CITY OF ALBUQUERQUE

July 7, 2017

J. Graeme Means, PE
High Mesa Consulting Group
6010 –B Midway Park Blvd NE
Albuquerque, NM 87109

Re: Hotel Chaco
2000 Bellamah Ave NW
Request Permanent C.O. - Accepted
Engineer's Stamp dated: 9/23/2016 (J13D66)
Certification dated: 6-11-17

Dear Mr. Means,

Based on the Certification received 6/12/2017, the site is acceptable for release of Certificate of Occupancy by Hydrology.

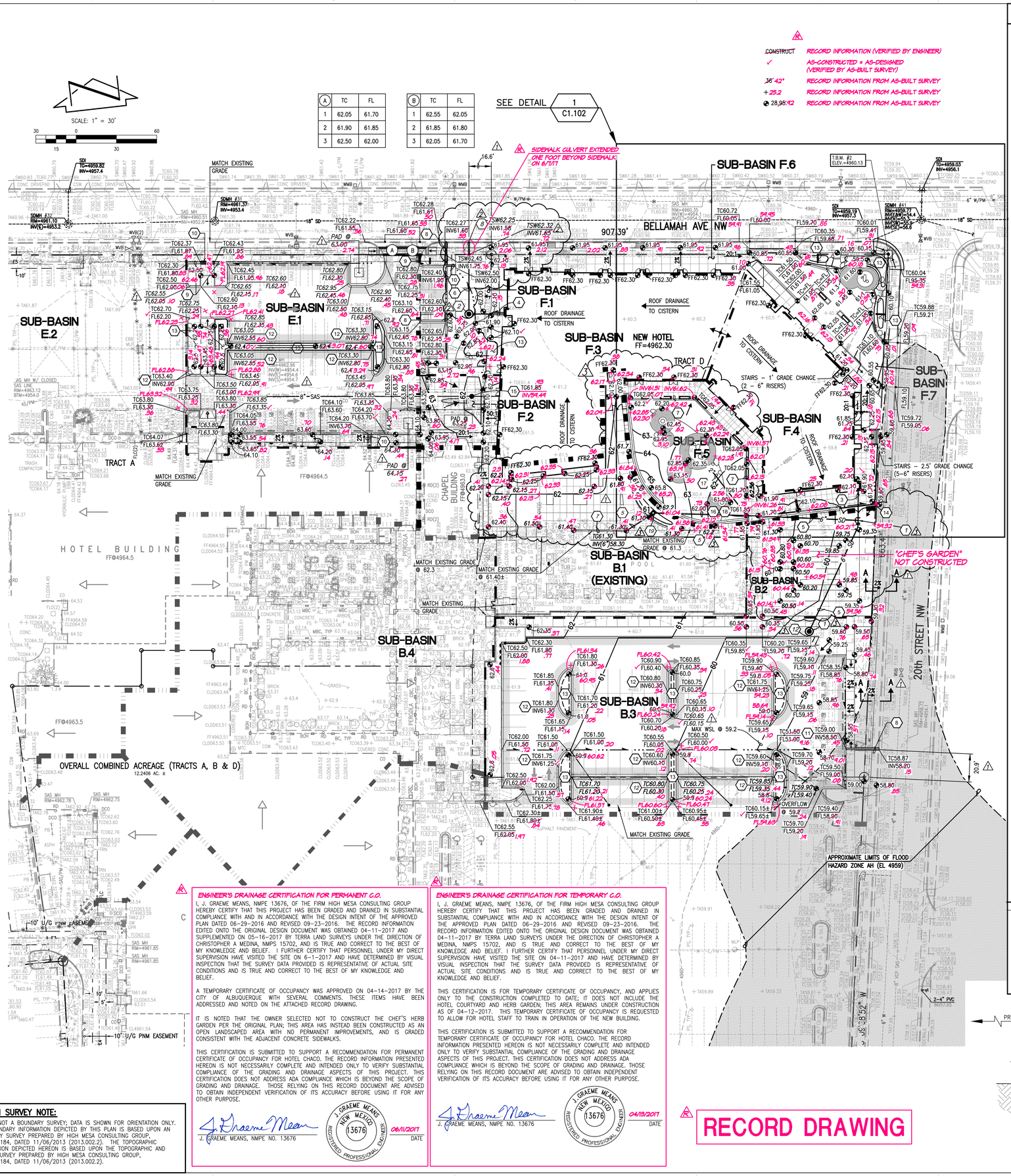
If you have any questions, you can contact me at 924-3986 or Totten Elliott at 924-3982.

Sincerely,

James D. Hughes, P.E.
Principal Engineer, Planning Dept.
Development and Review Services

TE/JH
C: email, Serna, Yvette M.; Fox, Debi; Tena, Victoria C.; Sandoval, Darlene M.

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov



A	TC	FL
1	62.05	61.70
2	61.90	61.85
3	62.50	62.00

B	TC	FL
1	62.55	62.05
2	61.85	61.80
3	62.05	61.70

LEGEND

AR	ASPHALT RAMP
AL	AREA LIGHT
AWCR	ASPHALT WHEELCHAIR RAMP
BCR	BIKE RACK
BLDG	BUILDING
BOH	BUILDING OVERHANG
BOL	BOLLARD
BRW	BRICK WALL
C&G	CURB & GUTTER
C	COMMUNICATIONS LINE
C/PM	COMMUNICATIONS LINE BY PAINT MARK
CBC	CONCRETE BUILDING COLUMN
CC	COMMUNICATIONS CONDUIT
CDP	CONCRETE DRIVE PAD
CMH	COMMUNICATIONS MANHOLE
CHC	CONCRETE HEADER CURB
CLD	CENTERLINE DOOR
CLDD	CENTERLINE DOUBLE DOOR
CLN	CONCRETE LANDING
CMP	COMMUNICATIONS PANEL
CMU	CONCRETE MASONRY UNIT WALL
CO	SANITARY SEWER CLEANOUT
CONC	CONCRETE
CPB	COMMUNICATIONS PULLBOX
CR	CONCRETE RAMP
CRW	CONCRETE RETAINING WALL
CS	CONCRETE STEPS
CSP	CONCRETE SPLASH PAD
CSW	CONCRETE SIDEWALK
CTC	CONCRETE TRASH CAN
DBL	DOUBLE
DCO	DOUBLE CLEANOUT SANITARY SEWER CLEANOUT
E/PM	ELECTRIC LINE BY PAINT MARK
EA	EDGE OF ASPHALT
EC	ELECTRIC CONDUIT
EO	ELECTRIC OUTLET
EP	ELECTRIC PANEL
EPB	ELECTRIC PULLBOX
FH	FIRE HYDRANT
FL	FLOWLINE
FNT	FOUNTAIN
FP	FLAG POLE
G/PM	GAS LINE BY PAINT MARK
G	GAS LINE
GLM	GAS LINE MARKER
GP	GUARD POST
GRV	GRAVEL
GS	GAS SERVICE
GVB	GAS VALVE BOX
HCS	HANDICAPPED PARKING SIGN
ICB	IRRIGATION CONTROL BOX
INV	INVERT
IVB	IRRIGATION VALVE BOX
LV	LAUNDRY VENT
MBC	METAL BUILDING COLUMN
MH	MANHOLE
MHR	METAL HAND RAIL
MR	METAL RAMP
MTS	METAL SIGN
OHC(1)	OVERHEAD COMMUNICATIONS (# OF LINES)
OHE(3)	OVERHEAD ELECTRIC (# OF LINES)
PI	PAINTED PARKING LOT ISLAND
PS	PAINTED PARKING STRIPE
RR	RIVER ROCKS
RRT	LANDSCAPING RAILROAD TIES
SAS	SANITARY SEWER
SBC	STUCCO BUILDING COLUMN
SCP	SCUPPER
SD	STORM DRAIN
SDI	STORM DRAIN INLET
SGP	STEEL GUARD POST
SP	STEEL POLE
SPD	SPEED BUMP
STW	STUCCO WALL
SW	SIDEWALK
TA	TOP OF ASPHALT
TC	TOP OF CURB
TCO	TOP OF CONCRETE
TG	TOP OF GRATE
TPB	TRAFFIC PULLBOX
TRN	ELECTRIC TRANSFORMER
TS	TRAFFIC SIGN
TSPB	TRAFFIC SIGNAL PULLBOX
TYP	TYPICAL
TVC	CABLE TELEVISION CABINET
TVCAB	CABLE TELEVISION CABINET
TVR	CABLE TELEVISION RISER
UNK	UNKNOWN
W	WATER
W/PM	WATER LINE BY PAINT MARK
WCR	CONCRETE WHEELCHAIR RAMP
WDF	WOOD FENCE
WGP	WOOD GUARD POST
WHB	WATER HOT BOX
WMB	WATER METER BOX
WP	WOOD POLE
WPP	WOOD POWER POLE
WVB	WATER VALVE BOX
XW	PAINTED CROSS WALK
0.5'ø	TREE TRUNK DIAMETER

DECIDUOUS TREE
SMALL DECIDUOUS TREE
CONIFEROUS TREE
SMALL CONIFEROUS TREE
SHRUB
SMALL SHRUB
GROUP SMALL TREES
BOULDER
PAINTED UTILITY MARKER
STUMP

INV	INVERT
TA	TOP OF ASPHALT PAVEMENT
TC	TOP OF CURB
TG	TOP OF GRATE
+ 20.05	EXISTING SPOT ELEVATION
ø 14.00	PROPOSED SPOT ELEVATION
	EXISTING FLOWLINE
	PROPOSED FLOWLINE
4920	EXISTING CONTOUR
20	PROPOSED CONTOUR
	EXISTING DIRECTION OF FLOW
	PROPOSED DIRECTION OF FLOW
	PROPERTY LINE
	PUBLIC EASEMENT LINE
	HIGH POINT / DIVIDE
	PROPOSED CONCRETE
	PROPOSED ASPHALT PAVING
	REVISION TEXT

CONSTRUCTION AND SO#19 NOTES

1. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL SYSTEM, 811, FOR DESIGNATION (LINE–SPOTTING) OF EXISTING UTILITIES.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL POTENTIAL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INTERPRETATIONS IT MAKES WITHOUT FIRST CONTACTING THE ENGINEER AS REQUIRED ABOVE.
3. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.
4. ALL CONSTRUCTION WITHIN PUBLIC RIGHT–OF–WAY SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE CITY OF ALBUQUERQUE STANDARDS AND PROCEDURES.
5. IF ANY UTILITY LINES, PIPELINES, OR UNDERGROUND UTILITY LINES ARE SHOWN ON THESE DRAWINGS, THEY ARE SHOWN IN AN APPROXIMATE MANNER ONLY, AND SUCH LINES MAY EXIST WHERE NONE ARE SHOWN. IF ANY SUCH EXISTING LINES ARE SHOWN, THE LOCATION IS BASED UPON INFORMATION PROVIDED BY THE OWNER OF SAID UTILITY, AND THE INFORMATION MAY BE INCOMPLETE, OR MAY BE OBSOLETE BY THE TIME CONSTRUCTION COMMENCES. THE ENGINEER HAS CONDUCTED ONLY PRELIMINARY INVESTIGATION OF THE LOCATION, DEPTH, SIZE, OR TYPE OF EXISTING UTILITY LINES, PIPELINES, OR UNDERGROUND UTILITY LINES. THIS INVESTIGATION IS NOT CONCLUSIVE, AND MAY NOT BE COMPLETE, THEREFORE, MAKES NO REPRESENTATION PERTAINING THERETO, AND ASSUMES NO RESPONSIBILITY OR LIABILITY THEREFOR. THE CONTRACTOR SHALL INFORM ITSELF OF THE LOCATION OF ANY UTILITY LINE, PIPELINE, OR UNDERGROUND UTILITY LINE IN OR NEAR THE AREA OF THE WORK IN ADVANCE OF AND DURING EXCAVATION WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE CAUSED BY ITS FAILURE TO LOCATE, IDENTIFY AND PRESERVE ANY AND ALL EXISTING UTILITIES, PIPELINES, AND UNDERGROUND UTILITY LINES. IN PLANNING AND CONDUCTING EXCAVATION, THE CONTRACTOR SHALL COMPLY WITH STATE STATUTES, MUNICIPAL AND LOCAL ORDINANCES, RULES AND REGULATIONS, IF ANY, PERTAINING TO THE LOCATION OF THESE LINES AND FACILITIES.
6. THE DESIGN OF PLANTERS AND LANDSCAPED AREAS IS NOT PART OF THIS PLAN. ALL PLANTERS AND LANDSCAPED AREAS ADJACENT TO THE BUILDING(S) SHALL BE PROVIDED WITH POSITIVE DRAINAGE TO AVOID ANY PONDING ADJACENT TO THE STRUCTURE. FOR CONSTRUCTION DETAILS, REFER TO LANDSCAPING PLAN.
7. AN EXCAVATION/CONSTRUCTION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN CITY RIGHT–OF–WAY. AN APPROVED COPY OF THESE PLANS MUST BE SUBMITTED AT THE TIME OF APPLICATION FOR THIS PERMIT.
8. BACKFILL COMPACTION SHALL BE ACCORDING TO MAJOR LOCAL STREET USE.
9. MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED.
10. IF THE SO#19 PERMIT INCLUDES A SIDEWALK CULVERT, CONTRACTOR SHALL TACK WELD PLATE TO EMBEDDED ANCHORS

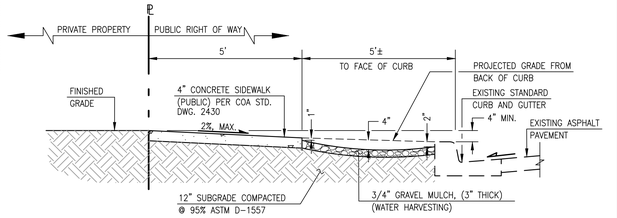
APPROVALS	NAME	DATE
HYDROLOGY		
SIDEWALK INSPECTOR		
STORM DRAIN MAINTENANCE		

EROSION CONTROL MEASURES

1. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE SITE INTO PUBLIC RIGHT–OF–WAY OR ONTO PRIVATE PROPERTY.
2. THE CONTRACTOR SHALL PROMPTLY CLEAN UP ANY MATERIAL EXCAVATED WITHIN THE PUBLIC RIGHT–OF–WAY SO THAT THE EXCAVATED MATERIAL IS NOT SUSCEPTIBLE TO BEING WASHED DOWN THE STREET.
3. WHEN APPLICABLE, CONTRACTOR SHALL SECURE "TOPSOIL DISTURBANCE PERMIT" FROM THE CITY AND/OR FILE A NOTICE OF INTENT (N.O.I.) WITH THE EPA PRIOR TO BEGINNING CONSTRUCTION.

GRADING AND DRAINAGE KEYED NOTES

1. CONSTRUCT STORM WATER QUALITY MANHOLE WITH VENTED LID PER TYP. SECTION, SHEET C1.102, RIM 59.50, INV(IN, 6") 55.90, INV(BOTTOM) 55.00 53.92
2. CONSTRUCT STORM WATER QUALITY MANHOLE PER TYP. SECTION, SHEET C1.102, RIM 61.80, INV(IN, 6") 60.00, INV(OUT, 6") 60.00, INV(BOTTOM) 58.00
3. 6" ROOF DRAIN TO NEW CISTERN, FOR CONTINUATION, SEE PO3.05
4. 8" ROOF DRAIN TO NEW CISTERN, FOR CONTINUATION, SEE PO3.05
5. INSTALL 6" *PRIVATE* STORM DRAIN @ S = 0.0100
6. *INSTALL 6" PVC STORM DRAIN, INSERT INTO BACK OF NEW SIDEWALK CULVERT*
7. NEW TRENCH DRAIN, SEE DETAIL C2/AS1.502
8. CONSTRUCT 12" WIDE SIDEWALK CULVERT PER COA STD DRAWING 2236 BY SO #19 PERMIT
9. CONSTRUCT 12" WIDE CONCRETE RUNDOWN (PRIVATE) PER TYPICAL SECTION, SHEET C1.102
10. CONSTRUCT 12" WIDE SIDEWALK CULVERT (PRIVATE) PER TYPICAL SECTION, SHEET C1.102
11. CONSTRUCT 12" WIDE SIDEWALK CULVERT (PRIVATE) AND CONCRETE RUNDOWN (PRIVATE) WITH ORIFICE PLATE (4" WIDE OPENING) AT PARKING LOT SIDE
12. CONSTRUCT 2' CURB CUT (FOR WATER HARVESTING) PER TYPICAL SECTION, SHEET C1.102
13. NEW WATER HARVESTING AREA
14. CONSTRUCT 4" DIA. WEEP HOLE IN NEW WALL, INV 61.70
15. NEW SANITARY SEWER MANHOLE WITH GRATED LID TO ACCEPT AND DRAIN RUNOFF FROM REFUSE BIN AREA, SEE SHEET C1.106
16. PROVIDE *6" PRIVATE* STORM DRAIN CONNECTION VIA BOTTOM INLET, INV 57.30
17. INSTALL *2" PRIVATE* STORM DRAIN (OVERFLOW DRAIN FROM WATER FEATURE), MIN. S = 0.0200
18. CONNECT WATER FEATURE OVERFLOW DRAIN TO 6" *PRIVATE* STORM DRAIN
19. *CONSTRUCT 24"x24" STORM DRAIN INLET PER TYPICAL SECTION, SHEET C1–102, TG 60.90, INV 58.00*
20. *INSTALL 6"x6"x6" TEE AND 6" 22 1/2° ELL, INV 56.50*



SECTION A–A
SCALE: 1" = 2'–0"

DESIGN SURVEY NOTE:

THIS IS NOT A BOUNDARY SURVEY; DATA IS SHOWN FOR ORIENTATION ONLY. THE BOUNDARY INFORMATION DEPICTED BY THIS PLAN IS BASED UPON AN BOUNDARY SURVEY PREPARED BY HIGH MESA CONSULTING GROUP, NMPS 11184, DATED 11/06/2013 (2013.002.2). THE TOPOGRAPHIC INFORMATION DEPICTED HEREON IS BASED UPON THE TOPOGRAPHIC AND UTILITY SURVEY PREPARED BY HIGH MESA CONSULTING GROUP, NMPS 11184, DATED 11/06/2013 (2013.002.2).

ENGINEER'S DRAINAGE CERTIFICATION FOR PERMANENT C.O.

I, J. GRAEME MEANS, NMPE 13676, OF THE FIRM HIGH MESA CONSULTING GROUP HEREBY CERTIFY THAT THIS PROJECT HAS BEEN GRADED AND DRAINED IN SUBSTANTIAL COMPLIANCE WITH AND IN ACCORDANCE WITH THE DESIGN INTENT OF THE APPROVED PLAN DATED 06–29–2016 AND REVISED 09–23–2016. THE RECORD INFORMATION EDITED ONTO THE ORIGINAL DESIGN DOCUMENT WAS OBTAINED 04–11–2017 AND SUPPLEMENTED ON 05–16–2017 BY TERRA LAND SURVEYS UNDER THE DIRECTION OF CHRISTOPHER A MEDINA, NMPS 15702, AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I FURTHER CERTIFY THAT PERSONNEL UNDER MY DIRECT SUPERVISION HAVE VISITED THE SITE ON 6–1–2017 AND HAVE DETERMINED BY VISUAL INSPECTION THAT THE SURVEY DATA PROVIDED IS REPRESENTATIVE OF ACTUAL SITE CONDITIONS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

A TEMPORARY CERTIFICATE OF OCCUPANCY WAS APPROVED ON 04–14–2017 BY THE CITY OF ALBUQUERQUE WITH SEVERAL COMMENTS. THESE ITEMS HAVE BEEN ADDRESSED AND NOTED ON THE ATTACHED RECORD DRAWING.

IT IS NOTED THAT THE OWNER SELECTED NOT TO CONSTRUCT THE CHEF'S HERB GARDEN PER THE ORIGINAL PLAN; THIS AREA HAS INSTEAD BEEN CONSTRUCTED AS AN OPEN LANDSCAPED AREA WITH NO PERMANENT IMPROVEMENTS, AND IS GRADED CONSISTENT WITH THE ADJACENT CONCRETE SIDEWALKS.

THIS CERTIFICATION IS SUBMITTED TO SUPPORT A RECOMMENDATION FOR PERMANENT CERTIFICATE OF OCCUPANCY FOR HOTEL CHACO. THE RECORD INFORMATION PRESENTED HEREON IS NOT NECESSARILY COMPLETE AND INTENDED ONLY TO VERIFY SUBSTANTIAL COMPLIANCE OF THE GRADING AND DRAINAGE ASPECTS OF THIS PROJECT. THIS CERTIFICATION DOES NOT ADDRESS ADA COMPLIANCE WHICH IS BEYOND THE SCOPE OF GRADING AND DRAINAGE. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE USING IT FOR ANY OTHER PURPOSE.

J. Graeme Means
J. GRAEME MEANS, NMPE NO. 13676 — 06/11/2017 DATE

ENGINEER'S DRAINAGE CERTIFICATION FOR TEMPORARY C.O.

I, J. GRAEME MEANS, NMPE 13676, OF THE FIRM HIGH MESA CONSULTING GROUP HEREBY CERTIFY THAT THIS PROJECT HAS BEEN GRADED AND DRAINED IN SUBSTANTIAL COMPLIANCE WITH AND IN ACCORDANCE WITH THE DESIGN INTENT OF THE APPROVED PLAN DATED 06–29–2016 AND REVISED 09–23–2016. THE RECORD INFORMATION EDITED ONTO THE ORIGINAL DESIGN DOCUMENT WAS OBTAINED 04–11–2017 BY TERRA LAND SURVEYS UNDER THE DIRECTION OF CHRISTOPHER A MEDINA, NMPS 15702, AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I FURTHER CERTIFY THAT PERSONNEL UNDER MY DIRECT SUPERVISION HAVE VISITED THE SITE ON 04–11–2017 AND HAVE DETERMINED BY VISUAL INSPECTION THAT THE SURVEY DATA PROVIDED IS REPRESENTATIVE OF ACTUAL SITE CONDITIONS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

THIS CERTIFICATION IS FOR TEMPORARY CERTIFICATE OF OCCUPANCY, AND APPLIES ONLY TO THE CONSTRUCTION COMPLETED TO DATE; IT DOES NOT INCLUDE THE HOTEL COURTYARD AND HERB GARDEN; THIS AREA REMAINS UNDER CONSTRUCTION AS OF 04–12–2017. THIS TEMPORARY CERTIFICATE OF OCCUPANCY IS REQUESTED TO ALLOW FOR HOTEL STAFF TO TRAIN IN OPERATION OF THE NEW BUILDING.

THIS CERTIFICATION IS SUBMITTED TO SUPPORT A RECOMMENDATION FOR TEMPORARY CERTIFICATE OF OCCUPANCY FOR HOTEL CHACO. THE RECORD INFORMATION PRESENTED HEREON IS NOT NECESSARILY COMPLETE AND INTENDED ONLY TO VERIFY SUBSTANTIAL COMPLIANCE OF THE GRADING AND DRAINAGE ASPECTS OF THIS PROJECT. THIS CERTIFICATION DOES NOT ADDRESS ADA COMPLIANCE WHICH IS BEYOND THE SCOPE OF GRADING AND DRAINAGE. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE USING IT FOR ANY OTHER PURPOSE.

J. Graeme Means
J. GRAEME MEANS, NMPE NO. 13676 — 04/19/2017 DATE

RECORD DRAWING

HERITAGE HOTELS & RESORTS

2000 Bellamah Ave. NW, Albuquerque, NM 87104

Gensler
500 S. Figueroa Street
Los Angeles CA 900071
Tel: 213.327.3600
Fax: 213.327.3601

DEKKER PERICH SABATINI — ARCHITECTURE / DESIGN / INSPIRATION
7601 JEFFERSON NE, SUITE 100 ALBUQUERQUE, NM 87109 — 505.761.9700 DPSDESIGN.ORG

HIGH MESA Consulting Group
6010–B MIDWAY PARK BLVD. NE
ALBUQUERQUE, NEW MEXICO 87109
PHONE: 505.345.4250 FAX: 505.345.4254
www.highmesacg.com

Issue	Date & Issue Description	By	Check
1	10.29.14	JDS	JGM
1	2/16 *N. PARKING LOT REV. ADD SECTION A–A*	J.D.S.	J.G.M.
2	6/16 *REPLACE CISTERNS W/ WATER QUALITY MH's*	J.D.S.	G.M.
3	9/16 *COURTYARD SITE PLAN ADJUSTMENTS*	J.D.S.	G.M.
R	04/17 *RECORD DRAWING AND TEMPORARY CERTIFICATION*	J.D.S.	G.M.
R	06/17 *PERMANENT CERTIFICATION*	J.D.S.	G.M.

Seal/Signature

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY JEFFREY G. MORTENSEN, NMPE #8547 ON 10/28/2014.

J. GRAEME MEANS NEW MEXICO 13676 REGISTERED PROFESSIONAL ENGINEER

06/11/2017 6–29–2016
04/19/2017 9–23–2016

Project Name
HOTEL OLD TOWN

Project Number
13-0020

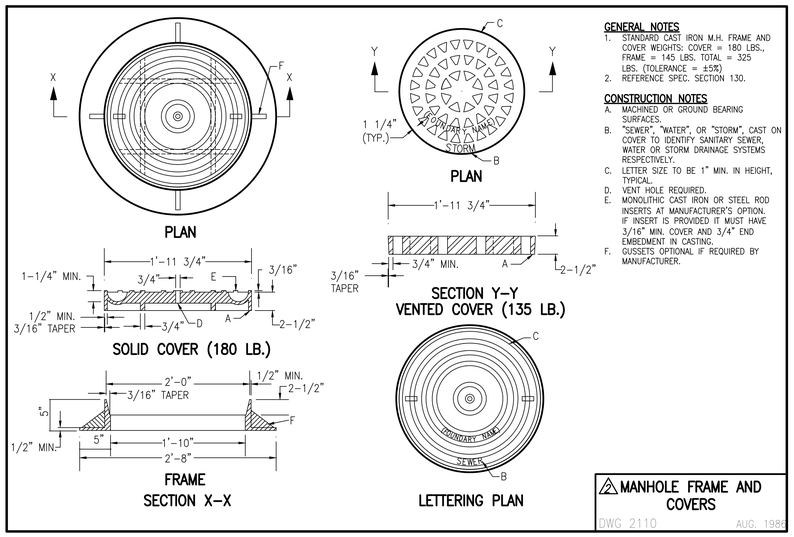
Description
GRADING AND DRAINAGE PLAN

Scale

C1.101

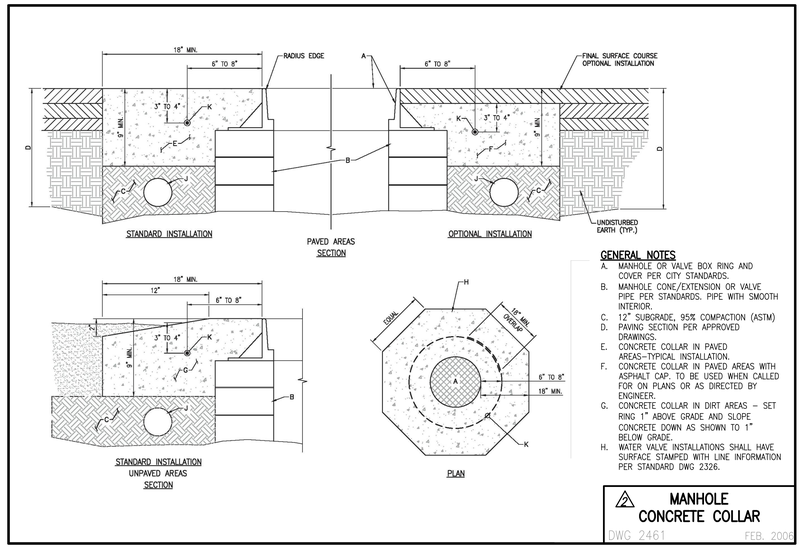
2014.032.1

File Path: P:\DATA\2014.032.1\DWG\AR\ | Plot Date: 06–08–2017
File Name: 140321_C–101_AB.DWG | Plot Time: 3:50 pm



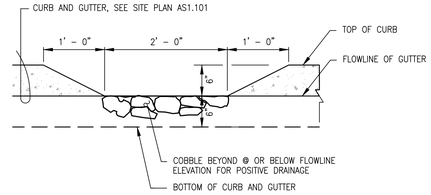
2 MANHOLE FRAME AND COVERS

DWG 2110 AUG. 1984



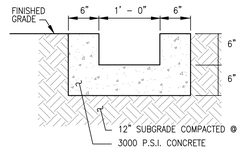
2 MANHOLE CONCRETE COLLAR

DWG 2461 FEB. 2001



E5 WATER HARVESTING CURB CUT SECTION

SCALE: 1" = 1'–0"



D5 TYPICAL RUNDOWN SECTION (PRIVATE)

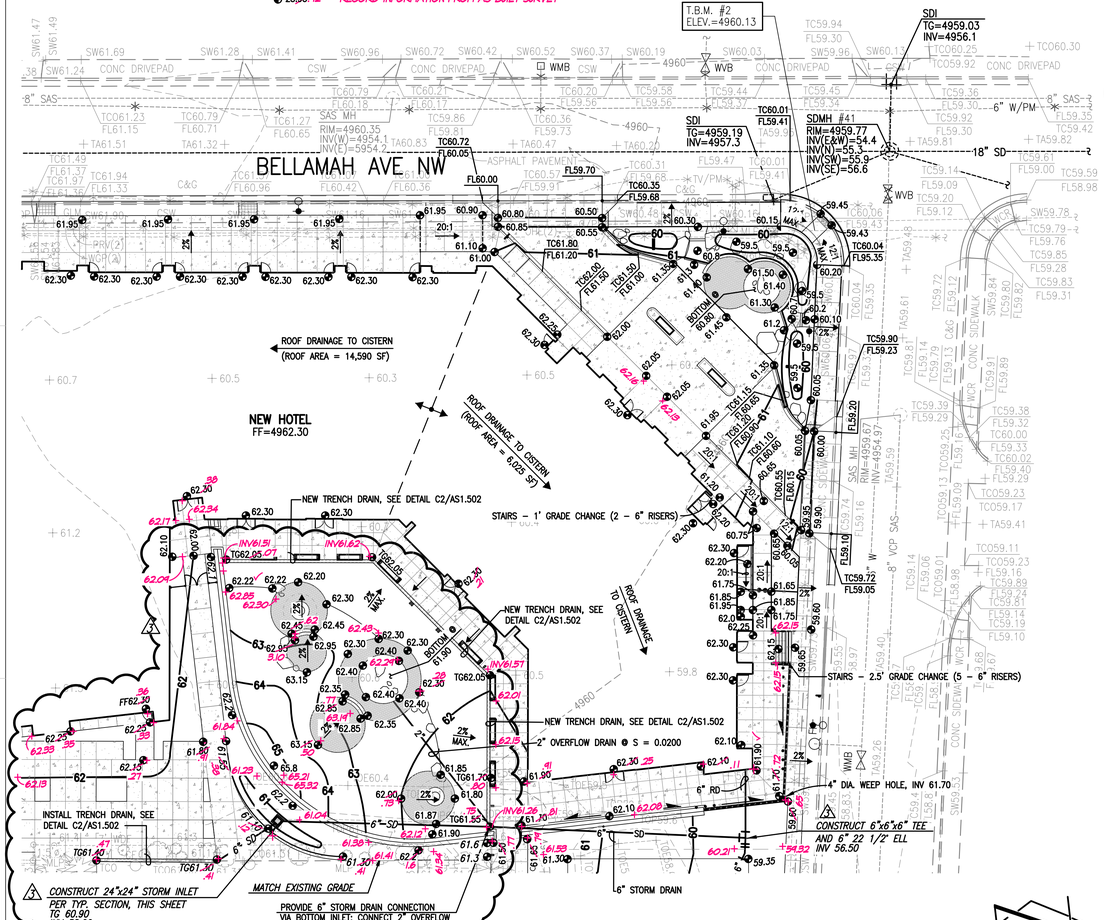
SCALE: 1" = 1'–0"

NOTE:
NOT FOR USE IN PUBLIC RIGHT OF WAY

RECORD DRAWING LEGEND

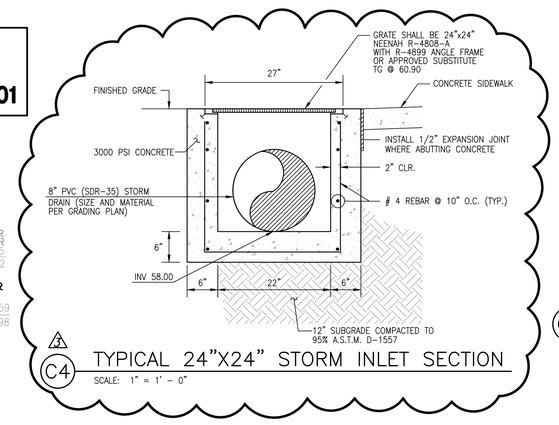
~~CONSTRUCT~~	RECORD INFORMATION (VERIFIED BY ENGINEER)
✓	AS-CONSTRUCTED = AS-DESIGNED (VERIFIED BY AS-BUILT SURVEY)
36' 42"	RECORD INFORMATION FROM AS-BUILT SURVEY
+25.2	RECORD INFORMATION FROM AS-BUILT SURVEY
⊕ 28.95 42	RECORD INFORMATION FROM AS-BUILT SURVEY

RECORD DRAWING
FOR CERTIFICATION, SEE SHEET C1.101



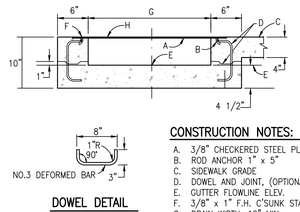
A1 DETAIL 1 CIVIL–101

SCALE: 1" = 20'



C4 TYPICAL 24"X24" STORM INLET SECTION

SCALE: 1" = 1' – 0"



SCALE: 1" = 1"

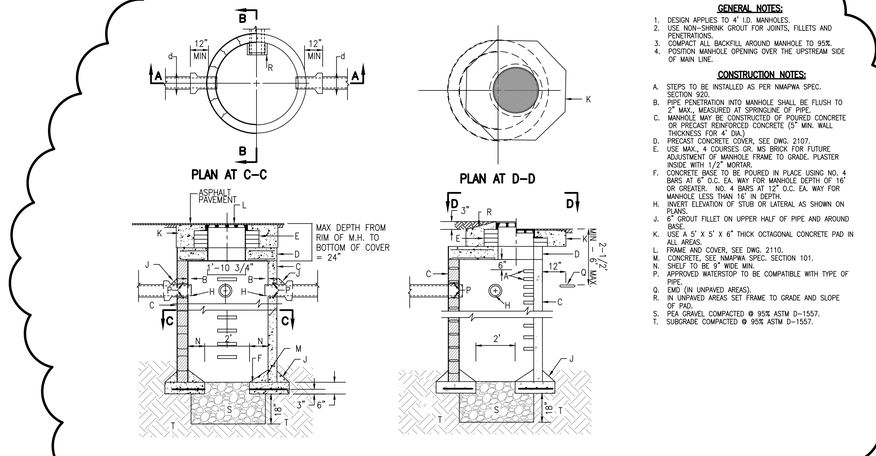
CONSTRUCTION NOTES:

A. 3/8" CHECKERED STEEL PLATE.
B. ROD ANCHOR 1" x 5"
C. SIDEWALK GRADE
D. DOWEL AND JOINT, (OPTIONAL).
E. GUTTER FLOWLINE ELEV.
F. 3/8" x 1" F.H. C'SUNK STAINLESS STEEL MACHINE SCREW.
G. DRAIN WIDTH, 12" MIN.
H. AFTER CLEANING SURFACE OF SCALE, RUST, OILS, ETC., PAINT GRATE WITH ONE SHOP COAT RED OXIDE, TWO FINISH COATS OF ALUMINUM PAINT (AASHTO M 69).

C5 SIDEWALK CULVERT SECTION (PRIVATE)

SCALE: 1" = 2"

NOTE:
NOT FOR USE IN PUBLIC RIGHT OF WAY



A5 STORMWATER QUALITY MANHOLE

NOT TO SCALE

2014.032.1

HERITAGE HOTELS & RESORTS

2000 Bellamah Ave. NW, Albuquerque, NM 87104

Gensler
500 S. Figueroa Street
Los Angeles CA 90071
Tel: 213.327.3600
Fax: 213.327.3601

DEKKER PERICH SABATINI
ARCHITECTURE / DESIGN / INSPIRATION
7601 JEFFERSON NE, SUITE 100 ALBUQUERQUE, NM 87109
505.761.9700 DPSDESIGN.ORG

HIGH MESA Consulting Group
6010-B MIDWAY PARK BLVD. NE
ALBUQUERQUE, NEW MEXICO 87109
PHONE: 505.345.4250 FAX: 505.345.4254
www.highmesacg.com

Issue	Date & Issue Description	By	Check
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3	9/16 COURTYARD SITE PLAN ADJUSTMENTS	J.D.S.	G.M.
R	04/17 RECORD DRAWING AND TEMPORARY CERTIFICATION	J.D.S.	G.M.
R	05/17 PERMANENT CERTIFICATION	J.D.S.	G.M.

Seal/Signature

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J. GRAEME MEANS NEW MEXICO 13676 REGISTERED PROFESSIONAL ENGINEER

6–29–2016
9–23–2016

Project Name 06/11/2017
HOTEL OLD TOWN

Project Number
13-0020

Description
DRAINAGE SECTIONS AND DETAILS

Scale

C1.102

File Path: P:\DATA\2014.032.1\DWG\AR\ Plot Date: 06–08–2017
File Name: 140321_C–102_AB.DWG Plot Time: 3:43 pm

DRAINAGE PLAN

I. INTRODUCTION AND EXECUTIVE SUMMARY

THIS PROJECT, LOCATED WITHIN THE OLD TOWN AREA OF ALBUQUERQUE, REPRESENTS A MODIFICATION TO AN EXISTING SITE WITHIN AN INFILL AREA. THE EXISTING SITE IS DEVELOPED AS THE SHERATON OLD TOWN COMPLEX THAT INCLUDES THE EXISTING HOTEL BUILDING AND ASSOCIATED SITE IMPROVEMENTS. A NEW HOTEL BUILDING WITH ASSOCIATED LANDSCAPED AND PAVING IMPROVEMENTS IS PROPOSED IN THE NORTHEAST CORNER OF THE SITE. THE DRAINAGE CONCEPT FOR THIS PROJECT WILL BE TO LIMIT DISCHARGE FROM THE SITE TO THE ALLOWABLE DISCHARGE RATE AS DEFINED IN THE APPROVED 2014 DRAINAGE MASTER PLAN, AS WELL AS CAPTURE ONSITE THE FIRST FLUSH OF RUNOFF FROM THE NEW IMPERVIOUS IMPROVEMENTS. THIS WILL BE DONE VIA ONSITE WATER HARVESTING, DETENTION PONDING, AND INSTALLATION OF CISTERNS TO CAPTURE ROOF RUNOFF FROM THE NEW HOTEL.

THIS SUBMITTAL IS MADE IN SUPPORT OF BUILDING PERMIT APPROVAL WITHIN THE JURISDICTION OF THE CITY OF ALBUQUERQUE.

II. PROJECT DESCRIPTION

AS SHOWN BY THE VICINITY MAP, THE SITE IS LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF RIO GRANDE BLVD NW AND BELLAMAH AVE NW. THE SITE IS DEVELOPED AS A HOTEL WITH CONVENTION SPACE, ASSOCIATED PAVED PARKING AND LANDSCAPING. THE NORTHEAST CORNER OF THE SITE IS CURRENTLY VACANT, WITH DEVELOPMENT PROPOSED AT THIS TIME. THE CURRENT LEGAL DESCRIPTION IS TRACTS A, B AND D, SHERATON OLD TOWN INN COMPLEX. AS SHOWN BY PANEL 331 OF 825 OF THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAPS PUBLISHED BY FEMA FOR BERNALILLO COUNTY, NEW MEXICO, REVISED AUGUST 16, 2012, THE SOUTHEAST CORNER OF THE SITE LIES WITHIN A DESIGNATED FLOOD HAZARD ZONE. THE FLOOD HAZARD ZONE HAS BEEN IDENTIFIED AS AN AH ZONE WITH A CORRESPONDING FLOOD ELEVATION OF 4959. IN RECOGNITION OF THIS FLOODPLAIN, THE FINISHED FLOOR OF THE PROPOSED HOTEL BUILDING AND ALL SUBSEQUENT OCCUPIED STRUCTURES WILL BE ESTABLISHED AT A MINIMUM OF ONE FOOT ABOVE THE CORRESPONDING FLOOD ZONE ELEVATION.

III. BACKGROUND DOCUMENTS

THE PREPARATION OF THIS PLAN RELIED UPON THE FOLLOWING DOCUMENTS AND ACTIVITIES:

- DRAINAGE MASTER PLAN FOR SHERATON OLD TOWN PREPARED BY HIGH MESA CONSULTING GROUP, NMPE 8547, DATED 06-23-2014. THE 2014 DMP ESTABLISHED THE DRAINAGE BASINS FOR THE PROPOSED DEVELOPMENT OF THE SITE, AS WELL AS DRAINAGE AND STORMWATER CONTROL GUIDELINES AND CRITERIA FOR PROPOSED DEVELOPMENT OF THE SITE.
- TOPOGRAPHIC SURVEY PREPARED BY HIGH MESA CONSULTING GROUP (NMPS 11184) DATED 11-06-2013. THIS REFERENCED SURVEY PROVIDES THE BASIS FOR THE EXISTING CONDITIONS OF THE PROJECT SITE (TRACTS A, B AND D).

IV. EXISTING CONDITIONS

THE PROJECT SITE CONSISTS OF THE NORTHEASTERN PORTION OF THE HOTEL SITE. A LARGE MAJORITY OF THE PROJECT SITE IS VACANT, WITH MINIMAL VEGETATION. THE DEVELOPED PORTIONS OF THE SITE CONSIST OF AN OUTDOOR POOL AND DECK, ALONG WITH THE EAST END OF THE PAVED PARKING LOT NORTH OF THE HOTEL. THE PROJECT SITE IS CHARACTERIZED BY 3 DRAINAGE BASINS, BASINS B, E, AND F.

A. BASIN B IS GENERALLY CHARACTERIZED BY THE CENTRAL PORTION OF THE OVERALL SITE. THIS BASIN CONSISTS OF THE HOTEL COURTYARD, SWIMMING POOL AND DECK AREA, AND UNDEVELOPED VACANT AREA IMMEDIATELY ADJACENT TO THE POOL. THE BASIN GENERALLY DRAINS WEST TO EAST, FLOWING TO AN EXISTING DETENTION POND THAT DISCHARGES VIA 4" DIAMETER CURB PENETRATION TO 20TH STREET NW. THE EXISTING DETENTION POND AND CURB PENETRATION HAVE MINIMAL CAPACITY COMPARED TO THE BASIN RUNOFF GENERATED, AND APPEAR TO PROVIDE NEGLIGIBLE PONDING AND CONTROL OF DISCHARGE TO 20TH STREET NW. THE EXISTING PEAK RATE OF DISCHARGE GENERATED BY THIS BASIN IS 3.7 CFS/AC.

B. BASIN E IS CHARACTERIZED BY THE NORTHWEST PORTION OF THE SITE. THE PORTION OF THIS BASIN THAT THE PROPOSED PROJECT WILL IMPACT IS DESIGNATED AS SUB-BASIN E-1. SUB-BASIN E-1 CONSISTS OF THE EASTERN PORTION OF THE PARKING LOT IMMEDIATELY NORTH OF THE EXISTING HOTEL BUILDING. RUNOFF FROM THE PARKING LOT SHEETFLOWS SOUTH TO NORTH TO A LANDSCAPED BUFFER ALONG THE NORTH EDGE OF THE SITE; EXCESS RUNOFF THAT IS NOT CAPTURED BY THE BUFFER SHEETFLOWS INTO BELLAMAH AVE NW, A FULLY DEVELOPED PUBLIC STREET. THERE IS NO CONCENTRATED POINT OF DISCHARGE FOR THIS SUB-BASIN. THE EXISTING PEAK RATE OF DISCHARGE GENERATED BY THIS SUB-BASIN IS 4.3 CFS/AC.

C. BASIN F IS CHARACTERIZED BY THE NORTHEAST PORTION OF THE SITE. THIS BASIN CONSISTS OF THE EXISTING UNDEVELOPED VACANT LAND AT THE NORTHEAST CORNER OF THE SITE. RUNOFF FROM THIS BASIN SHEETFLOWS FROM WEST TO EAST ACROSS THE BASIN AND INTO 20TH STREET NW, A FULLY DEVELOPED PUBLIC STREET. THERE IS NO CONCENTRATED POINT OF DISCHARGE FOR THIS BASIN; RUNOFF SHEETFLOWS INTO THE FRONTING STREET. THE EXISTING PEAK RATE OF DISCHARGE GENERATED BY THIS BASIN IS 3.4 CFS/AC.

THERE ARE NO SIGNIFICANT OFFSITE FLOWS ENTERING THE SITE. THE PAVED PARKING LOT SOUTH OF THE SITE DRAINS SOUTH, AWAY FROM THE PROJECT SITE. THE EXISTING PARKING LOT AND HOTEL BUILDING LOCATED WEST OF THE PROJECT SITE GENERALLY DRAIN WEST AND NORTH, AWAY FROM THE PROJECT. BELLAMAH AVENUE NW TO THE NORTH IS TOPOGRAPHICALLY LOWER THAN THE SITE AND THEREFORE CONTRIBUTES NO OFFSITE FLOWS. 20TH STREET NW TO THE EAST IS TOPOGRAPHICALLY LOWER THAN THE SITE, HOWEVER, THE STREET IS ASSOCIATED WITH A DESIGNATED FLOOD HAZARD ZONE THAT ENCROACHES ON THE PROPERTY. A CORRESPONDING ELEVATION OF 4959 HAS BEEN IDENTIFIED FOR THIS FLOOD HAZARD ZONE. ALL BUILDINGS ON THE SITE ARE CONSTRUCTED WITH A FINISHED FLOOR ELEVATION A MINIMUM OF ONE FOOT ABOVE THE CORRESPONDING FLOOD HAZARD ZONE.

V. DEVELOPED CONDITIONS

THE DEVELOPED CONDITIONS FOR EACH DRAINAGE BASIN THAT MAKES UP THE PROJECT SITE (B, E AND F) AND THE RESPECTIVE DEVELOPED SUB-BASINS ARE DISCUSSED BELOW:

A. THE PROPOSED CONSTRUCTION WITHIN BASIN B WILL CONSIST OF A PAVED PARKING LOT EXPANSION IMMEDIATELY SOUTH OF THE SWIMMING POOL, AND LANDSCAPED IMPROVEMENTS EAST OF THE POOL. THIS BASIN WILL BE DIVIDED INTO FOUR SUB-BASINS.

- SUB-BASIN B.1 CONSISTS OF THE EXISTING SWIMMING POOL AND DECK AREA. THIS SUB-BASIN IS ENCLOSED BY A NEW WALL. ALL RUNOFF GENERATED BY THE EXISTING IMPROVEMENTS IS CONTAINED WITHIN THE WALLED POOL AREA AND DRAINS TO NEW AND EXISTING LANDSCAPED AREAS THAT MANAGE THE RUNOFF FROM THIS SUB-BASIN.
- SUB-BASIN B.2 CONSISTS OF THE LANDSCAPED AREA IMMEDIATELY EAST OF THE POOL AREA. THIS SUB-BASIN WILL DRAIN WEST TO EAST TO A SHALLOW (< 12" DEPTH) LANDSCAPED DEPRESSION, WITH OVERFLOW DISCHARGING TO 20TH STREET NW.

  A CISTERN RECEIVING ROOF RUNOFF FROM THE NEW HOTEL WILL BE INSTALLED BELOW GRADE IN SUB-BASIN B-2. THE CISTERN WILL BE SIZED TO RETAIN BOTH THE FIRST ½" OF RUNOFF GENERATED FROM THE EAST PORTION OF THE NEW STAND-ALONE HOTEL BUILDING (DESIGNATED AS SUB-BASIN F.4) AS WELL AS THE DEVELOPED RUNOFF GENERATED BY THE NEW HOTEL COURTYARD (DESIGNATED AS SUB-BASIN F.5). OVERFLOW FROM THE CISTERN WILL BE DISCHARGED VIA 4" PVC CURB PENETRATION TO 20TH STREET NW.
- SUB-BASIN B.3 CONSISTS OF THE PAVED PARKING LOT EXPANSION IMMEDIATELY SOUTH OF THE SWIMMING POOL. RUNOFF GENERATED BY SUB-BASIN B.3 WILL SHEETFLOW FROM WEST TO EAST ACROSS THE PARKING LOT. SEVERAL LANDSCAPED ISLANDS WITHIN THE PARKING LOT WILL ACT AS WATER HARVESTING AREAS TO CAPTURE (TO THE MAXIMUM EXTENT PRACTICABLE) THE FIRST FLUSH OF RUNOFF GENERATED BY SUB-BASIN B.3. RUNOFF THAT IS NOT CAPTURED BY THE WATER HARVESTING AREAS WILL DISCHARGE VIA SIDEWALK CULVERT AND RUNDOWN INTO 20TH STREET NW. A 4" CURB OPENING AT THE UPSTREAM END OF THE CULVERT IS SIZED TO NOT EXCEED THE ALLOWABLE DISCHARGE RATE FOR THIS SUB-BASIN OF 2.75 CFS/AC. AS DEMONSTRATED BY THE CALCULATIONS REFERENCED IN SECTION VII, THE PARKING LOT WILL ACT AS A DETENTION POND SIZED TO CONTAIN THE DETAINED RUNOFF RESULTING FROM CONTROLLED DISCHARGE FROM THE SUB-BASIN.
- SUB-BASIN B.4 CONSISTS OF THE REMAINDER OF BASIN B THAT INCLUDES THE CENTRAL PORTION OF THE EXISTING HOTEL AND COURTYARD THAT ARE UPSTREAM OF SUB-BASIN B.3. THIS AREA IS OUTSIDE THE LIMITS OF THE PROPOSED DEVELOPMENT FOR THE PROJECT SITE, THEREFORE NO CHANGE IN HYDROLOGY IS PROPOSED OR ANTICIPATED. EXISTING RUNOFF FROM SUB-BASIN B.4 WILL BE ALLOWED TO FREELY FLOW THROUGH SUB-BASIN B.3 TO ULTIMATELY DISCHARGE TO 20TH STREET NW.

B. THE PROPOSED CONSTRUCTION WITHIN BASIN E WILL CONSIST OF THE MODIFICATION OF A PORTION OF THE EXISTING PARKING LOT WEST OF THE NEW STAND-ALONE HOTEL BUILDING. THIS BASIN IS DIVIDED INTO TWO SUB-BASINS.

- SUB-BASIN E.1 WILL CONSIST OF THE PROPOSED PARKING LOT MODIFICATIONS, INCLUDING THE ELIMINATION OF ELEVEN PARKING SPACES AND THE ADDITION OF NEW CURB AND LANDSCAPED WATER HARVESTING AREAS. THE WATER HARVESTING AREAS WILL BE SIZED TO CAPTURE THE FIRST FLUSH GENERATED BY SUB-BASIN E.1 TO THE MAXIMUM EXTENT PRACTICABLE. RUNOFF WILL GENERALLY SHEET FLOW FROM SOUTHEAST TO NORTHWEST, DRAINING THROUGH A NEW RUNDOWN AND SIDEWALK CULVERT INTO SUB-BASIN E.2, AND ULTIMATELY DISCHARGING TO BELLAMAH AVE NW. THE PROPOSED IMPROVEMENTS WILL RESULT IN A DECREASE IN IMPERVIOUS AREA, CREATING A DECREASE IN RUNOFF GENERATED IN THE DEVELOPED CONDITION.
- SUB-BASIN E.2 CONSISTS OF THE REMAINDER OF BASIN E BEYOND THE PROJECT LIMITS, INCLUDING THE EXISTING HOTEL AND THE NORTH AND WEST PARKING LOTS. NO DEVELOPMENT IS CURRENTLY PLANNED FOR SUB-BASIN E-2, THEREFORE NO CHANGE IN HYDROLOGY IS PROPOSED OR ANTICIPATED.

C. THE PROPOSED CONSTRUCTION WITHIN BASIN F WILL CONSIST OF A NEW STAND-ALONE HOTEL BUILDING, COURTYARD, ASSOCIATED PAVED SIDEWALKS AND LANDSCAPING. THIS BASIN WILL BE DIVIDED INTO SEVEN SUB-BASINS.

- SUB-BASIN F.1 CONSISTS OF THE PAVED PARKING AND LANDSCAPED IMPROVEMENTS IMMEDIATELY WEST OF THE NEW HOTEL BUILDING. IN ADDITION, A NEW CISTERN WILL BE LOCATED IN THIS SUB-BASIN THAT WILL RETAIN THE FIRST ½" OF RUNOFF GENERATED BY THE WEST PORTION OF THE HOTEL ROOF AREA (DESIGNATED AS SUB-BASIN F.3). SUB-BASIN F.1 DRAINS FROM SOUTH TO NORTH TO DISCHARGE INTO BELLAMAH AVE NW VIA NEW RUNDOWN AND SIDEWALK CULVERT. LANDSCAPED IMPROVEMENTS WILL BE GRADED TO ACT AS DEPRESSED WATER HARVESTING AREAS WHERE PRACTICABLE. AS A RESULT OF AN INCREASE IN LANDSCAPED LAND TREATMENT, THE RUNOFF GENERATED FROM THIS SUB-BASIN WILL BE DECREASED FROM THE EXISTING CONDITION.
- SUB-BASIN F.2 CONSISTS OF THE NEW PAVED SERVICE AREA IMMEDIATELY WEST OF THE NEW HOTEL BUILDING. TO AVOID RUNOFF FROM THE REFUSE COMPACTOR IN THIS AREA DRAINING TO THE ADJACENT PUBLIC STREET, THIS SUB-BASIN WILL DISCHARGE ALL DEVELOPED RUNOFF TO THE EXISTING PRIVATE SANITARY SEWER SYSTEM VIA A NEW SANITARY SEWER MANHOLE WITH GRATED LID. THEREFORE, NO RUNOFF FROM THIS SUB-BASIN WILL DISCHARGE TO BELLEMAH AVE NW IN THE DEVELOPED CONDITION.
- SUB-BASIN F.3 CONSISTS OF THE WEST PORTION OF THE NEW HOTEL BUILDING. RUNOFF GENERATED BY THE HOTEL ROOF AREA WILL BE CONVEYED VIA ROOF DRAIN TO A NEW CISTERN INSTALLED IN SUB-BASIN F.1; THE CISTERN IS SIZED TO RETAIN THE FIRST ½" OF ROOF RUNOFF. A 4" PVC CURB PENETRATION WILL DISCHARGE OVERFLOW FROM THE CISTERN NORTH TO BELLAMAH AVE NW.
- SUB-BASIN F.4 CONSISTS OF THE EAST PORTION OF THE NEW HOTEL BUILDING. RUNOFF GENERATED BY THE HOTEL ROOF AREA WILL BE CONVEYED VIA ROOF DRAIN TO A NEW CISTERN INSTALLED IN SUB-BASIN B.2; THE CISTERN IS SIZED TO RETAIN THE FIRST ½" OF ROOF RUNOFF. A 4" PVC CURB PENETRATION WILL DISCHARGE OVERFLOW FROM THE CISTERN EAST TO 20TH STREET NW.
- SUB-BASIN F.5 CONSISTS OF THE NEW HOTEL COURTYARD. RUNOFF FROM THIS BASIN WILL DRAIN TO A NEW TRENCH DRAIN. FROM THIS POINT, RUNOFF WILL BE CONVEYED VIA PRIVATE STORM DRAIN TO THE NEW CISTERN IN SUB-BASIN B.2 REFERENCED ABOVE. AS PREVIOUSLY MENTIONED (SEE SUB-BASIN B.2), THE CISTERN WILL BE SIZED TO CAPTURE THE DEVELOPED RUNOFF GENERATED BY SUB-BASIN F.5. A 4" PVC CURB PENETRATION WILL DISCHARGE OVERFLOW FROM THE CISTERN EAST TO 20TH STREET NW.
- SUB-BASIN F.6 CONSISTS OF THE PAVED SIDEWALKS, VALET DROPOFF AND LANDSCAPED BUFFERS NORTH AND NORTHEAST OF THE NEW HOTEL BUILDING. RUNOFF WILL DRAIN ACROSS THE PAVED IMPROVEMENTS INTO THE LANDSCAPED BUFFERS TO THE MAXIMUM EXTENT PRACTICABLE. THE LANDSCAPED BUFFERS WILL CAPTURE THE FIRST FLUSH FLOWS GENERATED BY SUB-BASIN F.6 TO THE MAXIMUM EXTENT PRACTICABLE. EXCESS RUNOFF THAT IS NOT CAPTURED WITHIN THE LANDSCAPED BUFFERS WILL SHEETFLOW INTO BELLAMAH AVE NW. DEVELOPED IMPROVEMENTS WILL RESULT IN A NEGLIGIBLE INCREASE IN RUNOFF GENERATED BY THE SUB-BASIN (0.1 CFS), AND A NEGLIGIBLE FIRST FLUSH VOLUME (120 CF).
- SUB-BASIN F.7 CONSISTS OF THE PAVED RESTAURANT PATIO, SIDEWALKS, VALET DROPOFF AND LANDSCAPE BUFFERS EAST OF THE NEW HOTEL BUILDING. RUNOFF WILL SHEET FLOW ACROSS THE PAVED IMPROVEMENTS, WITH LANDSCAPED BUFFERS CAPTURING RUNOFF TO THE MAXIMUM EXTENT PRACTICABLE. THE LANDSCAPED BUFFERS WILL CAPTURE FIRST FLUSH FLOWS GENERATED BY SUB-BASIN F.7 TO THE MAXIMUM EXTENT PRACTICABLE. EXCESS RUNOFF THAT IS NOT CAPTURED WITHIN THE LANDSCAPED BUFFERS SHEETFLOWS TO 20TH STREET NW. DEVELOPED IMPROVEMENTS WILL RESULT IN A NEGLIGIBLE INCREASE IN RUNOFF GENERATED BY THE SUB-BASIN (0.1 CFS), AND A NEGLIGIBLE FIRST FLUSH VOLUME (110 CF).

VI. CALCULATIONS

THE CALCULATIONS CONTAINED HEREON ANALYZE THE EXISTING AND DEVELOPED CONDITIONS FOR THE 100-YEAR, 6-HOUR RAINFALL EVENT. THE PROCEDURE FOR 40 ACRE AND SMALLER BASINS, AS SET FORTH IN THE REVISION OF SECTION 22.2, HYDROLOGY OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN CRITERIA, DATED JANUARY 1993, HAS BEEN USED TO QUANTIFY THE PEAK RATE OF DISCHARGE AND VOLUME OF RUNOFF GENERATED. THE CALCULATIONS FOR EACH BASIN WITHIN THE PROJECT SITE (B, E AND F) ARE SUMMARIZED AS FOLLOWS:

A. BASIN B: THE PROJECT SITE IMPROVEMENTS WILL RESULT IN A MINOR REDUCTION (1.9 CFS) IN DEVELOPED RUNOFF GENERATED BY BASIN B. THE ALLOWABLE (EXISTING) DISCHARGE RATE OF 10.4 CFS (3.7 CFS/AC) IS MAINTAINED AS A RESULT OF THE PROPOSED DEVELOPMENT.

- RUNOFF FROM SUB-BASIN B-1 IS SELF CONTAINED AND THEREFORE WILL RESULT IN A DECREASE IN RUNOFF DISCHARGED TO THE FRONTING PUBLIC STREETS OF 1.7 CFS.
- RUNOFF FROM SUB-BASIN B-2 WILL DRAIN WEST TO EAST TO A DEPRESSED, LANDSCAPED AREA THAT WILL MANAGE THE FIRST FLUSH. FIRST FLUSH CALCULATIONS DEMONSTRATE A VOLUME OF 20 CF DUE TO NEW IMPERVIOUS AREA.
- A HYDROGRAPH FOR SUB-BASIN B.3 WAS USED TO CALCULATE THE DETENTION PONDING REQUIRED IN THE NEW PARKING LOT TO MAINTAIN THE ALLOWABLE (EXISTING) DISCHARGE RATE FROM SUB-BASIN B.3 OF 2.25 CFS.
- THE AVERAGE END AREA METHOD WAS USED TO DEMONSTRATE ADEQUATE DETENTION PONDING CAPACITY IN THE SUB-BASIN B.3 PARKING LOT.

B. BASIN E: THE CURRENT PLANNED IMPROVEMENTS WITHIN SUB-BASIN E-1 (PORTION WITHIN PROJECT SITE) WILL RESULT IN A REDUCTION (0.1 CFS) IN DEVELOPED RUNOFF AS A RESULT OF A DECREASE IN IMPERVIOUS AREA. THE ALLOWABLE (EXISTING) DISCHARGE RATE OF 4.3 CFS/AC IS MAINTAINED.

- THE AVERAGE END AREA METHOD WAS USED TO DEMONSTRATE A WATER HARVESTING CAPACITY OF 125 CF.
- AS THE PROPOSED IMPROVEMENTS REMOVE AND REPLACE EXISTING IMPERVIOUS PAVING WITH PERVIOUS WATER HARVESTING AREAS, WITH NO NEW IMPERVIOUS AREA, FIRST FLUSH CALCULATIONS ARE NOT REQUIRED.

C. BASIN F: THE CURRENT PLANNED IMPROVEMENTS WILL RESULT IN A NEGLIGIBLE INCREASE (0.1 CFS) IN DEVELOPED RUNOFF DISCHARGED FROM BASIN F. THE DEVELOPED DISCHARGE RATE FROM BASIN F IS 1.8 CFS/AC, MEETING THE ALLOWABLE (EXISTING) DISCHARGE RATE OF 3.4 CFS/AC.

- THE INCREASE IN IMPERVIOUS AREA RUNOFF IN BASIN F WILL BE MITIGATED THROUGH THE RETENTION OF THE FIRST ONE-HALF INCH OF RUNOFF FROM THE NEW HOTEL BUILDING IN NEW CISTERNS PROPOSED ONSITE IN ADDITION TO WATER HARVESTING AREAS INTENDED TO CAPTURE THE FIRST FLUSH OF RUNOFF GENERATED TO THE MAXIMUM EXTENT PRACTICABLE.
- FIRST FLUSH CALCULATIONS DEMONSTRATE A FIRST FLUSH VOLUME OF 70 CF FROM SUB-BASIN F.1, 540 CF FROM SUB-BASIN F.3, 310 CF FROM SUB-BASIN F.4, 80 CF FROM SUB-BASIN F.5, 120 CF FROM SUB-BASIN F.6, AND 110 CF FROM SUB-BASIN F.7. THE COMBINED FIRST FLUSH FROM BASIN F THAT MUST BE MANAGED IS 1,230 CF.
- THE AVERAGE END AREA METHOD WAS USED TO DEMONSTRATE A WATER HARVESTING CAPACITY OF 170 CF IN SUB-BASIN F.1 AND 220 CF IN SUB-BASIN F.6.
- RUNOFF FROM SUB-BASIN F.2 WILL DRAIN TO THE EXISTING PRIVATE SANITARY SEWER SYSTEM AND THEREFORE WILL RESULT IN A DECREASE IN RUNOFF DISCHARGED TO THE FRONTING PUBLIC STREETS OF 0.3 CFS (THE EXISTING PEAK DISCHARGE RATE FOR THIS SUB-BASIN)
- ½" RUNOFF CALCULATIONS WERE USED TO DEMONSTRATE THE RUNOFF GENERATED BY THE NEW HOTEL BUILDING (800 CF FROM SUB-BASIN F.3 AND 460 CF FROM SUB-BASIN F.4) THAT MUST BE CAPTURED IN THE NEW ONSITE CISTERNS.
- THE COMBINED RETENTION OF RUNOFF VIA CISTERNS AND WATER HARVESTING IS 1650 CF, GREATER THAN THE REQUIRED FIRST FLUSH OF 1230 CF THAT MUST BE MANAGED.

VII. CONCLUSIONS

THE FOLLOWING CONCLUSIONS HAVE BEEN ESTABLISHED AS A RESULT OF EVALUATIONS CONTAINED HEREIN:

1. BASIN B
- PROPOSED HOTEL DEVELOPMENT WILL SUBDIVIDE THIS BASIN INTO FOUR (4) SUB-BASINS, B.1, B.2, B.3 AND B.4.
- THE PROPOSED IMPROVEMENTS TO THE COMPOSITE BASIN WILL RESULT IN A REDUCTION IN THE DEVELOPED RUNOFF DISCHARGED FROM THE SITE. SUB-BASIN SPECIFIC IMPROVEMENTS ARE AS FOLLOWS.
  - o SUB-BASIN B.1: THIS SUB-BASIN IS SELF CONTAINED; THE RUNOFF GENERATED WILL DRAIN TO AND BE MANAGED BY EXISTING AND PROPOSED LANDSCAPED IMPROVEMENTS, WITH ANY OVERFLOWS CONTAINED BY THE NEW WALL BOUNDING THE POOL AREA.
  - o SUB-BASIN B.2: THE PROPOSED LANDSCAPED IMPROVEMENTS WILL RESULT IN A DECREASE IN Q100 AND V100 RUNOFF GENERATED. THE NEGLIGIBLE FIRST FLUSH OF DEVELOPED RUNOFF GENERATED (20 CF) WILL BE CAPTURED ONSITE WITHIN A DEPRESS LANDSCAPED WATER HARVESTING AREA. OVERFLOW FROM THIS AREA WILL SHEETFLOW TO 20TH STREET NW.
  - o SUB-BASIN B.3: THE PROPOSED IMPROVEMENTS WILL RESULT IN AN INCREASE IN Q100 AND V100 RUNOFF GENERATED. TO MITIGATE THIS INCREASE, THE DISCHARGE RATE FROM THIS SUB-BASIN TO THE PUBLIC STREET WILL BE RESTRAINED TO THE EXISTING Q100 RATE FOR THIS SUB-BASIN. THIS WILL BE DONE BY CONTROLLING DISCHARGE TO 20TH STREET NW VIA A CULVERT WITH 4" CURB OPENING AT THE UPSTREAM END. THE SUBSEQUENT DETENTION PONDING ONSITE WILL BE LIMITED TO THE NEW PARKING LOT; CALCULATIONS DEMONSTRATE THE NEW PARKING LOT HAS CAPACITY TO CONTAIN THE DETAINED RUNOFF VOLUME FROM SUB-BASIN B.3
  - o SUB-BASIN B.4: THIS SUB-BASIN CONSISTS OF THE REMAINING PORTION OF BASIN B BEYOND THE PROJECT LIMITS. NO DEVELOPMENT IS PLANNED FOR THIS SUB-BASIN. AS SUCH, EXISTING RUNOFF FROM THIS SUB-BASIN WILL CONTINUE TO FLOW EAST THROUGH SUB-BASIN B.3, TO ULTIMATELY DISCHARGE THROUGH THE EXISTING PARKING LOT NORTH DRIVEPAD TO 20TH STREET NW.
- THE PROPOSED DEVELOPMENT OF BASIN B WILL DISCHARGE 7.75 CFS (2.75 CFS/AC) TO 20TH STREET, LESS THAN THE ALLOWABLE (EXISTING) DISCHARGE RATE OF 10.4 CFS (3.7 CFS/AC) TO 20TH STREET NW ESTABLISHED IN THE 2014 DMP. THE FIRST FLUSH FROM THE BASIN B IMPERVIOUS AREAS IS MANAGED AND CONTROLLED TO THE MAXIMUM EXTENT PRACTICABLE VIA THE USE OF WATER HARVESTING AREAS. CALCULATIONS FOR THE OVERALL SITE ARE INCLUDED TO SHOW THAT THE WATER HARVESTING AREAS AND CISTERNS PROPOSED ARE SUFFICIENT TO MANAGE THE FIRST FLUSH GENERATED.

1. BASIN E
- PROPOSED HOTEL DEVELOPMENT WILL SUBDIVIDE THIS BASIN INTO TWO (2) SUB-BASINS, E.1 AND E.2.
- THE PROPOSED IMPROVEMENTS TO THE COMPOSITE BASIN WILL RESULT IN A NEGLIGIBLE DECREASE (0.1 CFS) IN THE DEVELOPED RUNOFF GENERATED. SUB-BASIN SPECIFIC IMPROVEMENTS ARE AS FOLLOWS.
  - o SUB-BASIN E.1: THE PROPOSED IMPROVEMENTS WILL RESULT IN A DECREASE IN Q100 AND V100 RUNOFF GENERATED, DUE TO A DECREASE IN IMPERVIOUS LAND TREATMENT. RUNOFF FROM THIS SUB-BASIN WILL DRAIN VIA CULVERT & RUNDOWN TO SUB-BASIN E.2 WHERE IT WILL CONTINUE TO SHEETFLOW TO THE EXISTING LANDSCAPED BUFFER AT THE PERIMETER OF BASIN E AND OVERFLOW TO THE ADJACENT FRONTING PUBLIC STREETS.
  - o WHILE THERE ARE NO NEW IMPERVIOUS AREAS PROPOSED TO THIS BASIN, NEW WATER HARVESTING ISLANDS IN THIS SUB-BASIN WILL SERVE TO INCREASE THE OVERALL SITE CAPACITY TO MANAGE AND CONTROL THE FIRST FLUSH FROM DEVELOPMENT.
  - o SUB-BASIN E.2: THIS SUB-BASIN IS BEYOND THE PROJECT LIMITS, WITH NO DEVELOPMENT CURRENTLY PLANNED IN THIS SUB-BASIN. THEREFORE, NO CHANGE IN HYDROLOGY IS PROPOSED OR ANTICIPATED.
- THE PROPOSED DEVELOPMENT OF BASIN E WILL RESULT IN A DECREASE OF PEAK DISCHARGE RATE (2.4 CFS) TO BELLAMAH AVENUE; THEREFORE THE ALLOWABLE (EXISTING) DISCHARGE RATE OF 17.5 CFS (4.3 CFS/AC) TO THE FRONTING STREETS ESTABLISHED IN THE 2014 DMP IS MAINTAINED. NO NEW IMPERVIOUS AREA IS PROPOSED IN THIS BASIN; WATER HARVESTING AREA IMPROVEMENTS WILL DECREASE THE TOTAL IMPERVIOUS AREA, THEREFORE FIRST FLUSH CALCULATIONS ARE NOT REQUIRED FOR THIS BASIN.

3. BASIN F
- PROPOSED HOTEL DEVELOPMENT WILL SUBDIVIDE THIS BASIN INTO SEVEN (7) SUB-BASINS, F.1, F.2, F.3, F.4, F.5, F.6 AND F.7.
- THE PROPOSED IMPROVEMENTS TO THE COMPOSITE BASIN WILL RESULT IN A NEGLIGIBLE INCREASE (0.1 CFS) IN DEVELOPED RUNOFF DISCHARGED FROM THE SITE. SUB-BASIN SPECIFIC IMPROVEMENTS ARE AS FOLLOWS.
  - o SUB-BASIN F.1: THE PROPOSED IMPROVEMENTS WILL RESULT IN A DECREASE IN Q100 AND V100 RUNOFF GENERATED DUE TO A DECREASE IN IMPERVIOUS AREA. RUNOFF FROM THIS SUB-BASIN WILL DISCHARGE DIRECTLY TO BELLAMAH AVE NW VIA RUNDOWN AND SIDEWALK CULVERT. PROPOSED WATER HARVESTING AREAS WILL INCREASE THE CAPACITY FOR MANAGEMENT AND CONTROL OF FIRST FLUSH FROM THE OVERALL SITE.
  - o SUB-BASIN F.2: THE PROPOSED IMPROVEMENTS TO THIS SUB-BASIN (NEW HOTEL SERVICE AREA) WILL DRAIN THE V100 DEVELOPED RUNOFF TO THE EXISTING SANITARY SEWER SYSTEM, THEREBY AVOIDING THE DISCHARGE OF RUNOFF FROM THE REFUSE COMPACTOR TO THE PUBLIC STREET. AS A RESULT OF THESE IMPROVEMENTS, THERE WILL BE A DECREASE IN RUNOFF TO BELLAMAH AVE NW.
  - o SUB-BASIN F.3: THE PROPOSED IMPROVEMENTS TO THIS SUB-BASIN (WEST PORTION OF THE NEW HOTEL BUILDING) WILL RESULT IN AN INCREASE IN Q100 AND V100 RUNOFF GENERATED. TO MITIGATE THIS INCREASE, ROOF RUNOFF WILL BE ROUTED THROUGH A NEW CISTERN DESIGNED TO CAPTURE THE FIRST ½" OF DEVELOPED RUNOFF. OVERFLOW FROM THE CISTERN WILL DISCHARGE VIA 4" PVC CURB PENETRATION TO BELLAMAH AVE NW. THIS CISTERN WILL SERVE TO MANAGE AND CONTROL THE FIRST FLUSH OF RUNOFF FROM THIS SUB-BASIN.
  - o SUB-BASIN F.4: THE PROPOSED IMPROVEMENTS TO THIS SUB-BASIN (EAST PORTION OF THE NEW HOTEL BUILDING) WILL RESULT IN AN INCREASE IN Q100 AND V100 RUNOFF GENERATED. TO MITIGATE THIS INCREASE, ROOF RUNOFF WILL BE ROUTED THROUGH A NEW CISTERN DESIGNED TO CAPTURE THE FIRST ½" OF DEVELOPED RUNOFF. OVERFLOW FROM THE CISTERN WILL DISCHARGE VIA 4" PVC CURB PENETRATION TO 20TH STREET NW. THIS CISTERN WILL SERVE TO MANAGE AND CONTROL THE FIRST FLUSH OF RUNOFF FROM THIS SUB-BASIN.
  - o SUB-BASIN F.5: THE PROPOSED COURTYARD IMPROVEMENTS WILL RESULT IN A DECREASE IN Q100 AND V100 RUNOFF GENERATED DUE TO IMPROVED LAND TREATMENT. RUNOFF FROM THIS SUB-BASIN WILL BE ROUTED VIA TRENCH DRAIN AND PRIVATE STORM DRAIN TO A CISTERN DESIGNED TO CAPTURE THE RUNOFF GENERATED FROM SUB-BASIN F.5, OVERFLOW FROM THE CISTERN WILL DISCHARGE VIA 4" PVC CURB PENETRATION TO 20TH STREET NW.
  - o SUB-BASIN F.6: THE PROPOSED IMPROVEMENTS WILL RESULT IN A NEGLIGIBLE INCREASE IN Q100 AND V100 RUNOFF GENERATED (0.1 CFS) DUE TO INCREASED IMPERVIOUS AREA. THIS INCREASE WILL BE MITIGATED BY LANDSCAPED BUFFERS AND WATER HARVESTING AREAS THAT WILL CAPTURE THE FIRST FLUSH OF RUNOFF GENERATED TO THE MAXIMUM EXTENT PRACTICABLE. EXCESS RUNOFF WILL SHEETFLOW TO THE FRONTING STREET OF BELLAMAH AVE NW.
  - o SUB-BASIN F.7: THE PROPOSED IMPROVEMENTS WILL RESULT IN A NEGLIGIBLE INCREASE IN Q100 AND V100 RUNOFF GENERATED (0.1 CFS) DUE TO INCREASED IMPERVIOUS AREA. THIS INCREASE WILL BE MITIGATED BY LANDSCAPED BUFFERS DESIGNED TO MANAGE THE FIRST FLUSH OF RUNOFF TO THE MAXIMUM EXTENT PRACTICABLE. EXCESS RUNOFF WILL SHEETFLOW TO THE FRONTING STREET OF 20TH STREET NW.
- THE PROPOSED DEVELOPMENT OF BASIN F WILL RESULT IN AN INCREASE IN PEAK DISCHARGE RATE AND VOLUME GENERATED, HOWEVER, THIS INCREASE WILL BE MITIGATED BY ROUTING THE RUNOFF THROUGH CISTERNS AND WATER HARVESTING AREAS, THEREBY MAINTAINING THE ALLOWABLE (EXISTING) DISCHARGE RATE OF 3.4 CFS/AC TO THE FRONTING PUBLIC STREETS. CALCULATIONS ARE INCLUDED TO SHOW THAT THE WATER HARVESTING AREAS AND CISTERNS WITHIN THE OVERALL SITE ARE SUFFICIENT TO MANAGE THE FIRST FLUSH GENERATED BY THIS BASIN.

CALCULATIONS

I. SITE CHARACTERISTICS

A. PRECIPITATION ZONE = 2

B. $P_{100,\,6\,HR} = P_{360}$ = 2.35

C. TOTAL SITE (A_T) = 533,170 SF
12.24 AC

D. LAND TREATMENTS

1. EXISTING LAND TREATMENT

	TREATMENT								
	A		B		C		D		TOTAL
BASIN	AREA (AC)	%	AREA (AC)	%	AREA (AC)	%	AREA (AC)	%	AREA (AC)
B	0.0	0	0.36	13	1.25	44	1.21	43	2.82 AC
B.1*	0.0	0	0.08	19	0.13	32	0.20	49	0.41 AC
B.2*	0.0	0	0.0	0	0.17	100	0.0	0	0.17 AC
B.3*	0.0	0	0.0	0	0.82	100	0.0	0	0.82 AC
B.4*	0.0	0	0.27	21	0.0	0	1.04	79	1.31 AC
E	0.0	0	0.63	16	0.0	0	3.41	84	4.04 AC
E.1*	0.0	0	0.04	7	0.0	0	0.52	93	0.56 AC
E.2*	0.0	0	0.59	17	0.0	0	2.89	83	3.48 AC
F	0.0	0	0.0	0	1.05	84	0.20	16	1.25 AC
F.1*	0.0	0	0.0	0	0.02	17	0.10	83	0.12 AC
F.2*	0.0	0	0.0	0	0.02	33	0.04	67	0.06 AC
F.3*	0.0	0	0.0	0	0.44	100	0.0	0	0.44 AC
F.4*	0.0	0	0.0	0	0.25	100	0.0	0	0.25 AC
F.5*	0.0	0	0.0	0	0.21	100	0.0	0	0.21 AC
F.6*	0.0	0	0.0	0	0.13	100	0.0	0	0.13 AC
F.7*	0.0	0	0.0	0	0.12	100	0.0	0	0.12 AC

* USE PROPOSED SUB-BASIN LIMITS FOR COMPARISON TO DEVELOPED CONDITION

2. DEVELOPED LAND TREATMENT

	TREATMENT								
	A		B		C		D		TOTAL
BASIN	AREA (AC)	%	AREA (AC)	%	AREA (AC)	%	AREA (AC)	%	AREA (AC)
B	0.0	0	0.62	23	0.0	0	2.09	77	2.71 AC
B.1	0.0	0	0.08	20	0.0	0	0.33	80	0.41 AC
B.2	0.0	0	0.15	88	0.0	0	0.02	12	0.17 AC
B.3	0.0	0	0.12	15	0.0	0	0.70	85	0.82 AC
B.4†	0.0	0	0.27	21	0.0	0	1.04	79	1.31 AC
E	0.0	0	0.66	16	0.0	0	3.38	84	4.04 AC
E.1	0.0	0	0.07	12	0.0	0	0.49	88	0.56 AC
E.2†	0.0	0	0.59	17	0.0	0	2.89	83	3.48 AC
F	0.0	0	0.26	20	0.0	0	1.07	80	1.33 AC
F.1	0.0	0	0.06	50	0.0	0	0.06	50	0.12 AC
F.2	0.0	0	0.0	0	0.0	0	0.06	100	0.06 AC
F.3	0.0	0	0.0	0	0.0	0	0.44	100	0.44 AC
F.4	0.0	0	0.0	0	0.0	0	0.25	100	0.25 AC
F.5	0.0	0	0.14	67	0.0	0	0.07	33	0.21 AC
F.6	0.0	0	0.03	23	0.0	0	0.10	77	0.13 AC
F.7	0.0	0	0.03	25	0.0	0	0.09	75	0.12 AC

† REMAINDER OF BASIN LOCATED OUTSIDE PROJECT AREA

II. HYDROLOGY

A. EXISTING CONDITION

1. BASIN B

a. SUB-BASIN B.1 (PROPOSED SUB-BASIN LIMITS USED FOR COMPARISON PURPOSES)
i. VOLUME
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.53*0.00) + (0.78*0.08) + (1.13*0.13) + (2.12*0.20)/0.41 = 1.54 IN
$V_{100,6HR} = (E_W/12)A_T$ = (1.54/12)0.41 = 0.0526 AC-FT = 2,290 CF
ii. PEAK DISCHARGE
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100}$ = (1.56 * 0.00) + (2.28 * 0.08) + (3.14 * 0.13) + (4.70 * 0.20) = 1.5 CFS

- NOTE: VOLUME AND PEAK DISCHARGE FORMULAS SHOWN ABOVE USED FOR ALL SUB-BASIN RESULTS BELOW

b. SUB-BASIN B.2 (PROPOSED SUB-BASIN LIMITS USED FOR COMPARISON PURPOSES)
i. VOLUME
$V_{100,6HR}$ = 700 CF
ii. PEAK DISCHARGE
$Q_P = Q_{100}$ = 0.5 CFS

c. SUB-BASIN B.3 (PROPOSED SUB-BASIN LIMITS USED FOR COMPARISON PURPOSES)
i. VOLUME
$V_{100,6HR}$ = 3,360 CF
ii. PEAK DISCHARGE
$Q_P = Q_{100}$ = 2.6 CFS

d. SUB-BASIN B.4 (PROPOSED SUB-BASIN LIMITS USED FOR COMPARISON PURPOSES)
i. VOLUME
$V_{100,6HR}$ = 8,750 CF
ii. PEAK DISCHARGE
$Q_P = Q_{100}$ = 5.5 CFS

2. BASIN E

a. SUB-BASIN E.1 (PROPOSED SUB-BASIN LIMITS USED FOR COMPARISON PURPOSES)
i. VOLUME
$V_{100,6HR}$ = 4,120 CF
ii. PEAK DISCHARGE
$Q_P = Q_{100}$ = 2.5 CFS

b. SUB-BASIN E.2 (PROPOSED SUB-BASIN LIMITS USED FOR COMPARISON PURPOSES)
i. VOLUME
$V_{100,6HR}$ = 23,880 CF
ii. PEAK DISCHARGE
$Q_P = Q_{100}$ = 15.0 CFS

3. BASIN F

a. SUB-BASIN F.1 (PROPOSED SUB-BASIN LIMITS USED FOR COMPARISON PURPOSES)
i. VOLUME
$V_{100,6HR}$ = 850 CF
ii. PEAK DISCHARGE
$Q_P = Q_{100}$ = 0.5 CFS

b. SUB-BASIN F.2 (PROPOSED SUB-BASIN LIMITS USED FOR COMPARISON PURPOSES)
i. VOLUME
$V_{100,6HR}$ = 390 CF
ii. PEAK DISCHARGE
$Q_P = Q_{100}$ = 0.3 CFS

c. SUB-BASIN F.3 (PROPOSED SUB-BASIN LIMITS USED FOR COMPARISON PURPOSES)
i. VOLUME
$V_{100,6HR}$ = 1,800 CF
ii. PEAK DISCHARGE
$Q_P = Q_{100}$ = 1.4 CFS

d. SUB-BASIN F.4 (PROPOSED SUB-BASIN LIMITS USED FOR COMPARISON PURPOSES)
i. VOLUME
$V_{100,6HR}$ = 1,030 CF
ii. PEAK DISCHARGE
$Q_P = Q_{100}$ = 0.8 CFS

e. SUB-BASIN F.5 (PROPOSED SUB-BASIN LIMITS USED FOR COMPARISON PURPOSES)
i. VOLUME
$V_{100,6HR}$ = 860 CF
ii. PEAK DISCHARGE
$Q_P = Q_{100}$ = 0.7 CFS

f. SUB-BASIN F.6 (PROPOSED SUB-BASIN LIMITS USED FOR COMPARISON PURPOSES)
i. VOLUME
$V_{100,6HR}$ = 530 CF
ii. PEAK DISCHARGE
$Q_P = Q_{100}$ = 0.4 CFS

g. SUB-BASIN F.7 (PROPOSED SUB-BASIN LIMITS USED FOR COMPARISON PURPOSES)
i. VOLUME
$V_{100,6HR}$ = 490 CF
ii. PEAK DISCHARGE
$Q_P = Q_{100}$ = 0.4 CFS

B. DEVELOPED CONDITION

1. BASIN B

a. SUB-BASIN B.1
i. VOLUME
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.53*0.00) + (0.78*0.08) + (1.13*0.00) + (2.12*0.33)/0.41 = 1.86 IN
$V_{100,6HR} = (E_W/12)A_T$ = (1.86/12)0.41 = 0.0636 AC-FT = 2,770 CF
ii. PEAK DISCHARGE
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100}$ = (1.56*0.00) + (2.28*0.08) + (3.14*0.00) + (4.70*0.33) = 1.7 CFS

- NOTE: RUNOFF GENERATED BY SUB-BASIN TO BE SELF-CONTAINED VIA LANDSCAPING, RETAINING WALLS, AND POOL DECK DRAINS.

b. SUB-BASIN B.2
i. VOLUME
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.53*0.00) + (0.78*0.15) + (1.13*0.00) + (2.12*0.02)/0.17 = 0.94 IN
$V_{100,6HR} = (E_W/12)A_T$ = (0.94/12)0.17 = 0.0133 AC-FT = 580 CF
ii. PEAK DISCHARGE
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100}$ = (1.56*0.00) + (2.28*0.15) + (3.14*0.00) + (4.70*0.02) = 0.4 CFS
iii. FIRST FLUSH (90TH PERCENTILE STORM EVENT)
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.00*0.00) + (0.00*0.15) + (0.09*0.00) + (0.34*0.02)/0.17 = 0.04 IN
$V_{FIRST\ FLUSH} = (E_W/12)A_T$ = (0.04/12)0.17 = 0.0006 AC-FT = 20 CF
iv. WATER HARVESTING CAPACITY (AVERAGE END-AREA METHOD)

ELEV	AREA (SF)	VOL (CF)	ΣVOL (CF)
59	1400		
		570	570
59.3	2400		

V_{CAP}= 570 CF >> $V_{FIRST\ FLUSH}$= 20 CF; ∴ $V_{FIRST\ FLUSH}$ CONTAINED ONSITE

$V_{CREDIT\ B.2\ WH} = V_{CAP} - V_{FF\ B.2}$ = 570 CF - 20 CF = 550 CF ∴ WATER HARVESTING IN SUB-BASIN B.2 ACTS AS CREDIT FOR OVERALL PROJECT SITE ($V_{B.2\ (CREDIT)}$ = 550 CF)

v. CISTERN RETENTION VOLUME (LOCATED IN B.2, CAPTURES F.4 & F.5 RUNOFF)
$V_{REQ'D} = V_{1/2\ INCH}$ FROM SUB-BASIN F.4 + V_{100} FROM SUB-BASIN F.5
- SEE SUB-BASINS F.4 & F.5 FOR CALCULATIONS
$V_{1/2\ INCH\ F.4}$ = 460 CF
$V_{100\ F.5}$ = 940 CF
$V_{REQ'D}$ = 460 CF + 940 CF
$V_{REQ'D}$ = 1,400 CF

c. SUB-BASIN B.3
i. VOLUME
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.53*0.00) + (0.78*0.12) + (1.13*0.00) + (2.12*0.70)/0.82 = 1.92 IN
$V_{100,6HR} = (E_W/12)A_T$ = (1.92/12)0.82 = 0.1312 AC-FT = 5,720 CF
ii. PEAK DISCHARGE
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100}$ = (1.56*0.00) + (2.28*0.12) + (3.14*0.00) + (4.70*0.70) = 3.6 CFS
iii. HYDROGRAPH ANALYSIS
i. $Q_P = Q_{100\ YR,\ 6\ HR}$ = 3.6 CFS
ii. T_C = L / 3600 * V
V = K * (s *100)$^{1/2}$
K = 2 (FOR SHALLOW CONCENTRATED FLOW - PAVED)
s = 0.0125 FT/FT
V = 2 * (0.0125 *100)$^{1/2}$ = 2.24 FT/SEC
L = 260 FT
T_C = 260 / (3600 * 2.24) = 0.03 HR
PER DPM SECTION 22.2, USE MIN. T_C = 0.2 HR
iii. E = 1.92 IN
iv. T_B = 2.017 * E * A_T/Q_P - 0.25 * A_D/A_T
T_B = 2.017 * 1.92 * 0.82/3.6 - 0.25 * 0.70/0.82
T_B = 0.6687 HR
v. T_P = 0.7 * T_C + (1.6 - A_D/A_T)/12
T_P = 0.7 * 0.2 + (1.6 - 0.70/0.82)/12
T_P = 0.2022 HR
vi. T_D = 0.25 *(A_D/A_T)
T_D = 0.25 * (0.70/0.82)
T_D = 0.2134 HR
vii. $V_{TOTAL} = V_{100\ B.3}$ = 5,720 CF
viii. CONTROLLED DISCHARGE RATE
$Q_{B.3\ RELEASE}$ = 2.75 CFS/AC * 0.82 AC
$Q_{B.3\ RELEASE}$ = 2.25 CFS
ix. VOLUME @ $Q_{B.3\ RELEASE}$ = 2.25 CFS
$V_{B.3\ REL}$ = 4,270 CF (FROM HYDROGRAPH)
x. VOLUME OF DETENTION PONDING REQUIRED
$V_{POND\ REQ'D} = V_{100\ B.3} - V_{B.3\ REL}$
$V_{POND\ REQ'D}$ = 5,720 - 4,270 = 1,450 CF
iv. DETENTION PONDING CAPACITY (AVERAGE END-AREA METHOD)

ELEV	AREA (SF)	VOL (CF)	ΣVOL (CF)
58.5	0		
		765	765
59.0	3060		
		800	1565
59.2	4920		

V_{CAP} = 1,565 CF > $V_{POND\ REQ'D}$ = 1,450 CF; THEREFORE OK

v. FIRST FLUSH (90TH PERCENTILE STORM EVENT)
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.00*0.00) + (0.00*0.12) + (0.09*0.00) + (0.34*0.70)/0.82 = 0.29 IN
$V_{FIRST\ FLUSH} = (E_W/12)A_T$ = (0.29/12)0.82 = 0.0198 AC-FT = 860 CF
vi. WATER HARVESTING CAPACITY (AVERAGE END-AREA METHOD USED FOR EACH AREA)
$V_{B.3\ WATER\ HARVESTING}$ = 60 + 70 + 40 + 40 + 60 + 60 = 330 CF

d. SUB-BASIN B.4 (NO DEVELOPMENT IN THIS BASIN)

BASIN B (COMPOSITE)
i. VOLUME RELEASED FROM SITE
$V_{REL,\ BASIN\ B} = V_{100,\ B.2} + V_{100,\ B.3} + V_{100,\ B.4} - V_{WATER\ HARVEST\ B.3}$
$V_{REL,\ BASIN\ B}$ = 580 + 5,720 + 8,750 - 330
$V_{REL,\ BASIN\ B}$ = 14,720 CF
ii. ALLOWABLE PEAK DISCHARGE FROM BASIN B
$Q_{ALLOW,\ BASIN\ B} = Q_{ALLOW\ DEV\ B.3} + Q_{EXIST\ B.4}$
$Q_{ALLOW\ DEV\ B.3}$ = 2.75 CFS / AC * 0.82 AC = 2.25 CFS
$Q_{EXIST\ B.4} = Q_{100\ B.4}$ = 5.5 CFS (NO CHANGES TO THIS SUB-BASIN PROPOSED)
$Q_{ALLOW,\ BASIN\ B}$ = 2.25 CFS + 5.5 CFS = 7.75 CFS
iii. PEAK DISCHARGE (CONTROLLED) RELEASED FROM SITE
$Q_{100\ RELEASE,\ BASIN\ B} = Q_{B.3\ RELEASE} + Q_{B.4}$
$Q_{100\ RELEASE,\ BASIN\ B}$ = 2.25 + 5.5
$Q_{100\ RELEASE,\ BASIN\ B}$ = 7.75 CFS = $Q_{ALLOW,\ BASIN\ B}$ = 7.75 CFS ∴ OK

2. BASIN E

a. SUB-BASIN E.1
i. VOLUME
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.53*0.00) + (0.78*0.07) + (1.13*0.00) + (2.12*0.49)/0.56 = 1.95 IN
$V_{100,6HR} = (E_W/12)A_T$ = (1.95/12)0.56 = 0.0910 AC-FT = 3,960 CF
ii. PEAK DISCHARGE
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100}$ = (1.56*0.00) + (2.28*0.07) + (3.14*0.00) + (4.70*0.49) = 2.4 CFS
iii. FIRST FLUSH (90TH PERCENTILE STORM EVENT)
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.00*0.00) + (0.00*0.07) + (0.09*0.00) + (0.34*0.49)/0.56 = 0.30 IN
$V_{FIRST\ FLUSH} = (E_W/12)A_T$ = (0.30/12)0.56 = 0.0140 AC-FT = 610 CF
DEVELOPMENT OF SUB-BASIN E.1 DECREASES TOTAL IMPERVIOUS AREA BY REMOVAL OF EXISTING PAVING, THEREFORE NO FIRST FLUSH CALCULATIONS ARE REQUIRED
iv. WATER HARVESTING CAPACITY (AVERAGE END-AREA METHOD)

ELEV	AREA (SF)	VOL (CF)	ΣVOL (CF)
62.2	290		
		125	125
62.4	960		

V_{CAP} = 125 CF > $V_{FIRST\ FLUSH}$ = 0 CF ∴ WATER HARVESTING IN SUB-BASIN E.1 ACTS AS CREDIT FOR OVERALL PROJECT SITE ($V_{E.1\ (CREDIT)}$ = 125 CF)

b. SUB-BASIN E.2 (NO DEVELOPMENT)

3. BASIN F

a. SUB-BASIN F.1
i. VOLUME
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.53*0.00) + (0.78*0.06) + (1.13*0.00) + (2.12*0.06)/0.12 = 1.45 IN
$V_{100,6HR} = (E_W/12)A_T$ = (1.45/12)0.12 = 0.0145 AC-FT = 630 CF
ii. PEAK DISCHARGE
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100}$ = (1.56*0.00) + (2.28*0.06) + (3.14*0.00) + (4.70*0.06) = 0.4 CFS
iii. FIRST FLUSH (90TH PERCENTILE STORM EVENT)
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.00*0.00) + (0.00*0.06) + (0.09*0.00) + (0.34*0.06)/0.12 = 0.17 IN
$V_{FIRST\ FLUSH} = (E_W/12)A_T$ = (0.17/12)0.12 = 0.0017 AC-FT = 70 CF
iv. WATER HARVESTING CAPACITY (AVERAGE END-AREA METHOD)

ELEV	AREA (SF)	VOL (CF)	ΣVOL (CF)
61.5	170		
		170	170
62	510		

V_{CAP} = 170 CF > $V_{FIRST\ FLUSH}$ = 70 CF ∴ WATER HARVESTING IN SUB-BASIN F.1 ACTS AS CREDIT FOR OVERALL PROJECT SITE ($V_{F.1\ (CREDIT)}$ = 100 CF)
v. CISTERN RETENTION VOLUME
$V_{REQ'D} = V_{1/2\ INCH}$ FROM SUB-BASIN F.3
- SEE SUB-BASIN F.3 FOR CALCULATIONS
$V_{REQ'D}$ = 800 CF
vi. VOLUME RELEASED FROM SUB-BASIN
$V_{REL\ F.1} = V_{100} - V_{WATER\ HARVEST}$ = 630 - 170 = 460 CF

b. SUB-BASIN F.2
i. VOLUME
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.53*0.00) + (0.78*0.00) + (1.13*0.00) + (2.12*0.06)/0.06 = 2.12 IN
$V_{100,6HR} = (E_W/12)A_T$ = (2.12/12)0.06 = 0.0106 AC-FT = 460 CF
ii. PEAK DISCHARGE
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100}$ = (1.56*0.00) + (2.28*0.00) + (3.14*0.00) + (4.70*0.06) = 0.3 CFS

- NOTE: ALL RUNOFF FROM THIS SUB-BASIN (HOTEL SERVICE AREA) DRAINS INTO THE PROPOSED SANITARY SEWER SYSTEM, 0 CFS DISCHARGED TO PUBLIC STREET

c. SUB-BASIN F.3
i. VOLUME - 100 YR, 6HR
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.53*0.00) + (0.78*0.00) + (1.13*0.00) + (2.12*0.44)/0.44 = 2.12 IN
$V_{100,6HR} = (E_W/12)A_T$ = (2.12/12)0.44 = 0.0777 AC-FT = 3,390 CF
ii. VOLUME - FIRST 1/2" RUNOFF (TO BE RETAINED IN SUB-BASIN F.1 CISTERN)
$V_{1/2\ INCH}$ = 0.5 IN. * A_T
A_T = 0.44 AC * 43560 SF/AC * 144 IN²/ SF
A_T = 2,760,000 IN²
$V_{1/2\ INCH}$ = 0.5 * 2,760,000 = 1,380,000 IN³
$V_{1/2\ INCH}$ = 1,380,000 IN³ * 1 CF / 1728 IN³
$V_{1/2\ INCH}$ = 800 CF (SEE SUB-BASIN F.1 CISTERN)
iii. PEAK DISCHARGE
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100}$ = (1.56*0.00) + (2.28*0.00) + (3.14*0.00) + (4.70*0.44) = 2.1 CFS
iv. 4" CURB PENETRATION CAPACITY (Q_{REL})
Q_{REL} = 1.49/n * A * $R^{2/3}$ * $S^{1/2}$ (MANNING'S EQUN FOR PIPE FLOW)
WHERE:
n = 0.013
A = 0.087 SF
R = A/P; P = 1.05 => R = 0.083
S = 0.01000
Q_{REL} = 0.2 CFS
v. FIRST FLUSH (90TH PERCENTILE STORM EVENT)
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.00*0.00) + (0.00*0.00) + (0.09*0.00) + (0.34*0.44)/0.44 = 0.34 IN
$V_{FIRST\ FLUSH} = (E_W/12)A_T$ = (0.34/12)0.44 = 0.0125 AC-FT = 540 CF
vi. VOLUME RELEASED FROM SUB-BASIN
$V_{REL\ F.3} = V_{100} - V_{1/2"\ TO\ CISTERN}$ = 3390 - 800 = 2590 CF

d. SUB-BASIN F.4
i. VOLUME
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.53*0.00) + (0.78*0.00) + (1.13*0.00) + (2.12*0.25)/0.25 = 2.12 IN
$V_{100,6HR} = (E_W/12)A_T$ = (2.12/12)0.25 = 0.0442 AC-FT = 1,920 CF
ii. VOLUME - FIRST 1/2" RUNOFF (TO BE RETAINED IN SUB-BASIN B.2 CISTERN)
$V_{1/2\ INCH}$ = 0.5 IN. * A_T
A_T = 0.25 AC * 43560 SF/AC * 144 IN²/ SF
A_T = 1,568,160 IN²
$V_{1/2\ INCH}$ = 0.5 * 1,568,160 = 784,080 IN³
$V_{1/2\ INCH}$ = 784,080 IN³ * 1 CF / 1728 IN³
$V_{1/2\ INCH}$ = 460 CF (SEE SUB-BASIN B.2 CISTERN)
iii. PEAK DISCHARGE
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100}$ = (1.56*0.00) + (2.28*0.00) + (3.14*0.00) + (4.70*0.25) = 1.2 CFS
iv. 4" CURB PENETRATION CAPACITY (Q_{REL})
Q_{REL} = 1.49/n * A * $R^{2/3}$ * $S^{1/2}$ (MANNING'S EQUN FOR PIPE FLOW)
WHERE:
n = 0.013
A = 0.087 SF
R = A/P; P = 1.05 => R = 0.083
S = 0.01000
Q_{REL} = 0.2 CFS
v. FIRST FLUSH (90TH PERCENTILE STORM EVENT)
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.00*0.00) + (0.00*0.00) + (0.09*0.00) + (0.34*0.25)/0.25 = 0.34 IN
$V_{FIRST\ FLUSH} = (E_W/12)A_T$ = (0.34/12)0.25 = 0.0071 AC-FT = 310 CF
vi. VOLUME RELEASED FROM SUB-BASIN
$V_{REL\ F.4} = V_{100} - V_{1/2"\ TO\ CISTERN}$ = 1920 - 460 = 1460 CF

e. SUB-BASIN F.5
i. VOLUME
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.53*0.00) + (0.78*0.14) + (1.13*0.00) + (2.12*0.07)/0.21 = 1.23 IN
$V_{100,6HR} = (E_W/12)A_T$ = (1.23/12)0.21 = 0.0215 AC-FT = 940 CF

- NOTE: $V_{100,\ F.5}$ RETAINED IN SUB-BASIN B.2 CISTERN

ii. PEAK DISCHARGE
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100}$ = (1.56*0.00) + (2.28*0.14) + (3.14*0.00) + (4.70*0.07) = 0.6 CFS
iii. FIRST FLUSH (90TH PERCENTILE STORM EVENT)
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.00*0.00) + (0.00*0.14) + (0.09*0.00) + (0.34*0.07)/0.21 = 0.11 IN
$V_{FIRST\ FLUSH} = (E_W/12)A_T$ = (0.11/12)0.21 = 0.0019 AC-FT = 80 CF
$V_{FF,\ F.5}$ RETAINED IN SUB-BASIN B.2 CISTERN, ∴ $V_{FIRST\ FLUSH}$ CAPTURED ONSITE
iv. VOLUME RELEASED FROM SUB-BASIN
$V_{REL\ F.5} = V_{100} - V_{FF\ B.2\ CISTERN}$ = 940 - 80 = 860 CF

f. SUB-BASIN F.6
i. VOLUME
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.53*0.00) + (0.78*0.03) + (1.13*0.00) + (2.12*0.10)/0.13 = 1.81 IN
$V_{100,6HR} = (E_W/12)A_T$ = (1.81/12)0.13 = 0.0196 AC-FT = 850 CF
ii. PEAK DISCHARGE
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100}$ = (1.56*0.00) + (2.28*0.03) + (3.14*0.00) + (4.70*0.10) = 0.5 CFS
iii. FIRST FLUSH (90TH PERCENTILE STORM EVENT)
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.00*0.00) + (0.00*0.03) + (0.09*0.00) + (0.34*0.10)/0.13 = 0.26 IN
$V_{FIRST\ FLUSH} = (E_W/12)A_T$ = (0.26/12)0.13 = 0.0028 AC-FT = 120 CF
iv. WATER HARVESTING CAPACITY (AVERAGE END-AREA METHOD)

ELEV	AREA (SF)	VOL (CF)	ΣVOL (CF)
59.5	160		
		145	145
60	420		
		75	220
60.15	560		

V_{CAP} = 220 CF > $V_{FIRST\ FLUSH}$ = 120 CF ∴ WATER HARVESTING IN SUB-BASIN F.6 ACTS AS CREDIT FOR OVERALL PROJECT SITE ($V_{F.6\ WATER\ HARVESTING\ (CREDIT)}$ = 220 - 120 = 100 CF)
v. VOLUME RELEASED FROM SUB-BASIN
$V_{REL\ F.6} = V_{100} - V_{WATER\ HARVEST}$ = 850 - 220 = 630 CF

g. SUB-BASIN F.7
i. VOLUME
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.53*0.00) + (0.78*0.03) + (1.13*0.00) + (2.12*0.09)/0.12 = 1.79 IN
$V_{100,6HR} = (E_W/12)A_T$ = (1.79/12)0.12 = 0.0179 AC-FT = 780 CF
ii. PEAK DISCHARGE
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
$Q_P = Q_{100}$ = (1.56*0.00) + (2.28*0.03) + (3.14*0.00) + (4.70*0.09) = 0.5 CFS
iii. FIRST FLUSH (90TH PERCENTILE STORM EVENT)
$E_W = (E_AA_A+E_BA_B+E_CA_C+E_DA_D)/A_T$
E_W = (0.00*0.00) + (0.00*0.03) + (0.09*0.00) + (0.34*0.09)/0.12 = 0.26 IN
$V_{FIRST\ FLUSH} = (E_W/12)A_T$ = (0.26/12)0.12 = 0.0026 AC-FT = 110 CF
iv. VOLUME RELEASED FROM SUB-BASIN
$V_{REL\ F.7} = V_{100} - V_{CREDIT\ B.2\ WH}$ = 780 - 550 = 230 CF

BASIN F (COMPOSITE)
i. VOLUME RELEASED
$V_{REL,\ BASIN\ F} = V_{REL\ F.1} + V_{REL\ F.3} + V_{REL\ F.4} + V_{REL\ F.5} + V_{REL\ F.6} + V_{REL\ F.7}$
$V_{REL,\ BASIN\ F}$ = 460 + 2590 + 1460 + 860 + 630 + 230
$V_{REL,\ BASIN\ F}$ = 6,230 CF
ii. PEAK DISCHARGE RELEASED
$Q_{100,\ BASIN\ F} = Q_{100\ F.1} + Q_{REL\ F.3} + Q_{REL\ F.4} + Q_{100\ F.5} + Q_{100\ F.6} + Q_{100\ F.7}$
$Q_{100,\ BASIN\ F}$ = 0.4 + 0.2 + 0.2 + 0.6 + 0.5 + 0.5
$Q_{100,\ BASIN\ F}$ = 2.4 CFS
$Q_{REL\ PER\ AC,\ BASIN\ F}$ = 2.4 CFS / 1.33 AC = 1.8 CFS/AC

3 REVISED OVERALL SITE CALCULATIONS

i. VOLUME
a. VOLUME GENERATED
$V_{100\ EXIST\ SITE}$ = 49,275 CF
$V_{100\ DEVEL\ SITE}$ = 54,550 CF

b. VOLUME CAPTURED ON SITE
(INCL. ALL WATER HARVESTING AREAS & STORM WATER QUALITY MANHOLES)
$V_{CAPTURED}$ = 670 CF

c. VOLUME COMPARISON
$\Delta V_{100\ SITE} = V_{100\ DEV\ SITE} - V_{100\ CAPTURED\ SITE} - V_{100\ EXIST\ SITE}$
$\Delta V_{100\ SITE}$ = 54,550 - 670 - 49,275 = 4,605 CF (INCREASE TO PUBLIC STREETS)

ii. PEAK DISCHARGE GENERATED
$Q_{100\ EXIST\ SITE}$ = 32.1 CFS
$Q_{100\ DEVEL\ SITE}$ = 34.2 CFS

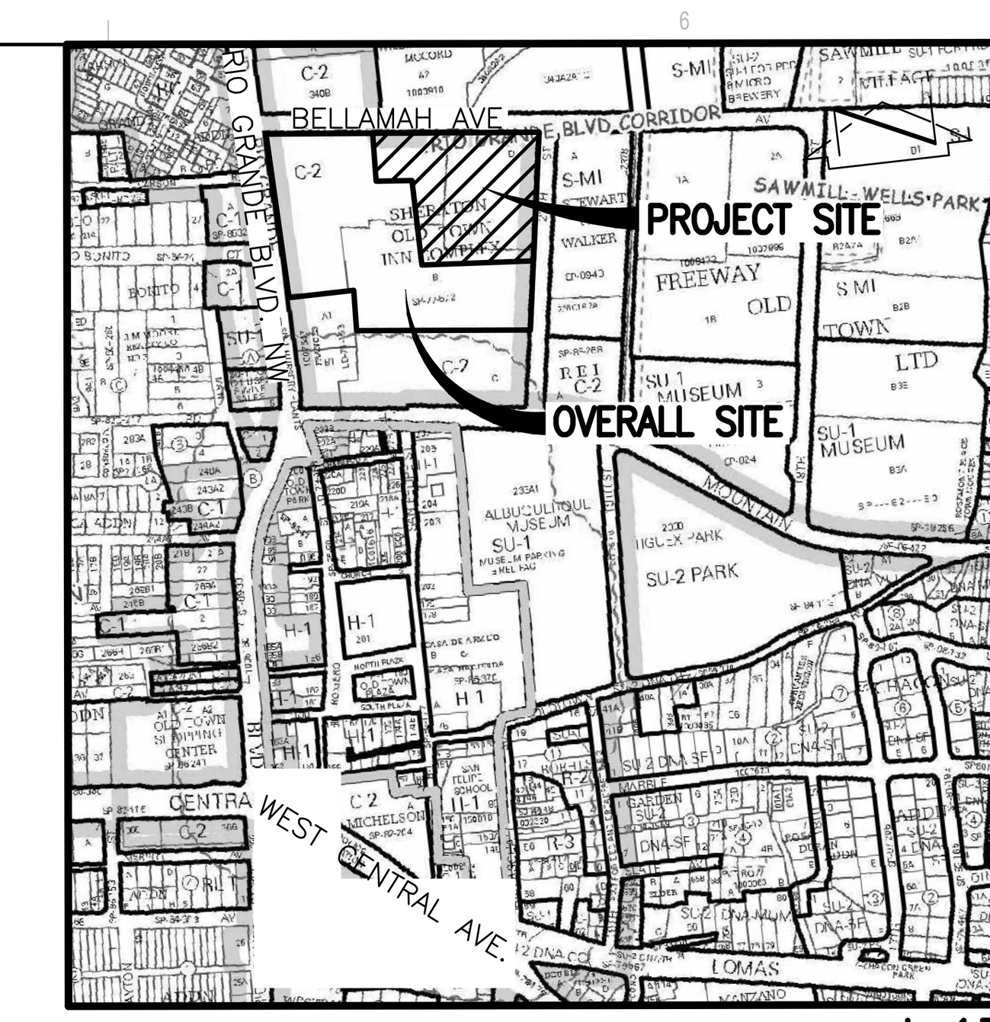
$\Delta Q_{100\ SITE}$ = 2.1 CFS (INCREASE TO PUBLIC STREETS)

iii. INCREASED RUNOFF AFFECT ON EXISTING FLOOD HAZARD ZONE AH
a. AREA OF FLOOD HAZARD ZONE AH
$A_{ZONE\ AH}$ = 391,900 SF

b. FLOOD HAZARD ZONE AH DEPTH ANALYSIS
$D_{FLOOD\ HAZARD\ ZONE} = \Delta V_{100\ SITE} / A_{ZONE\ AH}$ (DEPTH OF INCREASE)
$D_{FLOOD\ HAZARD\ ZONE}$ = 4,605 CF / 391,900 SF
$D_{FLOOD\ HAZARD\ ZONE}$ = 0.012 FT = 0.14 INCH

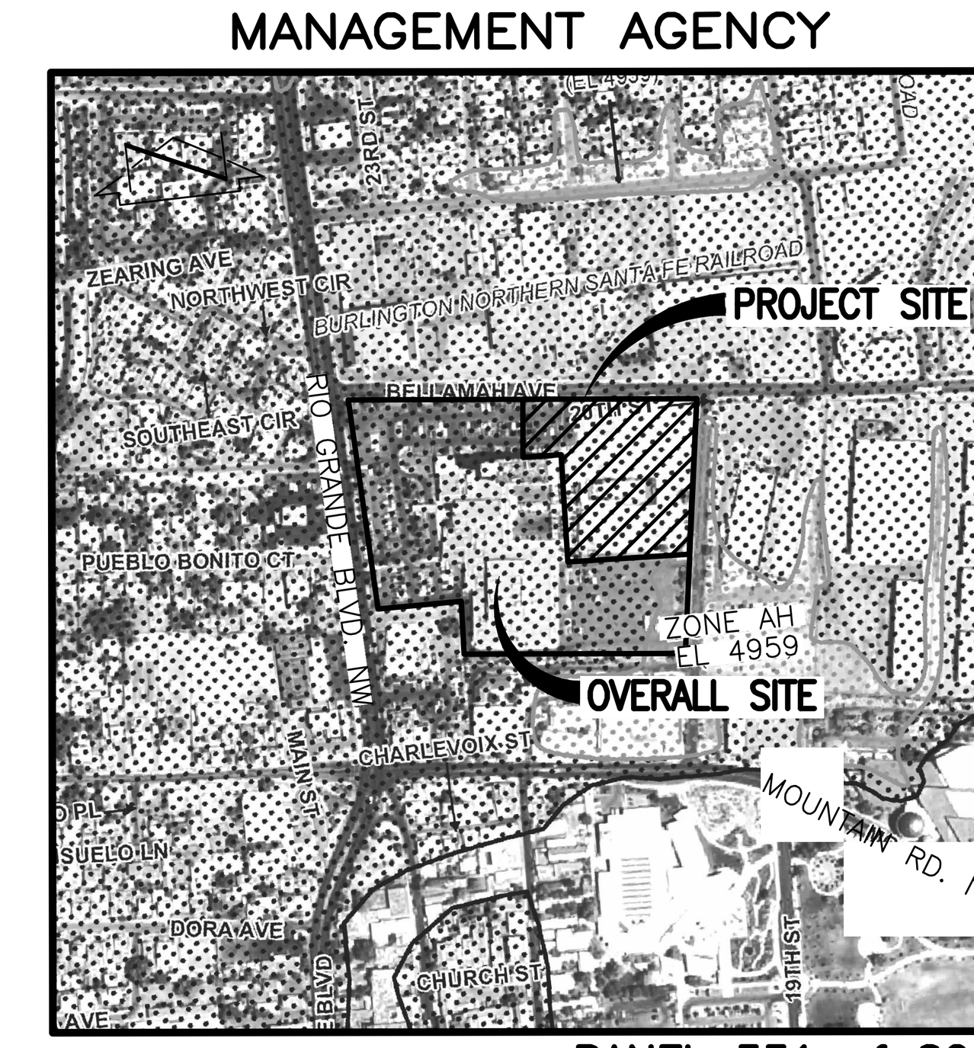
iv. SUMMARY

THE REVISIONS TO THE ORIGINAL APPROVED PLAN CONSIST OF REPLACING THE ORIGINAL APPROVED CISTERNS WITH STORM WATER QUALITY MANHOLES ALONG WITH AND INCREASING THE ONSITE STORM WATER HARVESTING AREAS TO THE MAXIMUM EXTENT PRACTICABLE. AS INDICATED BY THE REVISED CALCULATIONS ABOVE, THESE CHANGES TO THE SITE WILL RESULT IN A INCREASE IN DEVELOPED RUNOFF FROM THE SITE TO THE EXISTING FLOOD HAZARD ZONE AH OF 4,605 CF. THE INCREASE IN RUNOFF DISCHARGE WILL RESULT IN AN INCREASED FLOOD HAZARD ZONE AH DEPTH OF 0.14 INCH. DISCUSSIONS WITH THE CITY HYDROLOGIST DEEMED THAT THIS INCREASE IS NEGLIGIBLE AND THEREFORE ACCEPTABLE.



VICINITY MAP J-13
SCALE: 1" = 750'

FEDERAL EMERGENCY MANAGEMENT AGENCY



F.I.R.M. PANEL 331 of 825
SCALE: 1" = 500' DATED 08-16-2012

LEGAL DESCRIPTION

TRACTS A, B AND D, SHERATON OLD TOWN INN COMPLEX, ALBUQUERQUE, NEW MEXICO

BENCHMARKS

PROJECT BENCHMARK

AN AGRS BRASS DISK STAMPED "5-J13A", SET FLUSH WITH TOP OF CURB, AT THE NORTHWEST QUADRANT OF THE INTERSECTION OF MOUNTAIN ROAD N.W. AND NINETEENTH STREET N.W.
ELEVATION = 4960.499 FEET (NAVD 1988)

TEMPORARY BENCHMARK #1 (T.B.M.)

A MAG NAIL SET IN ASPHALT, IN THE NORTHWESTERN PORTION OF THE SITE, AS SHOWN ON SHEET C-101.
ELEVATION = 4961.25 FEET (NAVD 1988)

TEMPORARY BENCHMARK #2 (T.B.M.)

A CHISELED "+", BEING THE NORTHEASTERN PROPERTY CORNER OF TRACT D, AS SHOWN ON SHEET C-101.
ELEVATION = 4960.13 FEET (NAVD 1988)

TEMPORARY BENCHMARK #3 (T.B.M.)

A MAG NAIL SET IN CONCRETE, IN THE SOUTHEASTERN PORTION OF THE SITE, AS SHOWN ON SHEET C-101.
ELEVATION = 4958.16 FEET (NAVD 1988)

TEMPORARY BENCHMARK #4 (T.B.M.)

A MAG NAIL SET IN ASPHALT, IN THE SOUTHWESTERN PORTION OF THE SITE, AS SHOWN ON SHEET C-101.
ELEVATION = 4961.08 FEET (NAVD 1988)

RECORD DRAWING
FOR CERTIFICATION, SEE SHEET C1.101

R

2014.032.1

HERITAGE HOTELS & RESORTS

2000 Bellamah Ave. NW, Albuquerque, NM 87104

Gensler
500 S. Figueroa Street
Los Angeles CA 900071
Tel: 213.327.3600
Fax: 213.327.3601

DEKKER PERICH SABATINI
ARCHITECTURE / DESIGN / INSPIRATION
7601 JEFFERSON NE, SUITE 100 ALBUQUERQUE, NM 87109 | 505.761.9700 DPSDESIGN.ORG

HIGH MESA Consulting Group
6010-B MIDWAY PARK BLVD. NE
ALBUQUERQUE, NEW MEXICO 87109
PHONE: 505.345.4250 FAX: 505.345.4254
www.highmesacg.com

Issue	Date & Issue Description	By	Check
1	10.29.14	JDS	JGM
3	9/16 CALCS UPDATED FOR SITE CHANGES	J.D.S.	G.M.
R	06/17 RECORD DRAWING	J.D.S.	G.M.

Seal/Signature

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY JEFFREY G. MORTENSEN, NMPE #8547 ON 10/28/2014.

J. GRAEME MEANS NEW MEXICO 13676 REGISTERED PROFESSIONAL ENGINEER

Project Name 06/11/2017 9-23-2016
HOTEL OLD TOWN

Project Number
13-0020

Description
DRAINAGE PLAN AND CALCULATIONS

Scale

C1.103

File Path: P:\DATA\2014.032.1\ENG\AB\ Plot Date: 03-10-2017
File Name: 140321_C-103_AB.DWG Plot Time: 09:26 am

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Hotel Chaco Building Permit #: 1009090 City Drainage #: J13/D066

DRB#: _____ EPC#: _____ Work Order#: _____

Legal Description: Tract D, Sheraton-Oldtown

City Address: 2000 Bellamah Ave NW, Albuquerque NM

Engineering Firm: High Mesa Consulting Group Contact: Graeme Means, #13676

Address: 6010-B Midway Park Blvd NE, Albuquerque NM 87109

Phone#: 505-345-4250 Fax#: 505-345-4254 E-mail: gmeans@highmesacg.com

Owner: Heritage Hotels and Resorts, Inc. Contact: Jason Cosyleon

Address: 201 Third Street, Suite 1140, Albuquerque NM 87102

Phone#: 505-836-6700 Fax#: _____ E-mail: jcosyleon@hhandr.com

Architect: Gensler Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Other Contact: Klinger Constructors, LLC Contact: Mark Maestas

Address: 8701 Washington St. NE

Phone#: 505.858-3673 Fax#: _____ E-mail: markm@klingerllc.com

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE

_____ TRAFFIC/ TRANSPORTATION

_____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

X ENGINEER/ ARCHITECT CERTIFICATION

_____ CONCEPTUAL G & D PLAN

X GRADING PLAN

_____ DRAINAGE MASTER PLAN

_____ DRAINAGE REPORT

_____ CLOMR/LOMR

_____ TRAFFIC CIRCULATION LAYOUT (TCL)

_____ TRAFFIC IMPACT STUDY (TIS)

_____ EROSION & SEDIMENT CONTROL PLAN (ESC)

_____ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: _____ Yes X No

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

_____ BUILDING PERMIT APPROVAL

X CERTIFICATE OF OCCUPANCY (PERMANENT)

_____ PRELIMINARY PLAT APPROVAL

_____ SITE PLAN FOR SUB'D APPROVAL

_____ SITE PLAN FOR BLDG. PERMIT APPROVAL

_____ FINAL PLAT APPROVAL

_____ SIA/ RELEASE OF FINANCIAL GUARANTEE

_____ FOUNDATION PERMIT APPROVAL

_____ GRADING PERMIT APPROVAL

_____ SO-19 APPROVAL

_____ PAVING PERMIT APPROVAL

_____ GRADING/ PAD CERTIFICATION

_____ WORK ORDER APPROVAL

_____ CLOMR/LOMR

_____ PRE-DESIGN MEETING

_____ OTHER (SPECIFY) _____

DATE SUBMITTED: June 12, 2017 By: Justin Schara

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ___