PRELIMINARY SEWER REPORT

for Tract No. 36544 – Skyline Heights
in the City of Corona,
County of Riverside, California

PREPARED FOR :

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Section

1
INTRODUCTION

1.1 PURPOSE OF STUDY

The purpose of this report is to provide a sewer system analysis for the Tract No. 36544 Skyline Heights project (Project). Sewer service to the Project will be provided by the City of Corona. This report provides projected sewer flows, identifies existing facilities in the vicinity of the Project, and identifies proposed improvements associated with serving the Project. This report also presents Project phasing and identifies facilities required to serve each phase of the Project.

Tract No. 36544 is approximately 249.5 acres connecting to the City of Corona's westerly extension of Foothill Parkway. The Project's sewer flows are based on the City's planning criteria. This report will analyze the Skyline Heights onsite sewer system and provide an evaluation of impacts that project flows will have on offsite sewer facilities.

1.2 PROJECT DESCRIPTION

The Skyline Heights project consists of approximately 249.5 acres of vacant land situated in the hills on the southwest side of the City of Corona in western Riverside County, adjacent to Foothill Parkway. The site is located approximately 3 miles south of the 71 and 91 Freeways and approximately 4 miles west of Interstate 15. **Figure 1-1** provides a location map for the project. The project site was annexed to the City of Corona during the entitlement process. The Foothill Parkway Westerly Extension between Green River Road and Trudy Way borders the eastern portion of the project and will be the primary access to the site.

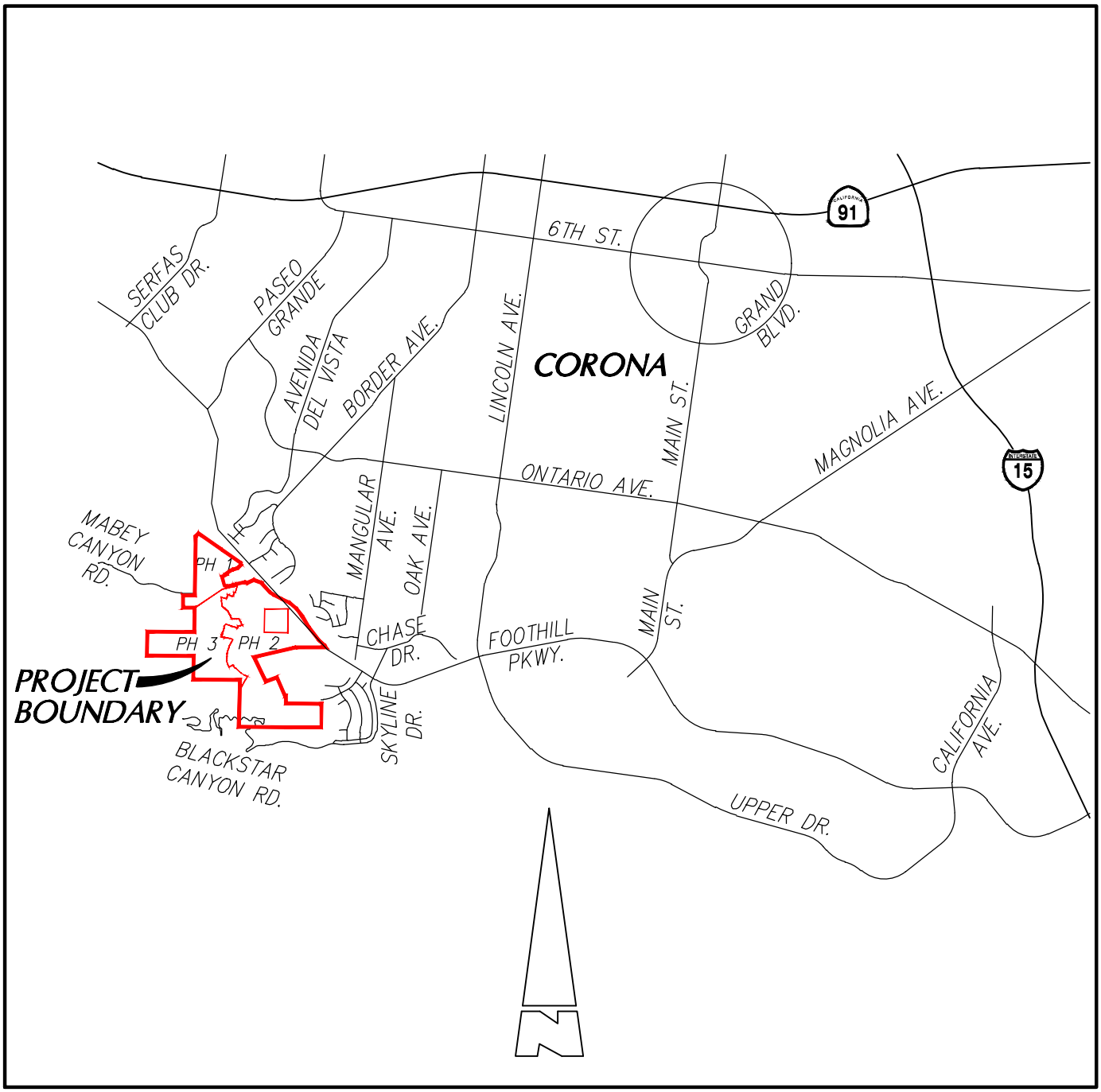
Skyline Heights is generally bounded to the north and east by single-family residences and to the south and west by the Cleveland National Forest and large privately-owned parcels. Within the general boundaries of the project is an undeveloped 10.0-acre parcel which is considered "Not a Part" and is owned by the U.S. Forest Service. Adjacent to the southeast portion of the project site is a single-family residential community. The immediate surrounding area consists of Low Density Residential (3-6 du/ac) as well as undeveloped open space within the City of Corona. Skyline Drive, a graded forest service access road, is located just to the south of the project. This road provides recreational hiking and mountain biking opportunities to residents on a local and regional level.

The project site consists of sparsely vegetated and otherwise undeveloped land with the exception of dirt roads. The site is characterized by steep topography, generally increasing in elevation from the northeast to the southwest. Several canyons and ravines are present which will convey natural drainage across the project site. Phase 1 is located at the northern end of the project and is geographically separated from Phases 2 and 3 to the south by Mabey Canyon.

Development within Phase 1 is proposed to consist of 104 residential units. Development within Phase 2 is proposed to consist of 111 residential units. Development within Phase 3 is proposed to consist of 77 residential units.

1.3 RELATED STUDIES

The City of Corona 2005 Sewer Master Plan, prepared by AKM Consulting Engineers, provides a regional study identifying existing and proposed major sewer facilities within the City's ultimate service area. The master plan study also presents design criteria to be utilized in sizing gravity sewer lines, sewer lift stations, and force mains; as well as provide information on the City's sewer generation rates that can be applied to determine projected average and peak wastewater flows. The master plan report identifies deficiencies in the City's sewer system and discusses the City's future planned Capital Improvement Projects to mitigate these system deficiencies. The City of Corona is in the process of updating the sewer system master plan.



LOCATION MAP

NOT TO SCALE

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FIGURE 1-1

J.N. 2012.1344.1 / R:\12\1344\FINAL\REPORTS\WAT\FIGURES\FIGURE 1-1 - LOCATION MAP.dwg 04/15/2024 13:48

Section

2

PLANNING CRITERIA AND PROJECTED SEWAGE FLOWS

This section presents the planning criteria used to estimate the sewage flows and evaluate the recommended sewer system improvements required for the Skyline Heights project. The criteria utilized in this study are in accordance with the September 2005 City of Corona Sewer Master Plan and the 2012 City's Department of Water and Power Design Policy.

2.1 PLANNING CRITERIA

The sewage generation factors used to estimate the average daily flows for the project are listed in **Table 2-1**.

TABLE 2-1

AVERAGE SEWER GENERATION FACTORS		
Land Use	**Value**	**Unit**
Low Density Residential (3-6 DU/AC)	270	gpd/unit
Low Medium Density Residential (6-8 DU/AC)	270	gpd/unit
Open Space Recreation	130	gpd/ac

To convert average daily flows to peak flows, the criteria from the 2005 Master Plan was used. To convert peak dry weather flow, the following formula was used:

$$\textbf{Peak Dry Weather Flow} = 1.95 * (\textbf{Average Flow in cfs})^{0.92}$$

Peak wet weather flows are calculated using the larger of the values determined from the following formulas:

$$\textbf{Peak Wet Weather Flow} = 1.265 * \textbf{Peak Dry Weather Flow}$$

$$\textbf{Peak Wet Weather Flow} = 2.6 * \textbf{Average Flow}$$

2.2 GRAVITY SEWERS

All gravity sewers are to be designed to convey peak flow. **Table 2-2** lists the maximum allowable d/D under peak dry weather flow and peak wet weather flows for existing and proposed gravity sewer lines. All proposed pipes 12-inch and smaller are to be designed with a d/D less than or equal to 0.50 at peak dry weather flows. During peak wet weather flows, the maximum allowable d/D is 0.82. Manning's Equation with an "n" value of 0.013 was used to size all gravity sewers. All new sewers are to be designed to maintain a minimum velocity of two feet per second at design capacity to prevent the deposition of solids. To minimize excessive wear and tear of the pipe, pipes shall be designed to not exceed a maximum 8 feet per second velocity. All pipes will have a minimum of 7 feet of cover. **Table 2-3** lists the minimum slope requirements for various pipe sizes. These minimum slopes are only permitted when minimum velocities are able to be met. Where a minimum velocity of 2.0 feet per second cannot be met during peak dry weather flows, the minimum required slope shall be 1.0 percent (0.01 ft/ft) unless otherwise approved in writing by the Department of Water and Power.

TABLE 2-2

d/D Criteria		
Flow Condition	**Pipe Size**	**Max d/D**
Peak Dry Weather Flow	Existing 12 inch diameter or smaller	0.64
	Existing 15 inch diameter or larger	0.67
	Proposed 12 inch diameter or smaller	0.50
	Proposed 15 inch diameter or larger	0.67
Peak Wet Weather Flow	All Pipes	0.82

TABLE 2-3

Minimum Slope Requirements	
Sewer Pipe Size (in)	**S (ft\ft)**
8	0.0040
10	0.0025
12	0.0020
15	0.0012
18	0.0010
21	0.0008
24	0.0007

2.3 PROJECTED SEWAGE FLOWS

Table 2-4 provides the projected sewer flows for the Skyline Heights project by development phase. The project can flow by gravity to the existing system and consists of three drainage areas. Each drainage area will consist of collector sewers that convey flow to a point of connection with the existing City of Corona sewer collection system. The average projected sewer flow for the Skyline Heights project is 80,043 gpd (0.124 cfs). The estimated peak dry weather flow for the Skyline Heights project based on the City's peak flow equation is approximately 0.286 cfs. The estimated peak wet weather flow is 0.362 cfs.

TABLE 2-4

SKYLINE HEIGHTS PROJECTED SEWER FLOWS

Phase	Land Use	Quantity, units	Quantity, acres	DU/AC	Sewer Generation Factor	Average Sewer Flow, gpd	Average Sewer Flow, mgd	Average Sewer Flow, cfs
1	Residential	104 units	13.2 ac	7.9	270 gpd/unit	28,080	0.028	0.043
2	Residential	111 units	34.7 ac	3.2	270 gpd/unit	29,970	0.030	0.046
2	Open Space Recreation	---	9.25 ac	---	130 gpd/ac	1,203	0.001	0.002
3	Residential	77 units	16.0 ac	4.8	270 gpd/unit	20,790	0.021	0.032
TOTAL		**292 units**				**80,043**	**0.080**	**0.124**

Section

3

EXISTING AND PROPOSED SEWER FACILITIES

This section presents the existing and proposed sewer facilities that will provide service to the Skyline Heights project.

3.1 EXISTING FACILITIES

The Skyline Heights project is located in the City of Corona service area. Existing sewer facilities have been extended to the north and east sides of the Project. All flows in this area are conveyed north to Wastewater Treatment Plant 1 (WWTP 1). WWTP 1 currently treats approximately 13.5 mgd of average daily flow.

There are a number of existing gravity sewer lines that are located near the Project boundary. In the northern area of the Project, an 8-inch gravity sewer line has been extended in Mabey Canyon Road to just northeast of Foothill Parkway. In the central portion of the Project, an 8-inch gravity sewer line has been extended in Border Avenue to approximately 1,000 feet northeast of Foothill Parkway. In the southern area of the Project, the existing subdivision located south of Foothill Parkway installed an 8-inch gravity sewer line in Trudy Way to within approximately 100 feet of the Project boundary.

3.2 PROPOSED FACILITIES

All onsite sewer facilities are proposed as 8-inch gravity sewer lines located within street right-of-way. The project site is broken up into three drainage areas. **Figure 3-1** provides the proposed sewer layout for the Skyline Heights project. The northern drainage area consists of the proposed 104 lots within Phase 1 of the Project. Flows from these lots are proposed to include an offsite sewer line in Foothill Parkway and Mabey Canyon Road to the existing 8-inch sewer line in Mabey Canyon Road. The central portion of the project consists of the majority of Phase 2 and all of Phase 3 and flow from this area will be conveyed to Foothill Parkway at Border Avenue. An offsite 8-inch sewer line is proposed to convey flow north in Border Avenue to the existing 8-inch sewer line. The southern area of the project includes 17 units within Phase 2 that will convey sewer flows south to the existing sewer line in Trudy Way.

3.2.1 ONSITE SEWER SYSTEM ANALYSIS

The precise slopes of proposed onsite sewer pipes is not known at this level of planning, but preliminary manhole to manhole sewer system calculations have been prepared based on the project utility layout and estimated sewer slopes based on proposed street grades. Calculations were prepared for peak dry weather flow and peak wet weather flow conditions. The

calculations for the onsite sewer system are provided in **Appendix A** and verify that 8-inch onsite piping is adequate to serve the project. Due to the topography of the project, all but a few of the sewer line sections will have slopes of greater than 1.0 percent. The few sections of line with slopes of less than 1.0 percent were confirmed to have velocities of greater than 2.0 feet per second during peak flows.

3.2.2 OFFSITE SEWER SYSTEM ANALYSIS

The City of Corona is in the process of updating their Sewer Master Plan. As part of that effort, the City evaluated the impact of the project flows on the offsite sewer system. The summary of required upgrades to be constructed prior to the first building permit of any phase of the proposed development, as determined from the City analysis is provided below:

- Upgrade existing 8-inch sewer in Brentwood Drive to a 12-inch sewer main from MH2039 to MH2041 (inclusive), approximately 164 LF.

- Upgrade existing 8-inch sewer in Kroonen Drive to a 12-inch sewer main from MH2034 to MH2035 (inclusive), approximately 170 LF.

- Upgrade existing 8-inch sewer in Kroonen Drive to a 12-inch sewer main from MH2033 to MH2034 (inclusive), approximately 169 LF.

All of the sewer segments identified above were identified in the City 2005 Master Plan as requiring replacement as part of the City's Capital Improvement Program. The segments of pipeline to be replaced were identified as CIP Project Number P-12 in the 2005 Master Plan. Relevant excerpts from the 2005 Master Plan showing the limits of these proposed improvements are provided in **Appendix B** for reference.

LEGEND

PROPOSED SEWER LINES

EXISTING SEWER LINES

CONNECT TO EX. 8" SEWER LINE

MABEY CANYON RD

BORDER AVE

CONNECT TO EX. 8" SEWER LINE

W CHASE DR

FOOTHILL PKWY

CONNECT TO EX. 8" SEWER LINE

EX. SINGLE FAMILY RES. LOW DENSITY RES. SP-83-7

EX. SINGLE FAMILY RES. LOW DENSITY RES. PLANNED COMMUNITY DEVELOPMENT

EX. SINGLE FAMILY RES. LOW DENSITY RES. R1-8.4

EX. SINGLE FAMILY RES. LOW DENSITY RES. R1-9.6

EX. SINGLE FAMILY RES. LOW DENSITY RES. R1-1A

TRACT 28941 EX. SINGLE FAMILY RES. LOW DENSITY RES. R1-8.4

TRACT 27302 EX. SINGLE FAMILY RES. LOW DENSITY RES. R1-7.2

A.P.N. 275-030-008 OPEN SPACE-CH

A.P.N. 275-040-003 VACANT AGRICULTURE

A.P.N. 275-040-001 OPEN SPACE-CH

MABEY CANYON DEBRIS BASIN

MABEY CANYON

A.P.N. 275-040-004 EXISTING RESIDENCE

A.P.N. 275-040-005 VACANT AGRICULTURE

N.A.P. A.P.N. 275-040-010 OPEN SPACE-CH

A.P.N. 275-040-001 OPEN SPACE-CH

A.P.N. 275-050-014 VACANT AGRICULTURE

A.P.N. 275-080-041 VACANT AGRICULTURE

A.P.N. 275-070-004 VACANT AGRICULTURE

A.P.N. 275-080-020 VACANT AGRICULTURE

A.P.N. 275-080-021 AGRICULTURE

A.P.N. 275-080-011 OPEN SPACE-CH

A.P.N. 275-070-010 VACANT AGRICULTURE

A.P.N. 275-080-009 OPEN SPACE-CH

600' 0 600'

SCALE: 1"=600'

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FIGURE 3-1

PROPOSED SEWER FACILITIES MAP

JN: 2012.1344 R:\12\1344\FINAL\REPORTS\SEW\FIGURES\1344 SEW FIG 3-1.dwg 5/28/25 9:31 AM

Section

4
PHASING

This section of the report identifies the proposed project phasing and provides the required sewer system improvements to serve each phase of the project.

4.1 PROJECT PHASING

The Skyline Heights project will be developed in three major phases. The first phase is the development at the north end of the project, north of Mabey Canyon. The second phase consists of the eastern portion of proposed development south of Mabey Canyon and the third phase includes the remainder of the project located along the western edge of the development. **Figure 4-1** provides the location of the proposed project phases.

4.2 SEWER FACILITY PHASING

The Project will be required to construct sewer infrastructure that allows phased construction of the Project. Service to Phase 1 is independent of the rest of the project and can be served by constructing offsite sewer lines in Foothill Parkway and Mabey Canyon Road and connection to the existing 8-inch gravity sewer line in Mabey Canyon Road. The majority of Phase 2 is within the central portion of the project that drains northeasterly to Border Avenue. Service to this phase will require the construction of an offsite sewer line in Border Avenue to the existing 8-inch gravity sewer line. The remainder of Phase 2 is in the southern portion of the Project and will require a short section of offsite sewer line to connect to the existing 8-inch sewer line in Trudy Way. Phase 3 of the Project will convey flow to the gravity sewer lines in the central portion of the project that were constructed in Phase 2. All flows from Phase 3 will be conveyed to the existing 8-inch gravity sewer line in Border Avenue. **Figure 4-1** provides the proposed sewer facility improvements for each phase of the project.

LEGEND

- PHASE 1
- PHASE 2
- PHASE 3
- PHASE 1 SEWER LINES
- PHASE 2 SEWER LINES
- PHASE 3 SEWER LINES
- EXISTING SEWER LINES

CONNECT TO EX. 8" SEWER LINE

MABEY CANYON RD

BORDER AVE

CONNECT TO EX. 8" SEWER LINE

W CHASE DR

FOOTHILL PKWY

CONNECT TO EX. 8" SEWER LINE

A.P.N. 275-030-008 OPEN SPACE-CH

A.P.N. 275-040-003 VACANT AGRICULTURE

A.P.N. 275-040-001 OPEN SPACE-CH

MABEY CANYON

A.P.N. 275-040-004 EXISTING RESIDENCE

MABEY CANYON DEBRIS BASIN

A.P.N. 275-040-005 VACANT AGRICULTURE

A.P.N. 275-040-001 OPEN SPACE-CH

N.A.P. A.P.N. 275-040-010 OPEN SPACE-CH

A.P.N. 275-050-014 VACANT AGRICULTURE

A.P.N. 275-080-041 VACANT AGRICULTURE

A.P.N. 275-070-004 VACANT AGRICULTURE

A.P.N. 275-080-020 VACANT AGRICULTURE

A.P.N. 275-080-021 AGRICULTURE

A.P.N. 275-080-011 OPEN SPACE-CH

A.P.N. 275-070-010 VACANT AGRICULTURE

A.P.N. 275-080-009 OPEN SPACE-CH

EX. SINGLE FAMILY RES. LOW DENSITY RES. R1-8.4

EX. SINGLE FAMILY RES. LOW DENSITY RES. PLANNED COMMUNITY DEVELOPMENT

EX. SINGLE FAMILY RES. LOW DENSITY RES. R1-7.2

EX. SINGLE FAMILY RES. LOW DENSITY RES. M-1A

TRACT 28941 EX. SINGLE FAMILY RES. LOW DENSITY RES. R1-8.4

600' 0 600'

SCALE: 1"=600'

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FIGURE 4-1

PROPOSED SEWER FACILITIES PHASING MAP

JN: 2012.1344 R:\12\1344\FINAL\REPORTS\SEW\FIGURES\1344 SEW FIG 4-1.dwg 5/28/25 9:50 AM

Section

5
CONCLUSIONS

This section of the report provides a summary of conclusions based on our evaluation of sewer system requirements for the Skyline Heights project.

5.1 CONCLUSIONS

The following conclusions have been made based on our analysis:

- The Skyline Heights project consists of three phases of development that will result in development of a maximum of 292 residential units.

- The Skyline Heights project can be served by constructing onsite 8-inch gravity sewer lines and connecting to the existing sewer system at three locations.

- The northern portion of the Project will be served by constructing an offsite gravity sewer line in Foothill Parkway and Mabey Canyon Road and connecting to an existing 8-inch sewer line in Mabey Canyon Road.

- The central portion of the Project will be served by constructing an offsite sewer line in Border Avenue and connecting to an existing 8-inch gravity sewer line, approximately 1,000 feet east of Foothill Parkway.

- The southern portion of the Project will be connected to the existing 8-inch gravity sewer line in Trudy Way that has been extended to approximately 100 feet east of the project boundary.

- The impact of project flows on the offsite sewer system were evaluated by the City of Corona and the required upgrades to be constructed prior to the first building permit of any phase to support project flows are summarized below.

    - Upgrade existing 8-inch sewer in Brentwood Drive to a 12-inch sewer main from MH2039 to MH2041 (inclusive), approximately 164 LF.

    - Upgrade existing 8-inch sewer in Kroonen Drive to a 12-inch sewer main from MH2034 to MH2035 (inclusive), approximately 170 LF.

    - Upgrade existing 8-inch sewer in Kroonen Drive to a 12-inch sewer main from MH2033 to MH2034 (inclusive), approximately 169 LF.

Appendix

A

ONSITE SEWER SYSTEM CALCULATIONS

1. Peak Dry Weather Flows – North
2. Peak Wet Weather Flows – North
3. Peak Dry Weather Flows – Central
4. Peak Wet Weather Flows – Central
5. Peak Dry Weather Flows – South
6. Peak Wet Weather Flows - South

NOTE: SEWER NODE DIAGRAM AT BACK OF APPENDIX A

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PROJECT: Skyline Heights Onsite Sewer System - North
SCENARIO: **Peak Dry Weather Flow Scenario**

DATE: 11/18/2025

FROM MH	TO MH	IN-LINE EDUs	CUMULATIVE EDUS	FLOW FACTOR (gpd/EDU)	AVG. DRY WEATHER FLOW (gpd)	AVG. DRY WEATHER FLOW (cfs)	PEAK FLOW (cfs)	LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' [1]	dn (feet)	dn/D [2]	C_a for Velocity [3]	VELOCITY (f.p.s.)	COMMENTS
30	28	24.00	24.0	270	6,480	0.010	0.028	8	2.5	0.006848	0.05648	0.08	0.0320	1.98	See velocity note below
28	26	8.00	32.0	270	8,640	0.013	0.037	8	2.5	0.008923	0.06407	0.10	0.0386	2.15	
26	24	0.00	32.0	270	8,640	0.013	0.037	8	2.1	0.009736	0.06687	0.10	0.0411	2.02	
24	22	0.00	32.0	270	8,640	0.013	0.037	8	2.1	0.009736	0.06687	0.10	0.0411	2.02	
22	20	0.00	32.0	270	8,640	0.013	0.037	8	11.0	0.004254	0.04511	0.07	0.0230	3.60	
20	18	72.00	104.0	270	28,080	0.043	0.109	8	10.0	0.013195	0.07721	0.12	0.0507	4.83	Flow from MH 32
18	16	0.00	104.0	270	28,080	0.043	0.109	8	10.0	0.013195	0.07721	0.12	0.0507	4.83	
16	14	0.00	104.0	270	28,080	0.043	0.109	8	4.0	0.020863	0.09636	0.14	0.0700	3.50	
14	12	0.00	104.0	270	28,080	0.043	0.109	8	4.0	0.020863	0.09636	0.14	0.0700	3.50	
12	10	0.00	104.0	270	28,080	0.043	0.109	8	1.0	0.041726	0.13512	0.20	0.1140	2.15	
10	8	0.00	104.0	270	28,080	0.043	0.109	8	6.0	0.017035	0.08746	0.13	0.0608	4.03	
8	6	0.00	104.0	270	28,080	0.043	0.109	8	6.0	0.017035	0.08746	0.13	0.0608	4.03	
6	4	0.00	104.0	270	28,080	0.043	0.109	8	6.0	0.017035	0.08746	0.13	0.0608	4.03	
4	2	0.00	104.0	270	28,080	0.043	0.109	8	6.0	0.017035	0.08746	0.13	0.0608	4.03	
36	34	36.00	36.0	270	9,720	0.015	0.041	8	1.0	0.015723	0.08406	0.13	0.0574	1.61	See velocity note below
34	32	28.00	64.0	270	17,280	0.027	0.070	8	1.0	0.026695	0.10862	0.16	0.0833	1.88	See velocity note below
32	20	8.00	72.0	270	19,440	0.030	0.078	8	1.0	0.029750	0.11454	0.17	0.0899	1.94	See velocity note below
[1] Based on n = 0.013															
[2] d/D using K' in Brater and King															
[3] From Brater and King based on d/D															

Velocity Note: During final engineering, engineer shall evaluate adjusting slopes to achieve a minimum velocity of 2.0 fps. Where a velocity of 2.0 fps cannot be achieved, a minimum pipe slope of 1.0 % will be allowed.

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PROJECT: Skyline Heights Onsite Sewer System - North
SCENARIO: **Peak Wet Weather Flow Scenario**

DATE: 11/18/2025

FROM MH	TO MH	IN-LINE EDUs	CUMULATIVE EDUS	FLOW FACTOR (gpd/EDU)	AVG. DRY WEATHER FLOW (gpd)	AVG. DRY WEATHER FLOW (cfs)	PEAK FLOW (cfs)	LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (f.p.s.)	COMMENTS
30	28	24.00	24.0	270	6,480	0.010	0.036	8	2.5	0.008663	0.06317	0.09	0.0378	2.13	
28	26	8.00	32.0	270	8,640	0.013	0.047	8	2.5	0.011288	0.07173	0.11	0.0455	2.30	
26	24	0.00	32.0	270	8,640	0.013	0.047	8	2.1	0.012316	0.07477	0.11	0.0484	2.17	
24	22	0.00	32.0	270	8,640	0.013	0.047	8	2.1	0.012316	0.07477	0.11	0.0484	2.17	
22	20	0.00	32.0	270	8,640	0.013	0.047	8	11.0	0.005381	0.05039	0.08	0.0271	3.87	
20	18	72.00	104.0	270	28,080	0.043	0.138	8	10.0	0.016692	0.08664	0.13	0.0600	5.17	Flow from MH 32
18	16	0.00	104.0	270	28,080	0.043	0.138	8	10.0	0.016692	0.08664	0.13	0.0600	5.17	
16	14	0.00	104.0	270	28,080	0.043	0.138	8	4.0	0.026392	0.10802	0.16	0.0826	3.75	
14	12	0.00	104.0	270	28,080	0.043	0.138	8	4.0	0.026392	0.10802	0.16	0.0826	3.75	
12	10	0.00	104.0	270	28,080	0.043	0.138	8	1.0	0.052784	0.15198	0.23	0.1348	2.30	
10	8	0.00	104.0	270	28,080	0.043	0.138	8	6.0	0.021549	0.09789	0.15	0.0716	4.32	
8	6	0.00	104.0	270	28,080	0.043	0.138	8	6.0	0.021549	0.09789	0.15	0.0716	4.32	
6	4	0.00	104.0	270	28,080	0.043	0.138	8	6.0	0.021549	0.09789	0.15	0.0716	4.32	
4	2	0.00	104.0	270	28,080	0.043	0.138	8	6.0	0.021549	0.09789	0.15	0.0716	4.32	
36	34	36.00	36.0	270	9,720	0.015	0.052	8	1.0	0.019890	0.09420	0.14	0.0677	1.72	See velocity note below
34	32	28.00	64.0	270	17,280	0.027	0.088	8	1.0	0.033769	0.12183	0.18	0.0982	2.02	
32	20	8.00	72.0	270	19,440	0.030	0.098	8	1.0	0.037634	0.12839	0.19	0.1059	2.09	

[1] Based on n = 0.013
[2] d/D using K' in Brater and King
[3] From Brater and King based on d/D

Velocity Note: During final engineering, engineer shall evaluate adjusting slopes to achieve a minimum velocity of 2.0 fps. Where a velocity of 2.0 fps cannot be achieved, a minimum pipe slope of 1.0 % will be allowed.

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PROJECT: Skyline Heights Onsite Sewer System - Central
SCENARIO: **Peak Dry Weather Flow Scenario**

DATE: 11/18/2025

FROM MH	TO MH	IN-LINE EDUs	CUMULATIVE EDUS	FLOW FACTOR (gpd/EDU)	AVG. DRY WEATHER FLOW (gpd)	AVG. DRY WEATHER FLOW (cfs)	PEAK FLOW (cfs)	LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (f.p.s.)	COMMENTS
68	67	6.00	6.0	270	1,620	0.003	0.008	8	2.00	0.002139	0.03269	0.05	0.0143	1.24	See velocity note below
67	66	4.00	10.0	270	2,700	0.004	0.013	8	2.00	0.003422	0.04074	0.06	0.0198	1.44	See velocity note below
66	65	0.00	10.0	270	2,700	0.004	0.013	8	1.80	0.003607	0.04171	0.06	0.0205	1.39	See velocity note below
65	64	16.00	26.0	270	7,020	0.011	0.030	8	1.80	0.008687	0.06325	0.09	0.0379	1.81	Flow from MH 105, see velocity note below
64	63	0.00	26.0	270	7,020	0.011	0.030	8	2.40	0.007523	0.05912	0.09	0.0343	2.00	
63	62	17.46	43.5	270	11,733	0.018	0.049	8	3.30	0.010292	0.06861	0.10	0.0427	2.57	Flow from MH 115
62	61	5.00	48.5	270	13,083	0.020	0.054	8	3.30	0.011376	0.07201	0.11	0.0458	2.65	
61	60	5.00	53.5	270	14,433	0.022	0.059	8	3.30	0.012452	0.07514	0.11	0.0487	2.72	
60	59	5.00	58.5	270	15,783	0.024	0.064	8	1.60	0.019416	0.09313	0.14	0.0666	2.16	
59	58	19.00	77.5	270	20,913	0.032	0.083	8	1.00	0.031818	0.11837	0.18	0.0942	1.98	Flow from MH 110, see velocity note below
58	57	4.00	81.5	270	21,993	0.034	0.087	8	12.00	0.009620	0.06649	0.10	0.0407	4.80	
57	56	4.00	85.5	270	23,073	0.036	0.091	8	12.00	0.010054	0.06787	0.10	0.0420	4.87	
56	55	4.00	89.5	270	24,153	0.037	0.095	8	12.00	0.010486	0.06922	0.10	0.0432	4.93	
55	54	64.00	153.5	270	41,433	0.064	0.156	8	11.00	0.017995	0.08975	0.13	0.0631	5.55	2 units plus flow from MH 80
54	53	3.00	156.5	270	42,243	0.065	0.159	8	8.00	0.021480	0.09773	0.15	0.0715	4.99	
53	52	2.00	158.5	270	42,783	0.066	0.160	8	8.00	0.021733	0.09829	0.15	0.0721	5.01	
52	51	1.00	159.5	270	43,053	0.067	0.161	8	0.65	0.076685	0.18350	0.28	0.1758	2.06	
51	50	3.00	162.5	270	43,863	0.068	0.164	8	11.00	0.018964	0.09206	0.14	0.0655	5.64	Flow from MH 75
50	49	0.00	162.5	270	43,863	0.068	0.164	8	12.00	0.018156	0.09013	0.14	0.0635	5.81	
49	48	0.00	162.5	270	43,863	0.068	0.164	8	12.00	0.018156	0.09013	0.14	0.0635	5.81	
48	47	13.00	175.5	270	47,373	0.073	0.176	8	11.00	0.020355	0.09523	0.14	0.0688	5.76	Flow from MH 70
47	46	0.00	175.5	270	47,373	0.073	0.176	8	11.00	0.020355	0.09523	0.14	0.0688	5.76	
46	45	0.00	175.5	270	47,373	0.073	0.176	8	3.90	0.034185	0.12254	0.18	0.0991	4.00	
45	44	0.00	175.5	270	47,373	0.073	0.176	8	5.40	0.029052	0.11324	0.17	0.0884	4.48	
44	43	0.00	175.5	270	47,373	0.073	0.176	8	7.60	0.024489	0.10414	0.16	0.0784	5.06	
43	42	0.00	175.5	270	47,373	0.073	0.176	8	8.50	0.023156	0.10137	0.15	0.0754	5.26	
42	41	0.00	175.5	270	47,373	0.073	0.176	8	6.00	0.027561	0.11032	0.17	0.0852	4.65	
41	40	0.00	175.5	270	47,373	0.073	0.176	8	6.00	0.027561	0.11032	0.17	0.0852	4.65	
86	85	6.00	6.0	270	1,620	0.003	0.008	8	2.50	0.001913	0.03090	0.05	0.0132	1.35	See velocity note below
85	84	6.00	12.0	270	3,240	0.005	0.015	8	2.50	0.003619	0.04178	0.06	0.0205	1.64	See velocity note below
84	83	14.00	26.0	270	7,020	0.011	0.030	8	8.00	0.004121	0.04441	0.07	0.0225	3.04	Flow from MH 90
83	82	14.00	40.0	270	10,800	0.017	0.045	8	12.00	0.005001	0.04868	0.07	0.0258	3.95	4 Units plus flow from MH 95
82	81	16.00	56.0	270	15,120	0.023	0.062	8	2.50	0.014931	0.08195	0.12	0.0553	2.50	Flow from MH 100
81	80	2.00	58.0	270	15,660	0.024	0.064	8	2.50	0.015421	0.08326	0.12	0.0566	2.53	
80	55	4.00	62.0	270	16,740	0.026	0.068	8	1.90	0.018809	0.09169	0.14	0.0651	2.34	
96	95	6.00	6.0	270	1,620	0.003	0.008	8	1.00	0.003024	0.03839	0.06	0.0181	0.98	See velocity note below
95	83	4.00	10.0	270	2,700	0.004	0.013	8	1.00	0.004839	0.04796	0.07	0.0252	1.13	See velocity note below

FROM MH	TO MH	IN-LINE EDUs	CUMULATIVE EDUS	FLOW FACTOR (gpd/EDU)	AVG. DRY WEATHER FLOW (gpd)	AVG. DRY WEATHER FLOW (cfs)	PEAK FLOW (cfs)	LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' [1]	dn (feet)	dn/D [2]	C_a for Velocity [3]	VELOCITY (f.p.s.)	COMMENTS
91	90	8.00	8.0	270	2,160	0.003	0.010	8	1.00	0.003941	0.04347	0.07	0.0218	1.06	See velocity note below
90	84	6.00	14.0	270	3,780	0.006	0.017	8	1.50	0.005384	0.05040	0.08	0.0271	1.43	See velocity note below
120	118	4.46	4.5	270	1,203	0.002	0.006	8	1.00	0.002300	0.03384	0.05	0.0150	0.90	Park flows converted to EDUs, see velocity note below
118	117	4.00	8.5	270	2,283	0.004	0.011	8	1.10	0.003954	0.04354	0.07	0.0219	1.11	See velocity note below
117	116	4.00	12.5	270	3,363	0.005	0.015	8	1.00	0.005922	0.05281	0.08	0.0290	1.20	See velocity note below
116	115	1.00	13.5	270	3,633	0.006	0.017	8	3.30	0.003500	0.04115	0.06	0.0201	1.86	See velocity note below
115	63	4.00	17.5	270	4,713	0.007	0.021	8	3.30	0.004447	0.04613	0.07	0.0238	1.99	See velocity note below
107	106	6.00	6.0	270	1,620	0.003	0.008	8	1.00	0.003024	0.03839	0.06	0.0181	0.98	See velocity note below
106	105	6.00	12.0	270	3,240	0.005	0.015	8	1.00	0.005723	0.05191	0.08	0.0283	1.19	See velocity note below
105	65	4.00	16.0	270	4,320	0.007	0.019	8	2.00	0.005272	0.04990	0.07	0.0267	1.64	See velocity note below
113	112	6.00	6.0	270	1,620	0.003	0.008	8	1.00	0.003024	0.03839	0.06	0.0181	0.98	See velocity note below
112	111	5.00	11.0	270	2,970	0.005	0.014	8	1.00	0.005282	0.04994	0.07	0.0268	1.16	See velocity note below
111	110	5.00	16.0	270	4,320	0.007	0.019	8	1.00	0.007456	0.05886	0.09	0.0340	1.29	See velocity note below
110	59	3.00	19.0	270	5,130	0.008	0.023	8	1.00	0.008734	0.06342	0.10	0.0380	1.35	See velocity note below
101	100	10.00	10.0	270	2,700	0.004	0.013	8	1.00	0.004839	0.04796	0.07	0.0252	1.13	See velocity note below
100	82	6.00	16.0	270	4,320	0.007	0.019	8	1.90	0.005409	0.05051	0.08	0.0272	1.61	See velocity note below
76	75	2.00	2.0	270	540	0.001	0.003	8	6.00	0.000449	0.01549	0.02	0.0047	1.36	See velocity note below
75	51	1.00	3.0	270	810	0.001	0.004	8	7.00	0.000604	0.01789	0.03	0.0059	1.59	See velocity note below
72	71	3.00	3.0	270	810	0.001	0.004	8	2.60	0.000991	0.02262	0.03	0.0083	1.13	See velocity note below
71	70	4.00	7.0	270	1,890	0.003	0.009	8	2.60	0.002161	0.03287	0.05	0.0144	1.42	See velocity note below
70	48	6.00	13.0	270	3,510	0.005	0.016	8	2.60	0.003820	0.04284	0.06	0.0213	1.70	See velocity note below
[1] Based on n = 0.013															
[2] d/D using K' in Brater and King															
[3] From Brater and King based on d/D															

Velocity Note: During final engineering, engineer shall evaluate adjusting slopes to achieve a minimum velocity of 2.0 fps. Where a velocity of 2.0 fps cannot be achieved, a minimum pipe slope of 1.0 % will be allowed.

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PROJECT: Skyline Heights Onsite Sewer System - Central
SCENARIO: **Peak Wet Weather Flow Scenario**

DATE: 11/18/2025

FROM MH	TO MH	IN-LINE EDUs	CUMULATIVE EDUS	FLOW FACTOR (gpd/EDU)	AVG. DRY WEATHER FLOW (gpd)	AVG. DRY WEATHER FLOW (cfs)	PEAK FLOW (cfs)	LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (f.p.s.)	COMMENTS
68	67	6.00	6.0	270	1,620	0.003	0.010	8	2.00	0.002705	0.03639	0.05	0.0168	1.34	See velocity note below
67	66	4.00	10.0	270	2,700	0.004	0.016	8	2.00	0.004328	0.04550	0.07	0.0233	1.54	See velocity note below
66	65	0.00	10.0	270	2,700	0.004	0.016	8	1.80	0.004562	0.04672	0.07	0.0242	1.48	See velocity note below
65	64	16.00	26.0	270	7,020	0.011	0.038	8	1.80	0.010989	0.07080	0.11	0.0447	1.94	Flow from MH 105, see velocity note below
64	63	0.00	26.0	270	7,020	0.011	0.038	8	2.40	0.009517	0.06614	0.10	0.0404	2.14	
63	62	17.46	43.5	270	11,733	0.018	0.062	8	3.30	0.013019	0.07672	0.12	0.0503	2.76	Flow from MH 115
62	61	5.00	48.5	270	13,083	0.020	0.068	8	3.30	0.014391	0.08051	0.12	0.0539	2.85	
61	60	5.00	53.5	270	14,433	0.022	0.075	8	3.30	0.015752	0.08414	0.13	0.0575	2.92	
60	59	5.00	58.5	270	15,783	0.024	0.081	8	1.60	0.024561	0.10429	0.16	0.0785	2.32	
59	58	19.00	77.5	270	20,913	0.032	0.105	8	1.00	0.040249	0.13275	0.20	0.1111	2.13	Flow from MH 110
58	57	4.00	81.5	270	21,993	0.034	0.110	8	12.00	0.012170	0.07436	0.11	0.0480	5.16	
57	56	4.00	85.5	270	23,073	0.036	0.115	8	12.00	0.012719	0.07589	0.11	0.0494	5.23	
56	55	4.00	89.5	270	24,153	0.037	0.120	8	12.00	0.013265	0.07740	0.12	0.0509	5.30	
55	54	64.00	153.5	270	41,433	0.064	0.197	8	11.00	0.022763	0.10055	0.15	0.0745	5.95	2 units plus flow from MH 80
54	53	3.00	156.5	270	42,243	0.065	0.201	8	8.00	0.027172	0.10955	0.16	0.0843	5.35	
53	52	2.00	158.5	270	42,783	0.066	0.203	8	8.00	0.027492	0.11018	0.17	0.0850	5.37	
52	51	1.00	159.5	270	43,053	0.067	0.204	8	0.65	0.097007	0.20711	0.31	0.2080	2.21	
51	50	3.00	162.5	270	43,863	0.068	0.208	8	11.00	0.023989	0.10310	0.15	0.0773	6.05	Flow from MH 75
50	49	0.00	162.5	270	43,863	0.068	0.208	8	12.00	0.022968	0.10097	0.15	0.0750	6.23	
49	48	0.00	162.5	270	43,863	0.068	0.208	8	12.00	0.022968	0.10097	0.15	0.0750	6.23	
48	47	13.00	175.5	270	47,373	0.073	0.223	8	11.00	0.025749	0.10676	0.16	0.0812	6.17	Flow from MH 70
47	46	0.00	175.5	270	47,373	0.073	0.223	8	11.00	0.025749	0.10676	0.16	0.0812	6.17	
46	45	0.00	175.5	270	47,373	0.073	0.223	8	3.90	0.043245	0.13753	0.21	0.1169	4.29	
45	44	0.00	175.5	270	47,373	0.073	0.223	8	5.40	0.036751	0.12692	0.19	0.1042	4.81	
44	43	0.00	175.5	270	47,373	0.073	0.223	8	7.60	0.030978	0.11681	0.18	0.0925	5.42	
43	42	0.00	175.5	270	47,373	0.073	0.223	8	8.50	0.029292	0.11369	0.17	0.0889	5.64	
42	41	0.00	175.5	270	47,373	0.073	0.223	8	6.00	0.034865	0.12370	0.19	0.1004	4.99	
41	40	0.00	175.5	270	47,373	0.073	0.223	8	6.00	0.034865	0.12370	0.19	0.1004	4.99	
86	85	6.00	6.0	270	1,620	0.003	0.010	8	2.50	0.002420	0.03459	0.05	0.0155	1.44	See velocity note below
85	84	6.00	12.0	270	3,240	0.005	0.019	8	2.50	0.004578	0.04679	0.07	0.0243	1.75	See velocity note below
84	83	14.00	26.0	270	7,020	0.011	0.038	8	8.00	0.005213	0.04963	0.07	0.0265	3.26	Flow from MH 90
83	82	14.00	40.0	270	10,800	0.017	0.057	8	12.00	0.006326	0.05445	0.08	0.0303	4.24	4 Units plus flow from MH 95
82	81	16.00	56.0	270	15,120	0.023	0.078	8	2.50	0.018888	0.09188	0.14	0.0653	2.68	Flow from MH 100
81	80	2.00	58.0	270	15,660	0.024	0.080	8	2.50	0.019508	0.09335	0.14	0.0668	2.71	
80	55	4.00	62.0	270	16,740	0.026	0.086	8	1.90	0.023793	0.10269	0.15	0.0768	2.51	
96	95	6.00	6.0	270	1,620	0.003	0.010	8	1.00	0.003826	0.04287	0.06	0.0213	1.05	See velocity note below
95	83	4.00	10.0	270	2,700	0.004	0.016	8	1.00	0.006121	0.05365	0.08	0.0297	1.21	See velocity note below

FROM MH	TO MH	IN-LINE EDUs	CUMULATIVE EDUS	FLOW FACTOR (gpd/EDU)	AVG. DRY WEATHER FLOW (gpd)	AVG. DRY WEATHER FLOW (cfs)	PEAK FLOW (cfs)	LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' [1]	dn (feet)	dn/D [2]	C_a for Velocity [3]	VELOCITY (f.p.s.)	COMMENTS
91	90	8.00	8.0	270	2,160	0.003	0.013	8	1.00	0.004985	0.04861	0.07	0.0257	1.14	See velocity note below
90	84	6.00	14.0	270	3,780	0.006	0.022	8	1.50	0.006811	0.05634	0.08	0.0319	1.53	See velocity note below
120	118	4.46	4.5	270	1,203	0.002	0.008	8	1.00	0.002909	0.03767	0.06	0.0176	0.97	Park flows converted to EDUs, see velocity note below
118	117	4.00	8.5	270	2,283	0.004	0.014	8	1.10	0.005002	0.04869	0.07	0.0258	1.19	See velocity note below
117	116	4.00	12.5	270	3,363	0.005	0.020	8	1.00	0.007491	0.05899	0.09	0.0342	1.29	See velocity note below
116	115	1.00	13.5	270	3,633	0.006	0.021	8	3.30	0.004428	0.04602	0.07	0.0237	1.99	See velocity note below
115	63	4.00	17.5	270	4,713	0.007	0.027	8	3.30	0.005625	0.05148	0.08	0.0280	2.15	
107	106	6.00	6.0	270	1,620	0.003	0.010	8	1.00	0.003826	0.04287	0.06	0.0213	1.05	See velocity note below
106	105	6.00	12.0	270	3,240	0.005	0.019	8	1.00	0.007239	0.05801	0.09	0.0333	1.28	See velocity note below
105	65	4.00	16.0	270	4,320	0.007	0.025	8	2.00	0.006670	0.05579	0.08	0.0315	1.76	See velocity note below
113	112	6.00	6.0	270	1,620	0.003	0.010	8	1.00	0.003826	0.04287	0.06	0.0213	1.05	See velocity note below
112	111	5.00	11.0	270	2,970	0.005	0.017	8	1.00	0.006682	0.05584	0.08	0.0315	1.25	See velocity note below
111	110	5.00	16.0	270	4,320	0.007	0.025	8	1.00	0.009432	0.06584	0.10	0.0402	1.38	See velocity note below
110	59	3.00	19.0	270	5,130	0.008	0.029	8	1.00	0.011048	0.07098	0.11	0.0448	1.45	See velocity note below
101	100	10.00	10.0	270	2,700	0.004	0.016	8	1.00	0.006121	0.05365	0.08	0.0297	1.21	See velocity note below
100	82	6.00	16.0	270	4,320	0.007	0.025	8	1.90	0.006843	0.05646	0.08	0.0320	1.73	See velocity note below
76	75	2.00	2.0	270	540	0.001	0.004	8	6.00	0.000568	0.01734	0.03	0.0056	1.45	See velocity note below
75	51	1.00	3.0	270	810	0.001	0.005	8	7.00	0.000764	0.02025	0.03	0.0070	1.69	See velocity note below
72	71	3.00	3.0	270	810	0.001	0.005	8	2.60	0.001254	0.02535	0.04	0.0098	1.21	See velocity note below
71	70	4.00	7.0	270	1,890	0.003	0.012	8	2.60	0.002734	0.03657	0.05	0.0169	1.53	See velocity note below
70	48	6.00	13.0	270	3,510	0.005	0.020	8	2.60	0.004833	0.04793	0.07	0.0252	1.82	See velocity note below
[1] Based on n = 0.013															
[2] d/D using K' in Brater and King															
[3] From Brater and King based on d/D															

Velocity Note: During final engineering, engineer shall evaluate adjusting slopes to achieve a minimum velocity of 2.0 fps. Where a velocity of 2.0 fps cannot be achieved, a minimum pipe slope of 1.0 % will be allowed.

KWC ENGINEERS
CIVIL ENGINEERS • PLANNERS • SURVEYORS

PROJECT: Skyline Heights Onsite Sewer System - South
SCENARIO: **Peak Dry Weather Flow Scenario**

DATE: 11/18/2025

FROM MH	TO MH	IN-LINE EDUs	CUMULATIVE EDUS	FLOW FACTOR (gpd/EDU)	AVG. DRY WEATHER FLOW (gpd)	AVG. DRY WEATHER FLOW (cfs)	PEAK FLOW (cfs)	LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' (1)	dn (feet)	dn/D(2)	C_a for Velocity(3)	VELOCITY (f.p.s.)	COMMENTS
166	164	3.00	3.0	270	810	0.001	0.004	8	12.0	0.000461	0.01568	0.02	0.0048	1.94	See velocity note below
164	162	3.00	6.0	270	1,620	0.003	0.008	8	12.0	0.000873	0.02139	0.03	0.0076	2.32	
162	160	3.00	9.0	270	2,430	0.004	0.011	8	12.0	0.001268	0.02550	0.04	0.0099	2.61	
160	158	6.00	15.0	270	4,050	0.006	0.018	8	12.0	0.002028	0.03181	0.05	0.0137	3.00	Flow from MH 170
158	156	2.00	17.0	270	4,590	0.007	0.021	8	12.0	0.002276	0.03369	0.05	0.0149	3.10	
156	154	0.00	17.0	270	4,590	0.007	0.021	8	11.0	0.002377	0.03432	0.05	0.0154	3.01	
154	152	0.00	17.0	270	4,590	0.007	0.021	8	11.0	0.002377	0.03432	0.05	0.0154	3.01	
152	150	0.00	17.0	270	4,590	0.007	0.021	8	8.0	0.002787	0.03690	0.06	0.0171	2.71	
170	160	6.00	6.0	270	1,620	0.003	0.008	8	4.0	0.001512	0.02772	0.04	0.0112	1.59	See velocity note below

[1] Based on n = 0.013

[2] d/D using K' in Brater and King

[3] From Brater and King based on d/D

Velocity Note: During final engineering, engineer shall evaluate adjusting slopes to achieve a minimum velocity of 2.0 fps. Where a velocity of 2.0 fps cannot be achieved, a minimum pipe slope of 1.0 % will be allowed.

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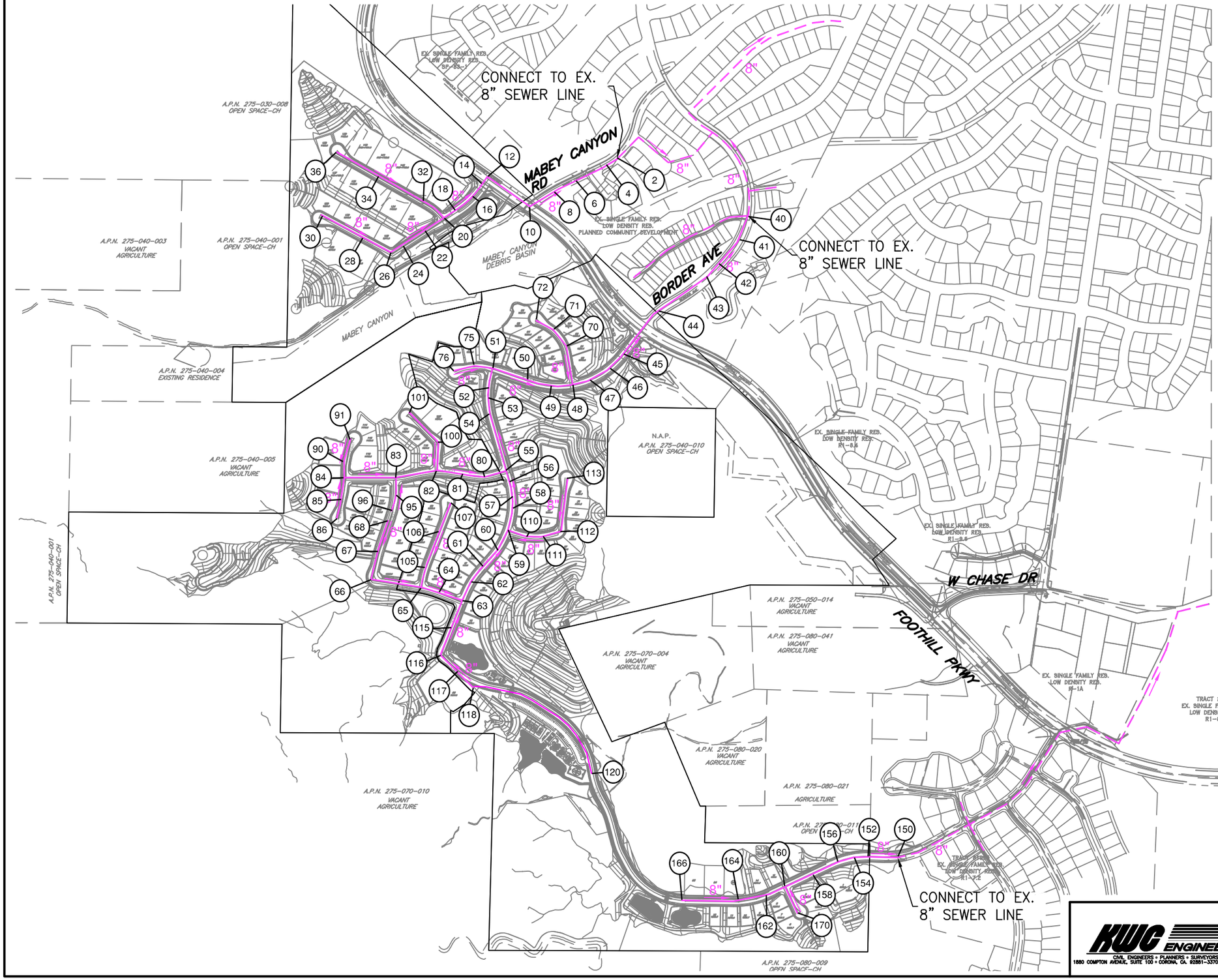
PROJECT: Skyline Heights Onsite Sewer System - South
SCENARIO: **Peak Wet Weather Flow Scenario**

DATE: 11/18/2025

FROM MH	TO MH	IN-LINE EDUs	CUMULATIVE EDUS	FLOW FACTOR (gpd/EDU)	AVG. DRY WEATHER FLOW (gpd)	AVG. DRY WEATHER FLOW (cfs)	PEAK FLOW (cfs)	LINE SIZE (inches)	DESIGN SLOPE (%)	DEPTH K' [1]	dn (feet)	dn/D [2]	C_a for Velocity [3]	VELOCITY (f.p.s.)	COMMENTS
166	164	3.00	3.0	270	810	0.001	0.005	8	12.0	0.000584	0.01758	0.03	0.0057	2.07	
164	162	3.00	6.0	270	1,620	0.003	0.010	8	12.0	0.001104	0.02380	0.04	0.0089	2.51	
162	160	3.00	9.0	270	2,430	0.004	0.014	8	12.0	0.001604	0.02844	0.04	0.0116	2.81	
160	158	6.00	15.0	270	4,050	0.006	0.023	8	12.0	0.002566	0.03551	0.05	0.0162	3.23	Flow from MH 170
158	156	2.00	17.0	270	4,590	0.007	0.026	8	12.0	0.002879	0.03748	0.06	0.0175	3.35	
156	154	0.00	17.0	270	4,590	0.007	0.026	8	11.0	0.003007	0.03828	0.06	0.0180	3.25	
154	152	0.00	17.0	270	4,590	0.007	0.026	8	11.0	0.003007	0.03828	0.06	0.0180	3.25	
152	150	0.00	17.0	270	4,590	0.007	0.026	8	8.0	0.003526	0.04129	0.06	0.0202	2.90	
170	160	6.00	6.0	270	1,620	0.003	0.010	8	4.0	0.001913	0.03090	0.05	0.0132	1.71	See velocity note below

[1] Based on n = 0.013
[2] d/D using K' in Brater and King
[3] From Brater and King based on d/D

Velocity Note: During final engineering, engineer shall evaluate adjusting slopes to achieve a minimum velocity of 2.0 fps. Where a velocity of 2.0 fps cannot be achieved, a minimum pipe slope of 1.0 % will be allowed.



LEGEND

- PROPOSED SEWER LINES
- EXISTING SEWER LINES
- CALCULATION MH NUMBER

N

600' 0 600'

SCALE: 1"=600'

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ONSITE SEWER NODE DIAGRAM

JN: 2012.1344 R:\12\1344\FINAL\REPORTS\SEW\FIGURES\1344 SEW FIG 3-1.dwg 8/12/24 8:28 AM

Appendix

B

2005 MASTER PLAN EXCERPTS

Table 8-4
Pipelines
Capital Improvement Program
City of Corona FY 2005-2010

CIP No.	Project Title	**	FY 2005-06	FY 2006-07	FY 2007-08	FY 2008-09	FY 2009-10	Future Years	Total Funding
P-1	Condition Deficiencies - Replacement at various locations	BR			$1,210,000				$1,210,000
P-2	Condition Deficiencies - Repair at various locations	BR		$2,100,000					$2,100,000
P-3	Pipe Replacement - Parkridge Ave (Completed)	-							
P-4	Diversion of Flow - Third St Easement	BR		$0					$0
P-5	Pipe Replacement - Green River Rd	SP	$2,010,000						$2,010,000
P-6	Pipe Replacement - Palisades Dr, Wardlow Rd, Research Dr, Railroad St	SP			$7,095,000				$7,095,000
P-7	Pipe Replacement - Maple St	BR	$356,000						$356,000
P-8	Pipe Replacement - Magnolia Ave	BR	$25,000						$25,000
P-9	Pipe Replacement - Harrison St	BR			$100,000				$100,000
P-10	Pipe Replacement - Avenida Del Vista, Sixth St, Smith Ave	BR						$2,350,000	$2,350,000
P-11	Pipe Replacement - Rincon St	BR				$390,000			$390,000
P-12	Pipe Replacement - Potomac Dr, Patriot Wy, Ontario Ave, Newton Dr, Kroonew Dr, Brentwood Dr, Avenida Del Vista	SP				$1,910,000	$1,910,000		$3,820,000
P-13	Pipe Replacement - Fullerton Ave, Ford St, Rimpau Ave	BR				$1,130,000			$1,130,000
P-14	Pipe Replacement - Railroad St	BR				$400,000			$400,000
P-15	Pipe Replacement - Lincoln Ave	BR			$400,000				$400,000
P-16	Pipe Replacement - Buena Vista Ave	BR						$70,000	$70,000
P-17	Pipe Replacement - Mangular Ave	E						$1,150,000	$1,150,000
P-18	Pipe Replacement - Garretson Ave	E						$1,160,000	$1,160,000
P-19	Pipe Replacement - Kirkwood Dr	E						$34,000	$34,000
P-20	Pipe Replacement - Bedford Canyon Rd easement	E						$60,000	$60,000
P-21	Pipe Replacement - Temescal Canyon Rd	E						$420,000	$420,000
P-22	Future Backbone Sewer to Eagle Valley	E						$1,350,000	$1,350,000
P-23	CMOM Compliance - CCTV		$500,000	$500,000	$500,000	$500,000			$2,000,000
P-24A	Miscellaneous Pipe Replacements	BR	$159,000	$100,000	$760,000	$1,220,000	$1,545,000	$50,000	$3,834,000
P-24B	Miscellaneous Pipe Replacements	E	$460,000						$460,000
P-24C	Miscellaneous Pipe Replacements	SP	$250,000	$1,435,000	$50,000	$50,000	$50,000	$240,000	$2,075,000
MP-25	Regional Studies	E		$50,000	$50,000	$50,000	$50,000	$50,000	$250,000
	Total Pipelines		**$3,760,000**	**$4,185,000**	**$10,165,000**	**$5,650,000**	**$3,555,000**	**$6,934,000**	**$34,249,000**

** Cost estimates based on present value dollars for 2005*

**The need for the project is broken down into three categories:

1. Betterment or Replacement, BR - City CIP Sewer Capital Replacement Fund Source: SEW CR - Fund: 474
2. Expansion for new development, E - City CIP Wastewater Capacity Fund Source: WPC TP - Fund: 440
3. Shared project, SP - City CIP Multi-Fund Project (Funds are from Funds 440 & 474; See City CIP for breakdown)

Project No. P-10

This project will replace 8-inch and 10-inch sewers in Avenida Del Vista, Sixth Street, and Smith Avenue that have been identified to exceed the capacity criterion under existing conditions. Per the hydraulic analyses, the depth to diameter ratio is expected to vary from 0.65 to full under peak dry weather conditions. Flow monitoring performed by the City from May 23, 2004 to May 24, 2004 of the 10-inch sewer at model manhole 14-18780 (City atlas I15, MH 2455), located in Smith Avenue resulted in a peak depth to diameter ratio of 0.62.

This project requires the existing sewers to be replaced with 5,795 feet of 15-inch diameter pipe.

An alternative to Project No. 10 is the diversion of flow from the intersection of Via del Rio and Avenida del Vista (MH 14-11660) west through the Coronita area. The total estimated ultimate average flow at MH 14-11660 is about 0.90 cfs. The diversion would require construction of approximately 900 feet of 10-inch diameter pipe in Via del Rio, west of Avenida del Vista. It would also require 10-inch pipes to be constructed through parts of the Coronita area (Via del Rio, Via Josefa, Via Santiago, and Frontage Road). See Figure 6-2 for exact locations. The sewer crossing the Riverside Freeway from Coronita would need to be 15-inches in diameter. With the diversion of flows, the sewer upgrades in Avenida del Vista from Via del Rio north to Sixth Street, east to Smith Avenue, and north to Railroad Street would not be necessary.

Project No. P-11

The depth to diameter ratio of the 12-inch sewer in Rincon Street, just upstream of the Smith and Rincon Lift Station, is expected to range from 0.69 to full under existing peak dry weather conditions. These sewers should be replaced with 961 feet of 15-inch diameter pipe.

Project No. P-12

This project is located upstream of Project P-10. Existing sewers estimated to flow in excess of the capacity criterion are prevalent in the 8-inch sewers with mild slopes, especially when the slope is less than 0.0040 ft/ft.

The total length of pipe included in Project P-12 is 10,093 feet. The extensive length is primarily a result of the anticipated ultimate flows. There is a large amount of land currently designated as open space in the tributary area. Per a recent aerial photo, these open spaces appear to be hillside slope areas. The City's General Plan designates these areas as low density residential under ultimate conditions. Also, as mentioned in Section 6, there is a portion of the City's Sphere of Influence (Skyline West) that may be developed with homes and will also contribute sewage to this part of the system.

If the tributary area is developed according to the City's General Plan data, the depth to diameter ratios expected in these sewers range from 0.76 to full throughout the entire project area. The recommended pipe replacements include the following: 627 feet of 10-inch diameter pipe, 2292 feet of 12-inch diameter pipe, and 7174 feet of 15-inch diameter pipe.

The northerly portion of Project No. P-12 can be eliminated if flows are diverted at the intersection of Via del Rio and Avenida del Vista (MH 14-11660). See the description of Project No. 10 above.

Legend

- Sewer Manhole
- Sewer Lift Station
- Wastewater Treatment Plant
- City Boundary
- Sphere of Influence Boundary
- WWTP Tributary Area Boundary
- Forcemain
- Gravity Sewer
- CIP Project P-1
- CIP Project P-2
- CIP Project P-3 through P-6
- CIP Project P-7 through P-10
- CIP Project P-11 through P-14
- CIP Project P-15 through P-18
- CIP Project P-19 through P-21
- CIP Project P-22
- Future Sewers to be Built by Others
- Proposed Sewer Lift Station Location
- Proposed Forcemain

1 Can be gravity drained northwest to intersection of Taber Street and Compton Avenue by construction of deep sewers

2 Lift Station can be eliminated if easements can be obtained to the east. Sewers may have to be constructed deep.

Alternative Gravity Sewer Alignment

N

1200 0 1200 2400 Feet

AKM	City of Corona Sewer Master Plan
Project No.: 0760562.10	Capital Improvement Projects
Date: September 2005	Figure 8-3