Drainage Reports

Abbreveated Water & Sewer Need Reports

Water Study

Wastewater Study

Stormwater Waiver Application

JACOBS WALLACE, LLC
ENGINEERING PLANNING MANAGEMENT

WASTEWATER DISTRIBUTION SYSTEM

BASIS OF DESIGN REPORT

FOR

HUDSON EAST - MULTI-FAMILY PROJECT
3440 & 3450 E. McDonald Drive
SCOTTSDALE, ARIZONA

OWNER:
Porchlight Homes
2915 East Baseline Road, Suite 118
Gilbert, Arizona 85234
480.813.1324

December 19, 2016
Revised: January 16, 2018

PREPARED BY:

JACOBS WALLACE, LLC
2233 W. Bethany Home Rd.
Phoenix, AZ 85015
602.757.5964

Registered Professional Engineer (Civil)
CERTIFICATE NO.
40224
CHARLES G. JACOBS
1-15-18
Date Signed
ARIZONA, U.S.A.
Expires: 12/31/18

8-DR-2018

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Accepted For:
City of Scottsdale
Water Resources Department
9379 E. San Salvador
Scottsdale, Arizona

December 19, 2016
Revised: January 16, 2018

By: _____

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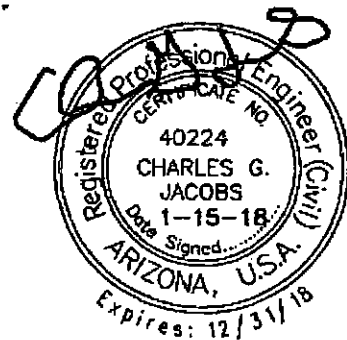
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      Calculations
      Preliminary Design
      City of Scottsdale Quarter Section Map

INTRODUCTION

The proposed project consists of a multi-story multi-family building with associated site improvements. The existing conditions include 2-delapidated buildings with associated site improvements sitting on 2 lots. The lots would be combined into one with the proposed project. The 1.085-acre site is located just west of Granite Reef Rd on the north side of McDonald Dr. The site is bordered to the north and west by an existing multi family development, to the east by existing commercial development, to the south by McDonald Drive. The site lies within the Southwest Quarter of Section 12, Township 2 North, Range 4 East of Gila and Salt River Base and Meridian. See the Appendix for a vicinity map.

EXISTING CONDITIONS

There is an existing 15" VCP sewer main within McDonald Dr. There are services from this main to each existing lot. The existing services will not be utilized for this project.

PROPOSED CONDITIONS

The proposed project will install a new 6" private sewer to service the project. There will be a new 6" sewer connection made within a new manhole on the existing 15" sewer within McDonald Dr. The proposed sanitary sewer system will consist of a new private 6" line serving the project at 1% minimum slope. The existing sewer services will be capped and abandoned at the right of way line of McDonald Dr.

The private sewer line construction and design will conform to Uniform Plumbing Code.

WASTEWATER ANALYSIS

Number of Units: 18 (units)
Unit Daily Flows:
    3 Bedroom = 400 gpd
Average Daily Flow:
    18*400gpd = 7,200 gpd
Peak Daily Flow:
    7,200 gpd * 4.5 = **32,400 gpd = 22.5 gpm**

SUMMARY

A 6" line with a slope of 1.0% flowing at 75% full carries 229 gpm with a velocity of 3.2 fps. A 6" line carrying 32 gpm flows with a velocity of 1.80 fps at 20% capacity. See attached calculations in the Appendix. These parameters fall within acceptable ranges as set forth in the City of Scottsdale guidelines.

<u>APPENDIX</u>

Manning Pipe Calculator

75% FULL

Given Input Data:

Shape .... Circular
Solving for .... Flowrate
Diameter .... 6.0000 in
Depth .... 4.5000 in
Slope .... 0.0100 ft/ft
Manning's n 0.0130

Computed Results:

Flowrate .... 229.6492 gpm-US
Area 0.1963 ft2
Wetted Area 0.1580 ft2
Wetted Perimeter .... 12.5664 in
Perimeter .... 18.8496 in
Velocity .... 3.2391 fps
Hydraulic Radius .... 1.8101 in
Percent Full .... 75.0000 %
Full flow Flowrate .... 251.8421 gpm-US
Full flow velocity .... 2.8577 fps

Critical Information
Critical depth .... 4.5680 in
Critical slope .... 0.0096 ft/ft
Critical velocity .... 3.2437 fps
Critical area 0.1635 ft2
Critical perimeter .... 12.5609 in
Critical hydraulic radius .... 1.8745 in
Critical top width .... 6.0000 in
Specific energy .... 0.5443 ft
Minimum energy .... 0.5710 ft
Froude number 1.0266
Flow condition .... Supercritical

Manning Pipe

Calculator **PEAK FLOW**
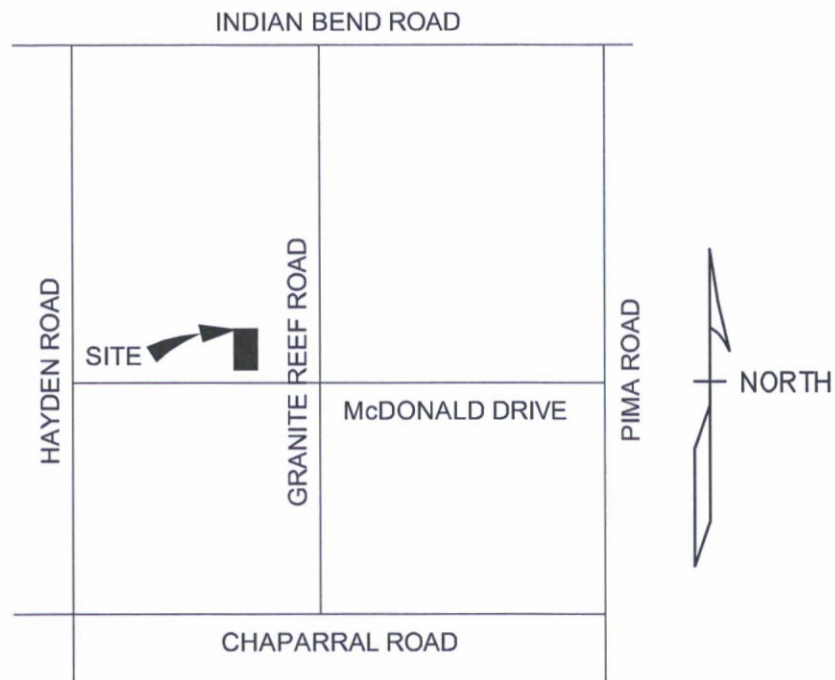
Set units: | m | mm | ft | in |

Pipe diameter, d_0	6	in ▾
Manning roughness, n ?	.013	
Pressure slope (possibly ? equal to pipe slope), S_0	.01	rise/run ▾
Percent of (or ratio to) full depth (100% or 1 if flowing full)	.202	fraction ▾

Results

Flow, Q	22.4999	gpm ▾
Velocity, v	1.7680	ft/sec ▾
Velocity head, h_v	0.5829	in ▾
Flow area	4.0834	sq. in. ▾
Wetted perimeter	5.5937	in ▾
Hydraulic radius	0.7300	in ▾
Top width, T	4.8179	in ▾
Froude number, F	1.17	
Shear stress (tractive force), tau	0.0631	psf ▾

INDIAN BEND ROAD

HAYDEN ROAD

GRANITE REEF ROAD

SITE

PIMA ROAD

McDONALD DRIVE

NORTH

CHAPARRAL ROAD

VICINITY MAP
NOT TO SCALE

PORCHLIGHT HOMES
MULTI-FAMILY RESIDENTIAL
CONCEPTUAL G&D AND UTILITY PLAN
8340 &8350 E. MCDONALD DRIVE
OF

A PORTION OF THE SW 1/4 OF SECTION 12, T.2N., R.4E.
MARICOPA COUNTY, ARIZONA.

DRAINAGE STATEMENT

THE EXISTING SITE DRAINAGE CONSISTS OF MOSTLY SHEET FLOW FROM NORTH TO SOUTH EVENTUALLY MAKING ITS WAY TO MCDONALD DRIVE. THE SITE IS MOSTLY IMPERVIOUS AREA IN ITS EXISTING CONDITION. A SMALL AREA DRAINS WESTERLY ONTO AN EXISTING CITY OF SCOTTSDALE OWNED PAVED ACCESS DRIVE. THIS DRIVE IS CONTINUOUS ALONG THE WESTERN AND NORTHERN BOUNDARIES OF THE PROJECT. THERE IS CURRENTLY NO RETENTION PROVIDED ON THE PROPERTY. NO OFFSITE RUNOFF AFFECTS THIS PROPERTY.

THE PROPOSED IMPROVEMENTS WILL NOT INCREASE THE IMPERVIOUS AREA. THE IMPERVIOUS SURFACE AREA IS REDUCED WITH THE PROPSOED DEVELOPMENT. SEE CALCULATIONS BELOW. SEEING AS THE PRE VS. POST CONDITIONS ARE DECREASED WITH THE PROPOSED IMPROVEMENTS WE ARE PROPOSING TO PROVIDE NO RETENTION FOR THE PROJECT. THE DRAINAGE WILL BE DIRECTED TO THE CITY OF SCOTTSDALE RIGHTS OF WAY VIA SHEET FLOW WITHIN THE PARKING AREAS. THE ROOF DRAINAGE WILL BE SPLASH BLOCK AND DIRECTED TO THE PAVED PARKING AREAS. THERE WILL BE A SMALL PAVED PORTION ALONG THE WEST SIDE OF THE PROJECT THAT WILL DISCHARGE INTO THE ACCESS DRIVE AS IT CURRENTLY DOES TODAY. THE PRE VS. POST RETENTION CALCULATIONS ARE SHOWN BELOW.

THE SITE OUTFALL OCCURS AT THE SOUTHWEST CORNER OF THE PROJECT AT AN ELEVATION OF 1268.8 WELL BELOW THE FFE OF THE PROPOSED STRUCTURES. THE BUILDINGS ARE SAFE FROM THE 100-YR STORM EVENT.

RETENTION CALCULATIONS

PRE. VS. POST DEVELOPMENT

PRE:
$VOL_r = P/12 * C * A$
WEIGHTED "C" = $39022(0.95)+8181(0.45)/47203 = 0.86$
A=47,203 SF (NET TOTAL BOTH LOTS)
P=2.2 (IN/HR)
$VOL_r = 7,442$ CF

POST:
$VOL_r = P/12 * C * A$
WEIGHTED "C" = $34105(0.95)+13098(0.45)/47203 = 0.81$
A=47,203 SF (NET TOTAL BOTH LOTS)
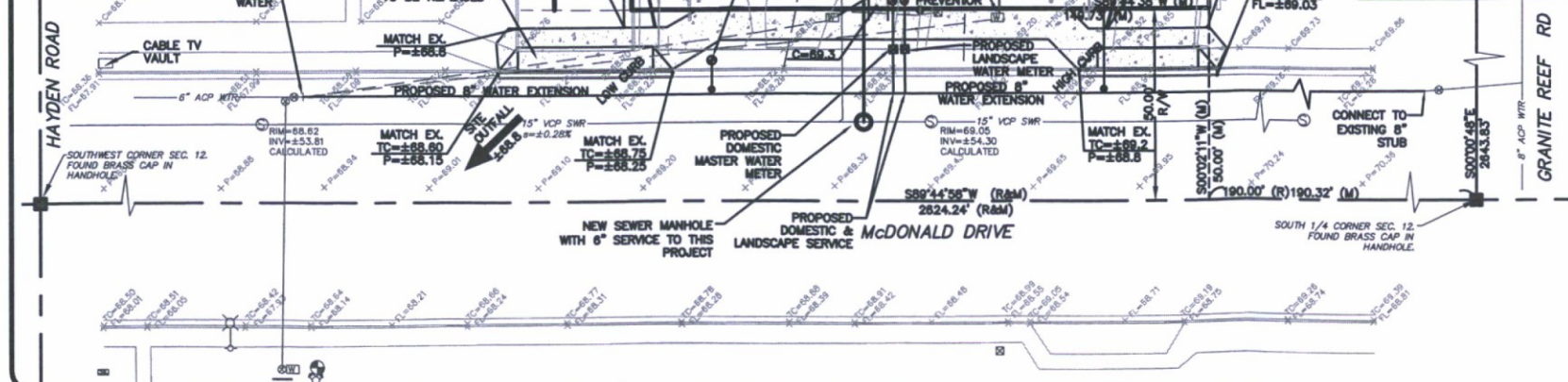P=2.2 (IN/HR)
$VOL_r = 7,009$ CF

$VOL_r = 7,009 - 7,442 = -432$ CF

FLOOD ZONE (FIRM)

THIS SITE FALLS WITHIN ZONE SHADED X PER 04013C1730L, EFFECTIVE ON 10/16/2013. DEFINED AS AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAG ARES LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD.

LEGEND

- BRASS CAP IN HANDHOLE
- SEWER CLEAN OUT
- SEWER MANHOLE
- WATER VALVE
- FIRE HYDRANT
- FIRE DEPT. CONNECTION
- WATER METER
- BACKFLOW PREVENTER
- GAS METER
- STREET LIGHT
- LIGHT POLE
- GROUND LIGHT
- ELECTRIC BOX
- TELEPHONE RISER
- CABLE RISER
- SIGN
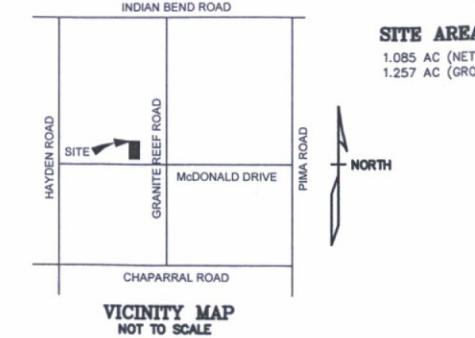- PALM TREE
- OLIVE TREE
- NON-DESCRIPT TREE
- SAGUARO CACTUS

C.M.U. WALL (4 OR 8 INCH BLOCKS)
BOUNDARY

SITE AREA
1.085 AC (NET)
1.257 AC (GROSS)

VICINITY MAP
NOT TO SCALE

INDIAN BEND ROAD
HAYDEN ROAD
GRANITE REEF ROAD
PIMA ROAD
SITE
McDONALD DRIVE
NORTH
CHAPARRAL ROAD

LEGAL DESCRIPTION

PARCEL NO.1:
THE EAST 340.00 FEET OF THE SOUTH 365.00 FEET AT THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 12, TOWNSHIP 2 NORTH, RANGE 4 EAST OF GILA AND SALT RIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA; EXCEPT THE EAST OF 265.00 FEET THEREOF.

PARCEL NO.2:
THE EAST 340.00 FEET OF THE SOUTH 365.00 FEET AT THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 12, TOWNSHIP 2 NORTH, RANGE 4 EAST OF GILA AND SALTRIVER BASE AND MERIDIAN, MARICOPA COUNTY, ARIZONA; EXCEPT THE EAST OF 190.00 FEET; AND EXCEPT THE WEST 75.00 FEET.
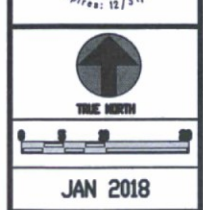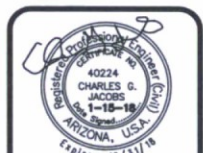
APN
174-12-001S & 174-12-001T

ZONING
R-5

CONSTRUCTION TYPE
VB

Site plan unit labels
- FFE=1271.3 UNIT 1
- FFE=1271.3 UNIT 2
- FFE=1270.9 UNIT 3
- FFE=1270.9 UNIT 4
- FFE=1270.9 UNIT 5
- FFE=1270.5 UNIT 6
- FFE=1270.5 UNIT 7
- FFE=1270.5 UNIT 8
- FFE=1270.5 UNIT 9
- FFE=1270.5 UNIT 10
- FFE=1271.5 UNIT 11
- FFE=1271.5 UNIT 12
- FFE=1271.5 UNIT 13
- FFE=1271.5 UNIT 14
- FFE=1271.1 UNIT 15
- FFE=1271.1 UNIT 16
- FFE=1271.1 UNIT 18

CROSS SECTION A-A
H 1"=20'
V: 1"=5'

PUBLIC DRIVE — GARAGE FFE=1270.5 — FFE=1271.1 GARAGE — PRIVATE DRIVE
RETAINING/SCREEN 6' WALL
CONC. WALK
EX. GROUND

JAN 2018

DRAWING NO.
C1.0

JOB: 0068