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## 1. INTRODUCTION

### 1.1 SUMMARY OF PROPOSED DEVELOPMENT:

City Center is a multi-story development located southeast of the Scottsdale Road/Camelback Road intersection and will replace an existing commercial/office building. This report is a refinement of the *Wastewater Master Plan for Scottsdale Collective*, dated July 23, 2021. Refer to **FIGURE 1** for a Vicinity Map and **FIGURE 2** highlighting major developments along the Camelback corridor.

This report presents a wastewater infrastructure analysis for the development of the seven commercial parcels comprising City Center. They will be replatted for high density residential and commercial retail uses. The intent of this design report is to evaluate the downstream wastewater infrastructure providing service to City Center compliant to City, County and State requirements.

### 1.2 LEGAL DESCRIPTIONS AND AREA:

The following parcels are all located within Section 23, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Scottsdale, Arizona.

- 173-41-016B, 173-41-017A, 173-41-006A, 173-41-005, and 173-41-004.

The parcels total 131,786 square feet or 3.03 acres, more or less.

## 2. DESIGN DOCUMENTATION

### 2.1 DESIGN COMPLIANCE:

Preparation of this report has been done in accordance with the City of Scottsdale's Design Standards & Policies Manual (DS&PM) 2018<sup>1</sup>, direction from the City of Scottsdale Water Resources Department and requirements of Maricopa County Environmental Health Department. Design flow calculations for the proposed sewer infrastructure are all based on the DS+PM recommendations in Section 7-1.403.

## 3. EXISTING CONDITIONS

### 3.1 EXISTING ZONING & LAND USE:

This existing parcels are zoned D/DMU-3 PBD DO, Downtown Multiple Use – Type 3. The four northern parcels are presently developed for commercial office use. The three southern parcels were previously developed but are presently undeveloped and being utilized for parking and construction yards.

### 3.2 EXISTING TOPOGRAPHY, VEGETATION AND LANDFORM FEATURES:

This area of Scottsdale is relatively flat with minor grades sloping to the Indian Bend Wash approximately one-half mile to the east. All parcels have been previously developed with buildings and pavement covering most of the properties and minor site landscaping typical of the downtown vicinity.

### 3.3 EXISTING UTILITIES:

Public sewer lines about the north, east and south frontages of the development with an 8" VCP extending into the site from Brown Avenue north of the Upton Condos described as follow:

- West: No sewer lines exist along the site's north Scottsdale Road frontage.
- North: Along Camelback Road a 12" VCP and a 15" PVC sewer line flows easterly.
- East: Along Brown Avenue, there is an 8" PVC/VCP sewer flowing southerly. The sewer originates just south of Camelback Road.
- South: Along Shoeman Lane there is an 8" VCP located on the south side of the ROW, originating off the southeast corner of the subject property and flowing easterly.
- Mid-site: There is an 8" VCP flowing east to Brown Avenue. This main is located in a 16' P.U. and provides service for all parcels bound by the associated public roads, except 173-41-004 (Parking lot) which appears to not have service.

Refer to **FIGURE 4** for the City's local sewer quarter section maps.

## 4. PROPOSED SEWER

### 4.1 GENERAL LAYOUT:

This 12" public sewer from Buckboard Trail west along Camelback Rd to the City Center frontage must be complete as a developer executed project and accepted by the City prior to the issuance of a Occupancy Permit for City Center.

plan in appendix shows 392ft of 12" public sewer

The Maya Hotel (Plan #4436-21-1) provided a 12" sewer stub at the intersection of Camelback Road and Buckboard Trail. Sewer service to the City Center site will be provided by this 12" sewer line constructed along Camelback Road as a part of this project. These improvements include approximately 351 ft of 12" SDR-26 and 63 ft of 12" SDR-35, and 6 manholes. Refer to **APPENDIX I** for the sewer extension plan.

future 15-inch

With the improvements described by the offsite improvement plans of The Maya Hotel, an in-lieu payment will made to the City for construction of a 12" sewer in Camelback Road from 75<sup>th</sup> Street to Miller Road prior to final improvement plan approval. This line must be completed as a City Capital Project prior to the issuance of an Occupancy Permit for City Center.

A 12" PVC service line is proposed to connect with the Camelback sewer terminal manhole at mid-site. All onsite sewer lines will be private.

The onsite sewers will consist of gravity lines around the perimeter of the site with lateral service connections to individual buildings. Refer to **APPENDIX II** for the proposed onsite sewer hydraulic calculations. The southern building 3 will need to provide a private lift station with a force main

Not accurate. City Center is responsible for a portion of the total in-lieu payment required as defined previously in the rezoning case. It will be City discretion regarding construction timing of the future 15-inch sewer from 75th St to Miller as it is related to the sequence and magnitude of various developments in the area.

extending through the garage to the western perimeter sewer. Refer to **APPENDICES III and IV** for calculations on the force main and wet well system.

Capacities of the offsite sewer system were evaluated in a Master Plan Update and Sewer Design Report for Scottsdale Collective (ref.3).

An existing public 8" VCP currently serves two lots at the northwest corner of Brown Ave and Shoeman Lane. The sewer will be terminated at the west property line of the Upton Condos with a new manhole and remain in place to serve these two properties. A new 10' wide easement will be dedicated on the City Center site with an existing 8' wide easement preserved offsite south of the property. The existing sewer will be located approximately 6' south of the proposed north easement line (4 ft north of the property line).

All applicable existing sewer services shall be abandoned per City requirements.

## 5. SANITARY SYSTEM COMPUTATIONS

### 5.1 SEWER FLOW UNIT DEMANDS AND PEAKING FACTORS:

**TABLE 1 - COS DS+PM DESIGN CRITERIA**

Land Use	Unit Demand (gpd)	Unit	Design Peaking Factor
High Density Residential	140	per dwelling	4.5
Commercial/Retail	0.5	per sq. ft.	3
Restaurant	1.2	per sq. ft.	6
Spa Backwash	72,000	per day	1
Pool Backwash	288,000	per day	1

### 5.2 VARIANCE FROM STATED DESIGN FLOWS:

No variance to the DS+PM requirements is being requested with this multi-story development.

**5.3 SEWER FLOWS ROUTED TO CAMELBACK ROAD:**
**TABLE 2 - CITY CENTER SEWER DEMANDS**

Land Use	Units or Area (sq. ft.)	Unit Demand (gpd)	Avg. Day Demand (gpd)	Avg. Day Demand (gpm)	Peak Flow (gpm)
High Density Residential	138	140	19,320.0	13.4	60.4
<b>SUBTOTAL =</b>			<b>19,320.0</b>	<b>13.4</b>	<b>60.4</b>
Commercial/Retail (Spaces 3 & 4)	10,770	0.5	5,385.0	3.7	11.2
Restaurant (Space 5)	8,488	1.2	10,185.6	7.1	42.4
Pool Backwash			288,000.0	200.0	200.0
Spa Backwash			72,000.0	50.0	50.0
<b>SUBTOTAL =</b>			<b>375,570.6</b>	<b>260.8</b>	<b>303.7</b>
Restaurant (Space 1)	8,598	1.2	10,317.6	7.2	43.0
<b>SUBTOTAL =</b>			<b>10,317.6</b>	<b>7.2</b>	<b>43.0</b>
Restaurant (Space 2)	7,431	1.2	8,917.2	6.2	37.2
<b>SUBTOTAL =</b>			<b>8,917.2</b>	<b>6.2</b>	<b>37.2</b>
<b>TOTAL DEMANDS =</b>			<b>414,125.4</b>	<b>287.6</b>	<b>444.2</b>

Refer to **APPENDIX V** for the sewer routing with labeled reaches and **APPENDIX II** for the pipe hydraulics of the labeled reaches. **Table 3** summarizes the reaches.

**TABLE 3 - ROUTED ONSITE FLOWS**

Service Reach	Peak Flow (gpm)	Service Dia (In)	Pipe Slope (ft/ft)	Peak Flow Depth (in)	Peak Flow Velocity (fps)
1A	60.4	8	0.008	1.9	2.1
1B	60.4	12	0.0055	1.8	1.8
2	303.7	6" FM	-	6.0	3.5
3A	37.2	6	0.011	1.6	2.1
3B	37.2	12	0.0055	1.6	1.6
4	340.9	12	0.0055	4.4	2.9
5	383.9	12	0.0055	4.7	3.0
6	444.3	12	0.0055	5.1	3.1

A 6" service sewer (S=1.10%) conveys has a full capacity of 264 gpm) at a velocity of 3.0 fps. An 8" service sewer (S=0.55%) conveys 304.24 gpm flow with a depth of 5.2 inches (d/D=0.65) at a velocity of 2.82 fps.

Reach 2 is a 6" force main designed to convey wastewater from the commercial/retail (spaces 3 and 4), restaurant (space 5), pool and spa backwash buildings. The force main discharges through the garage to the western perimeter gravity sewer (Reach 4).

Reach 6 is the private 12" sewer service at S=0.55% and conveys the peak 446.8 gpm site flow with a depth of 5.1 inches (d/D=0.43) at a velocity of 3.1 fps.

The 12" service sewer (S=0.33%) along Camelback Road has a d/D = 0.65 capacity of 918 gpm at a velocity of 2.9 fps which is sufficient to handle the accumulated flow of City Center.

**5.4 SEWER FLOWS EVALUATED IN SCOTTSDALE COLLECTIVE MASTER PLAN:**

**Table 4** was taken from the *Master Plan Update for Scottsdale Collective* and shows City Center now represents approximately 71% of the flow that was initially planned.

**TABLE 4 -SEWER DEMANDS FOR CITY CENTER FROM THE Scottsdale Collective MASTER PLAN UPDATE**

	Units or Area (sq. ft.)	Unit Demand (gpd)	Avg. Day Demand (gpd)	Avg. Day Demand (gpm)	Peak Hour (gpm)
High Density Residential	146	140	20,440	14	64
Resort Hotel	214	380	81,320	56	254
Restaurant	41,109	1.2	49,331	34	206
<b>SUBTOTAL</b>			<b>151,091</b>	<b>105</b>	<b>524</b>
Pool Backwash			144,000	100	100
<b>TOTAL DEMAND</b>			<b>295,091</b>	<b>205</b>	<b>624</b>

## 6. COMPUTATION SUMMARIES

**6.1 SUMMARY OF FLOWS TO CAMELBACK ROAD:**

**APPENDIX II** provides hydraulic calculations for the reach of 12" sewer from City Center to Buckboard Trail where it will connect to the existing 15" sewer system installed with the Maya Hotel project. Flow hydraulics are all compliant with the City's DS+PM criteria.

**6.2 PUMP STATION CALCULATIONS:**

The pump station inlet flow will be 303.7 gallons per minute. Discharge will be via a 6" force main. The total dynamic head (TDH) for the 6-inch force main is 16.2 feet, which serves as the basis for selecting an appropriate pump model as shown in **APPENDIX IV**. A submersible xylem or Grundfos pump is optioned for the 6-foot diameter wet well. Two pumps will be provided with one as spare. An adjacent vault will contain the plug valves and check valves. The control panel will provide operational flexibility along with status lights and an alarm. Backup power will be supplied by the building genset.

## 7. CONCLUSIONS

**7.1 PROPOSED IMPROVEMENTS:**

Construction of City Center will require:

- A 12" sewer extension west of Buckboard Trail along Camelback Road to the site.
- Removal of an existing 8" sewer west of the Upton Condos.
- Grease interceptors for each restaurant.
- A wet well and force main system.

- Onsite private 6", 8" and 12" gravity lines with 4-foot and 5-foot diameter manholes. The manhole receiving pumped wastewater and the wet well be coated with an epoxy-based Raven Lining System or approved equal.

## **7.2 PROJECT SCHEDULE:**

It is anticipated City Center will be developed as a single phase beginning in 2025/2026.

## **8. SUPPORTING MAPS**

### **8.1 UTILITY PLANS**

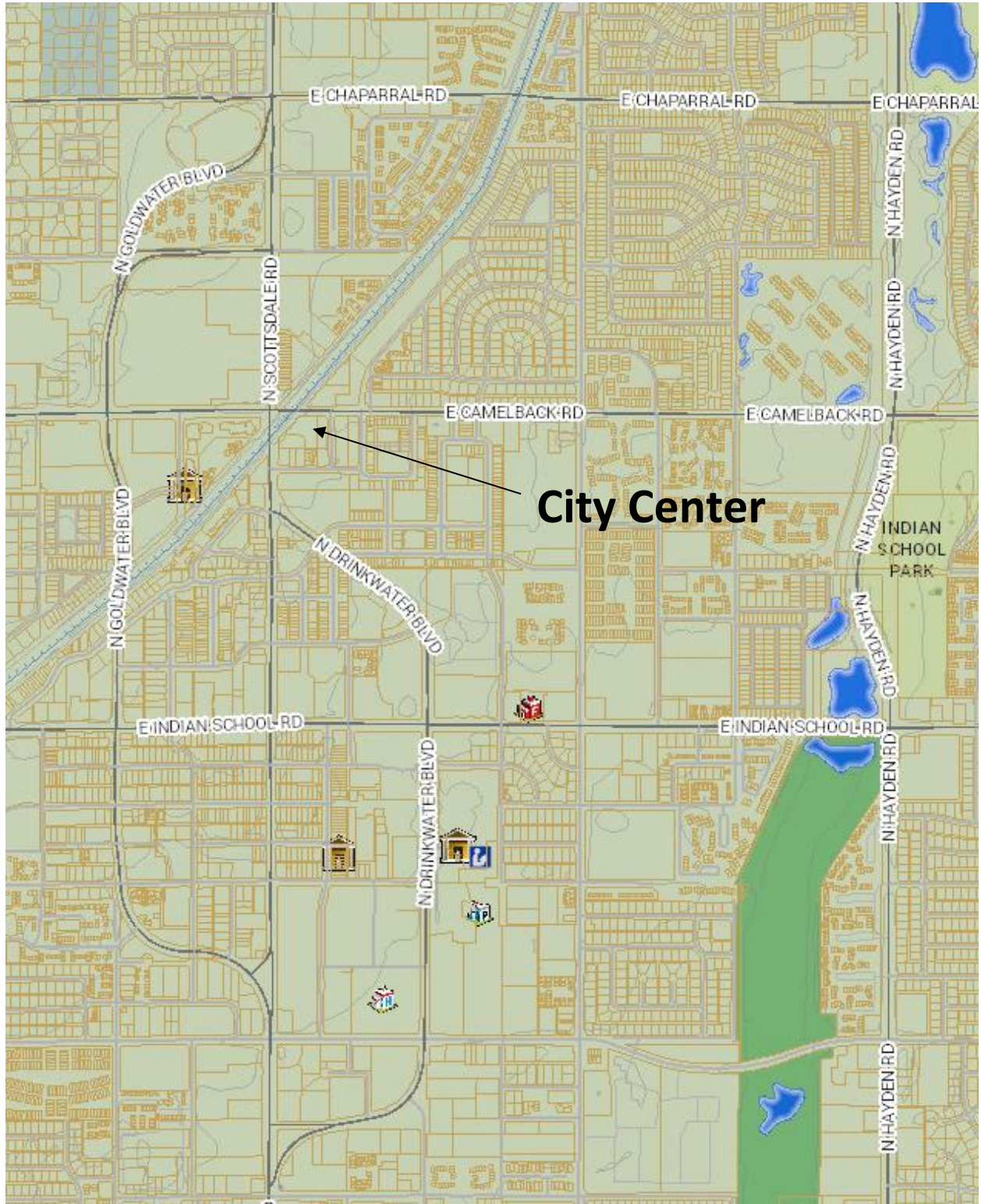
The Preliminary Utility Plan is provided in **APPENDICES V**.

## **9. REFERENCES**

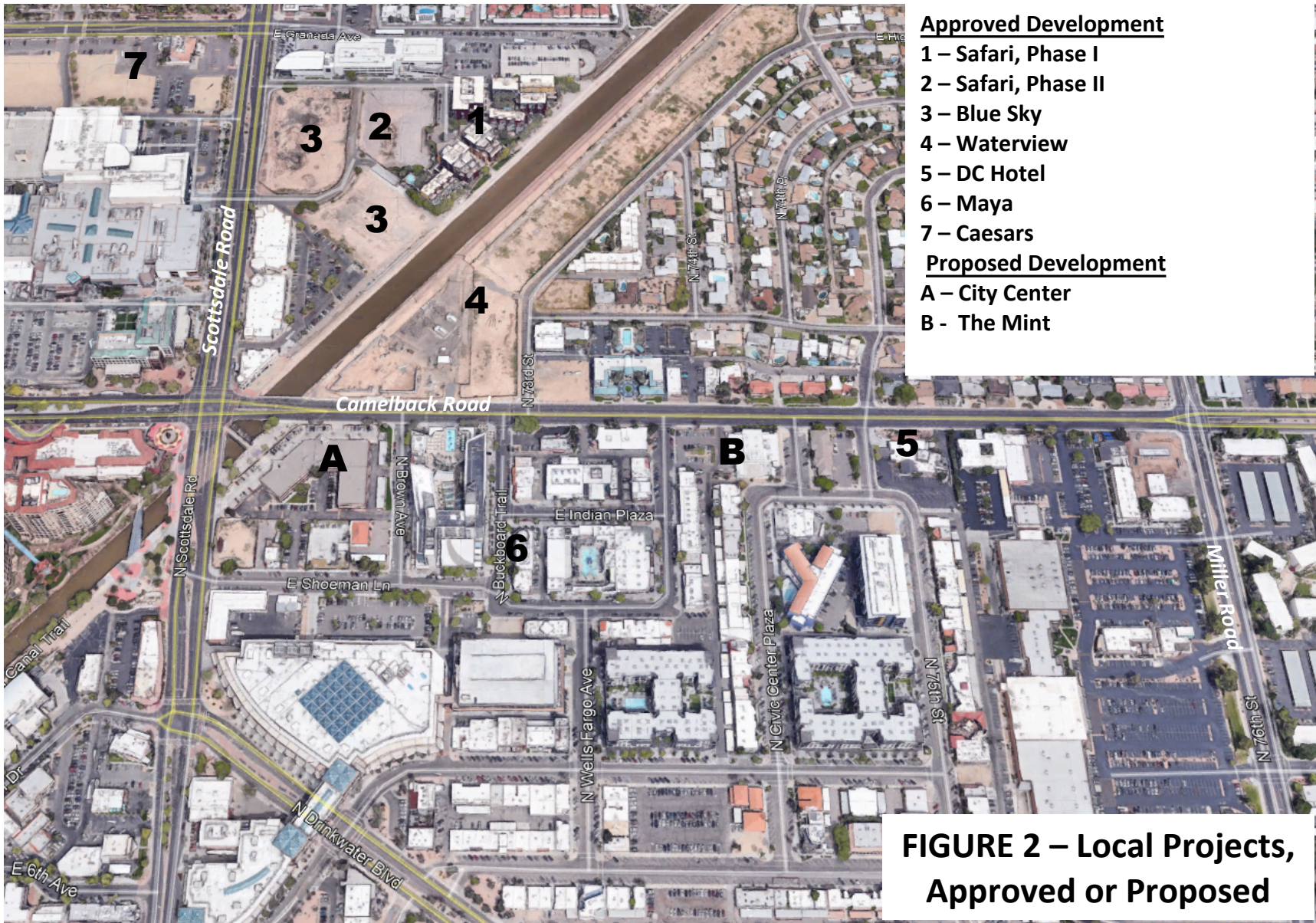
1. City of Scottsdale Design Standards & Policies Manual, 2018 (Chapter 7 – Wastewater)
2. City of Scottsdale Sewer Quarter Section number 17-45
3. Wastewater Master Plan Update for Scottsdale Collective and Final Sewer Design Report for Maya Hotel Peeps and Fiesta dated December 24, 2021

## **FIGURES**

1. Vicinity Map
2. Local Projects
3. Preliminary Site Plan
4. City Sewer Q-S Maps

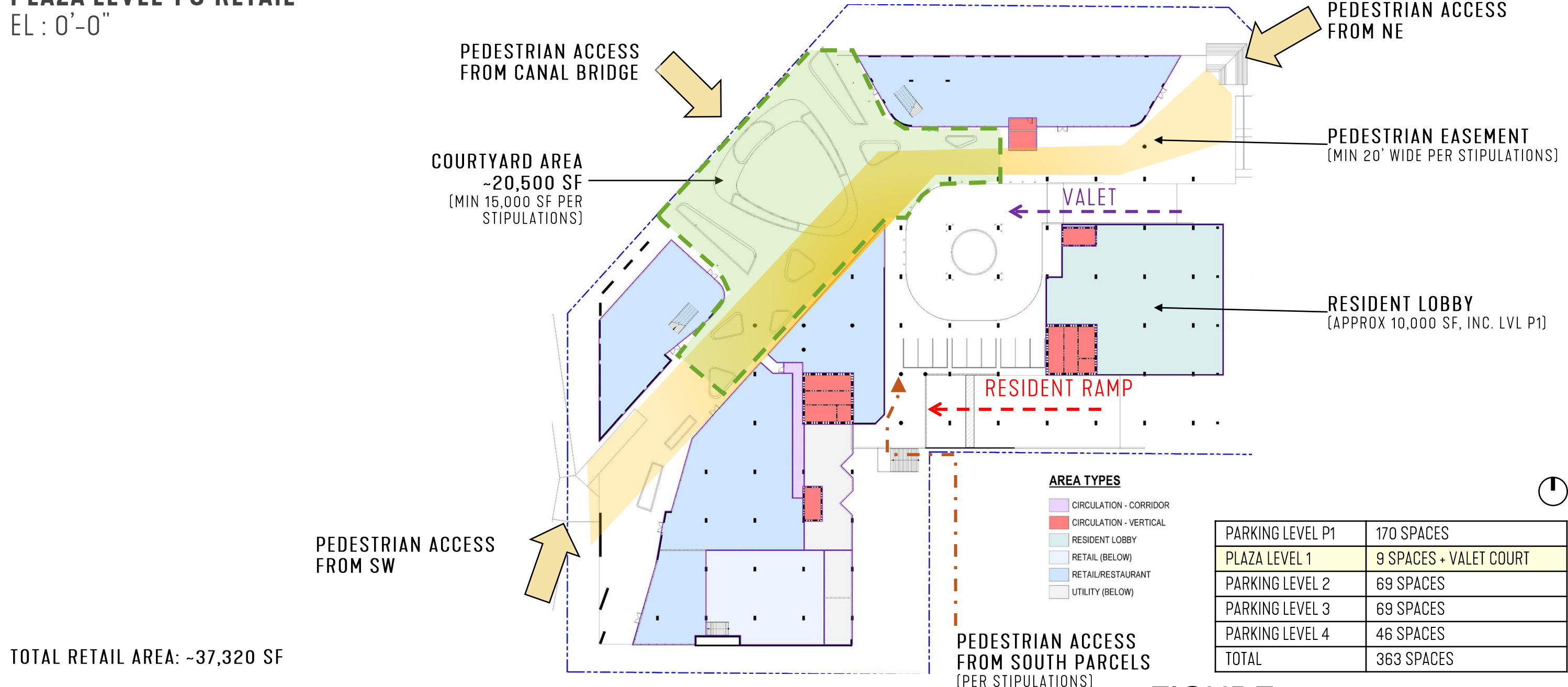


**FIGURE 1 –  
Vicinity Map**



# CITY CENTER

PLAZA LEVEL 1 & RETAIL  
EL : 0'-0"



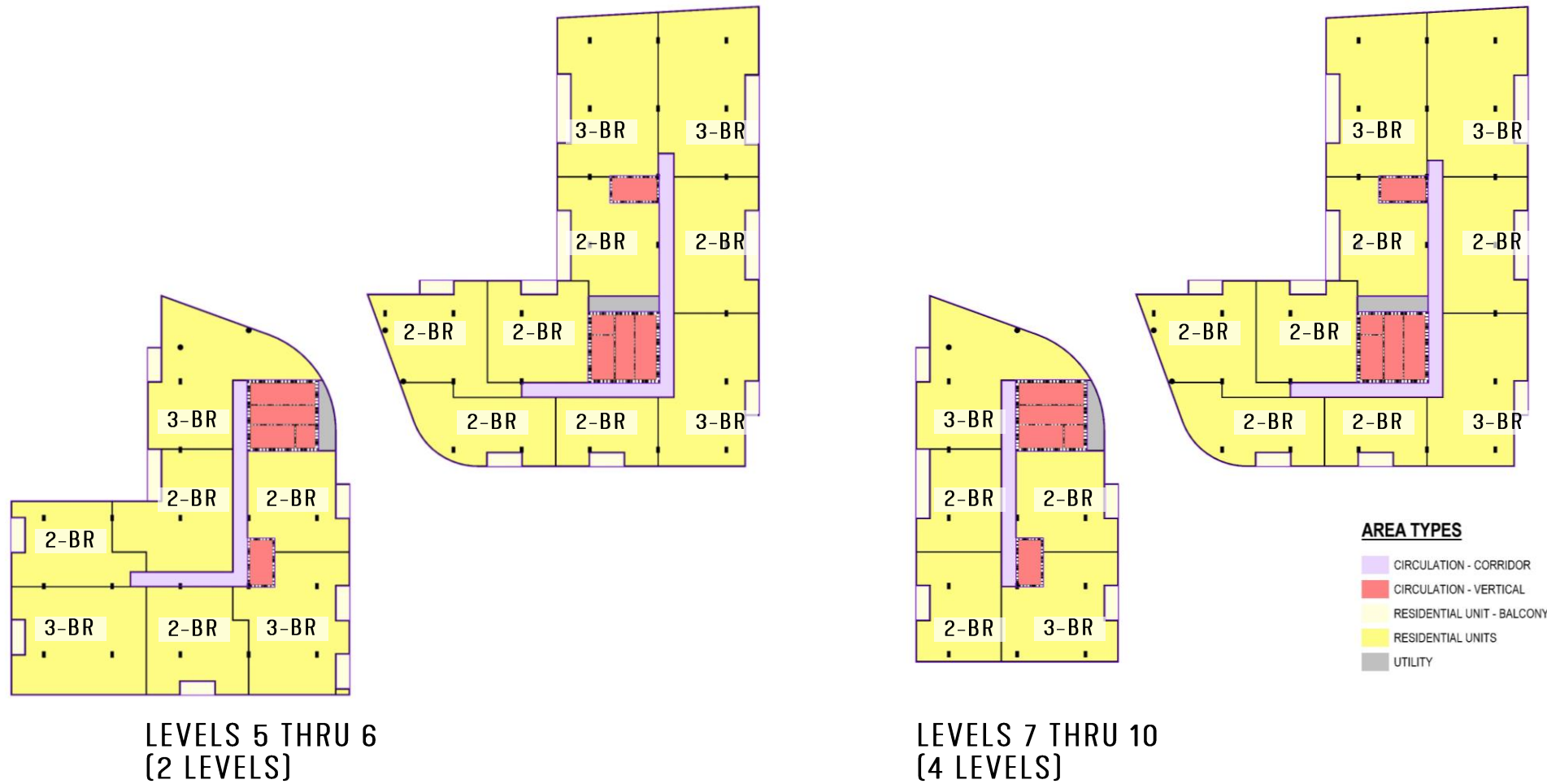
TOTAL RETAIL AREA: ~37,320 SF  
(PREVIOUS DESIGN: 31,698 SF)

FIGURE 3 -  
SITE PLAN

# CITY CENTER

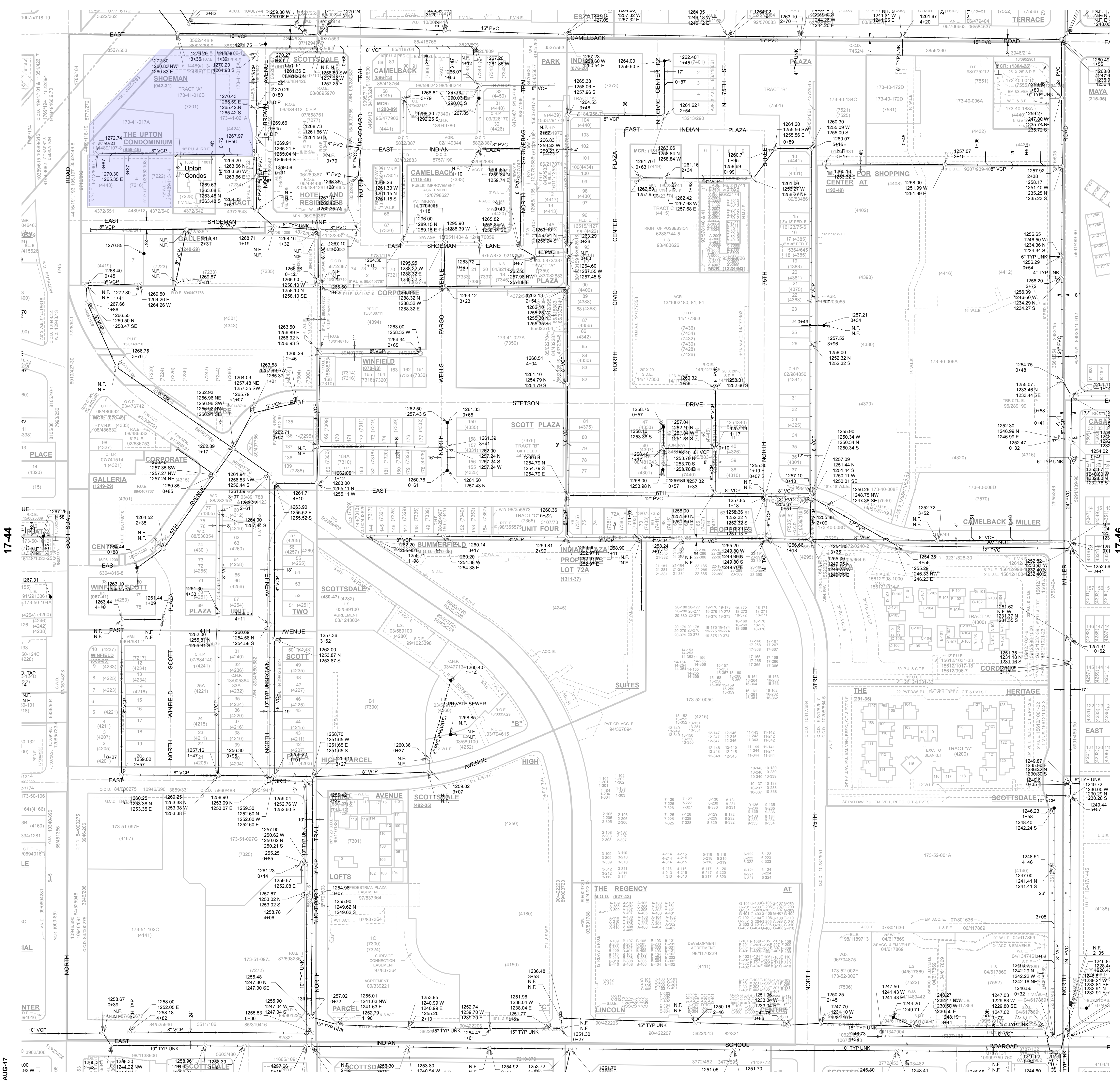
## MODIFIED CONDO CONCEPT – 10 FLOORS RESIDENTIAL FLOOR DIAGRAMS – TALLER CEILINGS

GROSS FLOOR AREA	375,133 SF GROSS
RESIDENTIAL AREA	323,762 SF NET SELLABLE
<i>EFFICIENCY</i>	<i>86%</i>



**FIGURE 3 -  
SITE PLAN**

COMPLETE RESIDENTIAL BUILDING (10 LEVELS)	
TOTAL 2-BR UNITS	98 UNITS
TOTAL 3-BR UNITS	51 UNITS
<i>TOTAL UNITS</i>	<i>149 TOTAL UNITS</i>



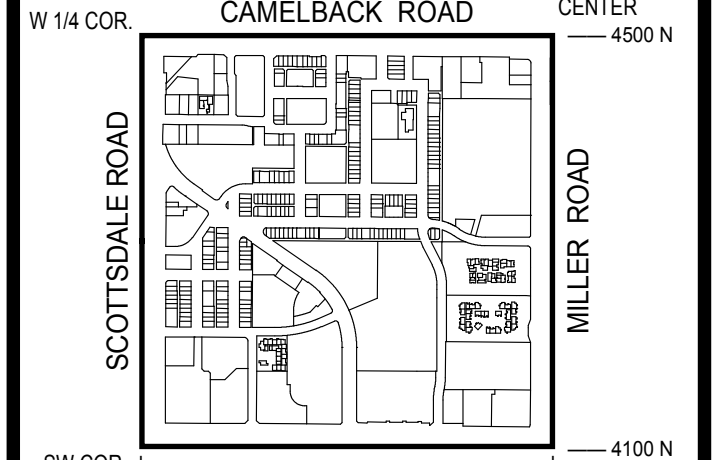
**GENERAL NOTES:**  
 THIS IS A COMPUTER GENERATED DRAWING. FOR ANY REVISIONS PLEASE CONTACT THE CITY OF SCOTTSDALE GIS DEPARTMENT AT (480) 312-7792.

THE SECTION LINE BEARING AND DISTANCES ARE BASED ON THE CITY OF SCOTTSDALE GPS SURVEY OF SEPTEMBER, 1991. BEARINGS ARE NAD 83 GRID AND DISTANCES ARE FLATTENED TO GROUND. WHERE NO CORNER WAS FOUND THE DIMENSIONS ARE GIVEN TO CALCULATED SECTION CORNERS AND ARE NOT "CALCULATED ON THE MAP."

**LEGEND:**

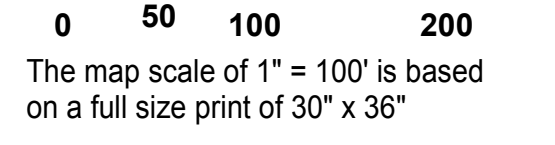
- Cleanout
- Lift Station
- Manhole
- Non-GPS Point
- Plug
- Sewer Service Point
- Sewer Tap Point
- Sewer Valve
- Treatment Plant
- Sewer Main - Gravity
- Sewer Main - Force
- Sewer Main - Private

**VICINITY MAP**



**NORTH**

SCALE: 1" = 100'



The map scale of 1" = 100' is based on a full size print of 30" x 36"

**SEWER QUARTER SECTION MAP**

**17-45**

SW 1/4 SEC. 23 T2N R4E













**FIGURE 4**

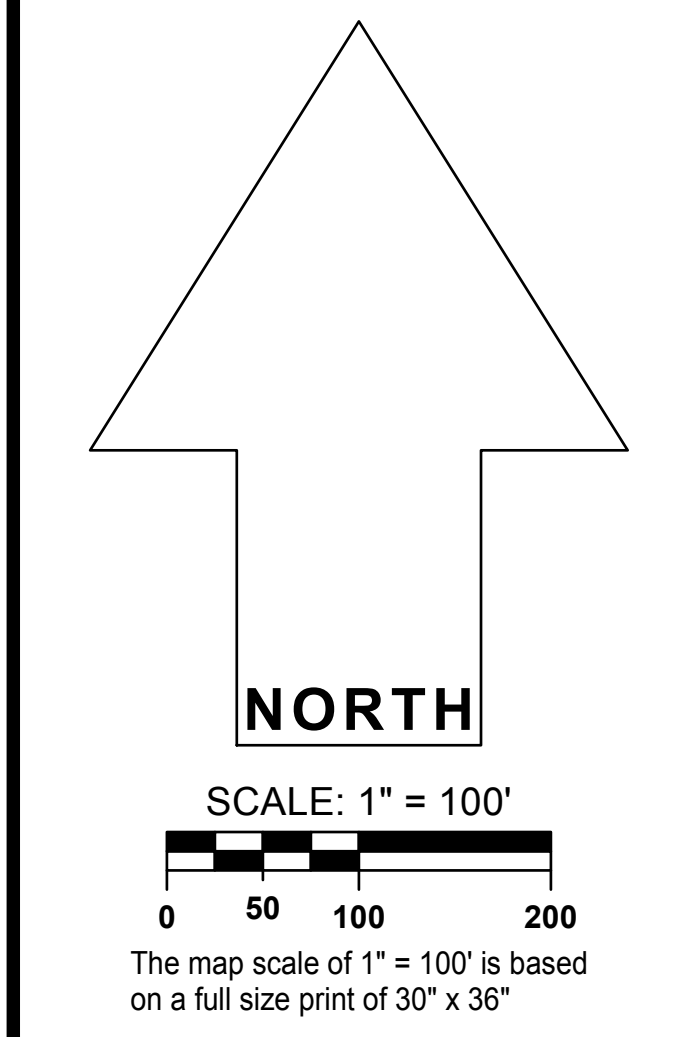
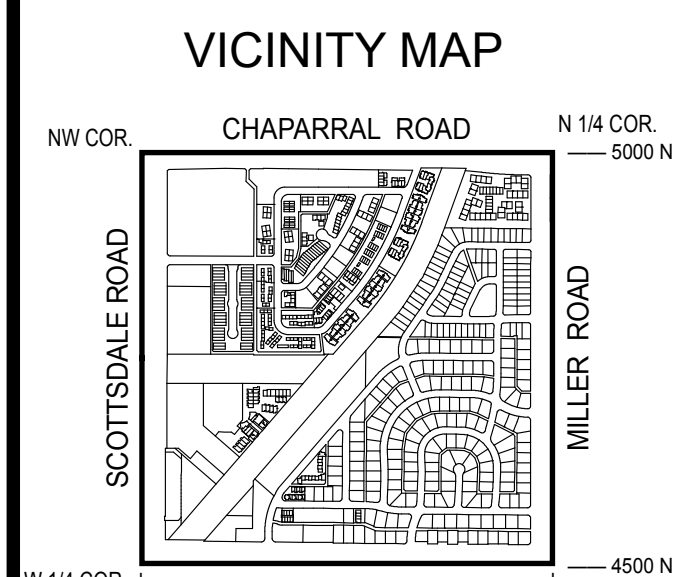
**CITY OF SCOTTSDALE**  
 SCOTTSDALE GEOGRAPHIC INFORMATION SYSTEMS  
 3623 North Drinkwater Boulevard  
 Scottsdale, Arizona 85251

NOT TO SCALE  
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 27-AUG-17

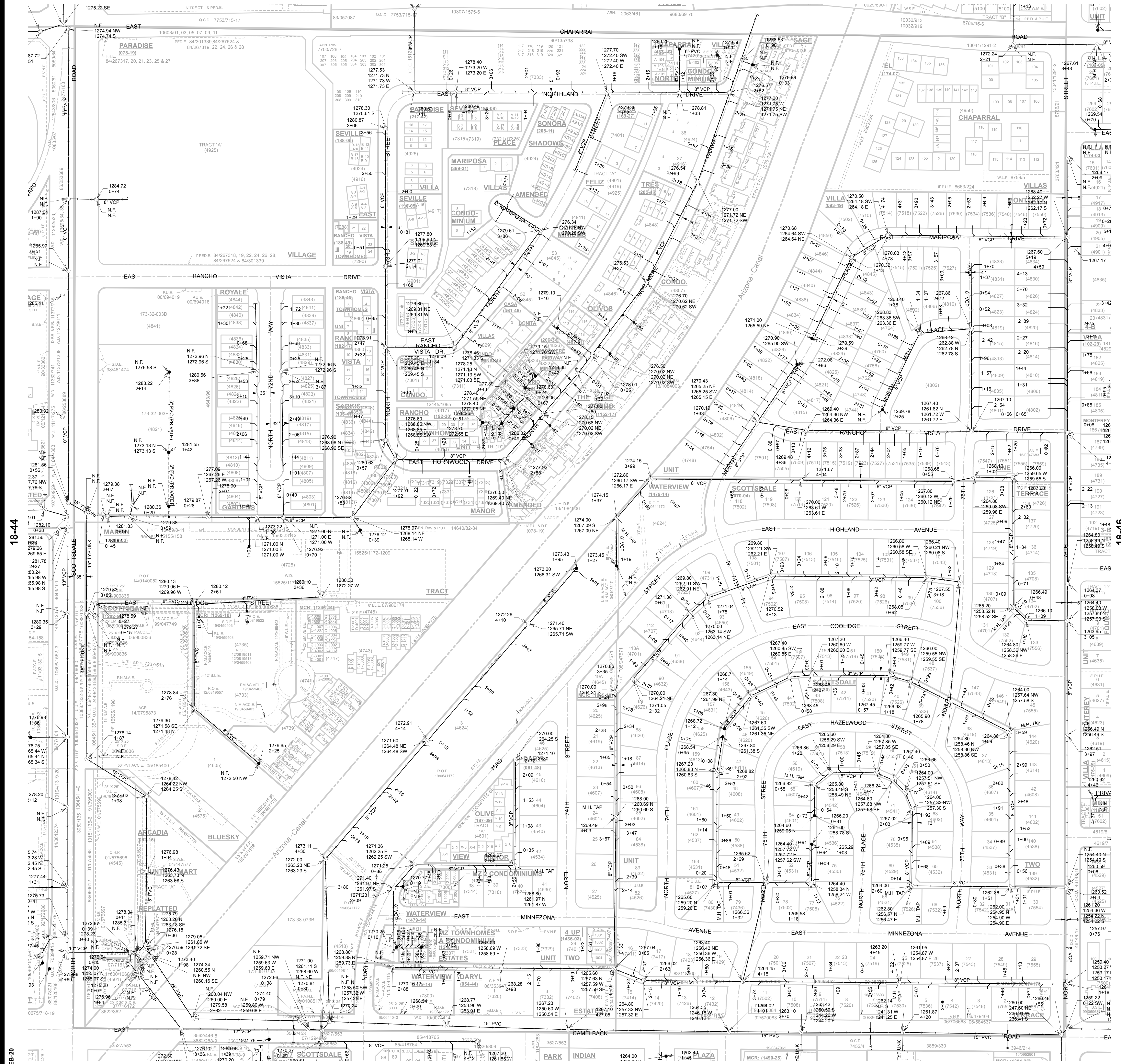
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**LEGEND:**

- Cleanout 
- Lift Station 
- Manhole 
- Non-GPS Point 
- Plug 
- Sewer Service Point 
- Sewer Tap Point 
- Sewer Valve 
- Treatment Plant 
- Sewer Main - Gravity 
- Sewer Main - Force 
- Sewer Main - Private 



**SEWER**  
**QUARTER SECTION MAP**  
**18-45**  
 NW 1/4 SEC. 23 T2N R4E  
**FIGURE 4**



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 THE CITY OF SCOTTSDALE  
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## **APPENDICIES**

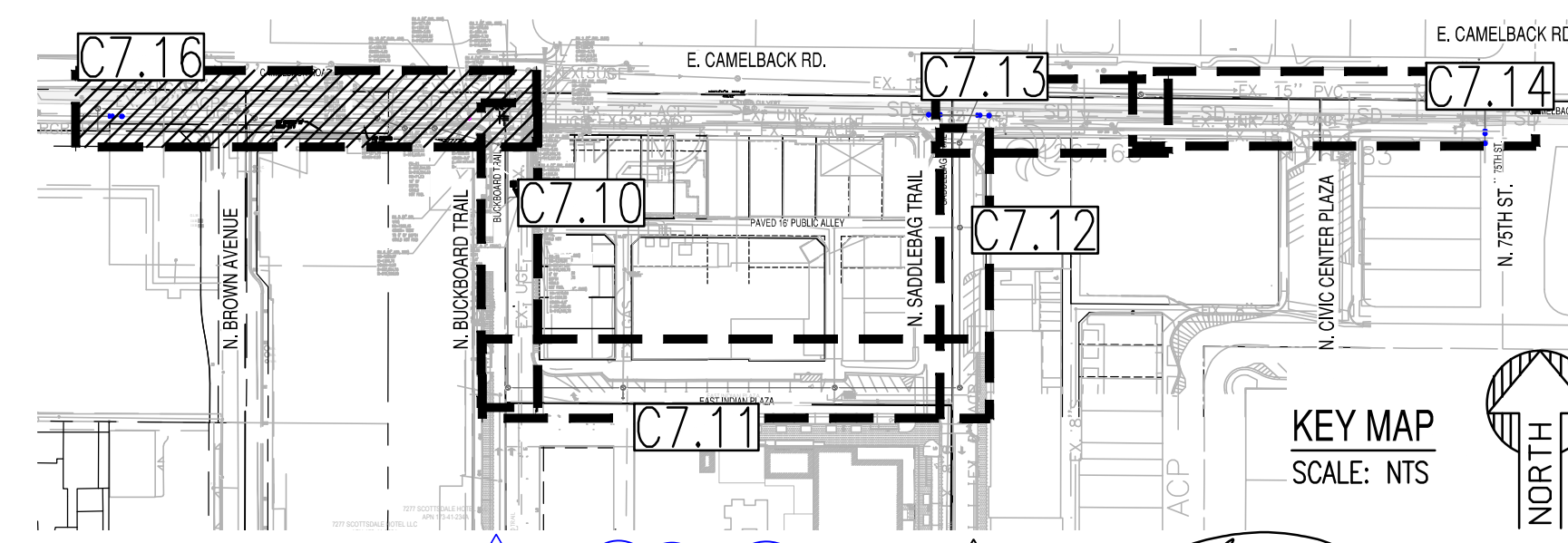
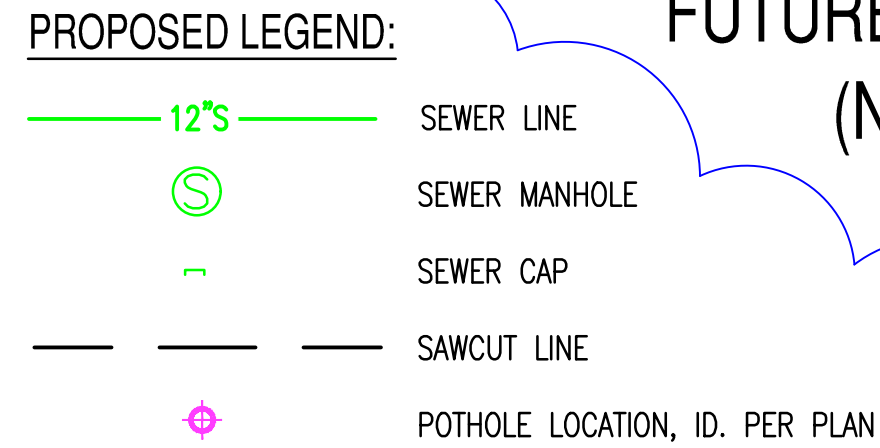
- I. Camelback Road Sewer Extension
- II. Sewer Hydraulic Calculations
- III. Force Main & Wet Well Calculations
- IV. Submersible Pump Selection
- V. Preliminary Utility Plan

UTILITY CROSSINGS (FOR REFERENCE ONLY)

CROSSING ID	UTILITY	ELEVATION	SEPARATION (FT)	REMARKS
UC-18	6" WATER BOT	1266.57	4.17	NO EXTRA PROTECTION REQUIRED
UC-19	12" SEWER TOP	1262.40	-	10' OF DEPTH, COULD NOT FIND.
UC-20	6" SEWER BOT	-	-	10' OF DEPTH, COULD NOT FIND.
UC-20A	2" ELECTRIC BOT	1269.08	6.14	NO EXTRA PROTECTION REQUIRED
UC-20B	12" SEWER TOP	1262.47	-	NO EXTRA PROTECTION REQUIRED
UC-21	2" ELECTRIC BOT	1269.50	5.94	NO EXTRA PROTECTION REQUIRED
UC-21A	12" SEWER TOP	1263.56	-	NO EXTRA PROTECTION REQUIRED
UC-21B	2" ELECTRIC BOT	1271.46	7.10	NO EXTRA PROTECTION REQUIRED
UC-21C	12" SEWER TOP	1264.36	-	NO EXTRA PROTECTION REQUIRED
UC-22	15" IRR BOT	1264.98	2.00	10' OF DEPTH, COULD NOT FIND.
UC-22A	12" SEWER TOP	1262.98	-	NO EXTRA PROTECTION REQUIRED
UC-22B	16" WATER BOT	TBD	-	16" WATER ELEVATION TO BE VERIFIED
UC-22C	12" SEWER TOP	1263.70	-	NO EXTRA PROTECTION REQUIRED
UC-23	16" WATER BOT	1266.43	2.00	16" WATER ELEVATION TO BE VERIFIED
UC-23A	12" SEWER TOP	1264.43	-	NO EXTRA PROTECTION REQUIRED
UC-24	18" IRR BOT	1266.81	2.40	18" IRR ELEVATION TO BE VERIFIED
UC-24A	12" SEWER TOP	1264.41	-	NO EXTRA PROTECTION REQUIRED

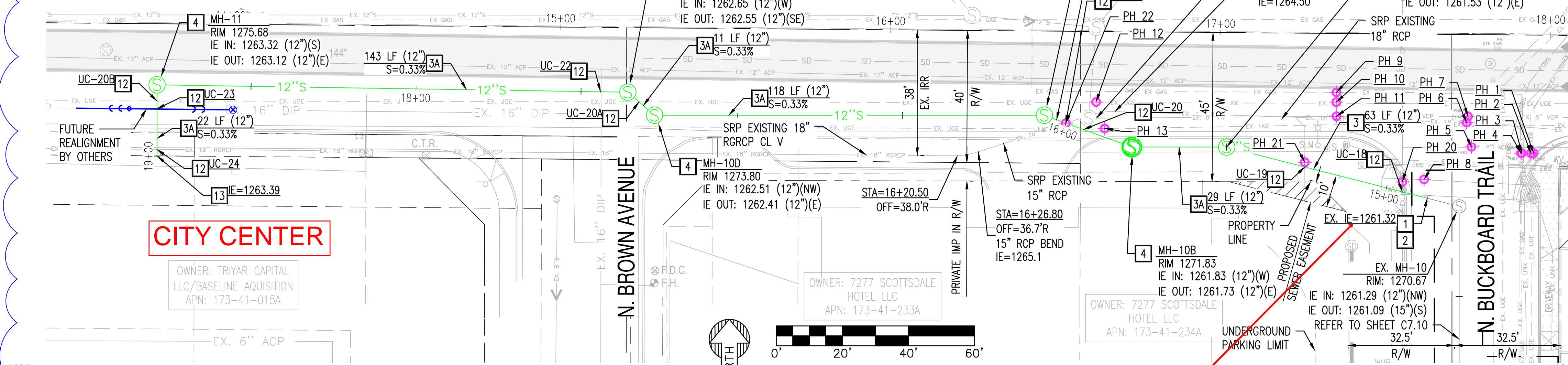
REQUIRES VERTICAL REALIGNMENT PER C.O.S. STD. DET. 2370 AND 2372. USE MECHANICALLY RESTRAINED JOINTS.

MAYA HOTEL  
OFFSITE SEWER IMPROVEMENTS  
FUTURE SEWER LINE TO CITY CENTER  
(NOT FOR CONSTRUCTION)



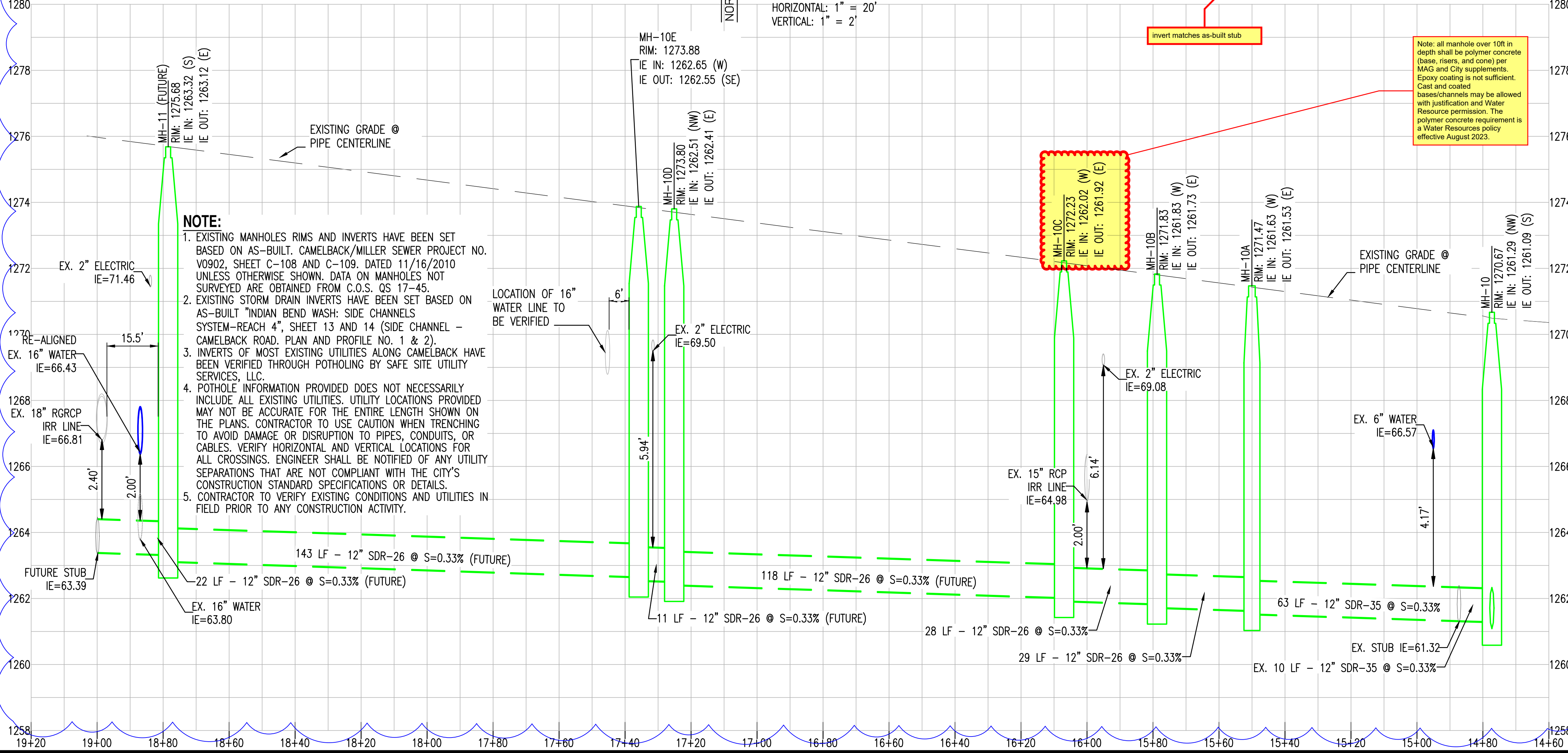
Professional Engineer Seal for Ali Samih Fakh, License No. 45621, State of Arizona. Expiration Date: 12-31-2024.

SRP UPDATE 02/01/2023 SEWER RE-ROUTE 08/24/2022



POT HOLE RESULTS

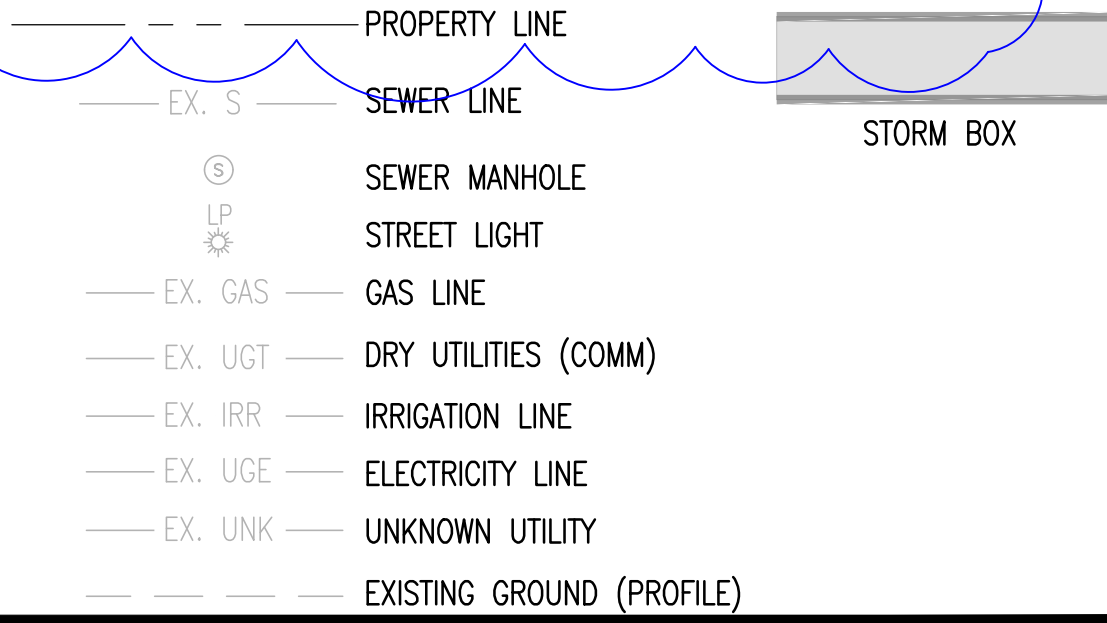
POT HOLE ID	UTILITY TYPE	PIPE/STRUCTURE SIZE	NATURAL GRADE	INVERT ELEVATION	COVER (FT)
1	COMM	2"	1269.86	1268.71	0.95
2	ELEC	2"	1269.95	1267.74	6.76
3	GAS	4"	1269.94	1264.49	5.05
4	ELEC	2"	1269.94	1263.34	6.40
5	WATER	8"	1269.97	1265.76	3.50
6	IRR	15"	1270.05	1266.40	2.20
7	SEWER	8"	1270.05	1261.44	7.78
8	WATER	6"	1262.45	-	8' OF DEPTH, COULD NOT FIND
9	GAS	4"	1271.05	1267.52	3.20
10	ELEC	2"	1271.05	1265.28	4.60
11	SEWER	8"	1271.01	1261.64	7.70
12	ELEC	2"	1271.50	1267.30	4.00
13	ELEC	2"	1271.10	1268.43	2.50
20	WATER	6"	1270.73	1266.63	3.60
21	SEWER	6"	1271.13	-	10' OF DEPTH, COULD NOT FIND
22	IRR	15"	1272.12	-	10' OF DEPTH, COULD NOT FIND



SANITARY CONSTRUCTION KEY NOTES

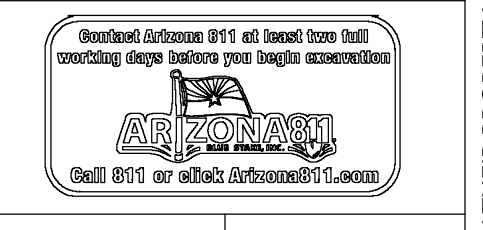
- CONTRACTOR SHALL VERIFY THE LOCATION OF THE EXISTING SANITARY SEWER LINE BEFORE PROCEEDING WITH TRENCHING.
- CONTRACTOR SHALL CONTACT ENGINEER IF EXISTING SEWER ELEVATION IS HIGHER THAN PROPOSED TIE-IN INVERT PRIOR TO ANY CONSTRUCTION ACTIVITY.
- FURNISH AND INSTALL PVC-SDR 35 SEWER LINE. SIZE, LENGTH AND SLOPE PER PLAN.
- FURNISH AND INSTALL PVC-SDR 26 SEWER LINE. SIZE, LENGTH AND SLOPE PER PLAN.
- FURNISH AND INSTALL 5' DIAMETER PRECAST CONCRETE SEWER MANHOLE PER MAG STD. DET. 420-1 (NO STEPS) WITH 12 CONCRETE COLLAR PER C.O.S. STD. DET. 2270 (18" COLLAR IN UNPAVED LOCATIONS), 30" WATER TIGHT COVER PER MAG STD. DET. 424-2 AND C.O.S. STD. DET. 2421. CAST-IN-PLACE BASE. MANHOLE TO BE EPOXY COATED IN ACCORDANCE WITH C.O.S. REQUIREMENTS.
- FURNISH AND INSTALL 4' DIAMETER PRECAST CONCRETE SEWER MANHOLE PER MAG STD. DET. 420-1 (NO STEPS) WITH 12 CONCRETE COLLAR PER C.O.S. STD. DET. 2270 (18" COLLAR IN UNPAVED LOCATIONS), CAST-IN-PLACE BASE. MANHOLE TO BE EPOXY COATED IN ACCORDANCE WITH C.O.S. REQUIREMENTS.
- CONTRACTOR SHALL VERIFY ALL INVERTS AND CLEARANCE OF CROSSING UTILITIES PRIOR TO COMMENCING CONSTRUCTION.
- PROVIDE PLUG AND MARKER FOR SEWER STUB PER MAG STD. DET. 427.

EXISTING LEGEND:



PRELIMINARY  
NOT FOR  
CONSTRUCTION

SUSTAINABILITY  
ENGINEERING  
GROUP



PROJECT: MAYA HOTEL  
LOCATION: NEC OF BUCKBOARD TRAIL AND SHOEMAN LANE SCOTTSDALE, AZ.

DRAWN	PG	07/13/2022
DESIGNED	PG	07/13/2022
QC	SC	07/15/2022
QA	TM	08/09/2022
PROJ. MGR.	AF	07/19/2022

DATE: 01/27/2022  
ISSUED FOR: PERMIT

REVISION NO.	DATE
1	08/24/2022
2	02/01/2023

JOB NO.: 200121  
SHEET TITLE:

FUTURE SEWER LINE  
TO CITY CENTER  
APPENDIX I

THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF SUSTAINABILITY ENGINEERING GROUP, AND SHALL REMAIN THEIR PROPERTY. THE USE OF THIS DRAWING SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE. CASE NO.: 9-2N-2020, 25-DR-2020 PLAN CHECK NO.: 4436-21-1

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**6" Service - Full Flow**

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**Project Description**

Friction Method	Manning Formula
Solve For	Full Flow Capacity

**Input Data**

Roughness Coefficient	0.013	
Channel Slope	0.01100	ft/ft
Normal Depth	6.00	in
Diameter	6.0	in
Discharge	264.1	gpm

**Results**

Discharge	264.1	gpm
Normal Depth	6.00	in
Flow Area	0.20	ft <sup>2</sup>
Wetted Perimeter	1.57	ft
Hydraulic Radius	1.50	in
Top Width	0.0	in
Critical Depth	4.69	in
Percent Full	100.0	%
Critical Slope	0.01209	ft/ft
Velocity	3.00	ft/s
Velocity Head	0.14	ft
Specific Energy	0.64	ft
Froude Number	0.00	
Maximum Discharge	284.1	gpm
Discharge Full	264.1	gal/min
Slope Full	0.01100	ft/ft
Flow Type	SubCritical	

## APPENDIX II – Sewer Hydraulic Calculations

### **Reach 1A - Peak Flow**

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.0080 ft/ft
Diameter	8.0 in
Discharge	60.40 gpm
Results	
Normal Depth	1.9 in
Flow Area	0.1 ft <sup>2</sup>
Wetted Perimeter	0.7 ft
Hydraulic Radius	1.1 in
Top Width	0.57 ft
Critical Depth	2.0 in
Percent Full	23.8 %
Critical Slope	0.0065 ft/ft
Velocity	2.11 ft/s
Velocity Head	0.07 ft
Specific Energy	0.23 ft
Froude Number	1.113
Maximum Discharge	521.81 gpm
Discharge Full	485.09 gpm
Slope Full	0.0001 ft/ft
Flow Type	Supercritical

## **APPENDIX II – Sewer Hydraulic Calculations**

## Reach 1B - Peak Flow

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth
Input Data	
Roughness Coefficient	0.013
Channel Slope	0.0055 ft/ft
Diameter	12.0 in
Discharge	60.40 gpm
Results	
Normal Depth	1.8 in
Flow Area	0.1 ft <sup>2</sup>
Wetted Perimeter	0.8 ft
Hydraulic Radius	1.1 in
Top Width	0.72 ft
Critical Depth	1.8 in
Percent Full	15.3 %
Critical Slope	0.0060 ft/ft
Velocity	1.76 ft/s
Velocity Head	0.05 ft
Specific Energy	0.20 ft
Froude Number	0.955
Maximum Discharge	1,275.63 gpm
Discharge Full	1,185.86 gpm
Slope Full	0.0000 ft/ft
Flow Type	Subcritical

## APPENDIX II – Sewer Hydraulic Calculations

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**Reach 2 - 6" Force Main**

---

**Project Description**

Friction Method	Hazen-Williams Formula
Solve For	Pressure at 1

**Input Data**

Pressure 2	0.00	psi
Elevation 1	1267.00	ft
Elevation 2	1273.74	ft
Length	259.00	ft
Roughness Coefficient	130.000	
Diameter	6.0	in
Discharge	303.7	gpm

**Results**

Pressure 1	3.84	psi
Headloss	2.11	ft
Energy Grade 1	1276.04	ft
Energy Grade 2	1273.92	ft
Hydraulic Grade 1	1275.85	ft
Hydraulic Grade 2	1273.74	ft
Flow Area	0.20	ft <sup>2</sup>
Wetted Perimeter	1.57	ft
Velocity	3.45	ft/s
Velocity Head	0.18	ft
Friction Slope	0.00816	ft/ft

**APPENDIX II –  
Sewer Hydraulic Calculations**

---

### Reach 3A - Peak Flow

---

#### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

#### Input Data

Roughness Coefficient	0.013
Channel Slope	0.01100 ft/ft
Diameter	6.0 in
Discharge	37.2 gpm

#### Results

Normal Depth	1.52 in
Flow Area	0.04 ft <sup>2</sup>
Wetted Perimeter	0.53 ft
Hydraulic Radius	0.89 in
Top Width	5.2 in
Critical Depth	1.70 in
Percent Full	25.4 %
Critical Slope	0.00708 ft/ft
Velocity	2.12 ft/s
Velocity Head	0.07 ft
Specific Energy	0.20 ft
Froude Number	1.24
Maximum Discharge	284.1 gpm
Discharge Full	264.1 gal/min
Slope Full	0.00022 ft/ft
Flow Type	SuperCritical

## APPENDIX II – Sewer Hydraulic Calculations

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**Reach 3B - Peak Flow**

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**Project Description**

Friction Method	Manning Formula
Solve For	Normal Depth

**Input Data**

Roughness Coefficient	0.013	
Channel Slope	0.00550	ft/ft
Diameter	8.0	in
Discharge	37.2	gpm

**Results**

Normal Depth	1.64	in
Flow Area	0.05	ft²
Wetted Perimeter	0.63	ft
Hydraulic Radius	0.99	in
Top Width	6.5	in
Critical Depth	1.57	in
Percent Full	20.5	%
Critical Slope	0.00664	ft/ft
Velocity	1.60	ft/s
Velocity Head	0.04	ft
Specific Energy	0.18	ft
Froude Number	0.91	
Maximum Discharge	432.7	gpm
Discharge Full	402.2	gal/min
Slope Full	0.00005	ft/ft
Flow Type	SubCritical	

**APPENDIX II –  
Sewer Hydraulic Calculations**

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**Reach 4 - Peak Flow**

---

**Project Description**

Friction Method                      Manning Formula  
Solve For                                Normal Depth

**Input Data**

Roughness Coefficient	0.013	
Channel Slope	0.00550	ft/ft
Diameter	12.0	in
Discharge	340.9	gpm

**Results**

Normal Depth	4.41	in
Flow Area	0.26	ft <sup>2</sup>
Wetted Perimeter	1.30	ft
Hydraulic Radius	2.41	in
Top Width	11.6	in
Critical Depth	4.37	in
Percent Full	36.7	%
Critical Slope	0.00568	ft/ft
Velocity	2.90	ft/s
Velocity Head	0.13	ft
Specific Energy	0.50	ft
Froude Number	0.98	
Maximum Discharge	1275.6	gpm
Discharge Full	1185.9	gal/min
Slope Full	0.00045	ft/ft
Flow Type	SubCritical	

**APPENDIX II –  
Sewer Hydraulic Calculations**

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**Reach 5 - Peak Flow**

---

**Project Description**

Friction Method	Manning Formula
Solve For	Normal Depth

**Input Data**

Roughness Coefficient	0.013
Channel Slope	0.00550 ft/ft
Diameter	12.0 in
Discharge	383.9 gpm

**Results**

Normal Depth	4.70 in
Flow Area	0.29 ft <sup>2</sup>
Wetted Perimeter	1.35 ft
Hydraulic Radius	2.53 in
Top Width	11.7 in
Critical Depth	4.65 in
Percent Full	39.1 %
Critical Slope	0.00572 ft/ft
Velocity	3.00 ft/s
Velocity Head	0.14 ft
Specific Energy	0.53 ft
Froude Number	0.98
Maximum Discharge	1275.6 gpm
Discharge Full	1185.9 gal/min
Slope Full	0.00058 ft/ft
Flow Type	SubCritical

**APPENDIX II –  
Sewer Hydraulic Calculations**

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**Reach 6 - Peak Flow**

---

**Project Description**

Friction Method                      Manning Formula  
Solve For                                Normal Depth

**Input Data**

Roughness Coefficient	0.013
Channel Slope	0.00550 ft/ft
Diameter	12.0 in
Discharge	446.9 gpm

**Results**

Normal Depth	5.10 in
Flow Area	0.32 ft <sup>2</sup>
Wetted Perimeter	1.42 ft
Hydraulic Radius	2.69 in
Top Width	11.9 in
Critical Depth	5.03 in
Percent Full	42.5 %
Critical Slope	0.00581 ft/ft
Velocity	3.13 ft/s
Velocity Head	0.15 ft
Specific Energy	0.58 ft
Froude Number	0.97
Maximum Discharge	1275.6 gpm
Discharge Full	1185.9 gal/min
Slope Full	0.00078 ft/ft
Flow Type	SubCritical

**APPENDIX II –  
Sewer Hydraulic Calculations**

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**Camelback 12" Sewer - d/D = 0.65**

---

**Project Description**

Friction Method	Manning Formula
Solve For	Discharge

**Input Data**

Roughness Coefficient	0.013
Channel Slope	0.00330 ft/ft
Normal Depth	7.80 in
Diameter	12.0 in

**Results**

Discharge	694.8 gpm
Flow Area	0.54 ft <sup>2</sup>
Wetted Perimeter	1.88 ft
Hydraulic Radius	3.46 in
Top Width	11.4 in
Critical Depth	6.33 in
Percent Full	65.0 %
Critical Slope	0.00630 ft/ft
Velocity	2.86 ft/s
Velocity Head	0.13 ft
Specific Energy	0.78 ft
Froude Number	0.67
Maximum Discharge	988.1 gpm
Discharge Full	918.6 gal/min
Slope Full	0.00189 ft/ft
Flow Type	SubCritical

**APPENDIX II –  
Sewer Hydraulic Calculations**

## Force Main Hydraulics

### Flows

Peak flow demand	303.7000 gpm
Peak flow demand	0.677 cfs
Peak flow demand with 5% factor	318.8850 gpm
Peak flow demand with 5% factor	0.710481 cfs
Force main diameter	6.00 in
Force main velocity	2.035378 ft/s
Force Main Length	143.00 ft

### Force main Losses

C	130.00
FM Out Elevation	1,267.00 ft
Pump inlet elevation	1,259.20 ft
Discharge elevation (FM Invert at MH)	1,274.90 ft
Static losses	15.70 ft
Friction headloss	1.2819 ft
10% safety factor	0.1282 ft
Total friction headloss to use	1.41 ft

### Minor Loss

	Diameter (in)	# fittings	K	hm (ft)
Pipe Entrance (Sharp Edged)	6.00	1.00	0.50	0.03216433
Ball check valve	6.00	1.00	1.30	0.08362725
90° Bend	6.00	2.00	0.25	0.03216433
Pipe exit	6.00	1.00	1.00	0.06432865
<b>Equivalent length</b>	<b>0.212284555 ft</b>			

### Total Dynamic Head

**17.32 ft**

## Wet Well Sizing

Minimum time between pump starts is 10 minutes

$$V_{min} = (T_{min} * Q_{out}) / 4 = 10 * 304 / 4 = 760 \text{ gallons or } 101.6 \text{ cu.ft.}$$

Wet well diameter = 6 ft

$$\text{Volume per foot of depth} = 9 * 3.14 = 28.6 \text{ cu.ft.}$$

$$\text{Operational depth} = 101.6 / 28.6 = 3.6 \text{ ft}$$

Rim el = 1271.40

6" service in = 1264.46

Alarm el = 1264.00

Lag pump on el = 1262.60

Lead Pump on el = 1261.60    3.6ft operational depth

Pump Off el = 1258.00

Pump Suction el = 1257.50

Wet Well Floor el = 1257.0

Wet Well Depth = 1214.4 ft

APPENDIX III -

Force Main and Wet Well Calculations

**Table A - Force Main Pipe Diameter**

Peak Design Flow:		304	gpm
		0.69	cfs
Pipe Dia (in)	Area (sq.in)	Area (sq.ft.)	Velocity (fps)
4	12.566	0.087	7.9
6	28.274	0.196	3.5
8	50.270	0.349	2.0

**Table B - Dynamic Head (304 gpm)**

Wet Well 6" Out El.	1267.00	ft
Gravity Manhole 6" in E	1274.90	ft
Static Head	7.90	ft
Friction Loss	2.12	ft
Fitting Losses	0.4	ft
Est. El. In to Pump Cl	6	ft
<b>TDH</b>	<b>16.42</b>	<b>ft</b>

Ref: Appendix II - Reach 2

**Table C - NPSHA**

$NPSHa = h_a - h_{vpa} + h_{st} - h_f$		
$h_a =$	14.7 psi	34 ft
$h_{vpa} =$	.339 psia	0.78 ft
$h_{st} =$	6"	0.5 ft
$h_f =$	negligable	0.0 ft
<b>Total</b>		<b>33.7 ft</b>

**Table D - System Curve**

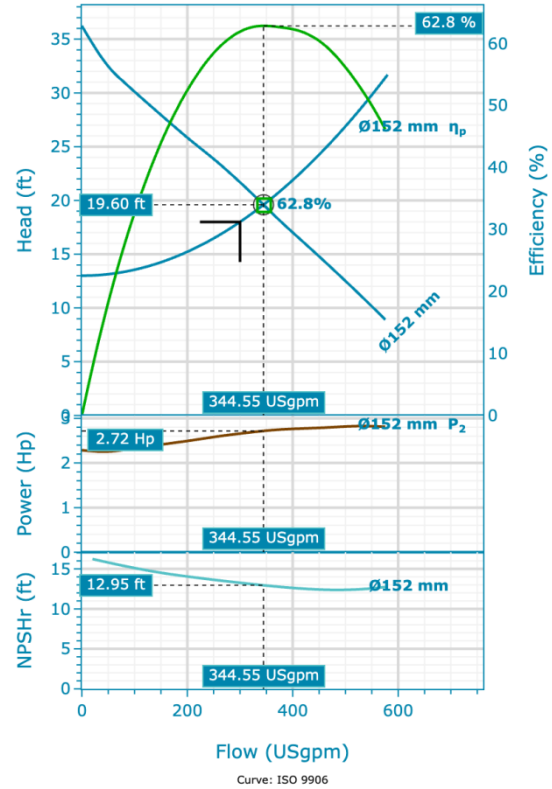
C-Value	Pipe Dia (in)	Pipe Length (ft)	
130	6	259	
Flow Rate (gpm)	Static Head (ft)	Headloss (ft)	Pipe Head (ft)
0	7.90	0	10.40
100	7.90	0.26	8.16
200	7.90	0.98	8.88
300	7.90	2.07	9.97
400	7.90	3.52	11.42

## APPENDIX IV

## NP 3085 MT 3~ Adaptive 462 | Configuration Summary



Flygt's self-cleaning non-clog N-pumps feature innovative designs and functions that deliver high sustained efficiency and the most reliable operation. This makes them the most reliable choice available for a broad range of wastewater applications for tough applications such as unscreened sewage, wastewater and sludge up to an 8 percent solids concentration. Impeller material available in Hardened cast Iron, Hard Iron and Stainless Steel to fit any wastewater application.



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances. Please consult your local Flygt representative for performance guarantees.

### Installation

#### Installation Type

P - Semi-Permanent, Wet

### Motor

#### Rated Voltage

460 V

#### Coupling

Y

#### Motor Efficiency Class

Standard

#### Rated Power

3 Hp

### Materials

#### Impeller Material

Hard-Iron

#### Volute Material

Grey Cast Iron

#### Stator Cover Material

Grey Cast Iron

### Performance

#### Explosion Proof

false

#### Max. Pumped Media Temp.

104 °F

#### Impeller Diameter

152 mm

## NP 3085 MT 3~ Adaptive 462 | Product Details

### N 3085

#### Wastewater N-Technology Pump With Adaptive N® Impeller

Flygt N-pumps take on the toughest applications and get the job done. Every component is designed and manufactured to deliver sustained high efficiency. Thanks to patented N-technology with its innovative self-cleaning impeller, Flygt N-pumps deliver the highest total efficiency. They lower your energy bill and reduce unplanned maintenance costs. That adds up to total peace of mind – and big savings over the long term. Most solid objects entering the pump will pass through the impeller between the impeller vanes. If an object gets caught on the leading edge of one of the vanes, it will slide along the backswept shape towards the perimeter of the inlet. Due to the mechanical self-cleaning design, a sludge concentration up to 8% can easily be pumped.

#### Flexible and Modular Design

- This self-cleaning pump features innovative functions that make it the best choice for a broad range of applications. The modular hydraulic design enables you to tailor the hydraulics to meet the requirements of virtually any application.
- Replaceable wear ring in two materials, gray iron or Hard-Iron, for different operation conditions
- Hardened gray iron impeller for typical wastewater applications
- Hard-Iron impeller for abrasive and corrosive applications
- Stainless steel impeller for special applications that require duplex stainless steel
- Short shaft overhang reduces shaft deflection and increases seal and bearing life
- Motor designed for submersible use. Heat is concentrated to the stator core for improved cooling properties
- The double mechanical seal system consists of two sets of mechanical shaft seals that work independently to provide double security. Available in Tungsten carbide (WCCR) or Silicone carbide (SiC) depending on pumped media.
- Griploc mechanical face seal system secures locking to the shaft, no rubber friction, no grub screws and no shaft damage
- Motor cable SUBCAB® specially developed for submersible use.

#### Product Features

- Sustained high efficiency
- Hardened cast iron, optional Duplex stainless steel and Hard-Iron impellers
- State-of-the-art wastewater pump with enhanced Adaptive N® hydraulic
- Sustained high efficiency with energy savings up to 25%
- Flexible and modular design
- Robust and reliable

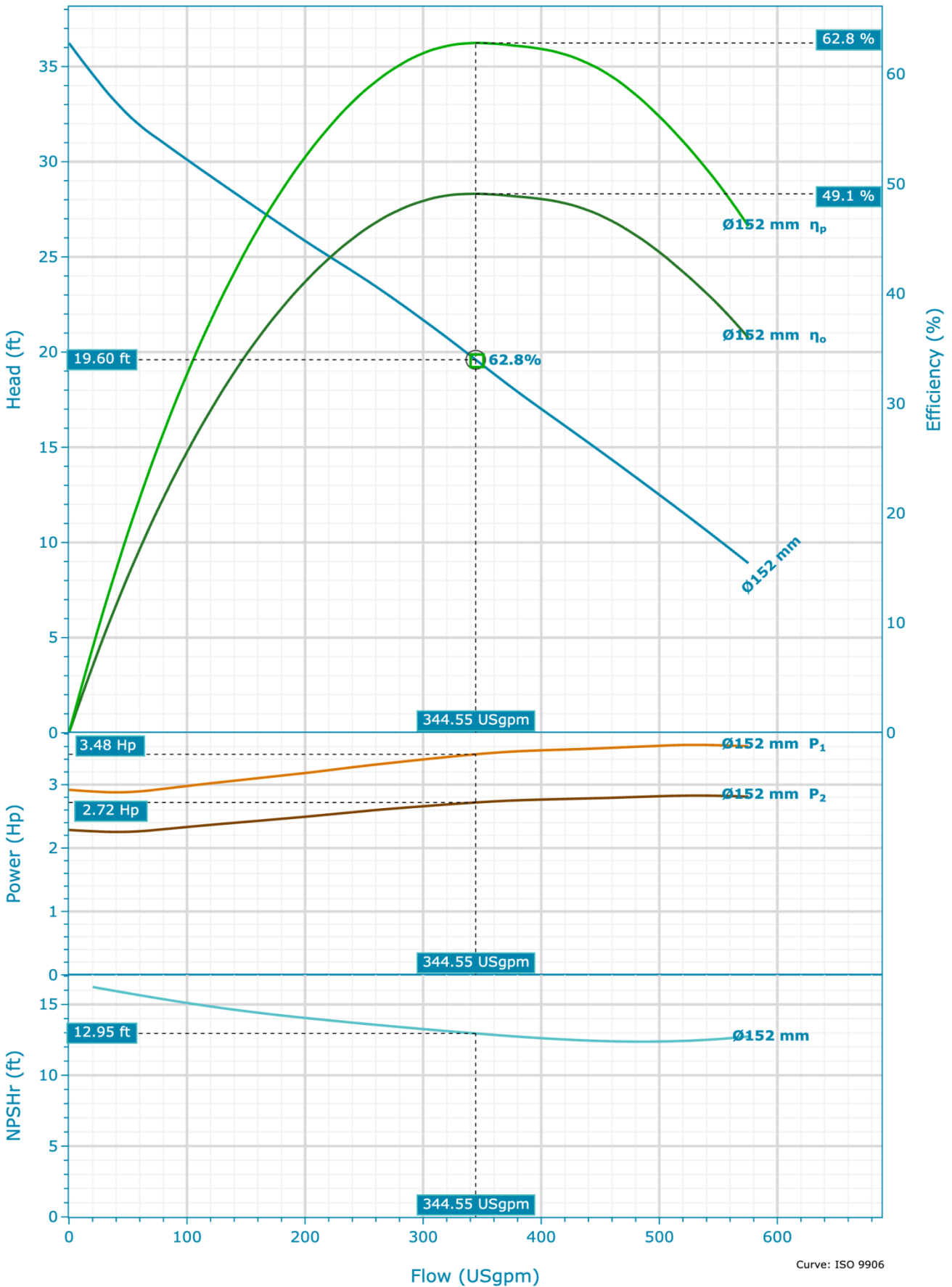
#### Construction Materials

Impeller Material	Volute Material	Stator Cover Material
Hard-Iron	Grey Cast Iron	Grey Cast Iron

#### Motor

Rated Power 3 Hp	Number Of Phases 3	Start Current Ratio 5.77	Motor Issue 10
Motor Denomination 15-10-4AL	Rated Motor Speed 1,715 RPM	Insulation Class H	Locked Rotor Code H
Motor Efficiency Class Standard	Rated Voltage 460 V	Approval Standard	Max starts per hour 30
Version Code 060	Rated Current 5 A	Total moment of inertia 0.4828 ft <sup>2</sup> lbf	Power Factor 100% 0.8
Frequency 60 Hz	Start Current 26 A	Type of duty S1	Power Factor 75% 0.73
Max P2 (1x) 2.83 Hp	Starting Current, Direct Starting 26 A	Stator Variant 62	Power Factor 50% 0.61
Number Of Poles 4	Starting Current, Star Delta 8.67 A	Motor Module 151	Efficiency 100% 78.1 % Efficiency 75% 78.5 % Efficiency 50% 76.2 %

**NP 3085 MT 3~ Adaptive 462 | Hydraulic Data & Performance Curve**



Curve: ISO 9906

Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances. Please consult your local Flygt representative for performance guarantees.

**Selection**

Series N 3000	System Type Single Pump
Name NP 3085 MT 3~ Adaptive 462	Operating Pumps 1
Frequency 60 Hz	Standby Pumps No Standby Pump
Total Flow 300.00 USgpm	Impeller Diameter 152 mm
Total Head 18.00 ft	Inlet Diameter 100 mm
Pump Flow 300.00 USgpm	Outlet Diameter 3 in
Pump Head 18.00 ft	Number Of Vanes 2

**Design Point**

Flow 344.55 USgpm	Shaft power (P2) 2.72 Hp
Head 19.6 ft	NPSHR 12.95 ft
Overall Efficiency ( $\eta_o$ ) 49.10 %	Static Head 13.00 ft
Pump Efficiency ( $\eta_p$ ) 62.84 %	Flow To BEP Ratio 99.7 %
Input Power (P1) 3.48 Hp	

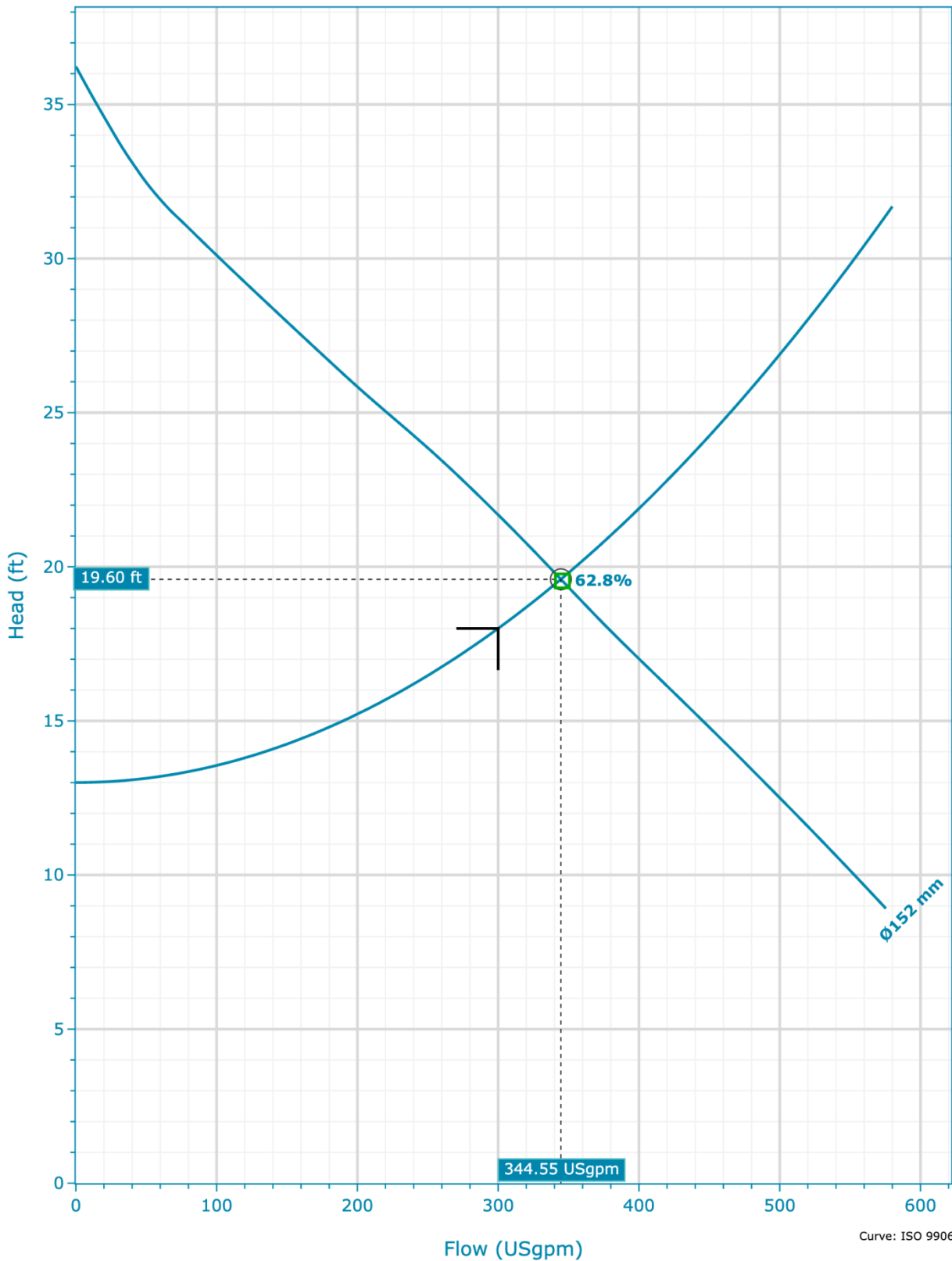
**Fluid**

Fluid Type Water	Density 62.428 lb/ft <sup>3</sup>
Fluid Temperature 39.2 °F	Dynamic Viscosity 1.567212 cP
Specific Gravity 1	Fluid Vapor Pressure 0.118 psi

**Design Curve**

Rated Speed 60 Hz	BEP Flow 345.66 USgpm
Max Flow 575.48 USgpm	BEP Head 19.54 ft
H@QMin 36.23 ft	Max P2 2.83 Hp
H@QMax 8.91 ft	Specific Energy 0.000125 kWh/USgal
BEP 62.8 %	

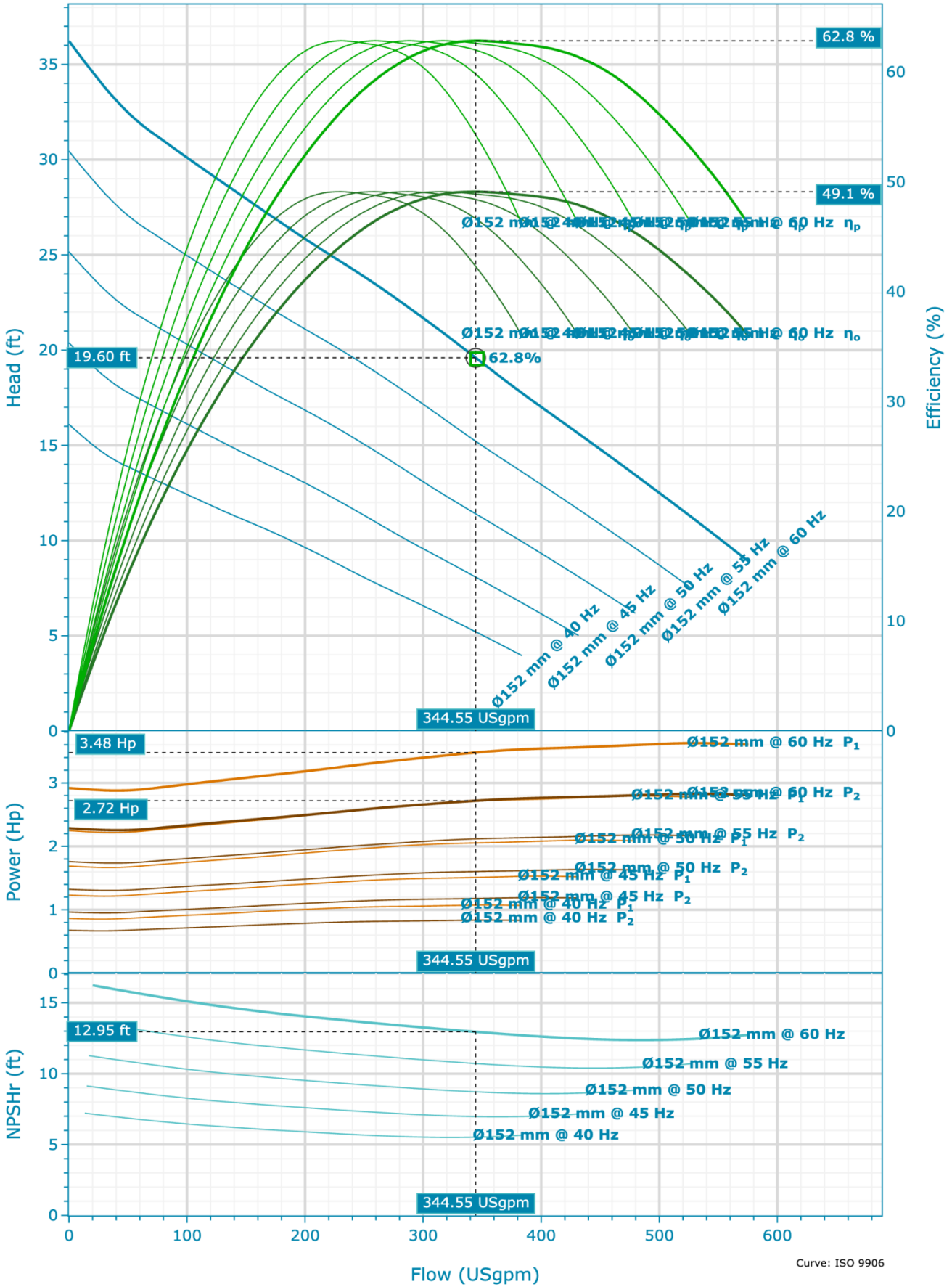
**NP 3085 MT 3~ Adaptive 462 | Duty Analysis**



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances. Please consult your local Flygt representative for performance guarantees.

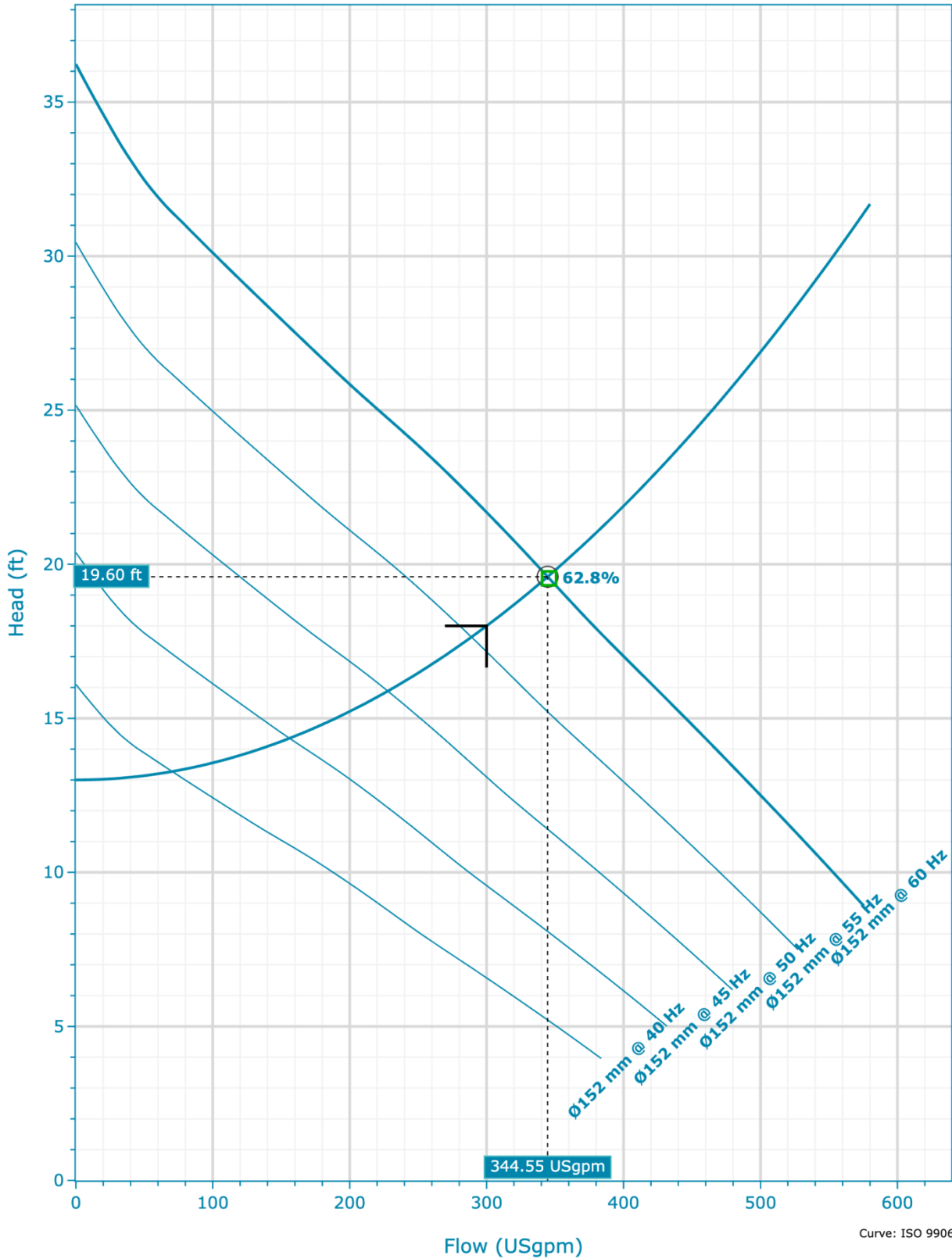
Name	Q (1x) [USgpm]	H (1x) [ft]	P2 (1x) [Hp]	Q [USgpm]	H [ft]	P2 [Hp]	$\eta_p$ [%]	SE [kWh/USgal]	NPSHr [ft]
DP @ 1x	344.55	19.6	2.72	344.55	19.6	2.72	62.84	0	12.95

**NP 3085 MT 3~ Adaptive 462 | Variable Speed Curve**



Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances. Please consult your local Flygt representative for performance guarantees.

**NP 3085 MT 3~ Adaptive 462 | Variable Speed Analysis**

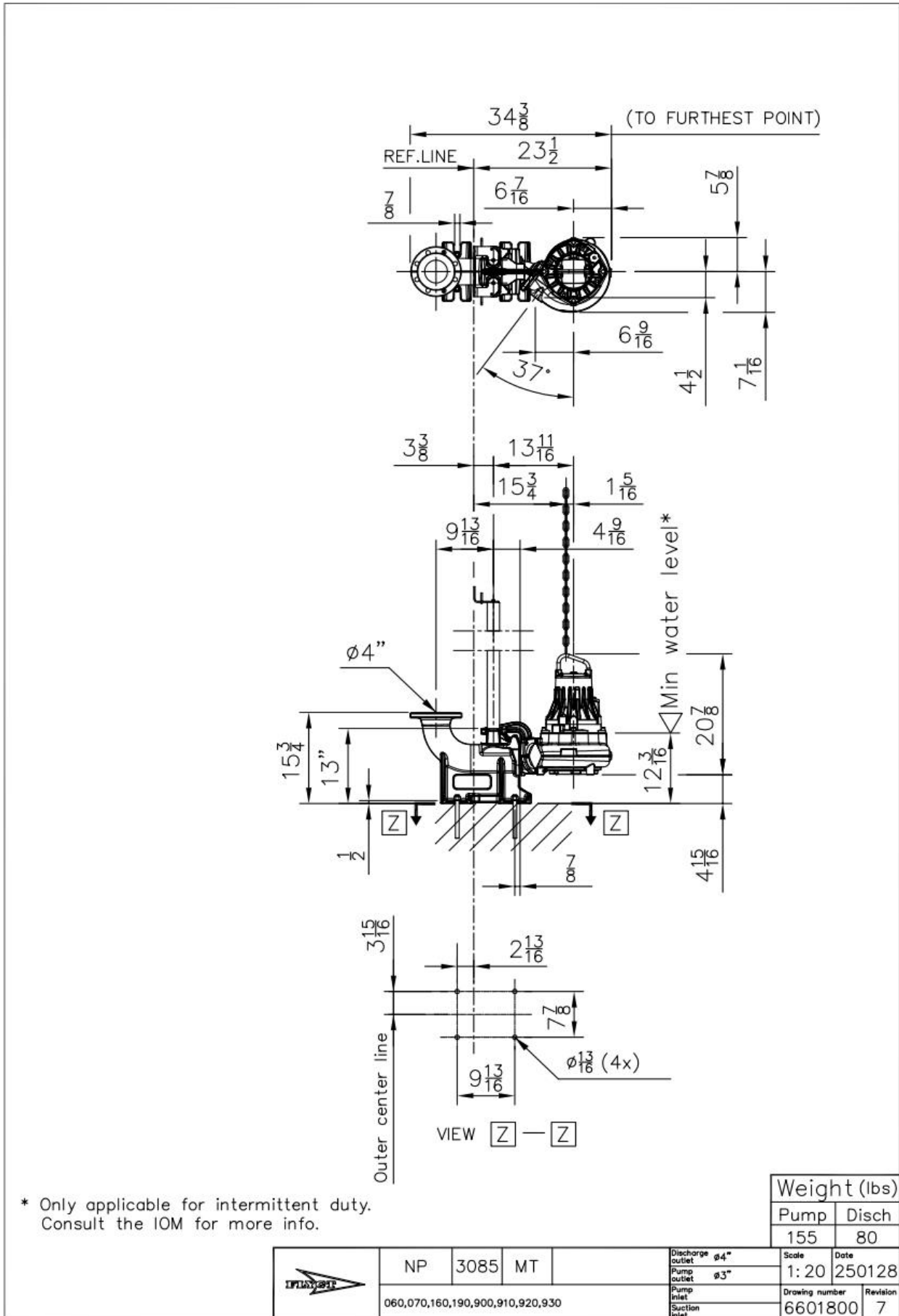


Nominal (mean) data shown. Under- and over-performance from this data should be expected due to standard manufacturing tolerances. Please consult your local Flygt representative for performance guarantees.

Name	Speed	Q (1x) [USgpm]	H (1x) [ft]	P2 (1x) [Hp]	Q [USgpm]	H [ft]	P2 [Hp]	ηp [%]	SE [kWh/USgal ]	NPSHr [ft]
DP @ 1x	40 Hz	70.31	13.27	0.69	70.31	13.27	0.69	34.04	0	6.69
DP @ 1x	45 Hz	156.04	14.35	1.06	156.04	14.35	1.06	53.56	0	7.86

DP @ 1x	50 Hz	227.81	15.88	1.52	227.81	15.88	1.52	60.37	0	9.35
DP @ 1x	55 Hz	288.92	17.64	2.06	288.92	17.64	2.06	62.44	0	11.05
DP @ 1x	60 Hz	344.55	19.6	2.72	344.55	19.6	2.72	62.84	0	12.95

NP 3085 MT 3~ Adaptive 462 | Dimensional Data & Drawing



<b>Company</b>	JCH
<b>Contact</b>	ERIC LORING
<b>Phone No.</b>	602.243.0585
<b>Email</b>	Eric.Loring@JCHinc.com

# Optional Pump Selection

# Submittal Data

PROJECT:	UNIT TAG:	QUANTITY:
REPRESENTATIVE: _____	TYPE OF SERVICE:	DATE: _____
ENGINEER:	SUBMITTED BY:	DATE:
CONTRACTOR:	APPROVED BY:	DATE:
	ORDER NO.:	DATE:

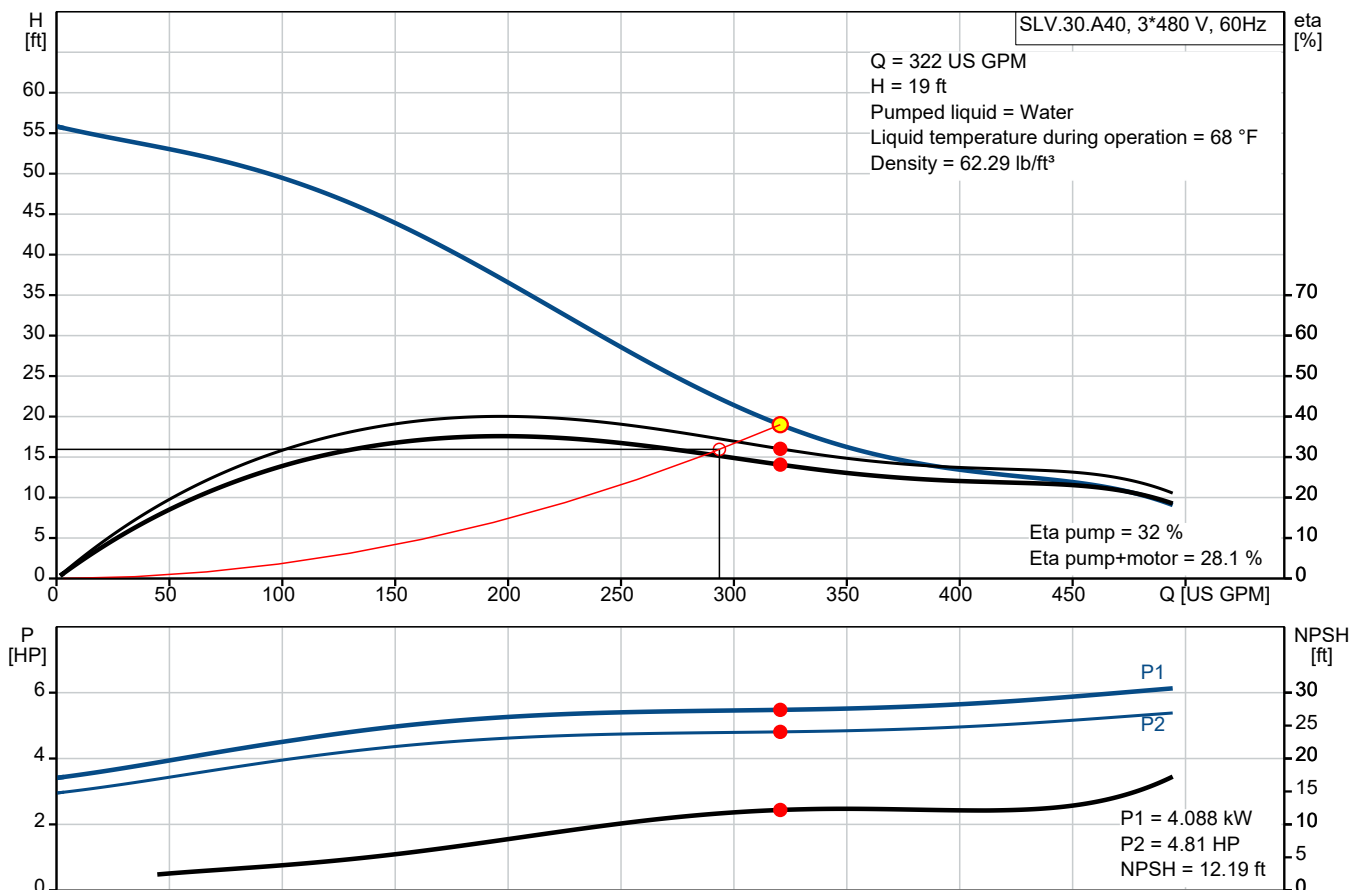
## SLV.30.A40 .55.EX.4.61R.C



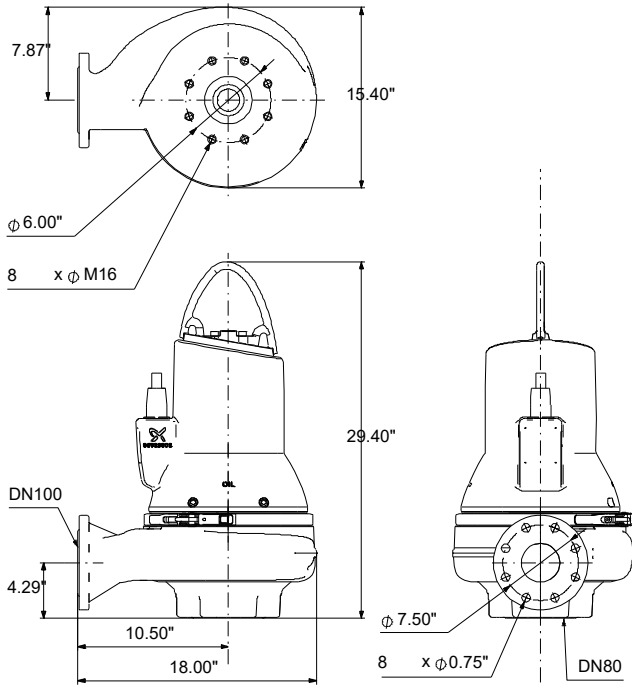
Submersible Grundfos SLV sewage pumps (1.1-11 kW) are fitted with a SuperVortex impeller. The free passage through the pump varies from 50-100 mm depending on size.

Note! Product picture may differ from actual product

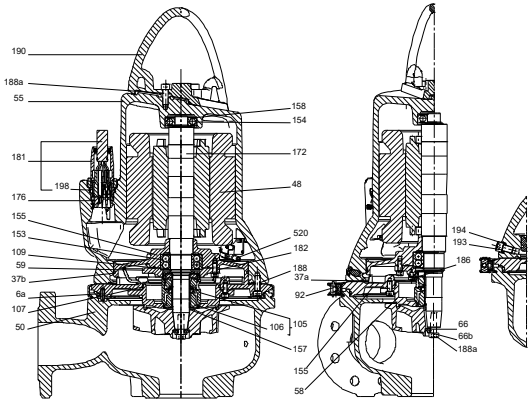
Conditions of Service		Pump Data		Motor Data	
Flow:	322 US GPM	Liquid temperature range:	32 .. 104 °F	Mains frequency:	60 Hz
Head:	19 ft	Maximum ambient temperature:	104 °F	Enclosure class:	IP68
Efficiency:	28.1 %	Product number:	99030280	Eta 1/1:	87.8 %
Liquid:	Water				
Temperature:	68 °F				
NPSH required:	12.19 ft				
Specific Gravity:	1.000				



# Submittal Data



- Materials:**  
 Pump housing: Cast iron  
 ASTM A48-250B  
 Impeller: Cast iron  
 ASTM A48-250B  
 EN 5.1301 EN-GJL-250  
 Motor: EN-GJL-250



Qty.	Description
1	<p><b>SLV.30.A40 .55.EX.4.61R.C</b>            Product No.: <a href="#">99030280</a></p> <p>Non-self-priming, single-stage, centrifugal pump designed for handling wastewater, process water and unscreened raw sewage.</p> <p>The pump is designed for intermittent and continuous operations in submerged installation. The efficient SuperVortex impeller provides passage of long fibres and solids up to 3.15 in and is suitable for wastewater with a dry matter content of up to 5 %. A unique stainless-steel clamp assembling system enables quick and easy disassembly of the pump from the motor unit for service and inspection. No special tools are required.</p> <p>Controls:</p> <p>Moisture sensor: with moisture sensors            Water-in-oil sensor: without water-in-oil sensor</p> <p>Liquid:</p> <p>Pumped liquid: Water            Liquid temperature range: 32 .. 104 °F            Selected liquid temperature: 68 °F            Density: 62.29 lb/ft<sup>3</sup></p> <p>Technical:</p> <p>Actual calculated flow: 322 US GPM            Maximum flow: 493 US GPM            Resulting head of the pump: 19 ft            Type of impeller: SUPER VORTEX            Max. Particle: 3.15 in            Primary shaft seal: SIC/SIC            Approvals: CSA, FM            Curve tolerance: ANSI/HI11.6:2017 3B2            Cooling jacket (Yes/No): N</p> <p>Materials:</p> <p>Pump housing: Cast iron            EN 5.1301 EN-GJL-250            ASTM A48-250B</p> <p>Impeller: Cast iron            EN 5.1301 EN-GJL-250            ASTM A48-250B</p> <p>Motor: EN-GJL-250</p> <p>Installation:</p> <p>Range of ambient temperature: -4 .. 104 °F            Maximum operating pressure: 87.02 psi            Type of inlet connection: ANSI            Type of outlet connection: ANSI            Size of inlet connection: DN 80            Size of outlet connection: DN 100            Pressure rating for connection: PN 10            Maximum installation depth: 39.4 ft            Auto coupling: 97626238            Frame range: C</p> <p>Electrical data:</p> <p>Power input P1: 6.44 HP            Rated power - P2: 5.5 HP            Mains frequency: 60 Hz            Rated voltage: 3 x 230/460V V            Voltage tolerance: +10/-10 %            Max starts per hour: 20</p>



Company name:

Created by:

Phone:

Date:

17/02/2025

**Qty. Description**

1	Rated current:	16.2/9.05 A
	Starting current:	120 A
	Cos phi - power factor:	0.78
	Cos phi - p.f. at 3/4 load:	0.7
	Cos phi - p.f. at 1/2 load:	0.59
	Rated speed:	1760 rpm
	Motor efficiency at full load:	87.8 %
	Motor efficiency at 3/4 load:	87.8 %
	Motor efficiency at 1/2 load:	86.2 %
	Number of poles:	4
	Method of start:	SD
	Enclosure class (IEC 34-5):	IP68
	Insulation class (IEC 85):	H
	Explosion proof:	yes
	Built-in motor protection:	THERMAL SWITCH
	Power cable type:	SEOOW 600V
	Length of power cable:	49.2 ft
	Power plug:	C/D
	Others:	
	Net weight:	294 lb
	Gross weight:	338 lb
	Country of origin:	US
	Custom tariff no.:	8413.70.2004



Company name:

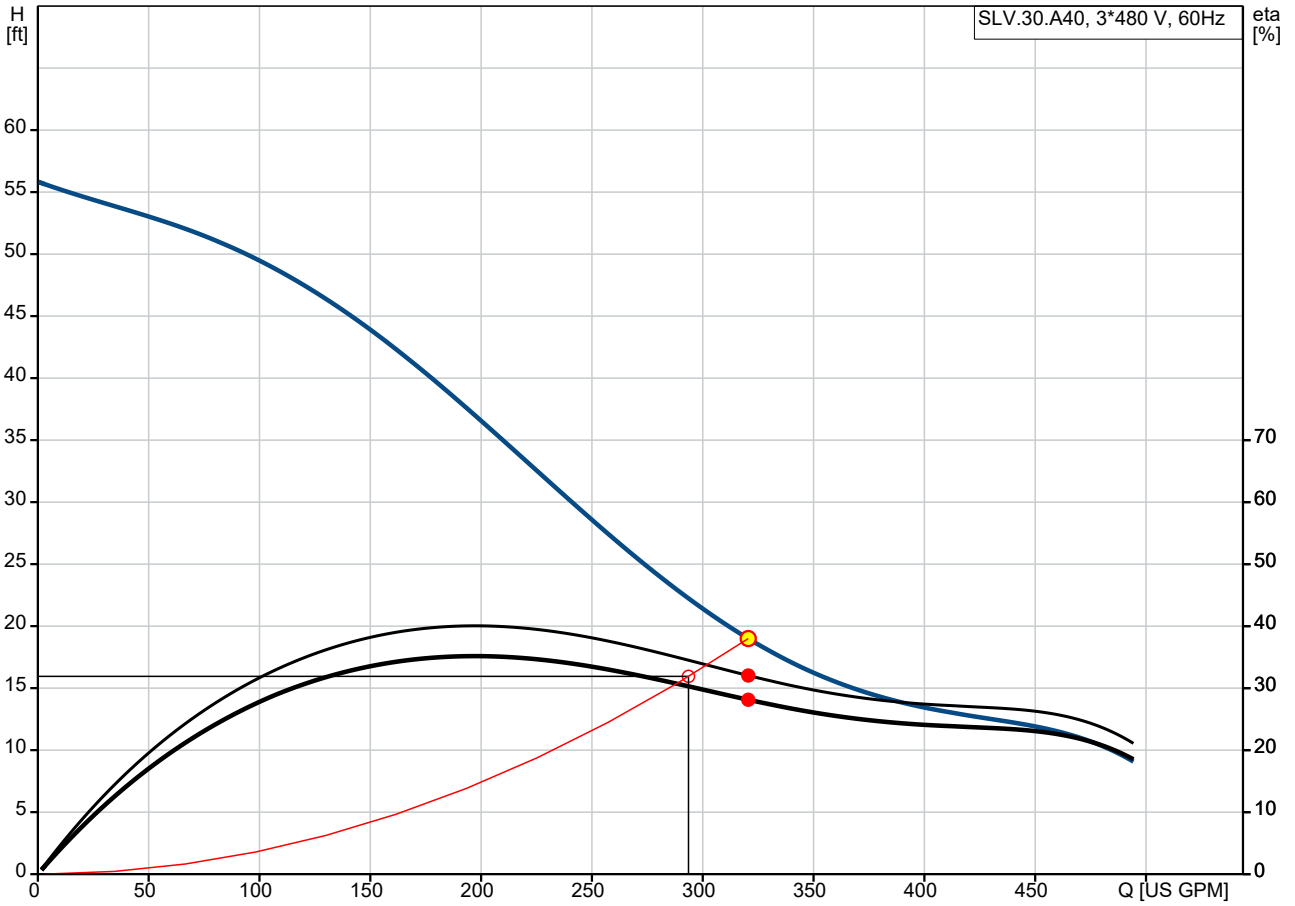
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Phone:

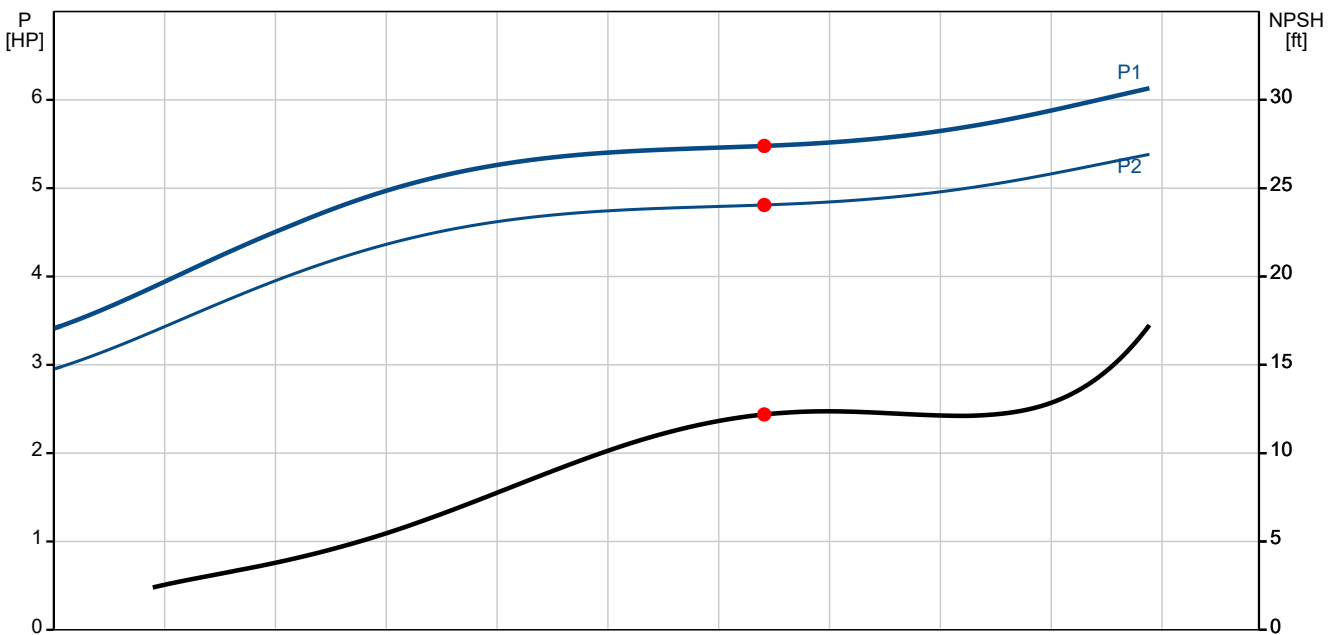
Date:

17/02/2025

### 99030280 SLV.30.A40 .55.EX.4.61R.C 60 Hz

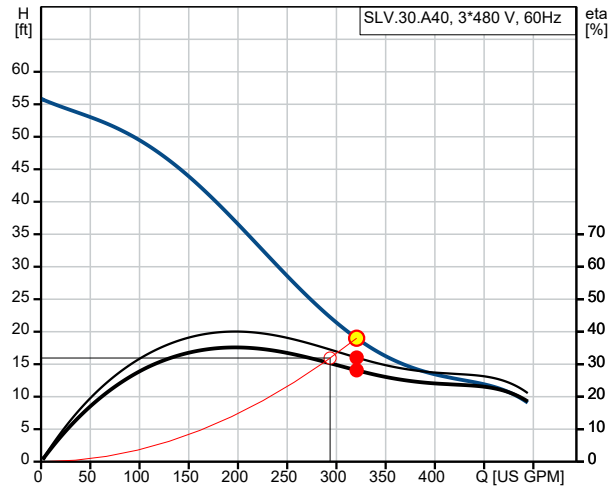


Q = 322 US GPM  
Pumped liquid = Water  
Density = 62.29 lb/ft<sup>3</sup>  
Eta pump+motor = 28.1 %  
H = 19 ft  
Liquid temperature during operation = 68 °F  
Eta pump = 32 %

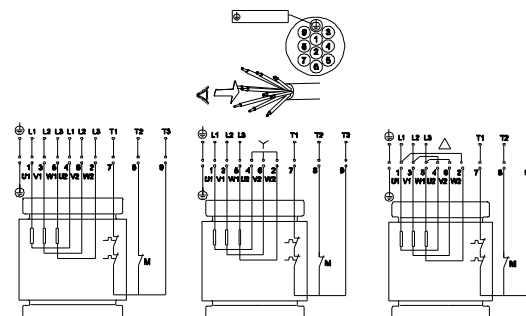
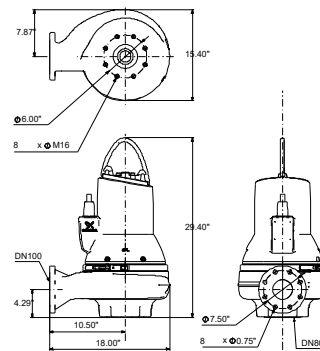
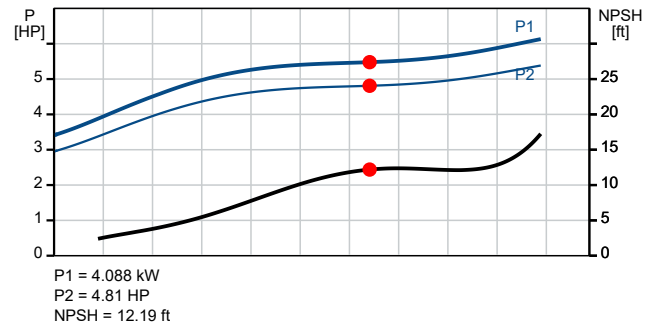


P1 = 4.088 kW  
P2 = 4.81 HP  
NPSH = 12.19 ft

Description	Value
<b>General information:</b>	
Product name:	SLV.30.A40 .55.EX.4.61R.C
Product No:	99030280
EAN number:	5712605418580
<b>Technical:</b>	
Actual calculated flow:	322 US GPM
Maximum flow:	493 US GPM
Resulting head of the pump:	19 ft
Maximum head:	54.14 ft
Type of impeller:	SUPER VORTEX
Max. Particle:	3.15 in
Primary shaft seal:	SIC/SIC
Approvals:	CSA, FM
Curve tolerance:	ANSI/HI11.6:2017 3B2
Cooling jacket (Yes/No):	N
<b>Materials:</b>	
Pump housing:	Cast iron
	EN 5.1301 EN-GJL-250
	ASTM A48-250B
Impeller:	Cast iron
	EN 5.1301 EN-GJL-250
	ASTM A48-250B
Motor:	EN-GJL-250
<b>Installation:</b>	
Range of ambient temperature:	-4 .. 104 °F
Maximum operating pressure:	87.02 psi
Type of inlet connection:	ANSI
Type of outlet connection:	ANSI
Size of inlet connection:	DN 80
Size of outlet connection:	DN 100
Pressure rating for connection:	PN 10
Maximum installation depth:	39.4 ft
Inst dry/wet:	SUBMERGED
Installation:	Vertical
Auto coupling:	97626238
Frame range:	C
<b>Liquid:</b>	
Pumped liquid:	Water
Liquid temperature range:	32 .. 104 °F
Selected liquid temperature:	68 °F
Density:	62.29 lb/ft <sup>3</sup>
<b>Electrical data:</b>	
Power input P1:	6.44 HP
Rated power - P2:	5.5 HP
Mains frequency:	60 Hz
Rated voltage:	3 x 230/460V V
Voltage tolerance:	+10/-10 %
Max starts per hour:	20
Rated current:	16.2/9.05 A
Starting current:	120 A
Cos phi - power factor:	0.78
Cos phi - p.f. at 3/4 load:	0.7
Cos phi - p.f. at 1/2 load:	0.59
Rated speed:	1760 rpm
Motor efficiency at full load:	87.8 %
Motor efficiency at 3/4 load:	87.8 %
Motor efficiency at 1/2 load:	86.2 %
Number of poles:	4



Q = 322 US GPM      H = 19 ft  
 Pumped liquid = Water      Density = 62.29 lb/ft<sup>3</sup>  
 Eta pump = 32 %      Eta pump+motor = 28.1 %  
 Liquid temperature during operation = 68 °F





Company name:

Created by:

Phone:

Date:

17/02/2025

Description	Value
Method of start:	SD
Enclosure class (IEC 34-5):	IP68
Insulation class (IEC 85):	H
Explosion proof:	yes
Built-in motor protection:	THERMAL SWITCH
Power cable type:	SEOOW 600V
Length of power cable:	49.2 ft
Power plug:	C/D
<b>Controls:</b>	
Control box:	not included
Moisture sensor:	with moisture sensors
Water-in-oil sensor:	without water-in-oil sensor
<b>Others:</b>	
Net weight:	294 lb
Gross weight:	338 lb
Country of origin:	US
Custom tariff no.:	8413.70.2004



**CIVIL ENGINEER**  
SUSTAINABILITY ENGINEERING GROUP  
5240 N. 16TH STREET, SUITE 105  
PHOENIX, ARIZONA 85016  
PHONE: 480-237-2507  
ATTN: ALI FAKIH  
EMAIL: ALI@AZSEG.COM

**CLIENT:**  
SMITH GROUP  
455 N. 3RD STREET, SUITE 250  
PHOENIX, AZ 85004  
PHONE: 602-824-5323  
ATTN: OZ WAGNER  
EMAIL: OZ.WAGNER@SMITHGROUP.COM

**PARCEL DESCRIPTION:**  
HIGH-DENSITY, MULTI-USE DEVELOPMENT INCLUDING RETAIL, RESTAURANTS,  
AND UNDERGROUND PARKING.

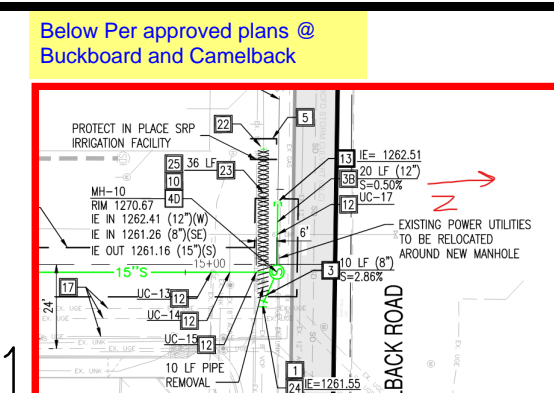
**SITE DATA:**  
APN: 173-41-016B, 173-41-017A, 173-41-006A,  
173-41-005 AND 173-41-004.  
ZONING: C-2-DO/C-3-DO  
LOT SIZE: 3.03 ACRES (131,786 SF)  
FLOOD ZONE: ZONE X (AREA OF MINIMAL FLOOD HAZARD)

**BASIS OF BEARING:**  
THE MONUMENT LINE OF CAMELBACK RD FROM THE WEST QUARTER  
CORNER TO THE CENTER OF SECTION 23 WHICH BEARS SOUTH 89  
DEGREES 31 MINUTES 36 SECONDS EAST.

**BENCHMARK:**  
FOUND BRASS CAP IN HAND HOLE WEST QUARTER CORNER OF SECTION  
23 TOWNSHIP 2 N RANGE 4 EAST AT INTERSECTION OF CAMELBACK RD. &  
SCOTTSDALE RD. ELEV=1,277.52 NAVD 88.

# SCOTTSDALE CITY CENTER PRELIMINARY UTILITY PLAN

7201 E. CAMELBACK ROAD, SCOTTSDALE, AZ 85251  
A PORTION OF THE SOUTHWEST QUARTER OF SECTION 23  
TOWNSHIP 2 N RANGE 4 EAST OF THE GILA AND SALT  
MERIDIAN, MARICOPA COUNTY, ARIZONA



Consultant to field/survey confirm sewer as-built elevation @ Buckboard and Camelback  
ELEVATION SHOWN HERE AT MIN SLOPE AND 6 NEW MANHOLES DESCRIBED.

## NOTES FOR IMPROVEMENT PLANS WHERE THERE IS EXISTING ACP OR PVC PIPE:

ANY WATER LINE PROJECT THAT INVOLVES CONNECTING TO AN EXISTING ACP OR PVC PIPE, REQUIRES SPECIAL ATTENTION. PER DSPM SECTION 6-1.408:

FITTINGS INSTALLED INTO ASBESTOS CEMENT PIPE (ACP) OR PVC PIPE WITHIN 6- FEET OF ANOTHER FITTING OR JOINT WILL REQUIRE THAT SECTION OF PIPE TO BE REMOVED AND REPLACED WITH DUCTILE IRON PIPE (DIP). EXISTING TEES, TAPPING SLEEVES AND RELATED APPURTENANCES THAT ARE NOT UTILIZED BY THE DEVELOPMENT SHALL BE REMOVED BY THE CONTRACTOR. A MINIMUM 3-FOOT SECTION OF PIPE SHALL BE REMOVED, WITH NO LESS THAN 6- FEET REMAINING TO THE NEAREST JOINT. THE REMOVED PIPE SHALL BE REPLACED WITH DIP.

WHEN MORE THAN 3- FEET OF EXISTING ACP OR PVC WATER LINES ARE EXPOSED DURING CONSTRUCTION AND THE BEDDING IS DISTURBED, THE WATER LINE MUST BE REPLACED WITH DIP (MINIMUM CLASS 350) WITH MECHANICAL JOINTS OR FLANGED JOINTS TO 3- FEET PAST THE SIDES OF THE EXPOSED CROSSING TRENCH. REFER TO MAG STD. DET. 403-3.

NO TAPPING SLEEVE AND VALVE SHALL BE USED ON ACP PIPE. VALVES WILL NEED BE CUT INTO ACP PIPE.

DISPOSAL OF MATERIALS CONTAINING ASBESTOS AND/OR LEAD SHALL BE IN ACCORDANCE WITH ALL REGULATIONS, LAWS AND ORDINANCES.

## PRELIMINARY WATER NOTES

- 1 CONNECTION TO EXISTING WATER LINE.
- 2 SAWCUT, REMOVE AND REPLACE EXISTING PAVEMENT.
- 3 PROPOSED TAPPING SLEEVE, VALVE, BOX & COVER.
- 4 PROPOSED FIRE HYDRANT ASSEMBLY.
- 5 6" DUCTILE IRON PIPE. LENGTH PER PLAN.
- 6 8" DUCTILE IRON PIPE. LENGTH PER PLAN.
- 6A 16" DUCTILE IRON PIPE. LENGTH PER PLAN.
- 7 2" COPPER DOMESTIC SERVICE CONNECTION.
- 8 1" IRRIGATION SERVICE CONNECTION.
- 9 BACKFLOW PREVENTION, SIZE TO MATCH WATER METER SIZE.
- 10 DOMESTIC CONNECTION TO BUILDING.
- 11 UTILITY CROSSING.
- 12 PROPOSED FIRE DEPARTMENT CONNECTION.
- 13 FIRE CONNECTION TO BUILDING. INCLUDING DOUBLE CHECK VALVE IN RISER ROOM
- 14 PROPOSED REMOTE FIRE DEPARTMENT CONNECTION.
- 15 PROPOSED FITTING, SIZE & ANGLE PER PLAN.
- 15A PROPOSED TEE, SIZE PER PLAN.
- 16 PROPOSED GATE VALVE WITH VALVE BOX AND COVER.
- 17 PROPOSED REDUCER.
- 18 VERTICAL REALIGNMENT.
- 19 AIR RELEASE VALVE.

## PRELIMINARY SEWER NOTES (ENTIRE ON-SITE SYSTEM IS PRIVATE)

- 1 6" PRIVATE PVC SEWER LINE. LENGTH & SLOPE PER PLAN
- 1A 8" PRIVATE PVC SEWER LINE. LENGTH & SLOPE PER PLAN
- 1B 12" PRIVATE PVC SEWER LINE. LENGTH & SLOPE PER PLAN
- 1C 6" DIP FORCE MAIN. LENGTH PER PLAN
- 2 SEWER CONNECTION TO BUILDING
- 3 REMOVE CAP AND CONNECT TO EXISTING STUB.
- 4 PROPOSED GREASE INTERCEPTOR
- 4A PROPOSED GREASE INTERCEPTOR WITH TRAFFIC RATED COVER
- 5 PROPOSED 4' PRECAST CONCRETE SEWER MANHOLE
- 5A PROPOSED 5' PRECAST CONCRETE SEWER MANHOLE
- 5B PROPOSED 4' POLYMER SEWER MANHOLE (INCLUDING BASE, RISER, AND CONE)
- 6 PROPOSED SEWER CAP
- 7 PROPOSED WETWELL WITH TRAFFIC RATED COVER
- 8 PROPOSED VALVE VAULT WITH TRAFFIC RATED COVER
- 9 PROPOSED CLEANOUT WITH TRAFFIC RATED COVER

## STREET LIGHT & ELECTRICAL NOTES:

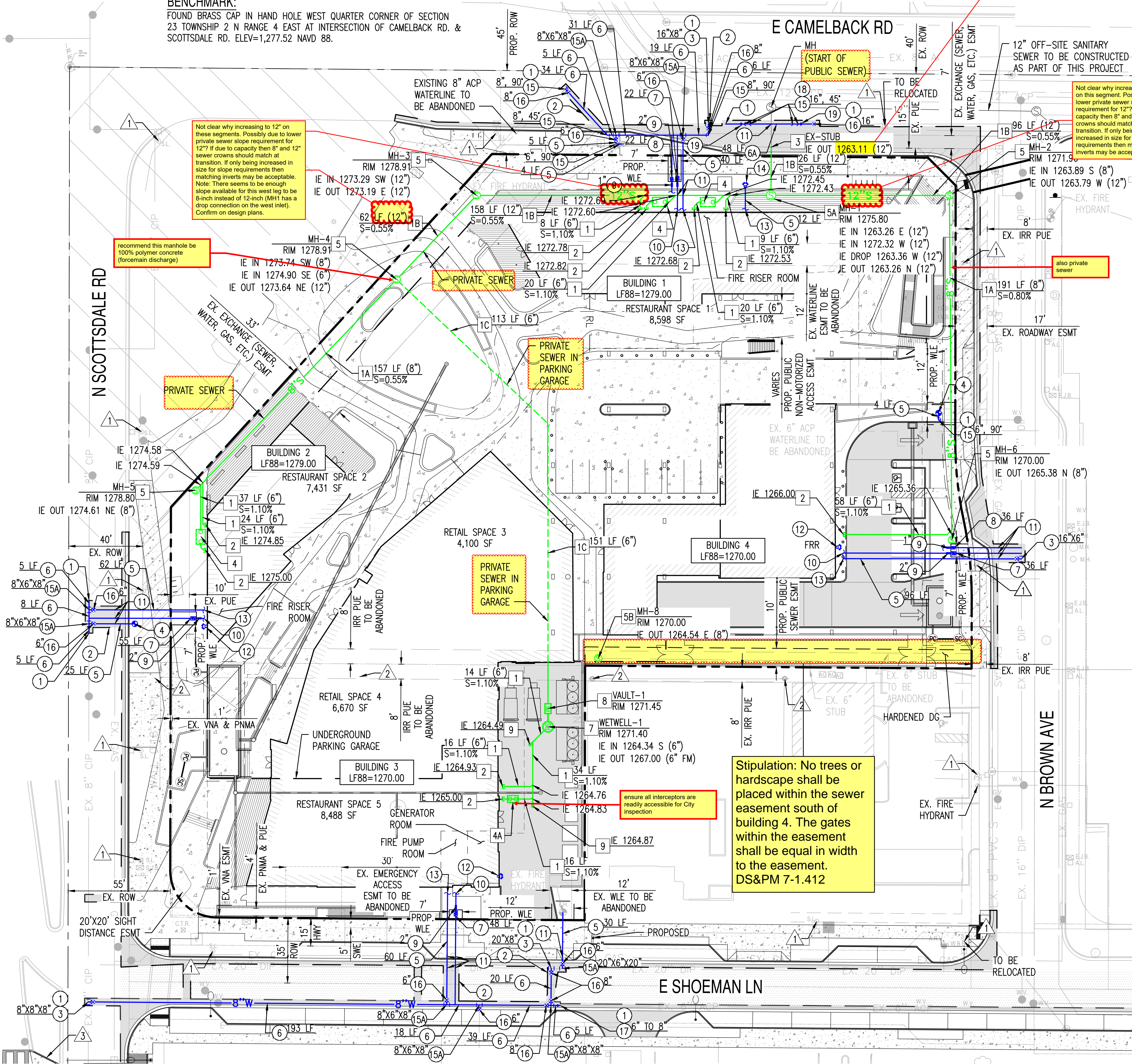
- 1 PRIOR TO ISSUANCE OF PERMITS, STREET LIGHT SHALL BE EVALUATED FOR COMPLIANCE WITH STREET-SCAPE PHASING PLAN AND CITY STANDARDS AND REQUIREMENTS. ANY LIGHTS NOT MEETING THESE STANDARDS OR REQUIREMENTS WILL BE UPGRADED OR REPLACED WITH CONFORMING STREET LIGHTS.
- 2 EXISTING POWER POLES AND LINES TO BE REMOVED. NEW ELECTRIC SERVICE WILL BE INSTALLED UNDERGROUND.
- 3 PROPOSED PEDESTRIAN CROSSING WITH HAWK TRAFFIC CONTROLS. SEE GRADING PLAN FOR DETAILS.

## PROPOSED UTILITY LEGEND:

---	PROPERTY LINE
- - -	EASEMENT LINE
—X—W—	WATER LINE
—X—S—	SEWER LINE
⊙	FIRE HYDRANT
⊙	FDC
⊙	WATER METER
⊙	GATE VALVE
⊙	T.S.V.B.&C.
⊙	BACK FLOW PREVENTER
⊙	REDUCER
⊙	CAP
⊙	BUILDING CONNECTION
⊙	SEWER MANHOLE
⊙	SEWER CLEAN OUT

## EXISTING LEGEND

—EX. S—	SEWER LINE
—EX. W—	WATER LINE
—IRR—	IRRIGATION LINE
—SD—	STORM DRAIN LINE
⊙	CATCH BASIN
⊙	SEWER MANHOLE
⊙	STORM MANHOLE
⊙	WATER VALVE
⊙	WATER METER BOX
⊙	FIRE HYDRANT
⊙	ELECTRIC CABINET
⊙	STREET LIGHT



Not clear why increasing to 12" on these segments. Possibly due to lower private sewer slope requirement for 12" if due to capacity then 8" and 12" sewer crowns should match at transition. If only being increased in size for slope requirements then matching inverts may be acceptable. Note: There seems to be enough slope available for this west leg to be 8-inch instead of 12-inch (MH1 has a drop connection on the west inlet). Confirm on design plans.

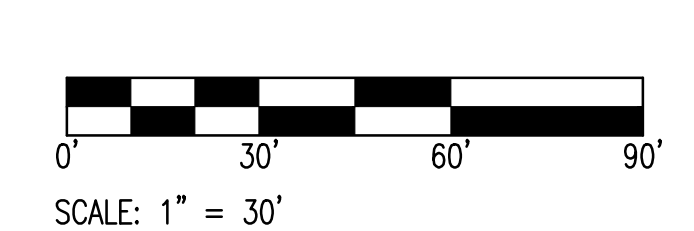
recommend this manhole be 100% polymer concrete (force main discharge)

Not clear why increasing to 12" on this segment. Possibly due to lower private sewer slope requirement for 12" if due to capacity then 8" and 12" sewer crowns should match at transition. If only being increased in size for slope requirements then matching inverts may be acceptable.

Stipulation: No trees or hardscape shall be placed within the sewer easement south of building 4. The gates within the easement shall be equal in width to the easement. DS&PM 7-1.412

ensure all interceptors are readily accessible for City inspection

suggest constant slope up to discharge point to eliminate possibility of air pockets that will corrode DIP. Alternatively HDPE force main could be considered.



PRELIMINARY  
NOT FOR  
CONSTRUCTION

SUSTAINABILITY  
ENGINEERING  
GROUP



SMITHGROUP



PROJECT: SCOTTSDALE CITY CENTER  
LOCATION: 7201 E. CAMELBACK ROAD, SCOTTSDALE, AZ, 85251

DRAWN: MM 06/13/2025  
DESIGNED: MM 07/30/2025  
CHECKED: AK 11/12/2024  
FINAL DC: SC 11/11/2024  
PROJ. MGR.: AK 07/30/2025

DATE: 07/30/2025  
ISSUED FOR: DRB

REVISION NO.: DATE:  
JOB NO.: 22117  
SHEET TITLE:

PRELIMINARY UTILITY PLAN

PAGE NO.: SHEET NO.:  
1 OF 1 C4.00

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