DRAINAGE STUDY
FOR
ARE – SCRIPPS HQ PROJECT

Job Number 19276

July 9, 2021

DRAINAGE STUDY

FOR

ARE – SCRIPPS HQ PROJECT

Job Number 19276

Carson Edgington, P.E.
R.C.E. #76519
Exp. 12/22

Prepared For:

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July 9, 2021

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1.0 INTRODUCTION

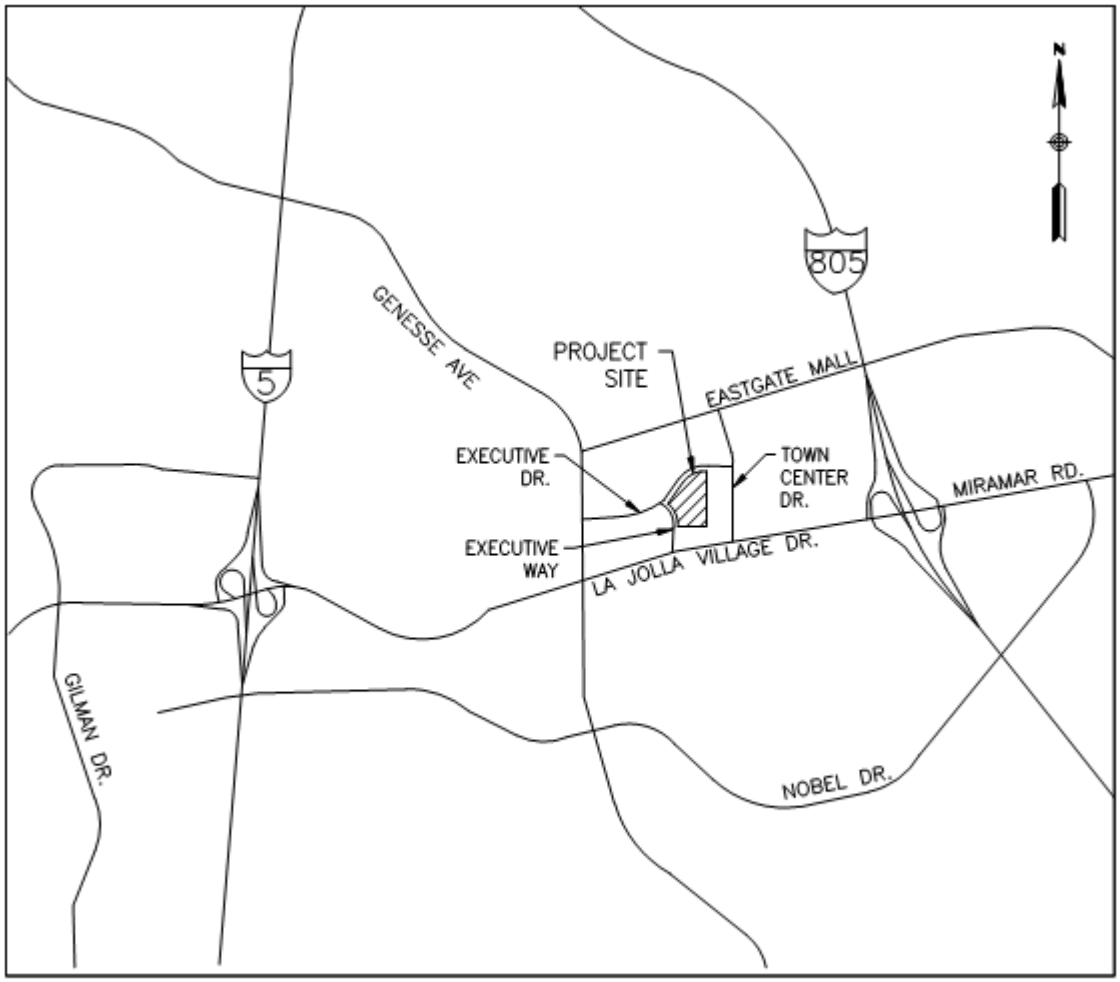
1.1 Project Description

This design report summarizes hydrologic and hydraulic analyses for the proposed ARE - Scripps HQ Project (herein referred to as the "project"). The project is located within the City of San Diego in the University Town Center community, at the south-east corner of Executive Drive and Executive Way. For the location of the project see Figure 1, Vicinity Map, located at the end of Section 1.0. The proposed redevelopment encompasses approximately 3.7 acres and consists of a 5-story Office Headquarters office building, an underground parking structure spaces, a separate parking structure, outdoor amenity areas, landscaped green spaces and associated surface improvements.

1.2 Water Quality

The project will include Low Impact Development (LID) Site Design, Source Control, Pollutant Control and Hydromodification Management Best Management Practices (BMPs), designed pursuant to the guidelines of the City of San Diego Storm Water Standards, dated October 1, 2018 (herein referred to as the "Storm Water Standards") to achieve water quality treatment and hydromodification management. Please refer to the report titled, "Priority Development Project (PDP) Storm Water Quality Management Plan (SWQMP): ARE - Scripps HQ," dated July 9, 2021 (or any revisions thereafter), prepared by Rick Engineering Company (Job No. 19276), for more information on storm water quality requirements and post-construction BMPs.

Figure 1: Vicinity Map



VICINITY MAP

2.0 HYDROLOGY

Hydrologic conditions for the project area have been analyzed for both pre-project and post-project conditions.

2.1 Methodology

The City of San Diego Drainage Design Manual, dated January 2017 requires that the Rational Method be used for hydrologic analysis of a watershed up to but not exceeding 1.0 square-mile (640 acres). The Rational Method computer program developed by Advanced Engineering Software (AES 2003) was used for this study because it satisfies the City of San Diego's design criteria.

2.2 AES Rational Method Computer Model

The AES hydrologic model is developed by creating independent node-link models of each interior drainage basin and linking these sub-models together at confluence points. The AES program has the capability to perform calculations for 15 hydrologic processes. These processes are assigned code numbers that appear in the results. The code numbers and their significance are as follows:

Subarea Hydrologic Processes (Codes)

Code 1:	Confluence analysis at node
Code 2:	Initial subarea analysis
Code 3:	Pipe flow travel time (computer-estimate pipe sizes)
Code 4:	Pipe flow travel time (user-specified pipe size)
Code 5:	Trapezoidal channel travel time
Code 6:	Street flow analysis through a subarea
Code 7:	User-specified information at a node
Code 8:	Addition of the subarea runoff to mainline
Code 9:	V-Gutter flow through subarea
Code 10:	Copy mainstream data onto memory bank
Code 11:	Confluence a memory bank with the mainstream memory

Code 12: Clear a memory bank

Code 13: Clear the mainstream memory

Code 14: Copy a memory bank onto the mainstream memory

Code 15: Hydrologic data bank storage functions

In order to perform the hydrologic analysis; base information for the study area is required. This information includes the existing drainage facility locations and sizes, existing land uses, flow patterns, drainage basin boundaries, and topographic elevations. Drainage basin boundaries, flow patterns, and topographic elevations are shown on the drainage exhibits located in the map pockets.

2.3 Design Criteria

The hydrologic conditions were analyzed in accordance with the City of San Diego's design criteria as follows:

Design Storm:	50-year
Runoff Coefficients [(1)]:	
Asphalt/Concrete	C = 0.95
Undisturbed, Natural Terrain	C = 0.45
Soil Type:	D
Rainfall Intensity:	Based on time-intensity criteria per City of San Diego

(1) Weighted runoff coefficients were calculated as required in in Section A.1.2 - Runoff Coefficient of the City of San Diego Drainage Design Manual (January 2017)

2.4 Hydrologic Results

The results of the Modified Rational Method analysis for the pre- and post-project are provided in Appendix A and B of this report respectively. Please refer to the Drainage Study Maps in Map Pockets 1 and 2 for the drainage area boundaries, nodes, and areas used in the Modified Rational Method analysis for pre-project and post-project conditions, respectively. A summary of the hydrologic results is provided below in Table 1.

Table 1: Summary of Hydrologic Results

Points of Interest (POI)/ Node Number	Pre-Project			Post-Project		
	Area (acres)	Tc (minutes)	Peak Flow, Q_{100} (cfs)	Area (acres)	Tc (minutes)	Peak Flow, Q_{100} (cfs)
BASIN 1: POI-1 (Node 105/1006)	1.44	10.20	3.69	1.47	7.66	3.54
BASIN 2: POI-2 (Node 206/2006)	2.31	15.70	5.49	2.48	13.02	5.91

Notes:

1) In the Pre-Project condition, the existing 18" RCP pipe in Executive Drive between Nodes 205-206 conveys 2.31 acres.

2) In the Post-Project condition, the existing 18" RCP pipe in Executive Drive between Nodes 205-206 conveys 2.48 acres and a higher flow rate when compared to the pre-project condition. The increased flow rate is 0.41 cfs, however, see the enclosed hydraulic calculations which validate that the existing pipe will not be under pressure flow since the anticipated normal depth is 11.3 inches within the 18-inch diameter pipe.

Pre-Project Condition

The project site consists of an existing building complex, formerly housing the San Diego Braille Institute. The facility is completely developed with walkways, outdoor courtyards, a smaller building, and parking lots on both the north and south ends of the project site. Two existing driveways provide access into the site off Executive Way on the south and Executive Drive on the north. The Project site (on-site area) is approximately 4.0 acres.

In the pre-project condition, the project site has two major drainage basins namely, Basin 1 and Basin 2. Basin 1 encompasses the westerly and some of the northerly portions of the project site, which generally flow to the northwest via the curb gutter in Executive Way, and the curb gutter in Executive Drive. This confluence point is depicted as Node 105 on the Drainage Study Map and

as point of interest (POI-1) in the summary table above. Ultimately, the street gutter flows are collected into the existing public storm drain system in executive Drive, on the west side of the Executive Dr. and Executive Way intersection. The total basin area to POI-1 is 1.44 acres.

Also in the pre-project condition, Basin 2 encompasses the larger portion of the project site, mainly the southerly, easterly and remaining northerly portions of the project site. However, only 2.31 acres of the existing site is collected into the existing underground storm drain network, which is conveyed into an existing curb inlet at Node 205. The project flows are conveyed into the existing public storm drain in Executive Drive via an existing 18" RCP pipe between nodes 205 and 206. The remaining 0.23-acre area sheets flows into Executive Drive and flows easterly along the curb gutter. The total watershed area conveyed to POI-2 is 2.31 acres.

Ultimately, both existing public storm drains systems in Executive Drive discharge into the Pacific Ocean through Los Peñasquitos Creek. Relevant as-built drawings are included for reference purposes in Appendix E.

Post-Project Condition

The proposed condition consists of a proposed office commercial building complex, parking structure and associated landscaped amenity spaces and a surface parking lot. Access into the site will remain off Executive Way on the south and Executive Drive on the north. The Project site (on-site graded area) is approximately 3.7 acres.

In the post-project condition, the project site was designed to maintain the pre-project drainage patterns; the two major drainage basins are identified as, Basin 1 and Basin 2. Basin 1 encompasses the westerly portions of the project site, including about 60% off the proposed building's rooftop. These areas will be collected in an underground storm system and routed through a bio-filtration basin located on the south side of the proposed building. Some of the landscaped areas will continue to sheet flow towards Executive Way, and the northerly landscaped areas will continue to shset flow towards Executive Drive. The existing curb gutter outlet structure at Node 1005 will convey a slightly lower flow rate into the curb gutter in Executive Way. The point of interest (POI-1) is depicted as Node 1006 on the Drainage Study Map and in the summary table above. Ultimately, the street gutter flows are collected into the existing public storm drain system in

executive Drive, on the west side of the Executive Dr. and Executive Way intersection. In the Post-Project condition, the total basin area to POI-1 is 1.47 acres.

Also in the post-project condition, Basin 2 encompasses the larger portion of the project site, including the future parking structure, surface parking lot, and landscaped outdoor amenity areas, as well as the second bio-filtration basin. In this condition, 2.48 acres of the proposed site is collected into the proposed underground storm drain network which is the existing public storm drain in Executive Drive via the existing 18" RCP pipe between nodes 2005 and 2006. The remaining 0.04-acre area sheets flows into Executive Drive and flows easterly along the curb gutter. The total basin area to POI-2 is 2.48 acres.

Lastly, The project does not propose to impact any jurisdiction water, or wetlands. As such, it is anticipated that the project will not be subject to requirements under the Federal Clean Water Act (CWA) Section 401 or 404.

3.0 HYDRAULICS

3.1 Hydraulic Methodology and Criteria

The 50-year pre-project and post-project peak flow rates determined using the Modified Rational Method were used to evaluate the potential impacts to existing storm drain system due to the project improvements. The 50-year post-project peak flow rates were also used to size the onsite storm drain system.

3.2 Storm Drain Sizing

Pipe sizes were evaluated using Manning's equation:

$Q = (1.486/n) A R^{2/3} S^{1/2}$

Where:

Q = discharge (cfs)

n = Manning coefficient of roughness

A = Cross-sectional Area of flow (sq. ft.)

R = Hydraulic radius (ft.) = A/WP (WP = Wetted Perimeter)

S = Slope of pipe (ft./ft.)

The Manning's roughness coefficient "n" used for the hydraulic calculations for RCP is 0.013 and for PVC pipes it is 0.012. The pipe sizes were evaluated based on the AES rational method flow rates with a 30% bump up sizing factor.

3.3 Storm Drain Evaluation Results

Normal depth hydraulic calculations were performed to size the on-site (private) storm drain pipes, and a more detailed pipe flow/pipe hydraulic analysis was performed for the existing 18" RCP pipe in Executive Drive which we anticipate will convey an increased flow rate of 0.41 cfs when compared to the pre-project condition. The pipe flow calculations validate that the existing pipe will not be under pressure flow since the anticipated normal depth is 11.3 inches within the 18-inch diameter pipe. Refer to the pipe hydraulic calculations included in Appendix C for further details.

For the private storm drain system, the pipe sizes were evaluated based on the AES rational method peak flow rates with a 30% bump up sizing factor and an assumed minimum pipe slope of 0.5%. A summary of the performed normal depth hydraulic analyses is provided in Appendix C in the form of a sizing matrix table.

4.0 CONCLUSION

This drainage report presents the hydrologic and hydraulic calculations in support of the ARE - Scripps HQ project. The 50-year pre- and post-project condition hydrologic analyses have been performed for the total tributary area to two points of interests. The 50-year post-project peak flow rates were utilized to size the proposed drainage system. The peak discharge rates were determined using the Modified Rational Method based on the hydrologic methodology and criteria described in the City of San Diego, Drainage Design Manual January 2017 edition.

Existing storm drain capacities have been verified based on the post-project 50-year peak flow rates to evaluate potential impacts. The included hydrologic and hydraulic calculations quantify the change in runoff (between pre- and post-project) and verify the adequacy of the existing storm drain system, including the existing 18" RCP in Executive Drive. Normal Depth hydraulic calculations were performed to size the onsite storm drain system. Since, the project has been designed to improve the collection and conveyance of storm water runoff within the project limits and the difference in the pre- and post-project 50-year peak flow (less than 1 cfs) is minimal, the project is not anticipated to result in any adverse impacts to downstream drainage facilities or adjacent properties. The project proposes on-site bio-filtration basins for Basin 1 and Basin 2.

Post-project runoff will be treated via a network of storm water management features, designed pursuant to the guidelines of the City of San Diego Storm Water Standards, dated October 1, 2018. Please refer to the report titled, "Priority Development Project (PDP) Storm Water Quality Management Plan (SWQMP): ARE - Scripps HQ," dated July 9, 2021 (or any revisions thereafter), prepared by Rick Engineering Company (Job No. 19276), for more information on storm water quality requirements and post-construction BMPs.

APPENDIX A

Modified Rational Method Analyses (50-year, 6-hour)
[Pre-Project]

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**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1261

                              Analysis prepared by:

                            RICK ENGINEERING COMPANY
                                5620 Friars Road
                             San Diego, California 92110
                           619-291-0707   Fax 619-291-4165

 ************************** DESCRIPTION OF STUDY **************************
 JN 19276 – ARE SCRIPPS HQ PROJECT
 4555 EXECUTIVE DR., SAN DIEGO, CA 92121
 PRE-PROJECT CONDITION (BASIN 100)
 **************************************************************************

  FILE NAME: C:\RCV\EX501.DAT
  TIME/DATE OF STUDY: 06:48 07/13/2021
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  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

  USER SPECIFIED STORM EVENT(YEAR) =  50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   4.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150
  2   20.0     15.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0180

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  1.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint = 10.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   117.00
  UPSTREAM ELEVATION(FEET) =    406.00
```

```
  DOWNSTREAM ELEVATION(FEET) =    401.20
  ELEVATION DIFFERENCE(FEET) =      4.80
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.041
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  TIME OF CONCENTRATION ASSUMED AS 6-MIN.
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.910
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    400.20  DOWNSTREAM(FEET) =    399.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =    86.00   CHANNEL SLOPE =  0.0070
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  90.000
  MANNING'S FACTOR = 0.020   MAXIMUM DEPTH(FEET) =   0.67
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.490
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.59
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   2.44
  Tc(MIN.) =    8.44
  SUBAREA AREA(ACRES) =     0.14       SUBAREA RUNOFF(CFS) =    0.29
  TOTAL AREA(ACRES) =        0.2         PEAK FLOW RATE(CFS) =       0.63

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   0.64
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     203.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   399.60  DOWNSTREAM(FEET) =   397.10
  FLOW LENGTH(FEET) =   178.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   4.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.94
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.63
  PIPE TRAVEL TIME(MIN.) =   0.75    Tc(MIN.) =    9.19
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     381.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.374
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.29   SUBAREA RUNOFF(CFS) =    0.83
```

```
  TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       1.46
  TC(MIN.) =    9.19

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    397.10  DOWNSTREAM(FEET) =    395.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =    15.00   CHANNEL SLOPE =  0.0933
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.023   MAXIMUM DEPTH(FEET) =   0.25
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.46
  FLOW VELOCITY(FEET/SEC.) =   4.27   FLOW DEPTH(FEET) =   0.11
  TRAVEL TIME(MIN.) =   0.06   Tc(MIN.) =    9.25
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     396.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.10 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.367
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.37   SUBAREA RUNOFF(CFS) =    1.06
  TOTAL AREA(ACRES) =        0.9   TOTAL RUNOFF(CFS) =       2.52
  TC(MIN.) =    9.25

****************************************************************************
  FLOW PROCESS FROM NODE    104.20 TO NODE    104.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.367
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.15   SUBAREA RUNOFF(CFS) =    0.30
  TOTAL AREA(ACRES) =        1.0   TOTAL RUNOFF(CFS) =       2.82
  TC(MIN.) =    9.25

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    395.70  DOWNSTREAM(FEET) =    393.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =   118.00   CHANNEL SLOPE =  0.0153
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.023   MAXIMUM DEPTH(FEET) =   0.40
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.82
  FLOW VELOCITY(FEET/SEC.) =   2.07   FLOW DEPTH(FEET) =   0.13
  TRAVEL TIME(MIN.) =   0.95   Tc(MIN.) =   10.20
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =     514.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE    105.10 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.238
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.17   SUBAREA RUNOFF(CFS) =    0.33
  TOTAL AREA(ACRES) =        1.2   TOTAL RUNOFF(CFS) =       3.15
  TC(MIN.) =   10.20

****************************************************************************
  FLOW PROCESS FROM NODE    105.20 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.238
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.11   SUBAREA RUNOFF(CFS) =    0.30
  TOTAL AREA(ACRES) =        1.3   TOTAL RUNOFF(CFS) =       3.45
  TC(MIN.) =   10.20

****************************************************************************
  FLOW PROCESS FROM NODE    105.30 TO NODE    105.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.238
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.12   SUBAREA RUNOFF(CFS) =    0.23
  TOTAL AREA(ACRES) =        1.4   TOTAL RUNOFF(CFS) =       3.69
  TC(MIN.) =   10.20
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.4  TC(MIN.) =     10.20
  PEAK FLOW RATE(CFS)   =       3.69
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1261

                             Analysis prepared by:

                            RICK ENGINEERING COMPANY
                                5620 Friars Road
                              San Diego, California 92110
                           619-291-0707   Fax 619-291-4165

 ************************** DESCRIPTION OF STUDY **************************
 JN 19276 – ARE SCRIPPS HQ PROJECT
 4555 EXECUTIVE DR., SAN DIEGO, CA 92121
 PRE-PROJECT CONDITION (BASIN 200)
 ************************************************************************

  FILE NAME: C:\RCV\EX50.DAT
  TIME/DATE OF STUDY: 16:45 01/25/2021
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  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

  USER SPECIFIED STORM EVENT(YEAR) =  50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   4.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150
  2   20.0     15.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0180

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  1.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint = 10.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   117.00
  UPSTREAM ELEVATION(FEET) =    406.00
```

```
  DOWNSTREAM ELEVATION(FEET) =    401.20
  ELEVATION DIFFERENCE(FEET) =      4.80
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.041
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  TIME OF CONCENTRATION ASSUMED AS 6-MIN.
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.910
  SUBAREA RUNOFF(CFS) =      0.66
  TOTAL AREA(ACRES) =      0.20   TOTAL RUNOFF(CFS) =      0.66

****************************************************************************
  FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    401.20  DOWNSTREAM(FEET) =    400.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =   301.00   CHANNEL SLOPE =  0.0017
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  90.000
  MANNING'S FACTOR = 0.020   MAXIMUM DEPTH(FEET) =   0.67
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.703
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.55
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   9.19
  Tc(MIN.) =   15.19
  SUBAREA AREA(ACRES) =     0.81       SUBAREA RUNOFF(CFS) =    1.86
  TOTAL AREA(ACRES) =        1.0         PEAK FLOW RATE(CFS) =       2.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.13   FLOW VELOCITY(FEET/SEC.) =   0.63
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =     418.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.703
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.64   SUBAREA RUNOFF(CFS) =    1.47
  TOTAL AREA(ACRES) =        1.6   TOTAL RUNOFF(CFS) =       4.00
  TC(MIN.) =   15.19

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   394.80  DOWNSTREAM(FEET) =   393.90
  FLOW LENGTH(FEET) =    83.00   MANNING'S N =  0.012
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.09
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =       4.00
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =   15.46
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    203.00 =     501.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.679
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.16   SUBAREA RUNOFF(CFS) =    0.36
  TOTAL AREA(ACRES) =        1.8   TOTAL RUNOFF(CFS) =       4.36
  TC(MIN.) =   15.46

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   393.90  DOWNSTREAM(FEET) =   392.70
  FLOW LENGTH(FEET) =    59.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.44
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.36
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   15.59
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    204.00 =     560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    204.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.667
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.41   SUBAREA RUNOFF(CFS) =    0.93
  TOTAL AREA(ACRES) =        2.2   TOTAL RUNOFF(CFS) =       5.29
  TC(MIN.) =   15.59

****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    205.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   392.70  DOWNSTREAM(FEET) =   391.60
  FLOW LENGTH(FEET) =    52.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.74
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.29
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   15.70
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    205.00 =     612.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    205.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.657
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.09   SUBAREA RUNOFF(CFS) =    0.20
  TOTAL AREA(ACRES) =        2.3   TOTAL RUNOFF(CFS) =       5.49
  TC(MIN.) =   15.70

****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    206.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   391.60  DOWNSTREAM(FEET) =   385.60
  FLOW LENGTH(FEET) =    85.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.53
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.49
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   15.82
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    206.00 =     697.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    206.10 TO NODE    206.10 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.647
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.10   SUBAREA RUNOFF(CFS) =    0.16
  TOTAL AREA(ACRES) =        2.4   TOTAL RUNOFF(CFS) =       5.65
  TC(MIN.) =   15.82

****************************************************************************
  FLOW PROCESS FROM NODE    206.20 TO NODE    206.20 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.647
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =  92
  SUBAREA AREA(ACRES) =    0.13   SUBAREA RUNOFF(CFS) =    0.21
  TOTAL AREA(ACRES) =        2.5   TOTAL RUNOFF(CFS) =       5.86
  TC(MIN.) =   15.82
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        2.5  TC(MIN.) =     15.82
  PEAK FLOW RATE(CFS)   =       5.86
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX B

Modified Rational Method Analyses (50-year, 6-hour)
[Post-Project]

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1261

                              Analysis prepared by:

                            RICK ENGINEERING COMPANY
                                5620 Friars Road
                             San Diego, California 92110
                           619-291-0707   Fax 619-291-4165

 ************************** DESCRIPTION OF STUDY **************************
 JN 19276 – ARE SCRIPPS HQ PROJECT
 4555 EXECUTIVE DR., SAN DIEGO, CA 92121
 POST-PROJECT CONDITION (BASIN 1000)
 **************************************************************************

  FILE NAME: C:\RCV\DEV501.DAT
  TIME/DATE OF STUDY: 07:39 07/14/2021
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

  USER SPECIFIED STORM EVENT(YEAR) =  50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   4.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150
  2   20.0     15.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0180

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  1.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint = 10.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   1000.00 TO NODE   1001.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    404.00
```

```
  DOWNSTREAM ELEVATION(FEET) =    403.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.500
  TIME OF CONCENTRATION ASSUMED AS 6-MIN.
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.910
  SUBAREA RUNOFF(CFS) =      1.30
  TOTAL AREA(ACRES) =      0.39   TOTAL RUNOFF(CFS) =      1.30

****************************************************************************
  FLOW PROCESS FROM NODE   1001.00 TO NODE   1002.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   400.00  DOWNSTREAM(FEET) =   399.84
  FLOW LENGTH(FEET) =    18.90   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.98
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.30
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    6.08
  LONGEST FLOWPATH FROM NODE   1000.00 TO NODE   1002.00 =     118.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1002.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.895
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
  SUBAREA AREA(ACRES) =    0.14   SUBAREA RUNOFF(CFS) =    0.33
  TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       1.62
  TC(MIN.) =    6.08

****************************************************************************
  FLOW PROCESS FROM NODE   1002.00 TO NODE   1003.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   399.84  DOWNSTREAM(FEET) =   399.65
  FLOW LENGTH(FEET) =    22.83   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.23
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.62
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    6.17
  LONGEST FLOWPATH FROM NODE   1000.00 TO NODE   1003.00 =     141.73 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1003.00 TO NODE   1003.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.17
  RAINFALL INTENSITY(INCH/HR) =   3.88
```

```
  TOTAL STREAM AREA(ACRES) =     0.53
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.62

****************************************************************************
  FLOW PROCESS FROM NODE   1100.00 TO NODE   1101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    75.00
  UPSTREAM ELEVATION(FEET) =    404.10
  DOWNSTREAM ELEVATION(FEET) =    401.50
  ELEVATION DIFFERENCE(FEET) =      2.60
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    5.150
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  TIME OF CONCENTRATION ASSUMED AS 6-MIN.
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.910
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   1101.00 TO NODE   1003.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    401.50  DOWNSTREAM(FEET) =    399.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =    35.00   CHANNEL SLOPE =  0.0600
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =  40.000
  MANNING'S FACTOR = 0.020   MAXIMUM DEPTH(FEET) =   0.50
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.832
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.42
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   0.41
  Tc(MIN.) =    6.41
  SUBAREA AREA(ACRES) =     0.16       SUBAREA RUNOFF(CFS) =    0.37
  TOTAL AREA(ACRES) =        0.2         PEAK FLOW RATE(CFS) =       0.49

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.78
  LONGEST FLOWPATH FROM NODE   1100.00 TO NODE   1003.00 =     110.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1003.00 TO NODE   1003.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.41
  RAINFALL INTENSITY(INCH/HR) =   3.83
  TOTAL STREAM AREA(ACRES) =     0.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.49
```

```
  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.62     6.17        3.878          0.53
      2        0.49     6.41        3.832          0.21

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        2.10     6.17       3.878
      2        2.09     6.41       3.832

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.10   Tc(MIN.) =    6.17
  TOTAL AREA(ACRES) =        0.7
  LONGEST FLOWPATH FROM NODE   1000.00 TO NODE   1003.00 =     141.73 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1003.00 TO NODE   1004.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   396.18  DOWNSTREAM(FEET) =   395.82
  FLOW LENGTH(FEET) =   108.71   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.06
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.10
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =    6.76
  LONGEST FLOWPATH FROM NODE   1000.00 TO NODE   1004.00 =     250.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1004.10 TO NODE   1004.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.766
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
  SUBAREA AREA(ACRES) =    0.08   SUBAREA RUNOFF(CFS) =    0.18
  TOTAL AREA(ACRES) =        0.8   TOTAL RUNOFF(CFS) =       2.28
  TC(MIN.) =    6.76

****************************************************************************
  FLOW PROCESS FROM NODE   1004.20 TO NODE   1004.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.766
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  SUBAREA AREA(ACRES) =    0.14   SUBAREA RUNOFF(CFS) =    0.24
  TOTAL AREA(ACRES) =        1.0   TOTAL RUNOFF(CFS) =       2.52
```

```
  TC(MIN.) =    6.76

****************************************************************************
  FLOW PROCESS FROM NODE   1004.00 TO NODE   1005.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    395.82  DOWNSTREAM(FEET) =    395.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =    10.00   CHANNEL SLOPE =  0.0320
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   1.000
  MANNING'S FACTOR = 0.023   MAXIMUM DEPTH(FEET) =   0.25
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.52
  FLOW VELOCITY(FEET/SEC.) =   3.76   FLOW DEPTH(FEET) =   0.21
  TRAVEL TIME(MIN.) =   0.04   Tc(MIN.) =    6.80
  LONGEST FLOWPATH FROM NODE   1000.00 TO NODE   1005.00 =     260.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1005.00 TO NODE   1005.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.80
  RAINFALL INTENSITY(INCH/HR) =   3.76
  TOTAL STREAM AREA(ACRES) =     0.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.52

****************************************************************************
  FLOW PROCESS FROM NODE   1200.00 TO NODE   1201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    40.00
  UPSTREAM ELEVATION(FEET) =    397.50
  DOWNSTREAM ELEVATION(FEET) =    396.90
  ELEVATION DIFFERENCE(FEET) =      0.60
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.486
  TIME OF CONCENTRATION ASSUMED AS 6-MIN.
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.910
  SUBAREA RUNOFF(CFS) =      0.10
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.10

****************************************************************************
  FLOW PROCESS FROM NODE   1201.00 TO NODE   1201.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.910
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .6000
  S.C.S. CURVE NUMBER (AMC II) =   0
  SUBAREA AREA(ACRES) =    0.21   SUBAREA RUNOFF(CFS) =    0.49
  TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       0.59
  TC(MIN.) =    6.00
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   1201.00 TO NODE   1005.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    396.50  DOWNSTREAM(FEET) =    395.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =    55.00   CHANNEL SLOPE =  0.0182
  CHANNEL BASE(FEET) =    1.50   "Z" FACTOR =  12.000
  MANNING'S FACTOR = 0.018   MAXIMUM DEPTH(FEET) =   0.40
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.59
  FLOW VELOCITY(FEET/SEC.) =   1.92   FLOW DEPTH(FEET) =   0.11
  TRAVEL TIME(MIN.) =   0.48   Tc(MIN.) =    6.48
  LONGEST FLOWPATH FROM NODE   1200.00 TO NODE   1005.00 =      95.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1005.00 TO NODE   1005.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.48
  RAINFALL INTENSITY(INCH/HR) =   3.82
  TOTAL STREAM AREA(ACRES) =     0.24
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.59

  ** CONFLUENCE DATA **
  STREAM     RUNOFF        Tc       INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.52     6.80        3.757          0.96
      2        0.59     6.48        3.819          0.24

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        3.07     6.48       3.819
      2        3.10     6.80       3.757

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.10   Tc(MIN.) =    6.80
  TOTAL AREA(ACRES) =        1.2
  LONGEST FLOWPATH FROM NODE   1000.00 TO NODE   1005.00 =     260.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1005.00 TO NODE   1006.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    395.50  DOWNSTREAM(FEET) =    393.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   130.00   CHANNEL SLOPE =  0.0192
  CHANNEL BASE(FEET) =    1.50   "Z" FACTOR =  12.000
  MANNING'S FACTOR = 0.023   MAXIMUM DEPTH(FEET) =   0.40
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.10
  FLOW VELOCITY(FEET/SEC.) =   2.55   FLOW DEPTH(FEET) =   0.26
```

```
  TRAVEL TIME(MIN.) =   0.85   Tc(MIN.) =    7.66
  LONGEST FLOWPATH FROM NODE   1000.00 TO NODE   1006.00 =     390.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   1006.00 TO NODE   1006.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.615
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  SUBAREA AREA(ACRES) =    0.27   SUBAREA RUNOFF(CFS) =    0.44
  TOTAL AREA(ACRES) =        1.5   TOTAL RUNOFF(CFS) =       3.54
  TC(MIN.) =    7.66
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.5  TC(MIN.) =      7.66
  PEAK FLOW RATE(CFS)   =       3.54
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0 Release Date: 06/01/2014  License ID 1261

                              Analysis prepared by:

                            RICK ENGINEERING COMPANY
                                5620 Friars Road
                             San Diego, California 92110
                           619-291-0707   Fax 619-291-4165

 ************************** DESCRIPTION OF STUDY **************************
 JN 19276 – ARE SCRIPPS HQ PROJECT
 4555 EXECUTIVE DR., SAN DIEGO, CA 92121
 POST-PROJECT CONDITION (BASIN 2000)
 **************************************************************************

  FILE NAME: C:\RCV\DEV50.DAT
  TIME/DATE OF STUDY: 08:34 07/14/2021
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  1981 SAN DIEGO HYDROLOGY MANUAL RAINFALL INFORMATION USED

  USER SPECIFIED STORM EVENT(YEAR) =  50.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   4.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150
  2   20.0     15.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0180

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  1.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint = 10.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE   2000.00 TO NODE   2001.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .5500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   130.00
  UPSTREAM ELEVATION(FEET) =    404.00
```

```
  DOWNSTREAM ELEVATION(FEET) =    403.50
  ELEVATION DIFFERENCE(FEET) =      0.50
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =   15.521
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.673
  SUBAREA RUNOFF(CFS) =      0.13
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.13

****************************************************************************
  FLOW PROCESS FROM NODE   2001.00 TO NODE   2002.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    403.50  DOWNSTREAM(FEET) =    398.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =    30.00   CHANNEL SLOPE =  0.1567
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   3.000
  MANNING'S FACTOR = 0.020   MAXIMUM DEPTH(FEET) =   3.00
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.645
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.59
  AVERAGE FLOW DEPTH(FEET) =   0.01   TRAVEL TIME(MIN.) =   0.31
  Tc(MIN.) =   15.84
  SUBAREA AREA(ACRES) =     0.11       SUBAREA RUNOFF(CFS) =    0.13
  TOTAL AREA(ACRES) =        0.2         PEAK FLOW RATE(CFS) =       0.26

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.01   FLOW VELOCITY(FEET/SEC.) =   2.12
  LONGEST FLOWPATH FROM NODE   2000.00 TO NODE   2002.00 =     160.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2002.00 TO NODE   2002.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.84
  RAINFALL INTENSITY(INCH/HR) =   2.64
  TOTAL STREAM AREA(ACRES) =     0.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE   2100.00 TO NODE   2101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   125.00
  UPSTREAM ELEVATION(FEET) =    404.00
  DOWNSTREAM ELEVATION(FEET) =    403.90
  ELEVATION DIFFERENCE(FEET) =      0.10
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =   11.675
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
```

```
 DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.069
 SUBAREA RUNOFF(CFS) =      0.60
 TOTAL AREA(ACRES) =      0.23   TOTAL RUNOFF(CFS) =      0.60

****************************************************************************
 FLOW PROCESS FROM NODE   2101.00 TO NODE   2102.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   400.13  DOWNSTREAM(FEET) =   399.34
 FLOW LENGTH(FEET) =   142.12   MANNING'S N =  0.012
 DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   2.83
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.60
 PIPE TRAVEL TIME(MIN.) =   0.84    Tc(MIN.) =   12.51
 LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2102.00 =     267.12 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2102.00 TO NODE   2102.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.994
 *USER SPECIFIED(SUBAREA):
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8200
 S.C.S. CURVE NUMBER (AMC II) =   0
 SUBAREA AREA(ACRES) =    0.53   SUBAREA RUNOFF(CFS) =    1.30
 TOTAL AREA(ACRES) =        0.8   TOTAL RUNOFF(CFS) =       1.90
 TC(MIN.) =   12.51

****************************************************************************
 FLOW PROCESS FROM NODE   2102.00 TO NODE   2002.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   399.30  DOWNSTREAM(FEET) =   399.13
 FLOW LENGTH(FEET) =     7.73   MANNING'S N =  0.012
 DEPTH OF FLOW IN   9.0 INCH PIPE IS   5.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.28
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.90
 PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   12.53
 LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2002.00 =     274.85 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2002.00 TO NODE   2002.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   12.53
 RAINFALL INTENSITY(INCH/HR) =   2.99
 TOTAL STREAM AREA(ACRES) =     0.76
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.90
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2200.00 TO NODE   2201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  UPSTREAM ELEVATION(FEET) =    400.50
  DOWNSTREAM ELEVATION(FEET) =    400.00
  ELEVATION DIFFERENCE(FEET) =      0.50
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =   11.314
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.102
  SUBAREA RUNOFF(CFS) =      1.88
  TOTAL AREA(ACRES) =      0.74   TOTAL RUNOFF(CFS) =      1.88

****************************************************************************
  FLOW PROCESS FROM NODE   2201.00 TO NODE   2202.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   399.72  DOWNSTREAM(FEET) =   399.29
  FLOW LENGTH(FEET) =    42.28   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.74
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.88
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   11.46
  LONGEST FLOWPATH FROM NODE   2200.00 TO NODE   2202.00 =     242.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2202.00 TO NODE   2202.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.088
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8200
  S.C.S. CURVE NUMBER (AMC II) =   0
  SUBAREA AREA(ACRES) =    0.39   SUBAREA RUNOFF(CFS) =    0.99
  TOTAL AREA(ACRES) =        1.1   TOTAL RUNOFF(CFS) =       2.87
  TC(MIN.) =   11.46

****************************************************************************
  FLOW PROCESS FROM NODE   2202.00 TO NODE   2002.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   399.25  DOWNSTREAM(FEET) =   399.13
  FLOW LENGTH(FEET) =    24.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.03
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.87
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   11.56
```

```
 LONGEST FLOWPATH FROM NODE   2200.00 TO NODE   2002.00 =     266.28 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2002.00 TO NODE   2002.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
 TIME OF CONCENTRATION(MIN.) =   11.56
 RAINFALL INTENSITY(INCH/HR) =   3.08
 TOTAL STREAM AREA(ACRES) =     1.13
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.87

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        0.26    15.84        2.645          0.20
     2        1.90    12.53        2.992          0.76
     3        2.87    11.56        3.079          1.13

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  3 STREAMS.

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        4.94    11.56       3.079
     2        4.92    12.53       2.992
     3        4.41    15.84       2.645

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       4.94   Tc(MIN.) =   11.56
 TOTAL AREA(ACRES) =        2.1
 LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2002.00 =     274.85 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2002.00 TO NODE   2003.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   395.70  DOWNSTREAM(FEET) =   392.14
 FLOW LENGTH(FEET) =   284.90   MANNING'S N =  0.012
 DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.49
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.94
 PIPE TRAVEL TIME(MIN.) =   0.73    Tc(MIN.) =   12.29
 LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2003.00 =     559.75 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2003.00 TO NODE   2003.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   12.29
```

```
  RAINFALL INTENSITY(INCH/HR) =   3.01
  TOTAL STREAM AREA(ACRES) =     2.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.94

****************************************************************************
  FLOW PROCESS FROM NODE   2300.00 TO NODE   2301.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    85.00
  UPSTREAM ELEVATION(FEET) =    402.60
  DOWNSTREAM ELEVATION(FEET) =    398.70
  ELEVATION DIFFERENCE(FEET) =      3.90
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.497
  *CAUTION: SUBAREA SLOPE EXCEEDS COUNTY NOMOGRAPH
   DEFINITION. EXTRAPOLATION OF NOMOGRAPH USED.
  TIME OF CONCENTRATION ASSUMED AS 6-MIN.
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.910
  SUBAREA RUNOFF(CFS) =      0.43
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.43

****************************************************************************
  FLOW PROCESS FROM NODE   2301.00 TO NODE   2302.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    398.50  DOWNSTREAM(FEET) =    396.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =    70.00   CHANNEL SLOPE =  0.0329
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =  99.000
  MANNING'S FACTOR = 0.020   MAXIMUM DEPTH(FEET) =   0.50
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.730
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8000
  S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.23
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   0.95
  Tc(MIN.) =    6.95
  SUBAREA AREA(ACRES) =     0.23       SUBAREA RUNOFF(CFS) =    0.69
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       1.12

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.35
  LONGEST FLOWPATH FROM NODE   2300.00 TO NODE   2302.00 =     155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2302.00 TO NODE   2003.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   392.65  DOWNSTREAM(FEET) =   392.14
  FLOW LENGTH(FEET) =    72.10   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.60
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =       1.12
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =    7.28
  LONGEST FLOWPATH FROM NODE   2300.00 TO NODE   2003.00 =     227.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2003.00 TO NODE   2003.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.28
  RAINFALL INTENSITY(INCH/HR) =   3.68
  TOTAL STREAM AREA(ACRES) =     0.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.12

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.94    12.29        3.014          2.09
      2        1.12     7.28        3.675          0.36

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        5.17     7.28       3.675
      2        5.86    12.29       3.014

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.86   Tc(MIN.) =   12.29
  TOTAL AREA(ACRES) =        2.4
  LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2003.00 =     559.75 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2003.00 TO NODE   2004.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   392.04  DOWNSTREAM(FEET) =   391.46
  FLOW LENGTH(FEET) =    91.17   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.25
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.86
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =   12.58
  LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2004.00 =     650.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2004.00 TO NODE   2004.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.988
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .4500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  SUBAREA AREA(ACRES) =    0.04   SUBAREA RUNOFF(CFS) =    0.05
  TOTAL AREA(ACRES) =        2.5   TOTAL RUNOFF(CFS) =       5.91
  TC(MIN.) =   12.58

****************************************************************************
  FLOW PROCESS FROM NODE   2004.00 TO NODE   2005.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   391.36  DOWNSTREAM(FEET) =   390.54
  FLOW LENGTH(FEET) =   135.74   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.16
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.91
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =   13.02
  LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2005.00 =     786.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2005.00 TO NODE   2006.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   390.40  DOWNSTREAM(FEET) =   385.60
  FLOW LENGTH(FEET) =    77.20   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.53
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.91
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   13.13
  LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2006.00 =     863.86 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2006.00 TO NODE   2006.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.935
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .4500
  S.C.S. CURVE NUMBER (AMC II) =   0
  SUBAREA AREA(ACRES) =    0.04   SUBAREA RUNOFF(CFS) =    0.05
  TOTAL AREA(ACRES) =        2.5   TOTAL RUNOFF(CFS) =       5.97
  TC(MIN.) =   13.13
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        2.5  TC(MIN.) =     13.13
  PEAK FLOW RATE(CFS)   =       5.97
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX C

Hydraulic Calculations (Pipe Flow) and Normal Depth Storm Drain Sizing Matrix [Post-Project]

```
**************************************************************************
                PIPE-FLOW HYDRAULICS COMPUTER PROGRAM PACKAGE
           (Reference: LACFCD,LACRD, AND OCEMA HYDRAULICS CRITERION)
          (c) Copyright 1982-2014 Advanced Engineering Software (aes)
              Ver. 21.0  Release Date: 06/01/2014  License ID 1261

                              Analysis prepared by:

                            RICK ENGINEERING COMPANY
                                5620 Friars Road
                             San Diego, California 92110
                           619-291-0707   Fax 619-291-4165

  ************************* DESCRIPTION OF STUDY *************************
  JN 19276 – ARE SCRIPPS HQ PROJECT
  4555 EXECUTIVE DR., SAN DIEGO, CA 92121
  PIPE HYDRAULICS FOR EXIST. 18” RCP IN EXECUTIVE DR. (Nodes 2005 to 2006)
  ************************************************************************

   FILE NAME: C:\RCV\NODE2006.DAT
   TIME/DATE OF STUDY: 08:42 07/14/2021

**************************************************************************
               GRADUALLY VARIED FLOW ANALYSIS FOR PIPE SYSTEM
                         NODAL POINT STATUS TABLE
                (Note: "*" indicates nodal point data used.)
                      UPSTREAM RUN                  DOWNSTREAM RUN
    NODE    MODEL   PRESSURE      PRESSURE+         FLOW         PRESSURE+
   NUMBER  PROCESS  HEAD(FT)   MOMENTUM(POUNDS)   DEPTH(FT)   MOMENTUM(POUNDS)
  2006.00-             1.50            121.01        0.50*            137.29
         } FRICTION
  2005.00-             0.94*Dc          87.78        0.94*Dc           87.78
         } CATCH BASIN
  2005.10-             1.28*            42.95        0.94 Dc           29.60
--------------------------------------------------------------------------
  MAXIMUM NUMBER OF ENERGY BALANCES USED IN EACH PROFILE =  25
--------------------------------------------------------------------------
  NOTE: STEADY FLOW HYDRAULIC HEAD-LOSS COMPUTATIONS BASED ON THE MOST
  CONSERVATIVE FORMULAE FROM THE CURRENT LACRD,LACFCD, AND OCEMA
  DESIGN MANUALS.
**************************************************************************
  DOWNSTREAM PIPE FLOW CONTROL DATA:
  NODE NUMBER =  2006.00           FLOWLINE ELEVATION =   385.60
  PIPE FLOW =       5.91 CFS       PIPE DIAMETER =  18.00 INCHES
  ASSUMED DOWNSTREAM CONTROL HGL =   387.100 FEET
--------------------------------------------------------------------------
  NODE  2006.00 : HGL = <  386.102>;EGL= <  388.120>;FLOWLINE= <  385.600>

**************************************************************************
  FLOW PROCESS FROM NODE  2006.00 TO NODE  2005.00 IS CODE =  1
  UPSTREAM NODE  2005.00     ELEVATION =   390.40  (FLOW IS SUPERCRITICAL)
--------------------------------------------------------------------------
  CALCULATE FRICTION LOSSES(LACFCD):
  PIPE FLOW   =       5.91 CFS     PIPE DIAMETER =  18.00 INCHES
  PIPE LENGTH =      77.20 FEET          MANNING'S N  =  0.01300
--------------------------------------------------------------------------
  NORMAL DEPTH(FT) =      0.48          CRITICAL DEPTH(FT) =      0.94
==========================================================================
  UPSTREAM CONTROL ASSUMED FLOWDEPTH(FT) =     0.94
```

```
==============================================================================
  GRADUALLY VARIED FLOW PROFILE COMPUTED INFORMATION:
------------------------------------------------------------------------------
  DISTANCE FROM      FLOW DEPTH  VELOCITY      SPECIFIC        PRESSURE+
   CONTROL(FT)           (FT)    (FT/SEC)     ENERGY(FT)    MOMENTUM(POUNDS)
         0.000          0.939      5.078          1.339            87.78
         0.013          0.920      5.196          1.340            87.83
         0.052          0.902      5.321          1.342            87.98
         0.121          0.884      5.452          1.346            88.25
         0.225          0.866      5.591          1.352            88.62
         0.365          0.848      5.737          1.359            89.12
         0.549          0.830      5.892          1.369            89.74
         0.781          0.811      6.056          1.381            90.49
         1.069          0.793      6.230          1.396            91.39
         1.420          0.775      6.414          1.414            92.44
         1.845          0.757      6.609          1.436            93.65
         2.355          0.739      6.817          1.461            95.03
         2.966          0.721      7.038          1.490            96.60
         3.695          0.702      7.274          1.525            98.37
         4.568          0.684      7.526          1.564           100.35
         5.614          0.666      7.795          1.610           102.56
         6.874          0.648      8.084          1.663           105.02
         8.404          0.630      8.393          1.724           107.75
        10.282          0.612      8.726          1.795           110.78
        12.621          0.593      9.085          1.876           114.13
        15.601          0.575      9.472          1.969           117.85
        19.521          0.557      9.891          2.077           121.95
        24.942          0.539     10.345          2.202           126.50
        33.128          0.521     10.839          2.346           131.53
        48.136          0.503     11.379          2.514           137.11
        77.200          0.502     11.396          2.520           137.29
------------------------------------------------------------------------------
  NODE  2005.00 : HGL = <  391.339>;EGL= <  391.739>;FLOWLINE= <  390.400>

******************************************************************************
  FLOW PROCESS FROM NODE  2005.00 TO NODE  2005.10 IS CODE =  8
  UPSTREAM NODE  2005.10     ELEVATION =   390.54  (FLOW IS SUBCRITICAL)
------------------------------------------------------------------------------
  CALCULATE CATCH BASIN ENTRANCE LOSSES(LACFCD):
  PIPE FLOW =       5.91 CFS          PIPE DIAMETER =  18.00 INCHES
  FLOW VELOCITY =   5.08 FEET/SEC.    VELOCITY HEAD =  0.401 FEET
  CATCH BASIN ENERGY LOSS = .2*(VELOCITY HEAD) = .2*(  0.401) =  0.080
------------------------------------------------------------------------------
  NODE  2005.10 : HGL = <  391.819>;EGL= <  391.819>;FLOWLINE= <  390.540>

******************************************************************************
  UPSTREAM PIPE FLOW CONTROL DATA:
  NODE NUMBER =  2005.10            FLOWLINE ELEVATION =   390.54
  ASSUMED UPSTREAM CONTROL HGL =    391.48 FOR DOWNSTREAM RUN ANALYSIS

==============================================================================
  END OF GRADUALLY VARIED FLOW ANALYSIS
```

Preliminary Storm Drain Size

The purpose of this table is to provide an estimated pipe size to convey the 100-year flow rates with a sizing factor.

Manning's n: 0.012

Sizing Factor (%): 30

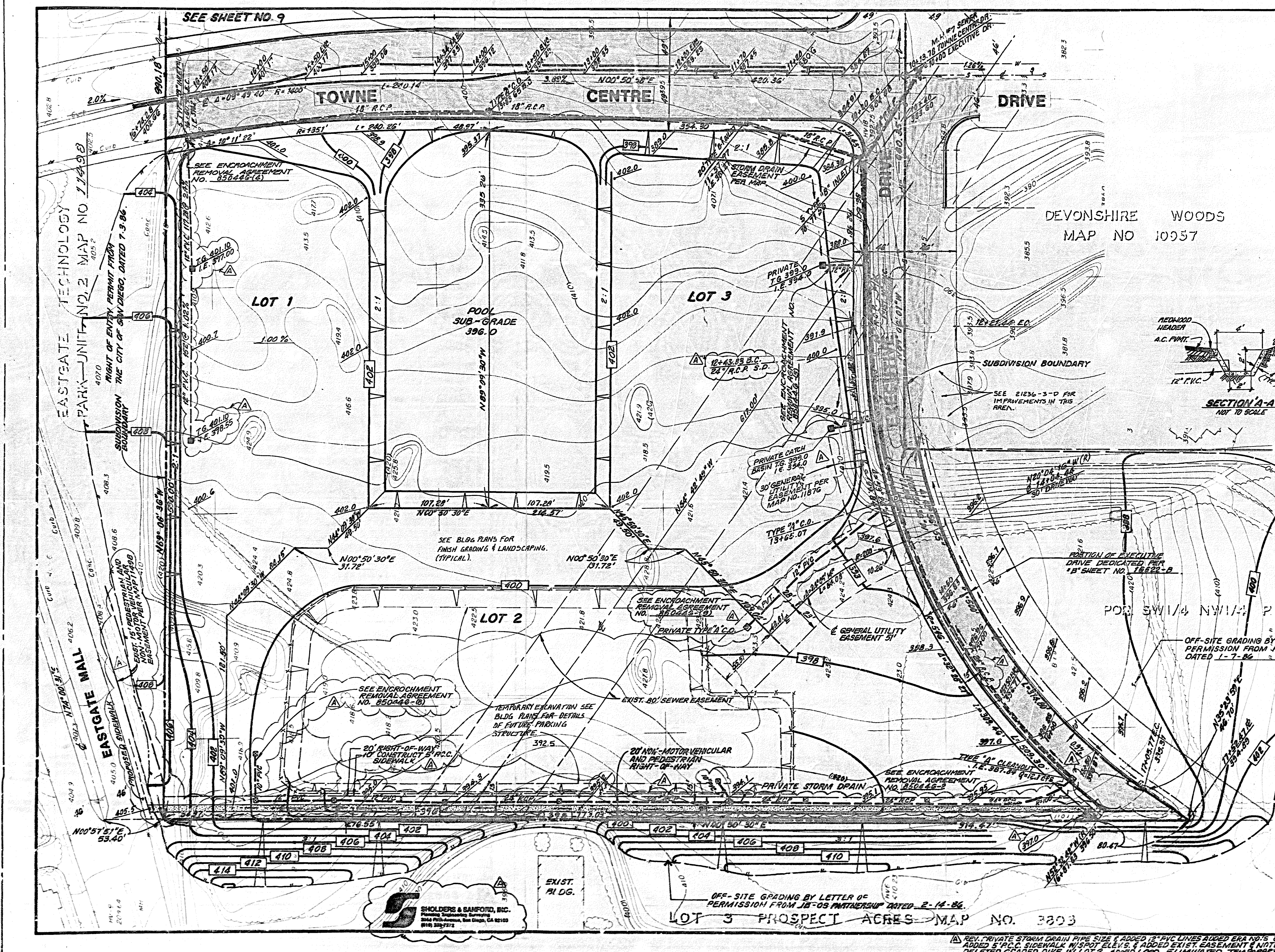
	Slope at:	0.5%		1.0%		2.0%		4.0%	
Q_{100} (cfs[1])	Q_{100} with Sizing Factor (cfs[1])	Minimum Pipe Size[2] (feet)	Recommended Pipe Size (inches)	Minimum Pipe Size[2] (feet)	Recommended Pipe Size (inches)	Minimum Pipe Size[2] (feet)	Recommended Pipe Size (inches)	Minimum Pipe Size[2] (feet)	Recommended Pipe Size (inches)
0.5	0.7	0.58	8"	0.51	6"	0.45	6"	0.39	6"
1.0	1.3	0.76	10"	0.66	8"	0.58	8"	0.51	6"
2.0	2.6	0.98	12"	0.86	12"	0.76	10"	0.66	8"
3.0	3.9	1.14	18"	1.00	12"	0.88	12"	0.77	10"
4.0	5.2	1.27	18"	1.12	18"	0.98	12"	0.86	12"
5.0	6.5	1.38	18"	1.21	18"	1.07	18"	0.94	12"
6.0	7.8	1.48	18"	1.30	18"	1.14	18"	1.00	12"
7.0	9.1	1.57	24"	1.38	18"	1.21	18"	1.06	18"
8.0	10.4	1.65	24"	1.45	18"	1.27	18"	1.12	18"
9.0	11.7	1.72	24"	1.51	18"	1.33	18"	1.17	18"
10.0	13.0	1.79	24"	1.58	24"	1.38	18"	1.21	18"
15.0	19.5	2.09	30"	1.83	24"	1.61	24"	1.41	18"
20.0	26.0	2.33	30"	2.04	30"	1.79	24"	1.58	24"
25.0	32.5	2.53	36"	2.22	30"	1.95	24"	1.71	24"
30.0	39.0	2.71	36"	2.38	30"	2.09	30"	1.83	24"
35.0	45.5	2.87	36"	2.52	36"	2.21	30"	1.94	24"
40.0	52.0	3.02	42"	2.65	36"	2.33	30"	2.04	30"
50.0	65.0	3.28	42"	2.88	36"	2.53	36"	2.22	30"
75.0	97.5	3.82	48"	3.35	42"	2.94	36"	2.59	36"
100.0	130.0	4.25	54"	3.74	48"	3.28	42"	2.88	36"

Note:

1. "cfs" = cubic feet per second.
2. Minimum pipe sizes are calculated using the Manning's equation and are based on the flow rates with 30% factor.

APPENDIX D

Reference Drawings



AS BUILT ENGINEER
ROBERT W. SANFORD RCE 18405
SHOLDERS & SANFORD INC
3569 FIFTH AVENUE
SAN DIEGO, CA. 92103

ENGINEER OF WORK:

BUSS SILVERS HUGHES & ASSOCIATES
1875 THIRD AVENUE
SAN DIEGO, CA 92101
(619) 239-2353 PROJ. NO.

BY: Michael Rust 6-3-86
Michael Rust R.C.E. 26375

BENCH MARK:
BRASS PLUG AT NORTHWEST CORNER OF EASTGATE MALL AND GENESEE AVE.
ELEVATION: 356.35 M.S.L.

"A" CHANGE ONLY BY S & S
William A. Ullrich DATE: 5-19-89
WILLIAM A. ULLRICH R.C.E. 25443 EXP. 12-31-89

GRADING PLANS FOR:
NEXUS TECHNOLOGY CENTRE UNIT NO.1

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 8 OF 17 SHEETS

TM 85-0446
W.O. NO. 85 0446

FOR CITY ENGINEER 12-22-86

DESCRIPTION	BY	APPROVED	DATE
ORIGINAL			
CONST. CHG. A	S&S		8-14-89
AS BUILT	S&S		6/18/92

CONTROL CERTIFICATE: 258-1705

CONTRACTOR: NEXUS DEV. DATE STARTED: 12-23-86
INSPECTOR: H. MOTAMANI* DATE COMPLETED: 4-17-92

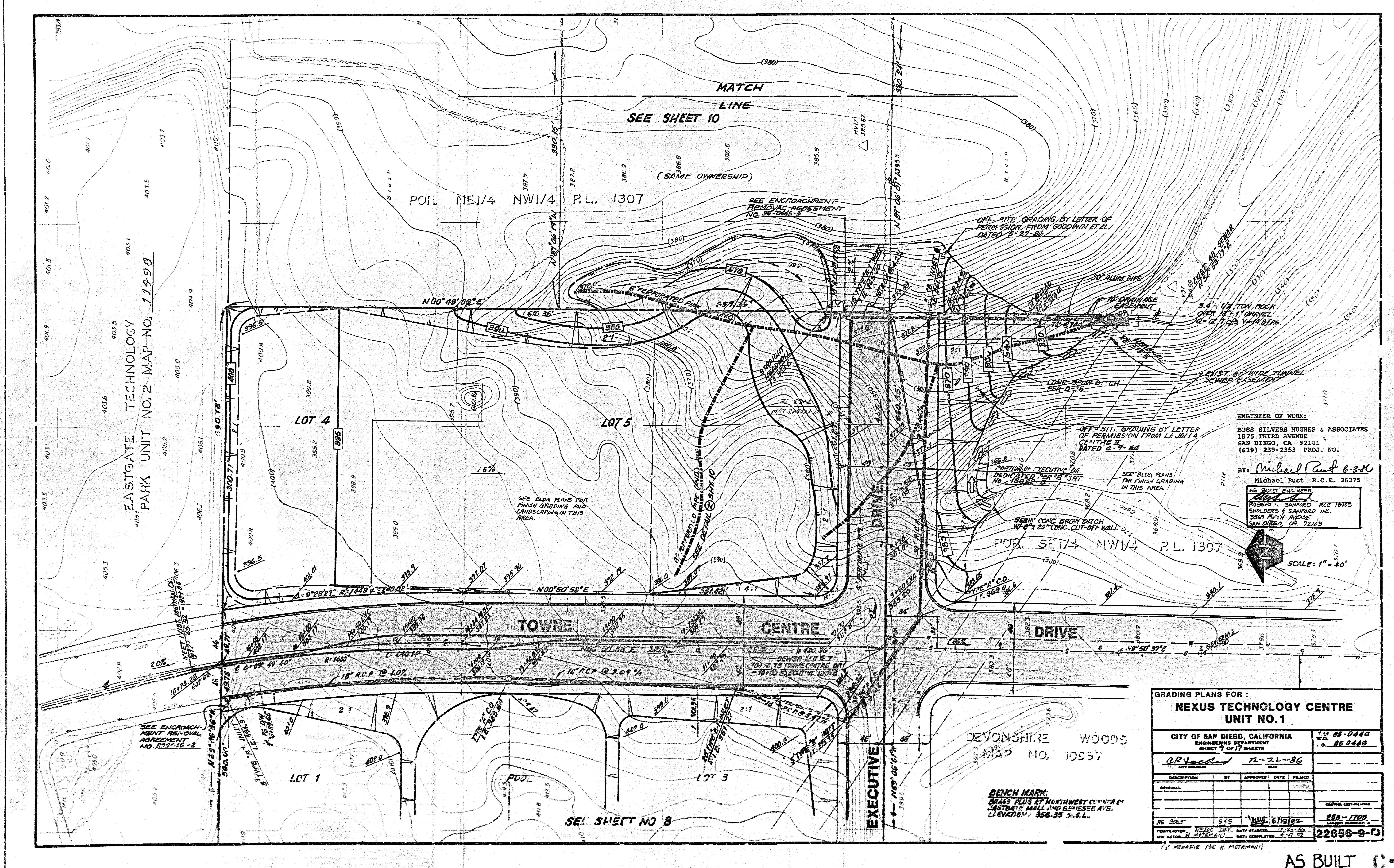
22656-8-D

⚠ REV. PRIVATE STORM DRAIN PIPE SIZE & ADDED 12" PVC LINES ADDED ERA NO'S 850446-(8) & -(9). ADDED 5' P.C.C. SIDEWALK W/SPOT ELEVS. & ADDED EXIST. EASEMENT & NOTE LOCATED OFF EASTGATE MALL. DELETED GRADED DIKE IN LOT 2. ADDED LOGO. ELIMINATED TEMPORARY 12" P.V.C. STORM DRAIN

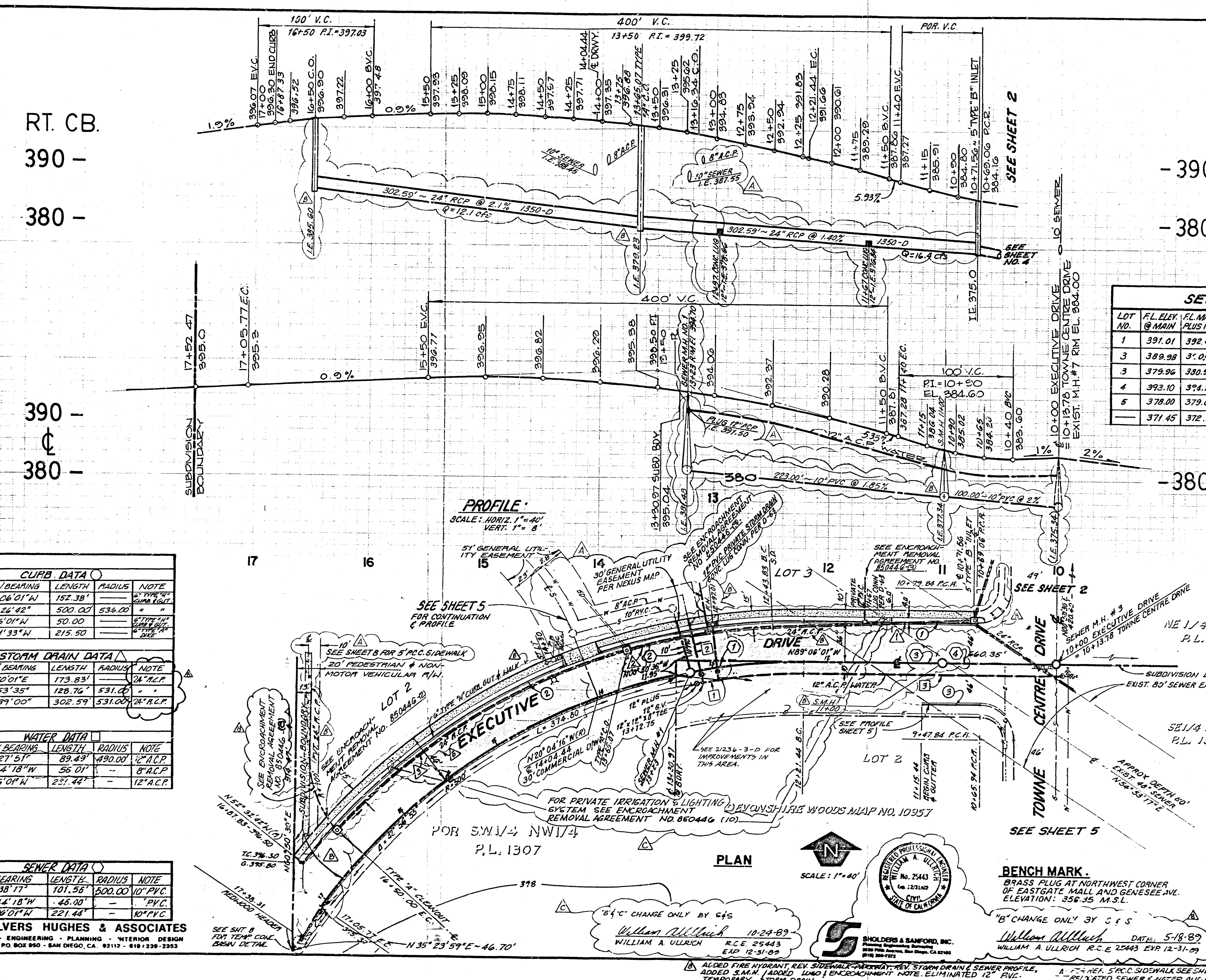
*(V. MOHARIE FOR H. MOTAMANI)

AS BUILT

10925



MATCH LINE
SEE SHEET 10
(SAME OWNERSHIP)
POR. NE1/4 NW1/4 P.L. 1307
SEE ENCROACHMENT REMOVAL AGREEMENT NO. 85-0446-3
OFF-SITE GRADING BY LETTER OF PERMISSION FROM GOODWIN ET. AL. DATED 5-27-86
30" ALUM PIPE
10' DRAINAGE EASEMENT
EXIST. 80' WIDE TUNNEL SEWER EASEMENT
COND. BROW DITCH PER D-75
EASTGATE TECHNOLOGY PARK UNIT NO. 2 MAP NO. 11498
LOT 4
LOT 5
6" PERFORATED PIPE
SEE BLDG. PLANS FOR FINISH GRADING AND LANDSCAPING IN THIS AREA.
OFF-SITE GRADING BY LETTER OF PERMISSION FROM LA JOLLA CENTRE II DATED 4-9-86
PORTION OF EXECUTIVE DR. DEDICATED PER "E" SHT.
SEE BLDG. PLANS FOR FINISH GRADING IN THIS AREA.
BEGIN CONC. BROW DITCH W/ 6" x 24" CONC. CUT-OFF WALL
POR. SE1/4 NW1/4 P.L. 1307
ENGINEER OF WORK:
BUSS SILVERS HUGHES & ASSOCIATES
1875 THIRD AVENUE
SAN DIEGO, CA 92101
(619) 239-2353 PROJ. NO.
BY: Michael Rust
Michael Rust R.C.E. 26375
AS BUILT ENGINEER
ROBERT W. SANFORD RCE 18405
SHOLDERS & SANFORD INC.
3514 FIFTH AVENUE
SAN DIEGO, CA. 92103
SCALE: 1" = 40'
TOWNE CENTRE DRIVE
EXECUTIVE DRIVE
18" R.C.P. @ 1.0%
16" RCP @ 3.69%
SEWER M.H. 2.7
SEE ENCROACHMENT REMOVAL AGREEMENT NO. 850446-2
LOT 1
LOT 3
POOL
DEVONSHIRE WOODS MAP NO. 10557
SEE SHEET NO 8
BENCH MARK:
BRASS PLUG AT NORTHWEST CORNER OF EASTGATE MALL AND GENESEE AVE.
ELEVATION: 356.35 M.S.L.
GRADING PLANS FOR:
NEXUS TECHNOLOGY CENTRE
UNIT NO. 1
CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 9 OF 17 SHEETS
12-22-86
258-1705
22656-9-D
AS BUILT



SEWER LATERAL TABLE							
LOT NO.	F.L. ELEV. @ MAIN	F.L. MAIN PLUS 1.0'	LENGTH IN FEET	INV. ELEV. @ P.L. 2%	TOP OF CURB ELEV.	DEPTH BELOW T.C. @ P.L.	STATION
1	391.01	392.01	49.00	392.99	398.98	5.99'	15+12 - 6"P.V.C. T.C.D.
3	389.98	390.98	28.00	391.94	398.50	6.96'	1+88.35 - 6"P.V.C. D/W
3	379.96	380.96	49.00	381.94	387.96	6.02'	11+85 - 6"P.V.C. T.C.D.
4	393.10	394.10	49.00	395.08	401.17	6.09'	15+96 - 6"P.V.C. T.C.D
5	378.00	379.00	49.00	379.98	385.64	5.66'	11+20 - 8"P.V.C. T.C.D
—	371.45	372.45	46.00	373.37	378.87	5.5'	6+25 - 6"P.V.C. T.C.D.

CURB DATA ◯

NO.	DELTA / BEARING	LENGTH	RADIUS	NOTE
1	N 89°06'01"W	152.38'	—	6" TYPE "H" CURB & GUT.
2	Δ = 53°26'42"	500.00'	536.00'	" "
3	N 89°06'01"W	50.00	—	6" TYPE "H" CURB & GUT.
4	N 82°41'33"W	215.50	—	6" TYPE "A" DIKE

STORM DRAIN DATA △

NO.	DELTA / BEARING	LENGTH	RADIUS	NOTE
1	N 88°20'01"E	173.83'	—	24" R.C.P.
2	Δ = 13°53'35"	128.76'	531.00'	" "
3	Δ = 32°39'00"	302.59'	531.00'	24" R.C.P.

WATER DATA □

NO.	DELTA / BEARING	LENGTH	RADIUS	NOTE
1	Δ = 10°27'51"	89.49'	490.00'	12" A.C.P.
2	N 10°44'18"W	56.01'	--	8" A.C.P.
3	N 89°06'01"W	231.44'	—	12" A.C.P.

SEWER DATA ◇

NO.	DELTA / BEARING	LENGTH	RADIUS	NOTE
1	Δ = 11°38'17"	101.56'	500.00'	10" P.V.C.
2	N 10°44'18"W	46.00'	—	" P.V.C.
3	N 89°06'01"W	221.44'	—	10" P.V.C.

BUSS SILVERS HUGHES & ASSOCIATES
ARCHITECTURE - ENGINEERING - PLANNING - INTERIOR DESIGN
1875 THIRD AVE. - P.O. BOX 950 - SAN DIEGO, CA. 92112 - 619/239-2353

BENCH MARK.
BRASS PLUG AT NORTHWEST CORNER OF EASTGATE MALL AND GENESEE AVE.
ELEVATION: 356.35 M.S.L.

"B" & "C" CHANGE ONLY BY S&S
William A. Ullrich 10-24-89
WILLIAM A. ULLRICH R.C.E. 25443 EXP 12-31-89

"B" CHANGE ONLY BY S&S
William A. Ullrich DATE: 5-18-89
WILLIAM A. ULLRICH R.C.E. 25443 EXP. 12-31-89

SHOLDERS & SANFORD, INC.

AS BUILT ENGINEER
ROBERT W. SANFORD RCE 18405
SHOLDERS & SANFORD INC.
3569 FIFTH AVENUE
SAN DIEGO, CA. 92103

ENGINEER OF WORK:
BUSS SILVERS HUGHES & ASSOCIATES
1875 THIRD AVENUE
SAN DIEGO, CA 92101
(619) 239-2353 PROJ. NO.

BY: Michael Rust 6-3-86
Michael Rust R.C.E. 26375

PRIVATE CONTRACT:

PLANS FOR THE IMPROVEMENT OF :

EXECUTIVE DRIVE

NEXUS TECHNOLOGY CENTRE UNIT NO. 1

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 3 OF 7 SHEETS

W.O. NO. 850446 (T.M. 85-0446)

FOR CITY ENGINEER 12-22-86

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL				
CHANGE "A"	BSH&A		7-9-87	
CONSTR. CHG. "B"	S&S		5-18-89	
CONST. CHG. "C"			11-9-89	
AS-BUILT	S&S		6/18/92	

CONTRACTOR NEXUS DEV. DATE STARTED 12-23-86
INSPECTOR H. MOTAMANI DATE COMPLETED 4-17-92

CONTROL CERTIFICATION
258-1705
LAMBERT COORDINATES

22656-3-D

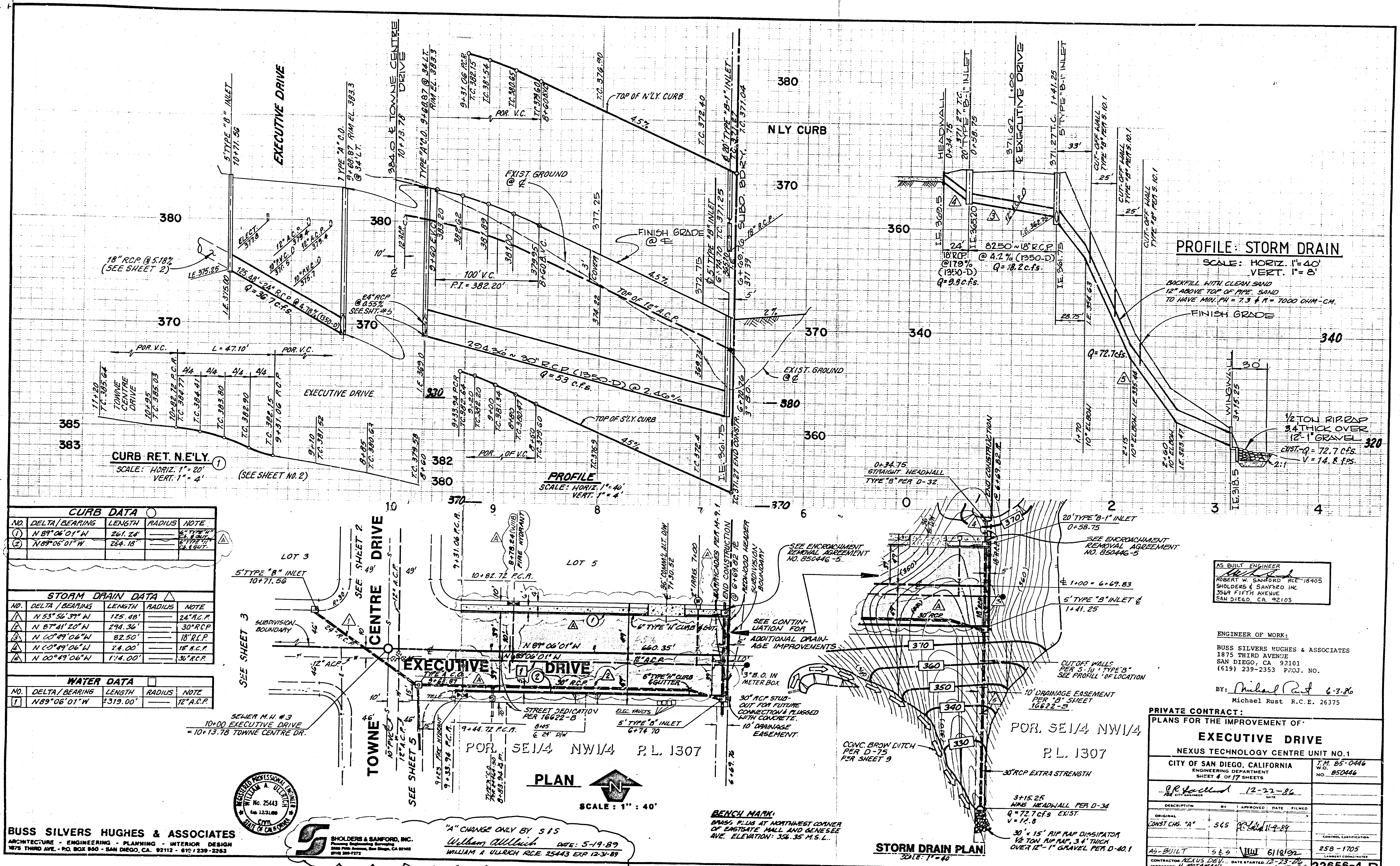
B. ADDED FIRE HYDRANT, REV. SIDEWALK-PARKWAY, REV. STORM DRAIN & SEWER PROFILE, ADDED S.M.H., ADDED LUG & ENCROACHMENT NOTE. ELIMINATED 12" PVC. TEMPORARY STORM DRAIN

C. ADDED ERA NOTE

A. FOR REF. 5' P.C.C. SIDEWALK SEE SHEET 8. ADDED TO 30' UTILITY ESE. PER NEXUS MAP. RELOCATED SEWER & WATER AND RELOCATED 12" PVC PIPE & CONC LUG. REVISED WATER DATA TABLE NO.'S 1 & 2. REVISED SEWER DATA TABLE NO.'S 1 & 2. (V. MOHARIR FOR H. MOTAMANI)

AS-BUILT

10925



CURB DATA ○				
NO.	DELTA/BEARING	LENGTH	RADIUS	NOTE
①	N 89°06'01" W	261.24'	——	6" TYPE "H" Cb. & GUT.
②	N 89°06'01" W	264.18'	——	6" TYPE "H" Cb. & GUT.

STORM DRAIN DATA △				
NO.	DELTA / BEARING	LENGTH	RADIUS	NOTE
1	N 53°56'39" W	125.48'	——	24" R.C.P.
2	N 87°41'20" W	294.36'	——	30" RCP
3	N 00°49'06" W	82.50'	——	18" R.C.P.
4	N 00°49'06" W	24.00'	——	18" R.C.P.
6	N 00°49'06" W	114.00'	——	30" R.C.P.

WATER DATA □				
NO.	DELTA/BEARING	LENGTH	RADIUS	NOTE
1	N89°06'01" W	±319.00'	——	12" A.C.P.

AS BUILT ENGINEER
ROBERT W. SANFORD RCE 18405
SHOLDERS & SANFORD INC
3569 FIFTH AVENUE
SAN DIEGO, CA 92103

ENGINEER OF WORK:
BUSS SILVERS HUGHES & ASSOCIATES
1875 THIRD AVENUE
SAN DIEGO, CA 92101
(619) 239-2353 PROJ. NO.

BY: Michael Rust 6-3-86
Michael Rust R.C.E. 26375

BUSS SILVERS HUGHES & ASSOCIATES
ARCHITECTURE - ENGINEERING - PLANNING - INTERIOR DESIGN
1875 THIRD AVE. - P.O. BOX 950 - SAN DIEGO, CA. 92112 - 619/239-2353

SHOLDERS & SANFORD, INC.

"A" CHANGE ONLY BY S & S
William A Ullrich DATE: 5-19-89
WILLIAM A. ULLRICH R.C.E. 25443 EXP. 12-31-89

PRIVATE CONTRACT:
PLANS FOR THE IMPROVEMENT OF:

EXECUTIVE DRIVE

NEXUS TECHNOLOGY CENTRE UNIT NO.1

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 4 OF 17 SHEETS

T.M. 85-0446
W.O. NO. 850446

FOR CITY ENGINEER 12-22-86 DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL				
CONST CHG. "A"	S&S		11-9-89	
AS-BUILT	S&S		6/18/92	

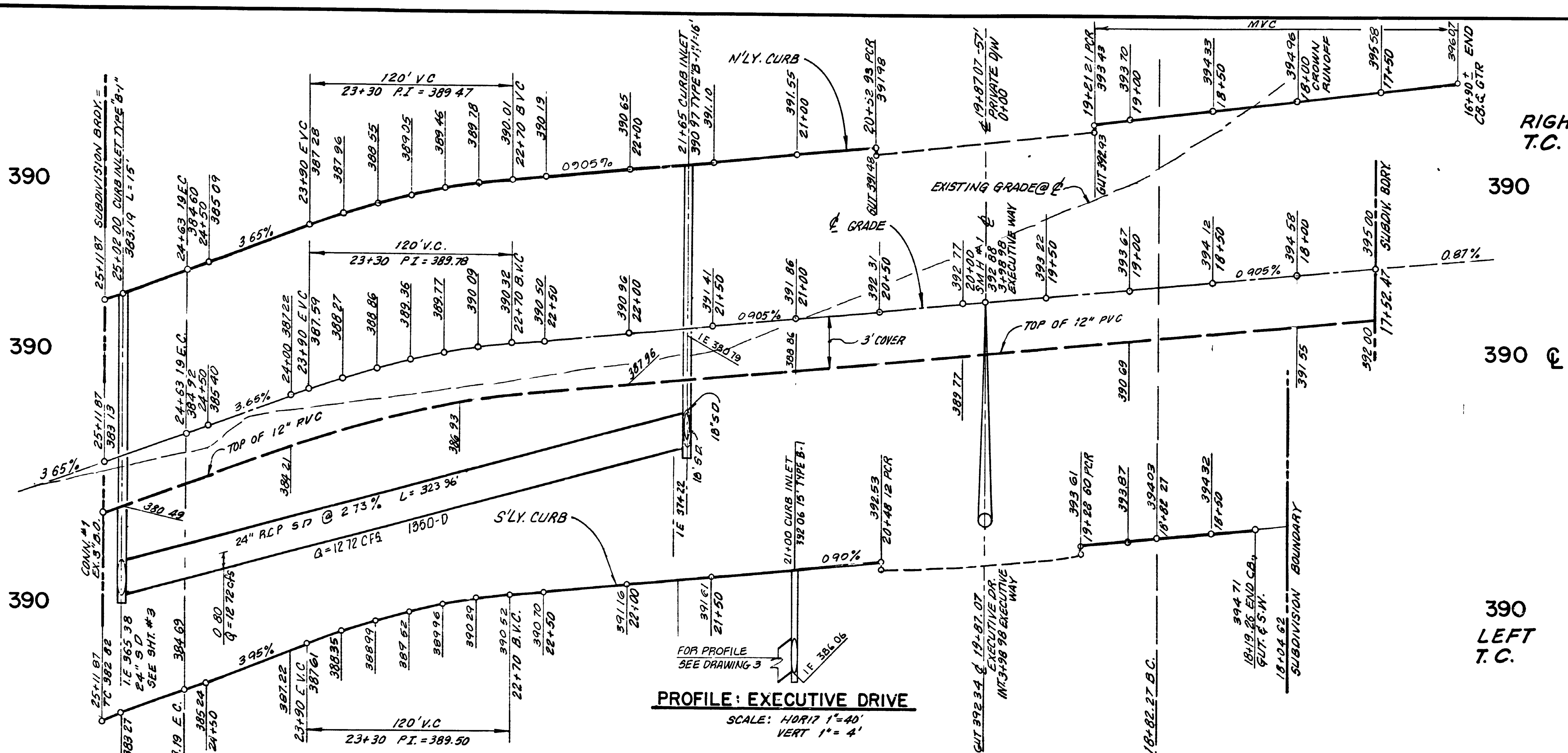
CONTRACTOR NEXUS DEV. DATE STARTED 12-23-86
INSPECTOR H. MOTAMANI DATE COMPLETED 4-17-92

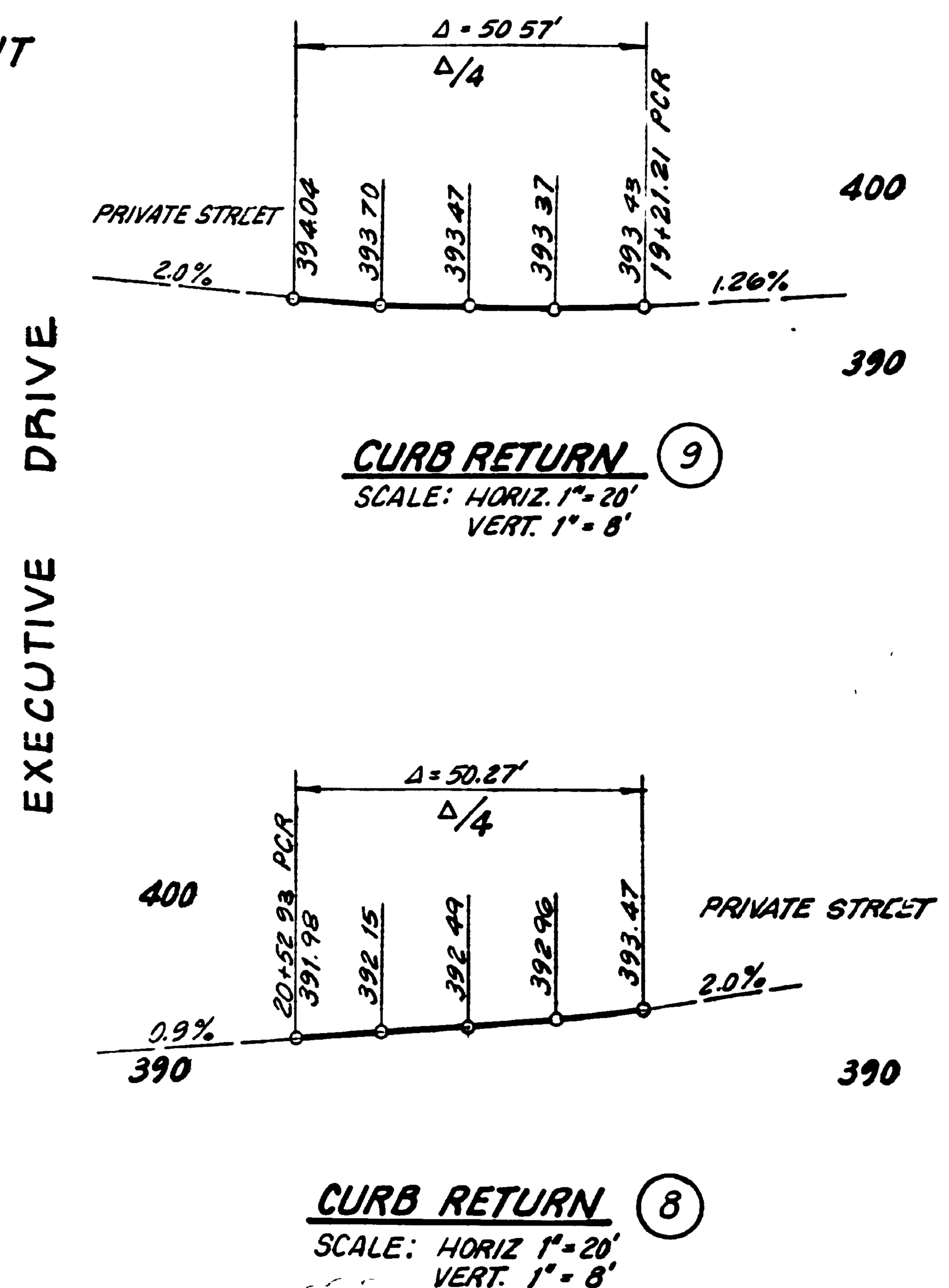
CONTROL CERTIFICATION
258-1705
LAMBERT COORDINATES

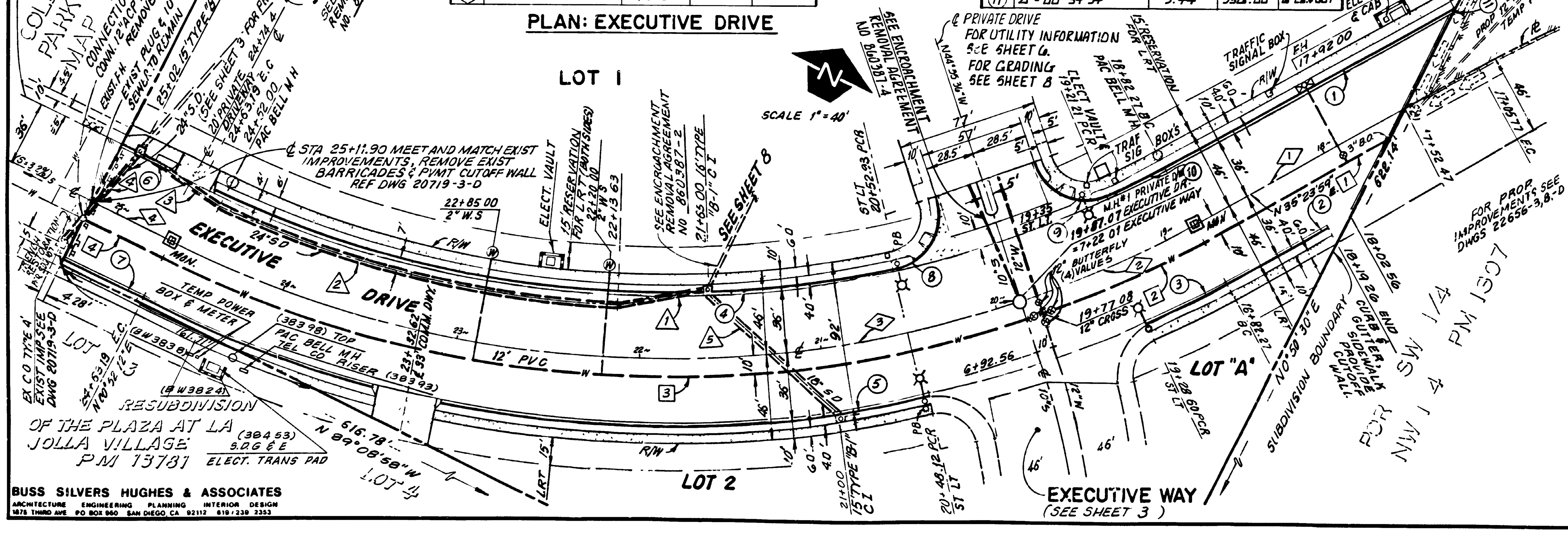
22556-4-D

A IMPROVED ENTIRE STREET, PAVEMENT & CURB & GUT. RELOCATED F.H. & ADDED 8" FIRE SERVICE / ADDED LOGO. V. MOHARIK FOR H. MOTAMANI

AS-BUILT
10925 A







℄ DATA				
NO	DELTA/BEARING	LENGTH	RADIUS	NOTE
1	N 35°23'59"E.	129.80'	———	
2	Δ= 10°00'29"	104 80'	600'	
3	Δ= 45°27'58"	476.12'	600'	
4	N 89°07'34"W	48 68'	———	

(CONT.) CURB DATA ○				
NO	DELTA/BEARING	LENGTH	RADIUS	NOTE
8	Δ = 96° 17'22"	50 42'	30 00'	6"cb & GUT
9	Δ = 96° 17'22"	50.42'	30 00'	6"Cb.& X-GUT.
10	Δ = 03°43'07"	36 60'	564 00'	6"Cb. & GUT
11	Δ = 00° 34'54"	5.44'	536.00'	6"Cb. & GUT

CURB DATA ○				
NO.	DELTA/BEARING	LENGTH	RADIUS	NOTE
1	N35°23'59"W	176 59	———	6"Cb & GUT
2	N35°23'59"W	63.02	———	" "
3	Δ = 4°25'27"	49 11'	636 00'	" "
4	Δ = 39° 10'36"	385.64'	564 00'	6"Cb & GUT
5	Δ = 39° 38'12"	439 98'	636.00'	PORTION 6"Cb & GUT
6	N89°07'38"W	30 70'	———	6"Cb & GUT
7	N89°07'38"W	48.68'	———	PORTION 6"Cb & GUT
(WATER DATA CONTINUE)				

WATER DATA □				
NO	DELTA/BEARING	LENGTH	RADIUS	NOTE
1	N35°23'59"E	112 14'	———	12" P.V.C
2	Δ = 9°03'13"	96.39'	610 00'	" "
3	Δ = 46°25'12"	494 21'	610.00'	" "
4	N 89°07'38"W	48 68'	———	" "

STORM DRAIN DATA △				
NO.	DELTA/BEARING	LENGTH	RADIUS	NOTE
1	N.53°19'59"E	46 81'	———	24" RCP 1350-D
2	Δ = 22°45'46'	226 85'	571 00'	" "
3	N78°38'39"W	50 30'	———	" "
4	N12°24'59"E	70.68'	———	" "
5	N 71°05'12"W SEE SHEET 3 FOR PROFILE	100.28'	———	18" R.C.P 1350-D

ISSUE	DATE
ISSUED FOR BID	5 .. 91
REVISIONS	10 .. 91
REVISIONS	10 ..

ENGINEER OF WORK △A
STUART ENGINEERING
7525 METROPOLITAN DR STE. 308
SAN DIEGO CA 92108
619-296-1010
Stuart Peace 12-3-90
STUART PEACE R.C.E 27232
MY REGISTRATION EXPIRES 3-31-93

REGISTERED PROFESSIONAL ENGINEER — STUART PEACE — No 27232 — CIVIL — STATE OF CALIFORNIA

BENCH MARK:
BRASS PLUG AT NORTHWEST CORNER OF EASTGATE MALL AND GENESEE AVE.
ELEV. = 356 35 DATUM M.S.L.

ENGINEER OF WORK:

BUSS SILVERS HUGHES & ASSOCIATES
1875 THIRD AVENUE
SAN DIEGO, CA 92101
(619) 239-2352 PROJ. NO.

BY: ____________________
Christopher Denchev - PE
RCE #34555

PRIVATE CONTRACT: PID-860387

PLANS FOR THE IMPROVEMENT OF.

EXECUTIVE DRIVE

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 2 OF 16 SHEETS

T.M. 86-0387
W.O. NO 860387

C R [signature] △A 11-25-87
FOR CITY ENGINEER DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL				
△A CHANGE	S.E	[signature]	12-6-90	
AS BUILT	S.E.	[signature]	9-11-91	

258-1705
LAMBERT COORDINATES

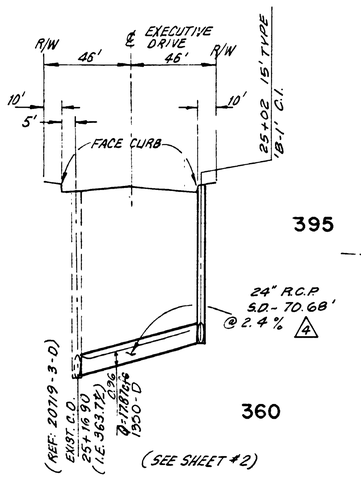
CONTRACTOR JOSEPH DAY DATE STARTED 11-25-87
INSPECTOR H MONTAMANI DATE COMPLETED 9-11-91

23657-2-D

△A CHANGE REVISE TOTAL SHEET NO & NEW ENGINEER OF WORK

BUSS SILVERS HUGHES & ASSOCIATES
ARCHITECTURE ENGINEERING PLANNING INTERIOR DESIGN

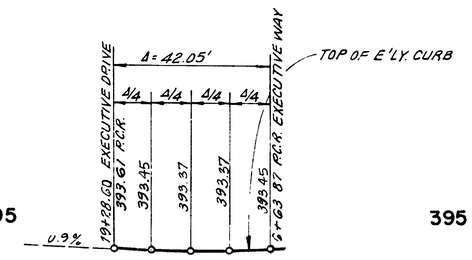
AS BUILT



CROSS SECTION FROM STA. 25+02 TO STA. 25+16.90

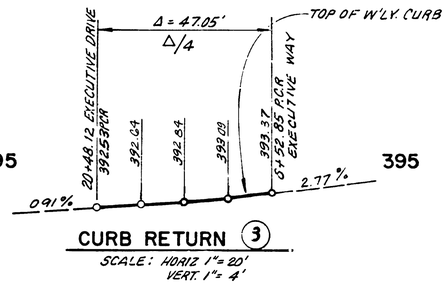
SCALE: HORIZ. 1"=40' VERT. 1"= 8'

EXECUTIVE DRIVE



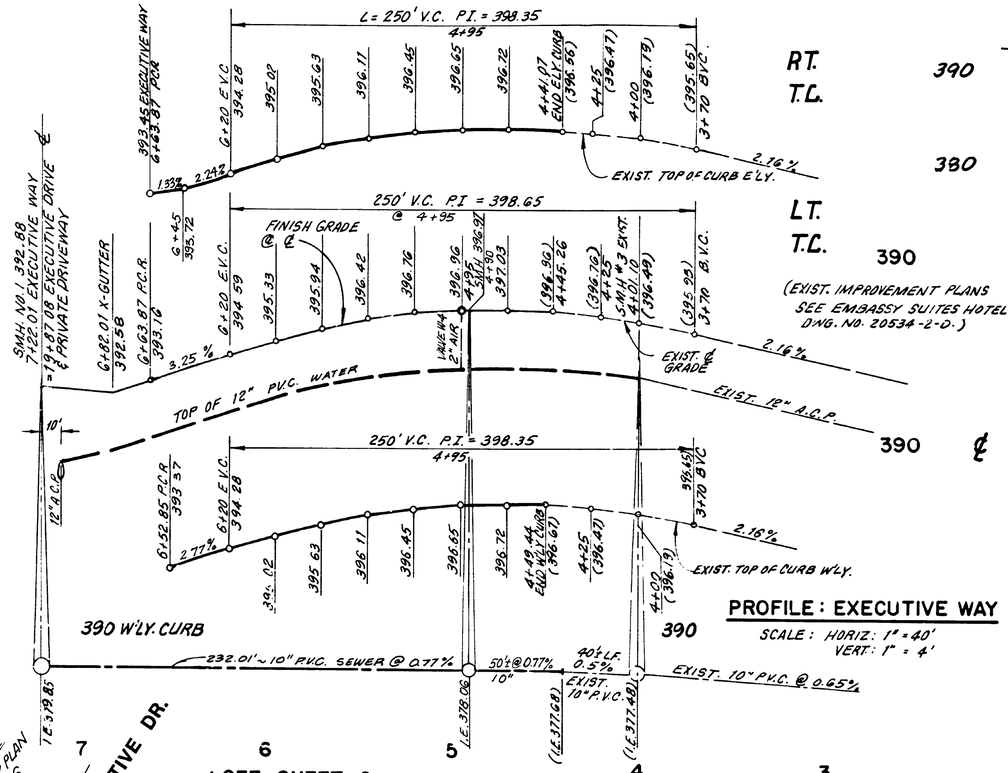
CURB RETURN (1)

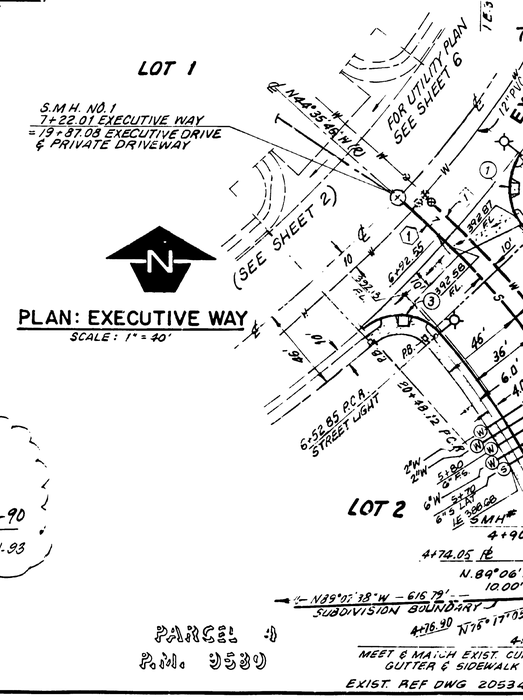
SCALE: HORIZ. 1"=20' VERT. 1"= 4'



CURB RETURN (3)

SCALE: HORIZ 1"= 20' VERT. 1"= 4'





PLAN: EXECUTIVE WAY

SCALE: 1" = 40'

CURB DATA

NO	DELTA/BEARING	LENGTH	RADIUS	NOTE
(1)	Δ = 90°18'31"	42.05'	30.00	6"CB&GUT
(2)	Δ = 31°09'15"	236.31'	436.00'	6"CB&GUT
(3)	Δ = 89°51'26"	47.95'	30.00'	" "
(4)	Δ = 29°08'11"	185.10'	364.00'	6"CB&GUT

WATER DATA

NO	DELTA/BEARING	LENGTH	RADIUS	NOTE
1	N44°35'36"W	19.53'	——	12"A.C.P.
2	Δ = 36°08'42"	258.65'	410.00'	12"A.C.P.

SEWER & ℄ DATA

NO.	DELTA / BEARING	LENGTH	RADIUS	NOTE
(1)	N 44°35'46" W	29.45'		10"P.V.C.
(2)	Δ = 35°25'43"	247.34'	400.00'	10"P.V.C.

ENGINEER OF WORK 4
STUART ENGINEERING
7625 METROPOLITAN DR STE. 208
SAN DIEGO, CA 92108
619-296-1010
Stuart Peade 12-3-90
STUART PEADE R.C.E. 27238
MY REGISTRATION EXPIRES 3-31-93

ENGINEER OF WORK:

BUSS SILVERS HUGHES & ASSOCIATES
1875 THIRD AVENUE
SAN DIEGO, CA 92101
(619) 239-2353 PROJ. NO.

BY: _____

BENCH MARK:

BRASS PLUG AT NORTHWEST CORNER OF EASTGATE MALL AND GENESEE AVENUE.

ELEV. = 356.35 DATUM: M.S.L.

ISSUE	DATE
ISSUED FOR BID	8.21.87
REVISIONS	10.5.87
REVISIONS	10.26.87

PRIVATE CONTRACT PID 860397

PLANS FOR THE IMPROVEMENT OF:

EXECUTIVE WAY

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 5 OF 16 SHEETS

T.M. 85-0387
W.O. 860387
NO

C.P. Leeder 4 11-25-87
ASST. CITY ENGINEER DATE

DESCRIPTION	BY	APPROVED	DATE	FILM NO.
ORIGINAL				
4 CHANGE AS BUILT	S.E.	M. [illegible]	12/6/90 3-11-91	

258-1705

CONTRACTOR JOSEPH DEY
INSPECTOR H. MONTAMANI
DATE STARTED 11-16-87
DATE COMPLETED 3-11-91

23657-3-D

4 CHANGE REVISE TOTAL SHEET NO. & NEW ENGINEER OF WORK

AS BUILT

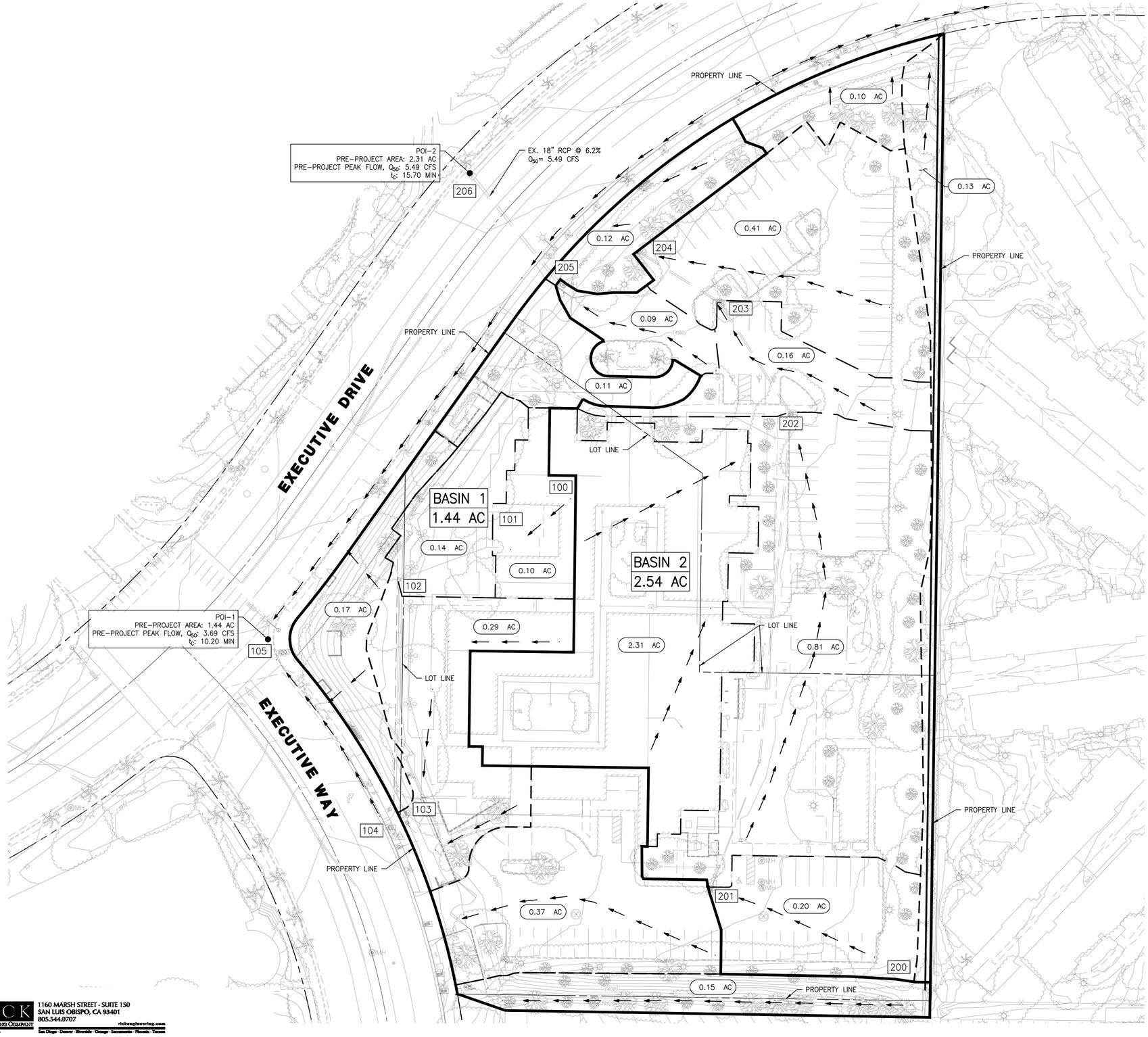
BUSS SILVERS HUGHES & ASSOCIATES
ARCHITECTURE - ENGINEERING - PLANNING - INTERIOR DESIGN
1875 THIRD AVE. - P.O. BOX 950 - SAN DIEGO, CA. 92112 - 619 / 239-2353

MAP POCKET 1

Pre-Project Drainage Map

for

ARE - Scripps HQ



LEGEND

- BASIN BOUNDARY
- SUBBASIN BOUNDARY
- FLOW PATTERN
- BASIN ID & AREA — BASIN 1 / 1.44 AC
- SUBBASIN AREA — 0.12 AC
- DRAINAGE STUDY NODE — 101

GRAPHIC SCALE: 1"=30'

DRAINAGE STUDY MAP

SCRIPPS HQ PROJECT (PRE-PROJECT CONDITION)

DATE: 7/9/2021

REVISED:

J- 19276

RICK ENGINEERING COMPANY
San Luis Obispo
1160 MARSH STREET - SUITE 150
SAN LUIS OBISPO, CA 93401
805.544.0707
rickengineering.com
San Diego - Denver - Riverside - Orange - Sacramento - Phoenix - Tucson

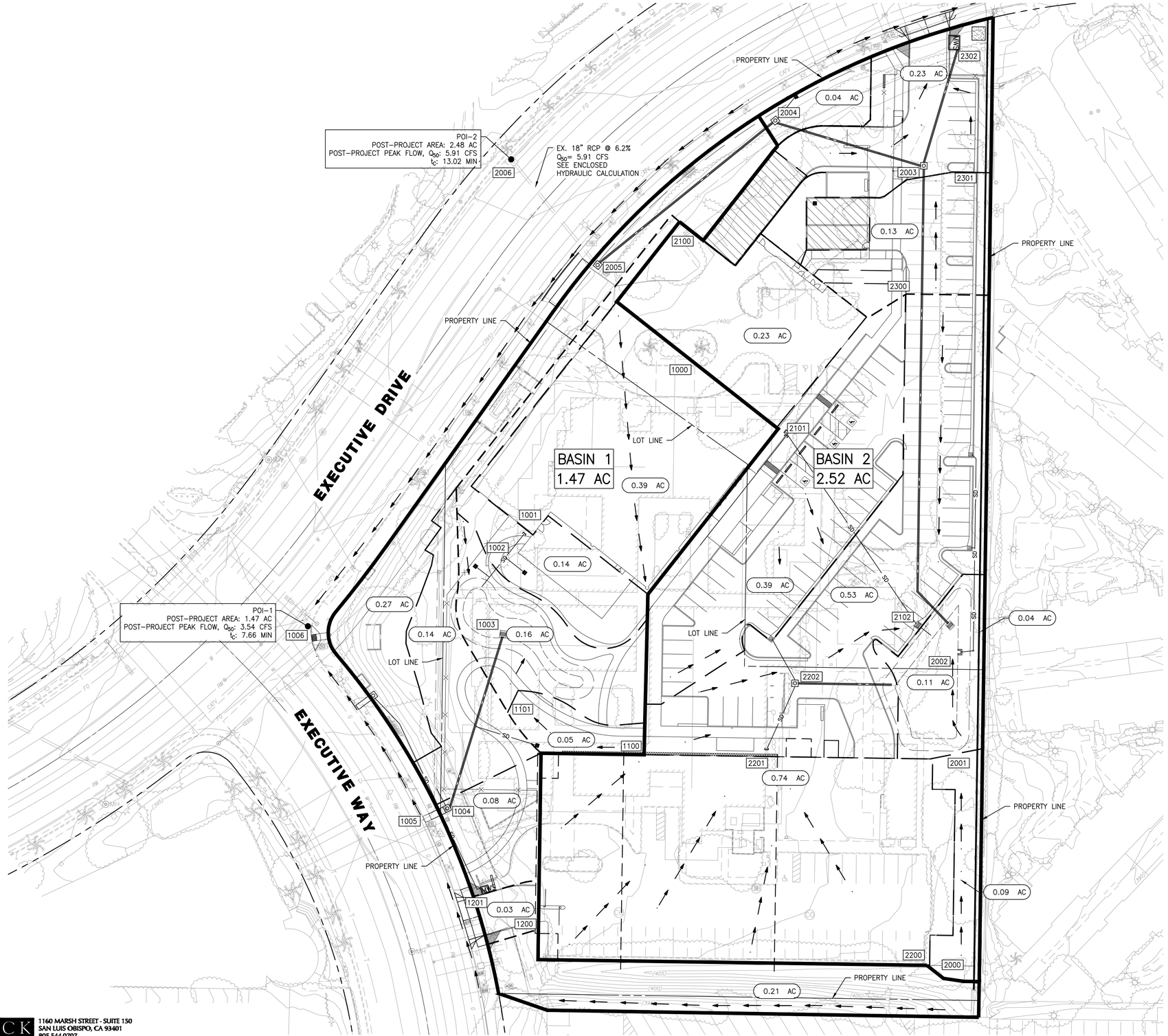
NOT FOR CONSTRUCTION – EXHIBIT FOR DRAINAGE STUDY REPORT ONLY

MAP POCKET 2

Post-Project Drainage Map

for

ARE - Scripps HQ



LEGEND

- BASIN BOUNDARY
- SUBBASIN BOUNDARY
- DRAINAGE STUDY BOUNDARY
- BASIN ID & AREA — BASIN 1 / 1.47 AC
- SUBBASIN AREA — 0.12 AC
- DRAINAGE STUDY NODE — 1001
- DRAINS TO BUILDING DRAINAGE SYSTEM

N

30 15 0 30 60 90

GRAPHIC SCALE: 1"=30'

DRAINAGE STUDY MAP

SCRIPPS HQ PROJECT (POST-PROJECT CONDITION)

DATE: 7/9/2021

REVISED:

J- 19276

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San Luis Obispo
1160 MARSH STREET - SUITE 150
SAN LUIS OBISPO, CA 93401
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