TOWN OF CHAPEL HILL

SIGNING PLAN
ORANGE COUNTY

LOCATION: ELLIOTT ROAD FROM APPROX. 650' WEST OF FORDHAM BOULEVARD TO EPHESUS CHURCH ROAD; FORDHAM BOULEVARD FROM APPROX. 400' SOUTH OF ELLIOTT ROAD TO APPROX. 430' NORTH OF ELLIOTT ROAD

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS
1264.02	PLACEMENT OF OBJECT MARKERS

GENERAL NOTES

- IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY TOWN FORCES.
- IF REMOVAL OR RELOCATION OF PRIVATE SIGNS SUCH AS STREET SIGNS, PARKING, BUS STOP, AND COMMUNITY WATCH, IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY TOWN FORCES.
- WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER
- ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.
- WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.
- THE BACKGROUND FOR TYPE E SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4025000000	901	CONTRACTOR FURNISHED, TYPE E SIGN	389	S.F.
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	1080	L.F.
4102000000	904	SIGN ERECTION, TYPE E	41	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	27	EA.
4192000000	907	DISPOSAL OF SUPPORT, U-CHANNEL	7	EA.

INDEX

SHEET NO.	DESCRIPTION
SGN-1	TITLE SHEET
SGN-2	SIGNING PLAN SUMMARY SHEET
SGN-3	N/A
SGN-4 THRU 6	SIGNING PLAN

No.	REVISIONS	DATE	BY

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NORTH CAROLINA PROFESSIONAL SEAL 030792 ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020	
DATE 7/6/2020	
SCALE	NTS
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

SIGNING PLAN
TITLE SHEET

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
SGN-1

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7/6/2020 K:\DUR_Roadway\011159020 - Elliott Extension\Plan\Signing\011159020_sgn_1.dgn

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(401) QUANTITY REQ'D _3_

30" X 24"
R3-17

ONE "U" POST PER SIGN

(402) QUANTITY REQ'D _1_

30" X 12"
R3-17BP

MOUNT BELOW SIGN #401
IN 1 INSTALLATION

(403) QUANTITY REQ'D _6_

30" X 30"
R1-1

ONE "U" POST PER SIGN

(404) QUANTITY REQ'D _2_

36" X 30"
R4-4

ONE "U" POST PER SIGN

(405) QUANTITY REQ'D _1_

18" X 18"
OM1-3

MOUNT BELOW SIGN #406
IN 1 INSTALLATION

(406) QUANTITY REQ'D _7_

24" X 30"
R4-7

ONE "U" POST PER SIGN

(407) QUANTITY REQ'D _1_

12" X 18"
R10-22

ONE "U" POST PER SIGN

(408) QUANTITY REQ'D _3_

12" X 18"
R9-7

ONE "U" POST PER SIGN

(409) QUANTITY REQ'D _2_

24" X 30"
R2-1

ONE "U" POST PER SIGN

(410) QUANTITY REQ'D _1_

36" X 12"
R6-1 (R)

ONE "U" POST PER SIGN

(411) QUANTITY REQ'D _2_

30" X 12"
R3-17AP

MOUNT BELOW SIGN #401
IN 1 INSTALLATION

MOUNT BELOW SIGN #423
IN 1 INSTALLATION

(412) QUANTITY REQ'D _8_

30" X 30"
W11-2

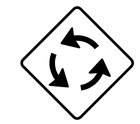
ONE "U" POST PER SIGN

(413) QUANTITY REQ'D _8_

24" X 12"
W16-7P (L)

MOUNT BELOW SIGN #412
IN 8 INSTALLATIONS

(414) QUANTITY REQ'D _4_

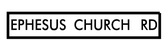


30" X 30"
W2-6

ONE "U" POST PER SIGN

MOUNT BELOW SIGN #417
IN 1 INSTALLATION

(415) QUANTITY REQ'D _3_



36" X 8"
W16-8P
4" LETTER HEIGHT

MOUNT BELOW SIGN #414
IN 3 INSTALLATIONS

(416) QUANTITY REQ'D _8_

12" X 36"
R1-6

ONE "U" POST PER SIGN

(417) QUANTITY REQ'D _4_

36" X 36" X 36"
R1-2

ONE "U" POST PER SIGN

(418) QUANTITY REQ'D _3_

90" X 18"
D1-1d
6" LETTER HEIGHT

ONE "U" POST PER SIGN

(419) QUANTITY REQ'D _4_

36" X 24"
R5-1A

ONE "U" POST PER SIGN

(420) QUANTITY REQ'D _4_

30" X 30"
R5-1

ONE "U" POST PER SIGN

(421) QUANTITY REQ'D _4_

30" X 24"
R6-4

ONE "U" POST PER SIGN

(422) QUANTITY REQ'D _1_

36" X 36"
S4-5

ONE "U" POST PER SIGN

(423) QUANTITY REQ'D _1_

36" X 36"
S1-1

ONE "U" POST PER SIGN

No.	REVISIONS	DATE	BY

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NORTH CAROLINA PROFESSIONAL SEAL 040192 ENGINEER CHADWICK W. BECK

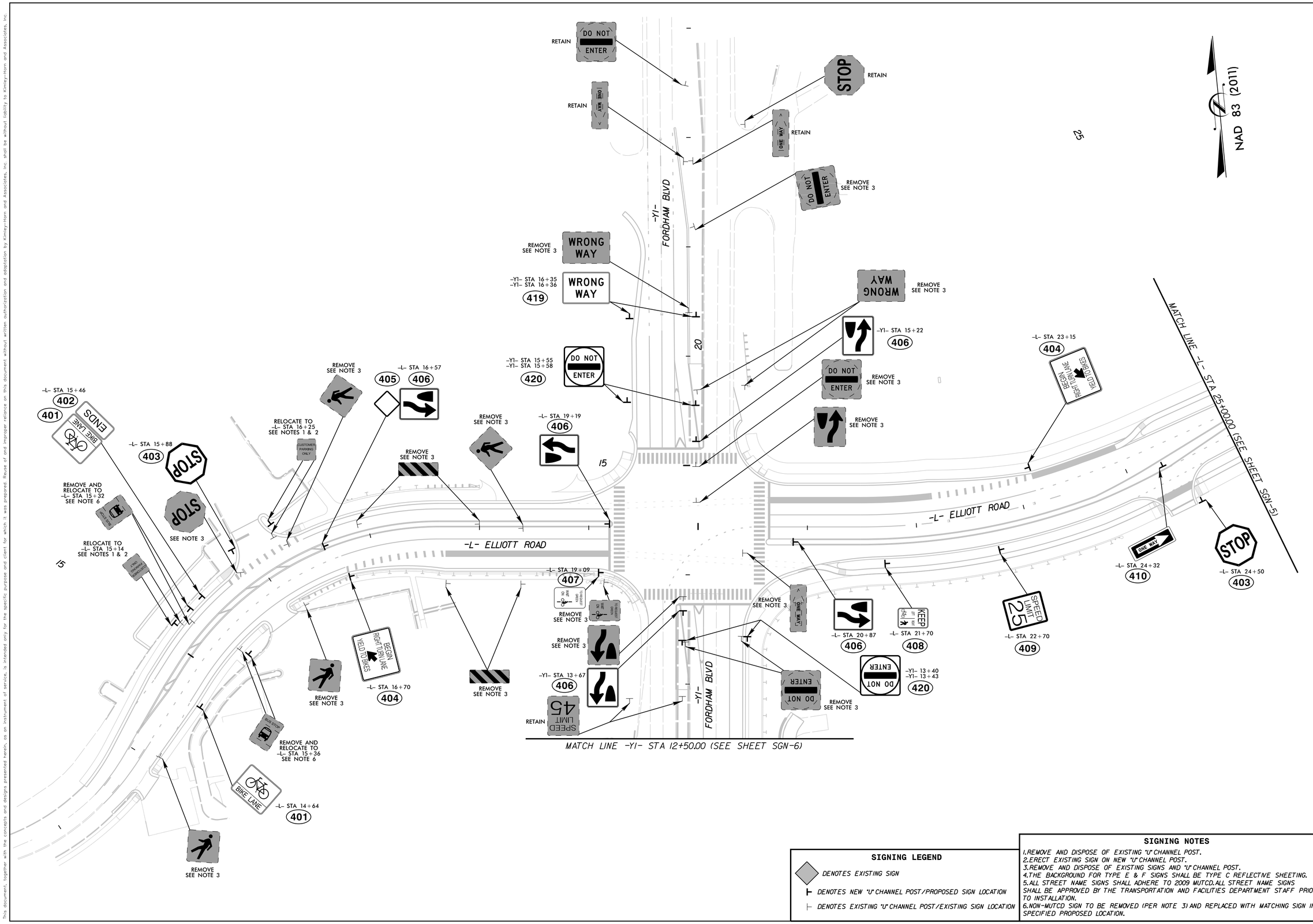
FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT	011159020
DATE	7/6/2020
SCALE	1" = 40'
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

SIGNING PLAN SUMMARY SHEET

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
SGN-2



SIGNING LEGEND

- DENOTES EXISTING SIGN
- DENOTES NEW "U" CHANNEL POST/PROPOSED SIGN LOCATION
- DENOTES EXISTING "U" CHANNEL POST/EXISTING SIGN LOCATION

SIGNING NOTES

1. REMOVE AND DISPOSE OF EXISTING "U" CHANNEL POST.
2. ERECT EXISTING SIGN ON NEW "U" CHANNEL POST.
3. REMOVE AND DISPOSE OF EXISTING SIGNS AND "U" CHANNEL POST.
4. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.
5. ALL STREET NAME SIGNS SHALL ADHERE TO 2009 MUTCD. ALL STREET NAME SIGNS SHALL BE APPROVED BY THE TRANSPORTATION AND FACILITIES DEPARTMENT STAFF PRIOR TO INSTALLATION.
6. NON-MUTCD SIGN TO BE REMOVED (PER NOTE 3) AND REPLACED WITH MATCHING SIGN IN SPECIFIED PROPOSED LOCATION.

No.	REVISIONS	DATE	BY

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT	011159020
DATE	7/6/2020
SCALE	1" = 40'
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

SIGNING PLAN

ELLIOTT ROAD EXTENSION

PREPARED FOR

TOWN OF CHAPEL HILL, NC

CHAPEL HILL NORTH CAROLINA

SHEET NUMBER

SGN-4

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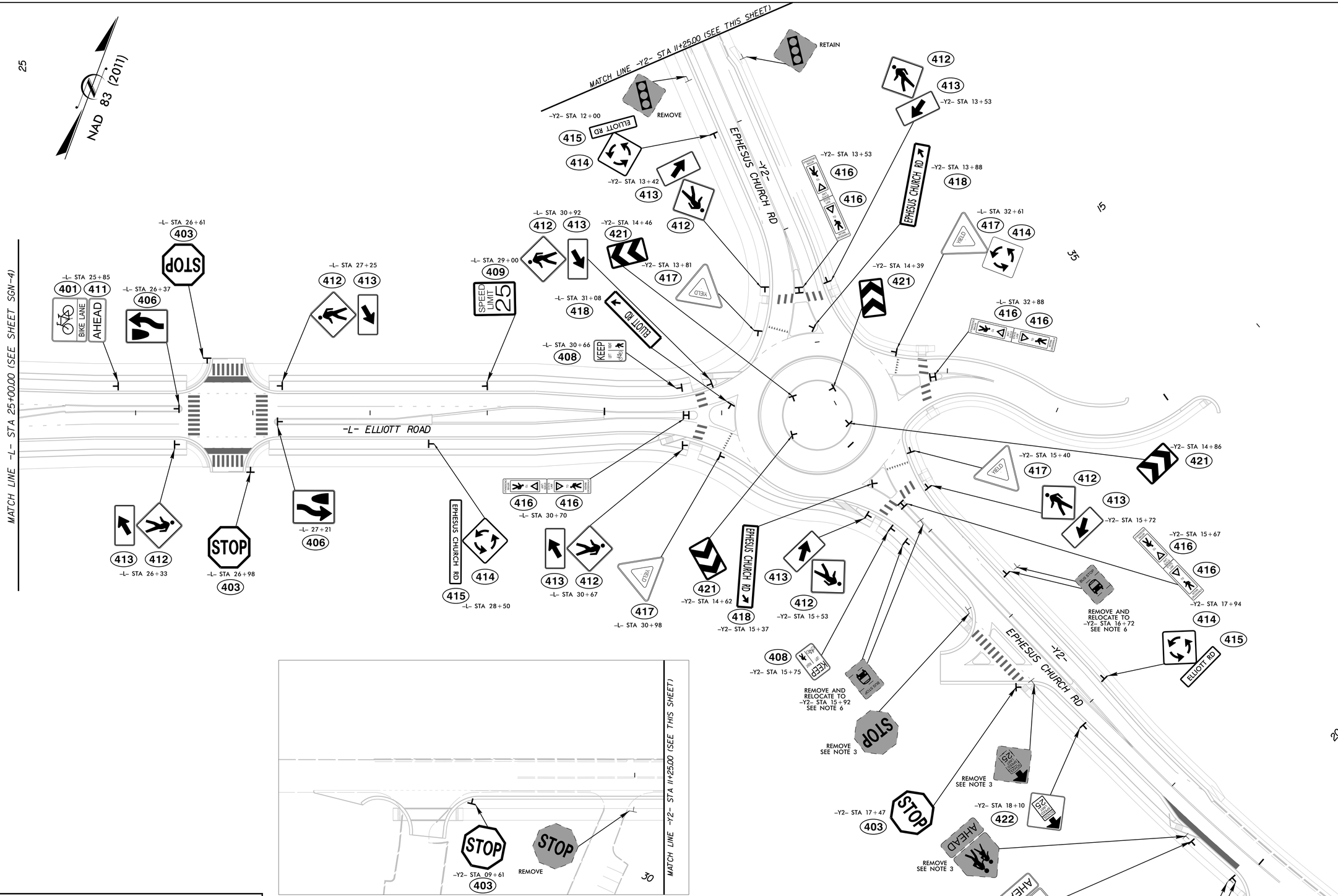

SIGNING NOTES

1. REMOVE AND DISPOSE OF EXISTING "U" CHANNEL POST.
2. ERECT EXISTING SIGN ON NEW "U" CHANNEL POST.
3. REMOVE AND DISPOSE OF EXISTING SIGNS AND "U" CHANNEL POST.
4. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.
5. ALL STREET NAME SIGNS SHALL ADHERE TO 2009 MUTCD. ALL STREET NAME SIGNS SHALL BE APPROVED BY THE TRANSPORTATION AND FACILITIES DEPARTMENT STAFF PRIOR TO INSTALLATION.
6. NON-MUTCD SIGN TO BE REMOVED (PER NOTE 3) AND REPLACED WITH MATCHING SIGN IN SPECIFIED PROPOSED LOCATION.

SIGNING LEGEND

- DENOTES EXISTING SIGN
- DENOTES NEW "U" CHANNEL POST/PROPOSED SIGN LOCATION
- DENOTES EXISTING "U" CHANNEL POST/EXISTING SIGN LOCATION

No.	REVISIONS	DATE	BY

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT	011159020
DATE	7/6/2020
SCALE	1" = 40'
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

SIGNING PLAN

ELLIOTT ROAD EXTENSION

PREPARED FOR

TOWN OF CHAPEL HILL, NC

CHAPEL HILL NORTH CAROLINA

SHEET NUMBER

SGN-5

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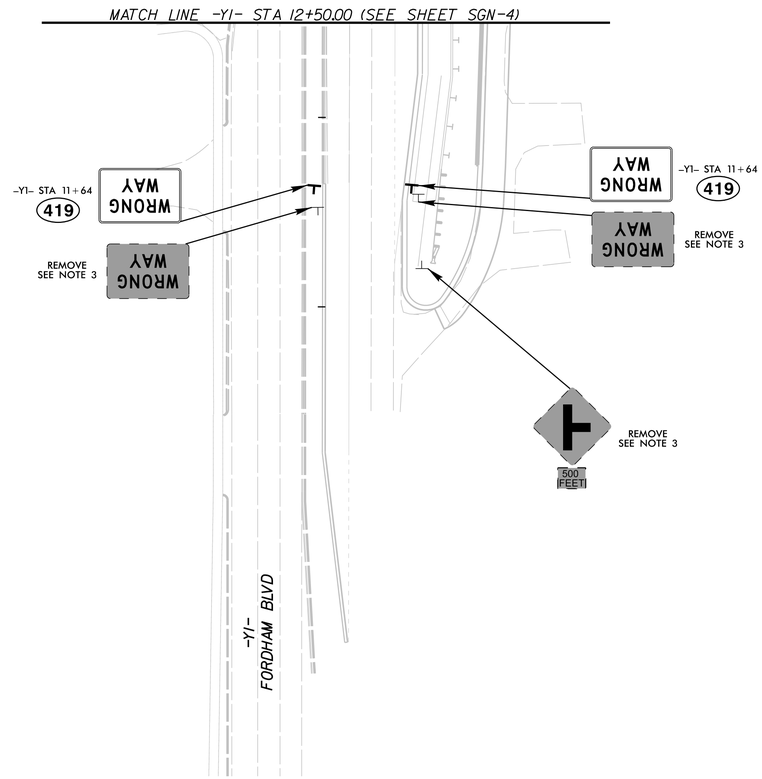

SIGNING NOTES

1. REMOVE AND DISPOSE OF EXISTING "U" CHANNEL POST.
2. ERECT EXISTING SIGN ON NEW "U" CHANNEL POST.
3. REMOVE AND DISPOSE OF EXISTING SIGNS AND "U" CHANNEL POST.
4. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.
5. ALL STREET NAME SIGNS SHALL ADHERE TO 2009 MUTCD. ALL STREET NAME SIGNS SHALL BE APPROVED BY THE TRANSPORTATION AND FACILITIES DEPARTMENT STAFF PRIOR TO INSTALLATION.
6. NON-MUTCD SIGN TO BE REMOVED (PER NOTE 3) AND REPLACED WITH MATCHING SIGN IN SPECIFIED PROPOSED LOCATION.

SIGNING LEGEND

- DENOTES EXISTING SIGN
- DENOTES NEW "U" CHANNEL POST/PROPOSED SIGN LOCATION
- DENOTES EXISTING "U" CHANNEL POST/EXISTING SIGN LOCATION

No.	REVISIONS	DATE	BY

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NORTH CAROLINA PROFESSIONAL SEAL 045325 ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020

DATE	7/6/2020
SCALE	1" = 40'
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

SIGNING PLAN

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
SGN-6

TOWN OF CHAPEL HILL

PAVEMENT MARKING PLAN
ORANGE COUNTY

LOCATION: ELLIOTT ROAD FROM APPROX. 650' WEST OF FORDHAM BOULEVARD TO EPHESUS CHURCH ROAD; FORDHAM BOULEVARD FROM APPROX. 400' SOUTH OF ELLIOTT ROAD TO APPROX. 430' NORTH OF ELLIOTT ROAD

INDEX

SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN AND SCHEDULE SHEET
PMP-2 THRU 3	N/A
PMP-4 THRU 6	PAVEMENT MARKING DETAILS

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - 2 LANE AND MULTILANE ROADWAYS
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOL AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY

PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION
	THERMOPLASTIC (4", 90 MILS)
TA	WHITE EDGELINE
TB	YELLOW EDGELINE
	THERMOPLASTIC (4", 120 MILS)
TC	WHITE 10' SKIP
TD	WHITE 3' - 9'/SP MINISKIP
TE	WHITE SOLID LANE LINE
TF	YELLOW 10' SKIP
TH	YELLOW SINGLE CENTER
TI	YELLOW DOUBLE CENTER
T8	WHITE 2' - 6'/SP MINISKIP
	THERMOPLASTIC (8", 90 MILS)
TN	WHITE GORE LINE
TO	WHITE DIAGONAL
TP	YELLOW DIAGONAL
	THERMOPLASTIC (12", 120 MILS)
T10	WHITE 3' - 3'/SP MINISKIP
	THERMOPLASTIC (24", 120 MILS)
T2	WHITE STOPBAR
T3	WHITE CROSSWALK LINE
	THERMOPLASTIC PAVEMENT MARKING SYMBOLS (90 MILS)
UA	LEFT TURN ARROW
UB	RIGHT TURN ARROW
UC	STRAIGHT ARROW
UJ	BICYCLE SYMBOL
UK	BICYCLE STRAIGHT ARROW
UM	12" YIELD LINE TRIANGLE
UN	24" YIELD LINE TRIANGLE
UR	SHARROW

GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHEN OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
ALL	THERMOPLASTIC	PERMANENT RAISED MARKERS

B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKINGS AT PROJECT LIMITS.

C) CONTRACTOR SHALL MILL ANY EXISTING MARKINGS OR SYMBOLS IN CONFLICT WITH PROPOSED MARKINGS.

D) RAISED REFLECTIVE PAVEMENT MARKINGS ARE TO BE PLACED ACCORDING TO NCDOT ROADWAY STANDARD DRAWINGS.

E) ALL RAISED REFLECTIVE PACEMENT MARKERS TO BE SNOWPLOWABLE.

F) OBTAIN APPROVAL OF PAVEMENT MARKING DESIGN PRIOR TO INSTALLTION.

G) ADDITIONAL SUPPLEMENTARY GREEN MARKINGS SHALL BE USED WITHIN ONSTREET BIKE PATHS AT AREAS OF INCREASED VEHICULAR CONFLICTS IN ADDITION TO THE STANDARD NCDOT PAVEMENT MARKINGS PER NACTO GUIDANCE.

LEGEND

SHEET NO.	DESCRIPTION
◨	CRYSTAL/RED PAVEMENT MARKER
◆	YELLOW/YELLOW PAVEMENT MARKER
⇦	DIRECTION OF TRAFFIC FLOW

No.	REVISIONS	DATE	BY

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020	
DATE	7/6/2020
SCALE	NTS
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

PAVEMENT MARKING PLAN AND SCHEDULE SHEET

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
PMP-1

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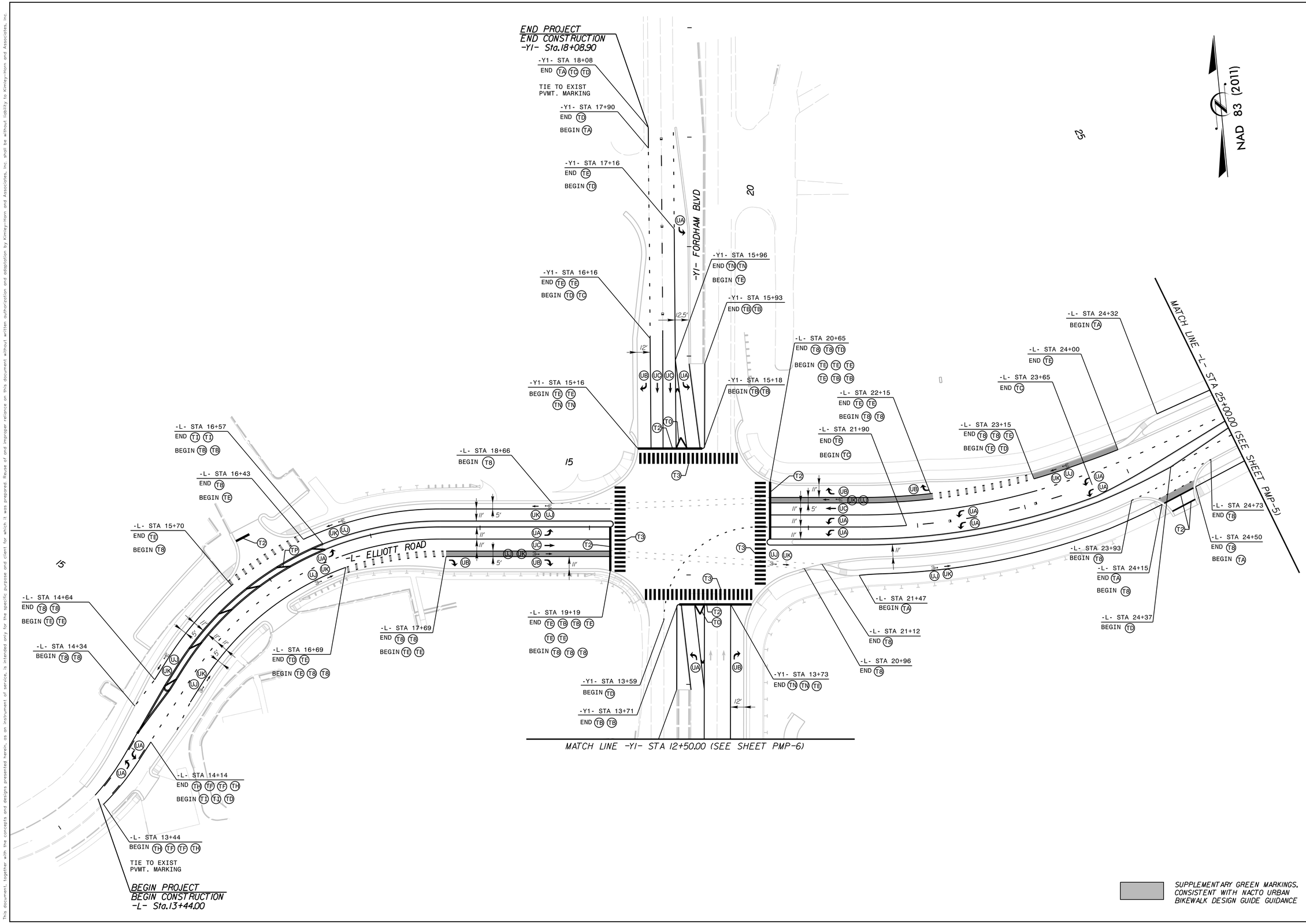

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NC LICENSE #: F-0102

FINAL DRAWINGS – FOR REVIEW PURPOSES ONLY

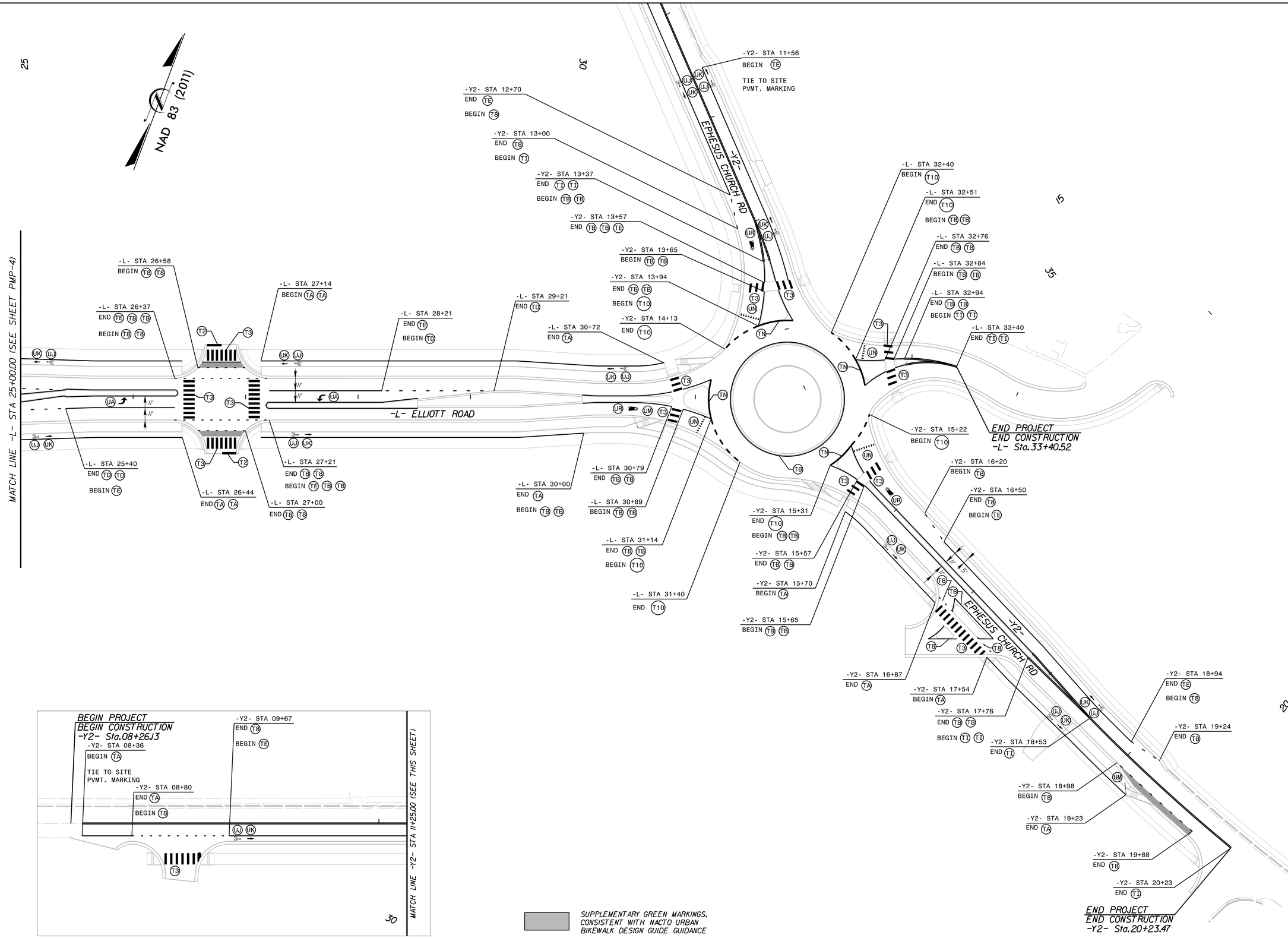
KHA PROJECT	011159020
DATE	7/6/2020
SCALE	1" = 40'
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

PAVEMENT MARKING PLAN

ELLIOTT ROAD EXTENSION

PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
PMP-4



No.	REVISIONS	DATE	BY

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NC LICENSE #: F-0102

FINAL DRAWINGS – FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 40'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

PAVEMENT MARKING PLAN

ELLIOTT ROAD EXTENSION

PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
PMP-5

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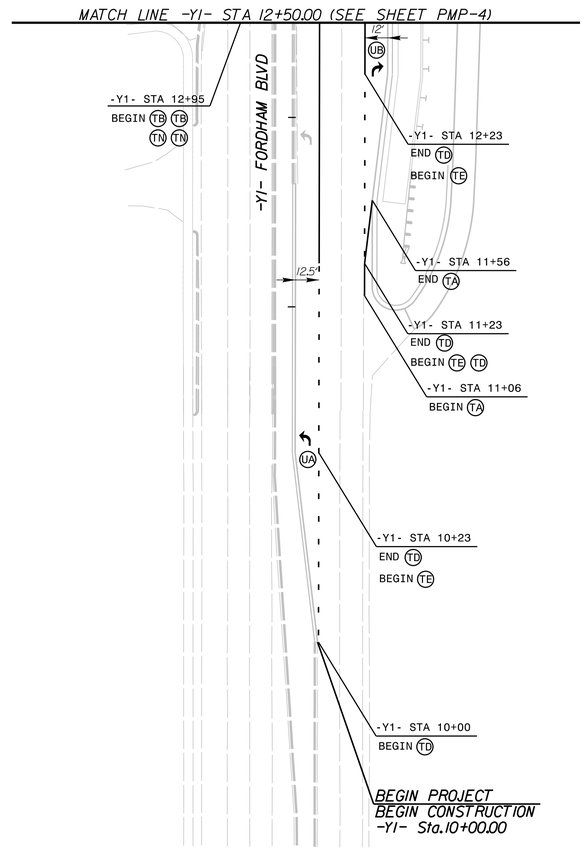

SUPPLEMENTARY GREEN MARKINGS, CONSISTENT WITH NACTO URBAN BIKEWALK DESIGN GUIDE GUIDANCE

No.	REVISIONS	DATE	BY

Kimley»Horn

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PAVEMENT MARKING PLAN

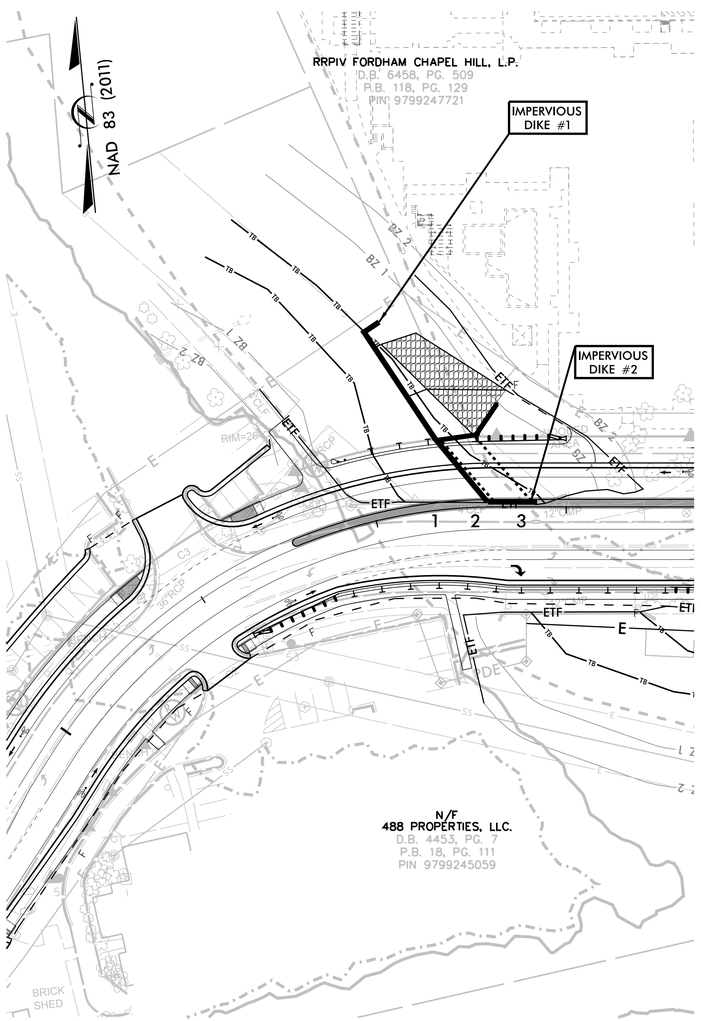
ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
PMP-6

CULVERT CONSTRUCTION SEQUENCE STA. 17+53 –L–

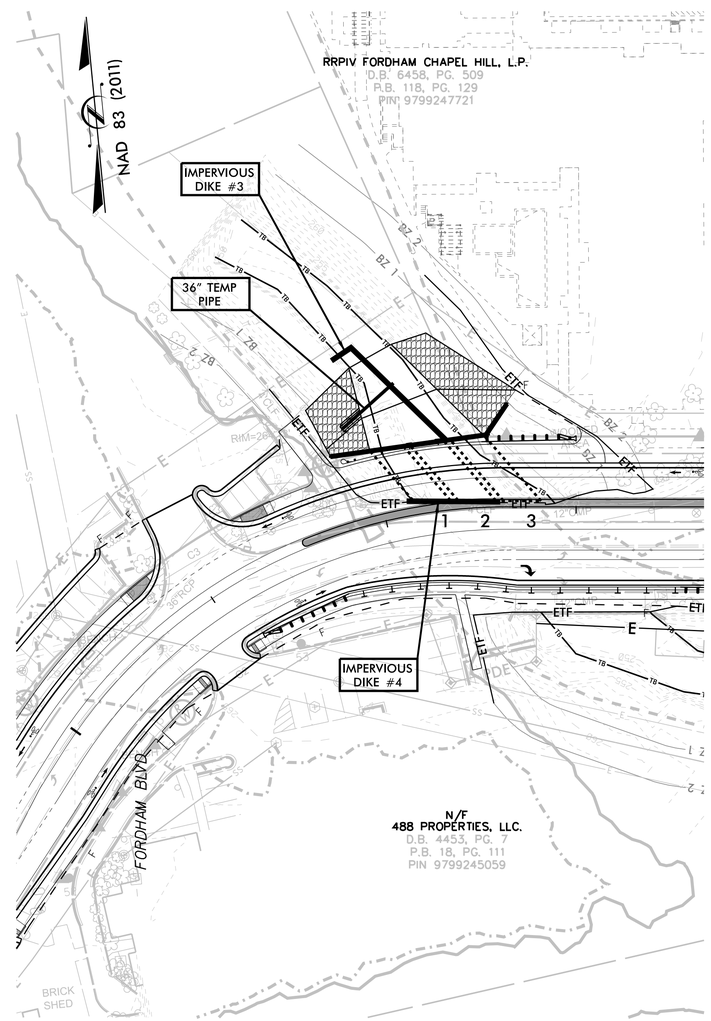
PHASE I

1.) CONSTRUCT TEMPORARY SPECIAL STILLING BASIN, AND ALL OTHER TEMPORARY EROSION CONTROL MEASURES TO STABILIZE WORK AREA.
2.) CONSTRUCT IMPERVIOUS DIKE #1 AND DIKE#2 AT LOCATIONS SHOWN IN SKETCH TO DIVERT FLOW INTO BARRELS 1 AND 2.
3.) DEWATER THE AREA BETWEEN THE EXISTING CULVERT AND UPSTREAM OF INLET CHANNEL IMPROVEMENTS. EXCAVATE UNDER PROPOSED CULVERT FOOTPRINT AND STREAM BED PER GEOTECHNICAL RECOMMENDATIONS / STRUCTURAL PLANS.
4.) REFERENCE SHEET TMP SHEETS FOR ADDITIONAL DETAIL REGARDING TRAFFIC MANAGEMENT.
5.) CONSTRUCT 1 @ 14'–11" X 9'–11" ELLIPTICAL STEEL ARCH CULVERT UPSTREAM EXTENSION (BARREL #3) IN EXCAVATED TRENCH AS SHOWN, INCLUDING WINGWALLS AT STATION 17+53 –L– AND CONSTRUCT ROADWAY FILL.
6.) MAKE UPSTREAM CHANNEL IMPROVEMENTS AND PLACE REQUIRED RIPRAP AND MATTING ON CHANNEL BANKS.



PHASE II

1.) MOVE IMPERVIOUS DIKES#1 AND #2 TO THE LOCATIONS OF DIKES#3 AND #4 SHOWN IN SKETCH TO DIVERT FLOW INTO BARREL 3. COLLAR & EXTEND EXISTING 36" RCP WITH TEMPORARY 36" PIPE. PIPE TO BE SUSPENDED OVER UPSTREAM EXCAVATION AS NEEDED.
2.) DEWATER THE AREA BETWEEN THE EXISTING CULVERT AND UPSTREAM OF INLET CHANNEL IMPROVEMENTS. EXCAVATE UNDER PROPOSED CULVERT FOOTPRINT AND STREAM BED PER GEOTECHNICAL RECOMMENDATIONS / STRUCTURAL PLANS.
3.) CONSTRUCT 2 @ 14'–11" X 9'–11" ELLIPTICAL STEEL ARCH CULVERT UPSTREAM EXTENSION (BARRELS #1 AND 2) IN EXCAVATED TRENCH AS SHOWN, INCLUDING WINGWALLS AT STATION 17+53 –L– AND CONSTRUCT ROADWAY FILL.
4.) MAKE UPSTREAM CHANNEL IMPROVEMENTS AND PLACE REQUIRED RIPRAP AND MATTING ON CHANNEL BANKS.
5.) REMOVE TEMPORARY SPECIAL STILLING BASIN.
6.) STABILIZE DISTURBED AREA AND REMOVE ALL EROSION AND SEDIMENT CONTROL DEVICES AS DIRECTED BY ENGINEER.
7.) FINISH ROADWAY AND DRAINAGE CONSTRUCTION.



* IF TEMPORARY PIPES ARE REQUIRED FOR PHASING ENSURE A M INIMUM OF 20 SF OF FLOWABLE AREA THROUGH THE IMPERVIOUS DIKE.

No.	REVISIONS	DATE	BY

Kimley»Horn
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NORTH CAROLINA PROFESSIONAL SEAL 030359 ENGINEER CHADWICK W. BECK

FINAL DRAWINGS: – FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 40'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

EROSION CONTROL CULVERT SEQUENCE

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
EC-1A

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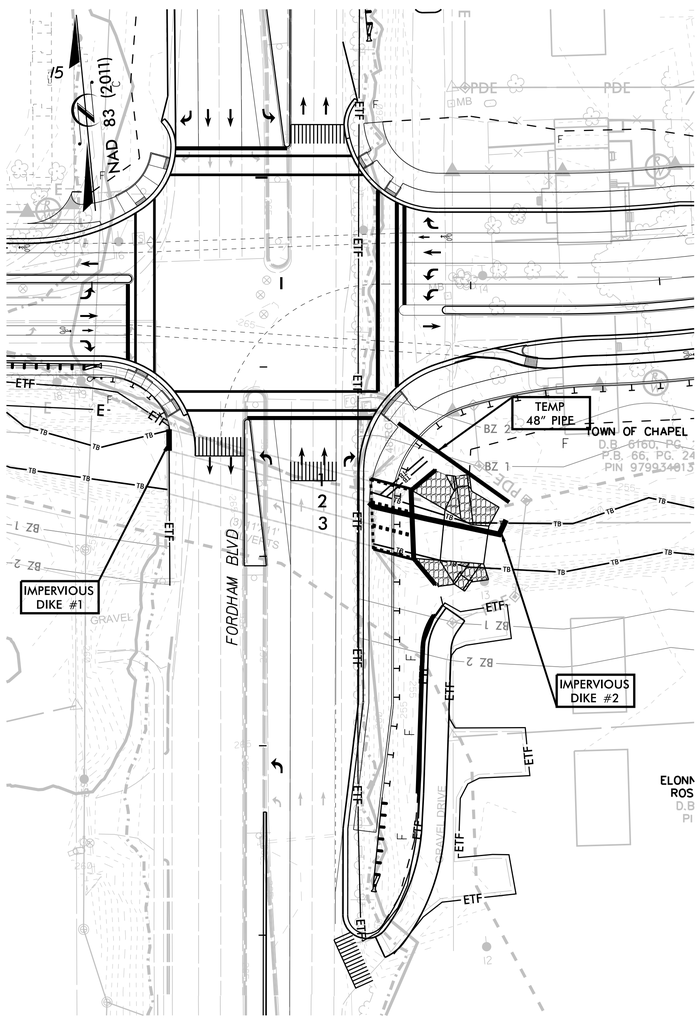
CULVERT CONSTRUCTION SEQUENCE STA. 13+37 –Y1–

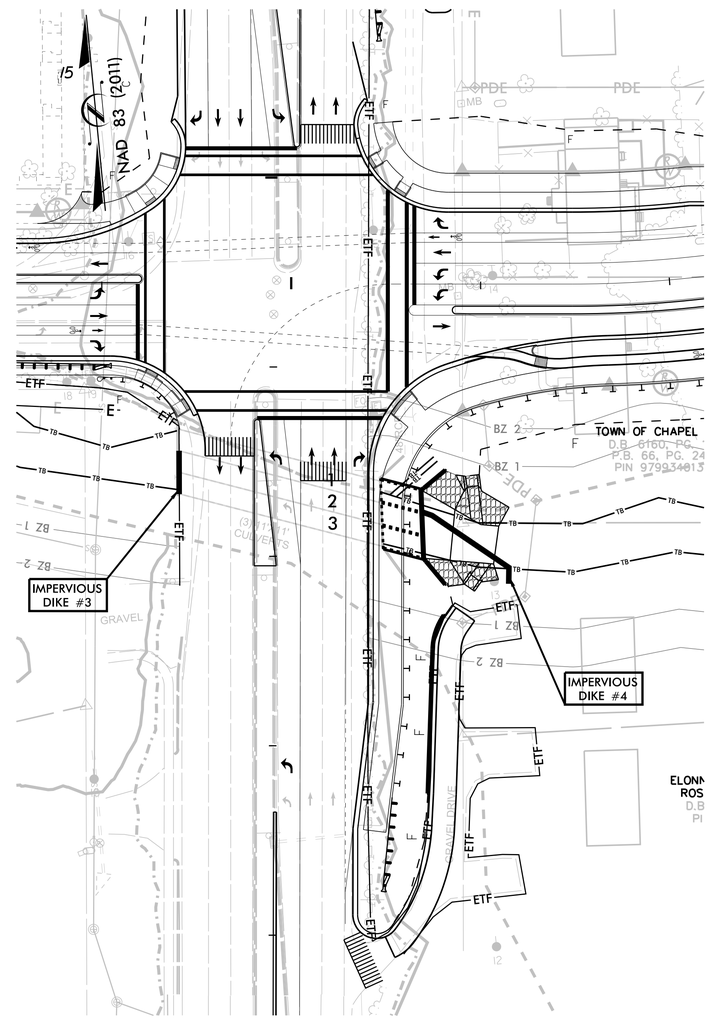
PHASE I

1.) CONSTRUCT TEMPORARY SPECIAL STILLING BASIN, AND ALL OTHER TEMPORARY EROSION CONTROL MEASURES TO STABILIZE WORK AREA.
2.) CONSTRUCT IMPERVIOUS DIKE #1 AND DIKE#2 AT LOCATIONS SHOWN IN SKETCH TO DIVERT FLOW INTO BARRELS 2 AND 3. COLLAR & EXTEND EXISTING 48" RCP WITH TEMP. 48" PIPE. PIPE TO BE SUSPENDED OVER DOWNSTREAM EXCAVATION AS NEEDED.
3.) DEWATER THE AREA BETWEEN THE EXISTING CULVERT AND DOWNSTREAM OF OUTLET CHANNEL IMPROVEMENTS. EXCAVATE UNDER PROPOSED CULVERT FOOTPRINT AND STREAM BED PER GEOTECHNICAL RECOMMENDATIONS / STRUCTURAL PLANS.
4.) REFERENCE SHEET TMP SHEETS FOR ADDITIONAL DETAIL REGARDING TRAFFIC MANAGEMENT.
5.) CONSTRUCT 1 @ 11' X 11' RCBC DOWNSTREAM EXTENSION (BARREL #1) IN EXCAVATED TRENCH AS SHOWN, INCLUDING WINGWALLS AT STATION 13+37 –Y1– AND CONSTRUCT ROADWAY FILL.
6.) MAKE DOWNSTREAM CHANNEL IMPROVEMENTS AND PLACE REQUIRED RIPRAP AND MATTING ON CHANNEL BANKS.



PHASE II

1.) MOVE IMPERVIOUS DIKES#1 AND #2 TO THE LOCATIONS OF DIKES#3 AND #4 SHOWN IN SKETCH TO DIVERT FLOW INTO BARREL 1.
2.) DEWATER THE AREA BETWEEN THE EXISTING CULVERT AND DOWNSTREAM OF OUTLET CHANNEL IMPROVEMENTS. EXCAVATE UNDER PROPOSED CULVERT FOOTPRINT AND STREAM BED PER GEOTECHNICAL RECOMMENDATIONS / STRUCTURAL PLANS.
3.) CONSTRUCT 2 @ 11' X 11' RCBC CULVERT DOWNSTREAM EXTENSION (BARRELS #2 AND 3) IN EXCAVATED TRENCH AS SHOWN, INCLUDING WINGWALLS AT STATION 13+37 –Y1– AND CONSTRUCT ROADWAY FILL.
4.) MAKE DOWNSTREAM CHANNEL IMPROVEMENTS AND PLACE REQUIRED RIPRAP AND MATTING ON CHANNEL BANKS.
5.) REMOVE TEMPORARY SPECIAL STILLING BASIN.
6.) STABILIZE DISTURBED AREA AND REMOVE ALL EROSION AND SEDIMENT CONTROL DEVICES AS DIRECTED BY ENGINEER.
7.) FINISH ROADWAY AND DRAINAGE CONSTRUCTION.



* IF TEMPORARY PIPES ARE REQUIRED FOR PHASING ENSURE A MINIMUM OF 20 SF OF FLOWABLE AREA THROUGH THE IMPERVIOUS DIKE.

No.	REVISIONS	DATE	BY

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NORTH CAROLINA PROFESSIONAL SEAL 030992 ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 40'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

EROSION CONTROL CULVERT SEQUENCE

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
EC-1B

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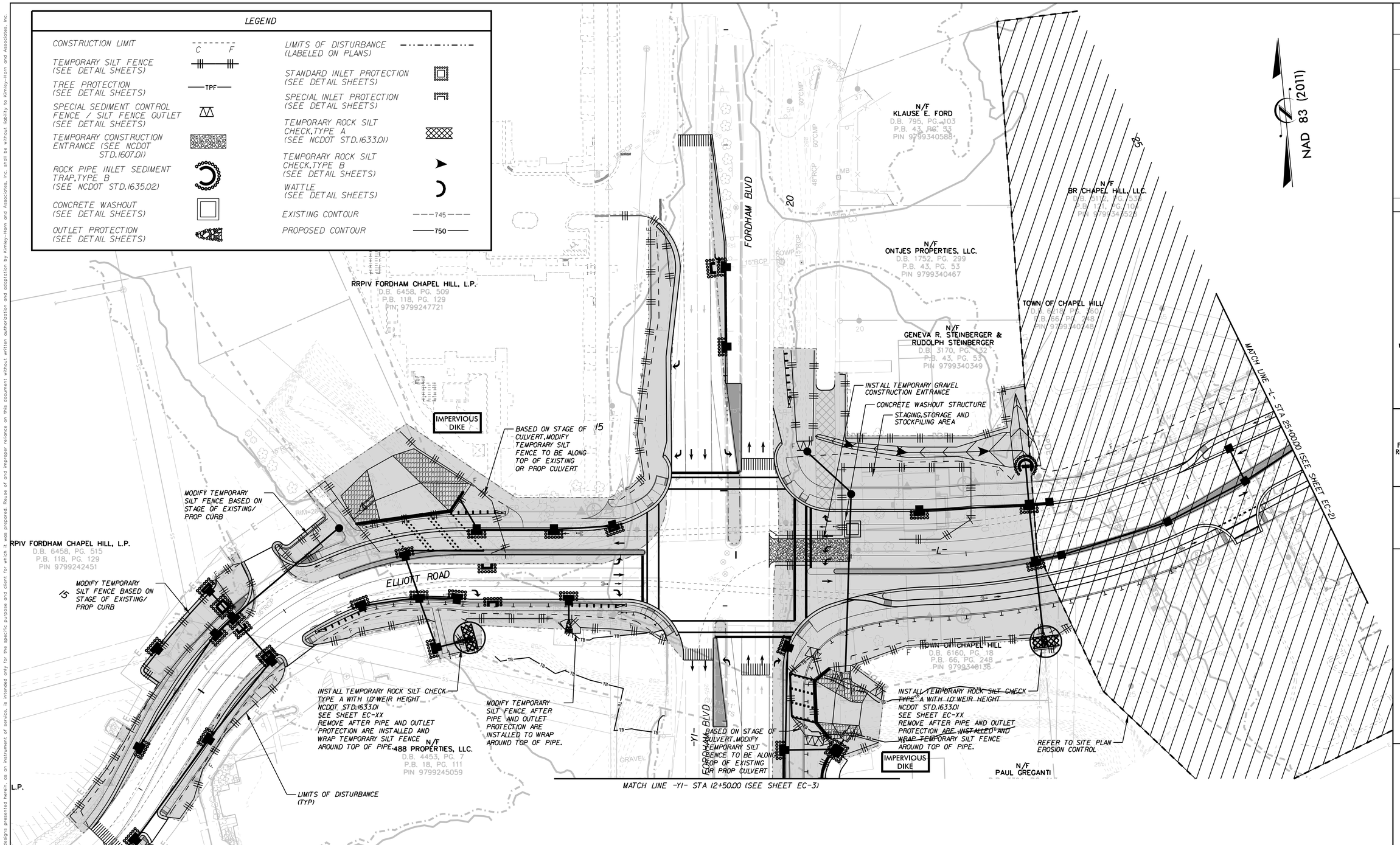

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

NOTE: SLOPES ON THIS PROJECT ARE PRIMARILY 2:1 AND 3:1. CONTRACTOR SHALL PROVIDE SOIL STABILIZATION ON ALL SLOPES WITHIN 7 DAYS OR AS REQUIRED BY NPDES GENERAL STORMWATER PERMIT. REFER TO CROSS SECTIONS AND MATTING SUMMARY SHEET.

GENERAL NOTES

1) CONTRACTOR TO ENSURE THAT ALL ROADWAYS AND CURB LINES ADJACENT TO THIS PROJECT ARE FREE OF DEBRIS,DIRT,AND EQUIPMENT DURING THE PROJECT DURATION UNLESS DIRECTED BY ENGINEER. ANY DAMAGE TO EXISTING CURB AND GUTTER AT CONSTRUCTION ENTRANCES MUST BE REPAIRED AT THE CONTRACTORS EXPENSE.
2) INLET PROTECTION WITHIN ROADWAY TO BE INSTALLED AS NEEDED TO PROTECT INLETS FROM SEDIMENT DURING LAND DISTURBING ACTIVITIES.CONTRACTOR TO ENSURE THAT INLETS ARE PROTECTED AT ALL TIMES.
3) THE ANGLE FOR GRADED SLOPES AND FILLS SHALL BE NO GREATER THAN THE ANGLE THAT CAN BE RETAINED BY VEGETATVIE COVER OR OTHER ADEQUATE EROSION-CONTROL DEVISES OR STRUCTURES. IN ANY EVENT, SLOPES LEFT EXPOSED WILL WITHIN 7 TO 14 CALENDAR DAYS OF COMPLETION OF ANY PHASE OF GRADING, BE PLANTED OR OTHERWISE PROVIDED WITH TEMPORARY GROUND COVER, DEVISES OR STRUCTURES SUFFICIENT TO RESTRAIN EROSION. PERMANENT GROUND COVER WILL BE PROVIDED FOR ALL DISTURBED AREAS WITHIN 15 WORKING DAYS OR NO MORE THAN 90 CALENDAR DAYS (WHICHEVER IS SHORTER) FOLLOWING COMPLETION OF CONSTRUCTION.

NPDES GENERAL STORMWATER PERMIT SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

No.	REVISIONS	DATE	BY

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 40'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

EROSION CONTROL

ELLIOTT ROAD EXTENSION

PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
EC-1

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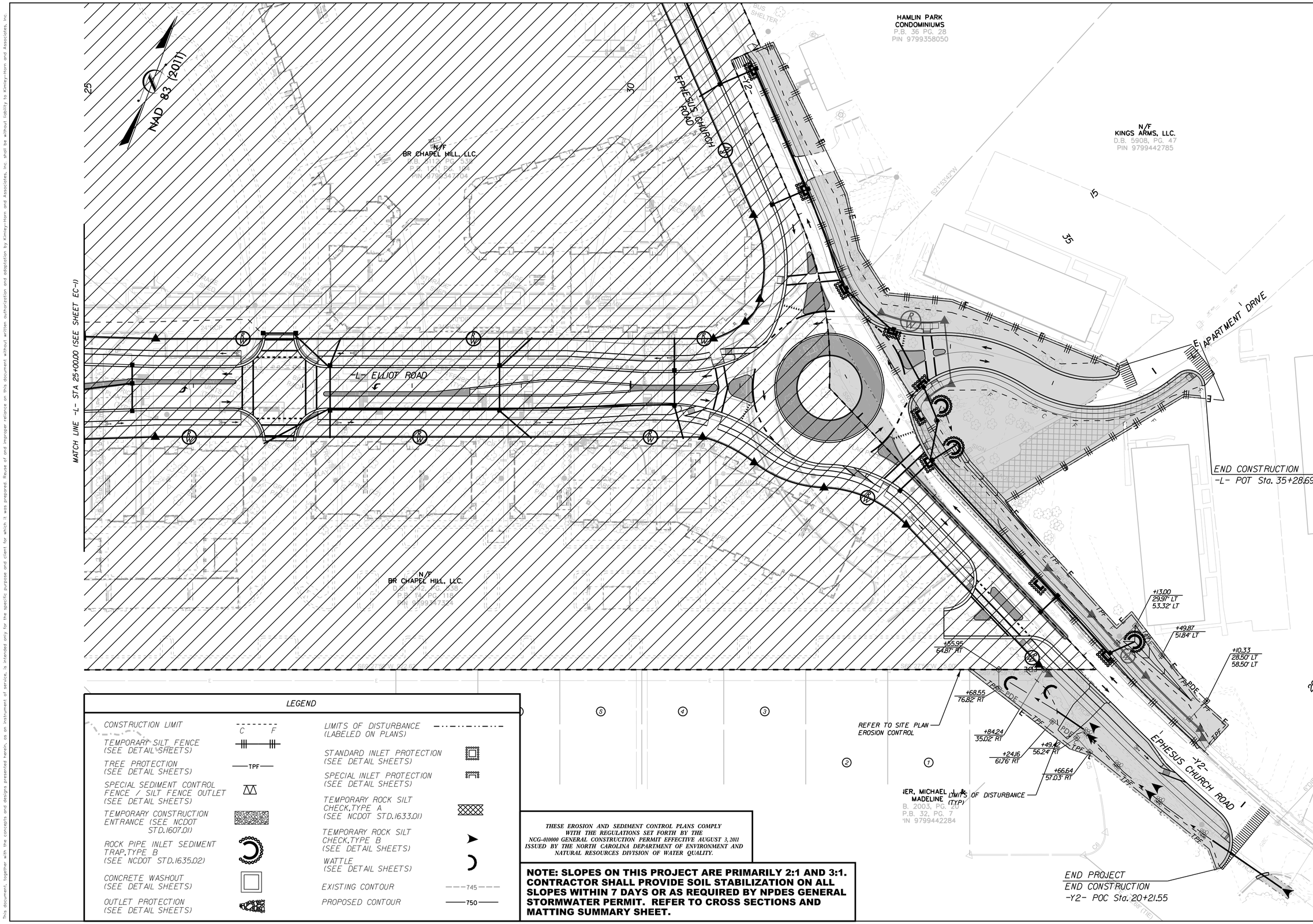

LEGEND

CONSTRUCTION LIMIT (C F)	LIMITS OF DISTURBANCE (LABELED ON PLANS)
TEMPORARY SILT FENCE (SEE DETAIL SHEETS)	STANDARD INLET PROTECTION (SEE DETAIL SHEETS)
TREE PROTECTION (SEE DETAIL SHEETS) (TPF)	SPECIAL INLET PROTECTION (SEE DETAIL SHEETS)
SPECIAL SEDIMENT CONTROL FENCE / SILT FENCE OUTLET (SEE DETAIL SHEETS)	TEMPORARY ROCK SILT CHECK,TYPE A (SEE NCDOT STD.1633.01)
TEMPORARY CONSTRUCTION ENTRANCE (SEE NCDOT STD.1607.01)	TEMPORARY ROCK SILT CHECK,TYPE B (SEE DETAIL SHEETS)
ROCK PIPE INLET SEDIMENT TRAP,TYPE B (SEE NCDOT STD.1635.02)	WATTLE (SEE DETAIL SHEETS)
CONCRETE WASHOUT (SEE DETAIL SHEETS)	EXISTING CONTOUR (745)
OUTLET PROTECTION (SEE DETAIL SHEETS)	PROPOSED CONTOUR (750)

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

NOTE: SLOPES ON THIS PROJECT ARE PRIMARILY 2:1 AND 3:1. CONTRACTOR SHALL PROVIDE SOIL STABILIZATION ON ALL SLOPES WITHIN 7 DAYS OR AS REQUIRED BY NPDES GENERAL STORMWATER PERMIT. REFER TO CROSS SECTIONS AND MATTING SUMMARY SHEET.

No.	REVISIONS	DATE	BY

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020	
DATE	7/6/2020
SCALE	1" = 40'
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

EROSION CONTROL

ELLIOTT ROAD EXTENSION

PREPARED FOR

TOWN OF CHAPEL HILL, NC

CHAPEL HILL NORTH CAROLINA

SHEET NUMBER

EC-2

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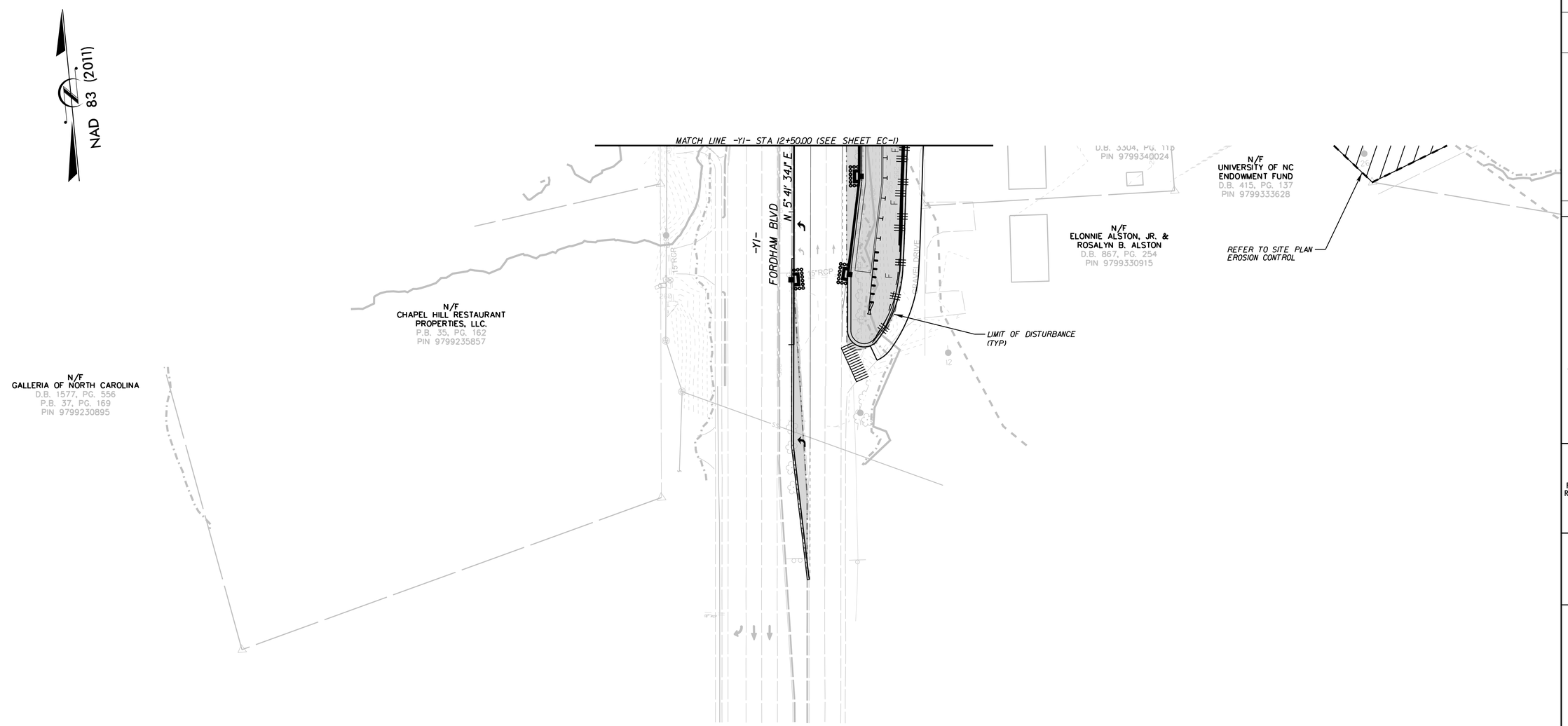

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LEGEND

CONSTRUCTION LIMIT	C F
TEMPORARY SILT FENCE (SEE DETAIL SHEETS)	
TREE PROTECTION (SEE DETAIL SHEETS)	TPF
SPECIAL SEDIMENT CONTROL FENCE / SILT FENCE OUTLET (SEE DETAIL SHEETS)	
TEMPORARY CONSTRUCTION ENTRANCE (SEE NCDOT STD.1607.01)	
ROCK PIPE INLET SEDIMENT TRAP, TYPE B (SEE NCDOT STD.1635.02)	
CONCRETE WASHOUT (SEE DETAIL SHEETS)	
OUTLET PROTECTION (SEE DETAIL SHEETS)	
LIMITS OF DISTURBANCE (LABELED ON PLANS)	
STANDARD INLET PROTECTION (SEE DETAIL SHEETS)	
SPECIAL INLET PROTECTION (SEE DETAIL SHEETS)	
TEMPORARY ROCK SILT CHECK, TYPE A (SEE NCDOT STD.1633.01)	
TEMPORARY ROCK SILT CHECK, TYPE B (SEE DETAIL SHEETS)	
WATTLE (SEE DETAIL SHEETS)	
EXISTING CONTOUR	745
PROPOSED CONTOUR	750

No.	REVISIONS	DATE	BY

Kimley»Horn

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NORTH CAROLINA PROFESSIONAL SEAL 045323 ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 40'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

EROSION CONTROL

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
EC-3

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CONSTRUCTION SEQUENCE

CONSTRUCTION SPECIFICATIONS

1. Erosion and Sediment Control (E&SC) permit and a Certificate of Coverage (COC) must be obtained before any land disturbing activities occur.

2. Hold preconstruction conference at least one week prior to starting construction and invite NCDEMLR LQS contact number is (919) 791-4200. In addition, contact the DEMLR Raleigh Regional Office at least 48 hours prior to commencing the land-disturbing activity using the aforementioned contact number.

3. Flag the work limits for protection.

4. Prior to any land disturbing (including demolition) activities, install silt/tree protection fence, construction entrance, and all other erosion control devices. Maintain all driveways by temporary stone.

5. In accordance with the erosion control plans, grade roadway and sidewalks, install storm drain, and place reinforced silt fence as shown. Stabilize all disturbed areas at the end of each work day. Place additional erosion control matting and stabilize 2:1 slopes as indicated. Modify silt fence placement around driveways and outlets as necessary, place silt fence around all temporary crossings and culverts as needed.

6. Complete final grading for roadway and sidewalk.

7. Finish grading of slopes, topsoil critical areas and permanently vegetate, seed and mulch.

8. All graded areas and bare soils will be seeded, fertilized and mulched according to NCDOT specifications to maintain a vigorous, dense, vegetative cover within 7 to 14 days or sooner of completion of any phase of grading. Refer to the latest NPDES Rules dated August 2011 for more information on ground stabilization requirements. In summary, critical areas should be stabilized by the end of day. Perimeter dikes, swales, ditches, slopes steeper than 3:1, and high quality (HQW) zones should be stabilized within 7 days. All other areas and slopes shall be stabilized within 14 days. If work on the project ceases for more than the above mentioned length of time, all disturbed areas shall have temporary vegetative ground cover established and erosion control devices maintained.

9. All erosion and sediment control practices will be inspected weekly and after rainfall events. Needed repairs will be made immediately.

10. Estimated time before final stabilization is 14 months.

11. Site includes approximately 4.14 acres of permanent vegetation area.

12. All E&SC measures must be maintained until all upgrade drainage areas have been stabilized with the establishment of permanent vegetation.

13. AFTER SITE IS STABILIZED, construction entrances, and construction staging and material area stockpile areas, and all other erosion control devices shall be removed, restored as existing, and permanently vegetated as described in the maintenance and vegetative plan. Contractor must receive permission by project inspector before any measures are removed.

14. When the project is complete, the permittee shall contact DEMLR to close out the E&SC Plan. After DEMLF informs the permittee of the project close out, via inspection report, the permittee shall visit deq.nc.gov/NCGOI to submit an electronic Notice of Termination (e-NOT). A $100 annual general permit fee will be charged until the e-NOT has been filled out.

MAINTENANCE

Follow the construction sequence throughout project development. Adequate erosion and sediment control measures must be installed, maintained and adjusted as needed during the demolition or clearing and grubbing phases as well as throughout the life of and until permanent vegetation on the project is established. When changes in construction activities are needed, amend the sequence schedule in advance to maintain management control.

Notification of Land Resources Sediment and Erosion Control Self-Inspection Program:

The Sedimentation Pollution Control Act was amended in 2006 to require that persons responsible for land-disturbing activities inspect a project after each phase of the project to make sure that the approved erosion and sedimentation control plan is being followed. Rules detailing the documentation of these inspections took effect October 1, 2010. To simplify documentation of Self-Inspection Reports and NPDES Self-Monitoring Reports, a combined form is now available. The new form was developed to satisfy the requirements of the Sedimentation Pollution Control Act and the NPDES Stormwater Permit for Construction Activities, NCG 010000. Beginning August 1, 2013, the Division of Energy, Mineral, and Land Resources is responsible for administering both the SPCA and the NPDES Stormwater Permit for Construction Activities, NCG 010000. The combined form should make it easier to comply with self-inspection requirements.

The Combined Self-Monitoring form is available as a PDF and Word document from the Land Quality web site. http://deq.nc.gov/about/divisions/energy-mineral-land-sources/erosion-sediment-control/forms

If you have questions, please contact the Land Quality Section at a DENR Regional Office at 919-791-4200.

If the same person conducts the land-disturbing activity & any related borrow or waste activity, the related borrow or waste activity shall constitute part of the land-disturbing activity unless the borrow or waste activity is regulated under the Mining Act of 1971, or is a landfill regulated by the Division of Waste Management. If the land-disturbing activity and any related borrow or waste activity are not conducted by the same person, they shall be considered separate land-disturbing activities and must be permitted either through the Sedimentation Pollution Control Act as a one-use borrow site or through the Mining Act.

MAINTENANCE PLAN

1. The Contractor shall check all erosion and sediment control practices for stability and operation following every runoff producing rainfall but in no case less than once every week. Any needed repairs will be made immediately by the Contractor to maintain all practices as designed. Also per National Pollutant Discharge Elimination System (NPDES) general stormwater permit, a rain gauge must be installed on site. The rain gauge must be kept onsite and inspections by the Contractor must be made and logged after every half inch of rainfall and once a week. The Contrractor shall maintain a copy of the approved E&SC plan with approval letter, copies of any 401/404 documents from DWR/USACOE, a copy of the NPDES permit with minimum of most recent 30 days if self-inspection records will be kept on project is completed.

2. The constractor shall install erosion and sediment control devices where equipment staging, material laydown, spoil or waste areas.

3. The Contractor shall remove sediment from erosion control devices when storage capacity has been approximately 50% filled. Gravel will be cleaned or replaced when the sediment pools no longer drains properly.

4. The Contractor shall remove sediment from behind silt fence when it becomes 0.5 feet deep at the fence. Silt fence will be repaired as necessary to maintain a barrier.

5. The Contractor shall fertilize, reseed as necessary, and mulch all seeded areas according to specifications in the vegetative plan to maintain a vigorous, dense vegetative cover.

6. The Contractor shall provide ground cover on exposed slopes or other areas within 7 to 14 days or sooner of completion of any phase of grading. Refer to the latest NPDES Rules dated August 2011 for more information on ground stabilization requirements. Permanent ground cover is to be provided for all disturbed areas within 7 to 14 days or sooner following completion of construction or development.

7. The Contractor shall use a silt bag for dewatering of trenching excavations and sediment containment devices for maintenance or removal purposes.

8. The Contractor shall use a layer of sand, screenings or fines on paved surfaces to aid in cleanup and prevent the deposition of any excavated material or vehicle tracking on the paved surface.

VEGETATIVE PLAN (6.10 AND 6.11)

SEEDING SCHEDULE

Date	Type	Planting Rate
	Shoulders, Side Ditches, Slopes (3:1)	
Aug. 15-Nov. 1	Tall Fescue	250 lbs./acre
Nov. 1-Mar. 1	Tall Fescue	250 lbs./acre
	& Abruzzi Rye	25 lbs./acre
Mar. 1-Apr. 15	Tall Fescue	250 lbs./acre
Aug. 15-Apr. 15	Rye Grain	40 lbs./acre
Aug. 15-May 15	Wheat	30 lbs./acre
Apr. 15-Jun. 15	Hulled Common Bermudagrass	12 lbs./acre
May 15-Aug. 15	German Millet	10 lbs./acre
May 15-Aug. 15	Browntop Millet	10 lbs./acre
May 1-Sept. 1	Kobe Lespedeza	10 lbs./acre
May 1-Sept. 1	Korean Lespedeza	10 lbs./acre
Jun. 15-Aug. 15	Tall Fescue	60 lbs./acre
	& Browntop Millet ***	35 lbs./acre
	or Sorghum-Sudan Hybrids ***	30 lbs./acre
	Slopes (3:1 to 2:1)	
Mar. 1-Jun. 1	Sericea Lespedeza (scarified)	50 lbs./acre
	and	
(Mar. 1-Apr. 15)	Add Tall Fescue	60 lbs./acre
(Mar. 1-Jun. 30)	or Add Weeping Lovegrass	5 lbs./acre
(Mar. 1-Jun. 30)	or Add Hulled Common Bermudagrass	8 lbs./acre
Jun. 1-Sep. 1	Tall Fescue ***	60 lbs./acre
Aug. 15-Apr. 15	Rye Grain	40 lbs./acre
Aug. 15-May 15	Wheat	30 lbs./acre
	& Browntop Millet ***	35 lbs./acre
	or Sorghum-Sudan Hybrids ***	30 lbs./acre
May 15-Aug. 15	German Millet	10 lbs./acre
May 15-Aug. 15	Browntop Millet	10 lbs./acre
May 1-Sept. 1	Kobe Lespedeza	10 lbs./acre
May 1-Sept. 1	Korean Lespedeza	10 lbs./acre
Sep. 1-Mar. 1	Sericea Lespedeza (unhulled-unscarified)	70 lbs./acre
	& Tall Fescue	50 lbs./acre
(Nov. 1-Mar. 1)	Add Abruzzi Rye	25 lbs./acre

Consult Conservation Engineer or Soil Conservation Service for additional information concerning other alternatives for vegetation of denuded areas. The above vegetation rates are those which do well under local conditions: other seeding rate combinations are possible.

*** Temporary - Reseed according to optimum season for desired permanent vegetation per Section 6.10 . Do not allow temporary cover to grow over 12 inches in height before mowing, otherwise, fescue may be shaded out.

SEEDING SPECIFICATIONS

1) After rough grading is completed, till soil in areas to be seeded and planted to a depth of six inches.

2) Apply agricultural lime, fertilizer, and superphosphate to disturbed areas to be vegetated.
A minimum of 2 tons limestone/acre with 3 tons limestone /acre in clay soils or per soils test
35 lbs. 10-10-10 fertilizer/1000 sq.ft. (1500 lbs/acre)
40 lbs. 50% superphosphate/1000 sq.ft. (1750 lbs/acre)

3) Disk nutrients into soil to a depth of six inches until surface is uniform and free of large dirt clods.

4) Seeding permanent grass.
3.0 lbs. KY-31 tall fescue/1000 sq.ft. (130 lbs./acre) during February 15 through May 15 or August 15 through November 15.
-OR-
3.0 lbs. KY-31 tall fescue and 2.0 lbs. annual ryegrass/1000 sq.ft. during November 15 through February 15.

5) Mulch seeded area with small grain straw at 90 lbs/1000 sq.ft. (2 tons/acre). Spread uniformly. Approximately 1/2 of ground surface should be visible to avoid blocking sunlight to seedlings. Mulch shall be applied by the crimping and mulching application technique. Tack mulch with asphalt emulsion at a rate of 400 gallons emulsion per acre of straw.

6) Mulch around shubbery and trees with pine straw to depth of 3 inches.

7) Temporary cover
1.0 lbs. brown top millet/1000 sq.ft. May through August 25.
-OR-
1.0 lbs. annual ryegrass/1000 sq.ft. August 25 through April.

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

TOPSOILING (6.04)

CONSTRUCTION SPECIFICATIONS

MATERIALS

Determine whether the quality and quantity of available topsoil justifies selective handling. Quality topsoil has the following characteristics:

Texture - loam, sandy loam, and silt loam are best; sandy clay loam, silty clay loam, clay loam, and loamy sand are fair. Do not use heavy clay and organic soils such as peat or muck as topsoil.

Organic matter content - (sometimes referred to as "humic matter") should be greater than 1.5% by weight.

Acidity - pH should be greater than 3.6 before liming, and liming is required if it is less than 6.0.

Soluble salts - should be less than 500 ppm.

Sodium - sodium adsorption ratio should be less than 12.

The depth of material meeting the above qualifications should be at least 2 inches. Soil factors such as rock fragments, slope, depth to water table, and layer thickness affect the ease of excavation and spreading of topsoil.

Generally, the upper part of the soil, which is richest in organic matter, is most desirable; however, material excavated from deeper layers may be worth storing if it meets the other criteria listed above.

Organic soils such as mucks and peats do not make good topsoil. They can be identified by their extremely light weight when dry.

STRIPPING

Strip topsoil only from those areas that will be disturbed by excavation, filling, roadbuilding, or compaction by equipment. A 4 to 6-inch stripping depth is common, but depth varies depending on the site. Determine depth of stripping by taking soil cores at several locations within each area to be stripped. Topsoil depth generally varies along a gradient from hilltop to toe of the slope. Put sediment basins, diversions, and other controls into place before stripping.

STOCKPILING

Select stockpile location to avoid slopes and natural drainageways, avoiding traffic routes. On large sites, respreading is easier and more economical when topsoil is stockpiled in small piles located near areas where they will be used. All stockpile areas used shall be stabilized with silt fence and seeded per the latest NPDES rules.

Sediment barriers - Use sediment fences or other barriers where necessary to retain sediment.

Temporary seeding - Protect topsoil stockpiles by temporarily seeding per the latest NPDES rules.

Permanent vegetation - If stockpiles will not be used within 12 months they must be stabilized with permanent vegetation to control erosion and weed growth.

SITE PREPARATION

Before spreading topsoil, establish erosion and sedimentation control practices such as diversions, berms, dikes, waterways, and sediment basins.

Grading - Maintain grades on the areas to be topsoiled according to the approved plan and do not alter them by adding topsoil.

Liming of subsoil - Where the pH of the existing subsoil is 6.0 or less, or the soil is composed of heavy clays, incorporate agricultural limestone in amounts recommended by soil tests or specified for the seeding mixture to be used. Incorporate lime to a depth of at least 2 inches by disking.

Roughening - Immediately prior to spreading the topsoil, loosen the subgrade by disking or scarifying to a depth of at least 4 inches, to ensure bonding of the topsoil and subsoil. If no amendments have been incorporated, loosen the soil to a depth of at least 6 inches before spreading topsoil.

SPREADING TOPSOIL

Do not spread topsoil while it is frozen or muddy or when subgrade is wet or frozen. Correct any irregularities in the surface that result from topsoiling or other operations to prevent the formation of depressions or water pockets.

Compact the topsoil enough to ensure good contact with the underlying soil, but avoid excessive compaction, as it increases runoff and inhibits seed germination. Light packing with a roller is recommended where high-maintenance turf is to be established.

On slopes and areas that will not be mowed, the surface may be left rough after spreading topsoil. A disk may be used to promote bonding at the interface between topsoil and subsoil.

After topsoil application, follow procedure for seedbed preparation, taking care to avoid excessive mixing of topsoil into the subsoil.

GRASS-LINED CHANNELS (6.30)

CONSTRUCTION SPECIFICATIONS

1. Remove all trees, brush, stumps, and other objectionable material from the foundation area and dispose of properly.

2. Excavate the channel and shape it to neat lines and dimensions shown on the plans plus a 0.2-ft overcut around the channel perimeter to allow for bulking during seedbed preparations and sod buildup.

3. Remove and properly dispose of all excess soil so that surface water may enter the channel freely.

4. The procedure used to establish grass in the channel will depend upon the severity of the conditions and selection of species. Protect the channel with mulch or a temporary liner sufficient to withstand anticipated velocities during the establishment period.

MAINTENANCE

During the establishment period, check grass-lined channels after every rainfall. After grass is established, periodically check the channel; check it after every heavy rainfall event. Immediately make repairs. It is particularly important to check the channel outlet and all road crossings for bank stability and evidence of piping or scour holes. Remove all significant sediment accumulations to maintain the designed carrying capacity. Keep the grass in a healthy, vigorous condition at all times, since it is the primary erosion protection for the channel.

LAND GRADING (6.02)

CONSTRUCTION SPECIFICATIONS

1. Construct and maintain all erosion and sedimentation control practices and measures in accordance with the approved sedimentation control plan and construction schedule.

2. Remove good topsoil from areas to be graded and filled, and preserve it for use in finishing the grading of all critical areas.

3. Scarify areas to be topsoiled to a minimum depth of 2 inches before placing topsoil.

4. Clear and grub areas to be filled to remove trees, vegetation, roots, or other objectionable material that would affect the planned stability of the fill.

5. Ensure that fill material is free of brush, rubbish, rocks, logs, stumps, building debris, and other materials inappropriate for constructing stable fills.

6. Place all fill in layers not to exceed 9 inches in thickness, and compact the layers as required to reduce erosion, slippage, settlement, or other related problems.

7. Do not incorporate frozen material or soft or highly compressible materials into fill slopes.

8. Do not place fill on a frozen foundation, due to possible subsidence and slippage.

9. Keep diversions and other water conveyance measures free of sediment during all phases of development.

10. Handle seeps or springs encountered during construction in accordance with approved methods.

11. Permanently stabilize all graded areas immediately after final grading is completed on each area in the grading plan per NPDES Soil Stabilization Timeframes.

12. Show topsoil stockpiles, borrow areas, and spoil areas on the plans, and make sure they are adequately protected from erosion. Include final stabilization of these areas in the plan.

MAINTENANCE

Periodically check all graded areas and the supporting erosion and sedimentation control practices, especially after heavy rainfalls. Promptly remove all sediment from diversion and other water-disposal practices. If washouts or breaks occur, repair them immediately. Prompt maintenance of small eroded areas before they become significant gullies is an essential part of an effective erosion and sedimentation control plan.

Note: Limit disturbances to the length that can be stabilized at the end of the work day.

RIP RAP (6.15)

CONSTRUCTION SPECIFICATIONS

Subgrade Preparation - Prepare the subgrade for riprap and filter to the required lines and grades shown on the plans. Compact any fill required in the subgrade to a density approximating that of the surrounding undisturbed material or overfill depressions with riprap. Remove brush, trees, stumps and other objectional material. Cut the subgrade sufficiently deep that the finished grade of the riprap will be at the elevation of the surrounding area. Channels should be excavated sufficiently to allow placement of the riprap in a manner such that the finished inside dimensions and grade of the riprap meet design specifications.

Sand and gravel filter blanket - Place the filter blanket immediately after the ground foundation is prepared. For gravel, spread filter stone in a uniform layer to the specified depth. Where more than one layer of filter material is used, spread the layers with minimal mixing.

Synthetic filter fabric - Place the cloth filter directly on the prepared foundation. Overlap the edges by at least 12 inches, and space anchor pins every 3 ft along the overlap. Bury the upstream end of the cloth a minimum of 12 inches below ground and where necessary, bury the lower end of the cloth or overlap with the next section as required. Take care not to damage the cloth when placing riprap. If damage occurs remove the riprap and repair the sheet by adding another layer of filter material with a minimum overlap of 12 inches around the damaged area. If extensive damage is suspected, remove and replace the entire sheet.

Where large stones are used or machine placement is difficult, a 4-inch layer of fine gravel or sand may be needed to protect the filter cloth.

Stone Placement - Placement of riprap should follow immediately after placement of the filter. Place riprap so that it forms a dense, well-graded mass of stone with a minimum of voids. The desired disbribution of stones throughout the mass may be obtained by selective loading at the quarry and controlled dumping during final placement. Place riprap to its full thickness in one operation. Do not place riprap by dumping through chutes or other methods that cause segregation of stone sizes. Take care not to dislodge the underlying base or filter when placing the stones.

The finished slope should be free of pockets of small stone or clusters of large
stones. Hand placing may be necessary to achieve the proper distribution of stone sizes to produce a relatively smooth, uniform surface. The finished grade of the riprap should blend with the surrounding area. No overfall or protrusion of riprap should be apparent.

MAINTENANCE

Inspect channels at regular intervals as well as after major rains, and make repairs promptly. Give special attention to the outlet and inlet sections and other points where concentrated flow enters. Carefully check stability at road crossings and look for indications of piping, scour holes, or bank failures. Make repairs immediately. Maintain all vegetation adjacent to the channel in a healthy, vigorous condition to protect the area from erosion and scour during out-of-bank flow. Control of weed and brush growth may be needed in some locations.

No.	REVISIONS	DATE	BY

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. DECK

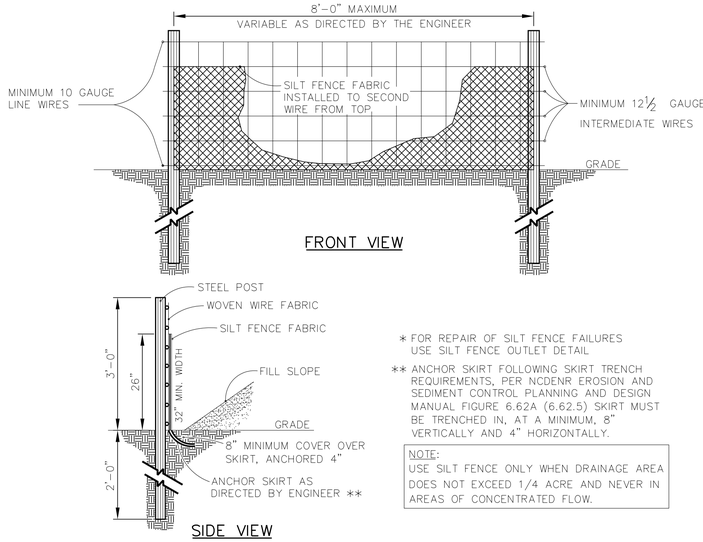
FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020	
DATE	7/6/2020
SCALE	1" = 40'
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

EROSION CONTROL DETAILS

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
EC-4



* FOR REPAIR OF SILT FENCE FAILURES USE SILT FENCE OUTLET DETAIL

** ANCHOR SKIRT FOLLOWING SKIRT TRENCH REQUIREMENTS, PER NCDENR EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL FIGURE 6.62A (6.62.5) SKIRT MUST BE TRENCHED IN, AT A MINIMUM, 8" VERTICALLY AND 4" HORIZONTALLY.

NOTE:
USE SILT FENCE ONLY WHEN DRAINAGE AREA DOES NOT EXCEED 1/4 ACRE AND NEVER IN AREAS OF CONCENTRATED FLOW.

CONSTRUCTION SPECIFICATIONS

1. Use a synthetic filter fabric of at least 95% by weight of polyolefins or polyester, which is certified by the manufacturer or supplier as conforming to the requirements in ASTM D 6461, which is shown in part in Table 6.62b.

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

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

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

CONSTRUCTION

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

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

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

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

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

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

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

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

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

10. Do not attach filter fabric to existing trees.

MAINTENANCE

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

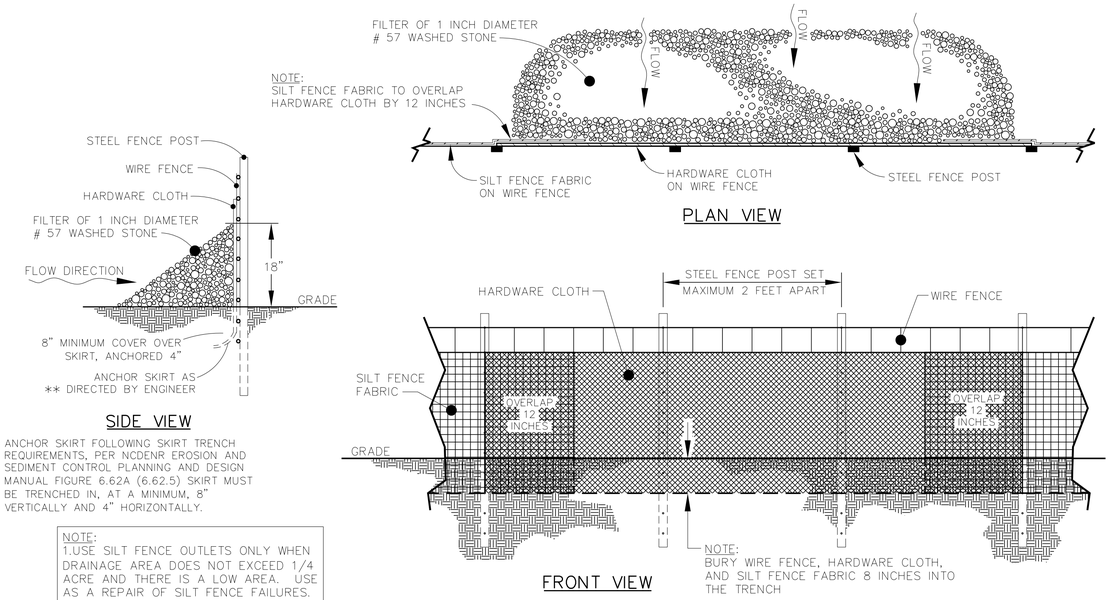
Should the fabric of a sediment fence collapse, tear, decompose or become ineffective, replace it promptly. Replace burlap every 60 days.

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

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

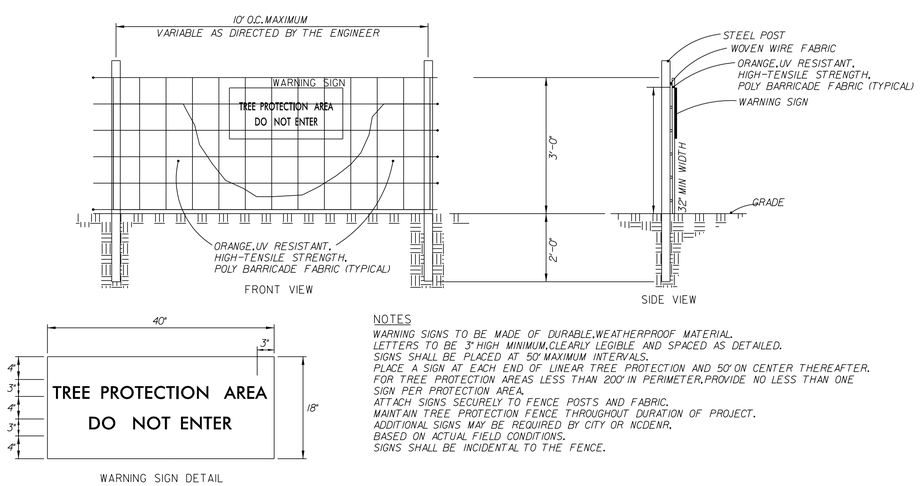
STANDARD TEMPORARY SILT FENCE (6.62)

NOTE: USE TREE PROTECTION COMBINATION IN WOODS AND STREAM AREAS NOTED ON PLANS



SPECIAL SEDIMENT CONTROL FENCE/ SILT FENCE OUTLET

MAINTENANCE:
SEE STANDARD TEMPORARY SILT FENCE DETAIL FOR MAINTENANCE INSTRUCTIONS.
INSPECT SEDIMENT CONTROL FENCE/SILT FENCE OUTLET AT LEAST WEEKLY AND AFTER EACH RUNOFF EVENT. MAKE ANY REPAIRS IMMEDIATELY.
SHOULD THE FABRIC OF A SEDIMENT FENCE/OUTLET COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.
REMOVE SEDIMENT ACCUMULATED BEHIND THE FENCE/OUTLET AS NEEDED TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN FALL EVENT, TO PREVENT DAMAGE. ALLOW TO DRAIN THROUGH THE OUTLET.
TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT TO PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE OUTLET.
ADD STONE TO OUTLET AS NEEDED TO MAINTAIN DESIGN.



NOTES
WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL.
LETTERS TO BE 3" HIGH MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAILED.
SIGNS SHALL BE PLACED AT 50' MAXIMUM INTERVALS.
PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER THEREAFTER.
FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTION AREA.
ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.
MAINTAIN TREE PROTECTION FENCE THROUGHOUT DURATION OF PROJECT.
ADDITIONAL SIGNS MAY BE REQUIRED BY CITY OR NCDENR.
BASED ON ACTUAL FIELD CONDITIONS.
SIGNS SHALL BE INCIDENTAL TO THE FENCE.

TREE PROTECTION DETAIL

NPDES GENERAL STORMWATER PERMIT SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

No.	REVISIONS	DATE	BY

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. DECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 40'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

EROSION CONTROL DETAILS

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
EC-5

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

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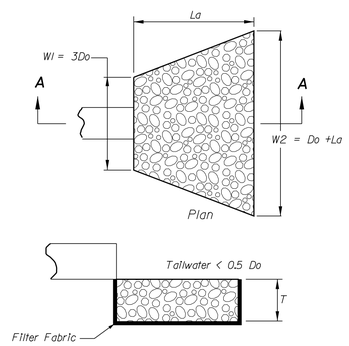
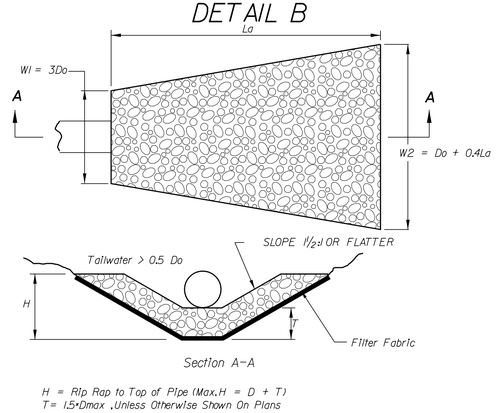
OUTLET STABILIZATION STRUCTURE DETAIL

DETAIL A



Pipe Outlet To Flat Area
With No Defined Channel

DETAIL B



H = Rip Rap to Top of Pipe (Max.H = D + T)
T= 1.5*Dmax ,Unless Otherwise Shown On Plans

Pipe Outlet to Well-Defined Channel

CONSTRUCTION SPECIFICATIONS

1. Ensure that the subgrade for the filter and riprap follows the required lines and grades shown in the plan. Compact any fill required in the subgrade to the density of the surrounding undisturbed material. Low areas in the subgrade on undisturbed soil may also be filled by increasing the riprap thickness.

2. The riprap and gravel filter must conform to the specified grading limits shown on the plans.

3. Filter cloth,when used,must meet design requirements and be properly protected from punching or tearing during installation. Repair any damage by removing the riprap and placing another piece of filter cloth over the damaged area. All connecting joints should overlap a minimum of 1 foot. If damage is extensive,replace the entire filter cloth.

4. Riprap may be placed by equipment,but take care to avoid damaging the filter.

5. The minimum thickness of the riprap should be 1.5 times the maximum stone diameter.

6. Riprap may be field stone or rough quarry stone. It should be hard,angular, highly weather-resistant and well graded.

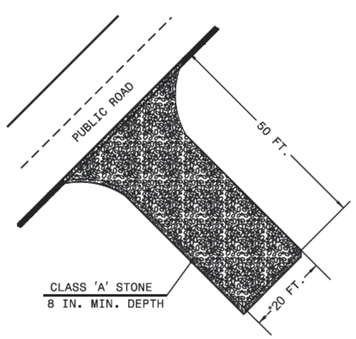
7. Construct the apron on zero grade with no overfall at the end. Make the top of the riprap at the downstream end level with the receiving area or slightly below it.

8. Ensure that the apron is properly aligned with the receiving stream and preferably straight throughout its length. If a curve is needed to fit site conditions,place it in the upper section of the apron.

9. Immediately after construction,stabilize all disturbed areas with vegetation.

MAINTENANCE

Inspect riprap outlet structures after heavy rains to see if any erosion around or below the riprap has taken place or if stones have been dislodged. Immediately make all needed repairs to prevent further damage.



NOTES

1. PROVIDE TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS.
2. LOCATE ENTRANCES TO PROVIDE FOR UTILIZATION BY ALL CONSTRUCTION VEHICLES.
3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY.
4. ANY MATERIAL TRACKED ONTO THE ROADWAY MUST BE CLEANED UP IMMEDIATELY.
5. LOCATE GRAVEL CONSTRUCTION ENTRANCE AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED. PROVIDE FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE.
6. NUMBER AND LOCATION OF CONSTRUCTION ENTRANCES TO BE DETERMINED BY THE ENGINEER.
7. USE CLASS 'A' STONE OR OTHER COARSE AGGREGATE APPROVED BY THE ENGINEER.
8. INSTALL CONSTRUCTION ENTRANCES IN A WAY TO PREVENT VEHICLES FROM BYPASSING CONSTRUCTION ENTRANCE LEAVING PROJECT SITE.

NOTE: PLACE GEOTEXTILE FOR DRAINAGE BENEATH STONE

*REVISE CONSTRUCTION ENTRANCE WIDTH TO 20'

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
GRAVEL CONSTRUCTION ENTRANCE

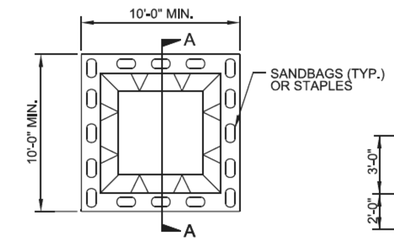
SHEET 1 OF 1
1607.01

MAINTENANCE:

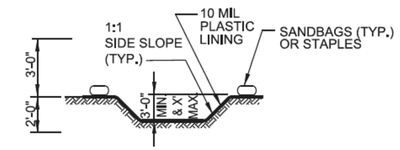
MAINTAIN THE STONE PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOPDRESSING WITH 2-INCH STONE. AFTER EACH RAINFALL, INSPECT ANY STRUCTURE USED TO TRAP SEDIMENT AND CLEAN IT OUT AS NECESSARY. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS.

WITH LINER, NO GRAVEL APPROACH

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



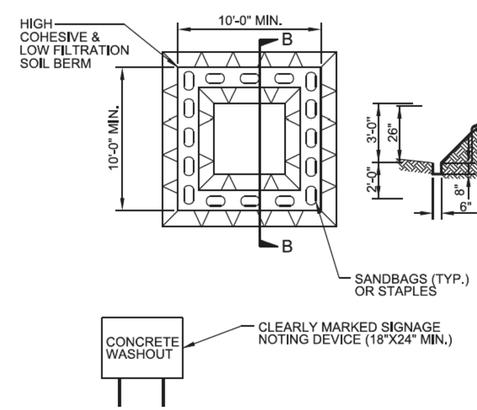
SECTION A-A

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

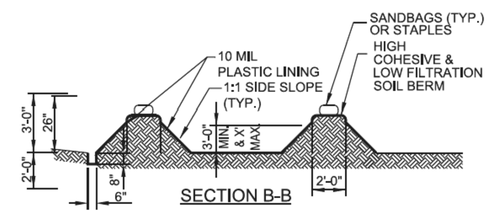
2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE
NOT TO SCALE



PLAN



SECTION B-B

NOTES;
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE
NOT TO SCALE

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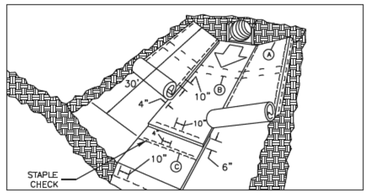
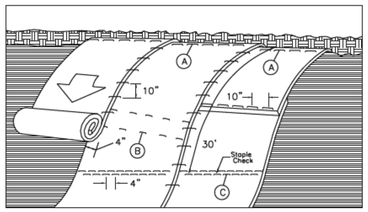
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
EC-6



MATTING IN DITCHES



MATTING ON SLOPES

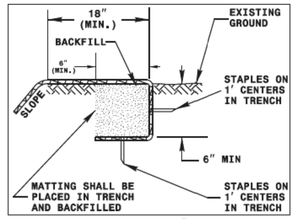


DIAGRAM (A)

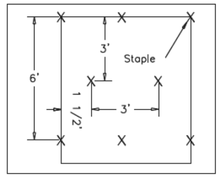


DIAGRAM (B)

Staple Check Pattern

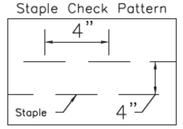


DIAGRAM (c)

NOTES

THIS DETAIL APPLIES TO STRAW, EXCELSIOR, COIR FIBER MAT AND PERMANENT SOIL REINFORCEMENT MAT (PSRM) INSTALLATION AND AS DIRECTED.

STAPLES SHALL BE NO. 11 GAUGE STEEL WIRE FORMED INTO A "U" SHAPE WITH A MINIMUM THROAT WIDTH OF 1 INCH AND NOT LESS THAN 6 INCHES IN LENGTH.

NOT TO SCALE

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR
MATTING INSTALLATION

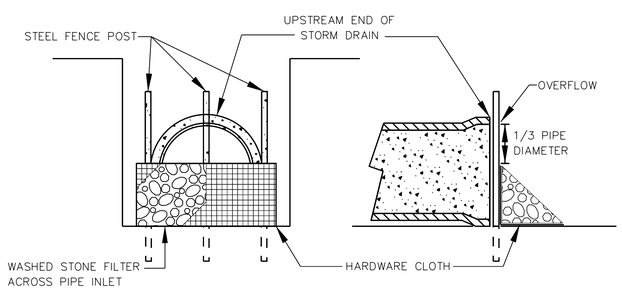
SHEET 1 OF 1

1631.01

TEMPORARY LINERS

MAINTENANCE:
1. Inspect Rolled Erosion Control Products (RECP) at least weekly and after each significant (1/2 inch or greater) rain fall event repair immediately.
2. Good contact with the ground must be maintained, and erosion must not occur beneath the RECP.
3. Any areas of the RECP that are damaged or not in close contact with the ground shall be repaired and stapled.
4. If erosion occurs due to poorly controlled drainage, the problem shall be fixed and the eroded area protected.
5. Monitor and repair the RECP as necessary until ground cover is established.

STONE FILTER INLET PROTECTION FOR STORM DRAIN UNDER CONSTRUCTION

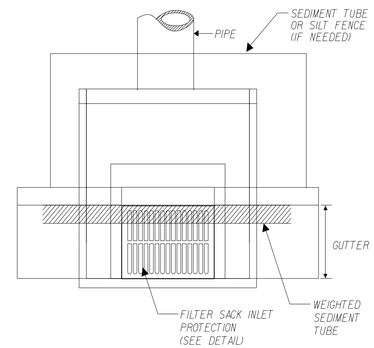


STONE FILTER INLET PROTECTION WILL BE CONSIDERED INCIDENTAL TO THE CONTRACT UNIT PRICE PER LINEAR FOOT OF PIPE CULVERT INSTALLATION.

MAINTENANCE:

INSPECT STANDARD PIPE INLET PROTECTION AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY. SHOULD THE STONE COLLAPSE, BREAK, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE FUNCTION FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE INLET PROTECTION MEASURE. TAKE CARE TO AVOID UNDERMINING THE INLET PROTECTION MEASURE DURING CLEANOUT. REMOVE ALL INLET PROTECTION MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRINGT THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

NOTE: USE INLET TUBES AS NEEDED TO PREVENT SILT AND DEBRIS FROM ENTERING INLETS DURING CONSTRUCTION.



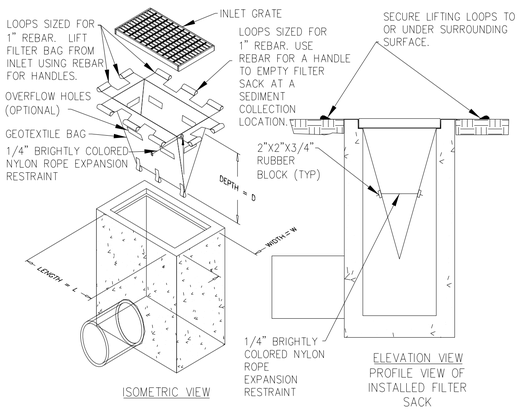
Inlet Tubes

Materials

Use inlet tubes that exhibit the following properties:
Produced by a Manufacturer experienced in sediment tube manufacturing. Composed of compacted geotextiles, curled excelsior wood, natural coconut fibers or hardwood mulch or a mix of these materials enclosed by a flexible netting material. Do not use straw, straw fiber, straw bales, pine needles or leaf mulch under this specification. Utilize an outer netting that consists of seamless, high-density polyethylene photodegradable materials treated with ultraviolet stabilizers or a seamless, high-density polyethylene non-degradable materials.

Installation:
Install inlet tubes lying flat on the ground, with no gaps between the underlying surface and the inlet tube.

Inspection and Maintenance:
Inlet tubes may be temporarily moved during construction as needed. Replace inlet tubes damaged during installation as directed by the Inspector or Manufacturer's Representative at the contractor's expense.



ISOMETRIC VIEW

ELEVATION VIEW
PROFILE VIEW OF INSTALLED FILTER SACK

1. EMPTY FILTER SACK WHEN BRIGHTLY COLORED EXPANSION RESTRAINT CAN NO LONGER BE SEEN.
2. GEOTEXTILE WILL BE A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS REQUIREMENTS IN THE SPECIFICATIONS TABLE.
3. AN OIL ADSORBENT PAD OR PILLOW CAN BE PURCHASED WHEN OIL SPILLS ARE A CONCERN.
4. INSPECT PER REGULATORY REQUIREMENTS.
5. THE WIDTH, "W", OF THE FILTER SACK WILL MATCH THE INSIDE WIDTH OF THE GRATED INLET BOX.
6. THE DEPTH, "D", OF THE FILTER SACK WILL BE BETWEEN 18 INCHES AND 36 INCHES.
7. THE LENGTH, "L", OF THE FILTER SACK WILL MATCH THE INSIDE LENGTH OF THE GRATED INLET BOX.

LOW TO MODERATE FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE		
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	800 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	80 %
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	0.55 SEC -1

MODERATE TO HIGH FLOW GEOTEXTILE FABRIC SPECIFICATION TABLE		
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	265 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	135 LBS
MULLEN BURST	ASTM D-3786	420 PSI
TRAPEZOID TEAR	ASTM D-4533	45 LBS
UV RESISTANCE	ASTM D-4355	90 %
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	1.5 SEC -1

SPECIAL INLET PROTECTION
NOT TO SCALE

STANDARD INLET PROTECTION (6.51)

CONSTRUCTION SPECIFICATIONS

1. As synthetic fabric, use a previous sheet of nylon, polyester, or ethylene yarn - extra strength (50 lb/1 inch minimum) - that contains ultraviolet ray inhibitors and stabilizers. Fabric should be sufficiently porous to provide adequate drainage of the temporary sediment pool. Burlap may be used for short-term applications. It must be replaced every 60 days.

2. Cut fabric from a continuous roll to eliminate joints.

3. For stakes, use 5-foot steel T posts.

4. Space stakes evenly around the perimeter of the inlet a maximum of 4 ft apart, and securely drive them into the ground, approximately 24 inches deep.

5. Place a 2 foot flap of wire mesh under the gravel for anchoring.

6. Fasten fabric and hog wire securely to the stakes and frame. Joints must be overlapped to the next stake.

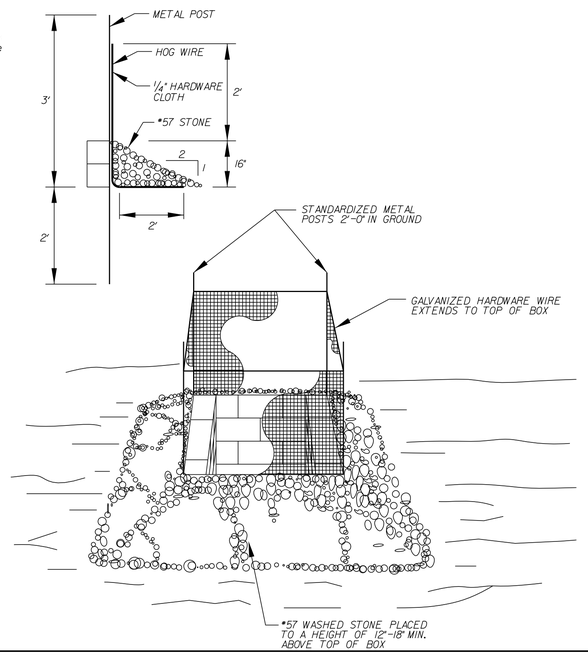
7. The top of the frame and fabric must be well below the ground elevation downslope from the drop inlet to keep runoff from bypassing the inlet. It may be necessary to build a temporary dike on the down slope side of the structure to prevent bypass flow. Material from within the sediment pool may be used for diking.

8. #57 washed stone shall be incidental to inlet Protection.

MAINTENANCE

Inspect the fabric barrier after each rain and make repairs as needed.

Remove sediment from the pool area as necessary to provide adequate storage volume for the next rain. Take care not to damage or undercut the fabric during sediment removal.



No.	REVISIONS	DATE	BY

Kimley»Horn
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PHONE: 919-677-2000
WWW.KIMLEY-HORN.COM
NC LICENSE #: F-0102

NORTH CAROLINA PROFESSIONAL SEAL 045195 ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 40'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

EROSION CONTROL DETAILS

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
EC-7

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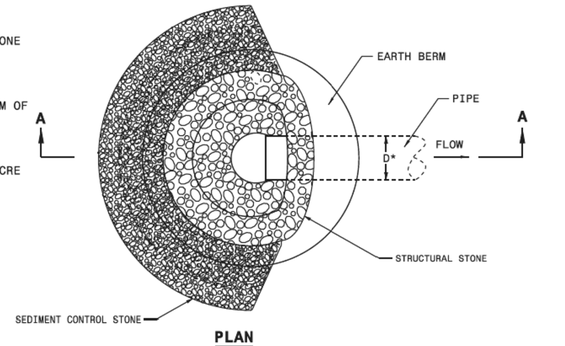
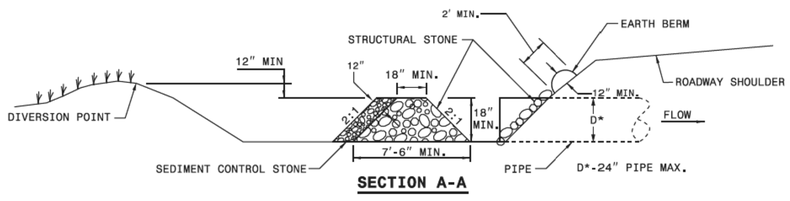
NOTES

USE CLASS A EROSION CONTROL STONE FOR STRUCTURAL STONE.
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.
CONSTRUCT TOP OF BERM A MINIMUM OF ONE FOOT BELOW THE SHOULDER OR DIVERSION POINT.
PROVIDE A TOTAL SEDIMENT TRAP VOLUME OF 3600± CUBIC FEET PER ACRE OF DISTURBED AREA. SOME OF THE REQUIRED VOLUME MAY BE PROVIDED BY UP OR DOWNSTREAM CONTROLS.



PLAN



SECTION A-A

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

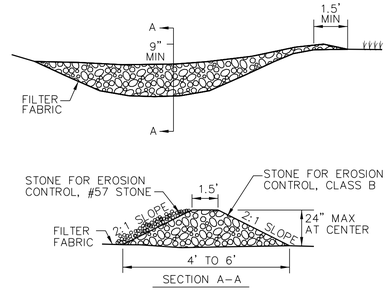
ROADWAY STANDARD DRAWING FOR
ROCK PIPE INLET SEDIMENT TRAP TYPE B

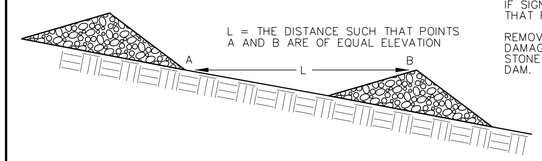
SHEET 1 OF 1
1635.02

MAINTENANCE

INSPECT ROCK PIPE INLET PROTECTION DEVICES AND CHANNELS FOR DAMAGE AFTER EACH RUNOFF EVENT.
ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE THE ROCK PIPE INLET PROTECTION DEVICE AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE DEVICE. CORRECT ALL DAMAGE IMMEDIATELY.
IF SIGNIFICANT EROSION OCCURS, INSTALL A PROTECTIVE RIPRAP LINER IN THAT PORTION OF THE CHANNEL. REMOVE SEDIMENT ACCUMULATED BEHIND THE DEVICE AS NEEDED TO PREVENT DAMAGE TO THE DEVICE AND CONTANIMATION OF THE FLOW INTO THE PIPE. ALLOW THE CHANNEL TO DRAIN THROUGH THE DEVICE, AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE DEVICE.
ADD STONES TO DAMS AS NEEDED TO MAINTAIN DESIGN HEIGHT AND CROSS SECTION.

TEMPORARY ROCK SILT CHECK, TYPE B (6.83)





NOTE:
CHECK DAMS TO BE INSTALLED AS INDICATED ON PLAN OR IF GRADE IS STEEPER PER PLAN DETAIL.

CONSTRUCTION SPECIFICATIONS

1. PLACE STONE TO THE LINES AND DIMENSIONS SHOWN IN THE PLAN ON A FILTER FABRIC FOUNDATION.
2. KEEP THE CENTER STONE SECTION AT LEAST 9 INCHES BELOW NATURAL GROUND LEVEL WHERE THE DAM ABUTS THE CHANNEL BANKS.
3. EXTEND STONE AT LEAST 1.5 FT BEYOND THE DITCH BANKS TO KEEP OVERFLOW WATER FROM CUTTING AROUND THE ENDS OF THE CHECK DAM.
4. SET SPACING BETWEEN DAMS TO ASSURE THAT THE ELEVATION AT THE TOP OF THE LOWER DAM IS THE SAME AS THE TOE ELEVATION OF THE UPPER DAM.
5. PROTECT THE CHANNEL DOWNSTREAM FROM THE LOWEST CHECK DAM, CONSIDERING THAT WATER WILL FLOW OVER AND AROUND THE DAM.
6. MAKE SURE THAT THE CHANNEL REACH ABOVE THE MOST UPSTREAM DAM IS STABLE.
7. ENSURE THAT CHANNEL APPURTENANCES, SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS, ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONES.
8. #57 WASHED STONE SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE PER TON "SEDIMENT CONTROL STONE."

MAINTENANCE

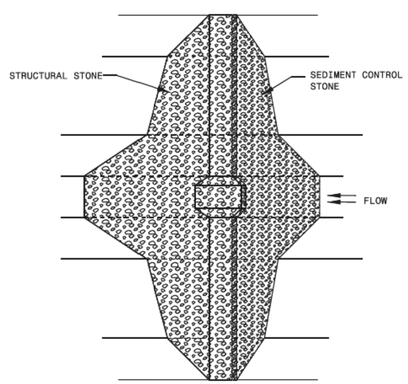
INSPECT CHECK DAMS AND CHANNELS FOR DAMAGE AFTER EACH RUNOFF EVENT.

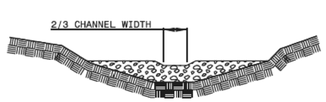
ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE THE CHECK DAM AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE DAM. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN DAMS, INSTALL A PROTECTIVE RIPRAP LINER IN THAT PORTION OF THE CHANNEL.

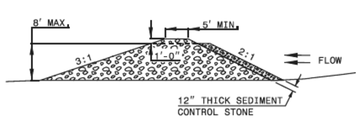
REMOVE SEDIMENT ACCUMULATED BEHIND THE DAMS AS NEEDED TO PREVENT DAMAGE TO CHANNEL VEGETATION, ALLOW THE CHANNEL TO DRAIN THROUGH THE STONE CHECK DAM, AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE DAM. ADD STONES TO DAMS AS NEEDED TO MAINTAIN DESIGN HEIGHT AND CROSS SECTION.

NOTES

USE CLASS I RIP RAP FOR STRUCTURAL STONE.
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.
INSTALL 3 COIR FIBER BAFFLES ON UPSTREAM SIDE OF SEDIMENT DAM IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1640.01.







STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR
TEMPORARY ROCK SEDIMENT DAM TYPE A

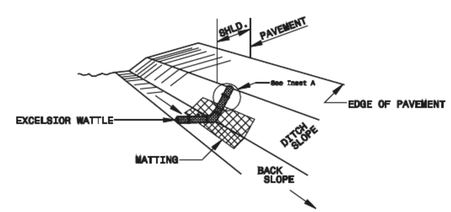
SHEET 1 OF 1
1634.01

MAINTENANCE

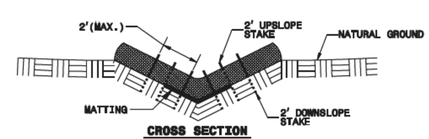
INSPECT CHECK DAMS AND CHANNELS FOR DAMAGE AFTER EACH RUNOFF EVENT.
ANTICIPATE SUBMERGENCE AND DEPOSITION ABOVE THE CHECK DAM AND EROSION FROM HIGH FLOWS AROUND THE EDGES OF THE DAM. CORRECT ALL DAMAGE IMMEDIATELY. IF SIGNIFICANT EROSION OCCURS BETWEEN DAMS, INSTALL A PROTECTIVE RIPRAP LINER IN THAT PORTION OF THE CHANNEL.
REMOVE SEDIMENT ACCUMULATED BEHIND THE DAMS AS NEEDED TO PREVENT DAMAGE TO CHANNEL VEGETATION, ALLOW THE CHANNEL TO DRAIN THROUGH THE STONE CHECK DAM, AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE DAM. ADD STONES TO DAMS AS NEEDED TO MAINTAIN DESIGN HEIGHT AND CROSS SECTION.

WATTLE DETAIL

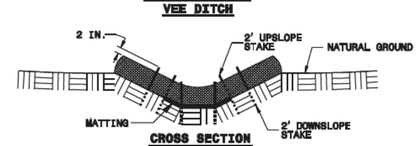
REVISED DIVISION NO.	DIVISION NO.
1-7777	EC-20
SUPERSEDES STD. NO.	SUPERSEDES STD. NO.
DIVISION	DIVISION



ISOMETRIC VIEW



CROSS SECTION
VEE DITCH



CROSS SECTION
TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

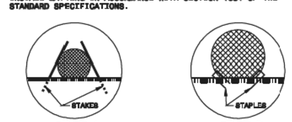
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

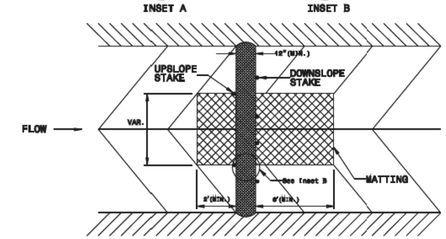
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.



INSET A INSET B



TOP VIEW

MAINTENANCE:

CONTRACTOR SHALL MAINTAIN THE WATTLES UNTIL THE PROJECT IS ACCEPTED OR UNTIL THE WATTLES ARE REMOVED. CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT THE WATTLES TO MAINTAIN EFFECTIVENESS. USE ALL EXCAVATED MATERIALS IN THE CONSTRUCTION OF ROADWAY/GREENWAY EMBANKMENTS EXCEPT WHERE OTHEREWISE DIRECTED. DISPOSE OF MATERIALS, WHICH ARE NOT USED IN THE CONSTRUCTION OF ROADWAY EMBANKMENTS IN WASTE AREAS.

No.	REVISIONS	DATE	BY

Kimley»Horn
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NC LICENSE #: F-0102

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT	011159020
DATE	7/6/2020
SCALE	1" = 40'
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

EROSION CONTROL DETAILS

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
EC-8

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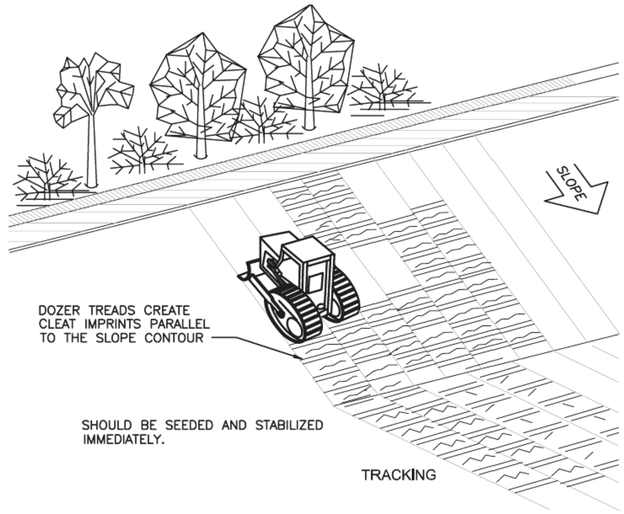
SURFACE ROUGHENING - TRACKING



TRACKING

TRACKING IS DEFINED AS DRIVING A TRACKED MACHINERY UP AND DOWN SLOPES, LEAVING THE CLEAT IMPRINTS PARALLEL TO THE SLOPE COUNTOUR.

WHEN AND WHERE TO USE IT:

TO SLOW EROSION, SURFACE ROUGHENING BY TRACKING SHOULD BE DONE AS SOON AS POSSIBLE AFTER VEGETATION HAS BEEN REMOVED FROM THE SLOPE.

TRACKING CAN BE USED WITH SEEDING, PLANTING AND TEMPORARY MULCHING TO STABILIZE AN AREA.

TRACKING SHOULD BE PERFORMED IMMEDIATELY AFTER GRADING ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENTLY) IN AN AREA.

INSTALLATION:

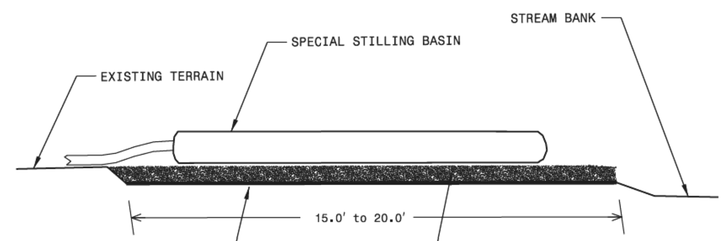
IT IS IMPORTANT TO AVOID EXCESSIVE COMPACTING OF THE SOIL SURFACE WHEN TRACKING BECAUSE SOIL COMPACTION INHIBITS VEGETATION GROWTH AND CAUSES HIGHER RUNOFF RATES. AS FEW PASSES AS POSSIBLE SHOULD BE MADE WITH THE MACHINERY IN ORDER TO MINIMIZE COMPACTION.

SURFACE ROUGHENED AREAS BY THE MEANS OF TRACKING SHOULD BE SEEDED AND MULCHED IMMEDIATELY.

INSPECTION AND MAINTENANCE:

INSPECTIONS SHOULD BE MADE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24-HOURS AFTER EACH RAINFALL EVENT THAT PRODUCES ½-INCHES OR MORE OF PRECIPITATION.

IF RILLS (SMALL WATERCOURSES THAT HAVE STEEP SIDES AND ARE USUALLY ONLY A FEW INCHES DEEP) APPEAR, THEY SHOULD BE RE-GRADED AND RE-SEEDED IMMEDIATELY.



NOTES

USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

PROVIDE STABILIZED OUTLET TO STREAM BANK.

WOOD PALLETS MAY BE USED IN LIEU OF STONE AND GEOTEXTILE AS DIRECTED. A SUFFICIENT NUMBER OF PALLETS MUST BE PROVIDED TO ELEVATE THE ENTIRE SPECIAL STILLING BASIN ABOVE NATURAL GROUND.

NOT TO SCALE

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR
SPECIAL STILLING BASIN

SHEET 1 OF 1
1630.06

Construction Method and Maintenance

Install the special stilling basin(s),geotextile and stone in accordance with Roadway Standard Drawings and at locations in the plans and as directed.Place the special stilling basin(s) on level ground.

Construct the special stilling basin(s) such that it is portable and can be used adjacent to each drilled pier,footing and/or culvert,as required by the project commitments.Temporary slope drain pipe(s) or pump discharge hoses will be attached to the special stilling basin(s) to divert runoff or pump effluent directly into the special stilling basin(s).The special stilling basin may be cut to allow slope drain pipe to be inserted if needed and tied off tightly.The remaining sleeve or spout of the bag,if present,may be used to connect more than one special stilling basin in series as directed.If not used in this manner,the sleeve shall be tied off tightly to allow the bag to contain the effluent and force it to filter through the sides of the special stilling basin.Place the special stilling basin(s) so the incoming runoff or pumped effluent flows into and through it without causing erosion to adjacent slopes or streambanks. In areas of turbidity and water quality concern,place the special stilling basin(s) up grade and direct its runoff into a sediment control measure before being allowed to discharge into jurisdictional waters.

Replace and dispose of the special stilling basin(s) when it is 3/4 full of sediment or when it is impractical for the bag to filter the sediment out at a reasonable flow rate.Prior approval from the Engineer shall be received before removal and replacement.

Provide a sufficient quantity of bags to contain silt from pumped effluent during construction of drilled piers,footing excavation and culvert construction.A sufficient quantity of special stilling basins shall be provided to contain sediment from temporary slope drain runoff.

Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site.

No.	REVISIONS	DATE	BY

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NORTH CAROLINA PROFESSIONAL SEAL 045 ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 40'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

EROSION CONTROL DETAILS

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
EC-9

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SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
EC-1	-L-	14+50	16+00	LT	2560
EC-1	-L-	16+50	19+00	RT	725
EC-1	-L-	20+50	21+00	LT	1084
EC-1	-L-	20+50	22+75	RT	4984
EC-2	-L-	33+50	34+50	LT	486
EC-1/3	-Y1-	11+50	13+50	RT	2573
EC-2	-Y2-	18+50	20+00	RT	2242
			SUBTOTAL		14654
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					100
THIS INCLUDES BUT IS NOT LIMITED TO MATTING ALL SLOPES AND					
AREAS AROUND PIPE INLET/OUTLETS THAT ARE NOT COVERED BY					
RIP RAP AND WHEN MEASURES ARE REMOVED					
				TOTAL	14754
				SAY	14760

MAINTENANCE:
INSPECT ROLLED EROSION CONTROL PRODUCTS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT RAIN FALL EVENT, REPAIR IMMEDIATLEY IF NEEDED.
GOOD CONTACT WITH GROUND MUST BE MAINTAINED AND EROSION MUST NOT OCCUR BENEATH THE MATTING.
ANY AREAS OF MATTING THAT ARE DAMAGED OR NOT IN CLOSE CONTACT WITH THE GROUND SHALL BE REPAIRED AND STAPLED.
IF EROSION OCCURES DUE TO POORLY CONTROLLED DRAINAGE, THE PROBLEM SHALL BE FIXED AND THE ERODED AREA PROTECTED.
MONITOR AND REPAIR THE MATTING AS NECCESSARY UNTIL GROUND COVER IS ESTABLISHED.

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NORTH CAROLINA PROFESSIONAL SEAL 045393 ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 40'
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DRAWN BY: TDW
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EROSION CONTROL DETAILS

ELLIOTT ROAD EXTENSION
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CHAPEL HILL NORTH CAROLINA

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

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

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

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

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

GROUND STABILIZATION SPECIFICATION

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

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plastic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

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

EQUIPMENT AND VEHICLE MAINTENANCE

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

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

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

PAINT AND OTHER LIQUID WASTE

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

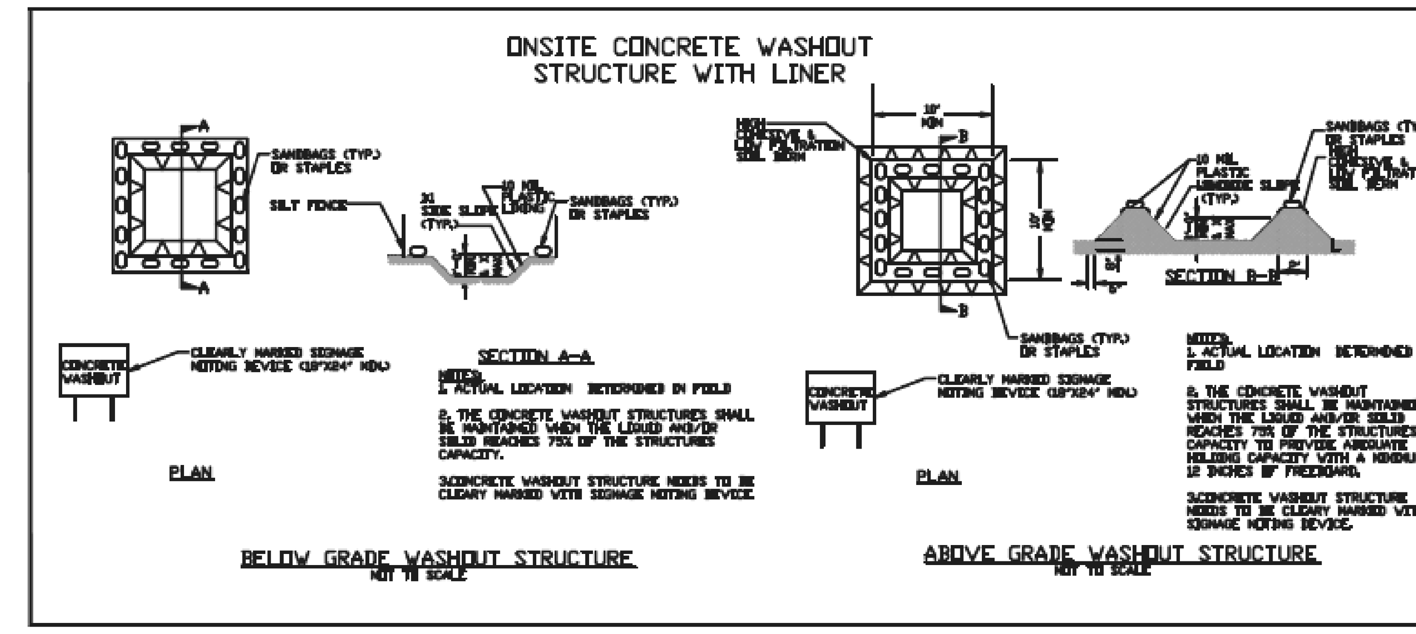
PORTABLE TOILETS

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

EARTHEN STOCKPILE MANAGEMENT

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

NORTH CAROLINA
Environmental Quality



CONCRETE WASHOUTS

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

HERBICIDES, PESTICIDES AND RODENTICIDES

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

HAZARDOUS AND TOXIC WASTE

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

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL CHADWICK W. BECK
FINAL DRAWINGS – FOR REVIEW PURPOSES ONLY

KHA PROJECT	DATE	SCALE	DESIGNED BY:	DRAWN BY:	CHECKED BY:
011159020	7/6/2020	1" = 40'	CWB	TDW	CWB

EROSION CONTROL DETAILS

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

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PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

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

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

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

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

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

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

2. Additional Documentation to be Kept on Site

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

(a) This General Permit as well as the Certificate of Coverage, after it is received.

(b) Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years

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

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.

(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(c) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.

(d) Anticipated bypasses and unanticipated bypasses.

(e) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Department's Environmental Emergency Center personnel at (800) 858-0368.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	• ***Within 24 hours***, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible***. The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days,*** a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment[40 CFR 122.41(l)(7)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

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

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

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

NORTH CAROLINA Environmental Quality

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK
FINAL DRAWINGS – FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 40'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

EROSION CONTROL DETAILS

ELLIOTT ROAD EXTENSION
PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
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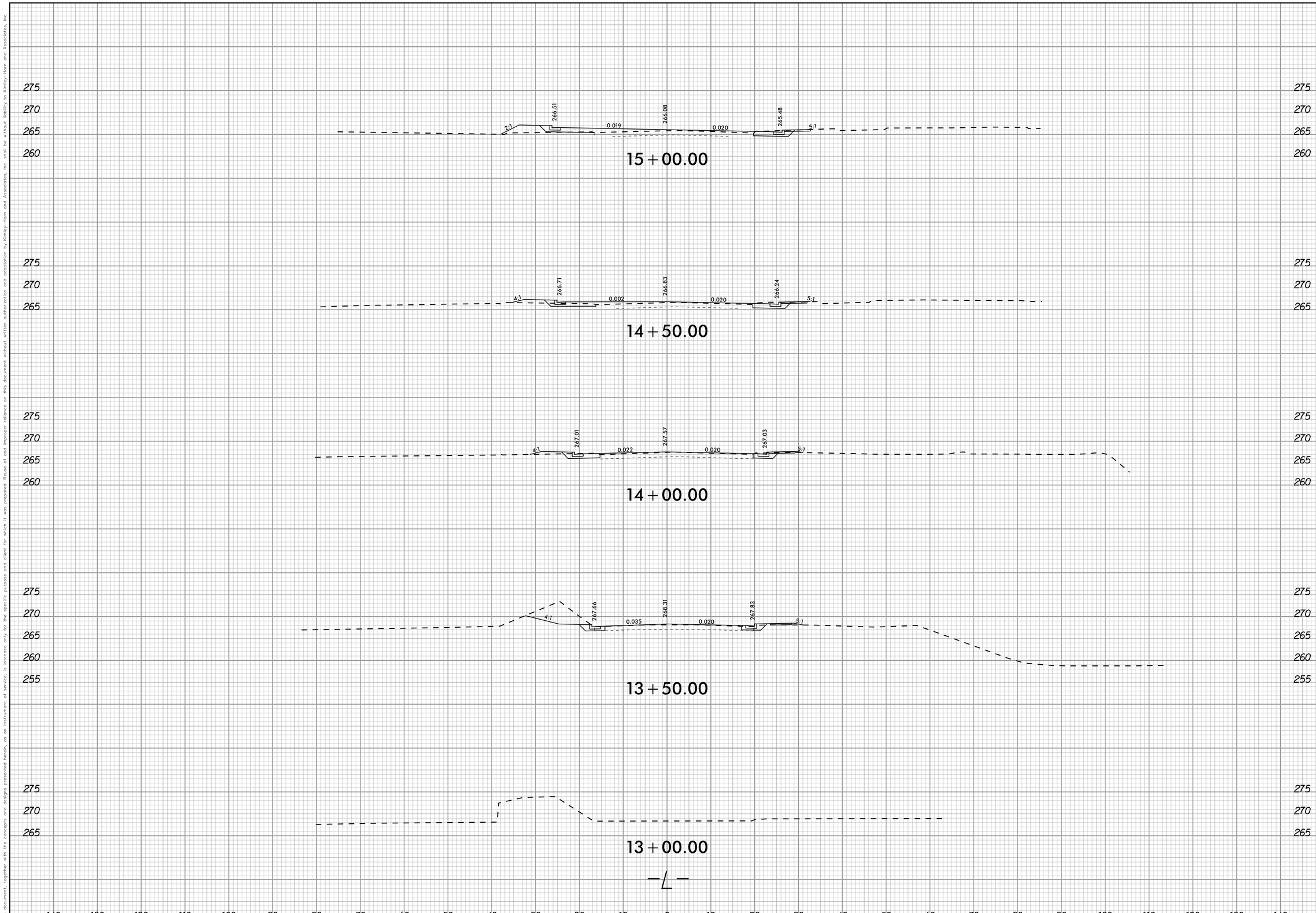

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK N. BELCHER

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 10'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

ROADWAY CROSS-SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
X-1

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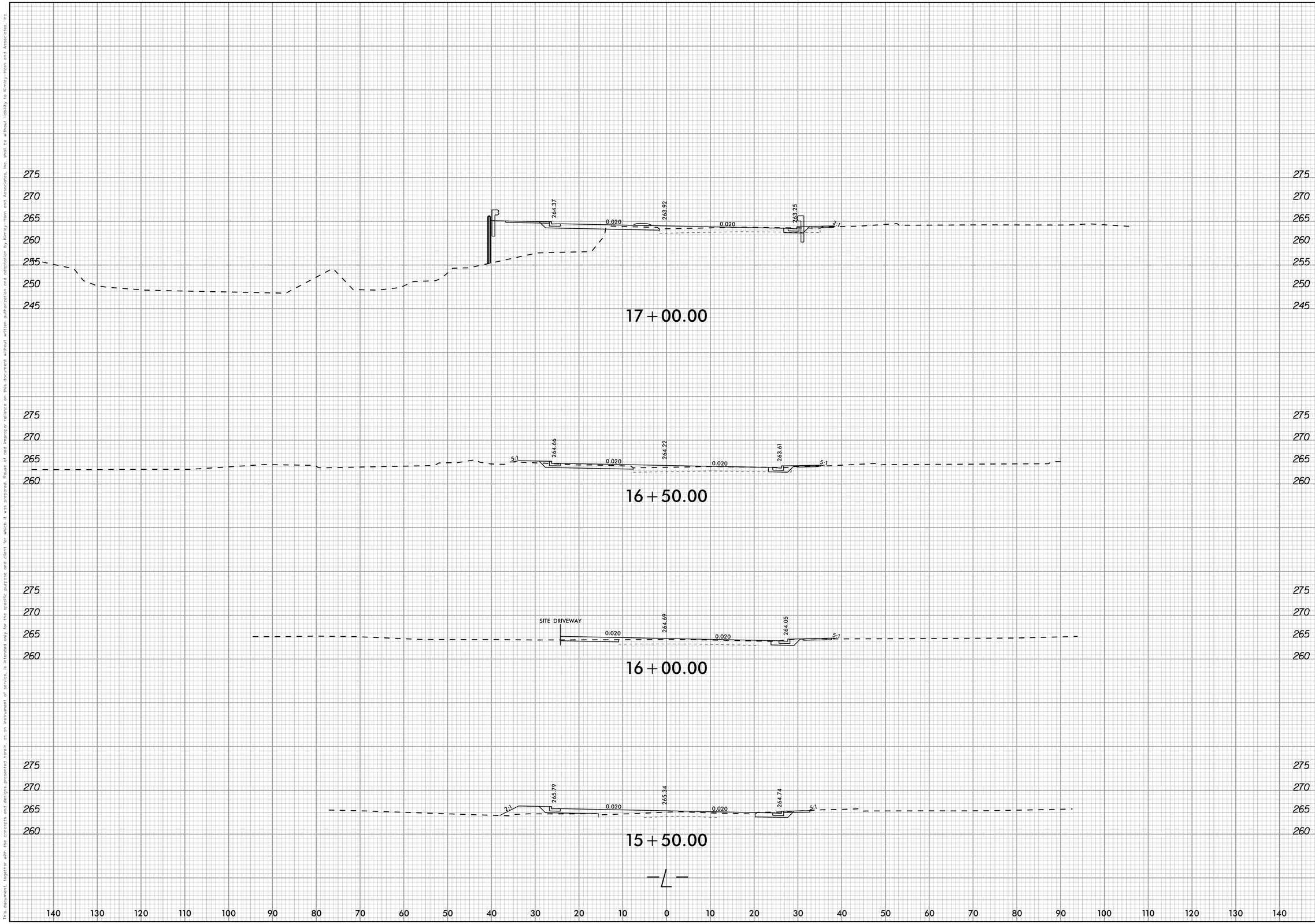

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NORTH CAROLINA PROFESSIONAL SEAL 19350 ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020

DATE	7/6/2020
SCALE	1" = 10'
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

ROADWAY CROSS-SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR

TOWN OF CHAPEL HILL, NC

CHAPEL HILL NORTH CAROLINA

SHEET NUMBER

X-2

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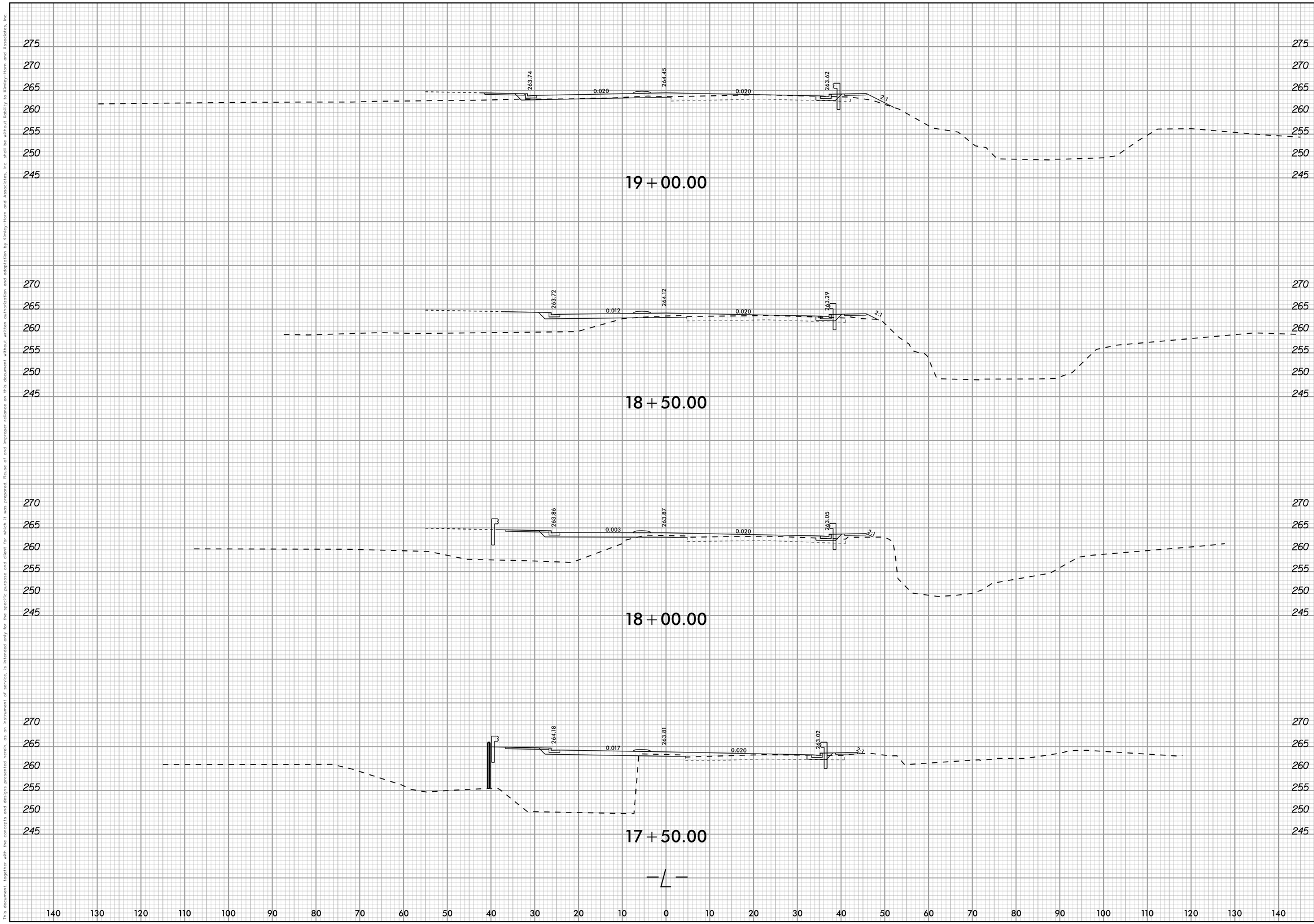

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NORTH CAROLINA PROFESSIONAL SEAL 045325 ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020

DATE	7/6/2020
SCALE	1" = 10'
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

ROADWAY CROSS -SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR

TOWN OF CHAPEL HILL, NC

CHAPEL HILL NORTH CAROLINA

SHEET NUMBER

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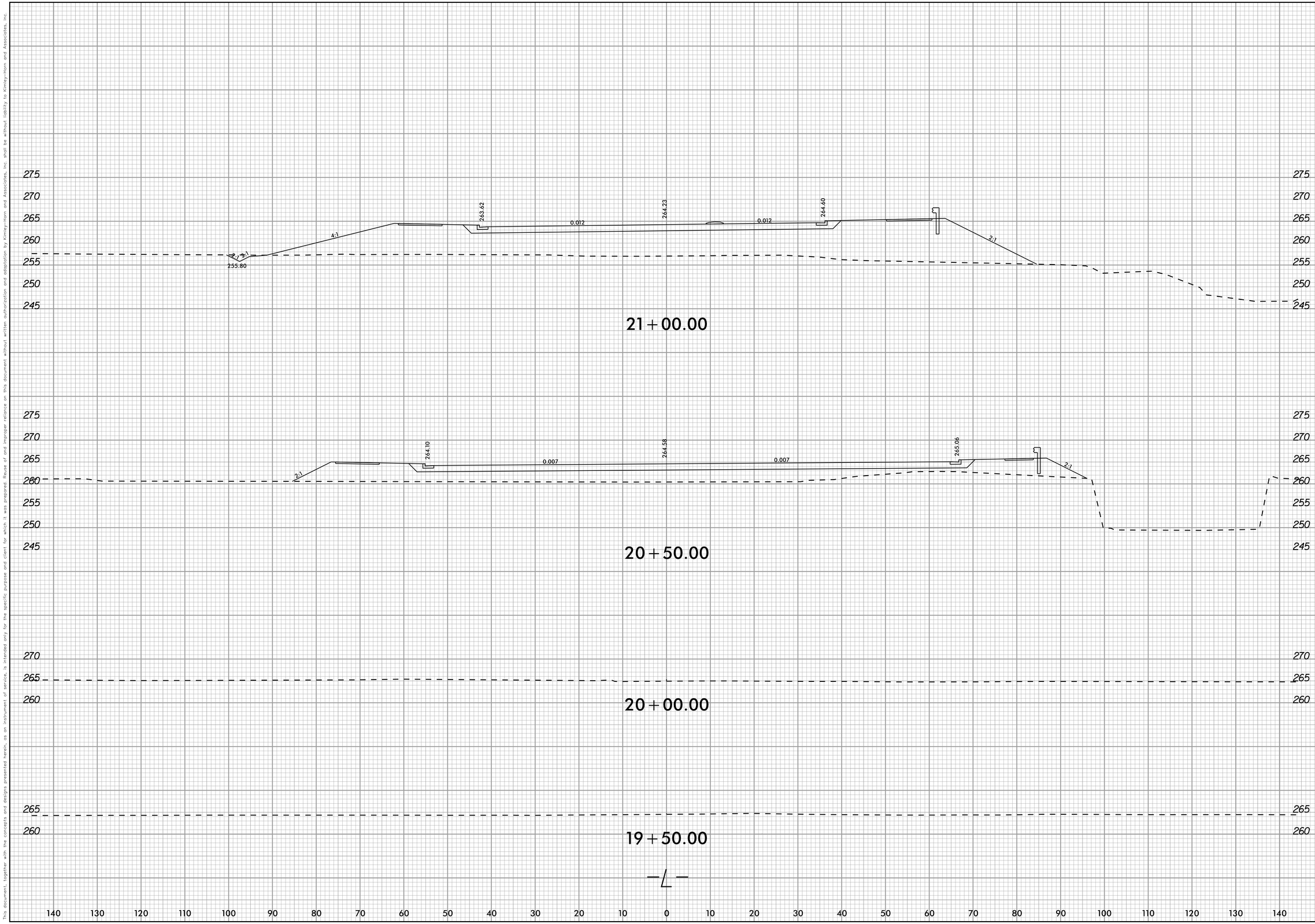

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NORTH CAROLINA PROFESSIONAL SEAL 049350 ENGINEER CHADWICK W. BECK

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KHA PROJECT 011159020

DATE	SCALE	DESIGNED BY:	DRAWN BY:	CHECKED BY:
7/6/2020	1" = 10'	CWB	TDW	CWB

ROADWAY CROSS-SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR

TOWN OF CHAPEL HILL, NC

CHAPEL HILL NORTH CAROLINA

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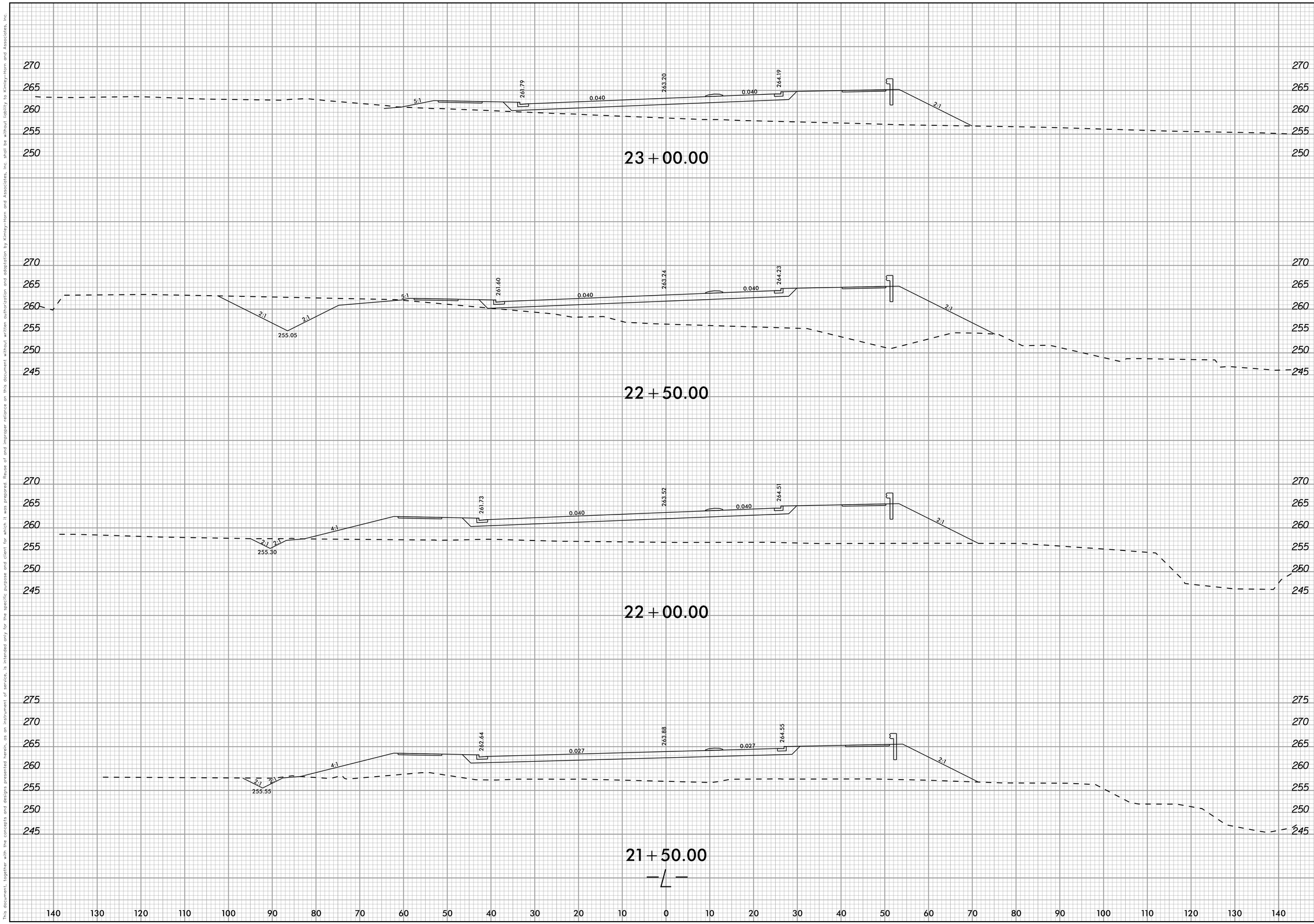

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020

DATE	7/6/2020
SCALE	1" = 10'
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

ROADWAY CROSS -SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR

TOWN OF CHAPEL HILL, NC

CHAPEL HILL NORTH CAROLINA

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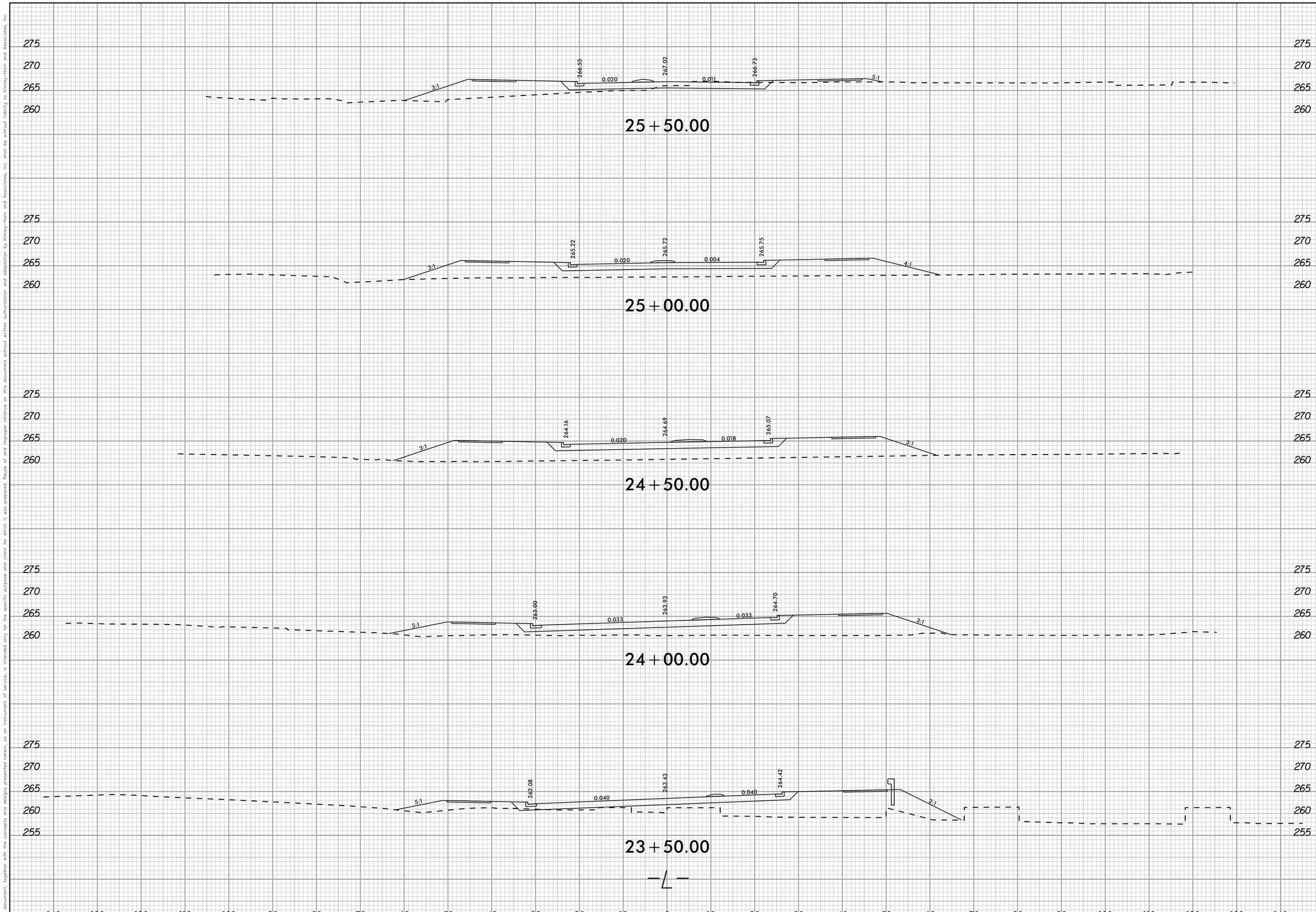

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. DELCH

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KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 10'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

ROADWAY CROSS-SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR
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CHAPEL HILL NORTH CAROLINA

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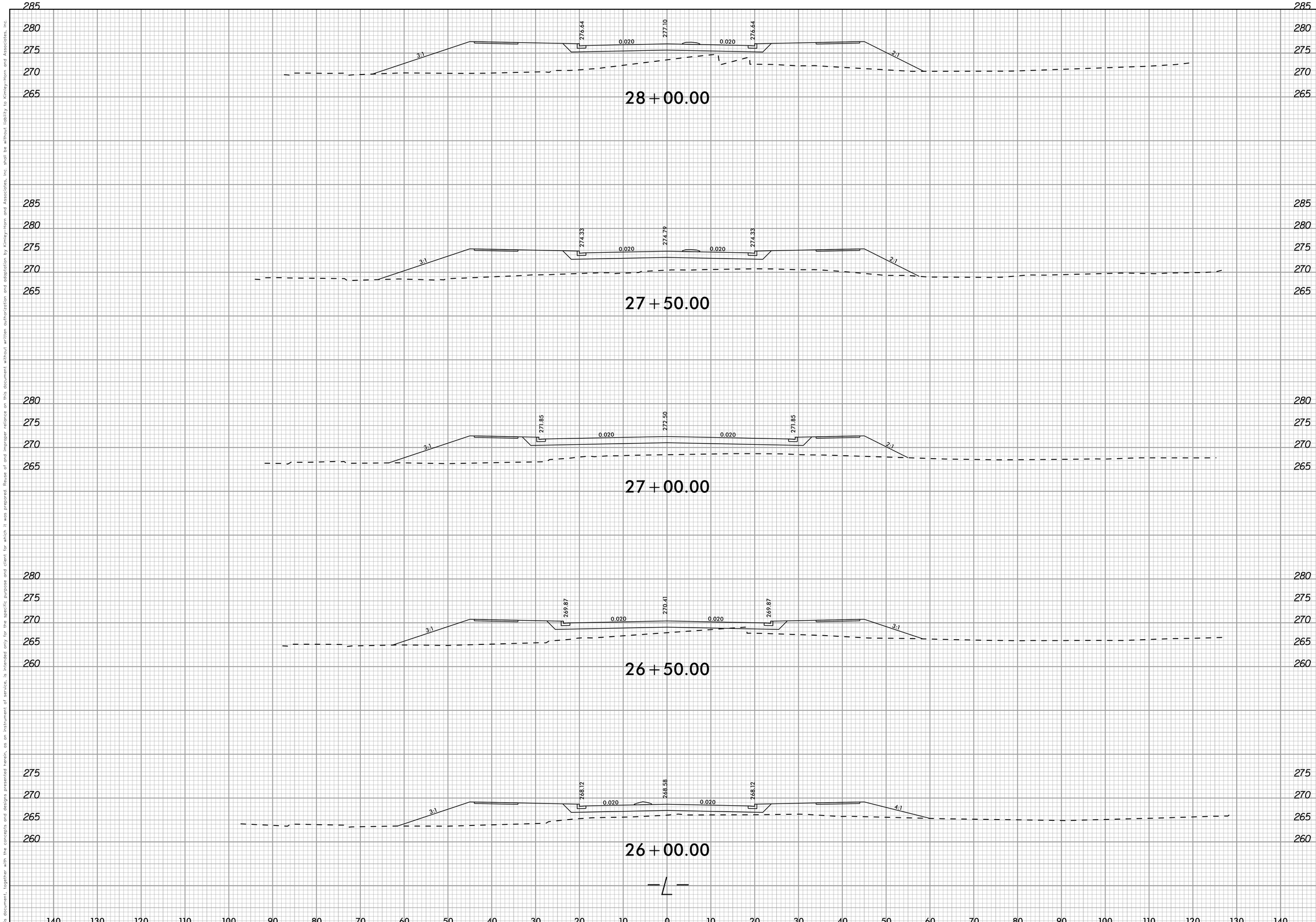

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NORTH CAROLINA PROFESSIONAL SEAL 045193 ENGINEER CHADWICK W. BELCHER

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 10'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

ROADWAY CROSS-SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR
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CHAPEL HILL NORTH CAROLINA

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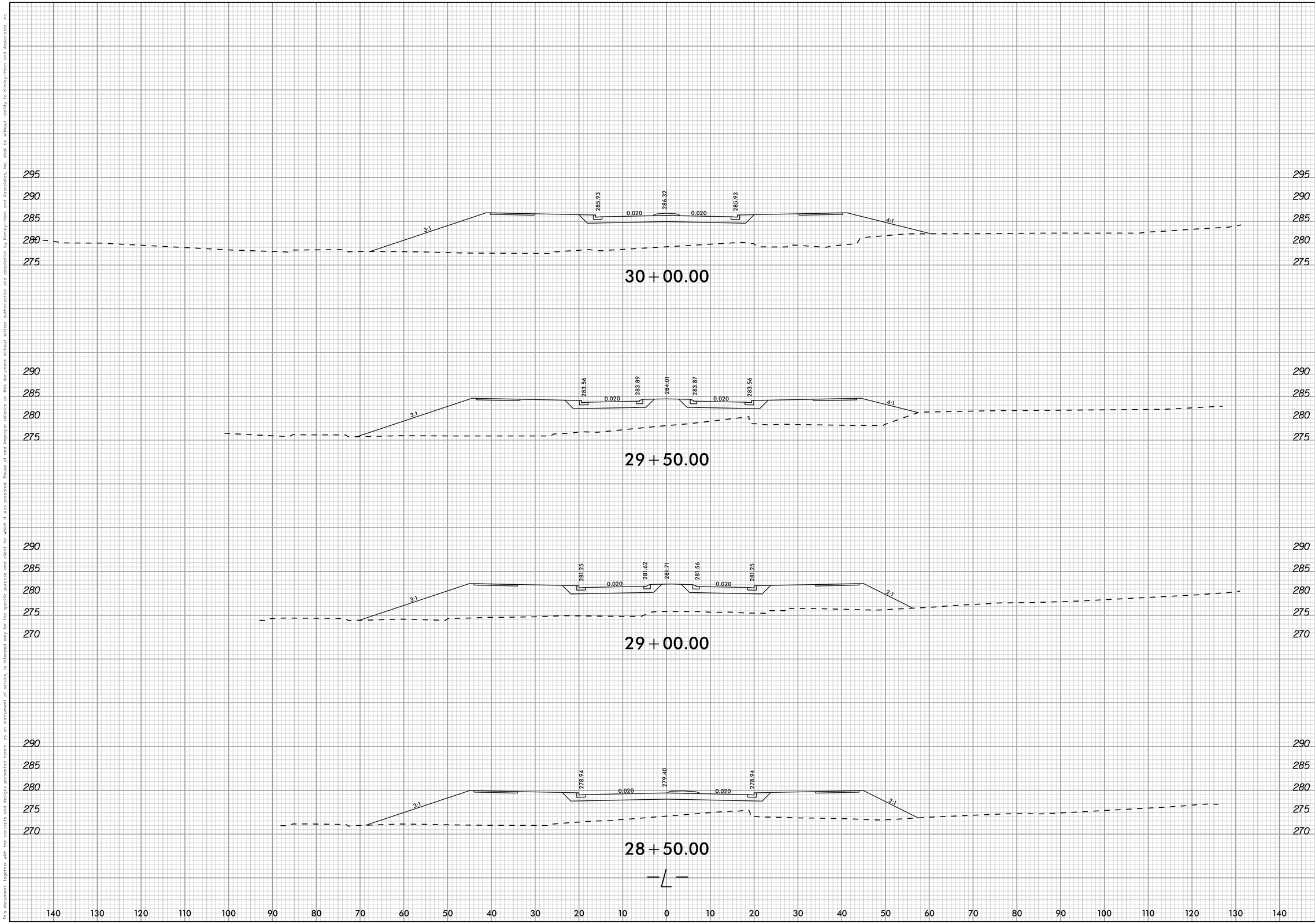

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FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 10'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

ROADWAY CROSS-SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR
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CHAPEL HILL NORTH CAROLINA

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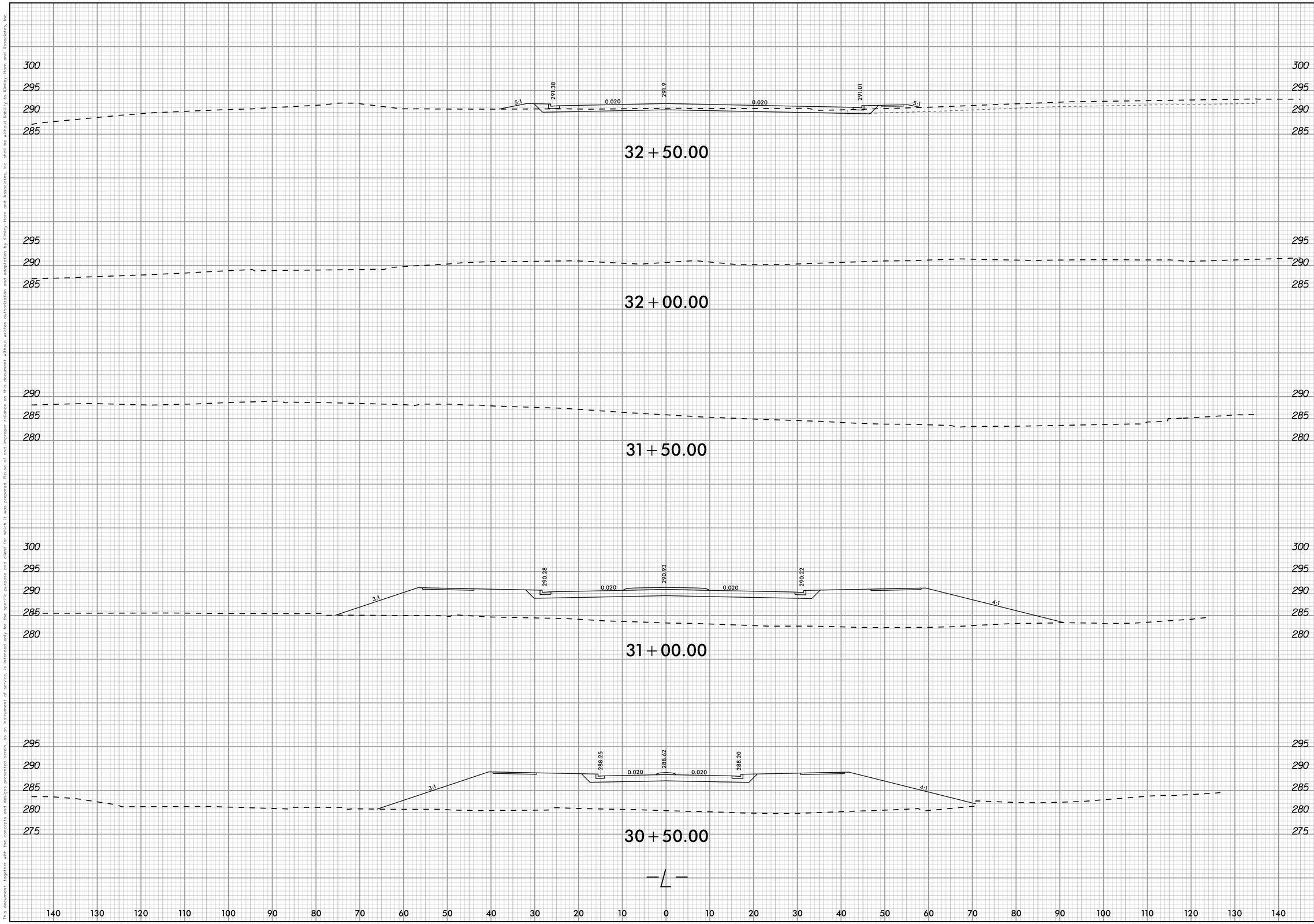

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020

DATE 7/6/2020

SCALE 1" = 10'

DESIGNED BY: CWB

DRAWN BY: TDW

CHECKED BY: CWB

ROADWAY CROSS-SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR

TOWN OF CHAPEL HILL, NC

CHAPEL HILL NORTH CAROLINA

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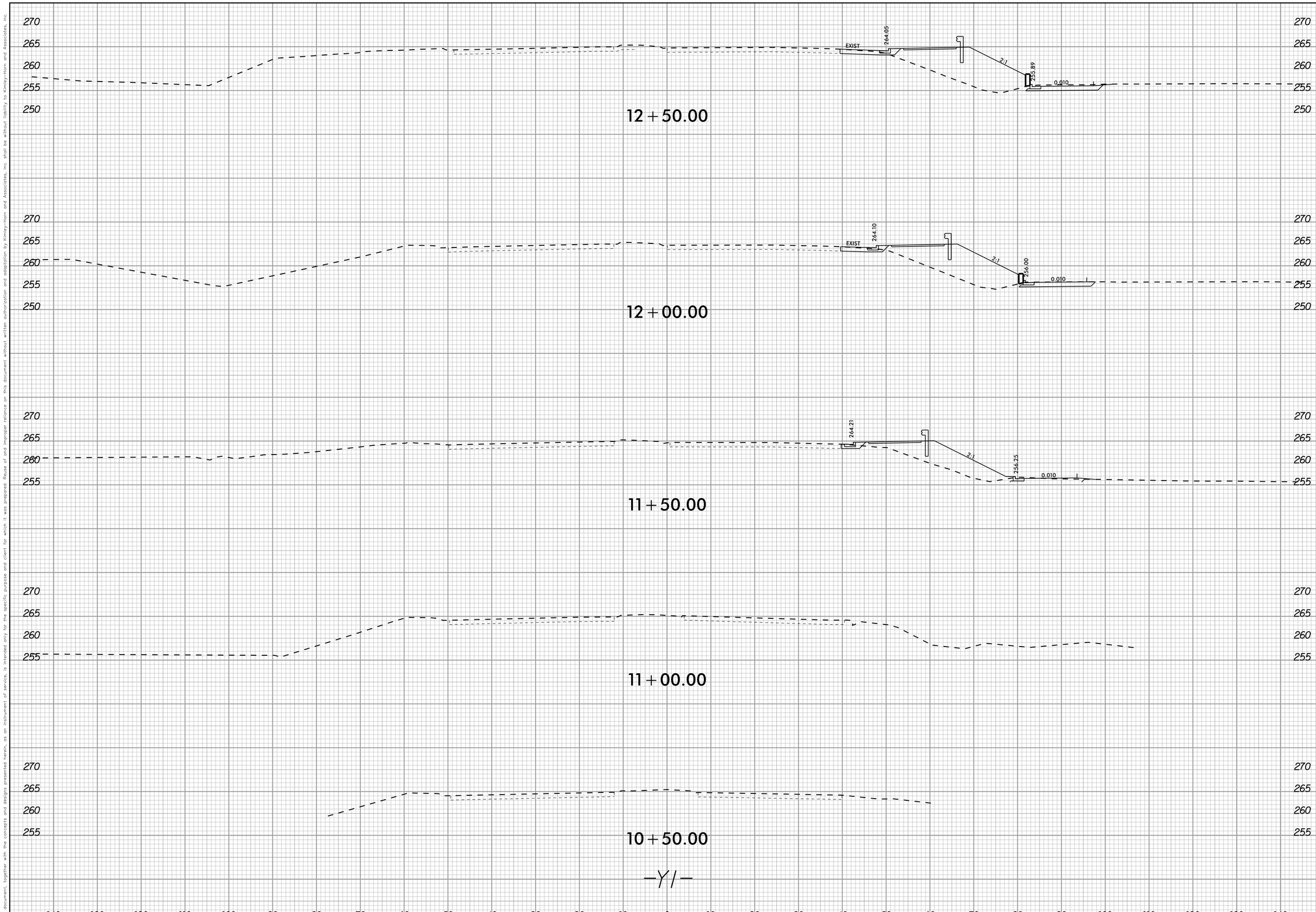

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK N. BELCHER

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 10'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

ROADWAY CROSS-SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
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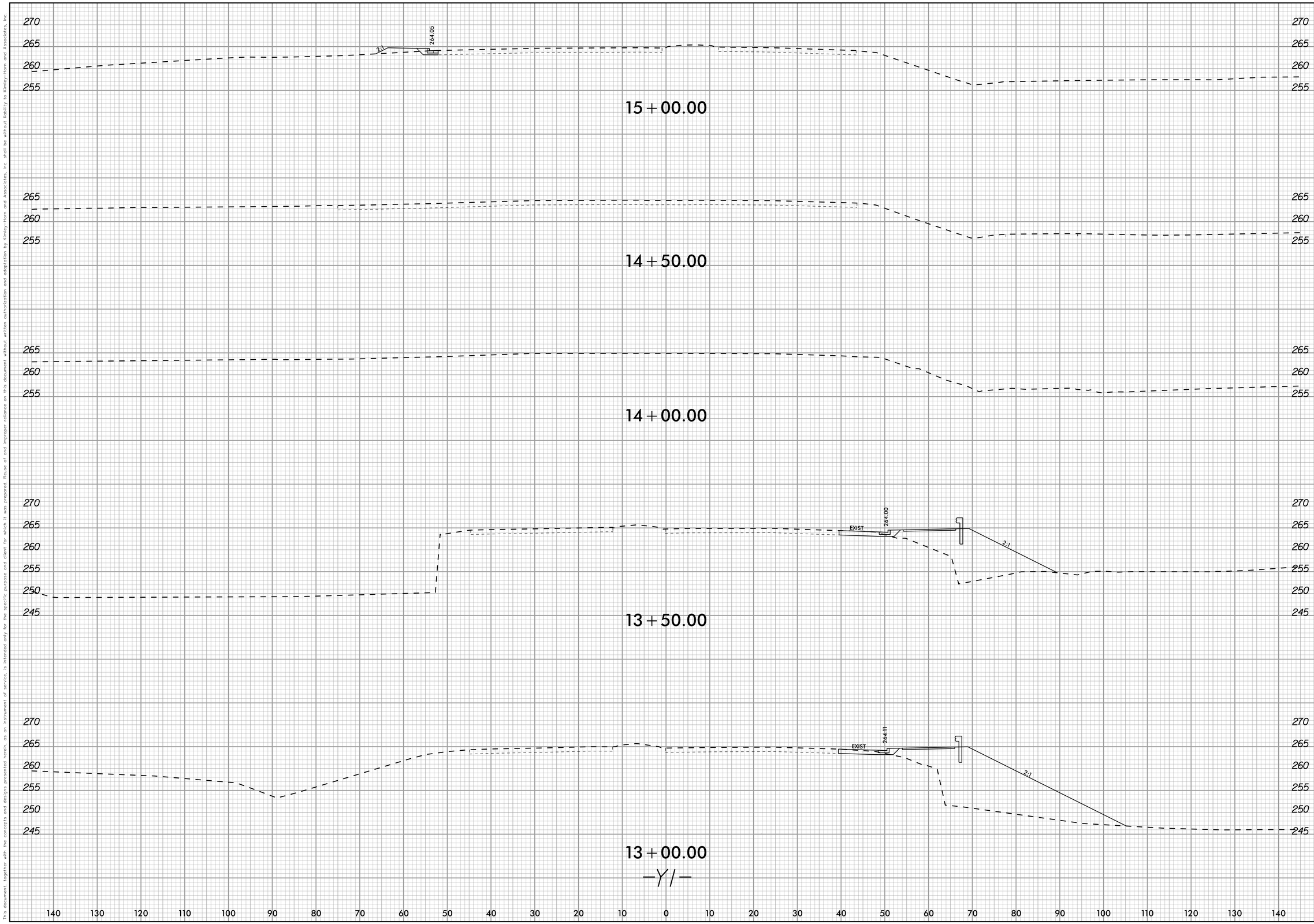

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020

DATE 7/6/2020

SCALE 1" = 10'

DESIGNED BY: CWB

DRAWN BY: TDW

CHECKED BY: CWB

ROADWAY CROSS -SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR

TOWN OF CHAPEL HILL, NC

CHAPEL HILL NORTH CAROLINA

SHEET NUMBER

X-11

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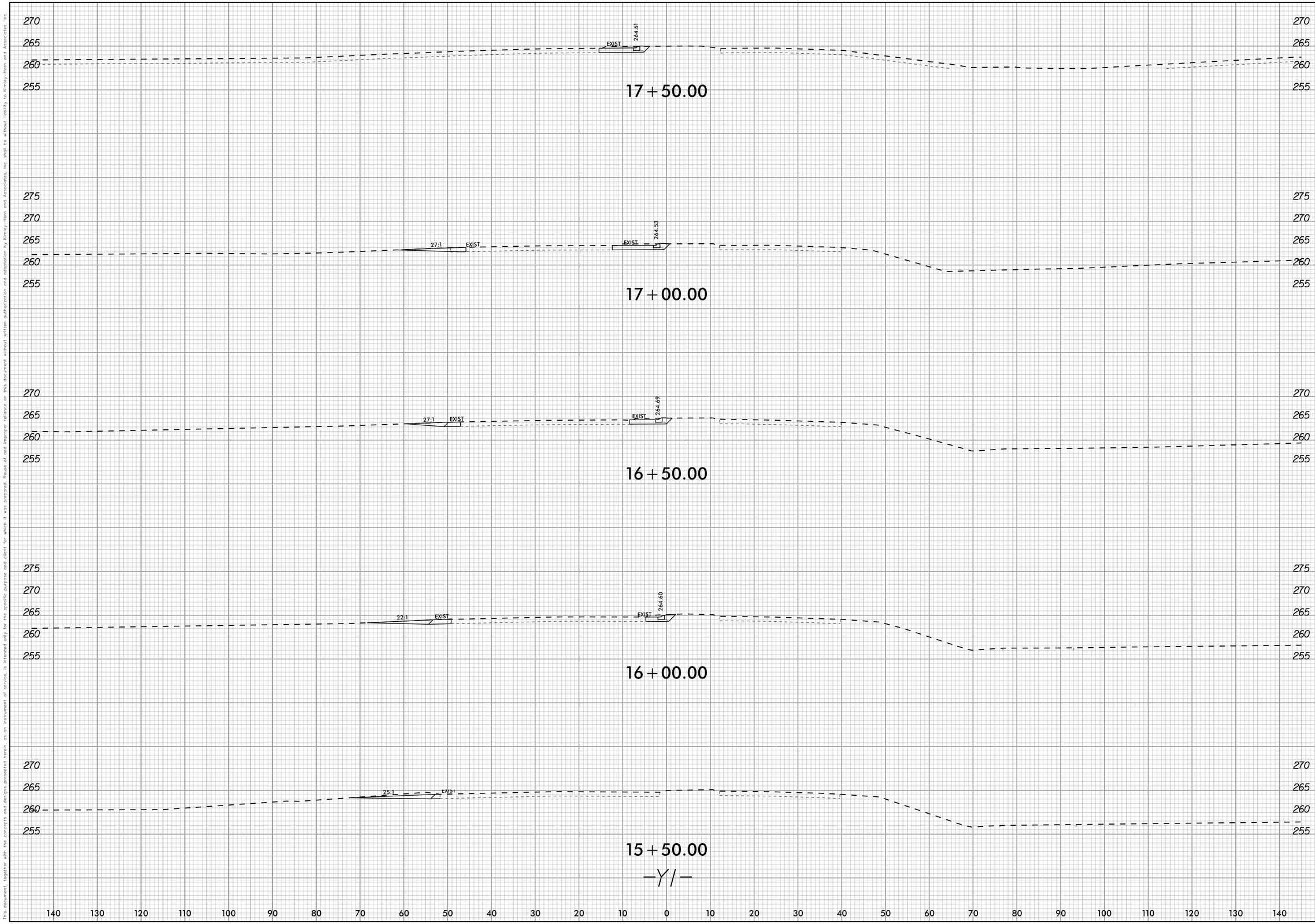

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS: - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020

DATE 7/6/2020

SCALE 1" = 10'

DESIGNED BY: CWB

DRAWN BY: TDW

CHECKED BY: CWB

ROADWAY CROSS-SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR

TOWN OF CHAPEL HILL, NC

CHAPEL HILL NORTH CAROLINA

SHEET NUMBER

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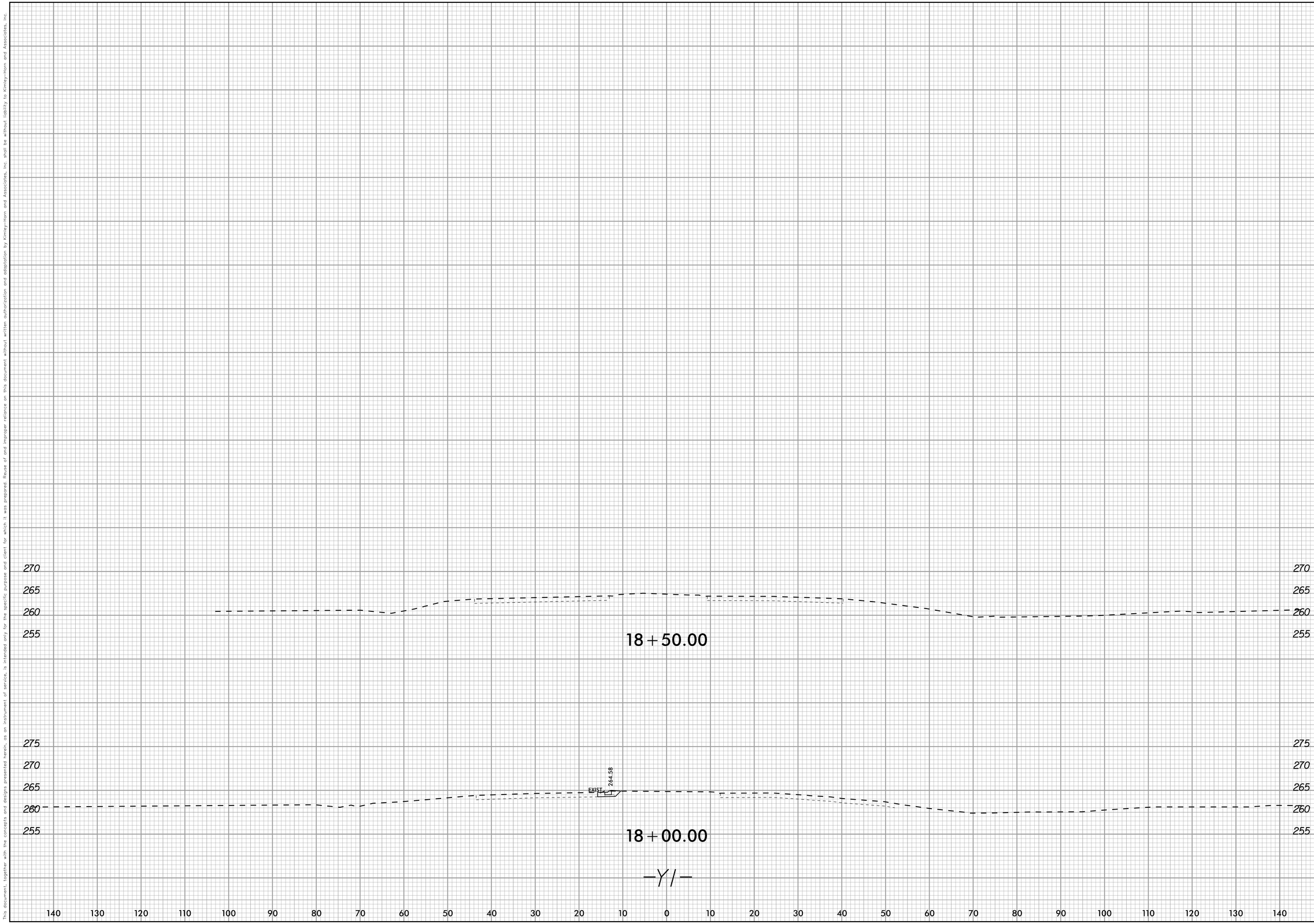

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020

DATE	7/6/2020
SCALE	1" = 10'
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

ROADWAY CROSS -SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR

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CHAPEL HILL NORTH CAROLINA

SHEET NUMBER

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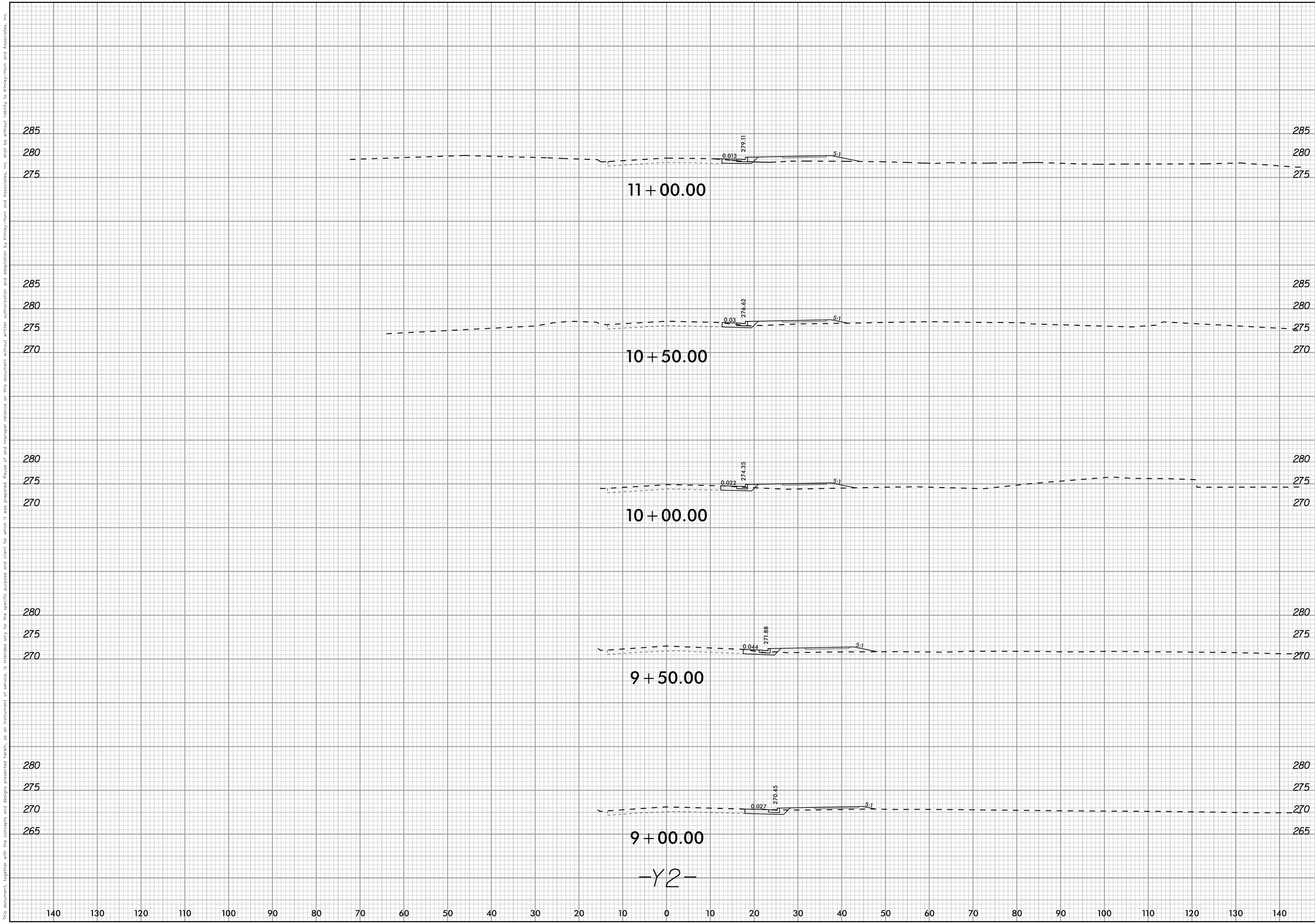

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KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 10'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

ROADWAY CROSS-SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
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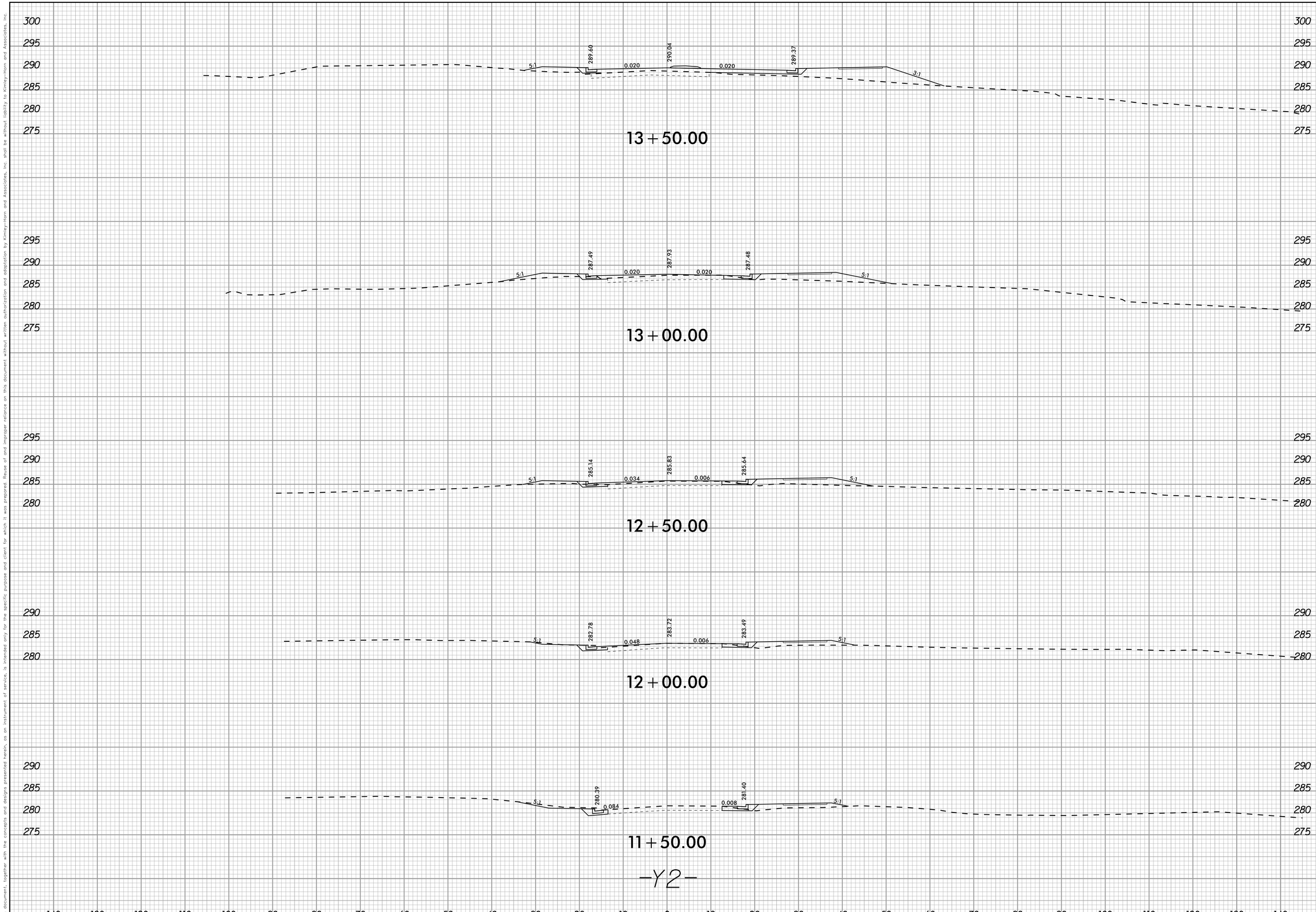

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 10'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

ROADWAY CROSS-SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
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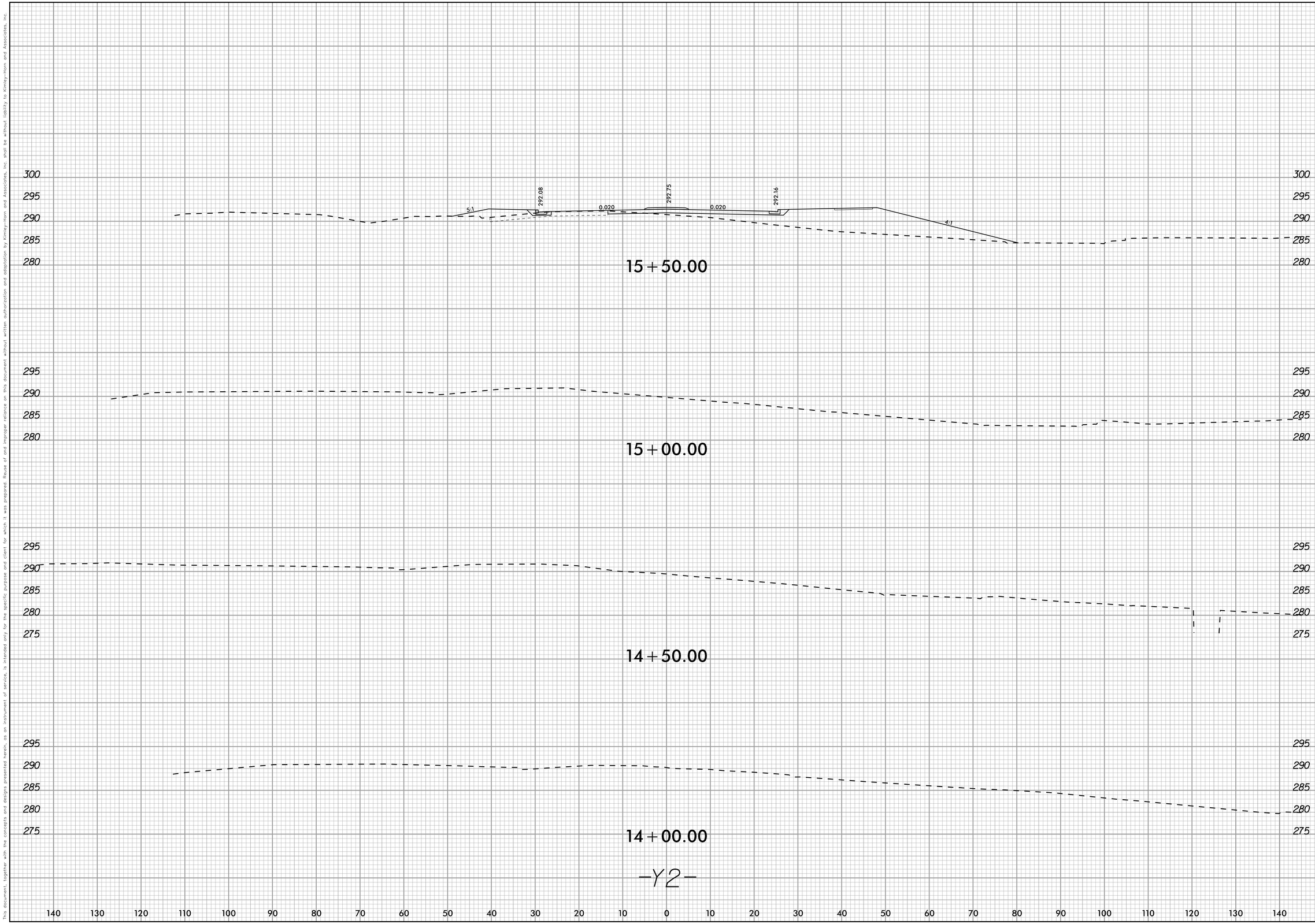

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020

DATE	7/6/2020
SCALE	1" = 10'
DESIGNED BY:	CWB
DRAWN BY:	TDW
CHECKED BY:	CWB

ROADWAY CROSS-SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR

TOWN OF CHAPEL HILL, NC

CHAPEL HILL NORTH CAROLINA

SHEET NUMBER

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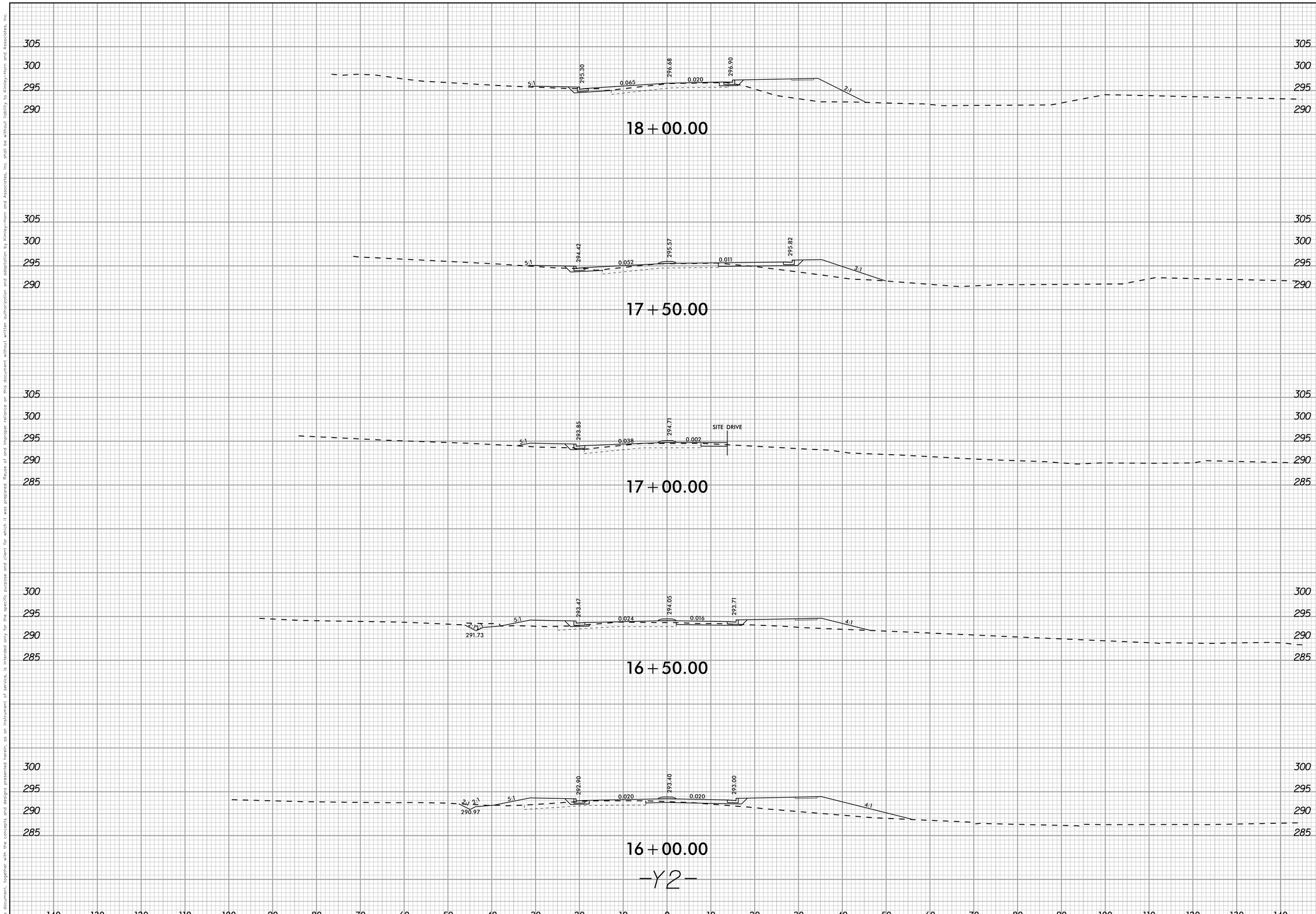

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK N. BELCHER

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020
DATE 7/6/2020
SCALE 1" = 10'
DESIGNED BY: CWB
DRAWN BY: TDW
CHECKED BY: CWB

ROADWAY CROSS-SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR
TOWN OF CHAPEL HILL, NC
CHAPEL HILL NORTH CAROLINA

SHEET NUMBER
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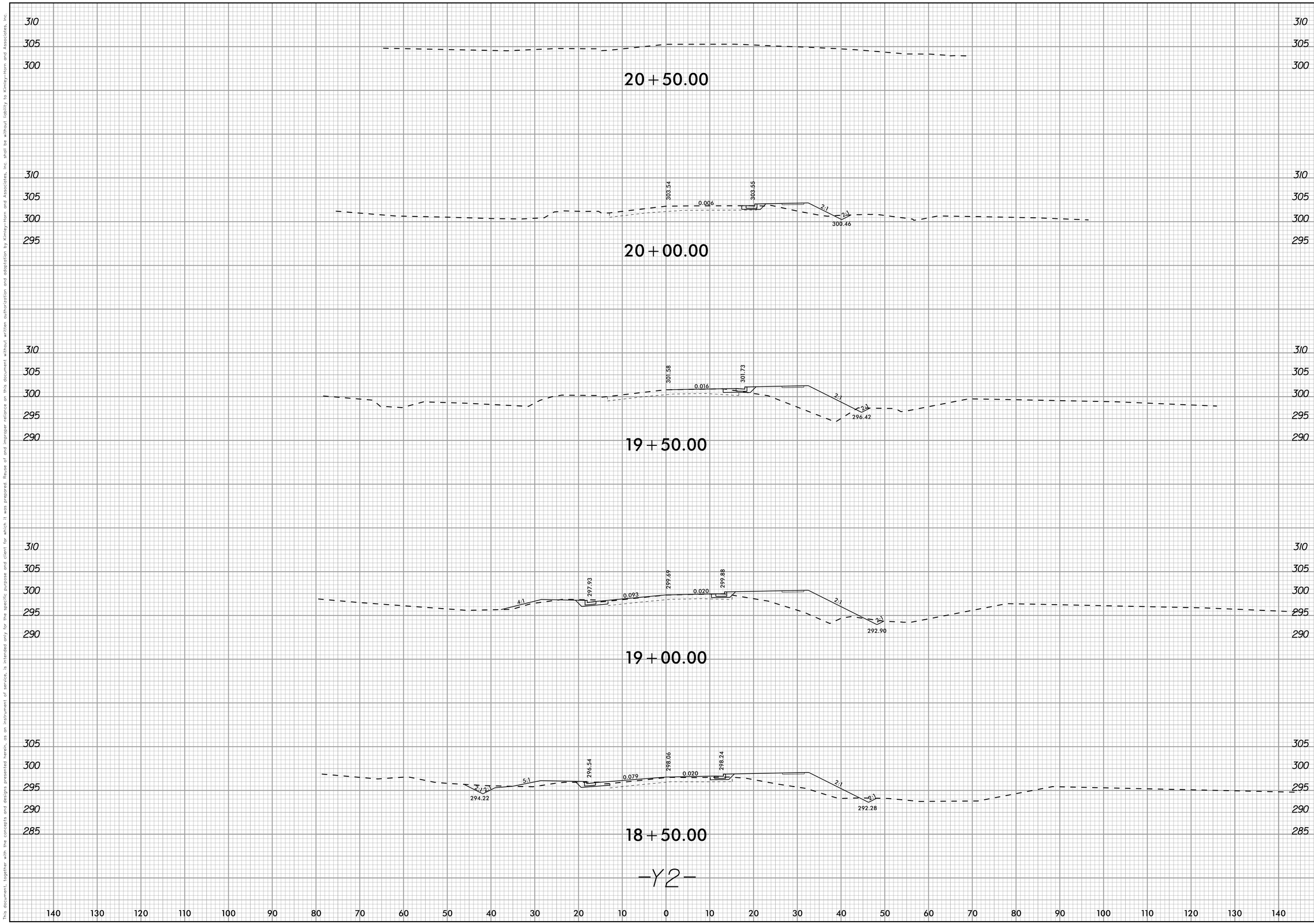

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NORTH CAROLINA PROFESSIONAL SEAL ENGINEER CHADWICK W. BECK

FINAL DRAWINGS - FOR REVIEW PURPOSES ONLY

KHA PROJECT 011159020

DATE 7/6/2020

SCALE 1" = 10'

DESIGNED BY: CWB

DRAWN BY: TDW

CHECKED BY: CWB

ROADWAY CROSS -SECTIONS

ELLIOTT ROAD EXTENSION

PREPARED FOR

TOWN OF CHAPEL HILL, NC

CHAPEL HILL NORTH CAROLINA

SHEET NUMBER

X-18

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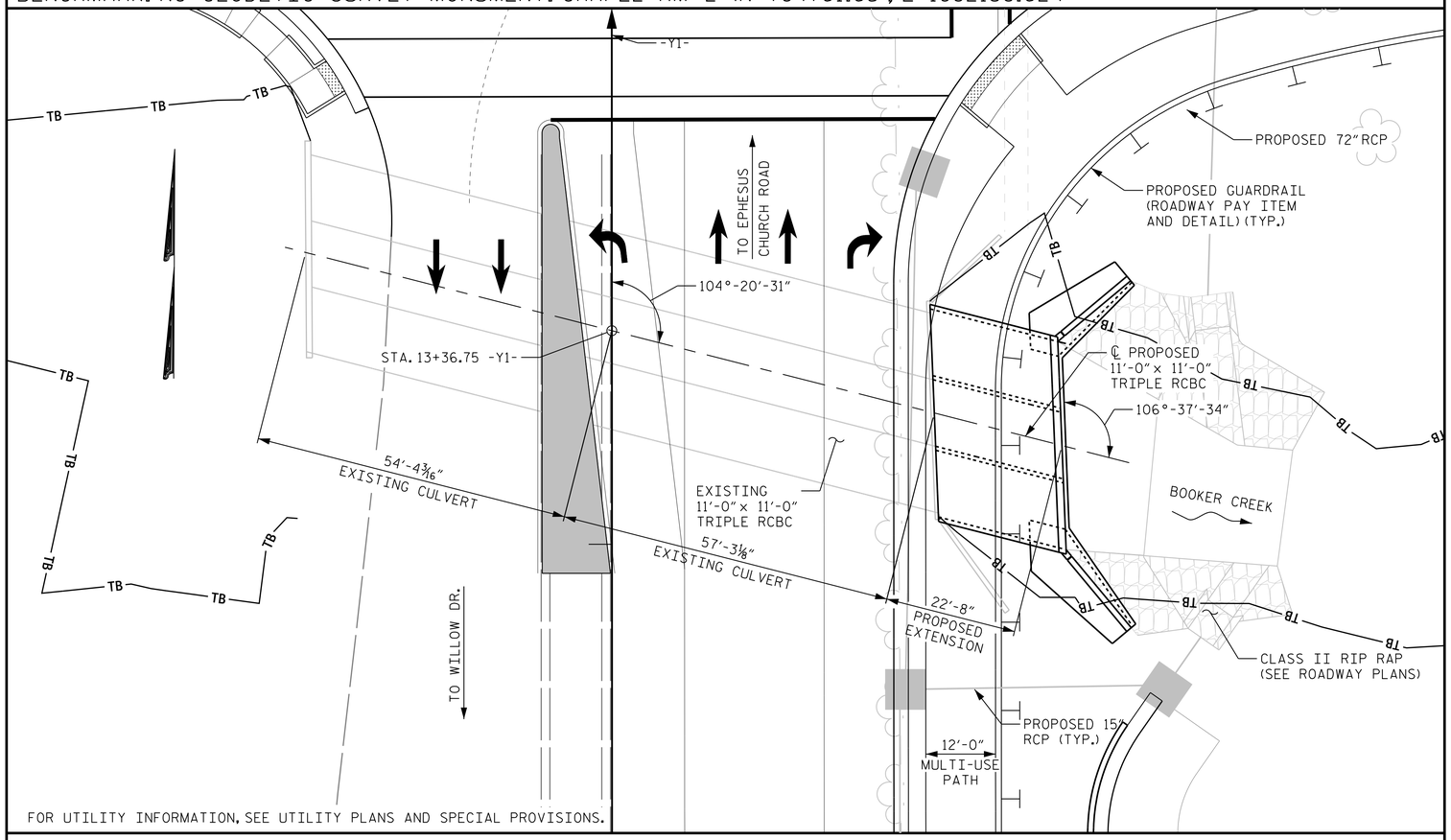
BENCHMARK: NC GEODETIC SURVEY MONUMENT: CHAPEL RM 2 (N 794761.65', E 1982138.62')



LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD ---------- HL-93 OR ALTERNATE LOADING

DESIGN FILL ---------- 4'-0" (MAX.), 2'-0" (MIN.)

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

THE REINFORCED CONCRETE BOX CULVERT SHALL BE PLACED ON THE STANDARD 1.0 FT. BLANKET OF FOUNDATION CONDITIONING MATERIAL. SEE SECTION 414 OF STANDARD SPECIFICATIONS.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING WALL SHEETS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF THE CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF FILL.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES WILL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACES OF EXTERIOR WALLS AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY USE THE EXISTING WINGS AS TEMPORARY SHORING FOR THE CONSTRUCTION OF THE CULVERT EXTENSIONS. IN THIS CASE, THE BOTTOM SLAB OF THE EXTENSION SHALL BE CURED AT LEAST 72 HOURS PRIOR TO CUTTING THE WINGS. THE WINGS MAY BE CUT EARLIER PROVIDED THE SLAB CONCRETE STRENGTH HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 1,500 PSI.

DOWELS SHALL BE USED TO CONNECT THE CULVERT EXTENSION TO THE EXISTING CULVERT AS SHOWN. FOR NOTE REGARDING SETTING OF DOWELS, SEE SHEET SN.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

NO PRECAST REINFORCED CULVERT OPTION WILL BE ALLOWED.

HYDRAULIC DATA

DESIGN DISCHARGE ---------- 2,300 CFS
FREQUENCY OF DESIGN FLOOD ------- 50 YR.
DESIGN HIGH WATER ELEVATION ----- 260.0 FT.
DRAINAGE AREA ---------- 5.9 SQ. MI.
BASE DISCHARGE (Q100) ---------- 2,700 CFS
BASE HIGH WATER ELEVATION ------ 260.7 FT.

OVERTOPPING FLOOD DATA

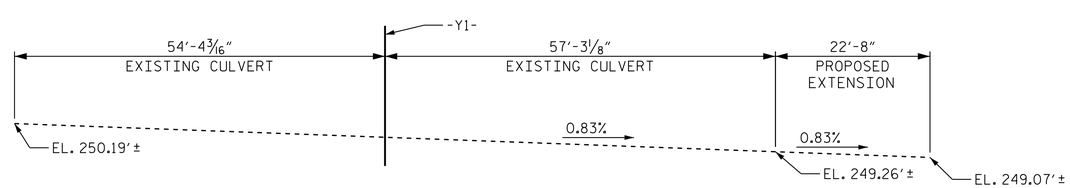
OVERTOPPING DISCHARGE ---------- 5,200 CFS
FREQUENCY OF OVERTOPPING FLOOD ---> 500 YR.
OVERTOPPING FLOOD ELEVATION ------ 264.73 FT.

TOTAL STRUCTURE QUANTITIES

CULVERT EXCAVATION STA. 13+36.75 -Y1-	LUMP SUM			
FOUNDATION CONDITIONING MATERIAL	98 TONS			
CLASS A CONCRETE				
BARREL @	3.710	CY/FT	84.1	C.Y.
WINGS ETC.			31.0	C.Y.
EDGE BEAMS			2.8	C.Y.
TOTAL			117.9	C.Y.
REINFORCING STEEL				
BARREL			18,958	LBS.
WINGS ETC.			2,699	LBS.
TOTAL			21,657	LBS.

ROADWAY DATA

GRADE POINT EL. @ STA. 13+36.75 -Y1- = 264.73'
BED ELEVATION @ STA. 13+36.75 -Y1- = 249.74'
ROADWAY SLOPES 2 : 1



PROFILE ALONG ℄ CULVERT

PROJECT NO. N/A
ORANGE COUNTY
STATION: 13+36.75 -Y1-

SHEET 1 OF 8 EXTENDS STR. NO. 670078

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON
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TOWN OF CHAPEL HILL

TRIPLE 11 FT. X 11 FT. CONCRETE BOX CULVERT 105° SKEW

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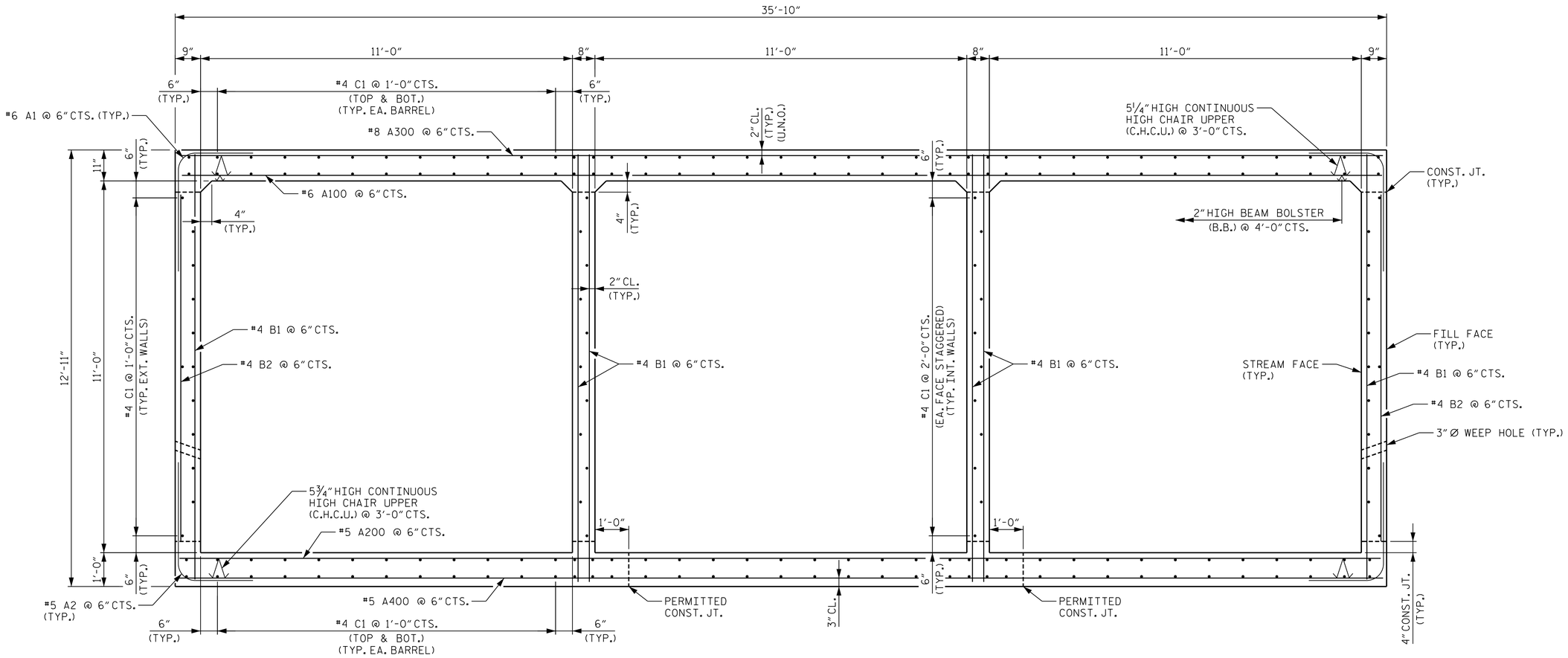

RIGHT ANGLE SECTION OF BARREL

THERE ARE 202 "C" BARS IN SECTION OF BARREL

PROJECT NO. N/A

ORANGE COUNTY

STATION: 13+36.75 -Y1-

SHEET 2 OF 8

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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TRIPLE 11 FT. X 11 FT. CONCRETE BOX CULVERT 105° SKEW

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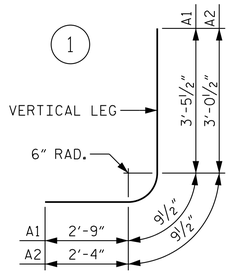
BARREL BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	88	6	1	7'-0"	925	A400	24	5	STR	35'-6"	889
A2	88	5	1	5'-10"	535	A401	2	5	STR	34'-2"	71
						A402	2	5	STR	32'-6"	68
A100	24	6	STR	35'-6"	1,280	A403	2	5	STR	30'-10"	64
A101	2	6	STR	34'-2"	103	A404	2	5	STR	29'-2"	61
A102	2	6	STR	32'-6"	98	A405	2	5	STR	27'-5"	57
A103	2	6	STR	30'-10"	93	A406	2	5	STR	25'-9"	54
A104	2	6	STR	29'-2"	88	A407	2	5	STR	24'-1"	50
A105	2	6	STR	27'-5"	82	A408	2	5	STR	22'-5"	47
A106	2	6	STR	25'-9"	77	A409	2	5	STR	20'-9"	43
A107	2	6	STR	24'-1"	72	A410	2	5	STR	19'-1"	40
A108	2	6	STR	22'-5"	67	A411	2	5	STR	17'-5"	36
A109	2	6	STR	20'-9"	62	A412	2	5	STR	15'-9"	33
A110	2	6	STR	19'-1"	57	A413	2	5	STR	14'-1"	29
A111	2	6	STR	17'-5"	52	A414	2	5	STR	12'-5"	26
A112	2	6	STR	15'-9"	47	A415	2	5	STR	10'-8"	22
A113	2	6	STR	14'-1"	42	A416	2	5	STR	9'-0"	19
A114	2	6	STR	12'-5"	37	A417	2	5	STR	7'-4"	15
A115	2	6	STR	10'-8"	32	A418	2	5	STR	5'-8"	12
A116	2	6	STR	9'-0"	27	A419	2	5	STR	4'-0"	8
A117	2	6	STR	7'-4"	22	A420	4	5	STR	2'-4"	10
A118	2	6	STR	5'-8"	17						
A119	2	6	STR	4'-0"	12	B1	268	4	STR	12'-7"	2,253
A120	4	6	STR	2'-4"	14	B2	88	4	STR	10'-2"	598
A200	24	5	STR	35'-6"	889	C1	202	4	STR	22'-4"	3,014
A201	2	5	STR	34'-2"	71						
A202	2	5	STR	32'-6"	68	D1	70	6	STR	2'-6"	263
A203	2	5	STR	30'-10"	64						
A204	2	5	STR	29'-2"	61	G1	4	5	STR	37'-0"	154
A205	2	5	STR	27'-5"	57						
A206	2	5	STR	25'-9"	54	S1	6	8	STR	37'-0"	593
A207	2	5	STR	24'-1"	50	S2	12	6	STR	37'-0"	667
A208	2	5	STR	22'-5"	47						
A209	2	5	STR	20'-9"	43						
A210	2	5	STR	19'-1"	40						
A211	2	5	STR	17'-5"	36						
A212	2	5	STR	15'-9"	33						
A213	2	5	STR	14'-1"	29						
A214	2	5	STR	12'-5"	26						
A215	2	5	STR	10'-8"	22						
A216	2	5	STR	9'-0"	19						
A217	2	5	STR	7'-4"	15						
A218	2	5	STR	5'-8"	12						
A219	2	5	STR	4'-0"	8						
A220	4	5	STR	2'-4"	10						
A300	24	8	STR	35'-6"	2,275						
A301	2	8	STR	34'-2"	182						
A302	2	8	STR	32'-6"	174						
A303	2	8	STR	30'-10"	165						
A304	2	8	STR	29'-2"	156						
A305	2	8	STR	27'-5"	146						
A306	2	8	STR	25'-9"	138						
A307	2	8	STR	24'-1"	129						
A308	2	8	STR	22'-5"	120						
A309	2	8	STR	20'-9"	111						
A310	2	8	STR	19'-1"	102						
A311	2	8	STR	17'-5"	93						
A312	2	8	STR	15'-9"	84						
A313	2	8	STR	14'-1"	75						
A314	2	8	STR	12'-5"	66						
A315	2	8	STR	10'-8"	57						
A316	2	8	STR	9'-0"	48						
A317	2	8	STR	7'-4"	39						
A318	2	8	STR	5'-8"	30						
A319	2	8	STR	4'-0"	21						
A320	4	8	STR	2'-4"	25	REINFORCING STEEL					18,927 LBS.

BAR TYPE



ALL BAR DIMENSIONS ARE OUT TO OUT

SPLICE LENGTH		
BAR SIZE	OTHER BAR	TOP BAR
#4	1'-10"	2'-5"
#5	2'-4"	3'-0"
#6	2'-9"	3'-7"
#7	3'-2"	4'-2"
#8	3'-8"	4'-9"

PROJECT NO. N/A

ORANGE COUNTY

STATION: 13+36.75 -Y1-

SHEET 3 OF 8

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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TOWN OF CHAPEL HILL

TRIPLE 11 FT. X 11 FT. CONCRETE BOX CULVERT 105° SKEW

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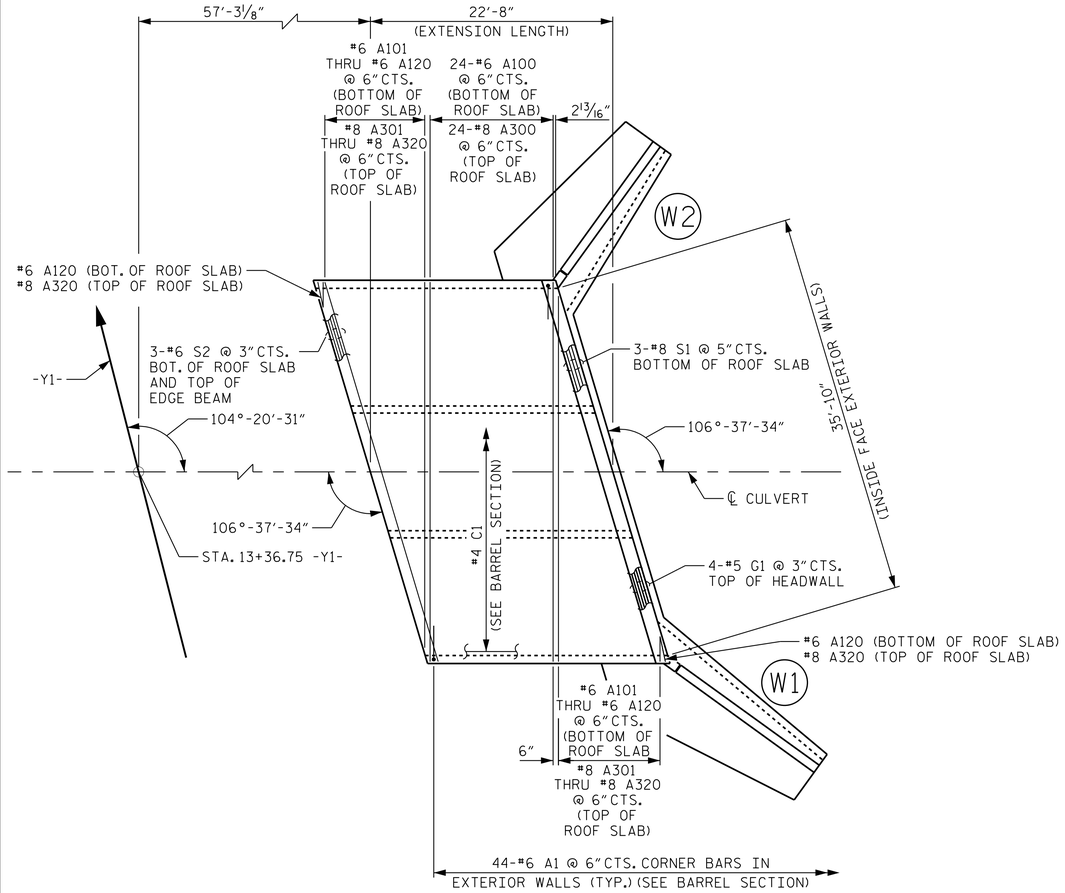
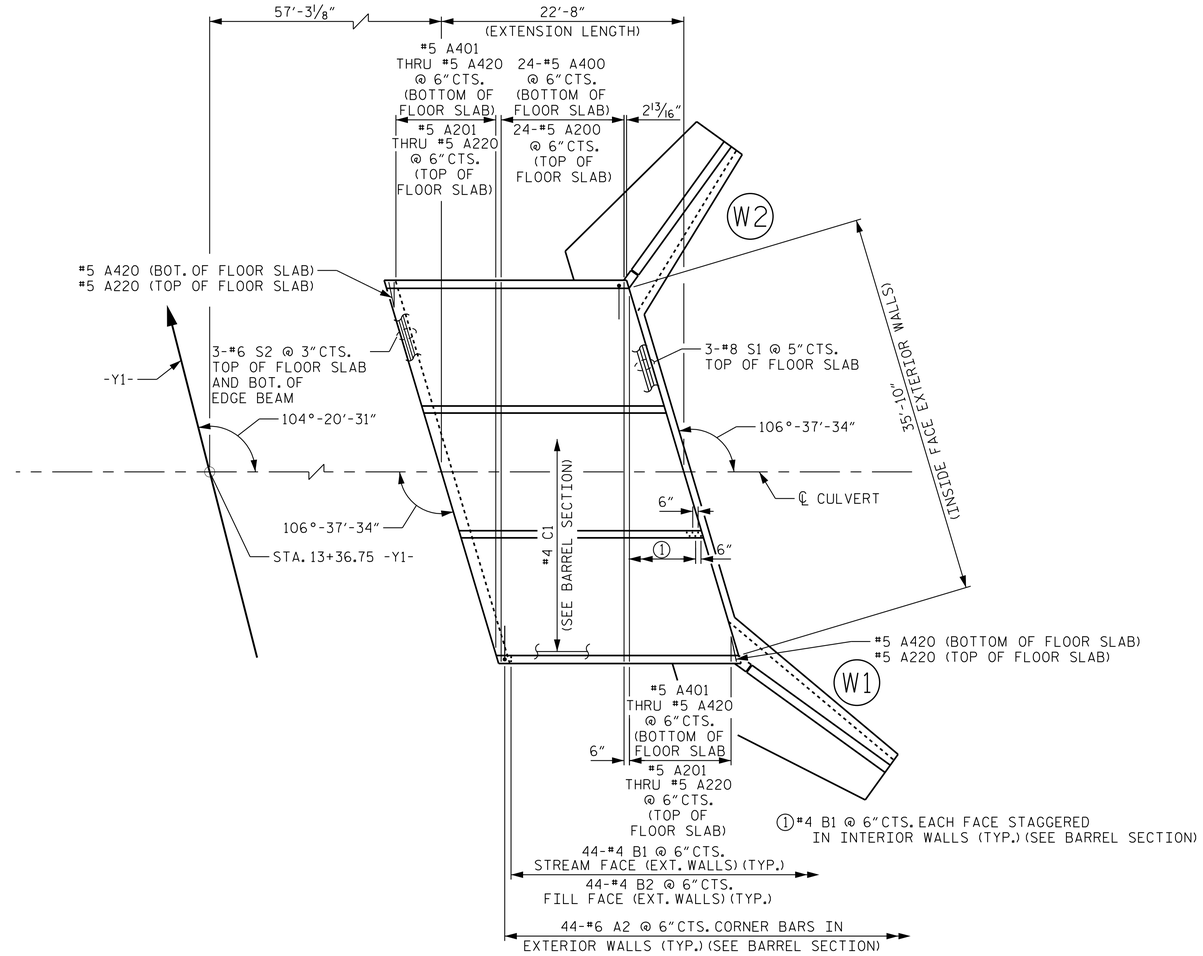
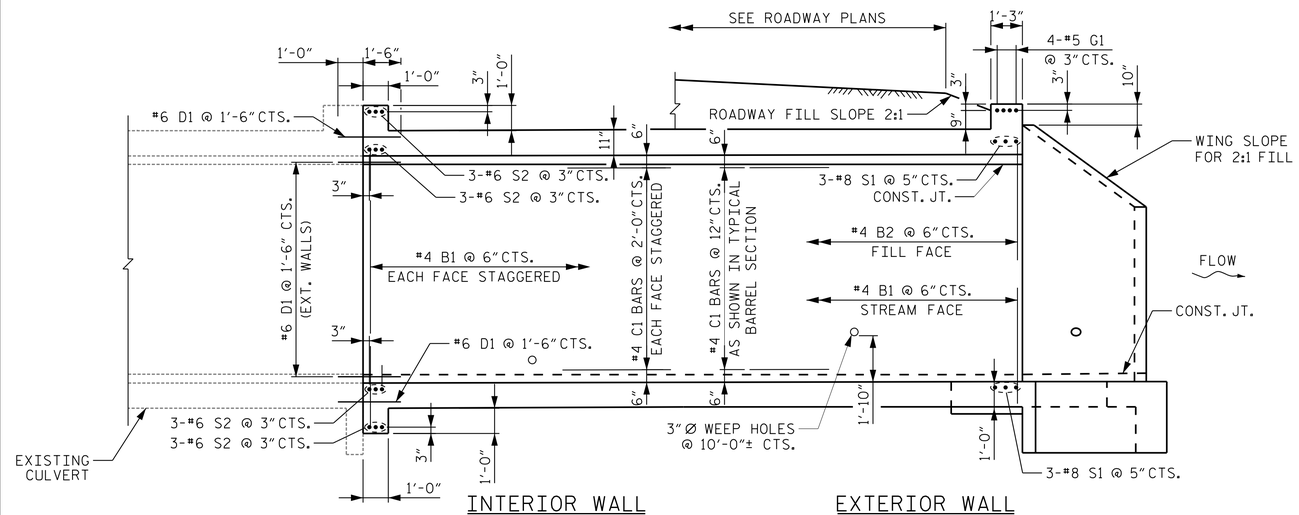


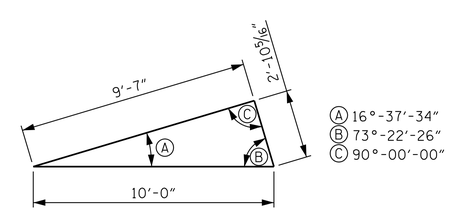
ROOF SLAB PLAN



FLOOR SLAB PLAN



CULVERT SECTION NORMAL TO ROADWAY



SKEW TRIANGLE

PROJECT NO. N/A

ORANGE COUNTY

STATION: 13+36.75 -Y1-

SHEET 4 OF 8

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TOWN OF CHAPEL HILL

TRIPLE 11 FT. X 11 FT. CONCRETE BOX CULVERT 105° SKEW

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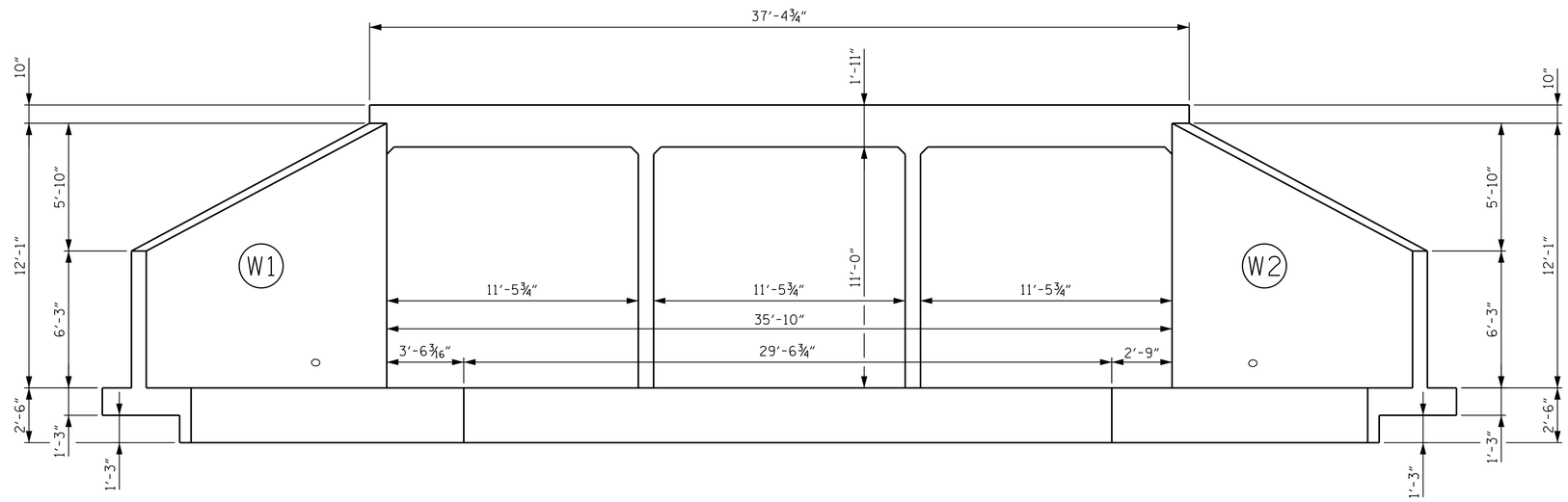

ELEVATION NORMAL TO SKEW

(LOOKING UPSTREAM)

PROJECT NO. N/A

ORANGE COUNTY

STATION: 13+36.75 -Y1-

SHEET 5 OF 8

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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TOWN OF CHAPEL HILL

TRIPLE 11 FT. X 11 FT.
CONCRETE BOX CULVERT
105° SKEW

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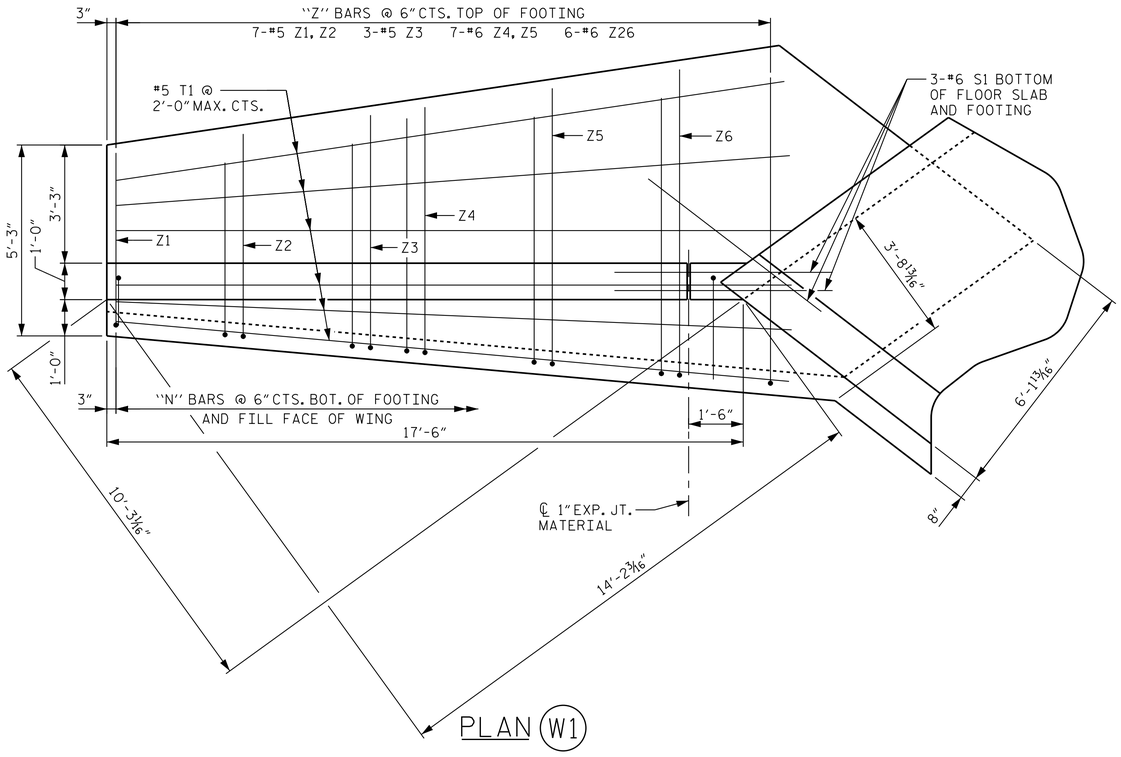
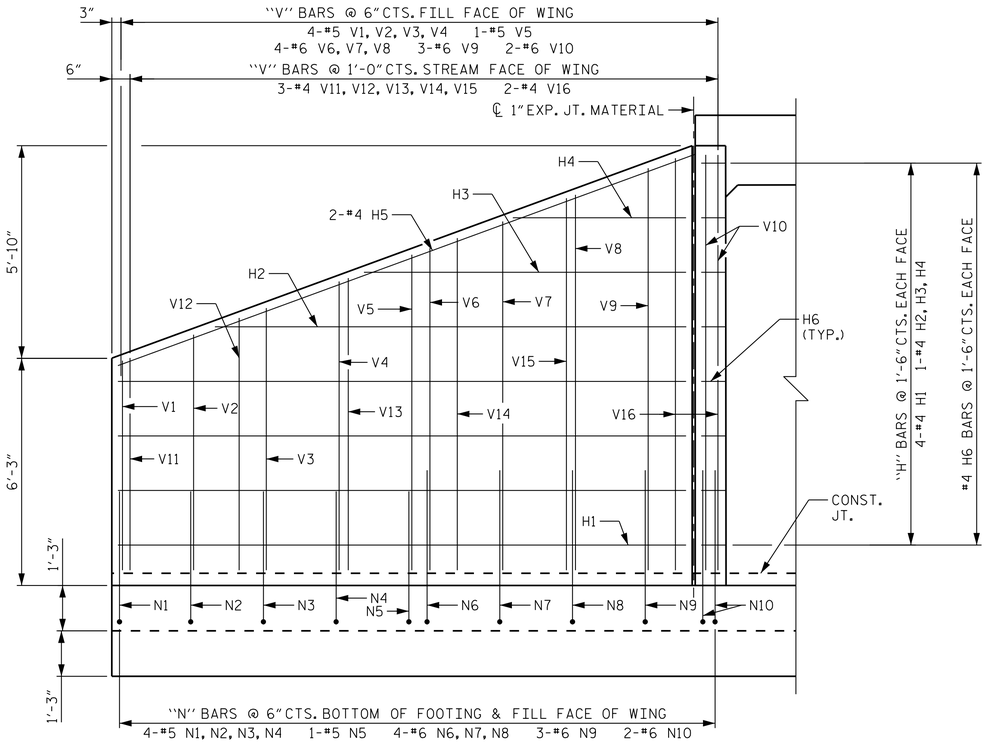
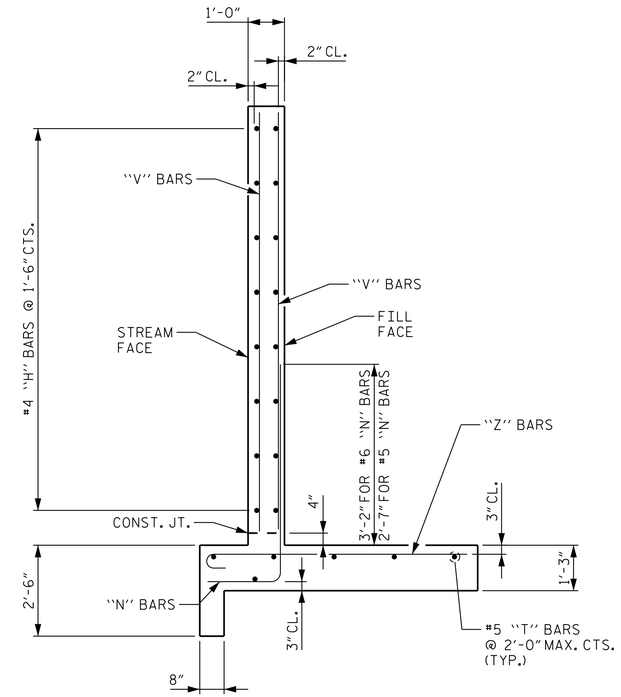


PLAN (W1)



ELEVATION (W1)



TYPICAL WING SECTION

PROJECT NO. N/A

ORANGE COUNTY

STATION: 13+36.75 -Y1-

SHEET 6 OF 8

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

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TOWN OF CHAPEL HILL

WING DETAILS FOR CONCRETE BOX CULVERT

SLOPE = 2:1

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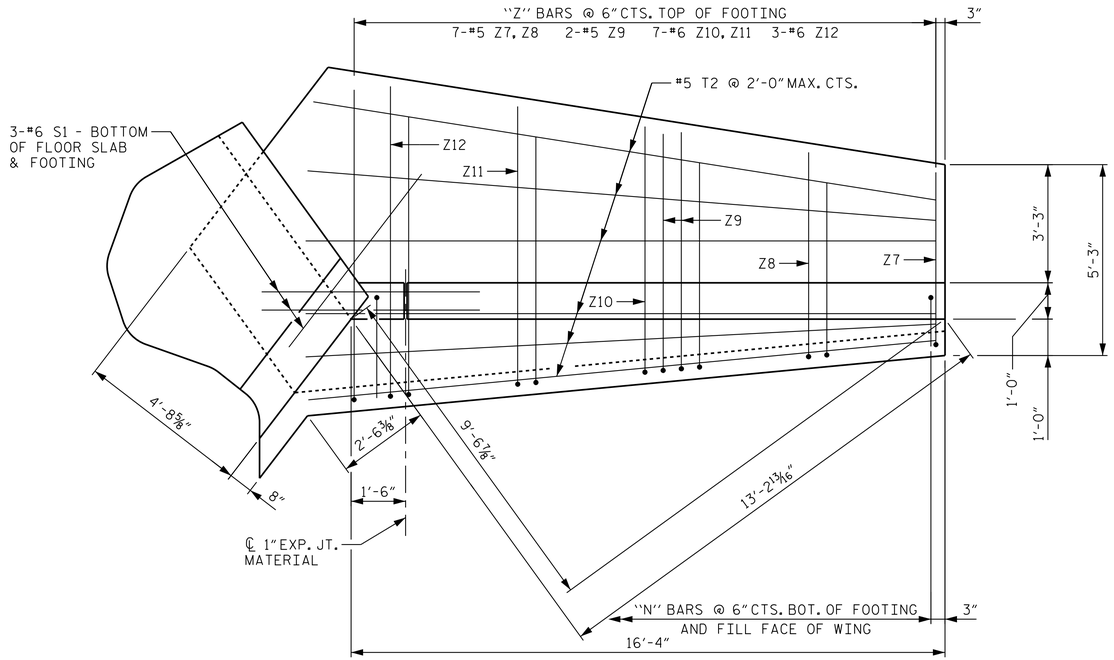
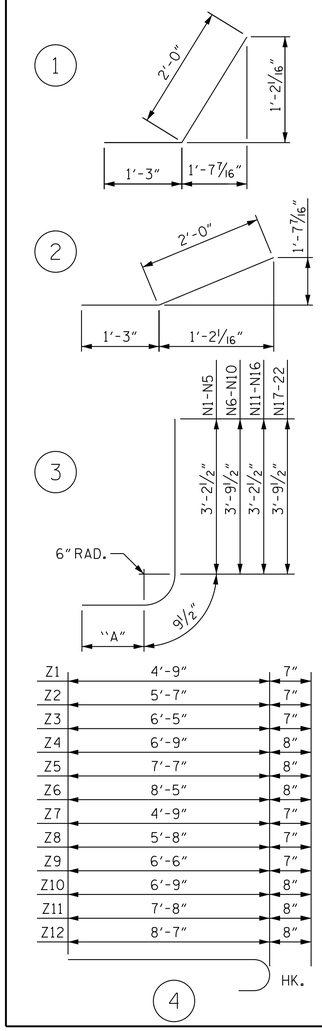


PLAN (W2)

BAR	"A"
N1	1'-0"
N2	1'-3"
N3	1'-5"
N4	1'-8"
N5	1'-10"
N6	1'-10"
N7	2'-0"
N8	2'-2"
N9	2'-4"
N10	2'-6"
N11	1'-1"
N12	1'-3"
N13	1'-4"
N14	1'-6"
N15	1'-8"
N16	1'-9"
N17	1'-10"
N18	2'-0"
N19	2'-2"
N20	2'-3"
N21	2'-5"
N22	2'-6"

BAR TYPES

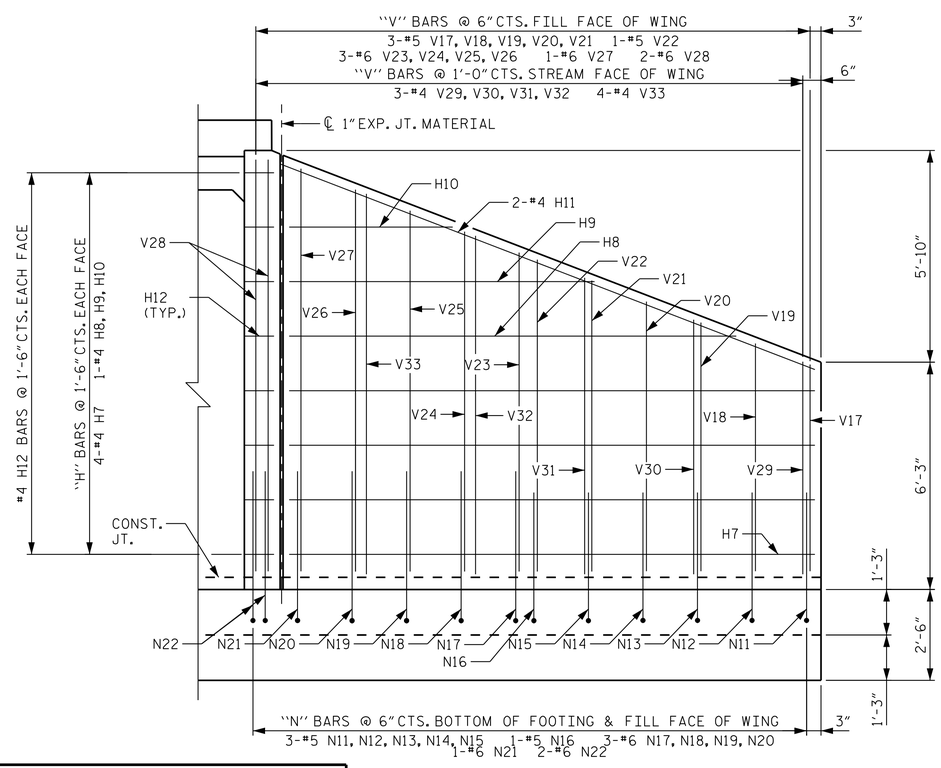
ALL BAR DIMENSIONS ARE OUT TO OUT.



WINGS BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	8	4	STR	15'-7"	83	V14	3	4	STR	9'-1"	18
H2	2	4	STR	12'-9"	17	V15	3	4	STR	10'-2"	20
H3	2	4	STR	8'-8"	12	V16	2	4	STR	11'-3"	15
H4	2	4	STR	4'-7"	6	V17	3	5	STR	5'-8"	18
H5	2	4	STR	16'-7"	22	V18	3	5	STR	6'-3"	20
H6	16	4	1	3'-3"	35	V19	3	5	STR	6'-10"	21
H7	8	4	STR	14'-4"	77	V20	3	5	STR	7'-5"	23
H8	2	4	STR	12'-0"	16	V21	3	5	STR	8'-0"	25
H9	2	4	STR	8'-2"	11	V22	1	5	STR	8'-7"	9
H10	2	4	STR	4'-3"	6	V23	3	6	STR	8'-9"	39
H11	2	4	STR	15'-4"	20	V24	3	6	STR	9'-4"	42
H12	16	4	2	3'-3"	35	V25	3	6	STR	9'-11"	45
						V26	3	6	STR	10'-6"	47
N1	4	5	3	5'-0"	21	V27	1	6	STR	11'-1"	17
N2	4	5	3	5'-2"	22	V28	2	6	STR	11'-5"	34
N3	4	5	3	5'-5"	23	V29	3	4	STR	5'-10"	12
N4	4	5	3	5'-7"	23	V30	3	4	STR	6'-11"	14
N5	1	5	3	5'-9"	6	V31	3	4	STR	8'-1"	16
N6	4	6	3	6'-4"	38	V32	3	4	STR	9'-3"	19
N7	4	6	3	6'-7"	40	V33	4	4	STR	10'-5"	28
N8	4	6	3	6'-9"	41						
N9	4	6	3	6'-11"	42	Z1	7	5	4	5'-4"	39
N10	2	6	3	7'-0"	21	Z2	7	5	4	6'-2"	45
N11	3	5	3	5'-0"	16	Z3	3	5	4	7'-0"	22
N12	3	5	3	5'-2"	16	Z4	7	6	4	7'-5"	78
N13	3	5	3	5'-4"	17	Z5	7	6	4	8'-3"	87
N14	3	5	3	5'-5"	17	Z6	6	6	4	9'-1"	82
N15	3	5	3	5'-7"	17	Z7	7	5	4	5'-4"	39
N16	1	5	3	5'-9"	6	Z8	7	5	4	6'-3"	46
N17	3	6	3	6'-4"	29	Z9	2	5	4	7'-1"	15
N18	3	6	3	6'-6"	29	Z10	7	6	4	7'-5"	78
N19	3	6	3	6'-8"	30	Z11	7	6	4	8'-4"	88
N20	3	6	3	6'-9"	30	Z12	3	6	4	9'-3"	42
N21	1	6	3	6'-11"	10						
N22	2	6	3	7'-0"	21						
S1	6	6	STR	6'-0"	54						
T1	6	5	STR	18'-7"	116						
T2	6	5	STR	17'-4"	108						
V1	4	5	STR	5'-9"	24						
V2	4	5	STR	6'-5"	27						
V3	4	5	STR	7'-2"	30						
V4	4	5	STR	7'-11"	33						
V5	1	5	STR	8'-8"	9						
V6	4	6	STR	8'-10"	53						
V7	4	6	STR	9'-7"	58						
V8	4	6	STR	10'-3"	62						
V9	3	6	STR	11'-0"	50						
V10	2	6	STR	11'-6"	35						
V11	3	4	STR	5'-9"	12						
V12	3	4	STR	6'-11"	14						
V13	3	4	STR	8'-0"	16						

REINFORCING STEEL FOR 2 WINGS	2,699 LBS.
CLASS A CONCRETE	
2 WINGS	27.4 C.Y.
1 HEADWALL	1.8 C.Y.
1 END CURTAIN WALL	1.8 C.Y.
TOTAL	31.0 C.Y.



ELEVATION (W2)

PROJECT NO. N/A

ORANGE COUNTY

STATION: 13+36.75 -Y1-

SHEET 7 OF 8

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416... 6/23/2020

TOWN OF CHAPEL HILL

WING DETAILS FOR CONCRETE BOX CULVERT

SLOPE = 2:1

Kimley»Horn
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Phone (919) 677-2000
NC LICENSE # F-0102

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DRAWN BY:	J. I. KIMBLE	DATE: 06/2020
CHECKED BY:	M. D. MAGEE	DATE: 06/2020
DESIGN ENGINEER OF RECORD:	J. C. WILSON	DATE: 06/2020

6/23/2020

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LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W × RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
								MOMENT				SHEAR				
							LIVE-LOAD FACTORS (γ_{LL})	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.16	--	1.75	1.38	2	TOP SLAB	17.92	1.16	1	TOP SLAB	0.75	
		HL-93 (OPERATING)	N/A		1.50	--	1.35	1.79	2	TOP SLAB	17.92	1.50	1	TOP SLAB	0.75	
		HS-20 (INVENTORY)	36.000	2	1.28	46.08	1.75	1.49	2	TOP SLAB	17.92	1.28	1	TOP SLAB	0.75	
		HS-20 (OPERATING)	36.000		1.66	59.76	1.35	1.94	2	TOP SLAB	17.92	1.66	1	TOP SLAB	0.75	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		2.73	36.86	1.40	2.86	2	TOP SLAB	17.92	2.73	1	TOP SLAB	0.75	
		SNGARBS2	20.000		2.53	50.60	1.40	2.68	2	TOP SLAB	17.92	2.53	1	TOP SLAB	0.75	
		SNAGRIS2	22.000		2.72	59.84	1.40	2.86	2	TOP SLAB	17.92	2.72	1	TOP SLAB	0.75	
		SNCOTTS3	27.250	3	1.31	35.70	1.40	2.05	2	TOP SLAB	17.92	1.31	3	TOP SLAB	35.83	
		SNAGGRS4	34.925		1.60	55.88	1.40	2.43	2	TOP SLAB	17.92	1.60	3	TOP SLAB	35.83	
		SNS5A	35.550		1.53	54.39	1.40	2.32	2	TOP SLAB	17.92	1.53	3	TOP SLAB	35.83	
		SNS6A	39.950		1.46	58.33	1.40	2.30	2	TOP SLAB	17.92	1.46	3	TOP SLAB	35.83	
		SNS7B	42.000		1.46	61.32	1.40	2.30	2	TOP SLAB	17.92	1.46	3	TOP SLAB	35.83	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		2.33	76.89	1.40	2.86	2	TOP SLAB	17.92	2.33	3	TOP SLAB	35.83	
		TNT4A	33.075		1.59	52.59	1.40	2.44	2	TOP SLAB	17.92	1.59	3	TOP SLAB	35.83	
		TNT6A	41.600		1.49	61.98	1.40	2.33	3	BOTTOM SLAB	35.83	1.49	3	TOP SLAB	35.83	
		TNT7A	42.000		1.50	63.00	1.40	2.37	3	BOTTOM SLAB	35.83	1.50	3	TOP SLAB	35.83	
		TNT7B	42.000		1.54	64.68	1.40	2.29	2	TOP SLAB	17.92	1.54	3	TOP SLAB	35.83	
		TNAGRIT4	43.000		1.50	64.50	1.40	2.33	3	BOTTOM SLAB	35.83	1.50	3	TOP SLAB	35.83	
		TNAGT5A	45.000		1.52	68.40	1.40	2.22	3	BOTTOM SLAB	35.83	1.52	3	TOP SLAB	35.83	
		TNAGT5B	45.000		1.44	64.80	1.40	2.17	3	BOTTOM SLAB	35.83	1.44	3	TOP SLAB	35.83	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

LOAD TYPE	MAX FACTOR	MIN FACTOR
DC	1.25	0.90
DW	1.50	0.65
EV	1.30	0.90
EH	1.35	0.90
ES	1.35	0.90
LS	1.75	--
WA	1.00	--

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

COMMENTS:

1.
2.
3.
4.

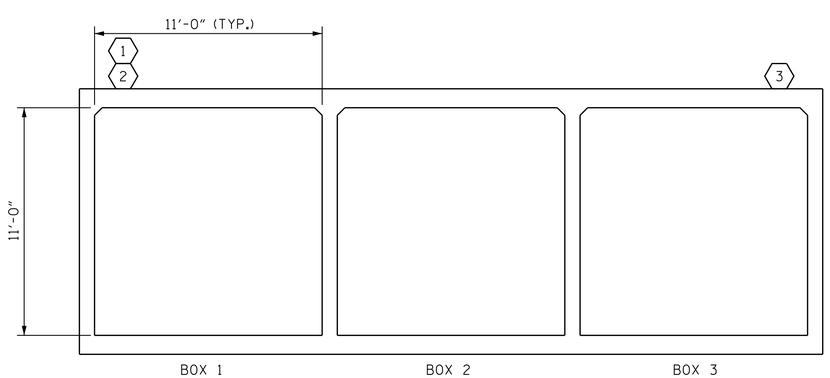
(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



LRFR SUMMARY

PROJECT NO. N/A

ORANGE COUNTY

STATION: 13+36.75 -Y1-

SHEET 8 OF 8

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416... 6/23/2020

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
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STD. NO. LRFR5

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ASSEMBLED BY : J.J. KIMBLE		DATE : 06/2020	
CHECKED BY : J.C. WILSON		DATE : 06/2020	
DRAWN BY : WMC 7/11	REV. 10/1/11	MAA/GM	
CHECKED BY : GM 7/11	REV. 12/17	MAA/THC	

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6/23/2020

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STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1 1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990

STD. NO. SN

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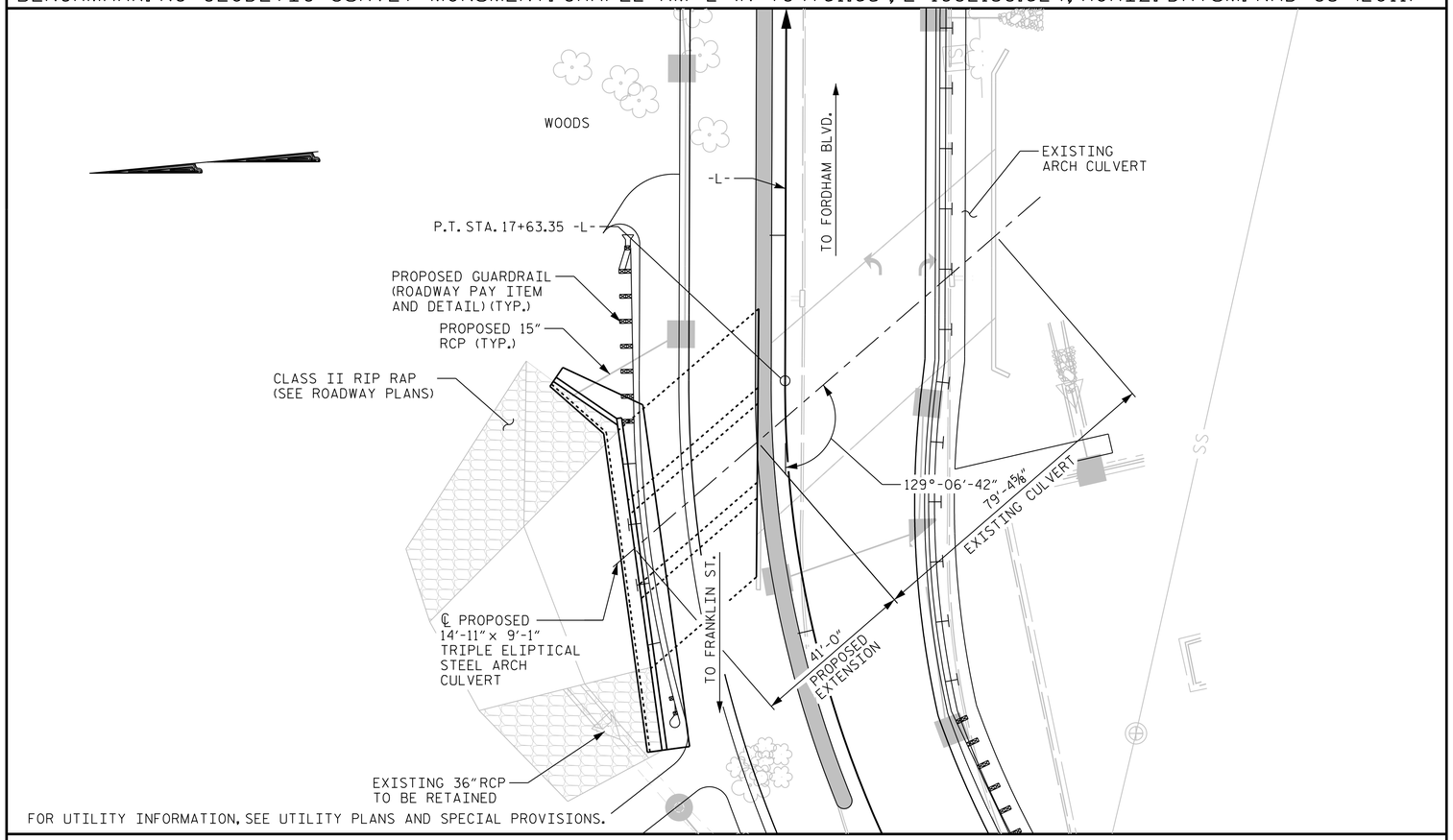
BENCHMARK: NC GEODETIC SURVEY MONUMENT: CHAPEL RM 2 (N 794761.65', E 1982138.62'), HORIZ. DATUM: NAD 83 (2011)



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

LOCATION SKETCH

NOTES

ASSUMED LIVE LOAD ---------- HL-93 OR ALTERNATE LOADING

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF THE CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF FILL.

THE 15" R.C. PIPE THROUGH STEM OF W1 SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT AS NECESSARY TO CLEAR PIPE.

IF APPROVED BY THE ENGINEER, THE CONTRACTOR MAY USE THE EXISTING WINGS AS TEMPORARY SHORING FOR THE CONSTRUCTION OF THE CULVERT EXTENSIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

ELLIPTICAL STEEL PIPE CULVERT SHALL BE DESIGNED BY THE CONTRACTORS ENGINEER BASED UPON THE SPECIFIED DESIGN CRITERIA. THE ELLIPTICAL STEEL PIPE CULVERT PLANS AND CALCULATIONS SHALL BE SIGNED AND SEALED BY A PROFFESSIONAL ENGINEER LICENSED IN THE STATE OF NORTH CAROLINA. PLANS AND CALCULATIONS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL. CONSTRUCTION OF THE ELLIPTICAL STEEL PIPE CULVERT SHALL NOT BEGIN UNTILL ALL APPROVALS HAVE BEEN RECEIVED.

ELLIPTICAL STEEL PIPE CULVERT EXTENSION SHALL MATCH THE SIZE AND CURVATURE OF THE EXISTING STEEL PIPE CULVERT. CONTRACTOR SHALL VERIFY SIZE OF EXISTING CULVERT PRIOR TO ORDERING ANY MATERIAL OR BEGINNING CONSTRUCTION AND NOTIFY THE ENGINEER IMMEDIATELY IF MEASUREMENTS VARY FROM WHAT IS SHOWN ON THE PLANS.

THE EXISTING CULVERT INDICATED ON THE PLACES IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOW FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE TOWN, ENGINEER, OR NCDOT FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXITING CULVERT SHOWN ON THE PLANS AND THE ACTUAL CONDITION AT THE PROJECT SITE.

FOR ELLIPTICAL STEEL PIPE CULVERT, SEE SPECIAL PROVISIONS.

HYDRAULIC DATA

DESIGN DISCHARGE ----------2,000 CFS
FREQUENCY OF DESIGN FLOOD -------25 YR.
DESIGN HIGH WATER ELEVATION-----260.15 FT.
DRAINAGE AREA ----------5.88 SQ. MI.
BASE DISCHARGE (Q100) ----------2,970 CFS
BASE HIGH WATER ELEVATION ------262.86 FT.

OVERTOPPING FLOOD DATA

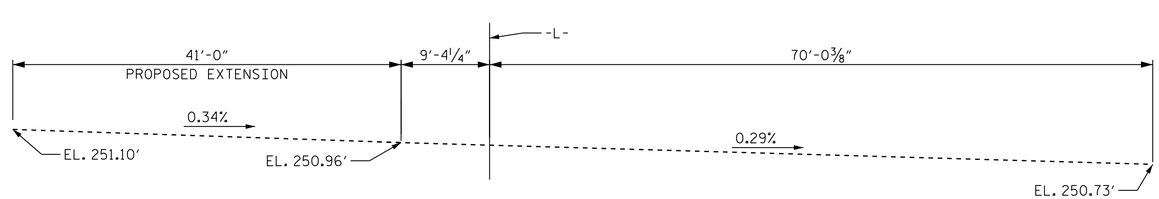
OVERTOPPING DISCHARGE ----------3,000 CFS
FREQUENCY OF OVERTOPPING FLOOD ---<500 YR.
OVERTOPPING FLOOD ELEVATION ------263.9 FT.

TOTAL STRUCTURE QUANTITIES

CULVERT EXCAVATION STA. 17+53.82 -L-		LUMP SUM
FOUNDATION CONDITIONING MATERIAL		105 TONS
CLASS A CONCRETE		
ENDWALL	155.4	C.Y.
REINFORCING STEEL		
ENDWALL	10,953	LBS.
ELLIPTICAL STEEL PIPE CULVERT		LUMP SUM

ROADWAY DATA

GRADE POINT EL. @ STA. 17+53.82 -L- = 263.81'
BED ELEVATION @ STA. 17+53.82 -L- = 250.93'
ROADWAY SLOPES 2 :1



PROFILE ALONG ℄ CULVERT

PROJECT NO. N/A
ORANGE COUNTY
STATION: 17+53.82 -L-

SHEET 1 OF 3 EXTENDS STR. NO. 670124

TOWN OF CHAPEL HILL

TRIPLE 14'-11" X 9'-1" ELLIPTICAL STEEL PIPE CULVERT 129° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON
DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416...
6/23/2020

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2			4					3

DRAWN BY: J. I. KIMBLE DATE: 06/2020
CHECKED BY: M. D. MAGEE DATE: 06/2020
DESIGN ENGINEER OF RECORD: J. C. WILSON DATE: 06/2020

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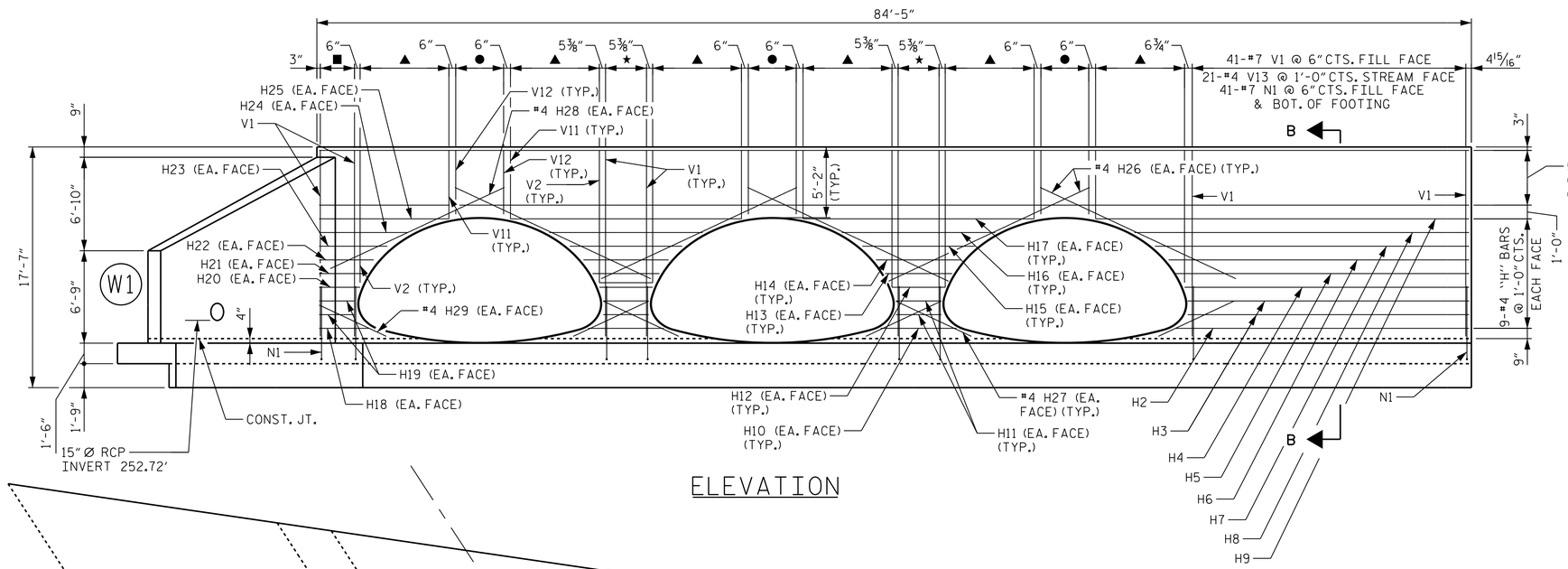


ELEVATION

NOTES

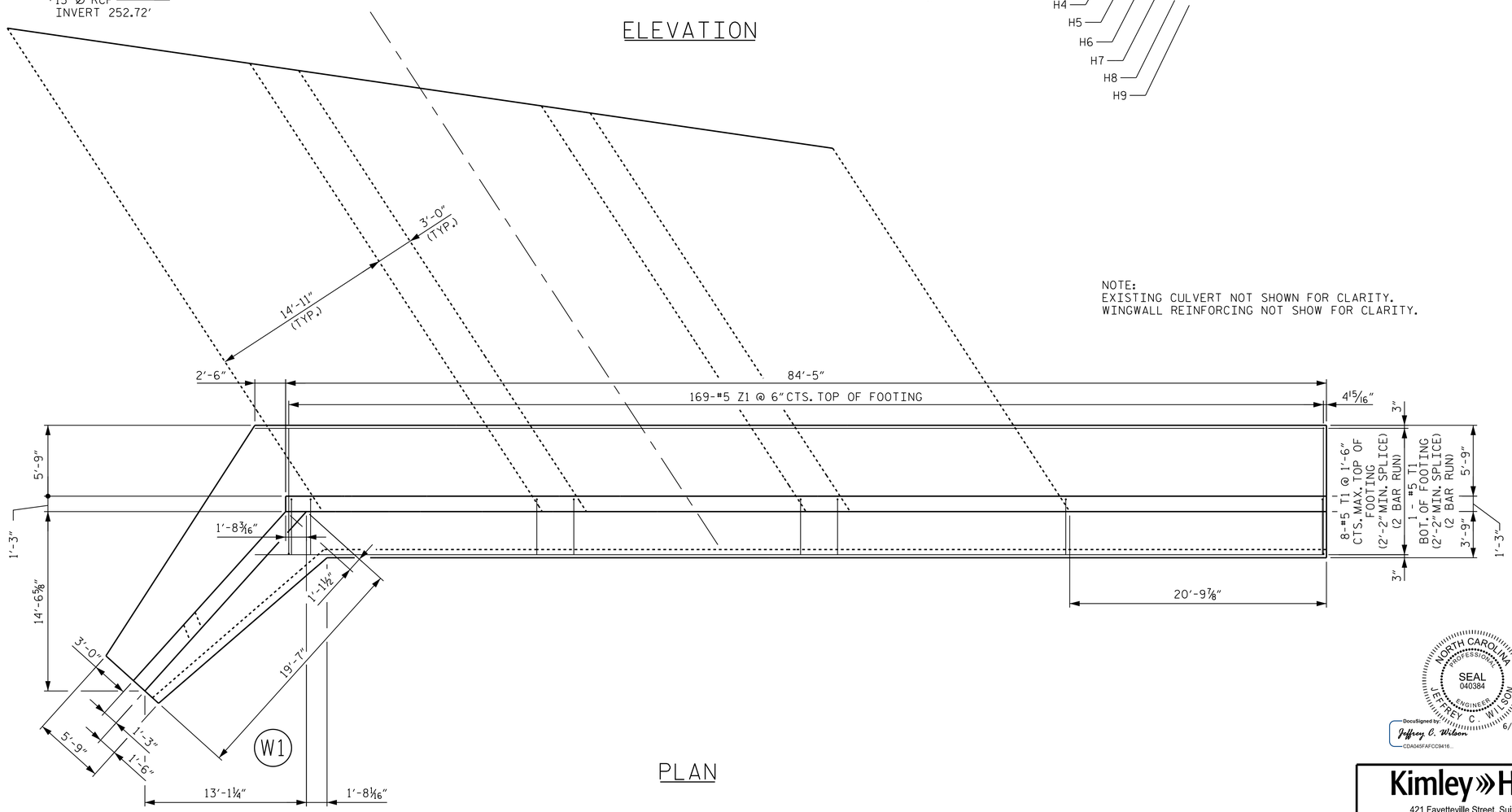
FOR SECTION B-B, SEE SHEET 3 OF 3.

■ 6-#7 V1 @ 6"CTS. FILL FACE
3-#4 V13 @ 1'-0"CTS. STREAM FACE
6-#7 N1 @ 6"CTS. FILL FACE & BOTTOM OF FOOTING

▲ "V" BARS @ 6"CTS. FILL FACE
1-#7 V2, V3, V4, V5, V6, V7
2-#7 V8, V9, V10, V11
"V" BARS @ 1'-0"CTS. STREAM FACE
1-#4 V14, V15, V16, V17, V18, V19, V20

● 8-#7 V12 @ 6"CTS. FILL FACE
4-#4 V21 @ 1'-0"CTS. STREAM FACE

★ 7-#7 V1 @ 6"CTS. FILL FACE
4-#4 V13 @ 1'-0"CTS. STREAM FACE
7-#7 N1 @ 6"CTS. FILL FACE & BOTTOM OF FOOTING



PLAN

NOTE:
EXISTING CULVERT NOT SHOWN FOR CLARITY.
WINGWALL REINFORCING NOT SHOW FOR CLARITY.

PROJECT NO. N/A
ORANGE COUNTY
STATION: 17+53.82 -L-

SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416...
6/23/2020

Kimley»Horn
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Raleigh, NC 27601-1772
Phone (919) 677-2000
NC LICENSE # F-0102

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TOWN OF CHAPEL HILL

TRIPLE 14'-11" X 9'-1"
ELLIPTICAL
STEEL PIPE CULVERT
129° SKEW

REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

SHEET NO. C02-2
TOTAL SHEETS 3

DRAWN BY: J. I. KIMBLE DATE: 06/2020
CHECKED BY: M. D. MAGEE DATE: 06/2020
DESIGN ENGINEER OF RECORD: J. C. WILSON DATE: 06/2020

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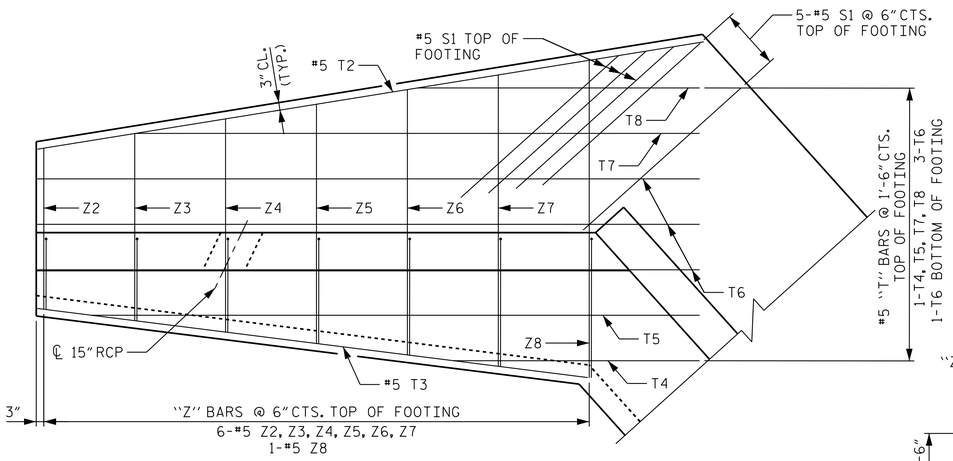
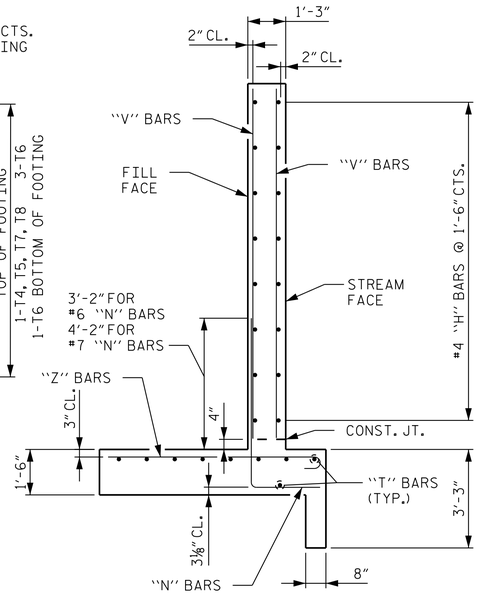
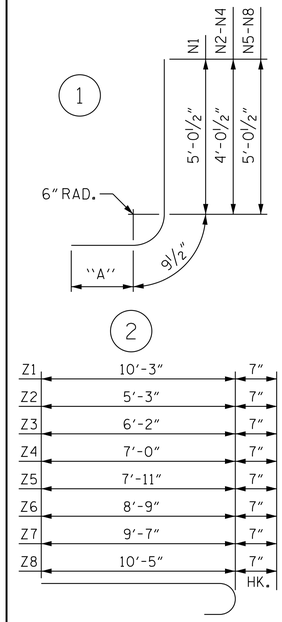


WING PLAN

(FOR APPROXIMATE PLAN VIEW LOCATION OF R.C. PIPE SEE SHEET C02-1)



SECTION A-A



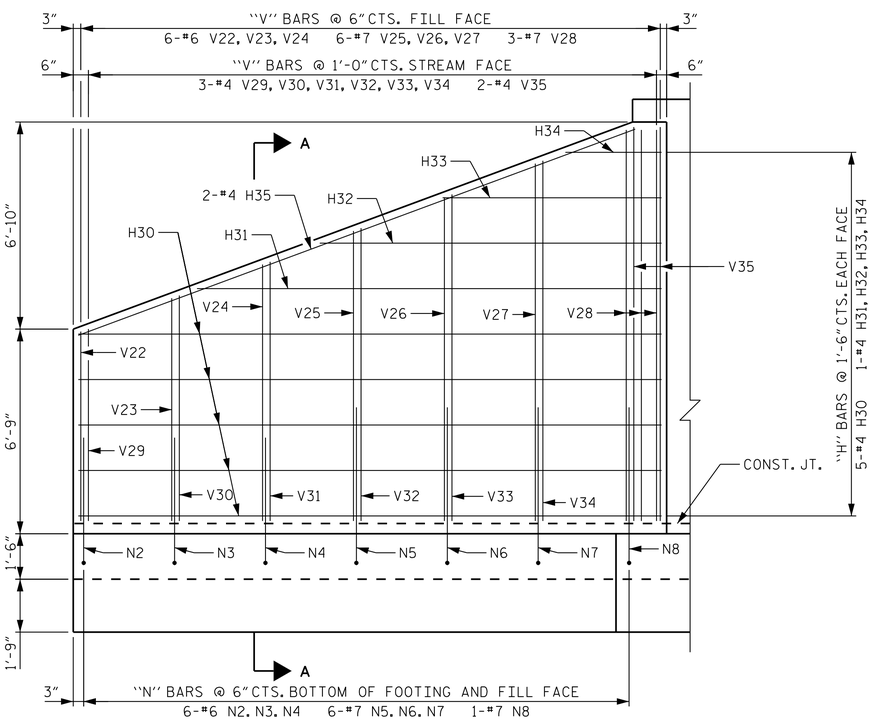
ALL BAR DIMENSIONS ARE OUT TO OUT.

BAR	"A"
N1	4'-1"
N2	1'-10"
N3	2'-2"
N4	2'-7"
N5	2'-11"
N6	3'-4"
N7	3'-8"
N8	4'-1"

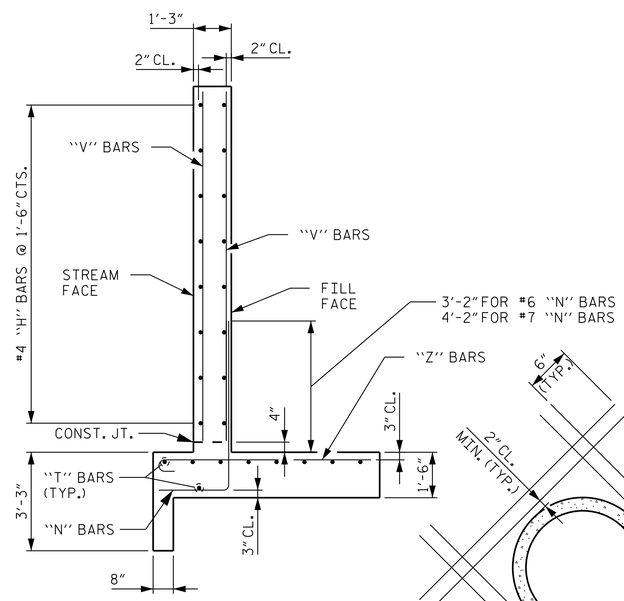
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	30	4	STR	29'-3"	586	T7	1	5	STR	18'-8"	19
H2	2	4	STR	21'-5"	29	T8	1	5	STR	9'-4"	10
H3	4	4	STR	20'-6"	55						
H4	2	4	STR	20'-9"	28	V1	61	7	STR	13'-7"	1,694
H5	2	4	STR	21'-5"	29	V2	6	7	STR	10'-0"	123
H6	2	4	STR	21'-11"	29	V3	6	7	STR	9'-2"	112
H7	2	4	STR	22'-11"	31	V4	6	7	STR	8'-2"	100
H8	2	4	STR	24'-5"	33	V5	6	7	STR	7'-8"	94
H9	2	4	STR	27'-3"	36	V6	6	7	STR	7'-2"	88
H10	4	4	STR	5'-6"	15	V7	6	7	STR	6'-8"	82
H11	8	4	STR	3'-3"	17	V8	12	7	STR	6'-2"	151
H12	4	4	STR	3'-10"	10	V9	12	7	STR	5'-8"	139
H13	4	4	STR	4'-10"	13	V10	12	7	STR	5'-2"	127
H14	4	4	STR	6'-2"	16	V11	12	7	STR	5'-0"	123
H15	4	4	STR	8'-2"	22	V12	24	7	STR	4'-8"	229
H16	4	4	STR	11'-2"	30	V13	32	4	STR	13'-7"	290
H17	4	4	STR	16'-10"	45	V14	6	4	STR	10'-0"	40
H18	2	4	STR	3'-7"	5	V15	6	4	STR	8'-2"	33
H19	4	4	STR	2'-7"	7	V16	6	4	STR	7'-2"	29
H20	2	4	STR	2'-11"	4	V17	6	4	STR	6'-2"	25
H21	2	4	STR	3'-5"	5	V18	6	4	STR	5'-8"	23
H22	2	4	STR	3'-11"	5	V19	6	4	STR	5'-2"	21
H23	2	4	STR	4'-11"	7	V20	6	4	STR	5'-0"	20
H24	2	4	STR	6'-5"	9	V21	12	4	STR	8'-7"	69
H25	2	4	STR	9'-5"	13	V22	6	6	STR	6'-3"	56
H26	8	4	STR	16'-2"	86	V23	6	6	STR	7'-4"	66
H27	10	4	STR	6'-1"	41	V24	6	6	STR	8'-5"	76
H28	2	4	STR	14'-11"	20	V25	6	7	STR	9'-6"	117
H29	2	4	STR	5'-4"	7	V26	6	7	STR	10'-8"	131
H30	10	4	STR	19'-3"	129	V27	6	7	STR	11'-9"	144
H31	2	4	STR	15'-3"	20	V28	3	7	STR	12'-10"	79
H32	2	4	STR	11'-3"	15	V29	3	4	STR	6'-4"	13
H33	2	4	STR	7'-2"	10	V30	3	4	STR	7'-5"	15
H34	2	4	STR	3'-2"	4	V31	3	4	STR	8'-6"	17
H35	2	4	STR	19'-7"	26	V32	3	4	STR	9'-7"	19
H36	16	4	STR	3'-1"	33	V33	3	4	STR	10'-9"	22
						V34	3	4	STR	11'-10"	24
N1	61	7	1	9'-10"	1,226	V35	2	4	STR	12'-11"	17
N2	6	6	1	6'-7"	59						
N3	6	6	1	7'-0"	63	Z1	169	5	2	10'-10"	1,910
N4	6	6	1	7'-4"	66	Z2	6	5	2	5'-10"	37
N5	6	7	1	8'-9"	107	Z3	6	5	2	6'-9"	42
N6	6	7	1	9'-1"	111	Z4	6	5	2	7'-7"	47
N7	6	7	1	9'-6"	117	Z5	6	5	2	8'-5"	53
N8	1	7	1	9'-10"	20	Z6	6	5	2	9'-4"	58
						Z7	6	5	2	10'-2"	64
S1	8	5	STR	7'-0"	58	Z8	1	5	2	11'-0"	11
T1	18	5	STR	44'-6"	835						
T2	1	5	STR	22'-0"	23						
T3	1	5	STR	18'-2"	19						
T4	1	5	STR	8'-2"	9						
T5	1	5	STR	20'-1"	21						
T6	4	5	STR	21'-8"	90						

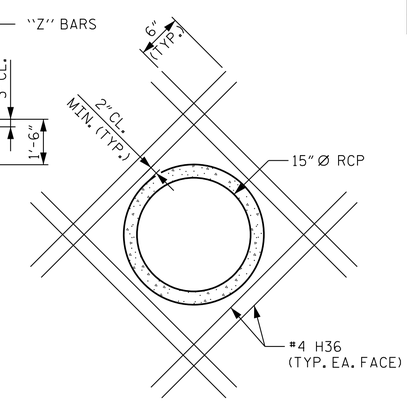
REINFORCING STEEL FOR ENDWALL	10,953 LBS.
CLASS A CONCRETE 1 ENDWALL	155.4 C.Y.



WING ELEVATION



SECTION B-B



DETAIL OF REINFORCING AROUND 15" Ø RCP

NOTE: THE 15" Ø PIPE THROUGH THE WING WALL OF THE CULVERT SHALL BE LOCATED BY THE ENGINEER. THE REINFORCING STEEL SHALL BE FIELD BENT OR CUT AS NECESSARY TO CLEAR THE PIPE.

FOR APPROXIMATE PLAN VIEW LOCATION OF R.C. PIPE, SEE SHEET C02-1.

PROJECT NO. N/A

ORANGE COUNTY

STATION: 17+53.82 -L-

SHEET 3 OF 3

TOWN OF CHAPEL HILL

TRIPLE 14'-11" X 9'-1" ELLIPTICAL STEEL PIPE CULVERT 129° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 040384 ENGINEER JEFFREY C. WILSON

DocuSigned by: Jeffrey C. Wilson CDA045FAFCC9416... 6/23/2020

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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C02-3
1			3			TOTAL SHEETS
2			4			3

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CHECKED BY: M. D. MAGEE	DATE: 06/2020
DESIGN ENGINEER OF RECORD: J. C. WILSON	DATE: 06/2020

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STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1 1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990

STD. NO. SN