

DEXTER WILSON ENGINEERING, INC.

WATER • WASTEWATER • RECYCLED WATER

CONSULTING ENGINEERS

**ADDENDUM NO. 1
TO THE
WATER SYSTEM ANALYSIS
FOR THE DEL MAR HIGHLANDS ESTATES
AFFORDABLE HOUSING PROJECT
IN THE CITY OF SAN DIEGO**

January 22, 2020

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FOR THE DEL MAR HIGHLANDS ESTATES
AFFORDABLE HOUSING PROJECT
IN THE CITY OF SAN DIEGO**

January 22, 2020



**Prepared by:
Dexter Wilson Engineering, Inc.
2234 Faraday Avenue
Carlsbad, CA 92008
760-438-4422**

Job No. 1525-001

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DEXTER WILSON ENGINEERING, INC.

DEXTER S. WILSON, P.E.
ANDREW M. OVEN, P.E.
STEPHEN M. NIELSEN, P.E.
NATALIE J. FRASCHETTI, P.E.
STEVEN J. HENDERSON, P.E.

January 22, 2020

1525-001

City of San Diego
Development Services Department
Water and Sewer Development Review
1222 First Avenue, 4th Floor
San Diego, CA 92101-4101

Attention: Leonard Wilson, P.E., Senior Civil Engineer

Subject: Addendum No. 1 to the Water System Analysis for the Del Mar Highlands Estates Affordable Housing Project in the City of San Diego

Introduction

This report is an addendum to a previous report entitled “Water System Analysis for the Del Mar Highlands Estates Affordable Housing Project in the City of San Diego” dated August 19, 2016, prepared by Dexter Wilson Engineering, Inc. (2016 Water Study). The original water study analyzed the existing public water system which included a hydraulic analysis to confirm the adequacy of the existing public water system in the vicinity of the project.

The original water study presented an affordable housing site consisting of 12 dwelling units. This Addendum No. 1 will account for the revised dwelling unit count of 26 units. As part of this Addendum No. 1, hydraulic modeling will be updated to address the modified development layout and updated water demands.

Leonard Wilson, P.E.

January 22, 2020

Del Mar Highlands Estates Affordable Housing Water Study Addendum No. 1

Del Mar Highlands Estates Affordable Housing Water Study Addendum No. 1

This Public Water Study Addendum No. 1 (Addendum No. 1) provides an update to the potable water service for the Del Mar Highlands Estates Affordable Housing development because of the proposed increase in affordable dwelling units. Where previously the affordable housing site project was proposed to include 12 multi-family residential units, the revised project proposes 26 multi-family residential units on the same 1.80-acre site. This Addendum addresses the project water demands and the required public water system components for the development site.

In the 2016 Water Study, the affordable housing development project was proposed with an onsite private water system with two connections to the public water system: one domestic connection and one fire protection connection. Because of the revised site layout which accommodates the increased unit count, the onsite private water system will now incorporate three connections to the public water system: one domestic connection and two fire protection connections. Akin to the 2016 Water Study, only the public water system is addressed in this Addendum; sizing of the private onsite water systems will be provided in a separate study.

The purpose of Addendum No. 1 is to evaluate the impact of the proposed unit count increase for the Del Mar Highlands Estates Affordable Housing project.

Proposed Land Use Plan

The proposed site development plan for the Del Mar Highlands Estates Affordable Housing project is provided in Appendix A and the previous land development plan used as a basis for the 2016 Water Study is shown in Appendix B. The western portion of the site adjacent to Old El Camino Real contains 24 multi-family residential units which were existing prior to the preparation of the 2016 Water Study.

Water Demand Projections

Water demands for the Del Mar Highlands Estates Affordable Housing project are updated as part of this addendum.

The water demands for the revised site plan are developed in accordance with the City of San Diego Design Guidelines and Standards. Multi-family residential water demand is estimated based on density and a unit water demand factor of 150 gpd/person.

2016 Water Study Water Demand. Table 1 below summarizes the average water demand for the Del Mar Highlands Affordable Housing project based on the land use plan presented in the 2016 Water Study.

The 2016 Water Study projected an average water demand for the project of 6,300 gpd (4.4 gpm).

TABLE 1 DEL MAR HIGHLANDS ESTATES AFFORDABLE HOUSING SITE 2016 WATER STUDY WATER DEMAND			
Land Use	Quantity	Demand Factor	Average Water Use, gpd
Residential (<9 DUs/acre)	12 Units	525 gpd/SF DU	6,300
TOTAL			6,300 gpd = 4.4 gpm

Addendum No. 1 Water Demand. Table 2 summarizes the average water demand for the Del Mar Highlands Affordable Housing project based on the revised increased unit site plan. The revised project proposes 26 residential units over 1.80 net acres equaling 14 units per acre. Table 2-1 in the City of San Diego Water Department Guidelines and Standards Book 2, attached as Appendix C, indicates that 14 units per acre falls in the range of 3.2 persons per dwelling unit. A dwelling unit density of 3.2 persons per dwelling unit and a unit water demand factor of 150 gpd/person results in a water demand rate of 480 gpd per multi-family dwelling unit at the project.

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Del Mar Highlands Estates Affordable Housing Water Study Addendum No. 1

The projected average water demand for the revised project is 12,480 gpd (8.7 gpm).

TABLE 2 DEL MAR HIGHLANDS ESTATES AFFORDABLE HOUSING SITE ADDENDUM NO. 1 WATER DEMAND			
Land Use	Quantity	Demand Factor	Average Water Use, gpd
Residential (14 DUs/acre)	26 Units	480 gpd/SF DU	12,480
TOTAL			12,480 gpd = 8.7 gpm

From the City of San Diego Guidelines and Standards, Figure 2-2, the maximum day demand to average annual demand ratio is approximately 2.4 based on the Coastal/Downtown peaking curve, resulting in an estimated maximum day demand of 29,952 gpd (21 gpm).

From the City of San Diego Guidelines and Standards, Figure 2-1, the peak hour demand to average annual demand ratio is approximately 6.1 based on the Coastal/Downtown peaking curve, resulting in an estimated peak hour demand of 76,128 gpd (53 gpm). Appendix C of this report presents the backup data for determining these peaking factors.

Water Demand Comparison. In comparing the projected water demands from Table 1 and Table 2, the proposed site plan will increase previous water demand projections by 6,180 gpd average. The increase in projected water demand is attributable to the increased unit count within the proposed site plan.

Fire Flow

The fire flow requirement for the Del Mar Highlands Estates Affordable Housing project was estimated based on the 2016 California Fire Code. The fire code takes into account building area and construction type. The largest building proposed for the project site will contain seven units and is estimated to be approximately 12,000 square feet based on largest unit

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Del Mar Highlands Estates Affordable Housing Water Study Addendum No. 1

type including garages. For construction type, the worst case, Type V-B, was assumed. This results in an estimated fire flow requirement of 3,000 gpm. After the expected minimum reduction of 50 percent for an NFPA approved fire sprinkler system, the final fire flow requirement for the project site equates to 1,500 gpm. The excerpt from the 2016 California Fire Code pertaining to fire flow requirements and the pertinent architectural information are both included in Appendix D.

Hydraulic Analysis of the Del Mar Highlands Estates Affordable Housing Project

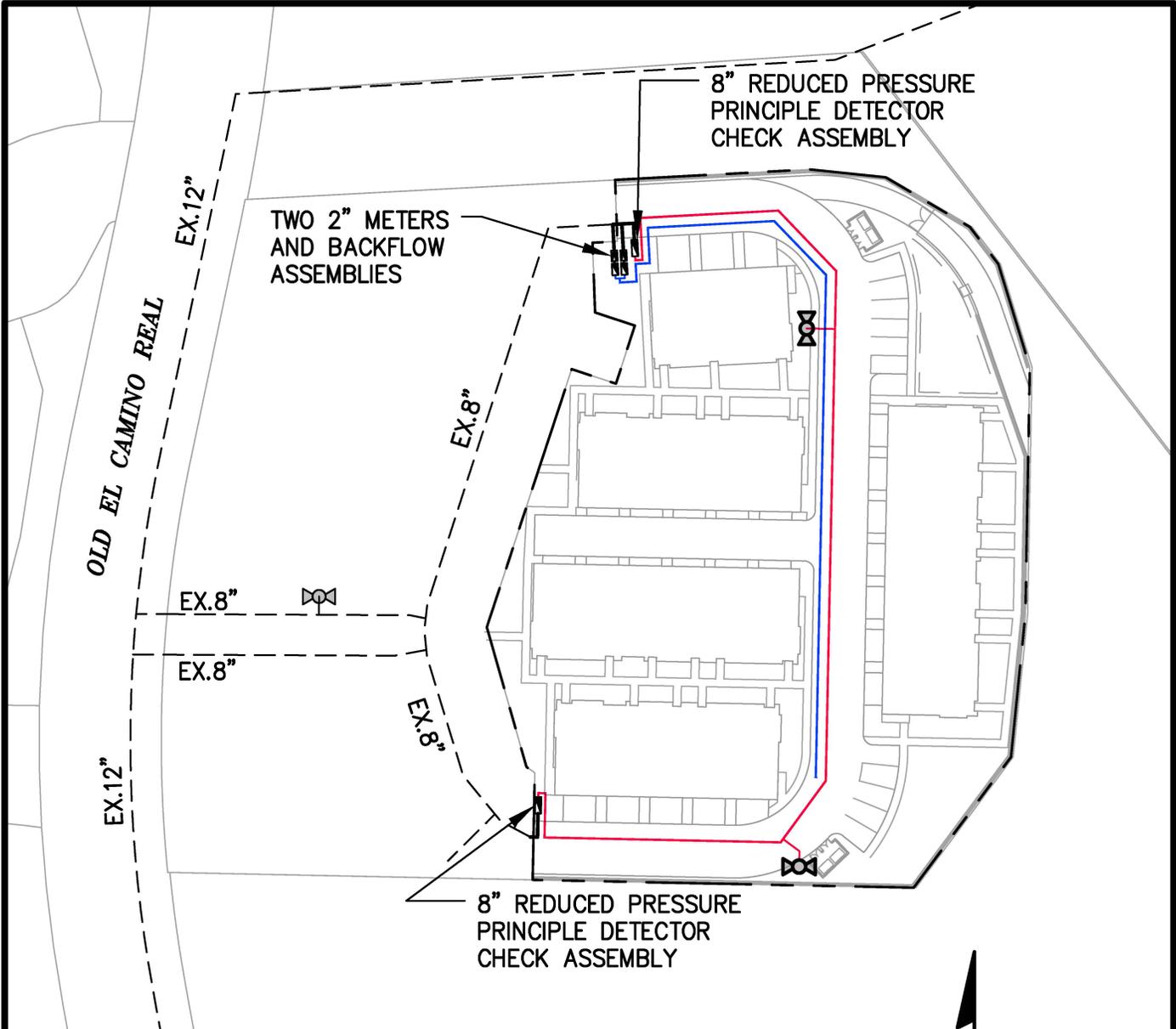
The University of Kentucky KYPIPE computer program was used to conduct a hydraulic model of the proposed water system within the study area. This computer program utilizes the Hazen-Williams equation for determining headloss in pipes; the Hazen-Williams "C" value used for all pipes is 120.

The computer model for this addendum analysis matches the 2016 Water Study and includes existing public and proposed public lines in the near vicinity of the project site. The two existing PRVs that serve the 360 Zone were inputted as sources for the computer model. One PRV feeds a 12-inch public water line in Rancho Las Brisas Trail and the other PRV in the 360 Zone feeds an 8-inch public water line in Modena Place. These locations were entered as the sources of the water model. The same HGL, 350 feet, from the 2016 Water Study for the two PRVs serving the 360 Zone is used in the computer model.

Appendix E presents the computer modeling results for the project site. The fire flow requirement of 1,500 gpm was analyzed at each of the two private fire system connection points within the site. A pipe break scenario was also modeled. Under all cases the fire flow requirement is being met with greater than 20 psi residual pressure. Minimum residual pressures onsite are greater than 101 psi under normal operating conditions and 98 psi under a pipe break scenario.

The results of the computer hydraulic analysis indicate that the proposed water system for the project can achieve greater than 20 psi residual pressure under a maximum day demand plus 1,500 gpm fire flow scenario by extending two private fire protection mains from the ends of the existing public water lines onsite as shown on Figure 1.

\\ARTIC\DWG\1525001\AFFORDABLE HOUSING\DHEAH_A-1_WTR_FIGURE-1.DWG 01-21-20 15:07:43 LAYOUT: LAYOUT1



LEGEND

- — — — — PROJECT BOUNDARY
- - - - - EXISTING PUBLIC WATER
- PROPOSED PRIVATE DOMESTIC SYSTEM
- PROPOSED PRIVATE FIRE SYSTEM
- ⊗ EXISTING PUBLIC FIRE HYDRANT
- ⊗ PROPOSED PRIVATE FIRE HYDRANT



FIGURE 1

WATER SYSTEM

DEL MAR HIGHLANDS ESTATES
AFFORDABLE HOUSING ADDENDUM NO.1

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

Private Onsite Water System

As mentioned earlier in this document, the onsite water systems for the Del Mar Highlands Estates Affordable Housing project are proposed to be private. This will entail the planning and construction of a dual water system within the affordable housing site. One private system will provide fire protection, and the second parallel private system will provide domestic service.

Figure 1 shows the basic layout of the private fire protection system including the locations of the two fire service connections to the public water system. The private domestic water system is anticipated to consist of two 2" water service laterals, meters, and RP backflow preventers. Both of these private water systems will be confirmed and addressed completely in a separate study specific to these private onsite water systems.

The private fire protection system will consist of two fire service connections to the 8-inch public water line in the existing onsite driveway. One connection will be at the north project entrance and the second will be at a similar south entrance. Each of the two 8-inch fire services will be followed by a reduced pressure principle detector check assembly. This size of the detector check is presently shown as 8-inch; this size may be reduced to 6-inch when the final onsite hydraulic calculations are completed as part of the Plumbing Permit for the onsite private fire protection system. The internal private fire protection system is anticipated to be 8-inch diameter which size is sufficient to provide the 1,500 gpm fire hydrant flow required for this site.

Conclusions and Recommendations

The proposed revised site plan for the Del Mar Highlands Estates Affordable Housing project will increase overall water demand for the development by approximately 6,180 gpd average. This increase in water demand will not impact any existing or proposed water line sizing for the project since the backbone water line sizing has been conservatively established for the community and surrounding area.

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Del Mar Highlands Estates Affordable Housing Water Study Addendum No. 1

At the time of the preparation of the 2016 Water Study, the project had a required fire flow demand of 1,750 gpm due to the proposed building size. The 2016 Water Study demonstrated that a 1,750 gpm fire flow can be delivered to the site. With the proposed increase in the number of housing units as well as an increase in the number of buildings in this Addendum No. 1, the fire flow requirement for the project has decreased to 1,500 gpm. No changes to the existing public water distribution system are recommended because of the site plan change other than a second connection for the proposed onsite private fire protection system.

The water system internal to the site will be private since the internal streets are to be private. A dual water system will be designed; one system will provide private fire protection service and a parallel system will provide domestic service. The final private systems line sizing will be provided in a separate private water systems study.

Dexter Wilson Engineering, Inc.



Andrew Owen, P.E.

AO:SH:ps

cc: Maykia Vang, Civil Sense, Inc.

Allen Kashani, P.E., Pardee Homes

Attachments

APPENDIX A

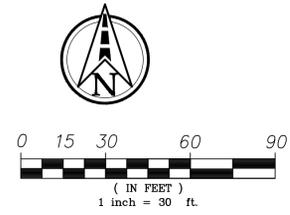
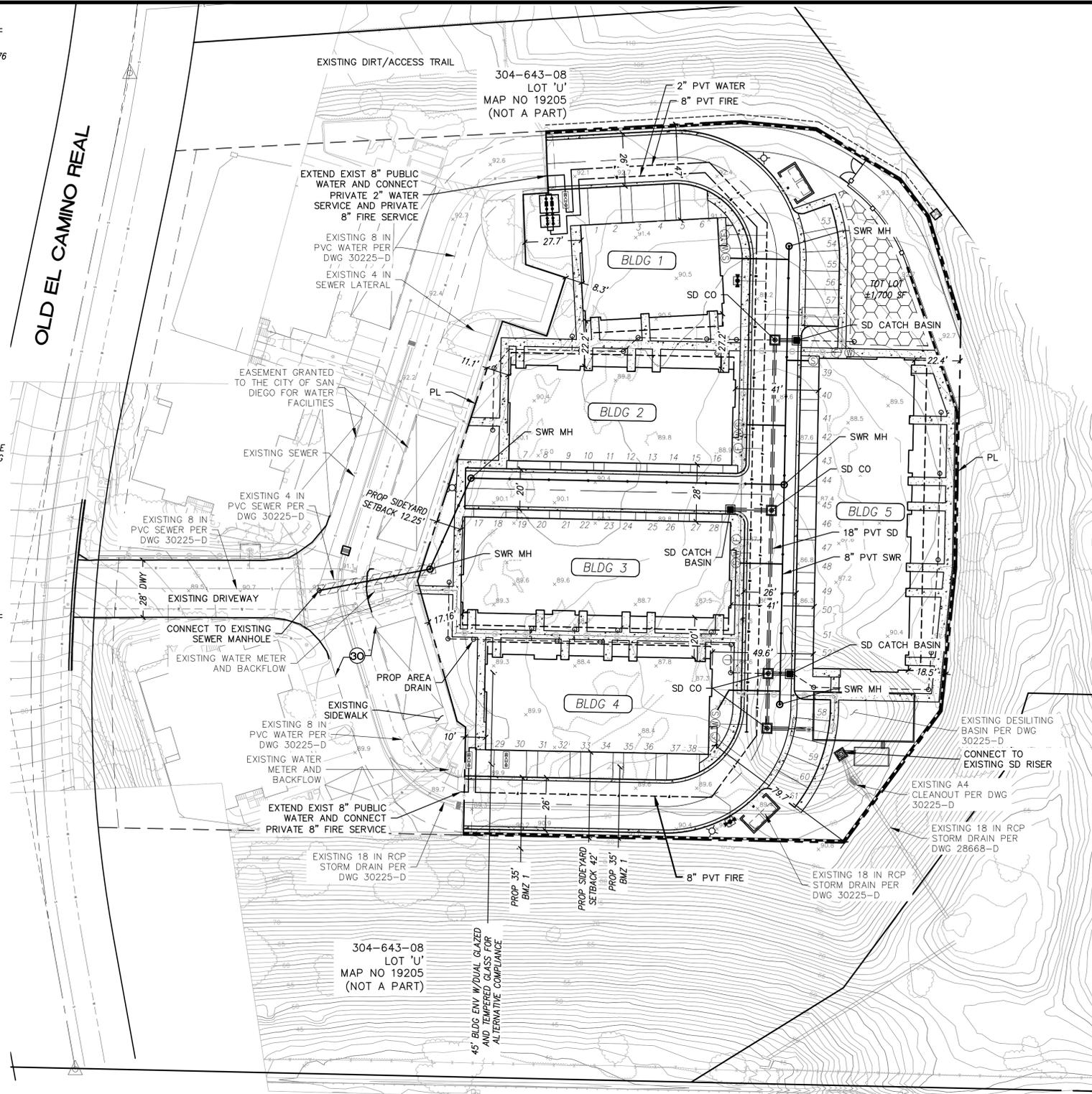
**NEW PROPOSED DEL MAR
HIGHLANDS ESTATES
AFFORDABLE HOUSING SITE PLAN**

DEVELOPMENT SUMMARY

1. SUMMARY OF REQUEST:
RESIDENTIAL DEVELOPMENT PERMIT AMENDMENT FOR A PLANNED PERMIT NO. 94-0576
PROPOSING AN ADDITIONAL 26 MULTI FAMILY AFFORDABLE DWELLING UNITS.
2. STREET ADDRESS: 14163 OLD EL CAMINO REAL SAN DIEGO, CA 92130
3. SITE AREA
TOTAL SITE AREA (GROSS): 1.80 ACRES (78,273 SF)
NET SITE AREA: 1.80 ACRES (78,273 SF)
(NET SITE AREA EXCLUDES REQUIRED STREET AND PUBLIC DEDICATIONS)
4. ZONING: AR-1-1
5. COMMUNITY PLANNING AREA: PACIFIC HIGHLANDS RANCH
6. EXISTING USE: VACANT
PROPOSED USE: MULTI-FAMILY DU
7. COVERAGE DATA
TOTAL LANDSCAPE / OPEN SPACE AREA: 25,752 SF
TOTAL HARDSCAPE / PAVED AREA: 22,837 SF
MIN GROSS FLOOR AREA (GFA): 1,310 SF NOT INCLUDING GARAGE
8. DENSITY
MAXIMUM DWELLING UNITS ALLOWED PER ZONE: 1 DU PER 10 ACRE LOT
NUMBER OF EXISTING UNITS TO REMAIN ONSITE: NONE
NUMBER OF PROPOSED DWELLING UNITS ONSITE: 13 DU
TOTAL NUMBER OF UNITS PROVIDED ON THE SITE: 13 DU
9. YARD / SETBACK
FRONT SETBACK REQUIRED: 25 FEET PROPOSED: N/A
SIDE SETBACK REQUIRED: N/A PROPOSED: N/A
STREET SIDE SETBACK REQUIRED: 20 FEET PROPOSED: 8 FEET
REAR SETBACK REQUIRED: 25 FEET PROPOSED: N/A
10. EXISTING BRUSH MANAGEMENT ZONE 1 IS 20 FEET
PROPOSED BRUSH MANAGEMENT ZONE 1 IS 80 FEET MINIMUM. BUILDING 2 ALONG THE SOUTH SIDE OF PROPERTY HAS A PROPOSED 35 FEET BMZ AND A 45 FEET BUILDING ENVELOPE WITH DUAL TEMPER/DUAL GLAZED GLASS FOR ALTERNATIVE COMPLIANCE.
11. UNIT COUNT:
BUILDING 1 - 3 UNITS
BUILDING 2 - 5 UNITS
BUILDING 3 - 6 UNITS
BUILDING 4 - 5 UNITS
BUILDING 5 - 7 UNITS
TOTAL 26 UNITS

LEGEND

- SLOPES 2:1 MAX
- PROPERTY LINE
- CURB AND GUTTER/ROLLED CURB
- SIDEWALK
- STORM DRAIN
- POTABLE WATER (PRIVATE)
- FIRE MAIN (PRIVATE)
- SEWER MAIN (PRIVATE)
- WATER SERVICE
- FIRE SERVICE
- SEWER SERVICE
- IRRIGATION SERVICE
- WATER METER AND BACKFLOW
- FIRE BACKFLOW
- ADA PATH OF TRAVEL
- PAD ELEVATION
- FIRE HYDRANT
- TOT LOT



PREPARED BY:
HENRY H. PENG
R.C.E. 63686



NAME: CIVIL SENSE, INC.
ADDRESS: 13475 DANIELSON STREET, SUITE 150
POWAY, CA 92128
PHONE: 858-843-4253

PROJECT ADDRESS:
14163 OLD EL CAMINO REAL
SAN DIEGO, CA 92130

PROJECT NAME:
DEL MAR HIGHLANDS ESTATES
AFFORDABLE SITE PDP/SDP
FOR AMENDMENT TO PRD/RPO

SHEET TITLE:
SITE PLAN

REVISION 12: _____
REVISION 11: _____
REVISION 10: _____
REVISION 9: _____
REVISION 8: _____
REVISION 7: _____
REVISION 6: _____
REVISION 5: _____
REVISION 4: _____
REVISION 3: _____
REVISION 2: _____
REVISION 1: _____

ORIGINAL DATE: 12/20/19

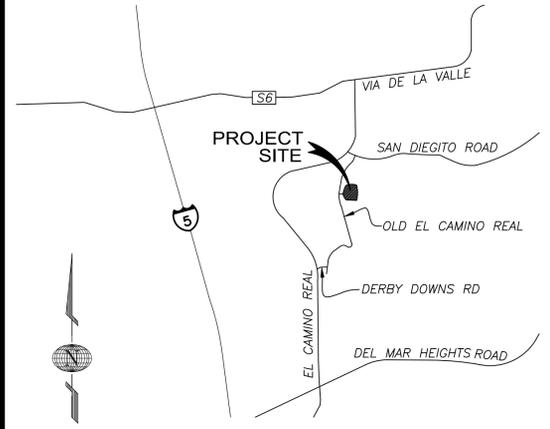
SHEET 3 OF 10

DEP # _____

APPENDIX B

**PREVIOUSLY APPROVED DEL MAR
HIGHLANDS ESTATES
AFFORDABLE HOUSING SITE PLAN**

DEL MAR HIGHLANDS ESTATES AFFORDABLE SITE PLANNED DEVELOPMENT PERMIT NO. XX-XXXX CITY OF SAN DIEGO



GENERAL NOTES

LOT SUMMARY

1. RESIDENTIAL LOTS:	1	TOTAL AREA:	_____
WATER QUALITY BASIN LOTS:	4	TOTAL AREA:	0.07 AC
HOA:	1	TOTAL AREA:	_____
MONUMENT SIGN LOTS:	X	TOTAL AREA:	_____
PUBLIC RIGHT OF WAY:		TOTAL AREA:	_____

- TOTAL AREA WITHIN SUBDIVISION IS 1.80 ACRES GROSS.
- GAS AND ELECTRIC: SAN DIEGO GAS & ELECTRIC
- TELEPHONE: TIME WARNER CABLE
- CABLE TELEVISION: TIME WARNER CABLE
- SEWER AND WATER: CITY OF SAN DIEGO
- DRAINAGE SYSTEM: AS REQUIRED BY CITY ENGINEER
- FIRE: CITY OF SAN DIEGO
- SCHOOL DISTRICT: SAN DIEGUITO UNION H.S./SOLANA BEACH ELEMENTARY SCHOOL DISTRICT
- ALL NEW UTILITIES WILL BE LOCATED UNDERGROUND
- CONTOUR INTERVAL: 2 FEET
- DATUM: GPS PT. NP. 542 - N 1,927,136.68, E 6,267,611.17, ELEV. = 190.83
- SOURCE: SAN-LO AERIAL SURVEYS
- DATE: 1-5-99
- ALL PROPOSED SLOPES ARE 2:1 UNLESS NOTED OTHERWISE
- GRADING SHOWN HEREON IS PRELIMINARY AND IS SUBJECT TO MODIFICATION IN FINAL DESIGN
- LOT DIMENSIONS AND SETBACK DIMENSIONS SHOWN HEREON ARE PRELIMINARY AND ARE SUBJECT TO MODIFICATION IN FINAL DESIGN
- OPEN SPACE LOTS TO BE MAINTAINED BY THE HOME OWNERS ASSOCIATION

OCCUPANCY CLASSIFICATION	ZONING DESIGNATION	TYPE OF CONSTRUCTION
MULTI-FAMILY	R-1	TYPE V / RATED

- ALL RESIDENTIAL LOCAL AND PRIVATE STREETS, WITH A GRADE BREAK OF 1% OR GREATER, SHALL HAVE VERTICAL CURVES IN ACCORDANCE WITH THE CITY STREET DESIGN MANUAL
- ALL PUBLIC WATER FACILITIES AND ASSOCIATED EASEMENTS WILL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CITY OF SAN DIEGO WATER FACILITY DESIGN GUIDELINES AND REGULATIONS, STANDARDS AND PRACTICES PERTAINING THERETO
- THIS TENTATIVE MAP INCLUDES MULTIPLE MAP UNITS WHICH MAY BE FILED AS INDIVIDUAL FINAL MAPS AS PERMITTED BY THE CALIFORNIA STATE SUBDIVISION MAP ACT. THE DEVELOPER RESERVES THE RIGHT TO FILE THE FINAL MAPS OUT OF NUMERICAL SEQUENCE. THE CITY ENGINEER SHALL REVIEW SUCH MAP UNITS AND IMPOSE REASONABLE CONDITIONS RELATING TO THE FILING OF SAID MAP UNITS

SOLAR ACCESS NOTE

THIS IS TO AFFIRM THAT THE DESIGN OF THIS SUBDIVISION PROVIDES, TO THE EXTENT FEASIBLE, FOR FUTURE PASSIVE OR NATURAL HEATING AND COOLING OPPORTUNITIES IN ACCORDANCE WITH THE PROVISION OF SECTION 66473.1 OF THE STATE SUBDIVISION MAP ACT.

ASSESSOR'S PARCEL NO.

304-643-10, 304-643-09, 304-643-08

LAMBERT COORDINATES

288-1705

DESITY

MAXIMUM NUMBER OF DWELLING UNITS ALLOWED PER ZONE: _____
MAXIMUM NUMBER OF DWELLING UNITS ON SITE: _____

BENCHMARK

LOCATION: OLD EL CAMINO REAL/SAN DIEGUITO ROAD
*SEBP (SOUTHEAST CORNER BRASS PLUG) TOP INLET
REFERENCE: CITY OF SAN DIEGO VERTICAL CONTROL BENCHMARK/OCTOBER 04, 2011
INDEX: NORTHING 295499 EASTING 1699630
ELEVATION: 22.473 DATUM IS: M.S.L.

*ELEVATION UP-DATED PER U.S.C.G.S. ADJUSTMENT OF 1970, MAY DIFFER FROM PREVIOUS ELEVATION

GEOLOGIC HAZARD CATEGORY

53 - LEVEL OR SLOPING TERRAIN, UNFAVORABLE GEOLOGIC STRUCTURE, LOW TO MODERATE RISK.

GRADING

- TOTAL AMOUNT OF SITE TO BE GRADED: 0.96 AC
- PERCENT OF TOTAL SITE GRADED: 53%
- AMOUNT OF SITE WITH 25% SLOPES OR GREATER: 0.08 AC
- PERCENT OF THE EXIST. SLOPES STEEPER THAN 25% PROPOSED TO BE GRADED: 100%
- PERCENT OF TOTAL SITE WITH 25% SLOPES OR GREATER: 4.4%
- AMOUNT OF CUT: 400 CUBIC YARDS
- AMOUNT OF FILL: 1600 CUBIC YARDS
- MAXIMUM HEIGHT OF FILL SLOPE(S): 4 FEET 2:1 SLOPE RATIO
- MAXIMUM HEIGHT OF CUT SLOPE(S): 0 FEET 2:1 SLOPE RATIO
- AMOUNT OF EXPORT SOIL: 0
- RETAINING/CRIB WALLS: HOW MANY: 0
MAXIMUM LENGTH: 0
MAXIMUM HEIGHT: 0

NOTE: ADDITIONAL WALLS UNDER 3' IN EIGHT MAY BE REQUIRED IN RESIDENTIAL PAD AREAS BASED ON FINAL HOUSE PLOTTING
ALL RESIDENTIAL LOCAL AND PRIVATE STREETS, WITH GRADE BREAK OF 1% OR GREATER, SHALL HAVE VERTICAL CURVES IN ACCORDANCE WITH THE CITY OF SAN DIEGO STREET DESIGN MANUAL

DEVELOPMENT SUMMARY

- SUMMARY OF REQUEST:
RESIDENTIAL DEVELOPMENT PERMIT AMENDMENT FOR A PLANNED PERMIT NO. 94-0576 PROPOSING AN ADDITIONAL 12 MULTI-FAMILY AFFORDABLE DWELLING UNITS.

- STREET ADDRESS
14163 OLD EL CAMINO REAL SAN DIEGO, CA 92130

- VALUE:
TOTAL SITE AREA (GROSS): 1.80 ACRES (78,273 SQ. FT.)
NET SITE AREA: _____ SQ. FT.)
(NET SITE AREA EXCLUDES REQUIRED STREETS AND PUBLIC DEDICATIONS)

- ZONING: AR-1-1
- COMMUNITY PLANNING AREA: PACIFIC HIGHLANDS RANCH

- COVERAGE DATA
TOTAL LANDSCAPE/OPEN SPACE AREA: _____
TOTAL HARDSCAPE/PAVED AREA: _____
MIN GROSS FLOOR AREA (GFA): 650 SF NOT INCLUDING GARAGE
MAX LOT COVERAGE: 10%

- DENSITY
MAXIMUM DWELLING UNITS ALLOWED PER ZONE: 1 DU PER LOT
NUMBER OF EXISTING UNITS TO REMAIN ON SITE: NONE
NUMBER OF PROPOSED DWELLING UNITS ON SITE: 12
TOTAL NUMBER OF UNITS PROVIDED ON THE SITE: 12

- YARD/SETBACK:
FRONT YARD: REQUIRED: 25'
STREET SIDE YARD: REQUIRED: N/A
SIDE YARD(S): REQUIRED: 20'
REAR YARD: REQUIRED: 25'

- BRUSH MANAGEMENT ZONE 1 IS 20'

LEGAL DESCRIPTION

PARCEL 1: APN 304-643-09
PARCEL A OF PARCEL MAP 19205 IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, APRIL 9, 2003.
PARCEL 2: APN 304-643-08
LOT U OF DEL MAR HIGHLANDS ESTATES, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 13818, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, JULY 2, 1999.

EXCEPTING THEREFROM, UNTIL DECEMBER 31, 2044, AS A MINERAL INTEREST AND NOT AS A ROYALTY INTEREST, ALL OF THE MINERALS OF EVERY KIND, INCLUDING, BUT NOT LIMITED TO, ALL OIL, GAS, HYDROCARBONS AND ASSOCIATED SUBSTANCES IN, UNDER OR THAT MAY BE EXTRACTED, PRODUCED AND SAVED FROM SAID REAL PROPERTY BUT WITHOUT THE RIGHT OF ENTRY TO THE SURFACE OF SAID REAL PROPERTY OR THE TOP 500 FEET OF THE SUBSURFACE OF SAID REAL PROPERTY FOR THE PURPOSES OF EXPLORING FOR, DEVELOPING AND REMOVING SUCH MATERIALS.

PARCEL 3: APN 304-643-10
PARCEL B OF PARCEL MAP 19205 CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY APRIL 9, 2003.

PARCEL 4:
AN EASEMENT FOR GENERAL UTILITY PURPOSES, TOGETHER WITH THE RIGHT TO REPLACE, MAINTAIN AND ALTERATION OF ANY UTILITY EQUIPMENT OR FACILITY, AND FOR VEHICULAR AND PEDESTRIAN INGRESS, EGRESS ON AND OVER THE DRIVEWAY ON PARCEL A OF PARCEL MAP 19205 CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, APRIL 9, 2003, DELINEATED ON SAID PARCEL MAP AS 'GENERAL UTILITY AND ACCESS EASEMENT GRANTED HEREON'.

SHEET INDEX

SHEET NUMBER	DESCRIPTION
1	COVER SHEET
2	EXISTING TOPOGRAPHY AND EASEMENTS
3	GRADING, UTILITY, AND SITE PLAN
4	FIRE ACCESS PLAN
5 -	LANDSCAPE PLAN

OWNER/DEVELOPER: PARDEE HOMES
13400 SABRE SPRINGS PARKWAY, SUITE 200
SAN DIEGO, CA 92128
(858)794-2500 FAX(858)794-2599

PLANNING: LATITUDE 33 PLANNING & ENGINEERING
9968 HIBERT ST. 2ND FLR
SAN DIEGO, CA 92131
(858) 751-0633

CIVIL ENGINEER: LATITUDE 33 PLANNING & ENGINEERING
9968 HIBERT ST. 2ND FLR
SAN DIEGO, CA 92131
(858) 751-0633

LANDSCAPE ARCHITECT: RICK ENGINEERING
5620 FRIARS RD.
SAN DIEGO, CA 92110
(619) 291-0707

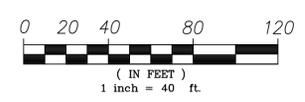
PREPARED IN THE OFFICE OF:

latitude 33
PLANNING & ENGINEERING
9968 Hibert Street, 2nd Floor, San Diego, CA 92131
Tel 858.751.0633

C. JOHN EARDENSOHN
RCE 34584 EXP. 9-30-2003

DATE

Name:	LATITUDE 33 PLANNING & ENGINEERING	Revision 14:	_____
Address:	9968 HIBERT ST. 2ND FLR SAN DIEGO, CA 92131	Revision 13:	_____
Phone #:	(858) 751-0633	Revision 12:	_____
Fax #:	(858) 751-0634	Revision 11:	_____
Project Address:	14163 OLD EL CAMINO REAL	Revision 10:	_____
Project Name:	DEL MAR HIGHLANDS ESTATES AFFORDABLE HOUSING	Revision 9:	_____
Sheet Title:	SITE DEVELOPMENT PERMIT COVER SHEET	Revision 8:	_____
Original Date:	_____	Revision 7:	_____
Sheet	1 of XXX	Revision 6:	_____
DEP#	_____	Revision 5:	_____
		Revision 4:	_____
		Revision 3:	_____
		Revision 2:	_____
		Revision 1:	_____



APPENDIX C

**EXCERPT FROM CITY OF SAN DIEGO
DESIGN GUIDELINES AND STANDARDS,
BOOK 2**

Chapter 2

WATER DEMANDS AND SERVICE CRITERIA

2.1 General

This chapter outlines planning procedures to estimate water demands and fire flows. Water system service requirements are also defined in terms of water pressure and reservoir storage.

2.2 Service Area

The DESIGN CONSULTANT defines the project's service area and identifies the pressure zones in which it is located. The Senior Civil Engineer in charge of either Water Planning and Project Development, or Planning and Development Review Water Review Section, approves the service area boundaries.

2.3 Land Use and Residential Population

The DESIGN CONSULTANT develops present and future land use maps for the service area to define the following land use categories: residential (by zone in accordance with Table 2-1), central business district, commercial and institutional, parks, hospitals, hotels, industrial, office, and schools.

The DESIGN CONSULTANT estimates the residential population in the service area based on present and future allowable land use. Unless more accurate population density estimates are available, the residential population in the service area is estimated based on the figures presented in Table 2-1.

**Table 2-1
Residential Population Density**

Zone	Dwelling Unit Density (dwelling unit/net acre)	Unit Density (persons/dwelling unit)	Population Density (persons/net acre)
A-1-10	0.1	3.5	0.4
A-1-5	0.2	3.5	0.7
A-1-1	1	3.5	3.5
R-1-40	1	3.5	3.5
R-1-20	2	3.5	7.0
R-1-10	4	3.5	14
R-1-5	9	3.5	32
R-2	14	3.2	45
R-2A	29	3.0	87
R-3	43	2.6	112
R-3A	73	2.2	161
R-4	109	1.8	196
R-4C	218	1.5	327

Dwelling unit density in Table 2-1 is based on net area. The net area is measured in acres, and is 80% of the gross area for each residential zone.

2.4 Average Annual Water Demands

For most projects, average annual water demands are determined based on the unit water demand criteria presented in Table 2-2.

**Table 2-2
Unit Water Demands**

Land Use Category	Unit Water Demand
Residential	150 gallons/person-day
Central Business District	6000 gallons/net acre-day
Commercial and Institutional	5000 gallons/net acre-day
Fully Landscaped Park	4000 gallons/net acre-day
Hospitals	22500 gallons/net acre-day
Hotels	6555 gallons/net acre-day
Industrial	6250 gallons/net acre-day
Office	5730 gallons/net acre-day
Schools	4680 gallons/net acre-day

Average annual water demands are calculated as the sum of: (1) the residential water demand, and (2) other water demands for each land use category as follows:

Residential Water Demand (gallons/day) = Residential Population x 150 gallons/person-day

Other Water Demand (gallons/day) = Land Use Area by Category (net acres) x Unit Water Demand for Each Land Use Category (gallons/net acre-day)

Average Annual Water Demand (gallons/day) = Residential Water Demand + Other Water Demands

On some projects, particularly large residential developments, using the unit water demands in Table 2-2 may generate unrealistically high estimates of water requirements. For these large projects, the DESIGN CONSULTANT or developer may request that the CIP Project Manager consider an alternative approach, making use of the City's water demand distribution data developed for macroscale planning purposes. Similarly, the CIP Project Manager may also consider alternative unit water demand estimates for specific land use types where such estimates are based on detailed demand evaluations.

2.5 Peak Water Demands

Unless the project involves a large development that calls for an alternative approach, peak hour and maximum day water demands are estimated using the peaking factors presented in Figures 2-1 and 2-2. These peaking factors correspond to the zones identified in Figure 2-3.

AFFORDABLE HOUSING

FIGURE 2-1
PEAK HOUR DEMAND FACTOR

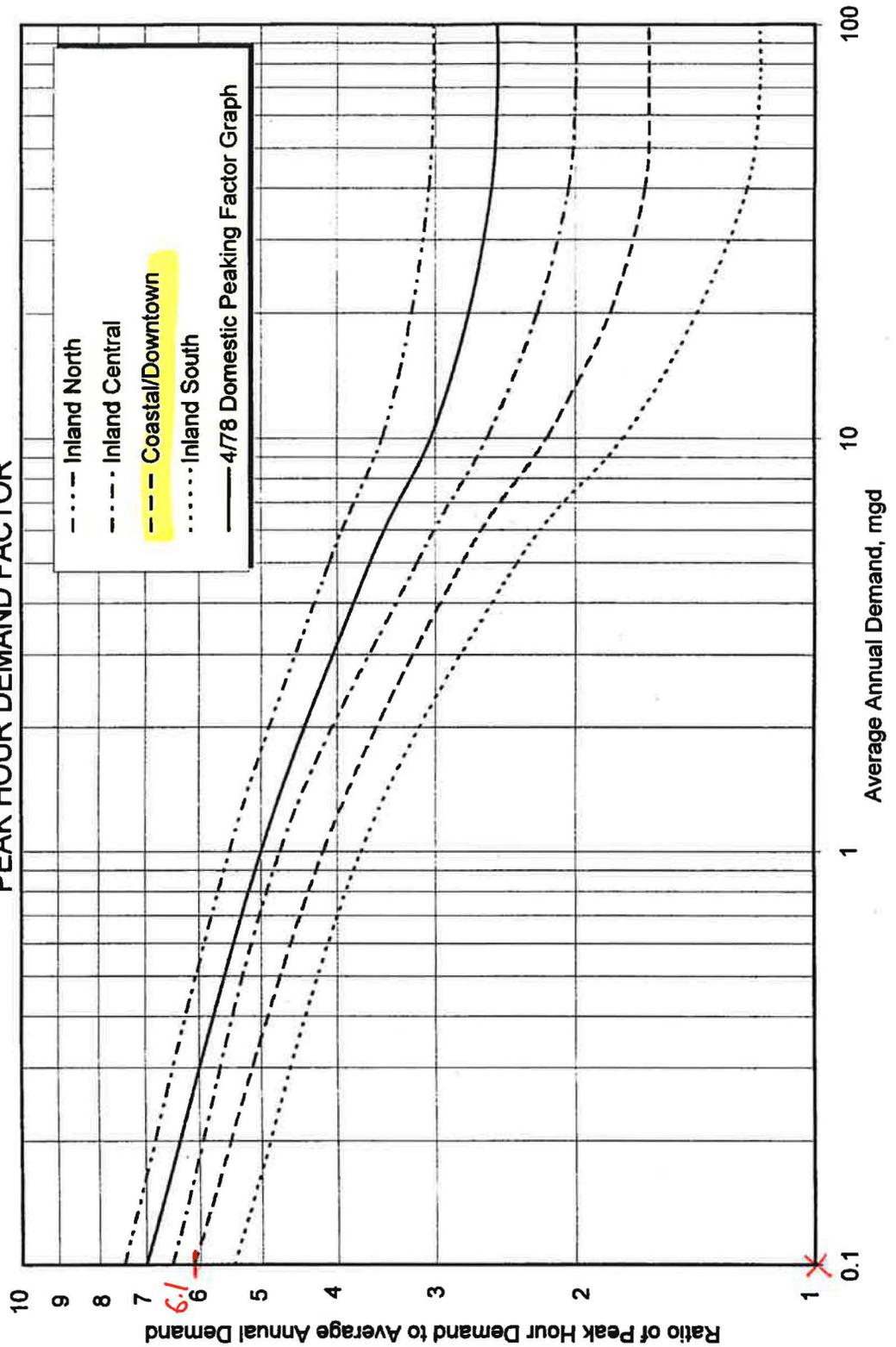
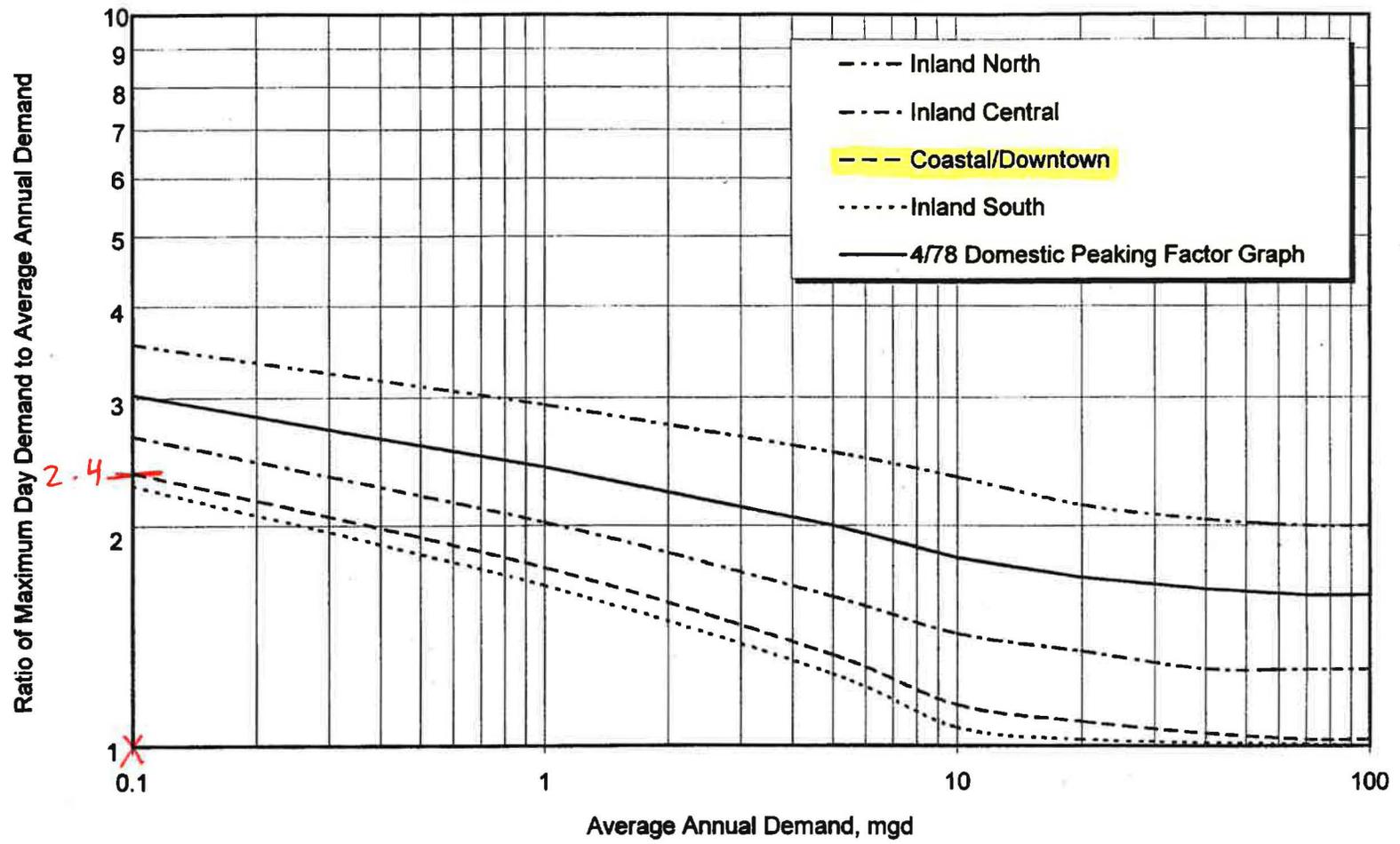


FIGURE 2-2
MAXIMUM DAY DEMAND FACTOR

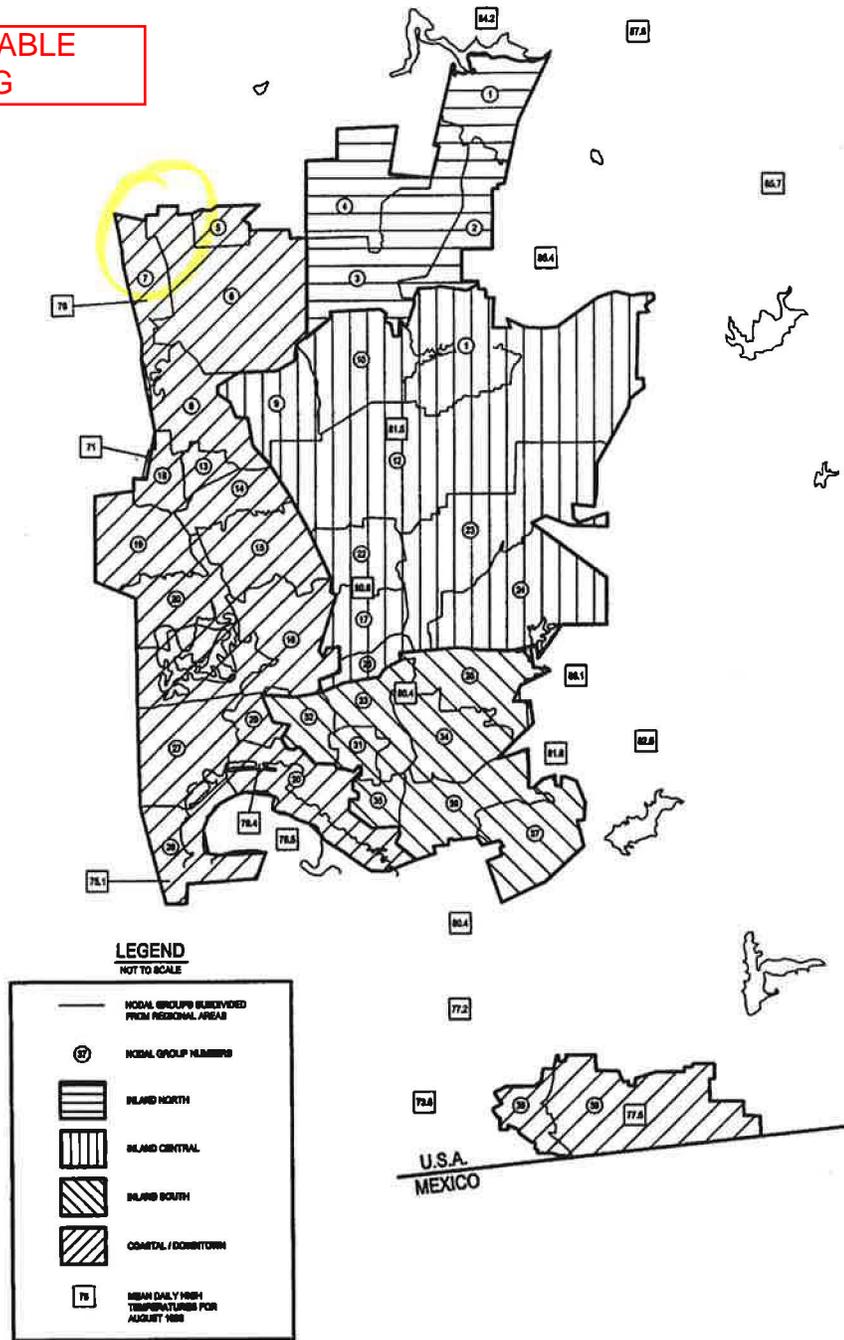


2-4

PEAKING FACTOR ZONES
(BOUNDARIES BASED ON LAND USE GROUPINGS)

FIGURE 2-3

AFFORDABLE HOUSING



July 1999

APPENDIX D

FIRE FLOW INFORMATION

CALIFORNIA FIRE CODE – MATRIX ADOPTION TABLE

APPENDIX B – FIRE-FLOW REQUIREMENTS FOR BUILDINGS

(Matrix Adoption Tables are non-regulatory, intended only as an aid to the user.
See Chapter 1 for state agency authority and building applications.)

Adopting Agency	BSC	BSC- CG	SFM		HCD			DSA		OSHPD				BSCC	DPH	AGR	DWR	CEC	CA	SL	SLC
			T-24	T-19*	1	2	1/AC	AC	SS	1	2	3	4								
Adopt Entire Chapter																					
Adopt Entire Chapter as amended (amended sections listed below)			X																		
Adopt only those sections that are listed below																					
[California Code of Regulations, Title 19, Division 1]																					
Chapter / Section																					
B105.2			X																		

* The *California Code of Regulations* (CCR), Title 19, Division 1 provisions that are found in the *California Fire Code* are a reprint from the current CCR, Title 19, Division 1 text for the code user's convenience only. The scope, applicability and appeals procedures of CCR, Title 19, Division 1 remain the same.

APPENDIX B

FIRE-FLOW REQUIREMENTS FOR BUILDINGS

SECTION B101 GENERAL

B101.1 Scope. The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix. This appendix does not apply to structures other than buildings.

SECTION B102 DEFINITIONS

B102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

FIRE-FLOW. The flow rate of a water supply, measured at 20 pounds per square inch (psi) (138 kPa) residual pressure, that is available for fire fighting.

FIRE-FLOW CALCULATION AREA. The floor area, in square feet (m²), used to determine the required fire flow.

SECTION B103 MODIFICATIONS

B103.1 Decreases. The fire chief is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

B103.2 Increases. The fire chief is authorized to increase the fire-flow requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall not be more than twice that required for the building under consideration.

B103.3 Areas without water supply systems. For information regarding water supplies for fire-fighting purposes in

rural and suburban areas in which adequate and reliable water supply systems do not exist, the fire code official is authorized to utilize NFPA 1142 or the *California Wildland-Urban Interface Code*.

SECTION B104 FIRE-FLOW CALCULATION AREA

B104.1 General. The fire-flow calculation area shall be the total floor area of all floor levels within the exterior walls, and under the horizontal projections of the roof of a building, except as modified in Section B104.3.

B104.2 Area separation. Portions of buildings which are separated by fire walls without openings, constructed in accordance with the *California Building Code*, are allowed to be considered as separate fire-flow calculation areas.

B104.3 Type IA and Type IB construction. The fire-flow calculation area of buildings constructed of Type IA and Type IB construction shall be the area of the three largest successive floors.

Exception: Fire-flow calculation area for open parking garages shall be determined by the area of the largest floor.

SECTION B105 FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.1 One- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum fire-flow and flow duration requirements for one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses shall be as specified in Tables B105.1(1) and B105.1(2).

TABLE B105.1(1)
REQUIRED FIRE-FLOW FOR ONE- AND TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES

FIRE-FLOW CALCULATION AREA (square feet)	AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE-FLOW (gallons per minute)	FLOW DURATION (hours)
0-3,600	No automatic sprinkler system	1,000	1
3,601 and greater	No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2) at the required fire-flow rate
0-3,600	Section 903.3.1.3 of the <i>California Fire Code</i> or Section 313.3 of the <i>California Residential Code</i>	500	1/2
3,601 and greater	Section 903.3.1.3 of the <i>California Fire Code</i> or Section 313.3 of the <i>California Residential Code</i>	1/2 value in Table B105.1(2)	1

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m.

TABLE B105.1(2)
REFERENCE TABLE FOR TABLES B105.1(1) AND B105.2

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute) ^b	FLOW DURATION (hours)
Type IA and IB ^a	Type IIA and IIIA ^a	Type IV and V-A ^a	Type IIB and IIIB ^a	Type V-B ^a		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	3
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. Types of construction are based on the *California Building Code*.

b. Measured at 20 psi residual pressure.

**TABLE B105.2
REQUIRED FIRE-FLOW FOR BUILDINGS OTHER THAN ONE- AND
TWO-FAMILY DWELLINGS, GROUP R-3 AND R-4 BUILDINGS AND TOWNHOUSES**

AUTOMATIC SPRINKLER SYSTEM (Design Standard)	MINIMUM FIRE-FLOW (gallons per minute)	FLOW DURATION (hours)
No automatic sprinkler system	Value in Table B105.1(2)	Duration in Table B105.1(2)
Section 903.3.1.1 of the <i>California Fire Code</i>	25% of the value in Table B105.1(2) ^a	Duration in Table B105.1(2) at the reduced flow rate
Section 903.3.1.2 of the <i>California Fire Code</i>	25% of the value in Table B105.1(2) ^b	Duration in Table B105.1(2) at the reduced flow rate

For SI: 1 gallon per minute = 3.785 L/m.

a. The reduced fire-flow shall be not less than 1,000 gallons per minute.

b. The reduced fire-flow shall be not less than 1,500 gallons per minute.

B105.2 Buildings other than one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum fire-flow and flow duration for buildings other than one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses shall be as specified in Tables B105.2 and B105.1(2).

Exception: *[SFM] Group B, S-2 and U occupancies having a floor area not exceeding 1,000 square feet, primarily constructed of noncombustible exterior walls with wood or steel roof framing, having a Class A roof assembly, with uses limited to the following or similar uses:*

1. *California State Parks buildings of an accessory nature (restrooms).*
2. *Safety roadside rest areas, (SRRA), public restrooms.*
3. *Truck inspection facilities, (TIF), CHP office space and vehicle inspection bays.*
4. *Sand/salt storage buildings, storage of sand and salt.*

B105.3 Water supply for buildings equipped with an automatic sprinkler system. For buildings equipped with an approved automatic sprinkler system, the water supply shall be capable of providing the greater of:

1. The automatic sprinkler system demand, including hose stream allowance.
2. The required fire-flow.

**SECTION B106
REFERENCED STANDARDS**

ICC	IWUIC—15	International Wildland-Urban Interface Code	B103.3
NFPA	1142—12	Standard on Water Supplies for Suburban and Rural Fire Fighting	B103.3

APPENDIX E

COMPUTER MODELING OUTPUT

AFFORDABLE HOUSING SITE

Node and Pipe Diagram is presented as Exhibit A

The following conditions were modeled:

1. Average Day Demand
2. Peak Hour Demand
3. Maximum Day Demand plus 1,500 gpm Fire Flow at Node 316
4. Maximum Day Demand plus 1,500 gpm Fire Flow at Node 336
5. Maximum Day Demand plus 1,500 gpm Fire Flow at Node 316, Pipe 301 Closed
6. Maximum Day Demand plus 1,500 gpm Fire Flow at Node 336, Pipe 301 Closed

Project: Del Mar Highlands Estates Affordable Housing, Addendum No. 1

Date: 1/22/2020

Job Number: 1525-001

Scenario: Average Day Demand

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
P-205	12	-13.94	0.04
P-202	12	-14.94	0.04
P-203	12	-13.94	0.04
P-204	12	-13.94	0.04
P-211	12	-5.01	0.01
P-214	12	-13.94	0.04
P-216	12	13.46	0.04
P-217	12	13.46	0.04
P-220	12	13.46	0.04
P-223	12	13.46	0.04
P-226	12	14.46	0.04
P-301	8	8.92	0.06
P-305	8	8.92	0.06
P-309	8	8.48	0.05
P-313	8	-5.58	0.04
P-317	8	0	0
P-323	8	0	0
P-332	8	8.7	0.06
P-336	8	0	0

Project: Del Mar Highlands Estates Affordable Housing, Addendum No. 1

Date: 1/22/2020

Job Number: 1525-001

Scenario: Peak Hour Demand

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
P-205	12	-85.01	0.24
P-202	12	-91.11	0.26
P-203	12	-85.01	0.24
P-204	12	-85.01	0.24
P-211	12	-30.59	0.09
P-214	12	-85.01	0.24
P-216	12	82.13	0.23
P-217	12	82.13	0.23
P-220	12	82.13	0.23
P-223	12	82.13	0.23
P-226	12	88.23	0.25
P-301	8	54.43	0.35
P-305	8	54.43	0.35
P-309	8	51.71	0.33
P-313	8	-34.02	0.22
P-317	8	0	0
P-323	8	0	0
P-332	8	53.07	0.34
P-336	8	0	0

Project: Del Mar Highlands Estates Affordable Housing, Addendum No. 1
Date: 1/22/2020
Job Number: 1525-001

Scenario: Maximum Day Demand plus 1,500 gpm Fire Flow at Node 316

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
P-205	12	-796.64	2.26
P-202	12	-799.04	2.27
P-203	12	-796.64	2.26
P-204	12	-796.64	2.26
P-211	12	-59.6	0.17
P-214	12	-796.64	2.26
P-216	12	769.12	2.18
P-217	12	769.12	2.18
P-220	12	769.12	2.18
P-223	12	769.12	2.18
P-226	12	771.52	2.19
P-301	8	737.04	4.7
P-305	8	737.04	4.7
P-309	8	804.72	5.14
P-313	8	702.24	4.48
P-317	8	1500	9.57
P-323	8	1500	9.57
P-332	8	20.88	0.13
P-336	8	0	0

Project: Del Mar Highlands Estates Affordable Housing, Addendum No. 1
Date: 1/22/2020
Job Number: 1525-001

Scenario: Maximum Day Demand plus 1,500 gpm Fire Flow at Node 336

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
P-205	12	-796.65	2.26
P-202	12	-799.05	2.27
P-203	12	-796.65	2.26
P-204	12	-796.65	2.26
P-211	12	10.43	0.03
P-214	12	-796.65	2.26
P-216	12	769.11	2.18
P-217	12	769.11	2.18
P-220	12	769.11	2.18
P-223	12	769.11	2.18
P-226	12	771.51	2.19
P-301	8	807.08	5.15
P-305	8	807.08	5.15
P-309	8	734.68	4.69
P-313	8	-727.72	4.64
P-317	8	0	0
P-323	8	0	0
P-332	8	1520.88	9.71
P-336	8	1500	9.57

Project: Del Mar Highlands Estates Affordable Housing, Addendum No. 1

Date: 1/22/2020

Job Number: 1525-001

Scenario: Maximum Day Demand plus 1,500 gpm Fire Flow at Node 316, Pipe 301 Closed

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
P-205	12	-795.08	2.26
P-202	12	-797.48	2.26
P-203	12	-795.08	2.26
P-204	12	-795.08	2.26
P-211	12	-795.08	2.26
P-214	12	-795.08	2.26
P-216	12	770.68	2.19
P-217	12	770.68	2.19
P-220	12	770.68	2.19
P-223	12	770.68	2.19
P-226	12	773.08	2.19
P-301	8		
P-305	8	0	0
P-309	8	1541.76	9.84
P-313	8	-34.8	0.22
P-317	8	1500	9.57
P-323	8	1500	9.57
P-332	8	20.88	0.13
P-336	8	0	0

Project: Del Mar Highlands Estates Affordable Housing, Addendum No. 1

Date: 1/22/2020

Job Number: 1525-001

Scenario: Maximum Day Demand plus 1,500 gpm Fire Flow at Node 336, Pipe 301 Closed

Pipe No.	Pipe Size (inches)	Model Run Flow (gpm)	Model Run Velocity (fps)
P-205	12	-795.08	2.26
P-202	12	-797.48	2.26
P-203	12	-795.08	2.26
P-204	12	-795.08	2.26
P-211	12	-795.08	2.26
P-214	12	-795.08	2.26
P-216	12	770.68	2.19
P-217	12	770.68	2.19
P-220	12	770.68	2.19
P-223	12	770.68	2.19
P-226	12	773.08	2.19
P-301	8		
P-305	8	0	0
P-309	8	1541.76	9.84
P-313	8	-1534.8	9.8
P-317	8	0	0
P-323	8	0	0
P-332	8	1520.88	9.71
P-336	8	1500	9.57

Project: Del Mar Highlands Estates Affordable Housing, Addendum No. 1

Date: 1/22/2020

Job Number: 1525-001

Scenario: Average Day Demand

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
470/360 PR		360	156.0	0.0	156.0
610/360 PR		360	156.0	0.0	156.0
J-3	180	360	78.0	73.7	4.3
J-4	158	360	87.5	83.2	4.3
J-5	154	360	89.3	84.9	4.3
J-6	99	360	113.1	108.8	4.3
J-12	95	360	114.8	110.5	4.3
J-15	86	360	118.7	114.4	4.3
J-17	40	360	138.6	134.3	4.3
J-18	110	360	108.3	104.0	4.3
J-21	205	360	67.2	62.8	4.3
J-24	148	360	91.9	87.5	4.3
J-302	92	360	116.1	111.8	4.3
J-306	91	360	116.6	112.2	4.3
J-310	98	360	113.5	109.2	4.3
J-312	92	360	116.1	111.8	4.3
J-316	94	360	115.3	110.9	4.3
J-332	93	360	115.7	111.4	4.3
J-336	93	360	115.7	111.4	4.3

Project: Del Mar Highlands Estates Affordable Housing, Addendum No. 1

Date: 1/22/2020

Job Number: 1525-001

Scenario: Peak Hour Demand

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
470/360 PR		360	156.0	0.0	156.0
610/360 PR		360	156.0	0.0	156.0
J-3	180	360	78.0	73.7	4.3
J-4	158	360	87.5	83.2	4.3
J-5	154	360	89.3	84.9	4.4
J-6	99	360	113.1	108.7	4.4
J-12	95	360	114.8	110.5	4.4
J-15	86	360	118.7	114.4	4.4
J-17	40	360	138.6	134.3	4.4
J-18	110	360	108.3	104.0	4.3
J-21	205	360	67.2	62.8	4.3
J-24	148	360	91.9	87.5	4.3
J-302	92	360	116.1	111.7	4.4
J-306	91	360	116.6	112.2	4.4
J-310	98	360	113.5	109.1	4.4
J-312	92	360	116.1	111.7	4.4
J-316	94	360	115.3	110.9	4.4
J-332	93	360	115.7	111.3	4.4
J-336	93	360	115.7	111.3	4.4

Project: Del Mar Highlands Estates Affordable Housing, Addendum No. 1

Date: 1/22/2020

Job Number: 1525-001

Scenario: Maximum Day Demand plus 1,500 gpm Fire Flow at Node 316

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
470/360 PR		360	156.0	0.0	156.0
610/360 PR		360	156.0	0.0	156.0
J-3	180	360	78.0	73.7	4.3
J-4	158	360	87.5	82.0	5.5
J-5	154	360	89.3	82.7	6.5
J-6	99	360	113.1	105.7	7.4
J-12	95	360	114.8	107.2	7.7
J-15	86	360	118.7	111.1	7.7
J-17	40	360	138.6	131.6	7.1
J-18	110	360	108.3	102.0	6.3
J-21	205	360	67.2	61.8	5.4
J-24	148	360	91.9	87.5	4.3
J-302	92	360	116.1	108.0	8.2
J-306	91	360	116.6	108.1	8.5
J-310	98	360	113.5	104.9	8.6
J-312	92	360	116.1	105.0	11.2
J-316	94	360	115.3	102.0	13.3
J-332	93	360	115.7	107.2	8.5
J-336	93	360	115.7	107.2	8.5

Project: Del Mar Highlands Estates Affordable Housing, Addendum No. 1

Date: 1/22/2020

Job Number: 1525-001

Scenario: Maximum Day Demand plus 1,500 gpm Fire Flow at Node 336

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
470/360 PR		360	156.0	0.0	156.0
610/360 PR		360	156.0	0.0	156.0
J-3	180	360	78.0	73.7	4.3
J-4	158	360	87.5	82.0	5.5
J-5	154	360	89.3	82.7	6.5
J-6	99	360	113.1	105.7	7.4
J-12	95	360	114.8	107.2	7.7
J-15	86	360	118.7	111.1	7.7
J-17	40	360	138.6	131.6	7.1
J-18	110	360	108.3	102.0	6.3
J-21	205	360	67.2	61.8	5.4
J-24	148	360	91.9	87.5	4.3
J-302	92	360	116.1	107.9	8.3
J-306	91	360	116.6	107.9	8.6
J-310	98	360	113.5	105.0	8.5
J-312	92	360	116.1	107.6	8.5
J-316	94	360	115.3	106.8	8.5
J-332	93	360	115.7	102.1	13.6
J-336	93	360	115.7	101.1	14.6

Project: Del Mar Highlands Estates Affordable Housing, Addendum No. 1

Date: 1/22/2020

Job Number: 1525-001

Scenario: Maximum Day Demand plus 1,500 gpm Fire Flow at Node 316, Pipe 301 Closed

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
470/360 PR		360	156.0	0.0	156.0
610/360 PR		360	156.0	0.0	156.0
J-3	180	360	78.0	73.7	4.3
J-4	158	360	87.5	82.0	5.5
J-5	154	360	89.3	82.8	6.5
J-6	99	360	113.1	105.7	7.4
J-12	95	360	114.8	107.2	7.7
J-15	86	360	118.7	111.0	7.7
J-17	40	360	138.6	131.6	7.1
J-18	110	360	108.3	102.0	6.3
J-21	205	360	67.2	61.8	5.4
J-24	148	360	91.9	87.5	4.3
J-302	92	360	116.1	105.3	10.9
J-306	91	360	116.6	105.7	10.9
J-310	98	360	113.5	102.7	10.9
J-312	92	360	116.1	102.7	13.4
J-316	94	360	115.3	99.7	15.5
J-332	93	360	115.7	104.8	10.9
J-336	93	360	115.7	104.8	10.9

Project: Del Mar Highlands Estates Affordable Housing, Addendum No. 1

Date: 1/22/2020

Job Number: 1525-001

Scenario: Maximum Day Demand plus 1,500 gpm Fire Flow at Node 336, Pipe 301 Closed

Node No.	Node El. Ft.	HGL Zone Ft. (Static)*	Static P psi	Model Run P, psi	Delta P from Static
470/360 PR		360	156.0	0.0	156.0
610/360 PR		360	156.0	0.0	156.0
J-3	180	360	78.0	73.7	4.3
J-4	158	360	87.5	82.0	5.5
J-5	154	360	89.3	82.8	6.5
J-6	99	360	113.1	105.7	7.4
J-12	95	360	114.8	107.2	7.7
J-15	86	360	118.7	111.0	7.7
J-17	40	360	138.6	131.6	7.1
J-18	110	360	108.3	102.0	6.3
J-21	205	360	67.2	61.8	5.4
J-24	148	360	91.9	87.5	4.3
J-302	92	360	116.1	104.7	11.5
J-306	91	360	116.6	105.1	11.5
J-310	98	360	113.5	102.7	10.9
J-312	92	360	116.1	105.3	10.9
J-316	94	360	115.3	104.4	10.9
J-332	93	360	115.7	99.2	16.5
J-336	93	360	115.7	98.3	17.4

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* * * * * K Y P I P E * * * * *
*
* Pipe Network Modeling Software
*
* CopyRighted by KYPIPE LLC (www.kypipe.com)
* Version: 10.009 10/01/2019
* Company: Dexter      Serial #: 592169
* Interface: Classic
* Licensed for Pipe2018
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Date & Time: Mon Jan 20 15:45:50 2020

Master File : c:\users\steven\desktop\dm highlands aff housing.KYP\dm highlands aff housing.P2K

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S U M M A R Y   O F   O R I G I N A L   D A T A
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U N I T S S P E C I F I E D

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FLOWRATE ..... = gallons/minute
HEAD (HGL) ..... = feet
PRESSURE ..... = psig
    
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P I P E L I N E D A T A

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

P I P E N A M E	N O D E N A M E S		L E N G T H (ft)	D I A M E T E R (in)	R O U G H N E S S C O E F F .	M I N O R L O S S C O E F F .
	#1	#2				
P205	J-6	J-5	1100.00	12.00	120.0000	0.00
P-202	J-3470/360	PR	20.00	12.00	120.0000	0.00
P-203	J-4	J-3	1400.00	12.00	120.0000	0.00
P-204	J-5	J-4	1200.00	12.00	120.0000	0.00
P-211	J-15	J-12	30.00	12.00	120.0000	0.00
P-214	J-12	J-6	290.00	12.00	120.0000	0.00
P-216	J-17	J-15	740.00	12.00	120.0000	0.00
P-217	J-18	J-17	1000.00	12.00	120.0000	0.00
P-220	J-21	J-18	1220.00	12.00	120.0000	0.00
P-223	J-24	J-21	1300.00	12.00	120.0000	0.00
P-226	610/360	PR J-24	20.00	12.00	120.0000	0.00
P-301	J-12	J-302	95.00	8.00	120.0000	0.00
P-305	J-302	J-306	60.00	8.00	120.0000	0.00
P-309	J-15	J-310	155.00	8.00	120.0000	0.00
P-313	J-306	J-310	30.00	8.00	120.0000	0.00
P-317	J-310	J-312	130.00	8.00	120.0000	0.00
P-323	J-312	J-316	110.00	8.00	120.0000	0.00
P-332	J-306	J-332	250.00	8.00	120.0000	0.00
P-336	J-332	J-336	50.00	8.00	120.0000	0.00

N O D E D A T A

NODE NAME	NODE TITLE	EXTERNAL DEMAND (gpm)	JUNCTION ELEVATION (ft)	EXTERNAL GRADE (ft)
470/360	PR	----	0.00	350.00
610/360	PR	----	0.00	350.00
J-3		1.00	180.00	
J-4		0.00	158.00	
J-5		0.00	154.00	
J-6		0.00	99.00	
J-12		0.00	95.00	
J-15		10.00	86.00	
J-17		0.00	40.00	
J-18		0.00	110.00	
J-21		0.00	205.00	
J-24		1.00	148.00	
J-302		0.00	92.00	
J-306		5.80	91.00	
J-310		2.90	98.00	
J-312		0.00	92.00	
J-316		0.00	94.00	
J-332		8.70	93.00	
J-336		0.00	93.00	

O U T P U T O P T I O N D A T A

OUTPUT SELECTION: ALL RESULTS ARE INCLUDED IN THE TABULATED OUTPUT
 MAXIMUM AND MINIMUM PRESSURES = 3
 MAXIMUM AND MINIMUM VELOCITIES = 3

S Y S T E M C O N F I G U R A T I O N

NUMBER OF PIPES(P) = 19
 NUMBER OF END NODES(J) = 17
 NUMBER OF PRIMARY LOOPS(L) = 1
 NUMBER OF SUPPLY NODES(F) = 2
 NUMBER OF SUPPLY ZONES(Z) = 1

=====
Case: 1 Average Day Demands

RESULTS OBTAINED AFTER 9 TRIALS: ACCURACY = 0.63482E-06

S I M U L A T I O N D E S C R I P T I O N (L A B E L)

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
	#1	#2						
P205	J-6	J-5	-13.94	0.00	0.00	0.04	0.00	0.00
P-202	J-3470/360	PR	-14.94	0.00	0.00	0.04	0.00	0.00
P-203	J-4	J-3	-13.94	0.00	0.00	0.04	0.00	0.00
P-204	J-5	J-4	-13.94	0.00	0.00	0.04	0.00	0.00
P-211	J-15	J-12	-5.01	0.00	0.00	0.01	0.00	0.00
P-214	J-12	J-6	-13.94	0.00	0.00	0.04	0.00	0.00
P-216	J-17	J-15	13.46	0.00	0.00	0.04	0.00	0.00
P-217	J-18	J-17	13.46	0.00	0.00	0.04	0.00	0.00
P-220	J-21	J-18	13.46	0.00	0.00	0.04	0.00	0.00
P-223	J-24	J-21	13.46	0.00	0.00	0.04	0.00	0.00
P-226	610/360	PR	14.46	0.00	0.00	0.04	0.00	0.00
P-301	J-12	J-302	8.92	0.00	0.00	0.06	0.00	0.00
P-305	J-302	J-306	8.92	0.00	0.00	0.06	0.00	0.00
P-309	J-15	J-310	8.48	0.00	0.00	0.05	0.00	0.00
P-313	J-306	J-310	-5.58	0.00	0.00	0.04	0.00	0.00
P-317	J-310	J-312	0.00	0.00	0.00	0.00	0.00	0.00
P-323	J-312	J-316	0.00	0.00	0.00	0.00	0.00	0.00
P-332	J-306	J-332	8.70	0.00	0.00	0.06	0.00	0.00
P-336	J-332	J-336	0.00	0.00	0.00	0.00	0.00	0.00

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
470/360	PR	----	350.00			
610/360	PR	----	350.00			
J-3		1.00	350.00	180.00	170.00	73.67
J-4		0.00	350.00	158.00	192.00	83.20
J-5		0.00	350.00	154.00	196.00	84.93
J-6		0.00	350.00	99.00	251.00	108.76
J-12		0.00	350.00	95.00	255.00	110.50
J-15		10.00	350.00	86.00	264.00	114.40
J-17		0.00	350.00	40.00	310.00	134.33
J-18		0.00	350.00	110.00	240.00	104.00
J-21		0.00	350.00	205.00	145.00	62.83
J-24		1.00	350.00	148.00	202.00	87.53
J-302		0.00	350.00	92.00	258.00	111.80
J-306		5.80	350.00	91.00	259.00	112.23
J-310		2.90	350.00	98.00	252.00	109.20
J-312		0.00	350.00	92.00	258.00	111.80
J-316		0.00	350.00	94.00	256.00	110.93
J-332		8.70	349.99	93.00	256.99	111.36
J-336		0.00	349.99	93.00	256.99	111.36

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
	#1	#2						
P205	J-6	J-5	-85.01	0.03	0.00	0.24	0.03	0.03
P-202	J-3470/360	PR	-91.11	0.00	0.00	0.26	0.03	0.03
P-203	J-4	J-3	-85.01	0.04	0.00	0.24	0.03	0.03
P-204	J-5	J-4	-85.01	0.04	0.00	0.24	0.03	0.03
P-211	J-15	J-12	-30.59	0.00	0.00	0.09	0.00	0.00
P-214	J-12	J-6	-85.01	0.01	0.00	0.24	0.03	0.03
P-216	J-17	J-15	82.13	0.02	0.00	0.23	0.03	0.03
P-217	J-18	J-17	82.13	0.03	0.00	0.23	0.03	0.03
P-220	J-21	J-18	82.13	0.04	0.00	0.23	0.03	0.03
P-223	J-24	J-21	82.13	0.04	0.00	0.23	0.03	0.03
P-226	610/360	PR	88.23	0.00	0.00	0.25	0.03	0.03
P-301	J-12	J-302	54.43	0.01	0.00	0.35	0.10	0.10
P-305	J-302	J-306	54.43	0.01	0.00	0.35	0.10	0.10
P-309	J-15	J-310	51.71	0.01	0.00	0.33	0.09	0.09
P-313	J-306	J-310	-34.02	0.00	0.00	0.22	0.04	0.04
P-317	J-310	J-312	0.00	0.00	0.00	0.00	0.00	0.00
P-323	J-312	J-316	0.00	0.00	0.00	0.00	0.00	0.00
P-332	J-306	J-332	53.07	0.02	0.00	0.34	0.09	0.09
P-336	J-332	J-336	0.00	0.00	0.00	0.00	0.00	0.00

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
610/360	PR	----	350.00			
J-3		6.10 (6.10)	350.00	180.00	170.00	73.67
J-4		0.00	349.96	158.00	191.96	83.18
J-5		0.00	349.92	154.00	195.92	84.90
J-6		0.00	349.89	99.00	250.89	108.72
J-12		0.00	349.88	95.00	254.88	110.45
J-15		61.00 (6.10)	349.88	86.00	263.88	114.35
J-17		0.00	349.90	40.00	309.90	134.29
J-18		0.00	349.93	110.00	239.93	103.97
J-21		0.00	349.96	205.00	144.96	62.82
J-24		6.10 (6.10)	350.00	148.00	202.00	87.53
J-302		0.00	349.87	92.00	257.87	111.74
J-306		35.38 (6.10)	349.86	91.00	258.86	112.17
J-310		17.69 (6.10)	349.86	98.00	251.86	109.14
J-312		0.00	349.86	92.00	257.86	111.74
J-316		0.00	349.86	94.00	255.86	110.87
J-332		53.07 (6.10)	349.84	93.00	256.84	111.30
J-336		0.00	349.84	93.00	256.84	111.30

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
	#1	#2						
P205	J-6	J-5	-796.64	2.12	0.00	2.26	1.93	1.93
P-202	J-3470/360	PR	-799.04	0.04	0.00	2.27	1.94	1.94
P-203	J-4	J-3	-796.64	2.70	0.00	2.26	1.93	1.93
P-204	J-5	J-4	-796.64	2.32	0.00	2.26	1.93	1.93
P-211	J-15	J-12	-59.60	0.00	0.00	0.17	0.02	0.02
P-214	J-12	J-6	-796.64	0.56	0.00	2.26	1.93	1.93
P-216	J-17	J-15	769.12	1.34	0.00	2.18	1.81	1.81
P-217	J-18	J-17	769.12	1.81	0.00	2.18	1.81	1.81
P-220	J-21	J-18	769.12	2.21	0.00	2.18	1.81	1.81
P-223	J-24	J-21	769.12	2.35	0.00	2.18	1.81	1.81
P-226	610/360	PR	771.52	0.04	0.00	2.19	1.82	1.82
P-301	J-12	J-302	737.04	1.14	0.00	4.70	12.04	12.04
P-305	J-302	J-306	737.04	0.72	0.00	4.70	12.04	12.04
P-309	J-15	J-310	804.72	2.20	0.00	5.14	14.17	14.17
P-313	J-306	J-310	702.24	0.33	0.00	4.48	11.01	11.01
P-317	J-310	J-312	1500.00	5.84	0.00	9.57	44.89	44.89
P-323	J-312	J-316	1500.00	4.94	0.00	9.57	44.89	44.89
P-332	J-306	J-332	20.88	0.00	0.00	0.13	0.02	0.02
P-336	J-332	J-336	0.00	0.00	0.00	0.00	0.00	0.00

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
470/360	PR	----	350.00			
610/360	PR	----	350.00			
J-3		2.40 (2.40)	349.96	180.00	169.96	73.65
J-4		0.00	347.26	158.00	189.26	82.01
J-5		0.00	344.94	154.00	190.94	82.74
J-6		0.00	342.82	99.00	243.82	105.65
J-12		0.00	342.26	95.00	247.26	107.15
J-15		24.00 (2.40)	342.26	86.00	256.26	111.05
J-17		0.00	343.60	40.00	303.60	131.56
J-18		0.00	345.41	110.00	235.41	102.01
J-21		0.00	347.61	205.00	142.61	61.80
J-24		2.40 (2.40)	349.96	148.00	201.96	87.52
J-302		0.00	341.12	92.00	249.12	107.95
J-306		13.92 (2.40)	340.39	91.00	249.39	108.07
J-310		6.96 (2.40)	340.06	98.00	242.06	104.89
J-312		0.00	334.23	92.00	242.23	104.96
J-316		1500.00	329.29	94.00	235.29	101.96
J-332		20.88 (2.40)	340.39	93.00	247.39	107.20
J-336		0.00	340.39	93.00	247.39	107.20

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
	#1	#2						
P205	J-6	J-5	-796.65	2.12	0.00	2.26	1.93	1.93
P-202	J-3470/360	PR	-799.05	0.04	0.00	2.27	1.94	1.94
P-203	J-4	J-3	-796.65	2.70	0.00	2.26	1.93	1.93
P-204	J-5	J-4	-796.65	2.32	0.00	2.26	1.93	1.93
P-211	J-15	J-12	10.43	0.00	0.00	0.03	0.00	0.00
P-214	J-12	J-6	-796.65	0.56	0.00	2.26	1.93	1.93
P-216	J-17	J-15	769.11	1.34	0.00	2.18	1.81	1.81
P-217	J-18	J-17	769.11	1.81	0.00	2.18	1.81	1.81
P-220	J-21	J-18	769.11	2.21	0.00	2.18	1.81	1.81
P-223	J-24	J-21	769.11	2.35	0.00	2.18	1.81	1.81
P-226	610/360	PR	771.51	0.04	0.00	2.19	1.82	1.82
P-301	J-12	J-302	807.08	1.35	0.00	5.15	14.25	14.25
P-305	J-302	J-306	807.08	0.85	0.00	5.15	14.25	14.25
P-309	J-15	J-310	734.68	1.86	0.00	4.69	11.97	11.97
P-313	J-306	J-310	-727.72	0.35	0.00	4.64	11.76	11.76
P-317	J-310	J-312	0.00	0.00	0.00	0.00	0.00	0.00
P-323	J-312	J-316	0.00	0.00	0.00	0.00	0.00	0.00
P-332	J-306	J-332	1520.88	11.51	0.00	9.71	46.06	46.06
P-336	J-332	J-336	1500.00	2.24	0.00	9.57	44.89	44.89

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
470/360	PR	----	350.00			
610/360	PR	----	350.00			
J-3		2.40 (2.40)	349.96	180.00	169.96	73.65
J-4		0.00	347.26	158.00	189.26	82.01
J-5		0.00	344.94	154.00	190.94	82.74
J-6		0.00	342.82	99.00	243.82	105.65
J-12		0.00	342.26	95.00	247.26	107.15
J-15		24.00 (2.40)	342.26	86.00	256.26	111.05
J-17		0.00	343.60	40.00	303.60	131.56
J-18		0.00	345.41	110.00	235.41	102.01
J-21		0.00	347.61	205.00	142.61	61.80
J-24		2.40 (2.40)	349.96	148.00	201.96	87.52
J-302		0.00	340.91	92.00	248.91	107.86
J-306		13.92 (2.40)	340.05	91.00	249.05	107.92
J-310		6.96 (2.40)	340.40	98.00	242.40	105.04
J-312		0.00	340.40	92.00	248.40	107.64
J-316		0.00	340.40	94.00	246.40	106.77
J-332		20.88 (2.40)	328.54	93.00	235.54	102.07
J-336		1500.00	326.29	93.00	233.29	101.09

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
	#1	#2						
P205	J-6	J-5	-795.08	2.12	0.00	2.26	1.92	1.92
P-202	J-3470/360	PR	-797.48	0.04	0.00	2.26	1.93	1.93
P-203	J-4	J-3	-795.08	2.69	0.00	2.26	1.92	1.92
P-204	J-5	J-4	-795.08	2.31	0.00	2.26	1.92	1.92
P-211	J-15	J-12	-795.08	0.06	0.00	2.26	1.92	1.92
P-214	J-12	J-6	-795.08	0.56	0.00	2.26	1.92	1.92
P-216	J-17	J-15	770.68	1.34	0.00	2.19	1.82	1.82
P-217	J-18	J-17	770.68	1.82	0.00	2.19	1.82	1.82
P-220	J-21	J-18	770.68	2.21	0.00	2.19	1.82	1.82
P-223	J-24	J-21	770.68	2.36	0.00	2.19	1.82	1.82
P-226	610/360	PR	773.08	0.04	0.00	2.19	1.83	1.83
P-301-XX	J-12	J-302						
P-305	J-302	J-306	0.00	0.00	0.00	0.00	0.00	0.00
P-309	J-15	J-310	1541.76	7.32	0.00	9.84	47.24	47.24
P-313	J-306	J-310	-34.80	0.00	0.00	0.22	0.04	0.04
P-317	J-310	J-312	1500.00	5.84	0.00	9.57	44.89	44.89
P-323	J-312	J-316	1500.00	4.94	0.00	9.57	44.89	44.89
P-332	J-306	J-332	20.88	0.00	0.00	0.13	0.02	0.02
P-336	J-332	J-336	0.00	0.00	0.00	0.00	0.00	0.00

NODE RESULTS

NODE NAME	NODE TITLE	EXTERNAL	HYDRAULIC	NODE	PRESSURE	NODE
		DEMAND gpm	GRADE ft	ELEVATION ft	HEAD ft	PRESSURE psi
470/360	PR	----	350.00			
610/360	PR	----	350.00			
J-3		2.40 (2.40)	349.96	180.00	169.96	73.65
J-4		0.00	347.27	158.00	189.27	82.02
J-5		0.00	344.96	154.00	190.96	82.75
J-6		0.00	342.84	99.00	243.84	105.67
J-12		0.00	342.29	95.00	247.29	107.16
J-15		24.00 (2.40)	342.23	86.00	256.23	111.03
J-17		0.00	343.57	40.00	303.57	131.55
J-18		0.00	345.39	110.00	235.39	102.00
J-21		0.00	347.60	205.00	142.60	61.79
J-24		2.40 (2.40)	349.96	148.00	201.96	87.52
J-302		0.00	334.91	92.00	242.91	105.26
J-306		13.92 (2.40)	334.91	91.00	243.91	105.69
J-310		6.96 (2.40)	334.91	98.00	236.91	102.66
J-312		0.00	329.07	92.00	237.07	102.73
J-316		1500.00	324.13	94.00	230.13	99.72
J-332		20.88 (2.40)	334.90	93.00	241.90	104.82
J-336		0.00	334.90	93.00	241.90	104.82

PIPELINE RESULTS

STATUS CODE: XX -CLOSED PIPE CV -CHECK VALVE

PIPE NAME	NODE NUMBERS		FLOWRATE gpm	HEAD LOSS ft	MINOR LOSS ft	LINE VELO. ft/s	HL+ML/ 1000 ft/f	HL/ 1000 ft/f
	#1	#2						
P205	J-6	J-5	-795.08	2.12	0.00	2.26	1.92	1.92
P-202	J-3470/360	PR	-797.48	0.04	0.00	2.26	1.93	1.93
P-203	J-4	J-3	-795.08	2.69	0.00	2.26	1.92	1.92
P-204	J-5	J-4	-795.08	2.31	0.00	2.26	1.92	1.92
P-211	J-15	J-12	-795.08	0.06	0.00	2.26	1.92	1.92
P-214	J-12	J-6	-795.08	0.56	0.00	2.26	1.92	1.92
P-216	J-17	J-15	770.68	1.34	0.00	2.19	1.82	1.82
P-217	J-18	J-17	770.68	1.82	0.00	2.19	1.82	1.82
P-220	J-21	J-18	770.68	2.21	0.00	2.19	1.82	1.82
P-223	J-24	J-21	770.68	2.36	0.00	2.19	1.82	1.82
P-226	610/360	PR	773.08	0.04	0.00	2.19	1.83	1.83
P-301-XX	J-12	J-302						
P-305	J-302	J-306	0.00	0.00	0.00	0.00	0.00	0.00
P-309	J-15	J-310	1541.76	7.32	0.00	9.84	47.24	47.24
P-313	J-306	J-310	-1534.80	1.41	0.00	9.80	46.84	46.84
P-317	J-310	J-312	0.00	0.00	0.00	0.00	0.00	0.00
P-323	J-312	J-316	0.00	0.00	0.00	0.00	0.00	0.00
P-332	J-306	J-332	1520.88	11.51	0.00	9.71	46.06	46.06
P-336	J-332	J-336	1500.00	2.24	0.00	9.57	44.89	44.89

NODE RESULTS

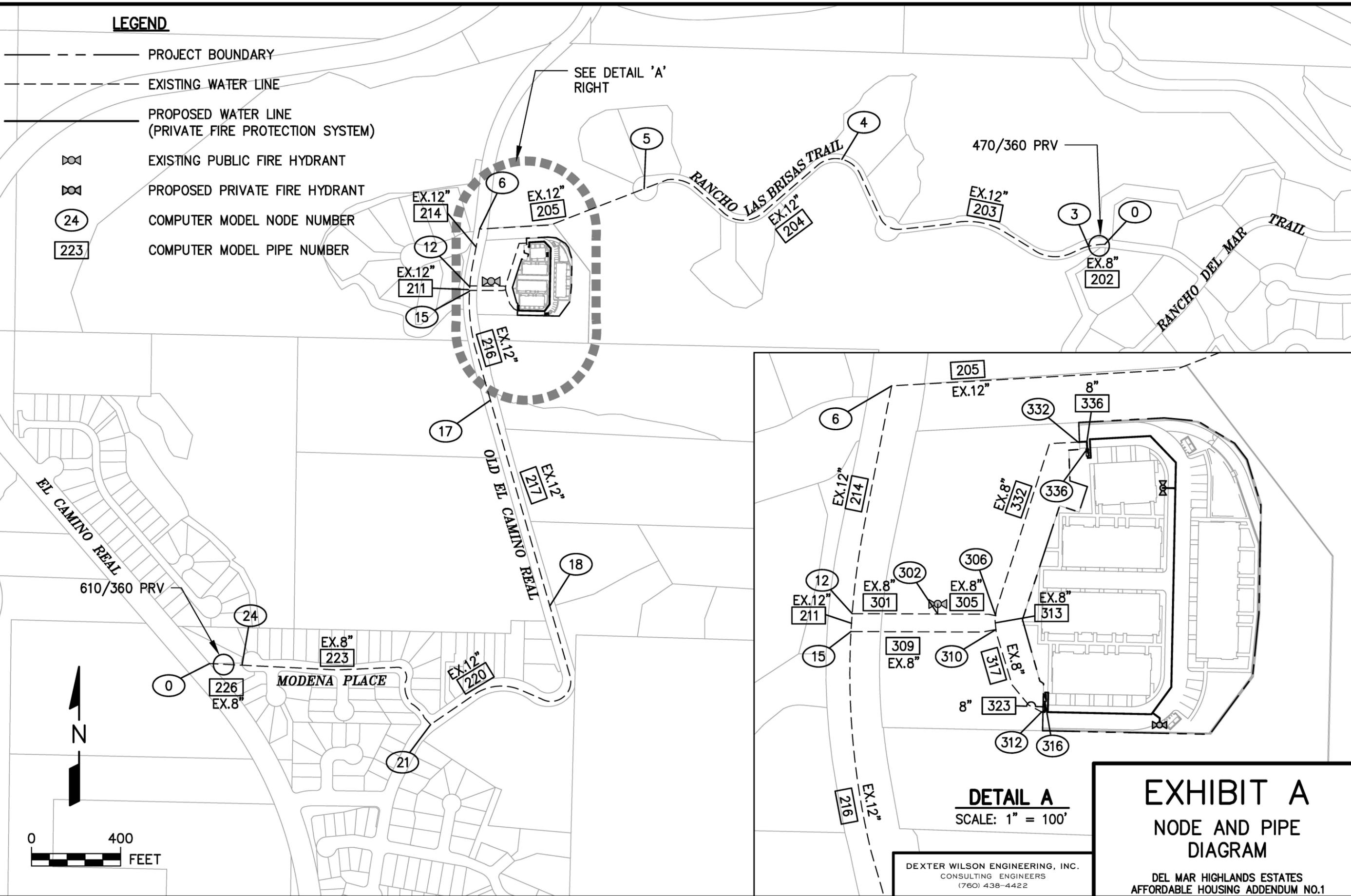
NODE NAME	NODE TITLE	EXTERNAL DEMAND gpm	HYDRAULIC GRADE ft	NODE ELEVATION ft	PRESSURE HEAD ft	NODE PRESSURE psi
470/360	PR	----	350.00			
610/360	PR	----	350.00			
J-3		2.40 (2.40)	349.96	180.00	169.96	73.65
J-4		0.00	347.27	158.00	189.27	82.02
J-5		0.00	344.96	154.00	190.96	82.75
J-6		0.00	342.84	99.00	243.84	105.67
J-12		0.00	342.29	95.00	247.29	107.16
J-15		24.00 (2.40)	342.23	86.00	256.23	111.03
J-17		0.00	343.57	40.00	303.57	131.55
J-18		0.00	345.39	110.00	235.39	102.00
J-21		0.00	347.60	205.00	142.60	61.79
J-24		2.40 (2.40)	349.96	148.00	201.96	87.52
J-302		0.00	333.50	92.00	241.50	104.65
J-306		13.92 (2.40)	333.50	91.00	242.50	105.08
J-310		6.96 (2.40)	334.91	98.00	236.91	102.66
J-312		0.00	334.91	92.00	242.91	105.26
J-316		0.00	334.91	94.00	240.91	104.39
J-332		20.88 (2.40)	321.99	93.00	228.99	99.23
J-336		1500.00	319.74	93.00	226.74	98.26

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LEGEND

- PROJECT BOUNDARY
- - - EXISTING WATER LINE
- PROPOSED WATER LINE (PRIVATE FIRE PROTECTION SYSTEM)
- ⊗ EXISTING PUBLIC FIRE HYDRANT
- ⊗ PROPOSED PRIVATE FIRE HYDRANT
- (24) COMPUTER MODEL NODE NUMBER
- [223] COMPUTER MODEL PIPE NUMBER

SEE DETAIL 'A' RIGHT



DETAIL A
SCALE: 1" = 100'

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

EXHIBIT A
NODE AND PIPE
DIAGRAM

DEL MAR HIGHLANDS ESTATES
AFFORDABLE HOUSING ADDENDUM NO.1