

**BENCHMARKS:**  
 COW Disc  
 Armour (Towneast Mall Drive) and Douglas (Gypsum Creek)  
 Northeast corner of RCBC  
 Elevation=1355.26 NAVD 88

X Cut on Top of Curb  
 Approximately 47' East and 28' South of the Northeast property corner on the East side of Longfellow.  
 Elevation=1347.82 NAVD 88

X Cut on Top of Curb  
 46' East and 28' South of the Southeast property corner on the East side of Longfellow.  
 Elevation=1339.94 NAVD 88

X Cut on Inlet  
 211' South and 45' East of the Northwest property corner on back of curb inlet on the West side of Armour.  
 Elevation=1337.48 NAVD 88

1 Onsite drainage basin, Area = 8.16 acres

**Project Narrative:**  
 The site is located on southeast corner of Kellogg and Armour. The site is about 8.17 acres and has buildings, parking and other facilities for car dealership. The entire site is covered by impervious surface. The scope of the project is to demolish existing building, parking and construct new building, parking and other facilities for car dealership. The use of site in proposed condition remains same as existing. Only 30% of the total water quality volume needs to be treated for redevelopment site as per City of Wichita Stormwater Design Manual. The entire site is drainage basin of Armour branch of Gypsum creek and drains without detention in existing condition. The flood detention and channel protections are not considered for this project.

**Water Quality and TSS Removal Calculation:**

Water Quality Volume (WQv) Calculation				
Calculation for water quality volume (WQv=P*Rv*A/12)		Soil Group 'D'		
85th percentile storm event (1.2 inches), P =	1.20	inches	Calculation of Rv	
Total area, A =	8.17	acres	Coeff.	Area
Rainfall Coeff, Rv =	0.874	cf	Coeff for undisturbed area, RvU=	0.05 0.00
Required Vol. for Water Quality =	0.71	ac-ft	Coeff for turf cover, disturbed, RvT=	0.25 0.89
Corresponding Water Quality Peak Flow =	9.90	cfs	Coeff for impervious area, RvI=	0.95 7.28
			Weighted, Rv =	0.874

Total water quality flow needs to be treated for proposed development is 30% of total water quality volume from the entire site. Corresponding water quality treatment flow =  $9.90 \times 0.30 = 2.97$  cfs.

Proposed Hydroguard unit (HG-6) is sized to accommodate the 2.97 cfs of treatment flow.

Hydroguard Sizing:  
 Critical Pecllet # =  $0.0033 \times 200 + 0.0045 = 0.6645$   
 Treatment flow based on critical Pecllet # for 6' diameter unit,  $Q = V_s \times h \times d / \text{Pecllet \#}$   
 Treatment  $Q = (0.0631 \times 6.0 \times 6) / 0.6645 = 3.42$  cfs

Water Quality Peak Flow Calculation		
Aera=	8.17	acres
WQv=	1.048	inches
Pond and Swamp Factor, Fp=	1.000	
Calculated CN=	98.6	
S=	0.138	inches
la=	0.028	inches
la/P=	0.023	
qu	740.0	cfs/sq.mi/in
<b>Water quality peak flow</b>	<b>9.90</b>	<b>cfs</b>

**Runoff Calculations (2-, 5-, 10-, 25-, and 100-yr)**

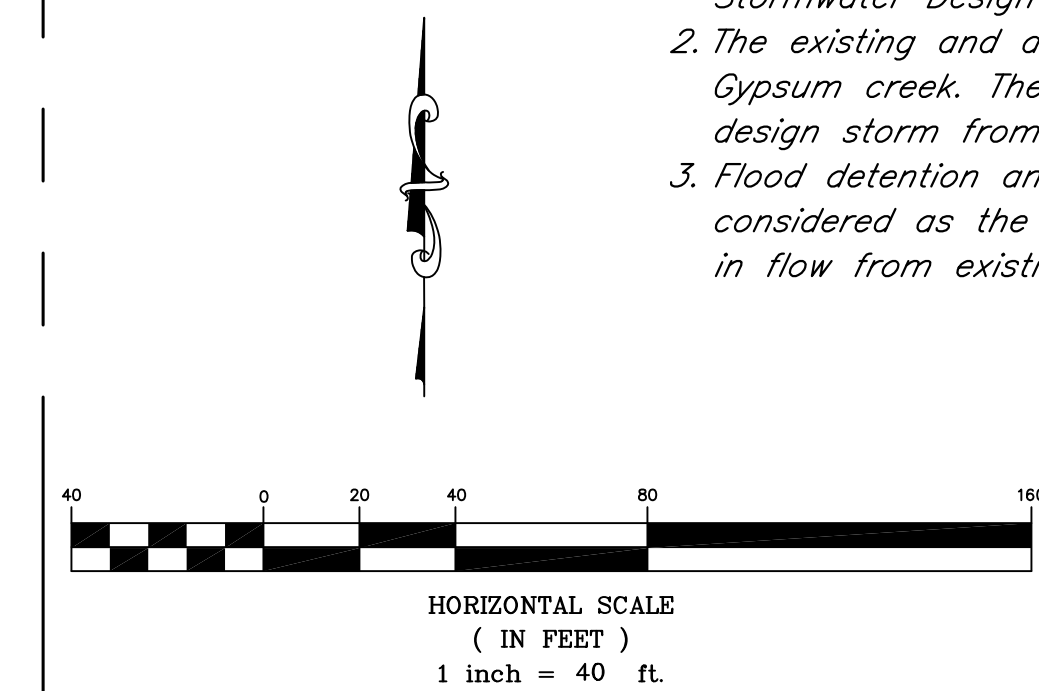
**EXISTING CONDITION:**  
 Total Area, A1 = 8.17 acres,  
 Total Impervious Area = 8.04 acres,  
 Grass Area = 0.13 acres  
 Hydrological Soil Group = D

EXISTING SITE									
DRAINAGE AREA	ACRES	Tc min	CN	Q2	Q5	Q10	Q25	Q100	REMARKS
Entire Site	8.17	15	98	30.36	39.21	45.38	53.32	68.29	Existing condition

**DEVELOPED CONDITION:**  
 Total Area, A1 = 8.17 acres,  
 Total Impervious Area = 7.28 acres,  
 Grass Area = 0.89 acres  
 Hydrological Soil Group = D

DEVELOPED SITE									
DRAINAGE AREA	ACRES	Tc min	CN	Q2	Q5	Q10	Q25	Q100	REMARKS
Entire Site	8.17	15	97	29.96	38.87	45.08	53.05	68.07	Developed condition

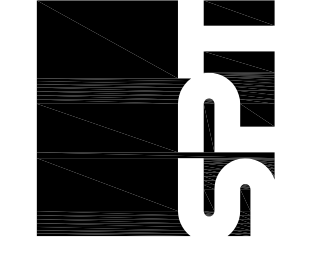
- Notes:**
- Existing and developed flows are calculated using the SCS Hydrograph method. "CN" & "T" values are established from "City of Wichita Stormwater Design Manual."
  - The existing and developed peak flows are routed to Armour branch of Gypsum creek. The SWS under Armour St. will be replaced to convey the design storm from the site.
  - Flood detention and extended detention for channel protection are not considered as the site is already developed and there will not be increase in flow from existing to developed condition.



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01-18-2013

DRAINAGE PLAN

C4.1