P. B. L. A. ENGINEERING, inc

Planning • Engineering • Surveying

# *PRELIMINARY*
# *HYDROLOGY and HYDRAULICS REPORT*

# *GOODMAN LOGISTICS CENTER*

## EL MONTE, CA

**PREPARED FOR:**

**GLC EL MONTE, LLC**
**18201 Von Karman Aveune**
**Suite 1170**
**Irvine, CA 92612**
*Preparation Date: January, 2018*

REGISTERED PROFESSIONAL ENGINEER
STEVEN D. LEVISEE
NO. 45926
EXP. 12-31-18
CIVIL
STATE OF CALIFORNIA

Prepared under the supervision of:

_____

Steve Levisee, P.E. Date

4790 Irvine Blvd., Suite 105-262 * Irvine, CA 92620 * (888) 714-9642 * Fax (714) 389-9191

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## Background and Purpose

GLC El Monte, LLC is proposing to develop two industrial / logistics buildings totaling 1,215,340 square feet of footprint with 10,000 square mezzanines in each building for a total Project floor area of 1,235,340 square feet on approximately 57 acres of land in the City of El Monte. The property is located at the southeast corner of Lower Azusa Road and Shirley Avenue. The property is improved with multiple buildings and site improvements and is formerly a Vons Grocery logistics facility. The site will be entirely demolished and graded for the proposed development along with the widening of Shirley Avenue along the Project frontage.

The purpose of this report is to establish the basis for final design of flood protection and drainage conveyance elements, ensure that these elements can be sized properly, and to ensure the development can comply with City and County requirements when constructed.

## Project Scope

This study contemplates the entire project site along with all tributary offsite areas. The land westerly of the site and Shirley Avenue is tributary to an existing inlet that directs public storm water through the site to an existing Los Angeles County Flood Control District (LACFCD) storm drain along the southerly boundary. (Project 33301)

This report will include only the developed condition hydrology due to the fact that LACFCD provides an allowable discharge in the 50 year storm on a per acre basis. This eliminates the need to prepare an existing condition study for comparison to the proposed development.

The Hydrology Map for both the proposed condition is given in Appendix A.

## Flood Designation

The property lies within Flood Insurance Rate Map Panel Number 06037C1675F. This panel is not obtainable from FEMA for the following reason: "*When FEMA identifies an area as having a single flood zone designation, it is determined not to be cost-effective to publish the map panel.*

Due to the nature of the area being fully developed with master planned drainage facilities, it is assumed the site is not within a potential 100 year flood inundation area.

## Project Location

## Design Criteria and Methods

This study and the related calculations are based on 50-year recurrence interval storm events for both the Pre-Developed and Developed Project conditions.

50 year rainfall depth and soil types are available online from the Los Angeles County Department of Public Works website and are provided in Appendix C.

Hydrology calculations are based on the LACFCD rational method by using the "HydroCalc" spreadsheet program available Los Angeles County Department of Public Works online.

Pipe hydraulic calculations are not included in this Preliminary Report. Full pipe hydraulic analysis will be provided in the final drainage report based on final construction documents.

Flood Routing calculations are performed using the LAR04 and RETARD programs also from CivilDesign Software.

### *Detention Basin Facility*

Storm water detention and water quality volume capture will be accomplished under Building 2 in an existing 53,300 square foot basement that will be salvaged and retrofitted for detention use. Flows will enter from both the east and west sides for the site storm drain system with access manholes and 72" diameter pipes to allow periodic access for maintenance and cleaning operations inside the basement. The basement has capacity to detain the required Water Quality Volume and excess detention to attenuate design storm flows to meet the 1 cubic foot/second outflow maximum set by LACFCD.

### *Water Quality Volume Treatment*

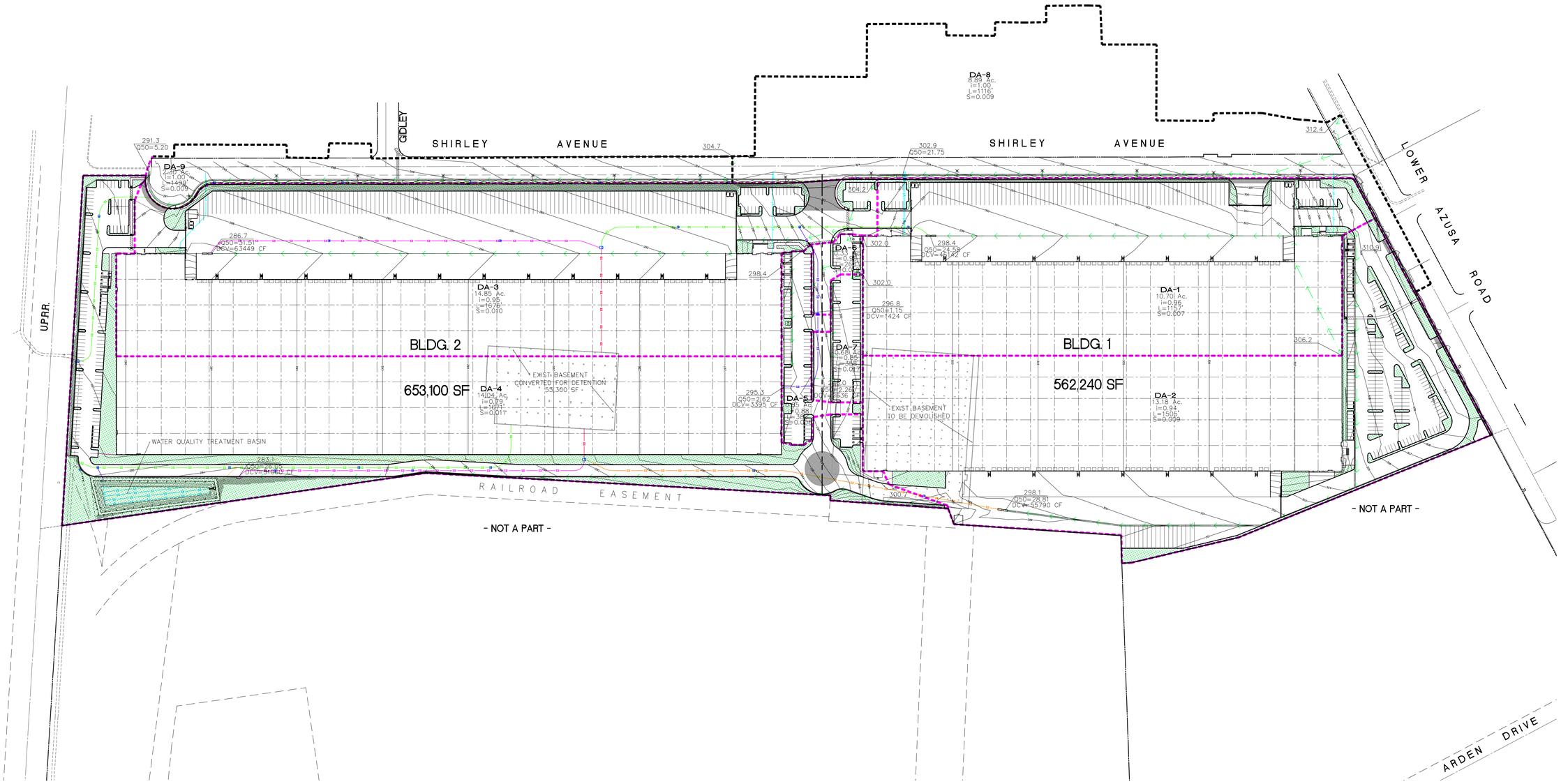
Water quality volume will be pumped to a bio-retention basin on the south east corner of the site. This is an open air basin with layers of select sand and gravel material and is underlain by perforated sub-drains. The stratum of select material will aloow drawdown of 4 inches/hour and will have plenty of capacity to treat the Water Quality Volume within 48 hours.

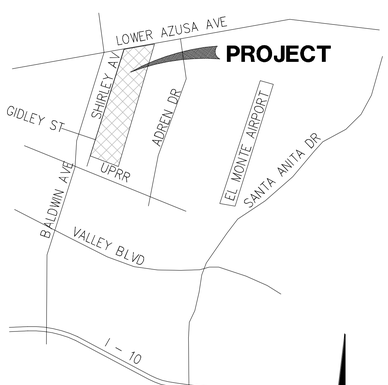
## Conclusion

This study and the related calculations indicated that the proposed development design flows can be conveyed to the proposed detention basins without danger of site flooding. Additionally, the detention basins are properly sized to attenuate the difference between post-development runoff and the allowable runoff rate published by LACFCD.

# APPENDIX A

# HYDROLOGY MAP – PROPOSED CONDITION




**VICINITY MAP**

NOT TO SCALE

***LEGEND:***

| | |
|---|---|
| DA-1 | SUB-AREA DESIGNATION |
| Q50=7.8 | 50 YR DISCHARGE (CFS) |
| DCV=12,050 | WATER QUALITY DESIGN CAPTURE VOLUME (CUBIC FEET) |
| 1.68 AC | SUB-AREA (ACRES) |
| S=0.020 | SLOPE OF FLOWPATH |
| L=546 | FLOWPATH LENGTH (FEET) |
| i | IMPERVIOUS RATIO |
| | SUB-AREA BOUNDARY |
| | FLOWPATH |

GRAPHIC SCALE

100 0 50 100 200 400

( IN FEET )
1 inch = 100 ft.

Jan 24 2018

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18201 VON KARMAN AVENUE
SUITE 1170
Irvine, California 92612

Telephone: (949) 407-0118

REVISIONS:

| | |
|---|---|
| x-x-xx | 1st RELEASE |

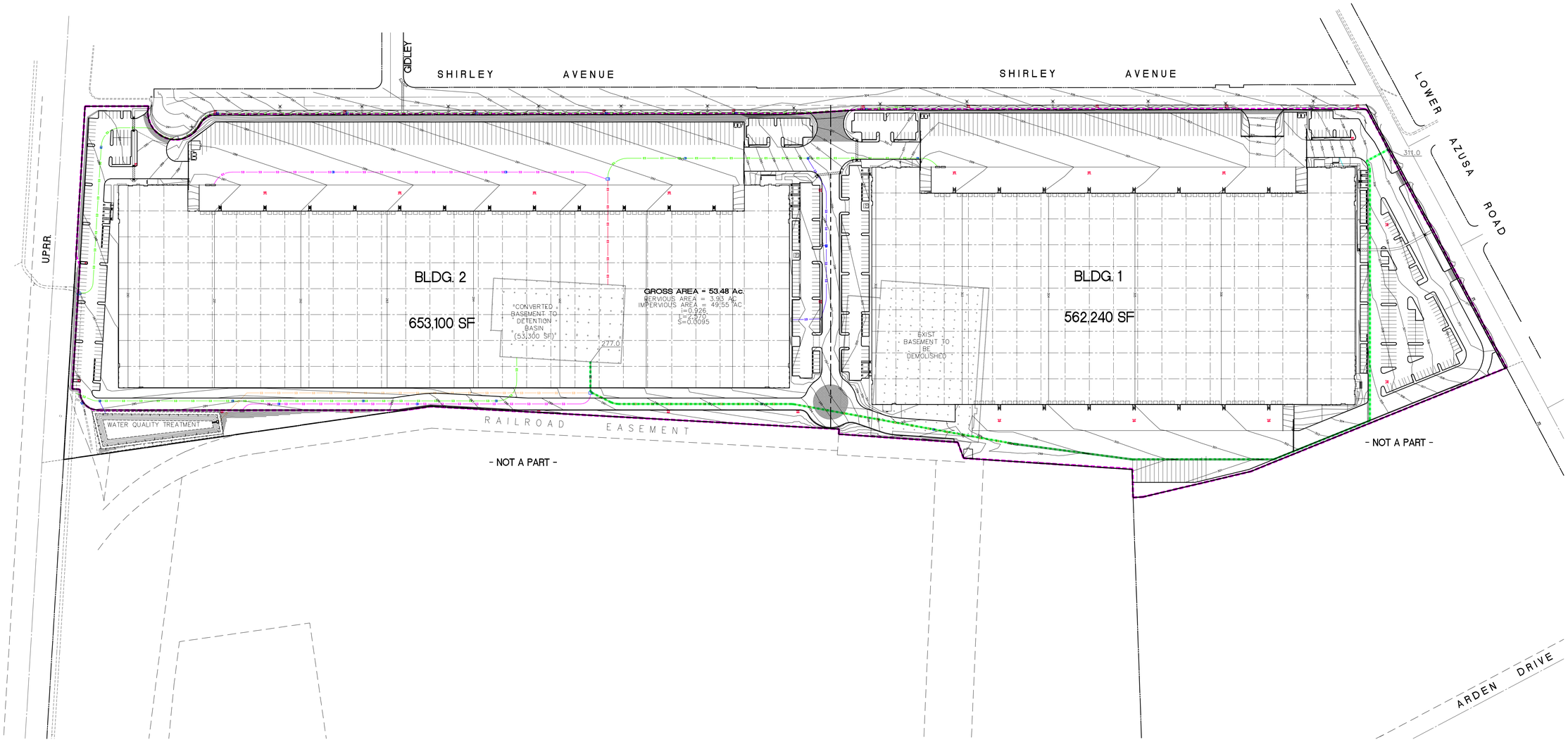
# HYDROLOGY MAP
# DEVELOPED CONDITION
## GOODMAN LOGISTICS CENTER
## EL MONTE, CA

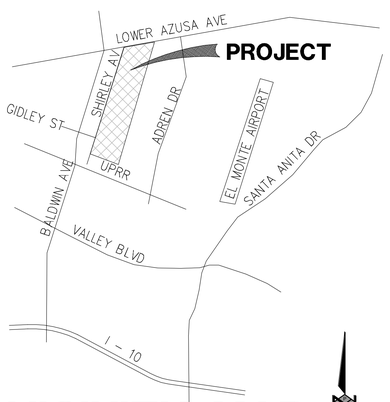
JOB NO. 128-1

SHEET 1 of 1

# APPENDIX B

# HYDROLOGY MAP – UNIT HYDROGRAPH for PROPOSED CONDITION




**VICINITY MAP**

NOT TO SCALE

*LEGEND:*

S=0.020 —— SLOPE OF FLOWPATH
L=546 —— FLOWPATH LENGTH
i —— IMPERVIOUS RATIO
—— SUB-AREA BOUNDARY
—— FLOWPATH

GRAPHIC SCALE

100 0 50 100 200 400

( IN FEET )
1 inch = 100 ft.

Jan 24 2018

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| | |
|---|---|
| x-x-xx | 1st RELEASE |

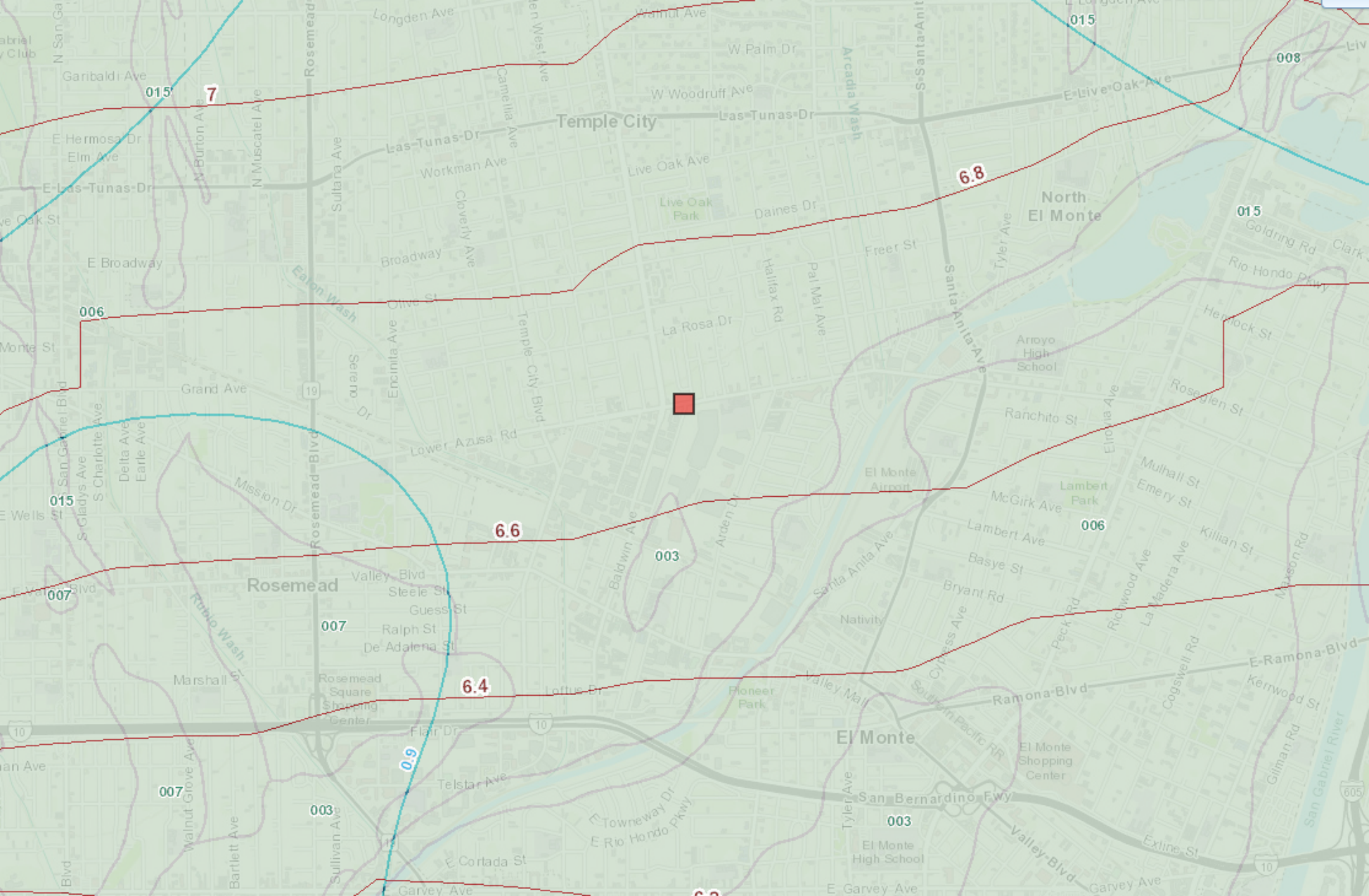
# INPUT UNIT HYDROGRAPH MAP
## DEVELOPED CONDITION
## GOODMAN LOGISTICS CENTER
## EL MONTE, CA

JOB NO. 128-1

SHEET 1 of 1

# APPENDIX C

# LACFCD REFERENCE DATA


7
6.8
6.6
6.4
0.9
Temple City
North El Monte
Rosemead
El Monte
Longden Ave
Garibaldi Ave
E Hermosa Dr
Elm Ave
E Las Tunas Dr
Las Tunas Dr
Workman Ave
Live Oak Ave
Live Oak Park
Daines Dr
E Broadway
Broadway
Olive St
La Rosa Dr
Grand Ave
Lower Azusa Rd
Mission Dr
Valley Blvd
Steele St
Guess St
Ralph St
De Adalena St
Marshall
Rosemead Square Shopping Center
Flair Dr
Telstar Ave
E Cortada St
Garvey Ave
E Garvey Ave
Loftus Dr
Pioneer Park
Valley Mall
Southern Pacific RR
El Monte Shopping Center
San Bernardino Fwy
El Monte High School
Ramona Blvd
E Ramona Blvd
Valley Blvd
Exline St
Arroyo High School
Ranchito St
Rosedale St
Mulhall St
Emery St
Killian St
McGirk Ave
Lambert Ave
Lambert Park
Basye St
Bryant Rd
Nativity
El Monte Airport
Freer St
Halifax Rd
Pal Mal Ave
Tyler Ave
Santa Anita Ave
S Santa Anita
Arcadia Wash
Eaton Wash
Rubio Wash
San Gabriel River
Rosemead Blvd
Temple City Blvd
Baldwin Ave
Arden Dr
Encinita Ave
Seaton Dr
Sultana Ave
Cloverly Ave
Camellia Ave
Walnut Ave
W Palm Dr
W Woodruff Ave
E Live Oak Ave
Goldring Rd
Rio Hondo Pkwy
Hemlock St
Clark
Eldridge Ave
Richwood Ave
La Madera Ave
Peck Rd
Cypress Ave
Cogswell Rd
Kernwood St
Gilman Rd
Mission Rd
Tyler Ave
E Towneway Dr
E Rio Hondo Pkwy
Sullivan Ave
Barlett Ave
Walnut Grove Ave
San Gabriel Blvd
S Gladys Ave
S Charlotte Ave
Delta Ave
Earle Ave
E Wells St
Monte St
N Burton Ave
N Muscatel Ave
N San Gabriel
Garibaldi Ave
015
008
006
003
007
019
10
605

COUNTY OF LOS ANGELES
**DEPARTMENT OF PUBLIC WORKS**
DESIGN DIVISION
Hydraulic Analysis Unit
**OFFICIAL**
**RECORD DOCUMENT**
Issued By: [illegible]
Date: 8 / 11 / 2015
Public Service That Works

Office Use Only
☐ Sent Initials: _____
☐ Fax ☒ Email ☐ Other: _____
Date: _____ Time: _____

# LOS ANGELES COUNTY
# DEPARTMENT OF PUBLIC WORKS
## DESIGN DIVISION – HYDRAULIC ANALYSIS UNIT

## INFORMATION REQUEST SUMMARY

**INFORMATION REQUESTED BY**
Requester's Name: JILL JOHNSON
Company: THIENES ENGINEERING, INC.
Phone Number: 714-521-4811 Fax Number: 714-521-4173
Email: jill@thieneseng.com

Method of Contact: ☒ Walk-in ☐ Phone ☐ Fax ☒ Email ☐ Prelim. Mtg. Date: 7-21-2015

Intended Use: PROPOSED DEVELOPMENT

Proposed Project Type: INDUSTRIAL Acreage Involved: _____

Will information be used in any litigation? ☐ YES ☒ NO
Case Info Name: _____ No: _____ Location: _____

Requester's Signature: [illegible]

**INFORMATION REQUESTED** (Attach site map if available)
LACFCD Facility: Name: _____
Unit: _____ Line: _____ Station: _____
City: El Monte
Street/Cross-street: Shirley, Lower Azusa, Arden
Thomas Guide: Page: 597 Grid: B 5 & 6 ☒ Site Map/Plans Submitted
Info. Requested:
- HYDROLOGY MAP
- ALLOWABLE "Q"
- HYDRAULIC CALCS

BELOW SECTION TO BE COMPLETED BY THE HYDRAULIC ANALYSIS UNIT

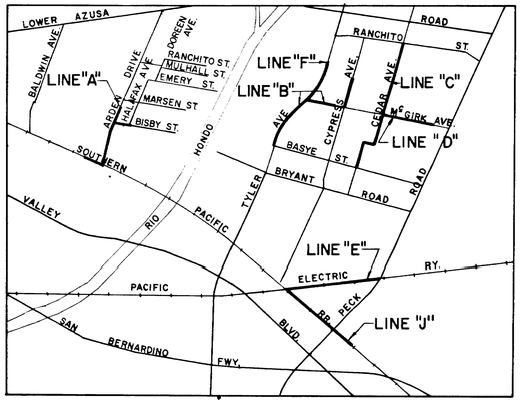
**INFORMATION PROVIDED:** *Allowable Q for Project 3301 and 27 per as-built drawings and hydrology maps. Unable to find hydraulic and hydrology calculations after a diligent search.*

**REFERENCES SEARCHED:** *Project 3301 and Project 27 hydrology maps.*

**COMMENTS, ETC:** *Allowable q per acre = 1.0 cfs*

**FOLLOW-UP REQUIRED:**

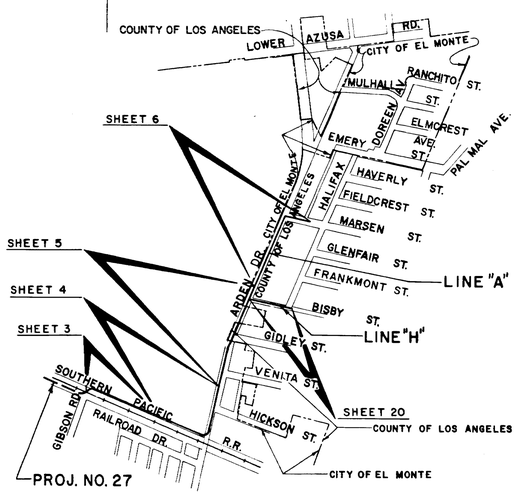
**INFORMATION PROVIDED BY:** *Shirley Cheng* Date: *8/11/2015*
**INFORMATION REVIEWED BY:** *Ambrose C. Ajaelo, P.E.* AVA Date: *8/11/2015*

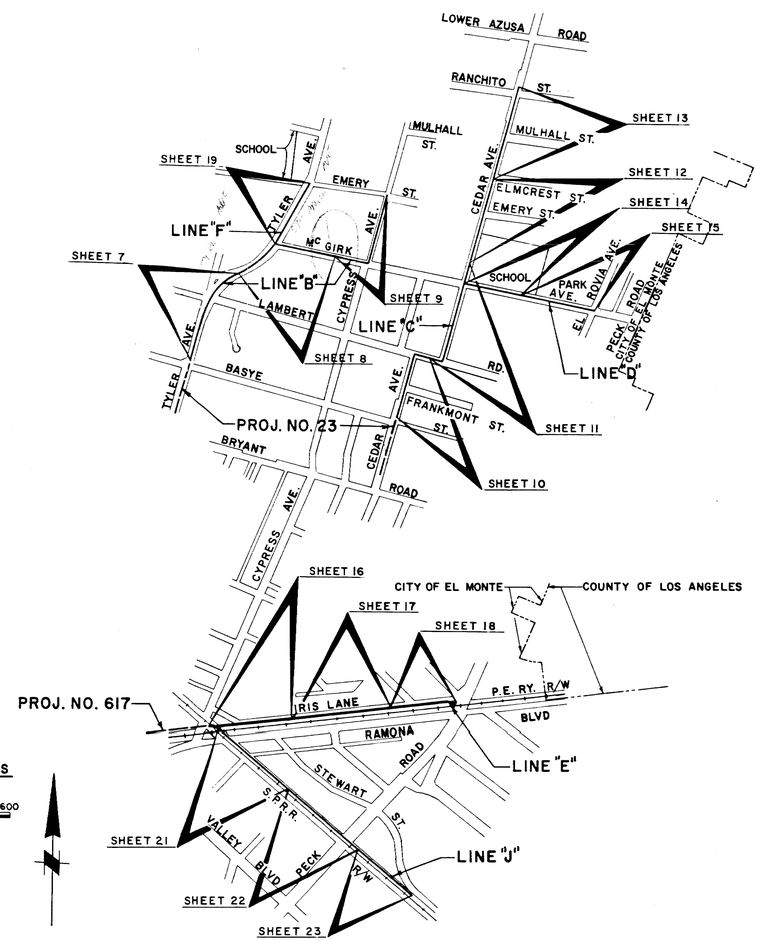



VICINITY MAP

2000 1000 0 2000

GRAPHIC SCALE




LOCATION PLANS

600 300 0 600

GRAPHIC SCALE

INDEX TO DRAWINGS

| SHEET NO. | TITLES |
|---|---|
| 1 | VICINITY MAP, LOCATION PLANS & INDEX TO DRAWINGS |
| 2 | GENERAL NOTES, STANDARD DRAWINGS, ABBREVIATIONS & LEGEND |
| | PLAN, PROFILE & SECTION |
| 3 | LINE "A" 0+57.87 TO 9+00 |
| 4 | LINE "A" 9+00 TO 17+75 |
| 5 | LINE "A" 17+75 TO 27+80 |
| 6 | DELETED |
| 7 | LINE "B" 60+42.59 TO 69+10 |
| 8 | LINE "B" 69+10 TO 79+60 |
| 9 | LINE "B" 79+60 TO 90+53 |
| 10 | LINE "C" 100+50 TO 107+80 |
| 11 | LINE "C" 107+80 TO 118+30 |
| 12 | LINE "C" 118+30 TO 126+20 |
| 13 | LINE "C" 126+20 TO 135+25 |
| 14 | LINE "D" 150+56 TO 155+70 |
| 15 | LINE "D" 155+70 TO 163+55 |
| 16 | LINE "E" 170+00 TO 178+85 |
| 17 | LINE "E" 178+85 TO 187+85 |
| 18 | LINE "E" 187+85 TO 194+17.41 |
| 19 | LINE "F" |
| 20 | DELETED |
| 21 | LINE "J" 240+00 TO 247+65 |
| 22 | LINE "J" 247+65 TO 257+20 |
| 23 | LINE "J" 257+20 TO 262+24.75 |
| 24 | RESURFACING PLAN & MISCELLANEOUS DETAILS |
| 25 | STRUCTURAL DETAILS R.C. BOX SCHEDULE |
| 26 | LOGS OF BORINGS I |
| 27 | LOGS OF BORINGS II |
| 28 | LOGS OF BORINGS III |
| 29 | LINES A & J SPECIAL STRUCTURAL DETAILS |
| 30 | LINES E & J SPECIAL STRUCTURAL DETAILS |

△ "AS BUILT" DRAWINGS

1964 STORM DRAIN BOND ISSUE

| DRAWN BY | REVISIONS | | |
|---|---|---|---|
| El Monte | MARK | DATE | DESCRIPTION |
| CHECKED BY El Monte | | | |
| DESIGNED BY El Monte | | | |
| SUBMITTED BY C.W.H. | | | |

CITY OF EL MONTE

APPROVED May 18, 1965
BY: Glenn F. Welch
GLENN F. WELCH RCE NO. 11816

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING-ARCHITECTURE

DATE May 14, 1965
BY: K.G. Tranbinger
K.G. TRANBINGER RCE NO. 10651

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT

PROJECT NO. 3301
EL MONTE UNIT I

A PORTION OF LINE A AND LINES B, C, D, E, F, & J

VICINITY MAP, LOCATION PLAN
& INDEX TO DRAWINGS

RECOMMENDED BY C.F. Eckelberry, DIVISION ENGINEER (DESIGN)
APPROVAL RECOMMENDED BY A.W. Ritchard, ASS'T CHIEF DEPUTY ENGINEER
APPROVED BY Walter J. Wood, CHIEF ENGINEER

| SCALE | DATE | DWG. NO. 364-3301-D3.1 |
|---|---|---|
| AS SHOWN | MAY 65 | SHEET 1 OF 30 |

"AS BUILT" DRAWING

## DEPARTMENT OF COUNTY ENGINEER
## COUNTY OF LOS ANGELES

### STANDARD DRAWINGS

| NO. | TITLE |
|---|---|
| S-3 | BRICK MANHOLE |
| S-15 | FRAME AND COVER |
| S-17 | STANDARD MANHOLE STEPS |

## COUNTY SANITATION DISTRICTS' OF LOS ANGELES COUNTY

### STANDARD DRAWINGS

| NO. | TITLE |
|---|---|
| G-b-48 | TEMPORARY SUPPORT DETAIL |

## LOS ANGELES COUNTY ROAD DEPARTMENT

### STANDARD DRAWINGS

| | |
|---|---|
| M57-39R | PARTIAL CONCRETE REPLACEMENT FOR CROSS GUTTERS AND SPANDRELS |
| M57-45R | REPAIRS OF CUTS IN CONCRETE PAVEMENT |

## LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

### STANDARD DRAWINGS

| NO. | TITLE |
|---|---|
| 2-D88 | LOCAL DEPRESSION NO. 2 |
| 2-D96 | STANDARD DROP STEP |
| 2-D102 | MANHOLE NO. 1 |
| 2-D107 | CONCRETE RINGS, REDUCER AND PIPE FOR MANHOLE SHAFT |
| 2-D112 | JUNCTION STRUCTURE NO. 2 |
| 2-D113 | MANHOLE NO. 4 |
| 2-D156 | MANHOLE FRAME AND COVER FOR CATCH BASINS |
| 2-D157 | CATCH BASIN REINFORCEMENT FOR ROUND MANHOLES |
| 2-D158 | DETAIL OF BOLT SUPPORT FOR CATCH BASINS |
| 2-D160 | CATCH BASIN NO. 1 |
| 2-D161 | DETAIL OF ANGLE & ANCHOR FOR CATCH BASINS |
| 2-D162 | CATCH BASIN NO. 2 |
| 2-D163 | CATCH BASIN NO. 3 |
| 2-D171 | STANDARD A305 REINFORCING BARS |
| 2-D172 | CATCH BASIN REINFORCEMENT |
| 2-D173, .2, .3 | PIPE SUPPORTS ACROSS TRENCHES |
| 2-D175 | REMOVABLE PROTECTION BAR FOR CATCH BASINS |
| 2-D177 | PIPE BEDDING IN TRENCHES |
| 2-D180 | TYPICAL FENCE, GATE, AND HEADWALL DETAILS FOR CHANNEL WALLS |
| 2-D181 | STANDARD NON-ROCKING MANHOLE FRAME AND COVER |
| 2-D184 | MANHOLE NO. 2 |
| 2-D187 | PAVEMENT REMOVAL, EXCAVATION, BACKFILL, AND RESURFACING IN STATE HIGHWAYS |
| 2-D188 | TRANSITION STRUCTURE NO. 3 |
| 2-D189 | JUNCTION STRUCTURE NO. 1 |
| 2-D190 | PIPE CONNECTIONS TO EXISTING STORM DRAINS |
| 2-D192 | AUTOMATIC FLAP GATE INLETS TO STORM DRAINS |
| 2-D193 | JUNCTION STRUCTURE NO. 4 |
| 2-D197 | STANDARD PRESSURE MANHOLE FRAME & COVER |
| 2-D210 | STANDARD PRESSURE MANHOLE SHAFT |
| 2-213.1, .2 | "D" LOAD TABLE FOR DESIGN OF REINFORCED CONCRETE PIPE |
| 2-D224 | CONNECTION TO CATCH BASIN FOR PIPES 12 INCHES THROUGH 72 INCHES |
| 2-D232 | DETAIL OF CATCH BASIN OPENING |
| 2-D235 | TRANSITION STRUCTURE NO. 1 |
| 2-D239 | TRANSITION STRUCTURE NO. 2 |
| 2-D249.1, .2 | CATCH BASIN NO. 8 |
| 2-D250 | REMODELING OF SANITARY SEWER HOUSE CONNECTIONS |
| 2-D251 | PROTECTION FOR MAIN LINE AND HOUSE CONNECTION SEWERS |
| 2-D264 | ADJUSTABLE PROTECTION BAR STIRRUP |
| 2-D393 | CONCRETE COLLAR FOR PIPES 12" INCHES THROUGH 66" INCHES |
| 2-D104 | MANHOLE NO.3 |
| 2-D191 | JUNCTION STRUCTURE NO.3 |
| 2-D399 | CRITERIA FOR THE DESIGN OF SHORING FOR EXCAVATIONS |
| 2-D400 | SAMPLE SHEET FOR USE AS A GUIDE IN PREPARING CALCULATIONS FOR SHORING OF EXCAVATIONS |
| 2-D413 | UNIFIED SOIL CLASSIFICATION SYSTEM |
| 2-D265 | INLET NO.1 |

### ABBREVIATIONS

| | |
|---|---|
| E.M.C.W. | EL MONTE CITY WATER |
| S.C.W. | SOUTHERN CALIFORNIA WATER CO. |
| S.G.V.W. | SAN GABRIEL VALLEY WATER CO. |
| P.T. & T. | PACIFIC TELEPHONE & TELEGRAPH CO. |
| S.Co.G. | SOUTHERN COUNTIES GAS CO. |
| S.C.E. | SOUTHERN CALIFORNIA EDISON CO. |
| T.S.C. | TRAFFIC SIGNAL CONDUIT |
| S.S. | SANITARY SEWER |
| H.C. | SANITARY SEWER HOUSE CONNECTION |
| S.D. | STORM DRAIN |
| W.M. | WATER METER |
| C.P. | CLAY PIPE |
| R.C.P. | REINFORCED CONCRETE PIPE |
| A.C. | ASPHALT CONCRETE |
| R. & O. | ROCK & OIL |
| C.B. | CATCH BASIN |
| J.S. | JUNCTION STRUCTURE |
| T.S. | TRANSITION STRUCTURE |
| M.H. | MANHOLE |
| T.S. | TRANSITION STRUCTURE |
| L.D. | LOCAL DEPRESSION |
| C.F. | CURB FACE |
| T.B. | TEST BORING |
| B.M. | BENCH MARK |
| B.C.R. | BEGINNING CURB RETURN |
| F.L. | FLOW LINE |
| R.W. | RIGHT OF WAY |
| C.M.P. | CORRUGATED METAL PIPE |
| M.T.D. | MULTIPLE TILE DUCT |
| E.P. | EDGE OF PAVEMENT |
| ABD. | ABANDONED |

### GENERAL NOTES

1. NUMBERS IN CIRCLES INDICATE ITEMS UNDER WHICH PAYMENT WILL BE MADE.
2. ELEVATIONS SHOWN ARE IN FEET ABOVE THE U.S.G.S. MEAN SEA LEVEL DATUM.
3. STATIONS SHOWN ON DRAWINGS ARE ALONG CENTER LINE OF CONDUIT OR ON A LINE NORMAL TO CENTER LINE OF CONDUIT.
4. STATIONS AND INVERT ELEVATIONS OF PIPE INLETS SHOWN ON THE PROFILES ARE AT THE INSIDE FACE OF THE CONDUIT, UNLESS OTHERWISE SHOWN.
5. ALL PIPE IN OPEN TRENCH SHALL BE BEDDED ACCORDING TO STANDARD DRAWING 2-D 177, CASE III, EXCEPT BELL AND SPIGOT PIPE WHICH SHALL BE CASE II BEDDING, UNLESS OTHERWISE SHOWN OR MODIFIED IN THE SPECIFICATIONS.
6. PIPE CONNECTIONS TO STORM DRAIN SHALL CONFORM TO STANDARD DRAWING 2-D191 OR 2-D193, UNLESS OTHERWISE SHOWN.
7. WHERE REQUIRED BY STANDARD DRAWING 2-D 213.1, CONCRETE BACKFILL SHALL BE USED AROUND CONNECTOR PIPES 36 INCHES OR LESS IN DIAMETER. (1/4) CONCRETE BACKFILL FOR MAIN LINE PIPE SHALL BE USED ONLY WHEN DIRECTED BY THE ENGINEER.
8. TIES FOR CATCH BASINS AS SHOWN ON THE DRAWINGS ARE FROM CURB RETURN TO CENTER LINE OF CATCH BASIN, UNLESS OTHERWISE SHOWN. WHERE NO TIE IS GIVEN, THE CATCH BASIN SHALL BE SO PLACED THAT THE DOWNSTREAM END OF THE LOCAL DEPRESSION BEGINS AT THE CURB RETURN.
9. THE OPENINGS AND TOP SLABS OF ALL SIDE INLET CATCH BASINS SHALL BE MODIFIED TO MEET THE REQUIREMENTS SHOWN ON STANDARD DRAWING 2-D 232. THE CURB FACE SHALL BE EQUAL TO THE EXISTING CURB FACE PLUS 4 INCHES.
10. LOCATIONS OF CATCH BASIN CONNECTOR PIPE JUNCTIONS WITH CATCH BASINS AS SHOWN ON THE DRAWINGS ARE SCHEMATIC. IT IS INTENDED THAT SUCH JUNCTIONS BE LOCATED AT THE DOWNSTREAM ENDS OF THE CATCH BASINS, UNLESS OTHERWISE SHOWN. IN ALL CASES THE EXACT LOCATIONS WILL BE DETERMINED IN THE FIELD BY THE ENGINEER TO MEET FIELD CONDITIONS.
11. MONOLITHIC CATCH BASIN CONNECTIONS SHALL BE CONSTRUCTED, WHERE APPLICABLE, PER STANDARD DRAWING 2-D 224.
12. THE DEPTH AT THE UPSTREAM END OF CATCH BASINS 10 FEET OR MORE IN LENGTH SHALL BE CURB FACE PLUS 12 INCHES, UNLESS OTHERWISE SHOWN.
13. "$V_I$" IS THE DEPTH OF INLET OF CATCH BASINS IN SERIES MEASURED FROM TOP OF CURB TO INVERT OF CONNECTOR PIPE.
14. EXISTING UTILITIES SHALL BE MAINTAINED IN PLACE BY THE CONTRACTOR, UNLESS OTHERWISE NOTED.
16. UTILITIES DESIGNATED BY THE SYMBOL ✱ WILL BE ABANDONED IN PLACE AND THE OWNER WILL INSTALL A NEW SECTION OF THE AFFECTED UTILITY AT A LOCATION IN CLOSE PROXIMITY TO, BUT WHICH DOES NOT PHYSICALLY INTERFERE WITH, THE PROPOSED STORM DRAIN CONDUIT AND APPURTENANT STRUCTURES.
17. UTILITIES DESIGNATED BY THE SYMBOL ✗ WILL BE REMOVED BY THE OWNER AND THE OWNER WILL REINSTALL A NEW SECTION OF THE AFFECTED UTILITY AT A LOCATION IN CLOSE PROXIMITY TO, BUT WHICH DOES NOT PHYSICALLY INTERFERE WITH, THE PROPOSED STORM DRAIN CONDUIT AND APPURTENANT STRUCTURES.
18. WHERE UTILITIES ARE INDICATED ON THE DRAWINGS TO BE SUPPORTED, SAID SUPPORTS SHALL BE IN ACCORDANCE WITH STANDARD DRAWING 2-D 173.1, .2 OR .3, UNLESS OTHERWISE INDICATED.
19. LOCATIONS SHOWN ON THE PLANS FOR EXISTING SANITARY SEWER HOUSE CONNECTIONS ARE APPROXIMATE ONLY.
20. SANITARY SEWER HOUSE CONNECTION RECONSTRUCTION AND RECONNECTION SHALL BE IN ACCORDANCE WITH STANDARD DRAWING 2-D 250, UNLESS OTHERWISE SHOWN.
21. SANITARY SEWERS AND HOUSE CONNECTIONS CROSSING OVER THE STORM DRAIN TRENCH SHALL BE SUPPORTED IN ACCORDANCE WITH STANDARD DRAWING 2-D 173.1 TO .3 AND ENCASED PER GENERAL NOTE 1 ON STANDARD DRAWING 2-D 173.1.
22. WHEN INDICATED ON THE DRAWINGS, SANITARY SEWERS AND HOUSE CONNECTIONS SHALL BE ENCASED OR BLANKETED IN ACCORDANCE WITH STANDARD DRAWING 2-D 251.
23. ALL OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES SHALL BE SEALED WITH 8 INCHES OF BRICK AND MORTAR OR 6 INCHES OF CONCRETE, UNLESS OTHERWISE SHOWN.
24. ALL RESURFACING, CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS AND OTHER EXISTING IMPROVEMENTS TO BE RECONSTRUCTED SHALL BE CONSTRUCTED AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS, UNLESS OTHERWISE NOTED.
25. REFER TO SHEET 24 FOR TYPICAL CATCH BASIN CONNECTOR PIPE PROFILE.
26. STREET RESURFACING PLANS ARE SHOWN ON SHEET 24.
27. SOIL TEST BORINGS FOR THIS PROJECT WERE MADE JANUARY AND MAY 1965.
28. THE SYMBOL ⊙—TREE "R" INDICATES A TREE TO BE REMOVED BY THE CONTACTOR AND NEED NOT BE REPLACED.

### LEGEND

FIRE HYDRANT
POWER, TELEPHONE OR GUY POLE
TRAFFIC SIGNAL
ELECTROLIER
TREE
GUTTER
WATER METER OR GAS METER
BENCH MARK
PROPERTY LINE
DRIVEWAY
LIMIT OF CONCRETE SURFACE
SIDEWALK
SIDE INLET CATCH BASIN & LOCAL DEPRESSION
GRATING TYPE CATCH BASIN
CURB
TEST BORING
PALM TREE
WATER OR GAS VALVE
DOWN GUY

1964 STORM DRAIN BOND ISSUE

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |

DRAWN BY: El Monte
CHECKED BY: El Monte
DESIGNED BY: El Monte
SUBMITTED BY: C.W.H.

CITY OF EL MONTE

APPROVED May 18 1965
BY: Glenn F. Welch
GLENN F. WELCH R.C.E. NO. 18816

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING-ARCHITECTURE

DATE May 14, 1965
BY: K.G. Transberger
K.G. TRANSBERGER R.C.E. NO. 10651

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

PROJECT NO. 3301
EL MONTE UNIT I
A PORTION OF LINE A AND LINES B, C, D, E, F, & J

GENERAL NOTES, STANDARD DRAWINGS, ABBREVIATIONS & LEGEND

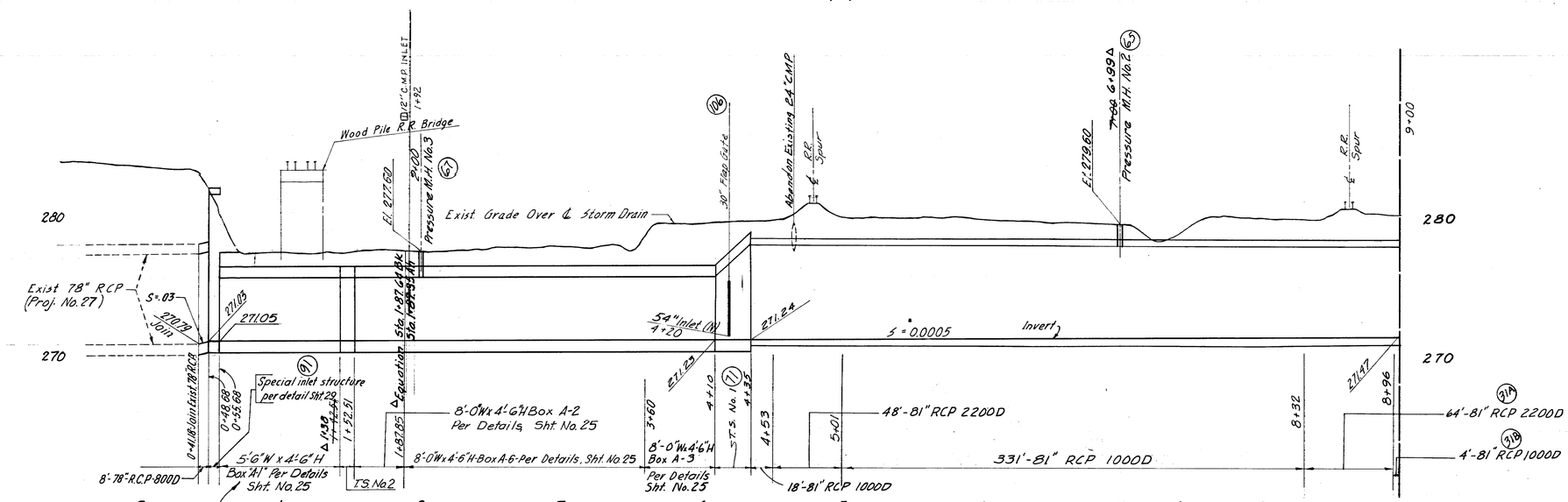
RECOMMENDED BY: C. E. Ashby, DIVISION ENGINEER (OBRIEN)
APPROVAL RECOMMENDED BY: R.W. Ditlevsen, ASS'T CHIEF DEPUTY ENGINEER
APPROVED BY: Walter J. Wood, CHIEF ENGINEER

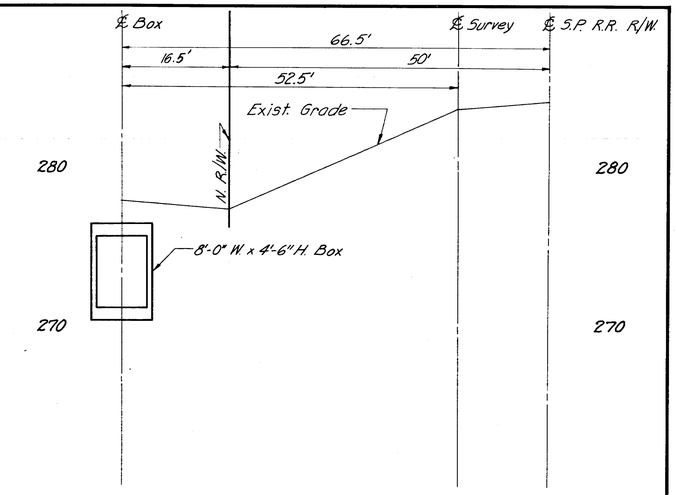
| SCALE | DATE | DWG. NO. 364-3301-D3.2 |
|---|---|---|
| | MAR. '65 | SHEET 2 OF 30 |

"AS BUILT" DRAWING

**PROFILE**
HORIZ. SCALE: 1" - 40
VERT. SCALE: 1" - 4'

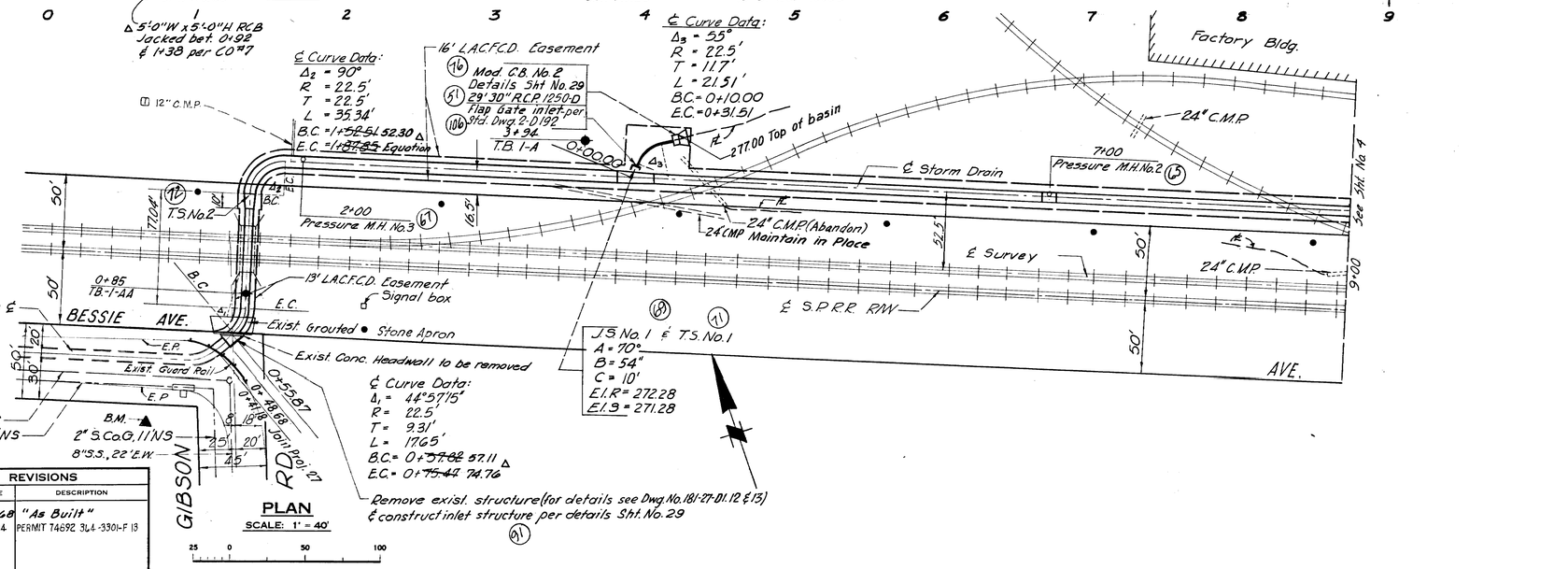
THIS PORTION OF LINE A TO BE CONSTRUCTED
ON PROPOSALS 3,4,5 AND 6 ONLY




CROSS SECTION
STA. 2+50
SCALE: HORIZ: 1"=10'
VERT: 1"=4'

BENCH MARK
L & T in ctr. conc. walk house #4159 35' S/O ℄ Bessie Ave. & 60' W/O ℄ Gibson Rd. County Rd. dept. S.G. 841. Elev. 283.12




**PLAN**
SCALE: 1' = 40'

| DRAWN BY | REVISIONS | | |
|---|---|---|---|
| El Monte | MARK | DATE | DESCRIPTION |
| CHECKED BY | Δ | 6-17-68 | "As Built" |
| El Monte | (1) | 10-1-84 | PERMIT 74692 3L4-3301-F 13 |
| DESIGNED BY | | | |
| El Monte | | | |
| SUBMITTED BY | | | |
| C.W.H. | | | |

1964 STORM DRAIN BOND ISSUE

CITY OF EL MONTE

APPROVED May 14 1965
BY: Glenn F. Welch
GLENN F. WELCH RCE NO. 11816

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING-ARCHITECTURE

DATE May 13 1965
BY: K. G. Tranbarger
K.G. TRANBARGER RCE NO. 10651

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT

PROJECT NO. 3301
EL MONTE
UNIT I LINE A

CONCRETE CONDUIT
0+57.87 TO 9+00
PLAN, PROFILE & SECTION

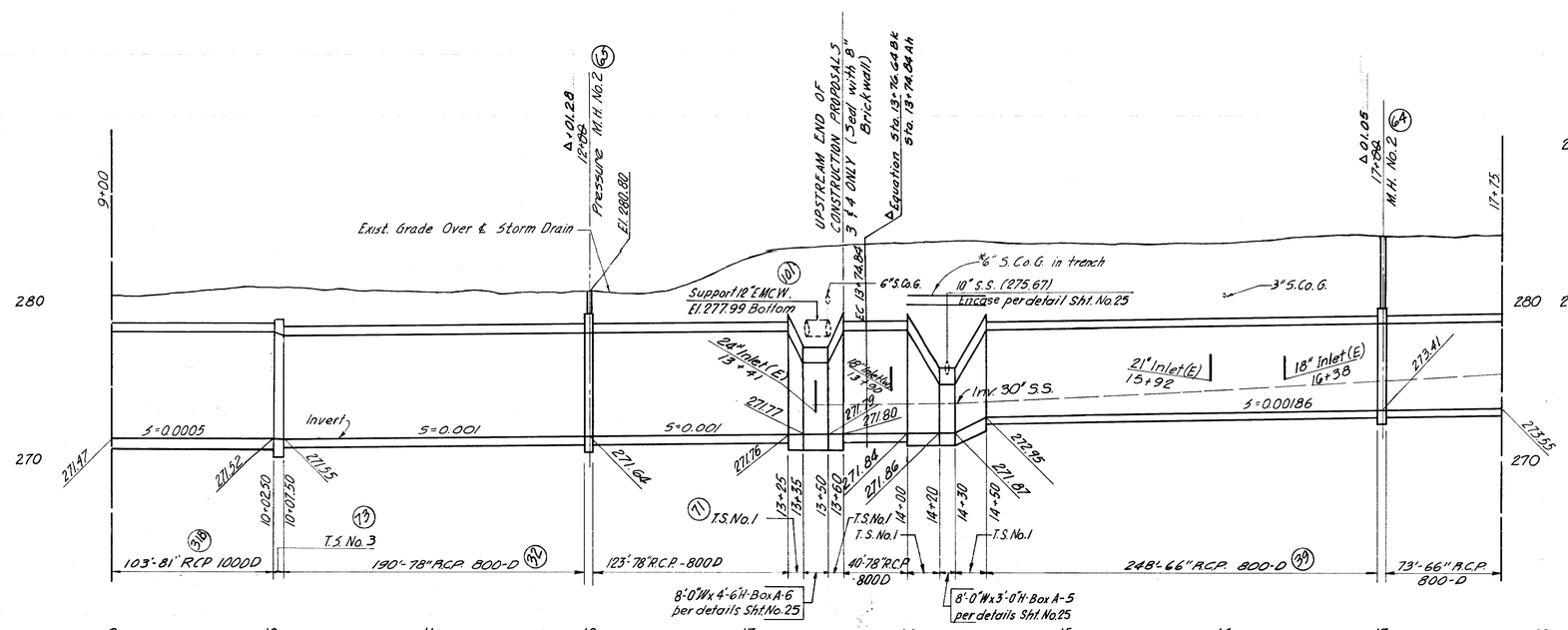
RECOMMENDED BY: C.F. Eshelby, DIVISION ENGINEER (DESIGN)
APPROVAL RECOMMENDED BY: R.W. Crichton, ASST. CHIEF DEPUTY ENGINEER
APPROVED BY: Walter J. Wood, CHIEF ENGINEER

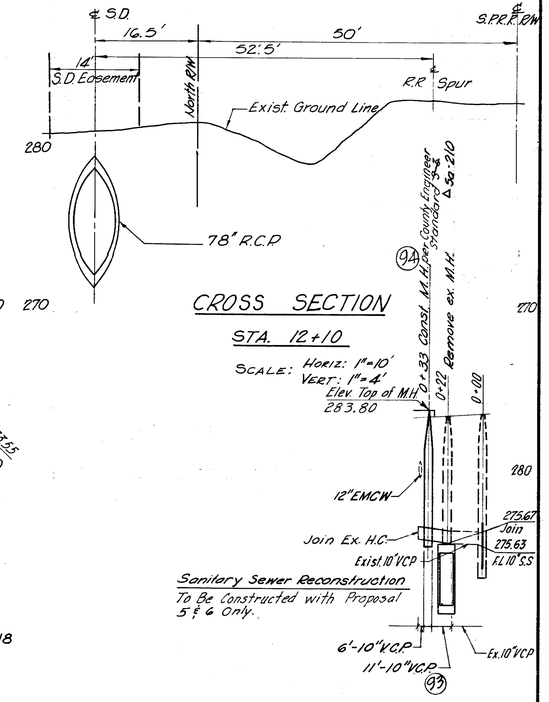
| SCALE | DATE | DWG. NO. 364-3301-D3.3 |
|---|---|---|
| AS SHOWN | MAR. '66 | SHEET 3 OF 30 |

"AS BUILT" DRAWING

## PROFILE

HORIZ. SCALE: 1" - 40
VERT. SCALE: 1" - 4'



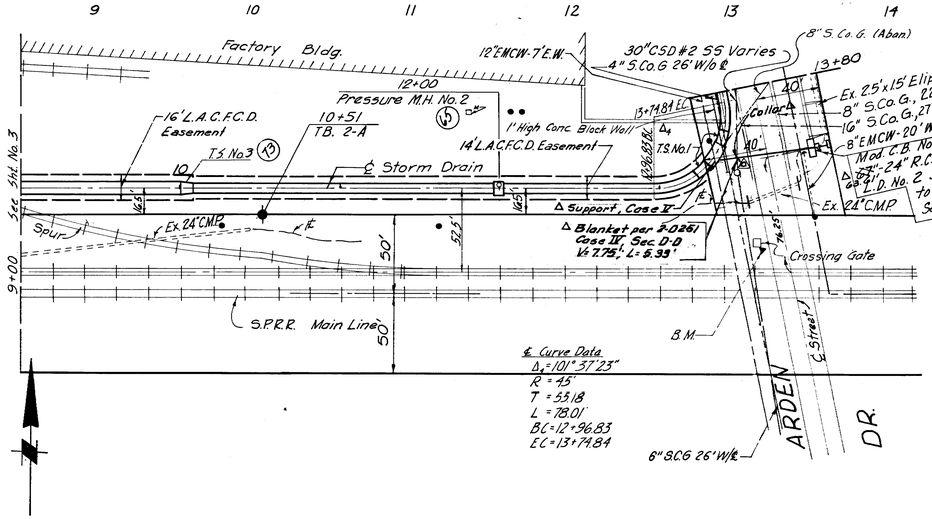

## CROSS SECTION

STA. 12+10

SCALE: HORIZ: 1"=10'
VERT: 1"=4'

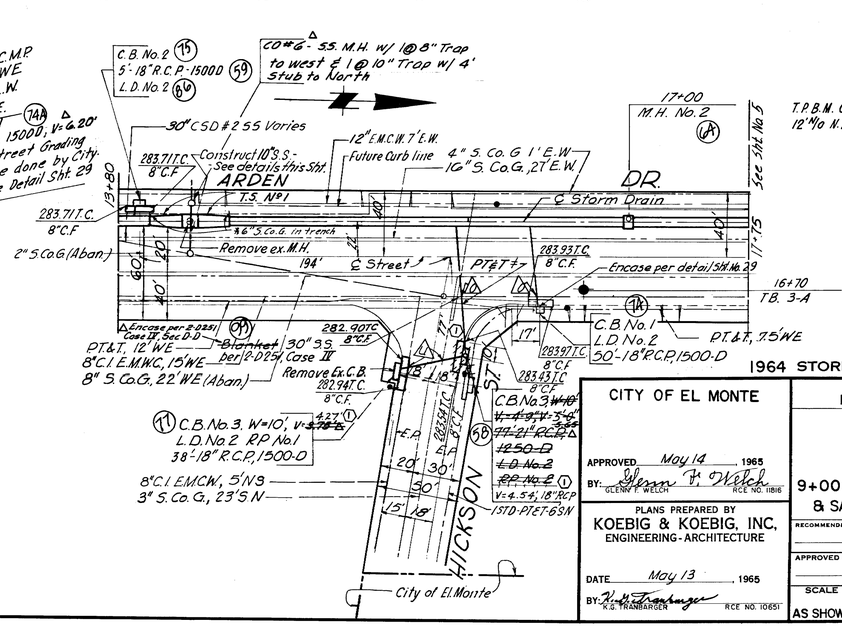
Elev. Top of M.H. 283.80

Sanitary Sewer Reconstruction
To Be Constructed with Proposal 5 & 6 Only.




## PLAN

SCALE: 1' = 40'




## BENCH MARK

T.P.B.M. Chisel square in base of R.R. X-ing Sig. gate 12" N/O N. track ℄ 15' W/O ℄ W. Arden Dr. El. 284.61

1964 STORM DRAIN BOND ISSUE

| DRAWN BY | REVISIONS | | |
|---|---|---|---|
| El Monte | MARK | DATE | DESCRIPTION |
| CHECKED BY | △ | 6-17-68 | "As Built" |
| El Monte | ① | 2-14-77 | Permit No. 74655-B |
| DESIGNED BY | | | |
| El Monte | | | |
| SUBMITTED BY | | | |
| C.W.H. | | | |

CITY OF EL MONTE

APPROVED May 14, 1965
BY: Glenn T. Welch
GLENN T. WELCH — R.C.E. NO. 11816

PLANS PREPARED BY
KOEBIG & KOEBIG, INC.
ENGINEERING-ARCHITECTURE

DATE May 13, 1965
BY: R. H. Trenbarger
R.H. TRENBARGER — R.C.E. NO. 10651

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

PROJECT NO. 3301
EL MONTE
UNIT 1 LINE A

CONCRETE CONDUIT
9+00 TO 17+75, PLAN, PROFILE, SECTION & SANITARY SEWER RECONSTRUCTION

RECOMMENDED BY: C. F. Ehlschlang — DIVISION ENGINEER (DESIGN)
APPROVAL RECOMMENDED BY: G. W. Cartland — ASS'T CHIEF DEPUTY ENGINEER
APPROVED BY: Walter J. Wood — CHIEF ENGINEER

| SCALE | DATE | DWG. NO. 364-3301-D3.4 |
|---|---|---|
| AS SHOWN | MAR. '66 | SHEET 4 OF 30 |

"AS BUILT" DRAWING

# APPENDIX D

# HYDROCALC RESULTS OUTPUT

# Peak Flow Hydrologic Analysis

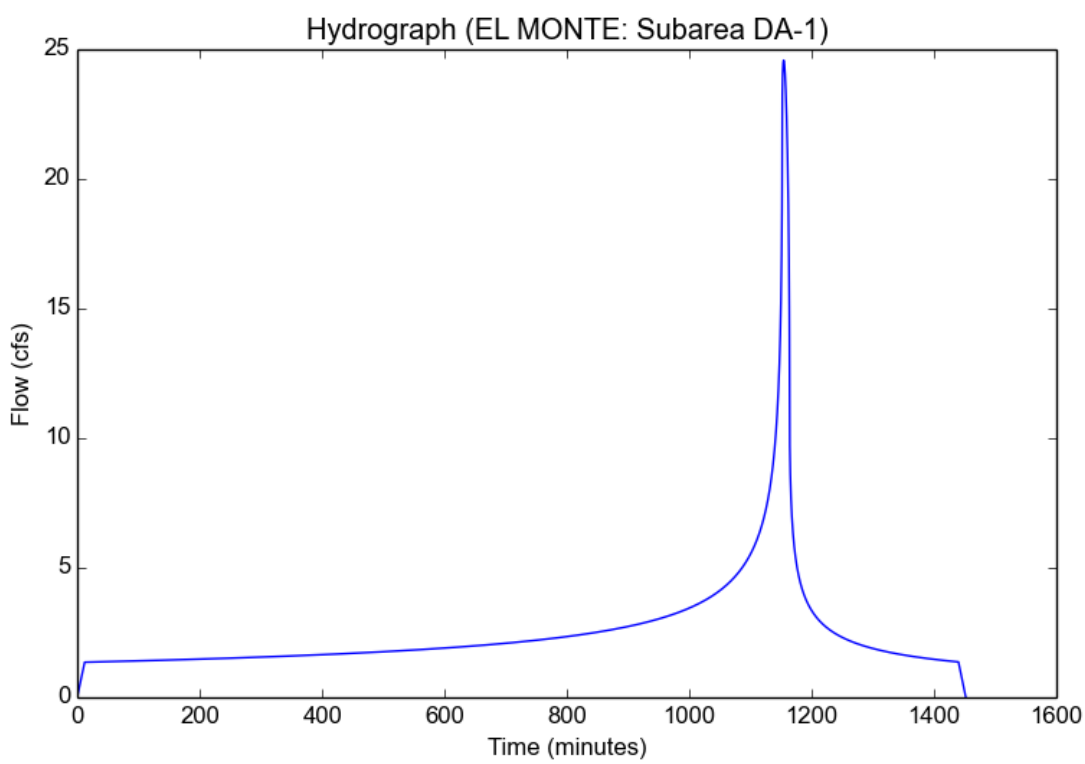
File location: L:/128-1 Goodman El Monte/HYDRO/HYDROCALC/EL MONTE - Subarea DA-1.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE |
| Subarea ID | Subarea DA-1 |
| Area (ac) | 10.7 |
| Flow Path Length (ft) | 1157.0 |
| Flow Path Slope (vft/hft) | 0.007 |
| 50-yr Rainfall Depth (in) | 6.6 |
| Percent Impervious | 0.96 |
| Soil Type | 3 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 6.6 |
| Peak Intensity (in/hr) | 2.6094 |
| Undeveloped Runoff Coefficient (Cu) | 0.4091 |
| Developed Runoff Coefficient (Cd) | 0.8804 |
| Time of Concentration (min) | 12.0 |
| Clear Peak Flow Rate (cfs) | 24.5806 |
| Burned Peak Flow Rate (cfs) | 24.5806 |
| 24-Hr Clear Runoff Volume (ac-ft) | 5.0718 |
| 24-Hr Clear Runoff Volume (cu-ft) | 220928.0684 |



# Peak Flow Hydrologic Analysis

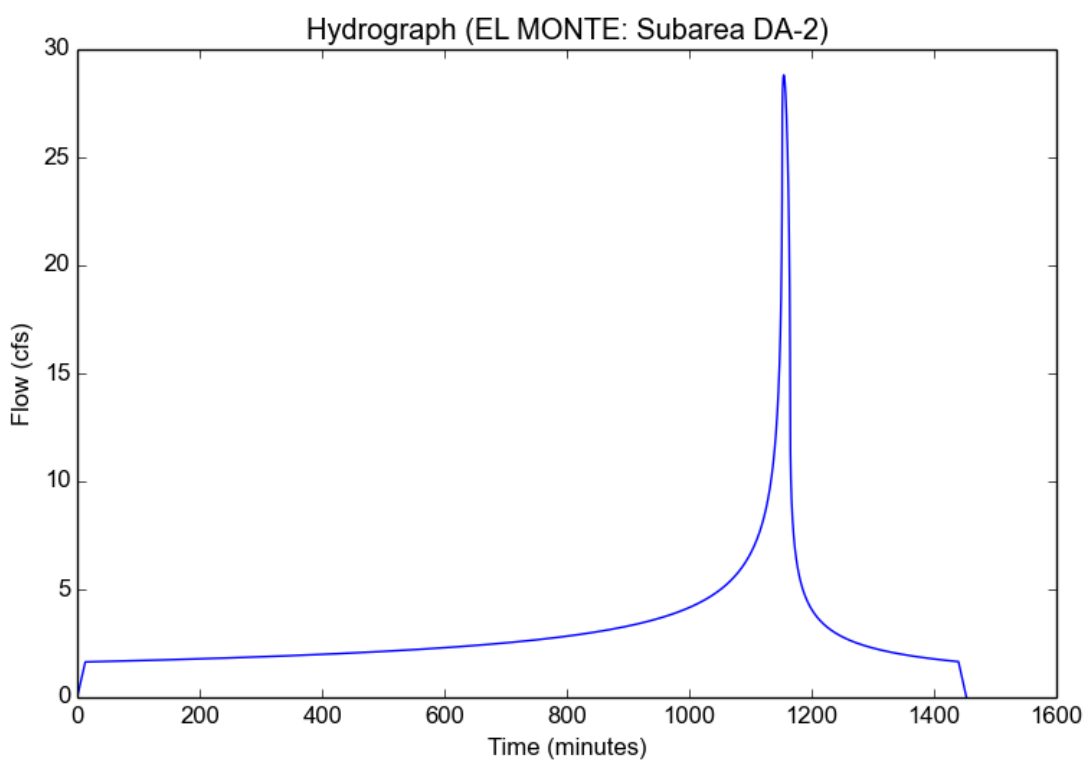
File location: L:/128-1 Goodman El Monte/HYDRO/HYDROCALC/EL MONTE - Subarea DA-2.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE |
| Subarea ID | Subarea DA-2 |
| Area (ac) | 13.18 |
| Flow Path Length (ft) | 1505.0 |
| Flow Path Slope (vft/hft) | 0.009 |
| 50-yr Rainfall Depth (in) | 6.6 |
| Percent Impervious | 0.94 |
| Soil Type | 3 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 6.6 |
| Peak Intensity (in/hr) | 2.5131 |
| Undeveloped Runoff Coefficient (Cu) | 0.399 |
| Developed Runoff Coefficient (Cd) | 0.8699 |
| Time of Concentration (min) | 13.0 |
| Clear Peak Flow Rate (cfs) | 28.8146 |
| Burned Peak Flow Rate (cfs) | 28.8146 |
| 24-Hr Clear Runoff Volume (ac-ft) | 6.1357 |
| 24-Hr Clear Runoff Volume (cu-ft) | 267272.1235 |



# Peak Flow Hydrologic Analysis

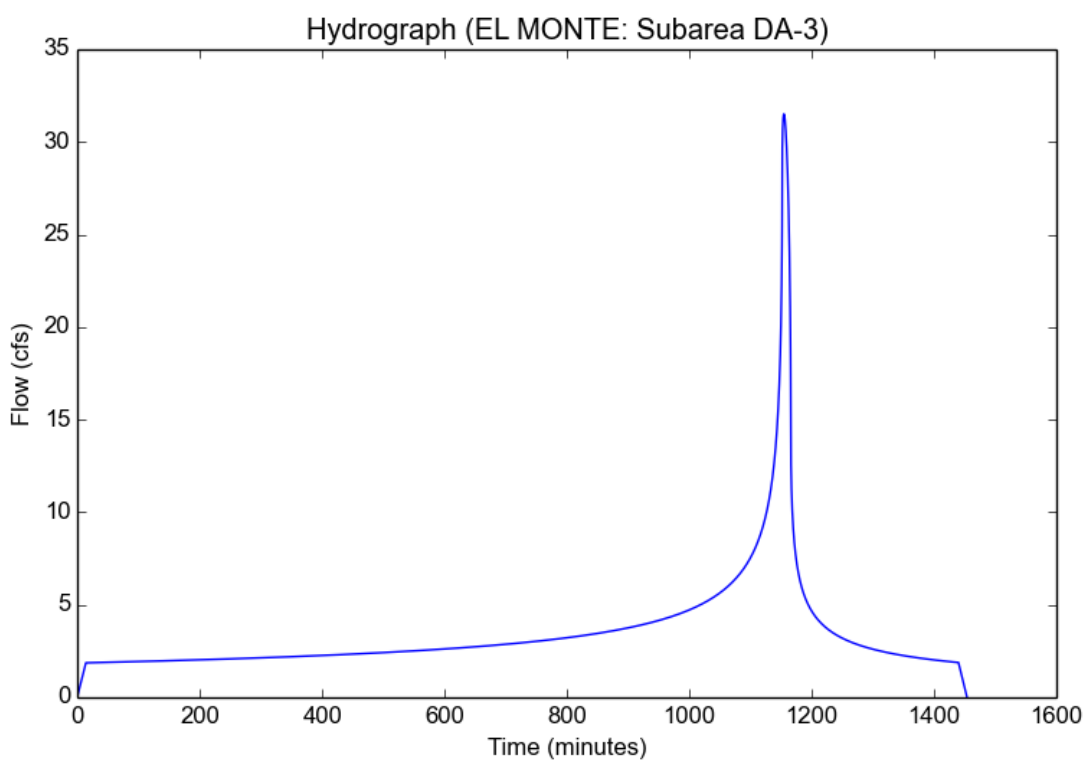
File location: L:/128-1 Goodman El Monte/HYDRO/HYDROCALC/EL MONTE - Subarea DA-3.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE |
| Subarea ID | Subarea DA-3 |
| Area (ac) | 14.85 |
| Flow Path Length (ft) | 1676.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 50-yr Rainfall Depth (in) | 6.6 |
| Percent Impervious | 0.95 |
| Soil Type | 3 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 6.6 |
| Peak Intensity (in/hr) | 2.4271 |
| Undeveloped Runoff Coefficient (Cu) | 0.3865 |
| Developed Runoff Coefficient (Cd) | 0.8743 |
| Time of Concentration (min) | 14.0 |
| Clear Peak Flow Rate (cfs) | 31.5125 |
| Burned Peak Flow Rate (cfs) | 31.5125 |
| 24-Hr Clear Runoff Volume (ac-ft) | 6.9758 |
| 24-Hr Clear Runoff Volume (cu-ft) | 303864.7939 |



# Peak Flow Hydrologic Analysis

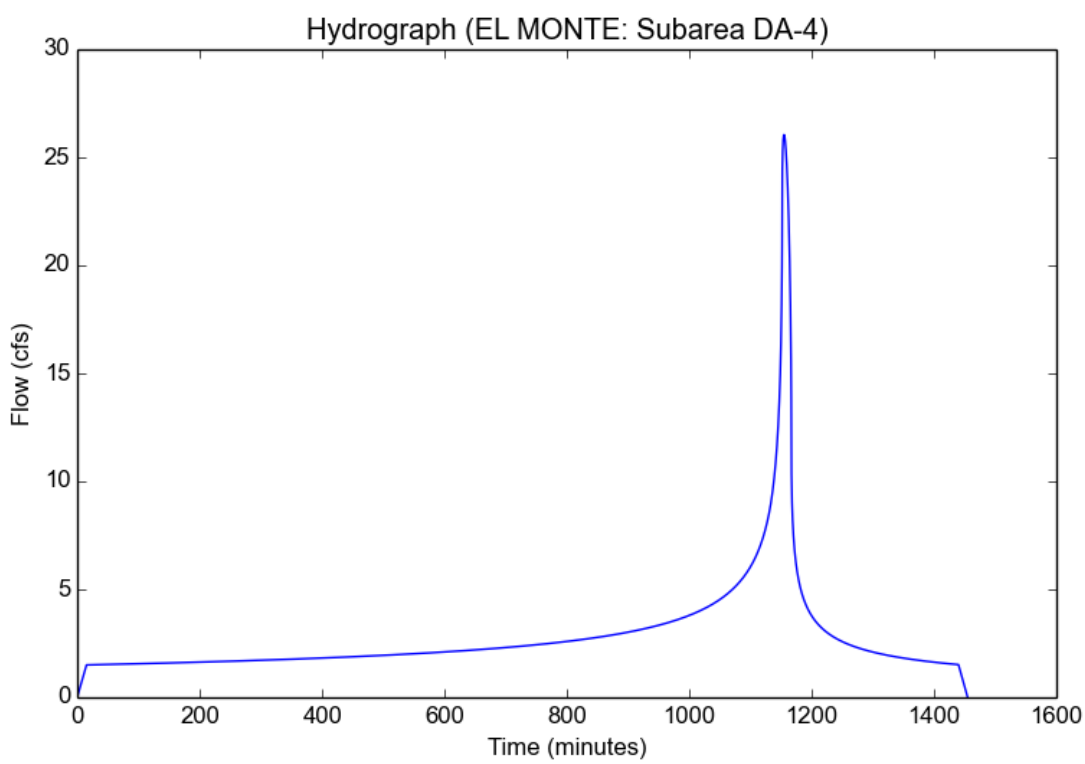
File location: L:/128-1 Goodman El Monte/HYDRO/HYDROCALC/EL MONTE - Subarea DA-4.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE |
| Subarea ID | Subarea DA-4 |
| Area (ac) | 14.04 |
| Flow Path Length (ft) | 1671.0 |
| Flow Path Slope (vft/hft) | 0.011 |
| 50-yr Rainfall Depth (in) | 6.6 |
| Percent Impervious | 0.79 |
| Soil Type | 3 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 6.6 |
| Peak Intensity (in/hr) | 2.3496 |
| Undeveloped Runoff Coefficient (Cu) | 0.3748 |
| Developed Runoff Coefficient (Cd) | 0.7897 |
| Time of Concentration (min) | 15.0 |
| Clear Peak Flow Rate (cfs) | 26.0515 |
| Burned Peak Flow Rate (cfs) | 26.0515 |
| 24-Hr Clear Runoff Volume (ac-ft) | 5.6438 |
| 24-Hr Clear Runoff Volume (cu-ft) | 245844.3088 |



# Peak Flow Hydrologic Analysis

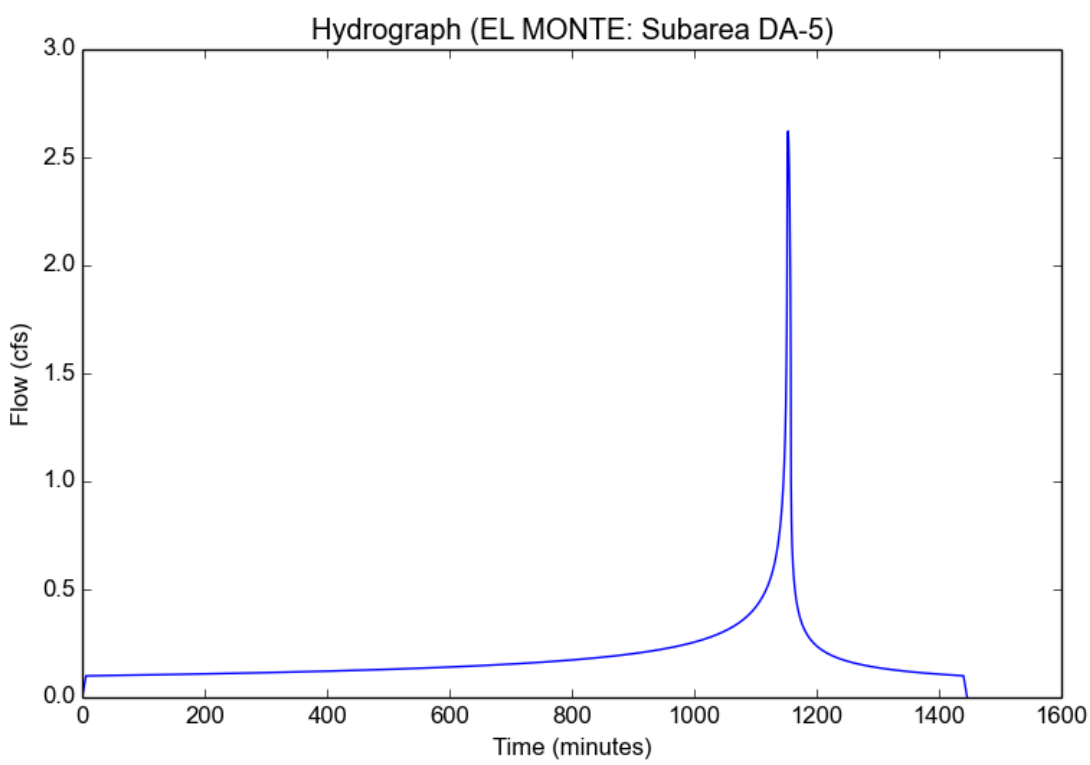
File location: L:/128-1 Goodman El Monte/HYDRO/HYDROCALC/EL MONTE - Subarea DA-5.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE |
| Subarea ID | Subarea DA-5 |
| Area (ac) | 0.85 |
| Flow Path Length (ft) | 385.0 |
| Flow Path Slope (vft/hft) | 0.008 |
| 50-yr Rainfall Depth (in) | 6.6 |
| Percent Impervious | 0.88 |
| Soil Type | 3 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 6.6 |
| Peak Intensity (in/hr) | 3.6144 |
| Undeveloped Runoff Coefficient (Cu) | 0.511 |
| Developed Runoff Coefficient (Cd) | 0.8533 |
| Time of Concentration (min) | 6.0 |
| Clear Peak Flow Rate (cfs) | 2.6216 |
| Burned Peak Flow Rate (cfs) | 2.6216 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.3743 |
| 24-Hr Clear Runoff Volume (cu-ft) | 16304.929 |



# Peak Flow Hydrologic Analysis

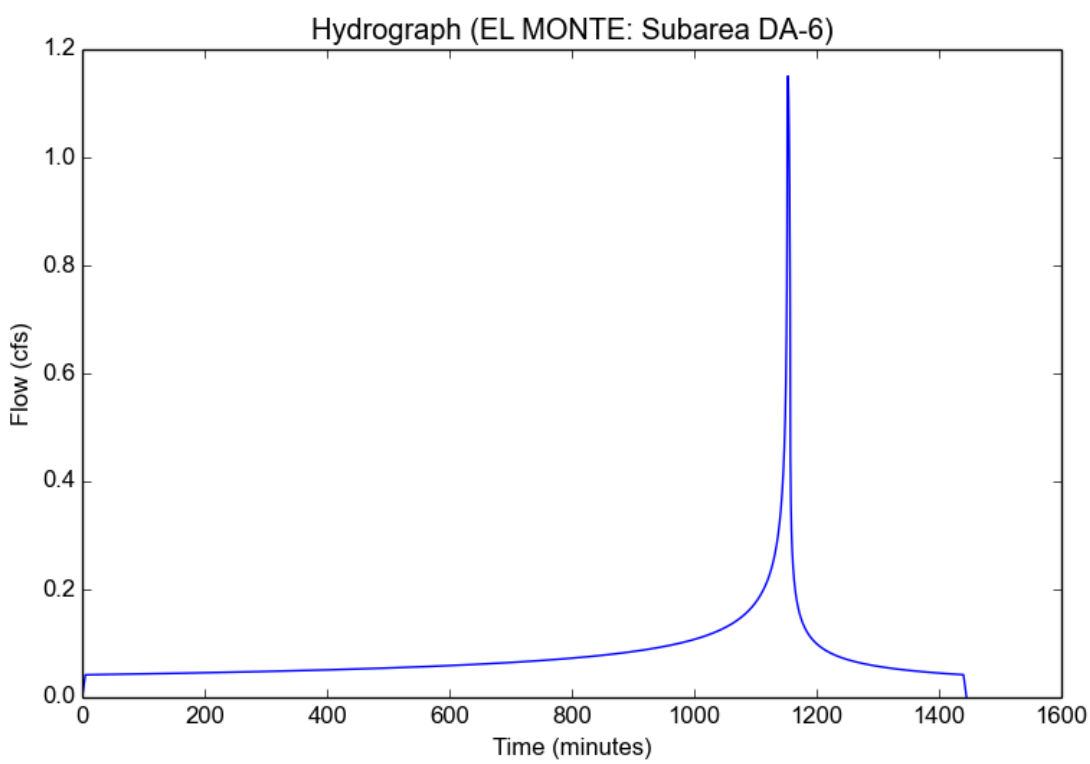
File location: L:/128-1 Goodman El Monte/HYDRO/HYDROCALC/EL MONTE - Subarea DA-6.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE |
| Subarea ID | Subarea DA-6 |
| Area (ac) | 0.33 |
| Flow Path Length (ft) | 268.0 |
| Flow Path Slope (vft/hft) | 0.019 |
| 50-yr Rainfall Depth (in) | 6.6 |
| Percent Impervious | 0.96 |
| Soil Type | 3 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 6.6 |
| Peak Intensity (in/hr) | 3.9377 |
| Undeveloped Runoff Coefficient (Cu) | 0.5346 |
| Developed Runoff Coefficient (Cd) | 0.8854 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 1.1505 |
| Burned Peak Flow Rate (cfs) | 1.1505 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.1564 |
| 24-Hr Clear Runoff Volume (cu-ft) | 6814.6793 |



# Peak Flow Hydrologic Analysis

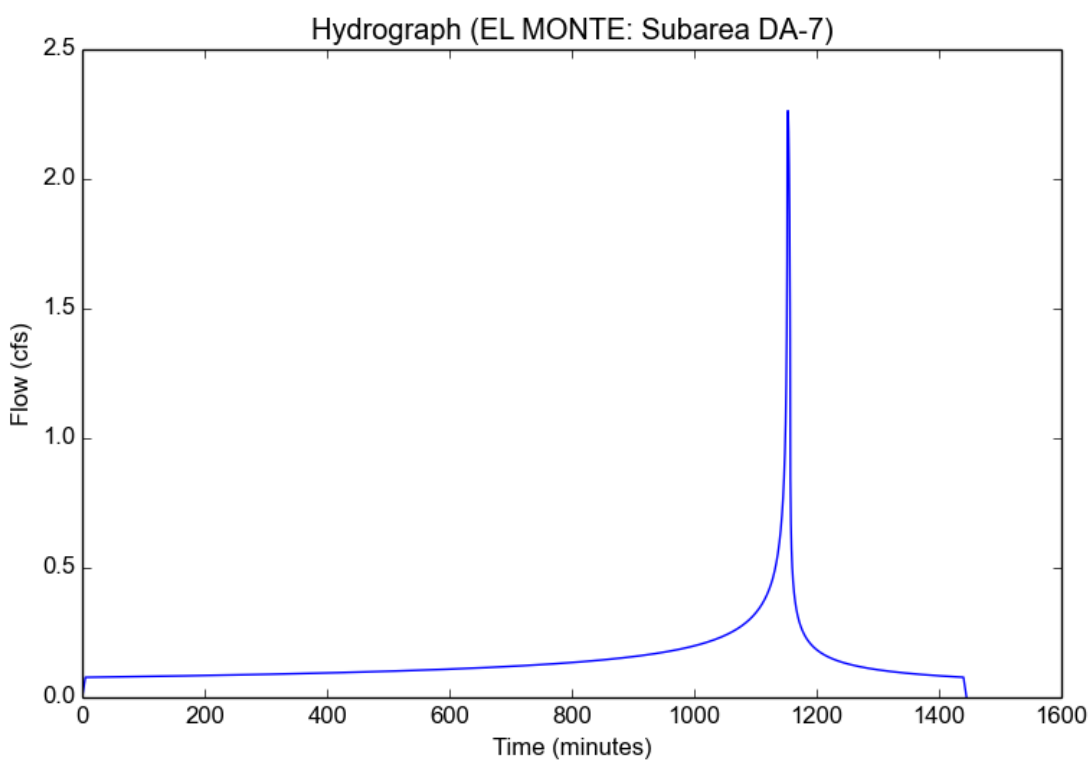
File location: L:/128-1 Goodman El Monte/HYDRO/HYDROCALC/EL MONTE - Subarea DA-7.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE |
| Subarea ID | Subarea DA-7 |
| Area (ac) | 0.68 |
| Flow Path Length (ft) | 358.0 |
| Flow Path Slope (vft/hft) | 0.017 |
| 50-yr Rainfall Depth (in) | 6.6 |
| Percent Impervious | 0.85 |
| Soil Type | 3 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 6.6 |
| Peak Intensity (in/hr) | 3.9377 |
| Undeveloped Runoff Coefficient (Cu) | 0.5346 |
| Developed Runoff Coefficient (Cd) | 0.8452 |
| Time of Concentration (min) | 5.0 |
| Clear Peak Flow Rate (cfs) | 2.2631 |
| Burned Peak Flow Rate (cfs) | 2.2631 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.2909 |
| 24-Hr Clear Runoff Volume (cu-ft) | 12670.7932 |



# Peak Flow Hydrologic Analysis

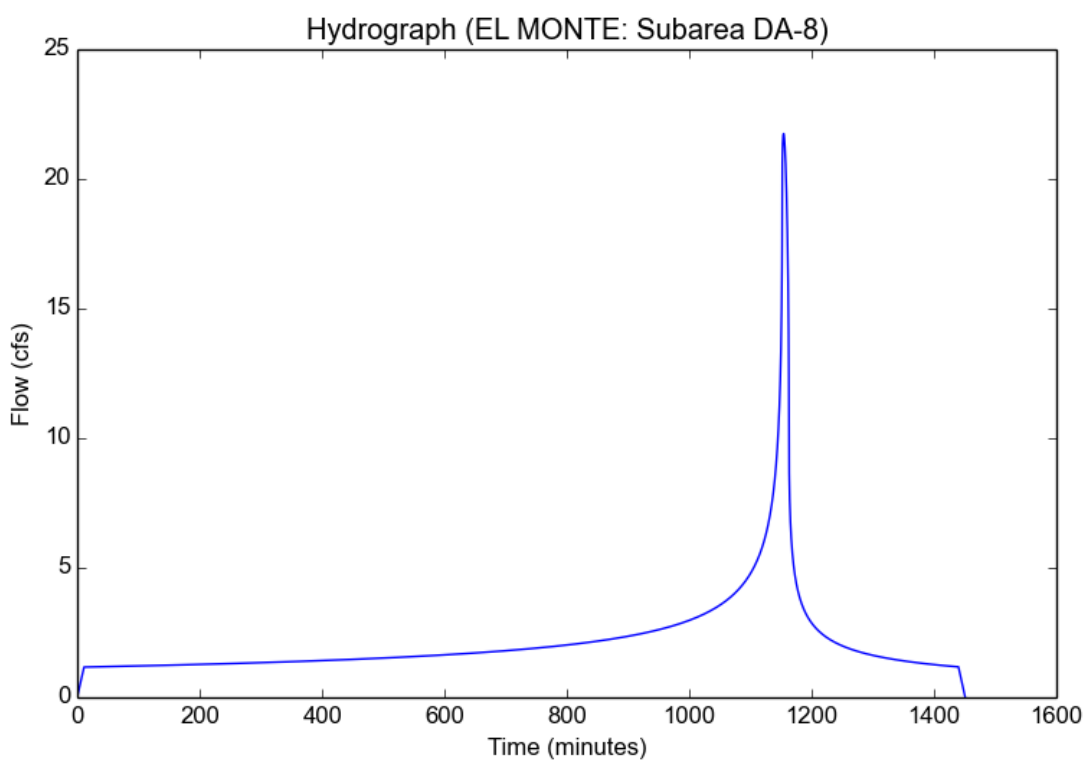
File location: L:/128-1 Goodman El Monte/HYDRO/HYDROCALC/EL MONTE - Subarea DA-8.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE |
| Subarea ID | Subarea DA-8 |
| Area (ac) | 8.89 |
| Flow Path Length (ft) | 1116.0 |
| Flow Path Slope (vft/hft) | 0.009 |
| 50-yr Rainfall Depth (in) | 6.6 |
| Percent Impervious | 1.0 |
| Soil Type | 3 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 6.6 |
| Peak Intensity (in/hr) | 2.7184 |
| Undeveloped Runoff Coefficient (Cu) | 0.4205 |
| Developed Runoff Coefficient (Cd) | 0.9 |
| Time of Concentration (min) | 11.0 |
| Clear Peak Flow Rate (cfs) | 21.7497 |
| Burned Peak Flow Rate (cfs) | 21.7497 |
| 24-Hr Clear Runoff Volume (ac-ft) | 4.3642 |
| 24-Hr Clear Runoff Volume (cu-ft) | 190104.0498 |



# Peak Flow Hydrologic Analysis

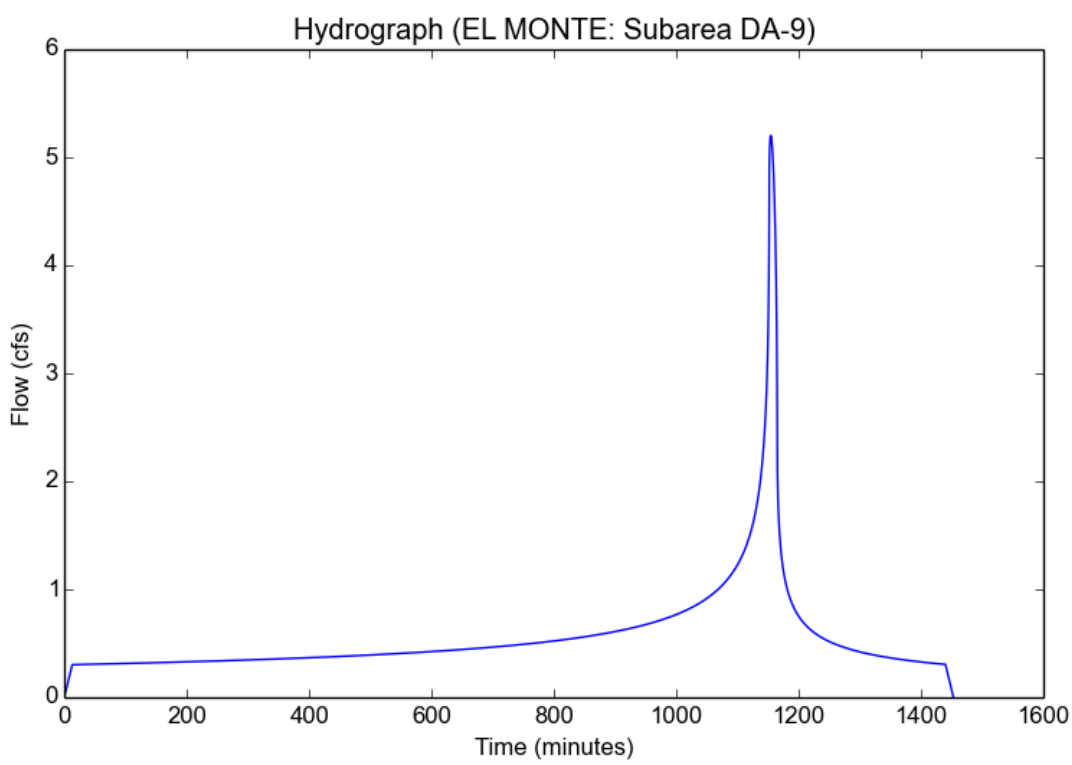
File location: L:/128-1 Goodman El Monte/HYDRO/HYDROCALC/EL MONTE - Subarea DA-9.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE |
| Subarea ID | Subarea DA-9 |
| Area (ac) | 2.3 |
| Flow Path Length (ft) | 1499.0 |
| Flow Path Slope (vft/hft) | 0.009 |
| 50-yr Rainfall Depth (in) | 6.6 |
| Percent Impervious | 1.0 |
| Soil Type | 3 |
| Design Storm Frequency | 50-yr |
| Fire Factor | 0 |
| LID | False |

## Output Results

| | |
|---|---|
| Modeled (50-yr) Rainfall Depth (in) | 6.6 |
| Peak Intensity (in/hr) | 2.5131 |
| Undeveloped Runoff Coefficient (Cu) | 0.399 |
| Developed Runoff Coefficient (Cd) | 0.9 |
| Time of Concentration (min) | 13.0 |
| Clear Peak Flow Rate (cfs) | 5.2021 |
| Burned Peak Flow Rate (cfs) | 5.2021 |
| 24-Hr Clear Runoff Volume (ac-ft) | 1.1291 |
| 24-Hr Clear Runoff Volume (cu-ft) | 49183.3049 |



# APPENDIX E

# DETENTION BASIN VOLUME CALCULATIONS

# DETENTION BASIN DESIGN

GOODMAN EL MONTE

***BASEMENT VOLUMES BY ELEVATION***

| ELEVATION (FT) | AREA (SF) | AREA (AC) | VOLUME (ACRE-FT) | CUMULATIVE (ACRE-FT) |
|---|---|---|---|---|
| 277 | 53,300 | 1.22 | 0.00 | 0 |
| 278 | 53,300 | 1.22 | 1.22 | 1.22 |
| 279 | 53,300 | 1.22 | 1.22 | 2.45 |
| 280 | 53,300 | 1.22 | 1.22 | 3.67 |
| 281 | 53,300 | 1.22 | 1.22 | 4.89 |
| 282 | 53,300 | 1.22 | 1.22 | 6.12 |
| 283 | 53,300 | 1.22 | 1.22 | 7.34 |
| 284 | 53,300 | 1.22 | 1.22 | 8.57 |
| 285 | 53,300 | 1.22 | 1.22 | 9.79 |

***PIPE VOLUMES BY ELEVATION***

| ELEVATION (FT) | SIZE (INF) | LENGTH (AC) | AVE AREA (SQ-FT) | VOLUME (ACRE-FT) |
|---|---|---|---|---|
| 277 | 72 | 0 | 0.00 | 0.00 |
| | 36 | 0 | 0.00 | 0.00 |
| 278 | 72 | 310 | 2.08 | 0.01 |
| | 36 | 480 | 0.37 | 0.00 |
| 279 | 72 | 310 | 6.84 | 0.05 |
| | 36 | 740 | 1.74 | 0.03 |
| 280 | 72 | 310 | 12.59 | 0.09 |
| | 36 | 1,692 | 4.67 | 0.18 |
| 281 | 72 | 310 | 18.52 | 0.13 |
| | 36 | 1,692 | 6.51 | 0.25 |
| 282 | 72 | 310 | 23.91 | 0.17 |
| | 36 | 1,692 | 7.07 | 0.27 |
| 283 | 72 | 310 | 27.68 | 0.20 |
| | 36 | 1,692 | 7.07 | 0.27 |
| 284 | 72 | 310 | 27.68 | 0.20 |
| | 36 | 1,692 | 7.07 | 0.27 |
| 285 | 72 | 310 | 27.68 | 0.20 |
| | 36 | 1,692 | 7.07 | 0.27 |

***TOTAL VOLUMES BY ELEVATION***

| ELEVATION (FT) | CUMULATIVE (ACRE-FT) | |
|---|---|---|
| 277 | 0.00 | |
| 278 | 1.24 | |
| 279 | 2.53 | |
| 280 | 3.94 | |
| 281 | 5.28 | <<SWDv=280.9 - 5.14 AC-FT |
| 282 | 6.56 | |
| 283 | 7.81 | |
| 284 | 9.04 | |
| 285 | 10.26 | |

Program Package Serial Number: 7014

WATER SURFACE PROFILE LISTING Date: 1- 9-2018 Time: 8:22:34

24" PIPE - FLOW VS DEPTH

| Station / L/Elem | Invert Elev / Ch Slope | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head / SF Ave | Energy Grd.El. / HF | Super Elev / SE Dpth | Critical Depth / Froude N | Flow Top Width / Norm Dp | Height/ Dia.-FT / "N" | Base Wt or I.D. / X-Fall | ZL / ZR | No Wth Prs/Pip / Type Ch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .000 | 10.000 | .397 | 10.397 | 5.00 | 4.51 | .32 | 10.71 | .00 | .49 | 2.03 | 3.000 | .000 | .00 | 2 .0 |
| 53.272 | .0100 | | | | | .0100 | .53 | .40 | 1.08 | .40 | .013 | .00 | .00 | PIPE |
| 53.272 | 10.533 | .397 | 10.930 | 5.00 | 4.51 | .32 | 11.25 | .00 | .49 | 2.03 | 3.000 | .000 | .00 | 2 .0 |
| 25.073 | .0100 | | | | | .0097 | .24 | .40 | 1.08 | .40 | .013 | .00 | .00 | PIPE |
| 78.345 | 10.783 | .403 | 11.186 | 5.00 | 4.42 | .30 | 11.49 | .00 | .49 | 2.05 | 3.000 | .000 | .00 | 2 .0 |
| 11.924 | .0100 | | | | | .0088 | .11 | .40 | 1.05 | .40 | .013 | .00 | .00 | PIPE |
| 90.269 | 10.903 | .416 | 11.319 | 5.00 | 4.21 | .28 | 11.59 | .00 | .49 | 2.07 | 3.000 | .000 | .00 | 2 .0 |
| 4.832 | .0100 | | | | | .0077 | .04 | .42 | .98 | .40 | .013 | .00 | .00 | PIPE |
| 95.101 | 10.951 | .430 | 11.381 | 5.00 | 4.02 | .25 | 11.63 | .00 | .49 | 2.10 | 3.000 | .000 | .00 | 2 .0 |
| 2.579 | .0100 | | | | | .0067 | .02 | .43 | .92 | .40 | .013 | .00 | .00 | PIPE |
| 97.680 | 10.977 | .444 | 11.421 | 5.00 | 3.83 | .23 | 11.65 | .00 | .49 | 2.13 | 3.000 | .000 | .00 | 2 .0 |
| 1.402 | .0100 | | | | | .0059 | .01 | .44 | .86 | .40 | .013 | .00 | .00 | PIPE |
| 99.082 | 10.991 | .459 | 11.450 | 5.00 | 3.65 | .21 | 11.66 | .00 | .49 | 2.16 | 3.000 | .000 | .00 | 2 .0 |
| .700 | .0100 | | | | | .0051 | .00 | .46 | .81 | .40 | .013 | .00 | .00 | PIPE |
| 99.782 | 10.998 | .475 | 11.472 | 5.00 | 3.48 | .19 | 11.66 | .00 | .49 | 2.19 | 3.000 | .000 | .00 | 2 .0 |
| .218 | .0100 | | | | | .0045 | .00 | .47 | .76 | .40 | .013 | .00 | .00 | PIPE |
| 100.000 | 11.000 | .492 | 11.492 | 5.00 | 3.31 | .17 | 11.66 | .00 | .49 | 2.22 | 3.000 | .000 | .00 | 2 .0 |
| WALL | ENTRANCE | | | | | | | | | | | | | |

Program Package Serial Number: 7014

WATER SURFACE PROFILE LISTING Date: 1- 9-2018 Time: 8:22:34

24" PIPE - FLOW VS DEPTH

| Station / L/Elem | Invert Elev / Ch Slope | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head / SF Ave | Energy Grd.El. / HF | Super Elev / SE Dpth | Critical Depth / Froude N | Flow Top Width / Norm Dp | Height/Dia.-FT / "N" | Base Wt or I.D. / X-Fall | ZL / ZR | No Wth Prs/Pip / Type Ch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100.000 | 11.000 | .871 | 11.871 | 5.00 | .72 | .01 | 11.88 | .00 | .23 | 8.00 | 8.000 | 8.000 | .00 | 0 .0 |

Program Package Serial Number: 7014

WATER SURFACE PROFILE LISTING Date: 1- 9-2018 Time: 8:22:34

24" PIPE - FLOW VS DEPTH

| Station / L/Elem | Invert Elev / Ch Slope | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head / SF Ave | Energy Grd.El. / HF | Super Elev / SE Dpth | Critical Depth / Froude N | Flow Top Width / Norm Dp | Height/ Dia.-FT / "N" | Base Wt or I.D. / X-Fall | ZL / ZR | No Wth Prs/Pip / Type Ch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .000 | 10.000 | .556 | 10.556 | 10.00 | 5.54 | .48 | 11.03 | .00 | .70 | 2.33 | 3.000 | .000 | .00 | 2 .0 |
| 35.886 | .0100 | | | | | .0100 | .36 | .56 | 1.11 | .56 | .013 | .00 | .00 | PIPE |
| 35.886 | 10.359 | .556 | 10.915 | 10.00 | 5.54 | .48 | 11.39 | .00 | .70 | 2.33 | 3.000 | .000 | .00 | 2 .0 |
| 39.198 | .0100 | | | | | .0094 | .37 | .56 | 1.11 | .56 | .013 | .00 | .00 | PIPE |
| 75.084 | 10.751 | .572 | 11.323 | 10.00 | 5.32 | .44 | 11.76 | .00 | .70 | 2.36 | 3.000 | .000 | .00 | 2 .0 |
| 12.383 | .0100 | | | | | .0083 | .10 | .57 | 1.05 | .56 | .013 | .00 | .00 | PIPE |
| 87.466 | 10.875 | .591 | 11.466 | 10.00 | 5.07 | .40 | 11.87 | .00 | .70 | 2.39 | 3.000 | .000 | .00 | 2 .0 |
| 5.964 | .0100 | | | | | .0073 | .04 | .59 | .98 | .56 | .013 | .00 | .00 | PIPE |
| 93.430 | 10.934 | .611 | 11.546 | 10.00 | 4.84 | .36 | 11.91 | .00 | .70 | 2.42 | 3.000 | .000 | .00 | 2 .0 |
| 3.386 | .0100 | | | | | .0064 | .02 | .61 | .92 | .56 | .013 | .00 | .00 | PIPE |
| 96.816 | 10.968 | .632 | 11.600 | 10.00 | 4.61 | .33 | 11.93 | .00 | .70 | 2.45 | 3.000 | .000 | .00 | 2 .0 |
| 1.918 | .0100 | | | | | .0056 | .01 | .63 | .86 | .56 | .013 | .00 | .00 | PIPE |
| 98.733 | 10.987 | .654 | 11.641 | 10.00 | 4.40 | .30 | 11.94 | .00 | .70 | 2.48 | 3.000 | .000 | .00 | 2 .0 |
| .970 | .0100 | | | | | .0049 | .00 | .65 | .81 | .56 | .013 | .00 | .00 | PIPE |
| 99.703 | 10.997 | .676 | 11.673 | 10.00 | 4.19 | .27 | 11.95 | .00 | .70 | 2.51 | 3.000 | .000 | .00 | 2 .0 |
| .297 | .0100 | | | | | .0042 | .00 | .68 | .76 | .56 | .013 | .00 | .00 | PIPE |
| 100.000 | 11.000 | .700 | 11.700 | 10.00 | 3.99 | .25 | 11.95 | .00 | .70 | 2.54 | 3.000 | .000 | .00 | 2 .0 |
| WALL | ENTRANCE | | | | | | | | | | | | | |

Program Package Serial Number: 7014

WATER SURFACE PROFILE LISTING Date: 1- 9-2018 Time: 8:22:34

24" PIPE - FLOW VS DEPTH

| Station / L/Elem | Invert Elev / Ch Slope | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head / SF Ave | Energy Grd.El. / HF | Super Elev / SE Dpth | Critical Depth / Froude N | Flow Top Width / Norm Dp | Height/Dia.-FT / "N" | Base Wt or I.D. / X-Fall | ZL / ZR | No Wth Prs/Pip / Type Ch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100.000 | 11.000 | 1.237 | 12.237 | 10.00 | 1.01 | .02 | 12.25 | .00 | .36 | 8.00 | 8.000 | 8.000 | .00 | 0 .0 |

Program Package Serial Number: 7014

WATER SURFACE PROFILE LISTING Date: 1- 9-2018 Time: 8: 5:49

36" PIPE - FLOW VS DEPTH

| Station / L/Elem | Invert Elev / Ch Slope | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head / SF Ave | Energy Grd.El. / HF | Super Elev / SE Dpth | Critical Depth / Froude N | Flow Top Width / Norm Dp | Height/ Dia.-FT / "N" | Base Wt or I.D. / X-Fall | ZL / ZR | No Wth Prs/Pip / Type Ch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .000 | 10.000 | .785 | 10.785 | 20.00 | 6.79 | .72 | 11.50 | .00 | 1.00 | 2.64 | 3.000 | .000 | .00 | 2 .0 |
| 8.120 | .0100 | | | | | .0100 | .08 | .79 | 1.13 | .79 | .013 | .00 | .00 | PIPE |
| 8.120 | 10.081 | .786 | 10.867 | 20.00 | 6.78 | .71 | 11.58 | .00 | 1.00 | 2.64 | 3.000 | .000 | .00 | 2 .0 |
| 56.962 | .0100 | | | | | .0093 | .53 | .79 | 1.13 | .79 | .013 | .00 | .00 | PIPE |
| 65.082 | 10.651 | .813 | 11.464 | 20.00 | 6.46 | .65 | 12.11 | .00 | 1.00 | 2.67 | 3.000 | .000 | .00 | 2 .0 |
| 16.791 | .0100 | | | | | .0082 | .14 | .81 | 1.06 | .79 | .013 | .00 | .00 | PIPE |
| 81.873 | 10.819 | .841 | 11.660 | 20.00 | 6.16 | .59 | 12.25 | .00 | 1.00 | 2.70 | 3.000 | .000 | .00 | 2 .0 |
| 8.550 | .0100 | | | | | .0071 | .06 | .84 | .99 | .79 | .013 | .00 | .00 | PIPE |
| 90.423 | 10.904 | .870 | 11.775 | 20.00 | 5.87 | .54 | 12.31 | .00 | 1.00 | 2.72 | 3.000 | .000 | .00 | 2 .0 |
| 4.891 | .0100 | | | | | .0063 | .03 | .87 | .93 | .79 | .013 | .00 | .00 | PIPE |
| 95.313 | 10.953 | .901 | 11.854 | 20.00 | 5.60 | .49 | 12.34 | .00 | 1.00 | 2.75 | 3.000 | .000 | .00 | 2 .0 |
| 2.825 | .0100 | | | | | .0055 | .02 | .90 | .87 | .79 | .013 | .00 | .00 | PIPE |
| 98.139 | 10.981 | .932 | 11.914 | 20.00 | 5.34 | .44 | 12.36 | .00 | 1.00 | 2.78 | 3.000 | .000 | .00 | 2 .0 |
| 1.432 | .0100 | | | | | .0048 | .01 | .93 | .81 | .79 | .013 | .00 | .00 | PIPE |
| 99.570 | 10.996 | .965 | 11.961 | 20.00 | 5.09 | .40 | 12.36 | .00 | 1.00 | 2.80 | 3.000 | .000 | .00 | 2 .0 |
| .430 | .0100 | | | | | .0042 | .00 | .97 | .76 | .79 | .013 | .00 | .00 | PIPE |
| 100.000 | 11.000 | 1.000 | 12.000 | 20.00 | 4.85 | .36 | 12.37 | .00 | 1.00 | 2.83 | 3.000 | .000 | .00 | 2 .0 |
| WALL ENTRANCE | | | | | | | | | | | | | | |
| 100.000 | 11.000 | 1.774 | 12.774 | 20.00 | 1.41 | .03 | 12.80 | .00 | .58 | 8.00 | 8.000 | 8.000 | .00 | 0 .0 |

Program Package Serial Number: 7014

WATER SURFACE PROFILE LISTING Date: 1- 9-2018 Time: 8: 5:49

36" PIPE - FLOW VS DEPTH

| Station / L/Elem | Invert Elev / Ch Slope | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head / SF Ave | Energy Grd.El. / HF | Super Elev / SE Dpth | Critical Depth / Froude N | Flow Top Width / Norm Dp | Height/ Dia.-FT / "N" | Base Wt or I.D. / X-Fall | ZL / ZR | No Wth Prs/Pip / Type Ch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .000 | 10.000 | .973 | 10.973 | 30.00 | 7.55 | .89 | 11.86 | .00 | 1.23 | 2.81 | 3.000 | .000 | .00 | 2 .0 |
| 52.404 | .0100 | | | | | .0093 | .49 | .97 | 1.12 | .97 | .013 | .00 | .00 | PIPE |
| 52.404 | 10.524 | .999 | 11.523 | 30.00 | 7.29 | .82 | 12.35 | .00 | 1.23 | 2.83 | 3.000 | .000 | .00 | 2 .0 |
| 23.371 | .0100 | | | | | .0083 | .19 | 1.00 | 1.06 | .97 | .013 | .00 | .00 | PIPE |
| 75.775 | 10.758 | 1.034 | 11.792 | 30.00 | 6.95 | .75 | 12.54 | .00 | 1.23 | 2.85 | 3.000 | .000 | .00 | 2 .0 |
| 11.510 | .0100 | | | | | .0073 | .08 | 1.03 | 1.00 | .97 | .013 | .00 | .00 | PIPE |
| 87.285 | 10.873 | 1.071 | 11.943 | 30.00 | 6.62 | .68 | 12.62 | .00 | 1.23 | 2.87 | 3.000 | .000 | .00 | 2 .0 |
| 6.532 | .0100 | | | | | .0064 | .04 | 1.07 | .93 | .97 | .013 | .00 | .00 | PIPE |
| 93.817 | 10.938 | 1.109 | 12.047 | 30.00 | 6.32 | .62 | 12.67 | .00 | 1.23 | 2.90 | 3.000 | .000 | .00 | 2 .0 |
| 3.727 | .0100 | | | | | .0056 | .02 | 1.11 | .87 | .97 | .013 | .00 | .00 | PIPE |
| 97.544 | 10.975 | 1.149 | 12.124 | 30.00 | 6.02 | .56 | 12.69 | .00 | 1.23 | 2.92 | 3.000 | .000 | .00 | 2 .0 |
| 1.886 | .0100 | | | | | .0049 | .01 | 1.15 | .81 | .97 | .013 | .00 | .00 | PIPE |
| 99.430 | 10.994 | 1.190 | 12.185 | 30.00 | 5.74 | .51 | 12.70 | .00 | 1.23 | 2.94 | 3.000 | .000 | .00 | 2 .0 |
| .570 | .0100 | | | | | .0043 | .00 | 1.19 | .76 | .97 | .013 | .00 | .00 | PIPE |
| 100.000 | 11.000 | 1.235 | 12.235 | 30.00 | 5.47 | .46 | 12.70 | .00 | 1.23 | 2.95 | 3.000 | .000 | .00 | 2 .0 |
| WALL | ENTRANCE | | | | | | | | | | | | | |
| 100.000 | 11.000 | 2.214 | 13.214 | 30.00 | 1.69 | .04 | 13.26 | .00 | .76 | 8.00 | 8.000 | 8.000 | .00 | 0 .0 |

Program Package Serial Number: 7014

WATER SURFACE PROFILE LISTING Date: 1- 9-2018 Time: 8: 5:49

36" PIPE - FLOW VS DEPTH

| Station / L/Elem | Invert Elev / Ch Slope | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head / SF Ave | Energy Grd.El. / HF | Super Elev / SE Dpth | Critical Depth / Froude N | Flow Top Width / Norm Dp | Height/ Dia.-FT / "N" | Base Wt or I.D. / X-Fall | ZL / ZR | No Wth Prs/Pip / Type Ch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .000 | 10.000 | 1.139 | 11.139 | 40.00 | 8.13 | 1.03 | 12.16 | .00 | 1.44 | 2.91 | 3.000 | .000 | .00 | 2 .0 |
| 34.607 | .0100 | | | | | .0094 | .32 | 1.14 | 1.10 | 1.13 | .013 | .00 | .00 | PIPE |
| 34.607 | 10.346 | 1.154 | 11.500 | 40.00 | 7.98 | .99 | 12.49 | .00 | 1.44 | 2.92 | 3.000 | .000 | .00 | 2 .0 |
| 33.620 | .0100 | | | | | .0086 | .29 | 1.15 | 1.07 | 1.13 | .013 | .00 | .00 | PIPE |
| 68.227 | 10.682 | 1.196 | 11.878 | 40.00 | 7.61 | .90 | 12.78 | .00 | 1.44 | 2.94 | 3.000 | .000 | .00 | 2 .0 |
| 15.372 | .0100 | | | | | .0075 | .12 | 1.20 | 1.00 | 1.13 | .013 | .00 | .00 | PIPE |
| 83.599 | 10.836 | 1.240 | 12.076 | 40.00 | 7.25 | .82 | 12.89 | .00 | 1.44 | 2.95 | 3.000 | .000 | .00 | 2 .0 |
| 8.501 | .0100 | | | | | .0066 | .06 | 1.24 | .94 | 1.13 | .013 | .00 | .00 | PIPE |
| 92.100 | 10.921 | 1.285 | 12.206 | 40.00 | 6.92 | .74 | 12.95 | .00 | 1.44 | 2.97 | 3.000 | .000 | .00 | 2 .0 |
| 4.791 | .0100 | | | | | .0058 | .03 | 1.29 | .87 | 1.13 | .013 | .00 | .00 | PIPE |
| 96.891 | 10.969 | 1.333 | 12.301 | 40.00 | 6.59 | .68 | 12.98 | .00 | 1.44 | 2.98 | 3.000 | .000 | .00 | 2 .0 |
| 2.403 | .0100 | | | | | .0051 | .01 | 1.33 | .81 | 1.13 | .013 | .00 | .00 | PIPE |
| 99.293 | 10.993 | 1.382 | 12.375 | 40.00 | 6.29 | .61 | 12.99 | .00 | 1.44 | 2.99 | 3.000 | .000 | .00 | 2 .0 |
| .707 | .0100 | | | | | .0045 | .00 | 1.38 | .76 | 1.13 | .013 | .00 | .00 | PIPE |
| 100.000 | 11.000 | 1.435 | 12.435 | 40.00 | 5.99 | .56 | 12.99 | .00 | 1.44 | 3.00 | 3.000 | .000 | .00 | 2 .0 |
| WALL | ENTRANCE | | | | | | | | | | | | | |
| 100.000 | 11.000 | 2.619 | 13.619 | 40.00 | 1.91 | .06 | 13.68 | .00 | .92 | 8.00 | 8.000 | 8.000 | .00 | 0 .0 |

Program Package Serial Number: 7014

WATER SURFACE PROFILE LISTING Date: 1- 9-2018 Time: 8: 5:49

36" PIPE - FLOW VS DEPTH

| Station / L/Elem | Invert Elev / Ch Slope | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head / SF Ave | Energy Grd.El. / HF | Super Elev / SE Dpth | Critical Depth / Froude N | Flow Top Width / Norm Dp | Height/ Dia.-FT / "N" | Base Wt or I.D. / X-Fall | ZL / ZR | No Wth Prs/Pip / Type Ch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .000 | 10.000 | 1.289 | 11.289 | 50.00 | 8.61 | 1.15 | 12.44 | .00 | 1.61 | 2.97 | 3.000 | .000 | .00 | 2 .0 |
| 4.934 | .0100 | | | | | .0095 | .05 | 1.29 | 1.09 | 1.27 | .013 | .00 | .00 | PIPE |
| 4.934 | 10.049 | 1.290 | 11.340 | 50.00 | 8.60 | 1.15 | 12.49 | .00 | 1.61 | 2.97 | 3.000 | .000 | .00 | 2 .0 |
| 53.151 | .0100 | | | | | .0089 | .47 | 1.29 | 1.08 | 1.27 | .013 | .00 | .00 | PIPE |
| 58.085 | 10.581 | 1.338 | 11.919 | 50.00 | 8.20 | 1.04 | 12.96 | .00 | 1.61 | 2.98 | 3.000 | .000 | .00 | 2 .0 |
| 20.922 | .0100 | | | | | .0079 | .16 | 1.34 | 1.01 | 1.27 | .013 | .00 | .00 | PIPE |
| 79.007 | 10.790 | 1.388 | 12.178 | 50.00 | 7.82 | .95 | 13.13 | .00 | 1.61 | 2.99 | 3.000 | .000 | .00 | 2 .0 |
| 11.030 | .0100 | | | | | .0069 | .08 | 1.39 | .94 | 1.27 | .013 | .00 | .00 | PIPE |
| 90.036 | 10.900 | 1.440 | 12.340 | 50.00 | 7.45 | .86 | 13.20 | .00 | 1.61 | 3.00 | 3.000 | .000 | .00 | 2 .0 |
| 6.066 | .0100 | | | | | .0061 | .04 | 1.44 | .88 | 1.27 | .013 | .00 | .00 | PIPE |
| 96.102 | 10.961 | 1.495 | 12.456 | 50.00 | 7.11 | .78 | 13.24 | .00 | 1.61 | 3.00 | 3.000 | .000 | .00 | 2 .0 |
| 3.028 | .0100 | | | | | .0053 | .02 | 1.49 | .82 | 1.27 | .013 | .00 | .00 | PIPE |
| 99.130 | 10.991 | 1.552 | 12.543 | 50.00 | 6.78 | .71 | 13.26 | .00 | 1.61 | 3.00 | 3.000 | .000 | .00 | 2 .0 |
| .870 | .0100 | | | | | .0047 | .00 | 1.55 | .76 | 1.27 | .013 | .00 | .00 | PIPE |
| 100.000 | 11.000 | 1.613 | 12.613 | 50.00 | 6.45 | .65 | 13.26 | .00 | 1.61 | 2.99 | 3.000 | .000 | .00 | 2 .0 |
| WALL | ENTRANCE | | | | | | | | | | | | | |
| 100.000 | 11.000 | 3.032 | 14.032 | 50.00 | 2.06 | .07 | 14.10 | .00 | 1.07 | 8.00 | 8.000 | 8.000 | .00 | 0 .0 |

Program Package Serial Number: 7014

WATER SURFACE PROFILE LISTING Date: 1- 9-2018 Time: 8: 5:49

36" PIPE - FLOW VS DEPTH

| Station / L/Elem | Invert Elev / Ch Slope | Depth (FT) | Water Elev | Q (CFS) | Vel (FPS) | Vel Head / SF Ave | Energy Grd.El. / HF | Super Elev / SE Dpth | Critical Depth / Froude N | Flow Top Width / Norm Dp | Height/ Dia.-FT / "N" | Base Wt or I.D. / X-Fall | ZL / ZR | No Wth Prs/Pip / Type Ch |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .000 | 10.000 | 1.433 | 11.433 | 60.00 | 9.00 | 1.26 | 12.69 | .00 | 1.77 | 3.00 | 3.000 | .000 | .00 | 2 .0 |
| 42.544 | .0100 | | | | | .0091 | .39 | 1.43 | 1.06 | 1.41 | .013 | .00 | .00 | PIPE |
| 42.544 | 10.425 | 1.464 | 11.890 | 60.00 | 8.75 | 1.19 | 13.08 | .00 | 1.77 | 3.00 | 3.000 | .000 | .00 | 2 .0 |
| 30.161 | .0100 | | | | | .0083 | .25 | 1.46 | 1.02 | 1.41 | .013 | .00 | .00 | PIPE |
| 72.705 | 10.727 | 1.520 | 12.247 | 60.00 | 8.35 | 1.08 | 13.33 | .00 | 1.77 | 3.00 | 3.000 | .000 | .00 | 2 .0 |
| 14.624 | .0100 | | | | | .0073 | .11 | 1.52 | .95 | 1.41 | .013 | .00 | .00 | PIPE |
| 87.330 | 10.873 | 1.579 | 12.452 | 60.00 | 7.96 | .98 | 13.44 | .00 | 1.77 | 3.00 | 3.000 | .000 | .00 | 2 .0 |
| 7.780 | .0100 | | | | | .0064 | .05 | 1.58 | .88 | 1.41 | .013 | .00 | .00 | PIPE |
| 95.110 | 10.951 | 1.640 | 12.591 | 60.00 | 7.59 | .89 | 13.49 | .00 | 1.77 | 2.99 | 3.000 | .000 | .00 | 2 .0 |
| 3.795 | .0100 | | | | | .0057 | .02 | 1.64 | .82 | 1.41 | .013 | .00 | .00 | PIPE |
| 98.905 | 10.989 | 1.705 | 12.694 | 60.00 | 7.23 | .81 | 13.51 | .00 | 1.77 | 2.97 | 3.000 | .000 | .00 | 2 .0 |
| 1.095 | .0100 | | | | | .0050 | .01 | 1.70 | .76 | 1.41 | .013 | .00 | .00 | PIPE |
| 100.000 | 11.000 | 1.774 | 12.774 | 60.00 | 6.89 | .74 | 13.51 | .00 | 1.77 | 2.95 | 3.000 | .000 | .00 | 2 .0 |
| WALL ENTRANCE | | | | | | | | | | | | | | |
| 100.000 | 11.000 | 3.504 | 14.504 | 60.00 | 2.14 | .07 | 14.58 | .00 | 1.20 | 8.00 | 8.000 | 8.000 | .00 | 0 .0 |

# APPENDIX F

# DETENTION BASIN OUTFLOW CALCULATIONS

# BASIN OUTFLOW CALCULATIONS

## DETENTION BASIN DESIGN -GOODMAN EL MONTE

### ***OUTFLOW PER WATER SURFACE ELEVATION***

FOR PIPE FLOW, SEE WSPG AND FLOW vs DEPTH GRAPH

| W/S ELEV | DEPTH | PUMP Q (cfs) | PIPE FLOW (cfs) | TOTAL Q (cfs) | |
|---|---|---|---|---|---|
| **277** | 0 | 1.0 | 0.00 | **1.0** | |
| | | | | | |
| **278** | 1 | 1.0 | 0.00 | **1.0** | |
| | | | | | |
| **279** | 2 | 1.0 | 0.00 | **1.0** | |
| | | | | | |
| **280** | 3 | 1.0 | 0.00 | **1.0** | |
| | | | | | |
| **281** | 4 | 1.0 | 0.00 | **1.0** | <<SWDv=281 |
| | | | | | |
| **282** | 5 | 1.0 | 7.80 | **8.8** | |
| | | | | | |
| **283** | 6 | 1.0 | 29.20 | **30.2** | |
| | | | | | |
| **284** | 7 | 1.0 | 61.80 | **62.8** | |
| | | | | | |
| **285** | 8 | 1.0 | 99.00 | **100.0** | |

# APPENDIX G

# FLOOD ROUTING RESULTS OUTPUT

```
  CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1997-2004 Version 6.4
-------------------------------------------------------------------
Study Date : 01/09/18 Input hydrograph file name : c:\CIVILD\1281.HYD
Output hydrograph file name: 1281.hin
GOODMAN EL MONTE - BASIN FLOOD ROUTING
50 YEAR, 4-DAY STORM
FILE: 1281

-------------------------------------------------------------------


User entry of depth-outflow-storage data
-------------------------------------------------------------------
Hydrograph time unit varies
Initial depth in storage basin =   0.00(Ft.)
-------------------------------------------------------------------
-------------------------------------------------------------------
Initial basin depth =   0.00 (Ft.)
Initial basin storage =      0.00 (Ac.Ft)
Initial basin outflow =   0.00 (CFS)
-------------------------------------------------------------------
-------------------------------------------------------------------
Depth vs. Storage and Depth vs. Discharge data @ 1 Min. Intervals:
 Basin Depth  Storage    Outflow   (S-O*dt/2)   (S+O*dt/2)
     (Ft.)    (Ac.Ft)    (CFS)     (Ac.Ft)    (Ac.Ft)
-------------------------------------------------------------------
   0.000      0.000      0.000      0.000        0.000
   1.000      1.240      1.000      1.239        1.241
   2.000      2.530      1.001      2.529        2.531
   3.000      3.940      1.002      3.939        3.941
   4.000      5.280      1.003      5.279        5.281
   5.000      6.560      8.800      6.554        6.566
   6.000      7.810     30.200      7.789        7.831
   7.000      9.040     62.800      8.997        9.083
   8.000     10.260     99.000     10.192       10.328
-------------------------------------------------------------------
                 Hydrograph Detention Basin Routing
Hydrograph at 1281 2 A Storm Day: 1 Drainage Area =   53.50
Total flood hydrograph volume this storm day =    2.61 Ac. Ft.
-------------------------------------------------------------------

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
-------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                      Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0       1.8     3.5     5.3     7.0 (Ft.)
    0     0.0     0.0      0.000  O       |       |       |       |      0.0
  100     1.0     0.1      0.067  O   I   |       |       |       |      0.1
  200     1.0     0.2      0.190  O   I   |       |       |       |      0.2
  300     1.0     0.2      0.301  |O  I   |       |       |       |      0.2
  400     1.0     0.3      0.399  |O  I   |       |       |       |      0.3
  500     1.0     0.4      0.488  |O  I   |       |       |       |      0.4
  600     1.0     0.5      0.567  | O I   |       |       |       |      0.5
  700     1.0     0.5      0.638  | O I   |       |       |       |      0.5
  800     1.0     0.6      0.701  | O I   |       |       |       |      0.6
  900     1.0     0.6      0.758  | O I   |       |       |       |      0.6
 1000     1.0     0.7      0.808  | O I   |       |       |       |      0.7
 1050     2.0     0.7      0.866  |  O    |I      |       |       |      0.7
 1100     2.0     0.8      0.953  |  O    |I      |       |       |      0.8
 1110     2.0     0.8      0.970  |  O    |I      |       |       |      0.8
 1120     2.0     0.8      0.987  |  O    |I      |       |       |      0.8
 1130     2.0     0.8      1.003  |  O    |I      |       |       |      0.8
 1131     2.0     0.8      1.005  |  O    |I      |       |       |      0.8
 1132     2.0     0.8      1.007  |  O    |I      |       |       |      0.8
 1133     3.0     0.8      1.010  |  O    |    I  |       |       |      0.8
 1134     3.0     0.8      1.013  |  O    |    I  |       |       |      0.8
 1135     3.0     0.8      1.016  |  O    |    I  |       |       |      0.8
 1136     3.0     0.8      1.019  |  O    |    I  |       |       |      0.8
 1137     3.0     0.8      1.022  |  O    |    I  |       |       |      0.8
 1138     3.0     0.8      1.025  |  O    |    I  |       |       |      0.8
```

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1139 | 3.0 | 0.8 | 1.028 | O | | I | | | | 0.8 |
| 1140 | 3.0 | 0.8 | 1.031 | O | | I | | | | 0.8 |
| 1141 | 3.0 | 0.8 | 1.034 | O | | I | | | | 0.8 |
| 1142 | 3.0 | 0.8 | 1.037 | O | | I | | | | 0.8 |
| 1143 | 3.0 | 0.8 | 1.040 | O | | I | | | | 0.8 |
| 1144 | 3.0 | 0.8 | 1.043 | O | | I | | | | 0.8 |
| 1145 | 3.0 | 0.8 | 1.046 | O | | I | | | | 0.8 |
| 1146 | 3.0 | 0.8 | 1.049 | O | | I | | | | 0.8 |
| 1147 | 3.0 | 0.8 | 1.052 | O | | I | | | | 0.8 |
| 1148 | 3.0 | 0.9 | 1.054 | O | | I | | | | 0.9 |
| 1149 | 3.0 | 0.9 | 1.057 | O | | I | | | | 0.9 |
| 1150 | 3.0 | 0.9 | 1.060 | O | | I | | | | 0.9 |
| 1151 | 3.0 | 0.9 | 1.063 | O | | I | | | | 0.9 |
| 1152 | 3.0 | 0.9 | 1.066 | O | | I | | | | 0.9 |
| 1153 | 3.0 | 0.9 | 1.069 | O | | I | | | | 0.9 |
| 1154 | 3.0 | 0.9 | 1.072 | O | | I | | | | 0.9 |
| 1155 | 3.0 | 0.9 | 1.075 | O | | I | | | | 0.9 |
| 1156 | 3.0 | 0.9 | 1.078 | O | | I | | | | 0.9 |
| 1157 | 4.0 | 0.9 | 1.082 | O | | | I | | | 0.9 |
| 1158 | 4.0 | 0.9 | 1.087 | O | | | I | | | 0.9 |
| 1159 | 4.0 | 0.9 | 1.091 | O | | | I | | | 0.9 |
| 1160 | 4.0 | 0.9 | 1.095 | O | | | I | | | 0.9 |
| 1161 | 4.0 | 0.9 | 1.100 | O | | | I | | | 0.9 |
| 1162 | 4.0 | 0.9 | 1.104 | O | | | I | | | 0.9 |
| 1163 | 4.0 | 0.9 | 1.108 | O | | | I | | | 0.9 |
| 1164 | 5.0 | 0.9 | 1.114 | O | | | | I | | 0.9 |
| 1165 | 5.0 | 0.9 | 1.119 | O | | | | I | | 0.9 |
| 1166 | 5.0 | 0.9 | 1.125 | O | | | | I | | 0.9 |
| 1167 | 5.0 | 0.9 | 1.131 | O | | | | I | | 0.9 |
| 1168 | 5.0 | 0.9 | 1.136 | O | | | | I | | 0.9 |
| 1169 | 6.0 | 0.9 | 1.143 | O | | | | | I | 0.9 |
| 1170 | 6.0 | 0.9 | 1.150 | O | | | | | I | 0.9 |
| 1171 | 6.0 | 0.9 | 1.157 | O | | | | | I | 0.9 |
| 1172 | 6.0 | 0.9 | 1.164 | O | | | | | I | 0.9 |
| 1173 | 6.0 | 0.9 | 1.171 | O | | | | | I | 0.9 |
| 1174 | 6.0 | 1.0 | 1.178 | O | | | | | I | 1.0 |
| 1175 | 6.0 | 1.0 | 1.185 | O | | | | | I | 1.0 |
| 1176 | 6.0 | 1.0 | 1.192 | O | | | | | I | 1.0 |
| 1177 | 6.0 | 1.0 | 1.199 | O | | | | | I | 1.0 |
| 1178 | 7.0 | 1.0 | 1.207 | O | | | | | I | 1.0 |
| 1179 | 7.0 | 1.0 | 1.216 | O | | | | | I | 1.0 |
| 1180 | 7.0 | 1.0 | 1.224 | O | | | | | I | 1.0 |
| 1181 | 7.0 | 1.0 | 1.232 | O | | | | | I | 1.0 |
| 1182 | 7.0 | 1.0 | 1.240 | O | | | | | I | 1.0 |
| 1183 | 7.0 | 1.0 | 1.249 | O | | | | | I | 1.0 |
| 1184 | 7.0 | 1.0 | 1.257 | O | | | | | I | 1.0 |
| 1185 | 7.0 | 1.0 | 1.265 | O | | | | | I | 1.0 |
| 1186 | 7.0 | 1.0 | 1.274 | O | | | | | I | 1.0 |
| 1187 | 7.0 | 1.0 | 1.282 | O | | | | | I | 1.0 |
| 1188 | 6.0 | 1.0 | 1.289 | O | | | | | I | 1.0 |
| 1189 | 6.0 | 1.0 | 1.296 | O | | | | | I | 1.0 |
| 1190 | 6.0 | 1.0 | 1.302 | O | | | | | I | 1.0 |
| 1191 | 6.0 | 1.0 | 1.309 | O | | | | | I | 1.1 |
| 1192 | 6.0 | 1.0 | 1.316 | O | | | | | I | 1.1 |
| 1193 | 6.0 | 1.0 | 1.323 | O | | | | | I | 1.1 |
| 1194 | 6.0 | 1.0 | 1.330 | O | | | | | I | 1.1 |
| 1195 | 6.0 | 1.0 | 1.337 | O | | | | | I | 1.1 |
| 1196 | 5.0 | 1.0 | 1.342 | O | | | | I | | 1.1 |
| 1197 | 5.0 | 1.0 | 1.348 | O | | | | I | | 1.1 |
| 1198 | 5.0 | 1.0 | 1.353 | O | | | | I | | 1.1 |
| 1199 | 5.0 | 1.0 | 1.359 | O | | | | I | | 1.1 |
| 1200 | 5.0 | 1.0 | 1.364 | O | | | | I | | 1.1 |
| 1201 | 4.0 | 1.0 | 1.369 | O | | | I | | | 1.1 |
| 1202 | 4.0 | 1.0 | 1.373 | O | | | I | | | 1.1 |
| 1203 | 4.0 | 1.0 | 1.377 | O | | | I | | | 1.1 |
| 1204 | 4.0 | 1.0 | 1.381 | O | | | I | | | 1.1 |
| 1205 | 4.0 | 1.0 | 1.385 | O | | | I | | | 1.1 |
| 1206 | 4.0 | 1.0 | 1.389 | O | | | I | | | 1.1 |
| 1207 | 4.0 | 1.0 | 1.393 | O | | | I | | | 1.1 |
| 1208 | 4.0 | 1.0 | 1.397 | O | | | I | | | 1.1 |
| 1209 | 3.0 | 1.0 | 1.400 | O | | I | | | | 1.1 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1210 | 3.0 | 1.0 | 1.403 | O | | I | | | 1.1 |
| 1211 | 3.0 | 1.0 | 1.406 | O | | I | | | 1.1 |
| 1212 | 3.0 | 1.0 | 1.409 | O | | I | | | 1.1 |
| 1213 | 3.0 | 1.0 | 1.411 | O | | I | | | 1.1 |
| 1214 | 3.0 | 1.0 | 1.414 | O | | I | | | 1.1 |
| 1215 | 3.0 | 1.0 | 1.417 | O | | I | | | 1.1 |
| 1216 | 3.0 | 1.0 | 1.420 | O | | I | | | 1.1 |
| 1217 | 3.0 | 1.0 | 1.422 | O | | I | | | 1.1 |
| 1218 | 3.0 | 1.0 | 1.425 | O | | I | | | 1.1 |
| 1219 | 3.0 | 1.0 | 1.428 | O | | I | | | 1.1 |
| 1220 | 3.0 | 1.0 | 1.431 | O | | I | | | 1.1 |
| 1221 | 2.0 | 1.0 | 1.432 | O | I | | | | 1.1 |
| 1222 | 2.0 | 1.0 | 1.433 | O | I | | | | 1.1 |
| 1223 | 2.0 | 1.0 | 1.435 | O | I | | | | 1.2 |
| 1224 | 2.0 | 1.0 | 1.436 | O | I | | | | 1.2 |
| 1225 | 2.0 | 1.0 | 1.437 | O | I | | | | 1.2 |
| 1226 | 2.0 | 1.0 | 1.439 | O | I | | | | 1.2 |
| 1227 | 2.0 | 1.0 | 1.440 | O | I | | | | 1.2 |
| 1228 | 2.0 | 1.0 | 1.442 | O | I | | | | 1.2 |
| 1229 | 2.0 | 1.0 | 1.443 | O | I | | | | 1.2 |
| 1230 | 2.0 | 1.0 | 1.444 | O | I | | | | 1.2 |
| 1231 | 2.0 | 1.0 | 1.446 | O | I | | | | 1.2 |
| 1232 | 2.0 | 1.0 | 1.447 | O | I | | | | 1.2 |
| 1233 | 2.0 | 1.0 | 1.448 | O | I | | | | 1.2 |
| 1234 | 2.0 | 1.0 | 1.450 | O | I | | | | 1.2 |
| 1235 | 2.0 | 1.0 | 1.451 | O | I | | | | 1.2 |
| 1236 | 2.0 | 1.0 | 1.453 | O | I | | | | 1.2 |
| 1237 | 2.0 | 1.0 | 1.454 | O | I | | | | 1.2 |
| 1238 | 2.0 | 1.0 | 1.455 | O | I | | | | 1.2 |
| 1239 | 2.0 | 1.0 | 1.457 | O | I | | | | 1.2 |
| 1240 | 2.0 | 1.0 | 1.458 | O | I | | | | 1.2 |
| 1241 | 2.0 | 1.0 | 1.459 | O | I | | | | 1.2 |
| 1242 | 2.0 | 1.0 | 1.461 | O | I | | | | 1.2 |
| 1243 | 2.0 | 1.0 | 1.462 | O | I | | | | 1.2 |
| 1244 | 2.0 | 1.0 | 1.464 | O | I | | | | 1.2 |
| 1245 | 2.0 | 1.0 | 1.465 | O | I | | | | 1.2 |
| 1246 | 2.0 | 1.0 | 1.466 | O | I | | | | 1.2 |
| 1247 | 2.0 | 1.0 | 1.468 | O | I | | | | 1.2 |
| 1248 | 2.0 | 1.0 | 1.469 | O | I | | | | 1.2 |
| 1249 | 2.0 | 1.0 | 1.470 | O | I | | | | 1.2 |
| 1250 | 2.0 | 1.0 | 1.472 | O | I | | | | 1.2 |
| 1251 | 2.0 | 1.0 | 1.473 | O | I | | | | 1.2 |
| 1252 | 2.0 | 1.0 | 1.475 | O | I | | | | 1.2 |
| 1253 | 2.0 | 1.0 | 1.476 | O | I | | | | 1.2 |
| 1254 | 2.0 | 1.0 | 1.477 | O | I | | | | 1.2 |
| 1255 | 2.0 | 1.0 | 1.479 | O | I | | | | 1.2 |
| 1256 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1257 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1258 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1259 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1260 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1261 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1262 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1263 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1264 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1265 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1266 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1267 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1268 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1269 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1270 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1271 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1272 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1273 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1274 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1275 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1276 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1277 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1278 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1279 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |
| 1280 | 1.0 | 1.0 | 1.479 | O | | | | | 1.2 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1281 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1282 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1283 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1284 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1285 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1286 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1287 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1288 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1289 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1290 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1291 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1292 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1293 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1294 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1295 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1296 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1297 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1298 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1299 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1300 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1310 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1320 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1330 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1340 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1350 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1360 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1370 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1380 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1390 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1400 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1420 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1440 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1460 | 1.0 | 1.0 | 1.479 | \| | O | \| | \| | \| | 1.2 |
| 1500 | 1.0 | 1.0 | 1.477 | \| | O | \| | \| | \| | 1.2 |

Remaining water in basin = 1.48 (Ac.Ft)
Peak flow out of basin = 1.00(CFS)
Peak flow time = 1255 Min., time interval # = 141
Maximum depth in basin = 1.19(Ft.)

Hydrograph Detention Basin Routing
Hydrograph at 1281 2 A Storm Day: 2 Drainage Area = 53.50
Total flood hydrograph volume this storm day = 9.77 Ac. Ft.
---

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
---

| Time (Min) | Inflow (CFS) | Outflow (CFS) | Storage (Ac.Ft) | .0 7.3 14.5 21.8 29.0 | Depth (Ft.) |
|---|---|---|---|---|---|
| 0 | 0.0 | 1.0 | 1.477 | IO \| \| \| \| \| | 1.2 |
| 100 | 3.0 | 1.0 | 1.550 | \|O I \| \| \| \| | 1.2 |
| 200 | 3.0 | 1.0 | 1.825 | \|O I \| \| \| \| | 1.5 |
| 300 | 3.0 | 1.0 | 2.100 | \|O I \| \| \| \| | 1.7 |
| 400 | 3.0 | 1.0 | 2.376 | \|O I \| \| \| \| | 1.9 |
| 500 | 3.0 | 1.0 | 2.651 | \|O I \| \| \| \| | 2.1 |
| 600 | 3.0 | 1.0 | 2.926 | \|O I \| \| \| \| | 2.3 |
| 700 | 4.0 | 1.0 | 3.271 | \|O I \| \| \| \| | 2.5 |
| 800 | 4.0 | 1.0 | 3.684 | \|O I \| \| \| \| | 2.8 |
| 900 | 5.0 | 1.0 | 4.167 | \|O I \| \| \| \| | 3.2 |
| 1000 | 6.0 | 1.0 | 4.787 | \|O I \| \| \| \| | 3.6 |
| 1050 | 7.0 | 1.0 | 5.166 | \|O I\| \| \| \| | 3.9 |
| 1100 | 9.0 | 2.9 | 5.600 | \| O \|I \| \| \| | 4.2 |
| 1110 | 9.0 | 3.4 | 5.679 | \| O \|I \| \| \| | 4.3 |
| 1120 | 10.0 | 3.9 | 5.760 | \| O \| I \| \| \| | 4.4 |
| 1130 | 11.0 | 4.5 | 5.848 | \| O \| I \| \| \| | 4.4 |
| 1131 | 11.0 | 4.5 | 5.857 | \| O \| I \| \| \| | 4.5 |
| 1132 | 11.0 | 4.6 | 5.866 | \| O \| I \| \| \| | 4.5 |
| 1133 | 11.0 | 4.6 | 5.875 | \| O \| I \| \| \| | 4.5 |
| 1134 | 11.0 | 4.7 | 5.883 | \| O \| I \| \| \| | 4.5 |

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1135    11.0     4.7      5.892  |    O  |   I   |       |       |      4.5
1136    11.0     4.8      5.901  |    O  |   I   |       |       |      4.5
1137    11.0     4.8      5.909  |    O  |   I   |       |       |      4.5
1138    12.0     4.9      5.919  |    O  |    I  |       |       |      4.5
1139    12.0     5.0      5.929  |    O  |    I  |       |       |      4.5
1140    12.0     5.0      5.938  |    O  |    I  |       |       |      4.5
1141    12.0     5.1      5.948  |    O  |    I  |       |       |      4.5
1142    12.0     5.1      5.957  |    O  |    I  |       |       |      4.5
1143    13.0     5.2      5.968  |    O  |     I |       |       |      4.5
1144    13.0     5.3      5.979  |    O  |     I |       |       |      4.5
1145    13.0     5.3      5.990  |    O  |     I |       |       |      4.6
1146    13.0     5.4      6.000  |    O  |     I |       |       |      4.6
1147    13.0     5.5      6.011  |     O |     I |       |       |      4.6
1148    14.0     5.5      6.022  |     O |      I|       |       |      4.6
1149    14.0     5.6      6.034  |     O |      I|       |       |      4.6
1150    14.0     5.7      6.045  |     O |      I|       |       |      4.6
1151    14.0     5.7      6.057  |     O |      I|       |       |      4.6
1152    15.0     5.8      6.070  |     O |       I       |       |      4.6
1153    15.0     5.9      6.082  |     O |       I       |       |      4.6
1154    15.0     6.0      6.095  |     O |       I       |       |      4.6
1155    16.0     6.0      6.108  |     O |       |I      |       |      4.6
1156    16.0     6.1      6.122  |     O |       |I      |       |      4.7
1157    17.0     6.2      6.137  |     O |       | I     |       |      4.7
1158    18.0     6.3      6.153  |     O |       |  I    |       |      4.7
1159    19.0     6.4      6.171  |      O|       |   I   |       |      4.7
1160    20.0     6.5      6.189  |      O|       |     I |       |      4.7
1161    21.0     6.7      6.209  |      O|       |      I|       |      4.7
1162    22.0     6.8      6.230  |      O|       |       I       |      4.7
1163    23.0     6.9      6.252  |      O|       |       |I      |      4.8
1164    24.0     7.1      6.276  |      O|       |       | I     |      4.8
1165    25.0     7.2      6.300  |      O|       |       |  I    |      4.8
1166    26.0     7.4      6.326  |       O       |       |   I   |      4.8
1167    26.0     7.5      6.352  |       O       |       |   I   |      4.8
1168    27.0     7.7      6.378  |       O       |       |    I  |      4.9
1169    27.0     7.9      6.405  |       O       |       |    I  |      4.9
1170    28.0     8.0      6.432  |       O       |       |     I |      4.9
1171    28.0     8.2      6.460  |       |O      |       |     I |      4.9
1172    28.0     8.4      6.487  |       |O      |       |     I |      4.9
1173    29.0     8.5      6.515  |       |O      |       |       I      5.0
1174    29.0     8.7      6.543  |       |O      |       |       I      5.0
1175    29.0     9.0      6.571  |       |O      |       |       I      5.0
1176    29.0     9.5      6.598  |       | O     |       |       I      5.0
1177    29.0     9.9      6.625  |       | O     |       |       I      5.1
1178    29.0    10.4      6.651  |       |  O    |       |       I      5.1
1179    29.0    10.8      6.676  |       |  O    |       |       I      5.1
1180    29.0    11.2      6.701  |       |   O   |       |       I      5.1
1181    28.0    11.6      6.724  |       |   O   |       |     I |      5.1
1182    28.0    12.0      6.746  |       |    O  |       |     I |      5.1
1183    28.0    12.4      6.768  |       |    O  |       |     I |      5.2
1184    27.0    12.7      6.788  |       |     O |       |    I  |      5.2
1185    27.0    13.0      6.807  |       |     O |       |    I  |      5.2
1186    26.0    13.3      6.825  |       |     O |       |   I   |      5.2
1187    26.0    13.6      6.842  |       |      O|       |   I   |      5.2
1188    25.0    13.9      6.858  |       |      O|       |  I    |      5.2
1189    24.0    14.1      6.872  |       |      O|       | I     |      5.2
1190    23.0    14.3      6.884  |       |      O|       |I      |      5.3
1191    22.0    14.5      6.894  |       |       O       I       |      5.3
1192    21.0    14.7      6.903  |       |       O      I|       |      5.3
1193    20.0    14.8      6.910  |       |       O     I |       |      5.3
1194    19.0    14.9      6.916  |       |       O   I   |       |      5.3
1195    18.0    15.0      6.920  |       |       O  I    |       |      5.3
1196    17.0    15.0      6.923  |       |       O I     |       |      5.3
1197    16.0    15.0      6.924  |       |       OI      |       |      5.3
1198    16.0    15.1      6.926  |       |       OI      |       |      5.3
1199    15.0    15.1      6.925  |       |       O       |       |      5.3
1200    14.0    15.0      6.924  |       |      IO       |       |      5.3
1201    14.0    15.0      6.923  |       |      IO       |       |      5.3
1202    13.0    15.0      6.920  |       |     I O       |       |      5.3
1203    13.0    14.9      6.917  |       |     I O       |       |      5.3
1204    12.0    14.8      6.913  |       |    I  O       |       |      5.3
1205    12.0    14.8      6.909  |       |    I  O       |       |      5.3
```

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1206    12.0    14.7      6.906  |        |    I  O       |        |      5.3
1207    11.0    14.6      6.901  |        |   I   O       |        |      5.3
1208    11.0    14.5      6.896  |        |   I   O       |        |      5.3
1209    11.0    14.5      6.891  |        |   I  O|       |        |      5.3
1210    10.0    14.4      6.885  |        |  I   O|       |        |      5.3
1211    10.0    14.3      6.879  |        |  I   O|       |        |      5.3
1212    10.0    14.2      6.873  |        |  I   O|       |        |      5.3
1213    10.0    14.1      6.867  |        |  I   O|       |        |      5.2
1214     9.0    13.9      6.860  |        |I     O|       |        |      5.2
1215     9.0    13.8      6.854  |        |I     O|       |        |      5.2
1216     9.0    13.7      6.847  |        |I     O|       |        |      5.2
1217     9.0    13.6      6.841  |        |I     O|       |        |      5.2
1218     9.0    13.5      6.834  |        |I    O |       |        |      5.2
1219     8.0    13.4      6.827  |        I     O |       |        |      5.2
1220     8.0    13.2      6.820  |        I     O |       |        |      5.2
1221     8.0    13.1      6.812  |        I     O |       |        |      5.2
1222     8.0    13.0      6.805  |        I     O |       |        |      5.2
1223     8.0    12.9      6.799  |        I     O |       |        |      5.2
1224     8.0    12.8      6.792  |        I     O |       |        |      5.2
1225     7.0    12.6      6.784  |       I|    O  |       |        |      5.2
1226     7.0    12.5      6.777  |       I|    O  |       |        |      5.2
1227     7.0    12.4      6.769  |       I|    O  |       |        |      5.2
1228     7.0    12.3      6.762  |       I|    O  |       |        |      5.2
1229     7.0    12.1      6.755  |       I|    O  |       |        |      5.2
1230     7.0    12.0      6.748  |       I|    O  |       |        |      5.2
1231     7.0    11.9      6.741  |       I|    O  |       |        |      5.1
1232     7.0    11.8      6.734  |       I|   O   |       |        |      5.1
1233     7.0    11.7      6.728  |       I|   O   |       |        |      5.1
1234     7.0    11.6      6.721  |       I|   O   |       |        |      5.1
1235     7.0    11.5      6.715  |       I|   O   |       |        |      5.1
1236     6.0    11.3      6.708  |      I |   O   |       |        |      5.1
1237     6.0    11.2      6.700  |      I |   O   |       |        |      5.1
1238     6.0    11.1      6.693  |      I |   O   |       |        |      5.1
1239     6.0    11.0      6.686  |      I |   O   |       |        |      5.1
1240     6.0    10.8      6.680  |      I |  O    |       |        |      5.1
1241     6.0    10.7      6.673  |      I |  O    |       |        |      5.1
1242     6.0    10.6      6.667  |      I |  O    |       |        |      5.1
1243     6.0    10.5      6.660  |      I |  O    |       |        |      5.1
1244     6.0    10.4      6.654  |      I |  O    |       |        |      5.1
1245     6.0    10.3      6.648  |      I |  O    |       |        |      5.1
1246     6.0    10.2      6.642  |      I |  O    |       |        |      5.1
1247     6.0    10.1      6.636  |      I |  O    |       |        |      5.1
1248     6.0    10.0      6.631  |      I |  O    |       |        |      5.1
1249     6.0     9.9      6.625  |      I | O     |       |        |      5.1
1250     6.0     9.8      6.620  |      I | O     |       |        |      5.0
1251     6.0     9.7      6.615  |      I | O     |       |        |      5.0
1252     6.0     9.7      6.610  |      I | O     |       |        |      5.0
1253     5.0     9.5      6.603  |    I   | O     |       |        |      5.0
1254     5.0     9.4      6.597  |    I   | O     |       |        |      5.0
1255     5.0     9.3      6.591  |    I   | O     |       |        |      5.0
1256     5.0     9.2      6.585  |    I   | O     |       |        |      5.0
1257     5.0     9.1      6.580  |    I   | O     |       |        |      5.0
1258     5.0     9.0      6.574  |    I   |O      |       |        |      5.0
1259     5.0     8.9      6.568  |    I   |O      |       |        |      5.0
1260     5.0     8.9      6.563  |    I   |O      |       |        |      5.0
1261     5.0     8.8      6.558  |    I   |O      |       |        |      5.0
1262     5.0     8.8      6.553  |    I   |O      |       |        |      5.0
1263     5.0     8.7      6.547  |    I   |O      |       |        |      5.0
1264     5.0     8.7      6.542  |    I   |O      |       |        |      5.0
1265     5.0     8.7      6.537  |    I   |O      |       |        |      5.0
1266     5.0     8.6      6.532  |    I   |O      |       |        |      5.0
1267     5.0     8.6      6.527  |    I   |O      |       |        |      5.0
1268     5.0     8.6      6.522  |    I   |O      |       |        |      5.0
1269     5.0     8.5      6.517  |    I   |O      |       |        |      5.0
1270     5.0     8.5      6.513  |    I   |O      |       |        |      5.0
1271     5.0     8.5      6.508  |    I   |O      |       |        |      5.0
1272     5.0     8.5      6.503  |    I   |O      |       |        |      5.0
1273     5.0     8.4      6.498  |    I   |O      |       |        |      5.0
1274     5.0     8.4      6.494  |    I   |O      |       |        |      4.9
1275     5.0     8.4      6.489  |    I   |O      |       |        |      4.9
1276     5.0     8.3      6.484  |    I   |O      |       |        |      4.9
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 1277     5.0     8.3      6.480  |    I  |O      |       |       |      4.9
 1278     5.0     8.3      6.475  |    I  |O      |       |       |      4.9
 1279     5.0     8.3      6.471  |    I  |O      |       |       |      4.9
 1280     5.0     8.2      6.466  |    I  |O      |       |       |      4.9
 1281     5.0     8.2      6.462  |    I  |O      |       |       |      4.9
 1282     5.0     8.2      6.457  |    I  |O      |       |       |      4.9
 1283     5.0     8.1      6.453  |    I  O       |       |       |      4.9
 1284     4.0     8.1      6.447  |   I   O       |       |       |      4.9
 1285     4.0     8.1      6.442  |   I   O       |       |       |      4.9
 1286     4.0     8.0      6.436  |   I   O       |       |       |      4.9
 1287     4.0     8.0      6.431  |   I   O       |       |       |      4.9
 1288     4.0     8.0      6.425  |   I   O       |       |       |      4.9
 1289     4.0     7.9      6.420  |   I   O       |       |       |      4.9
 1290     4.0     7.9      6.414  |   I   O       |       |       |      4.9
 1291     4.0     7.9      6.409  |   I   O       |       |       |      4.9
 1292     4.0     7.8      6.403  |   I   O       |       |       |      4.9
 1293     4.0     7.8      6.398  |   I   O       |       |       |      4.9
 1294     4.0     7.8      6.393  |   I   O       |       |       |      4.9
 1295     4.0     7.8      6.388  |   I   O       |       |       |      4.9
 1296     4.0     7.7      6.383  |   I   O       |       |       |      4.9
 1297     4.0     7.7      6.378  |   I   O       |       |       |      4.9
 1298     4.0     7.7      6.372  |   I   O       |       |       |      4.9
 1299     4.0     7.6      6.367  |   I   O       |       |       |      4.8
 1300     4.0     7.6      6.362  |   I   O       |       |       |      4.8
 1310     4.0     7.3      6.315  |   I   O       |       |       |      4.8
 1320     4.0     7.0      6.271  |   I  O|       |       |       |      4.8
 1330     4.0     6.8      6.231  |   I  O|       |       |       |      4.7
 1340     4.0     6.6      6.194  |   I  O|       |       |       |      4.7
 1350     3.0     6.3      6.153  |  I  O |       |       |       |      4.7
 1360     3.0     6.1      6.109  |  I  O |       |       |       |      4.6
 1370     3.0     5.8      6.069  |  I  O |       |       |       |      4.6
 1380     3.0     5.6      6.032  |  I  O |       |       |       |      4.6
 1390     3.0     5.4      5.997  |  I O  |       |       |       |      4.6
 1400     3.0     5.2      5.966  |  I O  |       |       |       |      4.5
 1420     3.0     4.8      5.911  |  I O  |       |       |       |      4.5
 1440     3.0     4.6      5.864  |  I O  |       |       |       |      4.5
 1460     3.0     4.3      5.824  |  IO   |       |       |       |      4.4
 1500     3.0     3.9      5.759  |  IO   |       |       |       |      4.4

      Remaining water in basin =    5.76 (Ac.Ft)
      Peak flow out of basin =    15.06(CFS)
      Peak flow time = 1198 Min., time interval # = 84
      Maximum depth in basin =    5.29(Ft.)


                    Hydrograph Detention Basin Routing
      Hydrograph at 1281 2 A Storm Day: 3 Drainage Area =   53.50
      Total flood hydrograph volume this storm day =    8.42 Ac. Ft.
      ---------------------------------------------------------------------

      Graph values: 'I'= unit inflow; 'O'=outflow at time shown
      ---------------------------------------------------------------------
Time   Inflow  Outflow    Storage                                      Depth
(Min)  (CFS)   (CFS)     (Ac.Ft) .0       7.3    14.5    21.8    29.0 (Ft.)
    0     0.0     3.9      5.759  I   O   |       |       |       |      4.4
  100     2.0     2.4      5.503  | O     |       |       |       |      4.2
  200     2.0     2.2      5.469  | O     |       |       |       |      4.1
  300     3.0     2.4      5.508  | OI    |       |       |       |      4.2
  400     3.0     2.7      5.565  |  O    |       |       |       |      4.2
  500     3.0     2.9      5.589  |  O    |       |       |       |      4.2
  600     3.0     3.0      5.600  |  O    |       |       |       |      4.2
  700     3.0     3.0      5.604  |  O    |       |       |       |      4.3
  800     4.0     3.3      5.660  |  OI   |       |       |       |      4.3
  900     4.0     3.7      5.724  |   O   |       |       |       |      4.3
 1000     5.0     4.2      5.805  |   OI  |       |       |       |      4.4
 1050     6.0     4.7      5.880  |    OI |       |       |       |      4.5
 1100     7.0     5.3      5.986  |    O I|       |       |       |      4.6
 1110     8.0     5.5      6.016  |     O I       |       |       |      4.6
 1120     8.0     5.7      6.049  |     O I       |       |       |      4.6
 1130     9.0     5.9      6.087  |     O |I      |       |       |      4.6
```

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1131 | 9.0 | 5.9 | 6.091 | \| | O | \|I | \| | \| | \| | 4.6 |
| 1132 | 9.0 | 6.0 | 6.096 | \| | O | \|I | \| | \| | \| | 4.6 |
| 1133 | 9.0 | 6.0 | 6.100 | \| | O | \|I | \| | \| | \| | 4.6 |
| 1134 | 10.0 | 6.0 | 6.105 | \| | O | \| I | \| | \| | \| | 4.6 |
| 1135 | 10.0 | 6.1 | 6.111 | \| | O | \| I | \| | \| | \| | 4.6 |
| 1136 | 10.0 | 6.1 | 6.116 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1137 | 10.0 | 6.1 | 6.121 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1138 | 10.0 | 6.2 | 6.127 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1139 | 10.0 | 6.2 | 6.132 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1140 | 10.0 | 6.2 | 6.137 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1141 | 11.0 | 6.3 | 6.144 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1142 | 11.0 | 6.3 | 6.150 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1143 | 11.0 | 6.3 | 6.157 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1144 | 11.0 | 6.4 | 6.163 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1145 | 11.0 | 6.4 | 6.169 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1146 | 11.0 | 6.5 | 6.176 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1147 | 12.0 | 6.5 | 6.183 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1148 | 12.0 | 6.6 | 6.191 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1149 | 12.0 | 6.6 | 6.198 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1150 | 12.0 | 6.6 | 6.206 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1151 | 12.0 | 6.7 | 6.213 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1152 | 13.0 | 6.7 | 6.222 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1153 | 13.0 | 6.8 | 6.230 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1154 | 13.0 | 6.8 | 6.239 | \| | O | \| I | \| | \| | \| | 4.7 |
| 1155 | 14.0 | 6.9 | 6.249 | \| | O | \| I | \| | \| | \| | 4.8 |
| 1156 | 14.0 | 7.0 | 6.258 | \| | O | \| I | \| | \| | \| | 4.8 |
| 1157 | 14.0 | 7.0 | 6.268 | \| | O | \| I | \| | \| | \| | 4.8 |
| 1158 | 15.0 | 7.1 | 6.279 | \| | O | \| I | \| | \| | \| | 4.8 |
| 1159 | 16.0 | 7.2 | 6.291 | \| | O | \| I | \| | \| | \| | 4.8 |
| 1160 | 17.0 | 7.2 | 6.305 | \| | O | \| I | \| | \| | \| | 4.8 |
| 1161 | 18.0 | 7.3 | 6.319 | \| | O | \| I | \| | \| | \| | 4.8 |
| 1162 | 19.0 | 7.4 | 6.335 | \| | O | \| I | \| | \| | \| | 4.8 |
| 1163 | 20.0 | 7.5 | 6.353 | \| | O | \| I | \| | \| | \| | 4.8 |
| 1164 | 21.0 | 7.6 | 6.371 | \| | O | \| I | \| | \| | \| | 4.9 |
| 1165 | 21.0 | 7.8 | 6.389 | \| | O | \| I | \| | \| | \| | 4.9 |
| 1166 | 22.0 | 7.9 | 6.409 | \| | O | \| I | \| | \| | \| | 4.9 |
| 1167 | 23.0 | 8.0 | 6.430 | \| | O | \| I | \| | \| | \| | 4.9 |
| 1168 | 23.0 | 8.1 | 6.450 | \| | O | \| I | \| | \| | \| | 4.9 |
| 1169 | 24.0 | 8.3 | 6.472 | \| | O | \| I | \| | \| | \| | 4.9 |
| 1170 | 24.0 | 8.4 | 6.494 | \| | O | \| I | \| | \| | \| | 4.9 |
| 1171 | 24.0 | 8.5 | 6.515 | \| | O | \| I | \| | \| | \| | 5.0 |
| 1172 | 25.0 | 8.7 | 6.538 | \| | O | \| I | \| | \| | \| | 5.0 |
| 1173 | 25.0 | 8.8 | 6.560 | \| | O | \| I | \| | \| | \| | 5.0 |
| 1174 | 25.0 | 9.2 | 6.582 | \| | O | \| I | \| | \| | \| | 5.0 |
| 1175 | 25.0 | 9.5 | 6.604 | \| | O | \| I | \| | \| | \| | 5.0 |
| 1176 | 25.0 | 9.9 | 6.625 | \| | O | \| I | \| | \| | \| | 5.1 |
| 1177 | 25.0 | 10.3 | 6.645 | \| | O | \| I | \| | \| | \| | 5.1 |
| 1178 | 25.0 | 10.6 | 6.665 | \| | O | \| I | \| | \| | \| | 5.1 |
| 1179 | 25.0 | 10.9 | 6.685 | \| | O | \| I | \| | \| | \| | 5.1 |
| 1180 | 25.0 | 11.3 | 6.704 | \| | O | \| I | \| | \| | \| | 5.1 |
| 1181 | 25.0 | 11.6 | 6.723 | \| | O | \| I | \| | \| | \| | 5.1 |
| 1182 | 24.0 | 11.9 | 6.740 | \| | O | \| I | \| | \| | \| | 5.1 |
| 1183 | 24.0 | 12.2 | 6.756 | \| | O | \| I | \| | \| | \| | 5.2 |
| 1184 | 24.0 | 12.4 | 6.772 | \| | O | \| I | \| | \| | \| | 5.2 |
| 1185 | 24.0 | 12.7 | 6.788 | \| | O | \| I | \| | \| | \| | 5.2 |
| 1186 | 23.0 | 12.9 | 6.802 | \| | O | \| I | \| | \| | \| | 5.2 |
| 1187 | 23.0 | 13.2 | 6.816 | \| | O | \| I | \| | \| | \| | 5.2 |
| 1188 | 22.0 | 13.4 | 6.828 | \| | O | \| I | \| | \| | \| | 5.2 |
| 1189 | 21.0 | 13.6 | 6.838 | \| | O | \| I | \| | \| | \| | 5.2 |
| 1190 | 20.0 | 13.7 | 6.847 | \| | O | \| I | \| | \| | \| | 5.2 |
| 1191 | 20.0 | 13.9 | 6.855 | \| | O | \| I | \| | \| | \| | 5.2 |
| 1192 | 19.0 | 14.0 | 6.862 | \| | O | \| I | \| | \| | \| | 5.2 |
| 1193 | 18.0 | 14.1 | 6.868 | \| | O | \| I | \| | \| | \| | 5.2 |
| 1194 | 17.0 | 14.1 | 6.872 | \| | O | \| I | \| | \| | \| | 5.2 |
| 1195 | 16.0 | 14.2 | 6.874 | \| | O | \|I | \| | \| | \| | 5.3 |
| 1196 | 15.0 | 14.2 | 6.876 | \| | O | I | \| | \| | \| | 5.3 |
| 1197 | 15.0 | 14.2 | 6.877 | \| | O | I | \| | \| | \| | 5.3 |
| 1198 | 14.0 | 14.2 | 6.876 | \| | O | \| | \| | \| | \| | 5.3 |
| 1199 | 13.0 | 14.2 | 6.875 | \| | I | O\| | \| | \| | \| | 5.3 |
| 1200 | 13.0 | 14.2 | 6.873 | \| | I | O\| | \| | \| | \| | 5.3 |
| 1201 | 12.0 | 14.1 | 6.870 | \| | I | O\| | \| | \| | \| | 5.2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1202 | 12.0 | 14.1 | 6.867 | \| | \| I O\| | \| | \| | 5.2 |
| 1203 | 12.0 | 14.0 | 6.864 | \| | \| I O\| | \| | \| | 5.2 |
| 1204 | 11.0 | 13.9 | 6.860 | \| | \| I O\| | \| | \| | 5.2 |
| 1205 | 11.0 | 13.9 | 6.856 | \| | \| I O\| | \| | \| | 5.2 |
| 1206 | 10.0 | 13.8 | 6.851 | \| | \| I O\| | \| | \| | 5.2 |
| 1207 | 10.0 | 13.7 | 6.846 | \| | \| I O\| | \| | \| | 5.2 |
| 1208 | 10.0 | 13.6 | 6.841 | \| | \| I O\| | \| | \| | 5.2 |
| 1209 | 9.0 | 13.5 | 6.835 | \| | \|I O \| | \| | \| | 5.2 |
| 1210 | 9.0 | 13.4 | 6.828 | \| | \|I O \| | \| | \| | 5.2 |
| 1211 | 9.0 | 13.3 | 6.823 | \| | \|I O \| | \| | \| | 5.2 |
| 1212 | 9.0 | 13.2 | 6.817 | \| | \|I O \| | \| | \| | 5.2 |
| 1213 | 8.0 | 13.1 | 6.810 | \| | I O \| | \| | \| | 5.2 |
| 1214 | 8.0 | 13.0 | 6.803 | \| | I O \| | \| | \| | 5.2 |
| 1215 | 8.0 | 12.8 | 6.796 | \| | I O \| | \| | \| | 5.2 |
| 1216 | 8.0 | 12.7 | 6.789 | \| | I O \| | \| | \| | 5.2 |
| 1217 | 8.0 | 12.6 | 6.783 | \| | I O \| | \| | \| | 5.2 |
| 1218 | 8.0 | 12.5 | 6.777 | \| | I O \| | \| | \| | 5.2 |
| 1219 | 7.0 | 12.4 | 6.769 | \| | I\| O \| | \| | \| | 5.2 |
| 1220 | 7.0 | 12.3 | 6.762 | \| | I\| O \| | \| | \| | 5.2 |
| 1221 | 7.0 | 12.1 | 6.755 | \| | I\| O \| | \| | \| | 5.2 |
| 1222 | 7.0 | 12.0 | 6.748 | \| | I\| O \| | \| | \| | 5.2 |
| 1223 | 7.0 | 11.9 | 6.741 | \| | I\| O \| | \| | \| | 5.1 |
| 1224 | 7.0 | 11.8 | 6.734 | \| | I\| O \| | \| | \| | 5.1 |
| 1225 | 7.0 | 11.7 | 6.728 | \| | I\| O \| | \| | \| | 5.1 |
| 1226 | 7.0 | 11.6 | 6.721 | \| | I\| O \| | \| | \| | 5.1 |
| 1227 | 6.0 | 11.4 | 6.714 | \| | I \| O \| | \| | \| | 5.1 |
| 1228 | 6.0 | 11.3 | 6.706 | \| | I \| O \| | \| | \| | 5.1 |
| 1229 | 6.0 | 11.2 | 6.699 | \| | I \| O \| | \| | \| | 5.1 |
| 1230 | 6.0 | 11.1 | 6.692 | \| | I \| O \| | \| | \| | 5.1 |
| 1231 | 6.0 | 10.9 | 6.685 | \| | I \| O \| | \| | \| | 5.1 |
| 1232 | 6.0 | 10.8 | 6.678 | \| | I \| O \| | \| | \| | 5.1 |
| 1233 | 6.0 | 10.7 | 6.672 | \| | I \| O \| | \| | \| | 5.1 |
| 1234 | 6.0 | 10.6 | 6.665 | \| | I \| O \| | \| | \| | 5.1 |
| 1235 | 6.0 | 10.5 | 6.659 | \| | I \| O \| | \| | \| | 5.1 |
| 1236 | 6.0 | 10.4 | 6.653 | \| | I \| O \| | \| | \| | 5.1 |
| 1237 | 6.0 | 10.3 | 6.647 | \| | I \| O \| | \| | \| | 5.1 |
| 1238 | 6.0 | 10.2 | 6.641 | \| | I \| O \| | \| | \| | 5.1 |
| 1239 | 6.0 | 10.1 | 6.636 | \| | I \| O \| | \| | \| | 5.1 |
| 1240 | 5.0 | 10.0 | 6.629 | \| | I \| O \| | \| | \| | 5.1 |
| 1241 | 5.0 | 9.9 | 6.622 | \| | I \| O \| | \| | \| | 5.0 |
| 1242 | 5.0 | 9.7 | 6.615 | \| | I \| O \| | \| | \| | 5.0 |
| 1243 | 5.0 | 9.6 | 6.609 | \| | I \| O \| | \| | \| | 5.0 |
| 1244 | 5.0 | 9.5 | 6.602 | \| | I \| O \| | \| | \| | 5.0 |
| 1245 | 5.0 | 9.4 | 6.596 | \| | I \| O \| | \| | \| | 5.0 |
| 1246 | 5.0 | 9.3 | 6.590 | \| | I \| O \| | \| | \| | 5.0 |
| 1247 | 5.0 | 9.2 | 6.584 | \| | I \| O \| | \| | \| | 5.0 |
| 1248 | 5.0 | 9.1 | 6.579 | \| | I \| O \| | \| | \| | 5.0 |
| 1249 | 5.0 | 9.0 | 6.573 | \| | I \|O \| | \| | \| | 5.0 |
| 1250 | 5.0 | 8.9 | 6.568 | \| | I \|O \| | \| | \| | 5.0 |
| 1251 | 5.0 | 8.8 | 6.562 | \| | I \|O \| | \| | \| | 5.0 |
| 1252 | 5.0 | 8.8 | 6.557 | \| | I \|O \| | \| | \| | 5.0 |
| 1253 | 5.0 | 8.7 | 6.552 | \| | I \|O \| | \| | \| | 5.0 |
| 1254 | 5.0 | 8.7 | 6.547 | \| | I \|O \| | \| | \| | 5.0 |
| 1255 | 5.0 | 8.7 | 6.542 | \| | I \|O \| | \| | \| | 5.0 |
| 1256 | 5.0 | 8.7 | 6.536 | \| | I \|O \| | \| | \| | 5.0 |
| 1257 | 5.0 | 8.6 | 6.531 | \| | I \|O \| | \| | \| | 5.0 |
| 1258 | 5.0 | 8.6 | 6.526 | \| | I \|O \| | \| | \| | 5.0 |
| 1259 | 5.0 | 8.6 | 6.522 | \| | I \|O \| | \| | \| | 5.0 |
| 1260 | 5.0 | 8.5 | 6.517 | \| | I \|O \| | \| | \| | 5.0 |
| 1261 | 5.0 | 8.5 | 6.512 | \| | I \|O \| | \| | \| | 5.0 |
| 1262 | 4.0 | 8.5 | 6.506 | \| | I \|O \| | \| | \| | 5.0 |
| 1263 | 4.0 | 8.4 | 6.499 | \| | I \|O \| | \| | \| | 5.0 |
| 1264 | 4.0 | 8.4 | 6.493 | \| | I \|O \| | \| | \| | 4.9 |
| 1265 | 4.0 | 8.4 | 6.487 | \| | I \|O \| | \| | \| | 4.9 |
| 1266 | 4.0 | 8.3 | 6.481 | \| | I \|O \| | \| | \| | 4.9 |
| 1267 | 4.0 | 8.3 | 6.475 | \| | I \|O \| | \| | \| | 4.9 |
| 1268 | 4.0 | 8.2 | 6.470 | \| | I \|O \| | \| | \| | 4.9 |
| 1269 | 4.0 | 8.2 | 6.464 | \| | I \|O \| | \| | \| | 4.9 |
| 1270 | 4.0 | 8.2 | 6.458 | \| | I \|O \| | \| | \| | 4.9 |
| 1271 | 4.0 | 8.1 | 6.452 | \| | I O \| | \| | \| | 4.9 |
| 1272 | 4.0 | 8.1 | 6.447 | \| | I O \| | \| | \| | 4.9 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1273 | 4.0 | 8.1 | 6.441 | I O | | | | 4.9 |
| 1274 | 4.0 | 8.0 | 6.435 | I O | | | | 4.9 |
| 1275 | 4.0 | 8.0 | 6.430 | I O | | | | 4.9 |
| 1276 | 4.0 | 8.0 | 6.424 | I O | | | | 4.9 |
| 1277 | 4.0 | 7.9 | 6.419 | I O | | | | 4.9 |
| 1278 | 4.0 | 7.9 | 6.413 | I O | | | | 4.9 |
| 1279 | 4.0 | 7.9 | 6.408 | I O | | | | 4.9 |
| 1280 | 4.0 | 7.8 | 6.403 | I O | | | | 4.9 |
| 1281 | 4.0 | 7.8 | 6.398 | I O | | | | 4.9 |
| 1282 | 4.0 | 7.8 | 6.392 | I O | | | | 4.9 |
| 1283 | 4.0 | 7.7 | 6.387 | I O | | | | 4.9 |
| 1284 | 4.0 | 7.7 | 6.382 | I O | | | | 4.9 |
| 1285 | 4.0 | 7.7 | 6.377 | I O | | | | 4.9 |
| 1286 | 4.0 | 7.7 | 6.372 | I O | | | | 4.9 |
| 1287 | 4.0 | 7.6 | 6.367 | I O | | | | 4.8 |
| 1288 | 4.0 | 7.6 | 6.362 | I O | | | | 4.8 |
| 1289 | 4.0 | 7.6 | 6.357 | I O | | | | 4.8 |
| 1290 | 4.0 | 7.5 | 6.352 | I O | | | | 4.8 |
| 1291 | 4.0 | 7.5 | 6.347 | I O | | | | 4.8 |
| 1292 | 4.0 | 7.5 | 6.342 | I O | | | | 4.8 |
| 1293 | 4.0 | 7.4 | 6.338 | I O | | | | 4.8 |
| 1294 | 4.0 | 7.4 | 6.333 | I O | | | | 4.8 |
| 1295 | 4.0 | 7.4 | 6.328 | I O | | | | 4.8 |
| 1296 | 4.0 | 7.4 | 6.324 | I O | | | | 4.8 |
| 1297 | 4.0 | 7.3 | 6.319 | I O | | | | 4.8 |
| 1298 | 4.0 | 7.3 | 6.314 | I O | | | | 4.8 |
| 1299 | 4.0 | 7.3 | 6.310 | I O | | | | 4.8 |
| 1300 | 4.0 | 7.2 | 6.305 | I O\| | | | | 4.8 |
| 1310 | 4.0 | 7.0 | 6.262 | I O\| | | | | 4.8 |
| 1320 | 3.0 | 6.7 | 6.216 | I O\| | | | | 4.7 |
| 1330 | 3.0 | 6.4 | 6.167 | I O\| | | | | 4.7 |
| 1340 | 3.0 | 6.1 | 6.122 | I O | | | | 4.7 |
| 1350 | 3.0 | 5.9 | 6.080 | I O | | | | 4.6 |
| 1360 | 3.0 | 5.6 | 6.042 | I O | | | | 4.6 |
| 1370 | 3.0 | 5.4 | 6.007 | I O | | | | 4.6 |
| 1380 | 3.0 | 5.2 | 5.975 | I O | | | | 4.5 |
| 1390 | 3.0 | 5.1 | 5.946 | I O | | | | 4.5 |
| 1400 | 3.0 | 4.9 | 5.918 | I O | | | | 4.5 |
| 1420 | 3.0 | 4.6 | 5.870 | I O | | | | 4.5 |
| 1440 | 2.0 | 4.3 | 5.816 | I O | | | | 4.4 |
| 1460 | 2.0 | 3.9 | 5.759 | I O | | | | 4.4 |
| 1500 | 2.0 | 3.4 | 5.666 | IO | | | | 4.3 |

Remaining water in basin = 5.67 (Ac.Ft)
Peak flow out of basin = 14.22(CFS)
Peak flow time = 1197 Min., time interval # = 83
Maximum depth in basin = 5.25(Ft.)

Hydrograph Detention Basin Routing
Hydrograph at 1281 2 A Storm Day: 4 Drainage Area = 53.50
Total flood hydrograph volume this storm day = 24.23 Ac. Ft.
---

Graph values: 'I'= unit inflow; 'O'=outflow at time shown
---

| Time (Min) | Inflow (CFS) | Outflow (CFS) | Storage (Ac.Ft) | .0 | 19.0 | 38.0 | 57.0 | 76.0 | Depth (Ft.) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0.0 | 3.4 | 5.666 | IO | | | | | 4.3 |
| 100 | 7.0 | 3.7 | 5.730 | OI | | | | | 4.4 |
| 200 | 7.0 | 5.6 | 6.034 | O | | | | | 4.6 |
| 300 | 7.0 | 6.4 | 6.165 | O | | | | | 4.7 |
| 400 | 8.0 | 7.1 | 6.275 | OI | | | | | 4.8 |
| 500 | 8.0 | 7.6 | 6.362 | O | | | | | 4.8 |
| 600 | 9.0 | 8.2 | 6.453 | O | | | | | 4.9 |
| 700 | 9.0 | 8.6 | 6.533 | O | | | | | 5.0 |
| 800 | 10.0 | 9.5 | 6.603 | O | | | | | 5.0 |
| 900 | 12.0 | 11.2 | 6.700 | OI | | | | | 5.1 |
| 1000 | 14.0 | 13.2 | 6.815 | O | | | | | 5.2 |
| 1050 | 17.0 | 15.0 | 6.922 | OI | | | | | 5.3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1100 | 22.0 | 18.5 | 7.126 | O\|I | | | | 5.5 |
| 1110 | 24.0 | 19.5 | 7.183 | O I | | | | 5.5 |
| 1120 | 25.0 | 20.5 | 7.245 | O I | | | | 5.5 |
| 1130 | 28.0 | 21.8 | 7.321 | \|O I | | | | 5.6 |
| 1131 | 29.0 | 22.0 | 7.331 | \|O I | | | | 5.6 |
| 1132 | 29.0 | 22.2 | 7.340 | \|O I | | | | 5.6 |
| 1133 | 30.0 | 22.3 | 7.351 | \|O I | | | | 5.6 |
| 1134 | 30.0 | 22.5 | 7.362 | \|O I | | | | 5.6 |
| 1135 | 30.0 | 22.7 | 7.372 | \|O I | | | | 5.6 |
| 1136 | 31.0 | 22.9 | 7.383 | \|O I | | | | 5.7 |
| 1137 | 31.0 | 23.1 | 7.394 | \|O I | | | | 5.7 |
| 1138 | 32.0 | 23.3 | 7.406 | \|O I | | | | 5.7 |
| 1139 | 32.0 | 23.5 | 7.418 | \|O I | | | | 5.7 |
| 1140 | 33.0 | 23.7 | 7.431 | \|O I | | | | 5.7 |
| 1141 | 33.0 | 23.9 | 7.444 | \| O I | | | | 5.7 |
| 1142 | 34.0 | 24.2 | 7.457 | \| O I | | | | 5.7 |
| 1143 | 34.0 | 24.4 | 7.471 | \| O I | | | | 5.7 |
| 1144 | 35.0 | 24.6 | 7.485 | \| O I | | | | 5.7 |
| 1145 | 36.0 | 24.9 | 7.501 | \| O I\| | | | 5.8 |
| 1146 | 36.0 | 25.2 | 7.516 | \| O I\| | | | 5.8 |
| 1147 | 37.0 | 25.4 | 7.532 | \| O I\| | | | 5.8 |
| 1148 | 38.0 | 25.7 | 7.549 | \| O I | | | | 5.8 |
| 1149 | 38.0 | 26.0 | 7.566 | \| O I | | | | 5.8 |
| 1150 | 39.0 | 26.3 | 7.583 | \| O I | | | | 5.8 |
| 1151 | 40.0 | 26.6 | 7.602 | \| O I | | | | 5.8 |
| 1152 | 41.0 | 27.0 | 7.622 | \| O \|I | | | | 5.8 |
| 1153 | 42.0 | 27.3 | 7.642 | \| O \|I | | | | 5.9 |
| 1154 | 43.0 | 27.7 | 7.663 | \| O \| I | | | | 5.9 |
| 1155 | 45.0 | 28.1 | 7.687 | \| O \| I | | | | 5.9 |
| 1156 | 47.0 | 28.5 | 7.713 | \| O \| I | | | | 5.9 |
| 1157 | 50.0 | 29.0 | 7.742 | \| O \| I | | | | 5.9 |
| 1158 | 53.0 | 29.6 | 7.775 | \| O \| I \| | | | | 6.0 |
| 1159 | 56.0 | 30.2 | 7.810 | \| O \| I\| | | | | 6.0 |
| 1160 | 59.0 | 31.2 | 7.849 | \| O \| I | | | | 6.0 |
| 1161 | 62.0 | 32.3 | 7.891 | \| O \| \| I | | | | 6.1 |
| 1162 | 65.0 | 33.5 | 7.935 | \| O \| \| I | | | | 6.1 |
| 1163 | 67.0 | 34.7 | 7.980 | \| O \| \| I | | | | 6.1 |
| 1164 | 69.0 | 35.9 | 8.027 | \| O\| \| I | | | | 6.2 |
| 1165 | 71.0 | 37.2 | 8.074 | \| O\| \| I | | | | 6.2 |
| 1166 | 72.0 | 38.5 | 8.121 | \| O \| I \| | | | | 6.3 |
| 1167 | 73.0 | 39.7 | 8.168 | \| O \| I \| | | | | 6.3 |
| 1168 | 74.0 | 40.9 | 8.214 | \| \|O \| I\| | | | | 6.3 |
| 1169 | 75.0 | 42.1 | 8.261 | \| \|O \| I\| | | | | 6.4 |
| 1170 | 75.0 | 43.3 | 8.305 | \| \| O \| I\| | | | | 6.4 |
| 1171 | 76.0 | 44.5 | 8.349 | \| \| O \| I | | | | 6.4 |
| 1172 | 76.0 | 45.6 | 8.392 | \| \| O \| I | | | | 6.5 |
| 1173 | 76.0 | 46.7 | 8.433 | \| \| O \| I | | | | 6.5 |
| 1174 | 76.0 | 47.8 | 8.473 | \| \| O \| I | | | | 6.5 |
| 1175 | 75.0 | 48.7 | 8.509 | \| \| O \| I\| | | | | 6.6 |
| 1176 | 75.0 | 49.7 | 8.545 | \| \| O \| I\| | | | | 6.6 |
| 1177 | 75.0 | 50.6 | 8.579 | \| \| O \| I\| | | | | 6.6 |
| 1178 | 74.0 | 51.4 | 8.611 | \| \| O \| I\| | | | | 6.7 |
| 1179 | 73.0 | 52.2 | 8.640 | \| \| O \| I \| | | | | 6.7 |
| 1180 | 72.0 | 52.9 | 8.667 | \| \| O \| I \| | | | | 6.7 |
| 1181 | 71.0 | 53.6 | 8.691 | \| \| O \| I \| | | | | 6.7 |
| 1182 | 70.0 | 54.1 | 8.714 | \| \| O \| I \| | | | | 6.7 |
| 1183 | 69.0 | 54.7 | 8.734 | \| \| O\| I \| | | | | 6.8 |
| 1184 | 68.0 | 55.2 | 8.752 | \| \| O\| I | | | | 6.8 |
| 1185 | 66.0 | 55.5 | 8.766 | \| \| O\| I | | | | 6.8 |
| 1186 | 64.0 | 55.8 | 8.778 | \| \| O\| I | | | | 6.8 |
| 1187 | 61.0 | 56.0 | 8.785 | \| \| O\|I | | | | 6.8 |
| 1188 | 58.0 | 56.1 | 8.787 | \| \| OI | | | | 6.8 |
| 1189 | 55.0 | 56.1 | 8.786 | \| \| O\| | | | | 6.8 |
| 1190 | 52.0 | 55.9 | 8.780 | \| \| I O\| | | | | 6.8 |
| 1191 | 49.0 | 55.7 | 8.771 | \| \| I O\| | | | | 6.8 |
| 1192 | 46.0 | 55.3 | 8.758 | \| \| I O\| | | | | 6.8 |
| 1193 | 44.0 | 54.9 | 8.743 | \| \| I O\| | | | | 6.8 |
| 1194 | 41.0 | 54.4 | 8.724 | \| \|I O \| | | | | 6.7 |
| 1195 | 39.0 | 53.9 | 8.703 | \| I O \| | | | | 6.7 |
| 1196 | 37.0 | 53.3 | 8.680 | \| I\| O \| | | | | 6.7 |
| 1197 | 36.0 | 52.6 | 8.657 | \| I\| O \| | | | | 6.7 |

```
1198    34.0    52.0      8.632  |        |     I |    O  |        |      6.7
1199    33.0    51.3      8.606  |        |    I  |    O  |        |      6.6
1200    31.0    50.6      8.578  |        |    I  |    O  |        |      6.6
1201    30.0    49.8      8.551  |        |   I   |   O   |        |      6.6
1202    29.0    49.1      8.522  |        |   I   |   O   |        |      6.6
1203    28.0    48.3      8.494  |        |  I    |   O   |        |      6.6
1204    27.0    47.6      8.465  |        |  I    |   O   |        |      6.5
1205    26.0    46.8      8.436  |        | I     |  O    |        |      6.5
1206    25.0    46.0      8.406  |        | I     |  O    |        |      6.5
1207    25.0    45.3      8.378  |        | I     |  O    |        |      6.5
1208    24.0    44.5      8.349  |        | I     | O     |        |      6.4
1209    23.0    43.7      8.320  |        |I      | O     |        |      6.4
1210    23.0    43.0      8.292  |        |I      | O     |        |      6.4
1211    22.0    42.2      8.264  |        |I      |O      |        |      6.4
1212    22.0    41.5      8.236  |        |I      |O      |        |      6.3
1213    21.0    40.8      8.209  |        I      |O      |        |      6.3
1214    21.0    40.1      8.182  |        I      O       |        |      6.3
1215    20.0    39.3      8.155  |        I      O       |        |      6.3
1216    20.0    38.6      8.129  |        I      O       |        |      6.3
1217    20.0    38.0      8.103  |        I     O|       |        |      6.2
1218    19.0    37.3      8.078  |        I     O|       |        |      6.2
1219    19.0    36.6      8.053  |        I     O|       |        |      6.2
1220    19.0    36.0      8.029  |        I     O|       |        |      6.2
1221    18.0    35.4      8.005  |       I|     O |       |        |      6.2
1222    18.0    34.7      7.981  |       I|     O |       |        |      6.1
1223    18.0    34.1      7.959  |       I|     O |       |        |      6.1
1224    17.0    33.5      7.935  |       I|     O |       |        |      6.1
1225    17.0    32.9      7.913  |       I|    O  |       |        |      6.1
1226    17.0    32.4      7.892  |       I|    O  |       |        |      6.1
1227    17.0    31.8      7.871  |       I|    O  |       |        |      6.0
1228    17.0    31.3      7.851  |       I|    O  |       |        |      6.0
1229    16.0    30.7      7.830  |      I |   O   |       |        |      6.0
1230    16.0    30.2      7.810  |      I |   O   |       |        |      6.0
1231    16.0    29.9      7.791  |      I |   O   |       |        |      6.0
1232    16.0    29.5      7.772  |      I |   O   |       |        |      6.0
1233    16.0    29.2      7.753  |      I |   O   |       |        |      6.0
1234    15.0    28.9      7.734  |      I |   O   |       |        |      5.9
1235    15.0    28.6      7.715  |      I |   O   |       |        |      5.9
1236    15.0    28.3      7.697  |      I |  O    |       |        |      5.9
1237    15.0    28.0      7.679  |      I |  O    |       |        |      5.9
1238    15.0    27.6      7.661  |      I |  O    |       |        |      5.9
1239    15.0    27.4      7.644  |      I |  O    |       |        |      5.9
1240    14.0    27.0      7.626  |    I   |  O    |       |        |      5.9
1241    14.0    26.7      7.608  |    I   |  O    |       |        |      5.8
1242    14.0    26.4      7.591  |    I   |  O    |       |        |      5.8
1243    14.0    26.2      7.574  |    I   |  O    |       |        |      5.8
1244    14.0    25.9      7.557  |    I   | O     |       |        |      5.8
1245    14.0    25.6      7.541  |    I   | O     |       |        |      5.8
1246    14.0    25.3      7.525  |    I   | O     |       |        |      5.8
1247    14.0    25.1      7.510  |    I   | O     |       |        |      5.8
1248    14.0    24.8      7.495  |    I   | O     |       |        |      5.7
1249    13.0    24.5      7.479  |    I   | O     |       |        |      5.7
1250    13.0    24.3      7.463  |    I   | O     |       |        |      5.7
1251    13.0    24.0      7.448  |    I   | O     |       |        |      5.7
1252    13.0    23.7      7.433  |    I   |O      |       |        |      5.7
1253    13.0    23.5      7.418  |    I   |O      |       |        |      5.7
1254    13.0    23.2      7.404  |    I   |O      |       |        |      5.7
1255    13.0    23.0      7.390  |    I   |O      |       |        |      5.7
1256    13.0    22.8      7.376  |    I   |O      |       |        |      5.7
1257    13.0    22.5      7.363  |    I   |O      |       |        |      5.6
1258    13.0    22.3      7.350  |    I   |O      |       |        |      5.6
1259    12.0    22.1      7.336  |    I   |O      |       |        |      5.6
1260    12.0    21.8      7.322  |    I   |O      |       |        |      5.6
1261    12.0    21.6      7.309  |    I   |O      |       |        |      5.6
1262    12.0    21.4      7.296  |    I   |O      |       |        |      5.6
1263    12.0    21.2      7.283  |    I   O       |       |        |      5.6
1264    12.0    21.0      7.270  |    I   O       |       |        |      5.6
1265    12.0    20.8      7.258  |    I   O       |       |        |      5.6
1266    12.0    20.5      7.246  |    I   O       |       |        |      5.5
1267    12.0    20.3      7.235  |    I   O       |       |        |      5.5
1268    12.0    20.2      7.223  |    I   O       |       |        |      5.5
```

```
1269    12.0    20.0      7.212  |    I  O       |       |       |      5.5
1270    12.0    19.8      7.201  |    I  O       |       |       |      5.5
1271    12.0    19.6      7.191  |    I  O       |       |       |      5.5
1272    12.0    19.4      7.180  |    I  O       |       |       |      5.5
1273    12.0    19.2      7.170  |    I  O       |       |       |      5.5
1274    11.0    19.1      7.159  |   I   O       |       |       |      5.5
1275    11.0    18.9      7.148  |   I  O|       |       |       |      5.5
1276    11.0    18.7      7.137  |   I  O|       |       |       |      5.5
1277    11.0    18.5      7.127  |   I  O|       |       |       |      5.5
1278    11.0    18.3      7.117  |   I  O|       |       |       |      5.4
1279    11.0    18.2      7.107  |   I  O|       |       |       |      5.4
1280    11.0    18.0      7.097  |   I  O|       |       |       |      5.4
1281    11.0    17.8      7.087  |   I  O|       |       |       |      5.4
1282    11.0    17.7      7.078  |   I  O|       |       |       |      5.4
1283    11.0    17.5      7.069  |   I  O|       |       |       |      5.4
1284    11.0    17.4      7.060  |   I  O|       |       |       |      5.4
1285    11.0    17.2      7.051  |   I  O|       |       |       |      5.4
1286    11.0    17.1      7.043  |   I  O|       |       |       |      5.4
1287    11.0    16.9      7.035  |   I  O|       |       |       |      5.4
1288    11.0    16.8      7.027  |   I  O|       |       |       |      5.4
1289    11.0    16.7      7.019  |   I  O|       |       |       |      5.4
1290    11.0    16.5      7.011  |   I O |       |       |       |      5.4
1291    11.0    16.4      7.004  |   I O |       |       |       |      5.4
1292    10.0    16.2      6.995  |   I O |       |       |       |      5.3
1293    10.0    16.1      6.986  |   I O |       |       |       |      5.3
1294    10.0    16.0      6.978  |   I O |       |       |       |      5.3
1295    10.0    15.8      6.970  |   I O |       |       |       |      5.3
1296    10.0    15.7      6.962  |   I O |       |       |       |      5.3
1297    10.0    15.6      6.954  |   I O |       |       |       |      5.3
1298    10.0    15.4      6.947  |   I O |       |       |       |      5.3
1299    10.0    15.3      6.939  |   I O |       |       |       |      5.3
1300    10.0    15.2      6.932  |   I O |       |       |       |      5.3
1310    10.0    14.1      6.869  |   IO  |       |       |       |      5.2
1320     9.0    13.1      6.812  |  I O  |       |       |       |      5.2
1330     9.0    12.2      6.761  |  I O  |       |       |       |      5.2
1340     9.0    11.6      6.721  |  IO   |       |       |       |      5.1
1350     9.0    11.0      6.690  |  IO   |       |       |       |      5.1
1360     8.0    10.5      6.658  |  IO   |       |       |       |      5.1
1370     8.0    10.0      6.628  |  IO   |       |       |       |      5.1
1380     8.0     9.5      6.604  |  IO   |       |       |       |      5.0
1390     8.0     9.2      6.585  |  O    |       |       |       |      5.0
1400     8.0     9.0      6.570  |  O    |       |       |       |      5.0
1420     7.0     8.6      6.534  | IO    |       |       |       |      5.0
1440     7.0     8.4      6.492  | IO    |       |       |       |      4.9
1460     7.0     8.2      6.457  | IO    |       |       |       |      4.9
1500     7.0     7.8      6.393  | IO    |       |       |       |      4.9
```

Remaining water in basin = 6.39 (Ac.Ft)
Peak flow out of basin = 56.10(CFS)
Peak flow time = 1188 Min., time interval # = 74
Maximum depth in basin = 6.79(Ft.)

# APPENDIX H

# WATER QUALITY CAPTURE VOLUME

# Peak Flow Hydrologic Analysis

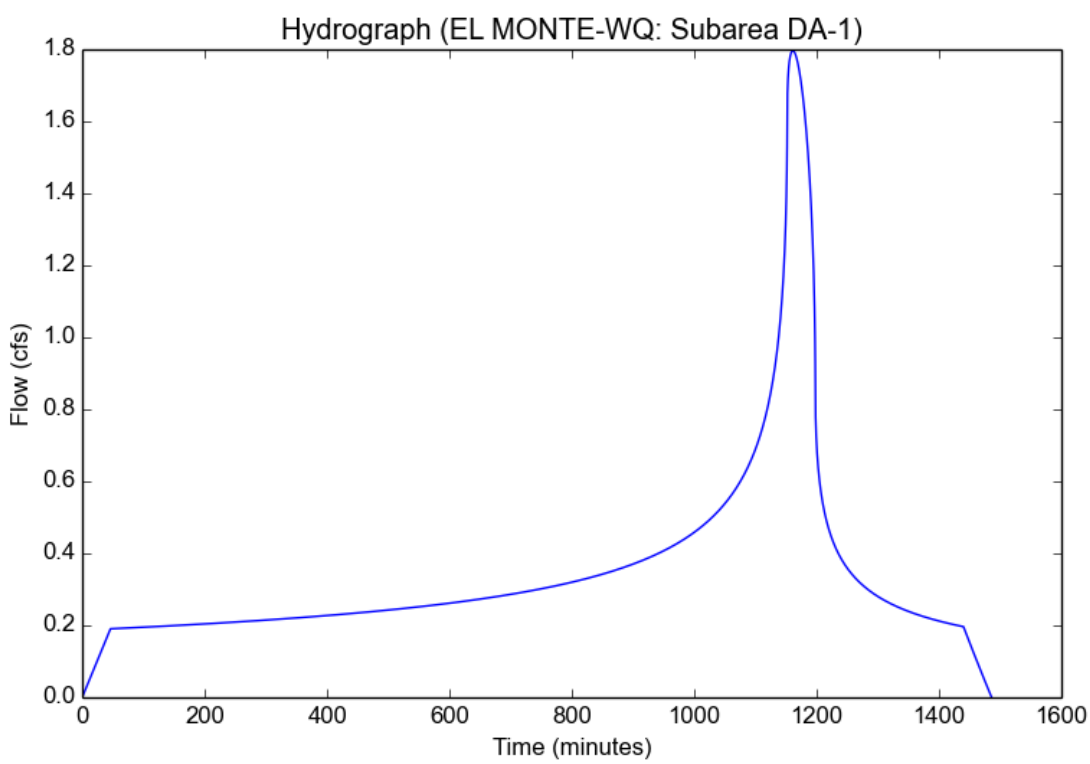
File location: L:/128-1 Goodman El Monte/WQMP/HYDROCALC/EL MONTE-WQ - Subarea DA-1.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE-WQ |
| Subarea ID | Subarea DA-1 |
| Area (ac) | 10.7 |
| Flow Path Length (ft) | 1157.0 |
| Flow Path Slope (vft/hft) | 0.007 |
| 85th Percentile Rainfall Depth (in) | 0.92 |
| Percent Impervious | 0.96 |
| Soil Type | 3 |
| Design Storm Frequency | 85th percentile storm |
| Fire Factor | 0 |
| LID | True |

## Output Results

| | |
|---|---|
| Modeled (85th percentile storm) Rainfall Depth (in) | 0.92 |
| Peak Intensity (in/hr) | 0.1934 |
| Undeveloped Runoff Coefficient (Cu) | 0.1 |
| Developed Runoff Coefficient (Cd) | 0.868 |
| Time of Concentration (min) | 46.0 |
| Clear Peak Flow Rate (cfs) | 1.7964 |
| Burned Peak Flow Rate (cfs) | 1.7964 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.7062 X 1.5=1.06 |
| 24-Hr Clear Runoff Volume (cu-ft) | 30761.3703 X 1.5=46142 |



# Peak Flow Hydrologic Analysis

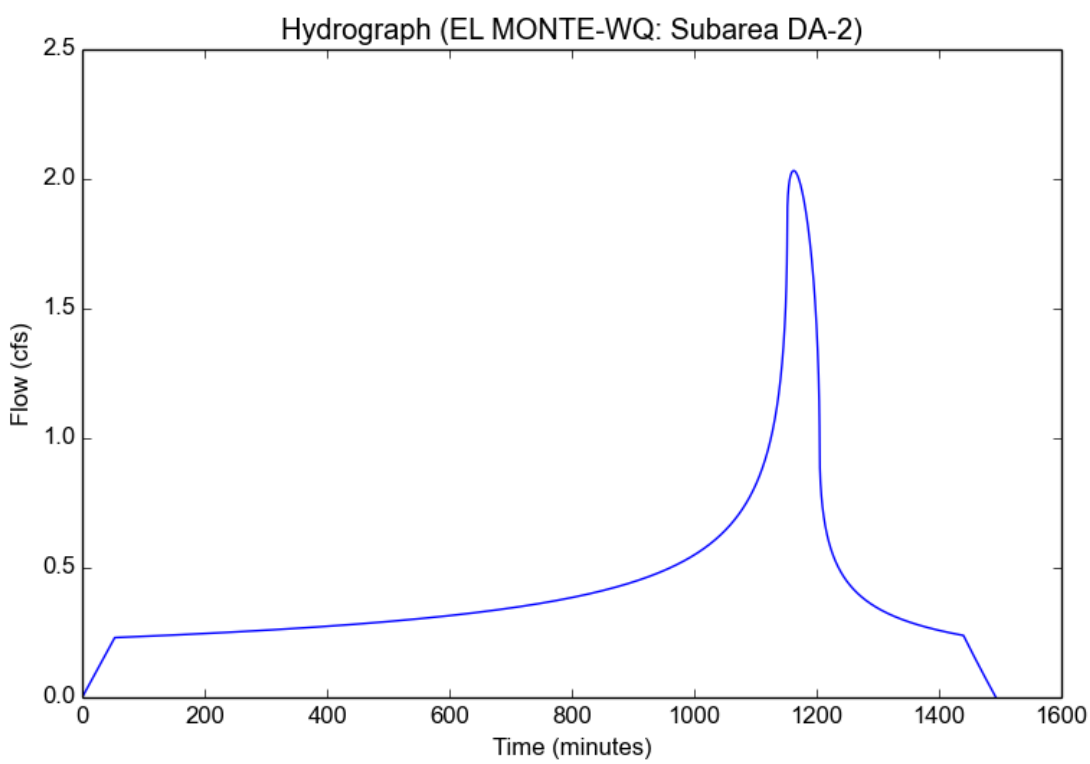
File location: L:/128-1 Goodman El Monte/WQMP/HYDROCALC/EL MONTE-WQ - Subarea DA-2.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE-WQ |
| Subarea ID | Subarea DA-2 |
| Area (ac) | 13.18 |
| Flow Path Length (ft) | 1505.0 |
| Flow Path Slope (vft/hft) | 0.009 |
| 85th Percentile Rainfall Depth (in) | 0.92 |
| Percent Impervious | 0.94 |
| Soil Type | 3 |
| Design Storm Frequency | 85th percentile storm |
| Fire Factor | 0 |
| LID | True |

## Output Results

| | |
|---|---|
| Modeled (85th percentile storm) Rainfall Depth (in) | 0.92 |
| Peak Intensity (in/hr) | 0.181 |
| Undeveloped Runoff Coefficient (Cu) | 0.1 |
| Developed Runoff Coefficient (Cd) | 0.852 |
| Time of Concentration (min) | 53.0 |
| Clear Peak Flow Rate (cfs) | 2.0321 |
| Burned Peak Flow Rate (cfs) | 2.0321 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.8538 X 1.5=1.28 |
| 24-Hr Clear Runoff Volume (cu-ft) | 37192.9934 X 1.5=55790 |



# Peak Flow Hydrologic Analysis

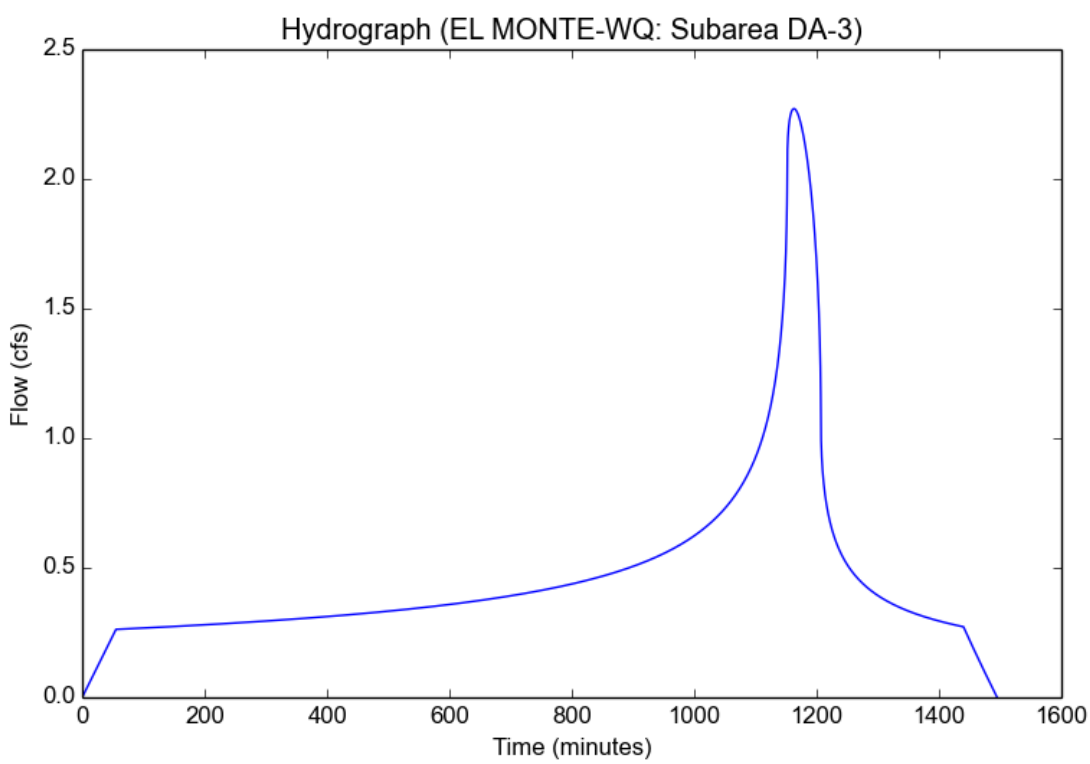
File location: L:/128-1 Goodman El Monte/WQMP/HYDROCALC/EL MONTE-WQ - Subarea DA-3.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE-WQ |
| Subarea ID | Subarea DA-3 |
| Area (ac) | 14.85 |
| Flow Path Length (ft) | 1676.0 |
| Flow Path Slope (vft/hft) | 0.01 |
| 85th Percentile Rainfall Depth (in) | 0.92 |
| Percent Impervious | 0.95 |
| Soil Type | 3 |
| Design Storm Frequency | 85th percentile storm |
| Fire Factor | 0 |
| LID | True |

## Output Results

| | |
|---|---|
| Modeled (85th percentile storm) Rainfall Depth (in) | 0.92 |
| Peak Intensity (in/hr) | 0.1778 |
| Undeveloped Runoff Coefficient (Cu) | 0.1 |
| Developed Runoff Coefficient (Cd) | 0.86 |
| Time of Concentration (min) | 55.0 |
| Clear Peak Flow Rate (cfs) | 2.2712 |
| Burned Peak Flow Rate (cfs) | 2.2712 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.9711 X 1.5=1.46 |
| 24-Hr Clear Runoff Volume (cu-ft) | 42299.2113 X 1.5=63449 |



# Peak Flow Hydrologic Analysis

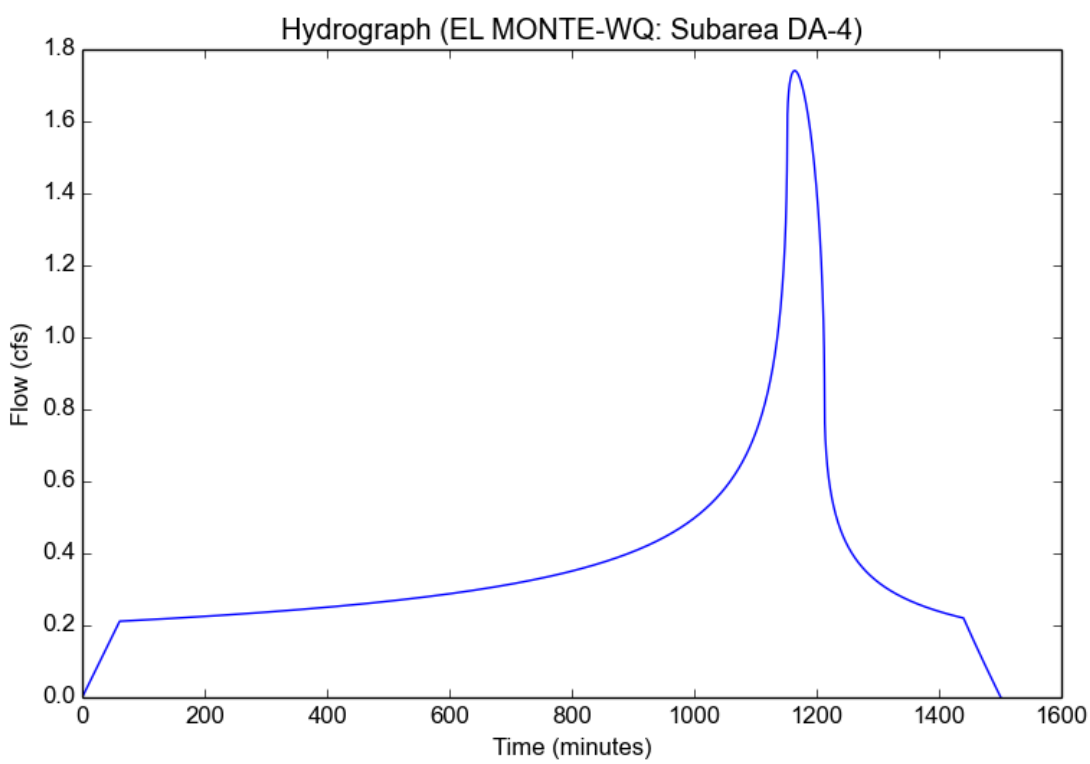
File location: L:/128-1 Goodman El Monte/WQMP/HYDROCALC/EL MONTE-WQ - Subarea DA-4.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE-WQ |
| Subarea ID | Subarea DA-4 |
| Area (ac) | 14.04 |
| Flow Path Length (ft) | 1671.0 |
| Flow Path Slope (vft/hft) | 0.011 |
| 85th Percentile Rainfall Depth (in) | 0.92 |
| Percent Impervious | 0.79 |
| Soil Type | 3 |
| Design Storm Frequency | 85th percentile storm |
| Fire Factor | 0 |
| LID | True |

## Output Results

| | |
|---|---|
| Modeled (85th percentile storm) Rainfall Depth (in) | 0.92 |
| Peak Intensity (in/hr) | 0.1694 |
| Undeveloped Runoff Coefficient (Cu) | 0.1 |
| Developed Runoff Coefficient (Cd) | 0.732 |
| Time of Concentration (min) | 61.0 |
| Clear Peak Flow Rate (cfs) | 1.7409 |
| Burned Peak Flow Rate (cfs) | 1.7409 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.7815 X 1.5=1.17 |
| 24-Hr Clear Runoff Volume (cu-ft) | 34040.0005 X 1.5=51060 |



# Peak Flow Hydrologic Analysis

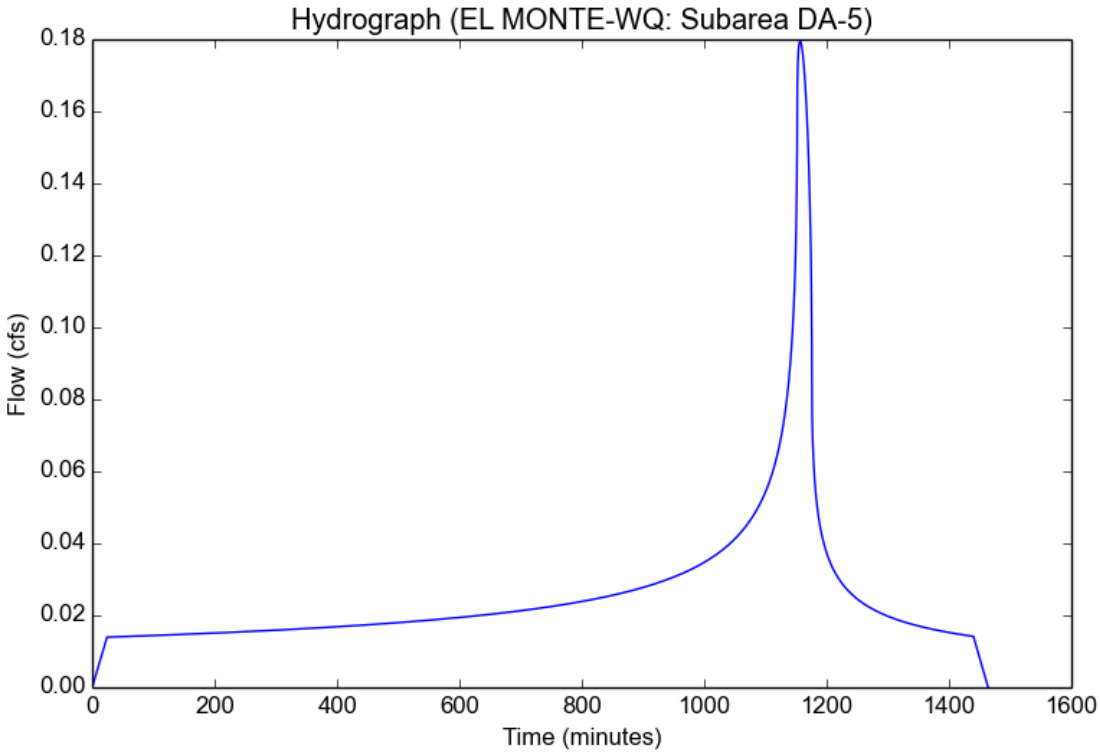
File location: L:/128-1 Goodman El Monte/WQMP/HYDROCALC/EL MONTE-WQ - Subarea DA-5.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE-WQ |
| Subarea ID | Subarea DA-5 |
| Area (ac) | 0.85 |
| Flow Path Length (ft) | 385.0 |
| Flow Path Slope (vft/hft) | 0.008 |
| 85th Percentile Rainfall Depth (in) | 0.92 |
| Percent Impervious | 0.88 |
| Soil Type | 3 |
| Design Storm Frequency | 85th percentile storm |
| Fire Factor | 0 |
| LID | True |

## Output Results

| | |
|---|---|
| Modeled (85th percentile storm) Rainfall Depth (in) | 0.92 |
| Peak Intensity (in/hr) | 0.2626 |
| Undeveloped Runoff Coefficient (Cu) | 0.1 |
| Developed Runoff Coefficient (Cd) | 0.804 |
| Time of Concentration (min) | 24.0 |
| Clear Peak Flow Rate (cfs) | 0.1795 |
| Burned Peak Flow Rate (cfs) | 0.1795 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.052 **X 1.5=0.078** |
| 24-Hr Clear Runoff Volume (cu-ft) | 2263.4374 **X 1.5=3395** |



# Peak Flow Hydrologic Analysis

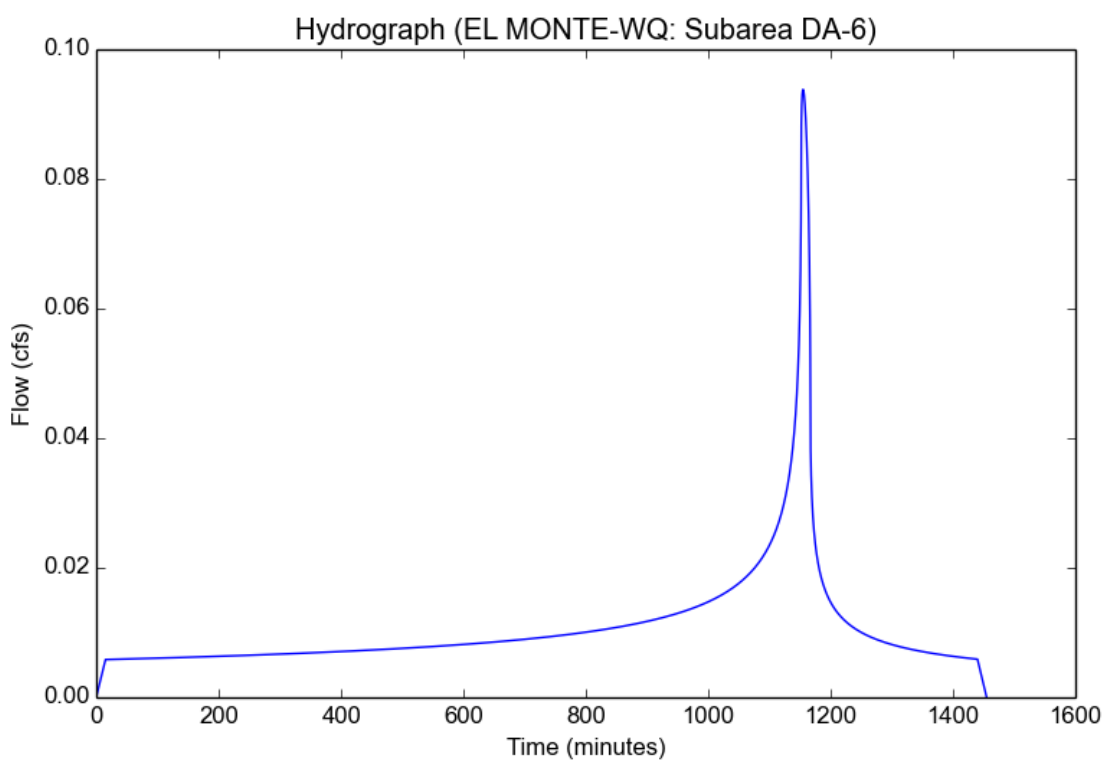
File location: L:/128-1 Goodman El Monte/WQMP/HYDROCALC/EL MONTE-WQ - Subarea DA-6.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE-WQ |
| Subarea ID | Subarea DA-6 |
| Area (ac) | 0.33 |
| Flow Path Length (ft) | 268.0 |
| Flow Path Slope (vft/hft) | 0.019 |
| 85th Percentile Rainfall Depth (in) | 0.92 |
| Percent Impervious | 0.96 |
| Soil Type | 3 |
| Design Storm Frequency | 85th percentile storm |
| Fire Factor | 0 |
| LID | True |

## Output Results

| | |
|---|---|
| Modeled (85th percentile storm) Rainfall Depth (in) | 0.92 |
| Peak Intensity (in/hr) | 0.3275 |
| Undeveloped Runoff Coefficient (Cu) | 0.1 |
| Developed Runoff Coefficient (Cd) | 0.868 |
| Time of Concentration (min) | 15.0 |
| Clear Peak Flow Rate (cfs) | 0.0938 |
| Burned Peak Flow Rate (cfs) | 0.0938 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.0218 X 1.5=0.033 |
| 24-Hr Clear Runoff Volume (cu-ft) | 948.692 X 1.5=1424 |

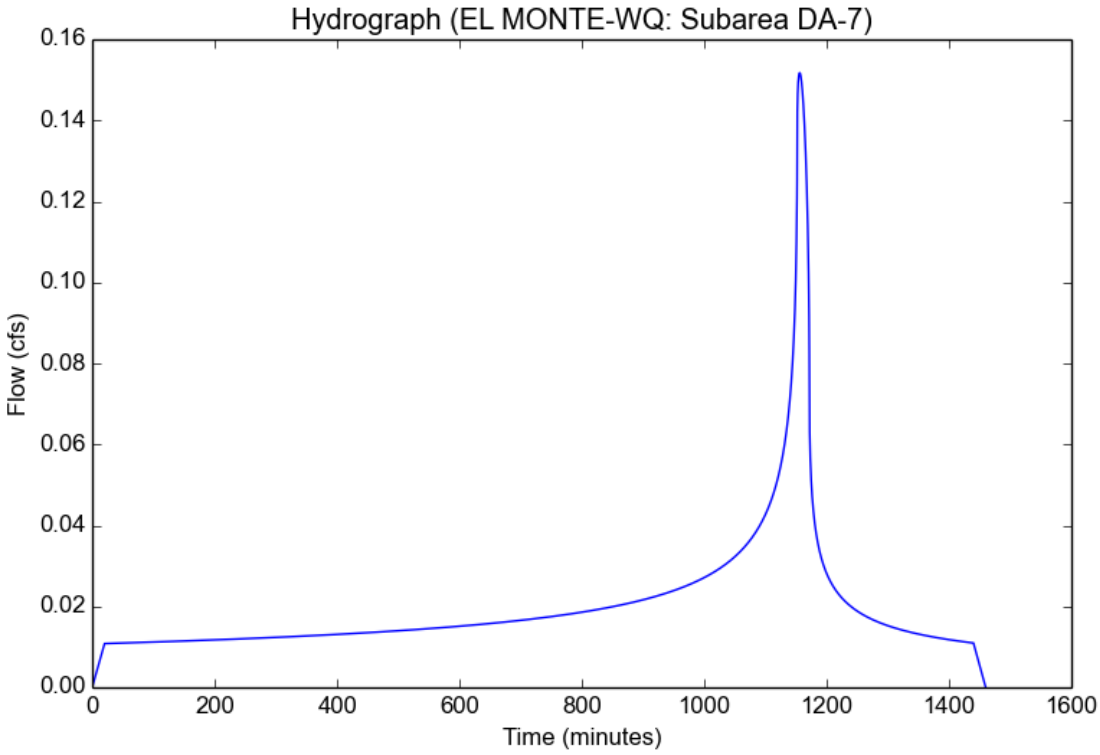


# Peak Flow Hydrologic Analysis

File location: L:/128-1 Goodman El Monte/WQMP/HYDROCALC/EL MONTE-WQ - Subarea DA-7.pdf
Version: HydroCalc 0.3.1

## Input Parameters

| | |
|---|---|
| Project Name | EL MONTE-WQ |
| Subarea ID | Subarea DA-7 |
| Area (ac) | 0.68 |
| Flow Path Length (ft) | 358.0 |
| Flow Path Slope (vft/hft) | 0.017 |
| 85th Percentile Rainfall Depth (in) | 0.92 |
| Percent Impervious | 0.85 |
| Soil Type | 3 |
| Design Storm Frequency | 85th percentile storm |
| Fire Factor | 0 |
| LID | True |

## Output Results

| | |
|---|---|
| Modeled (85th percentile storm) Rainfall Depth (in) | 0.92 |
| Peak Intensity (in/hr) | 0.2861 |
| Undeveloped Runoff Coefficient (Cu) | 0.1 |
| Developed Runoff Coefficient (Cd) | 0.78 |
| Time of Concentration (min) | 20.0 |
| Clear Peak Flow Rate (cfs) | 0.1517 |
| Burned Peak Flow Rate (cfs) | 0.1517 |
| 24-Hr Clear Runoff Volume (ac-ft) | 0.0403 X 1.5=0.060 |
| 24-Hr Clear Runoff Volume (cu-ft) | 1756.6937 X 1.5=2636 |