

# DRAINAGE STUDY

## IMPERIAL CENTER SUBDIVISION

### DESIGN CRITERIA

The design criteria used for this report include the following items:

1. Retention basin will detain the runoff of the entire area.
2. Retention basins shall be sized for a 100-year/24 –hour storm (assumed to be a total of 3 inches of rain).
3. Retention basin will drain out to the I.I.D. Alder Drain located on the east side of the property.
4. CONTECH Corrugated Metal Pipe Runoff Detention Systems, is proposed under the parking lot of the Commercial Center to detain 100% of the runoff of the entire site.

### 5. BASIN AREAS

Land Use	Area
Commercial	69.83 Ac
Street Area	7.81 Ac
<b>Total</b>	<b>77.64 Ac.</b>

### 6. RUNOFF ANALYSIS

The runoff analysis for the developed condition was performed using the *Rational Method*.

$$Q = C I A$$

$Q$  = Required storage,  
 $C$  = Runoff coefficient (1.0),  
 $i$  = Rainfall intensity total (3 inches),  
 $A$  = Area of basin in acres.

### 7. REQUIRED STORAGE

$$Q = C I A$$

$Q$  = Required storage,  
 $C$  = Runoff coefficient (1.0),  
 $i$  = Rainfall intensity total (3 inches),  
 $A$  = Area of basin in acres (77.64 acres)

$$Q_{req'd} = 3/12 \times 1 \times 77.64 = 19.31 \text{ ac-ft}$$
$$Q_{req'd} = 841,144 \text{ cf.}$$

**8. RETENTION BASIN SIZING**

A 48" corrugated metal pipe is proposed for the runoff storage under the parking lot.

A 48" pipe can store 12.5 cf/lf

$841,144 / 12.5 = 67,291.52$  lf of 48" pipe is required to store the runoff of the entire site.