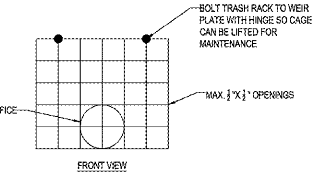


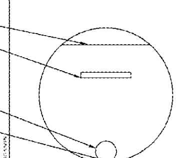
PRIMARY ORIFICE TRASH RACK

NOT TO SCALE

NOTES:

1. FINAL ENGINEER APPROVED SHOP DRAWINGS TO BE PROVIDED TO CITY ENGINEERING PRIOR TO CONSTRUCTION.

STM STRUCTURE B14 TO PROVIDE 5' OF SUMP AS A FORM OF PRETREATMENT PRIOR TO SYSTEM INFLOW. SEE SHEET C-6.1 FOR ADDITIONAL STM STRUCTURE INFORMATION.



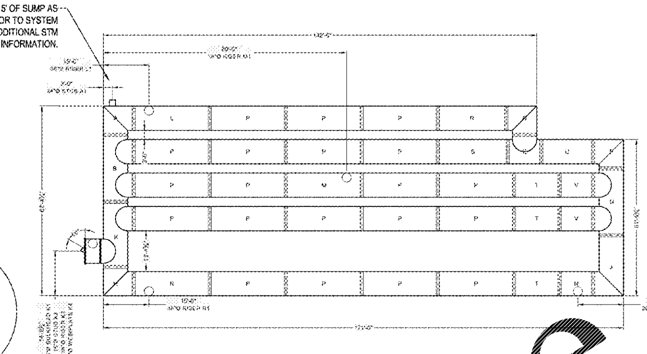
WEIR PLATE DETAIL

SCALE: NTS

THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (3) PAGES INCLUDING THE FOLLOWING:

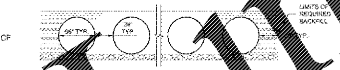
- **PIPE STORAGE = 43,797 CF**
- **MAINLINE PIPE GAGE = 12**
- **WALL TYPE = SOLID**
- **DIAMETER = 96"**
- **FINISH = ALT2**
- **CORRUGATION = 5x1**

CUSTOMER DATE



ASSEMBLY

SCALE: 1" = 20'
PIPE STORAGE: 43,797 CF
LOADING: H20
PIPE INV. = 740.00'±



TYPICAL SECTION VIEW

SCALE: N.T.S.

STUB INFORMATION

PIECE	STUB INVERT	SYSTEM INVERT
24"Ø STUB A1	742.35	740.00
15"Ø STUB K1	740.00	740.00

RISER INFORMATION

PIECE	RIM ELEV	SYSTEM INVERT
36"Ø RISER K3	752.00	740.00
36"Ø RISER L1	752.00	740.00
36"Ø RISER M1	753.00	740.00
36"Ø RISER N1	754.00	740.00
36"Ø RISER R1	752.00	740.00

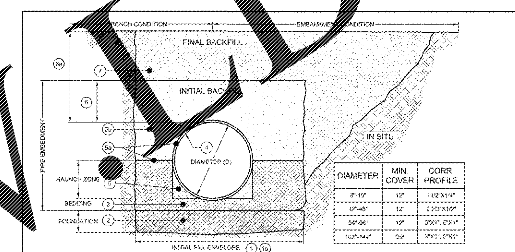
NOTES:

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.
- ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE AS REQUIRED, BY CONTRACTOR.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL ACCESS CASTINGS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND ARE NOT SUPPLIED BY CONTECH.

CONTECH ENGINEERED SOLUTIONS LLC — www.ContechES.com
CONTECH CMP DETENTION SYSTEMS — PROPOSAL DRAWING

96"Ø UNDERGROUND DETENTION SYSTEM - 568294-010
EASTSIDE CONNECTIONS
CHARLOTTE, NC
SITE DESIGNATION: UGDS

568294 | 010 | 10/6/2017 | KMR | KMR | C1 of 3



DIAMETER	MIN. COVER	CORR. PROFILE
8"-12"	12"	1½"X¼"
12"-48"	12"	2⅔"X½"
54"-96"	12"	3"X1", 5"X1"
102"-144"	D/8	3"X1", 5"X1"

- **BACKFILL REQUIREMENTS FOLLOW THE GUIDELINES OF AASHTO LRFD BRIDGE DESIGN (SEC 12) and CONSTRUCTION (SEC 26).**

1. MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE MINIMUM TRENCH WIDTH (12.6.6.1). PIPE ≤ 12": D + 16". PIPE > 12": 1.5D + 12"

1a. MINIMUM EMBANKMENT WIDTH FOR INITIAL FILL ENVELOPE (12.6.6.2): PIPE < 24": 3.0D. PIPE 24" - 144": D + 4'0". PIPE > 144": D + 10'0"

2. THE FOUNDATION UNDER THE PIPE AND SIDE BACKFILL SHALL BE ADEQUATE TO SUPPORT THE LOADS ACTING UPON IT (26.5.2).

3. BEDDING MATERIAL SHALL BE A RELATIVELY LOOSE MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE FROM SPRINGLINE OF PIPE TO 4"-8" BELOW BOTTOM OF PIPE.

4. CORRUGATED STEEL PIPE (CSP) (HEL-COR).

5. HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION (26.5.4).

5a. GEOTEXTILE SHALL BE USED IF REQUIRED BY ENGINEER TO PREVENT SOIL MIGRATION INTO VARYING SOIL TYPES.

5b. BACKFILL PLACED ABOVE SPRINGLINE TO MEET AASHTO 145, A-1, A-2 OR A-3 CLASSIFICATION OR APPROVED EQUAL. COMPACTED TO 90% STANDARD PROCTOR (T-99). MAXIMUM PARTICLE SIZE NOT TO EXCEED 3" (12.4.1.2). ALL LIFTS PLACED IN A CONTROLLED MANNER. IT IS RECOMMENDED THAT LIFTS NOT EXCEED AN 8" UNCOMPACTED LIFT HEIGHT TO PREVENT UNEVEN LOADING, AND THE LESSER OF 1/3 THE DIAMETER OR 24" AS THE MAXIMUM DIFFERENTIAL SIDE-TO-SIDE (26.5.4).

6. INITIAL BACKFILL ABOVE PIPE MAY INCLUDE ROAD BASE MATERIAL (AND RIGID PAVEMENT IF APPLICABLE). SEE TABLE ABOVE.

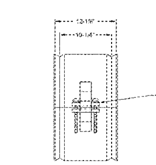
6a. TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT (12.6.6.3).

7. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD (26.5.4.1).

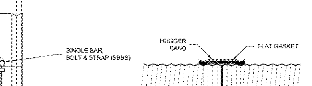
NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE PIPE DIA/2 BUT NO LESS THAN 12", OR 36" FOR PIPE DIAMETERS 72" AND LARGER. CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING (TABLE C12.6.7-1).

TYPICAL BACKFILL DETAIL

NOT TO SCALE



CONNECTION DETAIL (SBBS)



FLAT GASKET

2 2/3"x1/2" RE-ROLLED END HEL-COR PIPE

GENERAL NOTES:

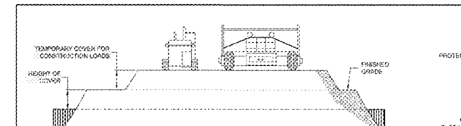
1. BAND MATERIALS AND/OR COATING CAN VARY BY LOCATION. CONTACT YOUR CONTECH REPRESENTATIVE FOR AVAILABILITY.
2. BANDS ARE SHAPED TO MATCH THE PIPE-ARCH WHEN APPLICABLE.
3. BANDS ARE NORMALLY FURNISHED AS FOLLOWS.
   - 12" THRU 48" 1-PIECE
   - 54" THRU 90" 2 PIECES
   - 102" THRU 144" 3-PIECES
4. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS.
5. ALL CMP IS REROLLED TO HAVE ANNULAR END CORRUGATIONS OF 2-2/3"x1/2".
6. DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
7. ORDER SHALL DESIGNATE GASKET OPTION, IF REQUIRED (SEE DETAILS ABOVE).

H-12 HUGGER BAND DETAIL

NOT TO SCALE

96"Ø UNDERGROUND DETENTION SYSTEM - 568294-010
EASTSIDE CONNECTIONS
CHARLOTTE, NC
SITE DESIGNATION: UGDS

568294 | 010 | 10/6/2017 | KMR | KMR | P2 of 3



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips) 18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

SCOPE

THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL

THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.

PIPE

THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

HANDLING AND ASSEMBLY

SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA).

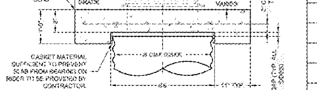
INSTALLATION

SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

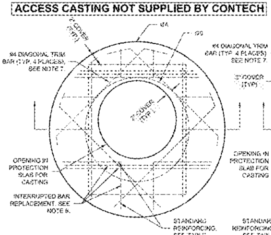
MATERIAL SPECIFICATION

SCALE: N.T.S.

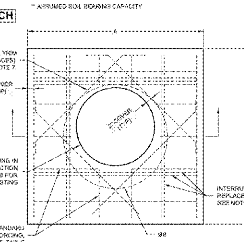


SECTION VIEW

ACCESS CASTING NOT SUPPLIED BY CONTECH



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

REINFORCING TABLE

Ø CMP RISER	A	Ø B	REINFORCING	**BEARING PRESSURE (PSF)
24"	Ø 4' / 4'x4'	26"	#5 @ 10" OCEW / #5 @ 10" OCEW	2,540 / 1,900
30"	Ø 4'-6" / 4'-6" x 4'-6"	32"	#5 @ 10" OCEW / #5 @ 9" OCEW	2,260 / 1,570
36"	Ø 5' / 5'x5'	38"	#5 @ 9" OCEW / #5 @ 8" OCEW	2,000 / 1,500
42"	Ø 5'-6" / 5'-6" x 5'-6"	44"	#6 @ 8" OCEW / #6 @ 6" OCEW	1,890 / 1,270
48"	Ø 6' / 6'x6'	50"	#6 @ 7" OCEW / #6 @ 7" OCEW	1,210 / 1,270

** ASSUMED SOIL BEARING CAPACITY

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION AND ACI 350.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 4,000 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS. EXTEND BARS A MINIMUM OF 12" BEYOND OPENING. BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERS, ARCHITECTS AND LAND SURVEYORS, ENDWELL, NY.

MANHOLE CAP DETAIL

SCALE: N.T.S.

96"Ø UNDERGROUND DETENTION SYSTEM - 568294-010
EASTSIDE CONNECTIONS
CHARLOTTE, NC
SITE DESIGNATION: UGDS

568294 | 010 | 10/6/2017 | KMR | KMR | P3 of 3

STORM WATER

BMP Inset Table
Extended Dry Detention

Project Name:	**Eastside Connections**
Sequence ID:	Underground System
Surface Area (sq. ft.):	N/A
Drainage Area (acres):	4.43
Land Use/Development Type:	Commercial Heavy
Percent Built-Upon Area:	90%
Maximum Depth (ft.):	8'
Forebay Present (Y/N):	N
Flow Diverters Present (Y/N):	N
Regulated By:	Post Construction Ordinance
Treatment Effectiveness:	0%
NC State Plane X (easting):	1473925
NC State Plane Y (northing):	526912

BOHLER ENGINEERING NC, PLLC
SITE CIVIL AND CONSULTING ENGINEERING · LAND SURVEYING · PROGRAM MANAGEMENT · LANDSCAPE ARCHITECTURE · SUSTAINABLE DESIGN · PERMITTING SERVICES · TRANSPORTATION SERVICES
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REVISIONS

REV	DATE	COMMENT	BY
1	10/11/17	PER CITY OF CLT & NCDOT COMMENTS	SRF
2	11/28/17	PER CITY OF CLT & NCDOT COMMENTS	SRF

811
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PROJECT No.:	NCC162120
DRAWN BY:	SRF/AJS
CHECKED BY:	BWR
DATE:	8/9/17
SCALE:	AS NOTED
CAD I.D.:	SW0

PROJECT:

CONNECTION POINT

FOR

EASTSIDE CONNECTIONS JV, LLC

LOCATION OF SITE
MONROE RD & LONG AVE
CHARLOTTE, NC 28212
MECKLENBURG COUNTY

BOHLER ENGINEERING NC, PLLC
NCBELS P-1132
1927 S. TRYON STREET, SUITE 310
CHARLOTTE, NC 28203
Phone: (980) 272-3400
Fax: (980) 272-3401
NC@BohlerEng.com

NORTH CAROLINA PROFESSIONAL ENGINEER REGISTERED No.31128 ANDREW P. MORIARTY 11/28/17

SHEET TITLE:

STORMWATER DETAILS

SHEET NUMBER:

C-11.3

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