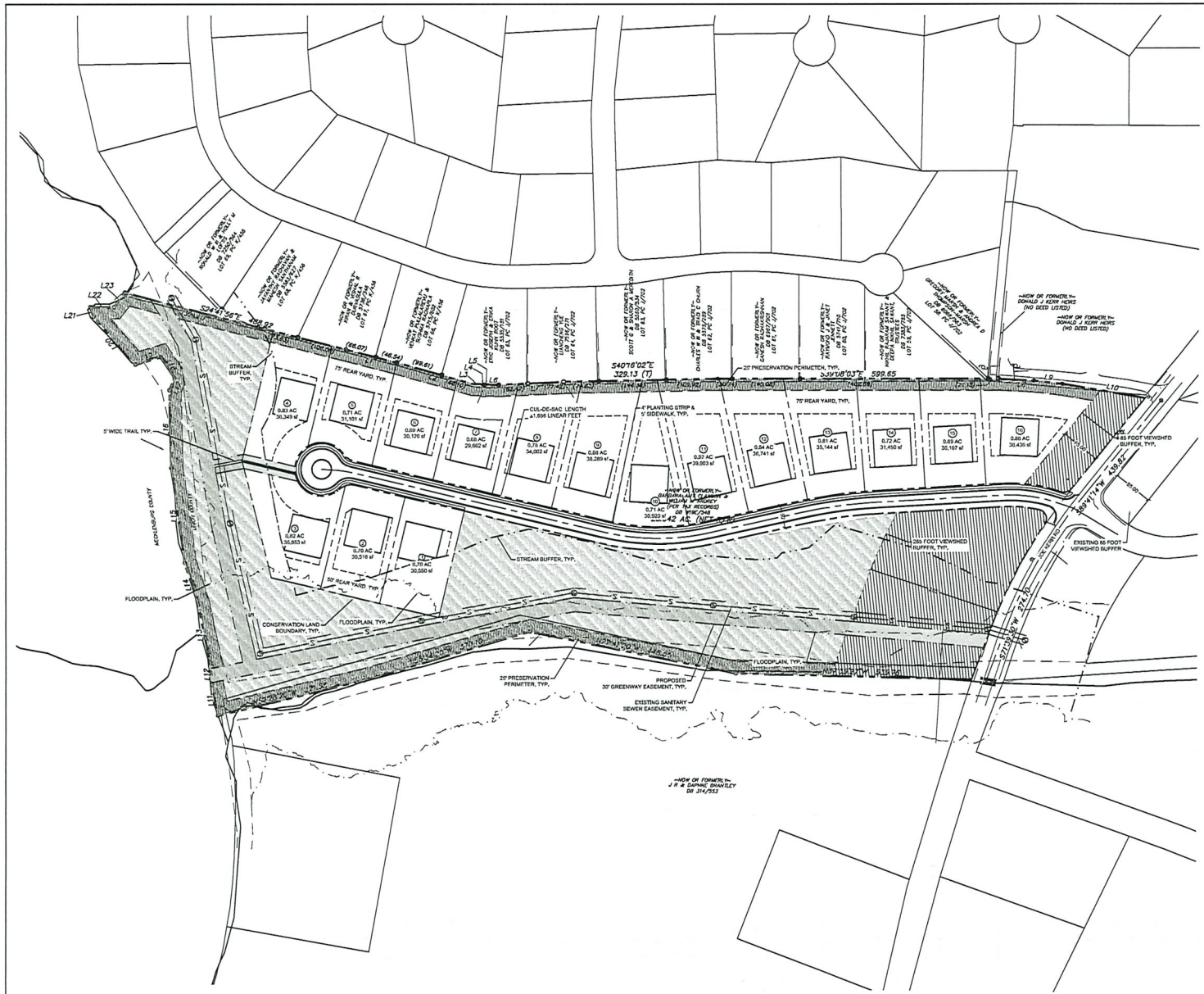
Currently

Currently, everything in the submitted construction plan, have been reviewed by the Village Engineer and approved other than the Stormwater detention. The Village Engineer has provided those comments and those comments have been sent to the applicant for revisions. The applicant is revising the plan and will have a final updated set of plans prior to the hearing.

Following the hearing and review of the plat and plans, Council will vote to approve or deny or request additional relative information and changes to the submitted documents. The final approved Construction Plans will then be reviewed by the Staff, the Village Engineer and all applicable outside agencies again if any changes are made. So long as those revisions do not affect the zoning regulations in a way that reduces the quality, the construction plan need not be reviewed again by the Planning Board and Council.

Recommendation

Planner's Recommendation: Staff recommends approval of The Estates at Marvin Branch Preliminary Plat and Construction Plans, contingent upon successful engineer review (if needed) and approvals from all outside applicable agencies.



DEVELOPMENT SUMMARY

PARCEL ID:	06222034
OWNER:	BARBARA AMY CLAWSON & WILLIAM M ARDREY 516 PACER LANE MARVIN, NC 28173
TOTAL ACREAGE:	±28.481 ACRES
JURISDICTION:	MARVIN, NC
EXISTING ZONING:	R (VILLAGE OF MARVIN)
PROPOSED USE:	CONVENTIONAL SUBDIVISION

DEVELOPMENT STANDARDS

MINIMUM LOT WIDTH AT SETBACK:	130 FEET
MINIMUM LOT WIDTH AT RIGHT OF WAY:	50 FEET
MINIMUM LOT AREA:	43,560 SF
MINIMUM FRONT YARD SETBACK:	50 FEET
MINIMUM SIDE YARD SETBACK:	20 FEET
MINIMUM CORNER YARD SETBACK:	25 FEET
MINIMUM REAR YARD SETBACK:	50 FEET (75 FEET WHEN ABUTTING EXISTING LOT)
MAXIMUM BUILDING HEIGHT:	35 FEET
VIEWSHED BUFFER WIDTH:	285 FEET
PROPOSED LOTS:	16 LOTS
PROPOSED DENSITY:	0.561 DUA
PROPOSED CONSERVATION LAND (C.L.):	37% (10.56 AC.)

MARVIN UDO SECTION 151.081
LARGE TRACT SUBDIVISION STANDARDS - MAXIMUM ALLOWABLE LOTS

GROSS ACREAGE OF THE TRACT TO BE SUBDIVIDED =	+/-28.481 AC. X (0.5521 + 0.00886 x C.L. 37%)
MAXIMUM NUMBER OF LOTS ALLOWED =	26.11
ROUNDED TO NEAREST WHOLE NUMBER =	26 TOTAL LOTS
PROPOSED LOTS:	16 LOTS
MINIMUM LOT SIZE ALLOWED:	20% OF TOTAL LOTS MAY BE MIN. 25K SF REMAINDER SHALL BE 30K SF
LOTS 30K SF OR GREATER:	15 (93.75%)
LOTS LESS THAN 30K SF:	1 (6.25%)
MINIMUM LOT SIZE PROPOSED:	+/-29,662 SF

HATCH LEGEND

- 85' & 285' VIEWSHED BUFFER
- CONSERVATION LAND (37% - 10.56 AC.)
- 30' GREENWAY EASEMENT
- 25' PRESERVATION PERIMETER

LINETYPE LEGEND

- PROJECT BOUNDARY LINE
- PROP. R/W
- EXIST. PROPERTY LINE
- EXIST. EOP
- FEMA FLOODZONE

SCALE: 1"=100'
0 50' 100' 150' 250'

LandDesign.
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM
NC ENG. FIRM LICENSE # C-0658

JONES HOMES USA

The Estates AT MARVIN BRANCH

VICINITY MAP (NTS)

SITE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015

PROJECT

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA - UNION COUNTY - NORTH CAROLINA

LANDDESIGN PROJECT 1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE

DESIGNED BY: RJK
DRAWN BY: RJK
CHECKED BY: RJK

SCALE: NORTH
VERT: NW
HORZ:

SHEET TITLE

CONCEPT PLAN

SHEET NUMBER

SK-1.0

ORIGINAL SHEET SIZE: 24" X 36"

LAND DEVELOPMENT PLANS FOR

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

VILLAGE OF MARVIN, NC

DATE: AUGUST 4TH, 2021

CHAPTER INDEX

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C-0.1	GENERAL NOTES
C-0.2	ALTA SURVEY
C-1.0	OVERALL LAYOUT PLAN
C-1.1	LAYOUT PLAN
C-1.2	LAYOUT PLAN
C-1.3	SITE DETAILS
C-1.4	SITE DETAILS
C-2.0	ROADWAY PLAN & PROFILE
C-2.1	ROADWAY PLAN & PROFILE
C-2.2	INTERSECTION SIGHT DISTANCE
C-2.3	FIRE ACCESS PLAN
C-2.4	FIRE ACCESS PLAN
C-3.0	OVERALL STORM DRAINAGE PLAN
C-3.1	STORM DRAINAGE PLAN
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C-4.0	OVERALL GRADING PLAN
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C-4.3	EARTHWORK
C-5.0	OVERALL PHASE 1 EROSION CONTROL PLAN
C-5.1	PHASE 1 EROSION CONTROL PLAN
C-5.2	PHASE 1 EROSION CONTROL PLAN
C-5.3	OVERALL PHASE 2 EROSION CONTROL PLAN
C-5.4	PHASE 2 EROSION CONTROL PLAN
C-5.5	PHASE 2 EROSION CONTROL PLAN
C-5.6	EROSION CONTROL DETAILS
C-5.7	EROSION CONTROL DETAILS
C-5.8	EROSION CONTROL DETAILS
C-5.9	EROSION CONTROL DETAILS
C-5.10	EROSION CONTROL DETAILS
C-5.11	EROSION CONTROL DETAILS
C-5.12	EROSION CONTROL DETAILS
C-5.13	EROSION CONTROL DETAILS
C-5.14	EROSION CONTROL DETAILS
C-5.15	EROSION CONTROL DETAILS
C-5.16	EROSION CONTROL DETAILS
C-5.17	EROSION CONTROL DETAILS
C-6.0	OVERALL UTILITY PLAN
C-6.1	UTILITY PLAN & PROFILE
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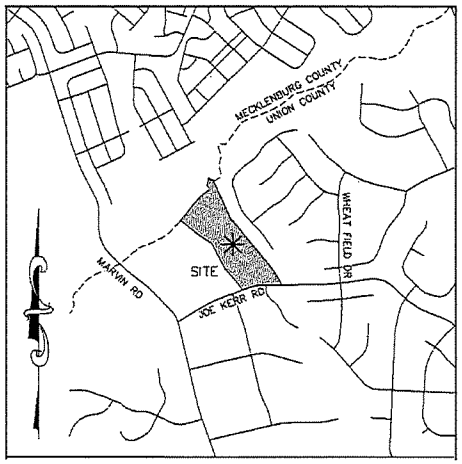
C-6.3	UTILITY DETAILS
C-6.4	UTILITY DETAILS
C-6.5	UTILITY DETAILS
C-7.0	OVERALL PLANTING PLAN
C-7.1	DETAILED PLANTING PLAN
C-7.2	DETAILED PLANTING PLAN

VICINITY MAP



5 500 1000 2000

PROJECT TEAM

DEVELOPER
JONES HOMES USA
370 CENTERPOINTE CIRCLE
SUITE 1136
ALTAMONTE SPRINGS, FL 32701
704.909.9246
CONTACT NAME: BEN KUHN

LANDSCAPE ARCHITECT
LANDDESIGN
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
CONTACT NAME: MARK KIME, RLA

CIVIL ENGINEER
LANDDESIGN
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
CONTACT NAME: MASON GREESON, PE

NORTH CAROLINA LANDSCAPE ARCHITECT #1523 MARK E. KIME
Aug 4 2021 4:18 PM

NORTH CAROLINA PROFESSIONAL ENGINEER 047108 MASON GREESON
8/4/2021

THE ESTATES AT
MARVIN BRANCH
LD PN 1020319

COVER SHEET

C-0.0

LandDesign.

ADDITIONAL MISCELLANEOUS NOTES:

1. ALL CONSTRUCTION, MATERIALS AND METHODS SHALL BE IN ACCORDANCE WITH UNION COUNTY, NCDEQ, AND NCDOT STANDARDS AND SPECIFICATIONS AND ALL OTHER CITY, STATE AND FEDERAL REGULATIONS AND/OR STANDARDS. CONTRACTOR SHALL OBTAIN A COPY OF ALL APPLICABLE STANDARDS AND SPECIFICATIONS AND BECOME FAMILIAR WITH SAID DOCUMENTS PRIOR TO CONSTRUCTION.
2. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED FROM ALL REGULATORY AUTHORITIES.
3. ALL INSPECTORS SHALL BE GIVEN 48 HOURS NOTICE PRIOR TO START OF CONSTRUCTION.
4. ANY DISCREPANCY / APPARENT ERRORS BETWEEN THESE PLANS AND FIELD CONDITIONS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY AND PRIOR TO PROCEEDING WITH THE WORK.
5. APPROVAL OF THIS PLAN IS NOT AUTHORIZATION TO GRADE ADJACENT PROPERTIES. WHEN FIELD CONDITIONS WARRANT OFF SITE GRADING, WRITTEN PERMISSION MUST BE OBTAINED FROM THE AFFECTED PROPERTY OWNERS.
6. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. ANY CONFLICTS WITH EXISTING UTILITIES SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY.
7. IF PROPOSED UTILITIES ARE INSTALLED WITHIN 12 INCHES, HORIZONTAL OR VERTICAL, FROM A GAS MAIN, THE CONTRACTOR SHALL INFORM THE APPROPRIATE GAS COMPANY.
8. RESPONSIBILITY FOR THE INSTALLATION AND MAINTENANCE OF ADEQUATE SAFETY DEVICES FOR THE PROTECTION OF THE PUBLIC, THE WORKERS, AND GENERAL PROTECTION OF THE WORK SHALL REST WITH THE CONTRACTOR DOING THE WORK.
9. NEW FINISHED CONTOURS SHOWN ARE TOP OF PAVING IN AREAS TO RECEIVE PAVEMENT AND TOP OF TOPSOIL IN AREAS TO BE SEEDED.
10. DIMENSIONS AND ELEVATIONS ON BUILDINGS ARE FOR GRADING PURPOSES ONLY AND ARE NOT TO BE USED TO LAYOUT FOOTINGS/BUILDINGS.
11. CONTRACTOR SHALL NOTIFY AND COOPERATE WITH ALL UTILITY COMPANIES OR FIRMS HAVING FACILITIES ON OR ADJACENT TO THE SITE BEFORE DISTURBING, ALTERING, REMOVING, RELOCATING, ADJUSTING OR CONNECTING TO SAID FACILITIES. CONTRACTOR SHALL PAY ALL COSTS IN CONNECTION WITH THE ALTERATION OF OR RELOCATION OF THE FACILITIES. CONTRACTOR SHALL RAISE OR LOWER EXISTING STRUCTURES AS REQUIRED TO MATCH FINISHED GRADES.
12. GRADING CONTRACTOR SHALL COOPERATE AND WORK WITH ALL OTHER CONTRACTORS PERFORMING WORK ON THIS PROJECT TO INSURE PROPER AND TIMELY COMPLETION OF THIS PROJECT.
13. FOR ANY WORK ON THE STATE OR CITY RIGHT-OF-WAY, THE GRADING CONTRACTOR SHALL:
   13.1. NOT STORE MATERIAL, EXCESS DIRT OR EQUIPMENT IN THE RIGHT-OF-WAY IN CASE OF MULTILANE HIGHWAYS. THE PAVEMENT SHALL BE KEPT FREE FROM ANY MUD OR EXCAVATION WASTE FROM TRUCKS OR OTHER EQUIPMENT. ON COMPLETION OF THE WORK ALL EXCESS MATERIAL SHALL BE REMOVED FROM THE RIGHT-OF-WAY.
   13.2. PROVIDE ALL NECESSARY AND ADEQUATE SAFETY PRECAUTIONS SUCH AS SIGNS, FLAGS, LIGHT BARRICADES AND FLAGMEN AS REQUIRED BY THE LOCAL AUTHORITIES AND IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. THE GRADING CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR AND HOLD HARMLESS UNION COUNTY, THE STATE OF NORTH CAROLINA, THE ARCHITECT/ENGINEER, AND THE OWNER FROM ANY CLAIMS FOR DAMAGE DONE TO EXISTING PRIVATE PROPERTY, PUBLIC UTILITIES, OR TO THE TRAVELING PUBLIC.
   13.3. COMPLETE WORK TO THE SATISFACTION OF THE CONTROLLING AUTHORITY AND OBTAIN A LETTER FROM THE DEPARTMENT STATING THAT THE WORK IS ACCEPTABLE.
14. CONTRACTOR SHALL IMPORT SUFFICIENT MATERIAL TO COMPLETE WORK AT NO ADDITIONAL COST, IN THE EVENT OF A SHORTAGE OF STRUCTURAL FILL.
15. CONTRACTOR TO COORDINATE ALL WORK WITH OTHER UTILITY INSTALLATIONS NOT COVERED IN THESE PLANS (ELECTRIC, TELEPHONE, GAS, CABLE, ETC.) AND ALLOW FOR THEIR OPERATIONS AND CONSTRUCTION TO BE PERFORMED.
16. CONTRACTOR SHALL REPAIR OR REPLACE IN-KIND ANY DAMAGE THAT OCCURS AS RESULT OF HIS WORK.
17. CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE THROUGHOUT CONSTRUCTION.
18. BEFORE ANY MACHINE WORK IS DONE, CONTRACTOR SHALL STAKE OUT AND MARK THE ITEMS ESTABLISHED BY THE SITE PLAN. CONTROL POINTS SHALL BE PRESERVED AT ALL TIMES DURING THE COURSE OF THE PROJECT. LACK OF PROPER WORKING POINTS AND GRADE STAKES MAY REQUIRE CESSATION OF OPERATIONS UNTIL SUCH POINTS AND GRADES HAVE BEEN PLACED TO THE OWNER'S SATISFACTION.
19. CONTRACTOR TO GRADE SITE TO A TOLERANCE OF +/- .10 FEET (BALANCED) OF SUBGRADE.
20. PE SEALED SHOP DRAWINGS FOR RETAINING WALLS MUST BE SUBMITTED TO THE ENGINEER PRIOR TO CONSTRUCTION.
21. THE DEVELOPER SHALL MAINTAIN EACH STREAM, CREEK, OR BACKWASH CHANNEL IN AN UNOBSTRUCTED STATE AND SHALL REMOVE FROM THE CHANNEL AND BANKS OF THE STREAM ALL DEBRIS, LOGS, TIMBER, JUNK AND OTHER ACCUMULATIONS.
22. ALL ELEVATIONS ARE IN REFERENCE TO THE BENCH MARK WHICH MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO BREAKING GROUND.
23. ALL FILL TO BE COMPACTED TO 95% STANDARD COMPACTION UNLESS OTHERWISE NOTED. CONTRACTOR TO CONSULT SITE GEOTECHNICAL ENGINEER FOR COMPACTION REQUIREMENTS.
24. THE PROPOSED CONTOURS SHOWN IN DRIVES, PARKING LOTS AND SIDEWALKS ARE FINISHED ELEVATIONS INCLUDING ASPHALT. REFER TO PAVEMENT CROSS-SECTION DATA TO ESTABLISH CORRECT SUB-BASE OR AGGREGATE BASE COURSE ELEVATIONS.
25. ON-SITE BURIAL PITS REQUIRE AN ON-SITE DEMOLITION LANDFILL PERMIT FROM THE ZONING ADMINISTRATOR.
26. ALL SLOPES NOT OTHERWISE NOTED SHALL BE 2:1 OR FLATTER.
27. NON-STANDARD ITEMS (IE: PAVERS, IRRIGATION SYSTEMS, ETC.) IN THE RIGHT-OF-WAY REQUIRE A RIGHT-OF-WAY ENCROACHMENT AGREEMENT WITH UNION COUNTY / NORTH CAROLINA DEPARTMENT OF TRANSPORTATION BEFORE INSTALLATION.
28. CONTACT THE APPROPRIATE UTILITY COMPANY TO RELOCATE/ABANDON/REMOVE ANY EXISTING UTILITIES. ALL EXISTING FACILITIES WHICH CONFLICT WITH THE IMPROVEMENTS UNDER THE SCOPE OF THIS PROJECT MUST BE RELOCATED/ABANDONED/REMOVED AT THE EXPENSE OF THE CONTRACTOR UNLESS PREVIOUS ARRANGEMENTS HAVE BEEN MADE WITH OWNER.
29. THE CONTRACTOR SHALL USE WHATEVER MEASURES ARE REQUIRED TO PREVENT SILT AND CONSTRUCTION DEBRIS FROM FLOWING ONTO ADJACENT PROPERTIES. CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL EROSION SEDIMENT AND SILTATION ORDINANCES. CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL STRUCTURES UPON COMPLETION OF PERMANENT DRAINAGE FACILITIES AND NOT BEFORE ALL AREAS DRAINING INTO THESE STRUCTURES ARE SUFFICIENTLY STABILIZED.
30. CONTRACTOR SHALL TAKE ALL AVAILABLE PRECAUTIONS TO CONTROL DUST. CONTRACTOR SHALL CONTROL DUST BY SPRINKLING, OR BY OTHER METHODS AS DIRECTED BY ENGINEER AND/OR OWNER'S REPRESENTATIVE AT NO ADDITIONAL COST TO OWNER.
31. CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL SEDIMENT CONTROL AND AIR POLLUTION ORDINANCES OR RULES.
32. LIMITS OF CLEARING SHOWN ON EROSION CONTROL PLANS ARE BASED ON CUT AND FILL SLOPES OR OTHER GRADING REQUIREMENTS.
33. ANY GRADING BEYOND THE LIMITS OF CONSTRUCTION SHOWN ON THE GRADING PLAN IS SUBJECT TO A FINE.
34. STABILIZATION IS THE BEST FORM OF EROSION CONTROL. TEMPORARY SEEDING IS NECESSARY TO ACHIEVE EROSION CONTROL ON DENUDED AREAS AND ESPECIALLY WHEN THE CONSTRUCTION SEQUENCE REQUIRES IT. GROUND STABILIZATION SHALL BE A MAXIMUM OF 7 DAYS FOR ALL PERIMETER AREAS AND SLOPES GREATER THAN 3:1. ALL OTHER AREAS ARE TO BE SEEDED OR LANDSCAPE WITHIN 14 DAYS OF COMPLETION OF GRADING.
35. CONTRACTOR SHALL INSTALL EROSION CONTROL MEASURES AS INDICATED ON EROSION CONTROL PLANS. NO EROSION CONTROL DEVICE MEASURE MAY BE REMOVED UNTIL THE SITE IS STABILIZED.
36. ALL STORM SEWER CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH NCDOT AND UNION COUNTY STANDARDS AND SPECIFICATIONS AND ALL OTHER CITY, STATE AND FEDERAL REGULATIONS AND/OR STANDARDS.
37. CATCH BASIN RIM ELEVATIONS ARE GIVEN TO EDGE OF ASPHALT, YARD INLETS TO FINISHED GRADE.
38. RIM ELEVATIONS GIVEN ON THESE PLANS ARE APPROXIMATE AND ARE FOR INFORMATIONAL PURPOSES ONLY. ACTUAL RIM ELEVATIONS SHALL BE DETERMINED BY CONTRACTOR AND ADJUSTED TO MATCH FIELD CONDITIONS.
39. THE PURPOSE OF THE STORM DRAINAGE EASEMENT IS TO PROVIDE STORM WATER CONVEYANCE AND ACCESS. ANY STRUCTURES AND/OR OBSTRUCTION TO STORM WATER FLOW OR ACCESS IS PROHIBITED.
40. ALL LINEAR FOOTAGE FOR ALL UTILITY PIPES ARE APPROXIMATE. ACTUAL INSTALLED QUANTITIES MAY VARY.
41. MINIMUM COVER ON ALL STORM PIPES SHALL BE 3 FEET FOR HDPE AND CLASS III RCP. CLASS IV RCP SHALL BE USED WHERE COVER WILL BE LESS THAN 3'.
42. ALL NON-STANDARD DRAINAGE STRUCTURES (CB'S, HW'S, FES'S, BOTTOMLESS CULVERTS, ETC.) WILL REQUIRE SEALED CONSTRUCTION DRAWINGS.
43. STORM DRAIN PIPE TO FOLLOW THE APPROVED NCDOT AND UNION COUNTY STANDARDS AND SPECIFICATIONS. HDPE AND RCP STORM DRAINAGE PIPE INSTALLED WITHIN EXISTING OR PROPOSED PUBLIC RIGHT-OF-WAY MUST BE APPROVED BY THE INSPECTOR PRIOR TO ANY BACKFILL BEING PLACED. BACKFILL MATERIAL MUST BE APPROVED BY THE INSPECTOR PRIOR TO PLACEMENT OF THE MATERIAL WITHIN THE PUBLIC RIGHT-OF-WAY.
   43.1. ALL RCP PIPE INSTALLED MUST BE INSPECTED AND APPROVED BY THE INSPECTOR PRIOR TO ANY BACKFILL BEING PLACED. THE INSPECTOR MUST BE PRESENT DURING THE BACKFILLING OPERATION AS WELL.
   43.2. BACKFILL MATERIAL USED TO INSTALL RCP PIPE WITHIN THE STREET RIGHT-OF-WAY SHALL BE SELECT MATERIAL, CLASS II-IV, AS DEFINED BY SECTION 1016-3 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES. UPON SUBMITTAL OF WRITTEN CERTIFICATION OF MATERIAL SUITABILITY BY A LICENSED GEOTECHNICAL ENGINEER, NCDOT CLASS I SELECT MATERIAL MAY BE USED. ALL BACKFILL MATERIAL SHALL BE APPROVED BY THE INSPECTOR PRIOR TO PLACEMENT OF THE MATERIAL WITHIN THE STREET RIGHT-OF-WAY.
   43.3. ALL STORM DRAINAGE PIPE AND STRUCTURES SHALL BE NCDOT APPROVED AND HAVE THE NCDOT STAMP ON THEM.
44. CONTRACTOR SHALL BE RESPONSIBLE FOR GETTING PUBLIC ROADS AND UNDERGROUND UTILITIES APPROVED AND ACCEPTED BY THE APPROPRIATE AGENCY.
45. COORDINATE ALL CURB AND STREET GRADES AT INTERSECTIONS WITH INSPECTOR.
46. IN ORDER TO ENSURE PROPER DRAINAGE, KEEP A MINIMUM OF 0.50% SLOPE ON THE CURB.
47. CURB AND GUTTER SHOWN ON PLANS MAY BE ADJUSTED BASED UPON FIELD STAKING BY ENGINEER. ASSOCIATED STORM DRAINAGE MAY ALSO REQUIRE MODIFICATION BASED UPON FIELD CONDITIONS.
48. ALL PERSONS OR AGENCIES DOING WORK IN THE PUBLIC STREETS, HIGHWAYS, OR PUBLIC RIGHTS-OF-WAY ARE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, COORDINATING THE WORK WITH ALL AFFECTED GOVERNMENT AGENCIES AND UTILITIES AND INFORMING OCCUPANT OF ADJACENT PROPERTIES OF ACCESS IMPACTS DUE TO THE WORK.
49. ALL LANE CLOSURES THAT ARE REQUIRED SHALL FOLLOW NCDOT AND UNION COUNTY STANDARDS AND SPECIFICATIONS AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
50. SUBSURFACE DRAINAGE FACILITIES WILL BE REQUIRED IN THE STREET RIGHT-OF-WAY IF IRRIGATION IS INSTALLED WITHIN THE RIGHT-OF-WAY.
51. IN ROLLING AND HILLY TERRAINS, SWEEPING OF THE STONE BASE AND/OR APPLICATION OF A TACK COAT MAY BE REQUIRED NEAR INTERSECTIONS. THESE REQUIREMENTS WILL BE ESTABLISHED BY THE INSPECTOR AND BASED ON FIELD CONDITIONS.
52. ALL ROAD IMPROVEMENTS TO BE COORDINATED WITH UNION COUNTY AND NCDOT PRIOR TO CONSTRUCTION.
53. DEVELOPER SHALL PROVIDE STREET SIGNS PER UNION COUNTY AND STATE STANDARDS.
54. CONTRACTOR SHALL COORDINATE SIGN LOCATION(S) ON SITE WITH OWNER OR OWNER'S REPRESENTATIVE.
55. NO ON-SITE DEMOLITION LANDFILLS (STUMP HOLES) WILL BE LOCATED ON THIS SITE.
56. CONTRACTOR SHALL MAINTAIN THE SITE IN A MANNER SO THAT WORKMEN AND PUBLIC ARE PROTECTED FROM INJURY.
57. THE CONTRACTOR SHALL CONTACT ALL OWNERS OF EASEMENTS, UTILITIES AND RIGHT-OF-WAYS, PUBLIC OR PRIVATE, PRIOR TO WORKING IN THESE AREAS.
58. EXISTING UTILITIES ARE ILLUSTRATED FOR INFORMATION PURPOSES ONLY. LANDDESIGN WILL NOT BE HELD RESPONSIBLE FOR THE ACCURACY OF UTILITY LOCATIONS, SIZES, DEPTHS, OR FOR COMPLETENESS OF UTILITY INFORMATION. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY AND MEET WITH ALL UTILITY OWNERS WHOSE FACILITIES WILL BE AFFECTED TO DETERMINE UTILITY LOCATIONS. THE CONTRACTOR SHALL PROTECT ALL UTILITIES FROM DAMAGE CAUSED BY HIS OPERATIONS OR THOSE OF HIS AGENTS. THE CONTRACTOR SHALL HOLD LANDDESIGN HARMLESS FOR ANY THIRD-PARTY INCONVENIENCE CREATED BY WORK OF HIS OWN FORCES OR THAT OF HIS AGENTS. ANY DAMAGES INCURRED SHALL BE THE CONTRACTORS FINANCIAL RESPONSIBILITY.
59. THE CONTRACTOR IS RESPONSIBLE FOR DAMAGE TO ANY EXISTING ITEM AND/OR MATERIAL INSIDE OR OUTSIDE THE CONSTRUCTION LIMITS.
60. DO NOT SCALE DRAWING FOR ACTUAL DIMENSIONS AS IT IS A REPRODUCTION AND SUBJECT TO DISTORTION.
61. ANY PLANTING STRIP AREA BETWEEN THE RIGHT-OF-WAY AND SIDEWALK IS TO BE INCLUDED IN AN UNRESTRICTED RIGHT-OF-WAY EASEMENT WHICH ALLOWS UNRESTRICTED UTILITY INSTALLATION AND MAINTENANCE. A SIDEWALK EASEMENT SHALL BE PROVIDED FOR ANY SIDEWALK LOCATED OUTSIDE OF STREET RIGHT-OF-WAYS.
62. WHEN PLACING ASPHALT AGAINST EXISTING SURFACES, A STRAIGHT EDGE SHALL BE USED TO PREVENT "HUMPING" AT THAT LOCATION.
63. STONE SHALL BE PRIMED IF PAVING IS NOT COMPLETE WITHIN SEVEN DAYS FOLLOWING STONE BASE APPROVAL.
64. SURFACES SHALL BE TACKED WHEN ASPHALT IS BEING PLACED OVER EXISTING ASPHALT STREETS OR ADJOINING CONCRETE, STORM DRAIN AND SANITARY SEWER STRUCTURES.
65. ALL CURB AND GUTTER SHALL BE BACKFILLED WITH SOIL APPROVED BY THE INSPECTOR WITHIN 48 HOURS AFTER CONSTRUCTION TO PREVENT EROSION.
66. MATERIALS DEEMED BY THE INSPECTOR AS UNSUITABLE FOR BACKFILL PURPOSES SHALL BE REMOVED AND REPLACED WITH SELECT BACKFILL MATERIAL.
67. ALL TRENCHES IN THE STREET RIGHT-OF-WAY SHALL BE BACKFILLED WITH SUITABLE MATERIAL IMMEDIATELY AFTER THE PIPE IS LAID. THE FILL AROUND ALL PIPE SHALL BE PLACED IN LAYERS NOT TO EXCEED SIX (6) INCHES AND EACH LAYER SHALL BE COMPACTED THOROUGHLY.
68. UNDER NO CIRCUMSTANCES SHALL WATER BE PERMITTED TO RISE IN UNBACKFILLED TRENCHES AFTER THE PIPE HAS BEEN PLACED.
69. THE INTERIOR SURFACES OF ALL STORM DRAINAGE STRUCTURES SHALL BE POINTED UP AND SMOOTHED TO AN ACCEPTABLE STANDARD USING MORTAR MIXED TO MANUFACTURER'S SPECIFICATIONS.
70. ALL PIPES IN STORM DRAIN STRUCTURES SHALL BE FLUSH WITH THE INSIDE WALL.
71. PRIOR TO FINAL ACCEPTANCE, THE DEVELOPER SHALL BE RESPONSIBLE FOR CORRECTING ALL PROBLEMS ASSOCIATED WITH THE PROJECT, INCLUDING THOSE ITEMS NOT NECESSARILY COVERED BY THE PLANS, TO INSURE THE SATISFACTORY COMPLETION OF THE TOTAL PROJECT.

MATERIALS + PAVING NOTES:

1. ALL MATERIALS, CONSTRUCTION METHODS, WORKMANSHIP, EQUIPMENT SERVICES AND TESTING FOR ALL IMPROVEMENTS SHALL BE IN ACCORDANCE WITH THE PROJECT DOCUMENTS AND THE GOVERNING AUTHORITIES' REQUIREMENTS. IN THE EVENT OF A CONFLICT BETWEEN THE PROJECT DOCUMENTS AND THE GOVERNING AUTHORITIES' REQUIREMENTS, THE MORE STRINGENT SHALL APPLY.
2. SUBGRADE PREPARATION, PAVEMENT STRENGTH AND THICKNESS SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT PREPARED FOR THIS PROJECT.
   2.1. PROOF ROLLING OF STREET SUBGRADE AND AGGREGATE BASE MATERIAL SHALL BE PERFORMED BY THE CONTRACTOR IN THE PRESENCE OF THE APPROPRIATE INSPECTOR.
   2.2. PAVEMENT SUBGRADE SHALL BE GRADED TO PREVENT PONDING AND INFILTRATION OF EXCESSIVE MOISTURE ON OR ADJACENT TO THE PAVEMENT SUBGRADE.
3. BREAKOUTS FOR REMOVAL OF EXISTING PAVEMENT AND CURBS SHALL BE MADE BY FULL DEPTH SAW CUT WHEN ADJACENT TO PROPOSED PAVEMENT AND/OR CURBS.
4. PROPOSED PAVEMENT AND/OR CURBS INTENDED TO TIE INTO EXISTING SHALL MATCH THE ELEVATION OF EXISTING PAVEMENT AND/OR CURBS.
5. PAVEMENT MARKINGS
   5.1. PAVEMENT MARKINGS SHALL BE PROVIDED IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)"
   5.2. FIRE LANES SHALL BE STRIPED AND/OR SIGNED IN ACCORDANCE WITH THE GOVERNING AUTHORITIES' REGULATIONS.
   5.3. ALL ACCESSIBLE PAVEMENT MARKINGS SHALL COMPLY WITH ADAAG STANDARDS AND STATE AND LOCAL CODES.
6. IF APPLICABLE, CONTRACTOR SHALL REFER TO THE SITE CIVIL, MEP AND IRRIGATION PLANS FOR CONDUIT TO BE INSTALLED UNDER PAVEMENT PRIOR TO COMMENCING PAVEMENT SUBGRADE PREPARATION.
7. ALL TESTING SHALL BE PERFORMED BY A QUALIFIED TESTING LABORATORY, EMPLOYED AND PAID DIRECTLY BY THE OWNER. TESTING SHALL BE PERFORMED, AT A MINIMUM, IN ACCORDANCE WITH THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT, NCDOT AND OTHER GOVERNING AGENCIES SPECIFICATIONS. IN THE EVENT THE RESULTS OF THE INITIAL TESTING DO NOT COMPLY WITH THE PLANS AND THE SPECIFICATIONS, SUBSEQUENT TEST NECESSARY TO DETERMINE THE ACCEPTABILITY OF CONSTRUCTION SHALL BE AT THE CONTRACTOR'S EXPENSE. PAVEMENT FOUND TO BE DEFICIENT IN STRENGTH OR THICKNESS SHALL BE REMOVED AND REPLACED SOLELY AT THE EXPENSE OF THE CONTRACTOR.

ACCESSIBILITY NOTES:

1. MAX CROSS SLOPE ON SIDEWALKS SHALL BE 2% MAXIMUM, UNLESS NOTED OTHERWISE.
2. ALL CURB RAMPS SHALL BE BROOM FINISHED PERPENDICULAR TO SLOPE.
3. ALL CURB RAMPS SHALL HAVE A 1:12 MAX SLOPE IN THE DIRECTION OF TRAVEL, 2% MAX CROSS SLOPE.

ADDITIONAL NOTES:

DRIVEWAY SHALL NOT BE LOCATED OVER WATER METERS, SEWER CLEANOUTS, OR VALVE BOXES. METERS WILL NOT BE SET IF WATER METER BOXES, SEWER CLEANOUTS, VALVE BOXES, OR THEIR APPURTENANCES ARE DAMAGED OR IMPROPERLY POSITIONED.

REFER TO UNION COUNTY SPECIFICATIONS, UNION COUNTY WATER AND SEWER EXTENSION POLICY, AND TO UNION COUNTY WATER AND SEWER EXTENSION ORDINANCE.

DE-WATERING: THE CONTRACTOR SHALL AT ALL TIMES PROVIDE AND MAINTAIN AMPLE MEANS AND EQUIPMENT WITH WHICH TO REMOVE AND PROPERLY DISPOSE OF ANY AND ALL WATER ENTERING THE EXCAVATION OR OTHER PARTS OF THE WORK AND KEEP ALL EXCAVATIONS DRY UNTIL SUCH A TIME AS PIPE LAYING AND GRADING IS COMPLETED AND STRUCTURES TO BE BUILT THEREIN ARE COMPLETED. NO WATER SHALL BE ALLOWED TO RISE AROUND THE PIPE IN UNBACKFILLED TRENCHES NOR SHALL IT BE ALLOWED TO RISE OVER MASONRY UNTIL THE CONCRETE OR MORTAR HAS SET (MINIMUM 24 HOURS). ALL WATER PUMPED OR DRAINED FROM THE WORK SHALL BE DISPOSED OF IN SUCH A MANNER AS TO PREVENT SILTATION AND EROSION TO ADJACENT PROPERTY OR OTHER CONSTRUCTION.

VERIFICATION HAS BEEN MADE BY LANDDESIGN THAT EACH LOT IS CAPABLE OF HAVING GRAVITY SEWER SERVICE TO THE CENTER OF THE LOT AT THE FRONT SETBACK.

ENGINEER VERIFIED DESIGN HAS BEEN BASED ON GROUND SURVEY.

IF WELL AND/OR SEPTIC SYSTEMS ARE ENCOUNTERED, THEN CONTACT TRACI COLLEY (704.283.3717) WITH ENVIRONMENTAL HEALTH FOR THEIR SEQUENCE OF EVENTS AND OTHER PERTINENT INFORMATION.

DESIGN ENGINEER SHALL CONFIRM THAT WATER AND SEWER MAINS AS WELL AS SERVICE LINES, METER BOXES, FIRE HYDRANTS AND LATERALS WILL NOT BE IN CONFLICT WITH ANY PROPOSED UTILITY INSTALLATIONS, LANDSCAPING AND/OR DRIVEWAYS. ANY CONFLICTS SHALL BE AT THE DEVELOPER'S EXPENSE TO COORDINATE AND RESOLVE AND COULD RESULT IN DELAY OF WATER METERS BEING SET.

NOTES TO THE ENGINEER:

ANY CHANGES MADE TO THE PLANS FOR OTHER DISCIPLINES (STORMWATER, EROSION, TREES, LANDSCAPING, ETC...) MUST BE SHOWN AND IDENTIFIED BY REVISION # AND CLOUDING. FAILURE TO DO SO WILL DELAY THE APPROVAL OF THIS PROJECT.

EXECUTE DOT ENCROACHMENTS AT TIME OF PERMITTING.

PROVIDE TO US A COPY OF THE DRIVEWAY PERMIT PLANS IF DIFFERENT THAN THE ENGINEERING PLANS.

SEND COPY OF PLANS TO GAS COMPANY IF WATER MAIN IS PARALLEL TO EXISTING ROADS.

FIRE HYDRANTS SHALL BE PLACED A MINIMUM DISTANCE OF 6 FEET FROM BACK OF CURB & GUTTER SECTIONS AND BACK OF DITCH IN ROADWAY SECTIONS AND HAVE A CLEAR SPACE OF 3 FEET AWAY FROM ANY PERMANENT STRUCTURES.

ONLY UCPW PERSONNEL WILL OPERATE THE ACTIVE VALVES WHICH INCLUDES THE TAPPING VALVE.

GENERAL NOTES:

1. BASE INFORMATION, INCLUDING EXISTING CONDITIONS, TOPOGRAPHY, EXISTING UTILITIES, AND BOUNDARY INFORMATION IS FROM PLANS BY: LDSI, INC.
2. WRITTEN DIMENSIONS PREVAIL OVER SCALED DIMENSIONS. NOTIFY LANDDESIGN OF ANY DISCREPANCIES.
3. DIMENSIONS ARE TO FACE OF OBJECT / BACK OF CURB, UNLESS NOTED OTHERWISE.
4. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL UNDERGROUND UTILITIES, PIPES, STRUCTURES, AND LINE RUNS IN THE FIELD PRIOR TO CONSTRUCTION. ANY DAMAGE TO NEW AND EXISTING UTILITIES ARE TO BE REPAIRED IMMEDIATELY AT NO ADDITIONAL EXPENSE TO THE OWNER. LANDDESIGN ASSUMES NO RESPONSIBILITY FOR ANY UTILITIES NOT SHOWN ON PLANS.
5. CONTRACTOR IS RESPONSIBLE TO PROVIDE AND INSTALL ALL ITEMS PER DRAWINGS AND SPECIFICATION(S).
6. THE CONTRACTOR SHALL EXAMINE AND BECOME FAMILIAR WITH ALL CONTRACT DOCUMENTS IN THEIR ENTIRETY, SURVEY THE PROJECT AND BECOME FAMILIAR WITH THE EXISTING CONDITIONS AND SCOPE OF WORK. ALL COSTS SUBMITTED SHALL BE BASED ON THOROUGH KNOWLEDGE OF ALL WORK AND MATERIALS REQUIRED ANY DISCREPANCY AND/ OR UNCERTAINTY AS TO WHAT MATERIAL OR PRODUCT IS TO BE USED, SHALL BE VERIFIED WITH THE OWNER OR LANDDESIGN PRIOR TO BIDDING.
7. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES REQUIRED FOR SAFE EXECUTION AND COMPLETION OF WORK, AND FOR INITIATING, MAINTAINING AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK.
8. IN THE EVENT A DISCREPANCY IS FOUND IN THE CONTRACT DOCUMENTS, THE OWNER & LANDDESIGN SHALL BE NOTIFIED IMMEDIATELY.
9. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.
10. CONTRACTOR SHALL VERIFY ALL MEASUREMENTS AT THIS SITE AND AND BE RESPONSIBLE FOR ACCURACY AND CORRECTNESS OF SAME.
11. CONTRACTOR SHALL COORDINATE WORK WITH ALL OTHER TRADES AND NOTIFY OWNER & LANDDESIGN OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION.
12. THE CONTRACTOR AND OR OWNER SHALL EMPLOY, AS REQUIRED BY GOVERNING AUTHORITIES, AN APPROVED TESTING LABORATORY TO MAKE ALL TESTS FROM CONCRETE, SOIL COMPACTION AND WELDING TO INSURE COMPLIANCE WITH PLANS, STANDARDS AND CODES. COST SHALL BE INCLUDED AS INCIDENTAL TO THE CONTRACT.
13. ALL EXISTING WORK OR LANDSCAPING NOT SHOWN TO BE ALTERED OR REMOVED SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION. THE CONTRACTOR(S) SHALL BEAR THE TOTAL EXPENSE FOR, AND SHALL REPAIR TO EXISTING CONDITIONS, AND DAMAGE TO EXISTING CONSTRUCTION EQUIPMENT, OR IMPROVEMENTS NOT INDICATED IN THE DRAWINGS OR SPECIFICATIONS TO RECEIVE ALTERATION, ADDITIONS OR REMOVAL.

LAYOUT NOTES:

1. ALL MATERIALS AND CONSTRUCTION WITHIN RIGHT OF WAYS SHALL BE IN ACCORDANCE WITH UNION COUNTY AND THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND CONSTRUCTION STANDARDS, AND STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
2. EXISTING UTILITIES ARE SHOWN SCHEMATICALLY AND ARE FOR THE CONTRACTOR'S GUIDANCE ONLY. THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING IMPROVEMENTS IN THE CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING IMPROVEMENTS DURING CONSTRUCTION. REPAIRS SHALL BE EQUAL TO OR BETTER THAN CONDITION PRIOR TO CONSTRUCTION.
4. ALL ONSITE PAVING DIMENSIONS ARE TO THE BACK OF CURB, WHERE APPLICABLE, UNLESS NOTED OTHERWISE.
5. ALL CURB RADII AND SIDEWALK RETURNS ARE 2' UNLESS NOTED OTHERWISE.
6. ALL PAVING AND EARTHWORK OPERATIONS SHALL CONFORM TO THE PROJECT GEOTECHNICAL REPORT.
7. BOUNDARY SURVEY: BOUNDARY SURVEY INFORMATION IS BASED ON THE BOUNDARY SURVEY PREPARED BY LDSI, INC. REFER TO THE BOUNDARY SURVEY AND PLAT TO VERIFY PROPERTY LINES AND EASEMENT LOCATIONS.
8. BUILDING DIMENSIONS: THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS TO VERIFY THE EXACT BUILDING DIMENSIONS.

GRADING NOTES:

1. STAKE PER SPOT ELEVATIONS AND NOTED SLOPES. CONTOURS ARE PROVIDED FOR MASS GRADING/INTENT ONLY.
2. WRITTEN DIMENSIONS AND GRADES PREVAIL OVER SCALED DIMENSIONS. NOTIFY LANDDESIGN OF ANY DISCREPANCIES.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING HIM/HERSELF FAMILIAR WITH ALL UNDERGROUND UTILITIES, PIPES, STRUCTURES AND LINE RUNS.
4. CONTRACTOR IS RESPONSIBLE FOR ALL FINAL QUANTITIES PER DRAWINGS AND SPECIFICATIONS ANY QUANTITIES PROVIDE BY LANDDESIGN ARE PROVIDED FOR CONVENIENCE ONLY AND SHALL NOT BE CONSIDERED ABSOLUTE. LANDDESIGN SHOULD BE NOTIFIED OF ANY GRADING DISCREPANCIES.
5. ALL SPOT ELEVATIONS SHOWN ON GRADING PLAN ARE TO EDGE OF PAVEMENT UNLESS OTHERWISE NOTED. ALL RIM ELEVATIONS ARE TO EDGE OF PAVEMENT.
6. REFER TO GEOTECHNICAL ENGINEER AND GEOTECH REPORT FOR INFORMATION ON SUBSURFACE MATERIALS, TOPSOIL, STRUCTURAL MATERIAL, DEEP FILLS, EXCAVATION, AND FOUNDATIONS.
7. APPROVAL OF THIS PLAN IS NOT AN AUTHORIZATION TO GRADE ADJACENT PROPERTIES. WHEN FIELD CONDITIONS WARRANT OFF-SITE GRADING, PERMISSION MUST BE OBTAINED FROM THE AFFECTED PROPERTY OWNERS.
8. IN ORDER TO ASSURE PROPER DRAINAGE, KEEP A MINIMUM OF .5% SLOPE ON THE CURB.
9. ALL PLANTING ISLANDS SHALL BE GRADED TO MOUND TO PROVIDE POSITIVE DRAINAGE.
10. CONTRACTOR TO VERIFY 2% MAX. CROSS-SLOPE ON ALL SIDEWALKS.
11. CONCRETE SIDEWALKS ADJACENT TO TREE SAVE LOCATIONS SHOULD BE POURED ON TOP OF EXISTING GRADE.
12. REFER TO LANDSCAPE PLAN FOR ALL TREE PROTECTION FENCE LOCATIONS AND INSTALLATION PROCEDURES. BEFORE GRADING/CONSTRUCTION BEGINS, CALL FOR INSPECTION OF TREE PROTECTION BARRICADES. NO SOIL DISTURBANCE OR COMPACTION, CONSTRUCTION MATERIALS, TRAFFIC, BURIAL PITS, TRENCHING, OR OTHER LAND DISTURBING ACTIVITY ALLOWED IN THE TREE PROTECTION ZONE.
13. DIMENSIONS ON BUILDINGS ARE FOR GRADING PURPOSES ONLY AND ARE NOT TO BE USED TO LAYOUT FOOTINGS.
14. GRADING CONTRACTORS SHALL NOTIFY AND COOPERATE WITH ALL UTILITY COMPANIES OR FIRMS HAVING FACILITIES ON OR ADJACENT TO THE SITE BEFORE DISTURBING, ALTERING, REMOVING, RELOCATING, ADJUSTING OR CONNECTING TO SAID FACILITIES. CONTRACTORS SHALL PAY ALL COSTS IN CONNECTION WITH THE ALTERATION OF OR RELOCATION OF THE FACILITIES. CONTRACTORS SHALL RAISE OR LOWER TOPS OF EXISTING MANHOLES AS REQUIRED TO MATCH FINISHED GRADES.
15. GRADING CONTRACTOR SHALL COOPERATE AND WORK WITH ALL OTHER CONTRACTORS PERFORMING WORK ON THIS PROJECT TO INSURE PROPER AND TIMELY COMPLETION OF THIS PROJECT.
16. CONTOURS ARE PROVIDED FOR GENERAL INTENT ONLY. SPOT ELEVATIONS SHALL SUPERCEDE. NOTIFY LANDDESIGN OF ANY DISCREPANCIES IMMEDIATELY.
17. PROPERTY OWNERS ARE RESPONSIBLE FOR ENSURING THAT ALL EXISTING TREES SHOWN ON APPROVED PLANS AS BEING RETAINED TO MEET THE REQUIREMENTS OF THIS ARTICLE ARE PROTECTED DURING THE CONSTRUCTION PROCESS FROM REMOVAL, DESTRUCTION, OR INJURY. BEFORE ANY EXCAVATION TAKES PLACE ON THE SUBJECT SITE, A BARRIER MUST BE ERECTED AROUND THE DRIP LINE OF ALL SUCH TREES SUFFICIENT TO PUT ON NOTICE ALL CONSTRUCTION PERSONNEL THAT ANY DISTURBANCE OF THE AREA WITHIN THE DRIPLINE OF SUCH TREES IS PROHIBITED, EXCEPT AS EXPRESSLY APPROVED BY THE ADMINISTRATOR. REQUIRED TREE BARRIERS MUST BE SHOWN ON CONSTRUCTION PLANS.

LandDesign.
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

NORTH CAROLINA C-015 LandDesign, Inc.

NORTH CAROLINA 21523 MARK E. KIRBY

Aug 4 2021 4:10 PM

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020319

REVISION / ISSUANCE

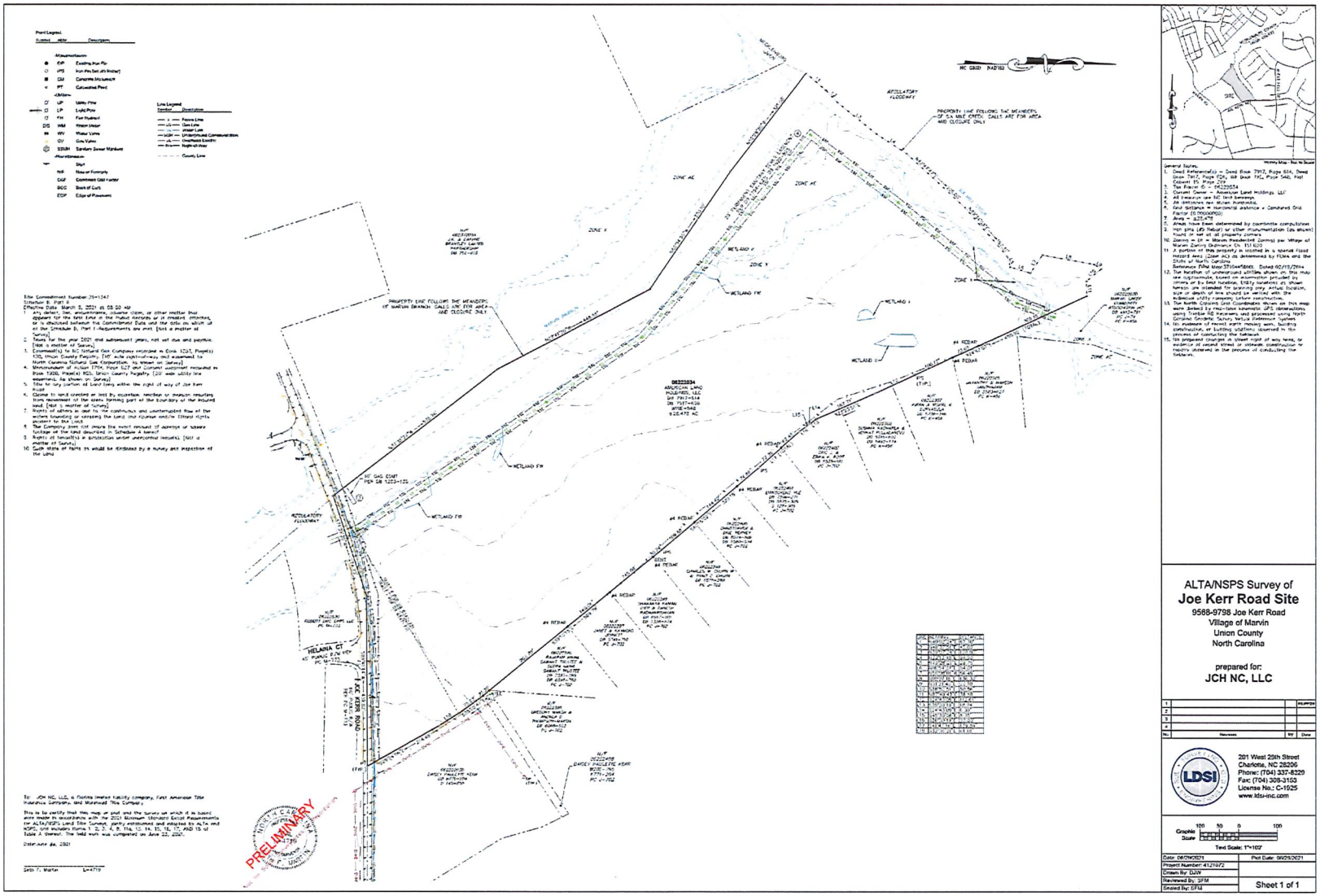
NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

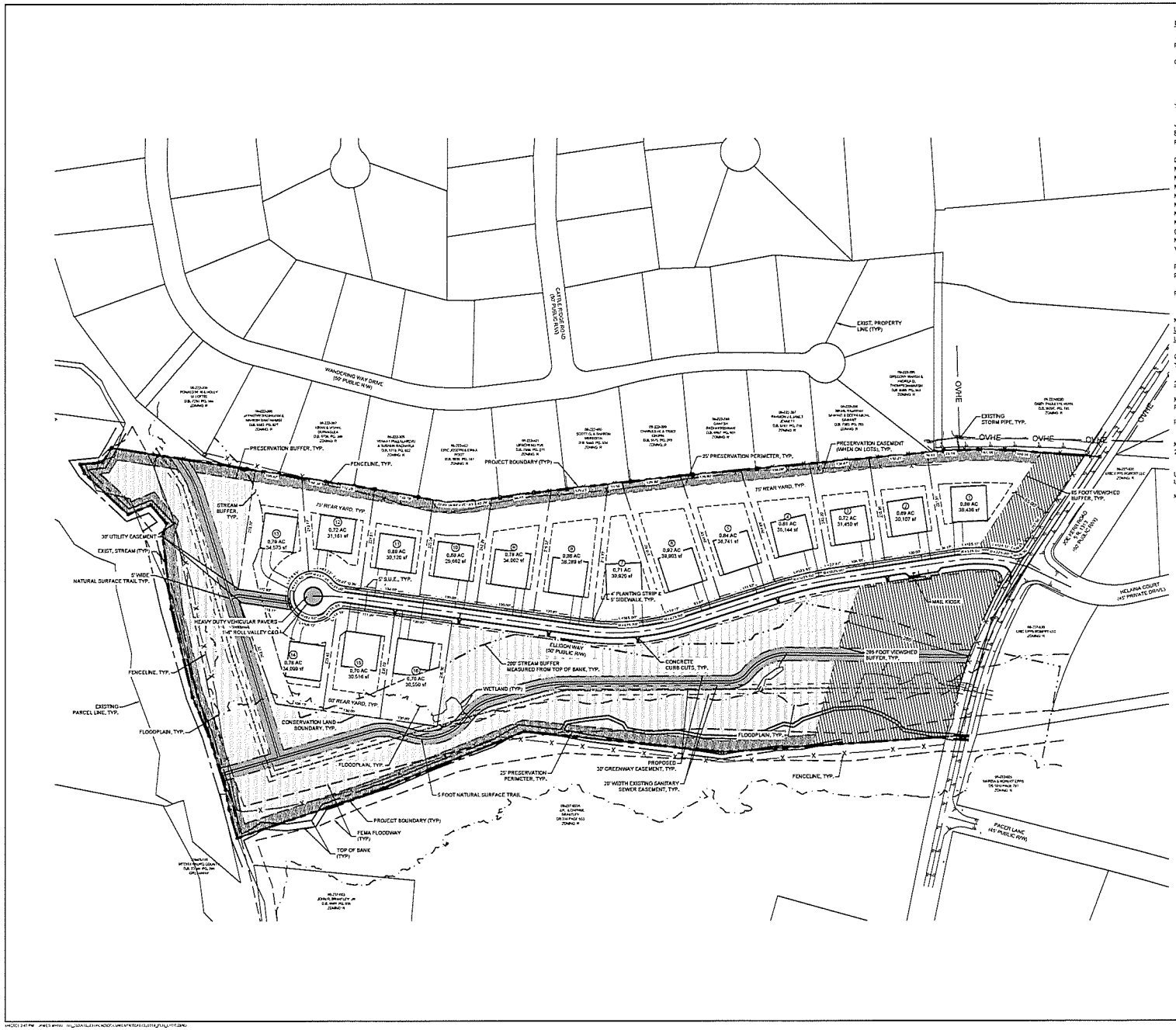
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT: 1"=4'
HORZ: N/A

GENERAL NOTES

C-0.1


Point Legend
Symbol ABBV Description
Monumentation
IPF Existing Iron Pin
IPS Iron Pin Set (#5 Rebar)
CM Concrete Monument
PT Calculated Point
Utilities
UP Utility Pole
LP Light Pole
FH Fire Hydrant
WM Water Meter
WV Water Valve
GV Gas Valve
SSMH Sanitary Sewer Manhole
Miscellaneous
Sign
NS New or Formerly
CGF Concrete Gutter
BOC Back of Curb
EOP Edge of Pavement
Line Legend
Symbol Description
Fence Line
Gas Line
Power Line
Underground Communication
Overhead Electric
Right-of-Way
County Line
Title Commitment Number: 21-1347
Schedule B, Part II
Effective Date: March 5, 2021 at 08:00 AM
1. Any defect, lien, encumbrance, adverse claim, or other matter that appears for the first time in the public records or is created, attached, or to be attached between the Commitment Date and the date on which all of the Schedule B, Part I-Requirements are met. [Not a matter of Survey]
2. Taxes for the year 2021 and subsequent years, not yet due and payable. [Not a matter of Survey]
3. [Intentionally] to 3C Natural Gas Company recorded in Book 1321, Page(s) 130, Union County Registry. [10' wide right-of-way and easement to North Carolina Natural Gas Corporation, as shown on Survey]
4. Memorandum of Action 1994, Page 627 and Consent Judgment recorded in Book 1308, Page(s) 903, Union County Registry. [20' wide utility line easement, as shown on Survey]
5. Title to any portion of Land lying within the right of way of Joe Kerr Road.
6. Claims to land created or lost by accretion, reliction or erosion resulting from movement of the water forming part of the boundary of the insured land. [Not a matter of Survey]
7. Rights of others in and to the continuous and uninterrupted flow of the waters bounding or crossing the Land and riparian and/or littoral rights incident to the Land.
8. The Company does not insure the exact amount of acreage or square footage of the land described in Schedule A hereof.
9. Rights of tenant(s) in possession under unrecorded lease(s). [Not a matter of Survey]
10. Gap area of rights as would be disclosed by a survey and inspection of the land.
To: JCH NC, LLC, a Florida limited liability company, First American Title Insurance Company, and Westfield Title Company;
This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2021 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items 1, 2, 3, 4, 8, 11a, 13, 14, 15, 16, 17, AND 19 of Table A thereof. The field work was completed on June 22, 2021.
Date: June 24, 2021
Seth T. Martin L-4770
PRELIMINARY
NORTH CAROLINA PROFESSIONAL SEAL L-4770 SURVEYOR
NC GRID NAD83
ZONE AE
ZONE X
WETLAND A
WETLAND FW
WETLAND I
WETLAND D
WETLAND E
WETLAND F
REGULATORY FLOODWAY
PROPERTY LINE FOLLOWS THE MEANDERS OF SA NAE CREEK. CALLS ARE FOR AREA AND CLOSURE ONLY
PROPERTY LINE FOLLOWS THE MEANDERS OF MARVIN BRANCH. CALLS ARE FOR AREA AND CLOSURE ONLY
MARVIN BRANCH
NC GAS EZMT
HELANIA CT
JOE KERR ROAD
06322034
AMERICAN LAND HOLDINGS, LLC
DB 7917-614
DB 7917-620
MYB-3-54
9.22-AC
#4 REBAR
IPS
EPT (TYP)
EPT
LTC
ETW
ETW
ETW



DEVELOPMENT SUMMARY

PARCEL ID	06222034
OWNER:	BARBARA AMY CLAWSON & WILLIAM M ARDREY 510 PACER LANE MARVIN, NC 28173
TOTAL ACREAGE:	±28.481 ACRES
JURISDICTION:	MARVIN, NC
EXISTING ZONING:	R (VILLAGE OF MARVIN)
PROPOSED USE:	CONVENTIONAL SUBDIVISION

DEVELOPMENT STANDARDS

MINIMUM LOT WIDTH AT SETBACK:	130 FEET
MINIMUM LOT WIDTH AT RIGHT OF WAY:	50 FEET
MINIMUM LOT AREA:	43,560 SF
MINIMUM FRONT YARD SETBACK:	50 FEET
MINIMUM SIDE YARD SETBACK:	20 FEET
MINIMUM CORNER YARD SETBACK:	25 FEET
MINIMUM REAR YARD SETBACK: (75 FEET WHEN ABUTTING EXISTING LOT)	50 FEET
MAXIMUM BUILDING HEIGHT:	35 FEET
VIEWSHED BUFFER WIDTH:	REFER TO SITE PLAN
PROPOSED LOTS	16 LOTS
PROPOSED DENSITY:	0.561 DUA
PROPOSED CONSERVATION LAND (C.L.)	37% (10.58 AC.)

MARVIN UDO SECTION 151.081
LARGE TRACT SUBDIVISION STANDARDS - MAXIMUM ALLOWABLE LOTS

GROSS ACREAGE OF THE TRACT TO BE SUBDIVIDED =	+/-28.481 AC. X (0.5521 + 0.00086 * C.L. 37%)
MAXIMUM NUMBER OF LOTS ALLOWED =	26.11
ROUNDED TO NEAREST WHOLE NUMBER =	26 TOTAL LOTS
PROPOSED LOTS:	16 LOTS
MINIMUM LOT SIZE ALLOWED	20% OF TOTAL LOTS MAY BE MIN. 25K SF
	REMAINDER SHALL BE 30K SF
LOTS 30K SF OR GREATER:	15 (93.75%)
LOTS LESS THAN 30K SF:	1 (6.25%)
MINIMUM LOT SIZE PROPOSED	+/-20,662 SF

HATCH LEGEND

- 85' & 285' VIEWSHED BUFFER
- CONSERVATION LAND (37% - 10.58 AC.)
- 30' GREENWAY EASEMENT
- 25' PRESERVATION PERIMETER

LINETYPE LEGEND

- PROJECT BOUNDARY LINE
- PROP. R/W
- EXIST. PROPERTY LINE
- EXIST. EOP
- FEMA FLOODZONE

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015 ENGINEERING

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 011.23 MARK E. KIME

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8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA
UNION COUNTY
NORTH CAROLINA

1D20319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT: 1"=4'
HORZ: 1" = 100'
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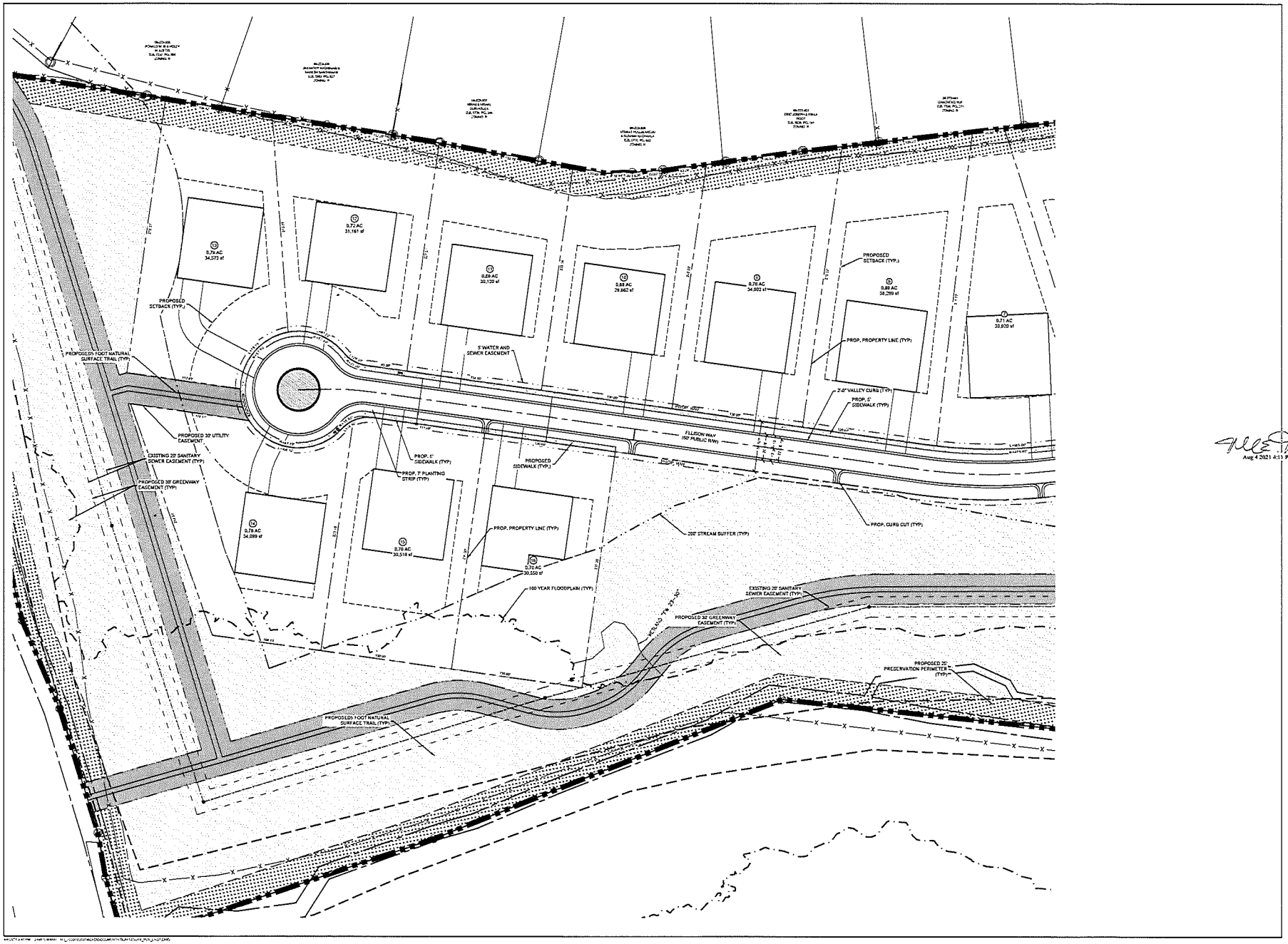
OVERALL LAYOUT PLAN

C-1.0



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NORTH CAROLINA C-015

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NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT 2974 MARK E. KIRK

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

LANDDESIGN PROJECT NUMBER 1020310

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

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HORIZ: 1"=40'

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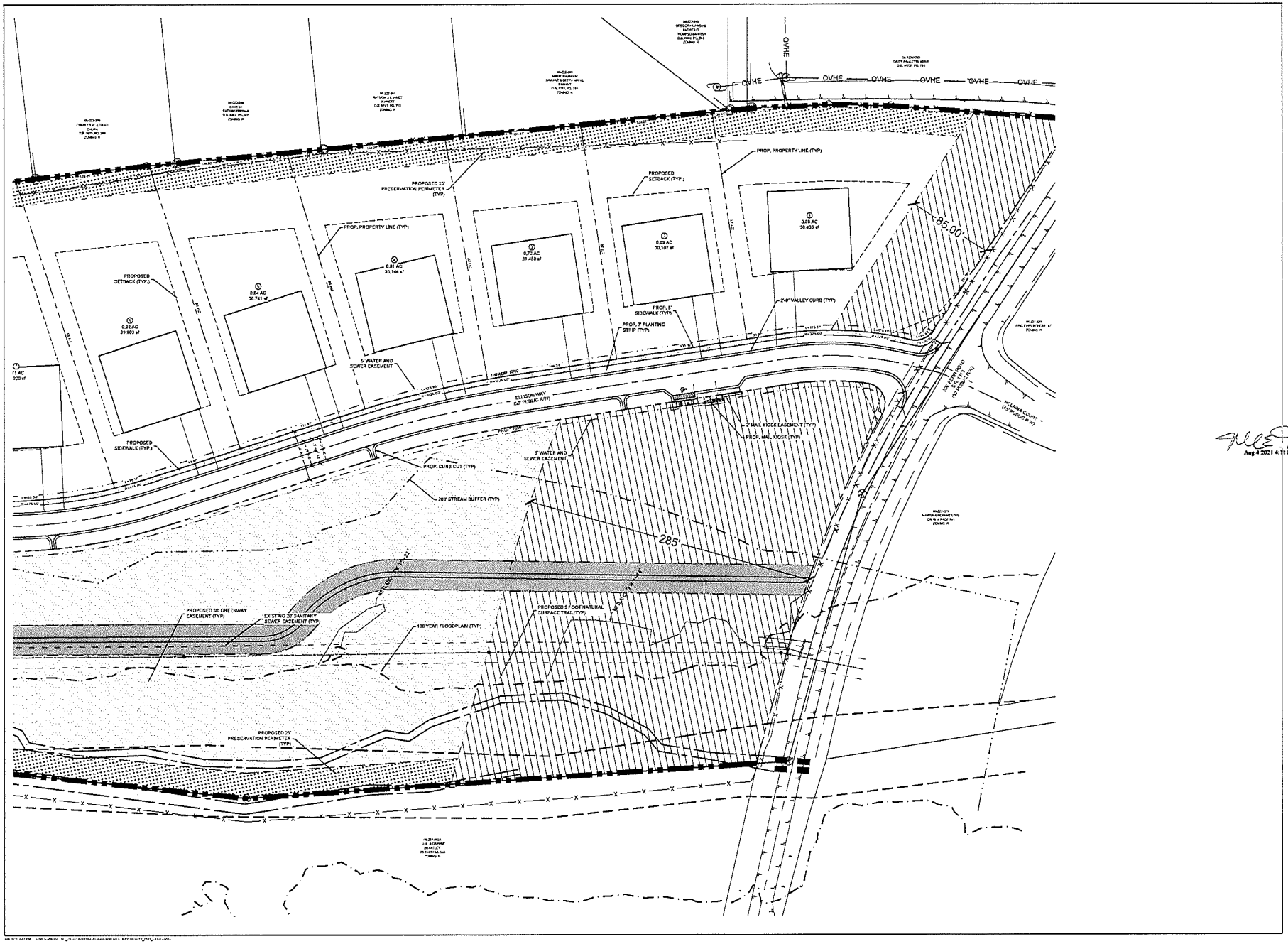
LAYOUT PLAN

C-1.1



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NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT SEAL #1523 MARK E. KING

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THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020319

REVISION / ISSUANCE

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CHECKED BY: MG

VERT: 1"=4'
HORZ: 1" = 40'

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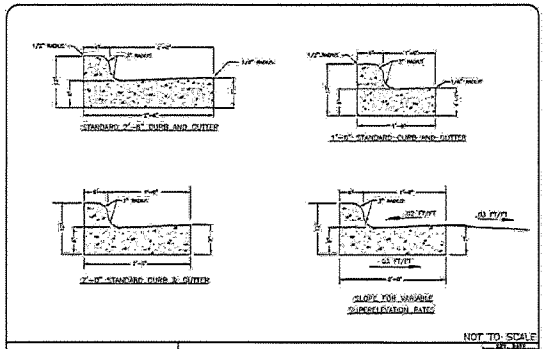
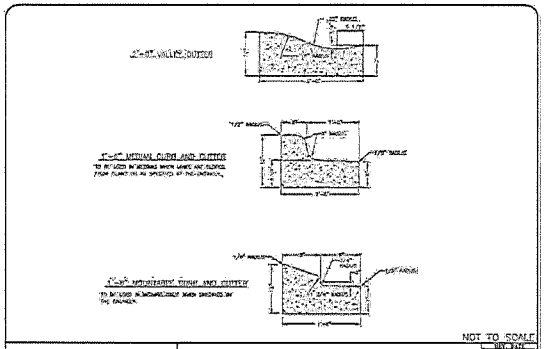
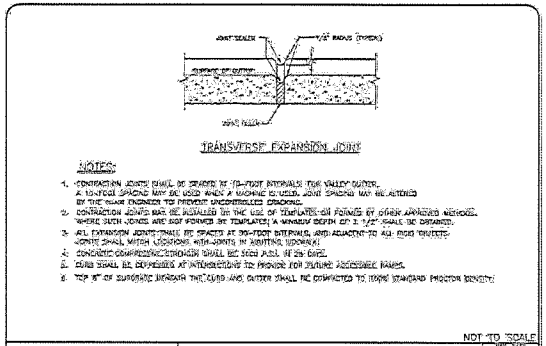
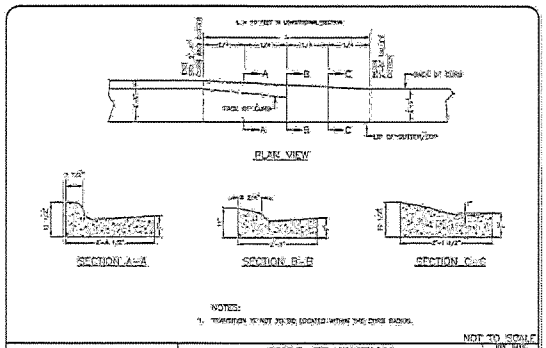
LAYOUT PLAN

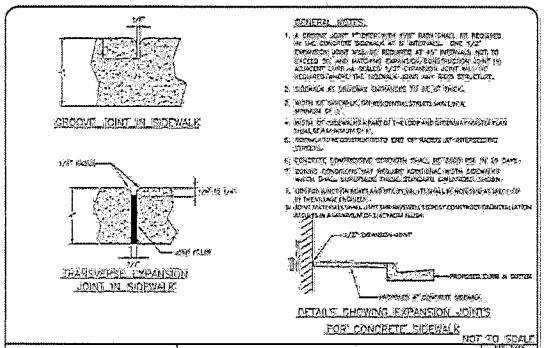
C-1.2

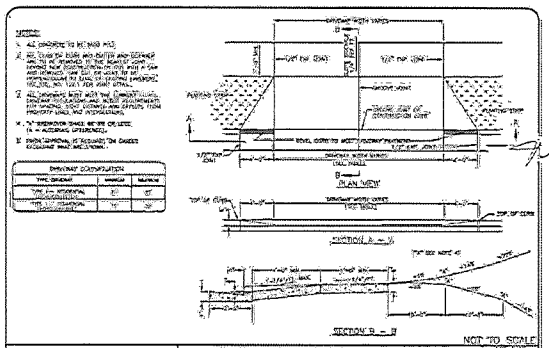


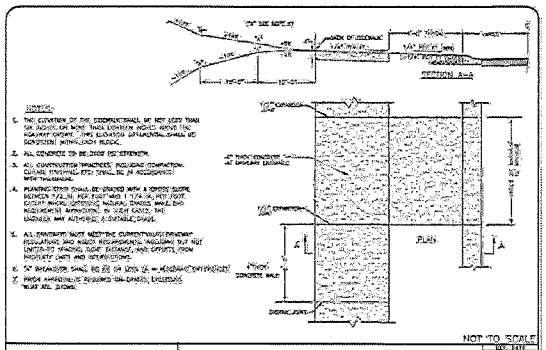


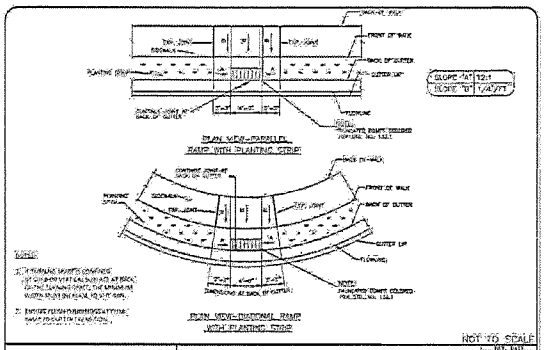


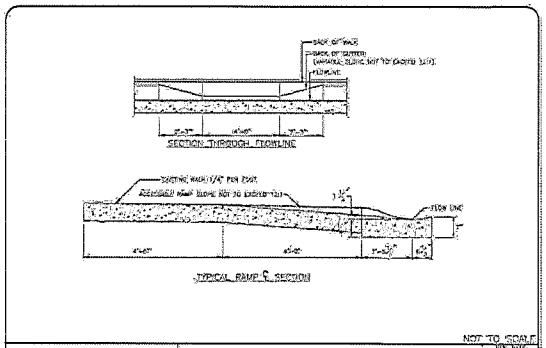












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NORTH CAROLINA PROFESSIONAL SEAL C-015 ENGINEERING

NORTH CAROLINA PROFESSIONAL SEAL #1523 LAND SURVEYING MARK E. KIMPEL

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8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020310

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

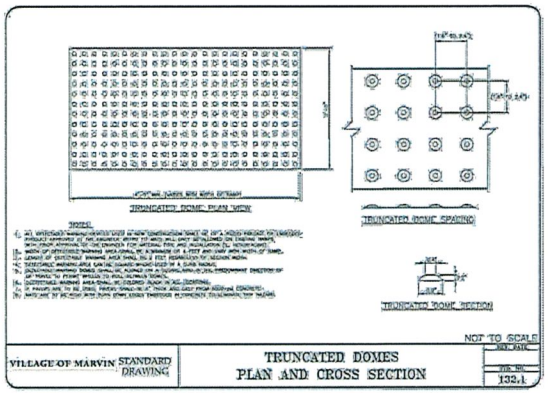
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

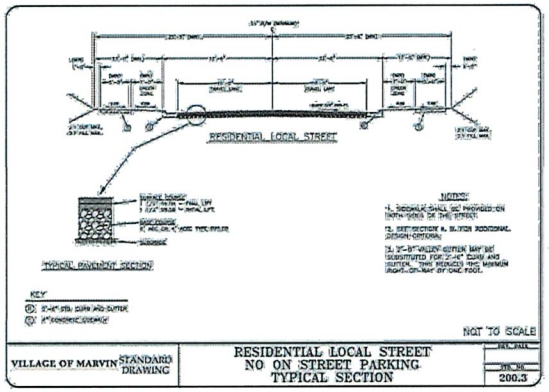
VERT: 1"=40'
HORZ: NTS

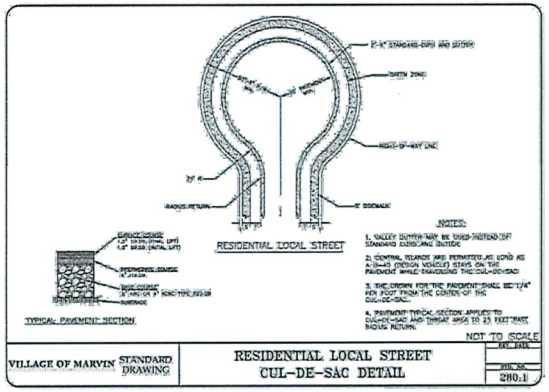
(NOT TO SCALE)

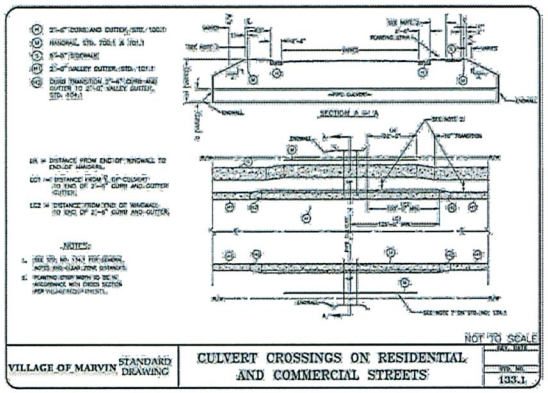
SITE DETAILS

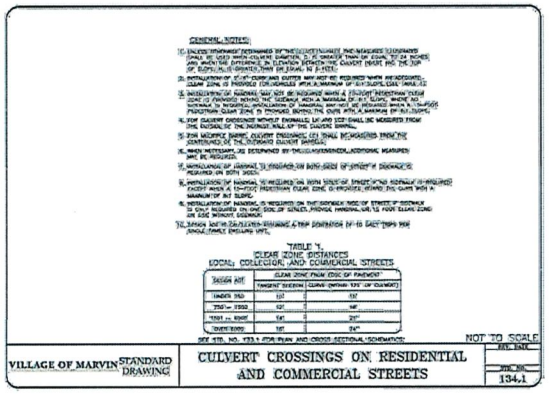
C-1.3

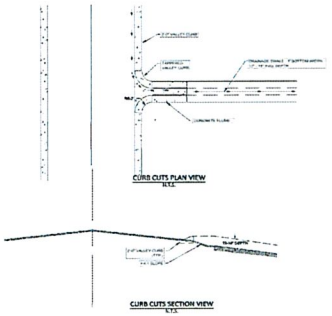


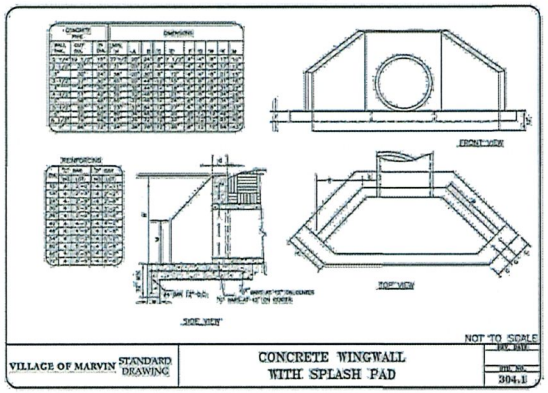


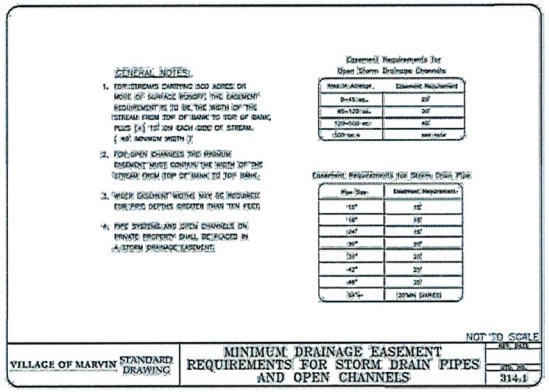












NOTES:

1. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 3000 PSI @ 28 DAYS, CONTAIN 4% MIN - 6% MAX AIR ENTRAINMENT AND BE PLACED WITH A 3.50 - 4.50 SLUMP IN ACCORDANCE WITH ACI 301.
2. REINFORCING STEEL RODS SHALL CONFORM TO ASTM A615, GRADE 60.
3. ANCHOR BOLTS SHALL CONFORM TO ASTM A193, GRADE B8M, TYPE 316 STAINLESS STEEL.
4. A 3 CBU CONFIGURATION IS DEPICTED. A 2 OR 4 CBU CONFIGURATION MAY BE USED AS LONG AS THEY ARE ARRANGED IN GROUPS SUCH THAT THE OVERALL DIMENSION OF THE CONCRETE BASE DOES NOT EXCEED 192 INCHES.

NOTE: REFER TO USPS STANDARDS FOR ADDITIONAL DETAILS OR INFORMATION

CAROLINA MAILBOXES, INC. CLASSIC MODEL

NOT TO SCALE

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SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015

NORTH CAROLINA PROFESSIONAL SEAL #1523 MARK E. KEZIOR

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8/4/2021

PROJECT

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

LANDDESIGN PROJECT

1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

SCALE

VERT: 1"=4'
HORZ: NTS

(NOT TO SCALE)

PAPERWORK SIZE: 24"x36" (ARCH D)

SHEET TITLE

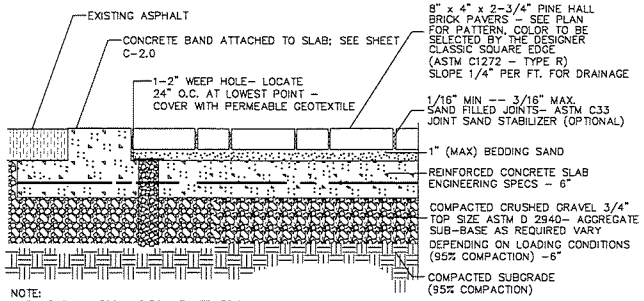
SITE DETAILS

SHEET NUMBER

C-1.4

PHB-PV21

Pine Hall Brick



NOTE:
1. BASE THICKNESS VARIES WITH TRAFFIC, CLIMATE, AND SOIL SUBGRADE
2. CONCRETE BASE MINIMUM 2% SLOPE FROM CENTERLINE TO CURB

HD BRICK PAVING (ON RIGID BASE)

SECTION

SCALE: NTS

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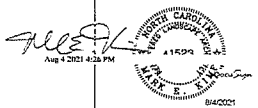


Aug 4 2021 4:26 PM

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

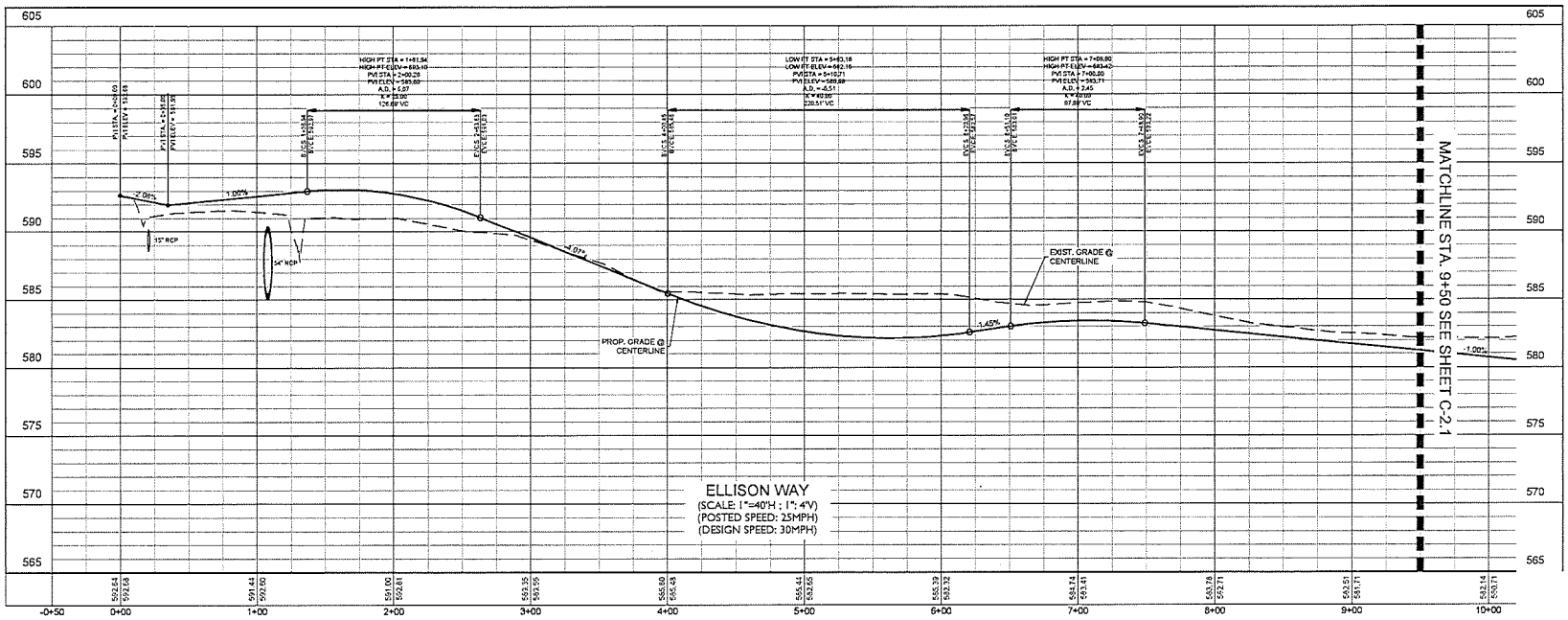
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

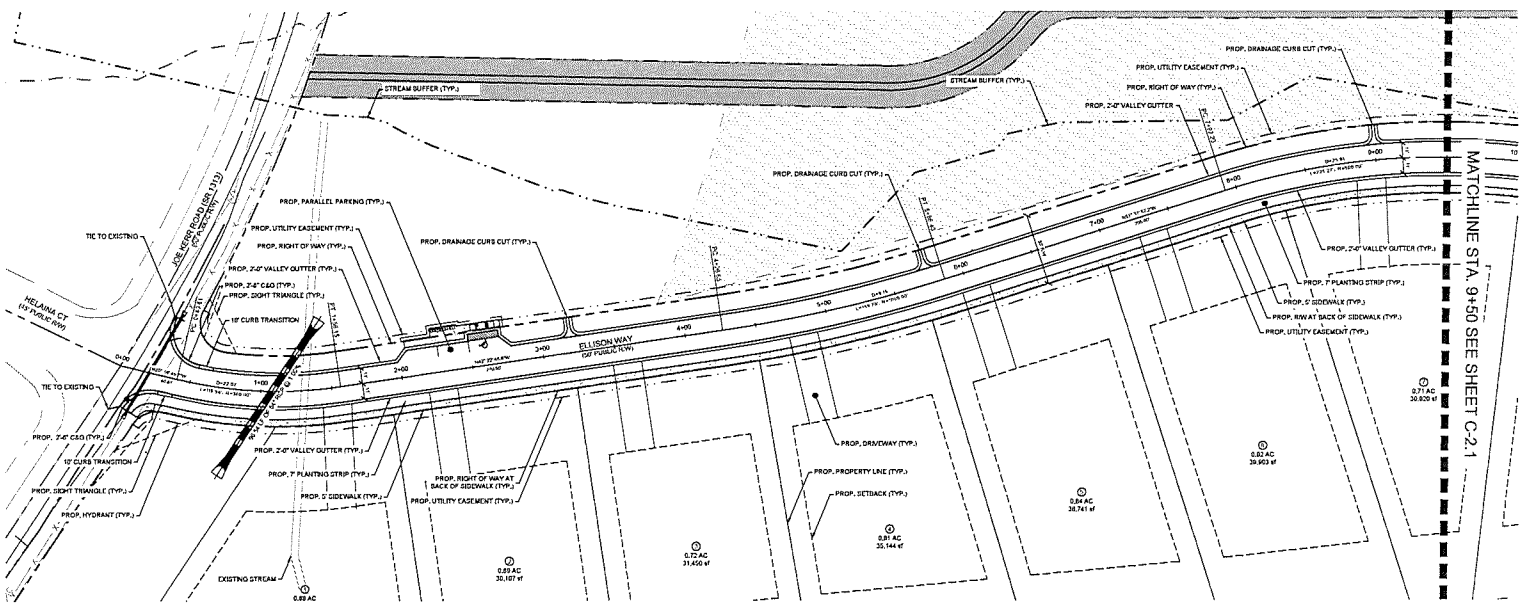
VERT: 1"=4'
HORZ: NTS

(NOT TO SCALE)

SITE DETAILS

C-1.5





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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043158 MARVIN L. CREECY

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

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DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

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HORZ: 1" = 40'

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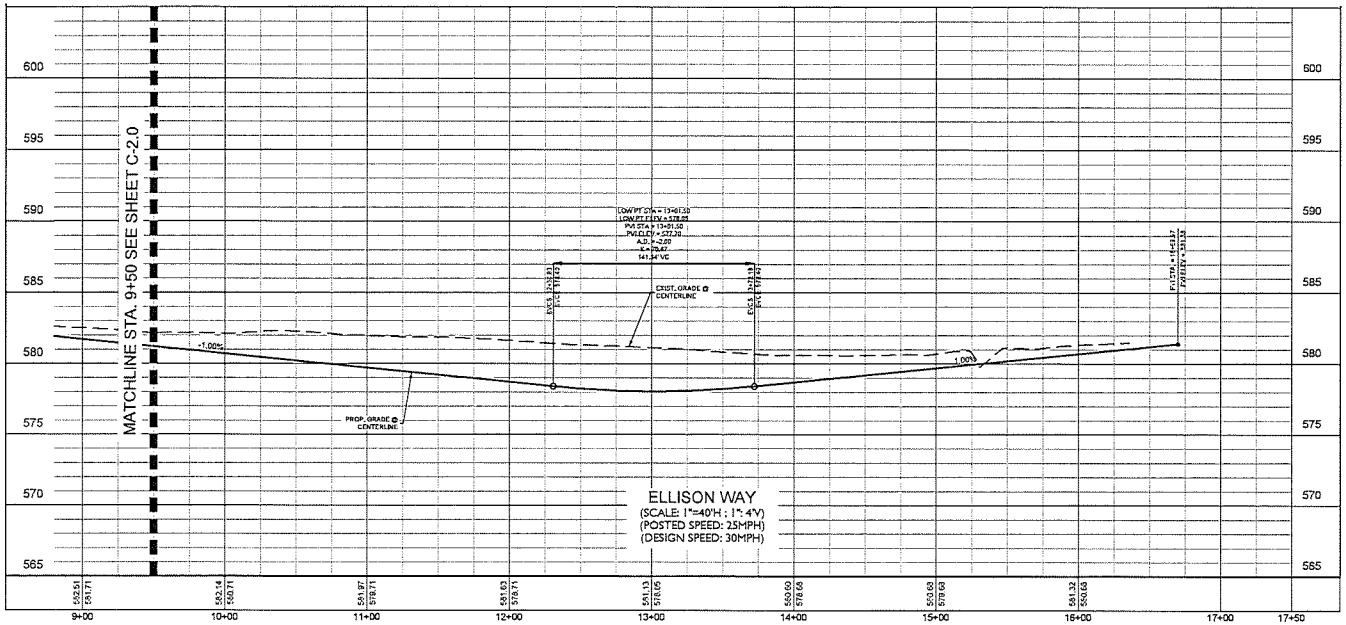
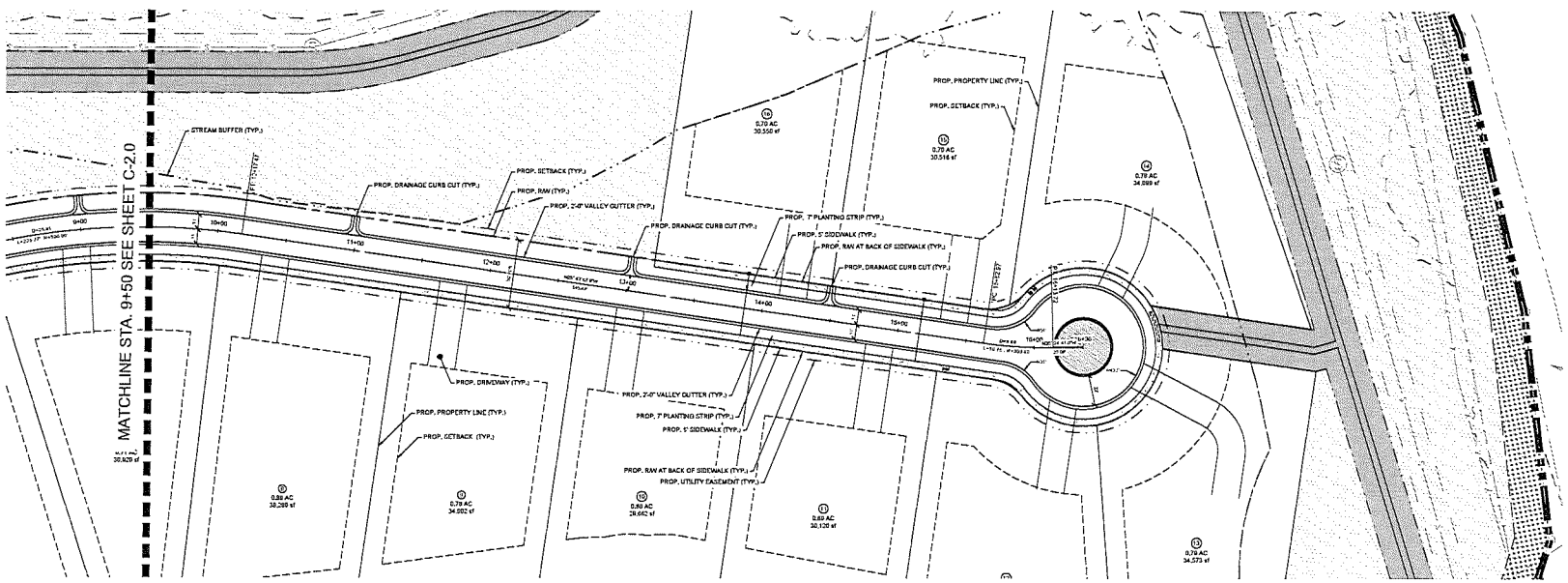
ROADWAY PLAN & PROFILE

C-2.0



NOTES:

1. SEE SHEETS C002 - C003 FOR ADDITIONAL NOTES.
2. SEE SHEET C421 FOR STORM SEWER GRADES AND INVERT ELEVATIONS.
3. SEE GRADING PLANS CHAPTER 5 FOR SITE GRADING INFORMATION.
4. CATCH BASIN RIM ELEVATIONS ARE GIVEN TO THE EDGE OF ASPHALT, YARD INLETS AT FINISHED GRADE.
5. RIM ELEVATIONS GIVEN ON THESE PLANS ARE APPROXIMATE AND ARE FOR INFORMATIONAL PURPOSES ONLY. ACTUAL RIM ELEVATIONS SHALL BE DETERMINED BY CONTRACTOR AND ADJUSTED TO MATCH FIELD CONDITIONS.
6. COORDINATE ALL CURB AND STREET GRADES AT INTERSECTIONS WITH INSPECTOR.
7. DEVELOPER WILL PROVIDE STREET SIGNS PER UNION COUNTY AND NCDOT STANDARDS.
8. IN ROLLING AND HILLY TERRAIN, SWEEPING OF THE STONE BASE AND/OR APPLICATION OF A TACK COAT MAY BE REQUIRED NEAR INTERSECTIONS. THESE REQUIREMENTS WILL BE ESTABLISHED BY THE INSPECTOR BASED ON FIELD CONDITIONS.
9. APPROVAL OF THIS PLAN IS NOT AN AUTHORIZATION TO GRADE ADJACENT PROPERTIES.
10. IN ORDER TO ENSURE PROPER DRAINAGE, KEEP A MINIMUM OF 0.50% SLOPE ON THE CURB.
11. CURB AND GUTTER SHOWN ON PLANS MAY BE ADJUSTED BASED UPON FIELD STAKING BY INSPECTOR / ENGINEER. ASSOCIATED STORM DRAINAGE MAY ALSO REQUIRE MODIFICATION BASED UPON FIELD CONDITIONS.
12. THE PURPOSE OF THE STORM DRAINAGE EASEMENT IS TO PROVIDE STORM WATER CONVEYANCE AND ANY STRUCTURES AND/OR OBSTRUCTION TO STORM WATER FLOW IS PROHIBITED.
13. ALL DESIGN AND CONSTRUCTION METHODS SHALL BE DONE IN ACCORDANCE WITH THE TOWN OF UNION COUNTY, NCDEQ AND NCDOT STANDARDS AND SPECIFICATIONS.
14. ALL YARD INLETS SHALL BE DROP INLET TYPE - SEE DETAILS.
15. ALL RADIUS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.



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NORTH CAROLINA PROFESSIONAL ENGINEER C-015

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036755 MICHAEL L. GRESSIE

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020310

REVISION / ISSUANCE

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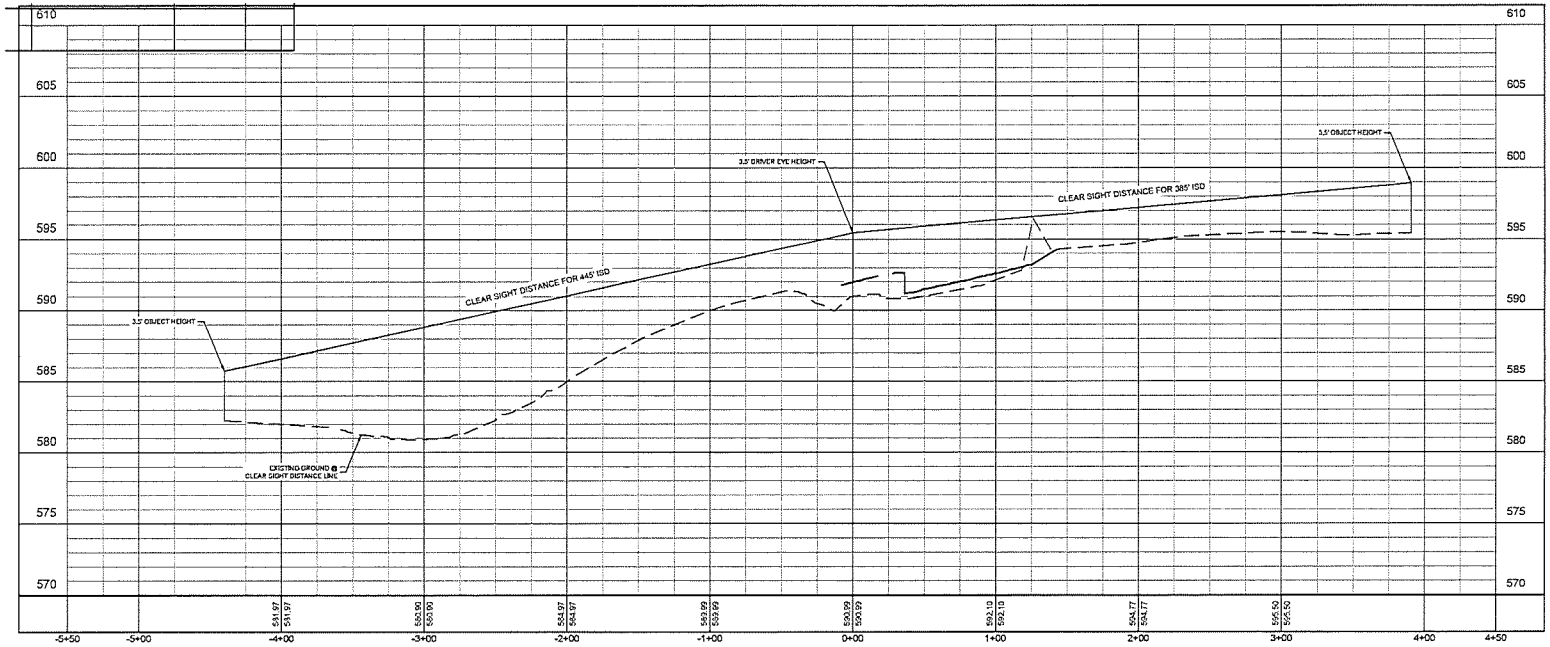
CHECKED BY: MG

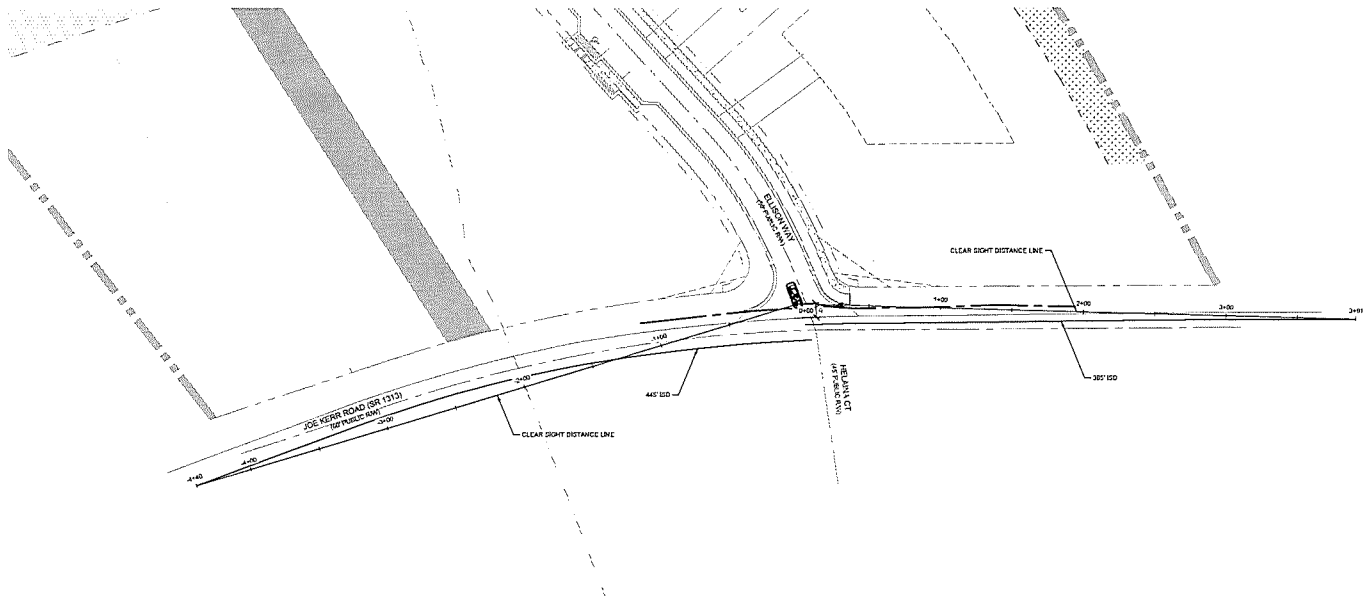
VERT. 1"=4'
HORZ. 1"=40'

0 20 40 80

ROADWAY PLAN & PROFILE

C-2.1





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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015 LANDDESIGN, INC.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19198 MARVIN L. GREENE

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020312

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

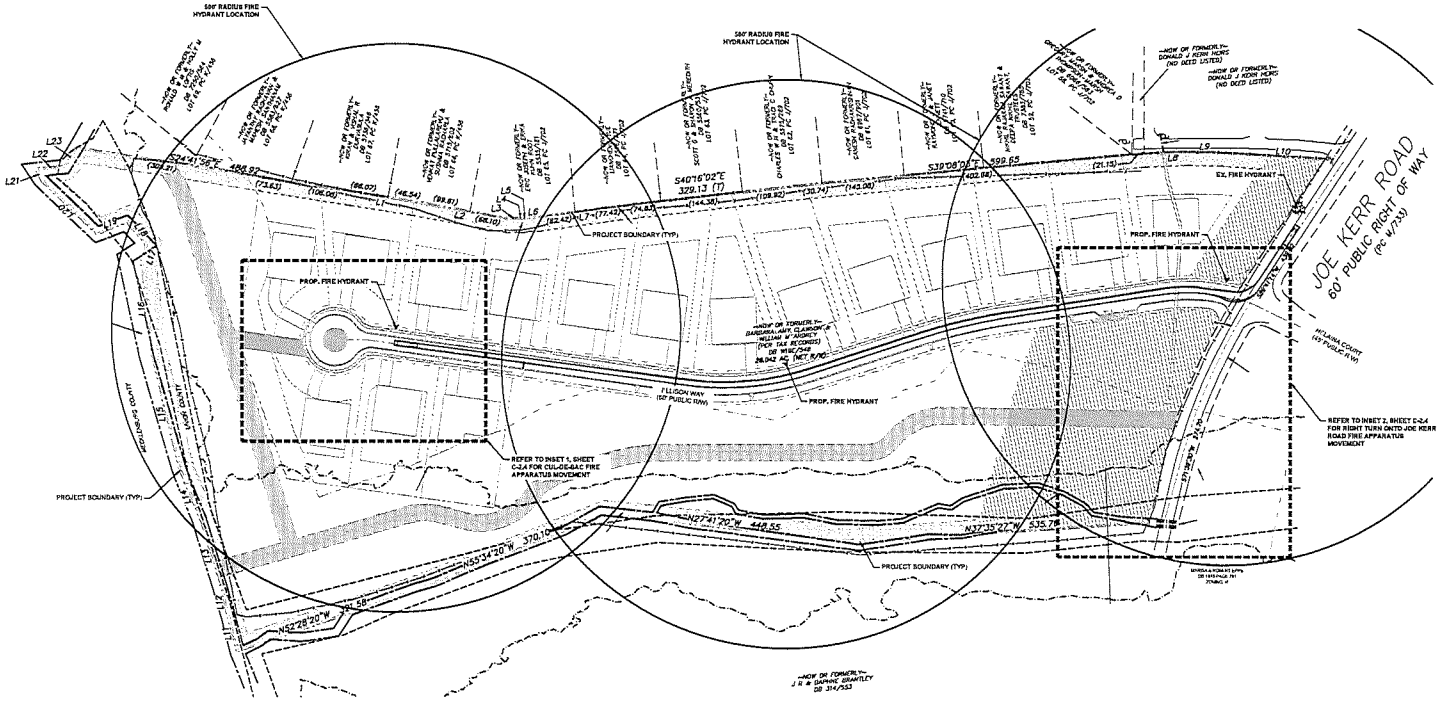
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

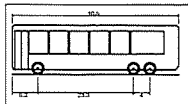
VERT: 1"=4'
HORZ: 1"=40'

0 20 40 80

INTERSECTION SIGHT DISTANCE

C-2.2





BUS-40 - Inter City Bus	
Overall Length	40.500ft
Overall Width	8.500ft
Overall Body Height	12.000ft
Min Body Ground Clearance	1.158ft
Track Width	8.500ft
Lock-to-lock time	5.00s
Max Steering Angle (Virtual)	41.90°

FIRE NOTES:

1. EMERGENCY VEHICLE ACCESS ROAD SHALL HAVE A MINIMUM 20' UNOBSTRUCTED AND CLEAR WIDTH THAT SHALL BE CAPABLE OF SUPPORTING 80,000 LBS.

BEFORE YOU DIG!
CALL 1-800-632-4949
N.C. ONE-CALL CENTER
IT'S THE LAW!

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015

NORTH CAROLINA PROFESSIONAL SEAL 1523 MARK S. KING

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8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020310

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DESIGNED BY: SMI
DRAWN BY: SMI
CHECKED BY: MG

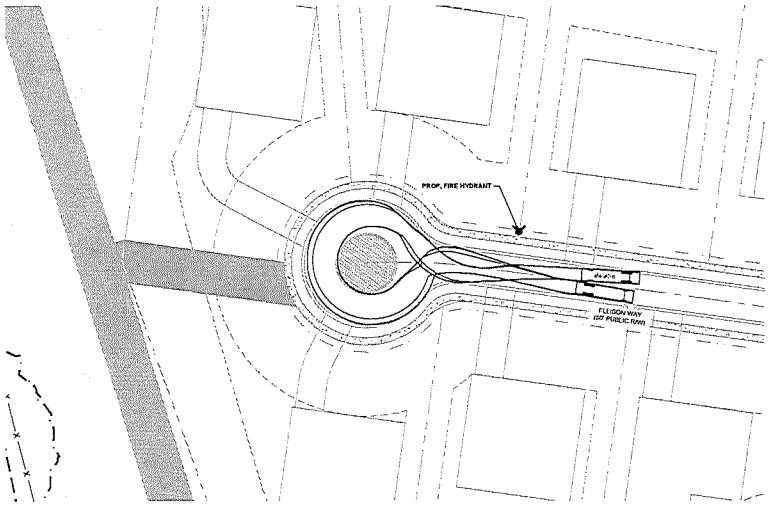
VERT: N/A
HORZ: 1"=100'

0 50' 100' 200'

FIRE ACCESS PLAN

C-2.3

INSET 1



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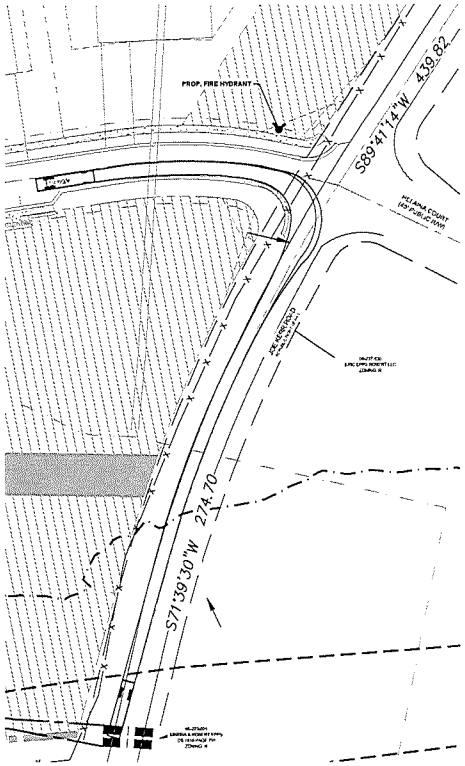

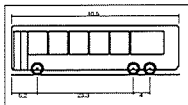

BUS-40 - Inter City Bus	
Overall Length	40.500ft
Overall Width	8.500ft
Overall Body Height	12.000ft
Min Body Ground Clearance	1.158ft
Track Width	8.500ft
Lock-to-lock time	5.00s
Max Steering Angle (Virtual)	41.90°

FIRE NOTES:

1. EMERGENCY VEHICLE ACCESS ROAD SHALL HAVE A MINIMUM 20' UNOBSTRUCTED AND CLEAR WIDTH THAT SHALL BE CAPABLE OF SUPPORTING 80,000 LBS.

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015

Aug 4 2021 4:15 PM

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-4599 MARK E. KIMES

DocuSign

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

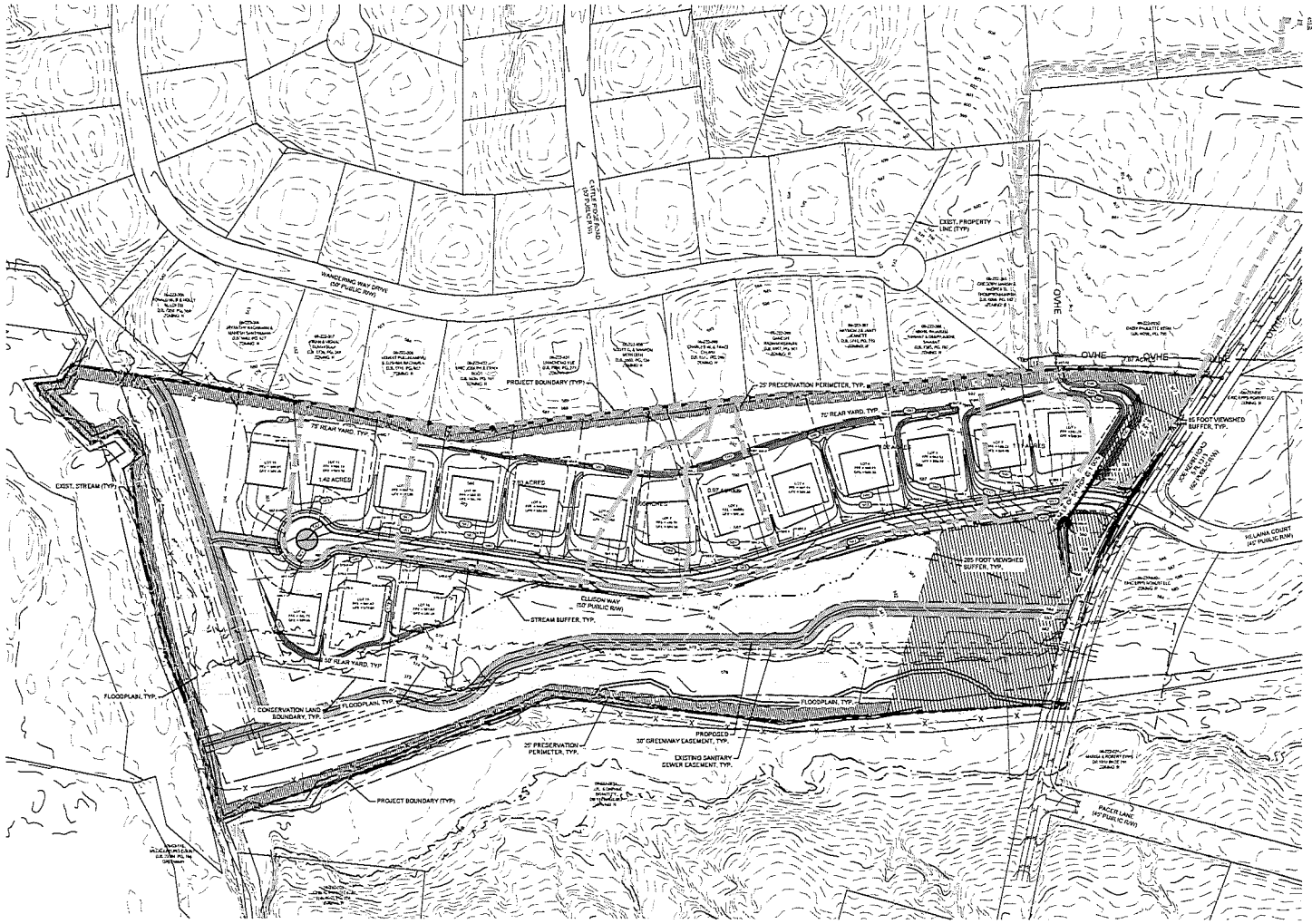
DESIGNED BY: SNI
DRAWN BY: SNI
CHECKED BY: MG

VERT: 1"=4'
HORZ: 1"=40'

0 20' 40' 80'

FIRE ACCESS PLAN

C-2.4



IMPERVIOUS CALCULATIONS:

TOTAL SITE AREA:	1,240,532 SQ.FT. (±28.481 ACRES)
EXISTING STREAMS/CREEKS	24,572 SQ.FT. (0.56 ACRES)
EXISTING WETLANDS	8,996.07 SQ.FT.(0.21 ACRES)
TOTAL PROJECT AREA:	1,207,091 (27.711 ACRES)
LOW DENSITY STORMWATER IMPERVIOUS (MAX. 24%)	287,751 SQ.FT.
ASPHALT (INCLUDES CEO)	49,968 SQ.FT.
CONCRETE SIDEWALK	11,154 SQ.FT.
18 LOTS @ 11,000 SQ.FT./LOT	176,520 SQ.FT.
TOTAL IMPERVIOUS	238,654 SQ.FT. (19.67%)

SOIL TYPE:
WA INCELL FINE SANDY LOAM, 0 TO 1 PERCENT SLOPES

LEGEND:

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- PROPOSED CONTOUR ELEVATION
- DRAINAGE EASEMENT
- STORM SEWER
- CURB CUT
- FLARED END SECTION

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015 MICHAEL J. GRESSER

NORTH CAROLINA PROFESSIONAL SEAL 045 MICHAEL L. GRESSER

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020310

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

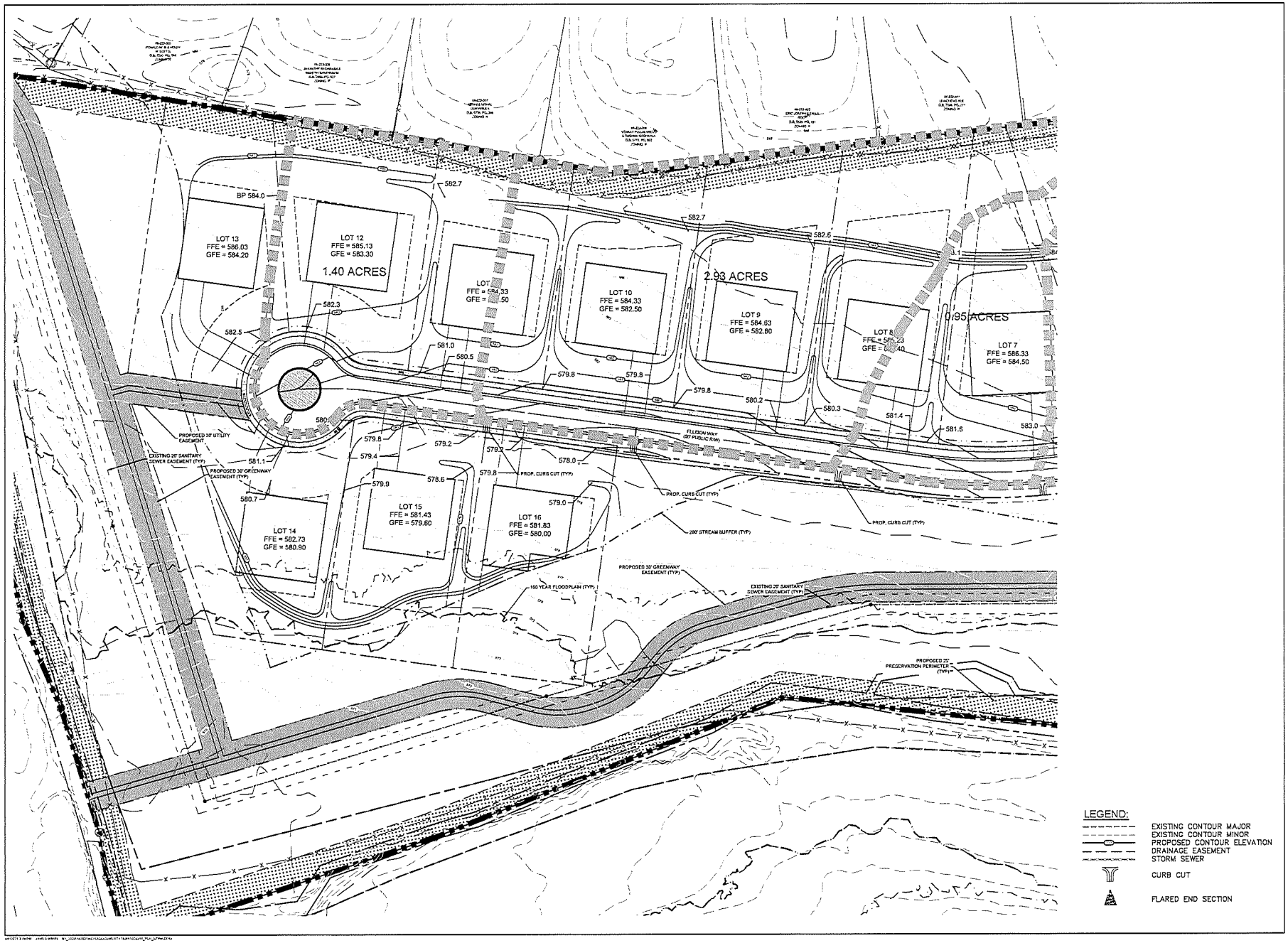
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT: 1"=4'
HORZ: 1"=100'

0 150 300 600

OVERALL STORM DRAINAGE PLAN

C-3.0



LEGEND:

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- PROPOSED CONTOUR ELEVATION
- DRAINAGE EASEMENT
- STORM SEWER
- CURB CUT
- FLARED END SECTION

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015

NORTH CAROLINA PROFESSIONAL LICENSED SEAL 43168 MARION L. CRESCENZI

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

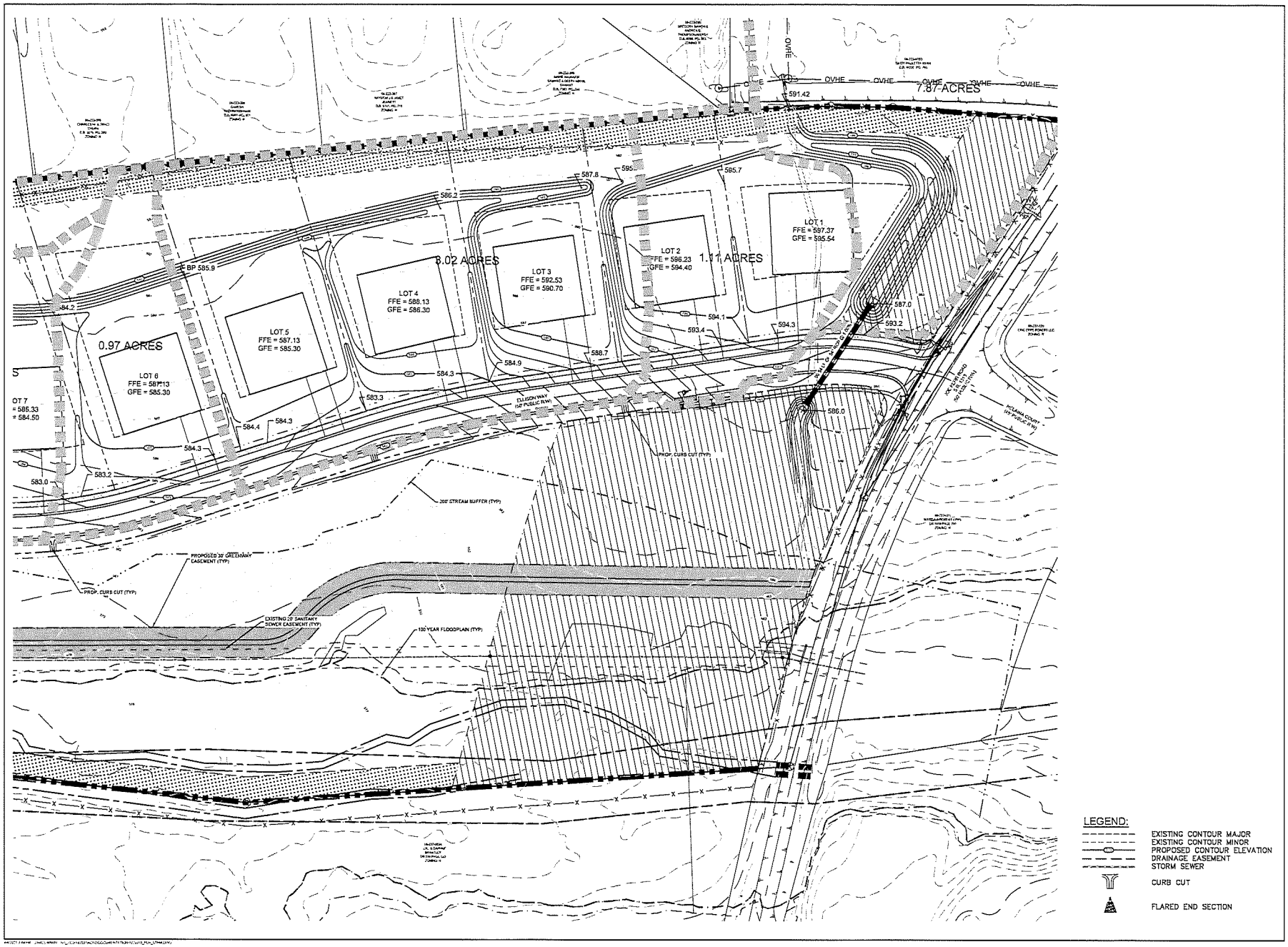
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT: 1"=4'
HORZ: 1"=40'

0 20 40 80

STORM DRAINAGE PLAN

C-3.1



LEGEND:

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- PROPOSED CONTOUR ELEVATION
- DRAINAGE EASEMENT
- STORM SEWER
- CURB CUT
- FLARED END SECTION

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NORTH CAROLINA C-015

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043199 MATTHEW A. GREGSON

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1000310

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-08-2021

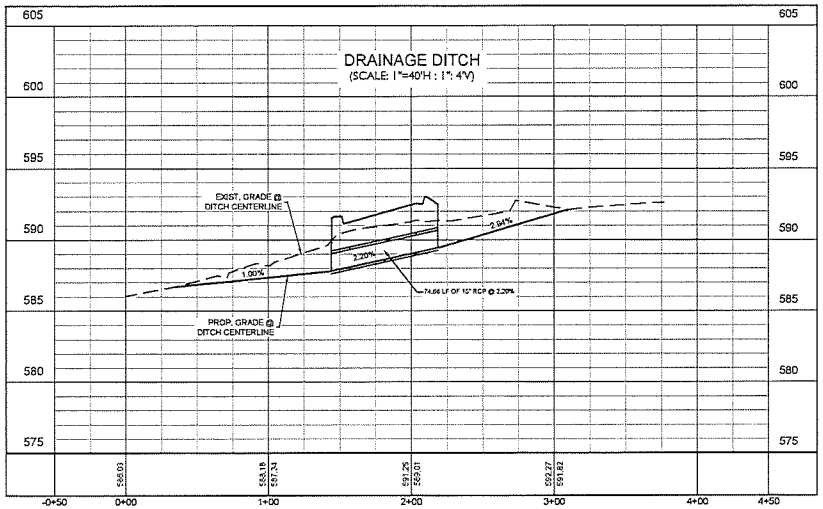
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

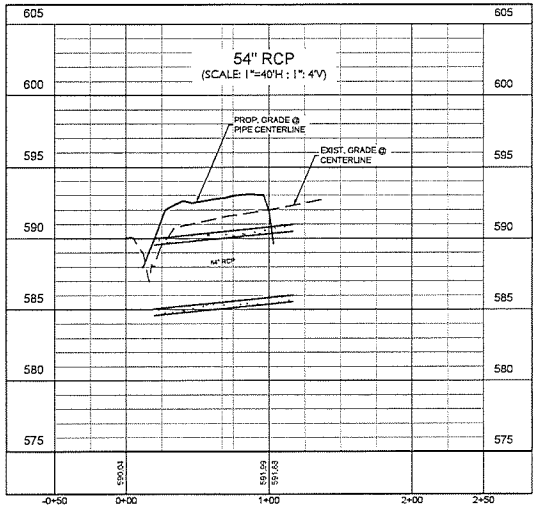
VERT: 1"=4'
HORZ: 1"=40'

0 20 40 80

STORM DRAINAGE PLAN

C-3.2





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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043168 MARVIN L. CREASER

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

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REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

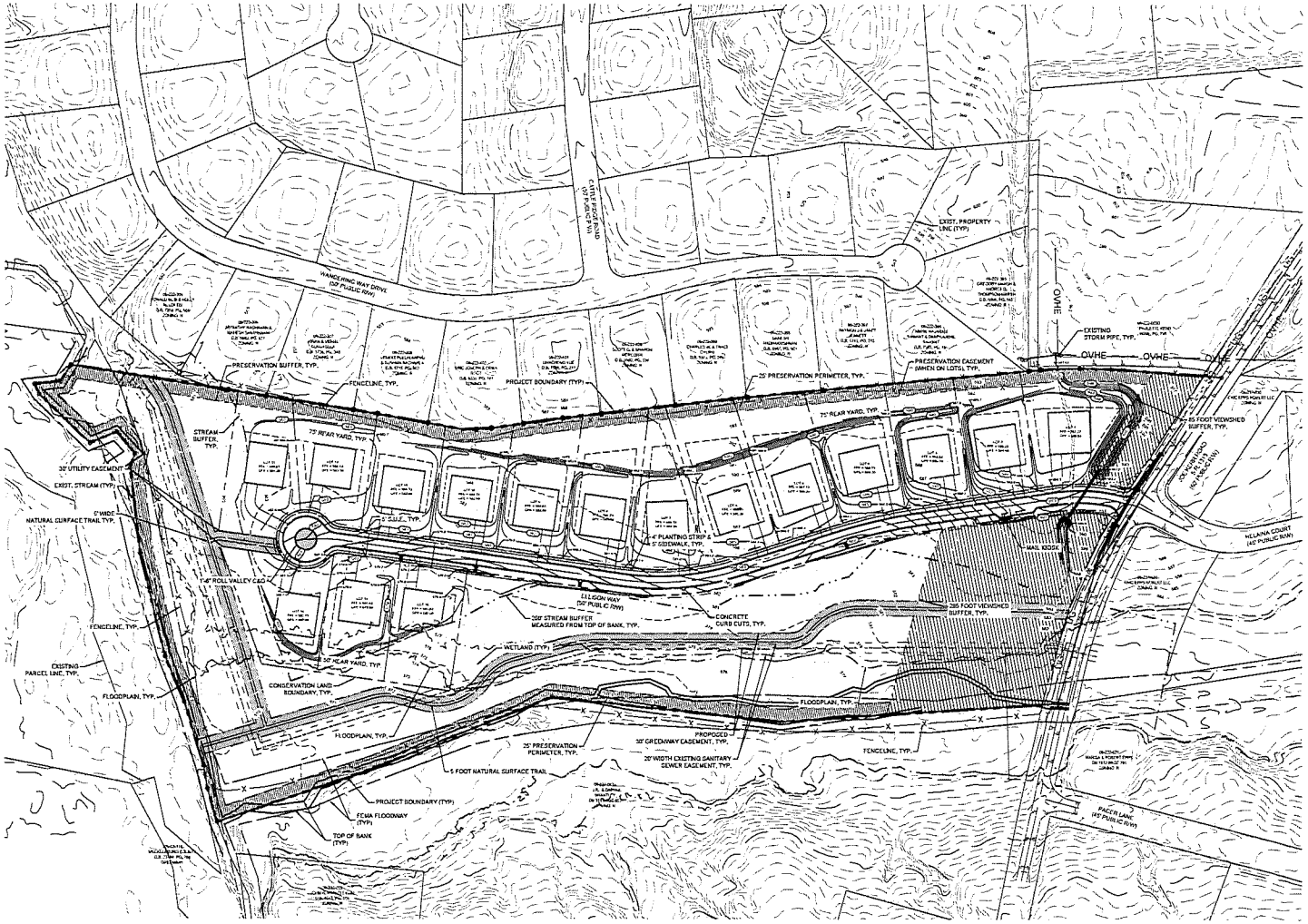
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT. 1"=4'
HORZ. 1"=40'

0 20 40 80

STORM DRAINAGE PROFILES

C-3.3



NOTES:

1. ALL CONTOURS AND SPOT ELEVATIONS REFLECT FINISHED GRADES.
2. REFER TO SOIL ENGINEERING RECOMMENDATION FOR DIRECTIONS ON FILL COMPACTION AND ANY STRUCTURAL CONSIDERATIONS.
3. PERMANENT CUT AND FILL SLOPES PLACED ON A SUITABLE FOUNDATION SHOULD BE CONSTRUCTED AT 2:1 (HORIZONTAL TO VERTICAL) OR FLATTER. PERMANENT SLOPES OF 3:1 SHOULD BE CONSTRUCTED WHERE MOWING IS DESIRABLE.
4. SITE CONTRACTOR SHALL PROTECT ALL TREES AND VEGETATION INDICATED TO REMAIN AND MAINTAIN ALL TREE PROTECTION BARRICADES.
5. THE PROPOSED CONTOURS SHOWN IN ROAD SECTIONS ARE FINISHED ELEVATIONS INCLUDING ASPHALT. PROPOSED CONTOURS IN ALL OTHER AREAS REPRESENT FINISHED GRADE. REFER TO PAVEMENT CROSS-SECTION DATA TO ESTABLISH CORRECT SUB-BASE OR AGGREGATE BASE COURSE ELEVATIONS TO BE COMPLETED UNDER THIS CONTRACT.
6. ANY GRADING BEYOND THE LIMITS OF CONSTRUCTION SHOWN IS SUBJECT TO A FINE.
7. CONTRACTOR SHALL BLEND NEW EARTHWORK SMOOTHLY WITH EXISTING CONTOURS.
8. DENUDED/CLEARING LIMITS SHOWN ON THESE PLANS ARE APPROXIMATE. CONTRACTOR SHALL SET CLEARING LIMITS BASED ON THE MINIMUM AMOUNT OF AREA REQUIRED TO CONSTRUCT THE PROPOSED IMPROVEMENTS DEPICTED WITHIN THESE PLANS (SEE CHAPTER 5 FOR EROSION CONTROL PLANS).
9. IF NECESSARY, SLOPES WHICH EXCEED EIGHT (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS. IN ADDITION TO HYDROSEEDING, IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL THE SLOPE IS BROUGHT TO GRADE.
10. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED. GROUND STABILIZATION ON PERIMETER AREAS AND SLOPES GREATER THAN 3:1 SHALL BE DONE WITHIN SEVEN (7) DAYS.
11. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED.
12. ALL PERMANENT DITCHES AND SLOPES SHALL BE STABILIZED WITH NORTH AMERICAN GREEN SC150 REINFORCED VEGETATION (STAPLE E PATTERN) OR APPROVED EQUAL.

LEGEND:

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- PROPOSED CONTOUR ELEVATION
- DRAINAGE EASEMENT
- STORM SEWER
- CURB CUT
- FLARED END SECTION

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015

NORTH CAROLINA PROFESSIONAL SEAL L-1523 MARK D. KIRK

Aug 4 2021 8:33 PM

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1000310

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MD

VERT: N.T.S
HORZ: 1"=100'

0 50 100 200 400

OVERALL GRADING PLAN

C-4.0

LEGEND:

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- PROPOSED CONTOUR ELEVATION
- DRAINAGE EASEMENT
- STORM SEWER
- CURB CUT
- FLARED END SECTION

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NORTH CAROLINA C-015

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NORTH CAROLINA PROFESSIONAL SEAL 21523 MARK E. KEZIOR

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

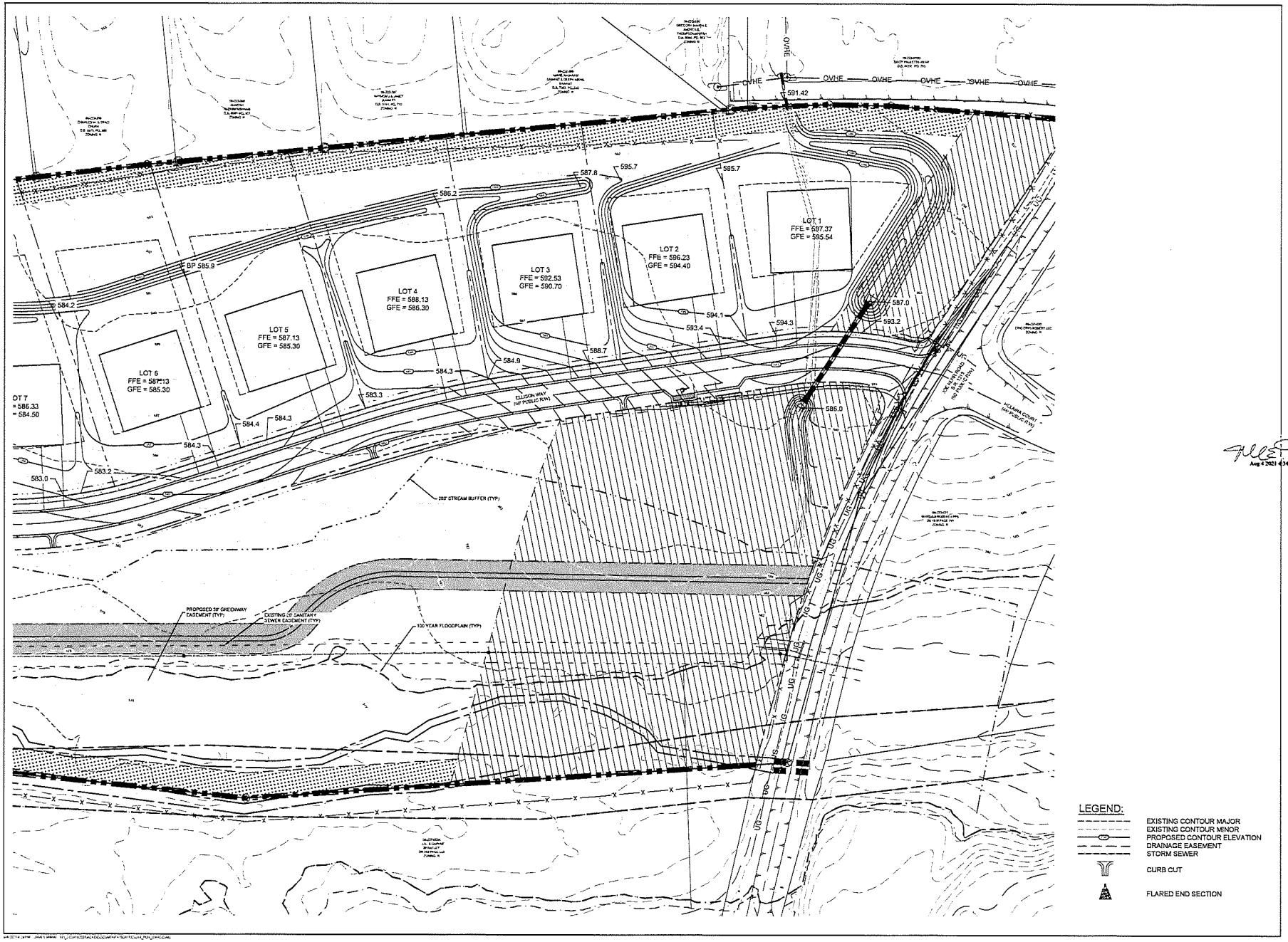
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT. 1"=4'
HORZ. 1"=40'

0 20 40 80

GRADING PLAN

C-4.1



LEGEND:

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- PROPOSED CONTOUR ELEVATION
- DRAINAGE EASEMENT
- STORM SEWER
- CURB CUT
- FLARED END SECTION

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THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

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REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

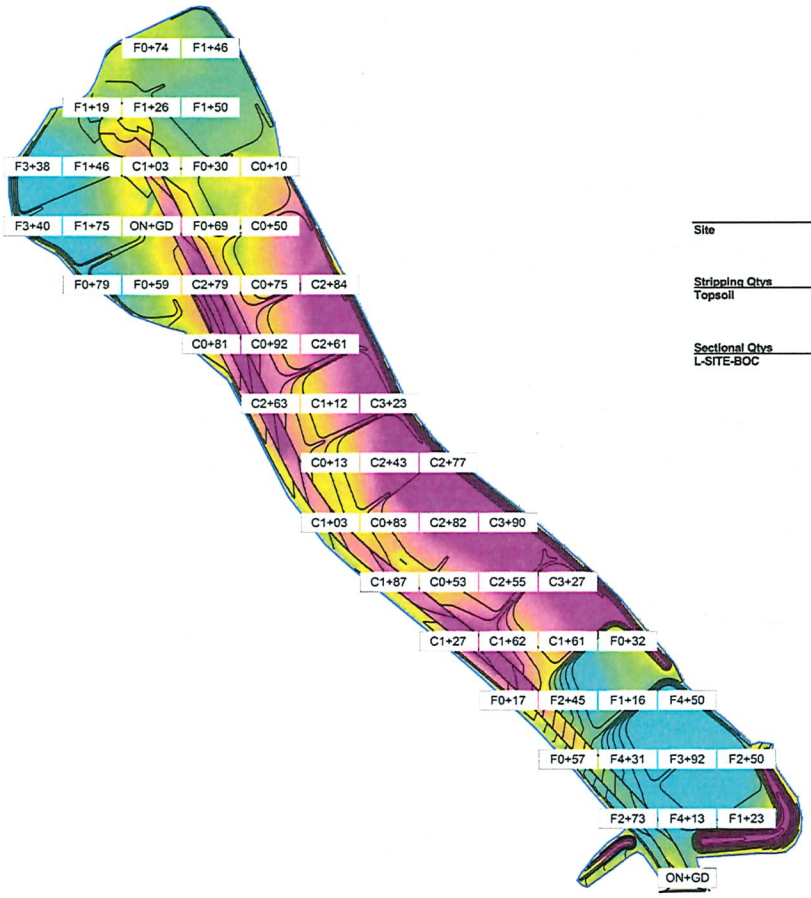
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT. 1"=4'
HORZ. 1" = 40'

0 20 40 80

GRADING PLAN

C-4.2



Job: Estates Agtek
Units: Ft-CY
Wed Aug 4, 2021 08:48:19 Page 1

Volume Report
Subgrade vs. Stripped

	Area				Volume		Comp/Ratio		Compact		Export	Change
	Total	Cut	Fill	OnGrade	Cut	Fill	Cut	Fill	Cut	Fill	-Import	Per .1 Ft
Site	508,864	257,486	229,377	22,001	16,988	14,860	1.00	1.15	16,988	17,089	-101	2,167

Stripping Qtys	Plane Area	Slope Area	Depth	Volume
Topsoil	508,864	509,467	0.500	9,435

Sectional Qtys	Plane Area	Slope Area	Depth	Volume
L-SITE-BOC	47,746	47,793	0.916	1,621

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NORTH CAROLINA PROFESSIONAL LANDSCAPE ARCHITECT SEAL

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA
UNION COUNTY
NORTH CAROLINA

1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT: 1"=4'
HORZ: ########

0 20 40 80

EARTHWORK

C-4.3

EROSION CONTROL LEGEND:

- DRAINAGE AREA LIMITS (SEDIMENT BASIN)
- DRAINAGE AREA LIMITS (SILT FENCE)
- LIMITS OF CONSTRUCTION/ CLEARING LIMITS
- SKIMMER ATTACHMENT (NCDEQ #6.64)
- BAFFLE (NCDEQ #6.65)
- PROP. R/W
- STORM DRAINAGE
- TEMPORARY SILT FENCE (NCDEQ #6.62)
- DOUBLE ROW HIGH HAZARD TEMPORARY SILT FENCE
- SPECIAL SEDIMENT CONTROL FENCE (NCDOT #1606.01)
- TEMP. CONSTRUCTION ENTRANCE/EXIT (NCDEQ #6.06)
- TD — TEMP. DIVERSION DITCH (NCDEQ #6.20)
- ROCK CHECK DAM (NCDEQ #6.63)
- SLOPE DRAIN (NCDEQ #6.32)
- TEMPORARY WETLAND MUD MAT CROSSING
- LD — LIMIT OF DISTURBANCE

LEGEND:

- EXIST. BOUNDARY LINE
- EXIST. MAJOR CONTOUR
- EXIST. MINOR CONTOUR
- PROP. MAJOR CONTOUR
- PROP. MINOR CONTOUR
- EXIST. TREELINE
- EXIST. R/W
- EXIST. PROPERTY LINE

STABILIZATION NOTE:

1. BE ADVISED THE 7/14-DAY SOIL STABILIZATION REQUIREMENTS APPLY TO ANY SECTION OF THE PROJECT WHERE LAND-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED AND SHALL SUPERSEDE ANY LESS STRINGENT STABILIZATION REQUIREMENTS ON THE PLANS.

PERMANENT SLOPE STABILIZATION NOTES:

1. ALL PERMANENT SLOPES 3:1 OR STEEPER AND ALL PERMANENT DITCHES SHALL BE STABILIZED USING NORTH AMERICAN GREEN SC250 REINFORCED VEGETATION INSTALLED PER MANUFACTURER'S SPECIFICATIONS USING STAPLE PATTERN "D".

STABILIZATION TIMEFRAMES
(Effective Aug. 1, 2019)

Site Area Description	Stabilization	Timeframe Exceptions
Perimeter dikes, berms, ditches, slopes	7 days	None
High Quality Water (HQW) Zones	7 days	None
Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
Slopes 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
All other areas with slopes flatter than 4:1	14 days	None, except for perimeters and HQW Zones.

CONSTRUCTION NOTES:

NOTES:

1. EROSION CONTROL PLANS SHALL NOT BE USED FOR FINAL GRADING. SEE CHAPTER 4 FOR FINAL GRADING PLAN.
2. SEE CHAPTER 6 FOR UTILITY PLANS.
3. SEE CHAPTER 7 FOR PLANTING PLANS
4. LIMITS OF CONSTRUCTION/ CLEARING LIMITS: 13.09 AC
5. REFERENCE SHEETS C-5.0 FOR EROSION CONTROL CONSTRUCTION SEQUENCE NOTES.

TEMPORARY SEDIMENT BASIN #1 - DATA TABLE

Basin Number	Drainage Area (Acres)	Denuded Area (Acres)	Sediment Basin Volume Required	Sediment Basin Volume Provided	Bottom Area Sq ft	Depth ft	Top Area Sq ft	Surface Area Required Sq ft	Surface Area Provided Sq ft	Side slope	Skimmer Size inches	Orifice Diameter inches	Head On Skimmer ft	Dewatering Time days	Peak Flow cfs
SB #1	11.45	11.45	20,609	61,540	17,843	3.0	23,843	11,315	23,843	3	5.0	2.00	0.333	3.86	26.60
			0					0							

TEMPORARY DITCH - DATA TABLE

DITCH NO.	AREA (AC)	DEPTH* (FT)	W(FT)	B (FT)	VELOCITY10 (FPS)	ROLLED EROSION CONTROL PRODUCT / LINING TYPE
1.1	9.16	1.5	8	2	3.3	STRAW WITH NET
1.2	2.29	1.5	7	1	2.4	JUTE NET

* DEPTH INCLUDES 0.5' OF FREEBOARD. MINIMUM DEPTH IS 1.5'.
** IF VELOCITY IS GREATER THAN 2 FPS, THEN LINER IS NEEDED.

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REV. DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015 MICHAEL L. GRESSMAN

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038198 MICHAEL L. GRESSMAN

8/4/2021

PROJECT

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

LANDDESIGN PROJECT 1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

SCALE

VERT: 1"=4'
HORZ: 1"=100'

0 50 100 200

SHEET TITLE

OVERALL PHASE 1 EROSION CONTROL PLAN

SHEET NUMBER

C-5.0

EROSION CONTROL LEGEND:

- DRAINAGE AREA LIMITS (SEDIMENT BASIN)
- DRAINAGE AREA LIMITS (SILT FENCE)
- LIMITS OF CONSTRUCTION/ CLEARING LIMITS
- SKIMMER ATTACHMENT (NCDEQ #6.54)
- BAFFLE (NCDEQ #6.65)
- PROP. R/W
- STORM DRAINAGE
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- TD TEMP. DIVERSION DITCH (NCDEQ #6.20)
- ROCK CHECK DAM (NCDEQ #6.63)
- SLOPE DRAIN (NCDEQ #6.32)
- TEMPORARY WETLAND MUD MAT CROSSING
- LIMIT OF DISTURBANCE

LEGEND:

- EXIST. BOUNDARY LINE
- EXIST. MAJOR CONTOUR
- EXIST. MINOR CONTOUR
- PROP. MAJOR CONTOUR
- PROP. MINOR CONTOUR
- EXIST. TREELINE
- EXIST. R/W
- EXIST. PROPERTY LINE

STABILIZATION NOTE:

1. BE ADVISED THE 7/14-DAY SOIL STABILIZATION REQUIREMENTS APPLY TO ANY SECTION OF THE PROJECT WHERE LAND-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED AND SHALL SUPERSEDE ANY LESS STRINGENT STABILIZATION REQUIREMENTS ON THE PLANS.

PERMANENT SLOPE STABILIZATION NOTES:

1. ALL PERMANENT SLOPES 3:1 OR STEEPER AND ALL PERMANENT DITCHES SHALL BE STABILIZED USING NORTH AMERICAN GREEN SC250 REINFORCED VEGETATION INSTALLED PER MANUFACTURER'S SPECIFICATIONS USING STAPLE PATTERN "D".

STABILIZATION TIMEFRAMES
(Effective Aug. 1, 2011)

Site Area Description	Stabilization	Timeframe Exceptions
Perimeter dikes, swales, ditches, slopes	7 days	None
High Quality Water (HQW) Zones	7 days	None
Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
Slopes 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
All other areas with slopes flatter than 4:1	14 days	None, except for perimeters and HQW Zones.

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SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015 LANDDESIGN, INC.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043168 MATTHEW L. CRESSWELL

8/4/2021

PROJECT

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

LANDDESIGN PROJECT 1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

SCALES

VERT: 1"=4'
HORZ: 1"=40'

0 20 40 80

ORIGINAL PAPER SIZE 24" X 36"

SHEET TITLE

PHASE 1 EROSION CONTROL PLAN

SHEET NUMBER

C-5.1

EROSION CONTROL LEGEND:

- DRAINAGE AREA LIMITS (SEDIMENT BASIN)
- DRAINAGE AREA LIMITS (SILT FENCE)
- LIMITS OF CONSTRUCTION/ CLEARING LIMITS
- SKIMMER ATTACHMENT (NCDEQ #6.54)
- BAFFLE (NCDEQ #6.65)
- PROP. R/W
- STORM DRAINAGE
- TEMPORARY SILT FENCE (NCDEQ #6.62)
- DOUBLE ROW HIGH HAZARD TEMPORARY SILT FENCE
- SPECIAL SEDIMENT CONTROL FENCE (NCDOT #1606.01)
- TEMP. CONSTRUCTION ENTRANCE/EXIT (NCDEQ #6.06)
- TEMP. DIVERSION DITCH (NCDEQ #6.20)
- ROCK CHECK DAM (NCDEQ #6.63)
- SLOPE DRAIN (NCDEQ #6.32)
- TEMPORARY WETLAND MUD MAT CROSSING
- LIMIT OF DISTURBANCE

LEGEND:

- EXIST. BOUNDARY LINE
- EXIST. MAJOR CONTOUR
- EXIST. MINOR CONTOUR
- PROP. MAJOR CONTOUR
- PROP. MINOR CONTOUR
- EXIST. TREELINE
- EXIST. R/W
- EXIST. PROPERTY LINE

STABILIZATION NOTE:

1. BE ADVISED THE 7/14-DAY SOIL STABILIZATION REQUIREMENTS APPLY TO ANY SECTION OF THE PROJECT WHERE LAND-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED AND SHALL SUPERSEDE ANY LESS STRINGENT STABILIZATION REQUIREMENTS ON THE PLANS.

PERMANENT SLOPE STABILIZATION NOTES:

1. ALL PERMANENT SLOPES 3:1 OR STEEPER AND ALL PERMANENT DITCHES SHALL BE STABILIZED USING NORTH AMERICAN GREEN SC250 REINFORCED VEGETATION INSTALLED PER MANUFACTURER'S SPECIFICATIONS USING STAPLE PATTERN "D".

STABILIZATION TIMEFRAMES
(Effective Aug. 3, 1993)

Site Area Description	Stabilization	Timeframe Exceptions
Perimeter dikes, swales, ditches, slopes	7 days	None
High Quality Water (HQW) Zones	7 days	None
Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
Slopes 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
All other areas with slopes flatter than 4:1	14 days	None, except for perimeters and HQW Zones.

LandDesign.
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

REV. DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043198 MARK L. GREESON

8/4/2021

PROJECT

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

LANDDESIGN PROJECT 1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

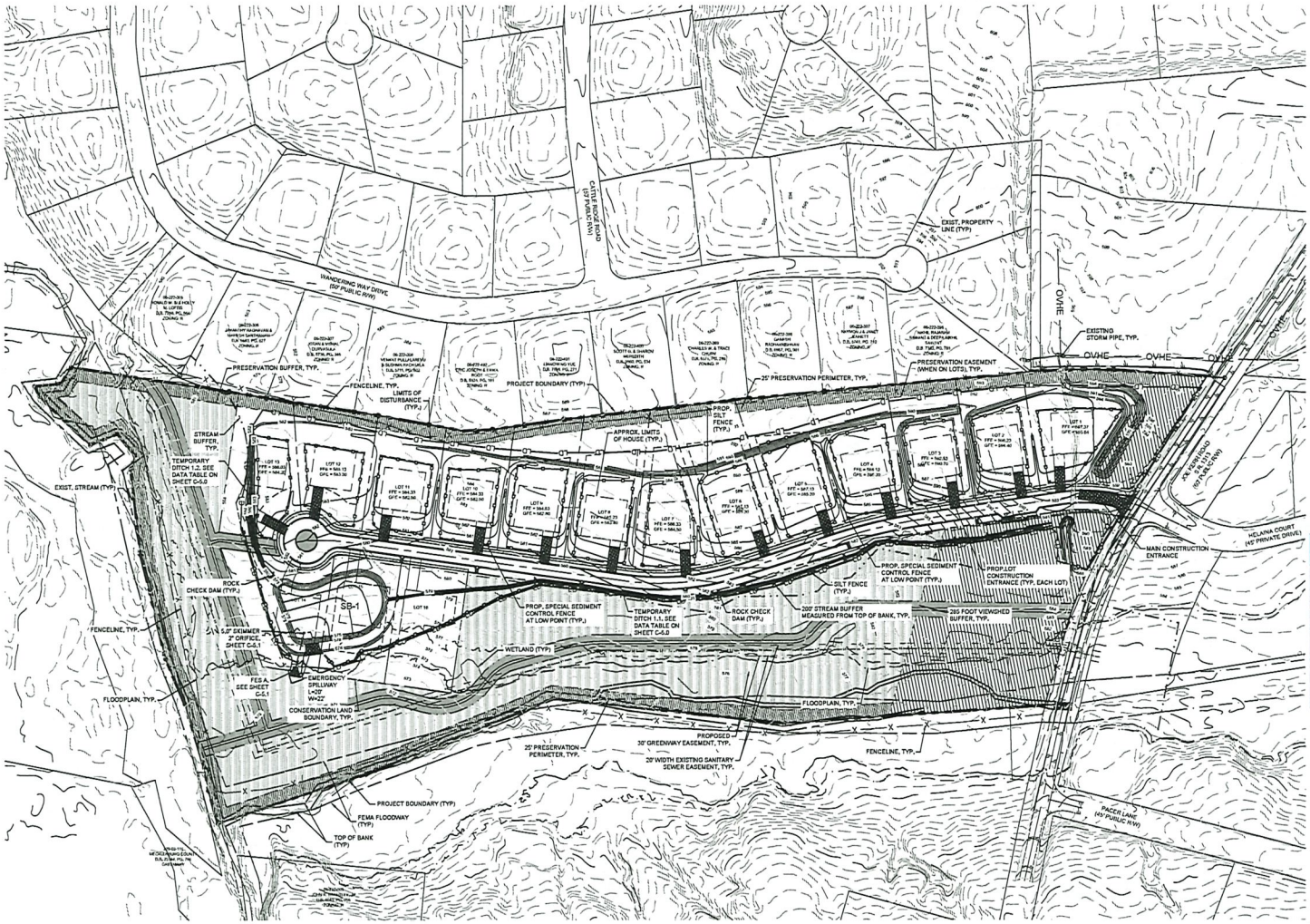
SCALE
VERT: 1"=4'
HORZ: 1"=40'
0 20' 40' 80'
(REFERENCE SHEET SIZE: 24"x36")

SHEET TITLE

PHASE 1 EROSION CONTROL PLAN

SHEET NUMBER

C-5.2



EROSION CONTROL LEGEND:

- DRAINAGE AREA LIMITS (SEDIMENT BASIN)
- DRAINAGE AREA LIMITS (SILT FENCE)
- LIMITS OF CONSTRUCTION/ CLEARING LIMITS
- SKIMMER ATTACHMENT (NCDEQ #6.64)
- BAFFLE (NCDEQ #6.65)
- PROP. R/W
- STORM DRAINAGE
- TEMPORARY SILT FENCE (NCDEQ #6.62)
- DOUBLE ROW HIGH HAZARD TEMPORARY SILT FENCE
- SPECIAL SEDIMENT CONTROL FENCE (NCDOT #1605.01)
- TEMP. CONSTRUCTION ENTRANCE/EXIT (NCDEQ #6.06)
- TD — TEMP. DIVERSION DITCH (NCDEQ #6.20)
- ROCK CHECK DAM (NCDEQ #6.53)
- SLOPE DRAIN (NCDEQ #6.32)
- TEMPORARY WETLAND MUD MAT CROSSING
- LD — LIMIT OF DISTURBANCE

LEGEND:

- EXIST. BOUNDARY LINE
- EXIST. MAJOR CONTOUR
- EXIST. MINOR CONTOUR
- PROP. MAJOR CONTOUR
- PROP. MINOR CONTOUR
- EXIST. TREELINE
- EXIST. R/W
- EXIST. PROPERTY LINE

STABILIZATION NOTE:

1. BE ADVISED THE 7/14-DAY SOIL STABILIZATION REQUIREMENTS APPLY TO ANY SECTION OF THE PROJECT WHERE LAND-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED AND SHALL SUPERSEDE ANY LESS STRINGENT STABILIZATION REQUIREMENTS ON THE PLANS.

PERMANENT SLOPE STABILIZATION NOTES:

1. ALL PERMANENT SLOPES 3:1 OR STEEPER AND ALL PERMANENT DITCHES SHALL BE STABILIZED USING NORTH AMERICAN GREEN SC250 REINFORCED VEGETATION INSTALLED PER MANUFACTURER'S SPECIFICATIONS USING STAPLE PATTERN "D".

STABILIZATION TIMEFRAMES
(Effective Aug. 1, 2014)

Site Area Description	Stabilization	Timeframe Exceptions
Perimeter dikes, swales, ditches, slopes	7 days	None
High Quality Water (HQW) Zones	7 days	None
Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
Slopes 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
All other areas with slopes flatter than 4:1	14 days	None, except for perimeters and HQW Zones.

CONSTRUCTION NOTES:

NOTE:

1. EROSION CONTROL PLANS SHALL NOT BE USED FOR FINAL GRADING. SEE CHAPTER 4 FOR FINAL GRADING PLAN.
2. SEE CHAPTER 6 FOR UTILITY PLANS.
3. SEE CHAPTER 7 FOR PLANTING PLANS
4. LIMITS OF CONSTRUCTION/ CLEARING LIMITS: 13.09 AC
5. REFERENCE SHEETC-5.0 FOR EROSION CONTROL CONSTRUCTION SEQUENCE NOTES.

BEFORE YOU DIG CALL NORTH CAROLINA 811 NC1 CONTACT CENTER IT'S THE LAW!

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REV. NO.

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015 Registration

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043195 KENNETH M. GREGORY UNION, N.C. OREGON

8/4/2021

PROJECT

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

LANDDESIGN PROJ # 1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

SCALE

VERT: 1"=4'
HORZ: 1"=100'

0 50' 100' 200'

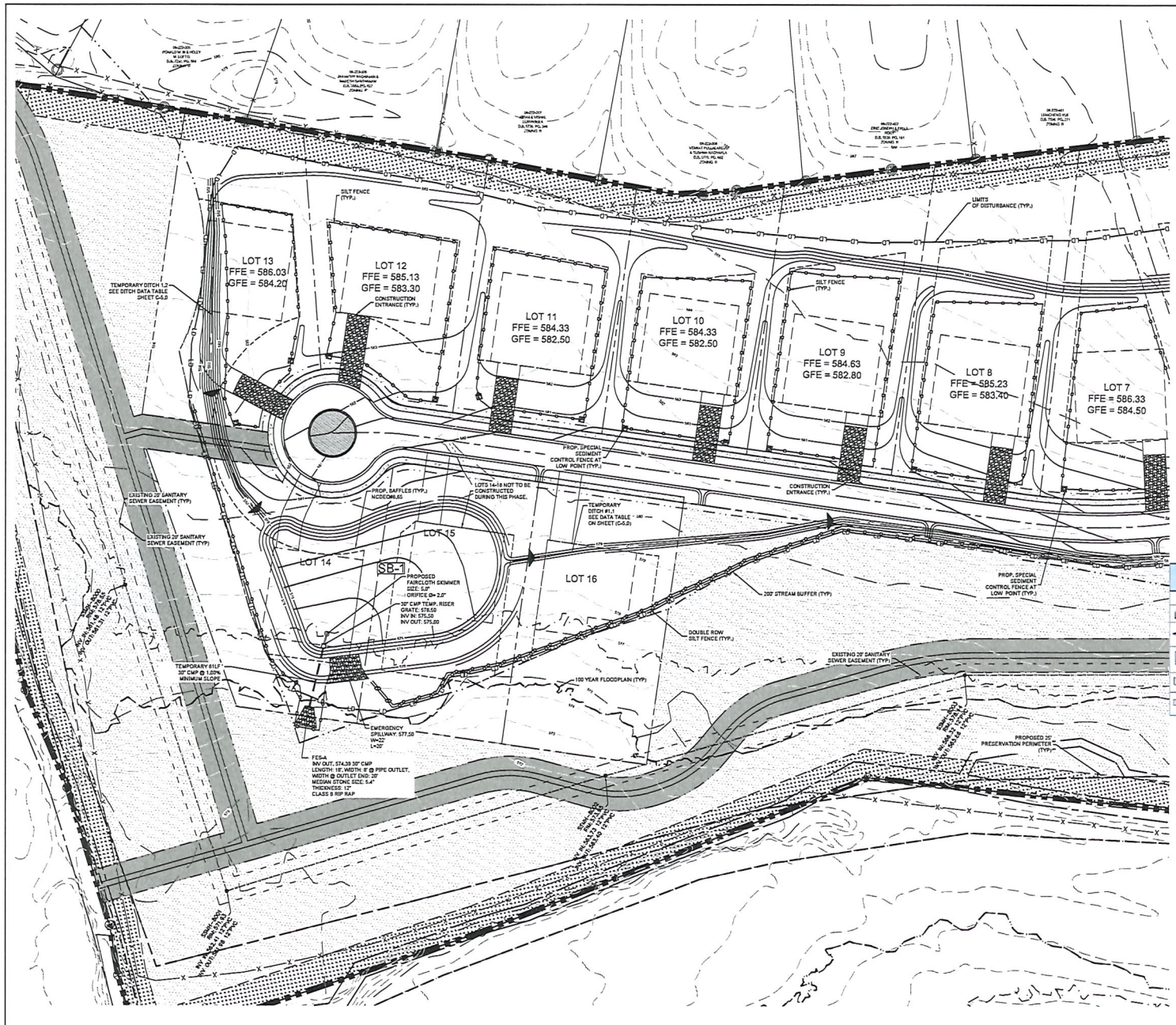
NORTH

SHEET TITLE

OVERALL PHASE 2 EROSION CONTROL PLAN

SHEET NUMBER

C-5.3



EROSION CONTROL LEGEND:

- DRAINAGE AREA LIMITS (SEDIMENT BASIN)
- DRAINAGE AREA LIMITS (SILT FENCE)
- LIMITS OF CONSTRUCTION/ CLEARING LIMITS
- SKIMMER ATTACHMENT (NCDEQ #6.54)
- BAFFLE (NCDEQ #6.55)
- PROP. R/W
- STORM DRAINAGE
- TEMPORARY SILT FENCE (NCDEQ #6.62)
- DOUBLE ROW HIGH HAZARD TEMPORARY SILT FENCE
- SPECIAL SEDIMENT CONTROL FENCE (NCDOT #1605.01)
- TEMP. CONSTRUCTION ENTRANCE/EXIT (NCDEQ #6.08)
- TD TEMP. DIVERSION DITCH (NCDEQ #6.20)
- ROCK CHECK DAM (NCDEQ #6.63)
- SLOPE DRAIN (NCDEQ #6.32)
- TEMPORARY WETLAND MUD MAT CROSSING
- LD LIMIT OF DISTURBANCE

LEGEND:

- EXIST. BOUNDARY LINE
- EXIST. MAJOR CONTOUR
- EXIST. MINOR CONTOUR
- PROP. MAJOR CONTOUR
- PROP. MINOR CONTOUR
- EXIST. TREELINE
- EXIST. R/W
- EXIST. PROPERTY LINE

STABILIZATION NOTE:

1. BE ADVISED THE 7/14-DAY SOIL STABILIZATION REQUIREMENTS APPLY TO ANY SECTION OF THE PROJECT WHERE LAND-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED AND SHALL SUPERSEDE ANY LESS STRINGENT STABILIZATION REQUIREMENTS ON THE PLANS.

PERMANENT SLOPE STABILIZATION NOTES:

1. ALL PERMANENT SLOPES 3:1 OR STEEPER AND ALL PERMANENT DITCHES SHALL BE STABILIZED USING NORTH AMERICAN GREEN SC250 REINFORCED VEGETATION INSTALLED PER MANUFACTURER'S SPECIFICATIONS USING STAPLE PATTERN "D".

STABILIZATION TIMEFRAMES
(Effective Aug. 1, 2017)

Soil Area Description	Stabilization	Temporary Exceptions
Perimeter dikes, swales, ditches, slopes	7 days	None
High Quality Water (HQW) Zones	7 days	None
Slopes steeper than 3:1	7 days	If slopes are 50' or less in length and are not steeper than 2:1, 14 days are allowed.
Slopes 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
All other areas with slopes flatter than 4:1	14 days	None, except for perimeters and HQW Zones.

CONSTRUCTION SEQUENCE NOTE:

1. REFERENCE SHEETS-5.0 FOR EROSION CONTROL CONSTRUCTION SEQUENCE NOTES.

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015 MICHAEL J. GRESSEN

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038168 MICHAEL J. GRESSEN

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA
UNION COUNTY
NORTH CAROLINA

1020319

REVISION / ISSUANCE

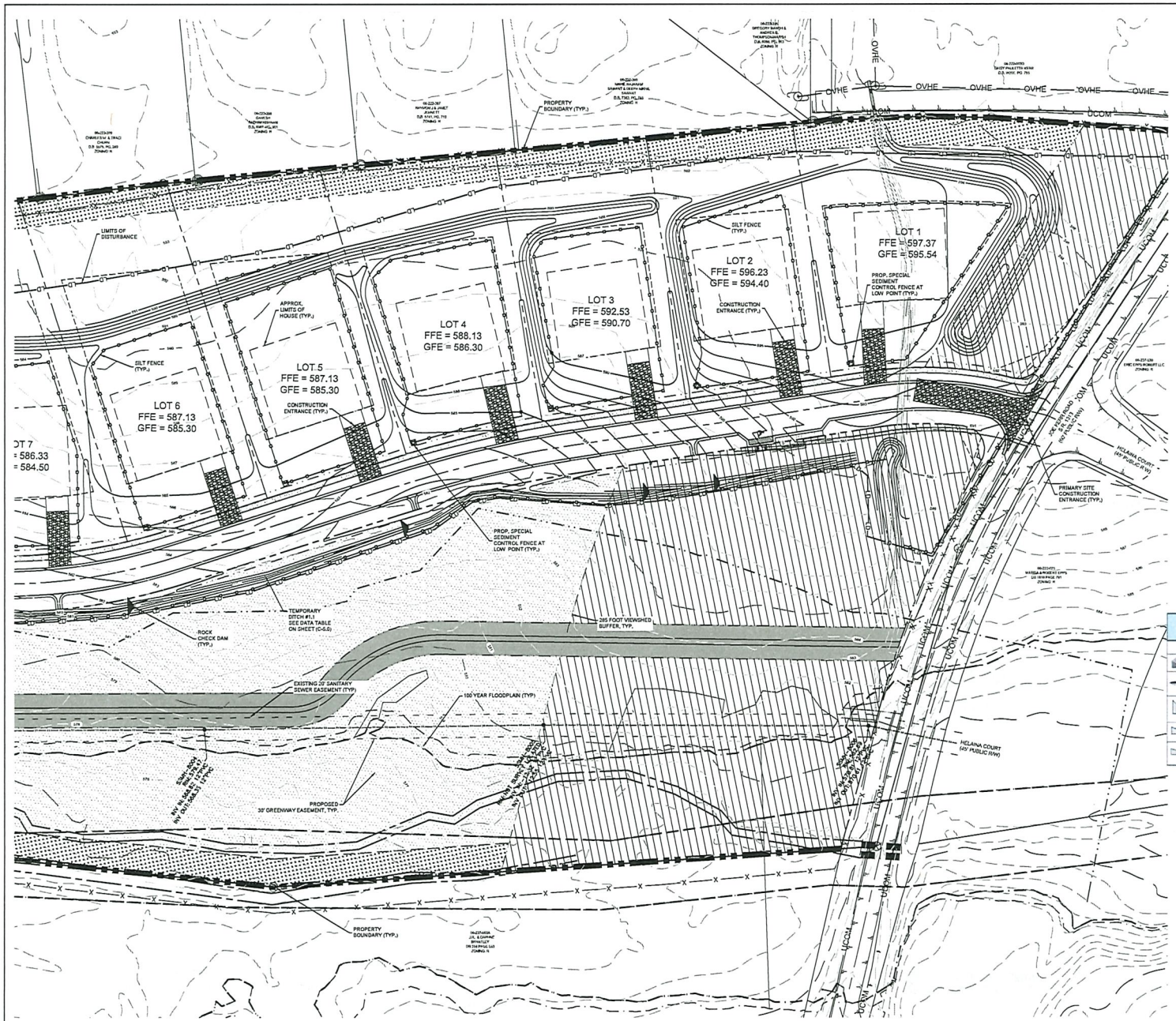
NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT: 1"=4'
HORZ: 1"=40'
0 20' 40' 80'

PHASE 2 EROSION CONTROL PLAN

C-5.4



EROSION CONTROL LEGEND:

- DRAINAGE AREA LIMITS (SEDIMENT BASIN)
- DRAINAGE AREA LIMITS (SILT FENCE)
- LIMITS OF CONSTRUCTION/ CLEARING LIMITS
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- BAFFLE (NCDEQ #6.65)
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- TEMP. CONSTRUCTION ENTRANCE/EXIT (NCDEQ #6.06)
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- TEMPORARY WETLAND MUD MAT CROSSING
- LD — LIMIT OF DISTURBANCE

LEGEND:

- EXIST. BOUNDARY LINE
- EXIST. MAJOR CONTOUR
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STABILIZATION NOTE:

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PERMANENT SLOPE STABILIZATION NOTES:

1. ALL PERMANENT SLOPES 3:1 OR STEEPER AND ALL PERMANENT DITCHES SHALL BE STABILIZED USING NORTH AMERICAN GREEN SC250 REINFORCED VEGETATION INSTALLED PER MANUFACTURER'S SPECIFICATIONS USING STAPLE PATTERN "D".

STABILIZATION TIMEFRAMES
(Effective Aug. 1, 2011)

SITE AREA DESCRIPTION	STABILIZATION	TIMEFRAME EXCEPTIONS
Perimeter dikes, swales, ditches, slopes	7 days	None
High Quality Water (HQW) Zones	7 days	None
Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
Slopes, 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
All other areas with slopes flatter than a 1	14 days	None, except for perimeters and HQW Zones.

CONSTRUCTION SEQUENCE NOTE:

1. REFERENCE SHEET C-5.0 FOR EROSION CONTROL CONSTRUCTION SEQUENCE NOTES.

LandDesign.
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

REV. DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015 JAMES E. CRAWFORD III

STATE OF OREGON REGISTERED PROFESSIONAL ENGINEER 93168 EXPIRES 12/31/21

8/4/2021

PROJECT

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA
UNION COUNTY
NORTH CAROLINA

LANDDESIGN PROJECT 1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

SCALE
VERT: 1"=4'
HORZ: 1"=40'
0 20' 40' 80'

SHEET TITLE

PHASE 2 EROSION CONTROL PLAN

SHEET NUMBER

C-5.5

6.51

HARDWARE CLOTH & GRAVEL INLET PROTECTION

Definition A temporary mesh or metal hardware cloth barrier and gravel filter separator placed over the opening of a drain inlet.

Purpose To prevent sediment from entering yard inlets, ground surface drains or drain inlets during construction. This practice allows drainage to be maintained.

Conditions Where Practice Applies To be placed around a catch basin or a drain inlet and where the flow is light to moderate. If heavy flow is anticipated use the Gravel Inlet Protection method (Practice 6.54, Block Dumpster Inlet Protection). It is also used where sheet drain inlets are to be made operational before permanent stabilization of the disturbed drainage area. This method of inlet protection is effective where the drain is expected to carry relatively sheet flow. The immediate land area around the inlet should be relatively flat (less than 5 percent) and free of unstabilized sediment that is easily removed.

This practice must not be used near the edge of fill material and must not divert water over cut or fill slopes.

Design Criteria Limit drainage area to one acre or less per inlet.

For occupied or unoccupied inlets with curb buttons, use type 3 posts. For posts used in A, B, D, E, F, use a minimum length of 5 feet. Make sure the posts are plumb and in line. Space between the posts at 3 feet. Securely drive each post into the ground to a minimum depth of 2 feet. The maximum spacing for the posts is 4 feet.

The wire mesh should be of a durable hardware cloth with a 1-inch mesh opening. The total height should be a minimum of 2 feet. Provide a flap of hardware cloth on the upstream projecting away from the inlet and to extend at the sides of the inlet for a complete fit. The underlayment mesh, with a length of 16 inches, should have a minimum slope of 2:1.

The top elevation of the structure must be at least 1.0 inches lower than the ground elevation downslope from the inlet. It is essential that all storm flow pass over the structure into the inlet rather than around the structure. Temporary diversion structures may be necessary to prevent bypass flow. Soil excavated when installing the structure and may be used for this purpose if graded well.

6

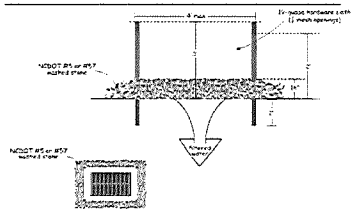

Figure 6.51a Hardware cloth and gravel filter protection

Construction Specifications
1. Unstitch seam at bottom of hardware cloth and unroll material.
2. Dig a shallow level pool 2 feet deep around the inlet. Slope sides of excavated pool at a minimum of 1 foot over 1 foot.
3. Surround the pool with wire mesh hardware cloth. Secure the wire mesh to the wood posts at the top, middle, and bottom. Place a 2-foot flap of the wire mesh under the gravel for anchoring is recommended.
4. Place clean gravel (No. 57 or #57 stone) on a 2:1 slope with a height of 16 inches around the wire mesh and to a level equal to or even with the top of the wire mesh.
5. Once the contributing drainage area has been stabilized, remove accumulated sediment and unused gravel (maintaining slopes).
6. Compact the area properly and stabilize it with pavement.

Maintenance Inspect after each weekly and after each significant (1 inch or greater) rainfall event. Clean the mesh, gravel, or any debris or other objects from the surface flow for subsequent use. Take care not to damage or undercut the wire mesh during removal and cleaning. Replace stone as needed.

References *Inlet Protection*
- N.C. Block and Gravel Inlet Protection
- N.C. Block Dumpster Inlet Protection

North Carolina Department of Transportation
Standard Specifications for Roads and Structures

6.06

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT

Definition A stabilized area or pad located at points where vehicles enter and leave a construction site.

Purpose To provide a buffer area where vehicles can drop their mud and sediment or avoid transporting it onto public roads, to control runoff from surface runoff, and to help control dust.

Conditions Where Practice Applies Wherever traffic will be leaving a construction site and enter onto paved public roads or other paved areas. Construction plans should limit traffic to properly constructed entrances.

Design Criteria Aggregate Size—1 to 2-1/2 inch washed stone.

Dimensions of gravel pad—
Thickness—6 inches minimum.
Width—12 feet minimum or full width at all points of the vehicular entrance and exit area, whichever is greater.
Length—50 feet minimum.

Location—Locate construction entrances and exits to limit sediment from leaving the site and to provide for maximum safety to all construction vehicles. Avoid steep grades, and entrances at curves in public roads.

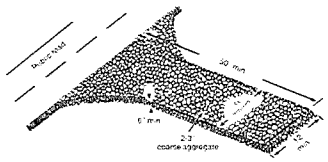

Figure 6.06a Gravel construction entrance/exit prevent sediment from leaving the construction site (modified from VA DMLR)

Construction Specifications
1. Unstitch seam at bottom of hardware cloth and unroll material.
2. Dig a shallow level pool 2 feet deep around the inlet. Slope sides of excavated pool at a minimum of 1 foot over 1 foot.
3. Surround the pool with wire mesh hardware cloth. Secure the wire mesh to the wood posts at the top, middle, and bottom. Place a 2-foot flap of the wire mesh under the gravel for anchoring is recommended.
4. Place clean gravel (No. 57 or #57 stone) on a 2:1 slope with a height of 16 inches around the wire mesh and to a level equal to or even with the top of the wire mesh.
5. Once the contributing drainage area has been stabilized, remove accumulated sediment and unused gravel (maintaining slopes).
6. Compact the area properly and stabilize it with pavement.

Maintenance Inspect after each weekly and after each significant (1 inch or greater) rainfall event. Clean the mesh, gravel, or any debris or other objects from the surface flow for subsequent use. Take care not to damage or undercut the wire mesh during removal and cleaning. Replace stone as needed.

References *Inlet Protection*
- N.C. Block and Gravel Inlet Protection
- N.C. Block Dumpster Inlet Protection

North Carolina Department of Transportation
Standard Specifications for Roads and Structures

6.65

POROUS BAFFLES

Definition Porous barriers installed inside a temporary sediment trap, skimmer basin, or sediment basin to reduce the velocity and turbulence of the water flowing through the measure, and to facilitate the settling of sediment from the water before discharge.

Purpose Sediment traps and basins are designed to temporarily pool runoff water to allow sediment to settle before the water is discharged. Unfortunately, they are usually not very efficient due to high turbulence and "short-circuiting" flows which take runoff quickly to the outlet with little interaction with most of the basin. Porous baffles improve the rate of sediment retention by distributing the flow and reducing turbulence. This process can improve sediment retention.

Conditions Where Practice Applies This practice should be used in any temporary sediment trap, skimmer basin, or temporary sediment basin.

Planning Considerations Porous baffles effectively spread the flow across the entire width of a sediment basin or trap. Water flows through the baffle material, but is slowed sufficiently to back up the flow, causing it to spread across the entire width of the baffle (Figure 6.65a).

Spreading the flow in this manner utilizes the full cross section of the basin, which in turn reduces flow rates or velocity as much as possible. In addition, the turbulence is also greatly reduced. This combination increases sediment deposition and retention and also decreases the particle size of sediment captured.

The installation should be similar to a sediment fence (Figure 6.65b). The fabric should be 700 g/m² coir erosion blanket (Figure 6.65c) or equal. A support wire across the top will help prevent excessive sagging if the material is attached to it with appropriate ties.

6.83

CHECK DAM

Definition A small temporary stone dam constructed across a drainage way.

Purpose To reduce erosion in a drainage channel by reducing the velocity of flow.

Conditions Where Practice Applies This practice may be used as a temporary measure to help control the erosion of channels in low, and moderate gradients.

Check dams may be used to:
- reduce velocity in small temporary channels that are drainage, but where permanent erosion control is impractical due to their short period of usefulness.
- reduce velocity in small grass channels where construction delays or weather conditions prevent timely installation of permanent linings.

Do not use check dams in intermittent or perennial streams.

Planning Considerations Check dams are independent structures built in the channel to reduce the velocity that will be filled or washed out at a later date. The dams should only be used where permanent stabilization measures are better not yet in place.

Check dams installed in grassed-lined channels may kill the vegetation lining it when grass after it is in contact with the water and be subject to excessive silt. All stone and gravel must be removed if mowing is planned as part of vegetative maintenance.

Design Criteria The following criteria should be used when developing a check dam:
- The drainage area is limited to one half acre.
- Keep a minimum height of 2 feet and no greater than 3 feet.
- Keep the center of the check dam at least 9 inches lower than the outer edges of material around the dam.
- Keep the side slopes of the dam at 2:1 or flatter.
- Ensure that the maximum spacing between dams places the toe of the upstream dam at the same elevation as the top of the downstream dam (Figure 6.83a).
- Stabilize outflow area along the channel to resist erosion.
- Use NCDOT Class B stone and line the upstream side of the dam with NCDOT #5 or #57 stone.
- Key the stone into the bank banks and extend it beyond the abutments a minimum of 1.5 feet to avoid washouts from overflow around the dam.

6.65

POROUS BAFFLES

Definition Porous barriers installed inside a temporary sediment trap, skimmer basin, or sediment basin to reduce the velocity and turbulence of the water flowing through the measure, and to facilitate the settling of sediment from the water before discharge.

Purpose Sediment traps and basins are designed to temporarily pool runoff water to allow sediment to settle before the water is discharged. Unfortunately, they are usually not very efficient due to high turbulence and "short-circuiting" flows which take runoff quickly to the outlet with little interaction with most of the basin. Porous baffles improve the rate of sediment retention by distributing the flow and reducing turbulence. This process can improve sediment retention.

Conditions Where Practice Applies This practice should be used in any temporary sediment trap, skimmer basin, or temporary sediment basin.

Planning Considerations Porous baffles effectively spread the flow across the entire width of a sediment basin or trap. Water flows through the baffle material, but is slowed sufficiently to back up the flow, causing it to spread across the entire width of the baffle (Figure 6.65a).

Spreading the flow in this manner utilizes the full cross section of the basin, which in turn reduces flow rates or velocity as much as possible. In addition, the turbulence is also greatly reduced. This combination increases sediment deposition and retention and also decreases the particle size of sediment captured.

The installation should be similar to a sediment fence (Figure 6.65b). The fabric should be 700 g/m² coir erosion blanket (Figure 6.65c) or equal. A support wire across the top will help prevent excessive sagging if the material is attached to it with appropriate ties.

6.65

POROUS BAFFLES

Definition Porous barriers installed inside a temporary sediment trap, skimmer basin, or sediment basin to reduce the velocity and turbulence of the water flowing through the measure, and to facilitate the settling of sediment from the water before discharge.

Purpose Sediment traps and basins are designed to temporarily pool runoff water to allow sediment to settle before the water is discharged. Unfortunately, they are usually not very efficient due to high turbulence and "short-circuiting" flows which take runoff quickly to the outlet with little interaction with most of the basin. Porous baffles improve the rate of sediment retention by distributing the flow and reducing turbulence. This process can improve sediment retention.

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The installation should be similar to a sediment fence (Figure 6.65b). The fabric should be 700 g/m² coir erosion blanket (Figure 6.65c) or equal. A support wire across the top will help prevent excessive sagging if the material is attached to it with appropriate ties.

6.64

SKIMMER SEDIMENT BASIN

Definition An earthen sedimentation facility that collects surface runoff, with a properly sized spillway lined with an impermeable geotextile or formed of plastic, membrane, and equipped with a floating skimmer for decanting.

Purpose Sediment basins are designed to temporarily store runoff to trap and settle out a portion of the sediment carried down creeks. Water discharge from a perforated riser for dewatering, which allows water to leave the basin fairly slowly. This is to promote the sediment settling rate to be better as solid which slows down the faster than the liquid. The water column where the water is released. A skimmer is preferred. The third component utilized to dewater a sediment basin from the surface. The basic concept is that the skimmer does not dewater the basin as fast as normal orifices or flat vertical slots. The basin will fill and then slowly discharge based on days. This process has two effects. First, the sediment in the runoff has more time to settle out prior to discharge. Second, a pool of water forms early in a storm event and this further increases sedimentation rates in the basin. Many of the storms will produce more volume than the normal sediment basin capacity, and flow rates in excess of the skimmer capacity, resulting in flow over the structure's spillway. This water is also coming from the top of the water column and has therefore been "filtered" by sediment as much as possible. (Adapted from: Southeastern Stormwater Solutions Guide Using Surface Filters, N.C. State University, Soil Science Department.)

Conditions Where Practice Applies Skimmer sediment basins are needed where drainage areas are too large for temporary sediment traps. Do not locate the skimmer sediment basin in intermittent or perennial streams.

Planning Considerations Select locations for skimmer basins during initial site evaluation. Install skimmer sediment basins before any site grading takes place within the drainage area.

Select skimmer sediment basin sites or outlets sediment from all areas that are not treated adequately by other sediment control measures. Always consider access for cleanout and disposal of the trapped sediment. Locations where a pond can be formed by constructing a low dam across a natural swale are preferred, subject to ways that impact downstream. Where practical, divert sediment-free runoff away from the basin.

A skimmer is a mechanical basin dewatering control device that withdraws water from the basin's water surface. Due to using only the highest quality water for discharge, the skimmer is the most effective dewatering device. A skimmer is shown in Figure 6.64a. By properly using the skimmer's control orifice, the skimmer can be made to dewater a designated volume (based on precipitation) in a desired time. The orifice controls water retention. Frequently, it should be carefully calibrated water connections, if time is necessary, that can withstand the expected flows. The orifice should be placed far from the inlet of the basin to promote the maximum sedimentation before discharge. The spillway should be located on natural groundwater to the greatest extent possible.

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8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJC
CHECKED BY: MG

VERT: 1"=4'
HORZ: NTS
(NOT TO SCALE)

EROSION CONTROL DETAILS

C-5.6

The area of basin a skimmer selects are stable, or incrementally less, than a conventional rock outlet or perforated riser. However, the basin is more efficient in removing sediments. Another advantage of the skimmer is that it can be reused on future projects. The main disadvantage of the skimmer is that it does require frequent maintenance, periodically to removing debris from the inlet.

A skimmer must dewater the basin from the top of the water surface. The rate of dewatering must be considered. A dewatering time of 3-5 days is required. **Any skimmer design that dewaters from the surface at a controlled rate is acceptable.**

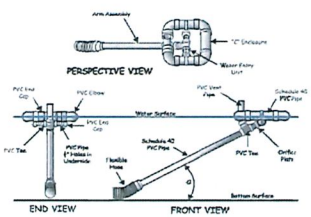

Figure 6.64a Schematic of a skimmer. from Pennsylvania Erosion and Sediment Pollution Control Manual, March, 2000.

6.64

SKIMMER SEDIMENT BASIN

Definition An earthen embankment suitably located to capture runoff, with a trapezoidal spillway lined with an impermeable geotextile or laminated plastic membrane, and equipped with a floating skimmer for dewatering.

Purpose Sediment basins are designed to provide an area for runoff to pool and settle out a portion of the sediment carried down gradient. Past designs used a perforated riser for dewatering, which allowed water to leave the basin from all depths. One way to improve the sediment capture rate is to have an outlet which dewaters the basin from the top of the water column where the water is clearest. A skimmer is probably the most common method to dewater a sediment basin from the surface. The basic concept is that the skimmer does not dewater the basin as fast as runoff enters it, but instead allows the basin to fill and then slowly drain over hours or days. This process has two effects. First, the sediment in the runoff has more time to settle out prior to discharge. Second, a pool of water forms early in a storm event and this further increases sedimentation rates in the basin. Many of the storms will produce more volume than the typical sediment basin capacity and flow rates in excess of the skimmer capability, resulting in flow over the emergency spillway. This water is also coming from the top of the water column and has thereby been "treated" to remove sediment as much as possible. (Adapted from Sediflux: Dewatering Sediment Basins Using Surface Outlets. N. C. State University, Soil Science Department.)

Conditions Where Practice Applies Skimmer sediment basins are needed where drainage areas are too large for temporary sediment traps. Do not locate the skimmer sediment basin in intermittent or perennial streams.

Planning Considerations Select locations for skimmer basins during initial site evaluation. Install skimmer sediment basins before any site grading takes place within the drainage area.

Select skimmer sediment basin sites to capture sediment from all areas that are not treated adequately by other sediment control measures. Always consider access for cleanout and disposal of the trapped sediment. Locations where a pond can be formed by constructing a low dam across a natural swale are generally preferred to sites that require excavation. Where practical, divert sediment-free runoff away from the basin.

A skimmer is a sedimentation basin dewatering control device that withdraws water from the basin's water surface, thus removing the highest quality water for delivery to the uncontrolled environment. A skimmer is shown in Figure 6.64a. By properly sizing the skimmer's control orifice, the skimmer can be made to dewater a design hydrologic event in a prescribed period. Because the spillway is actually used relatively frequently, it should be carefully stabilized using geotextiles, or rock if necessary, that can withstand the expected flows. The spillway should be placed as far from the inlet of the basin as possible to maximize sedimentation before discharge. The spillway should be located in natural groundcover to the greatest extent possible

The desired dewatering time can also be achieved by adjusting the skimmer size and orifice diameter using the spreadsheet certified "Sediment Control Measures", which is available at http://portal.ncdot.org/ncbi/links

Figure 6.64b Example Excel Spreadsheet

4	Skimmer Size (inches)
0.333	Head on Skimmer (feet)
2.25	Orifice Size (1/4 in increment)
2.96	Dewatering Time (days)

Skimmer Size (inches)	Head on Skimmer (feet)
1.5	0.125
2	0.167
2.5	0.208
3	0.25
4	0.333
5	0.333
6	0.417
8	0.5

Adapted from training materials developed by Albert R. Jarrett, Ph.D. for Erosion and Sediment Control/Stormwater Certification for NC DOT Projects Level IIIA and IIIB, N.C. State University, Department of Biological and Agricultural Engineering, 2007.

Design Criteria

Summary:	Skimmer Sediment Basin
Primary Spillway:	Trapezoidal spillway with impermeable membrane
Maximum Drainage Area:	10 acres
Minimum Volume:	1800 cubic feet per acre of disturbed area
Minimum Surface Area:	325 square feet per cfs of Q_p peak inflow
Minimum L/W Ratio:	2:1
Maximum L/W Ratio:	6:1
Minimum Depth:	2 feet
Dewatering Mechanism:	Skimmer
Minimum Dewatering Time:	2 days
Baffles Required:	3 baffles*

(*Omit Baffles if less than 25 feet or length-to-width ratio is less than 2:1)

Drainage area—Limit drainage areas to 10 acres.

Design basin life—Ensure a design basin life of 3 years or less.

Dam height—Limit dam height to 5 feet.

Basin location—Select areas that:

- Provide capacity for storage of sediment from as much of the planned disturbed area as practical;
- Exclude runoff from undisturbed areas where practical;
- Provide access for sediment removal throughout the life of the project
- Interfere minimally with construction activities.

Basin shape—Ensure that the flow length to basin width ratio is at least 2:1 to improve trapping efficiency. Length is measured at the elevation of the principal spillway.

Storage volume—Ensure that the sediment storage volume of the basin, as measured at the elevation of the crest of the principal spillway, is at least 1,800 cubic feet per acre for the disturbed area draining into the basin (3,600 cubic feet is equivalent to half an inch of sediment per acre of basin disturbed area).

Remove sediment from the basin when approximately one-half of the storage volume has been filled.

Spillway capacity—The spillway system must carry the peak runoff from the 10-year storm with a minimum 1 foot of freeboard in the spillway. Base runoff computations on the disturbed soil cover conditions expected during the effective life of the structure.

Sediment clean-out elevation—Determine the elevation at which the invert of the basin would be half-full. This elevation should also be marked in the field with a permanent stake set at this ground elevation (set the top of the stake).

6.64

SKIMMER SEDIMENT BASIN

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Conditions Where Practice Applies Skimmer sediment basins are needed where drainage areas are too large for temporary sediment traps. Do not locate the skimmer sediment basin in intermittent or perennial streams.

Planning Considerations Select locations for skimmer basins during initial site evaluation. Install skimmer sediment basins before any site grading takes place within the drainage area.

Select skimmer sediment basin sites to capture sediment from all areas that are not treated adequately by other sediment control measures. Always consider access for cleanout and disposal of the trapped sediment. Locations where a pond can be formed by constructing a low dam across a natural swale are generally preferred to sites that require excavation. Where practical, divert sediment-free runoff away from the basin.

A skimmer is a sedimentation basin dewatering control device that withdraws water from the basin's water surface, thus removing the highest quality water for delivery to the uncontrolled environment. A skimmer is shown in Figure 6.64a. By properly sizing the skimmer's control orifice, the skimmer can be made to dewater a design hydrologic event in a prescribed period. Because the spillway is actually used relatively frequently, it should be carefully stabilized using geotextiles, or rock if necessary, that can withstand the expected flows. The spillway should be placed as far from the inlet of the basin as possible to maximize sedimentation before discharge. The spillway should be located in natural groundcover to the greatest extent possible

- Dewatering—Allow the materials reasonable detention period before the basin is completely emptied (at least 48 hours).
- Inflow rate—Evaluate the inflow velocity and divert all sediment-free runoff.

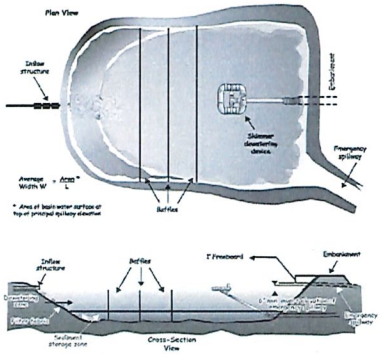

Figure 6.64c Example of a sediment basin with a skimmer outlet and emergency spillway. From Pennsylvania Erosion and Sediment Pollution Control Manual, March, 2000.

Construction Specifications

1. Clear, grub, and strip the area under the embankments of all vegetation and root mat. Remove all surface soil containing high amounts of organic matter and stockpile or dispose of it properly. Hand all unsuitable material to the designated disposal area. Place temporary sediment control measures below basin as needed.

2. Ensure that fill material for the embankment is free of roots, woody vegetation, organic matter, and other objectionable material. Place the fill in lifts not to exceed 9 inches, and machine compact it. Over fill the embankment 6 inches to allow for settlement.

3. Shape the basin to the specified dimensions. Prevent the skimming device from settling into the mud by excavating a shallow pit under the skimmer or providing a low support under the skimmer of stone or timber.

4. Place the barrel (typically 6inch Schedule 40 PVC pipe) on a firm, smooth foundation of compacted soil. Do not use permeable material such as sand, gravel, or crushed stone as backfill around the pipe. Place the fill material around the pipe spillway in 6inch layers and compact it under and around the pipe to at least the same density as the adjacent embankment. Care must be taken not to raise the pipe from the firm contact with its foundation when compacting under the pipe haunches.

Place a minimum depth of 2 feet of compacted backfill over the pipe spillway before crossing it with construction equipment. In no case should the pipe conduit be installed by cutting a trench through the dam after the embankment is complete.

5. Assemble the skimmer following the manufacturers instructions, or as designed.

6. Lay the assembled skimmer on the bottom of the basin with the flexible joint at the inlet of the barrel pipe. Attach the flexible joint to the barrel pipe and position the skimmer over the excavated pit or support. Be sure to attach a rope to the skimmer and anchor it to the side of the basin. This will be used to pull the skimmer to the side for maintenance.

7. Earthen spillway—Install the spillway in undisturbed soil to the greatest extent possible. The achievement of planned elevations, grade, design width and entrance and exit channel slopes are critical to the successful operation of the spillway. The spillway should be lined with laminated plastic or impermeable geotextile fabric. The fabric must be wide and long enough to cover the bottom and sides and extend over the top of the dam for anchoring in a trench. The edges may be secured with bench staples or pins. The fabric must be long enough to extend down the slope and past onto stable ground. The width of the fabric must be one piece, not joined or spliced, otherwise water can get under the fabric. If the length of the fabric is insufficient for the entire length of the spillway, multiple sections, spanning the complete width, may be used. The upper sections(s) should overlap the lower sections(s) so that water cannot flow under the fabric. Secure the upper edge and sides of the fabric in a trench with staples or pins. (Adapted from "A Manual for Designing, Installing and Maintaining Skimmer Sediment Basins." February, 1999. J. N. Fawcett & Sons.)

8. Inlet—Discharge water into the basin in a manner to prevent erosion. Use temporary slope drains or diversions with outlet protection to divert sediment-laden water to the upper end of the pool area to improve basin trap efficiency (Reference: *Runoff Control Measures and Outlet Protections*).

9. Erosion control—Construct the structure so that the disturbed area is minimized. Divert surface water away from bare areas. Complete the embankment before the area is cleared. Stabilize the emergency spillway embankment and all other disturbed areas above the crest of the principal spillway immediately after construction (Reference: *Surface Stabilization*).

10. Install porous baffles as specified in Practice 6.65, *Porous Baffles*.

11. After all the sediment-producing areas have been permanently stabilized, remove the structure and all the unstable sediment. Smooth the area to blend with the adjoining areas and stabilize properly (Reference: *Surface Stabilization*).

Maintenance Inspect skimmer sediment basins at least weekly and after each significant (one-half inch or greater) rainfall event and repair immediately. Remove sediment and restore the basin to its original dimensions when sediment accumulates to one-half the height of the first baffle. Pull the skimmer to one side so that the sediment underneath it can be excavated. Excavate the sediment from the entire basin, and just around the skimmer or the first pool. Make sure vegetation growing in the bottom of the basin does not hold down the skimmer.

Repair the baffles if they are damaged. Remember the baffles if water is flowing underneath or around them.

If the skimmer is clogged with trash and there is water in the basin, usually jerking on the rope will make the skimmer bob up and down and dislodge the debris and restore flow. If this does not work, pull the skimmer over to the side of the basin and remove the debris. Also check the orifice inside the skimmer to see if it is clogged; if so remove the debris.

If the skimmer arm or barrel plug is clogged, the orifice can be removed and the obstruction cleared with a plumber's snake or by flushing with water. Be sure and replace the orifice before repositioning the skimmer.

Check the fabric lined spillway for damage and make any required repairs. Replace the fabric if more than 25 percent of the spillway surface is damaged. Check the embankment, spillways, and outlet for erosion damage, and inspect the embankment for piping and settlement. Make all necessary repairs immediately. Remove all trash and other debris from the skimmer and pool areas.

Freezing weather can result in ice forming in the basin. Some special precautions should be taken in the winter to prevent the skimmer from plugging with ice.

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043158 JOHN L. CRESSLER

8/4/2021

PROJECT

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

LANDDESIGN PROJECT 1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

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HORZ: NTS

(NOT TO SCALE)

SHEET TITLE

EROSION CONTROL DETAILS

SHEET NUMBER

C-5.7

8/5/2021 8:24 AM RGRR PLAN_V1_J:\LANDDESIGN\DOCUMENTS\CAD\1020319_DT\EROSION CONTROL.DWG

Reference

Jarett, A. R. Proper Notice of the Current Online for the Fairchild Skimmer. Pennsylvania State University Department of Agricultural and Biological Engineering Fact Sheet #252. http://www.age.psu.edu/extension/factsheets/F/F252.pdf

Jarett, A. R. Controlling the Dewatering of Sedimentation Basins. Pennsylvania State University Department of Agricultural and Biological Engineering Fact Sheet #253. http://www.age.psu.edu/extension/factsheets/F/F253.pdf

Erosion and Sediment Pollution Control Manual, March, 2000. Commonwealth of Pennsylvania Dept. of Environmental Protection, Office of Water Management, Document #363-2134-008. http://www.dep.state.pa.us/dep/deputate/watershed/wm/ESCMan/ESCMan.htm

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A Manual for Designing, Installing and Maintaining Skimmer Sediment Basins. February, 1999. F. W. Faircloth & Son.

Surface Stabilization
- 6.10, Temporary Seeding
- 6.11, Permanent Seeding
- 6.12, Sodding
- 6.13, Trees, Shrubs, Vines, and Ground Covers

Runoff Control Measures
- 6.20, Temporary Diversions
- 6.21, Permanent Diversions
- 6.22, Perimeter Dike

Outlet Protection
- 6.41, Outlet Stabilization Structure

Sediment Traps and Barriers
- 6.65, Porous Baffles

Appendices
- 6.01, Earthwork Runoff
- 6.02, Sediment Basin Design

6.65 POROUS BAFFLES

Definition

Porous barriers installed inside a temporary sediment trap, skimmer basin, or sediment basin to reduce the velocity and turbulence of the water flowing through the measure, and to facilitate the settling of sediment from the water before discharge.

Purpose

Sediment traps and basins are designed to temporarily pool runoff water to allow sediment to settle before the water is discharged. Unfortunately, they are usually not very efficient due to high turbulence and "short-circuiting" flows which take runoff quickly to the outlet with little attention with most of the basin. Porous baffles improve the rate of sediment retention by distributing the flow and reducing turbulence. This process can improve sediment retention.

Conditions Where Practice Applies

This practice should be used in any temporary sediment trap, skimmer basin, or temporary sediment basin.

Planning Considerations

Porous baffles effectively spread the flow across the entire width of a sediment basin or trap. Water flows through the baffle material, but is slowed sufficiently to back up the flow, causing it to spread across the entire width of the baffle (Figure 6.65a).

Spreading the flow in this manner utilizes the full cross section of the basin, which in turn reduces flow rates or velocity as much as possible. In addition, the turbulence is also greatly reduced. This combination increases sediment deposition and retention and also decreases the particle size of sediment captured.

The installation should be similar to a silt fence (Figure 6.65b). The fabric should be 700 g/m² coir erosion blanket (Figure 6.55c) or equal. A support wire across the top will help prevent excessive sagging if the material is attached to it with appropriate ties.

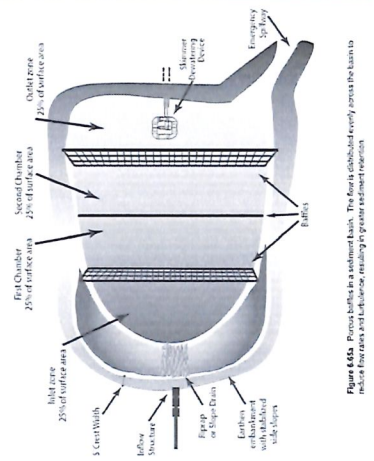
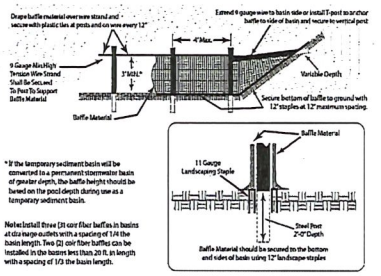


Figure 6.65a Porous baffles in a sediment basin. The flow is distributed evenly across the basin to reduce flow rates and turbulence, resulting in greater sediment retention

baffles need to be installed correctly in order to fully provide their benefits. Refer to Figure 6.65b and the following key points:

- The baffle material needs to be secured at the bottom and sides using staples.
- Most of the sediment will accumulate in the first bay, so this should be readily accessible for maintenance.



*If the temporary sediment basin will be converted to a permanent stormwater basin of greater depth, the baffle height should be based on the pool depth during use as a temporary sediment basin.

Note: Install three (3) coir fiber baffles in basins at dia.inlet outlets with a spacing of 1/4 the basin length. Two (2) coir fiber baffles can be installed in the basins less than 20 ft. in length with a spacing of 1/3 the basin length.

Figure 6.65b Coir Fiber Baffle Detail
Cross section of a porous baffle in a sediment basin.

Figure 6.65c Example of porous baffles made of 700 g/m² coir erosion blanket as viewed from the outlet.

Figure 6.65d Close-up of a porous baffle.

Design Criteria

The temporary sediment trap or temporary sediment basin should be sized using the appropriate design criteria.

The percent of surface area for each section of the baffle is as follows:
- inlet zone: 25%
- first cell: 25%
- second cell: 25%
- outlet zone: 25%

Baffle spacing in future permanent stormwater basins is beyond forebys.

Be sure to construct baffles up the sides of the trap or basin banks so water does not flow around the structures. Most of the sediment will be captured in the inlet zone. Smaller particle size sediments are captured in the later cells. Be sure to maintain access to the trap for maintenance and sediment removal.

The design life of the fabric is 6-12 months, but may need to be replaced more often if damaged or clogged.

Construction Specifications

MATERIALS

1. Use matting made of 100% coconut fiber (coir) twine woven into high strength matrix with the properties shown in Table 6.65a.

2. Staples should be made of 0.125 inch diameter new steel wire formed into a 'U' shape not less than 12 inches in length with a throat of 1 inch in width. The staples anchor the porous baffles into the sides and bottom of the basin.

3. Ensure that steel posts for porous baffles are of a sufficient height to support baffles at desired height. Posts should be approximately 1-3/8" wide measured parallel to the fence, and have a minimum weight of 1.25 lb/linear ft. The posts must be equipped with an anchor plate having a minimum area of 14.0 square inches and be of the self-fastener angle steel type to have a means of retaining wire and coir fiber mat in the desired position without displacement.

4. Use 9-gauge high tension wire for support wire.

Table 6.65a Specifications for Porous Baffle Material

Coir Fiber Baffle Material Property Requirements	
Thickness	0.30 in. minimum
Tensile Strength (Wet)	900 x 680 lb/ft minimum
Elongation (Wet)	80% x 34% maximum
Flow Velocity	10-12 ft/sec
Weight	20 oz/SY (680 g/m²) minimum
Minimum Width	6.6 feet
Open Area	50% maximum

CONSTRUCTION

1. Grade the basin so that the bottom is level from to back and side to side.

2. Install the coir fiber baffles immediately upon excavation of the basins.

3. Install posts across the width of the sediment trap (Practice 6.62, *Sediment Fence*).

4. Steel posts should be driven to a depth of 24 inches and spaced a maximum of 4 feet apart. The top of the fabric should be a minimum of 6 inches higher than the invert of the spillway. Tops of baffles should be a minimum of 2 inches lower than the top of the earthen embankment.

5. Install at least three rows of baffles between the inlet and outlet discharge point. Basins less than 20 feet in length may use 2 baffles.

6. Attach a 9 gauge high tension wire strand to the steel posts at a height of 6 inches above the spillway elevation with plastic ties or wire fasteners to prevent sagging. If the temporary sediment basin will be converted to a permanent stormwater basin of a greater depth, the baffle height should be based on the pool depth during use as a temporary sediment basin.

7. Extend 9 gauge minimum high tension wire strand to side of basin or install steel T-posts to anchor baffle to side of basin and secure to vertical end posts as shown in Figure 6.65b.

8. Drape the coir fiber mat over the wire strand mounted at a height of 6 inches above the spillway elevation. Secure the coir fiber mat to the wire strand with plastic ties or wire fasteners. Anchor the matting to the sides and floor of the basin with 12 inch wire staples, approximately 1 ft apart, along the bottom and side slopes of the basin.

9. Do not splice the fabric, but use a continuous piece across the basin

10. Adjustments may be required in the stapling requirements to fit individual site conditions.

Maintenance

Inspect baffles at least once a week and after each rainfall. Make any required repairs immediately.

Be sure to maintain access to the baffles. Should the fabric of a baffle collapse, tear, decompose, or become ineffective, replace it promptly.

Remove sediment deposits when it reaches half full, to provide adequate storage volume for the next rain and to reduce pressure on the baffles. Take care to avoid damaging the baffles during cleanout, and replace if damaged during cleanout operations. Sediment depth should never exceed half the designed storage depth.

After the contributing drainage area has been properly stabilized, remove all baffle materials and unstable sediment deposits, bring the area to grade, and stabilize it.

References

Sediment Traps and Barriers
- 6.61, Temporary Sediment Trap
- 6.61, Sediment Basins
- 6.62, Sediment Fence
- 6.64, Skimmer Sediment Basin

McLaughlin, Richard, "Soil Facts: Baffles to Improve Sediment Basins." N.C. State University Cooperative Extension Service Fact Sheet AGW-439-59, 2005.

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6.21 PERMANENT DIVERSIONS

Definition

A permanent ridge or channel or a combination ridge and channel constructed on a designed grade across sloping land.

Purpose

To divert water from areas where it is in excess to locations where it can be used or released without erosion or flood damage.

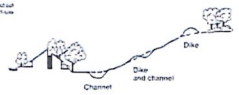
Conditions Where Practice Applies

This permanent site development practice applies to construction areas where runoff can be diverted and used or disposed of safely to prevent flood damage or erosion and sedimentation damage. Specific locations and conditions include:
- above steep slopes to limit surface runoff onto the slope;
- across long slopes to reduce slope length to prevent gully erosion;
- below steep grades where flooding, seepage problems, or sediment deposition may occur;
- around buildings or areas that are subject to damage from runoff.

Planning Considerations

Permanent diversions should be planned as a part of initial site development. They are principally runoff control measures that subdivide the site into specific drainage areas (Figure 6.21a). Permanent diversions can be installed as temporary diversions until the site is stabilized then completed as a permanent measure, or they can be installed in final form during the initial construction operation (Practice 6.20, *Temporary Diversions*). The amount of sediment generated and the maintenance required as a result of construction operations will determine which approach should be used. Stabilize permanent diversions with vegetation or materials such as riprap, paving stone, or concrete as soon as possible after installation. Base the location, type of stabilization, and diversion configuration on final site conditions. Evaluate function, scour, velocity control, outlet stability, and site aesthetics. When properly located, land forms such as landscape islands, swales or ridges can be used effectively as permanent diversions. Base the capacity of a diversion on the runoff characteristics of the site and the potential damage after development. Consider designing an emergency overflow section or bypass area to limit damage from storms that exceed the design storm. The overflow section may be designed as a weir with riprap protection.

Figure 6.21a Use of diversions to protect out of fill slopes, protect structures or off-site property, or break long slopes.



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8/4/2021

PROJECT

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

LANDDESIGN PROJECT 1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT: 1"=4'
HORZ: NTS
(NOT TO SCALE)

SHEET TITLE

EROSION CONTROL DETAILS

SHEET NUMBER

C-5.8

6.65 POROUS BAFFLES

Definition Porous barriers installed inside a temporary sediment trap, skimmer basin, or sediment basin to reduce the velocity and turbulence of the water flowing through the structure, and to facilitate the settling of sediment from the water before discharge.

Purpose Sediment traps and basins are designed to temporarily pool runoff water to allow sediment to settle before the water is discharged. Unfortunately, they are usually not very efficient due to high turbulence and "short-circuiting" flows which take runoff quickly to the outlet with little interaction with most of the basin. Porous baffles improve the rate of sediment retention by distributing the flow and reducing turbulence. This process can improve sediment retention.

Conditions Where Practice Applies This practice should be used in any temporary sediment trap, skimmer basin, or temporary sediment basin.

Planning Considerations Porous baffles effectively spread the flow across the entire width of a sediment basin or trap. Water flows through the baffle material, but is slowed sufficiently to back up the flow, causing it to spread across the entire width of the baffle (Figure 6.65a).

Spreading the flow in this manner utilizes the full cross section of the basin, which in turn reduces flow rates or velocity as much as possible. In addition, the turbulence is also greatly reduced. This combination increases sediment deposition and retention and also decreases the particle size of sediment captured.

The installation should be similar to a sediment fence (Figure 6.65b). The fabric should be 700 gm² *erosion* blanket (Figure 6.65c) or equal. A support wire across the top will help prevent excessive sagging if the material is attached to it with appropriate ties.

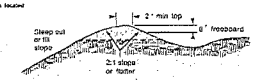
Construction Specifications

1. Remove and properly dispose of all trees, brush, stumps, or other objectionable material. Fill and compact all ditches, swales, or gullies that will be crossed to natural ground level or above.

2. *Just* before placement of fill, the base of the ridge should be divided by machinery.

3. Excavate, shape, and stabilize the diversion to line, grade, and cross section, as required in the design plan (Figure 6.20b)

Figure 6.20b Permanent diversion located above a slope.



4. Compact the ridge to prevent unequal settlement, and to provide stability against seepage.

5. Vegetatively stabilize the diversion after its installation.

Maintenance Inspect permanent diversions after every rainfall during the construction operation. Immediately remove any obstructions from the flow area, and repair the diversion ridge. Check outlets, and make timely repairs as needed. Maintain the vegetation in a vigorous, healthy condition at all times.

References

Surface Stabilization
6.10, Temporary Seeding
6.11, Permanent Seeding
6.14, Mulching

Runoff Control Measures
6.20, Temporary Diversions

Outlet Protection
6.40, Level Spreader
6.41, Outlet Stabilization Structure

Sediment Traps and Barriers
6.60, Temporary Sediment Trap
6.61, Sediment Basin

Appendices
8.03, Estimating Runoff
8.05, Design of Stable Channels and Diversions

Channel design— steep: parabolic, trapezoidal, or V-shaped
side slope: 2:1 or flatter
3:1 or flatter where vehicles cross

Grades— Either a uniform or a gradually increasing grade is preferred. Sudden decreases in grade accumulate sediment and should be expected to cause overtopping. A large increase in grade may erode.

Outlet—Design the outlet to accept flow from the diversion plus any other contributing areas. Divert undistributed runoff and release through a sediment-trapping device (Practice 6.60, *Temporary Sediment Trap* and Practice 6.61, *Sediment Basin*). Flow from undisturbed areas can be dispersed by a level spreader (Practice 6.40, *Level Spreader*).

Small diversions—Where the diversion channel grade is between 0.2 and 3%, a permanent vegetative cover is required. A parabolic channel and ridge 1.5 feet deep and 12 feet wide may be used for diversions with flows up to 5 cfs. This depth does not include freeboard or settlement. Side slopes should be 3:1 or flatter, and the top of the dike must be at least 2 feet wide.

Construction Specifications

1. Remove and properly dispose of all trees, brush, stumps, and other objectionable material.

2. Ensure that the top of the dike is not lower at any point than the design elevation plus the specified settlement.

3. Ensure that the top of the dike is not lower at any point than the design elevation plus the specified settlement.

4. Provide sufficient room around diversions to permit machine topsoiling and elevated.

5. Vegetate the ridge immediately after construction, unless it will remain in place less than 30 working days.

Maintenance Inspect temporary diversions once a week and after every rainfall. Immediately remove sediment from the flow area and repair the diversion ridge. Carefully check outlets and make timely repairs as needed. When the area protected is permanently stabilized, remove the ridge and the channel to blend with the natural ground level and appropriately stabilize it.

References

Surface Stabilization
6.10, Temporary Seeding
6.11, Permanent Seeding
6.14, Mulching

Outlet Protection
6.40, Level Spreader
6.41, Outlet Stabilization Structure

Sediment Traps and Barriers
6.60, Temporary Sediment Trap
6.61, Sediment Basin

Appendices
8.03, Estimating Runoff
8.05, Design of Stable Channels and Diversions

6.11 PERMANENT SEEDING

PS

Definition Establishing runoff and erosion on disturbed areas by establishing perennial vegetative cover with seed.

Purpose To reduce erosion and decrease sediment yield from disturbed areas, to permanently stabilize such areas in a manner that is compatible with adjacent conditions, and allow selection of the most appropriate plant materials.

Conditions Where Practice Applies Any graded area on which permanent, long-lived vegetative cover is the most practical or most effective method of stabilizing the soil. Permanent seeding may also be used on rough graded areas that will not be brought to final grade for a year or more.

Areas to be stabilized with permanent vegetation must be seeded or planted within 15 working days or 90 calendar days after final grade is reached, unless temporary stabilization is applied.

Introduction During previous phases of clearing, grading, excavating, the protective cover, often natural or manmade, is removed from the earth's surface. As the protective layer is removed, the resulting bare areas are exposed to the natural forces of rainfall, freezing, thawing, and wind. The result is soil erosion that leads to sediment pollution of North Carolina streams, rivers, lakes, and estuaries.

This design manual presents many alternative strategies for preventing erosion and reducing sediment loss during the construction process. Foremost among of protective vegetative cover during the construction process, however, is the crucial aim to achieving soil stabilization, control the soil erosion, and preventing sediment pollution of streams. Without vegetation or other protective and cover exposed and bare soil in place, large volumes of soil will be lost and waterways will be degraded by silt after project completion.

Sections of this practice standard address many of these various measures and set forth adequate criteria for the appropriate use of based on purpose and adaptability. Some sediment and erosion control practices recommended in earlier editions of the manual may no longer be applicable. For example, many popular and commonly used seed and plant varieties have been identified as invasive. Invasive plants are defined as species that aggressively outgrow, wilt, and displace, locally accepted native plant communities. In select cases where no practical alternative is available, these plants may be considered on a limited basis for soil stabilization, understanding that the goal is to eliminate the use of all invasive plants in favor of non-invasive native and/or introduced species that will provide an equally acceptable vegetative cover. Where there is no alternative to the use of an invasive species, measures need to be incorporated in the installation and maintenance of these plants so their than objects.

6.20 TEMPORARY DIVERSIONS

TD

Definition A temporary ridge or excavated channel or combination ridge and channel constructed across sloping land on a predetermined grade.

Purpose To protect work areas from upslope runoff, and to divert sediment-laden water to appropriate traps or stable outlets.

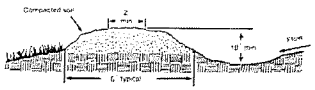
Conditions Where Practice Applies This practice applies to construction areas where runoff can be diverted and disposed of properly to prevent erosion, and sedimentation, or flood damage. Specific locations and conditions include:

- above disturbed or erosive areas, and above cut or fill slopes to prevent runoff from the slope;
- across unprotected slopes, as slope breaks, to reduce slope length;
- across slopes in areas excess runoff to stabilized outlets;
- where needed to divert sediment-laden water to sediment traps;
- at or near the perimeter of the construction area to keep sediment from exiting the site; and
- above disturbed areas before stabilization measures are in place, and maintain acceptable working conditions.
- Temporary diversions may also serve as sediment traps when the side has been constructed on a flat grade, they may also be used in conjunction with a sediment fence.

Planning Considerations It is important that diversions are properly designed, constructed, and maintained since they concentrate water flow and increase erosion potential (Figure 6.20a). Particular care must be taken in planning diversion grades. Too much slope can result in erosion, velocity of the diversion channel or at the outlet. A minimum of slope limits storage ponds to flatter may cause deposition to occur. The deposition reduces storage capacity, and may cause overtopping and failure. Frequent inspection and timely maintenance are essential to the proper functioning of diversions.

Sufficient area must be available for construction and properly maintain diversions. It is usually less costly to excavate a channel and form a ridge or place on the

Figure 6.20a Temporary earthen diversion dike



Impermeable disturbed soils behind protective (bioretention) and sediment low during construction and before a project is considered complete and acceptable. Installing appropriate vegetation maintained and conditionally fashion is the optimal means of achieving this stabilization. Vegetative specifications for most exposed soil conditions across North Carolina are provided in this section of the manual. It should be noted however, that no two sites in the State are exactly alike; therefore the protective vegetative cover for individual sites should be carefully selected. Each requires its own investigation, analysis, design and vegetative prescription as set forth in this section of the manual.

This practice standard describes three stages of vegetative cover; immediate, primary and long term. Effective and acceptable stabilization can be provided only when the optimum combination of immediate, primary, and long term vegetative practices are applied.

The vegetative measures presented in this chapter include application of seed, and and sprigs. Use of field and container grown plants are not addressed in this manual. Planting of these types of vegetation is typically at spacing and intervals that will not provide the required protective cover. However, the design professional is encouraged to utilize these larger plants to complement the required protective cover, particularly where these types of plants will provide seed for continued long term cover and wildlife habitat.

PLANNING CONSIDERATIONS

SOILS

Test and analyze the type(s) and quality of the existing soils on a site, their pH ranges, and their nutrient levels. Taking soil samples from the different areas of the project site and having them tested at a state or independent lab will provide a baseline for determining the pH modifiers and additional nutrients required for the selected plant varieties.

Disturbed conditions on a site may produce a variety of soil conditions. Nutrient and pH levels or deeply cut soils will be quite different from those soils found on the original surface. When sites are highly disturbed through mechanical means such as grading, the soils became mixed together in states different layers. These areas should be identified and tested.

Results from soil tests will usually include recommended application rates of soil modifiers such as lime and fertilizer for the selected plant species in the particular soils. Application rates will be provided in the report.

The texture of the soil on a site, which is the proportion of sand, silt, and clay in the soil, is an important physical indicator of the site's ability to support vegetation. In heavy clay soils amendments may be necessary to provide an adequately drained planting medium. Conversely, in extremely sandy soils, amendments may be required to provide for moisture and nutrient retention.

downhill side to the spoil than to build embankments by other methods. Where space is limited, it may be necessary to build the ridge by hauling in other material as many as will fence to divert the flow. Use gravel to form the downhill side when vehicles must cross frequently (Figure 6.20d).

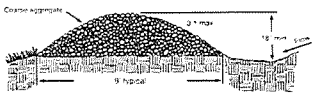


Figure 6.20d Temporary gravel diversion dike for vehicle crossing (modified from NC DWQ).

Place temporary diversions to function 1 year or more, or they may be constructed now at the end of a holiday or grading operation to protect over-fall. Diversions that are needed for more than 30 working days should be seeded and mulched as soon as they are constructed to preserve side height and reduce maintenance.

Where design velocities exceed 2.5 fps, a channel liner is usually necessary to prevent erosion (table 8.05a, Appendix 8.05).

Temporary diversions may serve as in-place sediment traps if constructed 1 to 2 feet and placed on a nearly flat grade. The dike serves as dam, which acts as the slope increases. A combination dike/levee and channel in which fill from the channel is used to stabilize the fence can trap sediment and divert runoff simultaneously.

Whenever feasible, build and stabilize diversions and outlets before removing other landdisturbing activities.

Design Criteria

Drainage area – 5 acres or less.

Capacity – peak runoff from 10-year storm.

Velocity – see Table 8.05a, Permissible Velocities for Human Protection, Appendix 8.05.

Ridge design – side slope: 2:1 or flatter
3:1 or flatter at points where cross
top width: 2 ft minimum
freeboard: 0.3 ft minimum
settlement: 10% of total fill height minimum

MAINTENANCE SCHEDULE:

1. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE CHECKED FOR STABILITY AND OPERATION FOLLOWING EVERY STORM EVENT, BUT IN NO CASE LESS THAN ONCE EVERY WEEK. ANY REPAIRS OR CLEANING NECESSARY TO MAINTAIN EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE COMPLETED IMMEDIATELY.

2. ALL SEEDED AREAS SHALL BE REFERTILIZED, RESEEDED AS NECESSARY, AND MULCHED ACCORDING TO THE SEEDING SCHEDULE.

CONSTRUCTION SEQUENCE NOTE:

LANDDESIGN, INC. DOES NOT INTEND FOR THE CONSTRUCTION SEQUENCING NOTES TO DICTATE NOR TAKE RESPONSIBILITY FOR ACTUAL CONSTRUCTION MEANS, METHODS, TECHNIQUES, PROCEDURES, AND SAFETY PRECAUTIONS WHICH ARE GOVERNED BY LOCAL, STATE AND FEDERAL GUIDELINES. THE CONTRACTOR IS SOLEY RESPONSIBLE FOR ALL CONSTRUCTION RELATED ACTIVITIES ASSOCIATED WITH THIS PROJECT.

CONSTRUCTION SEQUENCE:

1. OBTAIN GRADING/EROSION CONTROL PLAN APPROVAL FROM THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY (NCDEQ).
2. SET UP AN ON-SITE PRE-CONSTRUCTION MEETING WITH EROSION CONTROL INSPECTOR AND OWNER TO DISCUSS EROSION CONTROL MEASURES A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION.
3. PRIOR TO CLEARING OR INSTALLATION OF EROSION CONTROL DEVICES, CONTRACTOR SHALL STAKE CLEARING LIMITS AND STAKE ALL TREES, STRUCTURES TO REMAIN AND BE PROTECTED.
4. INSTALL TEMPORARY CONSTRUCTION ENTRANCE, CONSTRUCTION FENCING, SILT FENCE, SEDIMENT BASIN, TEMPORARY DIVERSION DITCHES, INLET PROTECTION, AND ANY OTHER MEASURES AS SHOWN ON THIS SHEET. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES AND STABILIZE SEDIMENT BASIN IMMEDIATELY AFTER INSTALLATION. CONTRACTOR SHALL STOCKPILE SOIL FROM BASINS TO USE AS FILL FOR GRADING OPERATIONS (BASED ON DIRECTION FROM THE GEOTECHNICAL ENGINEER).
   NOTE: NO SITE GRADING / CONSTRUCTION SHALL BEGIN UNTIL GRADING PERMIT HAS BEEN ISSUED.
5. UPON APPROVAL OF EC INSPECTOR, REMAINDER OF EC MEASURES TO BE INSTALLED CLEARING ONLY AS NECESSARY TO INSTALL THESE DEVICES. ALL DITCHES SHALL BE STABILIZED WITH MATTING AND SEED PER PLAN IMMEDIATELY AFTER CONSTRUCTION.
6. CONTRACTOR TO BLOCK ALL POSSIBLE ENTRANCES TO SITE BESIDES APPROVED CONSTRUCTION ENTRANCE W/ FENCING AND ORANGE BARRELS.
7. CALL FOR ON-SITE INSPECTION BY INSPECTOR, WHEN APPROVED BY THE INSPECTOR, CLEARING AND GRUBBING MAY BEGIN. THE CONTRACTOR SHALL DILIGENTLY AND CONTINUOUSLY MAINTAIN ALL EROSION CONTROL DEVICES AND STRUCTURES.
8. BEGIN GRADING, INSTALLING ADDITIONAL EROSION CONTROL MEASURES AS INDICATED, AS REQUIRED, AND AS DEEMED NECESSARY BY THE EROSION CONTROL INSPECTOR.
9. ALL AREAS THAT HAVE BEEN CLEARED AND GRUBBED SHALL BE STABILIZED WITH SEED AND STRAW UNTIL THE TIME COMES FOR WORK TO COMMENCE IN THOSE AREAS.
10. NO ADDITIONAL AREAS SHALL BE DISTURBED UNTIL PREVIOUS AREAS HAVE BEEN COMPLETED AND STABILIZED. CONTRACTOR SHALL MEET WITH THE EROSION CONTROL INSPECTOR PRIOR TO MOVING INTO THE NEXT AREA OF CONSTRUCTION.
11. INSTALLATION OF STORM DRAINAGE STRUCTURES SHALL COMMENCE AND CONTRACTOR SHALL INSTALL INLET PROTECTION AS NECESSARY AND AS SHOWN ON PLANS.
12. THE CONTRACTOR SHALL ADJUST EROSION CONTROL MEASURES DURING GRADING AND STORM DRAINAGE STRUCTURES ARE BROUGHT TO FINISHED GRADES.
13. THE CONTRACTOR SHALL DILIGENTLY AND CONTINUOUSLY MAINTAIN ALL EROSION CONTROL DEVICES AND STRUCTURES.
14. STABILIZATION IS THE BEST FORM OF EROSION CONTROL. TEMPORARY SEEDING IS NECESSARY TO ACHIEVE EROSION CONTROL ON LARGE DENUDED AREAS AND ESPECIALLY WHEN SPECIFIED AS PART OF THE CONSTRUCTION SEQUENCE. ALL SLOPES MUST BE SEEDED WITHIN 7 DAYS.
15. ALL EROSION CONTROL DEVICES SHOULD BE CHECKED PERIODICALLY AND AFTER EVERY MAJOR STORM EVENT. IF ANY FAILURES ARE FOUND THEY SHOULD BE REPAIRED AS SOON AS POSSIBLE.
16. THE CONTRACTOR SHALL MAINTAIN CLOSE CONTACT WITH THE EROSION CONTROL INSPECTOR AND LAND DEVELOPMENT EROSION CONTROL ENFORCEMENT AGENT SO THAT PERIODIC INSPECTIONS CAN BE PERFORMED AT APPROPRIATE STAGES OF CONSTRUCTION.
17. NO DEVICE SHALL BE REMOVED UNTIL SITE IS STABILIZED. APPROVAL BY A NCDEQ INSPECTOR MUST ALSO BE OBTAINED PRIOR TO THE REMOVAL OF ANY EROSION CONTROL MEASURES.
18. ALL EROSION CONTROL MEASURES SHOULD BE CHECKED PERIODICALLY AND AFTER EVERY RAINFALL EVENT. REPAIRS SHALL BE MADE IMMEDIATELY AS REQUIRED. INSPECTION AND REPAIR REPORTS SHALL BE KEPT BY THE CONTRACTOR AND PROVIDED TO THE INSPECTOR AND LAND DEVELOPMENT EROSION CONTROL AGENT AS REQUESTED.

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NORTH CAROLINA PROFESSIONAL SEAL 043168 ENGINEER MICHAEL J. FARMER, III

5/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

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(NOT TO SCALE)

EROSION CONTROL DETAILS

C-5.9

Soil tests will indicate the texture of the given soil but will not provide recommendations for amendments that will improve the soil texture. Generally, the addition of organic materials will improve the porosity of heavy clay soils and improve the water holding capacity of extremely sandy soils. On sites where these different soil conditions exist, it is recommended that a design professional with experience in soil modification be employed to recommend the proper amendments.

For more information visit the NCDA Agronomic Services Soil Testing web page http://www.ncagronomic.ncdacs.com

SOIL PREPARATION

Proper soil preparation is necessary for successful seed germination and root establishment. It is also necessary for establishment of sound springs, seed and woody plants. Heavily compacted soils prevent air, nutrients and moisture from reaching roots thereby retarding or preventing plant growth. The success of site stabilization and reduction of future maintenance are dependent on an adequately prepared soil bed. Following are the requirements for preparation of areas to be vegetated by grassing, springing, mulching, and/or planting of woody plants:

General Requirements:

- Preparation for primary/permanent stabilization shall not begin until all construction and utility work within the preparation area is complete. However, it may be necessary to prepare for nurse crops prior to completion of construction and installation of utilities.
- A North Carolina Department of Agriculture Soils Test (or equal) shall be obtained for all areas to be seeded, springsed, mulched or planted. Recommended fertilizer and pH adjusting products shall be incorporated into the prepared area and backfill material per the test.
- Areas to be seeded or planted shall be tillable ripped to a depth specified on the approved plans, construction sequence and/or construction bid list. Ripping consists of crossing theses in a crisscross pattern over the entire surface area, utilizing an implement that will not place the side walls of the furrows. Site preparation that does not comply with these documents shall not be acceptable. The depth of soil preparation may be established in a range based on the approval of the reviewing state or local agency. Once tilled or ripped according to the approved plan, all areas are to be returned to the approved final grade. pH modifiers and/or other soil amendments specified in the soil tests can be added during the soil preparation procedure or as described below.
- All stones larger than three (3) inches in any side, stalks, roots, and other extraneous materials that surface during the bed preparation shall be removed

Areas to be Seeded:

- Till or disc the prepared areas to be seeded to a minimum depth of four (4) inches. Remove stones larger than three (3) inches on any side, stalks, roots and other extraneous materials that surface. If not incorporated during the soil preparation process, add pH modifier and fertilizers at the rate specified in the soil test report.
- Re-compact the area utilizing a cultipacker roller. The finished grade shall be a smooth even soil surface with a loose, uniformly fine texture. All ridges and depressions shall be removed and filled to provide the approved surface drainage. Seeding of graded areas is to be done immediately after finished grades are obtained and seedbed preparation is completed.

Areas to be Springsed, Sodded, and/or Planted:

- At the time of planting till or disc the prepared areas to a depth of four (4) to six (6) inches below the approved finished grade. Remove all stones larger than three (3) inches on any side, stalks, roots and other extraneous materials that surface. If not incorporated in the ripping process, add pH modifier, fertilizer and other recommended soil amendments.
- Re-compact the area utilizing a cultipacker roller and prepare final grades as described above. Install springs, sod and plants as directed immediately after fine grading is complete. Mulch, root and/or tack as specified

VEGETATION

Availability of seed and plant materials is an important consideration of any construction stabilization effort. Throughout North Carolina, climate, economics, construction schedule delays and accelerations, and other factors present difficult challenges in specifying the different vegetation needed for site stabilization. To help resolve this issue, vegetative stabilization requires consideration in three categories:

- Immediate Stabilization – nurse crop varieties (Note: temporary mulching may be utilized for immediate stabilization if outlined on the approved plans and construction sequence.)
- Primary Stabilization – plant varieties providing cover up to 3 years with a specified maintenance program
- Long Term Stabilization – plant varieties providing protective cover with maintenance levels selected by the owner

An adequate job in one of these areas does not guarantee success in the later phases. Horticultural maintenance must be included in the plans.

Immediate vegetative cover will always require additional installation, soil amendments, and seed, mulch, and other horticultural maintenance until primary vegetative cover is established.

Where provisions are made for regular maintenance, primary vegetative cover may be the end result. As an example of primary vegetative cover being acceptable as an end use would be lawns in residential and commercial developments that are established, monitored and complemented with regular and approved horticultural maintenance practices. (See Example 6.11.a.)

In projects where continual maintenance will not be provided or scheduled following the primary stabilization of a project, long-term stabilization will be necessary. Maintenance of immediate vegetative cover must be included in the project construction sequence and on the approved plans. Examples of areas suitable for long term vegetation include roadsides, reforestation areas, industrial flood plains, restored riparian areas, phased closing of landfills, and strategic reclamations.

Complete stabilization requires using at least two, and most times, all three vegetative phases. The design professional must clearly communicate the point in their specifications, construction sequence, and on sheet communications to owners and installers. The charts in tables 6.11a through 6.11.d provide information to assist the design professional in this task. The tables are not inclusive and are presented only as alternatives. The professional is expected and required to provide design and specifications that combine the information in the manual with knowledge of the particular sites and their constraints.

pH AND NUTRIENT AMENDMENTS

Determining the nutrients that enable weed and nonnuisance plants to grow, flourish, and become established after planting are critical elements of the design and stabilization process. The soils tests previously described will provide a recipe for amendments based on particular plants and particular soils. The test results will recommend the amounts of base elements (nitrogen, phosphorous, potassium), pH modifiers and other trace elements that should be added to the soil for related species of seeds and plants.

The acid/base characteristic of the soil is a primary component of soil fertility. If the soil acidity is not in the proper range, other nutrients will be ineffective, resulting in less productive plant growth. Most plants grow best in a pH range of 6.5 – 7.0 (slightly acidic to neutral). The soil tests will recommend the specific amendments and application rates required to achieve this range. These amendments must be incorporated into the soil (not applied on the surface) to be effective. (See the General Requirements for soil preparation specifications and tuning for incorporation of soil amendments.)

The base elements are rarely found in bulk quantities. Lime can also be obtained in large quantities. They all must be thoroughly incorporated into the soil through appropriate mechanical means. Ground surface applications without proper soil tilling will result in poor results.

In addition to the base fertilizers, other trace elements are needed to produce healthy and vigorous growth. These include but may not be limited to sulfur, manganese, zinc, boron, chlorine and molybdenum. If not already included with bulk mixes of the base elements, they can be obtained from commercial suppliers.

Provisions for soils test during and/or after initial grading is complete shall be included on the approved plan, in the approved construction sequence, and on the bid item list utilized for the project. *If you did not obtain a soil test: Follow these recommendations for all grasses except centipedegrass.*

1. Apply 75 pounds of pulverized limestone per 1,000 sq. ft.
2. Apply a starter type fertilizer (one that is high in phosphorous) based on the type of grass and planting method. Fertilizer bags have a three-number system indicating the primary nutrients, such as 8-8-8 or 5-10-10. These numbers denote the N-P-K ratios—the percentages of each nutrient in a fertilizer. The percentages are always stated in the following order:
   N Nitrogen for green color and growth,
   P_2O_5 Phosphorus for good establishment and rooting,
   K_2O Potassium to enhance pest and environmental stress tolerance.

Some common examples of starter type fertilizers required for a 1,000 sq. ft. area include 40 pounds of 5-10-10, 20 pounds of 10-20-20, or 16 pounds of 18-2-6-6. For sandy soils, typical in coastal plain and sandhills of North Carolina, fertilizer rates should be increased by 20 percent.

Where available, it is recommended that the design professional specify organic compounds that meet the fertilization requirements, pH and other element requirements. Initial studies have indicated that these compounds have a more positive effect on the environment than some of the synthetic compounds used in manufacture inorganic fertilizers. These materials are readily available in the commercial trade as well as found in recycled yard waste debris, sewerage sludge, lime-stabilized sludge and animal manures. Materials proposed for use must be industry certified and or privately tested and certified to be acceptable for proposed areas of use and application prior to approval.

MULCHES AND TACKING AGENTS

Mulches and tacking agents may be required or necessary to protect a sediment's disturbed surface until the seed can germinate and provide the required protection from erosion. Selection of the materials used in this application should be based on their ability to hold moisture in the soil, as well as protect exposed soil from rainfall, storm water runoff, and wind. The availability of the selected material and the means to apply it are critical factors to consider when planning for the stabilization of any disturbed area. The mulch must cover a minimum of eighty (80) percent of the soil surface and must be secured by a tacking agent, crimping, or protective biodegradable netting. Netting that incorporates plastic mesh and/or plastic netting should not be used in wetlands, riparian buffers or floodplains due to the potential of small animal mortality. See Section 6.14 for detailed specifications and product applications.

SOIL BLANKETS

Soil blankets can be an acceptable and effective method of temporary sediment and erosion control in lieu of nurse crops. See Section 6.17 of the manual for descriptions of this product and how it can be used in conjunction with this section. In absence of mulches and tacking agents either means of protection may be necessary and required

PROTECTIVE MATTING

Protective matting consists of an impervious cover secured to the soil surface in lieu of vegetative cover. It is used to protect and stabilize the surface where the process of seeding or planting forms of vegetation may cause more erosion and off-site sedimentation from application of the mat. It is also used where a slope(s) area is intended to lay fallow for a period of time before additional construction or land disturbance takes place. If a permanent matting is selected, a combination of vegetation and matting is required. Seeds can be applied prior to installation of the matting only after proper seedbed preparation has been provided. Also, live stakes, dormant springs, and other vegetation forms can be inserted in the permanent matting once it has been installed. Pre-seeded permanent matting may be used for quicker root establishment and stabilization only if certified drainage and germination guarantees are provided. The reviewing agency must approve all pre-seeded matting on site prior to installation. Matting that incorporates plastic mesh and/or plastic netting should not be used in wetlands, riparian buffers or floodplains due to the potential of small animal mortality. See Section 6.17 for detailed specifications and recommended product applications.

STABILIZATION IN WETLANDS, RIPARIAN BUFFERS, AND FLOODPLAINS

Land disturbing activity involving streams, wetlands or other waterbodies may also require permitting by the U.S. Army Corps of Engineers or the N.C. Division of Water Quality. Approval of an erosion and sedimentation control plan is conditioned upon the applicant's compliance with federal and State water quality laws, regulations, and rules. Additionally, t.ebsdf plan should be disapproved if implementation of the plan would result in a violation of rules adopted by the Environmental Management Commission to protect riparian buffers along surface waters. Care should be taken in selecting vegetative stabilization of wetlands and riparian buffers to comply with permitting requirements of other agencies, as well as provide adequate ground cover.

Planning Considerations for Land Disturbing Activities Within Wetland, Riparian, and Floodplain Areas

Wetlands, riparian areas, floodplains, and/or terrestrial areas between streams and uplands, serve to buffer surface water and provide habitat for aquatic and terrestrial flora and fauna. When cleared and disturbed, these sensitive areas are difficult to protect. Because of their proximity to water courses, relatively high ground water tables, and flooding potential, detailed analysis and design is necessary to determine the appropriate erosion control measures during construction. Determining the appropriate and most expeditious means of permanent vegetative stabilization in these areas requires equally detailed analysis and design. The following considerations, for erosion control and stabilization should be taken into account during the design phase of the land disturbing project where sensitive areas are involved:

- Obtain and tests to determine the soil type, pH, texture and available nutrients.
- Based on the soil tests provide a schedule of nutrients and other soil amendments that will be required.

- Select a seeding mix of non-invasive species that will provide immediate stabilization (a short-term environment that will support and complement permanent vegetative stabilization) and include a selective native species mix that will eventually provide a permanent cover (a long-term environment that, with minimal maintenance, will provide adequate root and leaf cover).
- Invasive species are to be avoided. If native species and introduced non-invasive seed sources are not available, protective matting that will hold and foster the development of native cover from adjacent seed sources should be used. Continuous maintenance must be employed until the selected species have matured and are no longer susceptible to competition from invasive plants. If no alternative to the use of invasive seeds and plants is available, invasives approved on the plans must be utilized only with strict containment measures outlined in detail on the plans, in the construction sequence and in the maintenance specifications.
- A quickly germinating nurse crop of non-invasive, non-competitive annual grass species can be used along with native seeding and/or matting. These temporary species should be planted at minimal density so that they do not inhibit the growth and establishment of the permanent, native species. (See the plant sheet in Table 6. 1.a for recommended native and nurse crop species.)
- Seedbed preparation is key to successful establishment of seeds. Particular care should be taken, however, when working in wetlands, riparian areas, or floodplains due to their sensitive nature. Careful considerations should be given to the types and placement of large equipment working in these areas. This process must be outlined in detail on the plan's construction sequence.
- Installation techniques vary and should be planned for accordingly.
- A maintenance plan must be established for optimal plant establishment, submitted with the plans and included in the bid list for the project.

Like all construction sites, wetlands, riparian areas, and floodplains will vary widely in physical makeup across North Carolina. Different conditions will dictate specific treatment, design and plant selection within the Mountains, Piedmont, and Coastal Plain regions. Soil tests, seedbed preparation, mulching, matting, and maintenance will be critical for successful vegetative establishment and long-term protection of these environmentally sensitive areas. Unavoidable impacts to these areas during land disturbing activities must be addressed in detail on the plan sheets and construction sequence

Permanent native seed species within the seed mixtures should be selected based on natural occurrence of such species in the particular site area. Climate, soils, topography, and aspect are major factors affecting the suitability of plants for a particular site and these factors vary widely across North Carolina, with the most significant contrasts occurring among the three major physiographic regions of the state – Mountains, Piedmont, and Coastal Plain. Subregions of the state should also be considered. For example, the Triassic Basin in the Piedmont region may have characteristics that call for special soil treatment, limited plant selection, and special maintenance. Even within the riparian area, there may be need for different species depending on site conditions (i.e., dry sandy alluvial floodplains with wet pockets). Therefore, thoughtful planning is required when selecting species for individual sites in order to maximize successful vegetative establishment.

Native seed and plant species are included on the plant list in Appendix 8.02 of this manual.

The design professional should note that regardless of the benefits and advantages of native seeds and plants, there are potential issues if proper planning, installation and maintenance do not occur. These may include:

- Potential for erosion or washout during the establishment stage;
- Seasonal limitations on suitable seeding dates and availability of seed and plants;
- Adaptability of species at specific sites;
- Availability of water and appropriate temperatures during germination and early growth; and
- Lack of maintenance to control invasive plants and undesirable competition.

PLANTING

- Seed – Prepare the seed bed as described above in soil preparation. Apply seed at rates specified on the plans, subject as recommended in Tables 6.11a-d of this manual, with a cyclone seeder, rotary type spreader, drill, or hydroseeder (as and/or into the prepared bed. Incorporate the seed into the seed bed as specified. Provide finished grades as specified on the approved plan and carefully roll-pack the seedbed as terrain allows. If terrain does not allow for the use of a cultipacker, the approved plans and construction sequence must provide an alternative method of lightly compacting the soil, which immediately
- Springs and Sod – Install into the prepared seed bed per the most current guidance in Conservation Practice, NCSU Extension Bulletin AG-68, or Practice 6.12 Sodding

- Woody plants (liners, container, B&B) – These materials are typically used to supplement an herbaceous protective cover. They eventually are major components of long-term, permanent stabilization and should be chosen and planned in conjunction with immediate and long-term maintenance. The plants should be selected and specified by the design professional for each individual project. See Practice 6.13 *Trees, Shrubs, Vines, and Ground Covers.*

MAINTENANCE

The absence of or an incomplete landscape management specification and/or complete maintenance schedule shall constitute grounds for disapproval of the plans. Proper maintenance is critical for the continued stabilization once vegetative cover is established. Although maintenance strategies for different sites may be similar, no two construction sites in North Carolina have been or will be able to be controlled or protected in identical ways. Variations in climate, topography, soils, available moisture, size and many other conditions will dictate the maintenance methodology to be used. A detailed schedule of maintenance will be required on the plans. This schedule will illustrate how the initial planting will be transitioned to future immediate, short term and permanent protection. The schedule will address topics such as appropriate irrigation of plants during the early establishment phase, drought conditions, excessive rainfall, mulch replacement, supplemental seeding, supplemental soils tests, application of nutrients and amendments, control of competitive and invasive species, disease and insect control, and corrective maintenance, measures to address failure of vegetation to become established. Contractual responsibility for maintenance after initial establishment of vegetative cover will be provided on the plans, in the construction sequence and on the bid list for the project. Maintenance bonds and/or warranty guarantees may be required of the responsible party, especially for sites in or adjacent to environmentally sensitive sites such as wetlands, riparian buffers, floodplains, and waters of the State. See Example 6.11a for a sample maintenance specification and a minimum maintenance check list that shall be provided on all plans.

RECOMMENDED BID LIST

(These items should be included on documents utilized to obtain pricing for planting pertaining to vegetative stabilization of land disturbing projects in North Carolina.)

- Soil test prior to grading (price per each test).
- Soil test during grading operations (price per each test).
- Soil test at completion of grading and/or prior to seeding, sod laying, sodding and application of fertilizer, lime, and other soil amendments (price per each test).
- Ripping/subsoiling to a depth of six (6) inches. (Provide an alternate for ripping to a depth greater than six (6) inches.) (price per acre)
- Tilling disturbed ripped area to a depth of four (4) inches and re-compacting with a cultipacker roller (include in seeding price).

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THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

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C-5.10

- Seeding (price per square foot)
- Mulching (price per square foot).
- Repair seeding (price per square foot).
- Repair mulching (price per square foot).
- Matting (price per square yard).
- Watering (price per thousand gallons).
- Mowing (price per square foot).

SEEDING RECOMMENDATIONS

The following tables list herbaceous plants recommended for use as nurse crops for immediate stabilization and primary crops for initial and long-term stabilization. Nurse crops are expected to develop in two to five weeks and, with adequate maintenance, be an effective method of soil stabilization for a period of six months to one year. Nurse crops are not effective as primary long-term cover, however if properly maintained they can be an adequate cover and protection for the development of primary crops.

The goal for a primary crop is for it to develop over a three-week to one-year period and be effective up to three years with a well-defined maintenance program. The long-term goal for a primary crop is the initial step toward a sustainable protective cover without the need of maintenance. Where the primary crop is intended for a managed lawn and landscape aesthetics, the effective period can be extended by a more intense maintenance program. Where native species are utilized and become established during the planned maintenance program, a permanent cover that will support future succession species should exist and require little or no additional maintenance or management.

In uses of both nurse and primary crops, the development periods listed on the tables are optimal based on normal climatic conditions for the planting dates listed. The sediment and erosion control maintenance program must recognize that optimum temperatures and rainfall are the exception rather than the rule. The design professional needs to provide flexibility in the stabilization plan to address the potential ranges of temperature and moisture conditions we experience in North Carolina.

Information is provided for seeding rates, optimum planting dates in the state's three regions, sun and shade tolerance, invasive characteristics, compatibility in wetlands and riparian buffers, and installation maintenance considerations. By going through the lists the design professional can select the nurse and primary seed varieties and maintenance characteristics they feel are best suited for their site conditions, vegetation management expertise and maintenance capabilities.

To use the information in the seeding charts the plan preparer must:

- Determine what nurse crop best fits their site, soil conditions, and permanent seed mix.
- Obtain soil tests for all areas to be seeded.
- Know the site's region: mountains, piedmont, or coastal plain.
- Know if the areas to be seeded are sunny, part shade, or full shade.
- Know if the areas are well or poorly drained.
- Know if wetlands or riparian buffers are included in the areas to be seeded.
- Know if a chosen crop is invasive and if so, what potential impacts it will have on the site and adjacent properties.

With this knowledge the plan preparation may proceed utilizing the charts provided to provide the several seed mixes that will be applicable to the different areas requiring stabilization.

Table 6.11.a

HERBACEOUS PLANTS-Seeding recommendations for immediate stabilization/nurse crops

NURSE CROP SPECIES

[illegible]

Table 6.11.b

HERBACEOUS PLANTS-Seeding recommendations for primary stabilization

NONNATIVE SPECIES

[illegible]

Table 6.11.c

HERBACEOUS PLANTS-Seeding recommendations for primary stabilization

NATIVE SPECIES

[illegible]

Table 6.11.c (con't)

HERBACEOUS PLANTS-Seeding recommendations for primary stabilization

NATIVE SPECIES

[illegible]

Table 6.11.c (con't)

HERBACEOUS PLANTS-Seeding recommendations for primary stabilization

NATIVE SPECIES

[illegible]

Table 6.11.d

Seed Mixes for Native Species (lbs/ac)
When Mixed with 3, 4, or 5 Other Native Species
(See Table 6.11.a for nurse crop species to be added to these mixes)

	3 Other (total 4 species)	4 Other (total 5 species)	5 Other (total 6 species)
Switch Grasses (A)	3.0 lbs.	3.0 lbs.	2.5 lbs.
Indian Grasses (B)	7.0 lbs.	6.0 lbs.	5.0 lbs.
Deertongue (C)	6.0 lbs.	5.0 lbs.	4.0 lbs.
Big Bluestem (D)	7.0 lbs.	6.0 lbs.	5.0 lbs.
Little Bluestem (E)	7.0 lbs.	6.0 lbs.	5.0 lbs.
Sweet Woodreed (F)	2.5 lbs.	2.0 lbs.	1.5 lbs.
Rice Cutgrass (G)	6.0 lbs.	5.0 lbs.	4.0 lbs.
Indian Woodoats (H)	2.5 lbs.	2.0 lbs.	1.5 lbs.
Virginia Wild Rye (I)	6.0 lbs.	5.0 lbs.	4.0 lbs.
Eastern Bottlebrush Grass (J)	2.5 lbs.	2.0 lbs.	1.5 lbs.
Soft Rush (K)	2.5 lbs.	2.0 lbs.	1.5 lbs.
Sedges (L)	2.5 lbs.	2.0 lbs.	1.5 lbs.

NOTE:
With the native varieties, the seed mix should be in the range of 15 pounds per acre. Depending on availability of native seeds adaptable to North Carolina, the percentage of a particular variety used may be reduced or increased accordingly. Although diversity is desirable, it is imperative that the primary crop develop and become an effective protective cover. In addition to the native species mix, additional nurse crop species must be included to provide immediate stabilization and an adequate ground cover.

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6.10

TS

TEMPORARY SEEDING

Definition Planting annual grasses, small grains, or legumes to provide short, temporary cover or stabilization on disturbed areas.

Purpose To protect by stabilizing disturbed areas that will lie idle or be subject to land grading for a period of more than 21 calendar days.

Temporary seeding controls runoff and erosion until permanent vegetation or other erosion control measures can be established. In addition, it provides habitat for wildlife and enriches soil prepared for permanent vegetation or other land use purposes. Both field and surface water quality improve.

Conditions Where Practice Applies On any cleared, unvegetated, or sparsely vegetated area where vegetative cover is needed for less than 1 year. Applications of this practice include construction sites, temporary sediment basins, temporary road banks, and spoil banks.

Planning Considerations Annual plants, which sprout and grow rapidly and serve for only one season, are suitable for continuous vegetative cover. Temporary seeding protects the integrity of surface and near surface structures such as dikes, diversions, and the banks of dams and diversions. It can also reduce the amount of maintenance associated with these structures. For example, the frequency of sediment basin cleanouts will be reduced if upstream areas are stabilized by a temporary cover, or ditch sod.

Proper seedbed preparation, selection of appropriate species, and adequate seed are components of this Practice as in Practice 6.11, *Permanent Seeding*. Failure to follow recommended guidelines and recommendations certainly may result in inadequate or short-lived stand of vegetation that will not control erosion.

Temporary seeding provides protection for no more than 1 year. Damage to bare areas persistent after 1 year should be managed.

Specifications Complete grading before preparation seedbed, and install all BMP measures, erosion control practices such as dikes, waterways, and basins. Maintain steep slopes because they make seedbed preparation difficult and increase site erosion hazard. If area becomes compacted during grading, loosen with a disk or harrow. Mulch bare areas with straw, mulch, or other cover.

SEEDBED PREPARATION

Good seedbed preparation is essential to successful plant establishment. A good seedbed is well-pulverized, loose, and uniform. Where hand-seeding includes the mulch, the surface may be left with a more irregular surface of large clods and stones.

Liming—Apply lime according to soil test recommendations. If seedbed has a pH of less than 5.0, an application of ground agricultural limestone at the

rate of 1 to 1 1/2 tons/acre on coarse-textured soils and 2-3 tons/acre on fine-textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4-6 inches of soil. Soils with a pH of 6 or higher need not be limed.

Fertilizer—Base application rates on soil tests. When these are not possible, apply a 10-10-10 grade fertilizer at 750-1,000 lb/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.

Surface roughening—If recent tillage operations have resulted in a loose surface, additional roughening may not be required, except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by disking, raking, harrowing, or other suitable methods. (Coarse or furrow slopes steeper than 3:1 on the contour before seeding (Practice 6.03, *Surface Roughening*).

PLANT SELECTION

Select an appropriate species or species mixture from Table 6.10a for seeding in late winter and early spring, Table 6.10b for summer, and Table 6.10c for fall.

In the Mountains, December and January seedings have poor chances of success. When it is necessary to plant at these times, use recommendations for fall and a securely tacked mulch.

SEEDING

Evenly apply seed using a cyclone seeder (broadcast), drill, cultipacker seeder, or hydroseeder. Use seeding rates given in Tables 6.10a-6.10c. Broadcast seeding and hydroseeding are appropriate for steep slopes where equipment cannot be driven. Hand broadcasting is not recommended because of the difficulty in achieving a uniform distribution.

Small grains should be planted no more than 1 inch deep, and grasses and legumes no more than 1/2 inch. Broadcast seed must be covered by raking or chain dragging, and then lightly firmed with a roller or cultipacker. Hydroseeded mixtures should include a wood fiber (cellulose) mulch.

MULCHING

The use of an appropriate mulch will help ensure establishment under normal conditions, and is essential to stabilize areas under harsh site conditions (Practices 6.14, *Mulching*). Harsh site conditions include:

- seeding in fall for winter cover (wood fiber mulches are not considered adequate for this use);
- slopes steeper than 3:1;
- excessively hot or dry weather;
- adverse soils (shallow, rocky, or high in clay or sand); and
- areas receiving concentrated flow.

If the area to be mulched is subject to concentrated waterflow, as in channels, anchor mulch with netting (Practice 6.14, *Mulching*).

Maintenance Reseed and mulch areas where seedling emergence is poor, or where erosion occurs, as soon as possible. Do not mow. Protect from traffic as much as possible.

References *Site Preparation*
6.01, Surface Roughening
6.04, Topsoiling

Surface Stabilization
6.11, Permanent Seeding
6.14, Mulching

Appendix
8.02, Vegetation Tables

Table 6.10a Temporary Seeding Recommendations for Late Winter and Early Spring

Seeding mixture Species	Rate (lb/acre)
Rye (grain)	120
Annual lespedeza (Kobe in Piedmont and Coastal Plain, Korean in Mountains)	50

Omit annual lespedeza when duration of temporary cover is not to extend beyond June.

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

Soil amendments
Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

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

Maintenance
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Table 6.10b Temporary Seeding Recommendations for Summer

Seeding mixture Species	Rate (lb/acre)
German millet	40

In the Piedmont and Mountains, a small-stemmed Sudangrass may be substituted at a rate of 60 lb/acre.

Seeding dates
Mountains—May 15 - Aug. 15
Piedmont—May 1 - Aug. 15
Coastal Plain—Apr. 15 - Aug. 15

Soil amendments
Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer

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

Maintenance
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Table 6.10c Temporary Seeding Recommendations for Fall

Seeding mixture Species	Rate (lb/acre)
Rye (grain)	120

Seeding dates
Mountains—Aug. 15 - Dec. 15
Coastal Plain and Piedmont—Aug. 15 - Dec. 30

Soil amendments
Follow soil tests or apply 2,000 lb/acre ground agricultural limestone and 1,000 lb/acre 10-10-10 fertilizer.

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

Maintenance
Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Kobe (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

6.02

SEDIMENT FENCE

Definition A temporary sediment control measure consisting of fabric buried at the bottom, stretched, and supported by posts.

Purpose To retain sediment from small disturbed areas by reducing the velocity of sheet flows to allow sediment deposition.

Conditions Where Practice Applies Below small-disturbed areas that are less than ¼ acre per 100 feet of fence.

Where runoff can be stored behind the sediment fence without damaging the fence or the adjacent area behind the fence.

Do not install sediment fences across streams, ditches, or waterways, or other areas of concentrated flow.

Sediment fence should be placed along topographic elevation contours, where it can intercept stormwater runoff that is in dispersed sheet flow. Sediment fence should not be used alone below graded slopes greater than 10 feet in height.

Planning Considerations A sediment fence is a system to retain sediment on the construction site. The fence retains sediment primarily by retarding flow and promoting deposition. In operation, gradually the fence becomes clogged with fine particles, which reduce the flow rate. This causes a pond to develop behind the fence. The designer should anticipate ponding and provide sufficient storage area and overflow outlets to prevent flows from overtopping the fence. Since sediment fences are not designed to withstand high water levels, locate them so that only shallow pools can form. The toe-much of a sediment fence into higher ground to prevent flow around the end of the fence before the pool reaches design level. Curling each end of the fence uphill in a "J" pattern may be appropriate to prevent end flow. Provide stabilized outlets to protect the fence system and release storm flows that exceed the design storm.

Deposition occurs as the storage pool forms behind the fence. The designer can direct flows to specified deposition areas through appropriate positioning of the fence or by providing an excavated area behind the fence. Plan deposition areas at accessible points to promote routine cleanout and maintenance. Show deposition areas in the erosion and sedimentation control plan. A sediment fence acts as a diversion if placed slightly off the contour. A maximum slope of 2 percent is recommended. This techniques may be used to control shallow, sediment-laden flows from small disturbed areas and to deliver sediment-laden water to deposition areas. The anchoring of the toe of the fence should be reinforced with 12 inches of NC DOT #5 or #57 washed stone when flow will run parallel to the toe of the fence.

Sediment fences serve no function along ridges or near drainage divides where there is little movement of water. Confining or diverting runoff unnecessarily with a sediment fence may create erosion and sedimentation problems that would not otherwise occur.

Straw barriers have only a 20% trapping efficiency and are inadequate. Straw bales may not be used as place of sediment fence. Preexisting sediment fence with the fabric already stapled to this wooden posts does not meet minimum standards specified later in this section.

Anchoring of sediment fence is critical. The toe of the fabric must be anchored in a trench backfilled with compacted earth. Mechanical compaction must be provided in order for the fence to effectively pond runoff.

Design Criteria Ensure that drainage area is no greater than ¼ acre per 100 feet of fence. This is the maximum drainage area where the slope is less than 2 percent. Where all runoff is to be stored behind the fence, ensure that the maximum slope length behind a sediment fence does not exceed the specifications shown in Table 6.02a. The shorter slope length allowed for steeper slopes will greatly reduce the maximum drainage area. For example, a 10-20 % slope may have a maximum slope length of 25 feet. For a 100-foot length of sediment fence, the drainage area would be 25ft X 100ft = 2500 sq.ft., or 0.06 acres.

Table 6.02a Maximum Slope Length and Slope for which Sediment Fence Is Applicable

Slope	Slope Length (ft)	Maximum Area (ft²)
<2%	100	10,000
2 to 5%	75	7,500
5 to 10%	50	5,000
10 to 20%	25	2,500
>20%	15	1,500

Make the fence stable for the 10-year peak storm runoff.

Ensure that the depth of impounded water does not exceed 1.5 feet at any point along the fence.

If non-erosive outlets are provided, slope length may be increased beyond that shown in Table 6.02a, but runoff from the area should be determined and bypass capacity and erosion potential along the fence must be checked. The velocity of flow at the outlet or along the fence should be in keeping with Table 8.05d, Appendix 8.05.

Provide a riprap splash pad or other outlet protection device for any point where flow may overtop the sediment fence, such as natural depressions or swales. Ensure that the maximum height of the fence at a prefabricated, reinforced outlet does not exceed 2 feet and that support post spacing does not exceed 4 feet.

The danger life of a synthetic sediment fence should be 6 months.

Construction Specifications MATERIALS

1. Use a synthetic fiber fabric of at least 95% by weight of polyolefins or polyester, which is certified by the manufacturer or supplier as conforming to the requirements in ASTM D 6461, which is shown in part in Table 6.02b

Synthetic fiber fabric should contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 to 120° F

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2. Ensure that posts for sediment fences are 1.25 lb/linear ft minimum steel with a minimum length of 5 feet. Make sure that steel posts have projections to facilitate fastening the fabric.

3. For reinforcement of standard strength filter fabric, use wire fence with a minimum 14 gauge and a maximum mesh spacing of 6 inches.

Table 6.62b Specifications For Sediment Fence Fabric

Temporary Silt Fence Material Property Requirements					
	Test Method	Units	Supported* Silt Fence	Un-Supported* Silt Fence	Type of Value
Grab Strength	ASTM D 4632	N (lbs)			
Machine Direction			400	550	MARV
			(90)	(124)	
Cross-Machine Direction			400	450	MARV
			(90)	(101)	
Permittivity†	ASTM D 4491	sec-1	0.05	0.05	MARV
Apparent Opening Size†	ASTM D 4751	mm	0.60	0.60	Max. ARV*
		(US Sieve #)	(30)	(30)	
Ultraviolet Stability	ASTM D 4355	% Retained Strength	70% after 500h of exposure	70% after 500h of exposure	Typical

* Silt Fence support shall consist of 14 gage steel wire with a mesh spacing of 152 mm (6 inches), or prefabricated polymer mesh of equivalent strength.
† These default values are based on empirical evidence with a variety of sediment. For environmentally sensitive areas, a review of previous experience and/or site or regionally specific geotextile tests in accordance with Test Method D 5141 should be performed by the agency to confirm suitability of these requirements.
* As measured in accordance with Test Method D 4632.

CONSTRUCTION

1. Construct the sediment barrier of standard strength or extra strength synthetic filter fabrics.

2. Ensure that the height of the sediment fence does not exceed 24 inches above the ground surface. (Higher fences may impound volumes of water sufficient to cause failure of the structure.)

3. Construct the filter fabric from a continuous roll cut to the length of the barrier to avoid joints. When joints are necessary, securely fasten the filter cloth only at a support post with 4 feet minimum overlap to the next post.

4. Support standard strength filter fabric by wire mesh fastened securely to the upslope side of the posts. Extend the wire mesh support to the bottom of the trench. Fasten the wire reinforcement, then fabric on the upslope side of the fence post. Wire or plastic zip ties should have minimum 50 pound tensile strength.

5. When a wire mesh support fence is used, space posts a maximum of 8 feet apart. Support posts should be driven securely into the ground a minimum of 24 inches.

6. Extra strength filter fabric with 6 feet post spacing does not require wire mesh support fence. Securely fasten the filter fabric directly to posts. Wire or plastic zip ties should have minimum 50 pound tensile strength.

7. Excavate a trench approximately 4 inches wide and 8 inches deep along the proposed line of posts and upslope from the barrier (Figure 6.62a).

8. Place 12 inches of the fabric along the bottom and side of the trench.

9. Backfill the trench with soil placed over the filter fabric and compact. Thorough compaction of the backfill is critical to silt fence performance.

10. Do not attach filter fabric to existing trees.

SEDIMENT FENCE INSTALLATION USING THE SLICING METHOD
Instead of excavating a trench, placing fabric and then backfilling trench, sediment fence may be installed using specially designed equipment that inserts the fabric into a cut sliced in the ground with a disc (Figure 6.62b).

Installation Specifications

1. The base of both end posts should be at least one foot higher than the middle of the fence. Chunk with a level if necessary.

2. Install posts 4 feet apart in critical areas and 6 feet apart on standard applications.

3. Install posts 2 feet deep on the downstream side of the silt fence, and as close as possible to the fabric, enabling posts to support the fabric from upstream water pressure.

4. Install posts with the nipples facing away from the silt fabric.

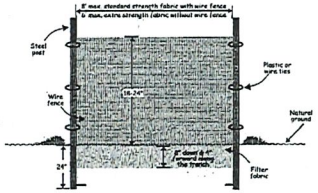
5. Attach the fabric to each post with three ties, all spaced within the top 8 inches of the fabric. Attach each tie diagonally 45 degrees through the fabric, with each puncture at least 1 inch vertically apart. Also, each tie should be positioned to hang on a post nipple when tightened to prevent sagging.

6. Wrap approximately 6 inches of fabric around the end posts and secure with 3 ties.

7. No more than 24 inches of a 36 inch fabric is allowed above ground level.

8. The installation should be checked and corrected for any deviations before compaction.

9. Compaction is vitally important for effective results. Compact the soil immediately next to the silt fence fabric with the front wheel of the tractor, skid steer, or other existing at least 60 pounds per square inch. Compact the upstream side first, and then each side twice for a total of 4 trips.



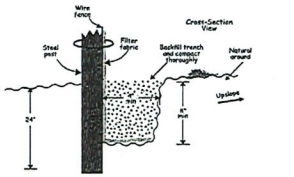


Figure 6.62a Installation detail of a sediment fence.

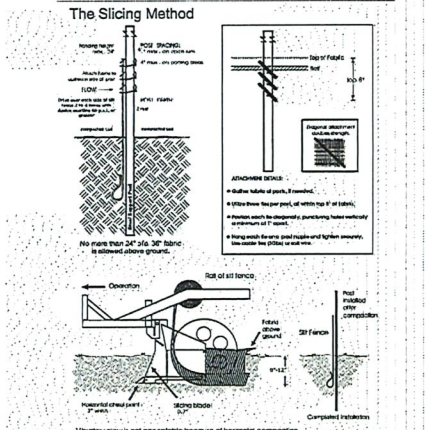


Figure 6.62b Schematics for using the slicing method to install a sediment fence. Adapted from *Silt Fence that Works*.

Maintenance Inspect sediment fences at least once a week and after each rainfall. Make any required repairs immediately.

Should the fabric of a sediment fence collapse, tear, decompose or become ineffective, replace it promptly.

Remove sediment deposits as necessary to provide adequate storage volume for the next rain and to reduce pressure on the fence. Take care to avoid undermining the fence during cleanout.

Remove all fencing materials and unstable sediment deposits and bring the area to grade and stabilize it after the contributing drainage area has been properly stabilized.

References ASTM D 6461—99. "Standard Specification for Silt Fence Materials" ASTM International. For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.

ASTM D 6462—01. "Standard Practice for Silt Fence Installation" ASTM International. For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.

C. Joel Sprague, PE, Silt Fence Performance Limits and Installation Requirements. Sprague and Sprague Consulting Engineers and TRI Environmental, Inc.

Carpenter Erosion Control. http://www.turfmy-site.com/

Kentucky Erosion Prevention and Sediment Control Field Manual, 2004.

Runoff Control Measures
6.20, Temporary Diversions

Outlet Protection
6.41, Outlet Stabilization Structure

Appendix
8.03, Estimating Runoff

6.05

TREE PROTECTION

Definition Practices to preserve and protect desirable trees from damage during project development.

Purpose To preserve and protect trees that have present or future value for their use in protection from erosion, for their landscape and aesthetic value, or for other environmental benefits.

Figure 6.05a Tree protection zone. A protected zone preserves roots and soil and keeps branches clear of contact with construction equipment and materials.

Conditions Where Practice Applies On development sites containing trees or stands of trees.

Planning Considerations Conserving the right trees can reap rewards for developers, homeowners, and communities. Healthy trees enhance property values and community development by providing shade, wildlife habitat, and beauty. Sickly, stressed trees reduce property values, discourage potential buyers and detract from a community. Post-construction maintenance and removal of trees is difficult and expensive. Replacing trees after construction can also be costly and time consuming.

Preserving and protecting trees and other natural plant groups often results in a more stable and aesthetically pleasing development. During site evaluation, note where valuable trees and other natural landscape features should be preserved, then consider these trees and plants when determining the location of roads, buildings, or other structures.

Trees that are near construction zones should be either protected or removed because damage during construction activities may cause the death of the tree at a later time.

Trees should be considered for preservation for the following benefits:

- They stabilize the soil and prevent erosion.
- They reduce stormwater runoff by intercepting rainfall, promote infiltration, and lower the water table through transpiration.
- They moderate temperature changes, promote shade, and reduce the force of wind.
- They provide buffers and screens against noise and visual disturbance, providing a degree of privacy.
- They filter pollutants from the air, remove carbon dioxide from the air, and produce oxygen.
- They provide a habitat for animals and birds.
- They increase property values and improve site aesthetics.

Consider the following characteristics when selecting trees to be protected and saved:

Tree vigor—Preserve healthy trees. A tree of low vigor is susceptible to damage by environmental changes that occur during site development. Healthy trees are less susceptible to insects and disease. Indications of poor vigor include dead tips of branches, small annual twig growth, stunted leaf size, sparse foliage, and pale foliage color. Hollow or rotten trees, cracked, split, or leaning trees, or trees with broken tips also have less chance for survival.

Tree age—Old, picturesque trees may be more aesthetically valuable than smaller, younger trees, but they may require more extensive protection.

Tree species—Preserve those species that are most suitable for site conditions and landscape design. Trees that are short-lived or brittle or are susceptible to attack by insects and disease may be poor choices for preservation.

Tree aesthetics—Choose trees that are aesthetically pleasing, shapely, large, or colorful. Avoid trees that are leaning or in danger of falling. Occasionally, an odd-shaped tree or one of unusual form may add interest to the landscape if strategically located. However, be sure the tree is healthy.

Wildlife benefits—Choose trees that are preferred by wildlife for food, cover, or nesting. A mixture of evergreens and hardwoods may be beneficial. Evergreen trees are important for cover during the winter months, whereas hardwoods are more valuable for food.

Construction activities can significantly injure or kill trees unless protective measures are taken. Although direct contact by equipment is an obvious means of damaging trees, more serious damage is caused by root zone stress from compacting, filling, or excavating too close to the tree. Clearly mark boundaries to maintain sufficient undisturbed area around the trees.

Design Criteria 1. Take stock of trees on the site. Hire a professional arborist or urban forester to inventory existing trees. An inventory records the variety, location, size, and health of each tree. A proper tree inventory creates the foundation for a successful tree protection plan. A professional can identify valuable trees and those that need attention or removal, identify any stressed trees that need removal. Stressed, unhealthy trees have wilting leaves, dying limbs, thinning crowns or other signs of declining health. Always remove insects, diseases, or storm-damaged trees prior to construction. This is fast, efficient, and saves resources.

2. Draw a base map. Include all the important site features such as existing vegetation, property lines, utility connections, slopes, and required setback distances before drawing in the proposed building(s):

- Map grading and drainage.
- Identify priority trees for protection. Mark their locations on the base map and sketch in approximate tree protection zones where temporary fences should be located around priority trees.
- Locate the building footprint: the areas where structures and their amenities will affect the landscape. Draw in the driveways, parking areas, and docks.
- Mark trees that need to be removed or pruned to make room for future structures and construction equipment.

3. Prepare a tree protection plan. A tree protection plan designates the valuable trees that must be protected during the construction process. Assemble a team to write a tree protection plan before ground is broken. The team should include the site managers as well as professionals who can provide tree protection advice (Table 1). Do not leave anyone out who should be involved. By working together, the team can identify potential conflicts between construction needs and tree protection, and identify compromise solutions.

Planning takes time, but it pays off during and after construction. Using the base map, the team can plan for tree protection, foresee problems, and solve them. Early planning helps to keep construction on schedule, reduce costs, and avoid conflicts:

- Locate construction activities after considering the priority trees and the development requirements.
- Look for potential conflicts, and explore alternate solutions.
- Consider grading and stormwater drainage. Remember that cutting or filling around roots will weaken and eventually kill valuable trees. Weigh alternatives such as retaining walls to protect priority trees.
- Designate tree protection zones (TPZs). The protection plan should specify the location of temporary tree protection fences to protect trees and their root zones during construction. TPZ fences identify "exclusion zones" where construction and equipment use is prohibited. Effective TPZs maintain a radius of at least 1.25 feet of protected area for each inch of trunk diameter (Table 6.05a).

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PLAN SCALE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL C-015 LANDDESIGN, INC.

NORTH CAROLINA PROFESSIONAL SEAL 23168 FARRIS L. CRISCO

8/4/2021

PROJECT

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

LANDDESIGN PROJECT NUMBER

1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

DATE PLOTTED

VERT: 1"=4'
HORZ: NTS

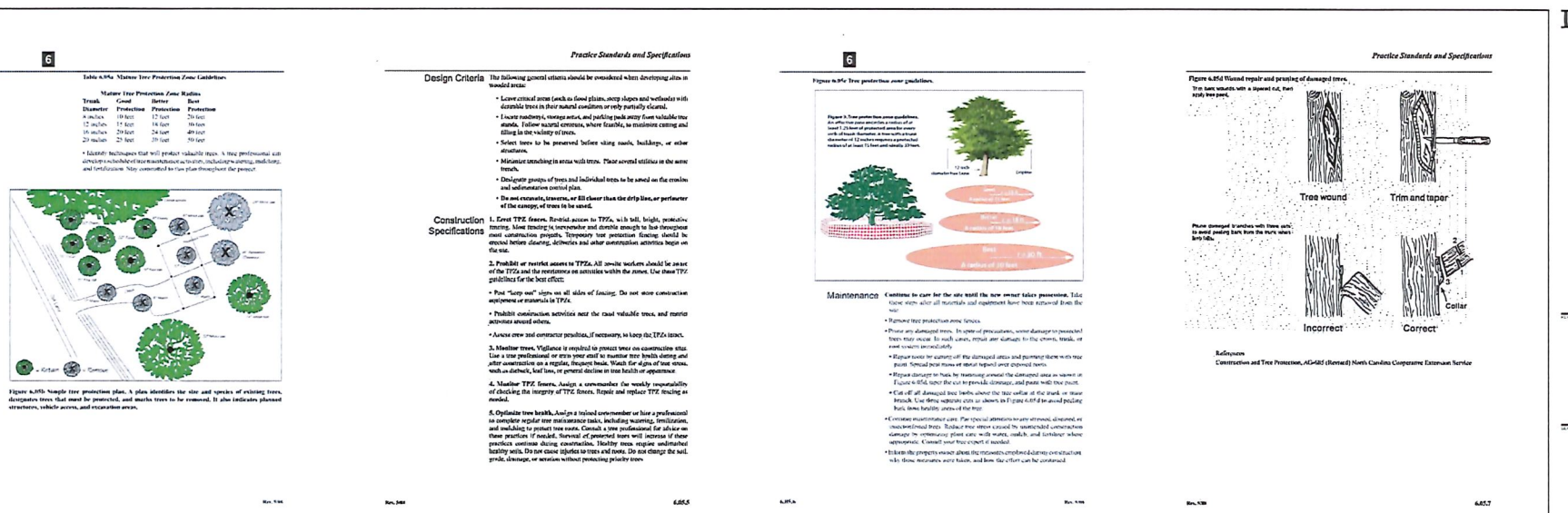
(NOT TO SCALE)
PARENTHESIS SHOWN ARE 22"x34" SIZE

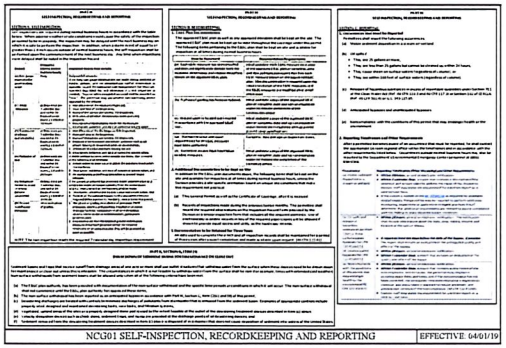
SHEET TITLE

EROSION CONTROL DETAILS

SHEET NUMBER

C-5.13





EROSION CONTROL NOTES:

1. PLEASE NOTE THAT THE DENUDED LIMITS SHOWN ON THESE PLANS ARE APPROXIMATE AND ARE FOR INFORMATIONAL PURPOSES ONLY. ACTUAL LIMITS OF DISTURBANCE SHALL BE BASED ON PERIMETER EROSION CONTROL MEASURES (SILT FENCE, CONSTRUCTION FENCE, TREE PROTECTION FENCE, ETC.) AND THE AREA REQUIRED FOR PROPER INSTALLATION.
2. ALL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE N.C. EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL, U.S. DEPT. OF AGRICULTURE, NCDOT, AND UNION COUNTY SEDIMENT AND EROSION CONTROL ORDINANCE.
3. WASTE AND EXCESS BORROW SHALL BE LEGALLY DISPOSED OF OFF-SITE.
4. ANY GRADING BEYOND THE DENUDED LIMITS SHOWN ON THE PLAN IS A VIOLATION OF THE STATE (NCDEQ) ORDINANCE AND IS SUBJECT TO A FINE.
5. GRADING MORE THAN ONE ACRE WITHOUT AN APPROVED EROSION CONTROL PLAN IS A VIOLATION OF THE STATE (NCDEQ) EROSION CONTROL ORDINANCE AND IS SUBJECT TO A FINE.
6. GROUND STABILIZATION MUST OCCUR WITHIN 7 DAYS ON PERIMETER AREAS AND SLOPES GREATER THAN 3:1, AND GROUND STABILIZATION MUST OCCUR WITHIN 14 DAYS IN OTHER AREAS. REFER TO THE N.C. EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL FOR ADDITIONAL REQUIREMENTS.
7. ADDITIONAL MEASURES TO CONTROL EROSION AND SEDIMENT MAY BE REQUIRED BY A REPRESENTATIVE OF THE STATE (NCDEQ) ENGINEERING DEPARTMENT.
8. SLOPES SHALL BE GRADED NO STEEPER THAN 2:1. 2:1 FILL SLOPES GREATER THAN 10' REQUIRE ADDITIONAL TERRACING.
9. PERMANENT CUT AND FILL SLOPES PLACED ON A SUITABLE FOUNDATION SHOULD BE CONSTRUCTED AT 2:1 (HORIZONTAL TO VERTICAL) OR FLATTER. PERMANENT SLOPES OF 3:1 SHOULD BE CONSTRUCTED WHERE MOWING IS DESIRABLE AND AS INDICATED. IF FILL MATERIAL IS BROUGHT ONTO THE PROPERTY OR IF WASTE MATERIAL IS HAULED FROM THE PROPERTY, THEN THE CONTRACTOR SHALL DISCLOSE THE LOCATION OF ANY OFF-SITE BORROW LOCATION AND/OR WASTE BURIAL LOCATION TO THE EROSION CONTROL INSPECTOR.
10. DRIVEWAY PERMIT FOR CONSTRUCTION ENTRANCES IN NCDOT RIGHT OF WAY MUST BE PRESENTED AT PRE-CONSTRUCTION MEETING.
11. APPROVAL OF THIS PLAN IS NOT AN AUTHORIZATION TO GRADE ADJACENT PROPERTIES. WHEN FIELD CONDITIONS WARRANT OFF-SITE GRADING, PERMISSION MUST BE OBTAINED FROM THE AFFECTED PROPERTY OWNER.
12. ALL EROSION CONTROL DEVICES SHALL REMAIN UNTIL SITE HAS BEEN PERMANENTLY STABILIZED.
13. CONTRACTOR SHALL PLACE BIODEGRADABLE EROSION CONTROL MATTING AND HYDROSEED ON ALL SLOPES GRADED AT 2:1 OR GREATER AS INDICATED ON THE PLAN AND ON ALL SLOPES ADJACENT TO ANY STREAM, WETLAND, OR EXISTING POND.
14. BASIN SLOPES / EMBANKMENTS SHALL BE STABILIZED AND SEEDED IMMEDIATELY AFTER CONSTRUCTION. SLOPES GREATER THAN 10 FEET SHALL ALSO BE MATTED.
15. CHANNEL LINING OR MATTING SHALL BE PROVIDED FOR DIVERSION DITCHES WHERE VELOCITIES EXCEED 2 FPS.
16. THE DEVELOPER SHALL MAINTAIN EACH STREAM, CREEK, OR BACKWASH CHANNEL IN AN UNOBSTRUCTED STATE AND SHALL REMOVE FROM THE CHANNEL AND BANKS OF THE STREAM ALL DEBRIS, LOGS, TIMBER, JUNK AND OTHER ACCUMULATIONS.
17. INLET PROTECTION IS REQUIRED FOR ALL INLETS LOCATED IN THE WORKING AREA AND ARE REQUIRED UNTIL THE SITE IS FULLY STABILIZED.
18. EROSION & SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. SELF INSPECTION RECORDS MUST BE MAINTAINED FOR EACH INSPECTION EVENT AND FOR EACH MEASURE. AT A MINIMUM, INSPECTION OF MEASURES MUST OCCUR EVERY 7 CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT > 0.5IN RAIN/24HR. RECORDS OF INSPECTIONS FOR PREVIOUS 30 DAYS SHALL REMAIN ON SITE AND AVAILABLE FOR AGENCY INSPECTORS DURING NORMAL WORK HOURS. PER SECTION II.B.3 OF THE NPDES PERMIT.
19. THE CONTRACTOR SHALL DILIGENTLY AND CONTINUOUSLY MAINTAIN ALL EROSION CONTROL DEVICES AND STRUCTURES.
20. CONTRACTOR TO ENSURE NCDENR SELF-INSPECTION PROGRAM IS PREFORMED THROUGHOUT THE DURATION OF THE PROJECT. THE SELF-INSPECTION REPORT SHOULD BE COMPLETED AFTER EACH PHASE OF THE PROJECT. PHASES INCLUDE BUT ARE NOT LIMITED TO INSTALLATION OF PERIMETER EROSION CONTROL MEASURES, CLEARING AND GRUBBING, COMPLETION OF ANY GRADING OF SLOPES OR FILLS, INSTALLATION OF STORM DRAINAGE SYSTEMS, COMPLETION OF CONSTRUCTION OR DEVELOPMENT AND ESTABLISHMENT OF PERMANENT OR TEMPORARY GROUND COVER.
21. ANY OFF-SITE BORROW AND WASTE REQUIRED FOR THIS PROJECT MUST COME FROM A SITE WITH AN APPROVED EROSION CONTROL PLAN, A SITE REGULATED UNDER THE MINING ACT OF 1971, OR A LANDFILL REGULATED BY THE DIVISION OF SOLID WASTE MANAGEMENT. TRASH/DEBRIS FROM DEMOLITION ACTIVITIES OR GENERATED BY ANY ACTIVITIES ON SITE MUST BE DISPOSED OF AT A FACILITY REGULATED BY THE DIVISION OF SOLID WASTE MANAGEMENT OR PER DIVISION OF SOLID WASTE MANAGEMENT OR DIVISION OF WATER RESOURCES RULES AND REGULATIONS.
22. ANY TEMPORARY DIVERSION DITCHES THAT WILL STAY IN PLACE LONGER THAN 30 DAYS WILL NEED TO BE SEEDED AND MULCHED WHEN THEY ARE CONSTRUCTED.

CONSTRUCTION SEQUENCE:

1. OBTAIN GRADING/EROSION CONTROL PLAN APPROVAL FROM THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY (NCDEQ).
2. SET UP AN ON-SITE PRE-CONSTRUCTION MEETING WITH EROSION CONTROL INSPECTOR AND OWNER TO DISCUSS EROSION CONTROL MEASURES A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION.
3. PRIOR TO CLEARING OR INSTALLATION OF EROSION CONTROL DEVICES, CONTRACTOR SHALL STAKE CLEARING LIMITS AND STAKE ALL TREES, STRUCTURES TO REMAIN AND BE PROTECTED.
4. INSTALL TEMPORARY CONSTRUCTION ENTRANCE, ALL PERIMETER CONTROLS (CONSTRUCTION/TREE PROTECTION/BUFFER FENCING, SILT FENCE, INLET PROTECTION), AND ANY OTHER MEASURES AS SHOWN ON SHEETS C600 - C611. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES. DO NOT CONSTRUCT SEDIMENT BASINS AT THIS TIME.
   NOTE: NO SITE GRADING / CONSTRUCTION SHALL BEGIN UNTIL GRADING PERMIT HAS BEEN ISSUED.
5. CALL FOR ON-SITE INSPECTION BY INSPECTOR. WHEN APPROVED BY THE INSPECTOR, CLEARING AND GRUBBING FOR THE INSTALLATION OF THE OUT OF ROADWAY SANITARY SEWER ONLY (SEWER THAT PARALLELS THE EXISTING LAKES) MAY BEGIN. THE CONTRACTOR SHALL DILIGENTLY AND CONTINUOUSLY MAINTAIN ALL EROSION CONTROL DEVICES AND STRUCTURES.
6. INSTALL THE OUT OF ROADWAY SANITARY SEWER AS SHOWN IN CHAPTER 9. CONTRACTOR SHALL SEED AND MULCH AREAS DISTURBED BY THE SEWER CONSTRUCTION AS SOON AS THE SEWER HAS BEEN INSTALLED AND THE TRENCH HAS BEEN BACKFILLED AND BROUGHT TO GRADE.
7. ONCE THE OUT OF ROADWAY SANITARY SEWER CONSTRUCTION HAS BEEN COMPLETED AND ALL DISTURBED AREAS HAVE BEEN PROPERLY STABILIZED, THE CONTRACTOR MAY BEGIN INSTALLING ALL THE SEDIMENT BASINS AS SHOWN ON SHEETS C600 - C611. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES.
8. CONSTRUCT TEMPORARY DIVERSION DITCHES, CLEAN WATER BYPASS DITCHES AND CHECK DAMS AS SHOWN ON SHEETS C600 - C611.
9. CONTRACTOR TO BLOCK ALL POSSIBLE ENTRANCES TO SITE BESIDES APPROVED CONSTRUCTION ENTRANCE W/ FENCING AND ORANGE BARRELS.
8. CALL FOR ON-SITE INSPECTION BY INSPECTOR. WHEN APPROVED BY THE INSPECTOR, CLEARING AND GRUBBING FOR THE REMAINDER OF CONSTRUCTION MAY BEGIN. THE CONTRACTOR SHALL DILIGENTLY AND CONTINUOUSLY MAINTAIN ALL EROSION CONTROL DEVICES AND STRUCTURES.
9. BEGIN SITE GRADING AND CONSTRUCTION. CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES AS INDICATED ON THE PLANS, AS REQUIRED, AND AS DEEMED NECESSARY BY THE EROSION CONTROL INSPECTOR AS CONSTRUCTION COMMENCES.
10. THE CONTRACTOR SHALL ADJUST EROSION CONTROL MEASURES DURING GRADING AND AS STORM DRAINAGE STRUCTURES ARE BROUGHT TO FINISHED GRADES.
11. THE CONTRACTOR SHALL DILIGENTLY AND CONTINUOUSLY MAINTAIN ALL EROSION CONTROL DEVICES AND STRUCTURES.
12. STABILIZATION IS THE BEST FORM OF EROSION CONTROL. TEMPORARY SEEDING IS NECESSARY TO ACHIEVE EROSION CONTROL ON LARGE DENUDED AREAS AND ESPECIALLY WHEN SPECIFIED AS PART OF THE CONSTRUCTION SEQUENCE. ALL SLOPES MUST BE SEEDED WITHIN 7 DAYS.
13. ONCE SITE CONSTRUCTION IS COMPLETE AND THE AREAS DRAINING TO THE SEDIMENT BASINS HAVE BEEN ADEQUATELY STABILIZED, THE CONTRACTOR SHALL REQUEST APPROVAL FROM THE NCDEQ INSPECTOR TO REMOVE THE SEDIMENT BASINS.
14. ALL EROSION CONTROL DEVICES SHOULD BE CHECKED PERIODICALLY AND AFTER EVERY MAJOR STORM EVENT. IF ANY FAILURES ARE FOUND THEY SHOULD BE REPAIRED AS SOON AS POSSIBLE.
15. THE CONTRACTOR SHALL MAINTAIN CLOSE CONTACT WITH THE EROSION CONTROL INSPECTOR SO THAT PERIODIC INSPECTIONS CAN BE PERFORMED AT APPROPRIATE STAGES OF CONSTRUCTION.
16. NO DEVICE SHALL BE REMOVED UNTIL SITE IS STABILIZED. APPROVAL BY A NCDEQ INSPECTOR MUST ALSO BE OBTAINED PRIOR TO THE REMOVAL OF ANY EROSION CONTROL MEASURES.
17. ALL EROSION CONTROL MEASURES SHOULD BE CHECKED PERIODICALLY AND AFTER EVERY RAINFALL EVENT. REPAIRS SHALL BE MADE IMMEDIATELY AS REQUIRED. INSPECTION AND REPAIR REPORTS SHALL BE KEPT BY THE CONTRACTOR AND PROVIDED TO THE INSPECTOR AND LAND DEVELOPMENT EROSION CONTROL AGENT AS REQUESTED.

EFFECTIVE OCTOBER 1, 2010, PERSONS RESPONSIBLE FOR LAND DISTURBING ACTIVITIES MUST INSPECT A PROJECT AFTER EACH PHASE OF THE PROJECT TO MAKE SURE THAT THE APPROVED EROSION EROSION CONTROL AND SEDIMENTATION CONTROL PLAN IS BEING FOLLOWED. SELF-INSPECTION REPORTS ARE REQUIRED. A SAMPLE SELF-INSPECTION REPORT, AS WELL AS DETAILS OF THE SELF-INSPECTION PROGRAM, CAN BE FOUND ON THE LAND QUALITY WEB SITE: HTTP://WWW.DLR.DNR.STATE.NC.US/PAGES/SEDIMENTAION_NEW.HTML

NOT EVERY PROJECT WILL HAVE ALL POSSIBLE PHASES, BUT A LIST OF PHASES INCLUDE: (1) INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROL MEASURES (2) INSTALLATION OF SEDIMENT TRAPS/BASINS. (3) CLEARING AND GRUBBING EXISTING GROUND COVER.

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NORTH CAROLINA PROFESSIONAL SEAL C-015 ENGINEER

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT: 1"=4'
HORZ: NTS
(NOT TO SCALE)

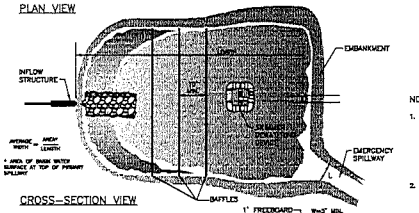
EROSION CONTROL DETAILS

C-5.14

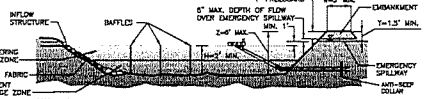
SKIMMER SEDIMENT BASIN DESIGN CRITERIA	
DRAINAGE AREA (ACRES)	< 10 AC.
MIN. LENGTH TO WIDTH RATIO	2:1
MAX. LENGTH TO WIDTH RATIO	6:1
MIN. VOLUME REQUIRED	1800 (CU. FT. PER AC. DISTURBED)
SURFACE AREA REQUIRED	325 (SQ. FT. PER CFS OF Q10)

* AREA OF BASIN WATER SURFACE AT TOP OF PRIMARY SPILLWAY

PLAN VIEW



CROSS-SECTION VIEW



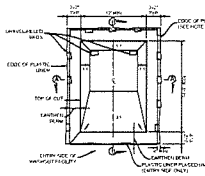
NOTES:

1. REFER TO NCDEQ/DWQ SECTION .0506 FOR ADDITIONAL DESIGN SPECIFICATIONS REGARDING SKIMMER SEDIMENT BASINS.
2. REFER TO STD. #30.19 FOR BAFFLE SPACING AND INSTALLATION.

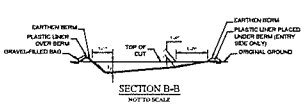
DATA BLOCK

BASIN	DRAINAGE AREA (ACRES)	DRAINAGE AREA (SQ.FT.)	Qm	BASIN VOLUME REQUIRED (CUBIC FT.)	BASIN VOLUME PROVIDED (CUBIC FT.)	BASIN SURFACE AREA REQUIRED (SQ. FT.)	BASIN SURFACE AREA PROVIDED (SQ. FT.)	CLEANOUT DEPTH (FT.) N/A	H (FEET)	J (FEET)	L (FEET)	T (FEET)	W (FEET)	SKIMMER PIPE DIAMETER	SKIMMER ORIFICE DIAMETER
1	10.52	10.52	51.77	18,936	262,213	22,519	31,279	6.5'	12.0'	12.0'	N/A	N/A	10.0'	6.0"	6.5"
2	2.51	2.51	12.35	4,516	89,170	5,373	15,944	5.0'	10.0'	10.0'	N/A	N/A	10.0'	3.0"	4.2"
3	26.23	26.23	129.09	47,214	475,233	56,144	97,178	6.0'	12.0'	12.0'	N/A	N/A	10.0'	9.0"	7.9"
4	13.69	13.69	67.32	24,634	253,311	29,294	39,963	5.0'	10.0'	10.0'	N/A	N/A	10.0'	6.0"	6.4"
5	10.17	10.17	50.05	18,306	158,184	21,770	25,917	5.0'	10.0'	10.0'	N/A	N/A	10.0'	6.0"	5.1"
6	7.12	7.12	35.04	12,816	119,550	15,241	20,605	5.0'	10.0'	10.0'	N/A	N/A	10.0'	5.0	4.8"

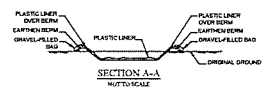
SKIMMER SEDIMENT BASIN



PLAN
TYPE "EXTRA WIDE" PIT

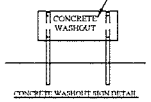


SECTION B-B
NOT TO SCALE



SECTION A-A
NOT TO SCALE

LETTERS A MINIMUM OF 5" IN HEIGHT



CONCRETE WASHOUT SIGN DETAIL

NOTES:

1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. INSTALL CONCRETE WASHOUT SIGN (24"X24", MINIMUM) WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.
3. TEMPORARY WASHOUT AREA MUST BE AT LEAST 50' FROM A STORM DRAIN, CREEK BANK OR PERIMETER CONTROL.
4. CLEAN OUT CONCRETE WASHOUT AREA WHEN 50% FULL.
5. THE KEY TO FUNCTIONAL CONCRETE WASHOUTS IS WEEKLY INSPECTIONS, ROUTINE MAINTENANCE, AND REGULAR CLEAN OUT.
6. SILT FENCE SHALL BE INSTALLED AROUND PERIMETER OF CONCRETE WASHOUT AREA EXCEPT FOR THE SIDE UTILIZED FOR ACCESSING THE WASHOUT.
7. A ROCK CONSTRUCTION ENTRANCE MAY BE NECESSARY ALONG ONE SIDE OF THE WASHOUT TO PROVIDE VEHICLE ACCESS.

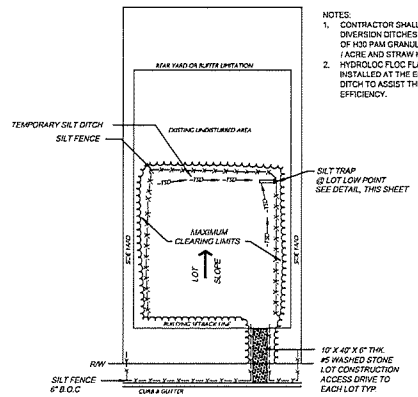
EXCAVATED PIT CONCRETE WASHOUT
N.T.S.

TYPICAL LOT DEVELOPMENT EROSION CONTROL DETAILS

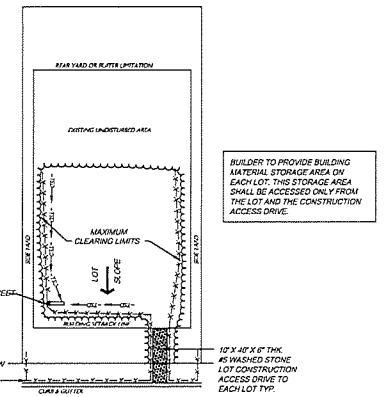
NOTE: ALL LOTS WILL BE REQUIRED TO OBTAIN INDIVIDUAL EROSION CONTROL PERMITS PRIOR TO CONSTRUCTION. THIS DETAIL IS FOR INFORMATION ONLY AND WILL NEED TO BE SUBMITTED FOR EACH LOT PERMIT AS APPLICABLE.

NOTES:

1. CONTRACTOR SHALL STABILIZE TEMPORARY DIVERSION DITCHES WITH A COMBINATION OF H30 PAM GRANULAR AT A RATE OF 15 LBS / ACRE AND STRAW MATTING.
2. HYDROLOC FLOC FLATS SHALL BE INSTALLED AT THE END OF EACH DIVERSION DITCH TO ASSIST THE SEDIMENT TRAPPING EFFICIENCY.

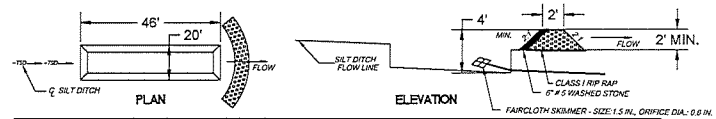


TYPICAL LOT DEVELOPMENT EROSION CONTROL
LOT SLOPING AWAY FROM STREET

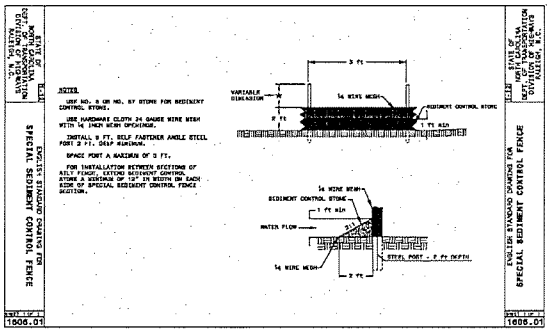


BUILDER TO PROVIDE BUILDING MATERIAL STORAGE AREA ON EACH LOT. THIS STORAGE AREA SHALL BE ACCESSED ONLY FROM THE LOT AND THE CONSTRUCTION ACCESS DRIVE.

TYPICAL LOT DEVELOPMENT EROSION CONTROL
LOT SLOPING TOWARD STREET



SILT TRAP DETAIL



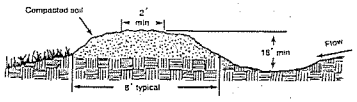


Figure 6.20a Temporary earthen diversion dike.

6.20.1

GENERAL NOTES:

1. Remove and properly dispose of all trees, brush, stumps, and other objectionable material.
2. Ensure that the minimum constructed cross section meets all design requirements.
3. Ensure that the top of the dike is not lower at any point than the design elevation plus the expected settlement.
4. Provide sufficient room around diversions to permit machine regrading and cleanout.
5. Vegetate the ridge immediately after construction, unless it will remain in place less than 30 working days.

TEMPORARY DIVERSION DITCH
NCDEQ #6.20
N.T.S.

LandDesign.
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
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WWW.LANDDESIGN.COM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015 CIVIL

NORTH CAROLINA PROFESSIONAL SEAL 053168 ENGINEER RICHARD L. CRISCO

5/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA
UNION COUNTY
NORTH CAROLINA

1020319

REVISION / ISSUANCE

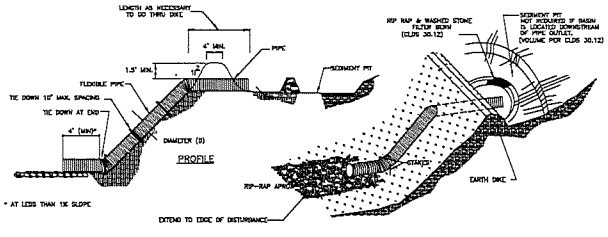
NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJE
CHECKED BY: MG

VERT: 1"=4'
HORZ: NTS
(NOT TO SCALE)

EROSION CONTROL DETAILS

C-5.15



CONSTRUCTION SPECIFICATIONS:

THE TOP OF THE EARTH DIKE OVER THE INLET PIPE AND THOSE DIKES CARRYING WATER TO THE PIPE SHALL BE AT LEAST 1.5 FEET HIGHER AT ALL POINTS THAN THE TOP OF THE INLET PIPE.

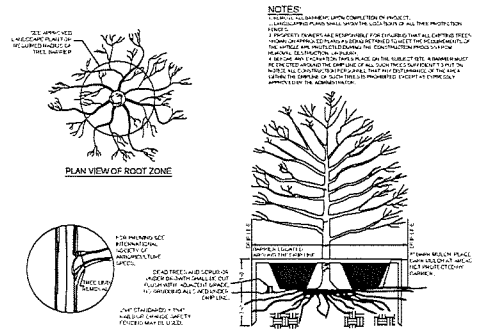
THE PIPE SHALL BE FLEXIBLE WITH WATER TIGHT CONNECTING BANDS. FLEXIBLE PIPE SHOULD BE STAKED ON EITHER SIDE.

A RIP RAP APRON SHALL BE PROVIDED AT THE OUTLET, IF DUMPING INTO A DISTURBED AREA.

4. THE SOIL AROUND AND UNDER THE INLET PIPE AND ENTRANCE SECTION SHALL BE HAND TAMPED IN 4" LIFTS TO THE TOP OF THE EARTH DIKE.
5. FOLLOW-UP INSPECTION AND ANY NEEDED MAINTENANCE SHALL BE PERFORMED AFTER EACH STORM BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT.
6. OUTLET PIPE SHOULD BE TAKEN OVER OR THROUGH ANY SILT FENCE, TAKING CARE NOT TO VOID THE EFFECTIVENESS OF THE SILT FENCE.

FLEXIBLE PIPE SLOPE DRAIN

NCDEQ 6.32 — NOT TO SCALE

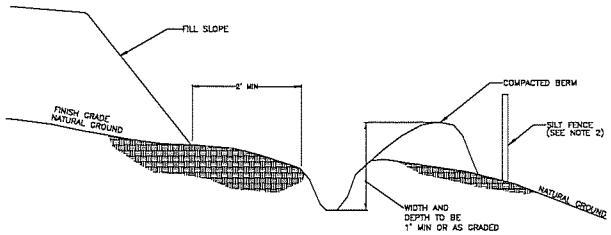


NOTES:

1. CLEARING AND GRADING UPON COMPLETION OF PROJECT.
2. REQUIRED PLANS SHALL SHOW THE LOCATION OF ALL TREE PROTECTION FENCES.
3. PROPERTY OWNERS ARE RESPONSIBLE FOR DISCARDING THAT HAS EXPIRED TREES. NONE CAN APPLIED PLANS AS BEING INTENDED TO MEET THE REQUIREMENTS OF THE ARTICLE ARE UNPROTECTED DURING THE CONSTRUCTION PROCESS FROM REMOVAL, DAMAGE OR DESTRUCTION.
4. NO TREE SHALL BE PLACED ON THE SUBJECT SITE. A BARRIER MUST BE ERECTED AROUND THE DRIPLINE OF ALL SUCH TREES SUFFICIENT TO PROTECT. NOTE: NO CONSTRUCTION FOR PLANS THAT MAY DISTURB/INJURE OF THE AREA WITHIN THE DRIPLINE OF SUCH TREES IS PROHIBITED EXCEPT AT EXPRESSLY APPROVED BY THE ADMINISTRATOR.

TREE PROTECTION

NOT TO SCALE



NOTE:

1. DITCH SHOULD HAVE LONGITUDINAL SLOPE OF 1%.
2. SILT FENCE MAY BE REQUIRED BEHIND BERM

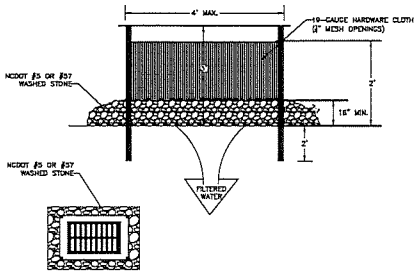
TEMPORARY DIVERSION DITCH

NCDEQ 6.20 — NOT TO SCALE

GENERAL NOTES:

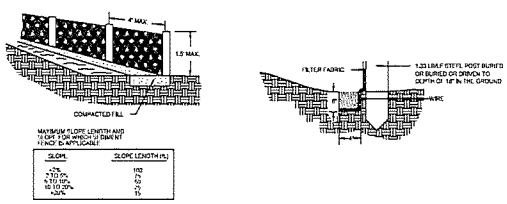
1. UNIFORMLY GRADE A SHALLOW DEPRESSION APPROACHING THE INLET.
2. DRIVE 5-FOOT STEEL POSTS 2 FEET INTO THE GROUND SURROUNDING THE INLET. SPACE POSTS EVENLY AROUND THE PERIMETER OF THE INLET, A MAXIMUM OF 4 FEET APART.
3. SURROUND THE POSTS WITH WIRE MESH HARDWARE CLOTH. SECURE THE WIRE MESH TO THE STEEL POSTS AT THE TOP, MIDDLE, AND BOTTOM. PLACING A 3-FOOT FLAP OF THE WIRE MESH UNDER THE GRAVEL FOR ANCHORING IS RECOMMENDED.
4. PLACE CLEAN GRAVEL (NC DOT #5 OR #57 STONE) ON A 2:1 SLOPE WITH A HEIGHT OF 18 INCHES AROUND THE WIRE, AND SMOOTH TO AN EVEN GRADE.
5. ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE ACCUMULATED SEDIMENT, AND ESTABLISH FINAL GRADING ELEVATIONS.
6. COMPACT THE AREA PROPERLY AND STABILIZED IT WITH GROUNDCOVER.

NOTE:
CONTRACTOR MAY USE OTHER NCDENR APPROVED INLET PROTECTION DEVICES IF APPROVED BY INSPECTOR



HARDWARE CLOTH AND GRAVEL INLET PROTECTION

NCDEQ 6.51 — NOT TO SCALE



MAXIMUM SLOPE LENGTH AND % SLOPE FOR WHICH SEDIMENT FENCE IS APPLICABLE

SLOPE	SLOPE LENGTH (FT)
<2%	100
2 TO 5%	87
5 TO 10%	62
10 TO 20%	37
>20%	25

SPECIFICATIONS FOR SEDIMENT FENCE FABRIC

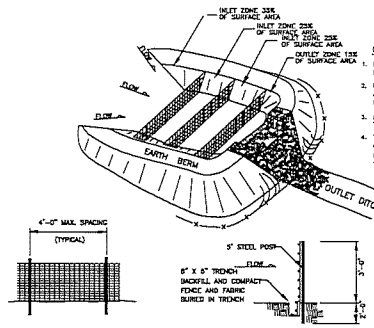
PHYSICAL PROPERTY	REQUIREMENTS
FILTERING EFFICIENCY	85% (MIN.)
TENSILE STRENGTH AT 20% (MAX.) ELONGATION	STANDARD STRENGTH: 30 LBS/LIN. INCH (MIN.)
	EXTRA STRENGTH: 50 LBS/LIN.IN (MIN.)
SLURRY FLOW RATE	0.3 GAL/SQ. FT/MIN (MIN.)

GENERAL NOTES

1. DRAINAGE AREA SHALL BE LESS THAN 1/4 ACRE PER 100 FEET OF FENCE.
2. DEPTH OF WATER BEHIND FENCE SHALL NOT EXCEED 1.5 FEET.
3. FOR REINFORCEMENT OF FABRIC USE 14 GAUGE MESH WITH 6" SPACING.
4. CONSTRUCT FENCE FROM A CONTINUOUS ROLL. JOINTS SHALL OVERLAP BY 4' MINIMUM.
5. IF WIRE MESH IS USED, FENCE POST SPACING MAY BE 8' MAXIMUM.
6. DO NOT ATTACH FABRIC TO EXISTING TREES.
7. INSPECT FENCES WEEKLY AND AFTER RAINFALL EVENTS. REPAIRS SHALL BE MADE IMMEDIATELY.
8. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO ENSURE ADEQUATE STORAGE VOLUMES.
9. PREFABRICATED SILT FENCE IS NOT ACCEPTABLE.

SEDIMENT FENCE (SILT FENCE)

NCDEQ 6.62 — NOT TO SCALE



GENERAL NOTES:

1. DRIVE 6' STEEL POST AT LEAST 24" INTO SOLID GROUND.
2. USE STAPLES 1' APART HORIZONTALLY AND VERTICALLY TO ATTACH THE FILTER FABRIC TO THE WIRE FENCE.
3. SPACE THE BAFFLES ACCORDING TO THE APPROVED PLAN.
4. THE FLOOR OF THE BASIN IN THE OUTLET ZONE AND BERMS SHOULD BE SEEDED IMMEDIATELY AFTER THE BASIN IS CONSTRUCTED.

BAFFLE INSTALLATION

NCDEQ 6.65 — NOT TO SCALE

LandDesign.
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

NORTH CAROLINA C-015 Registered Professional Engineer

NORTH CAROLINA PROFESSIONAL SEAL 045158 ENGINEER MARK L. CRESCENZO

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020310

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

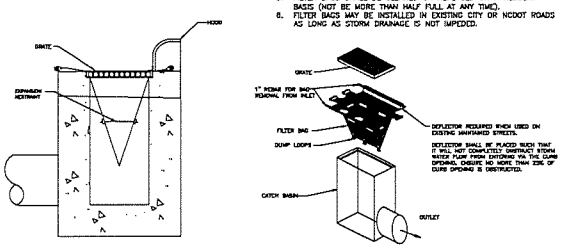
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT: 1"=4'
HORZ: NTS
(NOT TO SCALE)

EROSION CONTROL DETAILS

C-5.16

NOTES:
1. INLET MAINTENANCE SHALL BE DOCUMENTED IN PROJECT LOG BOOK.
2. FILTER TYPES SHALL BE APPROVED BY THE CITY INSPECTOR PRIOR TO INSTALLATION.
3. FILTER BAGS MAY BE REMOVED WHEN SITE IS STABILIZED AT THE DIRECTION OF THE ENGINEER.
4. FILTER BAGS SHALL BE REMOVED PRIOR TO STREET ACCEPTANCE AND/OR CLOSE OUT OF GRADING PERMIT.
5. FILTER BAGS SHALL BE CLEANED OR REPLACED ON A REGULAR BASIS (NOT BE MORE THAN HALF FULL AT ANY TIME).
6. FILTER BAGS MAY BE INSTALLED IN EXISTING CITY OR NCDOT ROADS AS LONG AS STORM DRAINAGE IS NOT IMPEDED.

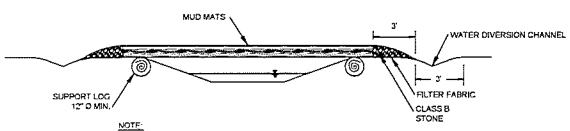


SECTION

INSTALLATION

CATCH INLET PROTECTION

NOT TO SCALE



NOTE:
1. CONSTRUCT WETLAND CROSSING WHEN FLOW IS AT NORMAL BASEFLOW.
2. MINIMIZE CLEARING AND EXCAVATION OF WETLAND BANKS. DO NOT EXCAVATE CHANNEL BOTTOM.
3. INSTALL WETLAND CROSSING PERPENDICULAR TO THE FLOW.
4. MAINTAIN CROSSING SO THAT RUNOFF IN THE CONSTRUCTION ROAD DOES NOT ENTER EXISTING CHANNEL.
5. STABILIZE AN ACCESS RAMP OF CLASS B STONE TO THE EDGE OF THE MUD MAT.
6. CONTRACTOR SHALL DETERMINE AN APPROPRIATE RAMP ANGLE ACCORDING TO EQUIPMENT UTILIZED.

MUD MAT CROSSING

NOT TO SCALE

GENERAL NOTES:
1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED, AND STRIPPED OF ANY VEGETATION AND ROOT MATERIAL. THE BASIN AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVERSIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE BEING CONSTRUCTED. SPILLWAYS SHOULD NOT BE CONSTRUCTED THROUGH FILL SECTIONS. ALL SPILLWAYS SHOULD BE LINED AND/OR RIPRAPPED.
3. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO DEPTH SHOWN ON STANDARD. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA IN SUCH A MANNER THAT IT WILL NOT ERODE.
4. THE TRAP SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NECESSARY.
5. CONSTRUCTION OPERATION SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IS MINIMIZED.
6. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER, UNLESS CERTIFIED BY REGISTERED GEOTECHNICAL ENGINEER.
7. SEDIMENT BASIN EMBANKMENTS SHOULD BE PROVIDED WITH EROSION CONTROL AND STABILIZATION.
8. STORAGE AREA MAY BE CONSTRUCTED IN ANY SHAPE PROVIDED THE MINIMUM STORAGE VOLUME REQUIREMENT IS MET. THE BASIN SHOULD ALSO BE ORIENTED SUCH THAT THE FILTER AND THE MAIN FLOW OF WATER AND SEDIMENT ARE ON OPPOSITE ENDS ON THE LONGEST BASIN DIMENSIONS.
9. THE LENGTH OF THE STONE OUTLET (SPILLWAY) IS TO BE BASED ON A 10 YEAR STORM.
10. WHENEVER TOPOGRAPHY ALLOWS, THE BASIN LENGTH SHOULD BE TWICE (2X) THE BASIN WIDTH, TO ALLOW FOR SETTLING. BAFFLES SHALL BE INSTALLED IN ALL BASINS.
11. CLEANOUT STAKES SHALL BE PLACED IN ALL SEDIMENT BASINS AT THE LOW POINT IN THE BASIN. THE STAKES SHALL BE MARKED SHOWING THE HALF FULL CLEANOUT POINT, OF THE BASIN.
12. SAFETY FENCING 3' HIGH SHOULD BE PLACED AROUND ALL SEDIMENT BASINS.
13. FOR DESIGN OF SEDIMENT BASINS, REFER TO THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
14. FOR SLOPES GREATER THAN 10' IN LENGTH AND PROTECTED BY SILT FENCE AT THE TOE OF THE SLOPE, SLOPE TERRACING WILL BE REQUIRED.
15. THE BERM ON SEDIMENT BASINS SHALL BE SEEDED ONCE FINAL GRADE HAS BEEN REACHED. THE SILT FENCE MAY BE REMOVED IF PERMISSION HAS BEEN GRANTED BY THE CITY LAND DEVELOPMENT INSPECTOR AFTER THE GRASS HAS GERMINATED AND STABLE GROUND HAS BEEN ESTABLISHED.
16. MATCHED STONE AND WIRE BACKING SHALL BE USED WITH SILT FENCE WHENEVER SILT FENCE IS PLACED AT THE TOE OF A SLOPE >10' VERTICAL OR ALONG ANY CHANNEL OR WATER COURSE

GENERAL NOTES-SEDIMENT BASINS

STD. NO. REV.

TEMPORARY SEEDING SCHEDULE

NTS

FOR LATE WINTER AND EARLY SPRING:

SEEDING MIXTURE:
RYE (GRAIN) – 120 LB/ACRE
ANNUAL LESPEDEZA (KOBE) – 50 LB/ACRE
(UNIT ANNUAL LESPEDEZA WHEN DURATION OF TEMPORARY COVER IS NOT TO EXTEND BEYOND JUNE)

SEEDING DATES:
JAN 1 – MAY 1

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE

FOR SUMMER:

SEEDING MIXTURE:
GERMAN MILLET – 40 LB/ACRE
(A SMALL-STEMMED SUDANGRASS MAY BE SUBSTITUTED AT A RATE OF 50 LB/ACRE)

SEEDING DATES:
MAY 1 – AUG. 15

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE

FOR FALL:

SEEDING MIXTURE:
RYE (GRAIN) – 120 LB/ACRE

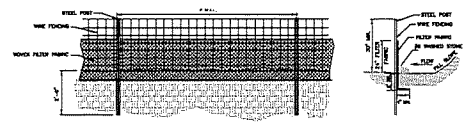
SEEDING DATES:
AUG. 15 – DEC 30

SOIL AMENDMENTS:
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10-10-10 FERTILIZER

MULCH:
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.

MAINTENANCE:
REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50 LB/ACRE OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/ACRE KOBE LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

FOR ADDITIONAL INFORMATION, REFER TO NCDENR EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (ESCPDM), SECTION 6.10. FOR PERMANENT SEEDING SPECIFICATIONS, INCLUDING SEED BED PREP, SEASONAL LIMITATIONS FOR SEEDING OPERATIONS, THE KINDS OF GRADES OF FERTILIZERS, THE KINDS OF SEED, AND THE RATES OF APPLICATION OF LIMESTONE, FERTILIZER, AND SEED, REFER TO NCDENR ESCPDM SECTION 6.11 AND THE CHARLOTTE LANDSCAPE CONSTRUCTION STANDARDS SECTION 04200 SEEDING AND SODDING OF TURFGRASS.



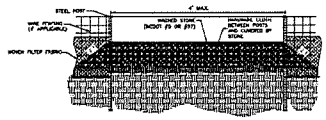
GENERAL NOTES:
1. WIRE FENCING SHALL BE A MINIMUM OF 32" IN WIDTH AND SHALL HAVE A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
2. WOVEN FILTER FABRIC BE USED WHERE SILT FENCE IS TO REMAIN FOR A PERIOD OF MORE THAN 30 DAYS.
3. STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
4. WIRE FENCING SHALL BE AT LEAST #10 GAGE WITH A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
5. TURN SILT FENCE UP SLOPE AT ENDS.
6. WIRE MESH SHALL BE MIN. 13 GAGE WITH MAXIMUM 12" OPENINGS.
7. WIRE AND WASHED STONE IS REQUIRED TO BE SHOWN ON PLANS AT THE TOE OF SLOPES GREATER THAN 10 FEET VERTICAL (2:1 SLOPE)
8. ORANGE SAFETY FENCE IS REQUIRED AT BACK OF SILT FENCE WHEN GRADING IS ADJACENT TO 30MM BUFFERS, STREAMS OR WETLANDS (REFER TO 30MM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.
9. DRAINAGE AREA CAN NOT BE GREATER THAN 1/4 ACRE PER 100 FT OF FENCE.
10. SLOPE LENGTHS CAN NOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
11. DO NOT INSTALL SEDIMENT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

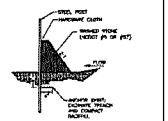
MAINTENANCE NOTES:
1. FILTER BARRIERS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC BECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

NOT TO SCALE

HIGH HAZARD
TEMPORARY SILT FENCE

STD. NO. REV.





GENERAL NOTES:
1. SEDIMENT FILTER OUTLET AND HARDWARE CLOTH SHALL BE 18 INCHES HIGH BUT NO TALLER THAN 18 INCHES.
2. HARDWARE CLOTH SHALL BE ANCHORED TO THE STEEL POSTS SECURELY USING 16 GAUGE TIE WIRE. HARDWARE CLOTH SHALL BE BURIED IN A MINIMUM OF 12 INCHES ALTERNATE AND CHECKERED PROTOCOL AS SHOWN IN ABOVE DETAIL. HARDWARE CLOTH TO BE SAME AS STD. (3/8"IN 1/4 GAUGE, 1/4" SPACING)
3. POSTS SHALL BE NO MORE THAN 4 FEET APART
4. SFC OUTLETS AT ANY POINT SHALL CONCENTRATED FLOWS ARE ANTICIPATED AND AT THE DIRECTION OF THE INSPECTOR.

MAINTENANCE NOTES:
1. FILTER OUTLETS SHALL BE INSPECTED BY THE FINANCIALLY RESPONSIBLE PARTY OR HIS AGENT IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS NEEDED SHALL BE MADE IMMEDIATELY.
2. THE STONE SHALL BE REPLACED PROMPTLY AFTER ANY EVENT THAT HAS CLOGGED OR REMOVED IT.
3. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN DEPOSITS REACH HALF THE HEIGHT OF THE BARRIER. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OUTLET IS REMOVED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

NOT TO SCALE

SILT FENCE
OUTLET

STD. NO. REV.

LandDesign.
223 NORTH GRAHAM STREET
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704.333.0325
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NORTH CAROLINA PROFESSIONAL SEAL C-015 ENGINEERING

NORTH CAROLINA PROFESSIONAL SEAL 053168 ENGINEER RAYMOND L. CROSS

5/4/2021

PROJECT:

THE ESTATES AT
MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT: 1"=4'
HORZ: NTS
(NOT TO SCALE)

SHEET TITLE:

EROSION CONTROL DETAILS

SHEET NUMBER:

C-5.17

HATCH LEGEND

- 285' VIEWSHED BUFFER
- CONSERVATION LAND (26% - 7.41 AC.)

LINETYPE LEGEND

- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING WATERMAIN
- PROPOSED WATERMAIN
- EXISTING STORM DRAINAGE
- PROPOSED STORM DRAINAGE
- EXISTING PROPERTY LINE
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED SANITARY SEWER EASEMENT
- PROPOSED SEWER MANHOLE
- PROPOSED SEWER CLEANOUT

ON-SITE SANITARY SEWER & WATER SUMMARY:	
PROP. 4' DIAMETER MANHOLES	9
NUMBER OF 3/4" IW SERVICES	1
NUMBER OF 3/4" DW SERVICES	16
NUMBER OF 4" SEWER SERVICES	16

SIZE	MATERIAL	LENGTH
8" SEWER	PVC	1,695 LF
4" SEWER	PVC	382 LF
8" WATER	PVC	1,850 LF
2" WATER	PVC	328 LF

SEE SHEETS C6.3 - C6.5 FOR NOTES AND DETAILS

DEVELOPMENT SUMMARY

PARCEL ID: 06222034
TOTAL ACREAGE: ±28.481 ACRES
JURISDICTION: MARVIN, NC
EXISTING ZONING: R (VILLAGE OF MARVIN)
PROPOSED USE: CONVENTIONAL SUBDIVISION

DEVELOPER: JONES HOMES USA
9717 EAGLE CREEK CENTER BLVD.
SUITE 200
ORLANDO, FL 32832
BEN KUHN
BJUHN@JONESHOMESUSA.COM
704-609-9246

LAND OWNERS: BARBARA AMY CLAWSON &
WILLIAM M ARDREY
516 PACER LANE
MARVIN, NC 28173

ENGINEER: LANDDESIGN, INC.
223 NORTH GRAHAM ST.
CHARLOTTE, NC 28202
704-333-0325
DALE STEWART
DSTEWART@LANDDESIGN.COM

DEVELOPMENT NOTES:

1. CONTRACTOR SHALL VERIFY THAT ALL PROPOSED AND EXISTING CONSTRUCTION WITHIN THE PROJECT LIMITS ADHERES TO ALL UNION COUNTY PUBLIC WORKS STANDARDS AND SPECIFICATIONS.
2. ANY WELLS OR ON-SITE WASTEWATER DISPOSAL SYSTEMS DISCOVERED DURING THE CONSTRUCTION PROCESS WILL BE ABANDONED IN ACCORDANCE WITH APPLICABLE NORTH CAROLINA LAWS AND RULES AFTER CONTACTING UNION COUNTY ENVIRONMENTAL HEALTH TO OBTAIN NECESSARY PERMITS.
3. SITE PLAN WILL FULLY COMPLY WITH THE UNION COUNTY DEVELOPMENT ORDINANCE, REZONING CASE NO. CZ-2017-001 AND SUP CASE NO. 2020-SUP-02.
4. THERE ARE NO KNOWN WELLS OR SEPTIC SYSTEMS ON THE PROPERTY.

UTILITY NOTES:

1. WATER LINES SHALL BE BURIED AS SPECIFIED IN UNION COUNTY STANDARD SPECIFICATIONS AND DETAILS FOR ROADS, STRUCTURES AND UTILITIES (LATEST EDITION). WATER MAINS SHALL NOT BE PLACED UNDER BUILDINGS OR STRUCTURES EXCEPT TO SUPPLY A SPRINKLER SYSTEM. THE MINIMUM COVER FOR WATER MAINS WITH AN 8" DIAMETER OR LESS IS 30 INCHES. IF THE MAIN EXCEEDS A 12 INCH DIAMETER, THE REQUIRED COVER IS 36 INCHES. ALL WATER LINES TO BE DUCTILE IRON PIPE.
2. WATER MAINS SHALL BE PLACED NO CLOSER THAN 4 FEET FROM THE BACK OF CURB TOWARD THE STREET, (4' PROPOSED).
3. WATER MAINS SHALL BE LOCATED AT LEAST 10 FEET LATERALLY FROM EXISTING AND PROPOSED SANITARY SEWERS.
4. WHERE IT IS NECESSARY FOR WATER MAINS TO CROSS OVER SEWER MAINS, VERTICAL 18" CLEARANCE IS REQUIRED.
5. EXISTING WATER SERVICES THAT WILL NOT BE UTILIZED MUST BE KILLED AT THE MAIN AND REMOVED AT CORP. STOP.
6. VALVES SHALL BE INSTALLED ON ALL BRANCHES FROM FEEDER MAINS AND BETWEEN MAINS AND HYDRANTS AS FOLLOWS:
7. PRIVATE WATER SYSTEMS MUST HAVE SUFFICIENT VALVE PLACEMENT AND NUMBER SO THE PRIVATE SYSTEM CAN BE ISOLATED FROM A PUBLIC WATER SYSTEM.
8. QUALITY OF WASTEWATER TO BE DELIVERED TO UCPWS SYSTEM FOR TREATMENT DOMESTIC.
9. SEWER MAIN DESIGN MUST BE LESS THAN 14' DEEP (MAX COVER).
10. FIRE HYDRANT SHALL BE PLACED A MINIMUM DISTANCE OF 4 FEET BACK OF CURB AND HAVE A CLEAR SPACE OF 3 FEET FROM ANY PERMANENT STRUCTURES.
11. METERS WILL NOT BE SET IF WATER METER BOXES, SEWER CLEANOUTS, VALVE BOXES OR THEIR APPURTENANCES ARE DAMAGED OR IMPROPERLY POSITIONED.
12. REFER TO UNION COUNTY SPECIFICATIONS, UNION COUNTY WATER AND SEWER EXTENSION POLICY AND TO UNION COUNTY WATER SEWER EXTENSION ORDINANCES.
13. ENGINEER VERIFIES DESIGN HAS BEEN BASED ON GROUND SURVEY.
14. THE WATER MAIN WILL BE RESTRAINT JOINT DIP 40 FEET BEFORE AND AFTER TO EACH FITTING.
15. PER THE ORDINANCE SECTION 21.7.05.A, ALL PROJECTS ENTAILING NEW CONSTRUCTION OF ANY PRINCIPAL STRUCTURE SHALL INSTALL ALL ON-SITE UTILITIES UNDERGROUND. UNDERGROUND UTILITIES (AND ASSOCIATED PEDESTALS, CABINETS, JUNCTION BOXES, AND TRANSFORMERS) MUST BE LOCATED IN BUILDING ALLEYS, WHERE POSSIBLE.
16. FIRE HYDRANTS SHALL BE INSTALLED AT INTERVALS NOT TO EXCEED 500 LINEAR FEET, UNLESS MORE RESTRICTIVE STANDARDS ARE SPECIFIED BY FIRE CODES.

ESTIMATED SEWER FLOWS:

SINGLE FAMILY 16 HOMES @ 190 GPD = 3,040 GPD

TOTAL ESTIMATED DEMAND =3,040 GPD

NATURE OF WASTEWATER: DOMESTIC
FLOWS TO CLTWATER

ESTIMATED WATER FLOWS:

SINGLE FAMILY 16 HOMES @ 400GPD = 6,400 GPD

IRRIGATION
HOME METERS 16 HOMES @ 200 GPD = 3,200 GPD
COMMON AREA 250,000 SF @ 1" PER WEEK /7 DAYS = 21,371 GPD

TOTAL ESTIMATED DEMAND = 30,971 GPD

FIRE FLOW - 2,000 GPM FOR 2 HOUR DURATION = 240,000 GALLONS

CONSTRUCTION SCHEDULE:

APPROVALS: DECEMBER 2021
BEGIN CONSTRUCTION: JANUARY 2022
COMPLETED CONSTRUCTION: JANUARY 2023

LandDesign.
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015 DALE L. STEWART

NORTH CAROLINA PROFESSIONAL SEAL 8/4/2021 DALE L. STEWART

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020310

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

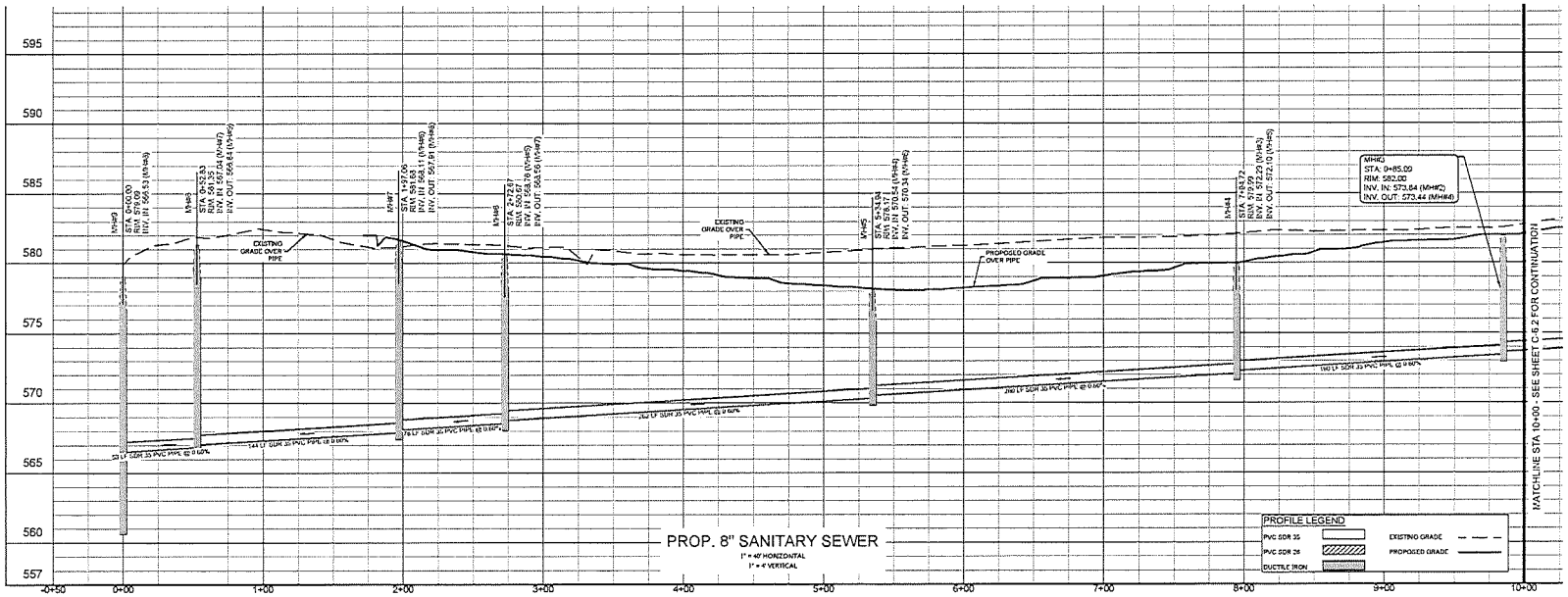
DESIGNED BY: RK
DRAWN BY: BJK
CHECKED BY: MG

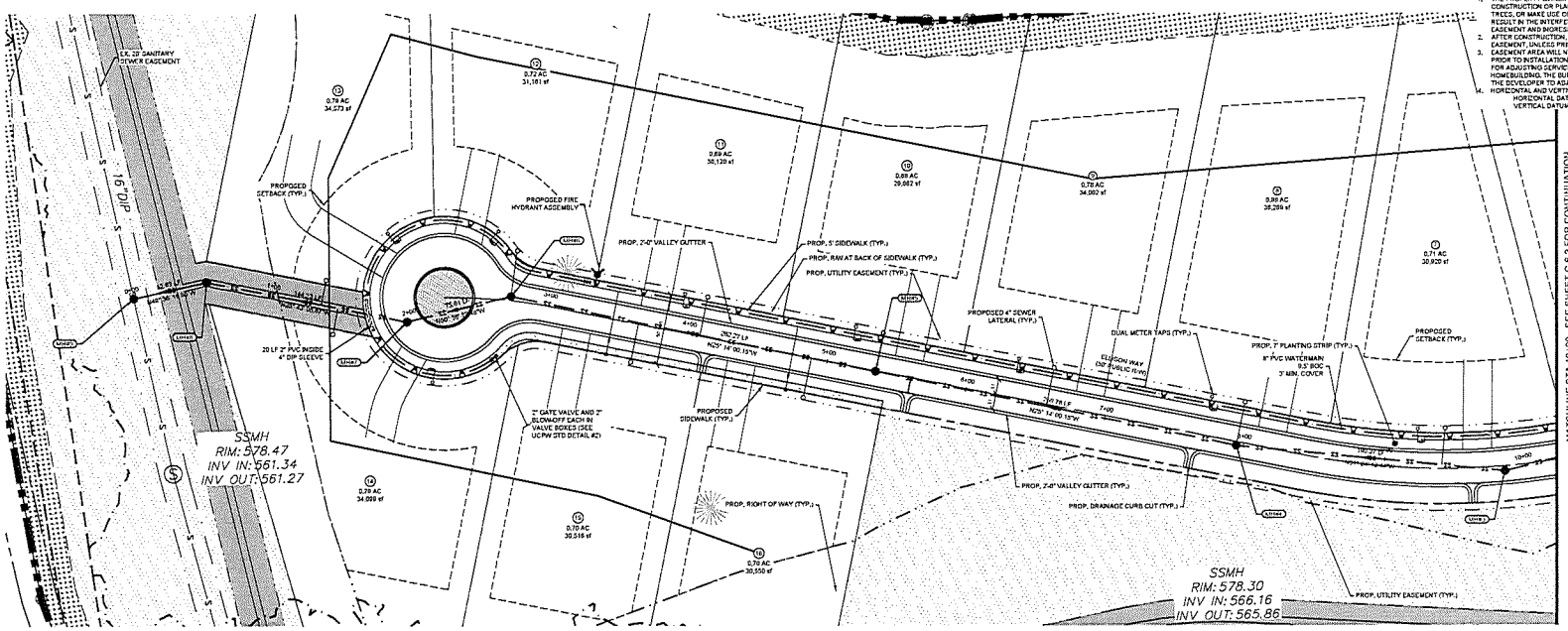
VERT: 1"=4'
HORZ: ########

0 100 200 400

OVERALL UTILITY PLAN

C-6.0





NOTES:

1. THE PROPERTY OWNER SHALL NOT CONSTRUCT OR PERMIT THE CONSTRUCTION OR PLACEMENT OF ANY TYPE OF STRUCTURE, PLANT TREES, OR MAKE USE OF THE EASEMENT AREA IN ANY MANNER THAN WILL RESULT IN THE INTERFERENCE OR IMPEDIMENT OF THE COUNTY'S EASEMENT AND INGRESS/EGRESS.
2. AFTER CONSTRUCTION, NO GRADING WILL BE ALLOWED INSIDE UCPW'S EASEMENT, UNLESS PRIOR APPROVAL IS GIVEN BY UCPW
3. EASEMENT AREA WILL NEED TO BE AT FINAL GRADE FOR THE SUBDIVISION PRIOR TO INSTALLATION OF SERVICES. UCPW WILL NOT BE RESPONSIBLE FOR ADJUSTING SERVICES IF GRADES ARE CHANGED DURING HOMEBUILDING. THE BUILDER WILL BE RESPONSIBLE FOR CONTACTING THE DEVELOPER TO ADJUST THE SERVICES.
4. HORIZONTAL AND VERTICAL CONTROL PROVIDED BY LDSI.
   HORIZONTAL DATUM: NAD 83 (2011)
   VERTICAL DATUM: NAVD 88

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015 MARK L. GREENWOOD

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020310

REVISION / ISSUANCE

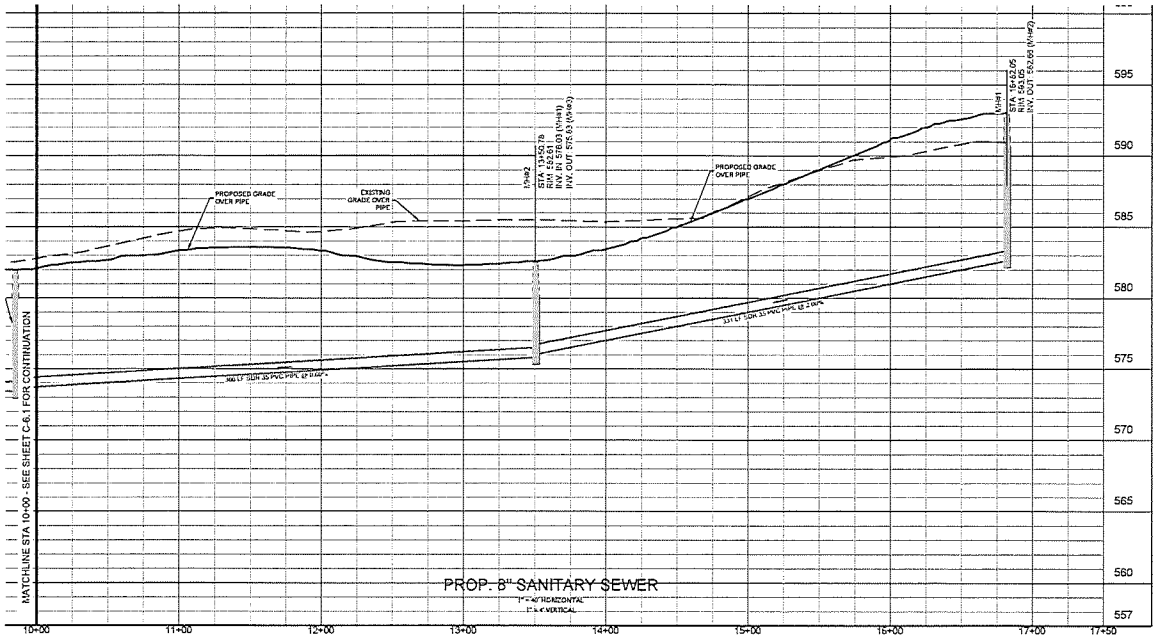
NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

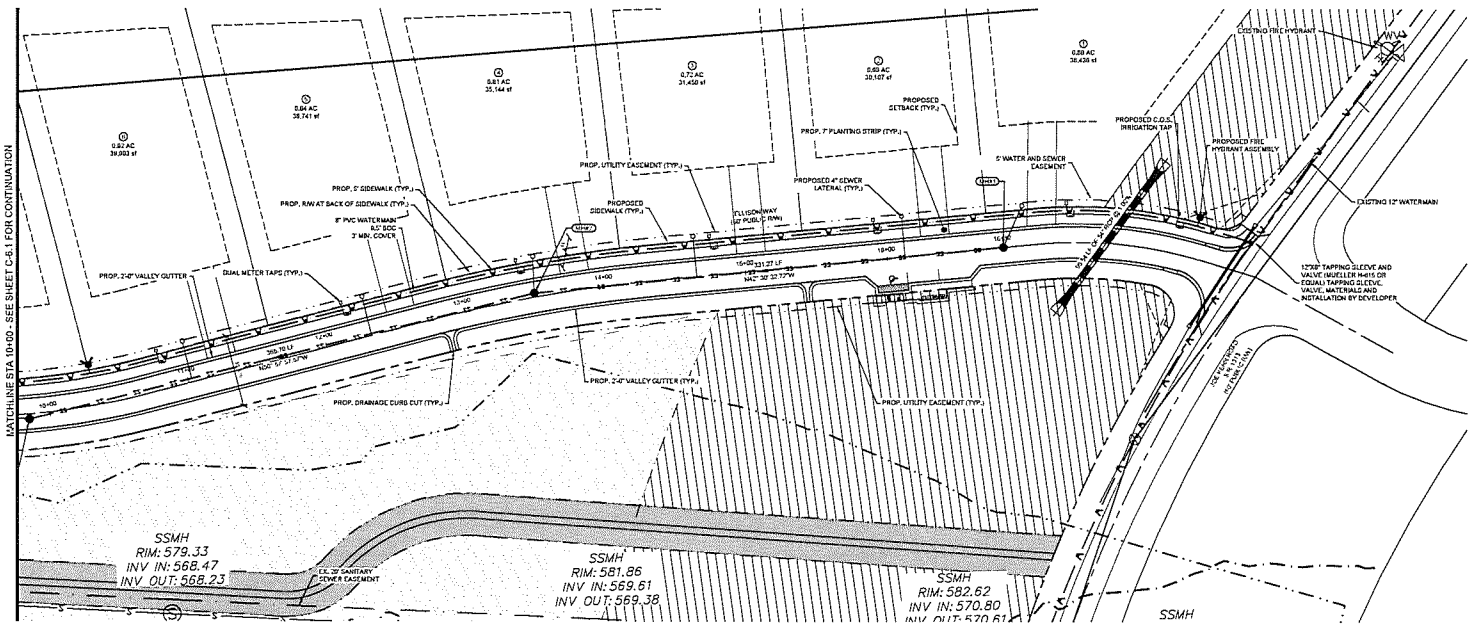
VERT. 1"=4'
HORZ. 1"=40'

UTILITY PLAN & PROFILE

C-6.1



PROFILE LEGEND			
PVC SDR 35		EXISTING GRADE	
PVC SDR 26		PROPOSED GRADE	
DUCTILE IRON			



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   HORIZONTAL DATUM: NAD 83 (2011)
   VERTICAL DATUM: NAVD 88

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015

NORTH CAROLINA PROFESSIONAL SEAL 045108 ENGINEER MICHAEL L. CHESSER

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020019

REVISION / ISSUANCE

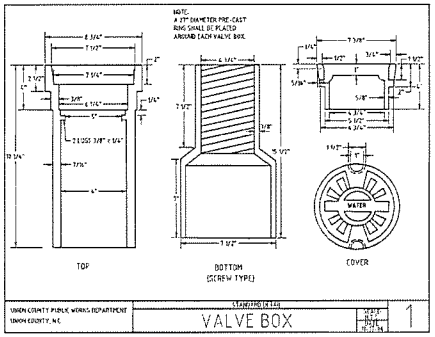
NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

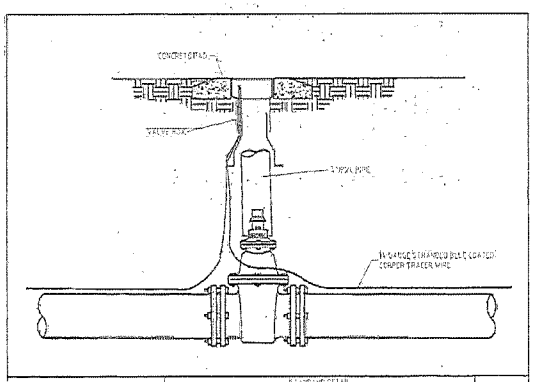
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MO

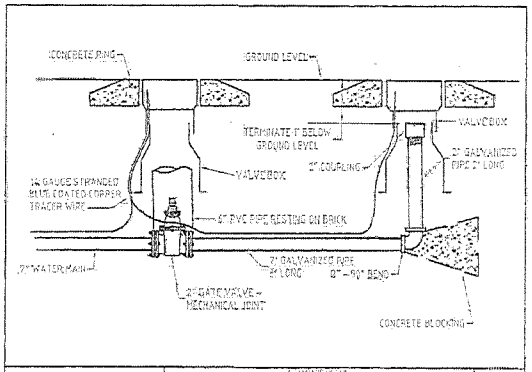
VERT: 1"=4'
HORZ: 1" = 40'

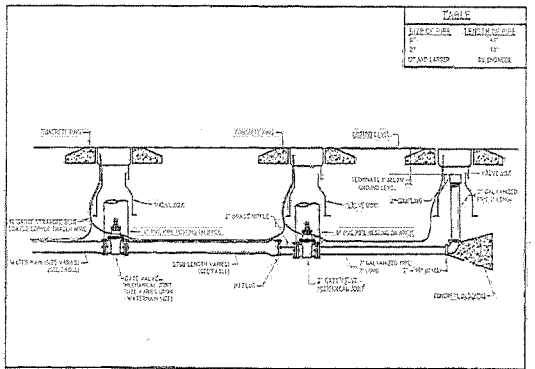
UTILITY PLAN & PROFILE

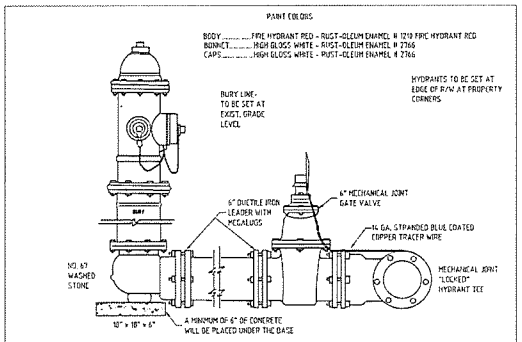
C-6.2

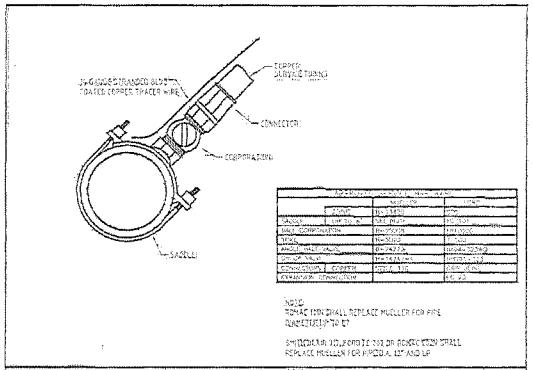


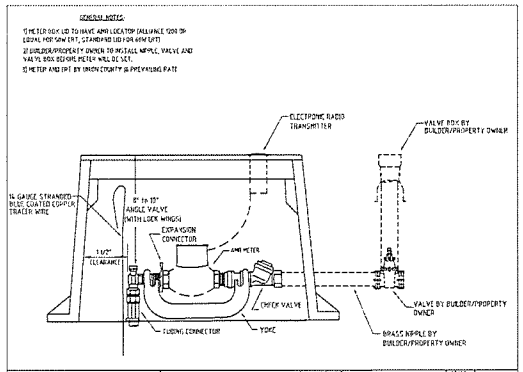


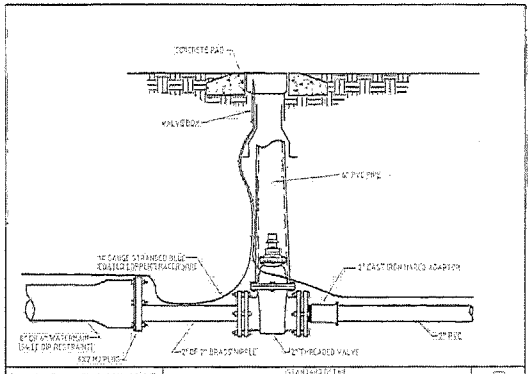


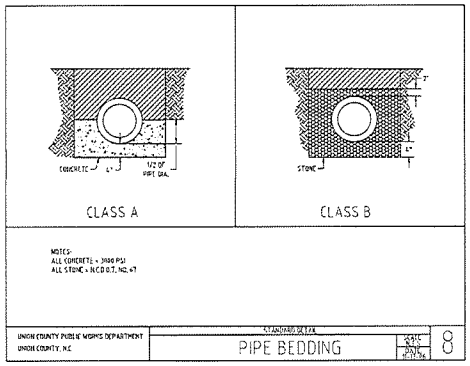












LandDesign.
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015 RICHARD J. KRAMER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19318 MICHAEL J. GRIFFITH

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020310

REVISION / ISSUANCE

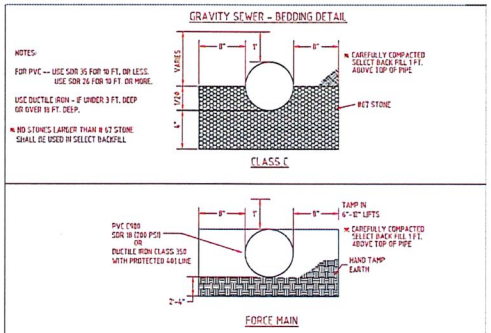
NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

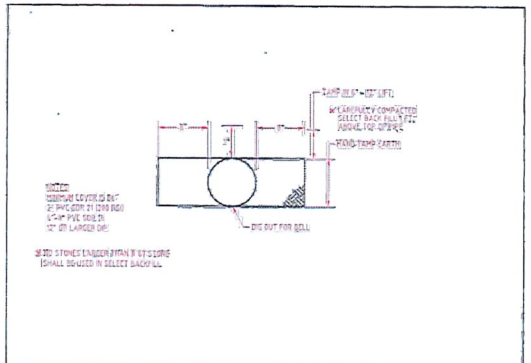
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

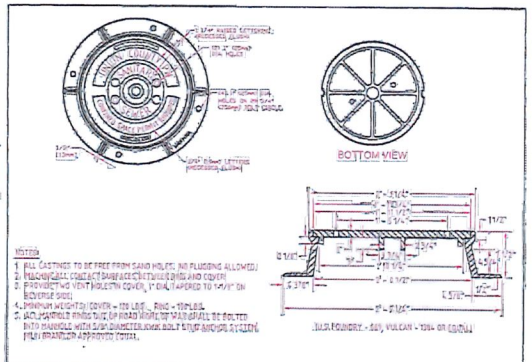
VERT. 1"=40'
HORZ.

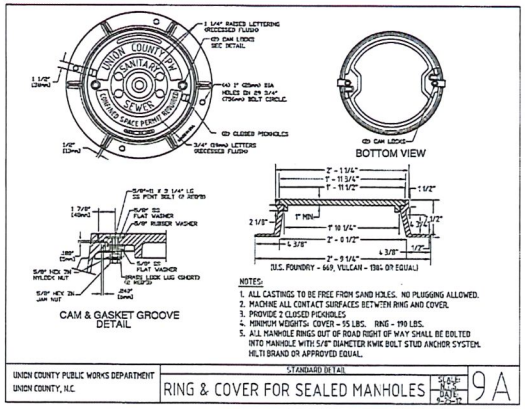
UTILITY DETAILS

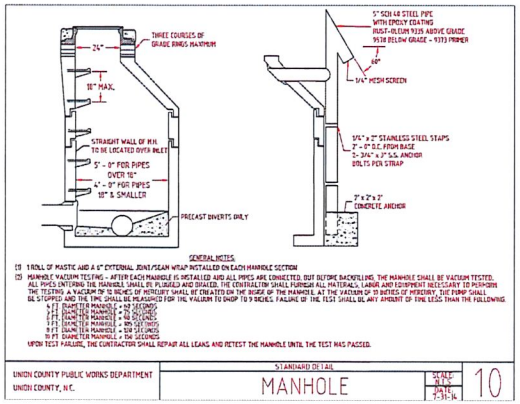
C-6.3

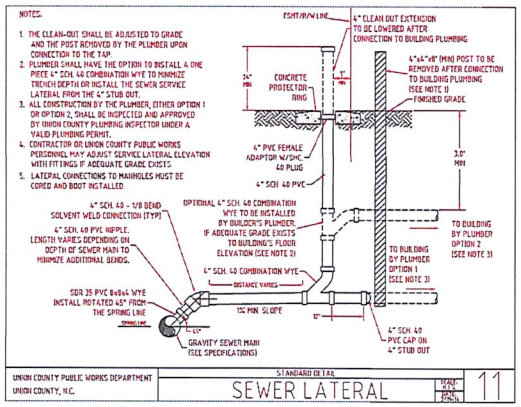


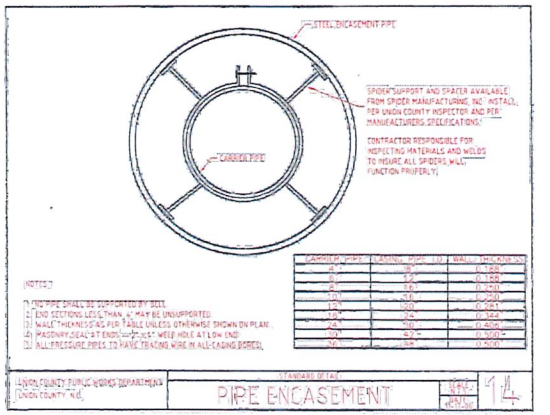




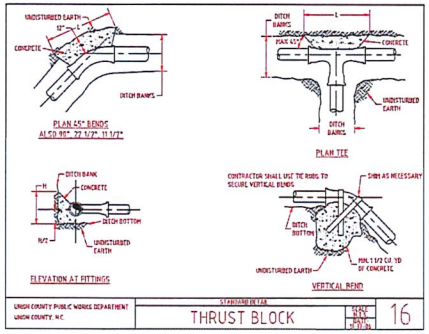








CARRIER PIPE	CASING PIPE (O.D.)	WALL THICKNESS
4"	10"	0.188"
6"	12"	0.188"
8"	16"	0.250"
10"	20"	0.250"
12"	24"	0.281"
16"	24"	0.344"
24"	30"	0.406"
30"	42"	0.500"
36"	48"	0.500"



ANCHORAGE SCHEDULE

PIPE SIZE	11 1/4° BEND		22 1/2° BEND		45° BEND		90° BEND		TEE		TEST PRESSURE (P.S.I)
	L	H	L	H	L	H	L	H	L	H	
6"	1'0"	1'6"	2'0"	1'6"	2'6"	1'6"	3'0"	1'6"	3'0"	1'6"	200
	1'6"	1'0"	2'0"	1'6"	3'0"	1'6"	4'0"	1'6"	3'0"	1'6"	100
8"	1'6"	1'6"	2'6"	1'6"	3'0"	2'0"	3'6"	2'0"	3'0"	2'0"	200
	2'0"	1'6"	3'0"	1'6"	3'0"	2'0"	4'0"	2'0"	3'0"	2'0"	100
12"	2'6"	1'6"	4'0"	2'0"	4'0"	2'0"	5'0"	2'0"	4'0"	2'0"	200
	3'0"	2'0"	5'0"	2'0"	6'0"	3'0"	7'0"	3'0"	5'0"	3'0"	100
16"	3'0"	1'6"	4'0"	3'0"	4'0"	3'0"	6'0"	3'0"	4'0"	3'0"	200
	4'0"	2'0"	5'0"	3'0"	6'0"	4'0"	8'0"	5'0"	5'0"	5'0"	100
12"	3'0"	2'0"	4'0"	3'0"	5'0"	4'0"	7'0"	4'0"	5'0"	4'0"	200
	4'0"	2'0"	6'0"	3'0"	6'0"	5'0"	8'0"	5'0"	6'0"	4'0"	100

THRUST BLOCK DIMENSIONS BASED ON SOIL BEARING CAPACITY OF 2000 P.S.F. AND A WATER TEST PRESSURE OF 150 P.S.I. SIZES OF THRUST BLOCKS MAY BE REVISED BY THE ENGINEER WHERE BEARING CAPACITY OF SOIL VARIES.

PROVIDE TAR PAPER JOINT BETWEEN CONCRETE THRUST BLOCK AND PORTION OF PIPE BEING ANCHORED.

ALL CONCRETE THRUST BLOCKS SHALL BE 2500 P.S.I CONCRETE.

MAXIMUM VERTICAL DEFLECTION SHALL BE 22 1/2°.

JOINTS SHALL REMAIN FREE OF CONCRETE FOR INSPECTION, REPAIR OR REPLACEMENT OF JOINTS.

UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.
STANDARD DETAIL
THRUST BLOCK SPECIFICATIONS
17

LandDesign.
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29108 MARVIN L. CHESSON JR.

8/4/2021

PROJECT

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA
UNION COUNTY
NORTH CAROLINA

1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

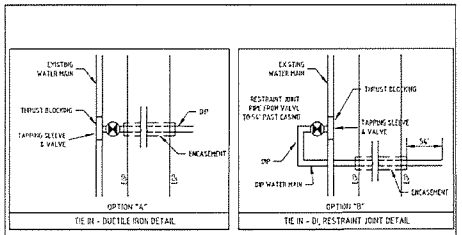
VERT: 1"=4'
HORZ:

SHEET TITLE

UTILITY DETAILS

SHEET NUMBER

C-6.4



NOTE:
OPTION "A" OR "B" WILL BE REQUIRED, DEPENDING ON THE AMOUNT OF SPACE AVAILABLE, TO BE FIELD VERIFIED

UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

TAPPING SLEEVE

SCALE: NTS
DATE: 10-10-19

18

NOTES:

1) INSTALLATION, MATERIALS AND DEVICES SHALL CONFORM TO UNION COUNTY PUBLIC WORKS SPECIFICATIONS AND REQUIREMENTS.

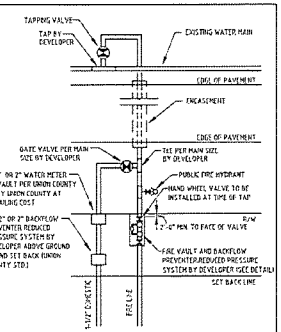
2) ALL PIPE TO BE RESTRAINT JOINT DIP FROM TAP TO BACKFLOW AND/OR FIRE VAULT THE 1-1/2 & 2 INCH PIPE SHALL BE BRASS TO THE BACKFLOW. ALTERNATE (3 INCH VALVE AND RESTRAINT JOINT DIP IN LIEU OF BRASS)

3) FEES MUST BE PAID PRIOR TO INSTALLATION.

4) NO PVC PIPE SHALL BE USED WITHIN 5 FEET EACH END OF BACKFLOW PREVENTER

5) 3 INCHES LARGER CONTRACTOR INSTALLS APPROPRIATE DIP LINE THROUGH VAULT AND SUPPLIES VAULT. UNION COUNTY WILL INSTALL METER AND BYPASS AT PREVAILING COSTS. CONTRACTOR TO INSTALL APPROPRIATE SIZE RPZ.

6) FIRE DEPARTMENT CONNECTION (FDC) MUST BE WITHIN 100 FT MAX OF PUBLIC HYDRANT PER FIRE CODE.



UNION COUNTY PUBLIC WORKS DEPARTMENT
UNION COUNTY, N.C.

STANDARD DETAIL

WATER CONNECTION

SCALE: NTS
DATE: 10-10-19

22

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223 NORTH GRAHAM STREET
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704.333.0325
WWW.LANDDESIGN.COM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015 LandDesign

NORTH CAROLINA PROFESSIONAL SEAL 043168 ENGINEER MICHAEL L. GREENE

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT: 1"=4'
HORZ:

UTILITY DETAILS

C-6.5

PLANT SCHEDULE STREET TREES								
TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	MIN. CONT.	MIN. CAL.	MIN. HT.	REMARKS
	ACRU	82	ACER RUBRUM	RED MAPLE	B & B	3" CAL.	10-12'	MATCH SPECIMEN, STRAIGHT LEADER

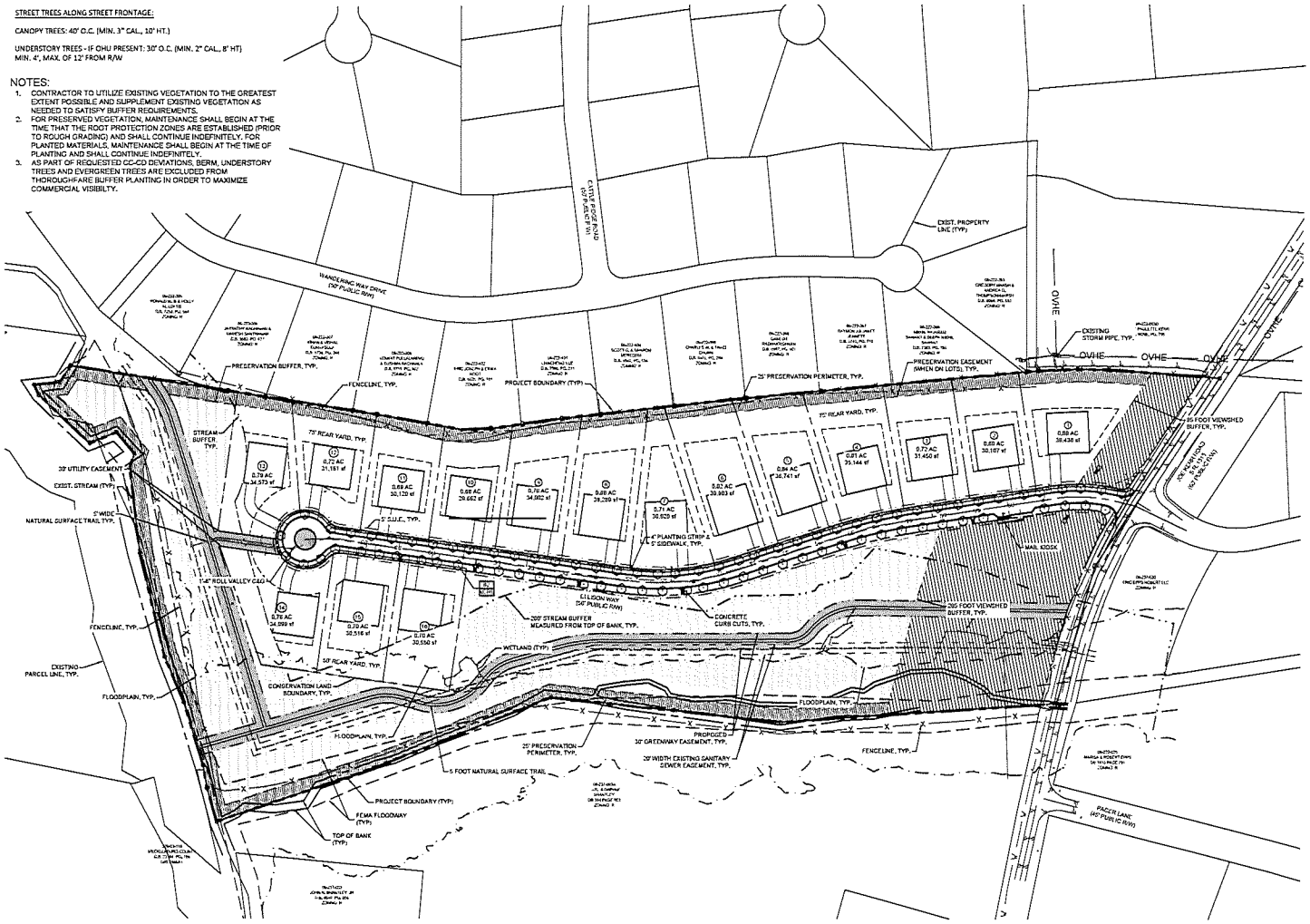
STREET TREES ALONG STREET FRONTAGE:

CANOPY TREES: 40' O.C. (MIN. 3" CAL., 10' HT.)

UNDERSTORY TREES - IF OHU PRESENT: 30' O.C. (MIN. 2" CAL., 8' HT)
MIN. 4', MAX. OF 12' FROM R/W

NOTES:

1. CONTRACTOR TO UTILIZE EXISTING VEGETATION TO THE GREATEST EXTENT POSSIBLE AND SUPPLEMENT EXISTING VEGETATION AS NEEDED TO SATISFY BUFFER REQUIREMENTS.
2. FOR PRESERVED VEGETATION, MAINTENANCE SHALL BEGIN AT THE TIME THAT THE ROOT PROTECTION ZONES ARE ESTABLISHED (PRIOR TO ROUGH GRADING) AND SHALL CONTINUE INDEFINITELY. FOR PLANTED MATERIALS, MAINTENANCE SHALL BEGIN AT THE TIME OF PLANTING AND SHALL CONTINUE INDEFINITELY.
3. AS PART OF REQUESTED CC-CD DEVIATIONS, BERM, UNDERSTORY TREES AND EVERGREEN TREES ARE EXCLUDED FROM THOROUGHFARE BUFFER PLANTING IN ORDER TO MAXIMIZE COMMERCIAL VISIBILTY.



HATCH LEGEND

- 85' & 285' VIEWSHED BUFFER
- CONSERVATION LAND (37% - 10.56 AC.)
- 30' GREENWAY EASEMENT
- 25' PRESERVATION PERIMETER

LINETYPE LEGEND

- PROJECT BOUNDARY LINE
- PROP. R/W
- EXIST. PROPERTY LINE
- EXIST. EOP
- FEMA FLOODZONE

LandDesign.
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

NORTH CAROLINA C-015 LANDDESIGN, INC.

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT 2174 MARK E. KIRKE

Aug 4 2021 4:17 PM

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020310

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

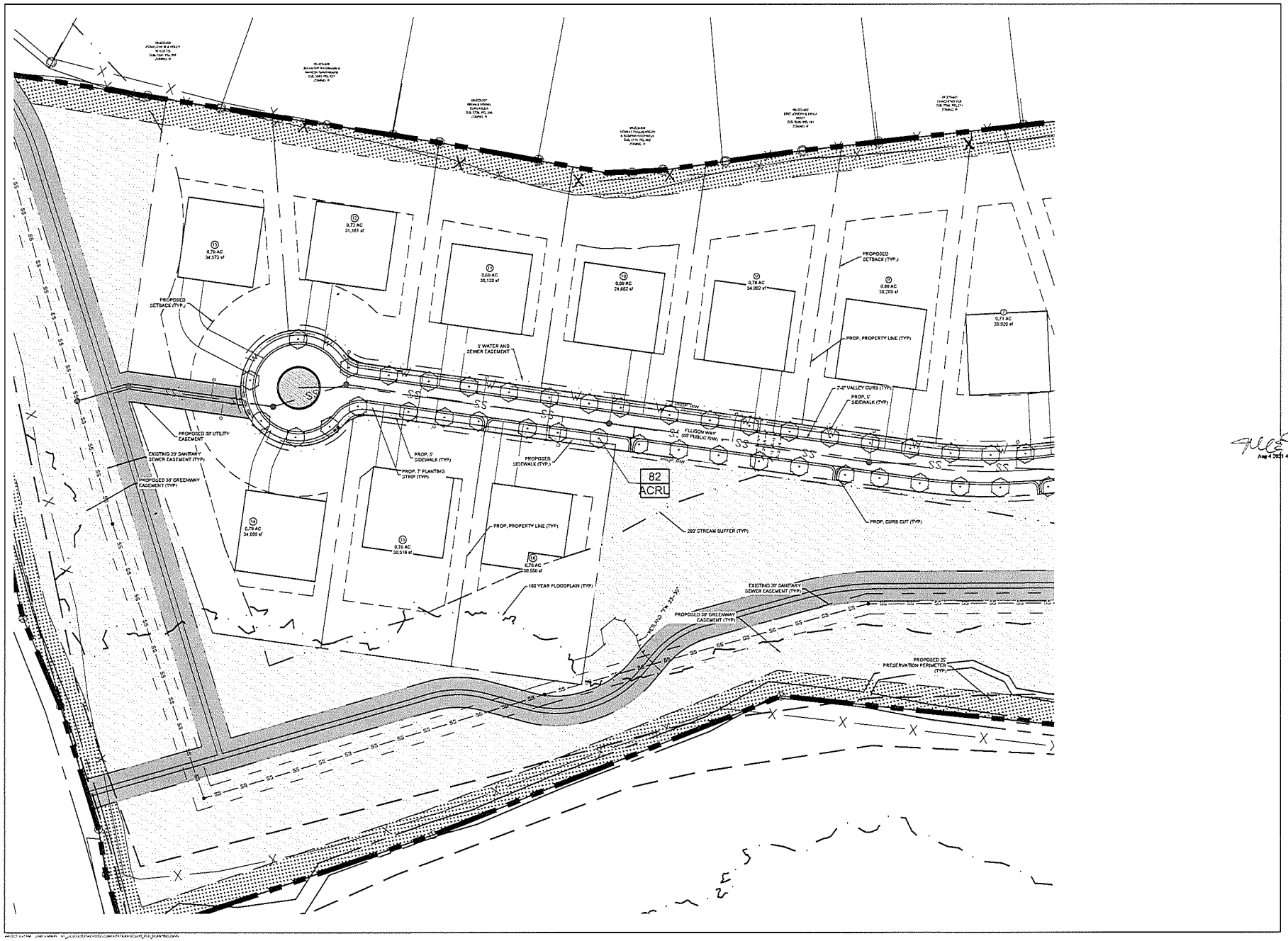
DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MO

VERT: 1"=4'
HORZ: 1" = 100'

0 50 100 200

OVERALL PLANTING PLAN

C-7.0



LandDesign.
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

NORTH CAROLINA PROFESSIONAL SEAL C-015 ENGINEERING

NORTH CAROLINA LICENSED LANDSCAPE ARCHITECT 1523 MARK E. KIME

Aug 4 2021 4:37 PM

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020319

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT: 1"=4'
HORZ: 1"=40'

0 20 40 80

DETAILED PLANTING PLAN

C-7.1

LandDesign.

223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015

Aug 4 2021 4:17 PM

NORTH CAROLINA PROFESSIONAL LANDSCAPE ARCHITECT SEAL 1523

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA

UNION COUNTY

NORTH CAROLINA

1020310

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT: 1"=4'
HORZ: 1" = 40'

0 20 40 80

DETAILED PLANTING PLAN

C-7.2

MATERIALS

A. TOPSOIL
1. TOPSOIL SHALL HAVE A PH VALUE FROM 5.6 - 7.6 AND SHALL BE NATURAL FERTILE, (AGRICULTURAL SOIL, BROWN IN COLOR) UNIFORM FRIABLE LOAM WITHOUT ADMIXTURE OF SUBSOIL CONTAINING ORGANIC MATTER OF 5 PERCENT OR GREATER AND SHALL BE CAPABLE OF SUSTAINING VIGOROUS PLANT GROWTH.
2. ALL TOPSOIL SHALL PASS A 1 INCH SCREEN AND 40 PERCENT SHALL PASS THE 100 MESH SCREEN. IT SHALL BE FREE OF ANY ADD-MIXTURE OF SUBSOIL, AND CONTAIN NO STONES, LUMPS, CLODS OF HARD EARTH, SLAG, CINDERS, STICKS, PLANTS OR THEIR ROOTS, TRASH OR OTHER EXTRANEOUS MATERIALS.
3. TOPSOIL MUST ALSO BE FREE OF PLANT PARTS OF BERMUDA GRASS, QUACKGRASS, JOHNSONGRASS, NUTSEDGE, POISON IVY, CANADA THISTLE, OR ANY NOXIOUS WEEDS AND SHALL NOT BE CONTAMINATED WITH ANY SUBSTANCE KNOWN HARMFUL TO THE GROWTH OF PLANTS OR HUMANS.
4. TOPSOIL SHALL NOT BE USED FOR PLANTING OPERATIONS WHILE IN A FROZEN OR MUDDY CONDITION.
5. TOPSOIL SOURCES SHALL BE TESTED BY A RECOGNIZED LABORATORY AT THE EXPENSE OF THE CONTRACTOR FOR PH, SOIL TEXTURE AND SOLUBLE SALTS. SALINITY SHALL NOT EXCEED 3 MILS PER CENTIMETER AT 25 DEGREES C AS DETERMINED BY SATURATED SOIL PASTE METHOD AS DESCRIBED IN USDA CIRCULAR #982. TEST RESULTS MUST BE PRESENTED IN WRITING TO THE LANDSCAPE ARCHITECT OR OWNER PRIOR TO PLACEMENT OF TOPSOIL ON SITE.
6. CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR CONTROL OF NOXIOUS OR INVASIVE SPECIES INTRODUCED BY CONTAMINATED TOPSOIL.
7. TOPSOIL THAT HAS BEEN STOCKPILED FOR A LONG PERIOD SHALL BE INOCULATED TO REESTABLISH ITS MICROBIAL ACTIVITY.

B. MULCH
SHALL BE TWICE SHREDDED HARDWOOD, AGED 1 YEAR.

C. DOLOMITE LIME
SHALL BE AGRICULTURE GRADE GROUND LIMESTONE MEETING ASTM C51 AND CONTAINING NOT LESS THAN 85 PERCENT TOTAL OF CALCIUM MAGNESIUM CARBONATE, FREE OF IMPURITIES, WITH 95 PERCENT PASSING A NUMBER 8 SIEVE AND 40 PERCENT PASSING A NUMBER 100 SIEVE.

D. SAND
SHALL BE CLEAN, WASHED, COARSE, MASONRY SAND, RIVER SAND ,OR NUMBER 2 BUILDERS SAND MEETING ASTM C 33.

E. TRACE ELEMENTS
SHALL BE ADDED AS REQUIRED BY SOILS TEST .

F. SEWAGE SLUDGE
WHEN DESIGNATED IN WRITING, COMPOSTED SEWAGE SLUDGE MAY BE USED AND SHALL BE COMMERCIALLY AVAILABLE, HIGH QUALITY, ENVIRONMENTALLY SAFE, STERILE, EPA APPROVED SOIL PRODUCT FOR AGRONOMIC USE. IT SHALL CONSIST OF SEWAGE SLUDGE WHICH HAS BEEN COMBINED WITH WOOD CHIPS OR OTHER BULKING AGENT, AERATED AND COMPOSTED FOR 21 DAYS INCLUDING 3 DAYS AT 131 DEGREE F. THE SEWAGE SLUDGE SHALL BE AGED, SHREDDED AND SCREENED AND EXHIBIT THE FOLLOWING CHARACTERISTICS

PH: 5.6 - 7.7

TOTAL NITROGEN (N) 1.2 PERCENT AVAILABLE
PHOSPHORIC ACID (P205) 1 PERCENT SOLUBLE
POTASH (K20) .25 PERCENT
MICRONUTRIENT CONTENT (FE, MN, B, ZN, NI, CU, B)
LOW CADMIUM CONTENT
EPA APPROVAL PATHOGEN DESTRUCTION

G. LEAF MOLD SHALL BE COMPOSTED LEAF MATERIAL, FREE OF NOXIOUS WEEDS AND DETRIMENTAL INSECTS.

H. COMMERCIAL FERTILIZER
TO MEET FED. SPECIFICATION O-F-241 TYPE 1 GRADE NOTED, LEVEL B. THE FERTILIZER SHALL BE GRANULAR UNLESS PACKETS, TABLETS, OR STAKES TO BE USED WITH MINIMUM OF 50 PERCENT OF TOTAL NITROGEN IN ORGANIC FORM WITH NO CYANAMID COMPOUNDS OR HYDRATED LIME MIXES TO BE ADDED OR FOUND IN THE FERTILIZER.

I. OTHER ACCEPTABLE FERTILIZER FORMS:
1. FOR TREES
ANUTRIPAK
JRP INTN'L, INC.
17 FOREST AVENUE
FOND DU LAC, WISCONSIN 54935
2. AJOBES, PLANT SPIKES - FOR TREES AND SHRUBS.
3. ALAVIN PRO OR SIMILAR APPROVED SLOW RELEASE FERTILIZER FOR LAWNS WITH THE FOLLOWING RATIO:
3 NITROGEN
1 PHOSPHORIC ACID
2 POTASH
4. A HOLLY-TONE OR SIMILAR APPROVED WITH CHELATED IRON FOR EVERGREEN PLANTS.

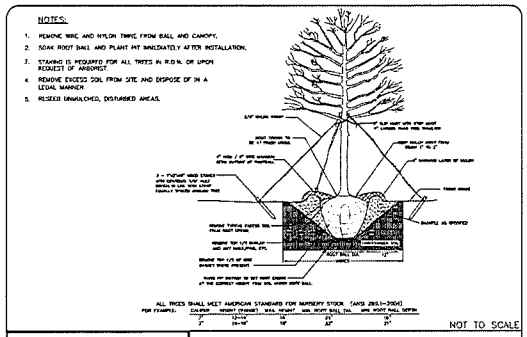
J. PEAT
1. SHALL CONFORM TO FEDERAL SPECIFICATION O-P-166C, PEAT MOSS, PEAT HUMUS, AND PEAT, REED-SEDGE.
2. SHALL BE LOW IN WOODY MATERIAL AND FREE OF MINERAL OR OTHER MATERIAL HARMFUL TO PLANT LIFE.
3. THE MIN. ORGANIC CONTENT TO BE APPROX. 90% WITH ACID REACTION FROM 4-5 PH, AND MOISTURE ABSORPTIVE CAPACITY NOT LESS THAN 450 PERCENT.
4. HUMUS TO BE SHREDDED, DRIED AND STERILIZED TO PASS 1/4 INCH SCREEN.
5. MOSS SHALL BE PULVERIZED AND HORTICULTURAL GRADE SPHAGNUM MOSS FREE OF EXTRANEOUS OR HARMFUL MATERIAL.
6. TO BE FINELY MILLED BLACK MICHIGAN PEAT OR OTHER SIMILAR APPROVED.

K. MANURE
1. SHALL BE WELL-ROTTED HORSE OR COW (OR COMBINATION THEREOF) MANURE. NOT TO CONTAIN OVER 25% STRAW OR LITTER. IT SHALL BE FREE OF FRESH MANURE, SAWDUST, WOOD CHIPS, LEATHER CHIPS, TAN BARK, LONG STRAW, SOFT HAY, STONES, FOREIGN INJURIOUS SUBSTANCES OR CHEMICALS USED TO HASTEN DECOMPOSITION.
2. TO BE TWO YEARS OLD MAXIMUM, NINE MONTHS MINIMUM WITH MINIMUM OF THREE TURNINGS WITHIN THIS TIME PERIOD.
3. NO BURNED OR PINE-RANGED MANURE WILL BE ACCEPTABLE.

L. SOIL AMENDMENTS
DIATOMACEOUS EARTH SOIL AMENDMENT CONSISTING OF SILICA, ALUMINA, IRON OXIDE AND SHALL HAVE 0.1 TO 1 MICRON PORE SIZE, WITH A MINIMUM OF 113 PERCENT WATER ABSORPTION, MAXIMUM 19 PERCENT LOSS SULPHATE SOUNDNESS, 80 PERCENT TOTAL POROSITY. A TOTAL OF 54 PERCENT TO PASS 10 MESH SCREEN, 98 PERCENT TO PASS 80 MESH SCREEN.

SOIL AMENDMENTS

NOTES:
1. REMOVE WIRE AND NYLON TWINE FROM BALL AND CANOPY.
2. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.
3. STAKING IS REQUIRED FOR ALL TREES IN R.O.W. OR UPON REQUEST OF ARBORIST.
4. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
5. RESEED UNMULCHED, DISTURBED AREAS.



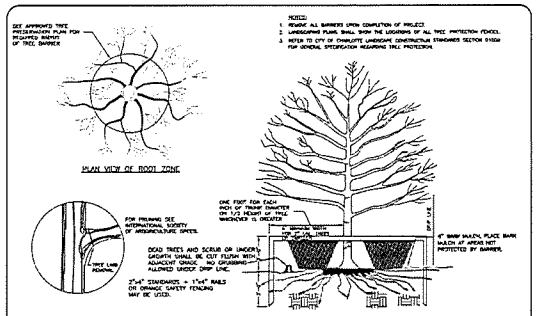
ALL TREES SHALL MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2004)

FOR EXAMPLE:	CALIPER	HEIGHT (FRONT)	MIN. HEIGHT	MIN. HEIGHT BALL DIA.	MIN. HEIGHT BALL DEPTH
	2"	12-14'	10'	22"	16"
	3"	14-16'	12'	32"	22"

NOT TO SCALE

TREE PLANTING
(FOR SINGLE AND MULTI-STEM TREES)

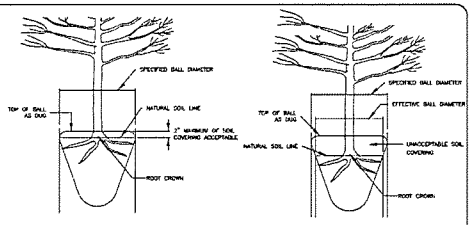
40.01



NOTES:
1. REMOVE ALL BARRIERS UPON COMPLETION OF PROJECT.
2. LANDSCAPE PLANS SHALL SHOW THE LOCATIONS OF ALL TREE PROTECTION FENCES.
3. REFER TO CITY OF CHARLOTTE LANDSCAPE CONSTRUCTION STANDARDS SECTION 01050 FOR GENERAL SPECIFICATION REGARDING TREE PROTECTION.

TREE PROTECTION DETAIL

40.02



ACCEPTABLE CONDITION
(AS DELIVERED)

UNACCEPTABLE CONDITION
(AS DELIVERED)

NOTE:
A ROOT FLARE EXCAVATION FOR ALL TREES SPECIFIED WILL BE DONE BY THE CITY ARBORIST TO ENSURE THAT TREES WERE NOT PLANTED/GROWN TOO DEEPLY AT SOURCE (NURSERY). LANDSCAPE CONTRACTOR SHALL HAVE SUPPLIER MARK GROUND LEVEL LINE ABOVE ROOT BALL. IF CITY ARBORIST DETERMINES THAT THERE IS EXCESSIVE SOIL OVER THE ROOT CROWN, THOSE TREES WILL BE REJECTED.

ROOT FLARE DEPTHS
(TREE ROOT BALL CONDITION ON TREES FROM SUPPLIERS)

40.09 | 9

LandDesign.
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

NORTH CAROLINA PROFESSIONAL SEAL C-015 LANDSCAPE ARCHITECTURE

Aug 4 2021 4:18 PM

NORTH CAROLINA PROFESSIONAL SEAL #1523 LANDSCAPE ARCHITECT MARK E. KEPPLER

8/4/2021

THE ESTATES AT MARVIN BRANCH

JONES HOMES USA
UNION COUNTY
NORTH CAROLINA

1020310

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	1ST LD SUBMITTAL	07-30-2021

DESIGNED BY: RK
DRAWN BY: RJK
CHECKED BY: MG

VERT. 1"=4'
HORZ. NTS

(NOT TO SCALE)

PLANTING DETAILS

C-7.3

For Estate Comments - send Email

1. According to the Village of Marvin Code of Ordinance Title XV: Land Usage, Chapter 150: Subdivisions, Section 150.065 Stormwater, Item A.2, 'In order to prevent flooding and damage to properties, all developments shall provide stormwater detention to control the peak runoff from the two-, ten-, 25-, 50-, and 100-year, 24-hour storm events to pre-development levels;" It does not appear the current design provide any control for these storm events to pre-development levels.
2. The drainage areas for CC#1 through CC#4 need to extend onto the adjacent properties behind the proposed lots as the contours clearly show runoff being sent toward this development.
3. The drainage areas for CC#5 through CC#10 appear to extend too far and can be reduced based on the contours shown.
4. The design calls for drainage swales to convey runoff from the road through channels to the stream buffer. There is no provision made for erosion protection within the swale or at the end of the swale to diffuse the flow before entering the stream buffer.
5. The plan shows the anticipated flow rate for each swale but does not provide the calculation identifying how the flow rate was derived.
6. While not a stormwater comment, the plan shows the greenway running roughly parallel with the stream so each drainage swale will cross it but no provisions to convey the water over or under the greenway, likely resulting in erosion issues with the greenway.

Please let me know if you have any questions or want to discuss these issues further. Thanks.

Item 3.

VILLAGE OF MARVIN

10004 New Town Road | Marvin, NC | 28173 | Tel: (704) 843-1680 | Fax: (704) 843-1660 | www.marvinnc.org

TO: Planning Board

FROM: Hunter Nestor, Village Planning & Zoning Administrator

SUBJECT: Major Subdivision Sketch Plan for the Heritage

DATE: December 15, 2021

Background

Attached to this memo is the Sketch Plan of the Heritage Subdivision. This is the first review and Staff will provide you with a report during the meeting. The applicant still has to hold a Public Input Meeting, after which the resulting comments and final version of the plan will be brought back to this board if revisions are made. The PIM meeting is tentatively scheduled for 1-12-22. Staff will provide more details during the meeting

SKETCH PLAN SUBMITTAL FOR

HERITAGE AT MARVIN

JCH NC, LLC

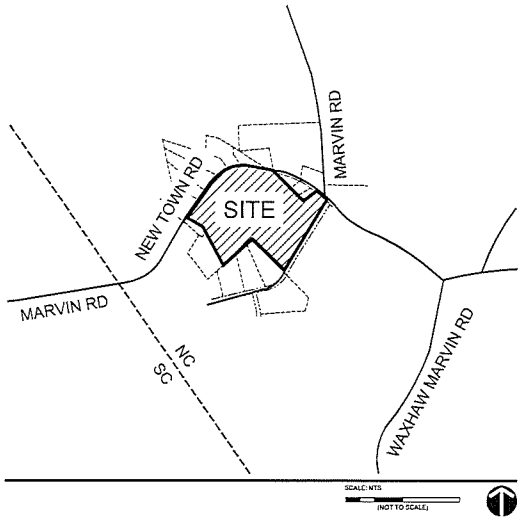
VILLAGE OF MARVIN, UNION COUNTY, NORTH CAROLINA

DATE: 11/05/2021

SHEET INDEX

Sheet Number	Sheet Title
SK-0.0	COVER
SK-1.0	LAYOUT PLAN
SK-2.0	SITE LAYOUT WITH AERIAL
SK-3.0	EXISTING CONDITIONS
SK-4.0	SLOPE ANALYSIS
SK-5.0	UTILITY PLAN

VICINITY MAP



PROJECT TEAM

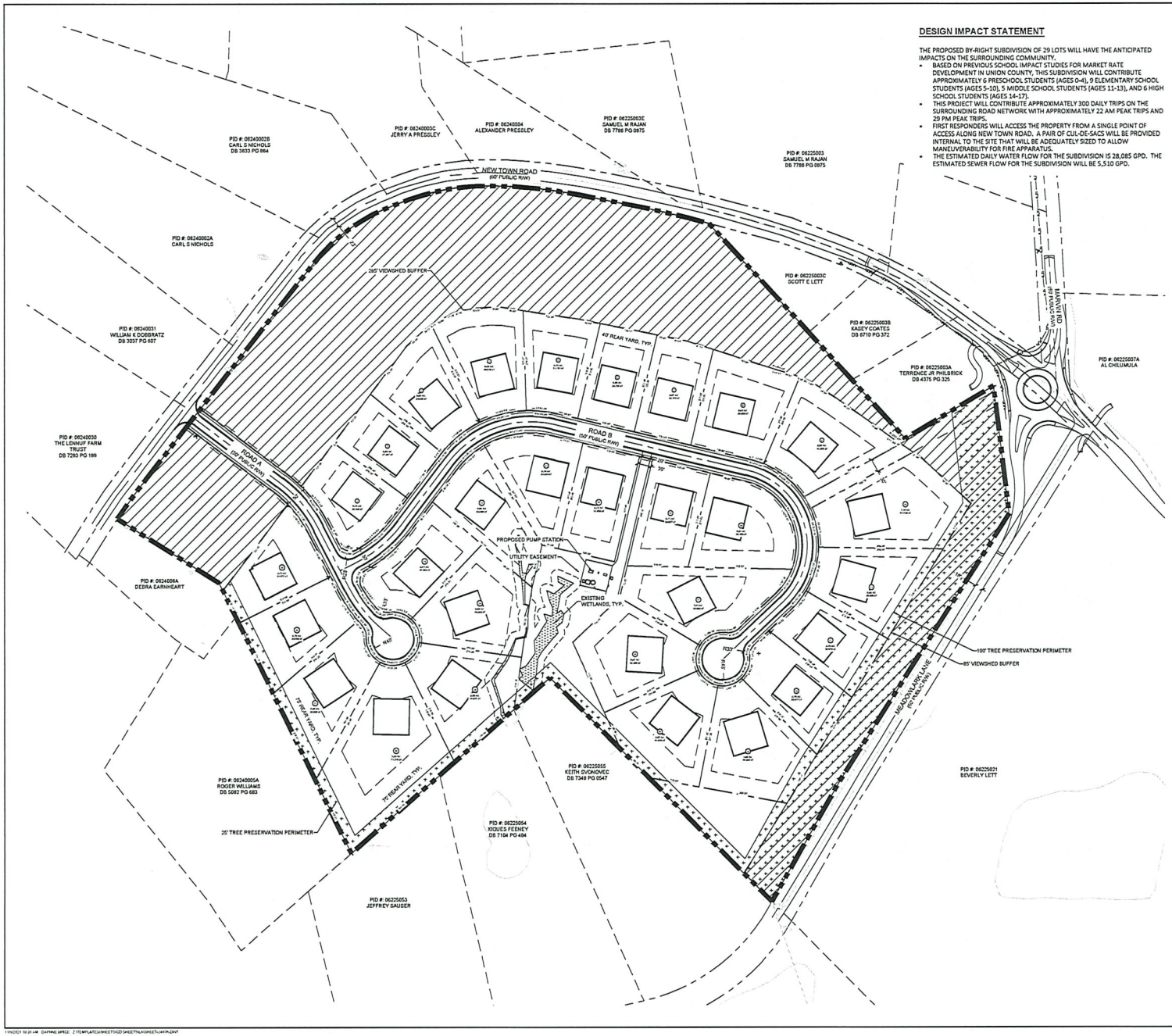
OWNER/DEVELOPER
JCH NC, LLC
370 CENTERPOINTE CIRCLE
SUITE 1136
ALTAMONTE SPRINS, FL 32701
704.909.9246
CONTACT NAME: BEN KUHN

LANDSCAPE ARCHITECT
LANDDESIGN
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
CONTACT NAME: MARK KIME, PLA

CIVIL ENGINEER
LANDDESIGN
223 NORTH GRAHAM STREET
CHARLOTTE, NC 28202
704.333.0325
CONTACT NAME: MASON GREESON, PE

SURVEYOR
CAROLINA DEVELOPMENT SERVICES
MONROW, NC 28110
704.238.1229

LandDesign.



DESIGN IMPACT STATEMENT

THE PROPOSED BY-RIGHT SUBDIVISION OF 29 LOTS WILL HAVE THE ANTICIPATED IMPACTS ON THE SURROUNDING COMMUNITY.

- BASED ON PREVIOUS SCHOOL IMPACT STUDIES FOR MARKET RATE DEVELOPMENT IN UNION COUNTY, THIS SUBDIVISION WILL CONTRIBUTE APPROXIMATELY 6 PRESCHOOL STUDENTS (AGES 0-4), 9 ELEMENTARY SCHOOL STUDENTS (AGES 5-10), 5 MIDDLE SCHOOL STUDENTS (AGES 11-13), AND 6 HIGH SCHOOL STUDENTS (AGES 14-17).
- THIS PROJECT WILL CONTRIBUTE APPROXIMATELY 300 DAILY TRIPS ON THE SURROUNDING ROAD NETWORK WITH APPROXIMATELY 22 AM PEAK TRIPS AND 29 PM PEAK TRIPS.
- FIRST RESPONDERS WILL ACCESS THE PROPERTY FROM A SINGLE POINT OF ACCESS ALONG NEW TOWN ROAD. A PAIR OF CUL-DE-SACS WILL BE PROVIDED INTERNAL TO THE SITE THAT WILL BE ADEQUATELY SIZED TO ALLOW MANEUVERABILITY FOR FIRE APPARATUS.
- THE ESTIMATED DAILY WATER FLOW FOR THE SUBDIVISION IS 28,085 GPD. THE ESTIMATED SEWER FLOW FOR THE SUBDIVISION WILL BE 5,510 GPD.

DEVELOPMENT SUMMARY

PARCEL ID:	06225022, 06240005
TOTAL ACREAGE:	±47.115 ACRES
JURISDICTION:	MARVIN, NC
ZONING:	R (MARVIN)
EXISTING USE:	VACANT
PROPOSED USE:	CONVENTIONAL SUBDIVISION
CURRENT OWNERS:	ANITA O'DELL (06225022) 2437 PLEASANT UNION CHURCH ROAD RALEIGH NC, 27614 JOHN PRIBAS (06240005) 3650 AUBUSSON TRACE ALPHARETTA GA, 30022

DEVELOPMENT STANDARDS:	
MINIMUM LOT AREA:	30,000 SF (20% @ 25,000 SF)
MINIMUM FRONT YARD SETBACK:	50 FEET
MINIMUM LOT WIDTH:	130 FEET
MINIMUM SIDE YARD SETBACK:	20 FEET
MINIMUM REAR YARD SETBACK:	40 FEET (75 IF ABUTTING R)
MAXIMUM BUILDING HEIGHT:	35 FEET
CONSERVATION LAND REQUIRED:	7.07 ACRES (15.0%)
CONSERVATION LAND PROVIDED:	14.86 ACRES (31.55%)
ROAD A	680 LF
ROAD B	1621 LF

MARVIN UDO SECTION 151.081
LARGE-TRACT SUBDIVISION STANDARDS - MAXIMUM ALLOWABLE LOTS

GROSS ACREAGE OF THE TRACT TO BE SUBDIVIDED:	±47.115 AC X [0.5521 + (0.00986 X C.L. 32.85%)]
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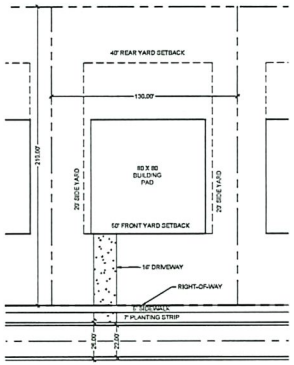
PROPOSED LOTS:	29
UNIT MIX:	
25,000SF+ LOTS	3 (10.35%)
30,000SF LOTS	26
TOTAL LOTS:	29
AVERAGE LOT SIZE:	37,788SF (0.867 AC)
DENSITY:	0.61 DUA



TYPICAL LOT PLAN

HATCH LEGEND

VIEWSHED BUFFER

TREE PRESERVATION PERIMETER

LINETYPE LEGEND

PROJECT BOUNDARY LINE
PROP. R/W
SETBACK LINE
UTILITY EASEMENT
LOT LINE

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CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

JONES HOMES USA

NORTH CAROLINA PROFESSIONAL SEAL C-015 LandDesign

PROJECT

HERITAGE AT MARVIN

JCH NC, LLC

VILLAGE OF MARVIN

UNION COUNTY, NC

LANDDESIGN PROJECT 1021139

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	SKETCH PLAN SUBMITTAL	11.05.2021

DESIGNED BY: MEK
DRAWN BY: RMS
CHECKED BY: MEK

SCALE: VERT: N/A HORZ: 1"=100'

0 50' 100' 200'

NORTH

SHEET TITLE

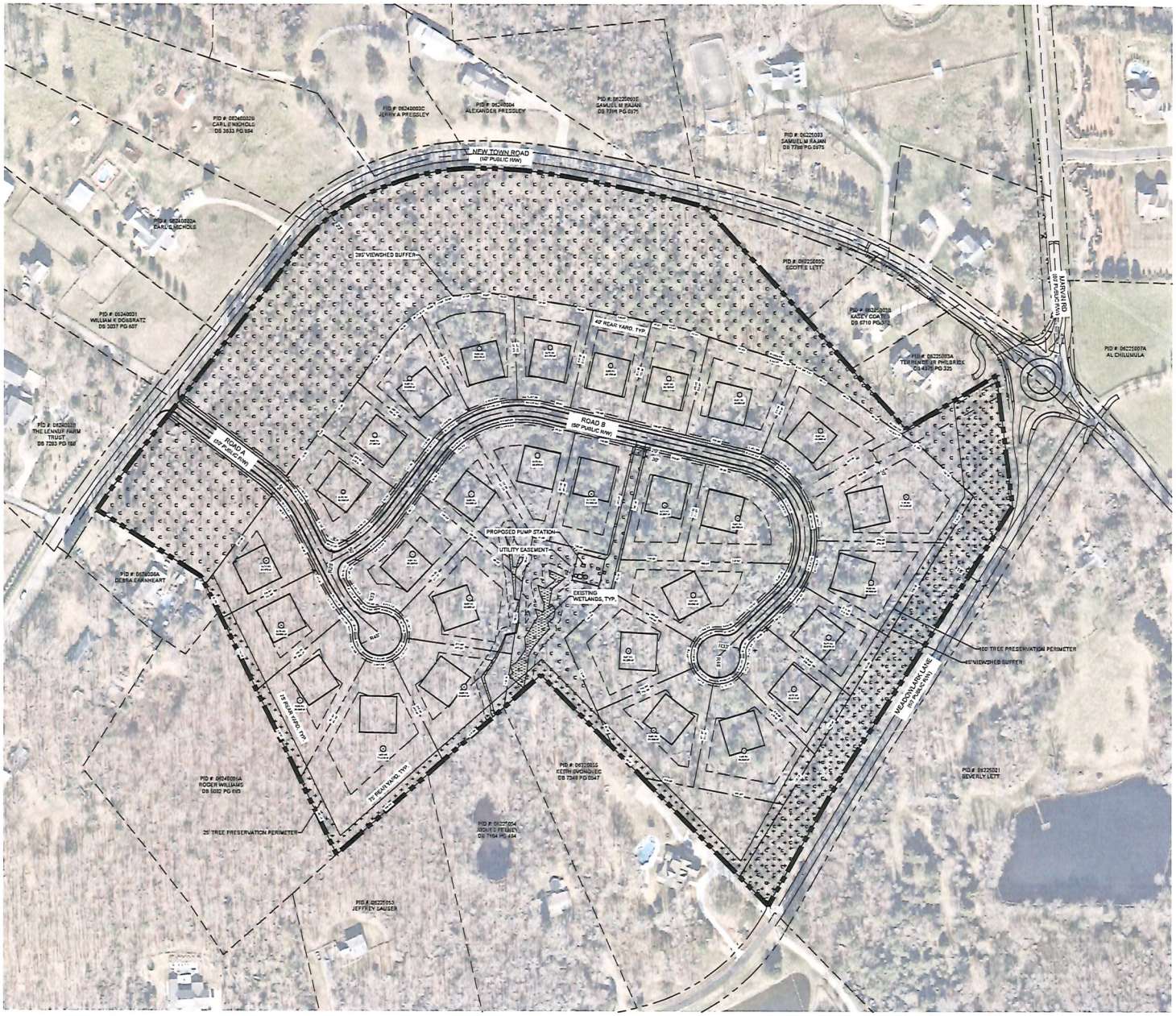
LAYOUT PLAN

SHEET NUMBER

SK-1.0

11/4/2021 10:21 AM DAYNE BRICE Z:\TEMPLATES\SHEETS\2D SHEETS\ALASHEETS\ARCH.DWT

ORIGINAL SHEET SIZE: 24" X 36"



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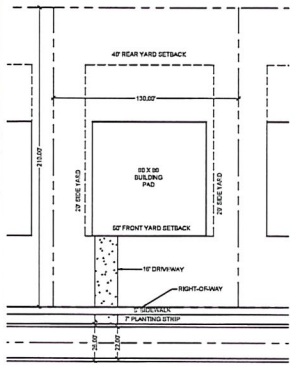

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LOT LINE

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VICINITY MAP

SEAL

PROJECT

HERITAGE AT MARVIN

JCH NC, LLC

VILLAGE OF MARVIN

UNION COUNTY, NC

LANDDESIGN PROJECT

1021139

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
1	SKETCH PLAN SUBMITTAL	11.05.2021

DESIGNED BY: MEK
DRAWN BY: RMS
CHECKED BY: MEK

SCALE

VERT: N/A
HORZ: 1"=100'

0 50' 100' 200'

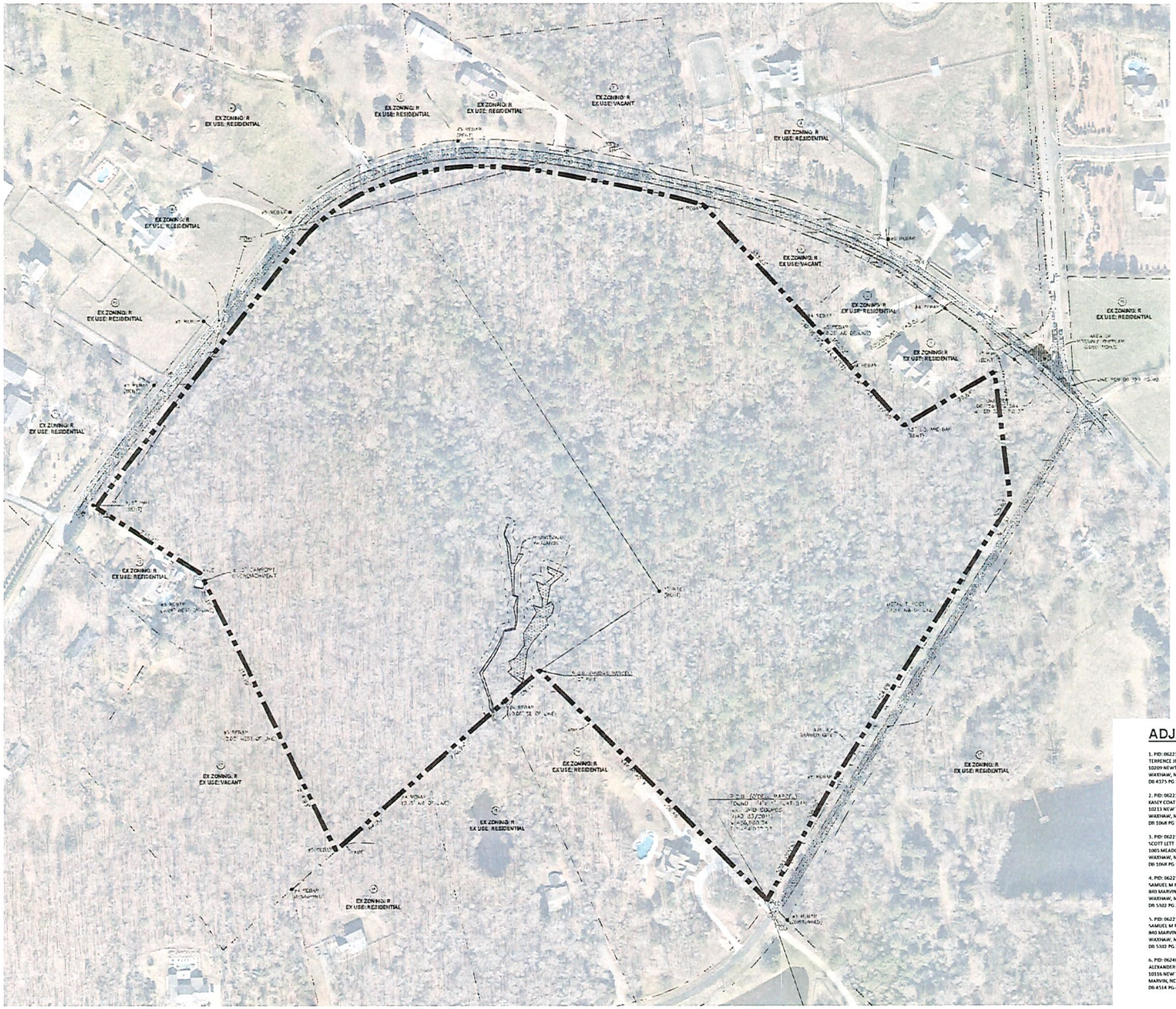
NORTH

SHEET TITLE

SITE LAYOUT WITH AERIAL

SHEET NUMBER

SK-2.0



ADJACENT PROPERTIES

1. PID: 06225003A
TERRENCE JR PHILBRICK
10209 NEW TOWN RD
WAXHAW, NC 28173
DB 4375 PG 325

2. PID: 06225003B
KASEY COATES
10213 NEW TOWN RD
WAXHAW, NC 28173
DB 1068 PG 569

3. PID: 06225003C
SCOTT LETT
1005 MEADOWLARK LN
WAXHAW, NC 28173
DB 1068 PG 569

4. PID: 06225001
SAMUEL M PAIAN
840 MARVIN RD
WAXHAW, NC 28173
DB 5302 PG 37

5. PID: 06225003E
SAMUEL M PAIAN
840 MARVIN RD
WAXHAW, NC 28173
DB 5302 PG 37

6. PID: 06240004
ALEXANDER PRESSLEY
10316 NEW TOWN RD
MARVIN, NC 28173
DB 4514 PG 425

7. PID: 06240003C
JERRY A PRESSLEY
10316 NEW TOWN RD
MARVIN, NC 28173
DB 3633 PG 864

8. PID: 06240002B
CARL S NICHOLS
10410 NEW TOWN RD
MARVIN, NC 28173
DB 691 PG 53

9. PID: 06240002A
CARL S NICHOLS
10410 NEW TOWN RD
MARVIN, NC 28173
DB 564 PG 218

10. PID: 06240011
WILLIAM K DORNBRATZ
10416 NEW TOWN RD
WAXHAW, NC 28173
DB 3037 PG 607

11. PID: 0620030
THE LENNUF FARM TRUST
10420 NEW TOWN RD
MARVIN, NC 28173
DB 6156 PG 639

12. PID: 0624006A
DEBRA EARNHEART
10501 NEW TOWN RD
MARVIN, NC 28173
DB 425 PG 792

13. PID: 06240005A
ROGER WILLIAMS
155 SUSANNAH LN
PAWLEYS ISLAND, SC 29585
DB 5082 PG 683

14. PID: 06225053
JEFFREY SAUSER
1210 MEADOWLARK LN
MARVIN, NC 28173
DB 462 PG 500

15. PID: 06225054
ROQUES TEENEY
1200 MEADOWLARK LN
WAXHAW, NC 28173
DB 3054 PG 108

16. PID: 06225055
KEITH SIJONOVIC
1150 MEADOWLARK LN
WAXHAW, NC 28173
DB 6201 PG 810

17. PID: 06225025
BEVERLY LETT
1005 MEADOWLARK LN
MARVIN, NC 28173
DB 258 PG 626
DB 260 PG 605
DB 265 PG 852

18. PID: 06225007A
AL CHILUMULA
206 BLACKHEATH CT
WAXHAW, NC 28173
DB 1561 PG 564

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JONES HOMES USA

NORTH CAROLINA
C-015
LANDDESIGN

PROJECT

HERITAGE AT MARVIN

JCH NC, LLC

VILLAGE OF MARVIN

UNION COUNTY, NC

LANDDESIGN PROJECT 1021139

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DESIGNED BY: MEK
DRAWN BY: RMS
CHECKED BY: MEK

SCALE
VERT: N/A
HORZ: 1"=100'
0 50' 100' 200'

NORTH

SHEET TITLE

EXISTING CONDITIONS

SHEET NUMBER

SK-3.0

11/5/2021 10:21 AM DAPHNE BROC Z:\TEMPLATES\SHEETTOOD\SHEETTALK\SHEETCHAR.DWT

ORIGINAL SHEET SIZE: 24" X 36"

SLOPE ANALYSIS:

- 10% - 14.99%
- 15% - 24.99%
- 25% - 100%

LandDesign.

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CHARLOTTE, NC 28202
704.333.0325
WWW.LANDDESIGN.COM

JONES HOMES USA

KEY MAP

SITE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL C-015

PROJECT

HERITAGE AT MARVIN

JCH NC, LLC

VILLAGE OF MARVIN

UNION COUNTY, NC

LANDDESIGN PROJECT 1021139

REVISION / ISSUANCE

NO.	DESCRIPTION	DATE
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DESIGNED BY: MCK
DRAWN BY: RMS
CHECKED BY: MCK

SCALE

VERT: N/A
HORZ: 1"=100'

0 50' 100' 200'

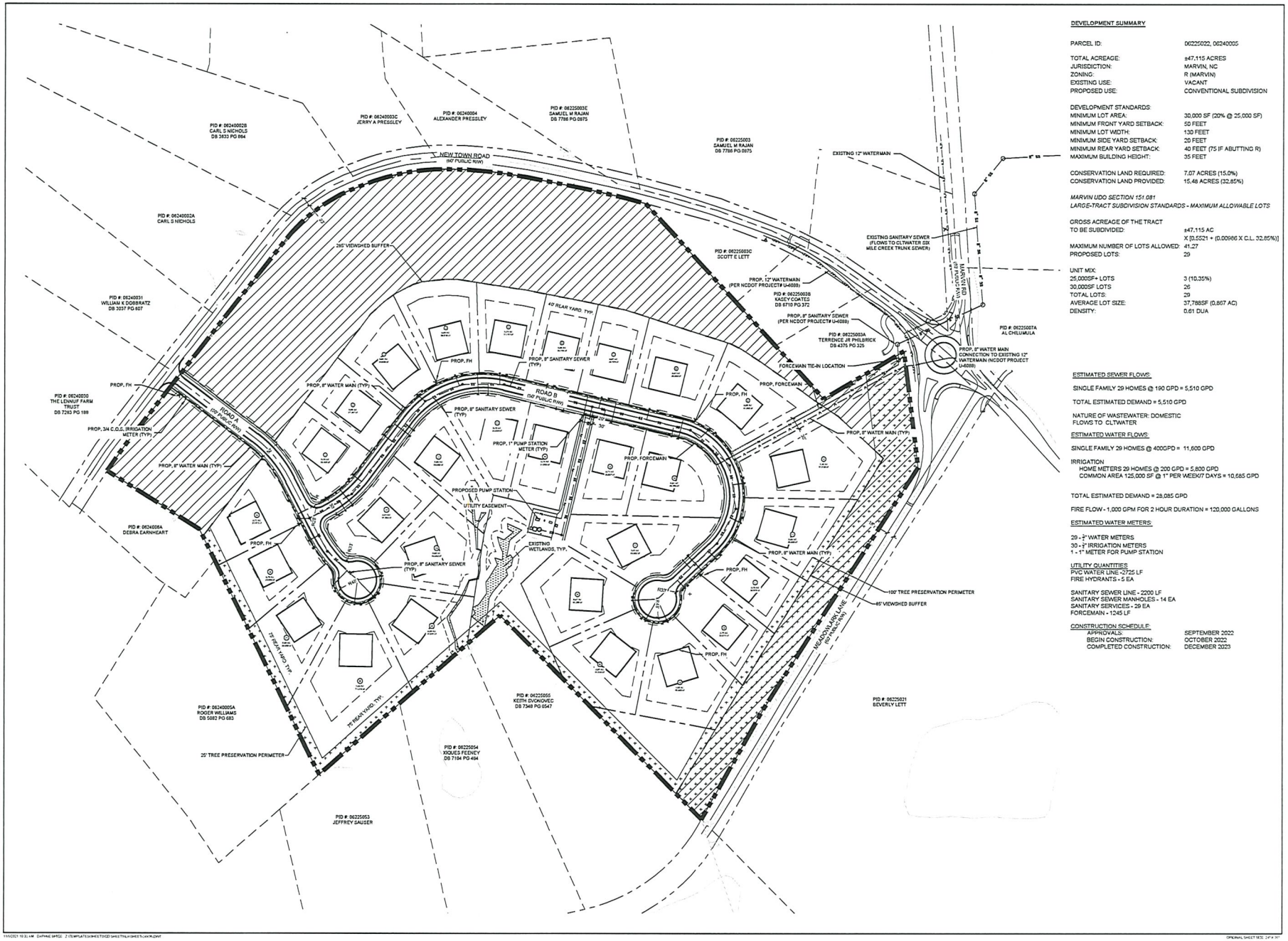
NORTH

SHEET TITLE

SLOPE ANALYSIS

SHEET NUMBER

SK-4.0



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ESTIMATED SEWER FLOWS:

SINGLE FAMILY 29 HOMES @ 190 GPD = 5,510 GPD

TOTAL ESTIMATED DEMAND = 5,510 GPD

NATURE OF WASTEWATER: DOMESTIC
FLOWS TO CLTWATER

ESTIMATED WATER FLOWS:

SINGLE FAMILY 29 HOMES @ 400GPD = 11,600 GPD

IRRIGATION
HOME METERS 29 HOMES @ 200 GPD = 5,800 GPD
COMMON AREA 125,000 SF @ 1" PER WEEK/7 DAYS = 10,685 GPD

TOTAL ESTIMATED DEMAND = 28,085 GPD

FIRE FLOW - 1,000 GPM FOR 2 HOUR DURATION = 120,000 GALLONS

ESTIMATED WATER METERS:

29 - ¾" WATER METERS
30 - ¾" IRRIGATION METERS
1 - 1" METER FOR PUMP STATION

UTILITY QUANTITIES
PVC WATER LINE -2725 LF
FIRE HYDRANTS - 5 EA

SANITARY SEWER LINE - 2200 LF
SANITARY SEWER MANHOLES - 14 EA
SANITARY SERVICES - 29 EA
FORCEMAIN - 1245 LF

CONSTRUCTION SCHEDULE:

APPROVALS:	SEPTEMBER 2022
BEGIN CONSTRUCTION:	OCTOBER 2022
COMPLETED CONSTRUCTION:	DECEMBER 2023

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SEAL

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UTILITY PLAN

SHEET NUMBER

SK-5.0