

**Preliminary Sewer Design Report**

**"Minnezona Condominiums"  
7314 E Minnezona  
Scottsdale, Arizona 85250**

July 27, 2022

Prepared By:

**g**-mar engineering consultants,  
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Job No. 21-08-010-00

Final basis of design  
report required prior  
to DRB approval.  
DSPM 7-1.201.B.

**PRELIMINARY Basis of Design  
Report**

- ACCEPTED
- ACCEPTED AS NOTED
- REVISE AND RESUBMIT



Disclaimer: If accepted; the preliminary approval is granted under the condition that a final basis of design report will also be submitted for city review and approval (typically during the DR or PP case). The final report shall incorporate further water or sewer design and analysis requirements as defined in the city design standards and policy manual and address those items noted in the preliminary review comments (both separate and included herein). The final report shall be submitted and approved prior to the plan review submission.  
For questions or clarifications contact the Water Resources Planning and Engineering Department at 480-312-5685.

BY apritchard

DATE 8/23/2022

Prepared for:

Kontexture  
3334 N 20<sup>th</sup> Street  
Phoenix, Arizona 85016  
Contact: Mark Cunningham

The City of Scottsdale  
Permit # 45-DR-2021

Signature:



Geoffrey A. Markowski, PE

July 27, 2022  
Date:

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## **Introduction:**

The purpose of this Sewer Design Report is to provide an analysis of the proposed sewer line and services for the new multi-family site located at 7314 E Minnezona, Scottsdale Arizona. The water design for the site shall comply with the water and waste water requirements of the City of Scottsdale. The report and analysis calculations are based on the Arizona Administrative Code Title 18, Chapter 9-E301, the City of Scottsdale Water Services Department Design Standards Manual, dated, January, 2020, the current adopted City of Scottsdale Fire Code and the 2018 Uniform Plumbing Code (UPC).

## **Property Description:**

The legal description of the site is the original lots 38 and 39 of the Final Plat for "Daryl Estates – Unit 2" according to Book 61 of Maps, Page 48, records of Maricopa County, Arizona. This development site is the two lots which will be combined with a Condominium Plat. Currently, each lot has an existing building structure on it with multi-family units. Both lots will be demolished, along with existing pools, hardscaping and landscaping. Refer to Appendix A for Aerial Photographs and Vicinity Map.

The site is currently zone R-5 for high density residential development.

## **Project Description:**

The development of this lot will consist of the construction of a three (3) new buildings. The north building will have five (5) living units. The south two (2) buildings will have two (2) living units each for a total of nine (9) individual living units on the property. Each unit will have a separate domestic service and sewer service to the unit. All units will have a 4-inch service stubs that exit the buildings. The units along the north end will stub out to an existing 8-inch main in the existing alley. The four units along the Minnezona frontage will extend out to 6-inch service stubs at the right-of-way line. From there, the new 6-inch service connections will stub in to a new 8-inch sewer main that will be installed within the Minnezona right-of-way. This new main will extend west approximately 285-feet to the existing sewer main in North 73<sup>rd</sup> Street. All sewer pipe will be installed per Plumbing Code requirements and City standards on private property, and per the City Design Standards and Policies Manual for off-site public mains and manholes. Refer to Appendix B for On-site Utility Plans to see connection location and detailing.

## **Design Flows:**

Per City of Scottsdale Design Standards and Policies Manual, Chapter 7, Section 7-1.403A, residential and multi-family design for sewer main between 6-inches and 12-inches, the design flow used would be 100-gallons per capita per day and with a peaking factor of 4. Based on the capacity requirements for the subject property that will be constructing and using the new sewer main service, the total persons at an average daily basis occupying the residences will be approximately 2.5 per dwelling unit. There are nine (9) units on the site. Using 100-gallons per capita per day would require a capacity usage of 2250-gallons per day (gpd). With the peak factor of 4, the peak discharge from the subject residence to the new sewer main will be approximately 9,000-gpd. Refer to Appendix D for Architectural Site Plan showing new building footprints with uses and fixtures.

4" on utility plan. 4" acceptable per unit per DSPM 7-1.409

THAT IS FINE WE CAN ADJUST TO 4" PRIOR TO CD APPROVAL!

## Basis of Design:

As mentioned, the five units along the north end of the site will provide new sewer service taps in to the existing 8-inch main located in the existing alley. Each building will have its own service tap. The new four units along Minnezona will also have new 6-inch service taps from the right-of-way to the new 8-inch sewer main being constructed within Minnezona right-of-way. The on-site sewer service taps will be placed at 1.04% per IPC 2015 standards. The new 8-inch main for Minnezona will be constructed at a slope of 0.52% from a new 48-inch manhole located near the southeast corner of the site. It will continue at this slope, west, to a new 60-inch manhole that will be installed to straddle over the existing 8-inch main located in 73<sup>rd</sup> Street.

The new 6-inch sewer services will be analyzed for its capacity relative to the new on-site sewer demand. Using Manning's formula to determine the maximum flow rate capacity for the new 6-inch pipe, with a design slope of 0.0104 ft./ft., and a 'n' value of 0.013, the flow is equal to: 148,653-gpd, at a d/D of 50% with a velocity of 2.34 feet per second (fps). The maximum Average Daily Flow generated by the site of 9,000-gpd, is approximately 6.05-percent of the 50% flow capacity of the new 6-inch sewer service lines that will tie in to both the existing 8-inch sewer main in the alley and the new sewer main in Minnezona. Refer to Appendix C for calculations of partially full sewer service and main pipe.

Likewise, the 8-inch sewer main at a slope of 0.0052 ft/ft, and an 'n' value of 0.013, the maximum flow is equal to 219,748-gpd, at a d/D of 50% with a velocity of 1.96-fps. Per DSPM Section 7-1.404, full pipe flow velocity of the pipe is at 5.01-fps with a total flow of 1,131,055-gpd. Refer to Appendix C for calculations of partially full sewer service and main pipe. The new demand of the development has a minimal affect and impact on the existing sewer system around the site as well as minimal impact to the new sewer main extension in Minnezona. No additional analysis is needed.

## Conformance with Master Plans:

N/A

## Environmental Issues:

No known past or current environmental issues exist on this property or in the existing 16-foot alley where the new sewer line will tie in to the existing sewer main.

## Conclusion:

The new 6-inch sewer services that will tie in to the new and existing 8-inch mains located in the alley to the north as well as in Minnezona to the south can adequately handle, the new demand flows from the new residential improvements to the subject property. The demand flow for the new 8-inch sewer main is minimal at less then 10.0% of the total flow capacity of the new service demand for the overall site development.

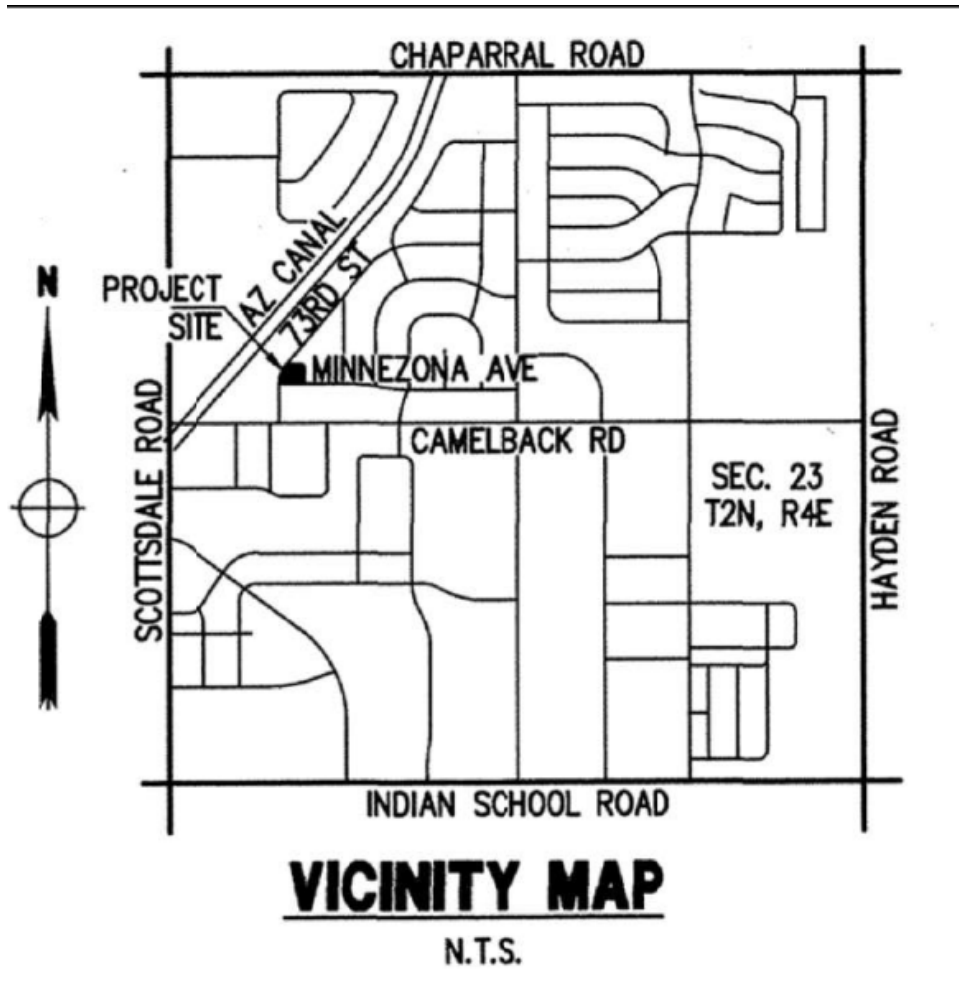
The existing and new 8-inch mains have been designed and analyzed to effectively collect and discharge sewage off-site, without negatively impacting the proposed or existing facilities. All calculations are based on the on-site conditions with the completion of the site improvements proposed for the pad including both residential structures being developed as separate entities for the subject property. No additional design or analysis is required.

**References:**

- City of Scottsdale DSPM, 2018, Chapter 7
- International Plumbing Code 2015
- Arizona Administrative Code Title 18, Chapter 9-E301
- MCESD ATC Application for Sewer Main Extension
- Mannings Equation for Partial Pipe Flow

APPENDIX A

Vicinity Map



# 2021 Maricopa County GIS Aerial Photograph



## APPENDIX B

**CIVIL ENGINEERING GENERAL NOTES**

- IF THE CONTRACTOR FINDS ANY DISCREPANCY OR OMISSION, THE ENGINEER SHALL BE NOTIFIED BEFORE ANY INTERPRETATION IS MADE.
- QUANTITIES SHOWN ARE FOR PERMIT PURPOSES ONLY AND ARE NOT FOR BIDDING OR CONTRACTING PURPOSES. THE CONTRACTOR IS RESPONSIBLE FOR BIDDING HIS OWN QUANTITY TAKE-OFF.
- THE BUILDING MATERIALS CONTAINING ASBESTOS WILL NOT BE USED ON THIS PROJECT.
- THE CONTRACTOR SHALL MAKE NO CLAIM FOR QUANTITY ADJUSTMENT UNLESS ALL CONSTRUCTION SURVEY STAKES ARE MAINTAINED FOR VERIFICATION.
- NOTHING IN THE CONTRACT DOCUMENTS SHALL CREATE ANY CONTRACTUAL RELATIONSHIP BETWEEN THE ENGINEER AND THE CONTRACTOR OR THE ENGINEER AND THE SUBCONTRACTOR.
- THE ENGINEER WILL NOT BE RESPONSIBLE FOR CONSTRUCTION OR SAFETY MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES UTILIZED IN CONNECTION BY THE CONTRACTOR OR SUBCONTRACTORS.
- CHANGE ORDERS SHALL BE EXECUTED IN WRITING BY THE OWNER OR HIS REPRESENTATIVE. VERBAL CHANGES WILL NOT BE HONORED.
- SEE ARCHITECTURAL DRAWINGS FOR ALL ON-SITE:
  - HORIZONTAL CONTROL & BUILDING LOCATIONS.
  - DETAILS AND HORIZONTAL LOCATION OF CURBS AND SIDEWALKS.
  - PARKING LOT LAYOUT.
- IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL EXISTING UNDERGROUND UTILITY FACILITIES BOTH HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION AND TAKE ALL NECESSARY PRECAUTIONS TO AVOID ANY DAMAGE TO EXISTING UNDERGROUND FACILITIES. CALL BLUE STAKE CENTER (602) 263-1100 OR A PRIVATE UNDERGROUND UTILITY LOCATION COMPANY 48 HOURS PRIOR TO EXCAVATING. THE ENGINEER AND/OR OWNER CANNOT GUARANTEE ANY ELEVATIONS OR LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ON THESE PLANS.
- UNDERGROUND INFORMATION AND UTILITIES SHOWN HAVE BEEN OBTAINED FROM INFORMATION PROVIDED ON QUARTER SECTION MAPS FROM THE UTILITY COMPANIES LOCATED WITHIN THE AREA. THUS, UNDERGROUND INFORMATION MUST BE FIELD VERIFIED BEFORE CONSTRUCTION.
- UTILITY COMPANIES SERVING THIS AREA ARE:
  - WATER: CITY OF SCOTTSDALE
  - SEWER: CITY OF SCOTTSDALE
  - TELEPHONE: CENTURYLINK
  - ELECTRIC: ARIZONA PUBLIC SERVICE
  - GAS: SOUTHWEST GAS
  - CABLE TV: COX COMMUNICATIONS
- LOCATION OF THE IRRIGATION SYSTEM IS THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR WILL BE RESPONSIBLE FOR ALL DAMAGES AT HIS COST.
- TOPOGRAPHIC INFORMATION SHOWN ON THIS DRAWING WAS OBTAINED FROM A TOPOGRAPHIC SURVEY PREPARED G-MAR, LLC, DATED, AUGUST 6, 2021 AND UPDATED, APRIL 27, 2022, PH: 602-524-7877.
- BOUNDARY INFORMATION SHOWN ON THIS PLAN WAS OBTAINED FROM A CONDOMINIUM PLAT PREPARED BY OUTER LIMITS LAND SURVEYING, PROJECT NO. 21123, DATED 11-15-2021. BOUNDARY INFORMATION SHOWN ON THIS DRAWING IS NOT CERTIFIED BY RECORD. CONTRACTOR SHALL CONTACT THE ENGINEER OF RECORD PRIOR TO LAYING OUT NEW CONSTRUCTION IF DISCREPANCIES ARE FOUND IN THE FIELD.
- THE CONTRACTOR SHALL VISIT THE SITE TO VERIFY THE SITE SURVEY INFORMATION AND OBSERVE ANY CHANGES.

**GRADING & DRAINAGE NOTES**

- SOIL REPORT PREPARED BY VANN ENGINEERING, INC., PROJECT NO. 29271, DATED, JANUARY 26, 2022.
- SUBGRADE SOIL PREPARATION, SITE GRADING, FILL AND COMPACTION SHALL CONFORM TO MAG SECTION 301, EXCEPT AS MODIFIED BY THE SOILS REPORT.
- FOUNDATIONS ARE DESIGNED FOR DRY CONDITIONS AND MUST REMAIN DRY DURING AND AFTER CONSTRUCTION.
- THE CONTRACTOR SHALL COMPLETE SPECIAL COMPACTION FOR ALL OF THE SIDE SLOPES OF EACH RETENTION BASIN. THIS COMPACTION MUST NOT INCLUDE THE BOTTOM OF THE RETENTION BASIN, BUT WILL INCLUDE AN AREA EXTENDING A MINIMUM OF TEN (10) FEET AWAY FROM THE TOP OF THE RETENTION BASIN SIDE SLOPES IN ALL DIRECTIONS FROM THE RETENTION BASIN.
- DURING LANDSCAPING ACTIVITIES, RETENTION BASIN SIDE SLOPES SHOULD BE PROTECTED BY A PERMANENT EROSION-PREVENTIVE LAYER TO MINIMIZE THE POTENTIAL FOR EROSION. THIS LAYER IS ANTICIPATED TO BE THICKER THAN THREE (3) INCHES. THE RETENTION BASIN SLOPES MUST BE OVER-EXCAVATED SO THAT THE SURFACE OF THE IN-PLACE EROSION-PREVENTIVE LAYER IS IN CONFORMANCE WITH THE RETENTION BASIN'S DESIGN DIMENSIONS AND FINISHED GRADE ELEVATIONS.
- ALL DEBRIS AND EXCESS EXCAVATION SHALL BE REMOVED FROM THE SITE.
- NO IMPORTED MATERIAL SHALL BE INCORPORATED INTO THE PROJECT WITHOUT PRIOR TESTING AND APPROVAL. ALL IMPORT MATERIAL MUST BE TESTED FOR ENVIRONMENTAL CONTAMINATION.
- THE SITE SHALL BE GRADED TO A SURFACE WHICH IS REASONABLY SMOOTH, COMPACTED AND FREE FROM IRREGULAR SURFACE CHANGES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADJUSTMENT TO FINISH GRADE OF ALL UTILITY VALVE COVERS, CLEANOUTS AND MANHOLE CASTINGS.
- ALL WALKWAYS AND A.C. PAVING LOCATED FIVE (5) FEET FROM BUILDING THRESHOLDS WILL BE CONSTRUCTED 1 FEET BELOW FINISHED FLOORS UNLESS NOTED OTHERWISE. SEE ARCHITECTURAL PLANS FOR INFO. WITHIN THE FIVE (5) FEET THRESHOLD AND THE BUILDING.
- RELOCATE ITEMS PER MAG SPEC. 350. CONTRACTOR RESPONSIBLE FOR FEES OR RELOCATION COSTS.
- SPOT ELEVATION SHOWN ON PLANS ARE FINISHED SURFACE ELEVATIONS.
- ALL ELEVATIONS SHOWN ON DETAILS CUT SECTIONS ARE AT LOCATION INDICATED ON DRAWINGS. SEE SPOT ELEVATIONS ON PLANS FOR OTHER LOCATIONS.

**GENERAL PAVING NOTES**

- THE FOLLOWING MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) SPECIFICATION SHALL APPLY TO THE GRADING & DRAINAGE PLANS UNLESS OTHERWISE NOTED:
  - ASPHALTIC PAVEMENT PER MAG SPEC. 321, 710, & 711 (R19 MM OR C-3/4 MIX DESIGN).
  - BITUMINOUS TACK COAT PER MAG SPEC. 321.4.
  - CONCRETE PAVEMENT PER MAG SPEC. 725.
  - BASE COURSE PER MAG SPEC. 310 & 702.2 (A25MM).
  - SAWCUT AND REMOVAL PER MAG SPEC. 336.
  - JOINT SEALANT PER MAG SPEC. 729.
  - ASPHALT CONCRETE OVERLAY PER MAG SPEC. 322.
  - BITUMINOUS PRIME COAT PER MAG SPEC. 315.
  - FOG SEAL COAT PER MAG SPEC. 333.
- RELOCATE ITEMS PER MAG SPEC. 350. CONTRACTOR RESPONSIBLE FOR FEES AND RELOCATION COSTS.
- THE PAVING CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADJUSTMENT TO FINISH GRADE OF ALL UTILITY VALVE COVERS, CLEANOUTS AND MANHOLE CASTINGS.
- PAVEMENT SEALANT SPECIFICATIONS:
  - SWEEP AND CLEAN SURFACE.
  - TREAT OIL SPOTS WITH PETRO SEAL OR APPROVED EQUAL.
  - CLEAN AND FILL CRACKS WITH BREWER FLEX OR APPROVED EQUAL.
  - FURNISH AND APPLY TWO COATS OF HUNTSAL OR APPROVED EQUAL.
- PAVEMENT MARKING MATERIALS SHALL BE FED. SPEC. TT-P-115 WITHOUT GLASS SPHERES; WHITE OR YELLOW AS INDICATED ON DRAWINGS. APPLICATION SHALL BE AS FOLLOWS:
  - APPLY PAINT WHERE INDICATED TO A 15 MIL WET THICKNESS x 4 INCHES WIDE AND TO DIMENSIONS SHOWN ON DRAWINGS. LINES TO BE STRAIGHT AND TRUE TO LINE WITH SHARP, CLEAN EDGES. INCLUDE ALL STRIPING DIRECTIONAL ARROWS, CROSSWALKS, LETTERING, HANDICAP DESIGNATIONS AND ALL OTHER TRAFFIC CONTROL MARKINGS SHOWN OR REQUIRED.
  - EQUIPMENT: SPECIFICALLY DESIGNED AND MANUFACTURED TO APPLY PAVEMENT PAINT.

**CITY OF SCOTTSDALE: GENERAL CONSTRUCTION NOTES FOR PUBLIC WORKS CONSTRUCTION**

- ALL CONSTRUCTION IN THE PUBLIC RIGHTS-OF-WAY OR IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO THE LATEST MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND UNIFORM STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION AS AMENDED BY THE LATEST VERSION OF THE CITY OF SCOTTSDALE SUPPLEMENTAL STANDARD SPECIFICATIONS AND SUPPLEMENTAL STANDARD DETAILS. IF THERE IS A CONFLICT, THE CITY'S SUPPLEMENTAL STANDARD DETAILS WILL GOVERN.
- THE CITY ONLY APPROVES THE SCOPE, NOT THE DETAIL, OF ENGINEERING DESIGNS; THEREFORE, IF CONSTRUCTION QUANTITIES ARE SHOWN ON THESE PLANS, THEY ARE NOT VERIFIED BY THE CITY.
- THE APPROVAL OF PLANS IS VALID FOR SIX (6) MONTHS. IF AN ENCROACHMENT PERMIT FOR THE CONSTRUCTION HAS NOT BEEN ISSUED WITHIN SIX MONTHS, THE PLANS MUST BE RESUBMITTED TO THE CITY FOR RE-APPROVAL.
- A PUBLIC WORKS INSPECTOR WILL INSPECT ALL WORKS WITHIN THE CITY OF SCOTTSDALE RIGHTS-OF-WAY AND IN EASEMENTS. NOTIFY INSPECTION SERVICES 24 HOURS PRIOR TO BEGINNING CONSTRUCTION BY CALLING 480-312-5750.
- WHENEVER EXCAVATION IS NECESSARY, CALL THE BLUE STAKE CENTER, 602-263-1100, TWO (2) WORKING DAYS BEFORE EXCAVATION BEGINS. THE CENTER WILL SEE THAT THE LOCATION OF THE UNDERGROUND UTILITY LINES IS IDENTIFIED FOR THE PROJECT. CALL IF NECESSARY.
- RIGHT-OF-WAY PERMITS ARE REQUIRED FOR ALL WORK IN PUBLIC RIGHTS-OF-WAY AND EASEMENTS GRANTED FOR PUBLIC PURPOSES. A RIGHT-OF-WAY PERMIT WILL BE ISSUED BY THE CITY ONLY AFTER THE REGISTRANT HAS PAID A BASE FEE PLUS A FEE FOR INSPECTION SERVICES. COPIES OF ALL PERMITS MUST BE RETAINED ON-SITE AND BE AVAILABLE FOR INSPECTION AT ALL TIMES. FAILURE TO PRODUCE THE REQUIRED PERMITS WILL RESULT IN IMMEDIATE SUSPENSION OF ALL WORK UNTIL THE PROPER PERMIT DOCUMENTATION IS OBTAINED.
- ALL EXCAVATION AND GRADING THAT IS NOT IN THE PUBLIC RIGHTS-OF-WAY OR NOT IN EASEMENTS GRANTED FOR PUBLIC USE MUST CONFORM TO APPENDIX J, GRADING, OF THE LATEST EDITION OF THE INTERNATIONAL BUILDING CODE. A PERMIT FOR THIS GRADING MUST BE SECURED FROM THE CITY FOR A FEE ESTABLISHED BY THE CITY.

**G-MAR GENERAL WATER & SEWER (ON-SITE)**

**MATERIALS:**

- WATER PIPE MATERIAL SHALL CONFORM TO 2012 UNIFORM PLUMBING CODE (UPC) 604.0 (CIP/PE, GALVANIZED, COPPER, POLYETHYLENE PIPE) EQUAL.
- PRIVATE SEWER LINES SHALL BE CONSTRUCTED PER THE UPC. PUBLIC SEWER LINES WHICH LAY WITHIN PUBLIC RIGHTS-OF-WAY AND EASEMENTS SHALL BE CONSTRUCTED PER M.A.G. ON-SITE SEWER PIPE MATERIAL SHALL BE PVC PIPE (SDR 35).
- FIRELINE PIPE MATERIAL AND FITTINGS (4 IN. AND LARGER) SHALL CONFORM TO AWWA C900 CLASS 150 AND MAG SPEC. 750.2 (DUCTILE IRON PIPE) AND 750.4 (DUCTILE FITTINGS). (FOR PIPE 3 IN. AND SMALLER, SEE NOTE #1 ABOVE.)
- IN ACCORDANCE WITH AAC R18-4-119, ALL MATERIALS WHICH MAY COME INTO CONTACT WITH DRINKING WATER SHALL CONFORM TO NATIONAL SANITATION FOUNDATION STANDARDS 60 AND 61. THE WATER, SEWER AND FIRE SPRINKLER SERVICE LINE CONNECTION POINT(S).

**INSTALLATION:**

- THE CONTRACTOR SHALL VERIFY CIVIL PLANS AND PLUMBING PLANS FOR BOTH HORIZONTAL AND VERTICAL LOCATIONS PRIOR TO CONSTRUCTION OF THE PROJECT.
- WATER, SEWER AND FIRE SPRINKLER SERVICE LINE CONNECTION POINT(S).
- ALL ON-SITE WATER AND SEWER CROSSINGS SHALL CONFORM TO UPC 720.0. ALL WATER AND SEWER LINES CROSSING GAS LINE MUST HAVE A MINIMUM OF 12" CLEARANCE. CONTRACTOR MUST COMPLY WITH G&A GENERAL NOTE #7.
- MUST HAND DIG CAREFULLY AT MARKED CROSSING LOCATION UNTIL GAS LINE IS FOUND AND EXPOSED.
- SEWER CLEANOUTS SHALL CONFORM TO UPC 719.0. SEWER BACKFLOW PREVENTION DEVICES SHALL CONFORM TO UPC 710.6.
- ALL ON-SITE TRENCHES SHALL REMAIN OPEN FOR CITY INSPECTION AND BACKFILL AS-BUILT INFORMATION IS COMPLETED.
- A NO. 12 BARE COPPER WIRE WILL BE INSTALLED FOR TRACING ALONG WITH THE MARKING TAPE SUCH THAT IT CAN BE DETECTED WITH STANDARD SURVEY TYPE METAL DETECTORS OR UTILITY LOCATORS TO A DEPTH OF 6 FEET. IT WILL TERMINATE AT EACH VALVE BOX COVER, MANHOLE OR CLEANOUT. CONTINUITY MUST BE CHECKED IN THE PRESENCE OF THE INSPECTOR AND AFTER BACKFILL IS COMPLETED. DURING BACKFILL OPERATIONS THE CONTRACTOR WILL INSTALL MARKING TAPE A MAXIMUM DISTANCE OF 12 INCHES ABOVE THE PIPE CROWN. THE TAPE SHALL BE 3 INCHES WIDTH, ACID ALKALI RESISTANT, REINFORCED WITH A 100 LB. TENSILE STRENGTH MATERIAL, COLORED CODED - BLUE FOR WATER AND GREEN FOR SEWER - IMPRINTED WITH THE WORDING "CAUTION" AT 2 FOOT INTERVALS (MAXIMUM) AND ALSO IDENTIFYING THE UTILITY LINE IT IS PROTECTING.

**NO CONFLICT SIGNATURE BLOCK**

Utility Company	Representative	Date Sent	Date Signed
ARIZONA PUBLIC SERVICE COMPANY	CCWCONTROLDESIG@APSC.COM	-	-
COX COMMUNICATIONS	PHX.TMC@COX.COM	-	-
CENTURYLINK	MAPS@CENTURYLINK.COM	-	-
SOUTHWEST GAS CORPORATION	VALERIE.GALLARDO	-	-
EL PASO NATURAL GAS CO.	JENNIFER ANGELES	-	-
CITY OF SCOTTSDALE, WATER	-	-	-
CITY OF SCOTTSDALE, SEWER	-	-	-

Engineer's Certification  
 I, **GOFFREY MARKOWSKI**, being the person responsible for designing the facilities necessary to serve this development, hereby certify that all of the utility companies listed above, have reviewed this project proposal. Conflict Forms have been obtained from each utility company and are not included with this submittal. I also certify that all on site transformers, cable boxes and any other public/private utility appurtenances are placed such that they do not impact the use or intended use of any dedicated easements or facilities developed with this project including but not limited to stormwater storage basins, sight distance easements and NAOS or other open space easements.

*[Signature]* Date: 2-27-18

**CIVIL IMPROVEMENT PLANS**

for  
**"MINNEZONA CONDOMINIUMS"**  
 7314 E. MINNEZONA AVENUE  
 SCOTTSDALE, ARIZONA 85251

**LEGAL DESCRIPTION**

LOT 38 AND 39 OF THE FINAL PLAT OF "DARYL ESTATES - UNIT TWO" AS RECORDED IN BOOK 61 OF MAPS, PAGE 48, RECORDS OF MARICOPA COUNTY, ARIZONA.

**PROJECT DESCRIPTION**

DEMOLITION OF EXISTING STRUCTURES AND POOL. CONSTRUCTION OF A NEW MULTI-FAMILY BUILDING STRUCTURES ALONG WITH NEW LANDSCAPING, WALKWAYS, PATIOS, POOL AND GRADING AND DRAINAGE IMPROVEMENTS. NEW STRUCTURES WILL BE PLACED SO THAT THE FINISHED FLOOR IS FREE FROM ANY INUNDATION FROM THE 100-YEAR DESIGN STORM EVENT AND AT LEAST 12-INCHES ABOVE NEAREST ADJACENT EXISTING GRADE. ALL GRADING AROUND THE FOUNDATION OF THE NEW STRUCTURE WILL ALLOW DRAINAGE TO FLOW AWAY FROM THE FOUNDATION. NO OTHER ON-SITE GRADING IMPROVEMENTS REQUIRED.

**RETENTION REQUIREMENTS - PRE. VS. POST DEVELOPMENT**

PER CITY OF SCOTTSDALE DRAINAGE & DESIGN STANDARDS & POLICIES MANUAL. (MARICOPA COUNTY DRAINAGE DESIGN MANUAL, VOLUME II AND III)

$V_r = A(P/12)C$      $V =$  Volume of retention required (cubic feet or acre-feet)  
 $P =$  Runoff factor for tributary areas  
 $C =$  100-year, 2-hour rainfall from NOAA Atlas 14(in inches)  
 $A =$  Drainage area (square feet or acres)

**PRE DEVELOPMENT                      POST DEVELOPMENT**

A = 13,000 S.F.                      A = 13,000 S.F.  
 P = 2.26 INCHES                  P = 2.26 INCHES  
 C = 0.85 R-5 ZONING              C = 0.91 WEIGHTED  
 **$V_r = 2,021$  CUBIC FEET**               **$V_r = 2,227$  CUBIC FEET**

**RETENTION REQUIREMENTS - 1ST FLUSH STORM EVENT**

SITE IS CONSIDERED "IN-FILL" DEVELOPMENT. THE GREATER OF PRE VS. POST OR 1ST FLUSH RETENTION REQUIRED ON-SITE. BASED ON ANALYSIS, 1ST FLUSH STORM EVENT IS LARGER RETENTION VOLUME REQUIREMENT.

$V_r = A(P/12)C$   
 $V =$  Volume of retention required (cubic feet or acre-feet)  
 $C =$  Runoff factor for tributary areas  
 $P =$  100-year, 2-hour rainfall from NOAA Atlas 14(in inches)  
 $A =$  Drainage area (square feet or acres)

A = 13,000 S.F.  
 P = 0.5 INCHES  
 C = 1.0 R-5 ZONING  
 **$V_r = 542$  CUBIC FEET**

**ON-SITE RETENTION PROVIDED**

**UST #1 VOLUME CALCULATIONS**

Volume =  $((D^2) * (P/4 * L))$   
 $D = 4$  FT.  
 $L = 45$  FT.  
 **$V_p = 565$  CU.FT.**

VOLUME PROVIDED =	565	CUBIC FEET
VOLUME REQUIRED =	542	CUBIC FEET
EXCESS VOLUME PROV. =	23	CUBIC FEET

**ESTIMATED QUANTITIES**

**OFF-SITE QUANTITIES:**

1" DOMESTIC LANDSCAPE SERVICE	45	L.F.
1" DOMESTIC SERVICE	405	L.F.
3/4" LANDSCAPE METER	1	EA.
3/4" DOMESTIC METER	9	EA.
6"x6" TAPPING SLEEVE, VALVE & COVER	2	EA.
6" PVC (C900) WATERLINE	50	L.F.
FIRE HYDRANT ASSEMBLY	1	EA.
EXISTING WATER SERVICE REMOVAL	2	EA.
STREET LIGHT & PULL BOX	1	EA.

**NOTE:** QUANTITIES SHOWN ARE FOR CITY PERMIT PURPOSES ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR HIS/HER OWN QUANTITY TAKE-OFF FOR BID PURPOSES.

**OWNER/DEVELOPER**

SCOTT GRADEN  
 8144 E. DEL BAROQUERO DR.  
 SCOTTSDALE, ARIZONA 85258  
 PH: 602-875-6221  
 CONTACT: SCOTT GRADEN

**ARCHITECT/DESIGNER**

KONTEXTURE  
 3334 N. 20TH STREET  
 PHOENIX, ARIZONA 85016  
 PH: 602-875-6221  
 CONTACT: DANIEL ISTRATE

**DATUM**

ADD 1200 TO SPOT ELEVATIONS SHOWN ON PLAN (NAVD '88 DATUM).

**BENCHMARK**

GDAC UNIQUE PID: 24574-1

DESCRIPTION: FOUND 3" CITY OF SCOTTSDALE BRASS CAP IN HANDHOLE, 0.8' DOWN AT THE INTERSECTION OF CAMELBACK AND SCOTTSDALE ROAD WITH AN ELEVATION OF 1277.516" (NAVD '88)

**ZONING: R-5**

A.P.N.: 173-38-060 & 173-38-061  
 NET LOT AREA: 13,000 S.F. (0.298 AC)  
 S.F. #18-45

SETBACKS: FRONT = 3'  
 REAR = 3'  
 LEFT = 3'  
 RIGHT = 3'

TOTAL DISTURBED AREA: ±13,000 S.F.

**EARTHWORK QUANTITIES**

CUT 120 C.Y.  
 FILL 330 C.Y.  
 NET FILL: 210 C.Y.

QUANTITIES ARE FOR PERMIT PURPOSES ONLY. CONTRACTOR SHALL MAKE HIS/HER OWN TAKE-OFF FOR CONSTRUCTION.

**SITE DATA:**

NET AREA: 13,000 S.F. (0.30 AC.)  
 GROSS AREA: 16,246 S.F. (0.37 AC.)  
 DISTURBED AREA: 13,000 S.F. (0.30 AC.)

**SHEET INDEX:**

SHEET NO.	PAGE NO.	TITLE
C1	1	COVER SHEET & CIVIL NOTES
C2	2	DETAILS & SECTIONS
C3	3	DETAILS & SECTIONS
C4	4	GRADING & DRAINAGE PLAN
C5	5	ON-SITE UTILITY PLAN

**AS-BUILT CERTIFICATION**

I HEREBY CERTIFY THAT THE "RECORD DRAWING" MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED ENGINEER/LAND SURVEYOR \_\_\_\_\_ DATE \_\_\_\_\_

REGISTRATION NUMBER \_\_\_\_\_

**ABBREVIATIONS**

(SOME ABBREVIATIONS MAY NOT APPLY TO THESE DRAWINGS)

BOTT.	BOTTOM
B/C	BACK OF CURB
C.F.	CUBIC FEET
CLF	CHAIN LINK FENCE
CONC.	CONCRETE
C.Y.	CUBIC YARD
D.E.	DRAINAGE EASEMENT
D/W	DRIVEWAY
ESMT.	EASEMENT
EXIST.	EXISTING
F.F.	FINISHED FLOOR
FND.	FOUND
FT.	FEET
MAS.	MASONRY
M	MONUMENT LINE
N.T.S.	NOT TO SCALE
PVMT.	PAVEMENT
P	PROPERTY LINE
PROP.	PROPOSED
P.U.E.	PUBLIC UTILITY EASEMENT
R/W	RIGHT OF WAY
S/W	SIDEWALK
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE

**LEGEND**

(SOME ITEMS MAY NOT APPLY TO THESE DRAWINGS)

	BOUNDARY LINE
	MONUMENT LINE
	PROPERTY CORNER
	EASEMENT LINE
	PROPOSED NAOS BOUNDARY

EXISTING	PROPOSED	
		MAS. FENCE
		VERT. CURB & GUTTER
		CONCRETE CURB
		BUILDING
		CONCRETE
		BRASSCAP IN HANDHOLE
		BRASSCAP FLUSH
		SIGN
		GAS METER
		TELEPHONE RISER
		CABLE RISER
		POWER POLE
		ELECTRICAL GUY DOWN
		STREET LIGHT OR LIGHT POLE
		WATER METER
		BACK FLOW PREVENTION ASSEMBLY
		DRYWELL/CATCH BASIN
		SPRINKLER CONTROL BOX
		WATER VALVE
		FIRE HYDRANT
		WATER
		UNDERGROUND CABLE TV
		OVERHEAD TELEPHONE
		UNDERGROUND TELEPHONE
		OVERHEAD ELECTRICAL
		UNDERGROUND ELECTRICAL
		SANITARY SEWER
		GAS
		STORM DRAIN
		FIRE LINE

	NATURAL GROUND ELEV.
	TOP OF CURB ELEV.
	PAVER ELEV.
	GUTTER ELEV.
	APPROX. FINISHED FLOOR ELEV.
	CONCRETE ELEV.
	RIM ELEV.
	INVERT ELEV.
	DRAINAGE SLOPE
	EXTREME OUTFALL

FIRM DATA					
COMMUNITY NUMBER	PANEL #	SUFFIX	DATE OF FIRM (INDEX DATE)	FIRM ZONE	BASE FLOOD ELEV. (IN AO ZONE, USE DEPTH)
045012	1770	M	7/20/21	X	N/A
	7/20/21				
THIS SITE IS NOT IN A SPECIAL FLOOD HAZARD ZONE. IT IS LOCATED IN FLOOD ZONE "X". NO OTHER OFF-SITE FLOWS IMPACT THE SITE. FINISHED FLOOR ELEVATIONS ARE AT LEAST 14" ABOVE THE EXTREME OUTFALL TO THE SITE AND AT LEAST 1-FOOT ABOVE NEAREST FLOOD ZONE BASE WATER SURFACE ELEVATION. THIS SITE OUTFALLS TO THE SOUTHEAST TO EXISTING RIGHT-OF-WAY AT AN ELEVATION OF APPROXIMATELY 1269.35 REFERENCED TO PROJECT BENCHMARK.					
ENGINEER'S CERTIFICATION THE LOWEST FLOOR ELEVATIONS AND/OR FLOOD PROOFING ELEVATIONS FOR THE ADDITION ON THIS PLAN ARE SUFFICIENTLY HIGH TO PROVIDED PROTECTION FROM FLOODING CAUSED BY A 100-YEAR STORM, AND ARE IN ACCORDANCE WITH SCOTTSDALE REVISED CODE, CHAPTER 37 - FLOODPLAIN AND STORMWATER REGULATIONS.					

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 waddell, arizona 85355  
 fax: 602.242.6221 • ph: 602.242.6220

**BACKFLOW PREVENTION REQUIREMENTS**

BUILDING TYPE	BLDG. SQ. FOOTAGE	FLOW DURATION	FIRE FLOW REQ'D.
V-B	3,130 S.F.	2 HOURS	1,500 GPM
V-B	3,905 S.F.	2 HOURS	1,750 GPM

THE FIRE SPRINKLER SYSTEM BEING INSTALLED IS A "WET PIPE SYSTEM" PER NFPA 13 FOR A COMMERCIAL FIRE SUPPRESSION SYSTEM. REQUIRED DEMAND FLOW CAN BE REDUCED BY 50% PER FIRE CODE.

ALL EXISTING OVERHEAD UTILITIES SHALL BE UNDERGROUNDED PER PRIVATE UTILITY COMPANY STANDARDS AND REQUIREMENTS. OWNER/DEVELOPER SHALL COORDINATE WITH PRIVATE UTILITY COMPANIES.

**ON-SITE WATER & SEWER CONST. NOTES**

- 1 INSTALL NEW 1" FEBCO LF-856 DOMESTIC REDUCED PRESSURE PRINCIPLE BACKFLOW ASSEMBLY.
- 2 INSTALL 1" FEBCO LF-856 LANDSCAPE REDUCED PRESSURE PRINCIPLE BACKFLOW ASSEMBLY.
- 3 NOT USED.
- 4 INSTALL NEW 1" DOMESTIC COPPER WATERLINE AND TRENCHING PER IPC STANDARDS. REFER TO PLUMBING PLANS TYPE AND MATERIAL.
- 5 1" LANDSCAPE COPPER WATERLINE AND TRENCHING PER IPC STANDARDS. REFER TO LANDSCAPE PLANS.
- 6 6" PVC SEWERLINE AT 1.04% PER IPC STANDARDS. MAINTAIN 3'-FEET OF COVER OVER SEWER LINE UNDER RETENTION BASIN.
- 7 CONNECT TO EXISTING SEWER SERVICE TAP. CONTRACTOR TO FIELD VERIFY VERTICAL AND HORIZONTAL LOCATION OF EXISTING SERVICE PRIOR TO TRENCHING AND CONNECTION.
- 8 REFER TO BUILDING & PLUMBING PLANS FOR CONTINUATION OF UTILITIES INTO BUILDING.
- 9 REFER TO LANDSCAPE PLANS FOR CONTINUATION.
- 10 INSTALL 6"x 6" TEE, VALVE & COVER PER M.A.G. STD. DETAIL 340 & 391-1, TYPE 'A'. EXISTING ACP MAIN SHALL BE REMOVED AND REPLACED WITH D.I.P. PER DSPM SEC. 6-1.40B.
- 11 CONSTRUCT 6" D.I.P. (PRESSURE CLASS 350 MIN. OR APPROVED EQUAL) FIRELINE.
- 12 CONSTRUCT 4" D.I.P. (PRESSURE CLASS 350 MIN. OR APPROVED EQUAL) FIRELINE.
- 13 WATER/SEWER CROSSING AND ENCASEMENT PER M.A.G. STD. DET. 404-3.
- 14 INSTALL 6" PVC CLEANOUT WITH QYE FITTING PER I.P.C. STANDARDS. ADJUST RIM TO FINISHED GRADE.
- 15 REFER TO FIRE SPRINKLER PLANS FOR CONTINUATION.
- 16 INSTALL 6" VALVE, BOX AND COVER PER M.A.G. STD. DET. 391-1.
- 17 INSTALL 4" VALVE, BOX AND COVER PER M.A.G. STD. DET. 391-1.
- 18 INSTALL 6" 90° BEND WITH THRUST BLOCKING PER M.A.G. SPECS.
- 19 INSTALL 6"x 4" TEE WITH THRUST BLOCKING PER M.A.G. SPECS.
- 20 4" PVC SEWERLINE AT 2.08% PER IPC STANDARDS.
- 21 INSTALL 4" DIA. PVC 45° BEND WITH SEWER CLEANOUT PER I.P.C. STANDARDS. ADJUST RIM TO FINISHED GRADE.
- 22 INSTALL FIRE HYDRANT ASSEMBLY COMPLETE PER M.A.G. STD. DET. 360-1 & C.O.B. STD. DET. 31412, 31414 & 31420.
- 23 EXISTING WATER SERVICE TAP AND METER TO BE ABANDONED PER CITY STANDARDS AND SPECS.

**OFF-SITE STREET LIGHTING NOTES:**

- A INSTALL NEW STREET LIGHT POLE. PROVIDE 25-FOOT TALL GALVANIZED STREETLIGHT POLE WITH 6-FT LUMINAIRE ARM PER C.O.S. STD. DETS. 2171-1 & 2171-2 WITH SIGNIFY LUMEC RFS-35W16LED3K-G2-R2M LUMINAIRE WITH CITYTOUCH CONNECTOR NODE, MODEL 127-277-CTCN.

**ON-SITE / OFF-SITE UTILITY CONSTRUCTION NOTES:**

- B REMOVE EXISTING POWER POLE. UNDERGROUND EXISTING UTILITIES PER PRIVATE UTILITY COMPANY STANDARDS.
- C REMOVE AND RELOCATE EXISTING COMMUNICATION RISER PER PRIVATE UTILITY COMPANY STANDARDS.
- D EXISTING GAS LINE AND METER TO BE ABANDONED AND REMOVED PER PRIVATE UTILITY COMPANY STANDARDS.
- E INSTALL NEW 3/4" WATER METER, BOX & COVER PER C.O.M. STANDARDS AND SPECS BY CITY FORCES.

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PROJECT: MINNEZONA CONDOMINIUMS  
 7314 E. MINNEZONA AVENUE  
 SCOTTSDALE, ARIZONA  
 CLIENT: KONTEXTURE  
 3334 N. 20TH STREET, PHOENIX, ARIZONA 85016

PR	1ST PRELIM SUBMITTAL	2ND PRELIM SUBMITTAL	3RD PRELIM SUBMITTAL
8-18-2021			
4-18-2022			
7-27-22			

DATE ISSUED: 2 AUG 2021  
 DRAWN BY: GM  
 CHECKED BY: GM

SHEET DESCRIPTION:  
 ON-SITE  
 UTILITY  
 PLAN

SHEET  
 C5  
 OF

C.O.S. #45-DR-2021

73RD ST.

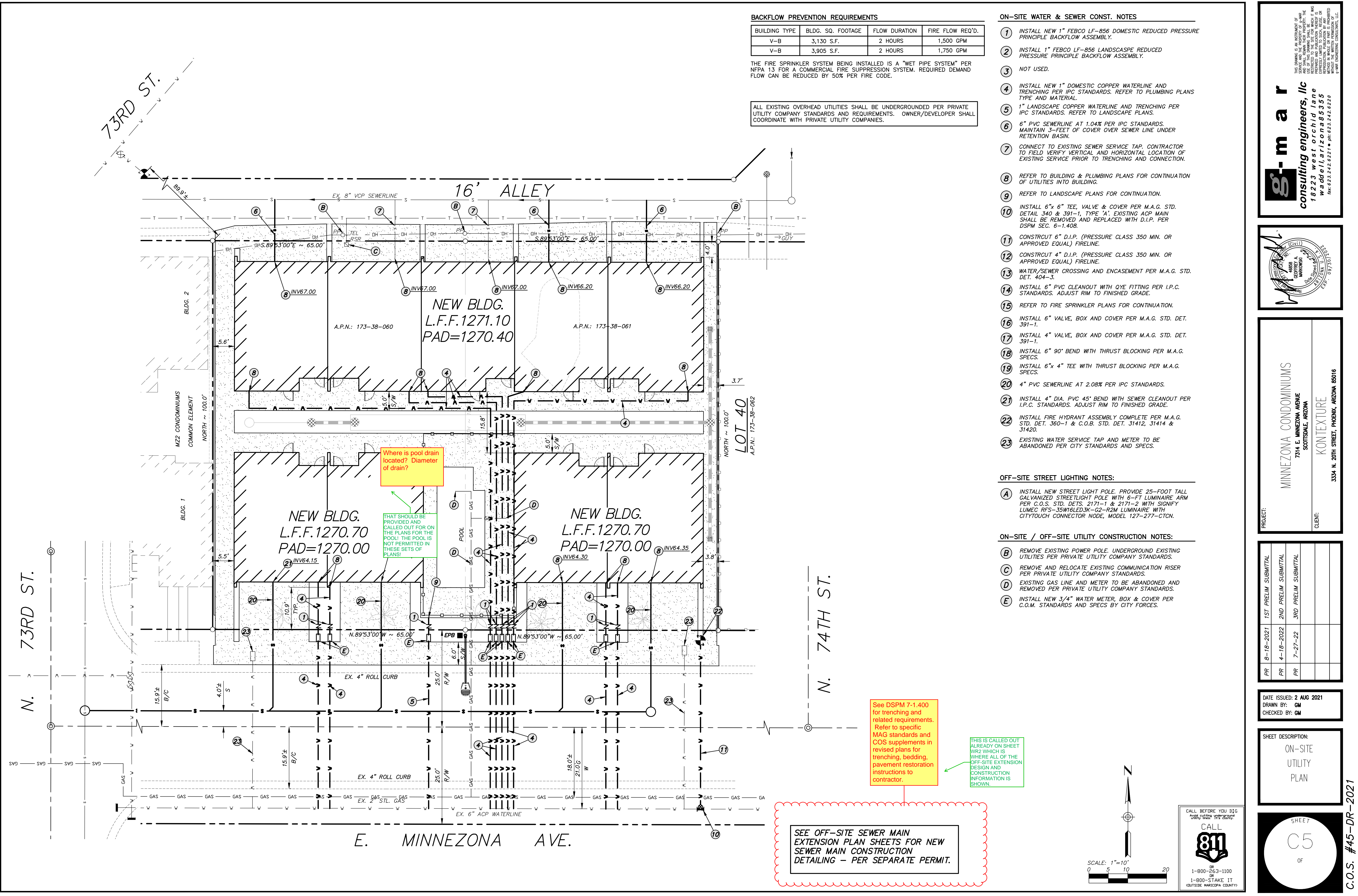
16' ALLEY

LOT 40  
 NORTH ~ 100.0'  
 A.P.N.: 173-38-062

N. 73RD ST.

N. 74TH ST.

E. MINNEZONA AVE.



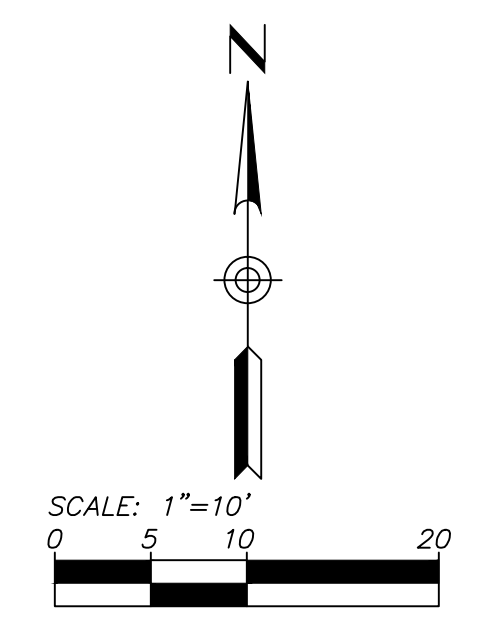
Where is pool drain located? Diameter of drain?

THAT SHOULD BE PROVIDED AND CALLED OUT FOR ON THE PLANS FOR THE POOL! THE POOL IS NOT PERMITTED IN THESE SETS OF PLANS!

See DSPM 7-1.400 for trenching and related requirements. Refer to specific MAG standards and COS supplements in revised plans for trenching, bedding, pavement restoration instructions to contractor.

THIS IS CALLED OUT ALREADY ON SHEET WR2 WHICH IS WHERE ALL OF THE OFF-SITE EXTENSION DESIGN AND CONSTRUCTION INFORMATION IS SHOWN.

SEE OFF-SITE SEWER MAIN EXTENSION PLAN SHEETS FOR NEW SEWER MAIN CONSTRUCTION DETAILING - PER SEPARATE PERMIT.

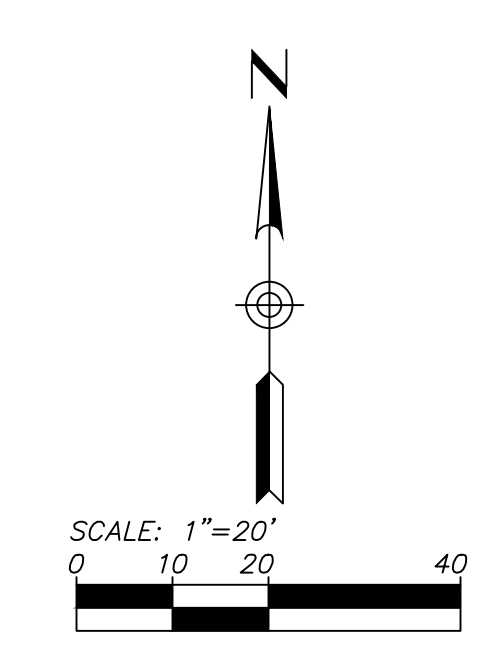
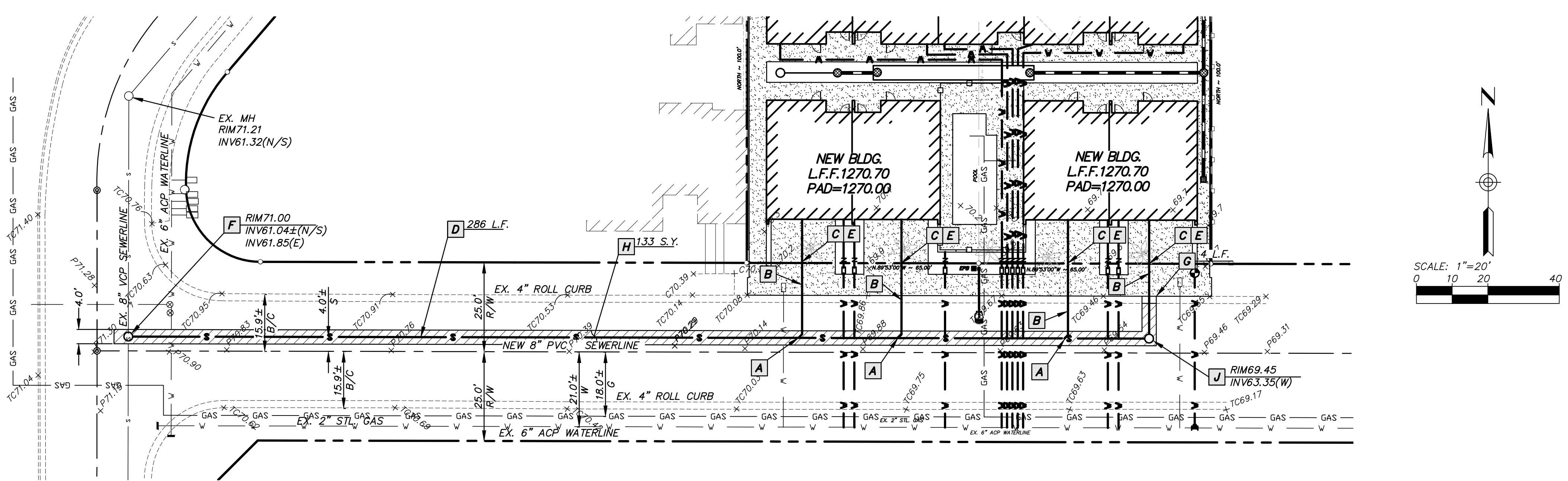


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OFF-SITE SEWER CONNECTION NOTES:

- A** INSTALL NEW SEWER CONNECTION PER M.A.G. STD. DET. 440-3 TYPE 'C'. CONTRACTOR TO FIELD VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING SEWER STUB PRIOR TO TRENCHING.
- B** 6" PVC (SDR 35) SEWERLINE @ 2.08% TRENCH & CONST. PER IPC STANDARDS. OFF-SITE TRENCHING IN RIGHT-OF-WAY PER C.O.S. STD. DET. 2201.
- C** INSTALL 6" SEWER CLEANOUT AND CAP AT RIGHT-OF-WAY LINE PER M.A.G. STD. DET. 441. INSTALL 6" BACKWATER VALVE AT RIGHT-OF-WAY PER I.R.C. SECTION 300B.1.
- D** 8" PVC (SDR 35) SEWERLINE @ 0.52% OFF-SITE TRENCHING IN RIGHT-OF-WAY PER C.O.S. STD. DET. 2201.
- E** REFER TO GRADING AND DRAINAGE PLANS FOR CONTINUATION ON-SITE.
- F** INSTALL 48" DIA. SANITARY SEWER MANHOLE PER M.A.G. STD. DETAILS 420-1 AND 420-2 WITH FRAME AND LID PER M.A.G. STD. DET. 423-3. SAWCUT AND TAP EXISTING SEWER MAIN AT INVERT PER PLAN. CONTRACTOR TO FIELD VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING MANHOLE AND MAIN PRIOR TO TRENCHING AND TAPPING. SEE PLAN FOR RIM AND INVERT ELEVATIONS. ADJUST RIM TO FINISHED GRADE.
- G** SAWCUT, REMOVE & REPLACE EXIST. 4" VERT. CURB AND GUTTER PER M.A.G. STD. DET. 220-1 TYPE 'C'. REMOVE AND REPLACE TO NEAREST CONTROL JOINTS.
- H** SAWCUT, REMOVE AND REPLACE EXISTING ASPHALT PAVEMENT PER C.O.S. STD. DET. 2200. MATCH INTO EXISTING PAVEMENT.
- J** INSTALL 48" DIA. SANITARY SEWER MANHOLE PER M.A.G. STD. DETAILS 420-1 AND 420-2 WITH FRAME AND LID PER M.A.G. STD. DET. 423-3. SEE PLAN FOR RIM AND INVERT ELEVATIONS. ADJUST RIM TO FINISHED GRADE. ADJUST RIM TO FINISHED GRADE.



E. MINNEZONA

C.O.S. INSPECTOR SHALL DETERMINE THE LIMITS OF SAWCUT FOR NEW SEWER MAIN AND TAP.

TWO (2) BEDROOM, ONE OFFICE, ONE GARAGE UNITS: 9 UNITS TOTAL

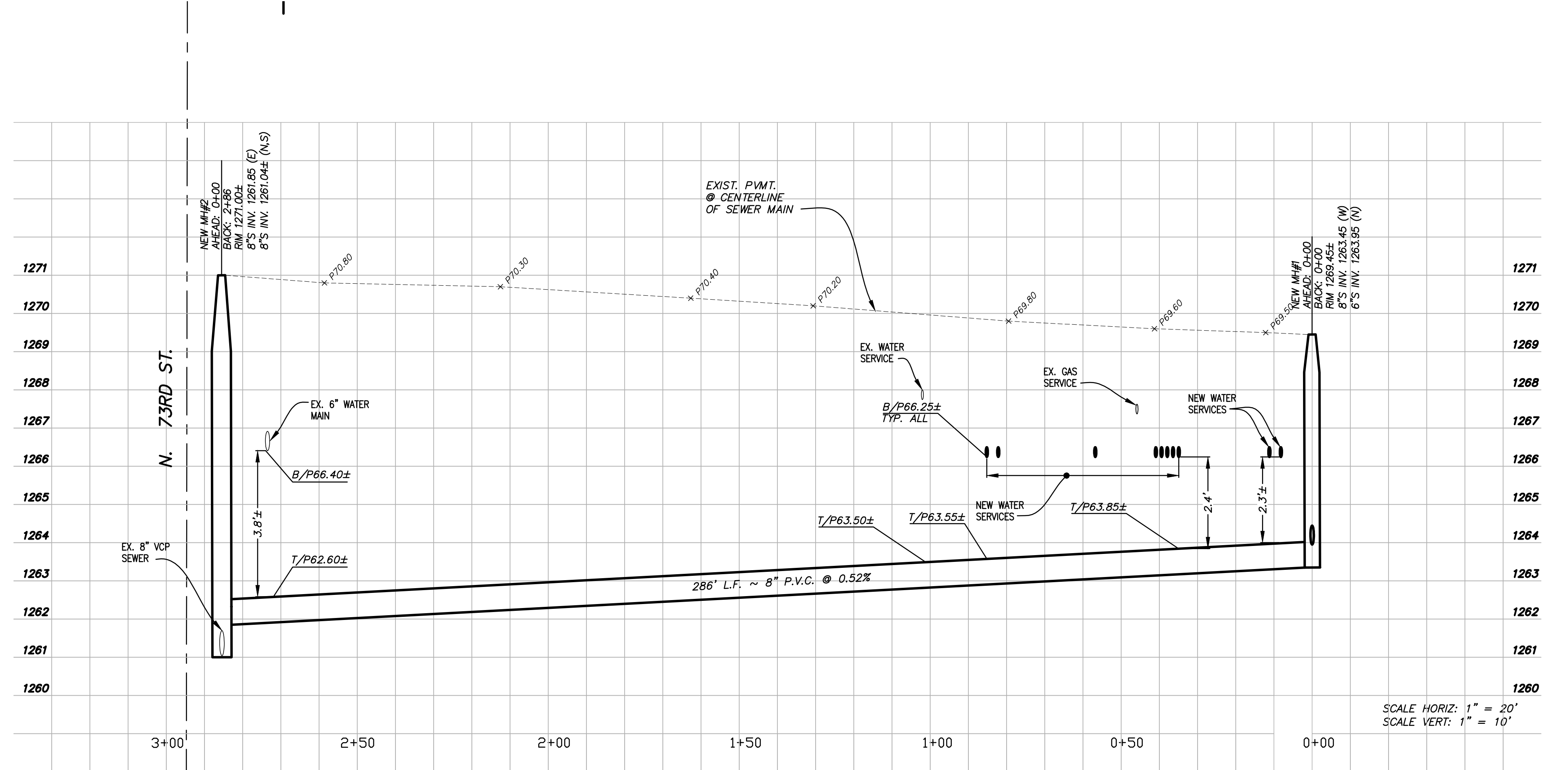
BUILDING AREA:  
 2ND FLOOR GFA: 7934 S.F.  
 3RD FLOOR GFA: 7426 S.F.  
 CORNER UNIT AREA (TO CENTERLINE OF SHARED WALL):  
 1ST FLOOR GFA: 788 S.F.  
 2ND FLOOR GFA: 889 S.F.  
 3RD FLOOR GFA: 893 S.F.  
 INTERIOR UNIT AREA (TO CENTERLINE OF SHARED WALL):  
 1ST FLOOR GFA: 788 S.F.  
 2ND FLOOR GFA: 866 S.F.  
 3RD FLOOR GFA: 770 S.F.

REQUIRED OPEN SPACE:  
 FRONTAGE OPEN SPACE: 2600 S.F. (20 S.F. PER LINEAR FOOT OF FRONTAGE)  
 REMAINDER: 260 S.F. (22% TOTAL OPEN SPACE MINUS FRONTAGE OPEN SPACE)

TOTAL: 2860 S.F. MINIMUM  
 REQUIRED PRIVATE OUTDOOR LIVING SPACE:  
 1ST FLOOR UNITS: 704 S.F. (1 X S.F. OF GFA)  
 2ND - 3RD FLOOR UNITS: 766 S.F. (.05 X S.F. OF GFA)  
 TOTAL: 1470 S.F. MINIMUM

LOT AREA:  
 PROPERTY AREA: 12,789 S.F.  
 POOL AREA: 365 S.F.  
 TRASH ENCLOSURE: 160 S.F.  
 PAVING/HARDSCAPE AREA: 4112 S.F. (NOT INCLUDING BUILDING FOOTPRINT OR POOL AREA)  
 PERVIOUS/SOFTSCAPE AREA: 2085 S.F. (GROUND LEVEL ONLY)

SITE INFORMATION:  
 APN: 173-38-060, 173-38-061 (REPLAT IN PROGRESS)  
 ZONING: R-5 (R-2 ALLOWED ON SITE)  
 LOT SIZE: 12,789 SQ. FT. @ 0.29 AC.  
 SECTION TOWN RANGE: 23 2N 4E  
 PUC: 0335  
 SUBDIVISION: DARYL ESTATES 2



SCALE HORIZ: 1" = 20'  
 SCALE VERT: 1" = 10'

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MINNEZONA CONDOMINIUMS  
 7314 E. MINNEZONA AVENUE  
 SCOTTSDALE, ARIZONA  
 CLIENT: KONTEXTURE  
 3334 N. 20TH STREET, PHOENIX, ARIZONA 85016

PR	8-18-0021	1-BSE-PRELIM ISUBMITTALS/UNIT
PR	4-18-0022	2-AND-PRELIM/2008/01/24/UNIT
PR	7-27-22	3RD PRELIM SUBMITTAL

DATE ISSUED: 2 AUG 2021  
 DRAWN BY: GM  
 CHECKED BY: GM

SHEET DESCRIPTION:  
 SEWER MAIN  
 EXTENSION  
 PLAN

SHEET  
 WR2  
 OF

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## APPENDIX C

# 6-inch Sewer Line Flow Rate Calculations 7314 E Minnezona Scottsdale, Arizona 85250

## Partially Full Pipe Flow Calculations - U.S. Units

II. Calculation of Discharge, Q, and average velocity, V  
for pipes more than half full

**Instructions:** Enter values in blue boxes. Calculations in yellow

### Inputs

Pipe Diameter, **D** =  in  
Depth of flow, **y** =  in  
(must have  $y \geq D/2$ )

Full Pipe Manning roughness, **n<sub>full</sub>** =   
Channel bottom slope, **S** =  ft/ft

### Calculations

**n/n<sub>full</sub>** =   
Partially Full Manning roughness, **n** =

Pipe Diameter, **D** =  ft  
Pipe Radius, **r** =  ft

Circ. Segment Height, **h** =  ft

Central Angle, **q** =  radians  
Cross-Sect. Area, **A** =  ft<sup>2</sup>

Wetted Perimeter, **P** =  ft  
Hydraulic Radius, **R** =  ft  
Discharge, **Q** =  cfs 148,653 gpd  
Ave. Velocity, **V** =  ft/sec

pipe % full  $[(A/A_{full}) * 100\%]$  =

$$r = D/2$$

$$h = 2r - y \quad y/D$$

Hydraulic Radius

$$R = A/P$$

Manning Equation

$$Q = (1.49/n)(A)(R^{2/3})(S^{1/2})$$

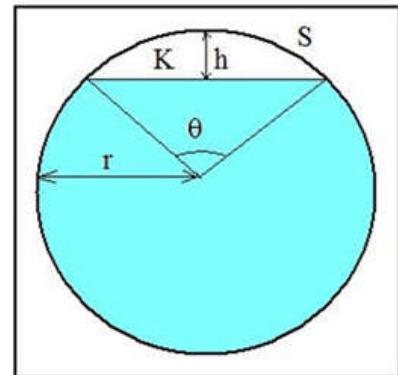
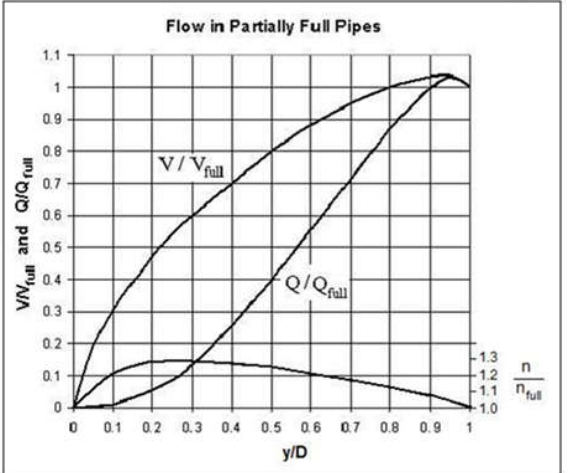
$$V = Q/A$$

$$\theta = 2 \arccos \left( \frac{r-h}{r} \right)$$

$$A = \pi r^2 - \frac{r^2(\theta - \sin \theta)}{2}$$

$$P = 2\pi r - r * \theta$$

Equation used for  $n/n_{full} = 1.25 - (y/D - 0.5) * 0.5$  (for  $0.5 \leq y/D \leq 1$ )



Partially Full Pipe Flow Parameters  
(More Than Half Full)

## APPENDIX D

