Grove Manor Subdivision - Phase 2

PRELIMINARY SUBDIVISION PLANS

for

Grove Manor, LLC

TOWN OF WAXHAW, UNION COUNTY, N.C.

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Development Data

Tax Parcel Nos.: 06165001A & 06165001B
Zoning Jurisdiction: Town Of Waxhaw (Pending)
Zoning Classification: CD-R4-PRD (Pending)
Site Data:
- Total Site Area: 20.27± Acres
- #2 Total Disturbed Area: 12.8± Acres
- Area Within Waxhaw-Marvin Road R/W: 0.13± Acres
- Net Site Area: 20.14± Acres
- Maximum Allowable R-4 Density: 3.63 Units/Acre
- Maximum Allowable Yield: 73 Lots
- Proposed Yield: 56 Lots
- Proposed Density: 2.78 Units/Acre
- Open Space Required: 4.03 Acres (20%)
- Open Space Provided: 8.7± Acres (43%)

Internal Area Summary:
- Proposed New Street R/W: 2.47± Acres
- Proposed Total Lot Area: 9.09± Acres
- Proposed Perimeter Buffer Area: 1.75± Acres
- Proposed Street Buffer Area: 0.20± Acres
- Wetland & Stream Buffer Area: 2.75± Acres
- Utility Easement Area: 0.75± Acres
- Net Site Area for Internal Tree Protection Area: 14.23± Acres
- Required Internal Tree Protection Area: 2.85± Acres
- Proposed Internal Tree Protection Area: 4.53± Acres
- Proposed Phase 2 Internal Tree Protection Area to be allocated to Phase 1: 1.5± Acres (See General Note # 37)

Proposed Lot Data:
- Minimum Lot Area: 6,000 SF
- Minimum Lot Width: 50'
- Minimum Setback: 20'
- Minimum Side Yard: 5'
- Minimum Side Yard on Corner Lot: 10'
- Minimum Rear Yard (Site Interior): 25'
- Minimum Rear Yard (Site Perimeter): 30'
- Maximum Building Height: 45'

Proposed Street Lengths (Measured Centerline To Centerline):
- Helmsworth Drive: 1,183 LF
- Natural Path Lane: 470 LF
- Idol Rock Way: 254 LF

Proposed Dwelling Data:
- Heated Area: 1,600 to 2,800 SF
- Building Heights: 25' to 30'

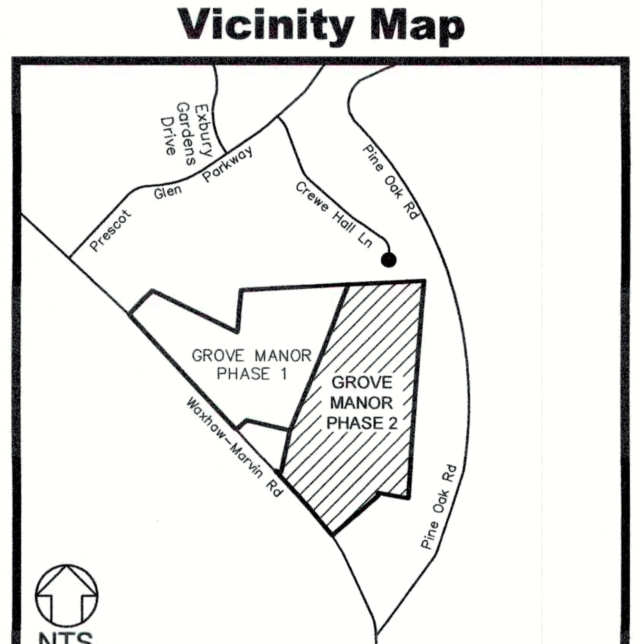
Engineer

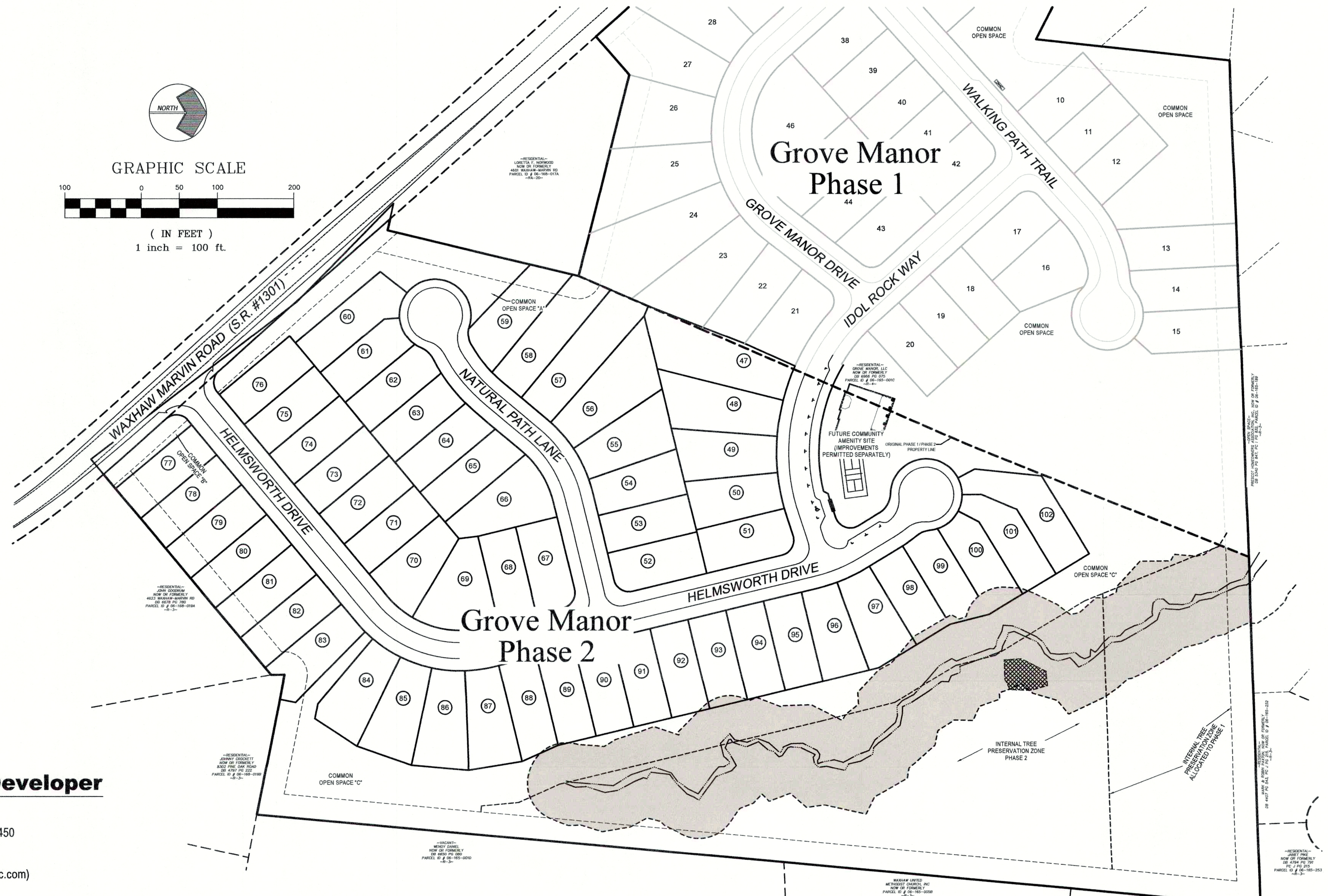
#2
Harris Engineering
5200 Park Road, Suite 231
Charlotte, NC 28209
Phone: (704) 334-1325
Fax: (704) 334-1330
Contact: Wayne M. Harris, P.E.
(wharris@he-nc.com)

Owner / Developer

Grove Manor NC, LLC
P.O. Box 8790
Virginia Beach, VA. 23450
Phone: (980) 406-3818
Contact: Doug Lawrie
(doug@sdgnc.com)

Vicinity Map





Site Plan

Scale: 1" = 100'

LOT YIELD CALCULATIONS		
DESCRIPTION	SQUARE FEET	ACRES
TOTAL SITE AREA	882,847.00	20.267
EXISTING FLOODPLAIN	0.00	0.000
EXISTING PONDS	0.00	0.000
EXISTING WETLANDS	698.00	0.016
TOTALS	**798.00**	**0.016**
DEVELOPABLE AREA	882,049.00	20.249
MINIMUM LOT SIZE	6,000.00	
MAXIMUM LOT YIELD	147.01	
PROPOSED LOTS	56.00	

OPEN SPACE CALCULATIONS			
OPEN SPACE AREAS	SQUARE FEET	ACRES	PERCENT OF OVERALL SITE AREA
COMMON OPEN SPACE "A"	9,176.68	0.211	1.04%
COMMON OPEN SPACE "B"	664.00	0.015	0.08%
COMMON OPEN SPACE "C"	294,703.68	6.765	33.38%
30' TREE PRESERVATION BUFFER	8,266.29	0.190	0.94%
30' TREE PRESERVATION BUFFER	67,733.73	1.555	7.67%
TOTALS	**380,544.39**	**8.736**	**43.11%**

INTERNAL TREE SAVE AREA SUMMARY			
INTERNAL TREE PRESERVATION ZONE AREA	SQUARE FEET	ACRES	PERCENT OF INTERNAL PROPERTY AREA
WITHIN COMMON OPEN SPACE "A"	0.00	0.000	0.00%
WITHIN COMMON OPEN SPACE "B"	0.00	0.000	0.00%
WITHIN COMMON OPEN SPACE "C"	197,304.89	4.529	31.83%
TOTAL TREE SAVE	**197,304.89**	**4.529**	**31.83%**
TREE SAVE TO BE DEDICATED TO PHASE 1	65,340.00	1.500	10.54%
TREE SAVE TO BE DEDICATED TO PHASE 2	131,964.89	3.029	21.29%

INTERNAL TREE SAVE CALCULATIONS		
DESCRIPTION	SQUARE FEET	ACRES
TOTAL SITE AREA	882,847.00	20.267
30' TREE PRESERVATION BUFFER	76,000.03	1.745
EXISTING STREET BUFFER	8,683.08	0.199
EXISTING PONDS	0.00	0.000
EXISTING UTILITY EASEMENTS	0.00	0.000
PROPOSED UTILITY EASEMENTS	32,714.14	0.751
PROPOSED SD & BMP EASEMENTS	32,714.14	0.751
DEDICATED RIGHT-OF-WAY	5,453.00	0.125
PROPOSED RIGHT-OF-WAY	107,359.91	2.465
TOTALS	262,924.29	6.036
INTERNAL PROPERTY AREA	619,922.71	14.231
INTERNAL TREE SAVE REQUIRED BY THE WAXHAW UDO (20%)	123,984.54	2.846
TREE SAVE AS SHOWN ON PHASE 2 CONSTRUCTION PLANS	197,304.89	4.529

NOTE: See sheet #3 for exact locations of Internal Tree Preservation Zone area.

General Notes

1. This Preliminary Subdivision Plan (Construction Documents) is submitted, and shall be constructed in accordance with the requirements of the Town of Waxhaw Zoning and Subdivision Ordinances, and the Waxhaw Engineering Design & Construction Standards Procedures Manual.
2. Boundary information per Boundary Survey prepared by Metrolina Engineering & Surveying Associates.
3. Existing topographic information within the project boundary is based on field-run survey performed by Metrolina Engineering & Surveying Associates. Existing topographic information beyond the project boundary is based NCDOT aerial LiDAR mapping.
4. All lot dimensions are preliminary and subject to revision thru the design and approval process. Reference record plat(s) for exact lot dimensions and Tree Save Areas.
5. Approximate completion time is summer 2020 (no phasing).
6. No on-site demolition landfills (i.e., Stump Holes) will be located on this site.
7. Construction of all development improvements shall be in accordance with the Waxhaw Engineering Design & Construction Standards Procedures Manual. See Sheet 12 for site-related details. The following additional details are included by reference:

Item	Standard. No.
Curb & Gutter	100.1, 101.1 & 102.1
Curb Transition	104.1
Concrete Sidewalk	106.1
Catch Basin Location	121.1 & 122.1
Accessible Ramps	131.1
Catch Basin	840.01 or 840.02 (NCDOT)
Drop Inlet (Grate)	840.14 or 840.15 (NCDOT)
Manhole	840.53 (NCDOT)
Flared End Section	307.1
Street Name Sign	702.1 & 704.1
Cluster Mail Box & Parking	719.1, 721.1, 725.1 & 727.1

8. All storm drainage pipe shall be Class 3 Reinforced Concrete Pipe (RCP) unless otherwise noted. Pipe lengths indicated on the plans are approximate and are subject to change due to field conditions.
9. See Sheets 5, 6 & 7 for Erosion Control Plan information and notes. See Sheet 13 for Erosion Control Details.
10. Stormwater Detention and Water Quality Improvements to satisfy requirements for Phase 2 are being provided by a redesign of BMP #3 located in Phase 1. Reference the revised plan and calculations for BMP # 3 for additional information. Grading as shown herein for the area around BMP #3 is taken from the revised Phase 1 Plans.
11. Site development and Grading Permit shall be in accordance with the Town of Waxhaw Code. Encroachment agreements may be required for work within existing rights-of-way.
12. The Erosion Control Inspector shall be given 48 hours advance notice prior to commencement of construction.
13. Sidewalk Note: The Contractor shall coordinate with the Waxhaw Town Engineer for the latest revision of the Handicap Ramp Detail(s) prior to placement of any sidewalk or handicapped ramps.
14. Coordinate all curb and street grades in intersections with the Waxhaw Town Engineer.
15. All road improvements at the tie-in to existing Waxhaw-Marvin Road shall be coordinated with the Inspector and/or NCDOT as required prior to construction. Intersection improvements shall be in accordance with the approved Driveway Permit and required specifications.
16. Right-of-way will be dedicated 30' from the centerline of Waxhaw-Marvin Road. This right-of-way will be dedicated and conveyed by record plat at the time of recordation for that portion of the site. A left-turn lane on Waxhaw-Marvin Road, designed and installed in accordance with NCDOT requirements, will be provided at the Helmsworth Drive intersection.
17. The developer shall provide street signs at all intersections per Waxhaw Std. #702.1.
18. Sight Triangles shown are the minimum required.
19. 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.
20. 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(s).
21. To insure proper drainage, minimum curb and gutter grade shall be 0.50%.
22. Subsurface drainage facilities may be required in the street right-of-way as deemed necessary by the Waxhaw Town Engineer.
23. The purpose of the "Storm Drain Easement" (SDE) is to provide storm water conveyance. Structures are not permitted in the easement area. Any other objects which impede storm water flow or system maintenance are also prohibited.
24. 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.
25. P.E. sealed shop drawings for any proposed retaining walls must be submitted to Waxhaw Engineering prior to construction.
26. "As-Built" drawings and plans of the storm drainage system, including designed ditches, must be submitted prior to subdivision final inspection to Waxhaw Engineering Department.
27. Prior to installation, PE sealed shop drawings for any underground detention systems must be furnished to Waxhaw Engineering for approval.
28. All non-standard items (i. e., pavers, irrigation systems, etc.) in the right-of-way require a right-of-way encroachment agreement prior to installation.
29. Prior to issuance of the Certificate of Occupancy, surveyor sealed as-built drawings of all water quality BMP's and detention systems must be provided.
30. Prior to plat recordation, any off-site R/W and/or construction easements are required to be obtained. Any required off-site R/W and/or easements shall be clearly shown on the roadway improvement plan.
31. Common Open Space areas will be provided in various locations on the site. The final open space locations and/or configurations may vary from this plan as determined during the review and approval process, however, the amount of open space provided shall not be less than stated under "Parcel Development Data". All Common Open Space shall be conveyed to the Grove Manor Homeowners Association and is for the beneficial use of the Grove Manor residents.
32. The proposed Neighborhood Amenity Area is located on a portion of Common Open Space, approximately as shown on this plan. The Amenity Area will be constructed in conjunction with home building activities in Grove Manor Phase 2. The Amenity Area will consist of a Clubhouse Building approximately 1,600 sf in size, a Pickleball Court, and parking. Parking will be provided by on-street parking located in front of the Amenity Area and will include one (1) handicapped accessible space.
33. Water and sanitary sewer service will be provided by extensions of the existing Union County Public Works (UCPW) systems. Fire hydrants will be installed in accordance with UCPW requirements.
34. Signage will be permitted in accordance with applicable UDO standards. The Applicant anticipates subdivision-type monumentation at the entrance at the intersection of Waxhaw-Marvin Road and Helmsworth Drive, with secondary signage at the proposed Amenity Area.
35. See Sheet 11 for Landscape Plan information related to street trees and Notes. See Sheet 12 for details related to tree protection and tree planting.
36. Perimeter and Street Buffers shall be provided along the site perimeter as shown on this plan. Tree Preservation areas will be provided in various locations on the site in accordance with the requirements of the UDO. Tree Preservation areas will consist of the following:
    - 30' Perimeter Buffer
    - 20' Street Buffer along Waxhaw-Marvin Road
    - Internal Tree Preservation Zones (Minimum of 20% of the internal site area as calculated per Section 9.21.8.A(2)c of the UDO).
37. A portion of the "Internal Tree Protection Zone" located within Phase 2 will be allocated to Phase 1 as required to satisfy the Phase 1 "Internal Tree Protection Zone" requirements. The location of the "Internal Tree Protection Zone" allocated to Phase 1 is shown on the Phase 2 Site Plan and Landscape Plan and will be included on the applicable Phase 2 final plat(s).
38. (#2) The temporary on-site benchmark used as the basis for all on-site surveys is a storm drain manhole located adjacent to the Grove Manor site in the rear of Lot 63 in the Prescot Subdivision, approximately 10.5' north of the rear property line of proposed Lot 14, rim elevation = 533.45 (NAVD 88).
39. There is no floodplain located on this site per FEMA Flood Insurance Rate Map (FIRM) Panel 4473J, map effective date October 16, 2008.
40. Maintenance of all storm drainage outside of public right-of-way is the responsibility of the Home Owner's Association or the private property owner.
41. Section 20 of the Waxhaw Unified Development Ordinance, as it existed at the time of the Conditional District Rezoning approval, shall govern the architecture of this subdivision.
42. All public streets, sidewalks, and other common areas or facilities shall be sufficiently illuminated to ensure the security of property and the safety of persons using such streets, sidewalks, and other common areas or facilities. Street lights shall be rated a minimum of 9500-lumen and shall be 100-watt high pressure sodium vapor located at all intersections and mid-block locations with intervals not exceeding 250 feet.
43. All internal speed limits shall be 25 mph, or as dictated by the Town of Waxhaw.
44. Parking spaces and access to the Cluster Mailbox unit shall meet ADA requirements. The Cluster Mailbox unit is subject to approval by the Waxhaw Post Master.
45. A 5' concrete sidewalk shall be installed along the Waxhaw-Marvin Road frontage. The sidewalk alignment may meander as necessary to save existing trees and/or to blend with existing site features. Berms and/or landscaping may be provided within the Common Open Space along Waxhaw-Marvin Road. The common open space located along the site's frontage on Waxhaw-Marvin Road shall be preserved as a 20' Street Buffer and landscape area, and no permanent above ground structures may be placed in this Open Space except for monument signs identifying the development and/or required utility installations (electric, phone, etc.). All public sidewalks shall be constructed with a maximum cross-slope of 2%, and a maximum longitudinal slope of 5% unless a steeper slope is required to match street grades.
46. A Stream Buffer shall be provided as indicated on this plan in accordance with the Town of Waxhaw requirements. The Buffer shall be 50' in width, measured from the top-of-bank, along both sides of the stream. The Buffer location is based on actual top-of-bank locations surveyed by Metrolina Engineering & Surveying Associates. The outer boundary of the Buffer shall be marked with the orange fabric fencing during construction. The Buffer shall remain undisturbed and no fill will be placed within the Buffer area.
47. Stream determination and wetland location were performed by Huysman & Bandy, Inc. The wetland and top-of-bank locations shown on this plan are based on field-run surveys by Metrolina Engineering & Surveying Associates. Documentation from the US Army Corp of Engineers and NCDEQ confirming the delineations will be provided to the Town.

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

COVER SHEET

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Revised Sheets 1, 3 thru 24 per review comments; Revised all sheets to update owner information.
#2 - 3/26/19: Revised Sheet 1, Note #38 per in-house review; Revised Sheets 1 thru 6 and 13 thru 16 per review comments; Revised Sheets 4, 6, 8 thru 10 & 15 per Client request; and revised all sheets to update Design Firm information.
#3 - 6/27/19: Revised Sheets 2 - 6, 11, 12, 14 - 16, 19 & 22 per review comments.
#4 - 7/8/19: Revised Sheets 3, 4, 6, 11 & 16 per review comments.

Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,585 ENGINEER WAYNE M. HARRIS 7/8/19

Scale: NOTED

Sheet No. 1 of 24

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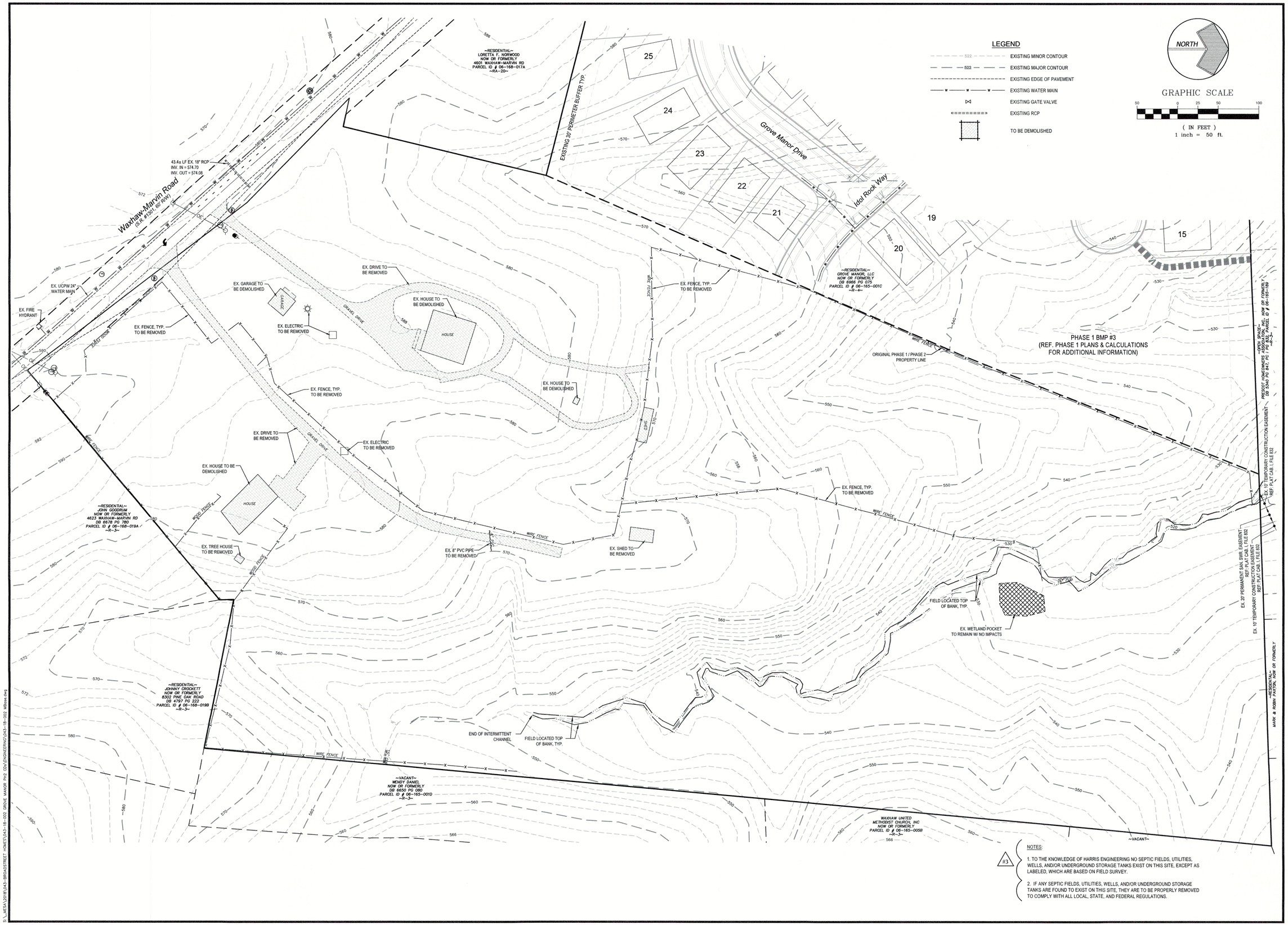


NOTES:

1. TO THE KNOWLEDGE OF HARRIS ENGINEERING NO SEPTIC FIELDS, UTILITIES, WELLS, AND/OR UNDERGROUND STORAGE TANKS EXIST ON THIS SITE, EXCEPT AS LABELED, WHICH ARE BASED ON FIELD SURVEY.

2. IF ANY SEPTIC FIELDS, UTILITIES, WELLS, AND/OR UNDERGROUND STORAGE TANKS ARE FOUND TO EXIST ON THIS SITE, THEY ARE TO BE PROPERLY REMOVED TO COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

#3

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

EXISTING CONDITIONS AND DEMOLITION PLAN

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

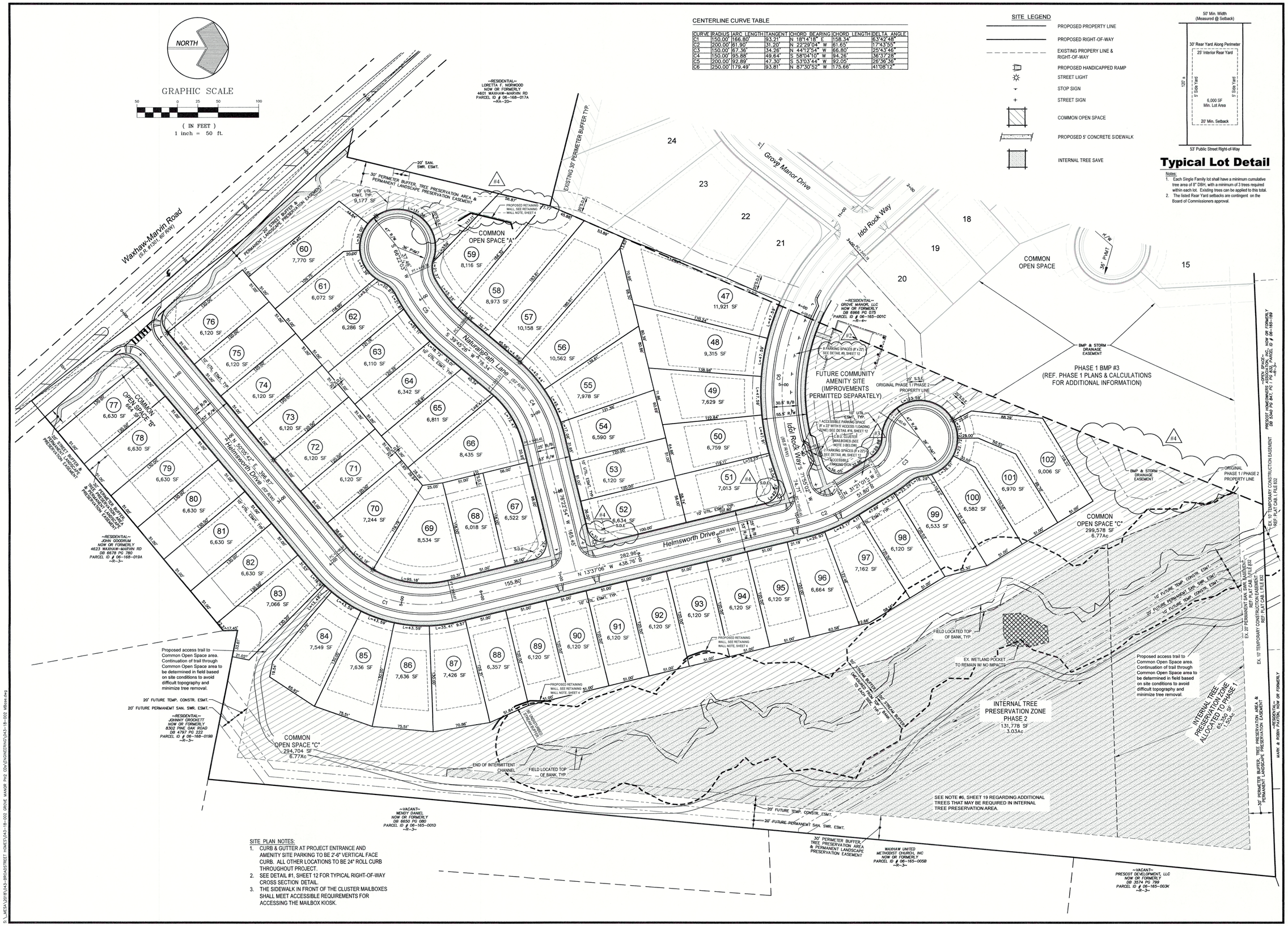
Revisions
#1 - 11/14/18: Revised owner information
#2 - 3/26/19: Revised per review comments; and updated Design Firm information.
#3 - 6/27/19: Revised Notes 1 & 2 (adding "wells") per review comments.

Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,585 WAYNE M. HARRIS 6/27/19

Scale: 1" = 50'

Sheet No. 2 of 24



CENTERLINE CURVE TABLE

CURVE	RADIUS	ARC LENGTH	TANGENT	CHORD BEARING	CHORD LENGTH	DELTA ANGLE
C1	150.00'	166.80'	93.21'	N 18°14'18" E	158.34'	63°42'48"
C2	200.00'	61.90'	31.20'	N 22°29'04" W	61.65'	17°43'55"
C3	150.00'	67.36'	34.26'	N 44°12'54" W	66.80'	25°43'46"
C4	150.00'	95.88'	49.64'	S 58°04'10" W	94.26'	36°37'28"
C5	200.00'	92.89'	47.30'	S 53°03'44" W	92.05'	26°36'36"
C6	250.00'	179.49'	93.81'	N 87°30'52" W	175.66'	41°08'12"

SITE LEGEND

- PROPOSED PROPERTY LINE
- PROPOSED RIGHT-OF-WAY
- EXISTING PROPERY LINE & RIGHT-OF-WAY
- PROPOSED HANDICAPPED RAMP
- STREET LIGHT
- STOP SIGN
- STREET SIGN
- COMMON OPEN SPACE
- PROPOSED 5' CONCRETE SIDEWALK
- INTERNAL TREE SAVE

Typical Lot Detail

Notes:
1. Each Single Family lot shall have a minimum cumulative tree area of 8" DBH, with a minimum of 3 trees required within each lot. Existing trees can be applied to this total.
2. The listed Rear Yard setbacks are contingent on the Board of Commissioners approval.

SITE PLAN NOTES:
1. CURB & GUTTER AT PROJECT ENTRANCE AND AMENITY SITE PARKING TO BE 2'-6" VERTICAL FACE CURB. ALL OTHER LOCATIONS TO BE 24" ROLL CURB THROUGHOUT PROJECT.
2. SEE DETAIL #1, SHEET 12 FOR TYPICAL RIGHT-OF-WAY CROSS SECTION DETAIL.
3. THE SIDEWALK IN FRONT OF THE CLUSTER MAILBOXES SHALL MEET ACCESSIBLE REQUIREMENTS FOR ACCESSING THE MAILBOX KIOSK.

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PROPOSED SITE PLAN

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

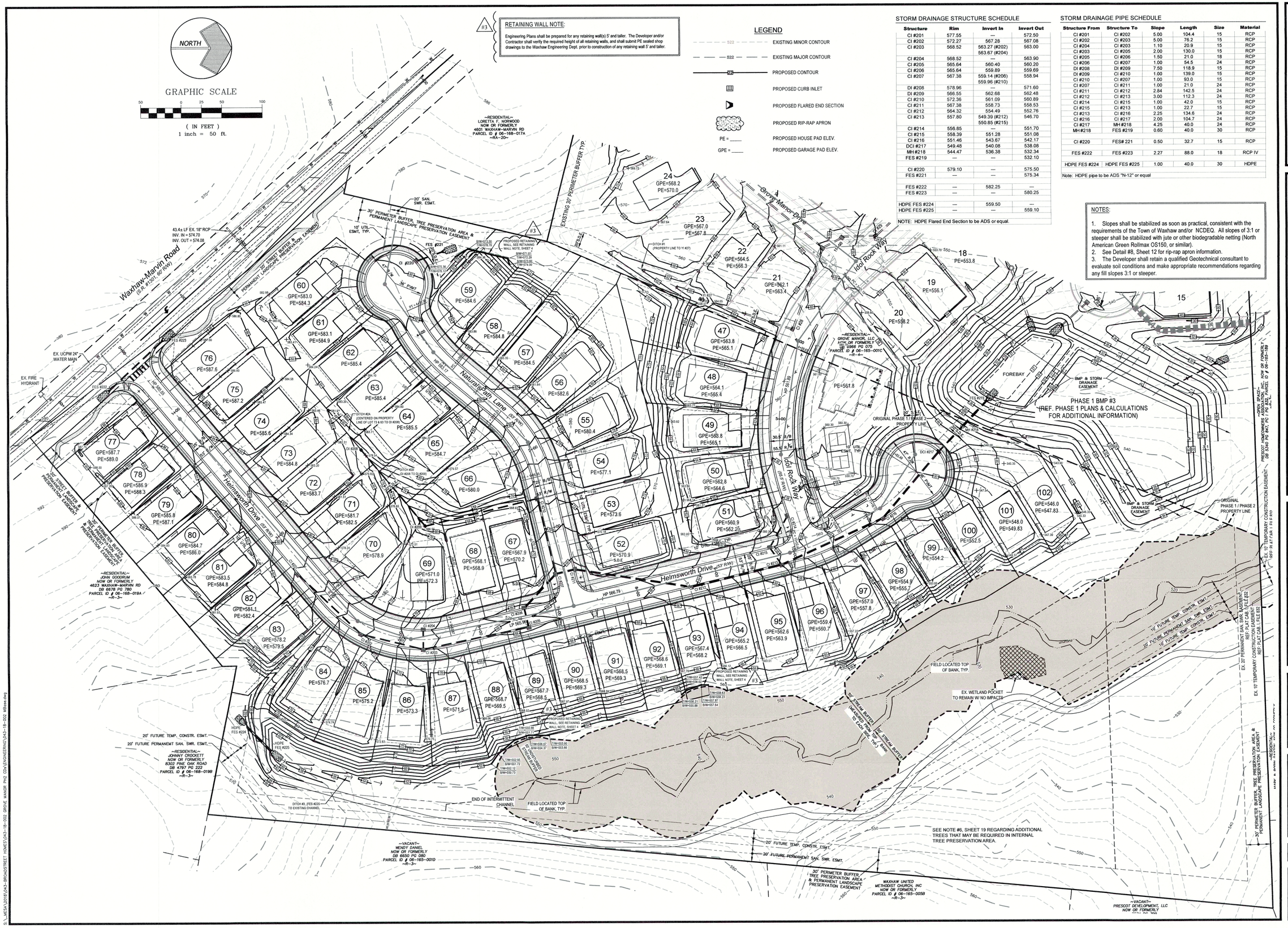
Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 3/25/19: Revised per review comments; and updated Design Firm information.
#3 - 6/27/19: Added 2 parking spaces on Helmsworth Drive (near cul-de-sac) per review comments.
#4 - 7/8/19: Revised Storm Drainage easements per review comments.

Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12585 ENGINEER WAYNE M. HARRIS 7/8/19

Scale: 1" = 50'

Sheet No. 3 of 24



RETAINING WALL NOTE:

Engineering Plans shall be prepared for any retaining wall(s) 5' and taller. The Developer and/or Contractor shall verify the required height of all retaining walls, and shall submit PE sealed shop drawings to the Waxhaw Engineering Dept. prior to construction of any retaining wall 5' and taller.

LEGEND

- 522 — EXISTING MINOR CONTOUR
- 522 — EXISTING MAJOR CONTOUR
- 522 — PROPOSED CONTOUR
- PROPOSED CURB INLET
- PROPOSED FLARED END SECTION
- PROPOSED RIP-RAP APRON
- PE = ____ PROPOSED HOUSE PAD ELEV.
- GPE = ____ PROPOSED GARAGE PAD ELEV.

STORM DRAINAGE STRUCTURE SCHEDULE

Structure	Rim	Invert In	Invert Out
CI #201	577.55	---	572.50
CI #202	572.27	567.28	567.08
CI #203	568.52	563.27 (#202) 563.67 (#204)	563.00
CI #204	568.52	---	563.90
CI #205	565.64	560.40	560.20
CI #206	565.64	559.89	559.69
CI #207	567.38	559.14 (#206) 559.96 (#210)	558.94
DI #208	578.96	---	571.60
DI #209	566.55	562.68	562.48
CI #210	572.36	561.09	560.89
CI #211	567.38	558.73	558.53
CI #212	564.32	554.49	552.76
CI #213	557.80	549.39 (#212) 550.85 (#215)	546.70
CI #214	556.85	---	551.70
CI #215	558.39	551.28	551.08
CI #216	551.46	543.67	542.17
DCI #217	549.48	540.08	538.08
MH #218	544.47	536.38	532.34
FES #219	---	---	532.10
CI #220	579.10	---	575.50
FES #221	---	---	575.34
FES #222	---	582.25	---
FES #223	---	---	580.25
HDPE FES #224	---	559.50	---
HDPE FES #225	---	---	559.10

NOTE: HDPE Flared End Section to be ADS or equal.

STORM DRAINAGE PIPE SCHEDULE

Structure From	Structure To	Slope	Length	Size	Material
CI #201	CI #202	5.00	104.4	15	RCP
CI #202	CI #203	5.00	76.2	15	RCP
CI #204	CI #203	1.10	20.9	15	RCP
CI #203	CI #205	2.00	130.0	15	RCP
CI #205	CI #206	1.50	21.0	18	RCP
CI #206	CI #207	1.00	54.5	24	RCP
DI #208	DI #209	7.50	118.9	15	RCP
DI #209	CI #210	1.00	139.0	15	RCP
CI #210	CI #207	1.00	93.0	15	RCP
CI #207	CI #211	1.00	21.0	24	RCP
CI #211	CI #212	2.84	142.5	24	RCP
CI #212	CI #213	3.00	112.3	24	RCP
CI #214	CI #215	1.00	42.0	15	RCP
CI #215	CI #213	1.00	22.7	15	RCP
CI #213	CI #216	2.25	134.6	24	RCP
CI #216	CI #217	2.00	104.7	24	RCP
CI #217	MH #218	4.25	40.0	24	RCP
MH #218	FES #219	0.60	40.0	30	RCP
CI #220	FES# 221	0.50	32.7	15	RCP
FES #222	FES #223	2.27	88.0	18	RCP IV
HDPE FES #224	HDPE FES #225	1.00	40.0	30	HDPE

Note: HDPE pipe to be ADS "N-12" or equal

NOTES:

1. Slopes shall be stabilized as soon as practical, consistent with the requirements of the Town of Waxhaw and/or NCDEQ. All slopes of 3:1 or steeper shall be stabilized with jute or other biodegradable netting (North American Green Rollmax OS150, or similar).
2. See Detail #8, Sheet 12 for rip-rap apron information.
3. The Developer shall retain a qualified Geotechnical consultant to evaluate soil conditions and make appropriate recommendations regarding any fill slopes 3:1 or steeper.

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209

P (704) 334-1325
F (704) 334-1330

NC #C-1170 & SC #C00946

PROPOSED GRADING & STORM DRAINAGE PLAN

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 3/26/19: Revised per review comments. Revised grading and storm drainage per Client direction. Revised per revision to Sheet 3 and added Retaining Wall Note per review comments.
#3 - 6/21/19: Revised per revision to Sheet 3 and added Retaining Wall Note per review comments.
#4 - 7/8/19: Revised Storm Drainage easements per revisions to Sheet 2 per review comments.

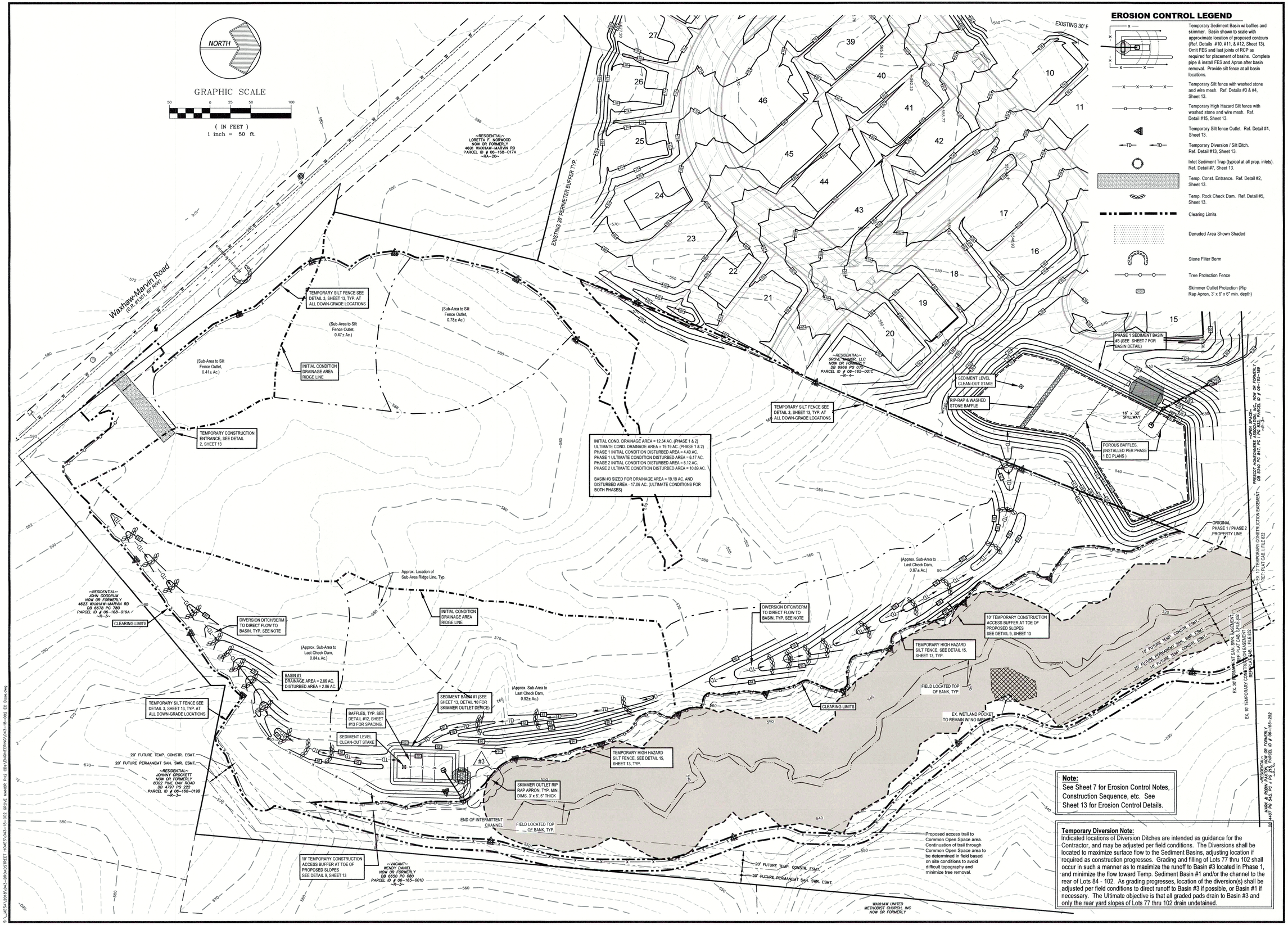
Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #19991 ENGINEER JAMES M. HARRIS 7/5/19

Scale: 1" = 50'

Sheet No. 4 of 24

S:\LMEA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CD\ENGINEERING\043-18-002 4Basic.dwg



EROSION CONTROL LEGEND

- Temporary Sediment Basin w/ baffles and skimmer. Basin shown to scale with approximate location of proposed contours (Ref. Details #10, #11, & #12, Sheet 13). Omit FES and last joints of RCP as required for placement of basins. Complete pipe & install FES and Apron after basin removal. Provide silt fence at all basin locations.
- Temporary Silt fence with washed stone and wire mesh. Ref. Details #3 & #4, Sheet 13.
- Temporary High Hazard Silt fence with washed stone and wire mesh. Ref. Detail #15, Sheet 13.
- Temporary Silt fence Outlet. Ref. Detail #4, Sheet 13.
- Temporary Diversion / Silt Ditch. Ref. Detail #13, Sheet 13.
- Inlet Sediment Trap (typical at all prop. inlets). Ref. Detail #7, Sheet 13.
- Temp. Const. Entrance. Ref. Detail #2, Sheet 13.
- Temp. Rock Check Dam. Ref. Detail #5, Sheet 13.
- Clearing Limits
- Denuded Area Shown Shaded
- Stone Filter Berm
- Tree Protection Fence
- Skimmer Outlet Protection (Rip Rap Apron, 3' x 6' x 6" min. depth)

Note:
See Sheet 7 for Erosion Control Notes, Construction Sequence, etc. See Sheet 13 for Erosion Control Details.

Temporary Diversion Note:
Indicated locations of Diversion Ditches are intended as guidance for the Contractor, and may be adjusted per field conditions. The Diversions shall be located to maximize surface flow to the Sediment Basins, adjusting location if required as construction progresses. Grading and filling of Lots 77 thru 102 shall occur in such a manner as to maximize the runoff to Basin #3 located in Phase 1, and minimize the flow toward Temp. Sediment Basin #1 and/or the channel to the rear of Lots 84 - 102. As grading progresses, location of the diversion(s) shall be adjusted per field conditions to direct runoff to Basin #3 if possible, or Basin #1 if necessary. The Ultimate objective is that all graded pads drain to Basin #3 and only the rear yard slopes of Lots 77 thru 102 drain undetained.

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

EROSION CONTROL PLAN - INITIAL CONDITION

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1: 11/14/18: Revised per review comments and revised owner information.
#2: 6/27/19: Revised per review comments. Revised per Grading Plan (Sheet 4) revisions; and updated Design Firm information.
#3: 6/27/19: Revised per revision to Sheet 3, added Sub-Areas and labels for drainage to Check Dams & Silt Fence Outlets per review comments.

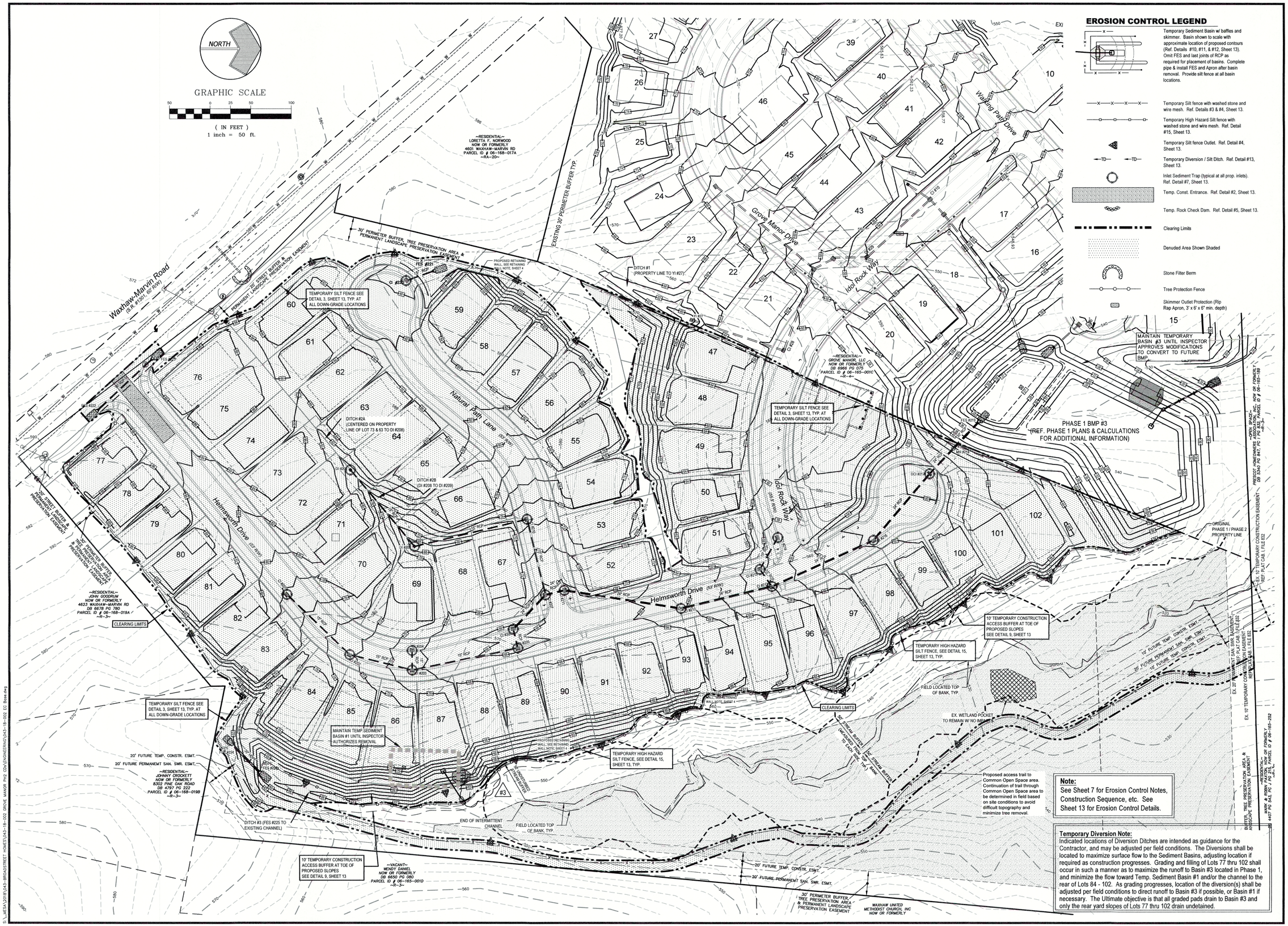
Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12989 ENGINEER WAYNE M. HARRIS 6/27/19

Scale: 1" = 50'

Sheet No. 5 Of 24

S:\MEBA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CDA\ENGINEERING\043-18-002 EC Base.dwg



EROSION CONTROL LEGEND

- Temporary Sediment Basin w/ baffles and skimmer. Basin shown to scale with approximate location of proposed contours (Ref. Details #10, #11, & #12, Sheet 13). Omit FES and last joints of RCP as required for placement of basins. Complete pipe & install FES and Apron after basin removal. Provide silt fence at all basin locations.
- Temporary Silt fence with washed stone and wire mesh. Ref. Details #3 & #4, Sheet 13.
- Temporary High Hazard Silt fence with washed stone and wire mesh. Ref. Detail #15, Sheet 13.
- Temporary Silt fence Outlet. Ref. Detail #4, Sheet 13.
- Temporary Diversion / Silt Ditch. Ref. Detail #13, Sheet 13.
- Inlet Sediment Trap (typical at all prop. inlets). Ref. Detail #7, Sheet 13.
- Temp. Const. Entrance. Ref. Detail #2, Sheet 13.
- Temp. Rock Check Dam. Ref. Detail #5, Sheet 13.
- Clearing Limits
- Denuded Area Shown Shaded
- Stone Filter Berm
- Tree Protection Fence
- Skimmer Outlet Protection (Rip Rap Apron, 3' x 6' x 6" min. depth)

Note:
See Sheet 7 for Erosion Control Notes, Construction Sequence, etc. See Sheet 13 for Erosion Control Details.

Temporary Diversion Note:
Indicated locations of Diversion Ditches are intended as guidance for the Contractor, and may be adjusted per field conditions. The Diversions shall be located to maximize surface flow to the Sediment Basins, adjusting location if required as construction progresses. Grading and filling of Lots 77 thru 102 shall occur in such a manner as to maximize the runoff to Basin #3 located in Phase 1, and minimize the flow toward Temp. Sediment Basin #1 and/or the channel to the rear of Lots 84 - 102. As grading progresses, location of the diversion(s) shall be adjusted per field conditions to direct runoff to Basin #3 if possible, or Basin #1 if necessary. The Ultimate objective is that all graded pads drain to Basin #3 and only the rear yard slopes of Lots 77 thru 102 drain undetained.

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

EROSION CONTROL PLAN - ULTIMATE CONDITION

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 3/26/19: Revised per review comments. Revised per Grading Plan (Sheet 4) revisions: Added Temp. Sediment Basin #3.
#3 - 6/27/19: Revised per revisions to Sheets 3 & 5 (per review comments).
#4 - 7/8/19: Revised Storm Drainage easements per revisions to Sheet 2 (per review comments).

Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,589 ENGINEER DANIEL HARRIS 7/8/19

Scale: 1" = 50'

Sheet No. 6 of 24

Seeding Specifications:

1. All open areas shall be seeded with Kentucky Fescue #31 or sodded.
2. Lime shall be applied at 4000/lb per acre.
3. Fertilizer shall be applied as follows: 10-10-10 at 1000 lb. per acre and 0-20-0 at 500 lb. per acre. No fertilizer shall be applied within 10 feet of water courses.
4. Seed shall be applied at 80 lb. per acre (add 30 lb. per acre annual rye if seeding between November and February).
5. Straw shall be applied at 3000 lb. per acre and asphalt tacked at 225 gal. per acre.
6. See Detail #12, Sheet 12 for "Temporary Seeding Schedule."

Seedbed Preparation Notes:

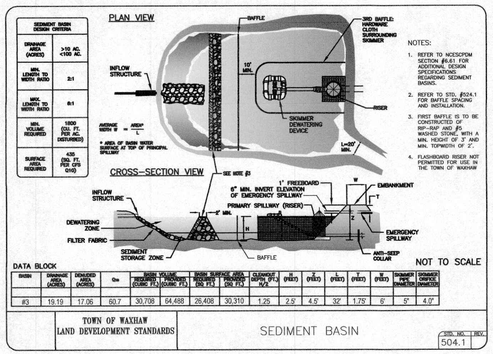
1. Surface water control features shall be installed per approved plan.
2. Loose rocks, roots and other obstructions shall be removed from the surface so that they will not interfere with establishment and/or maintenance of vegetation. Surface for final seed bed preparation at indicated finish grades, shall be reasonably smooth and uniform.
3. If no soil test is taken, fertilizer and lime shall be applied according to seeding specifications.
4. If soil test is taken, provide fertilizer and lime according to soil report.
5. Fertilizer and lime shall be applied uniformly and mixed with the soil during seedbed preparation.
6. Graded Slopes and Fills: The angles for graded slopes shall be no greater than the angle which can be retained by vegetative cover or other adequate erosion control measures. In any event, slopes left exposed shall be planted or otherwise provided with ground cover or other adequate erosion control measures sufficient to restrain erosion. See Erosion Control Note #20 for stabilization time frames. Maximum slope is 2:1.
7. Ground Cover: Whenever land disturbing activity is undertaken on a tract comprising more than one (1) acre, if more than one (1) contiguous acre is uncovered, a ground cover sufficient to restrain erosion must be planted or otherwise provided on that portion of the tract upon which further active construction is not being undertaken. See Erosion Control Note #20 for stabilization time frames.

Construction Sequence:

1. Schedule Obtain Erosion Control Plan approval and Grading Permit from the Waxhaw Engineering Department.
2. Schedule an on-site Pre-Construction conference with the Waxhaw Development Services Dept. (704-843-2195) a minimum of 48 hours prior to commencement of the work to discuss erosion control measures. No land disturbing activity, except that which is required to install erosion control measures, may commence prior to approval by the Erosion Control Inspector.
3. #2 Verify that Phase 1 Temp. Sediment Basin #3 has been modified per the revised Phase 1 plans, and therefore adequate to service Phase 2.
4. Install all perimeter measures per the Erosion Control Inspector's authorization: silt fence, tree protection fence, sediment basins / traps, diversion ditches, etc. and other measures as shown on plans, clearing only as necessary to install these devices. Minor grading shall be allowed if required by site conditions for installation of measures (basins, diversions, etc.). Mass grading of the Site is prohibited until installed measures are approved by the Erosion Control Inspector. Basin #1 shall be stabilized immediately upon completion.
5. Call for on-site inspection by Erosion Control Inspector. When approved, clearing and grubbing may begin.
6. The Contractor shall diligently and continuously maintain all erosion control devices and structures.
7. For phased erosion control plans, Contractor shall meet with Erosion Control Inspector prior to commencing with each phase of erosion control measures.
8. Stabilize site as areas are brought to finished grade per required stabilization schedule.
9. #2 Remove all temporary erosion control devices and structures only after site is fully stabilized and approval has been obtained from the Erosion Control Inspector. Removal of Basin #1 cannot occur until authorized by the Erosion Control Inspector based on one of the following: (a) adequate stabilization of the drainage area tributary to Basin #1, or (b) grading of Lots 77 thru 92 is adequately completed to direct runoff to Phase 1 Basin #3 and therefore Basin #1 is no longer required.
10. All erosion control measures shall be constructed in accordance with the Town of Waxhaw Engineering Design & Construction Standards Procedures Manual, and the NCDEQ Erosion and Sedimentation Control Planning and Design Manual, latest edition.

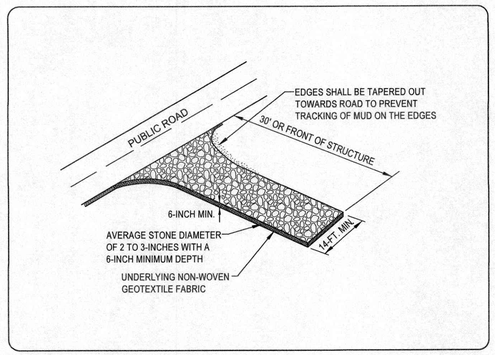
Individual Lot Construction Sequence:

1. A Single-Family Residential Lot ESC Installation and Maintenance Agreement is required prior to land disturbing activities.
2. Install perimeter silt & barrier fence per Details 3, 4 & 14, Sheet 13. When adjacent lots are under construction, the silt fence and/or barrier fence should be connected in order to provide a continuous barrier whenever possible.
3. Provide residential-scale Temporary Construction Entrance on each lot (14' min. x 30' min. or front of structure, See detail below).
4. Complete any necessary pad grading as required and install house footing and foundation.
5. Proceed w/ house construction, maintaining erosion control measures during construction.
6. Upon completion of house, prepare final grading & yard drainage as specified in the approved Grading & Drainage plans, insuring that surface flows and roof leader discharge is properly directed.
7. Provide final permanent lot stabilization.
8. With approval of the Inspector, remove any remaining erosion control measures (silt fence, etc.)



#2 PHASE 1, SEDIMENT BASIN #3 DETAIL

(DETAIL REPEATED FROM PHASE 1 PLANS)



RESIDENTIAL - SCALE TEMP. CONSTRUCTION ENTRANCE DETAIL

Erosion Control General Notes:

1. This Erosion Control Plan shall be designed and implemented in accordance with the Town of Waxhaw Engineering Design & Construction Standards Procedures Manual, and the NCDEQ Erosion and Sedimentation Control Planning and Design Manual, latest edition. All Erosion Control devices shall be installed in accordance with Waxhaw Standards and Sheet 13. "Std." numbers refer to the Town of Waxhaw Engineering Design & Construction Standards Procedures Manual.
2. Development and related Erosion Control of this Site will occur in phases as follows:
   Phase 1 - Initial Development Phase: Clearing and grading activities related to construction of proposed streets & related infrastructure, and mass site grading to prepare lots for future house construction, after passing required sediment erosion control inspection.
   Phase 2 - House Construction: Fine grading activities related to lot preparation for construction of individual homes. In addition to the general Erosion Control measures specified for the site, individual measures shall be provided as specified in Detail 14, Sheet 13 in order to minimize sediment loss from the site.
3. Total project area: 20.27± acres; total disturbed area = 12.8± acres.
4. Site grading is to be covered under the General Stormwater Permit NCG010000. Any land disturbing activity greater than 1 acre requires compliance with all conditions of the General Permit under NCDEQ. Any noncompliance is a violation of the Clean Water Act and may require enforcement by NCDEQ.
5. Soil classification: TbB2 (Tatum, gravelly silt loam, 2% - 8% slopes, eroded) and TbC2 (Tatum, gravelly silt loam, 8% - 15% slopes, eroded).
6. Additional measures to control erosion and sediment may be required by the Erosion Control Inspector.
7. Final location of silt fence shall be determined in the field based on actual site conditions, with the approval of the Erosion Control Inspector.
8. Any grading beyond the indicated clearing limits is a violation of the Town Erosion Control Ordinance and is subject to a fine.
9. No on-site demolition landfills (i.e., Stump Holes) will be located on this Site.
10. 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, and provided to the Town Erosion Control Inspector prior to proceeding.
11. The Contractor shall provide Temporary Diversion Ditches at any Sediment Trap / Basin location to direct surface flow to the trap / basin. Ditches should be placed to maximize flow to the trap / basin. Diversion Ditch and Check Dam locations as shown on this plan are to be used as a guide for the Contractor, however, final placement should be adjusted as necessary per field conditions or as directed by the Erosion Control Inspector. As grading progresses, modification to Diversion Ditches is anticipated in order to continue to direct flow(s) to basins / traps.
12. Stabilization is the best form of erosion control. Temporary seeding is necessary to achieve erosion control on large denuded areas and especially when specifically required as part of the construction sequence shown on the plan. All graded slopes must be seeded and mulched within 7 days of completion of grading. All remaining areas are to be seeded and mulched within 14 days.
13. All erosion control devices shall be inspected at least once a week and after each storm event of 0.5" or more.
14. Effective October 1, 2010, the financially responsible party/agent or the landowner/agent of a land disturbing activity greater than 1 acre must inspect a project after each phase of the project to make sure that the approved erosion and sedimentation control plan is being followed. Self-inspection reports are required. A sample self-inspection report and details of the self-inspection program can be found on the NCDEQ website. Inspection report and SWPPP must be located on site at all times and accessible by Erosion Control Inspector.
15. Silt sacks shall be placed in all inlets collecting drainage or that might potentially be affected by the proposed construction. Inlet protection must be maintained until all areas draining to the inlet are fully stabilized.
16. Any sediment or dirt tracked into the roads by Contractor activity shall be cleaned up immediately.
17. All disturbed areas not built upon will be provided with permanent groundcover.
18. The Professional Engineer registered with the State of North Carolina who prepared the Erosion Control Plan is solely responsible for identification and location of all environmental wetlands, perennial and intermittent streams and buffers shown on the plans.
19. The Town of Waxhaw is not responsible for the accuracy and adequacy of the design, dimensions, and elevations, which shall be confirmed and correlated at the job site. The Town of Waxhaw, through the approval of this document, assumes no responsibility for the completeness and/or accuracy of this document.
20. Effective August 3, 2011, the North Carolina NPDES General Permit for construction activities was modified to require the following ground stabilization time-frames:

Site Area Description	Stabilization	Time-frame Exceptions
Perimeter dikes, swales, ditches & slopes	7 days	none
High Quality Water (HQW) zones	7 days	none
Slopes steeper than 3:1	7 day	if slopes are10' or less in length & 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 w/ slopes flatter than 4:1	14 days	none, except for perimeters and HQW zones

21. No concrete washouts or any similar type use may be located within fifty (50') of a catch basin, drainage inlet or any other similar structure.
22. Slopes shall be stabilized as soon as practical, consistent with the requirements of the Town of Waxhaw and/or NCDEQ. All slopes of 3:1 or steeper shall be stabilized with jute or other biodegradable netting (North American Green Rollmax OS150, or similar).
23. #2 All slopes shall be tracked at the conclusion of the work day to ensure adequate surface roughness and minimize sediment loss.

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

EROSION CONTROL NOTES

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Revised per review comments and revised owner information
#2 - 2/20/19: Revised per review comments and updated design firm information.

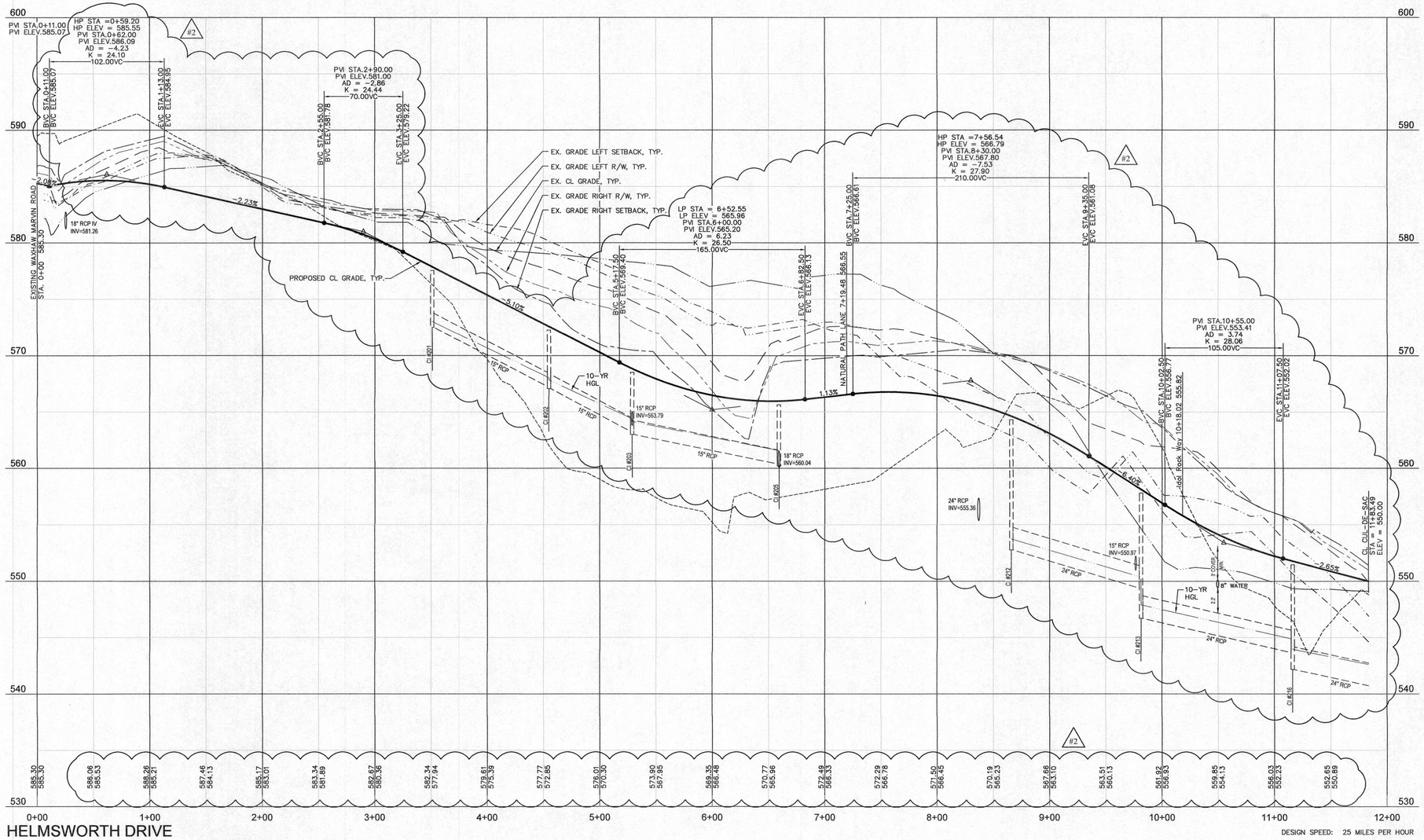
Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,385 ENGINEER WILLIAM H. HARRIS

Scale: NTS

Sheet No. 7 of 24

S:_AESA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CD\ENGINEERING\043-18-002 SH17 EC NotesSH.dwg



HELMSWORTH DRIVE

DESIGN SPEED: 25 MILES PER HOUR

VERTICAL
1 inch = 5 ft.

HORIZONTAL
(IN FEET)
1 inch = 50 ft.

STREET & STORM DRAINAGE PROFILES ON THIS SHEET:
- HELMSWORTH DRIVE
- FOR ADDITIONAL STORM DRAINAGE PROFILES, SEE SHEETS 9 & 10
- FOR STORM DRAINAGE STRUCTURE AND PIPE SCHEDULES SEE SHEETS 4 & 10.

HARRIS ENGINEERING
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CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
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STREET & STORM DRAINAGE PROFILES

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 3/26/19: Revised per Grading Plan (Sheet 4) revisions; and updated Design Firm information.

Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,585 ENGINEER WAYNE M. HARRIS

Scale: Horiz: 1" = 50'
Vert: 1" = 5'

Sheet No.
8
of 24

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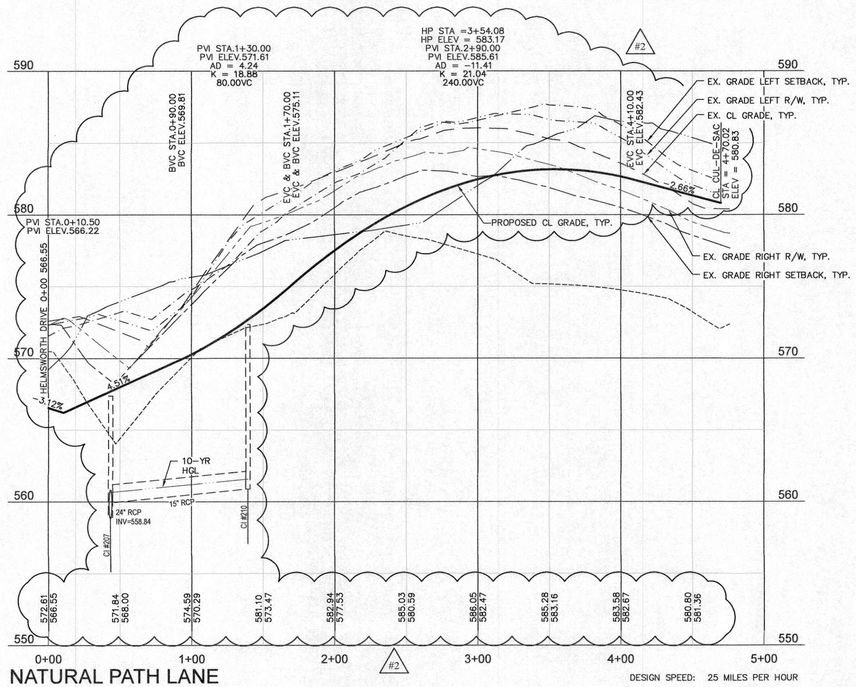
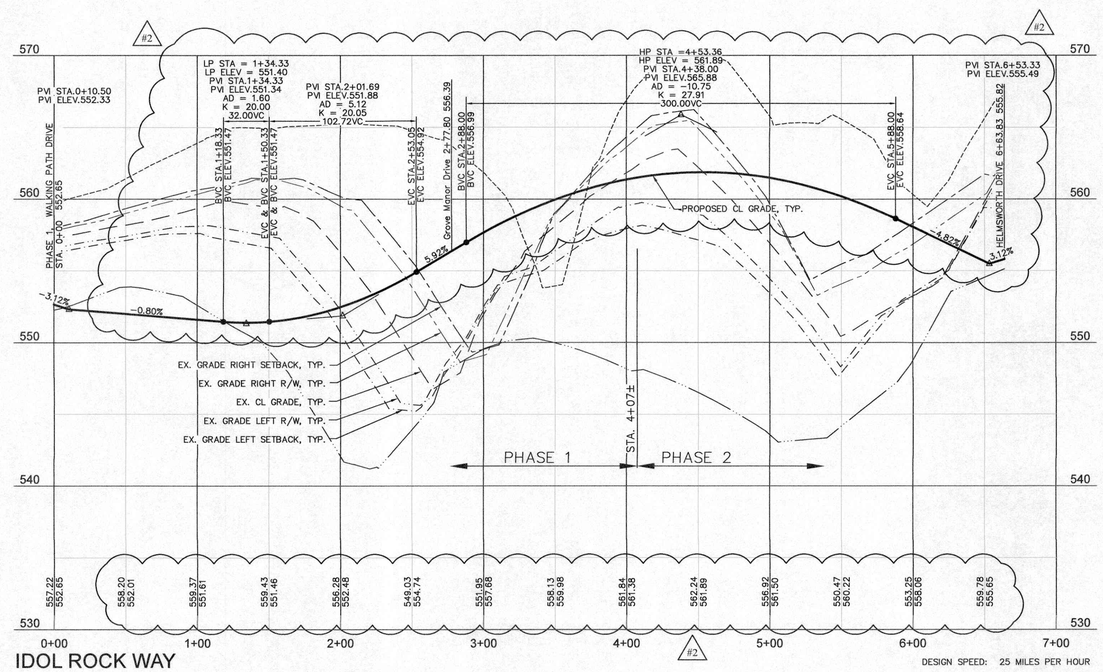


NATURAL PATH LANE

DESIGN SPEED: 25 MILES PER HOUR



IDOL ROCK WAY

DESIGN SPEED: 25 MILES PER HOUR

VERTICAL
1 inch = 5 ft.

HORIZONTAL
(IN FEET)
1 inch = 50 ft.

STREET & STORM DRAINAGE PROFILES ON THIS SHEET:
- NATURAL PATH LANE
- IDOL ROCK WAY
- FOR ADDITIONAL STORM DRAINAGE PROFILES, SEE SHEET 8 & 10
- FOR STORM DRAINAGE STRUCTURE AND PIPE SCHEDULES SEE SHEETS 4 & 10.

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
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STREET & STORM DRAINAGE PROFILES

Grove Manor - Phase 2

Grove Manor NC, LLC
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Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 3/26/19: Revised per Grading Plan (Sheet 4) revisions, and updated Design Firm information.

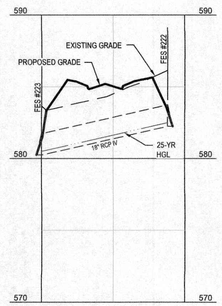
Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL 012,585 ENGINEER WILLIAM M. HARRIS

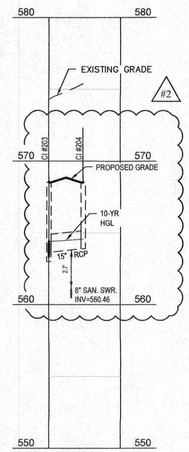
Scale: Horiz: 1" = 50'
Vert: 1" = 5'

Sheet No. 9 of 24

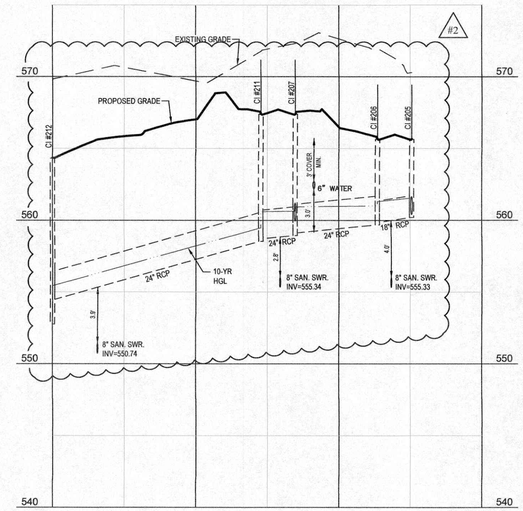
S:_MESA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CD\ENGINEERING\043-18-002 MBase.dwg



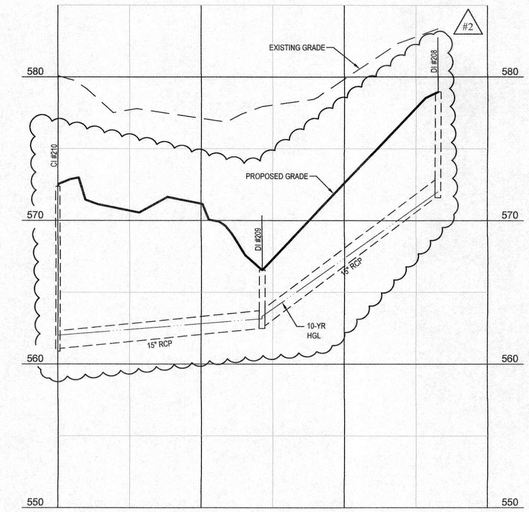
HELMSWORTH DRIVE ENTRY



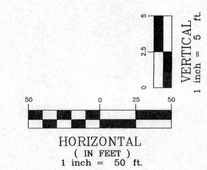
HELMSWORTH DRIVE CI #203 TO CI #204



HELMSWORTH DRIVE AND NATURAL PATH LANE CI #212 TO CI #205



CI #210 TO DI #208



STORM DRAINAGE STRUCTURE SCHEDULE

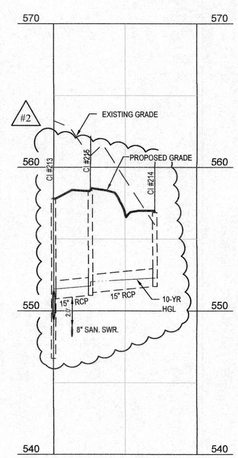
Structure	Rim	Invert In	Invert Out
CI #201	577.55	—	572.50
CI #202	572.27	567.28	567.08
CI #203	568.52	563.27 (#202) 563.67 (#204)	563.00
CI #204	568.52	—	563.90
CI #205	565.64	560.40	560.20
CI #206	565.64	559.89	559.69
CI #207	567.38	559.14 (#206) 559.96 (#210)	558.94
DI #208	578.96	—	571.60
DI #209	566.55	562.68	562.48
CI #210	572.36	561.09	560.89
CI #211	567.38	558.73	558.53
CI #212	564.32	554.49	552.76
CI #213	557.80	549.39 (#212) 550.85 (#215)	546.70
CI #214	556.85	—	551.70
CI #215	558.39	551.28	551.08
CI #216	551.46	543.67	542.17
DCI #217	549.48	540.08	538.08
MH #218	544.47	536.38	532.34
FES #219	—	—	532.10
CI #220	579.10	—	575.50
FES #221		—	575.34
FES #222	—	582.25	—
FES #223	—	—	580.25
HDPE FES #224	—	559.50	—
HDPE FES #225	—	—	559.10

NOTE: HDPE Flared End Section to be ADS or equal.

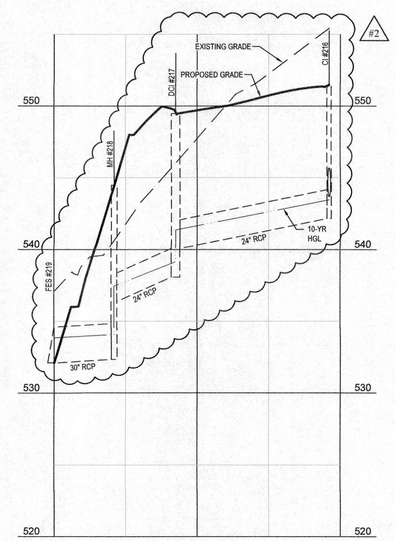
STORM DRAINAGE PIPE SCHEDULE

Structure From	Structure To	Slope	Length	Size	Material
CI #201	CI #202	5.00	104.4	15	RCP
CI #202	CI #203	5.00	76.2	15	RCP
CI #204	CI #203	1.10	20.9	15	RCP
CI #203	CI #205	2.00	130.0	15	RCP
CI #205	CI #206	1.50	21.0	18	RCP
CI #206	CI #207	1.00	54.5	24	RCP
DI #208	DI #209	7.50	118.9	15	RCP
DI #209	CI #210	1.00	139.0	15	RCP
CI #210	CI #207	1.00	93.0	15	RCP
CI #207	CI #211	1.00	21.0	24	RCP
CI #211	CI #212	2.84	142.5	24	RCP
CI #212	CI #213	3.00	112.3	24	RCP
CI #214	CI #215	1.00	42.0	15	RCP
CI #215	CI #213	1.00	22.7	15	RCP
CI #213	CI #216	2.25	134.6	24	RCP
CI #216	CI #217	2.00	104.7	24	RCP
CI #217	MH #218	4.25	40.0	24	RCP
MH #218	FES #219	0.60	40.0	30	RCP
CI #220	FES# 221	0.50	32.7	15	RCP
FES #222	FES #223	2.27	88.0	18	RCP IV
HDPE FES #224	HDPE FES #225	1.00	40.0	30	HDPE

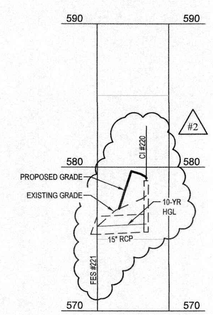
Note: HDPE pipe to be ADS "N-12" or equal



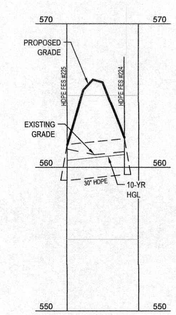
HELMSWORTH DRIVE AND IDOL ROCK WAY CI #213 TO CI #214



HELMSWORTH DRIVE TO BMP FES #219 TO CI #216



NATURAL PATH LANE FES #221 TO CI #220



BEHIND LOT #84 HDPE FES #224 TO HDPE FES #225

STORM DRAINAGE PROFILES ON THIS SHEET:
- HELMSWORTH DRIVE, CI #203 TO CI #204
- HELMSWORTH DRIVE AND NATURAL PATH LANE, CI #212 TO CI #205
- CI #210 TO DI #208
- HELMSWORTH DRIVE AND IDOL ROCK WAY, CI #213 TO CI #214
- HELMSWORTH DRIVE TO BMP, CI #216 TO FES #219
- NATURAL PATH LANE, CI #220 TO FES #221
- SEE SHEETS 8 & 9 FOR STORM DRAINAGE PROFILES ALONG EACH STREET

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

STORM DRAINAGE PROFILES

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 3/28/19: Revised per Grading Plan (Sheet 4) revisions; and updated Design Firm information.

Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,580 ENGINEER WILLIAM M. HARRIS

Scale: Horiz: 1" = 50' Vert: 1" = 5'

Sheet No. 10 of 24

S:_LACSA\2018\043-18-002\STREET HOMES\043-18-002 GROVE MANOR PH2 CIVIL\ENGINEERING\043-18-002 HBase.dwg

LEGEND

BOTANICAL TREE DESIGNATION / QUANTITY

COMMON OPEN SPACE

PROPOSED 5' CONCRETE SIDEWALK

INTERNAL TREE SAVE

SEE MITIGATION PLAN FOR HERITAGE TREE REMOVAL (SHEETS 19 THROUGH 24)

NOTES:

1. ALL INTERNAL TREE PROTECTION ZONES ARE TO HAVE A MINIMUM OF ONE (1) TREE PER 2500 SQ. FT. IF EXISTING TREES DO NOT MEET THIS REQUIREMENT, TREES SHALL BE ADDED PER U.D.O. SECTION 9.21.8.A(2)c.3. TREE SPECIES TO BE AS LISTED IN THE PLANTING CHART OR SIMILAR LARGE MATURING VARIETY, SELECTED FROM THE WAXHAW U.D.O. SECTION 9.21.15 "LARGE MATURING" TREE SPECIES LIST. ADDITIONAL SPECIES MAY BE AS USED SUBJECT TO SPECIFIC APPROVAL OF THE ADMINISTRATOR.

2. STREET TREES - TREE SPECIES TO BE AS LISTED IN THE PLANTING CHART OR SIMILAR SMALL MATURING VARIETY, SELECTED FROM THE WAXHAW U.D.O. SECTION 9.21.15 "SMALL MATURING" TREE SPECIES LIST. ADDITIONAL SPECIES MAY BE AS USED SUBJECT TO SPECIFIC APPROVAL OF THE ADMINISTRATOR.

3. REFERENCE SHEETS 19 THROUGH 24 FOR EXISTING TREES TO REMAIN IN THE STREET / LANDSCAPE BUFFERS, PERIMETER BUFFERS / TREE PRESERVATION AREAS, AND THE INTERNAL TREE PRESERVATION ZONES.

PLANTING CHART

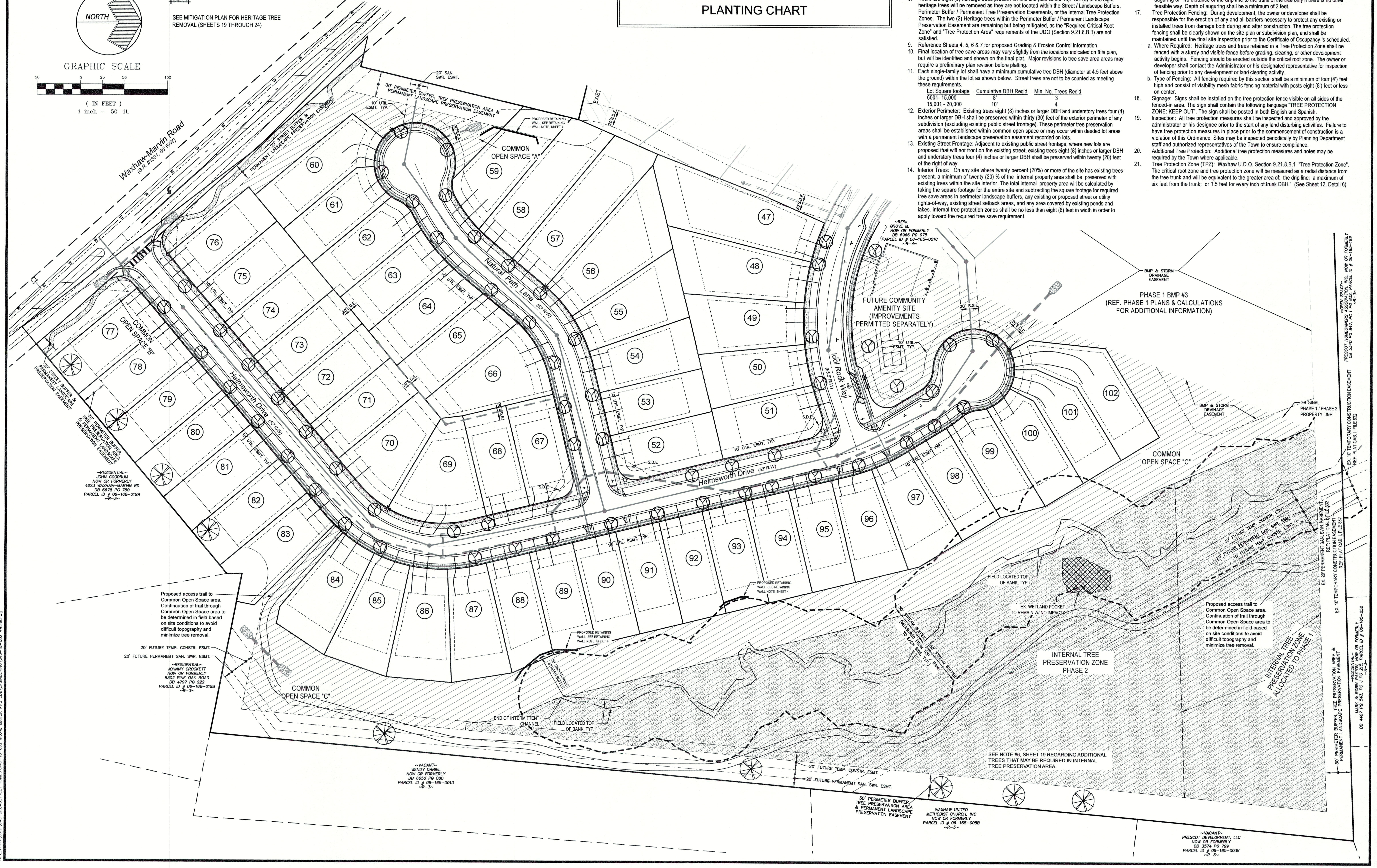
SYMBOL	MARK	BOTANICAL NAME	COMMON NAME	QUANTITY	SIZE	SPACING
PROPOSED TREES						
			MEDIUM MATURING TREES			
	AR	Acer Rubrum	Red Maple	9	Min. 2" DBH Min. Height: 12'	Min. 25'
STREET TREES						
			SMALL MATURING TREES			
	AP	A. Truncatum X Platniodes	Hedge Maple	62	Min. 2" DBH Min. Height: 8'	50' (Max.) See Plan

Landscape and Tree Protection Notes:

1. All trees shall be planted in accordance with Details 4, 5, 6, 7, 10, & 11, Sheet 12.
2. Street trees shall be small maturing. A tree every 50' is required to be within the planting strip. New trees shall be selected from approved Waxhaw tree species list (U.D.O. Section 9.21.15). Street section may be slightly modified at the discretion of the Town Engineer to accommodate utility placement.
3. All strapping and top 2/3 of wire basket must be cut away and removed from the root ball prior to backfilling planting pit. Remove top 1/3 of burlap from root ball.
4. For new planting areas, remove all construction debris. Un-compact and amend the top 24" of existing soil to meet topsoil/planting mix standards for trees.
5. Large maturing trees may not be planted where overhead distribution or transmission lines exist. If trees conflict with power lines or signs, call the Urban Forester to resolve before planting.
6. Adjust tree planting locations to avoid conflicts with underground utilities and/or proposed driveway locations.
7. New trees shall be a minimum of 8' tall & min. 2" caliper for street tree requirements.
8. There are eight (8) heritage trees present on this site (see Sheet 18). Six (6) of the eight heritage trees will be removed as they are not located within the Street / Landscape Buffers, Perimeter Buffer / Permanent Tree Preservation Easements, or the Internal Tree Protection Zones. The two (2) Heritage trees within the Perimeter Buffer / Permanent Landscape Preservation Easement are remaining but being mitigated, as the "Required Critical Root Zone" and "Tree Protection Area" requirements of the UDO (Section 9.21.8.B.1) are not satisfied.
9. Reference Sheets 4, 5, 6 & 7 for proposed Grading & Erosion Control information.
10. Final location of tree save areas may vary slightly from the locations indicated on this plan, but will be identified and shown on the final plat. Major revisions to tree save area areas may require a preliminary plan revision before platting.
11. Each single-family lot shall have a minimum cumulative tree DBH (diameter at 4.5 feet above the ground) within the lot as shown below. Street trees are not to be counted as meeting these requirements.

Lot Square footage	Cumulative DBH Req'd	Min. No. Trees Req'd
6001- 15,000	8"	3
15,001 - 20,000	10"	4

12. Exterior Perimeter: Existing trees eight (8) inches or larger DBH and understory trees four (4) inches or larger DBH shall be preserved within thirty (30) feet of the exterior perimeter of any subdivision (excluding existing public street frontage). These perimeter tree preservation areas shall be established within common open space or may occur within deeded lot areas with a permanent landscape preservation easement recorded on lots.
13. Existing Street Frontage: Adjacent to existing public street frontage, where new lots are proposed that will not front on the existing street, existing trees eight (8) inches or larger DBH and understory trees four (4) inches or larger DBH shall be preserved within twenty (20) feet of the right of way.
14. Interior Trees: On any site where twenty percent (20%) or more of the site has existing trees present, a minimum of twenty (20) % of the internal property area shall be preserved with existing trees within the site interior. The total internal property area will be calculated by taking the square footage for the entire site and subtracting the square footage for required tree save areas in perimeter landscape buffers, any existing or proposed street or utility rights-of-way, existing street setback areas, and any area covered by existing ponds and lakes. Internal tree protection zones shall be no less than eight (8) feet in width in order to apply toward the required tree save requirement.
15. Interior tree protection areas shall contain no less than one (1) tree per 2500 square feet of tree protection area. Where existing trees are insufficient to meet this standard, new trees shall be planted to meet this minimum standard. New trees shall be a minimum of two (2) inch caliper at planting.
16. Tree Protection During Construction: Existing trees must be protected during construction. Trees must be protected from direct or indirect root damage and trunk and crown disturbance. The following standards shall apply:
    a. Tree protection zones and tree save areas shall remain open and unpaved.
    b. Construction site activities such as parking, material storage, dirt stockpiling, concrete washout and other similar activities shall be prohibited within the tree protection zone.
    c. Changes that significantly raise or lower the grade of soil in tree save areas and tree protection zone are prohibited.
    d. If an underground utility must cross the drip line area, the contractor must tunnel or auger underneath major roots of the tree without cutting them. Permission may be granted for auguring of 1/3 distance of the drip line to the trunk of the tree only if there is no other feasible way. Depth of auguring shall be a minimum of 2 feet.
17. Tree Protection Fencing: During development, the owner or developer shall be responsible for the erection of any and all barriers necessary to protect any existing or installed trees from damage both during and after construction. The tree protection fencing shall be clearly shown on the site plan or subdivision plan, and shall be maintained until the final site inspection prior to the Certificate of Occupancy is scheduled.
    a. Where Required: Heritage trees and trees retained in a Tree Protection Zone shall be fenced with a sturdy and visible fence before grading, clearing, or other development activity begins. Fencing should be erected outside the critical root zone. The owner or developer shall contact the Administrator or his designated representative for inspection of fencing prior to any development or land clearing activity.
    b. Type of Fencing: All fencing required by this section shall be a minimum of four (4') feet high and consist of visibility mesh fabric fencing material with posts eight (8') feet or less on center.
18. Signage: Signs shall be installed on the tree protection fence visible on all sides of the fenced-in area. The sign shall contain the following language "TREE PROTECTION ZONE: KEEP OUT". The sign shall be posted in both English and Spanish.
19. Inspection: All tree protection measures shall be inspected and approved by the administrator or his designee prior to the start of any land disturbing activities. Failure to have tree protection measures in place prior to the commencement of construction is a violation of this Ordinance. Sites may be inspected periodically by Planning Department staff and authorized representatives of the Town to ensure compliance.
20. Additional Tree Protection: Additional tree protection measures and notes may be required by the Town where applicable.
21. Tree Protection Zone (TPZ): Waxhaw U.D.O. Section 9.21.8.B.1 "Tree Protection Zone". The critical root zone and tree protection zone will be measured as a radial distance from the tree trunk and will be equivalent to the greater area of: the drip line; a maximum of six feet from the trunk; or 1.5 feet for every inch of trunk DBH." (See Sheet 12, Detail 6)



HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
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PROPOSED LANDSCAPE PLAN

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 3/26/19: Updated Design Firm information.
#3 - 6/27/19: Revised per revision to Sheet 3 (per review comments).
#4 - 7/8/19: Revised Storm Drainage easements per revisions to Sheet 2 (per review comments).

Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL #12585 WAYNE M. HARRIS 7/8/19

Scale: 1" = 50'

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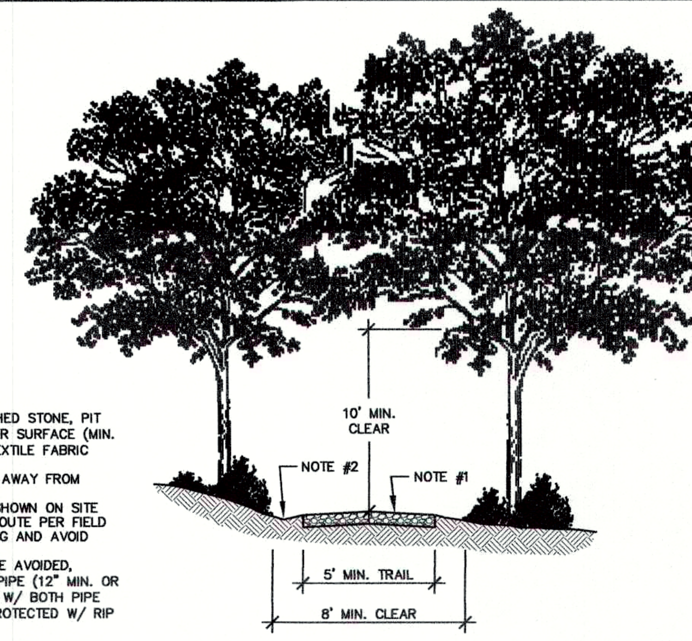
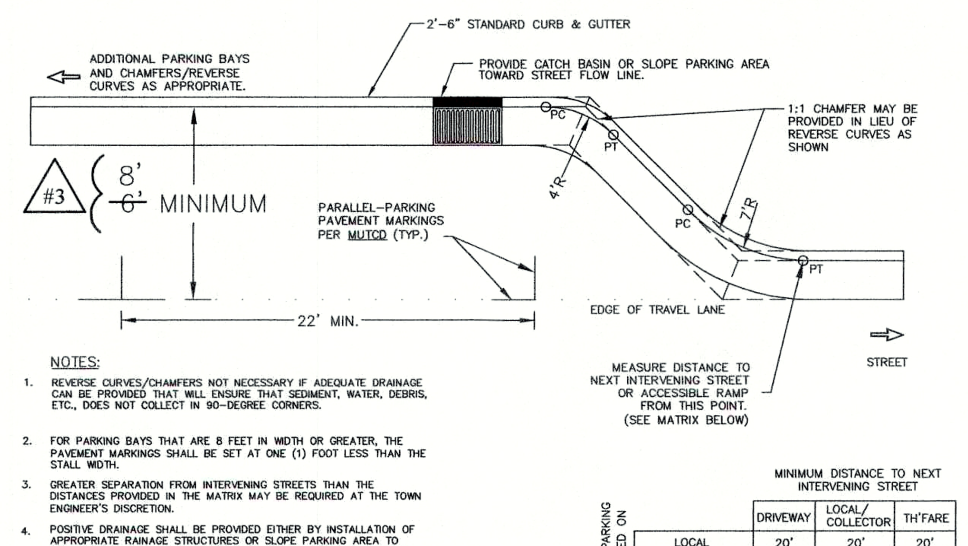
13 TYPICAL PEDESTRIAN TRAIL THRU COMMON AREA



NOTES:
1. TRAIL SURFACE TO BE CRUSHED STONE, PIT GRAVEL OR SIMILAR ALL-WEATHER SURFACE (MIN. DEPTH OF 6") PLACED ON GEOTEXTILE FABRIC OVER COMPACTED SOIL.
2. PROVIDE POSITIVE DRAINAGE AWAY FROM TRAIL SURFACE ON HIGH SIDE.
3. LOCATE TRAIL APPROX. AS SHOWN ON SITE PLAN, HOWEVER ADJUST FINAL ROUTE PER FIELD CONDITIONS TO MINIMIZE CLEARING AND AVOID CROSS-DRAIN SWALES.
4. IF CROSS-DRAINS CANNOT BE AVOIDED, CONTRACTOR TO PROVIDE HDPE PIPE (12" MIN. OR CONTACT ENGINEER FOR SIZING), W/ BOTH PIPE ENDS MITERED TO SLOPE AND PROTECTED W/ RIP RAP.

NOT TO SCALE

9 PARALLEL PARKING STANDARDS



NOTES:
1. REVERSE CURVES/CHAMFERS NOT NECESSARY IF ADEQUATE DRAINAGE CAN BE PROVIDED THAT WILL ENSURE THAT SEDIMENT, WATER, DEBRIS, ETC., DOES NOT COLLECT IN 90-DEGREE CORNERS.
2. FOR PARKING BAYS THAT ARE 8 FEET IN WIDTH OR GREATER, THE PAVEMENT MARKINGS SHALL BE SET AT ONE (1) FOOT LESS THAN THE STALL WIDTH.
3. GREATER SEPARATION FROM INTERVENING STREETS THAN THE DISTANCES PROVIDED IN THE MATRIX MAY BE REQUIRED AT THE TOWN ENGINEER'S DISCRETION.
4. POSITIVE DRAINAGE SHALL BE PROVIDED EITHER BY INSTALLATION OF APPROPRIATE RAINAGE STRUCTURES OR SLOPE PARKING AREA TO STREET FLOW LINE. SLOPING PARKING AREA TO STREET FLOW LINE ONLT PERMITTED IF ROAD GRADE IS GREATER THAN 2%.

MINIMUM DISTANCE TO NEXT INTERVENING STREET

PARALLEL PARKING BAY LOCATED ON	DRIVEWAY	LOCAL/ COLLECTOR	TH'FARE
LOCAL	20'	20'	20'

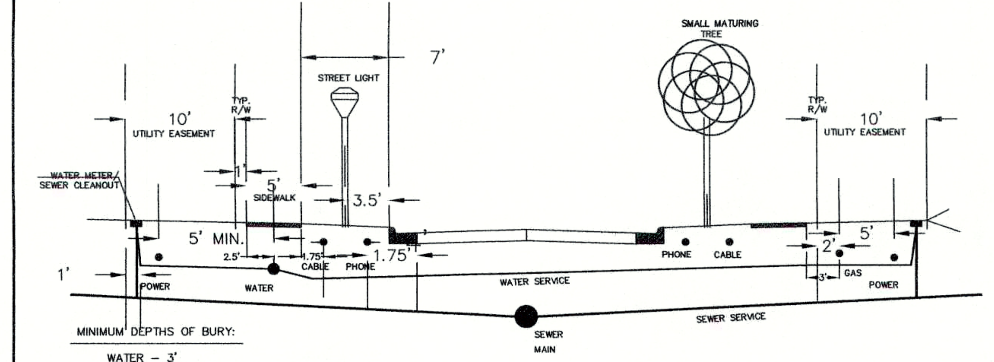
NOT TO SCALE

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — PARALLEL PARKING STANDARDS — STD. NO. 285.2 REV.

5 RESIDENTIAL SUBDIVISION UTILITY LAYOUT SECTION

A. THIS DETAIL IS A REFERENCE FOR UTILITY PLACEMENT ONLY, REFER TO RESIDENTIAL STREET TYPICAL DETAILS 200.1-210.4 FOR RIGHT OF WAY AND PAVEMENT SECTION INFORMATION BASED ON TYPE OF STREET BEING CONSTRUCTED.
B. STREET LIGHTS AND TREES SHOWN ON OPPOSITE SIDE OF STREET FOR ILLUSTRATIVE PURPOSES ONLY. REFER TO SITE PLAN FOR ACTUAL LOCATIONS.
C. REFER TO SECTION "H" OF DESIGN CRITERIA FOR PLACEMENT OF CLUSTER MAILBOX UNITS, AS WELL AS DETAILS 720.1-723.1.

1. GAS MAIN SHALL BE ON OPPOSITE SIDE OF STREET FROM WATER MAIN.
2. STREET TREES SHALL BE SMALL MATURING SPECIES 2" CALIPER
3. LIGHT POLES AND STREET TREES SHALL MAINTAIN A MINIMUM OFFSET DISTANCE OF 5' FROM WATER AND SEWER SERVICE LINES.
4. CABLE AND TELEPHONE PEDESTALS SHALL BE LOCATED WITHIN THE UTILITY EASEMENT, ALONG THE SIDE LOT LINES.

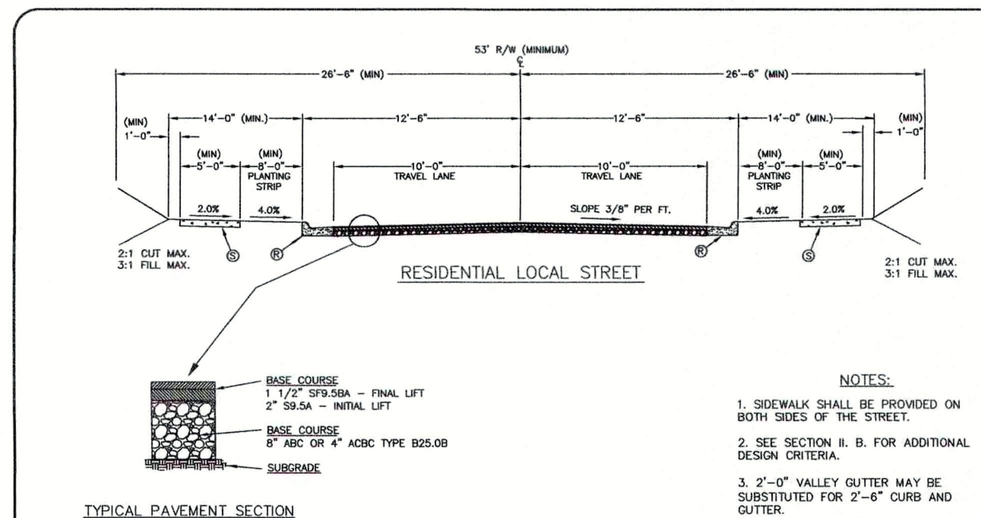


MINIMUM DEPTHS OF BURY:
WATER – 3'
SEWER – PER PLAN
GAS – 2.5'
POWER – 3'
CABLE – 1.5'
PHONE – 1.5'

NOT TO SCALE

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — RESIDENTIAL SUBDIVISION UTILITY LAYOUT TYPICAL SECTION — STD. NO. 200.0

1 LOCAL RESIDENTIAL STREET SECTION



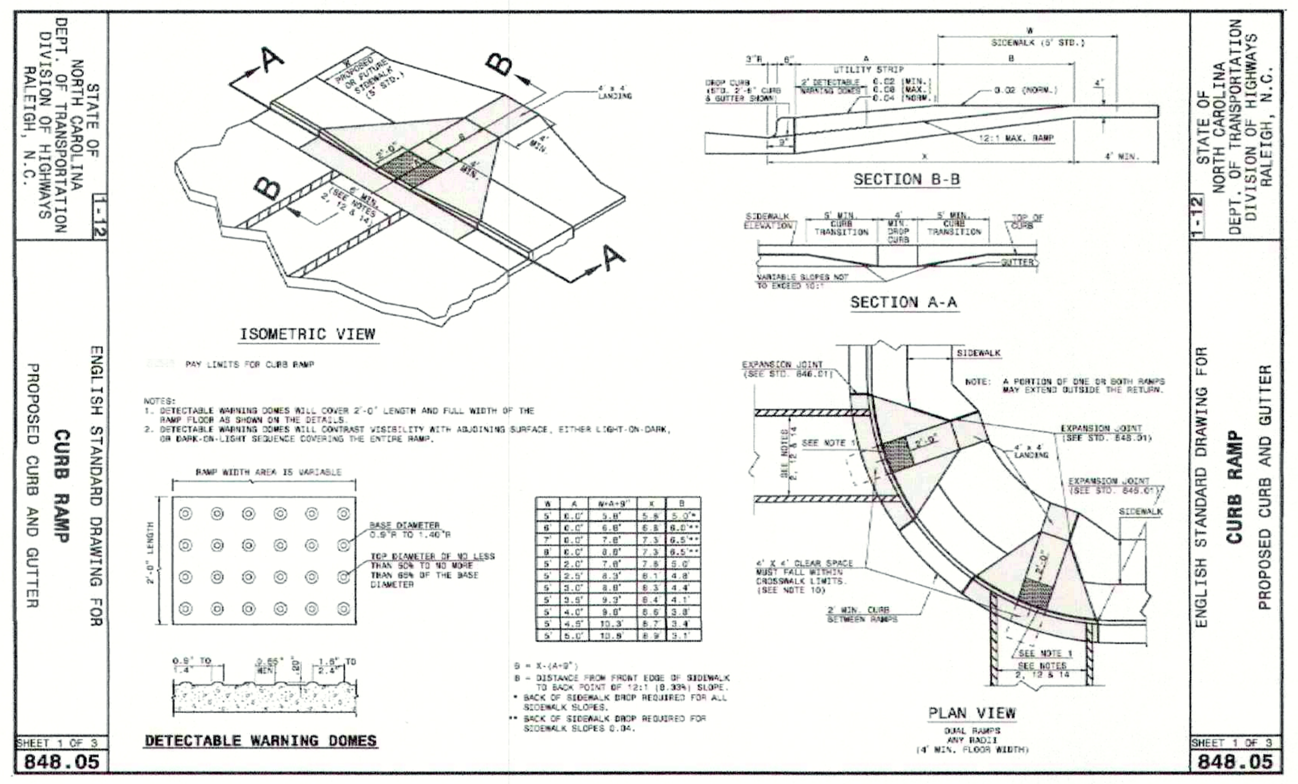
NOTES:
1. SIDEWALK SHALL BE PROVIDED ON BOTH SIDES OF THE STREET.
2. SEE SECTION II. B. FOR ADDITIONAL DESIGN CRITERIA.
3. 2'-0" VALLEY GUTTER MAY BE SUBSTITUTED FOR 2'-6" CURB AND GUTTER.

KEY
Ⓡ 2'-6" STD. CURB AND GUTTER
Ⓢ 4" CONCRETE SIDEWALK

NOT TO SCALE

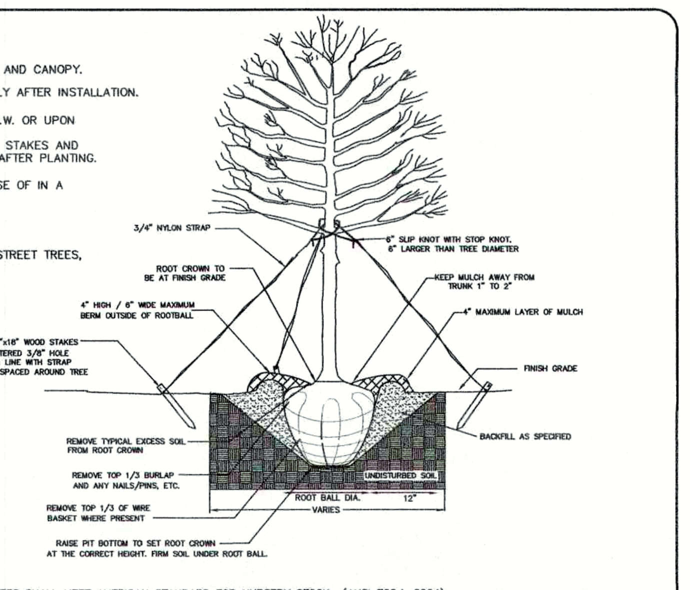
TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — RESIDENTIAL LOCAL STREET NO ON STREET PARKING TYPICAL SECION — STD. NO. 200.3

14 NCDOT RAMP DETAIL



10 TYPICAL TREE PLANTING DETAIL

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. STAKE ACCORDING TO CONSTRUCTION PLAN. STAKES AND STRAPPING ARE TO BE REMOVED ONE YEAR AFTER PLANTING.
4. REMOVE EXCESS SOIL FROM SITE AND DISPOSE OF IN A LEGAL MANNER.
5. RESEED UNMULCHED, DISTURBED AREAS.
6 MULTI-STEM TREES ARE NOT ALLOWED FOR STREET TREES, AND DISCOURAGED FOR ANY APPLICATION.



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

FOR EXAMPLE:	CALIPER	HEIGHT (RANGE)	MAX. HEIGHT	MIN. ROOT BALL DIA.	MIN. ROOT BALL DEPTH
	2"	12-14'	16'	24"	16"
	3"	14-16'	18'	32"	21"

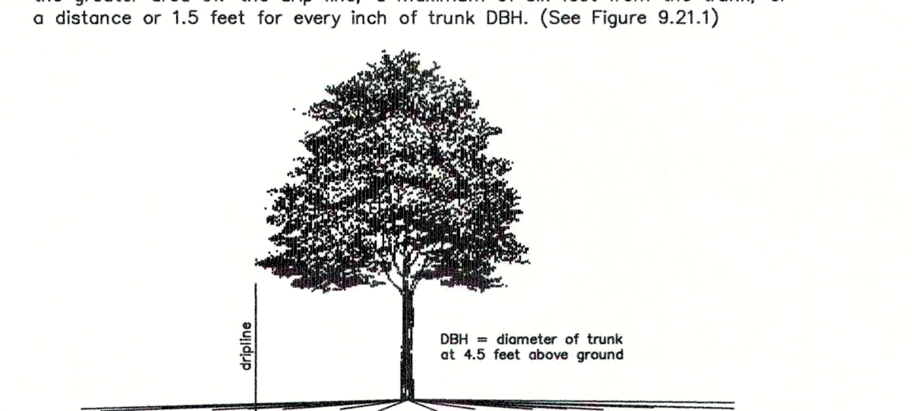
NOT TO SCALE

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — TREE PLANTING (FOR SINGLE AND MULTI-STEM TREES) — STD. NO. 600.1

6 CRITICAL ROOT / TREE PROTECTION ZONE DETAIL

MODIFIED PER ARBORIST REQUEST

The area containing the canopy and critical root zones of trees composing the existing tree canopy to be retained shall be known as the "Tree Protection Zone". The critical root zone and tree protection zone will be measured as a radial distance from the tree trunk and will be equivalent to the greater area of: the drip line; a maximum of six feet from the trunk; or a distance or 1.5 feet for every inch of trunk DBH. (See Figure 9.21.1)

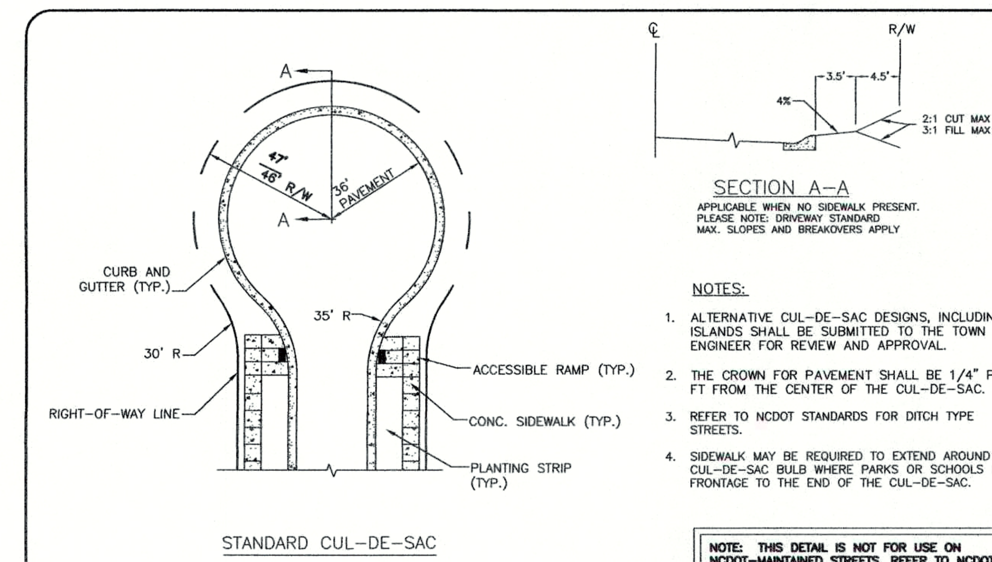


Roots extend out 2 to 3 times the dripline.

Critical Root Zone and Tree Protection Area
A radius equal to the greater of the following:
(1) 6 feet:
(2) The outer limits of the dripline; or
(3) 1.5 feet for each 1" of tree diameter (DBH)

If this tree's DBH is 20 inches then the critical root and tree protection zone is a 30 foot radius around the tree.

2 RESIDENTIAL LOCAL STREET CUL-DE-SAC



APPLICABLE WHEN NO SIDEWALK PRESENT. PLEASE NOTE: DRIVEWAY STANDARD MAX. SLOPES AND BREAKOVERS APPLY

NOTES:
1. ALTERNATIVE CUL-DE-SAC DESIGNS, INCLUDING ISLANDS SHALL BE SUBMITTED TO THE TOWN ENGINEER FOR REVIEW AND APPROVAL.
2. THE CROWN FOR PAVEMENT SHALL BE 1/4" PER FT FROM THE CENTER OF THE CUL-DE-SAC.
3. REFER TO NCDOT STANDARDS FOR DITCH TYPE STREETS.
4. SIDEWALK MAY BE REQUIRED TO EXTEND AROUND CUL-DE-SAC BULB WHERE PARKS OR SCHOOLS HAVE FRONTAGE TO THE END OF THE CUL-DE-SAC.

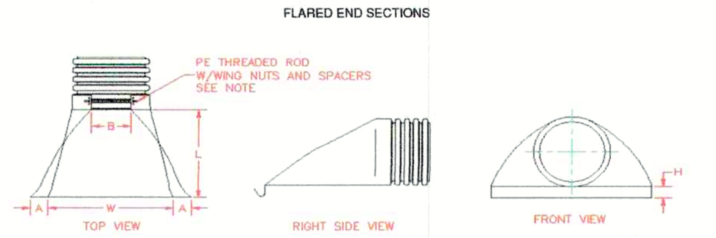
NOTE: THIS DETAIL IS NOT FOR USE ON NCDOT-MAINTAINED STREETS. REFER TO NCDOT SUBDIVISION ROADS MINIMUM CONSTRUCTION STANDARDS MANUAL.

NOT TO SCALE

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — RESIDENTIAL LOCAL STREET CUL-DE-SAC DETAIL — STD. NO. 280.1

17 HDPE FLARED END SECTION DETAIL

FLARED END SECTIONS



PART #	PIPE SIZE	A	B(MAX)	H	L	W
1015NP	10 in (250 mm)	3.8 in (95 mm)	10.0 in (254 mm)	6.5 in (165 mm)	28.0 in (711 mm)	34.5 in (876 mm)
1215NP	12 & 15 (300 & 375mm)	6.5 in (165 mm)	10.0 in (254 mm)	6.5 in (165 mm)	25.0 in (635 mm)	29.0 in (737 mm)
1810NP	18 in (450 mm)	7.5 in (191 mm)	15.0 in (381 mm)	6.5 in (165 mm)	32.0 in (813 mm)	35.0 in (889 mm)
2410NP	24 in (600 mm)	7.5 in (191 mm)	18.0 in (457 mm)	6.5 in (165 mm)	36.0 in (914 mm)	45.0 in (1143 mm)
3015NP	30 in (750 mm)	7.5 in (191 mm)	12.0 in (305 mm)	8.6 in (218 mm)	58.0 in (1473 mm)	63.0 in (1600 mm)
3615NP	36 in (900 mm)	7.5 in (191 mm)	25.0 in (635 mm)	8.6 in (218 mm)	58.0 in (1473 mm)	63.0 in (1600 mm)

NOTE:
FLARED END SECTION TO BE ADS OR EQUAL.

NOTE: ALL DIMENSIONS ARE NOMINAL

ADS — DRAWING # 6070; DRAWN BY JCB 01.17.07; APPROVED BY JCB 06.28.07; REVISIONS TJR 6/7/2016

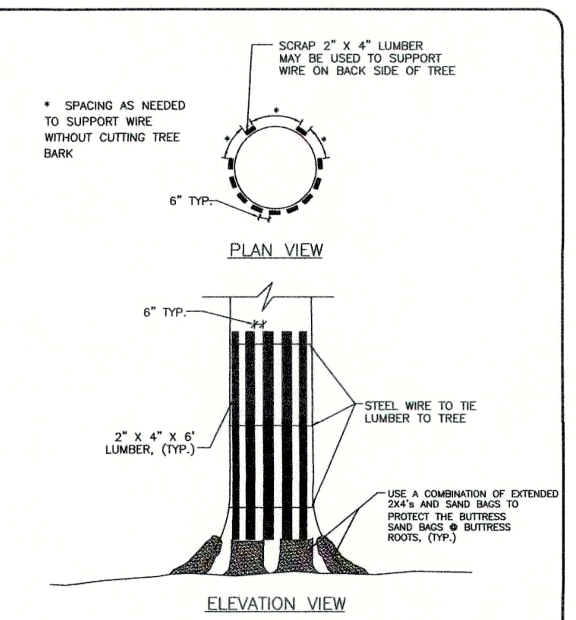
15 STREET LIGHT DETAIL

UNION POWER COOPERATIVE

COLONIAL LANTERN LED

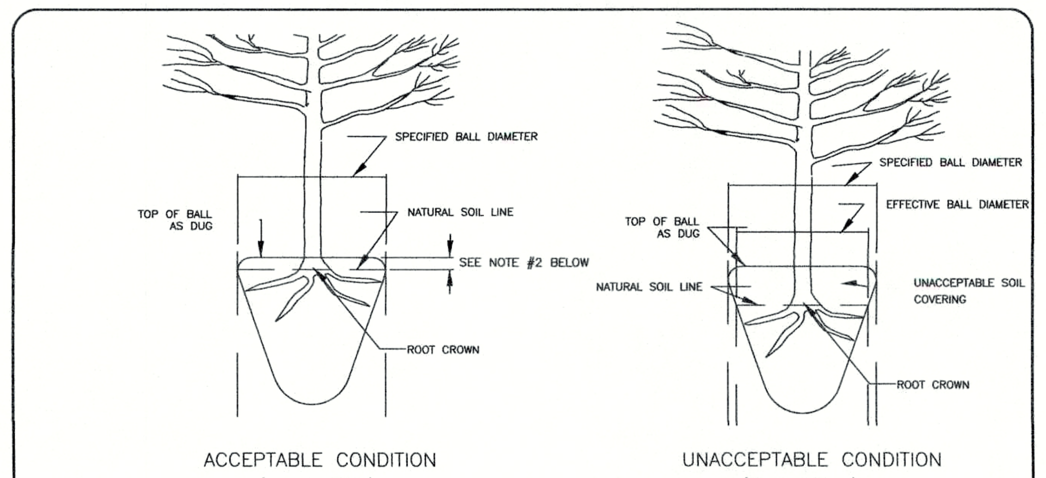
11 TEMPORARY TREE PROTECTION DETAIL

NOTES:
1. THIS TREE BUMPER DETAIL SHALL BE USED WHEN WORKING WITHIN 10' OF AN EXISTING TREE TO BE PROTECTED.
2. ALL TREES SHALL BE SAVED UNLESS NOTED OTHERWISE ON THE PLANS OR DIRECTED BY THE ENGINEER.
3. LUMBER, WIRE, ANDSANDBAGS MAY BE REUSED AT OTHER TREES.
4. THE INTENT OF THIS DETAILIS TO PROTECT EXISTING TREES FROM DAMAGEDURING CONSTRUCTION ESPECIALLY FROM BACKHOE ARM SWING. AN ALTERNATE APPROACH MAYBE USED IF APPROVED IN WRITINGBY THE ENGINEER AFTER CONSULTATION WITH THE ARBORIST OR HIS DULY AUTHORIZED REPRESENTATIVE.



TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — TEMPORARY TREE PROTECTION DETAIL — STD. NO. 617.1

7 ROOT FLARE DEPTHS

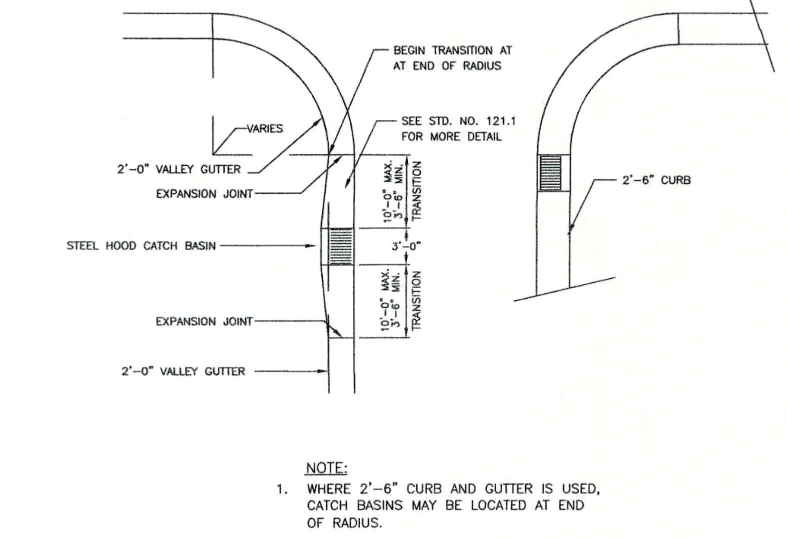


NOTES:
1. NO TREES ARE TO BE PLANTED UNTIL THE ARBORIST HAS INSPECTED AND APPROVED EACH TREE TO BE PLANTED.
2. THE ROOT CROWN SHOULD BE VISIBLE AND 2" ABOVE GRADE WHEN PLANTED. NO MORE THAN 1/3 OF THE ROOT BALL BALL (BELOW THE ROOT CROWN) SHOULD BE ABOVE GRADE. TWO INCHES (2") ABOVE GRADE IS RECOMMENDED AS BEST PLANTING HEIGHT.

NOTE:
A ROOT FLARE EXCAVATION FOR ALL TREES SPECIFIED WILL BE DONE BY THE 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 ARBORIST DETERMINES THAT THERE IS EXCESSIVE SOIL OVER THE ROOT CROWN, THESE TREES WILL BE REJECTED.

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — ROOT FLARE DEPTHS (TREE ROOT BALL CONDITION ON TREES FROM SUPPLIERS) — STD. NO. 614.1

3 CATCH BASIN PLACEMENT AT INTERSECTION

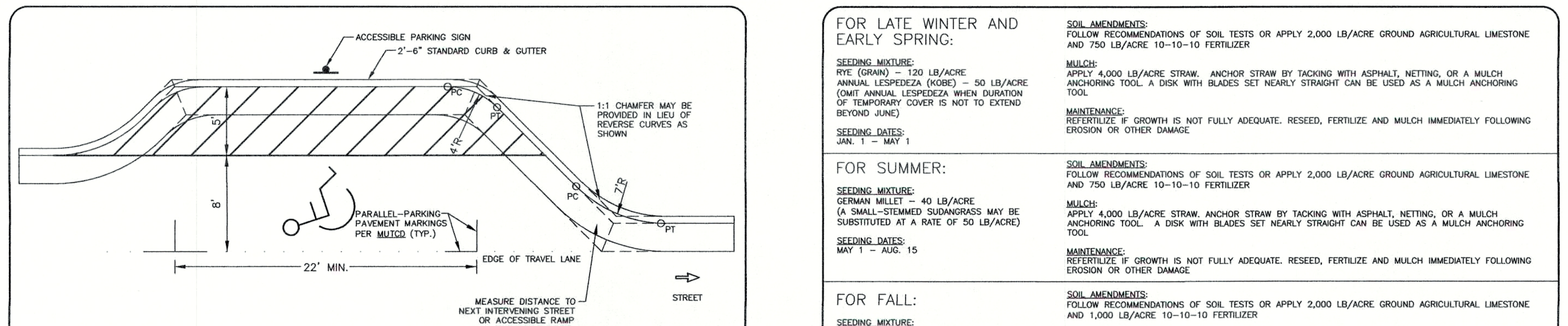


NOTE:
1. WHERE 2'-6" CURB AND GUTTER IS USED, CATCH BASINS MAY BE LOCATED AT END OF RADIUS.
2. RADIUS AT INTERSECTION MAY VARY.

NOT TO SCALE

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — CATCH BASIN PLACEMENT AT INTERSECTIONS — STD. NO. 122.1

16 ACCESSIBLE PARKING DETAIL



NOTES:
1. REVERSE CURVES/CHAMFERS NOT NECESSARY IF ADEQUATE DRAINAGE CAN BE PROVIDED THAT WILL ENSURE THAT SEDIMENT, WATER, DEBRIS, ETC., DOES NOT COLLECT IN 90-DEGREE CORNERS.
2. POSITIVE DRAINAGE SHALL BE PROVIDED EITHER BY INSTALLATION OF APPROPRIATE RAINAGE STRUCTURES OR SLOPE PARKING AREA TO STREET FLOW LINE. SLOPING PARKING AREA TO STREET FLOW LINE ONLT PERMITTED IF ROAD GRADE IS GREATER THAN 2%.

12 TEMPORARY SEEDING SCHEDULE

FOR LATE WINTER AND EARLY SPRING:

SEEDING MIXTURE:
RYE (GRAIN) – 120 LB/ACRE
ANNUAL LESPEDEZA (KOBE) – 50 LB/ACRE
(OMIT 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

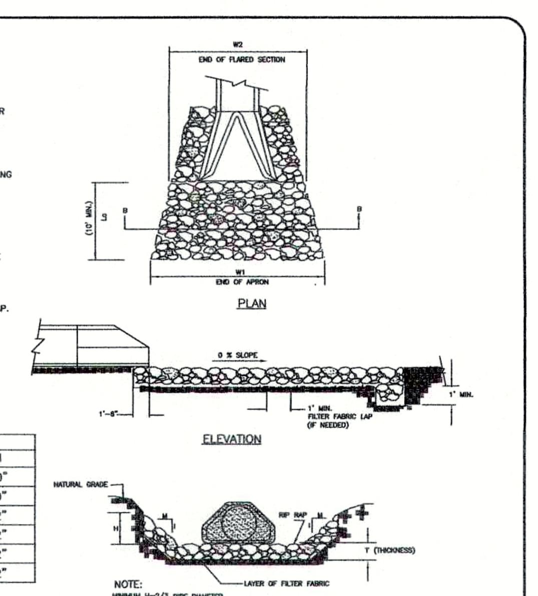
MAINTENANCE:
REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50 LB/ACRE OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/ACRE KOBE LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

FOR ADDITIONAL INFORMATION, REFER TO NCDEQ 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.

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — TEMPORARY SEEDING SCHEDULE — STD. NO. 521.1

8 RIPRAP APRON AT PIPE OUTFALLS

NOTES:
1. CLASS OR MEDIAN SIZE OF RIPRAP AND LENGTH, WIDTH AND DEPTH OF APRON TO BE DESIGNED BY THE ENGINEER.
2. REFER TO THE WAXHAW STORM WATER DESIGN MANUAL FOR RIPRAP APRON DESIGN STANDARDS.
3. RIPRAP SHOULD EXTEND UP BOTH SIDES OF THE APRON AND AROUND THE END OF THE PIPE OR CULVERT AT THE DISCHARGE OUTLET AT A MAXIMUM SLOPE OF 2:1 AND A HEIGHT NOT LESS THAN TWO THIRDS THE PIPE DIAMETER OR CULVERT HEIGHT.
4. THERE SHALL BE NO OVERFLOW FROM THE END OF THE APRON TO THE SURFACE OF THE RECEIVING CHANNEL. THE AREA TO BE PAVED OR RIPRAPPED SHALL BE UNDERCUT SO THAT THE INVERT OF THE APRON SHALL BE AT THE SAME GRADE (FLUSH) WITH THE SURFACE OF THE RECEIVING CHANNEL. THE APRON SHALL HAVE A CUTOFF OR TOE WALL AT THE DOWNSTREAM END.
5. THE WIDTH OF THE END OF THE APRON SHALL BE EQUAL TO THE BOTTOM WIDTH OF THE RECEIVING CHANNEL. MAXIMUM TAPER TO RECEIVING CHANNEL 5:1.
6. ALL SUBGRADE FOR STRUCTURE TO BE COMPACTED TO 95% OR GREATER.
7. THE PLACING OF FILL, EITHER LOOSE OR COMPACTED IN THE RECEIVING CHANNEL SHALL NOT BE ALLOWED.
8. NO BENDS OR CURVES IN THE HORIZONTAL ALIGNMENT OF THE APRON WILL BE PERMITTED.
9. FILTER FABRIC SHALL BE INSTALLED ON COMPACTED SUBGRADE PRIOR TO PLACEMENT OF RIP RAP.
10. ANY DISTURBED AREA FROM END OF APRON TO RECEIVING CHANNEL MUST BE STABILIZED.
USE USDA NOMOGRAPH FROM NC SEDIMENT AND EROSION CONTROL MANUAL OR CHARLOTTE MECKLENBURG STORM WATER DESIGN MANUAL FOR DESIGN DATA.



RIP RAP SUMMARY CHART

	OUTLET	La	W1	W2	*T	H
	FES #219	15'	8.5'	8.5'	12" (CLASS 1)	20"
	FES #221	10'	6'	6'	9" (CLASS 1)	10"
	FES #222**	10'	6'	6'	12" (CLASS 1)	12"
	FES #223**	10'	6'	6'	12" (CLASS 1)	12"
***	HDPE FES #224	10'	6'	6'	12" (CLASS 1)	12"
***	HDPE FES #225	15'	6'	6'	12" (CLASS 1)	12"

* d50 (see fig 8.06 a&b "NC SEDIMENT AND EROSION CONTROL MANUAL"
** FOR FES #222 & #223 MIN. APRON LENGTH = 10' OR DISTURBED LENGTH, WHICHEVER IS GREATER.
*** HDPE FLARED END SECTIONS TO BE ADS OR EQUAL

dmax = 1.5 x d50
T = 1.5 X dmax.
T(min.)=10"

NOTE: MINIMUM H=2/3 PIPE DIAMETER

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — RIPRAP APRON AT PIPE OUTFALLS OTHER THAN AT SWIM — STD. NO. 306.1

4 TREE PLANTING NOTES

PLANTINGS IN STREET RIGHT-OF-WAY

GENERAL NOTES
1. TREE GRATES AND ASSOCIATED IRRIGATION SYSTEMS ARE REQUIRED AT VARIOUS LOCATIONS IN THE UPTOWN AREAS TO COMPLY WITH THE UPTOWN STREETSCAPE GUIDELINES AND OTHER ZONING REQUIREMENTS. ALL OTHER INSTALLATIONS OF IRRIGATION SYSTEMS WITHIN THE RIGHT-OF-WAY OF TOWN OR STATE MAINTAINED STREETS REQUIRE AN ENCROACHMENT AGREEMENT EXECUTED THROUGH TOWN OR NCDOT. THE TOWN'S ENCROACHMENT AGREEMENT REVIEW/APPROVAL PROCESS MAY INCLUDE ADDITIONAL REQUIREMENTS. CONTACT TOWNS DEVELOPMENT SERVICES FOR ADDITIONAL INFORMATION REGARDING COST, SUBMITTAL, AND LIABILITY INSURANCE COVERAGE REQUIREMENTS.
2. AN INSPECTION SCHEDULE IS NEEDED FOR TREES THAT WILL BE PLANTED IN THE STREET RIGHT OF WAY DUE TO ZONING OR OTHER REQUIREMENTS. LANDSCAPE INSPECTION INCLUDE THE FOLLOWING:
   - SUBDRAINAGE INSPECTION
   - TREE PIT/WELL OR PLANTING STRIP INSPECTION
   - SOIL MIX APPROVALS/INSPECTIONS
   - TREE APPROVALS/INSPECTIONS – PRIOR TO PURCHASING THE TREES, TO BE MADE BY THE CITY ARBORIST. THIS MAY INCLUDE PHOTO APPROVAL OR PARTICIPATION IN TAGGING THE TREES.
   - TREE PLANTING INSPECTION
   - IRRIGATION INSPECTION
   - FINAL WALK THROUGH

ALL OF THE ABOVE INSPECTIONS WILL BE PERFORMED BY THE ARBORIST EXCEPT FOR THE TREE APPROVALS AS NOTED.

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — TREE PLANTING-NOTES (DRAINAGE AND INSPECTION) — STD. NO. 615.1

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

SITE DETAILS

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 3/26/19: Revised per review comments; and updated Design Firm information.
#3 - 6/27/19: Revised Detail 9 per review comments.

Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,585 ENGINEER WAYNE M. HARRIS 6/27/19

Scale: NTS

Sheet No. 12 of 24

S:_MESA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CDs\ENGINEERING\043-18-002 Shts12-13 Details.dwg

1 SPECIAL EROSION CONTROL REQUIREMENTS & NOTES

STD. & SPEC. #	TITLE	SPECIAL REQUIREMENTS & NOTES
6.11	PERMANENT SEEDING	–
6.17	ROLLED EROSION CONTROL PRODUCTS	–
6.51	HARDWARE CLOTH & GRAVEL INLET PROTECTION	–
6.60	TEMPORARY SEDIMENT TRAP	WEIR TOP WIDTH 10' MIN., BOTTOM 7' MIN.
6.61	SEDIMENT BASIN	FLASH BOARD RISER NOT PERMITTED
6.64	SKIMMER SEDIMENT BASIN	1ST BAFFLE: RIP RAP & WASHED STONE BERM 2ND BAFFLE: STANDARD BAFFLE 3RD BAFFLE: HARDWARE CLOTH SURROUNDING THE SKIMMER
NCDOT 1606.1	SPECIAL SEDIMENT CONTROL FENCE	–

THE STANDARDS & SPECIFICATIONS SHOWN ARE FROM THE "NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL" (NCESCPDM) PREPARED BY NC DEPT. OF ENVIRONMENT AND NATURAL RESOURCES (NCDENR); ALSO REFERENCE NCDOT "ROADWAY STANDARD DRAWINGS," LATEST EDITION.

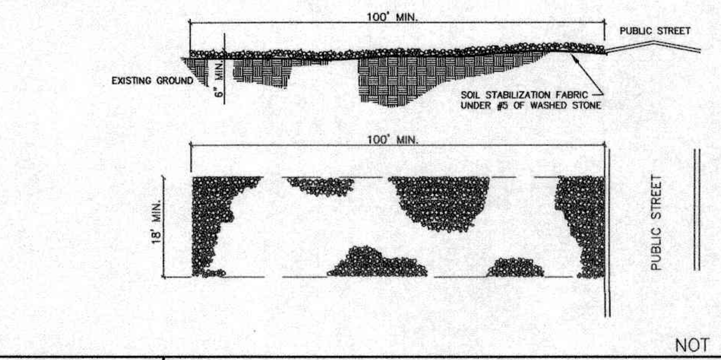
THE TOWN OF WAXHAW HAS ADOPTED THE SPECIFIC STANDARDS & SPECIFICATIONS SHOWN ON THIS DETAIL AS MANDATORY MINIMUM DESIGN STANDARDS & SPECIFICATIONS.

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — SPECIAL EROSION CONTROL REQUIREMENTS & NOTES — STD. NO. 500.1 REV. 1

2 STABILIZED CONSTRUCTION ENTRANCE

NOTES:

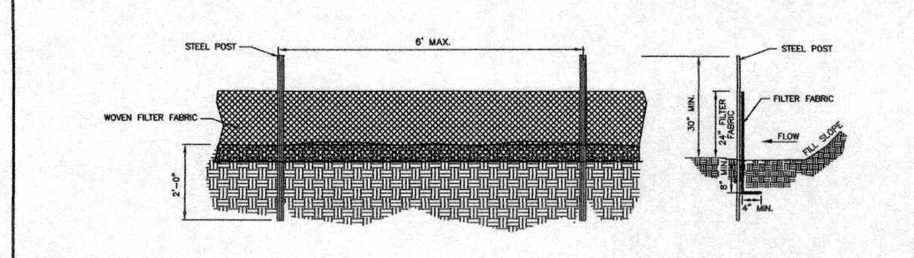
1. A STABILIZED ENTRANCE PAD OF #5 WASHED STONE AND RAILROAD BALLAST SHALL BE LOCATED WHERE TRAFFIC WILL ENTER OR LEAVE THE CONSTRUCTION SITE ONTO A PUBLIC STREET.
2. FILTER FABRIC OR COMPACTED CRUSHER RUN STONE SHALL BE USED AS A BASE FOR THE CONSTRUCTION ENTRANCE.
3. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC STREETS OR EXISTING PAVEMENT. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS WARRANT AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
4. ANY SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC STREETS MUST BE REMOVED IMMEDIATELY. ANY AGGREGATE TRACKED INTO THE ROADWAY MUST BE SWEPT BACK ONSITE ON A NIGHTLY BASIS.
5. WHEN APPROPRIATE, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTERING A PUBLIC STREET. WHEN WASHING IS REQUIRED, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN SEE STD. NO. 515.1.
6. THE TOWN MAY REQUIRE A STANDARD COMMERCIAL DRIVEWAY (STD. 108.1 & 109.1) TO ACCESS THE CONSTRUCTION SITE IF THE DRIVEWAY IS ON A THOROUGHFARE.



NOT TO SCALE

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — STABILIZED CONSTRUCTION ENTRANCE — STD. NO. 514.1

3 TEMPORARY SILT FENCE



GENERAL NOTES:

1. WOVEN FILTER FABRIC BE USED WHERE SILT FENCE IS TO REMAIN FOR A PERIOD OF MORE THAN 30 DAYS.
2. STEEL POSTS SHALL BE 5'-0" IN HEIGHT AND BE OF THE SELF-FASTENER ANGLE STEEL TYPE.
3. TURN SILT FENCE UP SLOPE AT ENDS.
4. ORANGE SAFETY FENCE IS REQUIRED AT BACK OF SILT FENCE WHEN GRADING IS ADJACENT TO SWIM BUFFERS, STREAMS OR WETLANDS (REFER TO SWIM BUFFER GUIDELINES). THE COLOR ORANGE IS RESERVED FOR VISUAL IDENTIFICATION OF ENVIRONMENTALLY SENSITIVE AREAS.
5. DRAINAGE AREA CAN NOT BE GREATER THAN 1/4 ACRE PER 100 FT OF FENCE.
6. SLOPE LENGTHS CAN NOT EXCEED CRITERIA SHOWN IN TABLE 6.62A NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.
7. DO NOT INSTALL SEDIMENT FENCE ACROSS STREAMS, DITCHES, WATERWAYS OR OTHER AREAS OF CONCENTRATED FLOW.

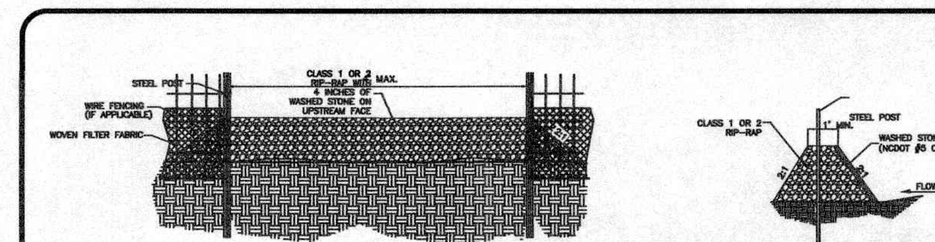
MAINTENANCE NOTES:

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 DECOMPOSE 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 APPROX. 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

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — TEMPORARY SILT FENCE — STD. NO. 507.1

4 SILT FENCE OUTLET



GENERAL NOTES:

1. SEDIMENT FILTER OUTLET SHALL BE 16 INCHES HIGH BUT NO TALLER THAN 18 INCHES.
2. CLASS 1 OR 2 RIP-RAP SHALL BE USED AND COVERED WITH 4 INCHES OF NCDOT #5 OR #57 WASHED STONE ON THE UPSLOPE SIDE.
3. POSTS SHALL BE NO MORE THAN 4 FEET APART.
4. SITE OUTLETS AT ANY POINT SMALL CONCENTRATED FLOWS ARE ANTICIPATED AND AT THE DIRECTION OF THE INSPECTOR.
5. ONE ACRE MAXIMUM DRAINAGE AREA PER OUTLET.

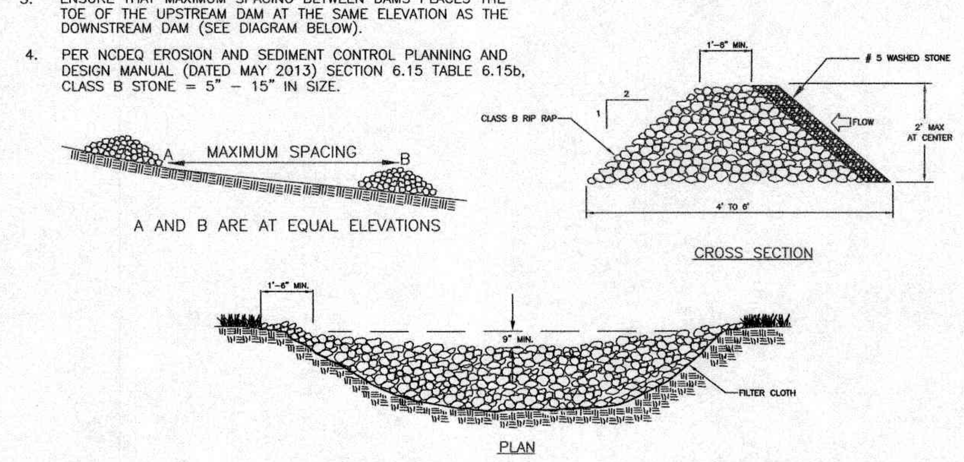
MAINTENANCE NOTES:

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.

5 TEMPORARY ROCK CHECK DAM

GENERAL NOTES:

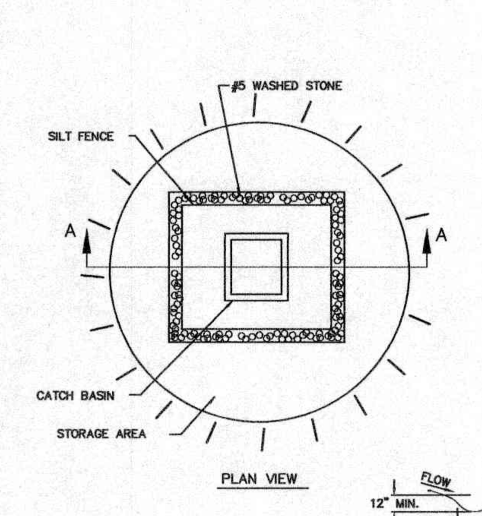
1. RIPRAP SIZE TO BE DESIGNED BY ENGINEER.
2. CHECK DAMS MAY BE USED IN SLOPING DITCHES OR CHANNELS TO SLOW VELOCITY OR TO CREATE SEDIMENT TRAPS.
3. ENSURE THAT MAXIMUM SPACING BETWEEN DAMS PLACES THE TOE OF THE UPSTREAM DAM AT THE SAME ELEVATION AS THE DOWNSTREAM DAM (SEE DIAGRAM BELOW).
4. PER NCDEQ EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (DATED MAY 2013) SECTION 6.15 TABLE 6.15b, CLASS B STONE = 5" – 15" IN SIZE.



NOT TO SCALE

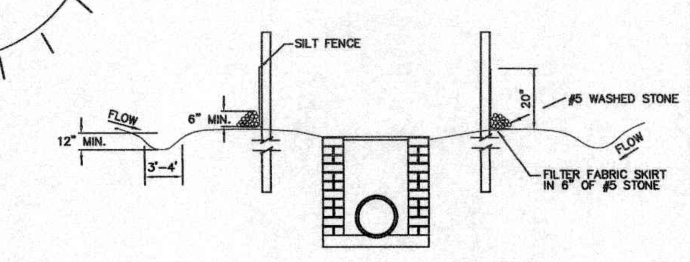
TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — TEMPORARY ROCK CHECK DAM — STD. NO. 513.1

6 SILT FENCE INLET SEDIMENT TRAP



GENERAL NOTES:

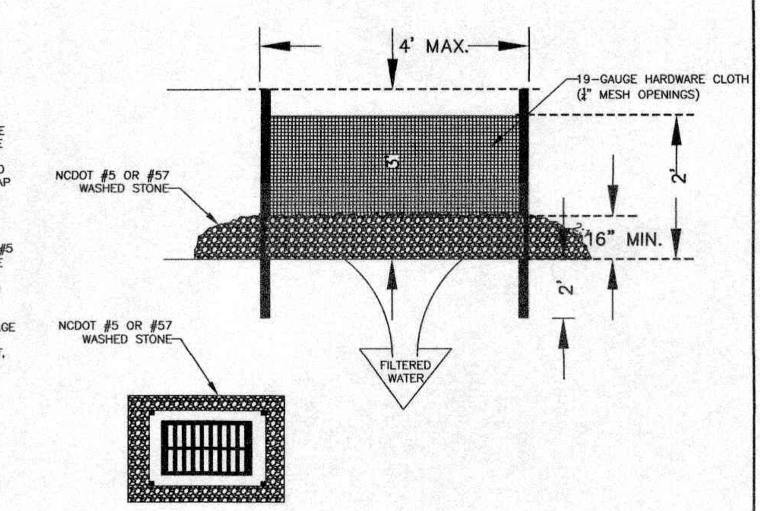
1. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP.
2. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
3. THE STRUCTURE SHALL BE INSPECTED AFTER EACH STORM EVENT AND REPAIRS MADE AS NECESSARY.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.
5. THE SEDIMENT TRAP SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE BASIN HAS BEEN PROPERLY STABILIZED.
6. SILT FENCE INSTALLATION SHALL BE IN ACCORDANCE WITH DETAIL #3.
7. IF HARDWARE CLOTH IS USED, THEN NEED TO INCREASE WASHED STONE TO MINIMUM 20".



7 TEMPORARY INLET PROTECTION

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 2-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 16 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.



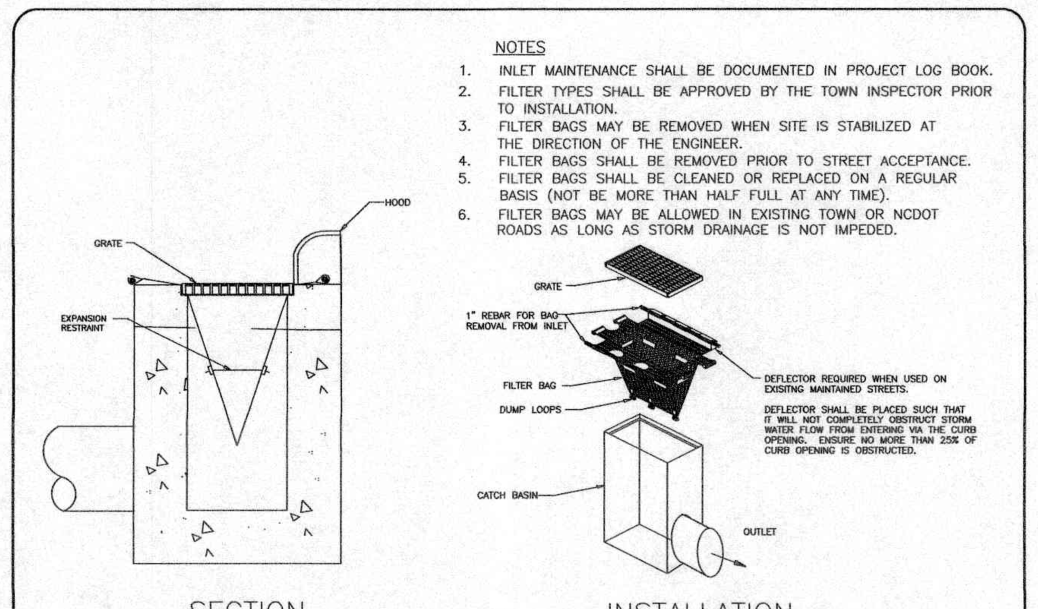
NOT TO SCALE

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — HARDWARE CLOTH AND GRAVEL INLET PROTECTION — STD. NO. 512.1

8 CATCH BASIN INLET PROTECTION

NOTES

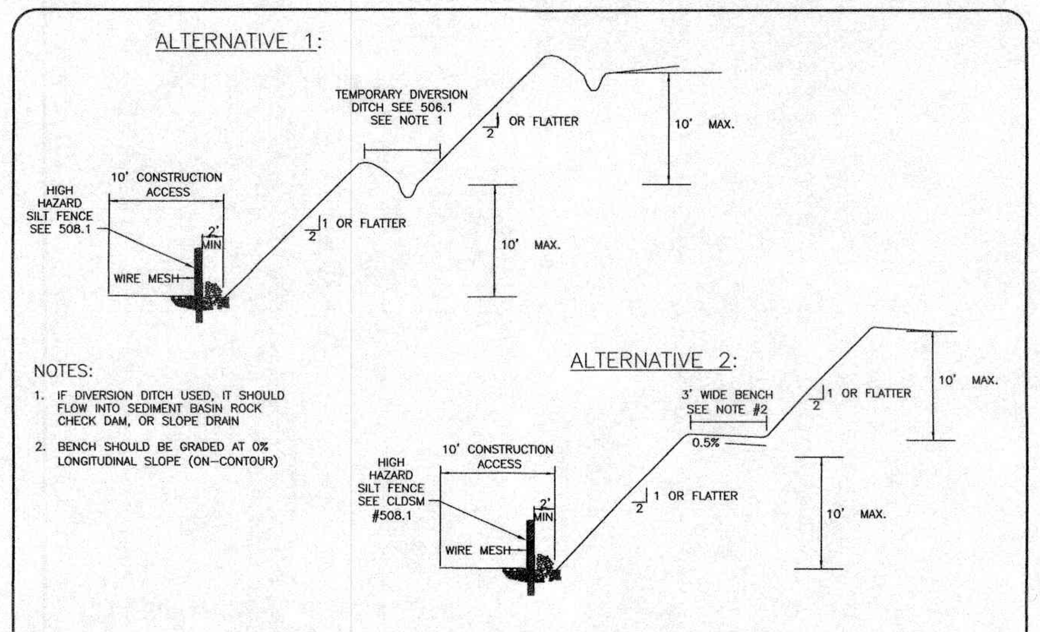
1. INLET MAINTENANCE SHALL BE DOCUMENTED IN PROJECT LOG BOOK.
2. FILTER TYPES SHALL BE APPROVED BY THE TOWN INSPECTOR PRIOR TO INSTALLATION.
3. FILTER BAGS MAY BE REMOVED WHEN SITE IS STABILIZED AT THE DIRECTION OF THE ENGINEER.
4. FILTER BAGS SHALL BE REMOVED PRIOR TO STREET ACCEPTANCE.
5. FILTER BAGS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



NOT TO SCALE

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — CATCH BASIN INLET PROTECTION — STD. NO. 519.1

9 SLOPE STABILITY



NOTES:

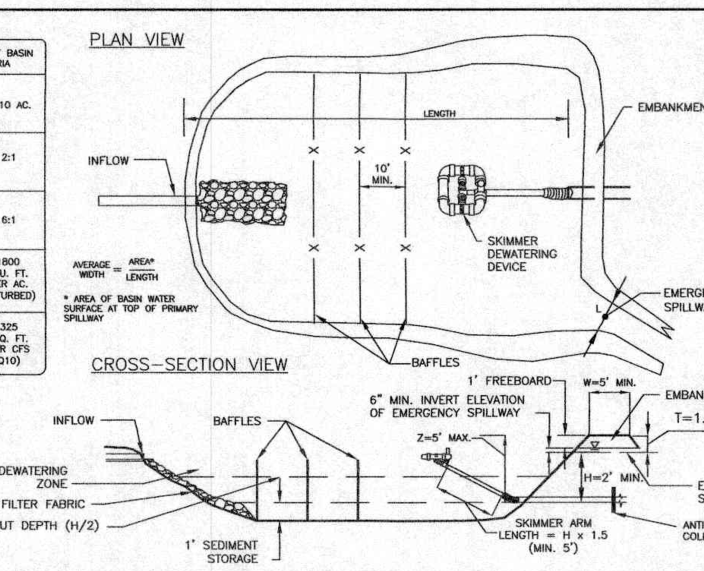
1. IF DIVERSION DITCH USED, IT SHOULD FLOW INTO SEDIMENT BASIN ROCK CHECK DAM, OR SLOPE DRAIN
2. BENCH SHOULD BE GRADED AT 0% LONGITUDINAL SLOPE (ON-CONTOUR)

NOT TO SCALE

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — SLOPE STABILITY — STD. NO. 520.1

10 SKIMMER SEDIMENT BASIN

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 Q10)



NOTES:

1. REFER TO NCESCPDM SECTION #6.64 FOR ADDITIONAL DESIGN SPECIFICATIONS REGARDING SKIMMER SEDIMENT BASINS.
2. REFER TO STD. #524.1 FOR BAFFLE SPACING AND INSTALLATION
3. SKIMMER INVERT ELEVATION = BASIN BOTTOM + 1' MIN.
4. H = SPILLWAY ELEVATION – SKIMMER INVERT ELEVATION

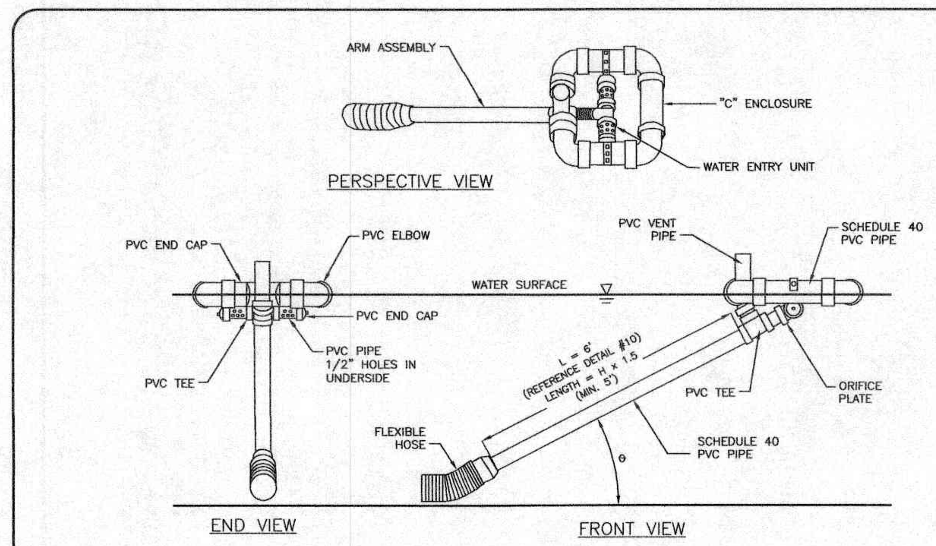
NOT TO SCALE

DATA BLOCK

BASIN	DRAINAGE AREA (ACRES)	DENUDED AREA (ACRES)	Q_{10}	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.) H/2	H (FT.)	Z (FT.)	L (FT.)	T (FT.)	W (FT.)	SKIMMER PIPE DIAMETER	SKIMMER ORIFICE DIAMETER
#1	2.86	2.86	9.05	5,148	7,548	2,940	3,200	1.5	3'	5.0'	10'	1.5'	5'	2"	1.4"

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — SKIMMER SEDIMENT BASIN — STD. NO. 502.1

11 SKIMMER



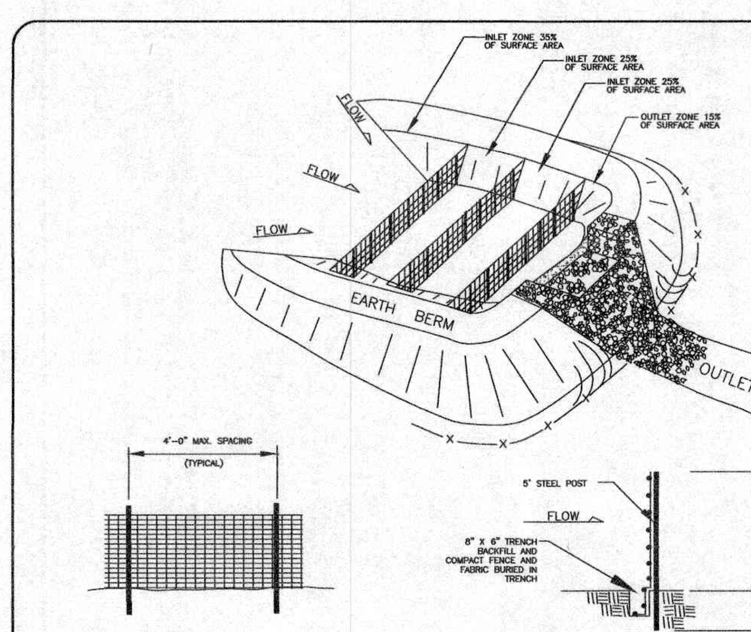
SCHEMATIC OF SKIMMER TAKEN FROM PENNSYLVANIA EROSION AND SEDIMENT POLLUTION CONTROL MANUAL, MARCH 2000.

"H" REFERS TO THE HEIGHT FROM INVERT OF FLEXIBLE HOSE ON SKIMMER TO THE INVERT OF THE PRIMARY SPILLWAY.

NOT TO SCALE

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — SKIMMER — STD. NO. 503.1

12 BAFFLE INSTALLATION



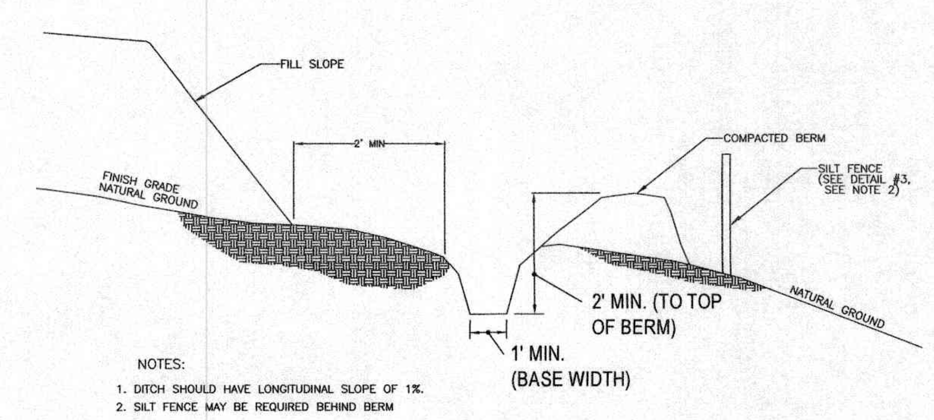
GENERAL NOTES:

1. DRIVE 5' STEEL POST AT LEAST 24" INTO SOLID GROUND.
2. USE STAPLES 1' APART HORIZONTALLY AND VERTICALLY TO ATTACH THE **POROUS MATERIAL** TO THE WIRE FENCE.
3. MINIMUM BAFFLE SPACING IS 10'.
4. THE FLOOR OF THE BASIN IN THE OUTLET ZONE AND BERMS SHOULD BE SEEDED IMMEDIATELY AFTER THE BASIN IS CONSTRUCTED.
5. REFER TO NCESCPDM SECTION #6.65 FOR ADDITIONAL SPECIFIATIONS.

NOT TO SCALE

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — BAFFLE INSTALLATION — STD. NO. 524.1

13 TEMPORARY DIVERSION / SILT DITCH



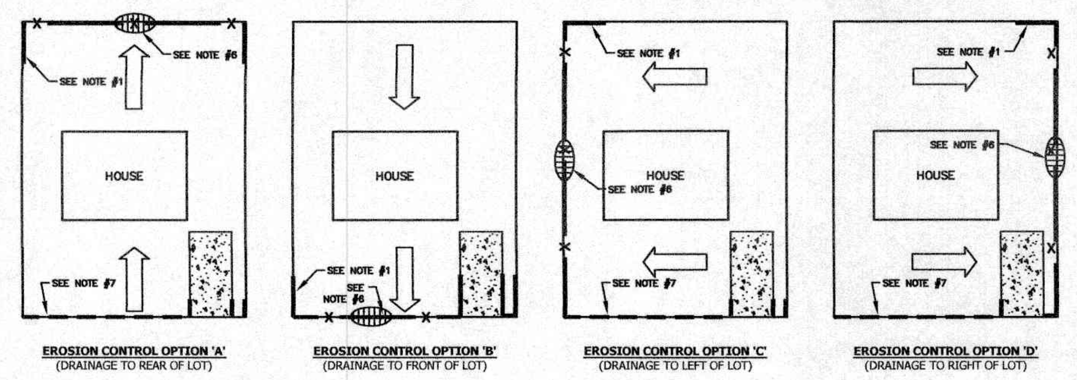
NOTES:

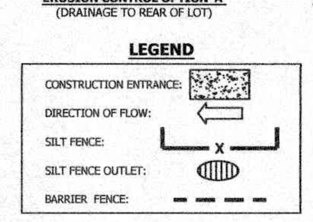
1. DITCH SHOULD HAVE LONGITUDINAL SLOPE OF 1%.
2. SILT FENCE MAY BE REQUIRED BEHIND BERM

NOT TO SCALE

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — TEMPORARY SILT DITCH — STD. NO. 506.1

14 TYP. INDIVIDUAL LOT EROSION CONTROL MEASURES

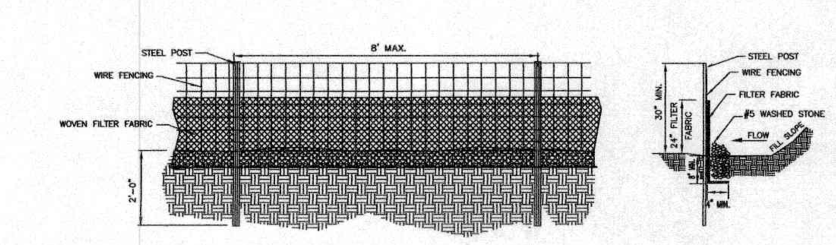




NOTES:

1. EXTEND SILT FENCE ALONG FRONT, SIDE AND/OR REAR PROPERTY LINES PARALLEL TO FLOW FOR A MINIMUM OF 8' OR AS FAR AS NECESSARY TO AVOID SEDIMENT LOSS AROUND ENDS OF FENCE.
2. WHEN ADJACENT LOTS ARE DISTURBED / UNDER CONSTRUCTION, SILT FENCE SHOULD BE CONNECTED TO SILT FENCE ON ADJOINING LOTS WHERE POSSIBLE TO PROVIDE A CONTINUOUS SILT BARRIER.
3. SEE EROSION CONTROL NOTES FOR INDIVIDUAL LOT CONSTRUCTION SEQUENCE.
4. SEE SHEET 4 FOR LOT GRADING.
5. CONSTRUCTION ENTRANCE MAY BE LOCATED ON EITHER SIDE OF LOT.
6. PROVIDE SILT FENCE OUTLET(S) IN LOW-LYING AREAS OF SILT FENCE (SEE DETAIL #3 & #4 THIS SHEET). OUTLET LOCATION(S) TO BE DETERMINED PER ACTUAL SITE CONDITIONS.
7. PROVIDE BARRIER FENCE (SILT FENCE, ORANGE TREE PROTECTION FENCE, ETC.) ACROSS LOT FRONTAGE TO RESTRICT VEHICULAR ACCESS TO THE TEMPORARY CONSTRUCTION ENTRANCE.

15 HIGH HAZARD TEMPORARY SILT FENCE



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 SWIM BUFFERS, STREAMS OR WETLANDS (REFER TO SWIM 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.

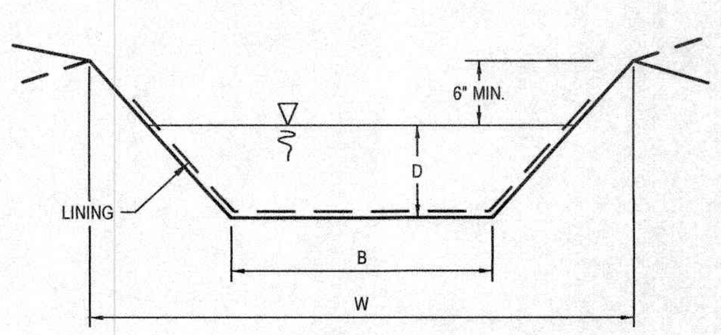
MAINTENANCE NOTES:

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 DECOMPOSE 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

TOWN OF WAXHAW LAND DEVELOPMENT STANDARDS — HIGH HAZARD TEMPORARY SILT FENCE — STD. NO. 508.1

16 TYPICAL DITCH SECTION



CHANNEL	Q_{10}	SLOPE	SS	D (ft)	W (ft)	B (ft)	V_{10}	LINING
1	17.6 cfs	4.7	3:1	0.6	9.6	3	6.07	NA GREEN SC 150 *
2A	1.31 cfs	4.6	3:1	0.3	5.8	1	3.18	NA GREEN S 150 *
2B	1.36 cfs	12.0	3:1	0.2	5.2	1	4.54	NA GREEN S 150 *
3	26.7 cfs	4.4	3:1	0.8	9.8	2	6.66	NA GREEN C 125 *

* OR EQUAL

S:_MESA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CDs\ENGINEERING\043-18-002 Shts12-13 Details.dwg

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

EROSION CONTROL DETAILS

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

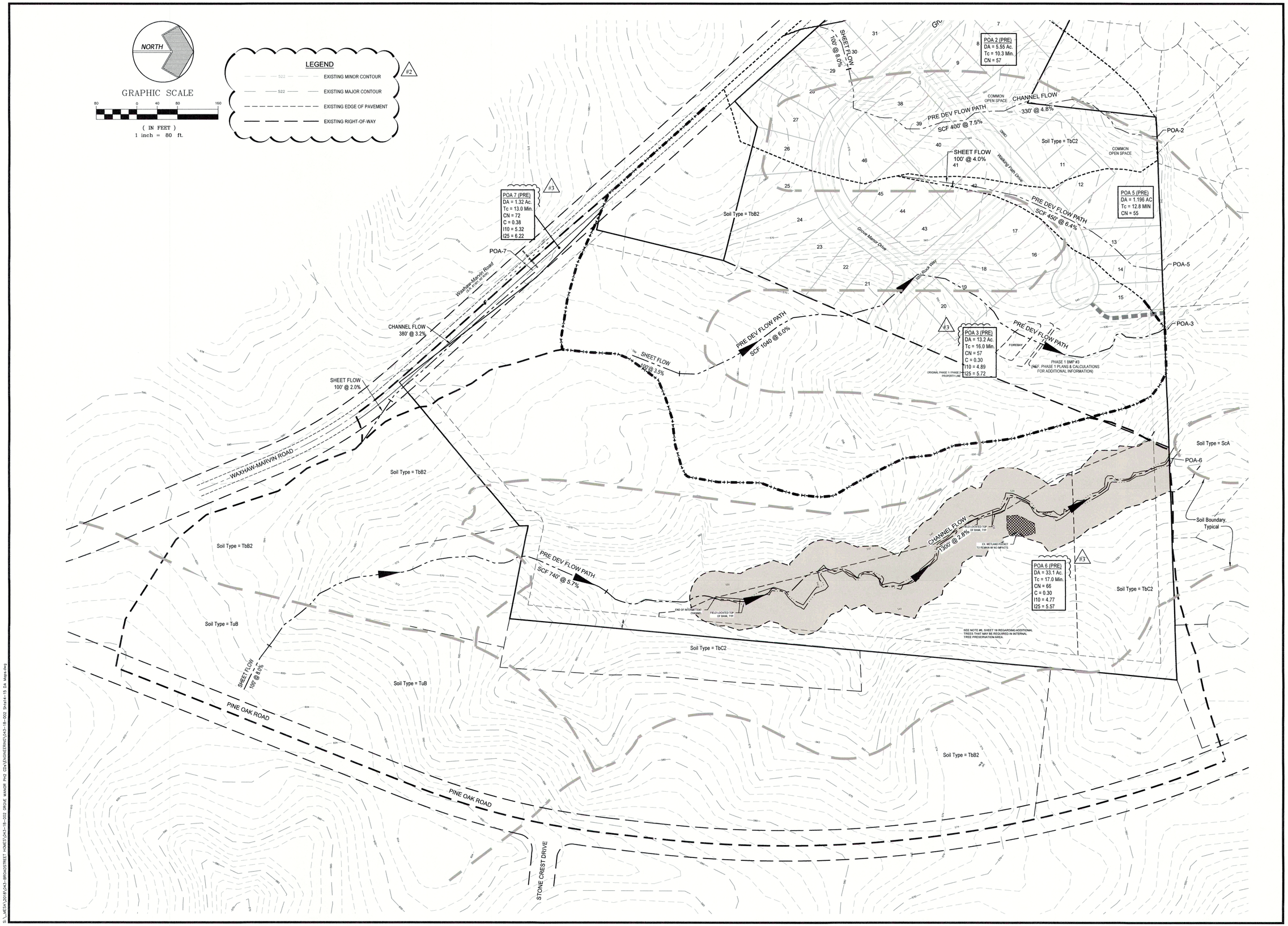
Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 3/26/19: Updated Design Firm information.

Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,585 ENGINEER WAYNE M. HARRIS

Scale:	NTS

Sheet No. 13 of 24



HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

PRE-DEVELOPMENT DRAINAGE AREA MAP

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

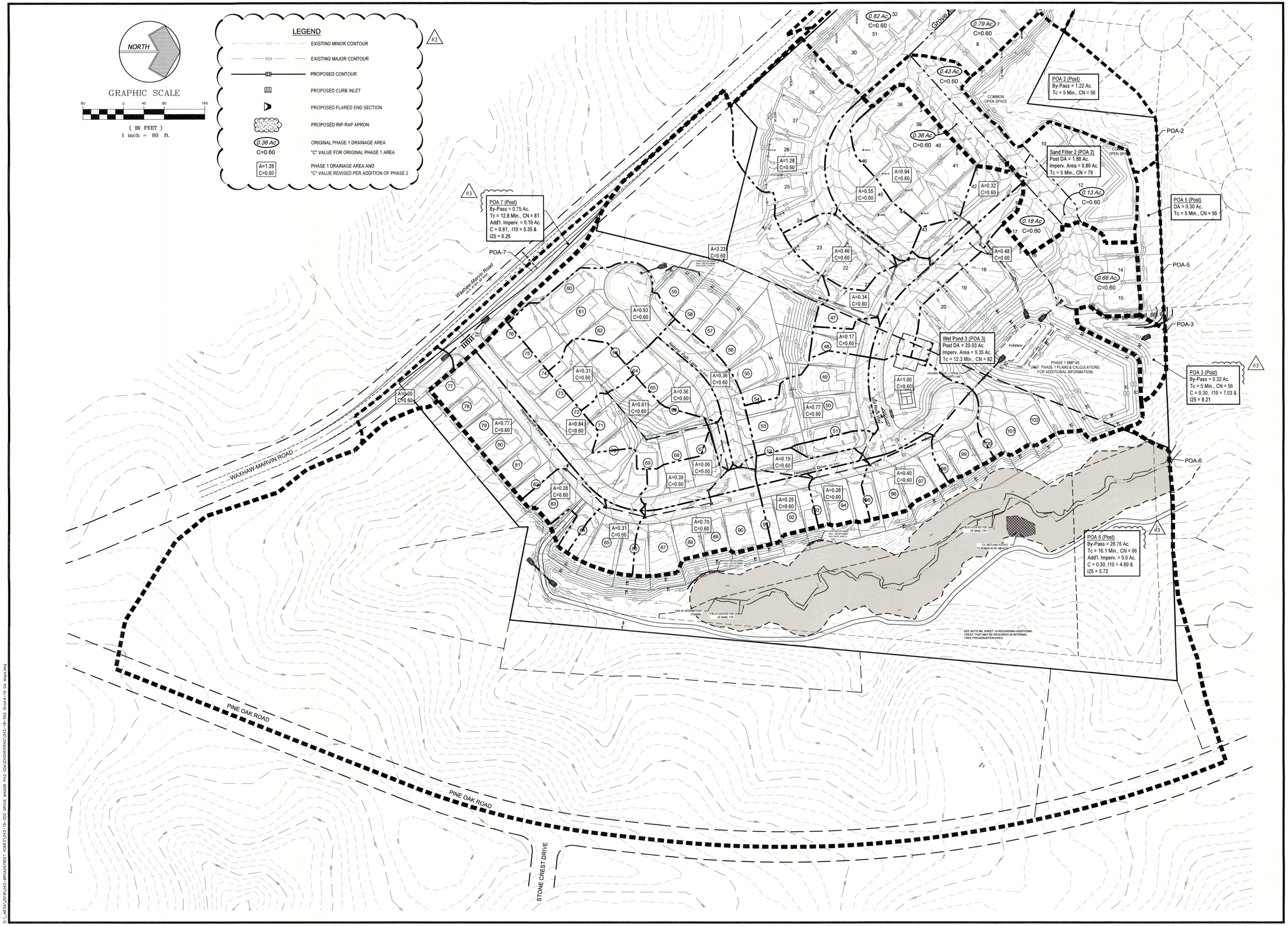
Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 3/26/19: Revised per review comments, and updated Design Firm information.
#3 - 6/27/19: Revised "Summary Box" for POA 3, 6 & 7 per review comments.

Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,585 ENGINEER WAYNE M. HARRIS 6/27/19

Scale: 1" = 80'

Sheet No. 14 of 24



HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

POST-DEVELOPMENT DRAINAGE AREA MAP

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 3/26/19: Revised per review comments, and updated Sheight Firm information.
#3 - 8/21/19: Revised per revisions to Sheets 4 and 14 revised "Summary Box" for POA's 5, 6 & 7 per review comments.

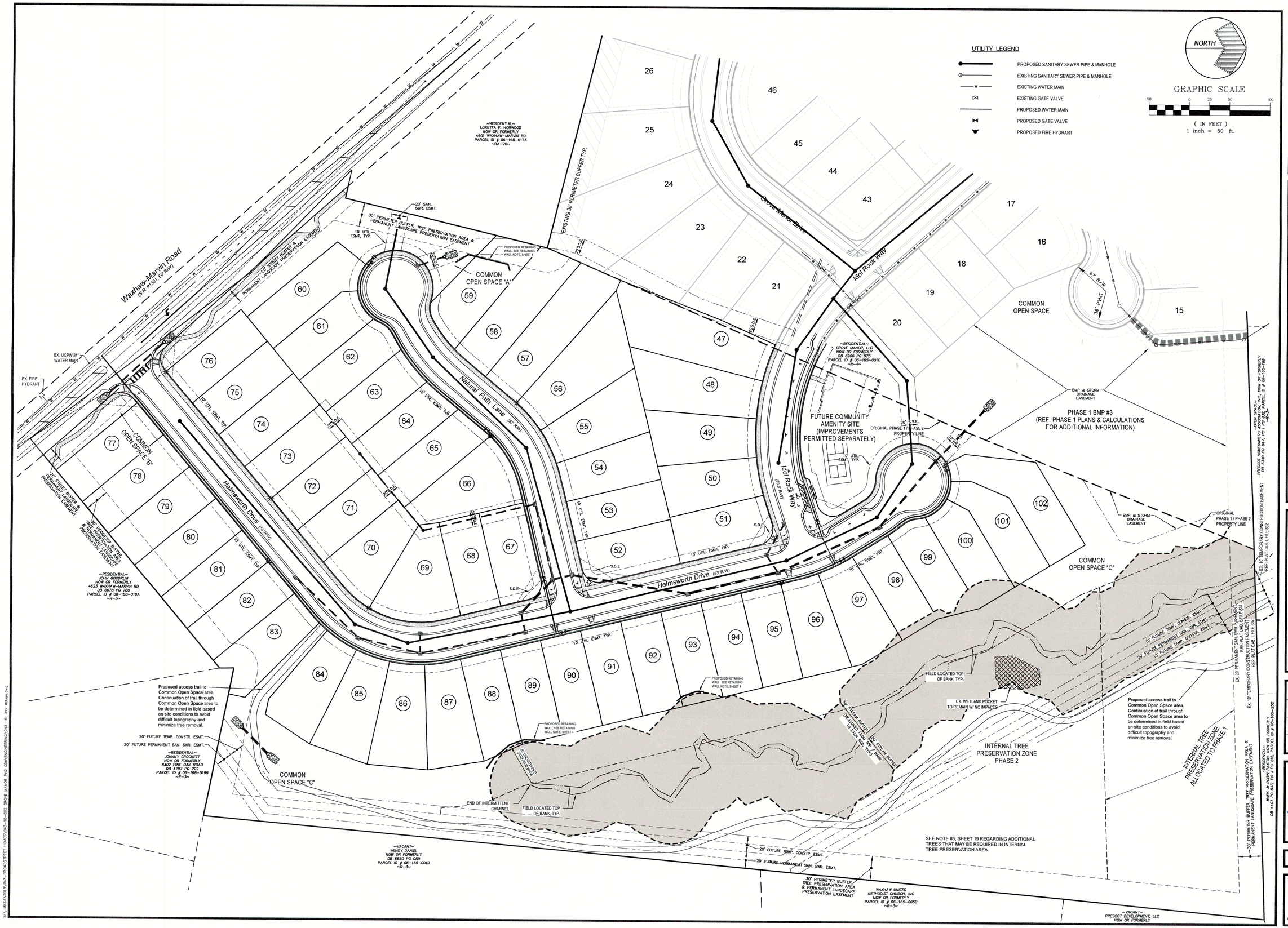
Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,614 ENGINEER WILLIAM M. HARRIS 8/21/19

Scale: 1" = 80'

Sheet No. 15 of 24

S:_MESA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CD's\ENGINEERING\043-18-002 Sht14-15 DA Maps.dwg



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5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

PROPOSED UTILITY PLAN

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

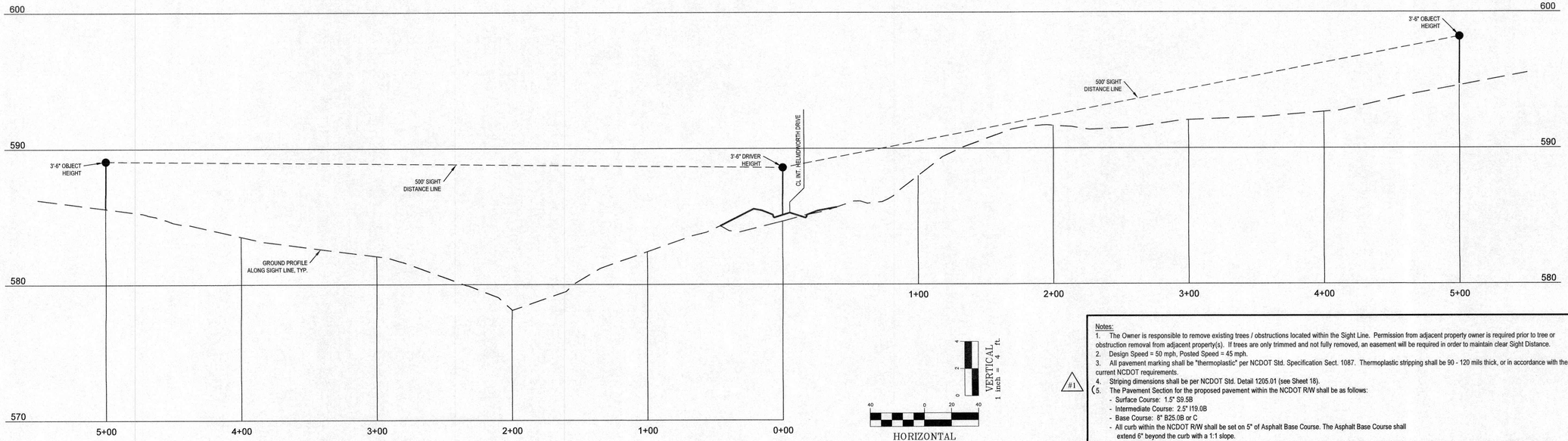
Revisions
#1 - 1174418: Revised per Site Plan revisions. Revised corner information.
#2 - 6/21/18: Revised per revision to Sheet 3 & Added Storm Drainage pipe sizes per review comments.
#3 - 6/27/18: Revised per revision to Sheet 3 & Added Storm Drainage pipe sizes per review comments.
#4 - 7/13/18: Revised Storm Drainage easements per revisions to Sheet 2 (per review comments)

Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,686 ENGINEER WAYNE M. HARRIS 7/19

Scale: 1" = 50'

Sheet No. 16 Of 24



SITE DISTANCE PROFILE

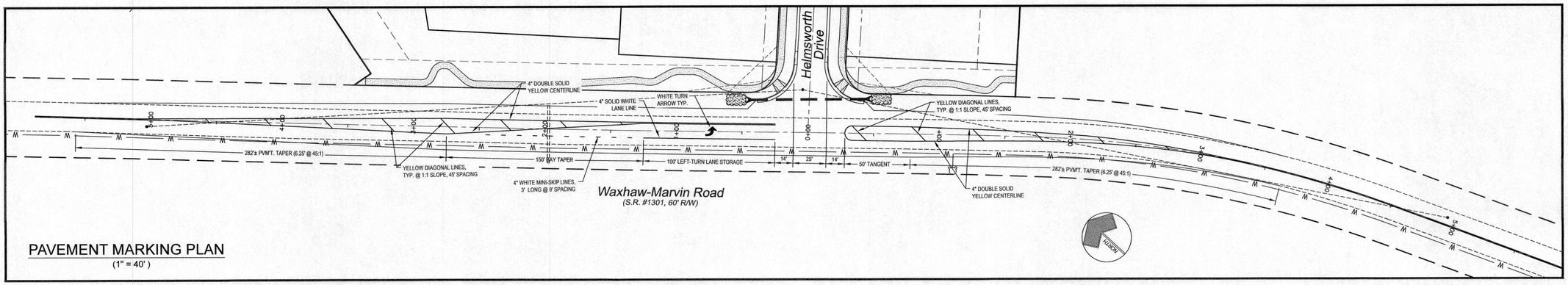
(1" = 4' / 40' , V / H)

VERTICAL
1 inch = 4' ft.

HORIZONTAL
(IN FEET)
1 inch = 40 ft.

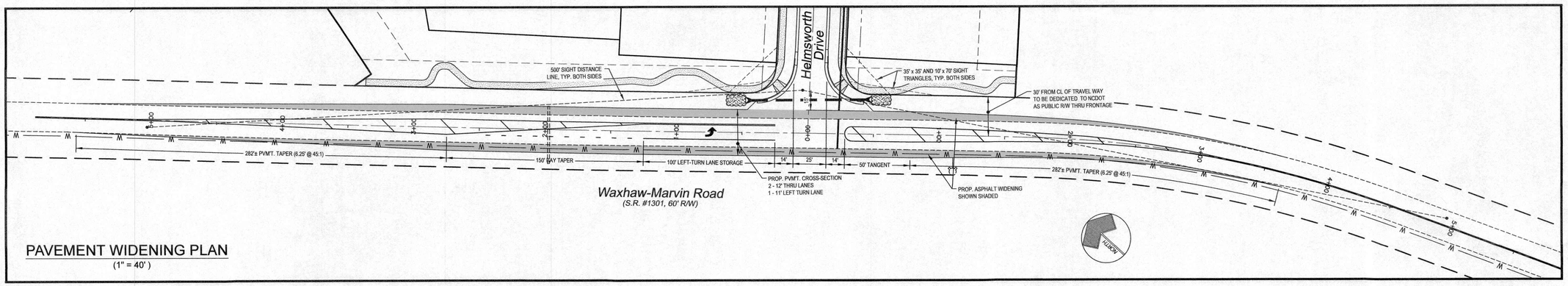
Notes:

1. The Owner is responsible to remove existing trees / obstructions located within the Sight Line. Permission from adjacent property owner is required prior to tree or obstruction removal from adjacent property(s). If trees are only trimmed and not fully removed, an easement will be required in order to maintain clear Sight Distance.
2. Design Speed = 50 mph, Posted Speed = 45 mph.
3. All pavement marking shall be "thermoplastic" per NCDOT Std. Specification Sect. 1087. Thermoplastic stripping shall be 90 - 120 mils thick, or in accordance with the current NCDOT requirements.
4. Striping dimensions shall be per NCDOT Std. Detail 1205.01 (see Sheet 18).
5. The Pavement Section for the proposed pavement within the NCDOT R/W shall be as follows: #1
   - Surface Course: 1.5" S9.5B
   - Intermediate Course: 2.5" I19.0B
   - Base Course: 8" B25.0B or C
   - All curb within the NCDOT R/W shall be set on 5" of Asphalt Base Course. The Asphalt Base Course shall extend 6" beyond the curb with a 1:1 slope.
6. Pavement markings shall be per NCDOT Std. Details. See Sheet 18 for Left-Turn Lane striping (NCDOT Std. #1205.05) and Pavement Marking (NCDOT Std. #1205.08). #1



PAVEMENT MARKING PLAN

(1" = 40')



PAVEMENT WIDENING PLAN

(1" = 40')

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5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209

P (704) 334-1325
F (704) 334-1330

NC #C-1170 & SC #C00946

PROPOSED STRIPING PLAN

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 3/28/19: Updated Design Firm information.

Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL 012,583 ENGINEER WAYNE M. HARRIS

Scale: NOTED

Sheet No. 17 of 24

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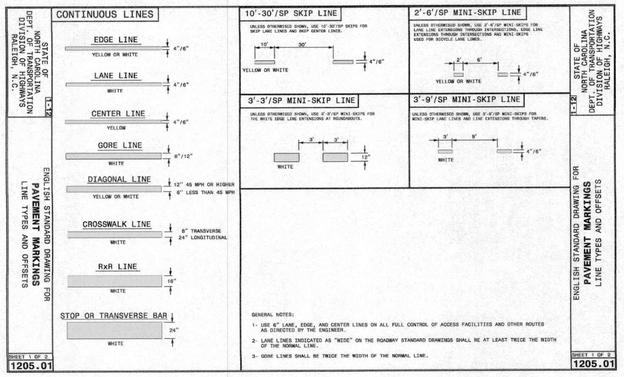
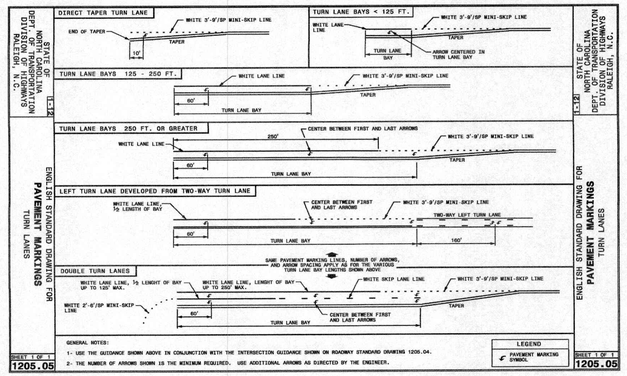
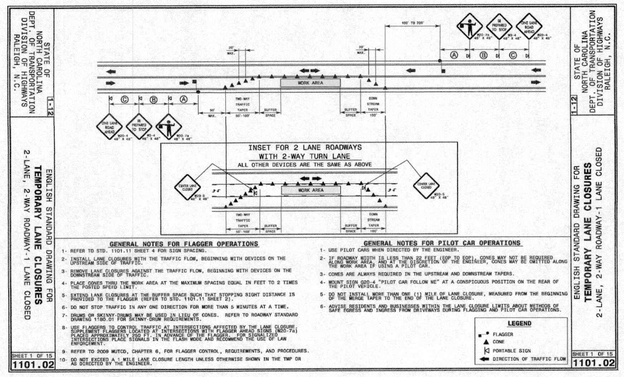
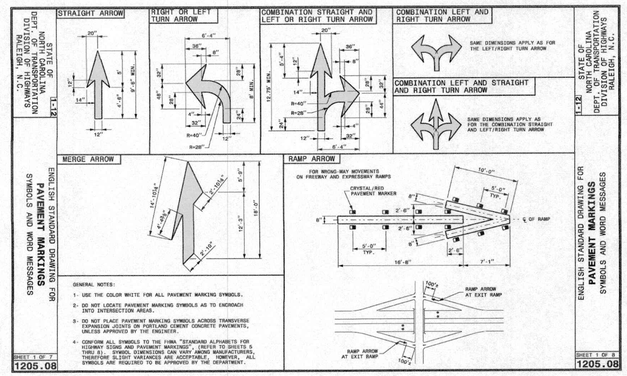
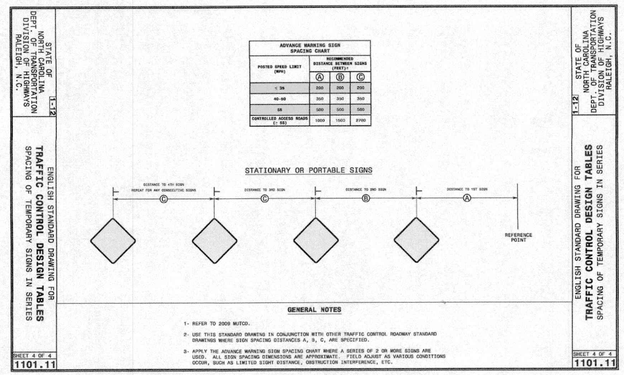










SYMBOL LEGEND

- FLAGMAN
- WORK ZONE
- FLAGMAN SIGN (W20-7a, 48" x 48")
- NON-METALIC DRUM W/ TYPE C STEADY BURN WARNING LIGHTS, PER NCDOT STD. #1130.01
- BE PREPARED TO STOP SIGN (W3-4, 48" x 48")
- PORTABLE SIGN
- TRAFFIC DIRECTION
- ONE LANE ROAD AHEAD SIGN (W20-4, 48" x 48")

CONSTRUCTION SEQUENCE

1. Install all necessary signage per NCDOT Std. 1101.02 (Sht. 1 of 15) prior to the start of construction and adhere to the general requirements as shown.
2. Begin preparation of the existing shoulder for proposed construction.
3. Provide drums, as shown in the plan, when grading is beyond 3' from edge of travel lane, per Detail.
4. Saw cut existing pavement as necessary to provide clean surface for proposed improvements (1' max.).
5. At the end of each workday the contractor shall be required to backfill up to the edge and elevation of existing pavement in areas adjacent to an open travel lane that has a drop-off of more than 3" (see backfill detail).
6. Complete compaction of the subgrade, binder, and surface courses as per NCDOT Standards, and in conjunction with the approved driveway / encroachment agreement.

TABLE A: BARRICADE WARNING LIGHTS

	TYPE A LOW INTENSITY	TYPE B HIGH INTENSITY	TYPE C LOW INTENSITY
LENS DIRECTIONAL FACE	1 OR 2	1	1 OR 2
FLASH RATE / MINUTE	55 TO 75	55 TO 75	CONSTANT
FLASH DURATION (a)	10%	8%	CONSTANT
MIN. EFFECTIVE INTENSITY (b)	4.0 CANDELAS	35 CANDELAS	--
MINIMUM BEAM CANDLE POWER (b)	--	--	2 CANDLES
HOURS OF OPERATION	DUSK TO DAWN	24 HRS / DAY	DUSK TO DAWN

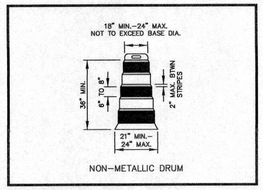
(a) LENGTH OF TIME THAT INSTANTANEOUS INTENSITY IS EQUAL TO OR GREATER THAN EFFECTIVE INTENSITY.

(b) THESE VALUES MUST BE MAINTAINED WITHIN A FULL 9 DEGREES ON EACH SIDE OF THE VERTICAL AXIS, AND 5 DEGREES ABOVE AND 3 DEGREES BELOW THE HORIZONTAL AXIS.

TYPE C STEADY BURN WARNING LIGHTS ARE MOST COMMONLY MOUNTED ON SEPARATE PORTABLE SUPPORTS OR ON TYPE 1 OR TYPE 11 BARRICADES AND ARE INTENDED TO CONTINUALLY WARN THE DRIVER THAT HE IS APPROACHING OR ADJACENT TO A HAZARDOUS AREA.

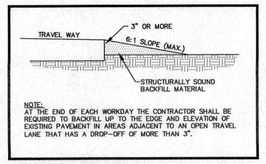
BARRICADE WARNING LIGHTS ARE PORTABLE, LENS DIRECTED, ENCLOSED LIGHTS. THE COLOR OF THE LIGHT EMITTED SHALL BE YELLOW.

BARRICADE WARNING LIGHTS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE INSTITUTE OF TRANSPORTATION ENGINEERS (ITE) STANDARD FOR FLASHING AND STEADY BURN BARRICADE WARNING LIGHTS (1971) (SEE TABLE A).



DRUM DETAIL

NTS

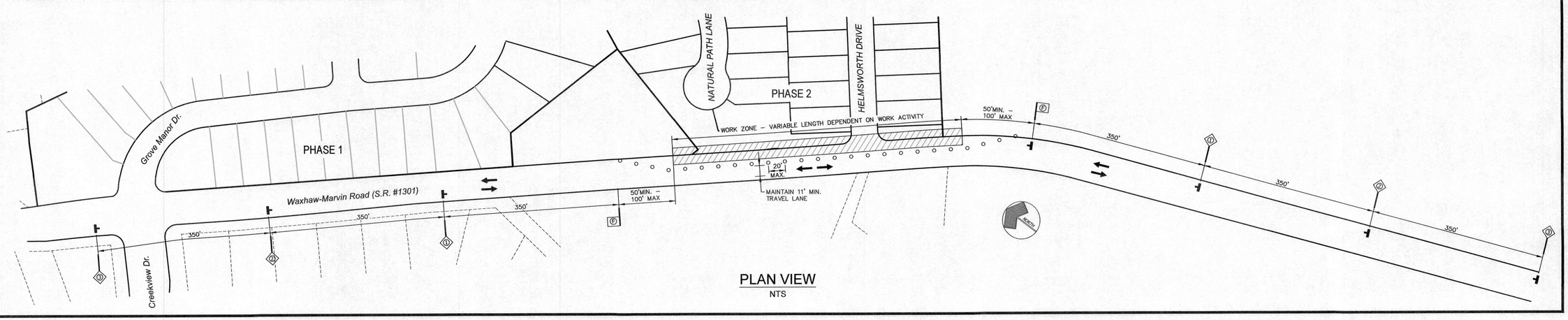


BACKFILL DETAIL

NTS

GENERAL REQUIREMENTS

1. Street space is at a minimum so no more space should be used for construction or maintenance work, than is absolutely necessary. Through barricading and channelization, the remaining street space is to be used to carry the traffic around the work area in the best way possible under prevailing conditions.
2. Traffic control devices shall be set up prior to the start of construction or maintenance operations and shall be removed or relocated as the work is finished or work conditions change. The agency doing the work shall patrol the work site as required to ensure that all traffic control devices are in place and operating at all times.
3. All traffic control signs for the work area shall be reflectorized. The reflective materials used shall be equal to or better than the Type I, Level A Reflective Sheeting Requirements in Section 633 of the Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-74).
4. At night, adequate barricades with reflectorized material and lights are required to call attention to and to indicate the actual location of obstructions and hazards.
5. When not in use during work hours or construction inactivity, equipment shall be parked a minimum of 10' away from the travel lane in such a manner as to not create a sight distance problem for motorists.
6. The minimum width for temporary travel lanes is 11 feet, however, a 12-foot lane is advisable and should be provided whenever possible.
7. Whenever traffic must be routed across the centerline, the two directions of traffic must be physically separated. Traffic cones can be effectively used for this purpose during daylight hours; reflectorized drums must be used at night.
8. Traffic shall not be routed across centerline with cones or drums during non-working hours. Contractor must be on site or change pavement markings appropriately.
9. Generally, the peak flow of traffic occurs between the hours of 6-9 am and 4-6:30 pm Monday through Friday. During these hours, construction activity which involve a lane closure will not be allowed on thoroughfare streets except in emergency situations or with the approval from the North Carolina Department of Transportation.
10. The agency doing the work shall provide flaggers and/or police control when required. Contractor may also be required to provide a uniformed officer to control traffic when working in and around a signalized intersection.
11. Every attempt shall be made to schedule and expedite the work to cause the least inconvenience to the traveling public.
12. In situations not covered in this design, the protection of the traveling public and the protection of the workers on site will dictate the measures to be taken consistent with the Work Area Traffic Control Handbook (WATCH).
13. Where complete street closure is necessary, the Department of Transportation will coordinate closure of the street and if necessary fully sign a detour route.
14. The City Engineer or Director of the Department of Transportation or their representatives are authorized to stop any construction or maintenance activity which is not properly signed and barricaded as required by this standard, the WATCH, and the MUTCD until such requirements are met.
15. This design standard cannot be used for all roadway construction situations. It is intended only to be used as a guideline. Specific situations may require engineering judgment in the placement of traffic control devices because of limited vertical and/or horizontal sight distance.
16. When personnel and/or equipment are within 3' of the edge of an open travel lane, the contractor shall refer to the WATCH for proper lane closure.
17. Operational signs are generally mounted on portable support. These are usually used for short-term operation to warn and guide traffic. Advanced warning signs (construction ahead) shall be mounted on stationary supports seven (7) days prior to the beginning of construction of the roadway.
18. All drums shall be ballasted in such a manner that they will be stable under wind and vehicle action. Ballasting shall be done with sandbags or other yielding material situated in the base of the drums.
19. Construction work shall not be allowed on both sides of the road simultaneously within the same area, unless the roadway is median divided.
20. At the end of each work day the contractors shall backfill up to the edge and elevation of the existing pavement areas within 2 feet of an open travel lane that include a drop off of more than 3 inches in accordance with WATCH. See Detail B, this sheet.
21. Pavement markings are to be installed by the contractor. Pre-lines must be approved prior to placement of the pavement markings.



PLAN VIEW

NTS

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

TRAFFIC CONTROL PLAN

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 7/24/18: Revised per review comments and revised owner information.
#2 - 8/24/18: Updated Design Firm information.

Job No.	043-18-002
Date	8/24/2018
Proj. Mgr.	WMH
Drawn	AW

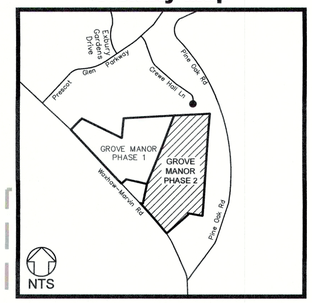
NORTH CAROLINA PROFESSIONAL SEAL #12585 ENGINEER WAYNE M. HARRIS 8/24/18

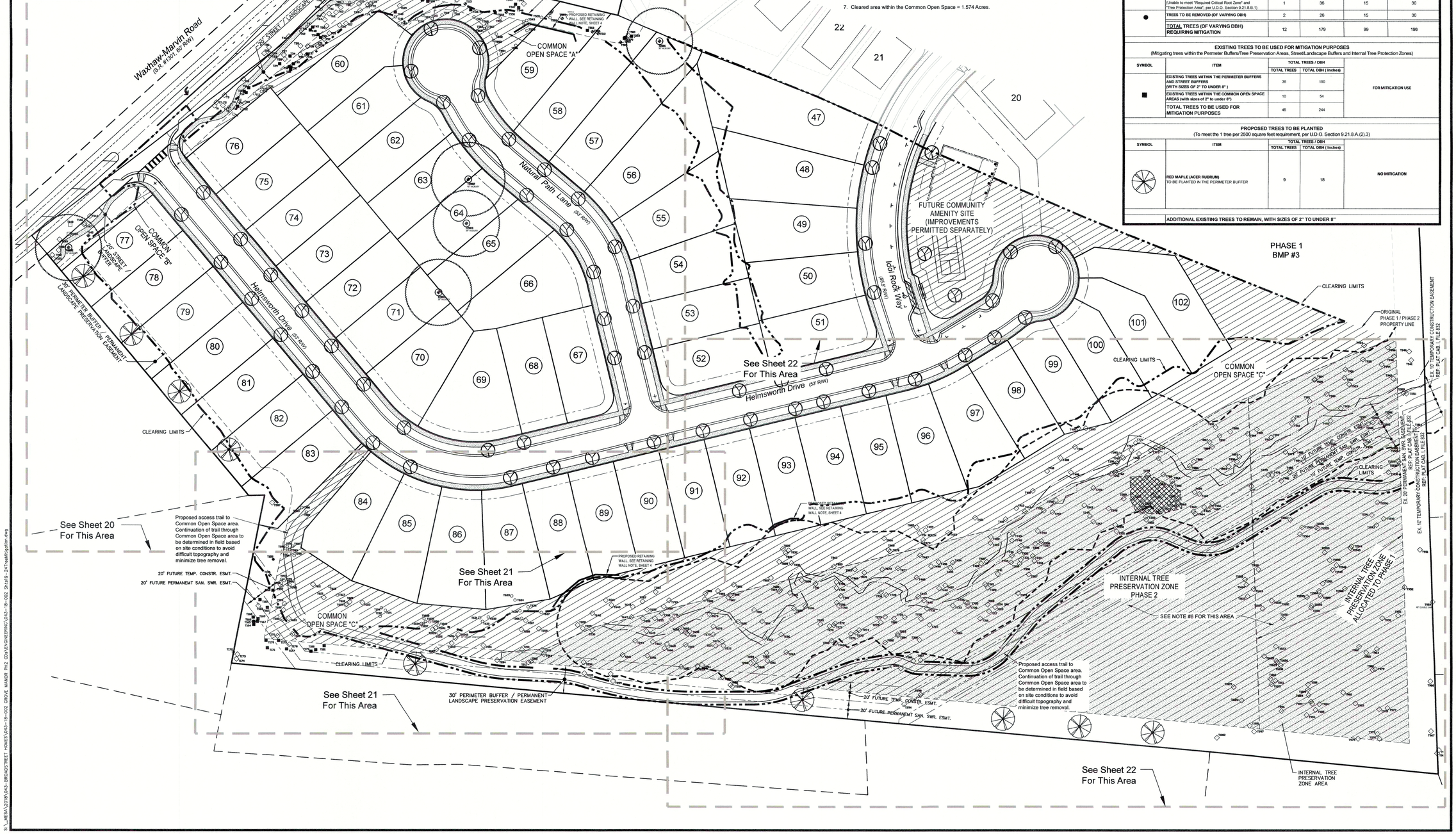
Scale: NTS

Sheet No. 18 of 24

S:_MESA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CD's\ENGINEERING\043-18-002 MBase.dwg

Vicinity Map





NOTES:

1. See Sheets 20 through 22 for enlarged tree mitigation plans.
2. See Sheets as follows for Tree Summary Tables:
   A. Existing Trees To Be Removed And Mitigated - Sheet 23
   B. Existing Trees To Remain But Mitigated - Sheet 23
   C. Existing Heritage Trees On Site - Sheet 23
   D. Existing Trees To Be Removed - Mitigation Not Required - Sheet 23
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3. All tree mitigation is achieved by preservation of existing trees that are less than 8" DBH for large maturing or 4" DBH for understory trees. These trees used for mitigation credit have been located by field survey, and are shown on Sheets 19 through 22.
4. Per the Town of Waxhaw, the only trees that are required to be shown on the plans and mitigated for removal, are the trees within the street/landscape buffers, perimeter buffers/permanent tree preservation easements and the internal tree protection zones (per the Tree Survey submitted with the approved rezoning plan). Five (5) of the six heritage trees are not located in these areas, and therefore will be included in the tree removal permit application.
5. One (1) heritage tree is located within the Perimeter Buffer / Tree Preservation Area, and will not be removed, however, due to proposed lot grading the "Required Critical Root Zone" and "Tree Protection Area" requirements (per UDO Section 9.21.8.b.1) cannot be satisfied, and therefore mitigation is provided.
6. Additional tree planting may be required within the Internal Tree Preservation Zone in order to satisfy minimum tree requirements. The Developer shall coordinate with the Urban Forester and/or Waxhaw staff as necessary to determine what areas require additional trees. The Developer may elect to transplant existing trees to satisfy this requirement.
7. Cleared area within the Common Open Space = 1.574 Acres.

TREE SUMMARY TABLE

TREES TO REMAIN
(To be undisturbed)

SYMBOL	ITEM	TOTAL TREES / DBH: TOTAL TREES	TOTAL TREES / DBH: TOTAL DBH (Inches)	
◇	TREES TO REMAIN	447	4860	NO MITIGATION REQUIRED

TREES TO BE REMOVED WITHOUT MITIGATION
(Within areas outside of the Permeter Buffers/Tree Preservation Areas, Street/Landscape Buffers and Internal Tree Protection Zones)

SYMBOL	ITEM	TOTAL TREES / DBH: TOTAL TREES	TOTAL TREES / DBH: TOTAL DBH (Inches)	
○	TREES TO BE REMOVED WITHOUT MITIGATION	63	727	NO MITIGATION REQUIRED
	HERITAGE TREES TO BE REMOVED WITHOUT MITIGATION	5	184	
	TOTAL TREES TO BE REMOVED WITHOUT MITIGATION	68	911	

TREES TO BE MITIGATED
(Within the Permeter Buffers/Tree Preservation Areas, Street/Landscape Buffers and Internal Tree Protection Zones)

SYMBOL	ITEM	TOTAL TREES / DBH: TOTAL TREES	TOTAL TREES / DBH: TOTAL DBH (Inches)	MITIGATION REQUIRED: TOTAL TREES REQUIRED FOR MITIGATION	MITIGATION REQUIRED: TOTAL DBH REQUIRED FOR MITIGATION (trees assumed to be at 2" DBH when planted)
◐	TREES TO REMAIN (Unable to meet "Required Critical Root Zone" and "Tree Protection Area", per U.D.O. Section 9.21.8.B.1)	9	117	69	138
	HERITAGE TREES TO REMAIN (Unable to meet "Required Critical Root Zone" and "Tree Protection Area", per U.D.O. Section 9.21.8.B.1)	1	36	15	30
●	TREES TO BE REMOVED (OF VARYING DBH)	2	26	15	30
	TOTAL TREES (OF VARYING DBH) REQUIRING MITIGATION	12	179	99	198

EXISTING TREES TO BE USED FOR MITIGATION PURPOSES
(Mitigating trees within the Permeter Buffers/Tree Preservation Areas, Street/Landscape Buffers and Internal Tree Protection Zones)

SYMBOL	ITEM	TOTAL TREES / DBH: TOTAL TREES	TOTAL TREES / DBH: TOTAL DBH (Inches)	
■	EXISTING TREES WITHIN THE PERMETER BUFFERS AND STREET BUFFERS (WITH SIZES OF 2" TO UNDER 8")	36	190	FOR MITIGATION USE
	EXISTING TREES WITHIN THE COMMON OPEN SPACE AREAS (with sizes of 2" to under 8")	10	54	
	TOTAL TREES TO BE USED FOR MITIGATION PURPOSES	46	244	

PROPOSED TREES TO BE PLANTED
(To meet the 1 tree per 2500 square feet requirement, per U.D.O. Section 9.21.8.A.(2).3)

SYMBOL	ITEM	TOTAL TREES / DBH: TOTAL TREES	TOTAL TREES / DBH: TOTAL DBH (Inches)	
	RED MAPLE (ACER RUBRUM) TO BE PLANTED IN THE PERIMETER BUFFER	9	18	NO MITIGATION

ADDITIONAL EXISTING TREES TO REMAIN, WITH SIZES OF 2" TO UNDER 8"

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00546

PROPOSED TREE PLANTING / MITIGATION PLAN

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 7/16/18: Revised per review comments and revised owner information.
#2 - 2/26/19: Updated Design Firm information.
#3 - 6/27/19: Revised per revision to Sheet 3 (per review comments).

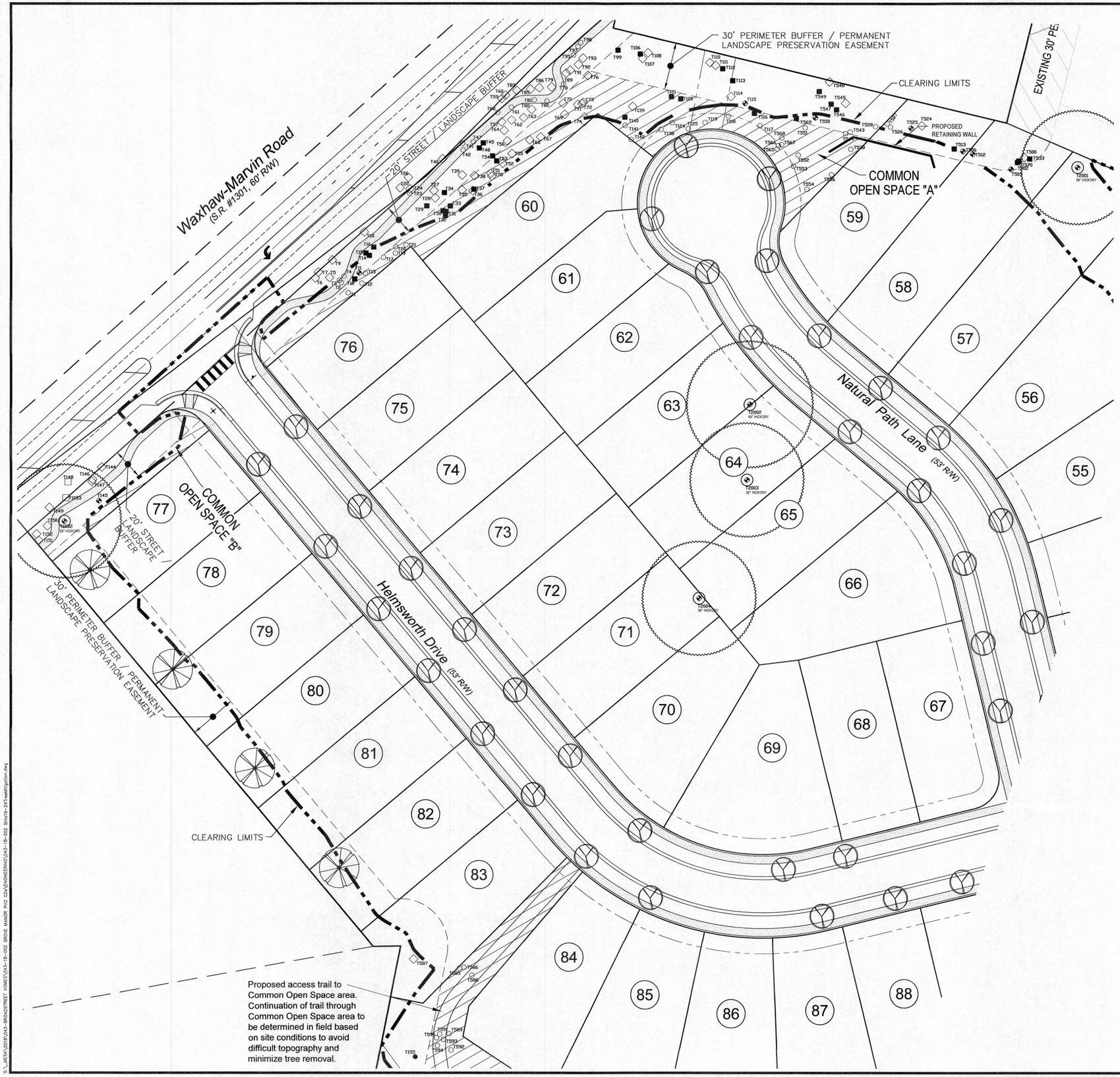
Job No.	043-18-002
Date	18/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,565 WAYNE M. HARRIS

Scale: 1" = 50'

Sheet No. 19 of 24

S:_MESA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CDA\ENGINEERING\043-18-002 Sht19-24TreeMitigation.dwg



S:_MESA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CDA\ENGINEERING\043-18-002 Sht19-24Treeallligation.dwg

TREE SUMMARY TABLE

TREES TO REMAIN
(To be undisturbed)

SYMBOL	ITEM	TOTAL TREES / DBH		
		TOTAL TREES	TOTAL DBH (Inches)	
◇	TREES TO REMAIN	447	4860	NO MITIGATION REQUIRED

TREES TO BE REMOVED WITHOUT MITIGATION
(Within areas outside of the Permeter Buffers/Tree Preservation Areas, Street/Landscape Buffers and Internal Tree Protection Zones)

SYMBOL	ITEM	TOTAL TREES / DBH		
		TOTAL TREES	TOTAL DBH (Inches)	
○	TREES TO BE REMOVED WITHOUT MITIGATION	63	727	NO MITIGATION REQUIRED
	HERITAGE TREES TO BE REMOVED WITHOUT MITIGATION	5	184	
	TOTAL TREES TO BE REMOVED WITHOUT MITIGATION	68	911	

TREES TO BE MITIGATED
(Within the Permeter Buffers/Tree Preservation Areas, Street/Landscape Buffers and Internal Tree Protection Zones)

SYMBOL	ITEM	TOTAL TREES / DBH		MITIGATION REQUIRED	
		TOTAL TREES	TOTAL DBH (Inches)	TOTAL TREES REQUIRED FOR MITIGATION	TOTAL DBH REQUIRED FOR MITIGATION (trees assumed to be at 2" DBH when planted)
	TREES TO REMAIN (Unable to meet "Required Critical Root Zone" and "Tree Protection Area", per U.D.O. Section 9.21.8.B.1)	9	117	69	138
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●	TREES TO BE REMOVED (OF VARYING DBH)	2	26	15	30
	TOTAL TREES (OF VARYING DBH) REQUIRING MITIGATION	12	179	99	198

EXISTING TREES TO BE USED FOR MITIGATION PURPOSES
(Mitigating trees within the Permeter Buffers/Tree Preservation Areas, Street/Landscape Buffers and Internal Tree Protection Zones)

SYMBOL	ITEM	TOTAL TREES / DBH		
		TOTAL TREES	TOTAL DBH (Inches)	
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	EXISTING TREES WITHIN THE COMMON OPEN SPACE AREAS (with sizes of 2" to under 8")	10	54	
	TOTAL TREES TO BE USED FOR MITIGATION PURPOSES	46	244	

PROPOSED TREES TO BE PLANTED
(To meet the 1 tree per 2500 square feet requirement, per U.D.O. Section 9.21.8.A.(2).3)

SYMBOL	ITEM	TOTAL TREES / DBH		
		TOTAL TREES	TOTAL DBH (Inches)	
	RED MAPLE (ACER RUBRUM) TO BE PLANTED IN THE PERMETER BUFFER	9	18	NO MITIGATION

ADDITIONAL EXISTING TREES TO REMAIN, WITH SIZES OF 2" TO UNDER 8"

NORTH

GRAPHIC SCALE

30 0 15 30 60

(IN FEET)
1 inch = 30 ft.

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209

P (704) 334-1325
F (704) 334-1330

NC #C-1170 & SC #C00946

PROPOSED TREE PLANTING / MITIGATION PLAN

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 2/26/19: Updated design / tree information.

Job No.	043-18-002
Date	18/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12585 WAYNE M. HARRIS

Scale: 1" = 30'

Sheet No. 20 of 24

NOTES:

1. See Sheets 20 through 22 for enlarged tree mitigation plans.

2. See Sheets as follows for Tree Summary Tables:
   A. Existing Trees To Be Removed And Mitigated - Sheet 23
   B. Existing Trees To Remain But Mitigated - Sheet 23
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7. Cleared area within the Common Open Space = 1.574 Acres.

NORTH

GRAPHIC SCALE

30 0 15 30 60

(IN FEET)
1 inch = 30 ft.

TREE SUMMARY TABLE

TREES TO REMAIN
(To be undisturbed)

SYMBOL	ITEM	TOTAL TREES / DBH		
		TOTAL TREES	TOTAL DBH (Inches)	
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TREES TO BE REMOVED WITHOUT MITIGATION
(Within areas outside of the Permeter Buffers/Tree Preservation Areas, Street/Landscape Buffers and Internal Tree Protection Zones)

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	TOTAL TREES TO BE REMOVED WITHOUT MITIGATION	68	911	

TREES TO BE MITIGATED
(Within the Permeter Buffers/Tree Preservation Areas, Street/Landscape Buffers and Internal Tree Protection Zones)

SYMBOL	ITEM	TOTAL TREES / DBH		MITIGATION REQUIRED	
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EXISTING TREES TO BE USED FOR MITIGATION PURPOSES
(Mitigating trees within the Permeter Buffers/Tree Preservation Areas, Street/Landscape Buffers and Internal Tree Protection Zones)

SYMBOL	ITEM	TOTAL TREES / DBH		
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PROPOSED TREES TO BE PLANTED
(To meet the 1 tree per 2500 square feet requirement, per U.D.O. Section 9.21.8.A.(2).3)

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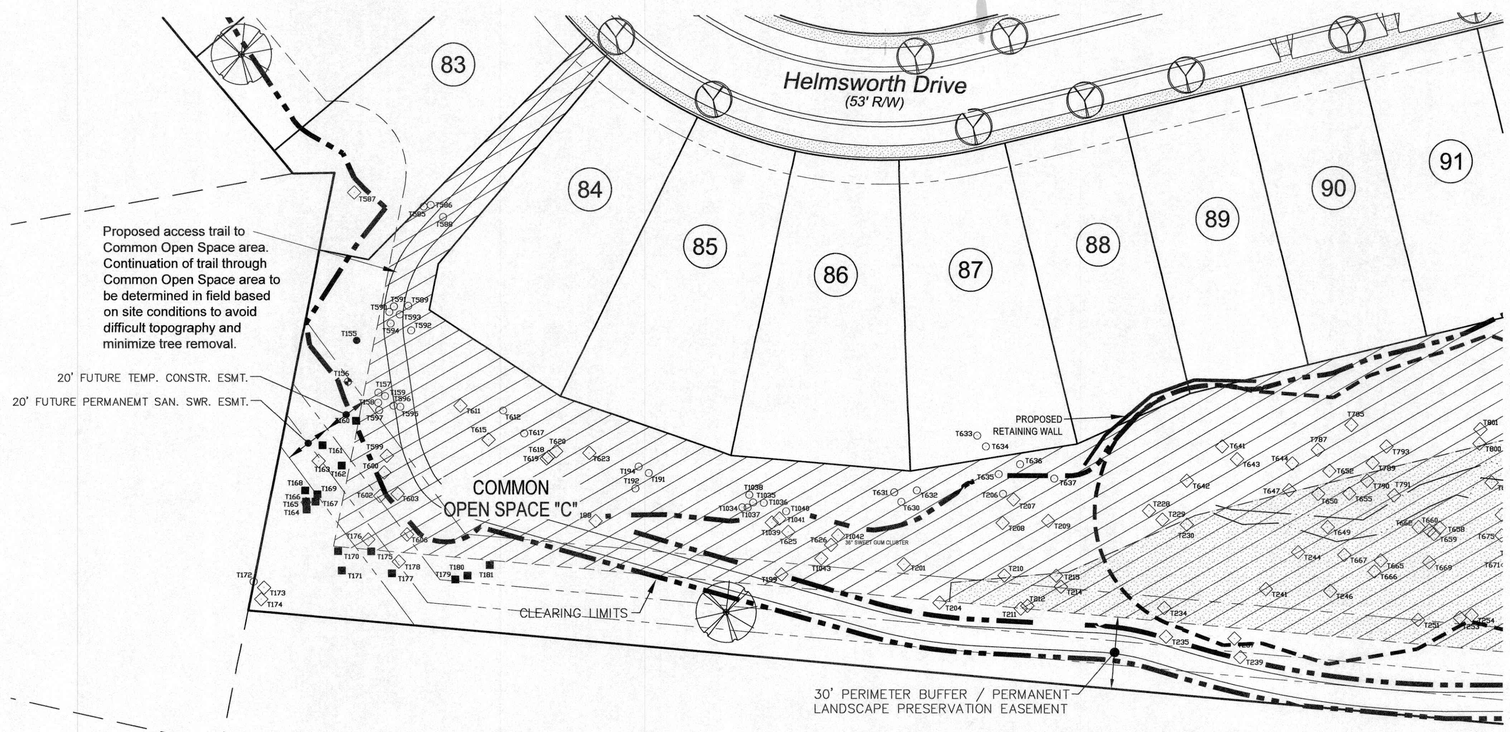
ADDITIONAL EXISTING TREES TO REMAIN, WITH SIZES OF 2" TO UNDER 8"



HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209

P (704) 334-1325
F (704) 334-1330

NC #C-1170 & SC #C00946

PROPOSED TREE PLANTING / MITIGATION PLAN

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Revised per review comments and revised owner information.
#2 - 5/28/19: Updated Design Plan information.

Job No.	043-18-002
Date	18/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,585 KENNETH M. HARRIS

Scale: 1" = 30'

Sheet No. 21 of 24

S:_MESA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CDA\ENGINEERING\043-18-002 Sht19-24TreeMitigation.dwg

TREE SUMMARY TABLE

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TREES TO BE MITIGATED
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SYMBOL	ITEM	TOTAL TREES / DBH: TOTAL TREES	TOTAL TREES / DBH: TOTAL DBH (Inches)	
	RED MAPLE (ACER RUBRUM) TO BE PLANTED IN THE PERIMETER BUFFER	9	18	NO MITIGATION
	ADDITIONAL EXISTING TREES TO REMAIN, WITH SIZES OF 2" TO UNDER 8"			

NOTES:

1. See Sheets 20 through 22 for enlarged tree mitigation plans.
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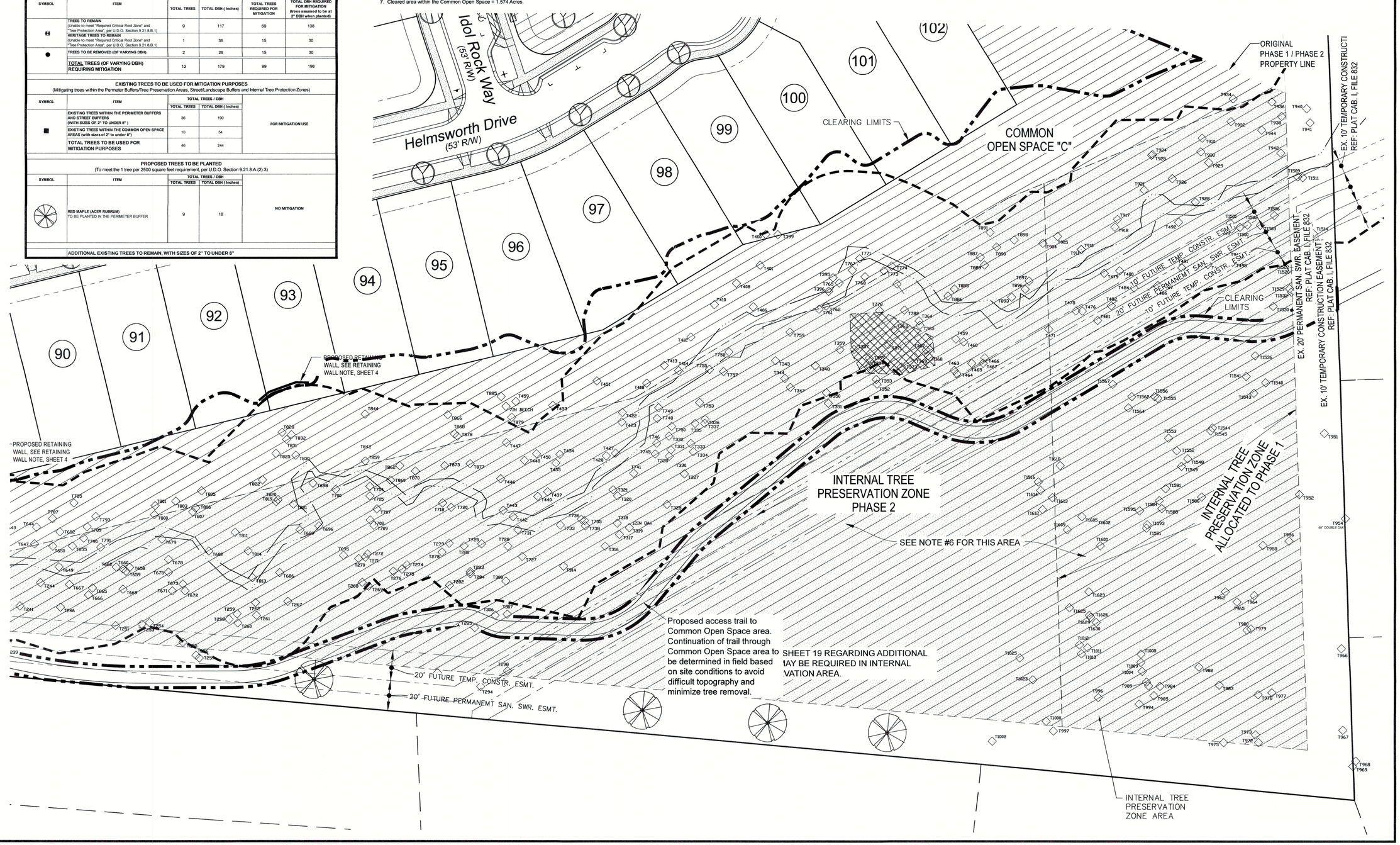

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

PROPOSED TREE PLANTING / MITIGATION PLAN

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1: 11/14/18: Revised per review comments and revised owner information.
#2: 12/21/18: Revised per review comments.
#3: 6/27/19: Revised per revision to Sheet 3 (per review comments)

Job No.	043-18-002
Date	18/24/2018
Proj. Mgr.	WMH
Drawn	AW

NORTH CAROLINA PROFESSIONAL SEAL #12,685 WAYNE M. HARRIS

Scale: 1" = 30'

Sheet No. 22 of 24

S:_MESA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CD's\ENGINEERING\043-18-002 Sht19-24TreeMitigation.dwg

Existing Trees To Be Removed - Mitigation Not Required

EXISTING TREES TO BE REMOVED - MITIGATION NOT REQUIRED			
SMALL MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 4" AND LARGE MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 8"			
TREE NUMBER	TREE SPECIES	TREE DBH (Inches)	LOCATION (TREE PRESERVATION AREAS)
T1	SWEET GUM	14	COMMON OPEN SPACE
T12	POPLAR	10	COMMON OPEN SPACE
T17	SWEET GUM	18	COMMON OPEN SPACE
T19	SWEET GUM	10	COMMON OPEN SPACE
T21	SWEET GUM	12	COMMON OPEN SPACE
T117	OAK	16	COMMON OPEN SPACE
T118	DOGWOOD	6	COMMON OPEN SPACE
T119	OAK	16	COMMON OPEN SPACE
T125	CEDAR	10	COMMON OPEN SPACE
T127	OAK	12	NATURAL PATH LANE R/W
T128	OAK	10	NATURAL PATH LANE R/W
T129	POPLAR	18	NATURAL PATH LANE R/W
T130	POPLAR	10	NATURAL PATH LANE R/W
T131	POPLAR	14	NATURAL PATH LANE R/W
T132	POPLAR	14	NATURAL PATH LANE R/W
T133	POPLAR	10	NATURAL PATH LANE R/W
T134	POPLAR	12	NATURAL PATH LANE R/W
T135	SWEET GUM	8	NATURAL PATH LANE R/W
T136	IRONWOOD	4	NATURAL PATH LANE R/W
T137	SWEET GUM	10	NATURAL PATH LANE R/W
T138	OAK	16	COMMON OPEN SPACE
T141	SWEET GUM	12	COMMON OPEN SPACE
T142	SWEET GUM	12	COMMON OPEN SPACE
T158	POPLAR	10	COMMON OPEN SPACE
T191	OAK	12	COMMON OPEN SPACE
T192	CEDAR	8	COMMON OPEN SPACE
T206	OAK	10	COMMON OPEN SPACE
T507	DOGWOOD	6	LOT 58
T515	OAK	12	LOT 59
T519	SWEET GUM	14	LOT 59
T522	POPLAR	16	LOT 59
T532	OAK	15	LOT 58
T536	HICKORY	8	COMMON OPEN SPACE
T540	OAK	20	LOT 59
T551	DOUBLE POPLAR	12	COMMON OPEN SPACE
T553	HICKORY	8	COMMON OPEN SPACE
T555	POPLAR	12	NATURAL PATH LANE R/W
T556	HARDWOOD	10	NATURAL PATH LANE R/W
T560	POPLAR	12	NATURAL PATH LANE R/W
T562	HICKORY	9	NATURAL PATH LANE R/W
T564	DOGWOOD	6	NATURAL PATH LANE R/W
T566	SWEET GUM	8	COMMON OPEN SPACE
T574	OAK	15	LOT 59
T575	SWEET GUM	14	NATURAL PATH LANE R/W
T576	POPLAR	10	NATURAL PATH LANE R/W
T577	OAK	18	COMMON OPEN SPACE
T579	PINE	13	COMMON OPEN SPACE
T580	SWEET GUM	10	COMMON OPEN SPACE
T581	SWEET GUM	12	COMMON OPEN SPACE
T582	POPLAR	12	COMMON OPEN SPACE
T583	OAK	12	LOT 83
T586	BEECH	14	COMMON OPEN SPACE
T589	POPLAR	8	COMMON OPEN SPACE
T590	POPLAR	12	COMMON OPEN SPACE
T596	SWEET GUM	9	COMMON OPEN SPACE
T617	POPLAR	10	COMMON OPEN SPACE
T631	BEECH	8	COMMON OPEN SPACE
T633	SWEET GUM	9	LOT 87
T636	OAK	15	COMMON OPEN SPACE
T637	OAK	16	COMMON OPEN SPACE
T1034	ELM	10	COMMON OPEN SPACE
T1035	SWEET GUM	10	COMMON OPEN SPACE
T1037	HICKORY	8	COMMON OPEN SPACE
TOTAL TREES TO BE REMOVED WITHOUT MITIGATION	63	727	
	TOTAL TREES	TOTAL TREE DBH (Inches)	

Existing Trees To Be Removed And Mitigated

EXISTING TREES TO BE REMOVED AND MITIGATED								
FOR SMALL MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 4" AND LARGE MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 8"					EXISITNG TREES TO BE USED FOR MITIGATION CREDIT			
TREE NUMBER	TREE SPECIES	TREE DBH (Inches)	TOTAL TREES REQUIRED FOR MITIGATION	LOCATION (TREE PRESERVATION AREAS)	TREE NUMBER	TREE SPECIES	TREE DBH (Inches)	LOCATION
T68	OAK	8	6	STREET BUFFER	T46	OAK	6	PERIMETER BUFFER
					T54	POPLAR	6	PERIMETER BUFFER
					T77	CEDAR	4	PERIMETER BUFFER
					T90	CEDAR	4	PERIMETER BUFFER
					T94	CEDAR	4	PERIMETER BUFFER
					T96	SWEET GUM	6	PERIMETER BUFFER
T155	OAK	18	9	PERIMETER BUFFER	T164	BEECH	4	PERIMETER BUFFER
					T166	POPLAR	6	PERIMETER BUFFER
					T170	POPLAR	6	PERIMETER BUFFER
					T171	POPLAR	4	PERIMETER BUFFER
					T175	PINE	6	PERIMETER BUFFER
					T177	CEDAR	6	PERIMETER BUFFER
					T179	CEDAR	4	PERIMETER BUFFER
					T180	POPLAR	6	PERIMETER BUFFER
					T181	POPLAR	4	PERIMETER BUFFER
REQUIRED MITIGATION TOTALS	2	26	15		PROPOSED MITIGATION TOTALS	15	76	
	TOTAL TREES TO BE MITIGATED	TOTAL TREE DBH TO BE MITIGATED (Inches)	TOTAL TREES REQUIRED FOR MITIGATION			TOTAL EXISTING TREES FOR MITIGATION	TOTAL EXISTING TREE DBH FOR MITIGATION (Inches)	

Existing Heritage Trees On Site

EXISTING HERITAGE TREES									
EXISTING HERITAGE TREES ON SITE						EXISITNG TREES TO BE USED FOR MITIGATION CREDIT			
TREE NUMBER	TREE SPECIES	TREE DBH (Inches)	TOTAL TREES REQUIRED FOR MITIGATION	TREE PRESERVATION AREA LOCATION	COMMENTS	TREE NUMBER	TREE SPECIES	TREE DBH (Inches)	LOCATION
T1032	HICKORY	36	15	STREET BUFFER	TO REMAIN AND BE MITIGATED - UNABLE TO MEET REQUIRED CRITICAL ROOT ZONE AND TREE PROTECTION AREA (PER U.D.O. SECTION 9.21.8.B.1)	T10	CEDAR	4	STREET BUFFER
						T16	SWEET GUM	4	STREET BUFFER
						T30	OAK	4	COMMON OPEN SPACE
						T31	SWEET GUM	6	COMMON OPEN SPACE
						T32	CEDAR	6	COMMON OPEN SPACE
						T33	SWEET GUM	4	COMMON OPEN SPACE
						T34	OAK	6	STREET BUFFER
						T37	PINE	6	COMMON OPEN SPACE
						T53	OAK	6	COMMON OPEN SPACE
T1042	SWEET GUM CLUSTER	36	0	COMMON OPEN SPACE	TO REMAIN - MITIGATION NOT REQUIRED	x	x	x	x
T2001	HICKORY	36	0	LOT 57	TO BE REMOVED - MITIGATION NOT REQUIRED	x	x	x	x
T2002	HICKORY	40	0	LOT 63	TO BE REMOVED - MITIGATION NOT REQUIRED	x	x	x	x
T2203	HICKORY	36	0	LOT 64	TO BE REMOVED - MITIGATION NOT REQUIRED	x	x	x	x
T2004	HICKORY	36	0	LOT 71	TO BE REMOVED - MITIGATION NOT REQUIRED	x	x	x	x
REQUIRED MITIGATION TOTALS	1	36	15			PROPOSED MITIGATION TOTALS	9	46	
	TOTAL TREES TO BE MITIGATED	TOTAL TREE DBH TO BE MITIGATED (Inches)	TOTAL TREES REQUIRED FOR MITIGATION				TOTAL TREES FOR MITIGATION	TOTAL TREE DBH FOR MITIGATION (Inches)	

Existing Trees To Remain But Mitigation Required - Unable To Meet Required Critical Root Zone And Tree Protection (Area Per U.D.O. Section 9.21.8.B.1)

EXISTING TREES TO REMAIN AND BE MITIGATED - UNABLE TO MEET REQUIRED CRITICAL ROOT ZONE AND TREE PROTECTION AREA (PER U.D.O. SECTION 9.21.8.B.1)								
FOR SMALL MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 4" AND LARGE MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 8"					EXISITNG TREES TO BE USED FOR MITIGATION CREDIT			
TREE NUMBER	TREE SPECIES	TREE DBH (Inches)	TOTAL TREES REQUIRED FOR MITIGATION	LOCATION (TREE PRESERVATION AREAS)	TREE NUMBER	TREE SPECIES	TREE DBH (Inches)	LOCATION
T11	OAK	12	6	STREET BUFFER	T14	SWEET GUM	4	STREET BUFFER
					T15	OAK	4	STREET BUFFER
					T54	POPLAR	6	STREET BUFFER
T115	OAK	12	6	PERIMETER BUFFER	T99	SWEET GUM	6	PERIMETTER BUFFER
					T120	SWEET GUM	6	COMMON OPEN SPACE
T145	OAK	14	9	STREET BUFFER	T29	OAK	6	STREET BUFFER
					T45	CEDAR	6	STREET BUFFER
					T48	OAK	6	STREET BUFFER
T156	OAK	12	6	PERIMETER BUFFER	T160	POPLAR	6	PERIMETER BUFFER
					T161	OAK	6	PERIMETER BUFFER
					T162	CEDAR	6	PERIMETER BUFFER
					T167	POPLAR	6	PERIMETER BUFFER
					T168	POPLAR	6	PERIMETER BUFFER
					T169	POPLAR	6	PERIMETER BUFFER
T503	SWEET GUM	16	9	PERIMETER BUFFER & LOT 58	T533	CEDAR	4	PERIMETER BUFFER & LOT 58
					T546	HARDWOOD	5	PERIMETER BUFFER
					T547	SYCAMORE	7	PERIMETER BUFFER
T506	OAK	13	9	PERIMETER BUFFER & LOT 59	T502	OAK	6	PERIMETER BUFFER & LOT 58
					T513	OAK	6	PERIMETER BUFFER & LOT 59
					T570	BEECH	5	PERIMETER BUFFER & LOT 58
T512	SWEET GUM	16	9	PERIMETER BUFFER & LOT 58	T116	POPLAR	6	COMMON OPEN SPACE
					T549	HARDWOOD	5	PERIMETER BUFFER
					T569	POPLAR	6	PERIMETER BUFFER
T525	POPLAR	8	6	PERIMETER BUFFER & LOT 59	T112	ASH	6	PERIMETER BUFFER
					T121	SWEET GUM	6	COMMON OPEN SPACE
T550	OAK	14	9	PERIMETER BUFFER	T106	SWEET GUM	4	PERIMETER BUFFER
					T113	MAGNOLIA	4	PERIMETER BUFFER
					T140	SWEET GUM	4	COMMON OPEN SPACE
T1032	HICKORY	36	15	STREET BUFFER	T10	CEDAR	4	STREET BUFFER
					T16	SWEET GUM	4	STREET BUFFER
					T30	OAK	4	COMMON OPEN SPACE
					T31	SWEET GUM	6	COMMON OPEN SPACE
					T32	CEDAR	6	COMMON OPEN SPACE
					T33	SWEET GUM	4	COMMON OPEN SPACE
					T34	OAK	6	STREET BUFFER
					T37	PINE	6	COMMON OPEN SPACE
					T53	OAK	6	COMMON OPEN SPACE
REQUIRED MITIGATION TOTALS	10	153	84		PROPOSED MITIGATION TOTALS	37	200	
	TOTAL TREES TO BE MITIGATED	TOTAL TREE DBH TO BE MITIGATED (Inches)	TOTAL TREES REQUIRED FOR MITIGATION			TOTAL EXISTING TREES FOR MITIGATION	TOTAL EXISTING TREE DBH FOR MITIGATION (Inches)	

NOTES:

1. See Sheets 20 through 22 for enlarged tree mitigation plans.

2. See Sheets as follows for Tree Summary Tables:
   - A. Existing Trees To Be Removed And Mitigated - Sheet 23
   - B. Existing Trees To Remain But Mitigated - Sheet 23
   - C. Existing Heritage Trees On Site - Sheet 23
   - D. Existing Trees To Be Removed - Mitigation Not Required - Sheet 23
   - E. Existing Trees Remaining (To Be Undisturbed) - Sheet 24

3. All tree mitigation is achieved by preservation of existing trees that are less than 8" DBH for large maturing or 4" DBH for understory trees. These trees used for mitigation credit have been located by field survey, and are shown on Sheets 19 through 22.

4. Per the Town of Waxhaw, the only trees that are required to be shown on the plans and mitigated for removal, are the trees within the street/landscape buffers, perimeter buffers/permanent tree preservation easements and the internal tree protection zones (per the Tree Survey submitted with the approved rezoning plan). Five (5) of the six heritage trees are not located in these areas, and therefore will be included in the tree removal permit application.

5. One (1) heritage tree is located within the Perimeter Buffer / Tree Preservation Area, and will not be removed, however, due to proposed lot grading the "Required Critical Root Zone" and "Tree Protection Area" requirements (per UDO Section 9.21.8.b.1) cannot be satisfied, and therefore mitigation is provided.

FOLLOWING TREE SUMMARY TABLES ON THIS SHEET:

- Existing Trees to be Removed - Mitigation Not Required
- Existing Trees to be Removed and Mitigated
- Existing Trees to Remain But Mitigation Required (Unable to Meet UDO Requirements for Root Zone Protection)
- Existing Heritage Trees

HE
HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

TREE SUMMARY TABLES

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Updated tables to include all trees required to be surveyed, per review comments; Revised owner information.
#2 - 3/26/19: Updated Design Firm information.

Job No. 043-18-002
Date 8/24/2018
Proj. Mgr. WMH
Drawn AW

NORTH CAROLINA PROFESSIONAL SEAL #12,585 ENGINEER WAYNE M. HARRIS

Scale: NTS

S:_MESA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CDs\ENGINEERING\043-18-002 Shts19-24TreeMitigation.dwg

Existing Trees Remaining (To Be Undisturbed)

EXISTING TREES REMAINING (TO BE UNDISTURBED)			
SMALL MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 4" AND LARGE MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 8"			
TREE NUMBER	TREE SPECIES	TREE DBH (Inches)	LOCATION (TREE PRESERVATION AREAS)
T5	OAK	8	STREET BUFFER
T6	OAK	14	STREET BUFFER
T7	OAK	8	STREET BUFFER
T9	OAK	14	STREET BUFFER
T18	CEDAR	16	STREET BUFFER
T22	PINE	12	EX. R/W
T24	OAK	10	STREET BUFFER
T26	PINE	12	EX. R/W
T27	SWEET GUM	16	STREET BUFFER
T28	SWEET GUM	14	STREET BUFFER
T35	OAK	12	COMMON OPEN SPACE
T36	OAK	10	COMMON OPEN SPACE
T38	OAK	10	COMMON OPEN SPACE
T39	OAK	12	STREET BUFFER
T40	SWEET GUM	12	EX. R/W
T50	POPLAR	10	COMMON OPEN SPACE
T51	SWEET GUM	12	COMMON OPEN SPACE
T52	SWEET GUM	12	COMMON OPEN SPACE
T55	OAK	10	COMMON OPEN SPACE
T56	OAK	10	STREET BUFFER
T57	CEDAR	10	STREET BUFFER
T59	SWEET GUM	8	EX. R/W
T60	POPLAR	14	EX. R/W
T62	OAK	10	STREET BUFFER
T63	OAK	8	STREET BUFFER
T66	SWEET GUM	10	COMMON OPEN SPACE
T67	SWEET GUM	12	COMMON OPEN SPACE
T69	DOUBLE OAK	12	COMMON OPEN SPACE
T70	SWEET GUM	16	COMMON OPEN SPACE
T71	SWEET GUM	12	COMMON OPEN SPACE
T72	SWEET GUM	8	COMMON OPEN SPACE
T73	SWEET GUM	8	COMMON OPEN SPACE
T74	SWEET GUM	12	COMMON OPEN SPACE
T76	SWEET GUM	8	COMMON OPEN SPACE
T79	CEDAR	10	STREET BUFFER
T82	SWEET GUM	12	STREET BUFFER
T83	SWEET GUM	12	EX. R/W
T85	OAK	10	STREET BUFFER
T86	SWEET GUM	16	STREET BUFFER
T89	SWEET GUM	12	STREET BUFFER
T91	POPLAR	10	STREET BUFFER
T92	POPLAR	14	STREET BUFFER
T93	SWEET GUM	14	STREET BUFFER
T107	PINE	14	PERIMETER BUFFER
T108	SWEET GUM	12	PERIMETER BUFFER
T110	ASH	8	PERIMETER BUFFER
T111	ASH	8	PERIMETER BUFFER
T114	SWEET GUM	12	PERIMETER BUFFER
T139	SWEET GUM	18	COMMON OPEN SPACE
T144	OAK	16	STREET BUFFER
T146	CEDAR	12	STREET BUFFER
T147	PERSIMMON	6	STREET BUFFER
T148	HOLLY	8	EX. R/W
T149	POPLAR	8	EX. R/W
T150	PERSIMMON	8	STREET BUFFER
T151	OAK	8	STREET BUFFER
T152	OAK	16	STREET BUFFER
T163	OAK	12	PERIMETER BUFFER
T165	OAK	10	PERIMETER BUFFER
T173	DOUBLE OAK	24	PERIMETER BUFFER
T174	DOUBLE OAK	10	PERIMETER BUFFER
T176	IRONWOOD	4	COMMON OPEN SPACE
T178	OAK	8	PERIMETER BUFFER
T188	OAK	20	COMMON OPEN SPACE
T199	OAK	12	COMMON OPEN SPACE
T201	OAK	12	COMMON OPEN SPACE
T204	OAK	14	PERIMETER BUFFER
T207	OAK	14	COMMON OPEN SPACE
T208	OAK	12	COMMON OPEN SPACE
T209	OAK	12	COMMON OPEN SPACE
T210	POPLAR	8	COMMON OPEN SPACE
T211	POPLAR	10	PERIMETER BUFFER
T212	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T228	OAK	14	COMMON OPEN SPACE
T229	OAK	16	COMMON OPEN SPACE
T230	OAK	14	INTERNAL TREE PRESERVATION ZONE
T234	OAK	14	INTERNAL TREE PRESERVATION ZONE
T235	POPLAR	8	PERIMETER BUFFER
T237	SWEET GUM	8	PERIMETER BUFFER
T239	SWEET GUM	8	PERIMETER BUFFER
T241	SWEET GUM	16	INTERNAL TREE PRESERVATION ZONE
T244	OAK	8	INTERNAL TREE PRESERVATION ZONE
T246	DOGWOOD	4	INTERNAL TREE PRESERVATION ZONE
T251	POPLAR	10	INTERNAL TREE PRESERVATION ZONE
T253	DOUBLE POPLAR	10	INTERNAL TREE PRESERVATION ZONE
T254	BEECH	8	INTERNAL TREE PRESERVATION ZONE
T255	OAK	10	INTERNAL TREE PRESERVATION ZONE
T256	OAK	10	PERIMETER BUFFER
T257	CEDAR	8	PERIMETER BUFFER
T258	OAK	12	INTERNAL TREE PRESERVATION ZONE
T259	OAK	12	INTERNAL TREE PRESERVATION ZONE
T260	CEDAR	10	INTERNAL TREE PRESERVATION ZONE
T261	OAK	16	INTERNAL TREE PRESERVATION ZONE
T262	OAK	10	INTERNAL TREE PRESERVATION ZONE
SUB-TOTAL TREES TO REMAIN W/O DISTURBANCE (CARRY TO TABLE @ RIGHT)	94	1052	
	TOTAL TREES	TOTAL TREE DBH (Inches)	

EXISTING TREES REMAINING (TO BE UNDISTURBED)			
SMALL MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 4" AND LARGE MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 8"			
TREE NUMBER	TREE SPECIES	TREE DBH (Inches)	LOCATION (TREE PRESERVATION AREAS)
T267	OAK	8	INTERNAL TREE PRESERVATION ZONE
T268	SWEET GUM	12	INTERNAL TREE PRESERVATION ZONE
T269	BEECH	10	INTERNAL TREE PRESERVATION ZONE
T270	OAK	8	INTERNAL TREE PRESERVATION ZONE
T271	OAK	8	INTERNAL TREE PRESERVATION ZONE
T272	OAK	12	INTERNAL TREE PRESERVATION ZONE
T274	OAK	10	INTERNAL TREE PRESERVATION ZONE
T275	OAK	14	INTERNAL TREE PRESERVATION ZONE
T276	CEDAR	8	INTERNAL TREE PRESERVATION ZONE
T278	SWEET GUM	10	INTERNAL TREE PRESERVATION ZONE
T279	SWEET GUM	12	INTERNAL TREE PRESERVATION ZONE
T280	ASH	10	INTERNAL TREE PRESERVATION ZONE
T282	OAK	12	INTERNAL TREE PRESERVATION ZONE
T283	SWEET GUM	10	INTERNAL TREE PRESERVATION ZONE
T284	SWEET GUM	14	INTERNAL TREE PRESERVATION ZONE
T285	SWEET GUM	14	INTERNAL TREE PRESERVATION ZONE
T293	OAK	8	PERIMETER BUFFER
T294	OAK	8	PERIMETER BUFFER
T296	CEDAR	8	PERIMETER BUFFER
T298	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T306	OAK	14	INTERNAL TREE PRESERVATION ZONE
T307	CEDAR	12	INTERNAL TREE PRESERVATION ZONE
T308	OAK	12	INTERNAL TREE PRESERVATION ZONE
T314	CEDAR	8	INTERNAL TREE PRESERVATION ZONE
T316	OAK	10	INTERNAL TREE PRESERVATION ZONE
T317	OAK	10	INTERNAL TREE PRESERVATION ZONE
T318	OAK	8	INTERNAL TREE PRESERVATION ZONE
T319	OAK	16	INTERNAL TREE PRESERVATION ZONE
T320	OAK	18	INTERNAL TREE PRESERVATION ZONE
T321	DOUBLE IRONWOOD	4	INTERNAL TREE PRESERVATION ZONE
T325	OAK	10	INTERNAL TREE PRESERVATION ZONE
T327	OAK	8	INTERNAL TREE PRESERVATION ZONE
T328	DOUBLE OAK	14	INTERNAL TREE PRESERVATION ZONE
T331	OAK	8	INTERNAL TREE PRESERVATION ZONE
T332	IRONWOOD	6	INTERNAL TREE PRESERVATION ZONE
T333	OAK	14	INTERNAL TREE PRESERVATION ZONE
T334	OAK	8	INTERNAL TREE PRESERVATION ZONE
T335	OAK	12	INTERNAL TREE PRESERVATION ZONE
T336	IRONWOOD	8	INTERNAL TREE PRESERVATION ZONE
T337	OAK	8	INTERNAL TREE PRESERVATION ZONE
T343	BEECH	18	INTERNAL TREE PRESERVATION ZONE
T344	OAK	8	INTERNAL TREE PRESERVATION ZONE
T347	IRONWOOD	4	INTERNAL TREE PRESERVATION ZONE
T348	DOGWOOD	4	INTERNAL TREE PRESERVATION ZONE
T350	OAK	12	INTERNAL TREE PRESERVATION ZONE
T351	DOUBLE OAK	8	INTERNAL TREE PRESERVATION ZONE
T352	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T355	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T357	OAK	10	INTERNAL TREE PRESERVATION ZONE
T358	OAK	12	INTERNAL TREE PRESERVATION ZONE
T359	OAK	8	INTERNAL TREE PRESERVATION ZONE
T363	IRONWOOD	6	INTERNAL TREE PRESERVATION ZONE
T364	OAK	12	INTERNAL TREE PRESERVATION ZONE
T365	IRONWOOD	6	INTERNAL TREE PRESERVATION ZONE
T367	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T368	OAK	8	INTERNAL TREE PRESERVATION ZONE
T369	OAK	10	INTERNAL TREE PRESERVATION ZONE
T371	OAK	10	INTERNAL TREE PRESERVATION ZONE
T373	OAK	12	INTERNAL TREE PRESERVATION ZONE
T395	POPLAR	10	COMMON OPEN SPACE
T396	SWEET GUM	12	COMMON OPEN SPACE
T399	OAK	18	LOT 99
T400	BEECH	20	LOT 99
T401	OAK	8	COMMON OPEN SPACE
T406	OAK	20	COMMON OPEN SPACE
T408	BEECH	24	COMMON OPEN SPACE
T410	BEECH	8	COMMON OPEN SPACE
T412	DOUBLE OAK	30	COMMON OPEN SPACE
T413	BEECH	18	COMMON OPEN SPACE
T414	OAK	14	COMMON OPEN SPACE
T418	OAK	12	COMMON OPEN SPACE
T422	OAK	16	INTERNAL TREE PRESERVATION ZONE
T423	OAK	12	INTERNAL TREE PRESERVATION ZONE
T427	BEECH	8	INTERNAL TREE PRESERVATION ZONE
T428	OAK	24	INTERNAL TREE PRESERVATION ZONE
T434	OAK	14	INTERNAL TREE PRESERVATION ZONE
T435	OAK	14	INTERNAL TREE PRESERVATION ZONE
T437	OAK	14	INTERNAL TREE PRESERVATION ZONE
T440	CEDAR	8	INTERNAL TREE PRESERVATION ZONE
T442	OAK	8	INTERNAL TREE PRESERVATION ZONE
T443	SWEET GUM	8	INTERNAL TREE PRESERVATION ZONE
T446	OAK	10	INTERNAL TREE PRESERVATION ZONE
T447	OAK	12	INTERNAL TREE PRESERVATION ZONE
T448	OAK	8	INTERNAL TREE PRESERVATION ZONE
T450	OAK	8	INTERNAL TREE PRESERVATION ZONE
T451	OAK	16	COMMON OPEN SPACE
T453	OAK	10	COMMON OPEN SPACE
T459	OAK	8	INTERNAL TREE PRESERVATION ZONE
T460	OAK	8	INTERNAL TREE PRESERVATION ZONE
T463	OAK	10	INTERNAL TREE PRESERVATION ZONE
SUB-TOTAL TREES TO REMAIN W/O DISTURBANCE	90	994	
	TOTAL TREES	TOTAL TREE DBH (Inches)	
TOTAL TREES TO REMAIN WITHOUT DISTURBANCE (CARRY TO TABLE @ RIGHT)	184	2046	
	TOTAL TREES	TOTAL TREE DBH (Inches)	

EXISTING TREES REMAINING (TO BE UNDISTURBED)			
SMALL MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 4" AND LARGE MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 8"			
TREE NUMBER	TREE SPECIES	TREE DBH (Inches)	LOCATION (TREE PRESERVATION AREAS)
T464	BEECH	10	INTERNAL TREE PRESERVATION ZONE
T465	OAK	10	INTERNAL TREE PRESERVATION ZONE
T466	OAK	12	INTERNAL TREE PRESERVATION ZONE
T467	OAK	14	INTERNAL TREE PRESERVATION ZONE
T471	OAK	20	INTERNAL TREE PRESERVATION ZONE
T475	OAK	24	INTERNAL TREE PRESERVATION ZONE
T476	OAK	8	INTERNAL TREE PRESERVATION ZONE
T479	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T480	OAK	10	INTERNAL TREE PRESERVATION ZONE
T481	OAK	10	INTERNAL TREE PRESERVATION ZONE
T482	IRONWOOD	4	INTERNAL TREE PRESERVATION ZONE
T484	OAK	8	INTERNAL TREE PRESERVATION ZONE
T486	OAK	12	INTERNAL TREE PRESERVATION ZONE
T487	BEECH	8	INTERNAL TREE PRESERVATION ZONE
T491	OAK	8	INTERNAL TREE PRESERVATION ZONE
T492	OAK	10	INTERNAL TREE PRESERVATION ZONE
T495	OAK	10	INTERNAL TREE PRESERVATION ZONE
T499	OAK	18	INTERNAL TREE PRESERVATION ZONE
T500	SWEET GUM	14	PERIMETER BUFFER & LOT 58
T524	POPLAR	8	PERIMETER BUFFER & LOT 59
T548	OAK	8	PERIMETER BUFFER
T599	HICKORY	9	COMMON OPEN SPACE
T602	HICKORY	10	COMMON OPEN SPACE
T603	PERSIMMON	12	COMMON OPEN SPACE
T606	POPLAR	10	COMMON OPEN SPACE
T611	OAK	12	COMMON OPEN SPACE
T615	DOGWOOD	5	COMMON OPEN SPACE
T618	POPLAR	9	COMMON OPEN SPACE
T619	SWEET GUM	18	COMMON OPEN SPACE
T620	SWEET GUM	18	COMMON OPEN SPACE
T623	SWEET GUM	16	COMMON OPEN SPACE
T625	SWEET GUM	8	COMMON OPEN SPACE
T626	HICKORY	9	COMMON OPEN SPACE
T641	POPLAR	12	COMMON OPEN SPACE
T642	HICKORY	8	COMMON OPEN SPACE
T643	HICKORY	12	COMMON OPEN SPACE
T644	OAK	14	COMMON OPEN SPACE
T647	OAK	19	COMMON OPEN SPACE
T649	OAK	10	INTERNAL TREE PRESERVATION ZONE
T650	OAK	15	INTERNAL TREE PRESERVATION ZONE
T652	SWEET GUM	8	COMMON OPEN SPACE
T655	SWEET GUM	10	INTERNAL TREE PRESERVATION ZONE
T657	ASH	12	INTERNAL TREE PRESERVATION ZONE
T658	OAK	15	INTERNAL TREE PRESERVATION ZONE
T659	OAK	9	INTERNAL TREE PRESERVATION ZONE
T660	OAK	12	INTERNAL TREE PRESERVATION ZONE
T662	OAK	8	INTERNAL TREE PRESERVATION ZONE
T665	HICKORY	9	INTERNAL TREE PRESERVATION ZONE
T666	PINE	8	INTERNAL TREE PRESERVATION ZONE
T667	PINE	10	INTERNAL TREE PRESERVATION ZONE
T669	BEECH	8	INTERNAL TREE PRESERVATION ZONE
T670	ASH	8	INTERNAL TREE PRESERVATION ZONE
T671	SWEET GUM	8	INTERNAL TREE PRESERVATION ZONE
T672	MAPLE	8	INTERNAL TREE PRESERVATION ZONE
T673	SWEET GUM	10	INTERNAL TREE PRESERVATION ZONE
T675	POPLAR	13	INTERNAL TREE PRESERVATION ZONE
T678	MAPLE	12	INTERNAL TREE PRESERVATION ZONE
T679	OAK	14	INTERNAL TREE PRESERVATION ZONE
T682	BEECH	12	INTERNAL TREE PRESERVATION ZONE
T686	ASH	10	INTERNAL TREE PRESERVATION ZONE
T689	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T695	OAK	16	INTERNAL TREE PRESERVATION ZONE
T696	CEDAR	12	INTERNAL TREE PRESERVATION ZONE
T698	SWEET GUM	12	INTERNAL TREE PRESERVATION ZONE
T700	HICKORY	8	INTERNAL TREE PRESERVATION ZONE
T704	OAK	13	INTERNAL TREE PRESERVATION ZONE
T705	SWEET GUM	14	INTERNAL TREE PRESERVATION ZONE
T707	OAK	12	INTERNAL TREE PRESERVATION ZONE
T708	OAK	10	INTERNAL TREE PRESERVATION ZONE
T709	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T718	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T720	POPLAR	9	INTERNAL TREE PRESERVATION ZONE
T725	OAK	12	INTERNAL TREE PRESERVATION ZONE
T727	HICKORY	8	INTERNAL TREE PRESERVATION ZONE
T728	SYCAMORE	9	INTERNAL TREE PRESERVATION ZONE
T731	POPLAR	13	INTERNAL TREE PRESERVATION ZONE
T733	OAK	8	INTERNAL TREE PRESERVATION ZONE
T735	OAK	12	INTERNAL TREE PRESERVATION ZONE
T736	OAK	18	INTERNAL TREE PRESERVATION ZONE
T738	OAK	12	INTERNAL TREE PRESERVATION ZONE
T741	OAK	14	INTERNAL TREE PRESERVATION ZONE
T745	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T746	BEECH	10	INTERNAL TREE PRESERVATION ZONE
T748	OAK	12	INTERNAL TREE PRESERVATION ZONE
T749	OAK	12	INTERNAL TREE PRESERVATION ZONE
T750	IRONWOOD	4	INTERNAL TREE PRESERVATION ZONE
T753	DOGWOOD	4	INTERNAL TREE PRESERVATION ZONE
T754	OAK	15	INTERNAL TREE PRESERVATION ZONE
T755	POPLAR	12	INTERNAL TREE PRESERVATION ZONE
T757	OAK	17	INTERNAL TREE PRESERVATION ZONE
SUB-TOTAL TREES TO REMAIN W/O DISTURBANCE	90	994	
	TOTAL TREES	TOTAL TREE DBH (Inches)	
TOTAL TREES TO REMAIN WITHOUT DISTURBANCE (CARRY TO TABLE @ RIGHT)	274	3040	
	TOTAL TREES	TOTAL TREE DBH (Inches)	

EXISTING TREES REMAINING (TO BE UNDISTURBED)			
SMALL MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 4" AND LARGE MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 8"			
TREE NUMBER	TREE SPECIES	TREE DBH (Inches)	LOCATION (TREE PRESERVATION AREAS)
T758	BEECH	12	INTERNAL TREE PRESERVATION ZONE
T759	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T761	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T762	BEECH	8	COMMON OPEN SPACE
T765	POPLAR	10	COMMON OPEN SPACE
T767	IRONWOOD	4	COMMON OPEN SPACE
T768	OAK	9	COMMON OPEN SPACE
T771	OAK	12	COMMON OPEN SPACE
T773	OAK	16	COMMON OPEN SPACE
T774	OAK	14	COMMON OPEN SPACE
T778	POPLAR	10	INTERNAL TREE PRESERVATION ZONE
T782	OAK	15	INTERNAL TREE PRESERVATION ZONE
T785	HICKORY	9	COMMON OPEN SPACE
T787	HICKORY	10	COMMON OPEN SPACE
T789	SWEET GUM	10	COMMON OPEN SPACE
T790	OAK	12	INTERNAL TREE PRESERVATION ZONE
T791	OAK	10	INTERNAL TREE PRESERVATION ZONE
T793	CEDAR	8	COMMON OPEN SPACE
T800	SWEET GUM	18	COMMON OPEN SPACE
T801	BEECH	13	COMMON OPEN SPACE
T803	HICKORY	8	COMMON OPEN SPACE
T805	OAK	9	COMMON OPEN SPACE
T806	OAK	13	INTERNAL TREE PRESERVATION ZONE
T807	SWEET GUM	10	INTERNAL TREE PRESERVATION ZONE
T811	TWIN OAK	12	INTERNAL TREE PRESERVATION ZONE
T813	OAK	12	INTERNAL TREE PRESERVATION ZONE
T814	IRONWOOD	5	INTERNAL TREE PRESERVATION ZONE
T819	OAK	18	INTERNAL TREE PRESERVATION ZONE
T820	IRONWOOD	5	INTERNAL TREE PRESERVATION ZONE
T821	OAK	13	INTERNAL TREE PRESERVATION ZONE
T822	POPLAR	10	COMMON OPEN SPACE
T825	OAK	14	COMMON OPEN SPACE
T828	SWEET GUM	11	COMMON OPEN SPACE
T830	HICKORY	8	COMMON OPEN SPACE
T831	DOGWOOD	4	COMMON OPEN SPACE
T832	OAK	13	COMMON OPEN SPACE
T844	POPLAR	8	COMMON OPEN SPACE
T859	HICKORY	10	COMMON OPEN SPACE
T860	DOGWOOD	5	INTERNAL TREE PRESERVATION ZONE
T862	OAK	15	INTERNAL TREE PRESERVATION ZONE
T866	OAK	8	COMMON OPEN SPACE
T868	OAK	12	COMMON OPEN SPACE
T870	DOGWOOD	6	INTERNAL TREE PRESERVATION ZONE
T873	HICKORY	10	INTERNAL TREE PRESERVATION ZONE
T877	OAK	8	INTERNAL TREE PRESERVATION ZONE
T878	OAK	10	COMMON OPEN SPACE
T879	OAK	13	COMMON OPEN SPACE
T885	SWEET GUM	18	INTERNAL TREE PRESERVATION ZONE
T886	OAK	8	INTERNAL TREE PRESERVATION ZONE
T887	OAK	14	INTERNAL TREE PRESERVATION ZONE
T889	HOLLY	4	INTERNAL TREE PRESERVATION ZONE
T890	OAK	10	INTERNAL TREE PRESERVATION ZONE
T891	OAK	10	INTERNAL TREE PRESERVATION ZONE
T893	OAK	10	INTERNAL TREE PRESERVATION ZONE
T896	IRONWOOD	4	INTERNAL TREE PRESERVATION ZONE
T897	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T898	OAK	8	INTERNAL TREE PRESERVATION ZONE
T904	SWEET GUM	8	INTERNAL TREE PRESERVATION ZONE
T905	SWEET GUM	9	INTERNAL TREE PRESERVATION ZONE
T910	OAK	15	INTERNAL TREE PRESERVATION ZONE
T911	HICKORY	12	INTERNAL TREE PRESERVATION ZONE
T917	HICKORY	10	INTERNAL TREE PRESERVATION ZONE
T918	OAK	9	INTERNAL TREE PRESERVATION ZONE
T921	OAK	17	INTERNAL TREE PRESERVATION ZONE
T924	DOGWOOD	5	INTERNAL TREE PRESERVATION ZONE
T925	DOGWOOD	4	INTERNAL TREE PRESERVATION ZONE
T926	OAK	8	INTERNAL TREE PRESERVATION ZONE
T928	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T929	OAK	8	INTERNAL TREE PRESERVATION ZONE
T930	OAK	15	INTERNAL TREE PRESERVATION ZONE
T931	DOGWOOD	5	INTERNAL TREE PRESERVATION ZONE
T932	OAK	14	INTERNAL TREE PRESERVATION ZONE
T934	OAK	8	COMMON OPEN SPACE
T936	OAK	11	INTERNAL TREE PRESERVATION ZONE
T938	OAK	8	INTERNAL TREE PRESERVATION ZONE
T940	BEECH	9	PERIMETER BUFFER
T941	OAK	14	PERIMETER BUFFER
T942	OAK	10	INTERNAL TREE PRESERVATION ZONE
T944	SWEET GUM	15	INTERNAL TREE PRESERVATION ZONE
T945	OAK	10	INTERNAL TREE PRESERVATION ZONE
T949	OAK	10	PERIMETER BUFFER
T950	OAK	10	PERIMETER BUFFER
T951	MAPLE	8	PERIMETER BUFFER
T952	CEDAR	12	PERIMETER BUFFER
T956	OAK	12	INTERNAL TREE PRESERVATION ZONE
T958	SWEET GUM	8	INTERNAL TREE PRESERVATION ZONE
T962	PINE	10	INTERNAL TREE PRESERVATION ZONE
T964	OAK	13	INTERNAL TREE PRESERVATION ZONE
T965	SWEET GUM	8	INTERNAL TREE PRESERVATION ZONE
T966	OAK	22	PERIMETER BUFFER
SUB-TOTAL TREES TO REMAIN W/O DISTURBANCE	90	925	
	TOTAL TREES	TOTAL TREE DBH (Inches)	
TOTAL TREES TO REMAIN WITHOUT DISTURBANCE (CARRY TO TABLE @ RIGHT)	364	3965	
	TOTAL TREES	TOTAL TREE DBH (Inches)	

EXISTING TREES REMAINING (TO BE UNDISTURBED)			
SMALL MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 4" AND LARGE MATURING TREES WITH DBH EQUAL TO OR GREATER THAN 8"			
TREE NUMBER	TREE SPECIES	TREE DBH (Inches)	LOCATION (TREE PRESERVATION AREAS)
T967	OAK	26	PERIMETER BUFFER
T969	CEDAR	8	PERIMETER BUFFER
T972	CEDAR	8	INTERNAL TREE PRESERVATION ZONE
T973	OAK	8	INTERNAL TREE PRESERVATION ZONE
T975	OAK	12	PERIMETER BUFFER
T977	OAK	10	INTERNAL TREE PRESERVATION ZONE
T978	OAK	12	INTERNAL TREE PRESERVATION ZONE
T979	OAK	12	INTERNAL TREE PRESERVATION ZONE
T980	SWEET GUM	10	INTERNAL TREE PRESERVATION ZONE
T982	OAK	12	INTERNAL TREE PRESERVATION ZONE
T983	HICKORY	12	INTERNAL TREE PRESERVATION ZONE
T984	BEECH	8	INTERNAL TREE PRESERVATION ZONE
T985	SWEET GUM	10	INTERNAL TREE PRESERVATION ZONE
T989	CEDAR	12	INTERNAL TREE PRESERVATION ZONE
T994	SWEET GUM	13	INTERNAL TREE PRESERVATION ZONE
T996	OAK	10	INTERNAL TREE PRESERVATION ZONE
T997	OAK	11	PERIMETER BUFFER
T1000	ASH	10	INTERNAL TREE PRESERVATION ZONE
T1002	HICKORY	10	PERIMETER BUFFER
T1008	PINE	9	INTERNAL TREE PRESERVATION ZONE
T1009	CEDAR	8	INTERNAL TREE PRESERVATION ZONE
T1011	OAK	8	INTERNAL TREE PRESERVATION ZONE
T1012	SWEET GUM	8	INTERNAL TREE PRESERVATION ZONE
T1013	DOGWOOD	5	INTERNAL TREE PRESERVATION ZONE
T1023	OAK	8	INTERNAL TREE PRESERVATION ZONE
T1025	TRIPLE OAK	10	INTERNAL TREE PRESERVATION ZONE
T1033	OAK	30	EX. R/W
T1039	HICKORY	13	COMMON OPEN SPACE
T1041	OAK	14	COMMON OPEN SPACE
T1042	SWEET GUM CLUSTER	36	COMMON OPEN SPACE
T1043	OAK	24	COMMON OPEN SPACE
T1500	OAK	24	INTERNAL TREE PRESERVATION ZONE
T1501	OAK	16	INTERNAL TREE PRESERVATION ZONE
T1502	OAK	14	INTERNAL TREE PRESERVATION ZONE
T1503	OAK	14	INTERNAL TREE PRESERVATION ZONE
T1506	OAK	10	INTERNAL TREE PRESERVATION ZONE
T1509	IRONWOOD	4	PERIMETER BUFFER
T1511	OAK	10	PERIMETER BUFFER
T1513	OAK	8	PERIMETER BUFFER
T1514	OAK	8	PERIMETER BUFFER
T1515	OAK	10	PERIMETER BUFFER
T1520	OAK	8	PERIMETER BUFFER
T1522	OAK	8	PERIMETER BUFFER
T1523	IRONWOOD	6	PERIMETER BUFFER
T1527	OAK	8	PERIMETER BUFFER
T1529	OAK	10	INTERNAL TREE PRESERVATION ZONE
T1530	POPLAR	12	INTERNAL TREE PRESERVATION ZONE
T1532	OAK	8	INTERNAL TREE PRESERVATION ZONE
T1533	POPLAR	8	PERIMETER BUFFER
T1535	OAK	8	PERIMETER BUFFER
T1536	OAK	12	INTERNAL TREE PRESERVATION ZONE
T1540	PINE	10	INTERNAL TREE PRESERVATION ZONE
T1541	DOUBLE CEDAR	10	INTERNAL TREE PRESERVATION ZONE
T1543	OAK	12	INTERNAL TREE PRESERVATION ZONE
T1544	OAK	12	INTERNAL TREE PRESERVATION ZONE
T1545	OAK	10	INTERNAL TREE PRESERVATION ZONE
T1548	OAK	12	INTERNAL TREE PRESERVATION ZONE
T1549	CEDAR	10	INTERNAL TREE PRESERVATION ZONE
T1552	BEECH	10	INTERNAL TREE PRESERVATION ZONE
T1553	CEDAR	10	INTERNAL TREE PRESERVATION ZONE
T1555	OAK	18	INTERNAL TREE PRESERVATION ZONE
T1556	OAK	12	INTERNAL TREE PRESERVATION ZONE
T1562	OAK	8	INTERNAL TREE PRESERVATION ZONE
T1564	DOGWOOD	4	INTERNAL TREE PRESERVATION ZONE
T1567	CEDAR	8	INTERNAL TREE PRESERVATION ZONE
T1581	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T1586	OAK	12	INTERNAL TREE PRESERVATION ZONE
T1591	OAK	12	INTERNAL TREE PRESERVATION ZONE
T1593	PINE	8	INTERNAL TREE PRESERVATION ZONE
T1595	POPLAR	8	INTERNAL TREE PRESERVATION ZONE
T1600	OAK	8	INTERNAL TREE PRESERVATION ZONE
T1605	CEDAR	12	INTERNAL TREE PRESERVATION ZONE
T1609	OAK	8	INTERNAL TREE PRESERVATION ZONE
T1612	OAK	8	INTERNAL TREE PRESERVATION ZONE
T1613	OAK	8	INTERNAL TREE PRESERVATION ZONE
T1614	OAK	8	INTERNAL TREE PRESERVATION ZONE
T1615	CEDAR	12	INTERNAL TREE PRESERVATION ZONE
T1618	DOUBLE OAK	10	INTERNAL TREE PRESERVATION ZONE
T1623	OAK	12	INTERNAL TREE PRESERVATION ZONE
T1625	POPLAR	10	INTERNAL TREE PRESERVATION ZONE
T1626	DOGWOOD	4	INTERNAL TREE PRESERVATION ZONE
T1629	DOGWOOD	4	INTERNAL TREE PRESERVATION ZONE
T1630	DOGWOOD	4	INTERNAL TREE PRESERVATION ZONE
SUB-TOTAL TREES TO REMAIN W/O DISTURBANCE	83	895	
	TOTAL TREES	TOTAL TREE DBH (Inches)	
TOTAL TREES TO REMAIN WITHOUT DISTURBANCE (CARRY TO TABLE @ RIGHT)	447	4860	
	TOTAL TREES	TOTAL TREE DBH (Inches)	

NOTES:

1. See Sheets 20 through 22 for enlarged tree mitigation plans.

2. See Sheets as follows for Tree Summary Tables:
   A. Existing Trees To Be Removed And Mitigated - Sheet 23
   B. Existing Trees To Remain But Mitigated - Sheet 23
   C. Existing Heritage Trees On Site - Sheet 23
   D. Existing Trees To Be Removed
      - Mitigation Not Required - Sheet 23
   E. Existing Trees Remaining (To Be Undisturbed) - Sheet 24

FOLLOWING TREE SUMMARY TABLES ON THIS SHEET:

- Existing Trees to Remain as Undisturbed

S:_MESA\2018\043-BROADSTREET HOMES\043-18-002 GROVE MANOR PH2 CDs\ENGINEERING\043-18-002 Shts19-24TreeMitigation.dwg

HARRIS ENGINEERING
5200 PARK ROAD
SUITE 231
CHARLOTTE, NC 28209
P (704) 334-1325
F (704) 334-1330
NC #C-1170 & SC #C00946

TREE SUMMARY TABLES

Grove Manor - Phase 2

Grove Manor NC, LLC
P.O. Box 8790, Virginia Beach, VA. 23450

Revisions
#1 - 11/14/18: Updated tables to include all trees required to be surveyed, per review comments; Revised owner information.
#2 - 3/26/19: Updated Design Firm information.

Job No. 043-18-002
Date 8/24/2018
Proj. Mgr. WMH
Drawn AW

NORTH CAROLINA PROFESSIONAL SEAL #12585 ENGINEER WAYNE M. HARRIS

Scale: NTS