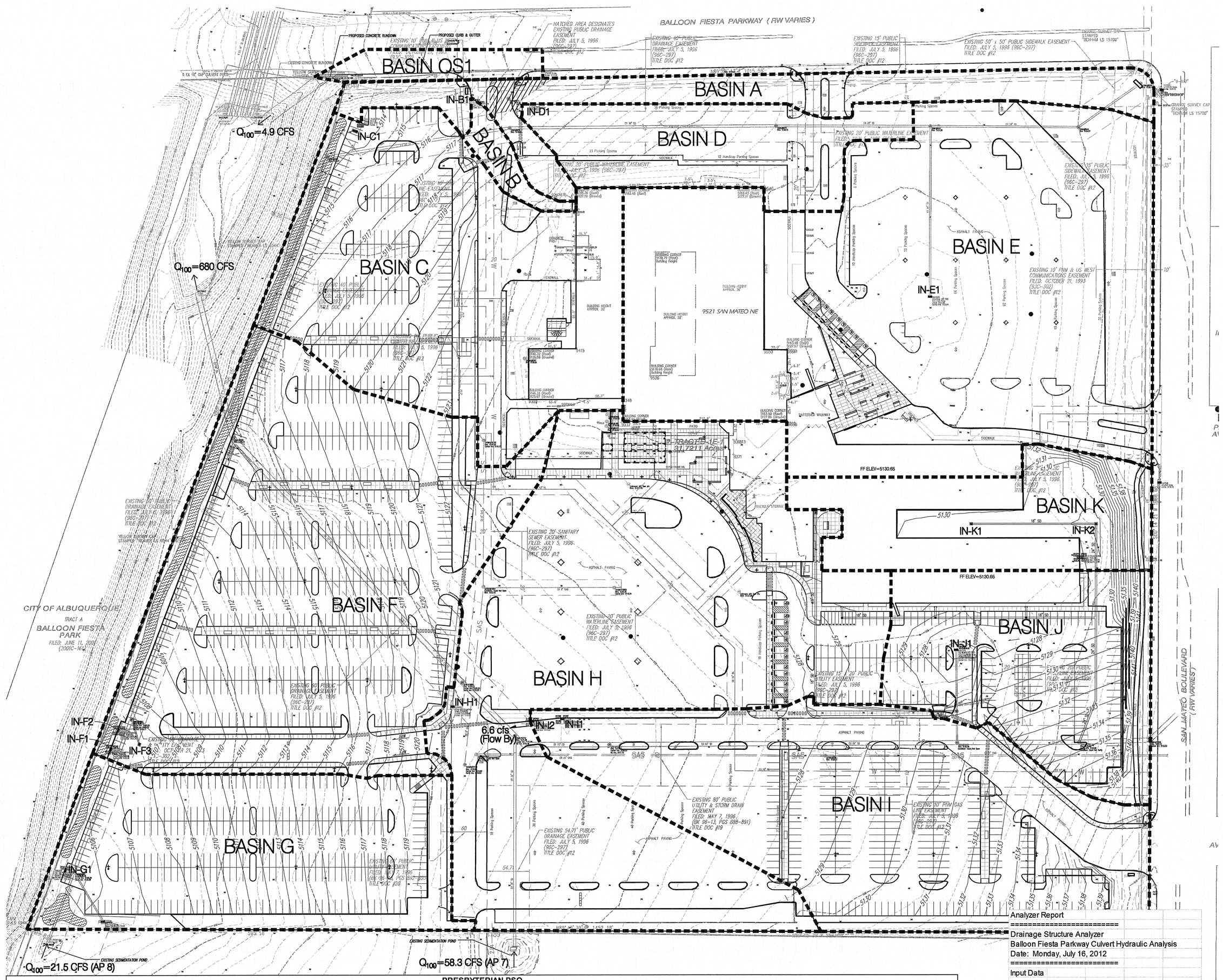


I. INTRODUCTION
THE PURPOSE OF THIS SUBMITTAL IS TO PROVIDE A CONCEPTUAL DRAINAGE MANAGEMENT PLAN AND CONCEPTUAL GRADING PLAN FOR DEVELOPMENT OF THE PRESBYTERIAN SYSTEMS OFFICE BUILDING LOCATED AT THE SOUTHEAST CORNER OF SAN MATEO BOULEVARD AND BALLOON FIESTA PARKWAY. LEGAL DESCRIPTION OF THE SITE IS TRACTS D-1B-2 & D-1E-1, SISTERS OF THE ORDER OF ST. DOMINIC. TOTAL SITE AREA IS APPROXIMATELY 38.0 ACRES.

II. EXISTING HYDROLOGIC CONDITIONS
THE SITE IS CURRENTLY DEVELOPED WITH THE CITICORP BUILDING. THIS BUILDING AND ASSOCIATED PARKING IS LOCATED IN THE NORTHEAST PORTION OF THE SITE. THE REMAINDER OF THE SITE HAS BEEN MASS GRADED, BUT IS UNDEVELOPED. THE APPROVED SITE PLAN FOR BUILDING PERMIT INCLUDED TWO ADDITIONAL BUILDINGS ON THE SITE PLUS ADDITIONAL PARKING. A DRAINAGE REPORT FOR THE CITICORP SITE DATED MAY 1996 WAS PREPARED BY BOHANNAN HUSTON, INC. THIS DRAINAGE REPORT ADDRESSED THE PUBLIC STORM DRAIN WHICH CROSSES THE SITE PLUS FULL BUILD OUT OF THE CITICORP SITE. PRIVATE STORM DRAINS AND INLETS FOR FULL BUILD OUT OF THE SITE WERE INSTALLED WITH PHASE 1. THE PURPOSE OF THIS DRAINAGE MANAGEMENT PLAN IS TO UPDATE THE ANALYSIS BASED ON THE CURRENT SITE PLAN AND TO VERIFY CAPACITY OF THE EXISTING PRIVATE INLETS.

THE PUBLIC STORM DRAIN WHICH CROSSES THE SITE CONSISTS OF A NORTH AND SOUTH STORM DRAIN SYSTEM. WITHIN THE PRESBYTERIAN SITE THE NORTH STORM DRAIN PIPE SIZES RANGE BETWEEN 24" AND 36". THE SOUTH STORM DRAIN PIPE SIZES RANGE BETWEEN 66" AND 78". THE OUTFALL FOR THIS STORM DRAIN IS NEAR THE NORTHWEST CORNER OF THE SITE. THIS PIPE DISCHARGES TO AN ENERGY DISSPATER AND OPEN CHANNEL WHICH FLOWS TO THE NORTH. THE PEAK FLOW FOR FULLY DEVELOPED CONDITIONS IS 680 CFS (COA PROJECT NO. 546991). AN EXISTING CULVERT CROSSING (6-48" CMP) AT BALLOON FIESTA PARKWAY CONVEYS FLOWS ACROSS THE ROAD. AN ANALYSIS OF THE THIS CULVERT CROSSING WAS PERFORMED TO VERIFY CAPACITY. THE AVAILABLE HEAD IS 6.7 FEET. THIS CULVERT IS INLET CONTROLLED AND HAS A CAPACITY OF 686 CFS, SEE CULVERT ANALYSIS ON THIS SHEET.

THE CITICORP DRAINAGE REPORT REFERENCED ABOVE INCLUDED ANALYSIS OF OFFSITE FLOWS FROM THE SOUTH. THERE ARE TWO SEDIMENTATION PONDS THAT WERE CONSTRUCTED WITH THE CITICORP ONISITE PROJECT (COA PROJECT NO. 546981). THE LOCATION OF THESE PONDS ARE SHOWN ON THE DRAINAGE MANAGEMENT PLAN. THE OFFSITE FLOWS ENTERING THE STORM DRAIN ARE 58.3 CFS (AP7) AND 21.5 CFS (AP8). THIS DRAINAGE REPORT ALSO INCLUDES INLET CAPACITY CALCULATIONS FOR THE EXISTING INLETS IN BALLOON FIESTA PARKWAY. THERE IS AN EXISTING INLET IMMEDIATELY UPSTREAM OF THE WEST ENTRANCE. BASED ON THE ANALYSIS CONTAINED IN THE APPROVED DRAINAGE REPORT, THE INLET INTERCEPTS ALL OF THE FLOW WITHIN BALLOON FIESTA PARKWAY. AN EXISTING CONCRETE RUNDOWN NEAR THE NORTHWEST CORNER OF THE SITE CONVEYS STREET DRAINAGE DOWNSTREAM OF THE INLET TO THE EXISTING CHANNEL. BASIN OS1 DEFINES THE DRAINAGE AREA BETWEEN THE EXISTING RUNDOWN AND UPSTREAM INLET. BASIN A FREE DISCHARGES INTO BALLOON FIESTA PARKWAY. IT IS NOT CLEAR FROM THE REPORT WHETHER THIS BASIN WAS INCLUDED IN THE INLET CALCULATIONS. ASSUMING THAT IT WAS NOT, THEN THE PEAK FLOW AT THE RUNDOWN IS 4.9 CFS.

III. PROPOSED HYDROLOGIC CONDITIONS
THIS PROJECT INCLUDES THE CONSTRUCTION OF A NEW 192,700 SQUARE FOOT BUILDING, NEW PARKING AND LANDSCAPING. THE EXISTING AND PROPOSED IMPROVEMENTS ARE SHOWN ON THE GRADING PLAN. THE HYDROLOGIC ANALYSIS FOR THIS SITE IS BASED ON THE 100-YR, 6-HR STORM EVENT IN ACCORDANCE WITH CHAPTER 22.2 OF THE CITY OF ALBUQUERQUE DEVELOPMENT PROCESS MANUAL. WATER HARVESTING WILL BE INCORPORATED INTO THE GRADING AND DRAINAGE DESIGN. 12" WIDE CURB OPENINGS ARE SHOWN ON THE UPSTREAM SIDE OF LANDSCAPE ISLANDS. THESE OPENINGS WILL DIVERT STORM WATER TO THE LANDSCAPE ISLANDS. FLOWS IN EXCESS OF AVAILABLE CAPACITY WILL BYPASS THE WATER HARVESTING AREA AND BE INTERCEPTED BY DOWNSTREAM INLETS AND STORM DRAIN SYSTEM. SEE THE GRADING PLAN FOR LOCATION OF CURB OPENINGS.

THE APPROVED DRAINAGE REPORT FOR THE CITICORP SITE DELINEATED THE ONSITE DRAINAGE BASINS AND LAND TREATMENTS. THESE DRAINAGE BASINS AND LAND TREATMENTS WERE UPDATED BASED ON THE CURRENT SITE PLAN.

AN ANALYSIS OF THE EXISTING INLETS WAS PERFORMED. ALL OF THE INLETS, EXCEPT IN-B1, IN-F2 AND IN-I1 WERE DESIGNED IN A SUMP CONDITION. THE CAPACITY OF THE INLETS ON A CONTINUOUS GRADE WERE ANALYZED USING HEC-22 METHOD. THIS ANALYSIS DEMONSTRATES THAT ALL OF THE EXISTING INLETS HAVE ADEQUATE CAPACITY EXCEPT IN-C1 AND THE PAIRED INLETS IN-F1 AND IN-F2. THE EXISTING INLET DESIGNED FOR BASIN C WAS ORIGINALLY A TYPE 'C' SINGLE GRATE. THIS INLET DID NOT HAVE ADEQUATE CAPACITY AND WAS NOT PLACED IN A LOCATION THAT WORKED WITH THE NEW SITE PLAN. A NEW TYPE 'D' DOUBLE GRATE INLET (IN-C1) WILL BE CONSTRUCTED TO PROVIDE THE NECESSARY CAPACITY. TO PROVIDE THE ADDITIONAL CAPACITY FOR BASIN F, A NEW TYPE 'D' SINGLE GRATE INLET (IN-F3) WILL BE ADDED.

V. CONCLUSION
THIS DRAINAGE MANAGEMENT PLAN PROVIDES FOR GRADING AND DRAINAGE ELEMENTS WHICH ARE CAPABLE OF SAFELY PASSING THE 100 YEAR STORM IN ACCORDANCE WITH CITY REQUIREMENTS AND ARE IN CONFORMANCE WITH THE PREWOUSLY APPROVED DRAINAGE REPORT FOR THE CITICORP SITE. WITH THIS SUBMITTAL WE ARE REQUESTING CONCEPTUAL GRADING AND DRAINAGE PLAN APPROVAL FOR SITE PLAN FOR BUILDING PERMIT.

**Presbyterian PSO**
**Proposed Conditions Basin Data Table**
This table is based on the DPM Section 22.2, Zone: 2

| Basin ID | Area (SQ. FT) | Area (AC.) | Land Treatment Percentages A | B | C | D | Q(100) (cfs/ac.) | Q(100) (CFS) | WT E (inches) | V(100-24hr)) CF |
|---|---|---|---|---|---|---|---|---|---|---|
| A | 49313 | 1.13 | 0.0% | 0.0% | 87.0% | 13.0% | 3.34 | 3.8 | 1.26 | 5386 |
| B | 6096 | 0.14 | 0.0% | 0.0% | 35.0% | 65.0% | 4.15 | 0.6 | 1.77 | 1033 |
| C | 143506 | 3.29 | 0.0% | 0.0% | 18.0% | 82.0% | 4.42 | 14.6 | 1.94 | 27144 |
| D | 48134 | 1.11 | 0.0% | 0.0% | 22.0% | 78.0% | 4.36 | 4.8 | 1.90 | 8882 |
| E | 271510 | 6.23 | 0.0% | 0.0% | 22.0% | 78.0% | 4.36 | 27.2 | 1.90 | 50098 |
| F | 208862 | 4.79 | 0.0% | 0.0% | 13.0% | 87.0% | 4.50 | 21.6 | 1.99 | 40716 |
| G | 104188 | 2.39 | 0.0% | 0.0% | 14.0% | 86.0% | 4.48 | 10.7 | 1.98 | 20190 |
| H | 251122 | 5.76 | 0.0% | 0.0% | 11.0% | 89.0% | 4.53 | 26.1 | 2.01 | 49536 |
| I | 160426 | 3.68 | 0.0% | 0.0% | 13.0% | 87.0% | 4.50 | 16.6 | 1.99 | 31274 |
| J | 80966 | 1.86 | 0.0% | 0.0% | 20.0% | 80.0% | 4.39 | 8.2 | 1.92 | 15127 |
| K | 57583 | 1.32 | 0.0% | 0.0% | 46.0% | 54.0% | 3.98 | 5.3 | 1.66 | 9024 |
| OS1 | 10625 | 0.24 | 0.0% | 0.0% | 0.0% | 100.0% | 4.70 | 1.1 | 2.12 | 2231 |

**PRESBYTERIAN PSO**
**INLET TABLE**

| INLET # | CONTRIBUTING BASIN | INLET TYPE | TOP OF GRATE | ACTUAL FLOW | AVAIL HEAD FT | CAPACITY | Grate Calculation |
|---|---|---|---|---|---|---|---|
| * IN-B1 | B | 1-A-SGL | 5114.14 | 0.6 | N/A | 0.6 | Cont Grade |
| IN-C1 | C | 1-D-DBL | 5113.20 | 14.6 | 0.8 | 26.2 | Sump |
| * IN-D1 | D | 1-C-SGL | 5117.16 | 4.8 | 0.5 | 5.1 | Sump |
| * IN-E1 | E | 1-D-DBL | 5127.09 | 27.2 | 2.9 | 63.9 | Sump |
| * IN-F1 | F | 1-C-SGL | 5106.41 | ** | 0.5 | 5.1 | Sump |
| * IN-F2 | F | 1-A-SGL | 5106.84 | ** | N/A | 10.5 | Cont Grade |
| IN-F3 | F | 1-D-SGL | 6106.00 | 21.6 | 0.9 | 18.0 | Sump |
| * IN-G1 | G | 1-A-SGL | 5100.26 | 10.7 | 0.5 | 10.8 | Sump |
| * IN-H1 | H + BASIN I FLOW BY | 1-A-DBL | 5119.47 | 32.7 | 1.0 | 35.9 | Sump |
| * IN-I1 | I | 1-A-SGL | 5118.63 | ** | N/A | 7.6 | Cont Grade |
| * IN-I2 | I | 1-C-SGL | 5117.30 | 16.6 | 0.3 | 2.4 | Sump |
| * IN-J1 | J | 1-D-SGL | 5126.62 | 8.2 | 3.1 | 33.3 | Sump |
| IN-K1 | K | 1-D-SGL | 5129.00 | 2.6 | 0.5 | 8.0 | Sump |
| IN-K2 | K | 1-D-SGL | 5128.70 | 2.6 | 0.8 | 16.1 | Sump |

* Existing inlet constructed with the phase 1 building
** Inlets IN-F1, IN-F2 & IN-F3 intercept runoff from Basin F. Inlets IN-I1 & IN-I2 intercept runoff from Basin I

**PRESBYTERIAN PSO**
**Contributing Area**
**HEC-22 METHOD**
**100 -YEAR ONSITE FLOWS**

Manning's Coefficient for Street and Pavement Gutters n= 0.016

| BASIN ID FOR INLET | BASIN ID | Contributing Area (acres) | Area Basin Q (cfs) | Total Rtd Q (cfs) | Inlet Width (ft) | Inlet Length (ft) | Inlet Type | Total Spread of Water T (ft) | Depth of Flow d (ft) | Intercept Q Qi (cfs) | Bypass Q Qb (cfs) | Long. Slope $S_L$ (ft/ft) | Cross Slope $S_X$ (ft/ft) | Splash Over $V_O$ (fps) | Gutter Velocity V (fps) | Ratio Frontal Flow Eo | Total Frontal Flow Rf | Total Side Flow Rs | Efficiency E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B | IN-B1 | 0.14 | 0.6 | 0.6 | 2.08 | 3.33 | C | 2.8 | 0.11 | 0.6 | 0.0 | 0.0667 | 0.0375 | 10.0 | 4.0 | 0.97 | 1.0 | 0.2 | 0.98 |
| F | IN-F2 | 4.80 | 21.6 | 21.6 | 2.08 | 6.83 | A | 22.6 | 0.38 | 10.5 | 11.1 | 0.0196 | 0.0167 | 10.0 | 5.1 | 0.23 | 1.0 | 0.3 | 0.48 |
| I | IN-I1 | 3.68 | 16.6 | 16.6 | 2.08 | 6.83 | A | 27.3 | 0.30 | 7.6 | 9.0 | 0.0172 | 0.0110 | 10.0 | 4.1 | 0.19 | 1.0 | 0.3 | 0.46 |

**NOTES:**
1. Design Criteria from the HEC-22 Urban Drainage Design Manual, Second Edition.
   Flow spread from 10-yr event must maintain one through lane open at all times. Runoff from 100-year storm shall be contained within the R/W
2. Total allowable ponding width for typical section based on COA criteria.
3. Manning's n=0.016 (rough texture- asphalt pavement), HEC-22 Urban Drainage Design Manual Second Edition, pg 4-10.
4. Sediment accumulation is not anticipated.
5. No reduction in routed Q's for attenuation.

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Analyzer Report
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Drainage Structure Analyzer
Balloon Fiesta Parkway Culvert Hydraulic Analysis
Date: Monday, July 16, 2012
===========================
Input Data
----------
Shape                    Circular
Material                 CMP-12G
Roughness                0.022000
Entrance Edge            Projecting
Number of Barrels        6
Length                   180.00 ft
Slope                    2.000%
Tailwater                0.00 ft
Inlet Control Equation   Entrance Loss
Size (W x T):            48.00 x 0.1090
Headwater                6.70 ft

Output Results
--------------
Flow Rate                686.2 cfs
Control                  Inlet
Capacity                 720.2 cfs
Manning's Velocity       10.87 ft/s
Headwater                6.70 ft
Critical Depth           3.22 ft
Normal Depth             3.12 ft
Size (W x T):            48.00 x 0.1090
```

**LEGEND**
DRAINAGE BASIN

N

60 30 0 60
SCALE: 1"=60'

Bohannan Huston


architecture
interiors
landscape
planning
engineering

Dekker
Perich
Sabatini

7601 Jefferson NE Suite 100
Albuquerque, NM 87109
505 761-9700
fax 761-4222
dps@dpsdesign.org


ARCHITECT

ENGINEER

GLENN S. BROUGHTON
NEW MEXICO
14871
REGISTERED PROFESSIONAL ENGINEER

PROJECT

Presbyterian Systems Office
Administrative Admendment
9521 San Mateo NE
Albuquerque, New Mexico

REVISIONS

| | |
|---|---|
| DRAWN BY | BO |
| REVIEWED BY | GSB |
| DATE | 6/12/12 |
| PROJECT NO. | 11-0100 |

DRAWING NAME
DRAINAGE MANAGEMENT PLAN

SHEET NO.
--
OF