

SOIL BORING DATA

DEPTH	DESCRIPTION
• SB#1	2" FROZEN DARK BROWN SANDY TOPSOIL W/TRACE OF VEGETATION, FILL
8"	FROZEN BROWN AND GRAY FINE SAND W/ TRACE OF GRAVEL AND OCCASIONAL STONES, FILL
3'4"	MEDIUM COMPACT MOIST BROWN FINE SAND W/TRACE OF GRAVEL, LITTLE PEBBLES, OCCASIONAL STONES AND POSSIBLE ORGANIC STREAKS, FILL
6'0"	SLIGHTLY COMPACT WET BROWN FINE TO MEDIUM SAND W/TRACES OF GRAVEL AND SILT
8'6"	MEDIUM COMPACT WET BROWN FINE SAND W/TRACE OF GRAVEL
11'6"	EXTREMELY COMPACT WET BROWN FINE SAND W/TRACE OF GRAVEL
• SB#2	5" FROZEN BLACK ASPHALT MILLINGS
10"	FROZEN GRAY SAND & GRAVEL, AGGREGATE FILL
2'4"	VERY COMPACT MOIST BROWN FINE SAND W/TRACE OF GRAVEL, CINDERS AND DARK BROWN TOPSOIL STREAKS, FILL
3'9"	COMPACT MOIST BROWN FINE SAND W/TRACE OF GRAVEL, FILL
5'8"	COMPACT VERY MOIST BROWN FINE SAND W/TRACE OF GRAVEL, FILL
6'0"	COMPACT VERY MOIST DARK BROWN TO BLACK SANDY TOPSOIL
6'6"	COMPACT MOIST BROWN FINE SAND W/TRACE OF GRAVEL AND TOPSOIL STREAKS (BAG SAMPLE)
12'0"	COMPACT WET BROWN FINE TO MEDIUM SAND W/TRACES OF GRAVEL AND SILT
15'0"	EXTREMELY COMPACT WET BROWN FINE TO MEDIUM SAND W/TRACE OF GRAVEL

NOTES:

- INSTALLED 1" DIAMETER PVC PIEZOMETER IN BORING WITH SCREEN BOTTOM AT 14' AND 3' STICK-UP.
- WATER LEVEL IN PIEZOMETER AT COMPLETION AT 7.96' BELOW GROUND SURFACE.

PRELIMINARY

QUANTITIES THIS SHEET

ITEM	UNIT	AMOUNT
12" RCP C76 CLIV STORM SEWER	LF	26
STORM CATCH BASIN, 4' DIA	EA	2
STORM MANHOLE, 4' DIA	EA	1
CONTECH CDS-4, 4' DIA	EA	1
CONTECH CMP DETENTION SYSTEM (PER DETAIL THIS SHEET)	LS	1
6" SCH40 SANITARY SEWER LEAD	LF	45
1" TYPE K COPPER WATER SERVICE	LF	53
ON-SITE PAVEMENT	SY	800

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For design assistance, drawings, and pricing send completed worksheet to: dyods@contech-cpi.com

CONTECH SOLUTIONS

Project Summary		Enter Information in Blue Cells	
Date:	3/22/2015	Project Name:	Auto Rite
City / Country:	Rochester Hills, MI	State:	MI
Designed By:	KSL	Company:	Contech
Telephone:	248-257-0000		

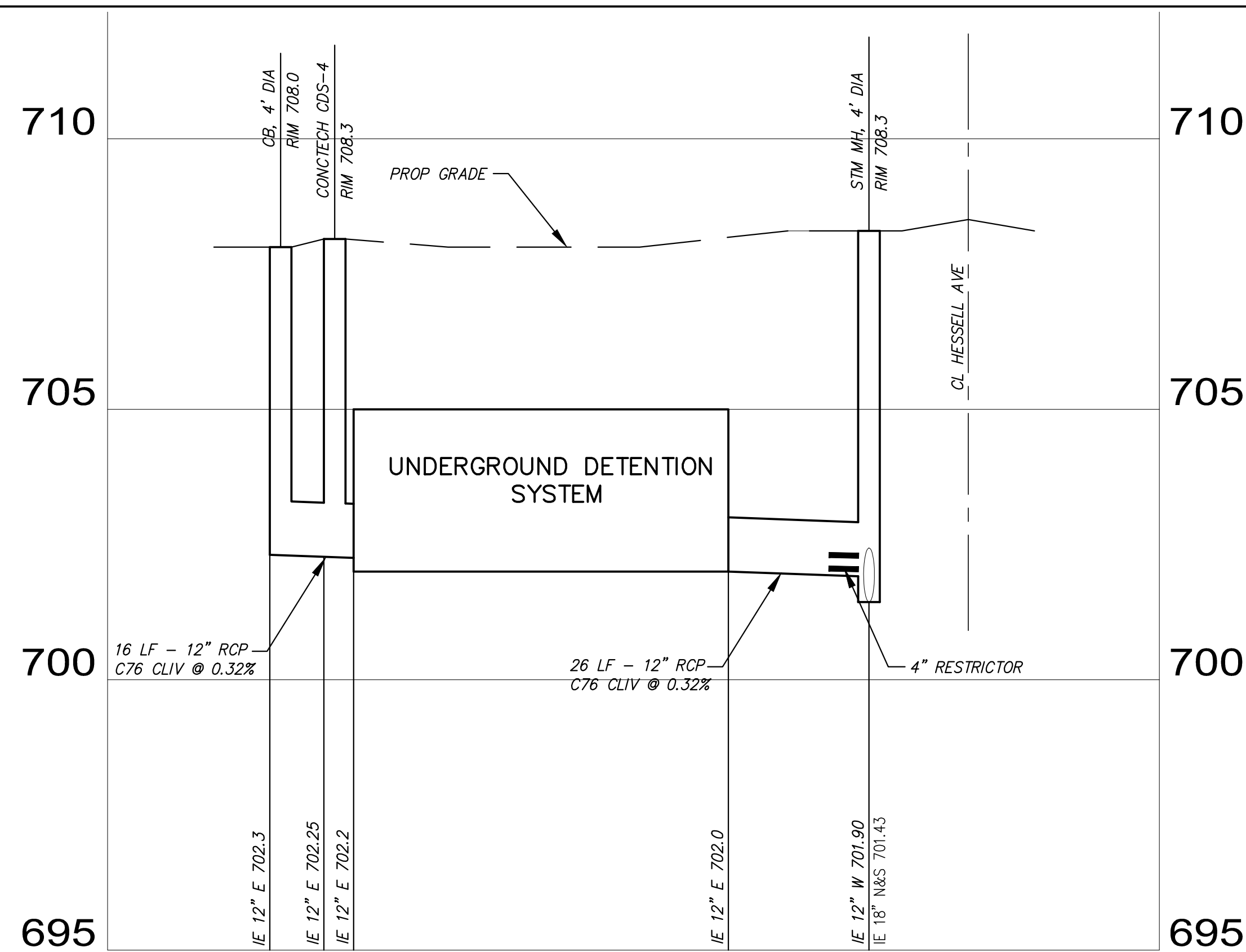
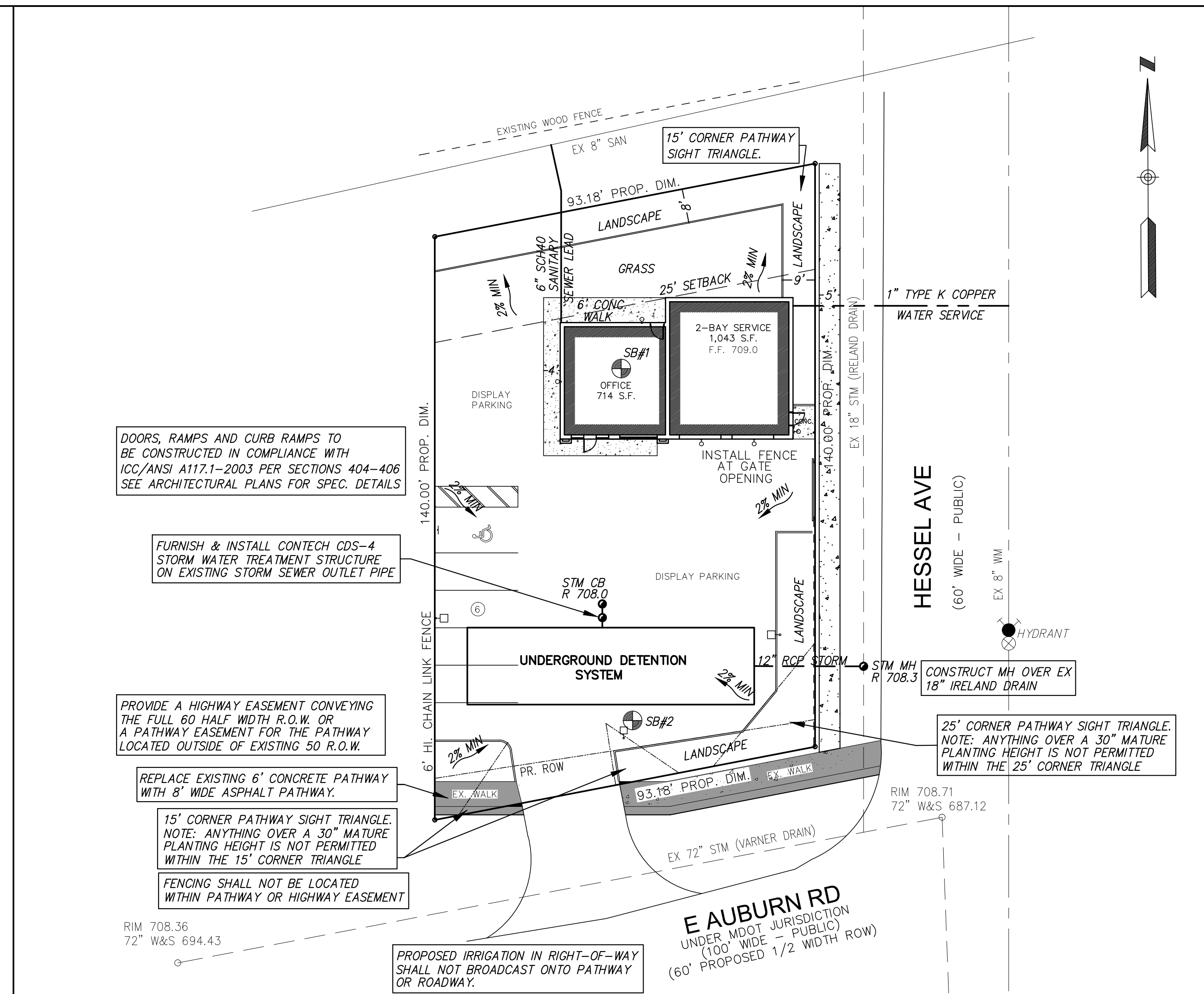
Corrugated Metal Pipe Calculator	
Storage Volume Required (cf):	2,570
Limiting Width (ft):	60.00
Invert Depth Below Asphalt (ft):	6.00
Slope or Perforated Pipe:	Perforated
Space or Diameter (in):	36
Number of Headers:	1
Spacing between Barrels (ft):	1.50
Stone Width Around Perimeter of System (ft):	4
Depth A Porous Stone Above Pipe (in):	2
Depth C Porous Stone Below Pipe (in):	4
Stone Porosity (0 to 40%):	30

System Storage	
Pipe Storage:	1,928 cf
Porous Stone Storage:	701 cf
Total Storage Provided:	2,629 cf
Number of Barrels:	4
Length per Barrel:	64.0 ft
Length per Header:	16.5 ft
Rectangular Footprint (W x L):	18.5 ft x 69. ft

CONTECH Materials	
Total CMP Footage:	273 ft
Approximate Total Pieces:	13 pcs
Approximate Coupling Bands:	12 bands
Approximate Trucks:	2 trucks

Construction Quantities	
Total Excavation:	284 cy
Porous Stone Backfill For Storage:	87 cy stone
Backfill to Grade Excluding Stone:	128 cy fill

**Construction quantities are approximate and should be verified upon final design.



SANITARY SEWER BASIS OF DESIGN

UNIT FACTOR: 0.3 UNITS PER 1000 SQ.FT.
2,500 SQ.FT. X 0.3 = 0.75 UNITS

INITIAL FLOW: 3 PEOPLE / UNIT
TOTAL POPULATION = 2.5 PEOPLE = 3.0 PEOPLE
AVE. FLOW = 100 GAL/CAPITA/DAY X 3.0 PEOPLE = 0.0005 CFS
86,400 SEC/DAY X 7.48 GAL/C.F.

PEAK FLOW = [(18 + √0.003) / (4 + √0.003) X 0.0005] = 0.002 CFS

FUTURE POPULATION: INITIAL POPULATION = FUTURE POPULATION = 3.0 PEOPLE

ULTIMATE FLOW: INITIAL FLOW = ULTIMATE FLOW

STORM SEWER CALCULATIONS

STORM SEWER OUTLET: IRELAND DRAIN (18")

PER OC-WRC IRELAND DRAIN STORM CALCULATIONS
DESIGN FLOW TO MH11 OF VARNER DRAIN
C = 0.3 A = 8 AC T_c = 80.31 MIN
Q_s = 2.40 CFS

AUTO RITE LLC SITE

AREA = 0.29 AC
C = 70% 0.95 (FUTURE PAVEMENT/BUILDING)
30% 0.15 (GREENBELT)
= 0.71
T = 15 MIN, I₂₅ = 215/T + 25 = 1.11
Q = 0.98 CFS
Q_s = 0.2 CFS/AC
Q_a = 0.06 CFS
Q_o = Q_s / A x C = 0.28 CFS
CONTECH CDS-4 TREATMENT FLOW CAPACITY = 0.70 CFS

V_t VOLUME OF STORAGE REQUIRED FOR 100 YR STORM

T₁₀₀ = -25 + √10,312.5/Q_o = 166.34 MIN
V_{s100} = (16,500 x T) / (T + 25) - 40 x Q x T = 12,469.90 FT³
V_t = V_{s100} / (A x C) = 2,567.55 FT³
VOLUME PROVIDED 2,627 FT³

EXISTING WATER TABLE ELEVATION IS APPROXIMATELY 700. THE BOTTOM OF THE ON-SITE STORAGE IS 702.

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CITY OF ROCHESTER HILLS AUTO RITE LLC STORM SEWER/UTILITY PLAN

NO.	DATE	SUBMITTAL	NO.	DATE	REVISION	PROJECT NO.:	SCALE:	SHEET NO.
1	6/19/14	OWNER	1	5/15/15	PER R.H. REVIEW (4/22/15)	RH14-026	1"=20'	1
2	3/17/15	OWNER	2	5/20/15	PER STEPIEN REVIEW (5/18/15)	RH14026D1		
3	11/10/15	PLANNING	3	5/27/15	PER STEPIEN REVIEW (5/21/15)			
4	12/21/15	PLANNING	4	6/01/15	PER STEPIEN REVIEW (5/29/15)			
			5	9/15/15	PER CITY REVIEW (8/27/15)			
			6	10/6/15	PER CITY REVIEW (9/29/15)			
			7	11/10/15	PER CITY REVIEW (10/28/15)			
			8	12/17/15	PER STEPIEN/CITY MTD			
			9	1/26/16	PER STEPIEN/CITY REVIEW (1/25/15)			

SECTION 25 TOWN 3 NORTH RANGE 11 EAST
CITY/TOWN: ROCHESTER HILLS OAKLAND COUNTY, MI
CITY FILE #13-005.2