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

By: David Mann
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**ONE SCOTTSDALE
(Stacked 40s)**
MASTER ON-SITE WASTEWATER PLAN

Revised January 28, 2016
Revised February 10, 2012
Revised April 16, 2009
August 25, 2005
WP# 154391

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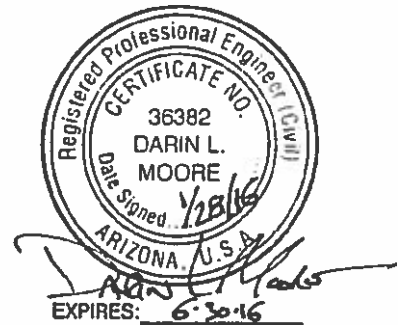


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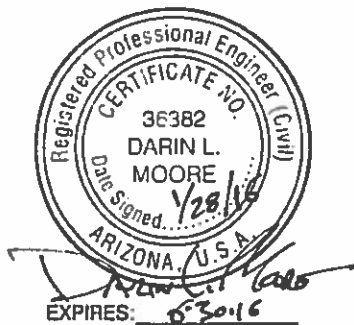
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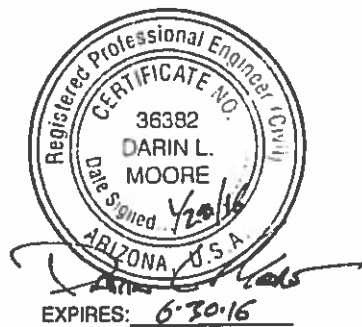
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1.0 INTRODUCTION

1.1 General Background

This plan has been prepared in accordance with Wood, Patel & Associates, Inc.'s (Wood/Patel's) understanding of City of Scottsdale technical requirements for wastewater collection systems and our understanding of the Master On-Site Wastewater Plan submission requirements as defined in the November 19, 2002 Development Agreement No. 2002-142-COS, between the Corrigan Land & Livestock Company, LLC, Corrigan Real Estate Investment, LLC, DMB Stacked 40s LLC, and the City of Scottsdale (Development Agreement), for the approximate 160-acre (gross) parcel of land formerly known as the Stacked 40s, currently known as One Scottsdale.

One Scottsdale is located at the northeast corner of Scottsdale Road and Union Hills Drive; south of Thompson Peak Parkway and east of Scottsdale Road. It is dissected by the Arizona Department of Transportation (ADOT) State Route 101 Freeway, and bound on the north by the Grayhawk Master Planned Community (hereafter referred to as Grayhawk), and on the east by both Grayhawk and Arizona State Trust Land. Specifically, One Scottsdale is located in the west half of Section 26, Township 4 North, Range 4 East of the Gila and Salt River Meridian. Plate 1 – *Vicinity Map* displays its specific location. Center Drive is now called Legacy Boulevard.

One Scottsdale will be developed on approximately 120 acres north of the State Route 101 Freeway, hereinafter referred to as the Project Area, and is anticipated to be a phased mixed-use development that may include single-family residential, multi-family residential, hotel, mixed-use office, retail, and commercial uses as applicable per the Development Agreement.

For the purposes of this plan, the scope of work per the Development Agreement stipulations is included as follows:

1. *MASTER ON-SITE WASTEWATER PLAN. The Master On-Site Wastewater Plan shall conform to the draft Water and Wastewater Report Guidelines available through the City Water Resources Department and shall include:*
 - a. *A description of the wastewater system requirements for the Planning Unit and the phasing of such requirements.*

- b. *A discussion of the timing of and parties responsible for construction of all wastewater facilities.*
- c. *The conceptual location, size, type and capacity of the necessary wastewater collection, transmission, and treatment system components needed to serve the Planning Unit, and a preliminary analysis of the impact of the proposed development on the existing system with wastewater demand generation factors base upon land use.*
- d. *The calculations necessary to substantiate the selection of the size, type, and capacity of the wastewater transmission and treatment facilities.*
- e. *Compliance with the adopted City's Wastewater System Master Plan for the respective area.*
- f. *Estimated peak flow from all contributions upstream of the proposed development that may flow through the on-site system shall be assessed for impacts to the entire system.*

2. *MASTER ON-SITE WASTEWATER PLAN APPROVAL. Before the submittal of any basis of design reports to the Plan Review and Permit Services Division, the Master Developer shall have obtained approval from the City Water Resources Department of the Master On-Site Wastewater Plan.*

The intent of this Master Plan revision is to support a proposed amendment to the One Scottsdale zoning. Refer to Section 1.2, Table 1.2 for the revised Conceptual Planning Areas land use budget.

1.2 Study Area and Planning Units

One Scottsdale is further described as containing "Planning Unit I", "Planning Unit II" and "Planning Unit III" as shown in Plate 2 – *Modeled On-Site Land Use Plans*. The scope of this Master On-Site Wastewater Plan includes the Project Area consisting of "Planning Unit II" and "Planning Unit III". Mr. John R. Lund and the City of Scottsdale are parties to a separate Development Agreement, Agreement Number 2002-143-COS, relating to the development of the South Parcel also known as Planning Unit I. **Therefore the Stacked 40s Development Agreement (Number 2002-142-COS) shall no longer apply to the South Parcel (Planning Unit I) upon the effective date of Agreement Number 2002-143-COS.** The original Stacked 40s Land Use Budget comparison is provided below in Table 1.1.

**Table 1.1:
Land Use Budget**

Category	Zoning	Permitted Uses Within Planning Units		Original Total Allowed	Proposed Total Allowed
		II	III		
Residential ²	PRC PCD	X	X	1,100 Units	2,466 Units
Commercial / Retail / Office	PRC PCD	X	X	1,800,000 SF	2,866,145 SF
Hotel	PRC PCD	X	X	400 Rooms	400 Rooms

Notes:

1. Source: Schedule C, Stacked 40s Land Use Budget, Development Agreement
2. A maximum of 750 residential units within Planning Unit III.

According to the Development Agreement, the approved Development Plan for the Project Area is on file with the Planning and Development Services Department at the City of Scottsdale. The two (2) proposed Planning Unit locations are as follows: Planning Unit II will extend north from the State Route 101 Freeway to Legacy Boulevard, and Planning Unit III will extend north from Legacy Boulevard to Thompson Peak Parkway. A summary of proposed planning areas designated for development within the Project Area is provided in Table 1.2 – *Conceptual Planning Areas*. For a detailed breakdown of land-use as used for estimated wastewater flow rates, please refer to the *Modeled On-Site Land Use Plans* in Plate 2 and *Modeled Land Use Calculations* in Appendix A.

**Table 1.2:
Conceptual Planning Areas¹**

Description	Residential Dwelling Units ²	Commercial			Total (Sq. Ft.)	Hotel ² (Rooms)
		Office (Sq. Ft.)	Retail (Sq. Ft.)	Restaurant (Sq. Ft.)		
Planning Unit II	1716	1,859,145	234,400	70,000	2,163,545	400
Planning Unit III	✓750	✓637,100	35,500	20,000	702,600	0
Total	2,466	2,496,245	269,900	100,000	2,866,145	400

Notes:

1. Source: Client-furnished December 2015 land plan for modeling purposes.

608,000 + 25,300 = 633,300 current 2-128 III

1.3 Build-Out Condition

The design criteria utilized to project wastewater flows and to determine required pipe sizes for the Project Area is based on the maximum number of residences, hotel rooms and square footage of commercial uses allowed. Significant changes in land use and/or projected wastewater flow rates may require an amendment to the Master Plan and/or review and re-approval by the City of Scottsdale. All water and sanitary sewer lines within the Project Area will be constructed by the owner/developer.

1.4 Construction Phasing

It is anticipated that Planning Units II and III will be constructed in several phases. On-site sewer line construction will generally coincide with the development phasing, to be modeled with future basis-of-design (BOD) reports for individual phases.

2.0 EXISTING CONDITIONS

2.1 Topographic Conditions

Currently, the Project Area consists of a mass graded condition for both Planning Units II and III. The Henkel development and associated infrastructure in the southern portion of Planning Unit II is built, along with the Legacy Boulevard improvements that dissect the area. The land generally slopes in a southerly direction at an approximate slope of 1.5 percent from Thompson Peak Parkway to ADOT State Route 101 Freeway. The peak elevation within the area is approximately 1,669 feet, located near Thompson Peak Parkway. The lowest elevation within the Project Area is approximately 1,608 feet near the intersection of Scottsdale Road and State Route 101 Freeway.

2.2 Existing Wastewater Infrastructure

City of Scottsdale public wastewater collection systems adjacent to the Project Area include an existing 12-inch gravity sewer located along East Thompson Peak Parkway, north of Planning Unit III, an existing 15-inch gravity sewer located along Scottsdale Road, west of Planning Units II and III, and an existing 12-inch sewer extending from east to west, located in the Legacy Boulevard alignment, from the eastern boundary of the Project Area to Scottsdale Road.

3.0 WASTEWATER COLLECTION SYSTEM DESIGN CRITERIA AND FLOW RATES

3.1 Design Criteria

For the purpose of this Master On-Site Wastewater Plan, wastewater design flows and pipe-sizing criteria utilized are based on Wood/Patel's understanding of the following:

- Applicable wastewater system design criteria listed in the *City of Scottsdale Design Standards and Policy Manual, 2004 update*;
- Wastewater 'unit daily design flows' as provided by City of Scottsdale staff, and potential development conditions as provided by the client
- Title 18, Chapter 9 of the *Arizona Administrative Code*;
- City of Scottsdale Water Reuse Masterplan (2012)

Please refer to Appendix B – *Wastewater Collection System Design Criteria*, for detailed information regarding design criteria.

3.2 Peaking Factor Variations

An argument can be made that the reality and potential of residential and commercial wastewater flows peaking simultaneously is unlikely. Therefore, the selected approach utilized in this Master Plan determined wastewater design flows based on commercial and residential sources peaking independently. Results of this analysis are presented in Appendix C – *Modeled Wastewater Design Flows*.

3.3 Wastewater Design Flows

Wastewater design flows were estimated using design criteria listed in Section 3.1, and are summarized in Table 3.1. According to City of Scottsdale staff, the existing sewer main extending along Legacy Boulevard through the area should be designed to accommodate wastewater flows from approximately 1,295 off-site dwelling units east of the area and north of Legacy Boulevard. Wastewater design flows from these off-site dwelling units are included in the calculations. Please refer to Plate 2 – *Modeled On-Site Land Use Plans*. Detailed flow calculations are provided in Appendix C – *Modeled Wastewater Design Flows* and Appendix D – *Pipe Capacity Calculations*.

Table 3.1:
Wastewater Design Flows (GPD)

Outfall Number	Average-Day	Maximum-Day
1	175,877	429,077
2	351,678	1,046,478
3	190,600	690,100
4	75,600	218,600
5	268,550	1,074,200
6	222,610	583,280
Total	1,284,915	4,041,735

737,960 per
Leickson report
(one Scottsdale)

3.4 Off-Site Wastewater Flows to Scottsdale Road (Master Plan Demands)

Off-Site Wastewater design flows were estimated using design criteria listed in Section 3.1, and are summarized in Table 3.2. See Appendix C for detailed Calculations.

Table 3.2:
Off-Site Wastewater Design Flows (GPD)

Phase	Acres	ADF (GPD)	PEAK Flow Factor (GPD)
Planning Unit II	64.2	92,897	371,590
Planning Unit III	56.7	82,045	328,180
TOTAL	120.9	174,942	699,769

PF OF 4 is
High for Area
> 20 AC

485 gpm

737,960 per

Leickson
Report

3.6 Million
knowly report
(one Scottsdale)

3.5 Wastewater Flows from Future Off-Site Development

It is Wood/Patel's understanding that the City of Scottsdale is currently investigating potential sewerage alignments to serve future development in the area east of Planning Units II and III and north of the State-Route 101 Freeway intersection. These proposed

alignments would convey sewage from this area to the east and/or south, ultimately outfalling into the proposed public sewer line located in the Miller Road alignment. In the event these alignments are not feasible, a portion of future wastewater flows from this area may need to be routed through One Scottsdale. As portions of Phase II are developed along the eastern boundary, the developer shall meet with the City of Scottsdale staff to discuss potential sewer extensions for the state land to the east.

Project: Master On-Site Wastewater Plan for One Scotland
 Location: (Surrey) City of Scotland
 Date: December 4, 2015
 Reference: City of Scotland Design Standards and Plans Manual

FILE ENGINEER: M. HINDLEBERRY • L. B. M. HINDLEBERRY
 Proj Number: 152481
 Proj Engineer: JDR

UPSTREAM NODE	DOWNSTREAM NODE	LOCATION (PLANNING UNIT)	PLANNING UNIT SUB-CONTRIBUTING TO FLOW	RESIDENTIAL		COMMERCIAL		HOTEL		AVE DAILY FLOW (ADP) PER SEGMENT (GPD)										CUMULATIVE AVERAGE DAILY FLOW (GPD)										PEAK RESIDENTIAL & HOTEL FLOWS * AVE. DAY COMMERCIAL FLOWS (GPD)										PEAK COMMERCIAL FLOWS * AVE. DAY RESIDENTIAL & HOTEL FLOWS (GPD)									
				NO. OF DWELLING UNITS	AREA (SQ)	NO. OF ROOMS	RESID.	OFFICE	RETAIL	RESTAURANT	HOTEL	TOTAL (GPD)	RESID. (GPD)	OFFICE (GPD)	RETAIL (GPD)	RESTAURANT (GPD)	HOTEL (GPD)	TOTAL ADP (GPD)	INFLU. & INFLOW (GPD)	RESID. (PP-4.0)	OFFICE (ADP)	RETAIL (ADP)	RESTAURANT (PP-4.0)	HOTEL (PP-4.0)	TOTAL MAX (GPD)	RESID. (ADP)	OFFICE (PP-3.0)	RETAIL (PP-3.0)	RESTAURANT (PP-4.0)	HOTEL (ADP)	TOTAL MAX (GPD)	PEAK DESIGN DIA. (IN)																	
A1	A2	40 AC. 0	40 AC. 0	422	107,088	15,332	202,048	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A2	A3	50 AC. 0	50 AC. 0	522	130,500	18,667	229,333	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A3	A4	60 AC. 0	60 AC. 0	542	159,000	24,000	253,000	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A4	A5	70 AC. 0	70 AC. 0	562	177,500	29,333	267,500	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A5	A6	80 AC. 0	80 AC. 0	582	196,000	34,667	282,000	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A6	A7	90 AC. 0	90 AC. 0	602	214,500	40,000	296,500	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A7	A8	100 AC. 0	100 AC. 0	622	233,000	45,333	311,000	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A8	A9	110 AC. 0	110 AC. 0	642	251,500	50,667	325,500	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A9	A10	120 AC. 0	120 AC. 0	662	270,000	56,000	340,000	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A10	A11	130 AC. 0	130 AC. 0	682	288,500	61,333	354,500	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A11	A12	140 AC. 0	140 AC. 0	702	307,000	66,667	369,000	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A12	A13	150 AC. 0	150 AC. 0	722	325,500	72,000	383,500	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A13	A14	160 AC. 0	160 AC. 0	742	344,000	77,333	398,000	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A14	A15	170 AC. 0	170 AC. 0	762	362,500	82,667	412,500	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A15	A16	180 AC. 0	180 AC. 0	782	381,000	88,000	427,000	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A16	A17	190 AC. 0	190 AC. 0	802	399,500	93,333	441,500	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A17	A18	200 AC. 0	200 AC. 0	822	418,000	98,667	456,000	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A18	A19	210 AC. 0	210 AC. 0	842	436,500	104,000	470,500	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A19	A20	220 AC. 0	220 AC. 0	862	455,000	109,333	485,000	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A20	A21	230 AC. 0	230 AC. 0	882	473,500	114,667	500,000	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A21	A22	240 AC. 0	240 AC. 0	902	492,000	120,000	514,500	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A22	A23	250 AC. 0	250 AC. 0	922	510,500	125,333	529,000	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A23	A24	260 AC. 0	260 AC. 0	942	529,000	130,667	543,500	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A24	A25	270 AC. 0	270 AC. 0	962	547,500	136,000	558,000	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,127	360,800	8										
A25	A26	280 AC. 0	280 AC. 0	982	566,000	141,333	572,500	280	41,400	19,700	2,420	0.000	0.000	0.000	0.000	113,709	64,400	19,700	2,420	0.000	0.000	0.000	0.000	0.000	113,709	337,600	19,700	2,420	0.000	0.000	0.000	0.000	396,800	64,400	39,127	57,600	201,1												

4.0 PROPOSED SEWER SYSTEM

4.1 Preliminary Sewer Pipe Sizes

Pipes were sized to accommodate peak-flow conditions at ultimate build-out for the Project Area, plus off-site flows as discussed in Section 3.3. Using the design criteria mentioned previously, the resulting conceptual skeleton sewer system includes sewer pipes ranging in diameter from 8-inches to 12-inches, as shown in Plate 2. Please refer to the Appendix D – *Pipe Capacity Calculations* and Plate 2 – *Modeled On-Site Land Use Plans* for the recommended sewer configuration.

4.2 Modifications to Existing Sewer

The existing public 12-inch sewer located south of Legacy Boulevard within the Project Area has been abandoned and a new 12-inch line placed within the Legacy Boulevard right-of-way. This line serves an off-site area east of the Project Area (a portion of Grayhawk). This line is currently in operation as of the third quarter of 2007 and is shown in Plate 2.

4.3 Deer Valley Road Sewer Interceptor

Per the Development Agreement, an off-site sewer interceptor line was designed and funded by the Stacked 40s (One Scottsdale) developer to connect to the Deer Valley Road sewer that currently flows to the existing 15-inch sewer line in Scottsdale Road, adjacent to the Project Area. This off-site sewer redirects existing wastewater flows and increases the available capacity of the existing 15-inch sewer located along Scottsdale Road to serve the Project Area. This interceptor is in use as of 2006.

4.4 Proposed Wastewater Outfall Connections

There are six (6) proposed wastewater-outfall connections that will be made to the existing public 15-inch sewer line located in Scottsdale Road (see Plate 2). It is Wood/Patel's understanding that the City of Scottsdale will review the existing 15-inch line located in Scottsdale Road for capacity issues as the Project Area develops based on demands shown in Table 3.2 and the Off-Site Wastewater Design Flow Calculations (Please refer to Appendix C- *Modeled Wastewater Design Flows*).

4.5 Legacy Boulevard (Center Drive)

Center Drive is now called Legacy Boulevard. It is our understanding that the managing partner of One Scottsdale caused Legacy Boulevard through the Site to be constructed to coincide with the adjoining City of Scottsdale sponsored Legacy Boulevard. At this time, Legacy Boulevard (a public roadway) has been constructed and is in use by the general public.

5.0 CONCLUSIONS

The One Scottsdale (Stacked 40s) On-Site Master Wastewater Plan, revised January 28, 2016, is believed to meet City of Scottsdale standards and requirements. It is intended to serve as a guide for construction documents associated with the proposed on-site and off-site (Deer Valley Road sewer re-routing modifications) wastewater collection systems. The following highlights critical conclusions:

1. Planning Units II and III's on-site wastewater collection system is ~~capable of being~~ ^{to BE} designed in accordance with the City of Scottsdale's current wastewater-system design criteria.
2. Wood/Patel believes that the modeled on-site wastewater system will provide necessary system conveyance and capacity within the previously-defined design, according to calculation results contained in this plan.
3. The work presented models full entitlement build-out per the project zoning case. Full entitlement build-out may or may not occur.
4. The On-Site Master Wastewater Plan for One Scottsdale (Stacked 40s) demonstrates the adequacy of the proposed on-site wastewater collection system to serve the proposed Planning Units II and III.
5. The existing 15-inch public sewer located in Scottsdale Road has more available capacity since the Deer Valley sewer re-routing modifications were completed. It is our understanding that the City of Scottsdale will monitor the performance of the existing 15-inch public sewer in Scottsdale Road as development in the area progresses.
6. City of Scottsdale to evaluate the offsite sewer capacities and implement any necessary capital improvement projects in a future city master plan update.
7. Basis of design reports are required for each phase of development within Planning Units II and III to demonstrate compliance with this master plan.

APPENDIX A

MODELED LAND USE CALCULATIONS

Project: Master On-Site Wastewater Plan for One
 Scottsdale (Stacked 40s)
 Location: Scottsdale, Arizona
 Date: December 4, 2015

Proj. Number: 154391
 Proj. Engineer: JGR

PLANNING UNIT II

PHASE 1						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DU _s)	COMMERCIAL			AREA (SF)	HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)		
17 (Henkel Building)	---	325,156	---	---	325,156	---
SUBTOTAL	---	325,156	---	---	325,156	---

PHASE 2						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DU _s)	COMMERCIAL			TOTAL COMMERCIAL (SF)	HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)		
2a	133	---	62,500	26,000	88,500	---
2b	266	---	23,831	---	23,831	---
2c	133	---	62,500	26,000	88,500	---
2d	266	---	23,831	---	23,831	---
SUBTOTAL	798	---	172,662	52,000	224,662	---

PHASE 3						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DU _s)	COMMERCIAL			TOTAL COMMERCIAL (SF)	HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)		
3a	---	260,000	3,000	5,000	268,000	140
3b	---	140,000	2,000	---	142,000	---
3c	---	260,000	3,000	---	263,000	---
3d	---	140,000	2,000	---	142,000	---
SUBTOTAL	---	800,000	10,000	5,000	815,000	140

Project: Master On-Site Wastewater Plan for One
 Scottsdale (Stacked 40s)
 Location: Scottsdale, Arizona
 Date: December 4, 2015

Proj. Number: 154391
 Proj. Engineer: JGR

PHASE 4						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DUs)	COMMERCIAL			TOTAL COMMERCIAL (SF)	HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)		
4a	279	---	---	---	---	280
4b	267	---	---	8,000	8,000	---
4c	372	---	---	---	---	---
SUBTOTAL	918	---	---	8,000	8,000	280

PHASE 5						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DUs)	COMMERCIAL			TOTAL COMMERCIAL (SF)	HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)		
5a	---	127,834	21,074	2,500	151,408	---
5b	---	204,533	15,332	2,500	222,365	---
5c	---	204,533	15,332	---	219,865	---
SUBTOTAL	---	536,900	51,738	5,000	593,638	---

PHASE 6						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DUs)	COMMERCIAL			TOTAL COMMERCIAL (SF)	HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)		
6	---	197,089	---	---	197,089	---
SUBTOTAL	---	197,089	---	---	197,089	---

PLANNING UNIT II TOTAL 1,716 1,859,145 234,400 70,000 2,163,545 400

Project: Master On-Site Wastewater Plan for One
 Scottsdale (Stacked 40s)
 Location: Scottsdale, Arizona
 Date: December 4, 2015

Proj. Number: 154391
 Proj. Engineer: JGR

PLANNING UNIT III

PHASE 1						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DUs)	COMMERCIAL			TOTAL COMMERCIAL (SF)	HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)		
1	388	---	---	---	---	---
SUBTOTAL	388	---	---	---	---	---

PHASE 2						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DUs)	COMMERCIAL			TOTAL COMMERCIAL AREA (SF)	HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)		
2	362	---	---	---	---	---
SUBTOTAL	362	---	---	---	---	---

PHASE 3						
PLANNING UNIT SUB-AREA	RESIDENTIAL (DUs)	COMMERCIAL			TOTAL COMMERCIAL AREA (SF)	HOTEL (ROOMS)
		OFFICE AREA (SF)	RETAIL AREA (SF)	RESTAURANT AREA (SF)		
3a	---	159,275	17,750	15,000	192,025	---
3b	---	159,275	17,750	---	177,025	---
3c	---	159,275	---	15,000	174,275	---
3d	---	159,275	---	---	159,275	---
SUBTOTAL	---	637,100	35,500	30,000	702,600	---

PLANNING UNIT III TOTAL	750	637,100	35,500	30,000	702,600	---
FULL BUILDOUT TOTAL	2,466	2,466,245	269,900	100,000	2,864,145	400

633,300 proposed
 (TDI + Erickson Reports)

APPENDIX B

WASTEWATER COLLECTION SYSTEM DESIGN CRITERIA

Project: Master On-Site Wastewater Plan for One Scottsdale (Stacked 40s)
 Location: Scottsdale, Arizona
 Date: December 4, 2015

Proj. Number: 154391
 Proj. Engineer: JGR

ONSITE WASTEWATER DESIGN CRITERIA

DESCRIPTION	VALUE	UNITS	Note
GENERAL			
Minimum Mean Full-Flow Velocity:	2.50	ft/s	1
Max. Peak Flow Depth-to-Diameter Ratio (8-12' Dia. Sewers):	0.65	---	1,3
Max. Peak Flow Depth-to-Diameter Ratio (>12' Dia. Sewers):	0.70	---	1
Max. Utilized Capacity:	90	%	---
Minimum Pipe Diameter:	8	in	1
RESIDENTIAL			
Average Day Wastewater Flow per Person, (8-12' Dia. Sewers):	100	gpd/person	2
Average Day Wastewater Flow per Person, (>12' Dia. Sewers):	100	gpd/person	2
Population Density, On-Site:	2.00	persons/DU	2
Population Density, Off-Site Condominiums:	1.70	persons/DU	2
Peaking Factor, Residential:	4.00	---	1
OFFICE			
Average Day Wastewater Flow, Office:	0.10	gpd/SF	2
Peaking Factor, Office:	3.00	n/a	2
RETAIL			
Average Day Wastewater Flow, Retail:	0.60	gpd/sf	2
Peaking Factor, Retail:	3.50	---	2
RESTAURANT			
Average Day Wastewater Flow, Restaurant:	1.20	gpd/sf	
Peaking Factor, Restaurant:	6.00		
HOTEL			
Average Day Wastewater Flow, Hotel:	100	gpd/room	
Peaking Factor, Hotel:	4.00	---	1

OFFSITE WASTEWATER DESIGN CRITERIA

DESCRIPTION	VALUE	UNITS	Note
MIXED USE DEVELOPMENT			
Average Day Wastewater Flow per Acre	1447	gpd/acre	2
Max. Day Wastewater Flow per Acre	2098	gpd/acre	2
Peaking Factor	4	---	2

Notes: 1 -
 2 -
 3 -

APPENDIX C

MODELED WASTEWATER DESIGN FLOWS

WOOD/PATEL **OFFSITE WASTEWATER DESIGN FLOWS**

CIVIL ENGINEERS • HYDROLOGISTS • LAND SURVEYORS • CONSTRUCTION MANAGERS

Project: Master On-Site Wastewater Plan to One Scottsdale
 Location: Scottsdale, Arizona
 Date: January 29, 2016
 References: City of Scottsdale Water Reuse Master Plan (2012)

Proj. Number: 154391
 Proj. Engineer: John Gordy Ritchie, P.E.

PHASE	APPLICABLE UNIT	NUMBER OF UNITS	ADF/ APPLICABLE UNIT (GPAD) ¹	TOTAL ADF (GPD)	MAX ADF/ APPLICABLE UNIT (GPAD) ¹	TOTAL MAX ADF (GPD)	F.A.R. PEAKING FACTOR ¹	PEAK ADF (GPD) ¹
Planning Unit II	Acres	64.2	1447	92,897	2098	134,692	4	371,590
Planning Unit III	Acres	56.7	1447	82,045	2098	118,957	4	328,180
Totals		120.9		174,942		253,648		699,769

Notes:
 1. Wastewater design flow rates and peaking factors established from the City of Scottsdale Water Reuse Master Plan (2012)

So 4041735 gpd (DSTHAM)
 VS. 699769 gpd (RIP)
 (5.8 factor)

APPENDIX D

PIPE CAPACITY CALCULATIONS

Project: Master On-Site Wastewater Plan for One Scottsdale (Stacked 40s)
 Location: Scottsdale, Arizona
 Date: December 4, 2015

Proj. Number: 154391
 Proj. Engineer: JGR

UPSTREAM NODE	DOWNSTREAM NODE	MAX DAY FLOW (GPD)	PIPE DIA. (IN.)	PIPE SLOPE (FT / FT)	d/D RATIO	FULL FLOW VELOCITY (FPS)	PIPE CAPACITY (GPD)	SURPLUS CAPACITY (GPD)	PERCENT OF CAPACITY
A5	A4	368,909	8	0.00550	57.7%	2.6	580,390	213,481	63.2%
A4	A3	396,561	8	0.00550	60.7%	2.6	580,390	183,829	68.3%
A2	A1 (OUTFALL # 1)	429,077	8	0.00550	64.0%	2.6	580,390	151,313	73.9%
B5	B4	357,600	10	0.00430	43.0%	2.6	930,533	572,933	38.4%
B3	B2	592,280	12	0.00300	48.1%	2.5	1,263,964	671,684	46.9%
B2	B1 (OUTFALL #2)	1,046,478	12	0.00300	69.4%	2.5	1,263,964	217,487	82.8%
C2	C1 (OUTFALL #3)	690,100	10	0.00430	64.1%	2.6	930,533	240,433	74.2%
D2	D1 (OUTFALL #4)	218,600	10	0.00430	33.0%	2.6	930,533	711,933	23.5%
E4	E3	880,600	12	0.00310	60.8%	2.5	1,284,858	404,258	68.5%
E10	E3	96,800	8	0.00550	27.7%	2.6	580,390	483,590	16.7%
E3	E2	977,400	12	0.00360	62.0%	2.7	1,384,603	407,203	70.6%
E5	E2	96,800	8	0.00550	27.7%	2.6	580,390	483,590	16.7%
E2	E1 (OUTFALL #5)	1,074,200	12	0.00310	69.9%	2.5	1,284,858	210,658	83.6%
F14	F12	155,200	8	0.00550	35.3%	2.6	580,390	425,190	26.7%
F12	F11	155,200	8	0.00550	35.3%	2.6	580,390	425,190	26.7%
F17	F11	154,400	8	0.00550	35.2%	2.6	580,390	425,990	26.6%
F11	F10	309,600	8	0.00550	52.0%	2.6	580,390	270,790	53.3%
F10	F9	309,600	10	0.00430	39.7%	2.6	930,533	620,933	33.3%
F19	F9	96,800	8	0.00550	27.7%	2.6	580,390	483,590	16.7%
F9	F8	406,400	10	0.00430	46.3%	2.6	930,533	524,133	43.7%
F5	F4	193,058	8	0.00550	39.7%	2.6	580,390	387,333	33.3%
F4	F6	278,115	8	0.00550	48.8%	2.6	580,390	302,275	47.9%
F6	F10	278,115	8	0.00550	48.8%	2.6	580,390	302,275	47.9%
F10	F8	325,898	8	0.00550	53.6%	2.6	580,390	254,493	56.2%
F7	F8	155,783	8	0.00550	27.1%	2.6	580,390	424,608	26.8%
F8	F2	583,280	10	0.00430	57.4%	2.6	930,533	347,253	62.7%
F2	F1 (OUTFALL #6)	583,280	10	0.00430	57.4%	2.6	930,533	347,253	62.7%

A1 $d/D = 0.7$ $486720 - 429077 = 57643$ gpd

AVAIL TO OFFSITE

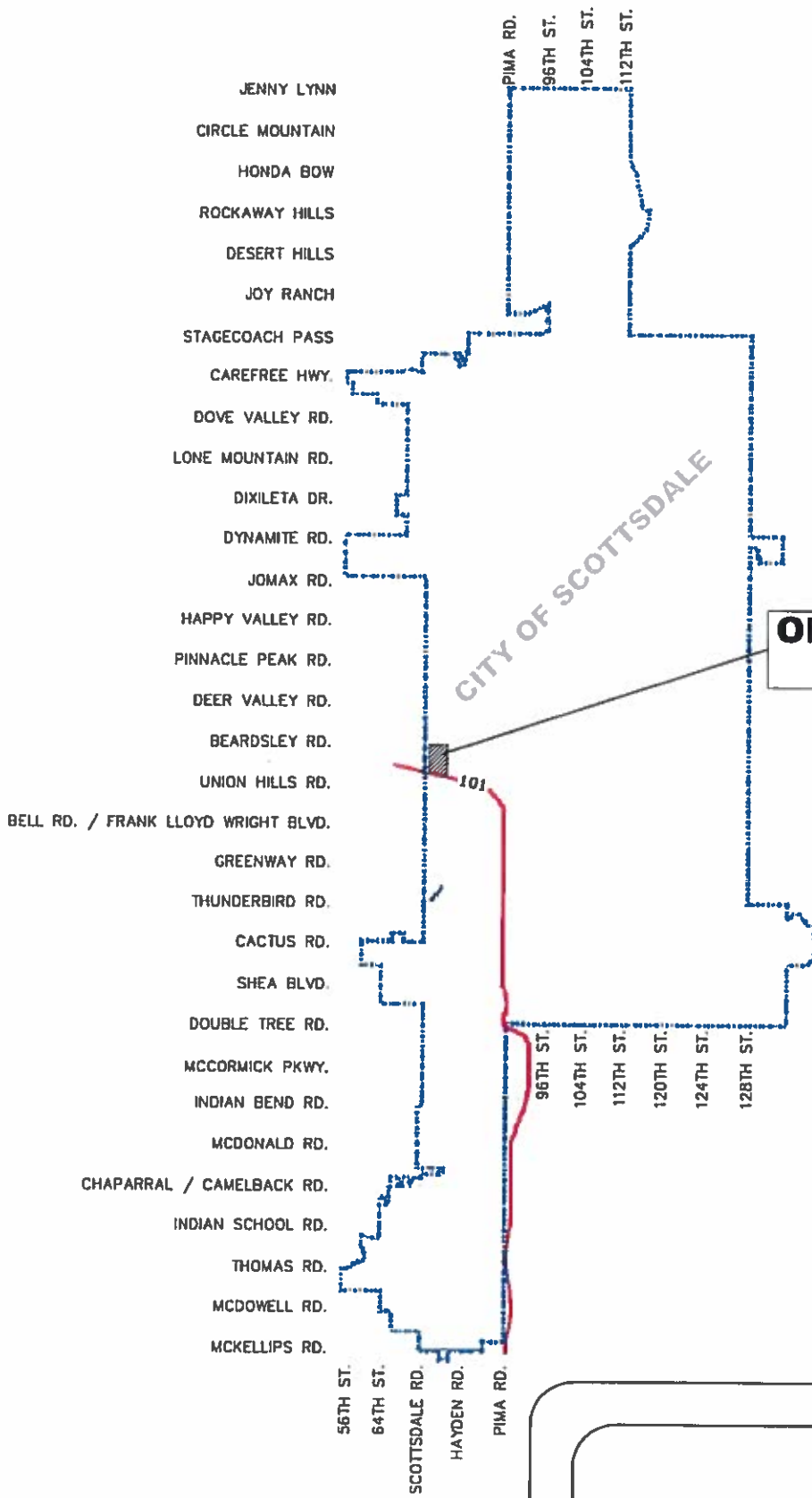
B1 $d/D = 0.7$ $1058400 - 1046478 = 11922$ gpd

AVAIL TO OFFSITE

(Not much)

PLATE 1

VICINITY MAP



**ONE SCOTTSDALE
(Stacked 40s)**

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PLATE 1

ONE SCOTTSDALE (Stacked 40s) VICINITY MAP	WOOD/PATEL & ASSOCIATES Civil Engineers Hydrologists Land Surveyors Construction Managers (602) 335-8500
--	--

PLATE 2

MODELED ON-SITE LAND USE PLANS

EAST THOMPSON PEAK PARKWAY



PLANNING UNIT III

LEGACY BLVD

SCOTTSDALE ROAD

PLANNING UNIT II

OUTER LOOP 101 FREEWAY

PLANNING UNIT I (NOT A PART)

3 PHASE AREA IN PLANNING UNIT III

1 PHASE AREA IN PLANNING UNIT II

--- PLANNING UNIT LINE

PLATE 2

JANUARY 2016

ONE SCOTTSDALE
MODELED ON-SITE
LAND USE PLAN

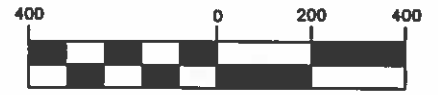
WOOD/PATEL
ASSOCIATES
Civil Engineers
Hydrologists
Land Surveyors
Construction Managers
(602) 556-8500

PLATE 3

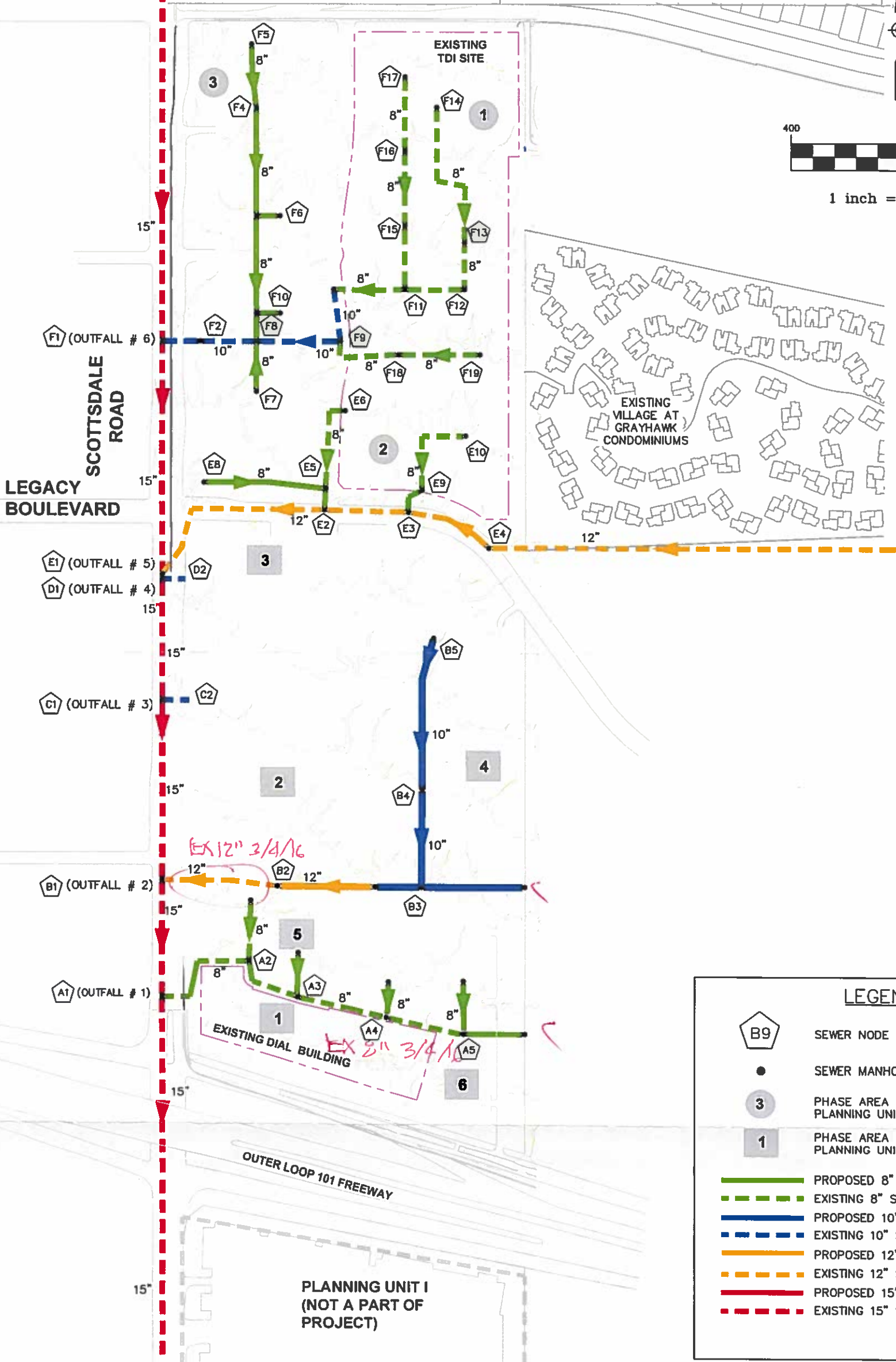
MODELED ON-SITE WASTEWATER COLLECTION SYSTEM

PRELIMINARY
NOT FOR
CONSTRUCTION
OR RECORDING

EAST THOMPSON PEAK PARKWAY



1 inch = 400 ft.



LEGEND	
	SEWER NODE
	SEWER MANHOLE
	PHASE AREA IN PLANNING UNIT III
	PHASE AREA IN PLANNING UNIT II
	PROPOSED 8" SEWER LINE
	EXISTING 8" SEWER LINE
	PROPOSED 10" SEWER LINE
	EXISTING 10" SEWER LINE
	PROPOSED 12" SEWER LINE
	EXISTING 12" SEWER LINE
	PROPOSED 15" SEWER LINE
	EXISTING 15" SEWER LINE

PLATE 3
JANUARY 2016

<p>ONE SCOTTSDALE ON-SITE WASTEWATER COLLECTION SYSTEM</p>	<p>WOOD/PATEL ASSOCIATES Civil Engineers Hydrologists Land Surveyors Construction Managers (802) 836-8900</p>
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At [2016]1241871\Project Support\Reports\Draw 820\24445\1517 - Mainline - Plate 3.dwg