SCALE 1"=40'

OIL/GREASE TRAP DESIGN

Professional StruCIVIL Engineers, Inc.
VERSION 1.01
City of Austin Guidelines

PROJECT: **Bob Johnson, 2051 FM 1626, Austin, Texas**

DRAINAGE AREA DATA

Drainage Area to Control		$A_d := 3541.70 \cdot ft^2$
Drainage Area Impervious Cover		$A_d = 3541.7\ ft^2$
Runoff Coefficient	6 month event	$C_6 := 0.72$
	25 year event	$C_{25} := 0.93$
Rainfall Intensity	6 month event	$I_6 := .68 \cdot in \cdot hr^{-1}$
	25 year event	$I_{25} := 9.84 \cdot in \cdot hr^{-1}$
Flow Rate	6 month event	$Q_6 := C_6 \cdot I_6 \cdot A_d = 0.04\ ft^3 \cdot sec^{-1}$
	25 year event	$Q_{25} := C_{25} \cdot I_{25} \cdot A_d = 0.75\ ft^3 \cdot sec^{-1}$

OIL/GREASE/SAND TRAP DATA & CALCULATIONS

Surface Area	$A_{surface} := 2.5 + \frac{A_d}{1000} = 8.85\ ft^2$	Use 1000 Gallons HMI Surface Area	$A_{us} := 44.24 \cdot ft^2$
Cross Sectional Area	$A_{cross} := 1.5 \cdot \frac{A_d}{1000} = 5.31\ ft^2$	Cross Sectional Area	$A_{cp} := 13.74 \cdot ft^2$
Depth	$D_{min} := 3.0 \cdot ft$	Depth provided 3.0 ft	
Width	$W_{width} := D_{min} = 3\ ft$	Width provided 4.58 ft	
Length	$L_{length} := 1.5 \cdot W_{width} = 4.5\ ft$	Length provided	$L_{length} := 9.66 \cdot ft$

L-PIPE DATA

Pipe Diameter	$P_d := 4\ in$	$A_{pipe} := \frac{\pi \cdot P_d^2}{4} = 12.57\ in^2$
Grate Inlet Elevation	$H_{inlet} := 664.10\ ft$	
6 months velocity through trap	$V_{t6} := \frac{Q_6}{A_{cp}} = 0.175\ \frac{ft}{min}$	Less than 3 fpm
4" Pipe Velocity	$V_{t6} := \frac{Q_6}{A_{pipe}} = 0.46\ \frac{ft}{s}$	$H_o := H_{inlet} - 3.0 \cdot ft = 661.1\ ft$

$$H_{t6} := 2.9 \cdot \frac{V_{t6}^2}{2 \cdot g} + H_o = \frac{V_{t6}^2}{2 \cdot g} = 661.11\ ft$$

Outlet Elevation	$H_o = 661.1\ ft$	
25yrs. WSEL Elevation	$H_{25} := H_o + 1.5 \cdot ft = 662.6\ ft$	
6 month Elevation	$H_{t6} = 661.11\ ft$	
6 month Velocity	$V_{t6} = 0.175\ \frac{ft}{min}$	(should be less than 3 fpm)

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OVER FLOW WEIR DATA

Length of Weir $W_{length} := 18 \cdot in$

$$V_{t25} := \left[(3.1^2) \cdot \frac{(H_{25} - H_{t6})}{2.9} \cdot ft \cdot sec^{-2} + 2 \cdot \left(\frac{9}{2.9} \right) \cdot (H_{25} - H_o) \right]^{0.5} = 6.18\ \frac{ft}{s}$$

$$V_{t25} := V_{t25} \cdot \frac{A_{pipe}}{A_{cp}} = 2.356\ \frac{ft}{min}$$

25 yrs. WSEL $H_{25} = 662.6\ ft$

25yrs. Velocity through trap $V_{t25} = 2.356\ \frac{ft}{min}$ (should be less than 4 fpm)

METAL GRATE R-4990-AA, TYPE-A BY NEENAH

Grate Length	$L_{grate} := 35.0 \cdot ft$
Grate Perimeter	$P_{grate} := 2.0 \cdot ft$
Grate Area	$A_{grate} := 0.2 \cdot ft^2$
Grate Head	$H_{grate} := 1 \cdot in$

Weir Flow Calculations

$$Q_{weir} := 3.3 \cdot P_{grate} \cdot H_{grate}^{1.5} \cdot ft^{\frac{1}{2}} \cdot sec^{-1} = 0.159\ ft^3 \cdot sec^{-1}$$

Orifice Flow Calculations

$$Q_{orifice} := 0.6 \cdot A_{grate} \cdot \sqrt{2 \cdot g \cdot H_{grate}} = 0.278\ ft^3 \cdot sec^{-1}$$

$$Q_{grate} := Q_{weir} \cdot L_{grate} \cdot ft^{-1} = 5.56\ ft^3 \cdot sec^{-1}$$

NOTE (1) USE 1000 gallons. HMI
(2) GRATE INLET OPENINGS SIZE 1/2" NOMINAL.
METAL GRATE R-4990-AA, TYEP-A BY NEENAH

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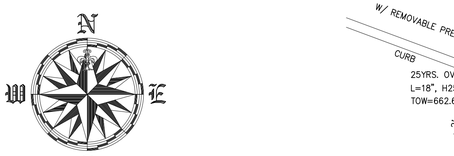
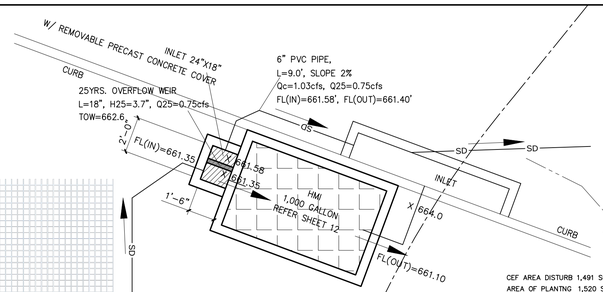
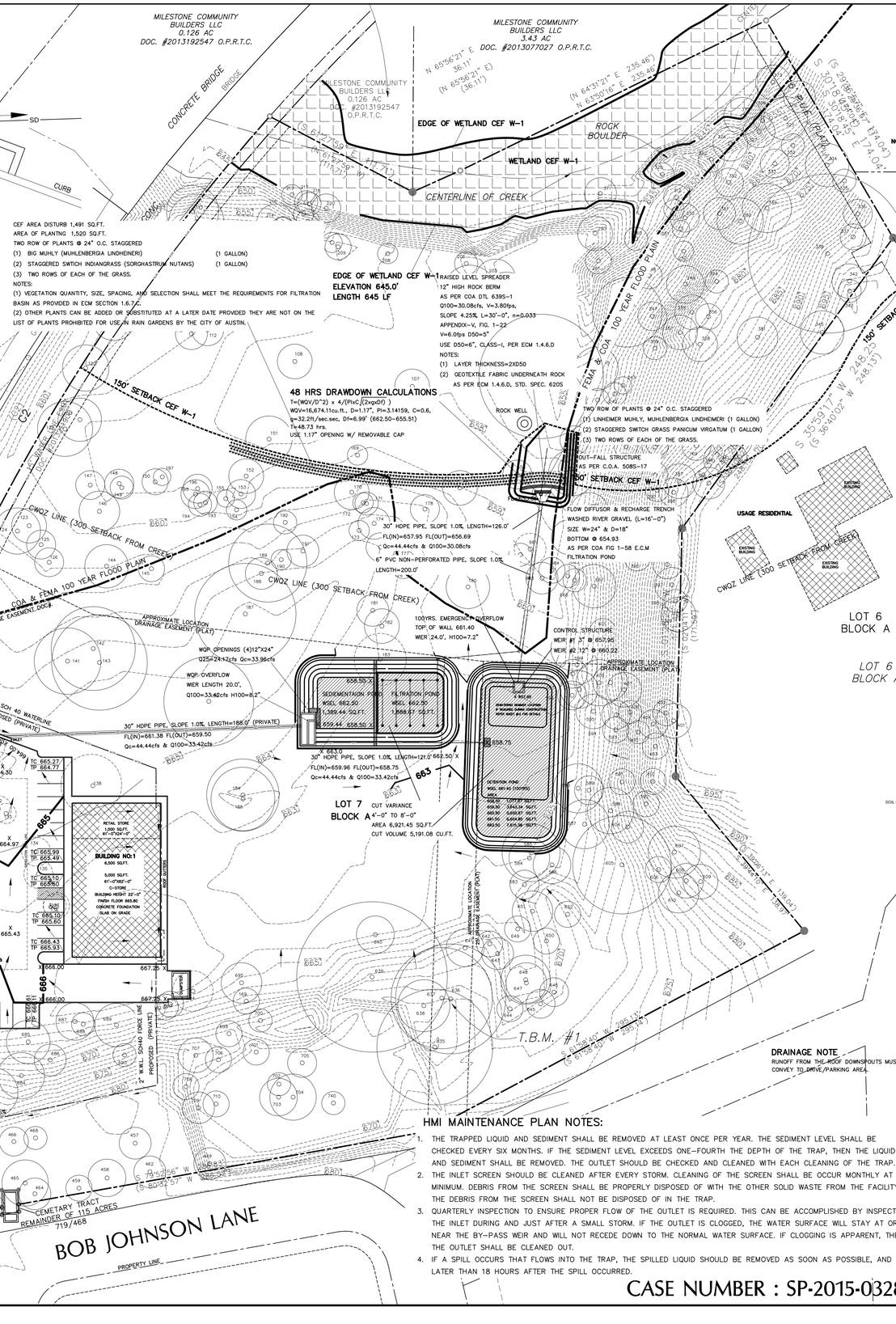
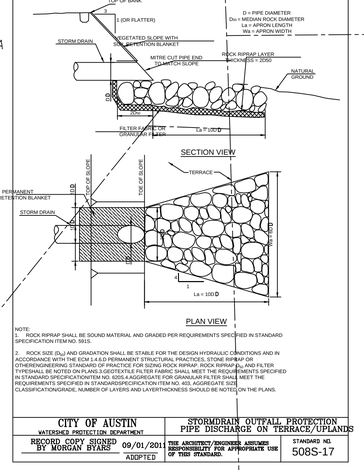




HMI 25YRS. OVERFLOW PLAN

SCALE 1/4"=1'-0"





HMI MAINTENANCE PLAN NOTES:

1. THE TRAPPED LIQUID AND SEDIMENT SHALL BE REMOVED AT LEAST ONCE PER YEAR. THE SEDIMENT LEVEL SHALL BE CHECKED EVERY SIX MONTHS. IF THE SEDIMENT LEVEL EXCEEDS ONE–FOURTH THE DEPTH OF THE TRAP, THEN THE LIQUID AND SEDIMENT SHALL BE REMOVED. THE OUTLET SHOULD BE CHECKED AND CLEANED WITH EACH CLEANING OF THE TRAP.
2. THE INLET SCREEN SHOULD BE CLEANED AFTER EVERY STORM. CLEANING OF THE SCREEN SHALL BE OCCUR MONTHLY AT A MINIMUM. DEBRIS FROM THE SCREEN SHALL BE PROPERLY DISPOSED OF WITH THE OTHER SOLID WASTE FROM THE FACILITY. THE DEBRIS FROM THE SCREEN SHALL NOT BE DISPOSED OF IN THE TRAP.
3. QUARTERLY INSPECTION TO ENSURE PROPER FLOW OF THE OUTLET IS REQUIRED. THIS CAN BE ACCOMPLISHED BY INSPECTING THE INLET DURING AND JUST AFTER A SMALL STORM. IF THE OUTLET IS CLOGGED, THE WATER SURFACE WILL STAY AT OR NEAR THE BY–PASS WEIR AND WILL NOT RECEDE DOWN TO THE NORMAL WATER SURFACE. IF CLOGGING IS APPARENT, THEN THE OUTLET SHALL BE CLEANED OUT.
4. IF A SPILL OCCURS THAT FLOWS INTO THE TRAP, THE SPILLED LIQUID SHOULD BE REMOVED AS SOON AS POSSIBLE, AND NO LATER THAN 18 HOURS AFTER THE SPILL OCCURRED.

CASE NUMBER : SP-2015-0328D

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MIRZA TAHIR BAIG, P.E., #82577 ON 05/24/2016
FIRM REGISTRATION F–4951

Rev.	Description	Date	Drawn
6	ISSUED FOR APPROVAL	05/24/16	
5	ISSUED FOR APPROVAL	03/14/16	
4	ISSUED FOR APPROVAL	01/19/16	
3	ISSUED FOR APPROVAL	12/28/15	
2	ISSUED FOR APPROVAL	10/29/15	
1	ISSUED FOR APPROVAL	08/12/15	
0	ISSUED FOR APPROVAL	04/24/15	

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Project : BOB JOHNSON GAS STATION
2051 W FM 1626 ROAD
AUSTIN, TEXAS 78652

Title : GRADING AND DRAINAGE SITE PLAN

PROJECT 29896

SHEET 6 OF 24

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