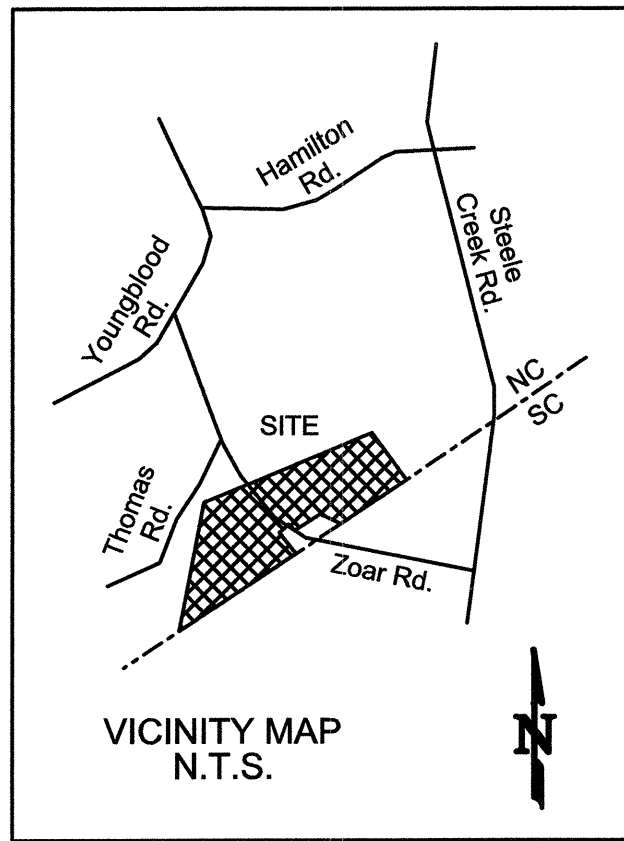




CREEKSHIRE

CHARLOTTE, NORTH CAROLINA ETJ

APPROVED FOR
CONSTRUCTION
By Joshua Weaver (jweaver@charlottenc.gov) at 5:52 pm, May 10, 2012

SWM / DETENTION

N/A

EROSION CONTROL

FOR A PRE-CONSTRUCTION MEETING
48 HRS. PRIOR TO ANY LAND
DISTURBING ACTIVITY, CONTACT:

N/A

DRAINAGE PLAN

APPROVED

By Jordan Miller (jbmiller@charlottenc.gov) at 12:48 pm, May 09, 2012

As noted on sheet 8

TREE ORDINANCE

APPROVED

By Kelly Robertson (krobertson@charlotte.nc.us) at 12:26 pm, Apr 30, 2012

CDOT DRIVEWAYS

APPROVED

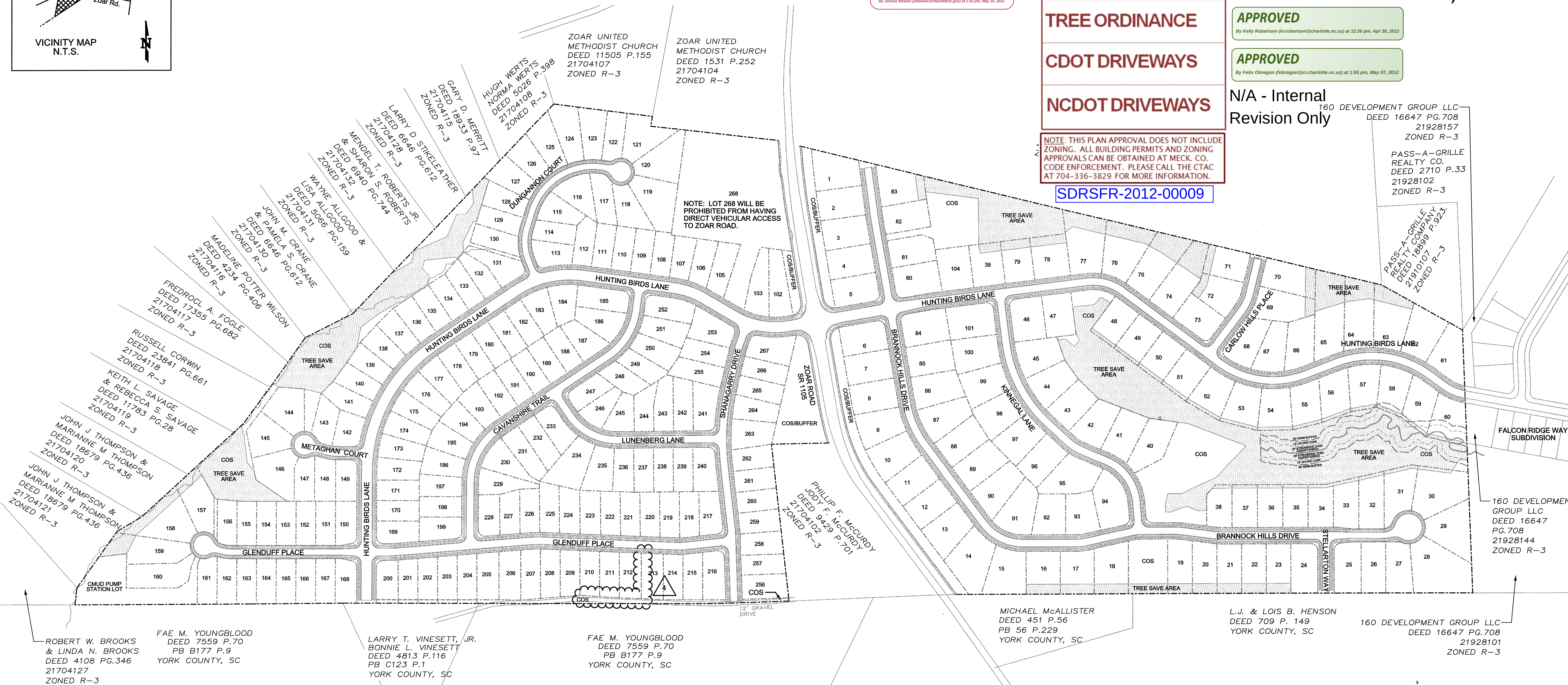
By Felix Obregon (fobregon@ci.charlotte.nc.us) at 1:55 pm, May 07, 2012

NCDOT DRIVEWAYS

N/A - Internal
Revision Only

NOTE: THIS PLAN APPROVAL DOES NOT INCLUDE
ZONING. ALL BUILDING PERMITS AND ZONING
APPROVALS CAN BE OBTAINED AT MECK. CO.
CODE ENFORCEMENT. PLEASE CALL THE CTAC
AT 704-336-3829 FOR MORE INFORMATION.

SDRSFR-2012-00009



NOTE:
ALL BASE INFORMATION USED WAS TAKEN FROM DIGITAL FILES
PROVIDED BY SITE DESIGN STUDIO.

ALL FLOOD STUDY INFORMATION EXCEPT FOR TRIBUTARY UP TO
C.O.S. BETWEEN LOTS 18 & 19 WAS TAKEN FROM PLANS PREPARED
BY LASH ENGINEERING DATED 03-15-2007 SIGNED 03-15-2007

FOR ALL OTHER DESIGN INFORMATION NOT INCLUDED IN THESE
REVISED SHEETS, REFER TO THE APPROVED SET OF PLANS BY
SITE DESIGN STUDIO DATED JUNE 21, 2006, SIGNED APRIL 16, 2007

Call North Carolina One-Call Center, Inc. Before Digging: 1-800-632-4949
A federal law now in effect states that any person who engages in excavation activities without first using an available
one-call notification system to determine locations of underground facilities; or without heeding location information or
markings and subsequently damages a pipeline facility shall be subject to a fine, imprisonment, or both. The law also
states that OSHA may be notified of any accident caused by an excavator.

DESIGNERS:
PREVIOUSLY APPROVED PLANS:
SITE DESIGN STUDIO
4828 CAROUSEL DRIVE
CHARLOTTE, NC 28212
704-763-7876

THIS PLAN SET:
INSITE ENGINEERING & SURVEYING
8041 CORPORATE CENTER DRIVE
SUITE 200
CHARLOTTE, NC 28226
704-540-4706

OWNER:
MI HOMES
5350 77 CENTER DRIVE
SUITE 100
CHARLOTTE, NC 28217

DEVELOPMENT DATA:
EXISTING ZONING = R-3

DEVELOPMENT ZONING CRITERIA = R-3 (WITH TREE ORDINANCE INCENTIVES FOR TREE SAVE AREA)

PROPOSED USE = SINGLE FAMILY DETACHED RESIDENTIAL

TOTAL GROSS SITE AREA = 99.15 AC
CMU PUMP STATION AREA 0.59 AC
NET SITE AREA (FOR TREE SAVE CALC.) = 98.56 AC

COMMON OPEN SPACE PROVIDED = 12.55 AC
PERCENT OF GROSS SITE AREA = 12.66%
TREE SAVE AREA = 10.13 AC
PERCENT OF NET SITE AREA = 10.28%
PERMITTED NO. OF LOTS (BASE ZONING) = 297
PROPOSED NO. OF LOTS = 268

LOT CRITERIA:
MIN. LOT SIZE = 8000 SF*
MIN. LOT WIDTH = 60 FT*
MIN. FRONT SETBACK = 20 FT**
REAR YARD (INTERIOR LOTS) = 30 FT*
REAR YARD (EXTERIOR LOTS) = 45 FT*
SIDE YARD (INTERIOR SIDE YARDS) = 3 FT**
SIDE YARD (EXTERIOR BOUNDARY) = 6 FT**
SIDE YARD (CORNER LOTS) = 10 FT**

* PER CLUSTER DEVELOPMENT PROVISIONS OF THE ZONING ORDINANCE
** PER TREE SAVE AREA INCENTIVE PROVISIONS OF THE TREE ORDINANCE

SHEET INDEX

OVERALL SITE PLAN

2. PRELIMINARY SUBDIVISION PLAN

PRELIMINARY SUBDIVISION PLAN

4. GRADING & STORM DRAINAGE PLAN

5. ROAD PROFILES (1 OF 2)

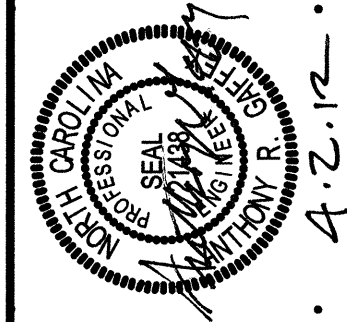
6. ROAD PROFILES (2 OF 2)

7. CULVERT DETAILS

8. STORM DRAINAGE PLAN & PROFILE

0 75 150 300
GRAPHIC SCALE
SCALE: 1" = 150'

DATE:	JUNE 27, 2011
TECHNICIAN:	SCD
CHECKED BY:	ARG
SCALE:	1"=150'
PROJECT NO.:	
DRAWING TITLE:	overall site plan

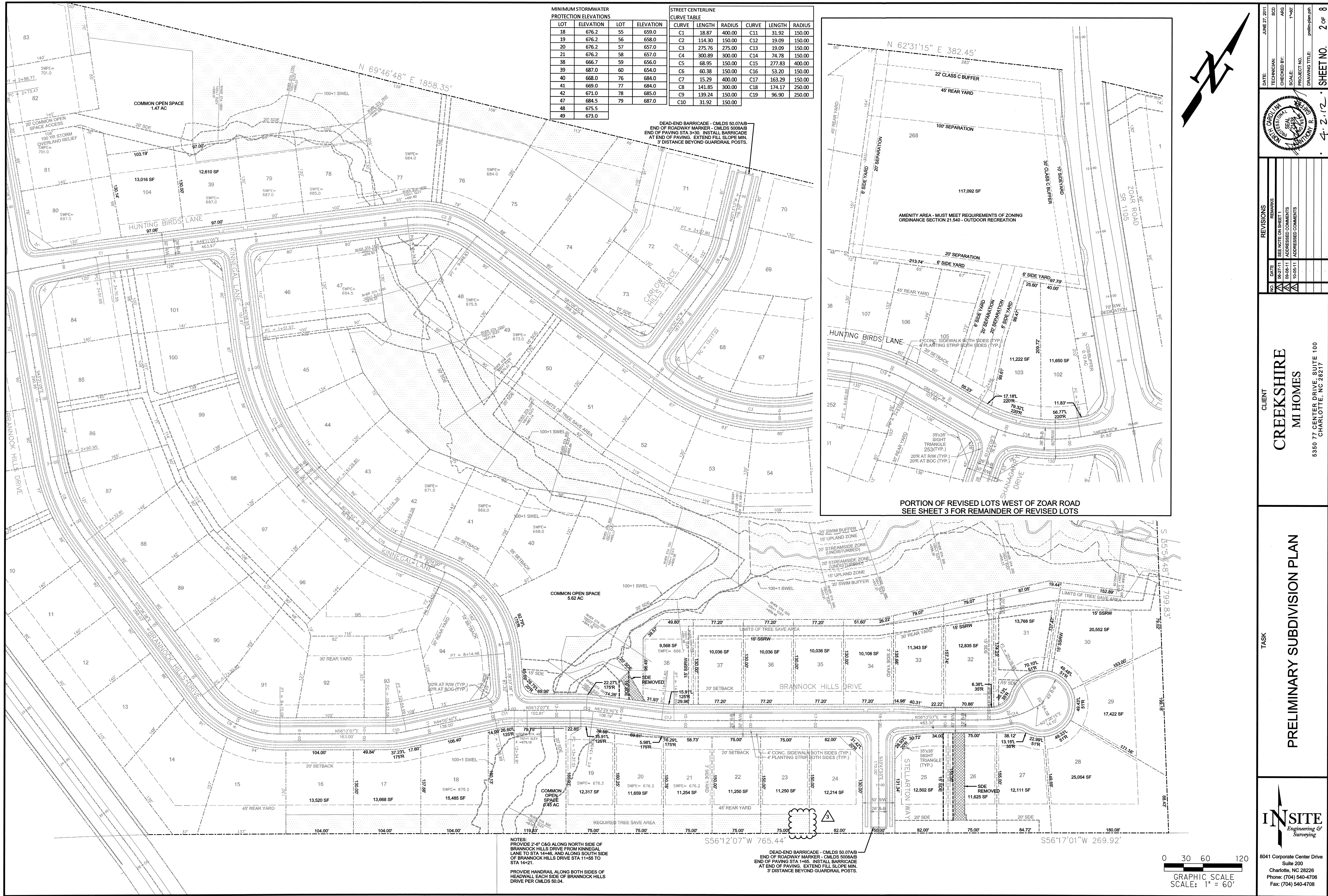


NO.	DATE	REVISIONS	REMARKS
1	06-27-11	SEE NOTE ON SHEET 1	
2	06-08-11	ADDED COMMENTS	
3	10-05-11	ADDED COMMENTS	
4	02-29-12	REVISED STORM DRAINAGE OUTFALL	

CLIENT
**CREEKSHIRE
MI HOMES**
5350 77 CENTER DRIVE, SUITE 100
CHARLOTTE, NC 28217

TASK
OVERALL SITE PLAN

INSITE
Engineering & Surveying
8041 Corporate Center Drive
Suite 200
Charlotte, NC 28226
Phone: (704) 540-4706
Fax: (704) 540-4708



DATE: JUNE 27, 2011
TECHNICIAN: SCD
CHECKED BY: ARG
SCALE: 1"=60'
PROJECT NO.:
DRAWING TITLE: PRELIMINARY SUBDIVISION PLAN
SHEET NO. 2 OF 8

REVISIONS

NO.	DATE	REMARKS
1	06-27-11	SEE NOTE ON SHEET 1
2	06-29-11	ADDRESSED COMMENTS
3	10-05-11	ADDRESSED COMMENTS

CLIENT

CREEKSHIRE MI HOMES

5350 77 CENTER DRIVE, SUITE 100
CHARLOTTE, NC 28217

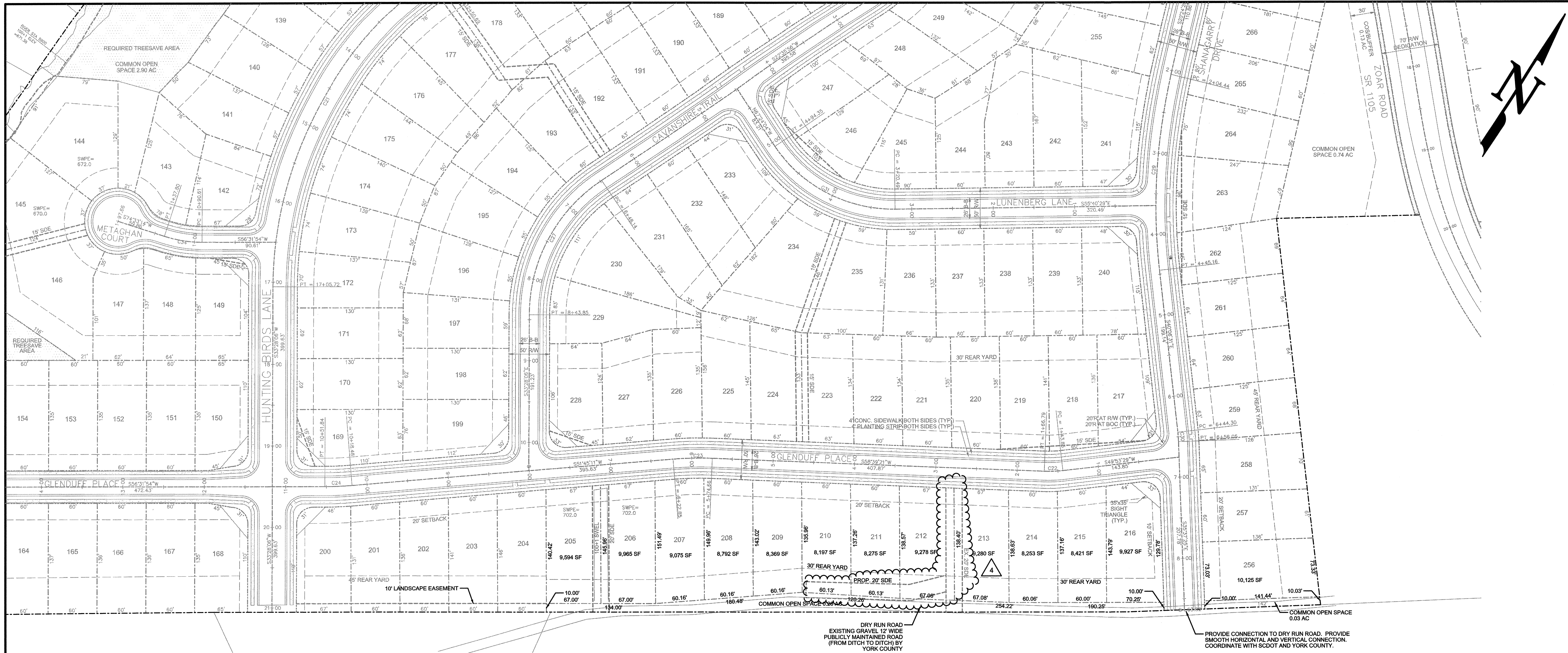
TASK

PRELIMINARY SUBDIVISION PLAN

IN SITE

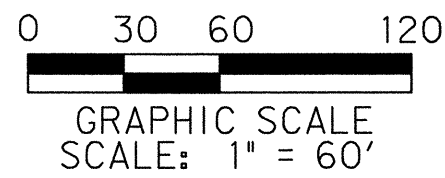
Engineering & Surveying

8041 Corporate Center Drive
Suite 200
Charlotte, NC 28226
Phone: (704) 540-4706
Fax: (704) 540-4708



STREET CENTERLINE		
CURVE TABLE		
CURVE	LENGTH	RADIUS
C18	174.17	250.00
C19	96.90	250.00
C20	217.77	300.00
C21	455.03	465.00
C22	22.95	150.00
C23	48.19	400.00
C24	33.36	400.00
C25	47.18	150.00
C26	168.98	200.00
C27	195.71	200.00
C28	17.11	150.00
C29	240.72	700.00
C30	11.74	150.00
C31	173.87	175.00
C32	101.63	150.00
C33	303.38	195.00
C34	47.18	150.00

MINIMUM STORMWATER	
PROTECTION ELEVATION:	
LOT	ELEVATION
130	706.0
131	706.0
132	704.0
133	701.0
134	697.0
135	693.5
136	691.5
137	703.0
138	703.0
144	672.0
145	670.0
157	665.0
158	664.0
159	658.0
205	702.0
206	702.0



DATE: JUNE 27, 2011

TECHNICIAN: SCD

CHECKED BY: ANG

SCALE: 1"=60'

PROJECT NO.

DRAWING TITLE: preliminary-subdivision-plan

SHEET NO. 3 OF 8

NO. DATE

REVISIONS

REMARKS

SEE NOTE ON SHEET 1

ADDRESS COMMENTS

REVISED STORM DRAINAGE OUTFALL

CLIENT

CREEKSHIRE MI HOMES

5350 77 CENTER DRIVE, SUITE 100 CHARLOTTE, NC 28217

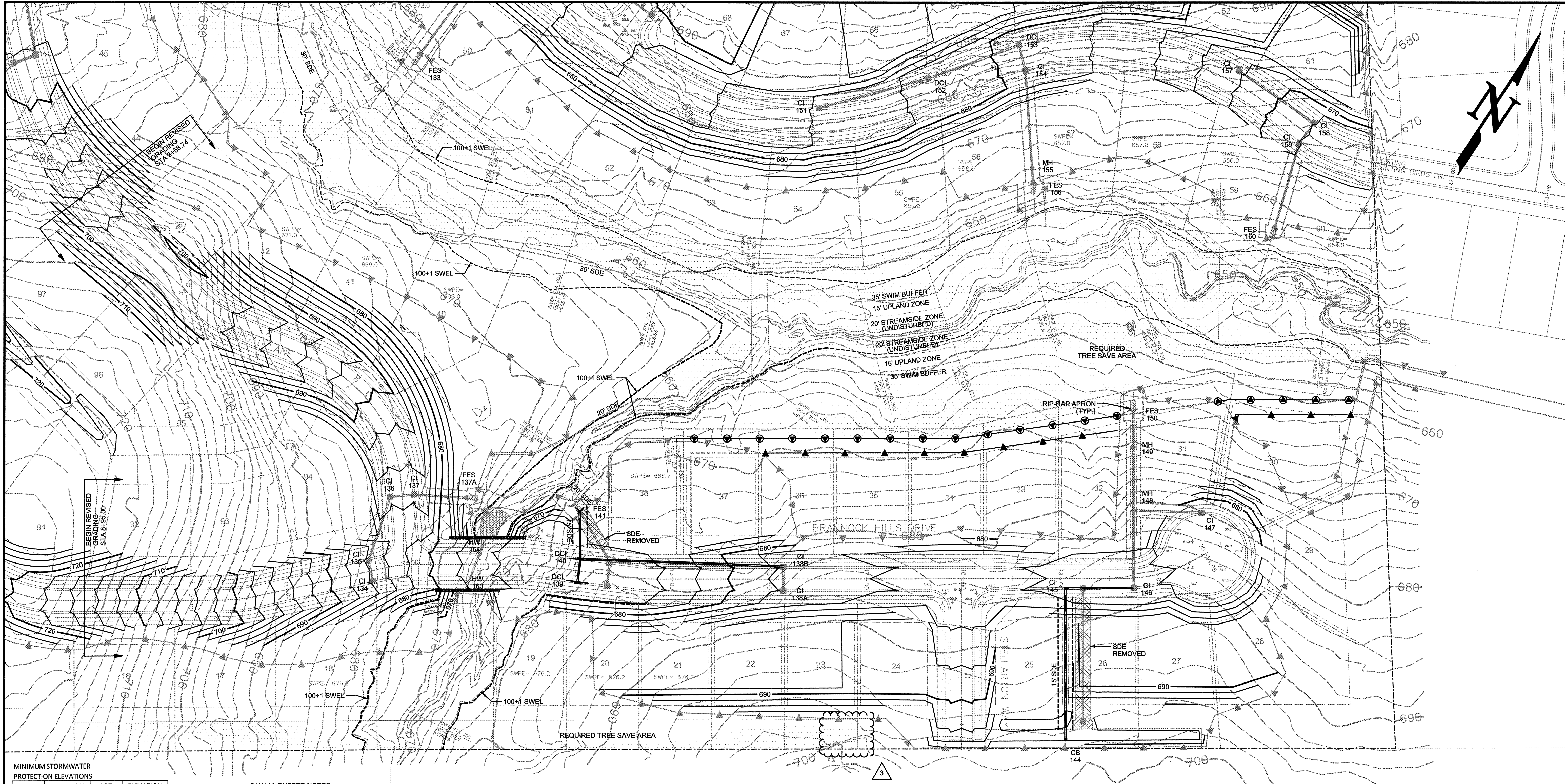
TASK

PRELIMINARY SUBDIVISION PLAN

INSITE

Engineering & Surveying

8041 Corporate Center Drive Suite 200 Charlotte, NC 28226 Phone: (704) 540-4706 Fax: (704) 540-4708



MINIMUM STORMWATER PROTECTION ELEVATIONS			
LOT	ELEVATION	LOT	ELEVATION
18	676.2	55	659.0
19	676.2	56	658.0
20	676.2	57	657.0
21	676.2	58	657.0
38	666.7	59	656.0
39	687.0	60	654.0
40	668.0	76	684.0
41	669.0	77	684.0
42	671.0	78	685.0
47	684.5	79	687.0
48	675.5		
49	673.0		

- LEGEND
- STORM DRAINAGE (PROPOSED)
 - STORM DRAINAGE (PREVIOUSLY APPROVED)
 - PROPOSED GRADES
 - EXISTING GRADES
 - LIMITS OF CONSTRUCTION (PREVIOUSLY APPROVED)
 - LIMITS OF CONSTRUCTION (REVISED)
 - LIMITS OF CONSTRUCTION/TEMPORARY SILT FENCE, CMLDS 30.06A (REVISED)
 - REQUIRED TREE SAVE AREA (PREVIOUSLY APPROVED)

S.W.I.M. BUFFER NOTES

- THE STREAMSIDE ZONE OF THE BUFFER MUST BE LEFT COMPLETELY UNDISTURBED. IN THE MANAGED USE ZONE, A LIMITED NUMBER OF TREES CAN BE REMOVED PROVIDED THAT THE TREE DENSITY REMAINING IS A MINIMUM OF 8 HEALTHY TREES OF A MINIMUM 6 INCH CALIPER PER 1000 SF. REMOVAL OF EXISTING VEGETATION MUST BE PERFORMED IN SUCH A MANNER AS TO PREVENT DAMAGE TO THE ROOTS OF REMAINING TREES.
- ALL ENGINEERED CHANNELS AND PIPED OUTFALLS END OUTSIDE OF THE BUFFER.
- NO FILL MATERIAL IS TO BE BROUGHT INTO THE BUFFER AND NO STRUCTURES ARE ALLOWED WITHIN ANY OF THE BUFFER AREAS (EXCEPT NON-COMMERCIAL OUT BUILDINGS NOT EXCEEDING 150 SF).
- GRADING AND OTHER LAND DISTURBING ACTIVITIES ARE ALLOWED ONLY IN THE UPLAND ZONE; HOWEVER, THESE ACTIVITIES MUST BE PERFORMED IN SUCH A MANNER AS TO PREVENT DAMAGE TO THE ROOTS OF REMAINING TREES. GRASS OR OTHER SUITABLE GROUND COVER CAN BE APPLIED TO THE UPLAND ZONE.
- THE OUTSIDE BUFFER BOUNDARY MUST BE CLEARLY MARKED BY ORANGE FABRIC FENCING PRIOR TO ANY LAND DISTURBING ACTIVITIES (GRADING, TREE CUTTING OR STUMPING, ETC.) AT THE SITE AND THIS FENCING MUST BE CALLED OUT ON THE PLANS.
- THE OUTSIDE BOUNDARY OF THE STREAM BUFFER MUST BE PERMANENTLY MARKED WITH AN IRON PIN OR OTHER ACCEPTABLE PROPERTY CORNER MARKER AT STREET CROSSINGS AND THIS IRON MUST BE CALLED OUT ON PLANS.

NOTE: NO DRAINAGE AREAS FROM PREVIOUSLY APPROVED PLANS WERE CHANGED DUE TO THE REVISED GRADING PER THIS REVISION.

STORMCHART

LINE ID	D.A.	RIM EL.	INV. UP	INV. DN	Q	CAPACITY	VELOCITY	LENGTH	SLOPE	PIPE SIZE
(AC)	(FT)	(FT)	(FT)	(CFS)	(CFS)	(FT/SEC)	(%)	(IN)		
CH37-FES137A	0.34	684.41	673.00	672.00	12.2	14.0	8.2	56	1.79	18
CH36-CH37	1.22	684.41	679.47	679.17	10.8	11.7	7.2	24	1.25	18
CH35-CH36	0.95	685.58	680.53	679.72	5.9	11.5	4.2	66	1.19	18
CH34-CH35	0.45	685.58	681.08	680.78	1.9	11.7	2.6	24	1.25	18
DC140-FES141	0.41	674.03	668.88	668.00	10.3	14.1	7.7	49	1.80	18
CH138B-DC140	0.13	682.17	677.17	669.13	5.7	20.6	4.1	209	3.85	18
CH138A-CH138B	1.22	682.17	677.67	677.42	5.2	10.6	4.4	24	1.01	18
DC139-DC140	0.81	674.03	670.78	670.54	3.4	10.5	4.6	24	1.00	18
MH149-FES150	0.00	672.00	665.40	665.00	18.0	24.2	7.2	35	1.14	24
MH148-MH149	0.00	682.00	674.00	668.00	16.3	31.7	13.5	66	9.09	18
CH146-MH148	0.20	682.40	677.80	676.20	13.3	14.9	8.6	80	2.00	18
CH145-CH146	0.54	683.44	679.05	678.00	12.7	12.9	7.2	70	1.50	18
CB144-CH145	2.57	695.50	689.00	679.25	10.8	26.3	6.5	155	6.29	18
CH147-MH148	0.81	680.20	674.85	674.25	3.4	9.7	1.9	70	0.86	18

RIM ELEVATIONS ARE LOCATED AT EDGE OF PAVEMENT
B=SLAB TYPE CATCH BASIN
A=CLASS IV RCP
FES=FLARED END SECTION
DC=DOUBLE CURB INLET
CI=CURB INLET
CB=CATCH BASIN
MH=MANHOLE

Grading Notes

- Property boundary from survey by Jack R.Christian and Associates. See sheet L-2.
- All proposed contours and spot elevations are finished surface grade.
- Existing and proposed contours are at two foot intervals.
- All cut and fill slopes are to be 3:1 maximum grade, unless otherwise noted in plans or details. Sediment basin embankments may be set at 2:1 slopes.
- No soil disturbance or compaction, construction materials, traffic, trenching, or other land disturbing activity shall be permitted beyond limits of grading.
- Proposed contours within public street rights-of-way and immediate edges are for reference only. See profile sheets and cross-section details for exact elevations.
- Coordinate all curb and street grades in intersection with Inspector. Warp pavement and gutter at intersections as necessary to provide smooth transitions and to prevent ponding of water along curbs.
- Approval of this plan is not an authorization to grade adjacent properties. When field conditions warrant off-site grading, written permission must be obtained from affected property owners.
- Subsurface drainage facilities may be required in the street right-of-way if deemed necessary by the Inspector.
- No grading is allowed in any areas indicated as "Tree Save Areas" or SWM buffers.
- Contractor shall coordinate locations of all borrow pits and topsoil spoil areas with developer. These locations shall be inside Limits of Construction shown on plan.
- Contractor to ensure drainage away from all building pads.
- Owner shall employ the services of an independent testing laboratory (ITL) to determine the suitability of soils for intended use. Contractor shall schedule these services. Unsuitable soils shall be undercut as directed by the ITL, replaced, and compacted with approved fill material.
- All slopes greater than ten (10) vertical feet shall be terraced or otherwise stabilized to slow water velocity. See detail 8/L-14.
- Minimum 10' clear zone from Top of Channel Bank to denuded limit shall be maintained.
- No disturbance of any wetlands shall occur until all State and Federal permits are obtained. Copies of permits shall be given to City Inspector.

Project: Creekshire Subdivision
Location: City of Charlotte ETJ
Rainfall Intensity = 4 in/hr
Computed By: SCD
Checked By: ARG
Date: 9/13/2011

Inlet #	Drainage Area(AC)	Runoff Coef. C	Surface Q		Slope		K	Inlet Q cap	Spread T	Depth D	Bypass		Remarks
			Sub	Total	Long	Trans.					Q	To Inlet #	
137	0.34	0.6	0.82	0.82	0.0500	0.03125	30	0.94	3.7	0.12	0.00	140	
136	1.22	0.6	2.93	2.93	0.0500	0.03125	30	1.86	6.0	0.19	1.07	140	
135	0.95	0.6	2.28	2.28	0.1000	0.03125	32	1.37	4.8	0.15	0.91	140	
134	0.45	0.6	1.08	1.08	0.1000	0.03125	32	0.86	3.6	0.11	0.22	139	
138a	1.22	0.6	2.93	2.93	0.0300	0.03125	26	1.89	6.6	0.21	1.04	139	
138b	0.13	0.85	0.44	0.44	0.0300	0.03125	26	0.58	3.3	0.10	0.00	140	
140	0.41	0.85	1.39	3.38	SAG	0.03125	7.0	0.22	7.0	0.22	N/A	N/A	SAG/DOUBLE CB
139	0.81	0.6	1.94	3.20	SAG	0.03125			6.8	0.21	N/A	N/A	SAG/DOUBLE CB

GRATE INLET EQUATIONS

T (from Manning equation)
 $T = [Q \cdot n \cdot (2.48)^{0.58} / (S \cdot 1.49)^{0.58}]^{1.49}$ (Eq. 5.5)
 $Q_{CAP} = K \cdot D^{5.93}$ (Eq. 5.7)
 $K = \text{Grate Coefficient (Figure 6-1)}$
 $D = 1/2$ (Eq. 5.6)
 $Z = 1/S$ (Eq. 5.4)

Grate Inlet in Sump
 $D_{WIER} = (Surface \cdot Q_{total} / 3.3P)^{0.5}$ (Eq. 5.8)
 $P = 6.94 \text{ ft. single type "E" grate}$
 $P = 9.92 \text{ ft. Double type "E" grate}$
Grate Inlet on Grade
For Double Grate assume 30% more "Inlet Q cap"
Drop Inlet Orifice
 $D_{ORICE} = [Surface \cdot Q_{total} / 0.6 \cdot A \cdot 64.4^{1/2}]^{0.5}$ (Eq. 5.8)
 $A = 3.66 \text{ sq. ft. drop inlet grate}$ (Eq. 5.6)
 $T=DZ$

NOTE:
Tables and equations referenced in Calculation are located in:
Charlotte Mecklenburg
Stormwater Design Manual

0 25 50 100
GRAPHIC SCALE
SCALE: 1" = 50'

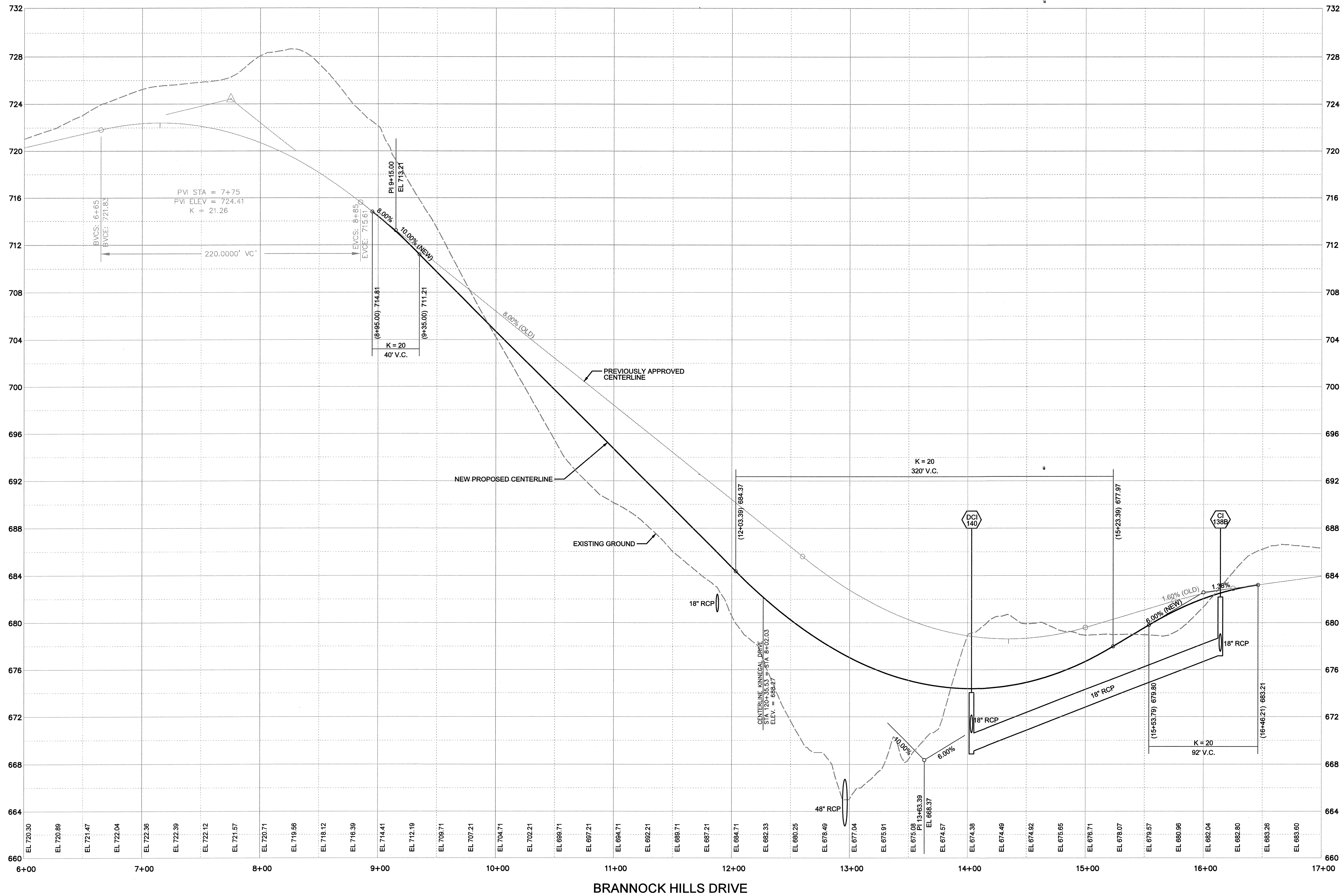
DATE: JUNE 27, 2011
TECHNICIAN: SCD
CHECKED BY: ARG
SCALE: 1"=50'
PROJECT NO.:
DRAWING TITLE: grade-drain plan
SHEET NO. 4 of 8

REVISIONS
NO. DATE REVISIONS
1 06/27/11 SEE NOTE ON SHEET
2 08/08/11 ADDRESS COMMENTS
3 10/05/11 ADDRESS COMMENTS

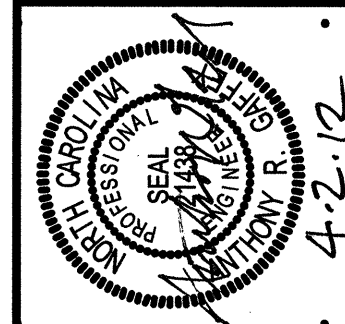
CLIENT
CREEKSHIRE
MI HOMES
5350 77 CENTER DRIVE, SUITE 100
CHARLOTTE, NC 28217

TASK
GRADING & STORM DRAINAGE PLAN

IN SITE
Engineering & Surveying
8041 Corporate Center Drive
Suite 200
Charlotte, NC 28226
Phone: (704) 540-4708
Fax: (704) 540-4708



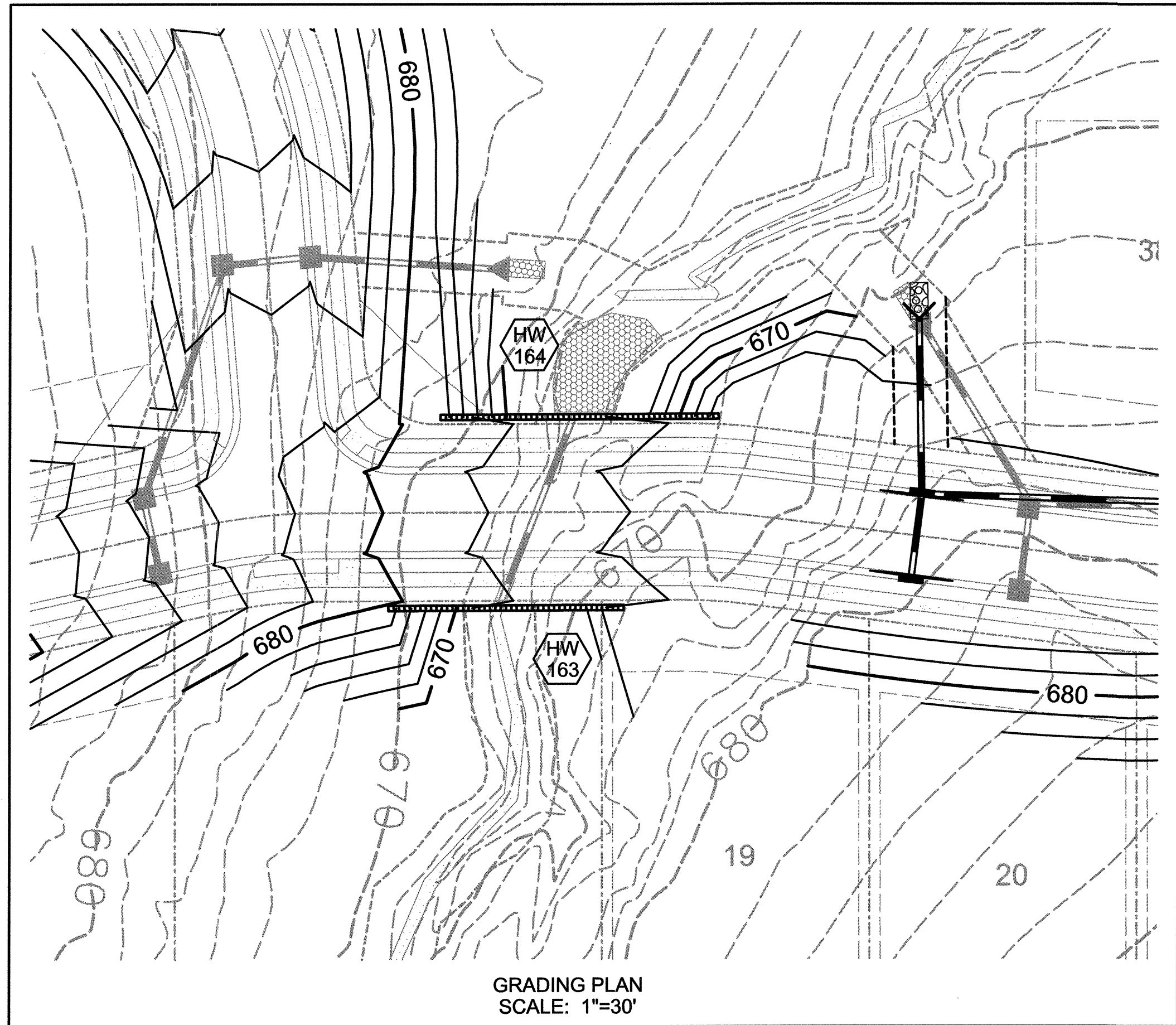
DATE:	JUNE 27, 2011
TECHNICIAN:	SCD
CHECKED BY:	ARG
SCALE:	1"=40' HORIZ. 1"=4' VERT.
PROJECT NO.:	100
DRAWING TITLE:	road-profile.sph
SHEET NO.:	5 OF 8



REVISIONS		REMARKS
NO.	DATE	
1	06-27-11	SEE NOTE ON SHEET
2	09-08-11	ADDRESSED COMMENTS

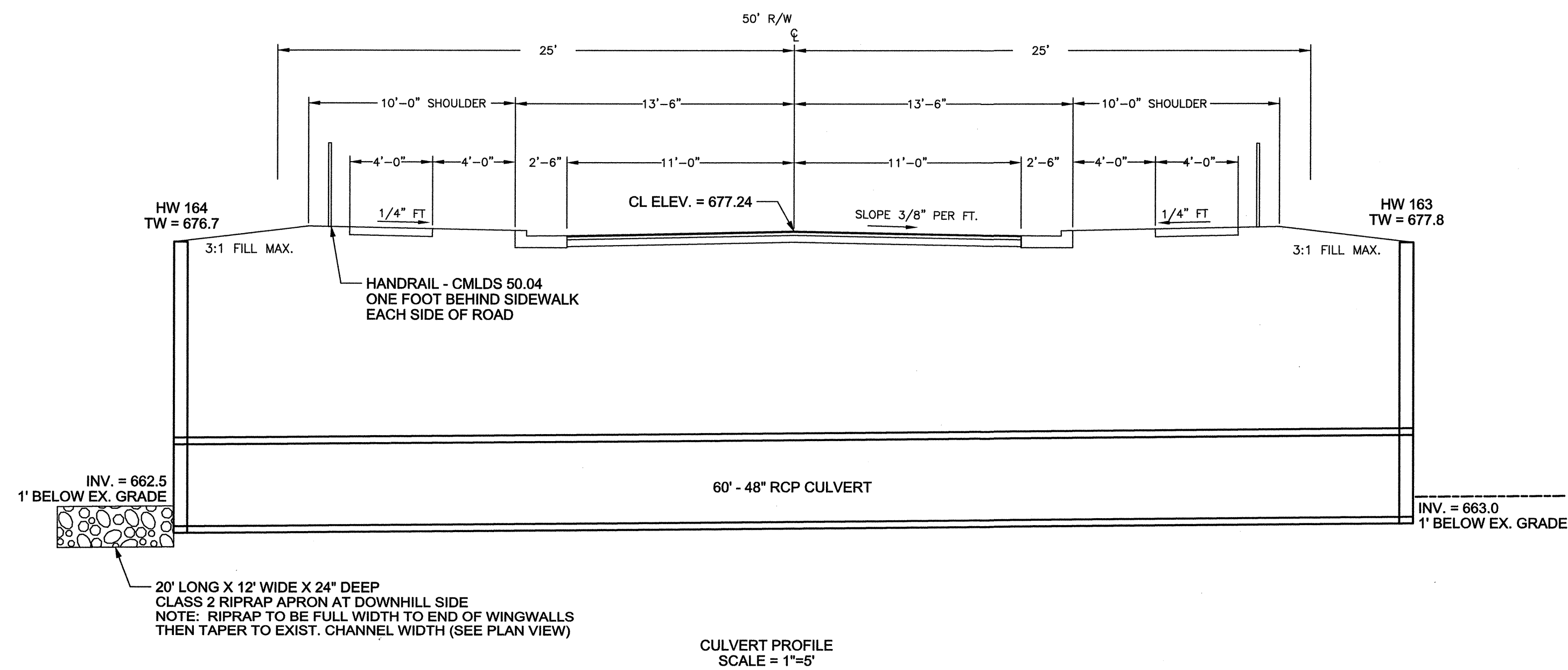
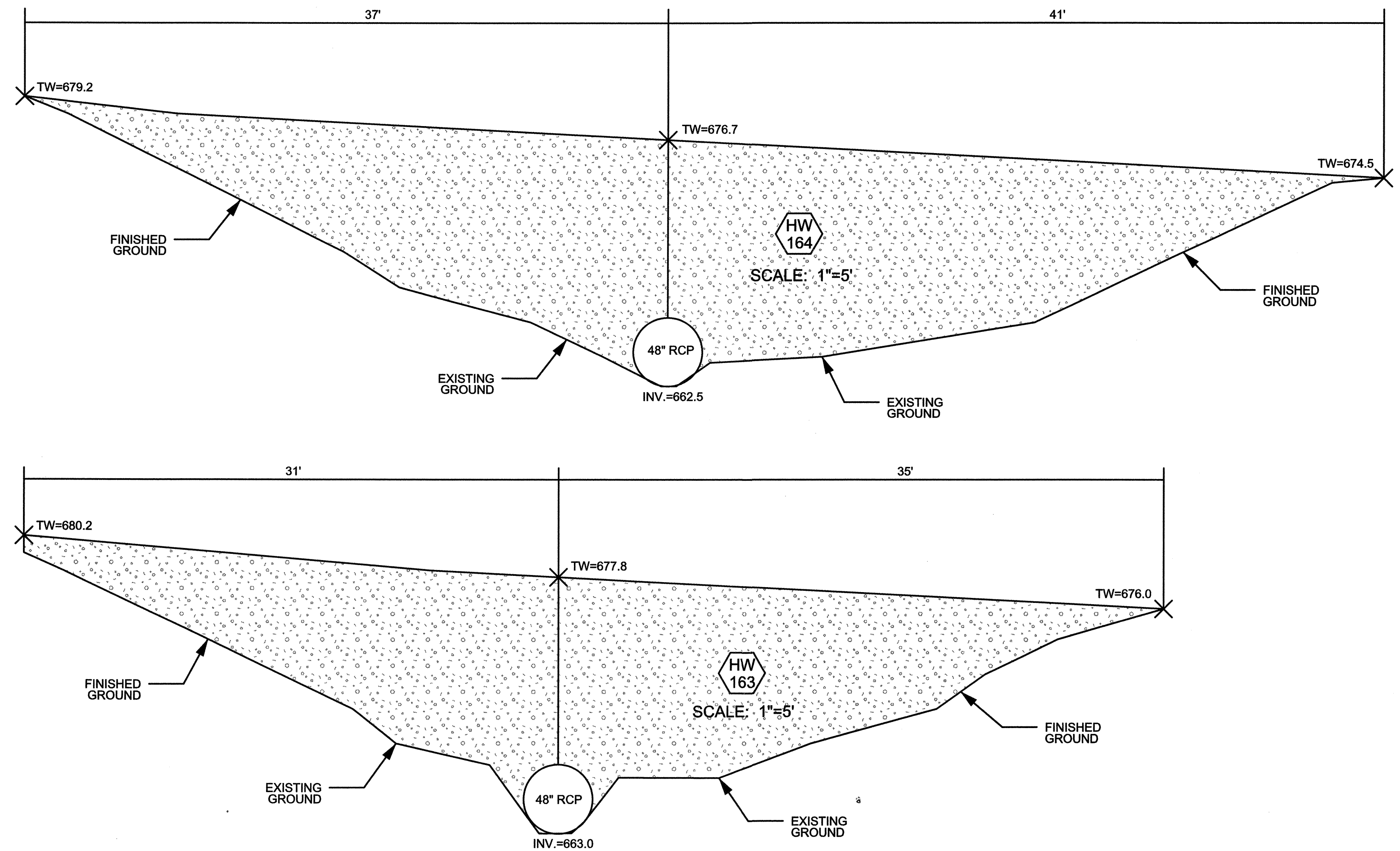
CLIENT
CREEKSHIRE MI HOMES
5350 77 CENTER DRIVE, SUITE 100
CHARLOTTE, NC 28217

TASK
ROAD PROFILES (1 OF 2)



NOTES:

1. DEVELOPER'S GEOTECHNICAL ENGINEER SHALL SUPERVISE EXCAVATION OF CHANNEL AND VERIFY BEDDING REQUIREMENTS PRIOR TO INSTALLATION OF PIPE. UNSUITABLE MATERIALS ARE TO BE REMOVED FROM UNDER CULVERT AND PIPE INSTALLED ON FIRM SOIL OR BEDDING
2. CONTRACTOR/DEVELOPER SHALL SUBMIT PE SEALED HEADWALL DESIGN PLANS TO NCDOT FOR APPROVAL PRIOR TO CONSTRUCTION.
3. HEADWALLS SHALL BE POURED IN PLACE AND LOCATED OUTSIDE PUBLIC STREET RIGHT-OF-WAY, AS SHOWN ON PLAN.



NO.	DATE	REVISIONS
1	06-27-11	SEE NOTE ON SHEET 1
2	09-05-11	ADDRESSED COMMENTS

CLIENT
CREEKSHIRE MI HOMES
5350 77 CENTER DRIVE, SUITE 100
CHARLOTTE, NC 28217

TASK
CULVERT DETAILS

