

SEWER BASIS OF DESIGN REPORT FOR NATURAL RESULTS SURGERY CENTER & MEDICAL SPA

Scottsdale, Arizona

March 8th, 2023

PREPARED FOR

Kohan Architecture
490 Post Street, #1135
San Francisco, California 94102

DEVELOPER

Natural Results Plastic Surgery
7943 East Thompson Peak Parkway, #101
Scottsdale, Arizona 85255

SITE ADDRESS

20001 North Scottsdale Road
Scottsdale, Arizona 85255

61-DR-2014 #4

FINAL Basis of Design Report

☒ **APPROVED**

☐ **APPROVED AS NOTED**

☐ **REVISE AND RESUBMIT**



Disclaimer: If approved; the approval is granted under the condition that the final construction documents submitted for city review will match the information herein. Any subsequent changes in the water or sewer design that materially impact design criteria or standards will require re-analysis, re-submittal, and approval of a revised basis of design report prior to the plan review submission.; this approval is not a guarantee of construction document acceptance. For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY apritchard

DATE 4/4/2023

PREPARED BY



4450 north 12th street, #228
phoenix, arizona 85014
CYPRESS # 21.143

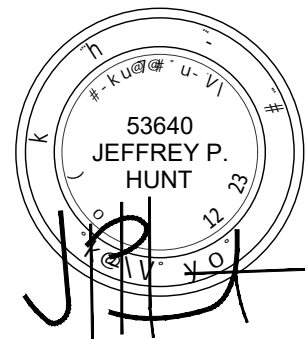
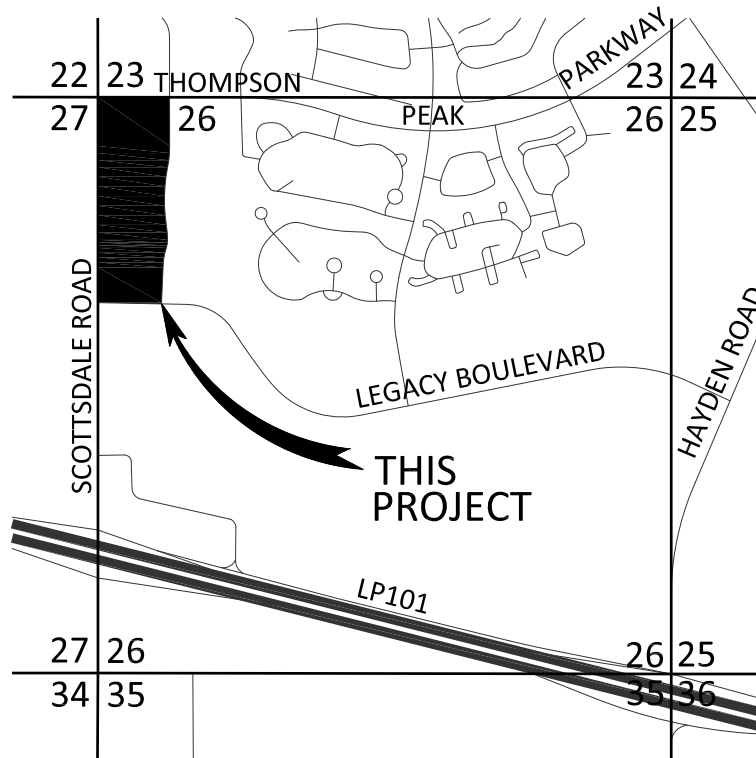


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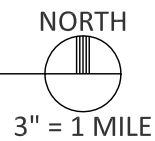
APPENDICES

- A Master Utility Plan
- C Preliminary Utility Plan
- D Sewer Flow Calculation



IN THE NW 1/4 OF THE SW 1/4 OF SECTION 26,
T. 4 N., R. 4 E., G.&S.R.M.,
CITY OF SCOTTSDALE, MARICOPA COUNTY, ARIZONA

LOCATION MAP



INTRODUCTION: PROJECT DESCRIPTION AND LOCATION

The Project is known as 'Natural Results Surgery Center & Medical Spa' and is located at 20001 North Scottsdale Road in Scottsdale, Arizona. The project is also known as Lot 4, or Pad B, of One Scottsdale (herein referred to as the "Master Development").

The proposed project consists of the development of a two-story medical office building to with the required paved parking, utility and drainage improvements, and amenity landscaping.

The utility provider for sewer facilities is the City of Scottsdale.

EXISTING CONDITIONS

Per available utility maps and as-built records, existing sewer mains are located in Scottsdale Road to the west of the project, within the existing Tract B supporting residential development to the east of the Master Development, and another main through the center of the Master Development. A 15" VCP sewer main is tapped from a manhole within Scottsdale Road to the west of the project and supplies sewer service to existing residential development east of the Project.

The Master Development will be constructing public sewer infrastructure to support the Project. At the time of the Project, there will be an existing 6" sewer stub to the site at the east. This existing service connects to the existing 8" PVC sewer main in the center of the Master Development, ultimately continuing out to the 15" VCP sewer main in Scottsdale Road. Refer to Appendix A for Master Utility Plan.

PROPOSED CONDITIONS

The Project consists of developing a pad site with a new 2-story medical office and spa building. The building will have a footprint of 17,000 square feet. Conservatively, the total building use will be split evenly between office use and spa use. The new building will connect to the existing 6" service lateral installed by the Master Development with a minimum slope of 1.04%. This is anticipated to provide adequate sizing to supply building. Refer to Appendix B for Preliminary Utility Plan.

REQUIRED COMPUTATIONS

EXISTING SEWER DEMAND:

Average Day Demand (Commercial/Retail): $0.5 \text{ GPD/SF} \times 15,774 \text{ SF} = 7,887 \text{ GPD}$

Peak Demand: $3 \times 7,887 = 23,661$ GPD

PROPOSED SEWER DEMAND:

Average Day Demand [PER CITY OF SCOTTSDALE DSPM 2018 – CH. 7]

(Spa): $0.8 \text{ GPD/SF} \times 10,560 \text{ SF} = 8,448$ GPD

(Office): $0.4 \text{ GPD/SF} \times 6,440 \text{ SF} = 2,576$ GPD

Total: 11,024 GPD / 7.66 GPM

Peak Demand:

(Spa): $8,448 \times 3.5 = 29,568$ GPD

(Office): $2,576 \times 3.0 = 7,728$ GPD

Peak Total: 37,296 GPD / 25.9 GPM

The minimum design velocity is greater than 2.5 ft/second and maximum d/D ratio is 0.65 per the Scottsdale DSPM. With a minimum slope of 1.1% and the above parameters, the proposed sewer line shall have a full flow velocity of 3.41 ft/second and a partial flow d/D ratio of 0.21. Thus, the proposed sewer service shall be sufficient to serve the new development. Refer to Appendix C for Sewer Flow Calculation.

CONCLUSION

CYPRESS respectfully submits this report as the Wastewater Design Report for the proposed Natural Results Surgery Center & Medical Spa Development. The proposed wastewater system shall be designed in accordance with ADEQ, International Building Code, and the City of Scottsdale standards.

Appendix A

Maser Utility Plan

SCOTTSDALE ROAD

WATER & FIRE LINE NOTES

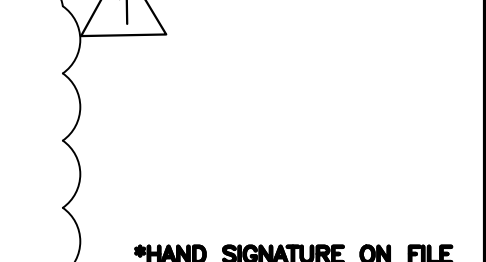
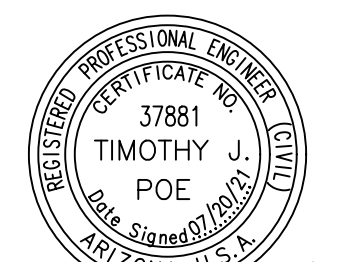
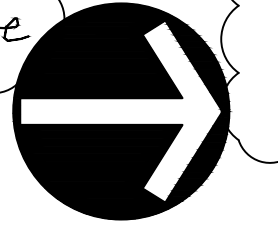
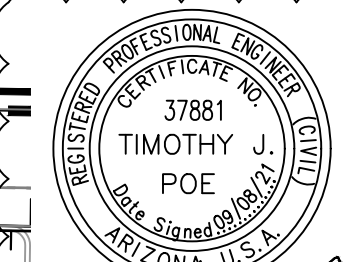
- CONNECT TO EXISTING WATER LINE STUB. CONTRACTOR TO VERIFY LOCATION AND SIZE PRIOR TO START OF CONSTRUCTION AND NOTIFY ENGINEER IF DIFFERENT THAN SHOWN ON PLANS.
- INSTALL 8" DUCTILE IRON PIPE-PRESSURE CLASS 350 WRAPPED IN HIGH DENSITY POLYETHYLENE IN ACCORDANCE WITH M.A.G. STD. SPEC. 610, AND A.W.W.A. C105. LENGTHS AS INDICATED ON PLAN. MEG-A-LUG JOINT RESTRAINTS PER M.A.G. STD. DET. 303-1 & 303-2.
- INSTALL 8" VALVE, BOX & COVER PER M.A.G. STD. DET. 391-1, TYPE "C".
- INSTALL 12"x8" FLANGED CROSS WITH MECHANICAL JOINTS & MEG-A-LUGS. MEG-A-LUG JOINT RESTRAINTS PER M.A.G. STD. DET. 303-1 & 303-2.
- INSTALL FIRE HYDRANT COMPLETE PER M.A.G. STD. DET. 360 & 362 WITH MEG-A-LUG JOINT RESTRAINTS PER M.A.G. STD. DET. 303-1 & 303-2.
- INSTALL 6" DUCTILE IRON PIPE-PRESSURE CLASS 350 WRAPPED IN HIGH DENSITY POLYETHYLENE IN ACCORDANCE WITH M.A.G. STD. SPEC. 610, AND A.W.W.A. C105. LENGTHS AS INDICATED ON PLAN. MEG-A-LUG JOINT RESTRAINTS PER M.A.G. STD. DET. 303-1 & 303-2.
- INSTALL 6" VALVE, BOX & COVER PER M.A.G. STD. DET. 391-1, TYPE "C".
- INSTALL 8"x6" FLANGED TEE WITH MECHANICAL JOINTS & MEG-A-LUGS. MEG-A-LUG JOINT RESTRAINTS PER M.A.G. STD. DET. 303-1 & 303-2.
- INSTALL 4" DUCTILE IRON FIRE LINE PIPE-PRESSURE CLASS 350 WRAPPED IN HIGH DENSITY POLYETHYLENE IN ACCORDANCE WITH M.A.G. STD. SPEC. 610, AND A.W.W.A. C105. LENGTHS AS INDICATED ON PLAN. MEG-A-LUG JOINT RESTRAINTS PER M.A.G. STD. DET. 303-1 & 303-2.
- INSTALL 4" VALVE, BOX & COVER PER M.A.G. STD. DET. 391-1, TYPE "C".
- INSTALL 8"x4" FLANGED TEE WITH MECHANICAL JOINTS & MEG-A-LUGS. MEG-A-LUG JOINT RESTRAINTS PER M.A.G. STD. DET. 303-1 & 303-2.
- INSTALL 3" DUCTILE IRON PIPE-PRESSURE CLASS 350 WRAPPED IN HIGH DENSITY POLYETHYLENE IN ACCORDANCE WITH M.A.G. STD. SPEC. 610, AND A.W.W.A. C105. LENGTHS AS INDICATED ON PLAN. MEG-A-LUG JOINT RESTRAINTS PER M.A.G. STD. DET. 303-1 & 303-2.
- FUTURE 3" WATER METER AND VAULT PER PHASE II HOTEL PLANS.
- INSTALL 8"x3" FLANGED TEE WITH MECHANICAL JOINTS & MEG-A-LUGS. MEG-A-LUG JOINT RESTRAINTS PER M.A.G. STD. DET. 303-1 & 303-2.
- INSTALL 2" TYPE "K" SOFT COPPER WATER PIPE. LENGTH AS NOTED ON PLANS.
- INSTALL 2" 90° BEND.
- NEW 2" LANDSCAPE IRRIGATION METER & SERVICE PER C.O.S. STD. DET. 2330.
- INSTALL 2" WATER METER STOP, BOX AND COVER PER C.O.S. STD. DET. 2330. METER INSTALLED PER SEPARATE FUTURE PLANS.
- INSTALL 2" SERVICE SADDLE PER C.O.S. STD. DET. 2330.
- CAP AND STUB WATERLINE FOR FUTURE EXTENSION PER M.A.G. STD. DET. 390 TYPE "B".
- VERTICALLY REALIGN WATERLINE PER C.O.S. STD. DET. 2370. THRUST BLOCKING PER M.A.G. STD. DET. 380 & 381.
- INSTALL 8" 90° BEND.
- INSTALL 8"x8" FLANGED TEE WITH MECHANICAL JOINTS & MEG-A-LUGS. MEG-A-LUG JOINT RESTRAINTS PER M.A.G. STD. DET. 303-1 & 303-2.
- INSTALL CURB STOP WITH FLUSHING PIPE PER M.A.G. STD. DET. 390.
- INSTALL 6"x4" FLANGED TEE WITH MECHANICAL JOINTS & MEG-A-LUGS. MEG-A-LUG JOINT RESTRAINTS PER M.A.G. STD. DET. 303-1 & 303-2.
- INSTALL 3" VALVE, BOX & COVER PER M.A.G. STD. DET. 391-1, TYPE "C".
- INSTALL AIR RELEASE VALVE PER C.O.S. STD. DET. 2348.

SEWER NOTES

- INSTALL 5" DIA. SEWER MANHOLE PER M.A.G. STD. DET. 420-1. RIM AND INVERT AS INDICATED ON PLANS.
- INSTALL 8" PVC SDR-35 PRIVATE SEWER LINE. LENGTH AND SLOPE AS INDICATED ON PLANS.
- INSTALL 6" PVC SDR-35 PRIVATE SEWER LINE. LENGTH AND SLOPE AS INDICATED ON PLANS.
- INSTALL SEWER CLEANOUT PER M.A.G. STD DET 440-3.
- INSTALL 8" PVC SDR-35 SEWER TAP FOR FUTURE CONNECTION. INVERT PER PLAN.
- INSTALL 6" PVC SDR-35 SEWER TAP FOR FUTURE CONNECTION. INVERT PER PLAN.
- INSTALL SEWER CONCRETE ENCASEMENT FOR PIPE CROSSING PER M.A.G. STD. DET. 404-3.
- INSTALL 10" PVC SDR-35 PRIVATE SEWER LINE. LENGTH AND SLOPE AS INDICATED ON PLANS.
- CONSTRUCT CONCRETE ENCASEMENT CAP OVER TOP HALF OF EXISTING SEWER PER M.A.G. STD. DET. 404-3, MODIFIED.

SLEEVE NOTES

- INSTALL 4" PVC SCH-40 SLEEVE FOR FUTURE GAS LINE WITH MINIMUM 2' OF COVER. DETECTABLE WARNING TAPE IS REQUIRED FOR ALL GAS (YELLOW) LINE 12" ABOVE SLEEVE AND DOUBLE STRIPS AT WATERLINE CROSSINGS PER C.O.S. STD. SPECIFICATION 601.3.5 & 601.3.6. BACKFILL SHALL BE IN ACCORDANCE WITH M.A.G. STANDARD SPECIFICATIONS.
- ADDITIONAL NOTES:
- MINIMUM 3' OF COVER FOR 8" AND LESS WATERLINES (UNLESS NOTED OTHERWISE).
 - DETECTABLE WARNING TAPE IS REQUIRED FOR ALL WATER (BLUE) AND SEWER (GREEN) LINE 12"-18" BELOW SUBGRADE.
 - STATION & OFFSETS BASED ON THE INTERSECTION OF SCOTTSDALE ROAD AND THOMPSON PEAK PARKWAY, WHERE STA=0+00 S.



4" HAND SIGNATURE ON FILE

Call at least two full working days before you begin excavation.

ARIZONA 811

Dial 8-1-1 or 1-800-STAKE-IT (762-5348)

In Maricopa County: (602) 263-1100

ONE SCOTTSDALE - PHASE 1
CIVIL IMPROVEMENT PLANS
SCOTTSDALE, AZ

UTILITY PLAN

DRAWING NO. **C501**

SHEET 23 OF 37

DATE: 05/10/21
DWG SCALE: 1"=20'
PROJECT NO: 180-168
APPROVED BY: [Signature]
TJP

12-SA-2021

7-PP-2007#3 2062-20

REVISION RECORD	
NO	DATE
1	07/20/21
2	08/04/21

DESCRIPTION	
1	FIELD CHANGES
2	ADD GAS LINE ELEVATIONS

Civil & Environmental Consultants, Inc.

11811 N. Tatum Blvd., Suite 3057 - Phoenix, AZ 85028

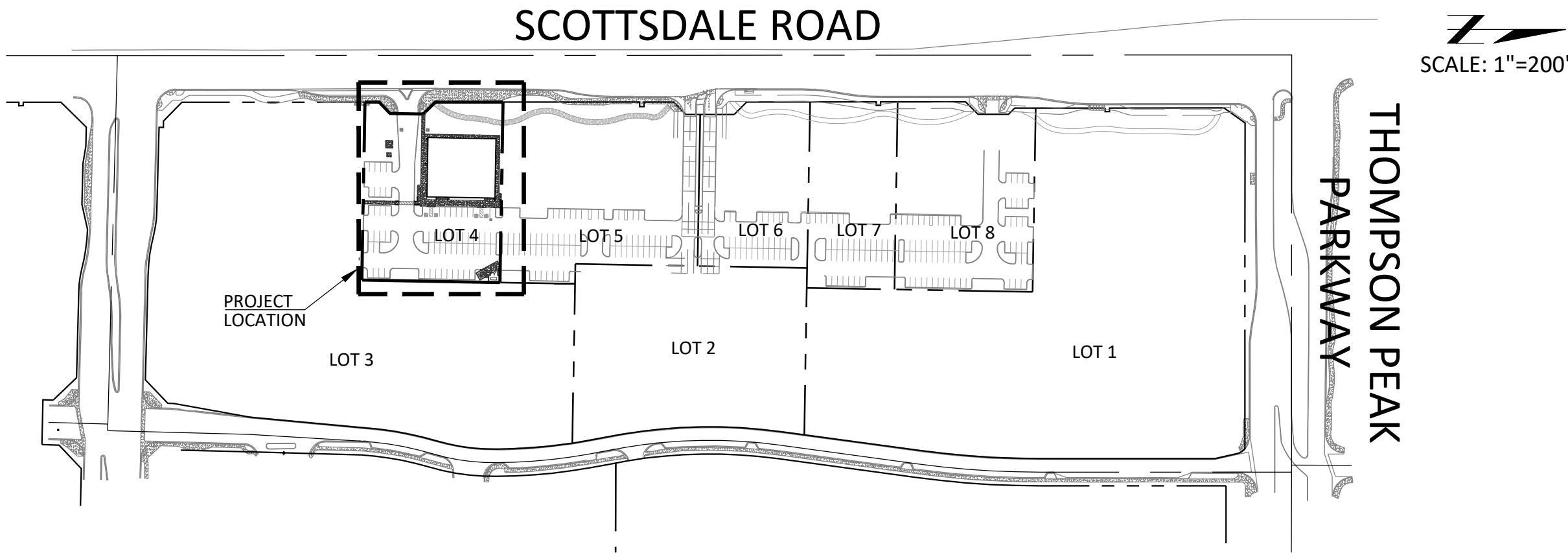
Ph: 602.760.2324 • 877.231.2324 • Fax: 602.760.2330

www.cedinc.com

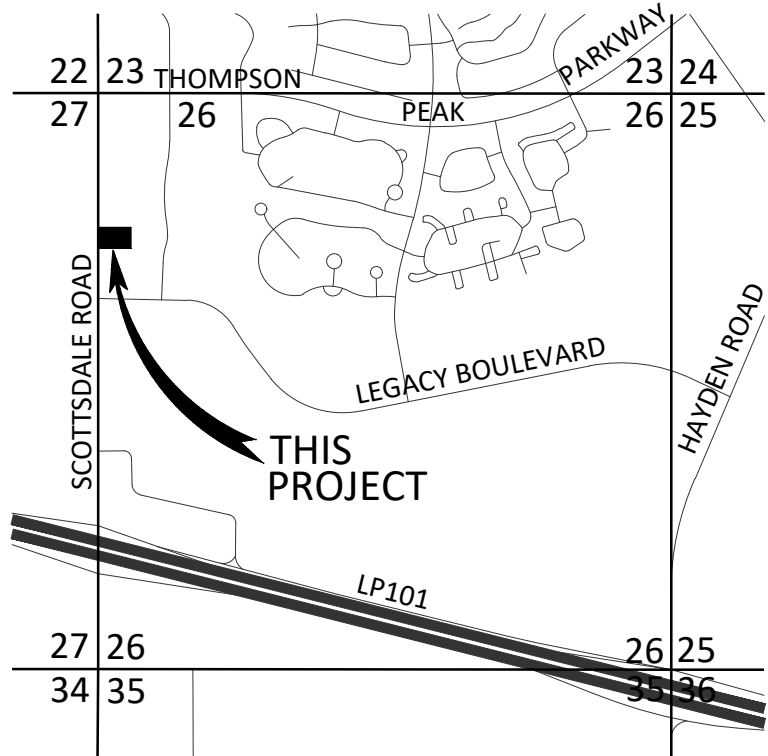
Appendix B
Preliminary Utility Plan

PRELIMINARY IMPROVEMENT PLAN for
NATURAL RESULT SURGERY CENTER & MEDICAL SPA

SEC THOMPSON PEAK PARKWAY AND SCOTTSDALE ROAD PHOENIX, ARIZONA
A PORTION NORTHEAST QUARTER OF SECTION 19, TOWNSHIP 20 NORTH, RANGE 21 WEST OF THE
GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA

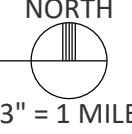


PROJECT OVERVIEW



IN THE NW 1/4 OF THE SW 1/4 OF SECTION 26,
T. 4 N., R. 4 E., G. & S. R. M.,
CITY OF SCOTTSDALE, MARICOPA COUNTY, ARIZONA

LOCATION MAP



PROJECT INFORMATION

PROJECT DESCRIPTION:
THE PROJECT CONSISTS OF THE CONSTRUCTION OF A TWO-STORY MEDICAL BUILDING ON AN EXISTING PAD SITE WITHIN THE ONE SCOTTSDALE MASTER DEVELOPMENT.

ADDRESS:
20001 NORTH SCOTTSDALE ROAD
SCOTTSDALE, ARIZONA 85255

APN: 215-05-010 (OVERALL DEVELOPMENT PARCEL)

ZONING: PRC, PCD

PAD B AREA: 63,280 SF (1.45 AC)
DISTURBED AREA: 20,550 SF (0.47 AC)

SURVEY NOTES

- THE SURVEY FOR THIS PROJECT WAS PERFORMED BY:
SURVEY INNOVATION GROUP, INC.
7301 EAST EVANS ROAD
SCOTTSDALE, ARIZONA 85260
PH: 623-869-0223
CONTACT: JASON SEGNERI, R.L.S.
- THE BASIS OF BEARINGS FOR THIS PROJECT IS THE NORTH LINE OF THE NORTHWEST QUARTER OF SEC 26 AS SHOWN IN BOOK 1115, PAGE 41 MARICOPA COUNTY RECORDS. SAID LINE BEARING S 89°57'38" E.
- THE BASIS OF ELEVATION FOR THIS PROJECT IS THE MARICOPA COUNTY 4-INCH MC ENG DEPT BRASS CAP IN HAND HOLE AT THE INTERSECTION OF SCOTTSDALE ROAD AND THOMPSON PEAK PARKWAY, CITY OF SCOTTSDALE GPS POINT #8660, AN ELEVATION OF 1662.725' (NAVD 88).

BENCHMARK

THE BENCHMARK USED FOR THIS PLAN IS THE MARICOPA COUNTY 4-INCH MC ENG DEPT BRASS CAP IN HAND HOLE AT THE INTERSECTION OF SCOTTSDALE ROAD AND THOMPSON PEAK PARKWAY, CITY OF SCOTTSDALE GPS POINT #8660, AN ELEVATION OF 1662.725' (NAVD 88).

LEGAL DESCRIPTION

LOT 4 OF THE ONE SCOTTSDALE FINAL PLAT, BEING REPLAT OF LOT 3, OF THE REPLAT PARCEL 1 OF ONE SCOTTSDALE, ACCORDING TO THE PLAT OF RECORD IN THE OFFICE OF THE COUNTY RECORDER OF MARICOPA COUNTY, ARIZONA, RECORDED IN BOOK 1115, PAGE 41.

DRAINAGE STATEMENT

-SITE IS IN A SPECIAL FLOOD HAZARD AREA - NO
-OFFSITE FLOWS AFFECT THIS SITE - NO
-PER THE MASTER DRAINAGE REPORT (FINAL DRAINAGE REPORT FOR ONE SCOTTSDALE, CEC, JANUARY 21, 2021), THE ONE SCOTTSDALE DEVELOPMENT IS ONLY REQUIRED TO PROVIDE FIRST FLUSH STORMWATER TREATMENT. THIS TREATMENT IS PROVIDED FOR THE DEVELOPMENT VIA VORTEX STORMWATER QUALITY STRUCTURES BY THE OVERALL ONE SCOTTSDALE DEVELOPMENT AND THIS PROJECT IS NOT REQUIRED TO PROVIDE ANY ADDITIONAL STORMWATER INFRASTRUCTURE.
-EXTREME STORM OUTFALLS THE SITE AT THE SOUTH DRIVEWAY AT THE ELEVATION OF 1641.65.

FLOODPLAIN INFORMATION

ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP PANEL NUMBER 04013C1760, DATED NOVEMBER 04, 2015 THE PARCEL IS LOCATED IN THE ZONE X AREA, WHICH IS DEFINED AS AREAS OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD.

LEGEND

---	PROJECT RIGHT-OF-WAY	⊙	NEW SEWER CLEANOUT
---	EXISTING RIGHT-OF-WAY	W	NEW WATER METER
---	PROJECT PROPERTY LINE	BF	NEW BACKFLOW PREVENTER
---	EXISTING PROPERTY LINE	↔	NEW FIRE CONNECTION
---	ROADWAY CENTERLINE	○	SURVEY MONUMENT AS NOTED
---	EXISTING EASEMENT	• (99.99P)	SPOT ELEV. (EXIST. GRADE)
---	EXISTING CONTOUR	• (99.99P)	SPOT ELEV. (PER SEPARATE PLAN)
---	NEW CONTOUR	• 99.99P	SPOT ELEV. (NEW GRADE)
---	EXISTING CONCRETE	ROW	RIGHT-OF-WAY
---	NEW ASPHALT	B/C	BACK OF CURB
---	NEW CONCRETE	R	RADIUS
---	NEW WALL	P	PAVEMENT (ASPHALT)
---	EXISTING CURB	C	CONCRETE
---	EXISTING PAINT STRIPE	G	GUTTER
---	NEW CURB	TC	TOP OF CURB
---	NEW PAINT STRIPE	FG	FINISHED GRADE
---	NEW RAILING	GB	GRADE BREAK
---	EXISTING STORM DRAIN PIPE	FFE	FINISHED FLOOR ELEVATION
---	EXISTING SEWER LINE		
---	EXISTING WATER LINE		
---	NEW SEWER LINE		
---	NEW WATER LINE		
---	NEW FIRE SERVICE		
---	EXISTING SEWER MANHOLE		
---	EXISTING SEWER CLEANOUT		
---	EXISTING SEWER STUB		
---	EXISTING WATER STUB		
---	EXISTING WATER VALVE		
---	EXISTING FIRE HYDRANT		
---	EXISTING AIR RELEASE VALVE		

OWNER/DEVELOPER

NATURAL RESULTS PLASTIC SURGERY
7930 EAST THOMPSON PEAK PARKWAY, #101
SCOTTSDALE, ARIZONA 85255
PH: 480-418-5300
ATTN: DR. CARLOS MATA

CIVIL ENGINEER

CYPRESS CIVIL DEVELOPMENT
4450 NORTH 12TH STREET, #228
PHOENIX, ARIZONA 85014
PH: 623-282-2498
ATTN: JEFF HUNT, PE

ARCHITECT

KOHAN ARCHITECTURE
490 POST STREET, #1135
SAN FRANCISCO, CALIFORNIA 94102
PH: 415-348-0008
ATTN: MARZI EMAMI GHOREISHI, AIA

UTILITIES

WATER: CITY OF SCOTTSDALE
SEWER: CITY OF SCOTTSDALE
ELECTRIC: APS
GAS: SOUTHWEST GAS
TELEPHONE: CENTURYLINK
CABLE: COX COMMUNICATIONS

SHEET INDEX

- COVER SHEET
- GRADING & DRAINAGE PLAN
- UTILITY PLAN

CYPRESS
CIVIL



4450 north 12th street
suite 228
phoenix, arizona 85014
p: 623.282.2498
e: jphunt@cypresscivil.com

NO.	DATE	REVISION

PRELIMINARY IMPROVEMENT PLAN for
NATURAL RESULT SURGERY CENTER & MEDICAL SPA
SEC THOMPSON PEAK PKWY AND SCOTTSDALE RD SCOTTSDALE, ARIZONA

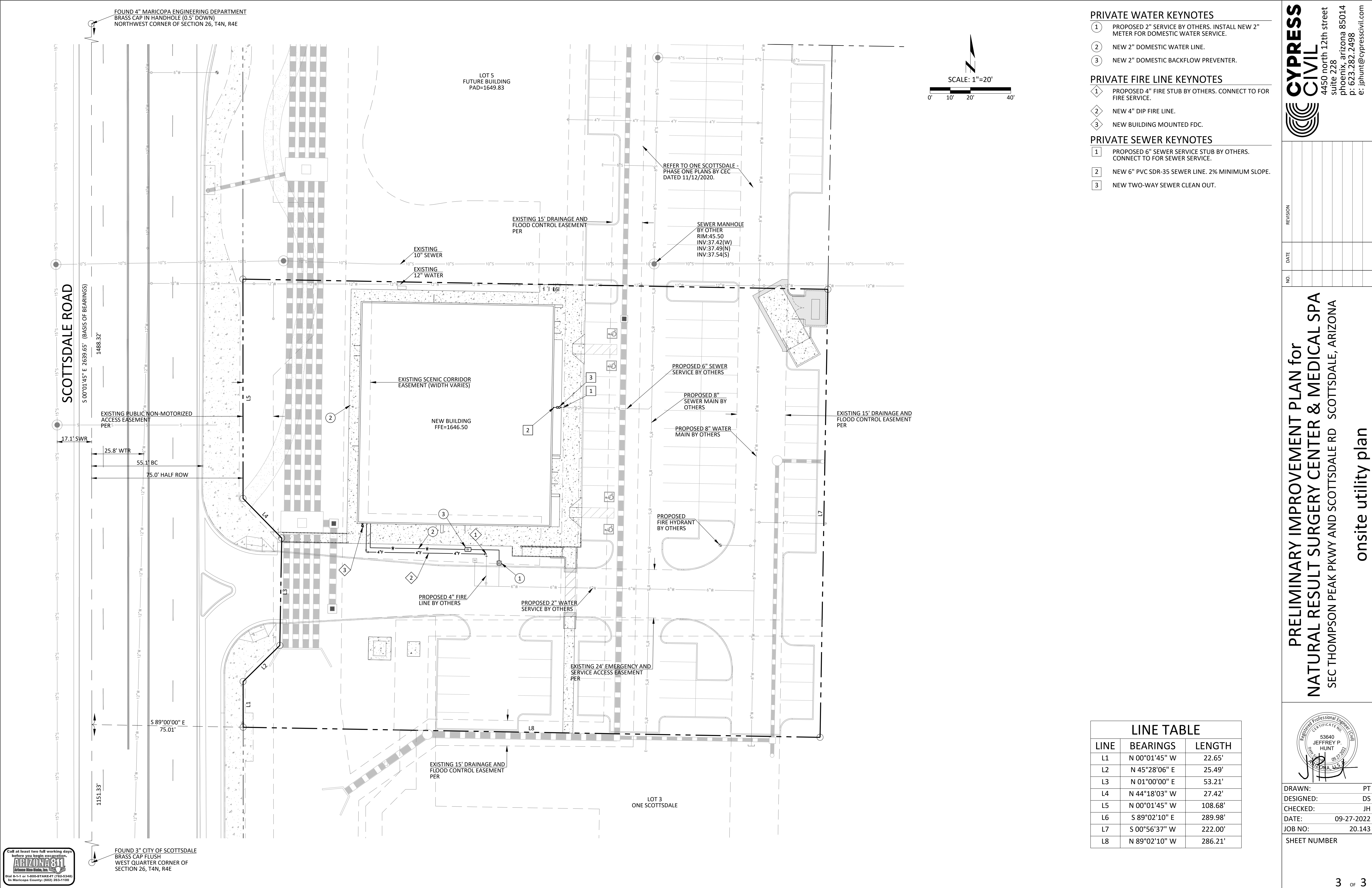
cover



DRAWN:	PT
DESIGNED:	DS
CHECKED:	JH
DATE:	09-27-2022
JOB NO:	20.143

SHEET NUMBER





- PRIVATE WATER KEYNOTES**
- 1 PROPOSED 2" SERVICE BY OTHERS. INSTALL NEW 2" METER FOR DOMESTIC WATER SERVICE.
 - 2 NEW 2" DOMESTIC WATER LINE.
 - 3 NEW 2" DOMESTIC BACKFLOW PREVENTER.
- PRIVATE FIRE LINE KEYNOTES**
- 1 PROPOSED 4" FIRE STUB BY OTHERS. CONNECT TO FOR FIRE SERVICE.
 - 2 NEW 4" DIP FIRE LINE.
 - 3 NEW BUILDING MOUNTED FDC.
- PRIVATE SEWER KEYNOTES**
- 1 PROPOSED 6" SEWER SERVICE STUB BY OTHERS. CONNECT TO FOR SEWER SERVICE.
 - 2 NEW 6" PVC SDR-35 SEWER LINE. 2% MINIMUM SLOPE.
 - 3 NEW TWO-WAY SEWER CLEAN OUT.

LINE TABLE		
LINE	BEARINGS	LENGTH
L1	N 00°01'45" W	22.65'
L2	N 45°28'06" E	25.49'
L3	N 01°00'00" E	53.21'
L4	N 44°18'03" W	27.42'
L5	N 00°01'45" W	108.68'
L6	S 89°02'10" E	289.98'
L7	S 00°56'37" W	222.00'
L8	N 89°02'10" W	286.21'

Call at least two full working days before you begin excavation.

ARIZONA811

811 or 1-800-4AN-ARIZONA (1-800-426-2746)

In Maricopa County (602) 263-1100

FOUND 3" CITY OF SCOTTSDALE
BRASS CAP FLUSH
WEST QUARTER CORNER OF
SECTION 26, T4N, R4E

FOUND 4" MARICOPA ENGINEERING DEPARTMENT
BRASS CAP IN HANDHOLE (0.5' DOWN)
NORTHWEST CORNER OF SECTION 26, T4N, R4E

CYPRESS CIVIL

4450 north 12th street
suite 228
phoenix, arizona 85014
p: 623.282.2498
e: jphunt@cypresscivil.com

REVISION

DATE

NO.

PRELIMINARY IMPROVEMENT PLAN for
NATURAL RESULT SURGERY CENTER & MEDICAL SPA
SEC THOMPSON PEAK PKWY AND SCOTTSDALE RD SCOTTSDALE, ARIZONA

onsite utility plan

REGISTERED PROFESSIONAL ENGINEER
53640
JEFFREY P. HUNT
09-27-2022
ARIZONA, U.S.A.

DRAWN: PT
DESIGNED: DS
CHECKED: JH
DATE: 09-27-2022
JOB NO: 20.143
SHEET NUMBER

3 OF 3

Appendix C

Sewer Flow Calculation



SITE CONSULTING
SURVEY
SITE ENGINEERING

Sewer Design Report Calculations

ONE SCOTTSDALE MEDICAL SPA

Sewage Flow Per Day (From Table 1, A.A.C. Title 18, Chapter 9)

Total Flow (GPD)	11,024
Upstream Population	
Dry Peaking Factor	
Wet Weather Peaking Factor	1
Dry Peak Flow (GPD)	37,296
Wet Peak Flow (GPD)	37,296

$$Q = \frac{1.49}{n} AR^{2/3} S^{1/2}$$

Where:

Q = flow in cfs

n = Manning's Roughness Coefficient

A = Cross sectional area of flow

R = hydraulic radius

S = pipe slope

SYSTEM MINIMUM SLOPE

$n =$	0.013
Pipe diameter (in) =	6
Pipe Slope (ft/ft) =	0.011

Full Flow*

Depth of flow (in) =	4.50
ϕ (radian) =	4.19
Area (in ²) =	22.75
Wetted Perimeter (in) =	12.57
Hydraulic Radius (in) =	1.81
Velocity (ft/sec) =	3.41
d/D ratio =	0.75
Pipe Capacity (GPD)	347,745

Design Flow

Depth of flow (in) =	1.27
ϕ (radian) =	1.91
Area (in ²) =	4.35
Wetted Perimeter (in) =	5.73
Hydraulic Radius (in) =	0.76
Velocity (ft/sec) =	1.91
d/D ratio =	0.21

*Full Flow refers to d/D of 0.75 per AAC R18-9-E301.4.01.D.2.e