Appendix I

Detention Pond Data

Existing Detention Ponds

1. **Black Dam** – Source: As-built (1-23-2009) Construction Plans for Regional Water Quality Structure at Black Arroyo Dam, Albuquerque New Mexico. Prepared for AMAFCA by Wilson & Company, 3-10-2008.
2. **Cabezon Subdivision – Tract 17 Detention Pond** - Source: AHYMO_97 Model Input File for - Cabezon Communities Phase I Drainage Management Plan (Unit 16) Wilson & Company, Feb. 2004.
3. **Gateway Pond** - Source: Drainage Analysis Report. Prepared for SSCAFCA by Bohannan-Huston. November 4, 2010.
4. **Sugar Ridge Subdivision Detention Pond** - Source: Based on an as-built topographic survey prepared by Smith Engineering Company and documented in a report titled – Letter of Map Revision (LOMR) for Sugar Channel, Rio Rancho, NM. Prepared for City of Rio Rancho, prepared by Smith Engineering Company December 2009.
5. **Wallen Park Subdivision Detention Pond** – Source: Based on As-Built Plans (2-26-2008). Wallen Park Subdivision. Prepared for Wallen Builders, prepared by Community Sciences Corporation 5-4-2007. Also see Detention Pond Figure 3 prepared by Smith Engineering to assist in the detention pond elevation-area-discharge data preparation.
6. **Sunset Pond** – Source: Based on As-Built Plans (Feb. 2009). Prepared for SSCAFCA, Prepare by ASCG Inc. January 2008.
7. **Wexford Pond** – Source: Obtained from AHYMO from Black Arroyo watershed Management Plan. Prepared for SSCAFCA, prepared by ASCG. Final August 2002.
8. **Stone Bridge Detention Pond (Bernalillo County)** – Source: Developed by Smith Engineering Company based on 2010 Lidar contour mapping along with field observations and measurements.
9. **19th Ave. Retention Pond.** Source: Developed by Smith Engineering Company. Based on 2010 Lidar Contour mapping along with field observations.

Proposed or Possible Detention Ponds

1. **Sugar Pond – Source :** Proposed Construction Plans – Prepared for SSCAFCA, prepared by WH Pacific, June 2011.

2. **Lisbon Dam – Source :** Conceptual Design by Smith Engineering Company, July 2013

3. **19th Ave. Dam (West Branch at west side of Unser Blvd.)** – Source : Conceptual Design by Smith Engineering Company, July 2013

HEC-HMS Output for: Existing Conditions Detention Pond Routings

HEC-HMS Output for: DEVEX Conditions Detention Pond Routings

HEC-HMS Output for: Ultimate Conditions Detention Pond Routings

Existing Detention Ponds

1. **Black Dam –** Source: As-built (1-23-2009) Construction Plans for Regional Water Quality Structure at Black Arroyo Dam, Albuquerque New Mexico. Prepared for AMAFCA by Wilson & Company, 3-10-2008.

2. **Cabezon Subdivision – Tract 17 Detention Pond -** Source: AHYMO_97 Model Input File for - Cabezon Communities Phase I Drainage Management Plan (Unit 16) Wilson & Company, Feb. 2004.

3. **Gateway Pond -** Source: Drainage Analysis Report. Prepared for SSCAFCA by Bohannan-Huston. November 4, 2010.

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9. **19th Ave. Retention Pond.** Source: Developed by Smith Engineering Company. Based on 2010 Lidar Contour mapping along with field observations.

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

CONSTRUCTION PLANS FOR

REGIONAL WATER QUALITY STRUCTURE AT BLACK ARROYO DAM ALBUQUERQUE, NEW MEXICO

AMAFCA

AMAFCA

INDEX

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5	WEST BRANCH ARROYO DROP STRUCTURE PLAN & PROFILE
6	EAST BRANCH CHANNEL PLAN & PROFILE
7	WATER QUALITY STRUCTURE DETAILS
8	LOW FLOW IN-TAKE STRUCTURE
9	SITE DETAILS
10	SITE DETAILS
11	TESCM EROSION & SEDIMENT CONTROL MEASURES
12	TESCM SILT FENCE INSTALLATION AND CHECK DAMS
13	TESCM PIPE SLOPE DRAIN & SEDIMENT TRAPS
14	DROP INLET & CULVERT PROTECTION

BLACK ARROYO DAM PROPERTIES	
MAXIMUM GRADE ABOVE EXISTING GRADE AT CENTERLINE	22.5 FT
LENGTH	3,273 FT
MAXIMUM WIDTH AT BASE	200 FT
CREST WIDTH	15 FT
SLOPE UPSTREAM FACE	3:1 FT/FT
SLOPE DOWNSTREAM FACE	2.5:1 FT/FT
ELEVATION OF THE DAM CREST (TOD)	5175.0 FT
ELEVATION OF THE EMERGENCY SPILLWAY CREST	5165.75 FT
WATER SURFACE ELEVATION 1/2 PMP, 6-HOUR LOCAL EVENT	5173.25 FT
WATER SURFACE ELEVATION 100-YEAR 24-HOUR EVENT	5160.99 FT
ELEVATION OF THE OUTLET CONDUIT UPSTREAM	5146.00 FT
ELEVATION OF THE OUTLET CONDUIT DOWNSTREAM	5144.08 FT
OUTLET CONDUIT SIZE AND TYPE	2 - 8.5' x 8.5' CBCs
OUTLET CONDUIT CAPACITY AT TOD ELEVATION 5175.0'	3865 CFS
DRAINAGE AREA	6,347 ACRE
HAZARD CLASSIFICATION	HIGH
2 PMP 6 HOUR LOCAL STORM DESIGN RAINFALL	7.12 IN
FREEBOARD	9.25 FT
LOCATION OF OUTLET WORKS INTAKE STRUCTURE (@ ℄ OF UPSTREAM HEADWALL)	N 1534254.33 E 1512979.64

AS-BUILT

SURVEYOR'S CERTIFICATION

I, Dan B. Holmes, New Mexico Land Surveyor No. 9243, do hereby certify that the as-built elevations shown on these plans were surveyed under my supervision and that they are true and correct to the best of my knowledge and belief.

Dan B. Holmes

02-11-09

Date

DAN B. HOLMES NEW MEXICO 9243 REGISTERED PROFESSIONAL LAND SURVEYOR

State of New Mexico)
) ss.
County of Bernalillo)

I, Daniel S. Aguirre, PE, CFM, state that I am a qualified professional engineer licensed in the state of New Mexico, that I have inspected the **REGIONAL WATER QUALITY STRUCTURE AT THE BLACK ARROYO DAM** and appurtenant structures and find them to be in accordance with the record construction drawings and specifications and are now in satisfactory condition for acceptance.

Daniel S. Aguirre, PE, CFM

License Number 11955

Date submitted 2/9/09

DANIEL S. AGUIRRE NEW MEXICO 11955 PROFESSIONAL ENGINEER

STATE OF NEW MEXICO)
) SS.
COUNTY OF BERNALILLO)

I, JOHN P. KELLY, P.E., BEING FIRST DULY SWORN, UPON MY OATH, STATE THAT I AM THE EXECUTIVE ENGINEER FOR THE ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY, ALBUQUERQUE, NM, A GOVERNMENTAL ENTITY ORGANIZED UNDER THE LAWS OF THE STATE OF NEW MEXICO, THAT THE ACCOMPANYING CONSTRUCTION DRAWINGS CONSISTING OF 14 SHEETS FOR THE REGIONAL WATER QUALITY STRUCTURE AT BLACK ARROYO DETENTION DAM WERE MADE UNDER THE AUTHORITY OF THE BOARD OF DIRECTORS OF SAID ENTITY AND THAT, IN THEIR BEHALF, I HAVE READ AND EXAMINED THE STATEMENTS AND REPRESENTATIONS AND ALL THAT SHOWN HEREIN IS DONE WITH THEIR FREE CONSENT AND IN ACCORDANCE WITH THEIR WISHES AND STATE THAT THE SAME ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

John P Kelly DATE 2-28-08
JOHN P. KELLY, P.E. EXECUTIVE ENGINEER

SUBSCRIBED AND SWORN TO BEFORE ME THIS 28th DAY OF Feb., 2008

Pamela S. Woodruff
NOTARY PUBLIC

OFFICIAL SEAL Pamela S. Woodruff Notary Public State of New Mexico My Commission Expires 9-22-08

MY COMMISSION EXPIRES 9-22-08

STATE OF NEW MEXICO)
) SS.
COUNTY OF BERNALILLO)

I, DANIEL S. AGUIRRE, P.E., CFM HEREBY CERTIFY THAT I AM A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW MEXICO, QUALIFIED IN CIVIL ENGINEERING; THAT THE ACCOMPANYING DESIGN REPORT WAS PREPARED BY ME OR UNDER MY SUPERVISION; THAT THE ACCOMPANYING CONSTRUCTION DRAWINGS CONSISTING OF 14 SHEETS WAS PREPARED BY ME OR UNDER MY SUPERVISION; THAT THE ACCOMPANYING CONSTRUCTION DRAWINGS CONSISTING OF 14 SHEETS IS IN COMPLIANCE WITH THE DAM DESIGN, CONSTRUCTION AND DAM SAFETY REGULATIONS(19.25.12 NMAC) AND THAT THE SAME ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

, LICENSE 11955,
DANIEL S. AGUIRRE, P.E., CFM

DATE SUBMITTED 3/10/08

STATE OF NEW MEXICO)
) SS.
COUNTY OF SANTA FE)

HEREBY CERTIFY THAT THE ACCOMPANYING CONSTRUCTION DRAWINGS I FOR THE REGIONAL WATER QUALITY STRUCTURE AT THE BLACK ARROYO DETENTION DAM AND APPURTENANT STRUCTURES HAS BEEN DULY EXAMINED BY ME AND ACCEPTED FOR FILING ON THE DAY OF , 200

DATE

JOHN D'ANTONIO, P.E.
NEW MEXICO STATE ENGINEER

APPROVED FOR CONSTRUCT

DEVELOPER CUBB NORTH LLC

CITY OF RIO RANCHO DEPARTMENT OF PUBLIC INFRASTRUCTURE

AMAFCA EXECUTIVE ENGINEER

SSCAFCA EXECUTIVE DIRECTOR

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

WILSON & COMPANY
2600 THE AMERICAN ROAD SE
SUITE 100
RIO RANCHO, NEW MEXICO
87124
P: (505) 348-4000
F: (505) 348-4072
WWW.WILSONCO.COM

DANIEL S. AGUIRRE NEW MEXICO 11955 REGISTERED PROFESSIONAL ENGINEER

REGIONAL WATER STRUCTURE AT BL

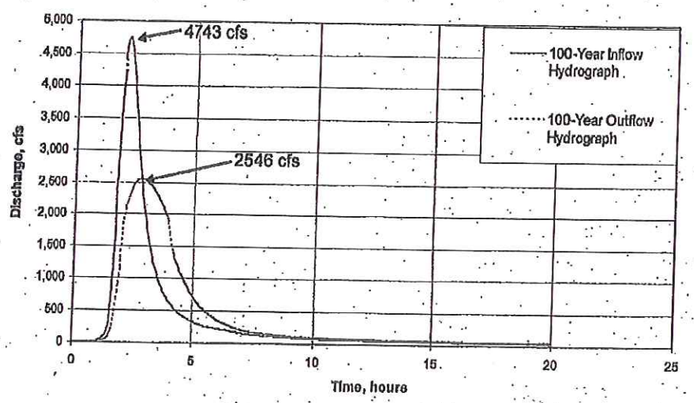
TITLE SHEE

REVISIONS	NO.	DATE	REMA

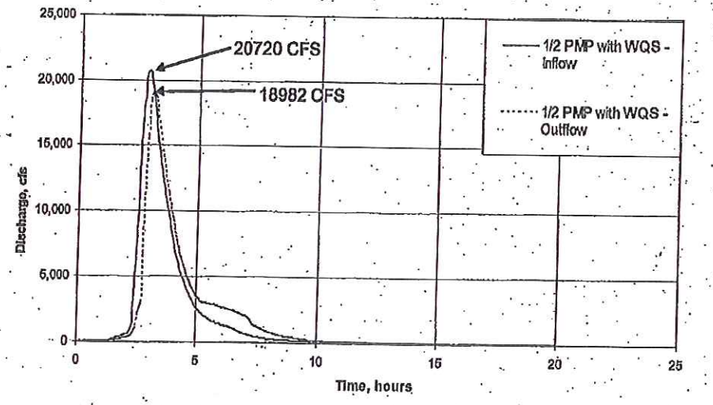
DESIGN	M.H	WCEA NO. X42186
DRAWN	H.L.C	PROJECT NO.
CHECK	M.H	N/A

T:\Projects\V42186\12\01_Cad\B42186V01.dgn 2/27/2008 2:49:18 PM MST

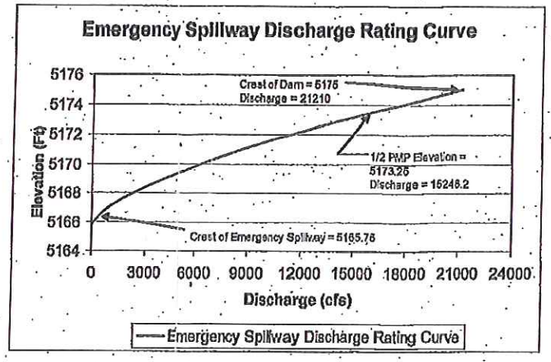
Inflow and Outflow Hydrographs for the Combined Black Arroyo Dam and Water Quality Structure, 100-year 24-hour Storm Event



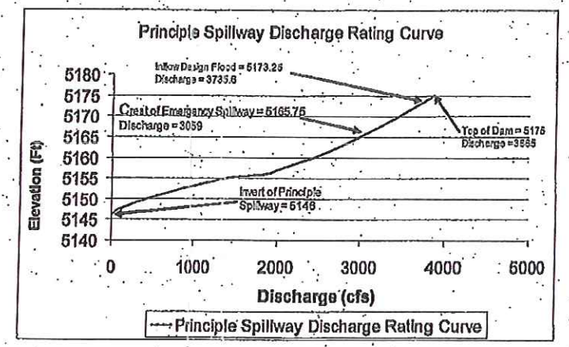
Inflow and Outflow Hydrographs for the Combined Black Arroyo Dam and Water Quality Structure, 1/2 PMP, 6-Hour Local Storm Event



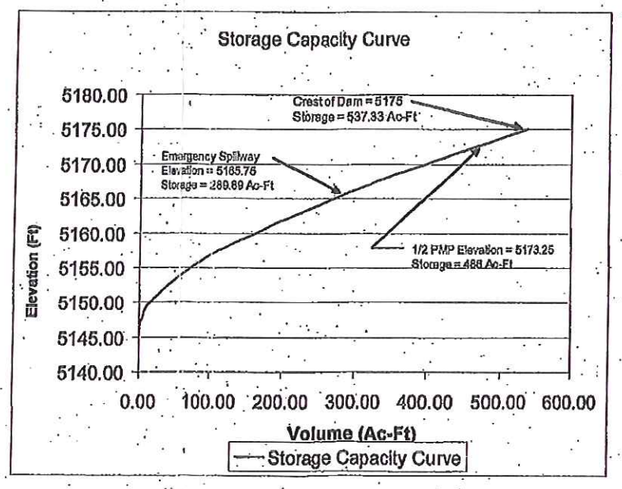
Emergency Spillway Discharge Rating Curve



Principle Spillway Discharge Rating Curve



Storage Capacity Curve



BLACK ARROYO DAM PROPERTIES	
MAXIMUM GRADE ABOVE EXISTING GRADE AT CENTERLINE	
LENGTH	
MAXIMUM WIDTH AT BASE	
CREST WIDTH	
SLOPE UPSTREAM FACE	
SLOPE DOWNSTREAM FACE	
ELEVATION OF THE DAM CREST (TOD)	
ELEVATION OF THE EMERGENCY SPILLWAY CREST	
WATER SURFACE ELEVATION 1/2 PMP, 6-HOUR LOCAL EVENT	
WATER SURFACE ELEVATION 100-YEAR 24-HOUR EVENT	
ELEVATION OF THE OUTLET CONDUIT UPSTREAM	
ELEVATION OF THE OUTLET CONDUIT DOWNSTREAM	
OUTLET CONDUIT SIZE AND TYPE	2 - 6
OUTLET CONDUIT CAPACITY AT TOD ELEVATION 5175.0'	
DRAINAGE AREA	
HAZARD CLASSIFICATION	
2 PMP 6 HOUR LOCAL STORM DESIGN RAINFALL	
FREEBOARD	
LOCATION OF OUTLET WORKS INTAKE STRUCTURE (@ ℄ OF UPSTREAM HEADWALL)	

Proposed Black Arroyo Dam Rating Curve Information With WQS

Elevation (feet)	Surface Area (Acre)	Incremental Volume (Ac-Ft)	Storage (Ac-Ft)	Discharge** (CFS)	
5146.00	0.00	0.00	0.00	0.0	Principl Spillway
5147.00	3.00	1.50	1.50	51.9	
5148.00	3.63	3.32	4.82	146.7	
5149.00	4.25	3.94	8.76	269.4	
5150.00	9.22	6.74	15.49	414.8	
5151.00	10.10	9.66	25.15	579.7	
5152.00	11.23	10.67	35.82	762.0	
5153.00	12.48	11.86	47.67	960.3	
5154.00	13.57	13.03	60.70	1173.2	
5155.00	14.40	13.99	74.68	1400.0	
5156.00	14.46	14.43	89.11	1633.0	
5157.00	15.28/18.9*	14.87	103.98	2018.5	
5158.00	19.39	19.15	123.13	2162.9	
5159.00	19.88	19.64	142.76	2288.2	
5160.00	20.44	20.16	162.92	2428.0	
5161.00	20.97	20.71	183.63	2547.4	
5162.00	21.52	21.25	204.87	2663.2	
5163.00	22.12	21.82	226.69	2774.2	
5164.00	22.76	22.44	249.13	2881.0	
5165.00	23.31	23.04	272.17	2983.9	
5165.76	23.80	23.49	289.89	3059.9	Emerge Spillway
5166.00	23.96	23.64	295.80	3168.6	
5167.00	24.53	24.25	320.05	4150.7	
5168.00	25.15	24.84	344.89	5644.0	
5169.00	25.84	25.50	370.38	7523.3	
5170.00	26.53	26.19	396.57	9738.9	
5171.00	27.16	26.86	423.42	12255.3	
5172.00	27.86	27.52	450.94	15059.7	
5173.00	28.49	28.18	479.12	18138.9	
5173.25			486.40	18981.6	Design Elevatio
5174.00	29.09	28.79	507.91	21477.6	
5175.00	29.76	29.43	537.33	25074.8	Top of D

*There are 2 areas shown at Elevation 5157 for the calculations of the Volume. The 15.28 surface area used to calculate the incremental volume at elevation 5157. The 18.9 value is the surface area used to calculate the incremental volume at elevation 5158.

**Discharge includes total of Principle and Emergency Spillways

TABLE A

SOUTH 16 -28"S x 20" R CMP			NORTH 16 -28"S X 20" R CMP		
CMP	INVERT WEST	INVERT EAST	CMP	INVERT WEST	INVERT EAST
1	5157.68	5160.09	1	5158.12	5161.21
2	5157.81	5160.20	2	5157.88	5161.18
3	5157.82	5160.53	3	5157.86	5161.15
4	5157.72	5160.99	4	5158.07	5161.28
5	5157.89	5160.03	5	5158.01	5161.20
6	5157.80	5160.87	6	5157.92	5161.17
7	5157.83	5160.94	7	5157.84	5161.18
8	5157.84	5160.96	8	5157.94	5161.12
9	5157.77	5160.93	9	5157.90	5161.13
10	5157.77	5160.91	10	5157.91	5161.17
11	5157.72	5160.97	11	5158.01	5161.11
12	5157.78	5160.91	12	5157.84	5161.10
13	5157.71	5160.88	13	5157.92	5161.14
14	5157.78	5160.93	14	5157.92	5161.16
15	5157.74	5160.97	15	5157.96	5161.13
16	5157.78	5160.93	16	5157.93	5161.11

SOUTH & NORTH CMP's BEGINNING WITH #1 @ SOUTH END OF EACH BATTERY FOR CMP'S & ENDING WITH #16. EQUAL INVERTS WEST & EAST FOR EACH CMP.

RECORD DRAWING DATE 1-23-2009

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

WILSON & COMPANY
2600 THE AMERICAN ROAD SE
SUITE 100
RIO RANCHO, NEW MEXICO
87124
(505) 893-5021

REGIONAL WATER QUALITY STRUCTURE AT BLACK DAM

HYDROLOGY/HYD

REVISIONS	NO.	DATE	REMA

DESIGN	MJI	WCEA NO.	X4218
DRAWN	HLC	PROJECT NO.	N/A
CHECK	MJI		

DANIEL A. AURBE NEW MEXICO 12177 REGISTERED PROFESSIONAL ENGINEER 1955 1/22/09

T:\Projects\X4218012\W\Water Qual Struct\01_Gen\8412HYDRAUICSL.dwg 2/28/2008 7:30:31 AM MST

CABEZON TRACT 17 DETETION POND (3 PAGES)
ELEV. STORAGE DISHCARGE DATA

FROM

CABEZON COMMUNITIES PHASE I
DRAINAGE MANAGEMENT PLAN (Unit 16)
Wilson & Company, Feb. 2004

CD in report with AHYMO models

Copy of model beginning text and RESERVOIR ROUTING DATA

```
START                0.0 HRS   PUNCH CODE=0   PRINT LINES=-1
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
* * * *
*S     7/22/04
*S     WILSON & CO.'S CABEZON COMMUNITIES DRAINAGE MASTER PLAN, PHASE 2 OF
*S     DEVELOPMENT: THIS MODEL TAKES BOTH CABEZON PHASE 1 AND 2 INTO THE
*S     MODIFIED BLWMP MODEL DEVELOPED BY ASCG (1/20/04) TO ASSESS
CABEZON'S
*S     IMPACT ON BLACK DAM. IT MODELS DEVELOPED CONDITIONS IN ALL
SUBBASINS;
*S     SEDIMENT BULKING ADJUSTED TO 6% REFLECT THIS; ALSO, MUSKINGHAM
CUNGE
*S     ROUTING (COMMAND: ROUTE MCUNGE) CONSISTENTLY USED
*S     THIS MODEL USES A STEP OF 0.05 HR (3 MIN) SO THAT THE ENTIRE 24 HR
*S     HYDROGRAPH IS CAPTURED AND VOLUMETRIC RUNOFF IS MORE COMPLETELY
*S     ACCOUNTED FOR
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
* * * *
*S  01/20/2004 ADJUSTMENTS TO THIS MODEL FROM THE BLWMP
*S  "DOUBLE" COUNTING OF STREETS IN LAND TREATMENT REMOVED
*S  SUB-BASIN 211 ROUTED ADJUSTED TO EXISTING FIELD CONDITIONS (XING
SOUTHERN)
*S  NOTHING ELSE HAS BEEN ADJUSTED - USER ACCEPTS THIS MODEL AS IS AND
TAKES THE
*S  RESPONSIBILITY FOR CHECKING IT FOR ACCURACY PRIOR TO USE...
**********************************************************************
*******
*      -------HYDROLOGY MODEL-----------
*S * * * FUTURE CONDITIONS MODEL - ALTERNATE B  * * * * * * * * * * * * * *
* * * *
*S * * * 3 DAMS ON THE WEST BRANCH                          * * * * * * * * *
*S * * * UNSER GATEWAY DAM, AND WATER QUALITY DIVERSIONS * * * * * * * * * *
*S * * * ROUTING WITH MCUNGE METHOD AFTER WATER QUALITY DIVERSIONS ARE  *
* * * *
```

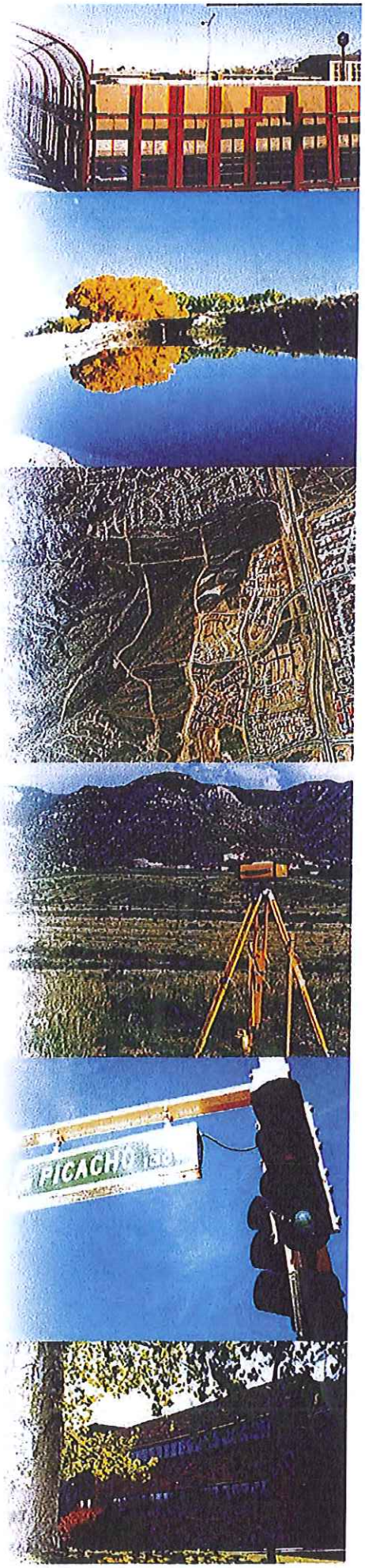
```
*S * * * UTILIZED TO ADJUST FOR THE UNSTABLE HYDROGRAPHS WITH A STEEP
SLOPE * * *
*S * * * AFTER MODIFICATION TO REDIRECT THE FIRST FLUSH OF 0.25" RUNOFF
FOR SWQ *
* LH
********************************************************************** * *
*
* LH FILE MODIFIED BY LH/ASCG TO REFLECT FULL DEVELOPMENT WITHIN THE BLACK
     *
* LH ARROYO WATERSHED USING THE SSCAFCA LAND TREATMENTS FOR LOTS AND
     *
* LH ZONING DEVELOPED FOR THE MONTOYAS ARROYO STUDY.
     *
* LH THIS MODEL IS INTENDED TO PROVIDE A BIG PICTURE STUDY FOR THE BLACK
     *
* LH ARROYO AND SHOULD NOT BE USED TO DEVELOP DETAILED SOLUTIONS.
     *
* LH THE FEMA RESTUDY MODEL HAS BEEN ADDED TO IVORY AND LISBON CROSSING
DESIGN*
* LH MODEL AND CHANGED TO DEVELOPED CONDITIONS.
     *
* LH                                                              *
* LH THE FOLLOWING THINGS WERE CHANGED IN THE MODEL:
     *
* LH                                                                  *
* LH MODIFIED PRINT LINE COMMAND AND ROUTES CHANGED TO MANNINGS ROUTE FOR
     *
* LH ALL WELL DEFINED CHANNELS (ALSO CHANGED IN RESTUDY MODEL PORTION)
*
* LH MODIFIED SLOPE FOR ROUTING THRU BASIN 103 FROM 0.0179 TO 0.0214
FT/FT.      *
* LH SEE RUN CHRONOLOGY FOR OTHER CHANGES IN THE MODEL.
     *
*
LH*********************************************************************
* * *
*
*  ORIGINAL AHYMO MODEL DEVELOPED FOR:
*  FEMA RE-STUDY
*  SANDOVAL COUNTY, NEW MEXICO
*
*  RESTUDY AREA:  CITY OF RIO RANCHO
*  FLOODING SOURCE: BLACK ARROYO
*
**********************************************************************
******
* LH   ALL SEDIMENT BULKING WAS MODIFIED TO USE THE SEDIMENT BULK COMMAND
AND
*  NOT THE DIVIDE HYD COMMANDS IN THE PREVIOUS FEMA RESTUDY MODELS.
*  SEE RUNCHRONOLOGY FOR AN EXPLANATION OF THE BULKING FACTORS.
*

*S  ROUTE FLOWS THROUGH Pond/Park in Unit 17
*S  Pond Based on final design grades with 7 ac-ft of
*S  low storage/WQ and then filling remainder of park/field
*S  graded at 2%
ROUTE RESERVOIR        ID=2  HYD NO=P.Out  INFLOW ID=1 CODE=4.2
```

OUTFLOW (CFS)	STORAGE (AF)	ELEV (FT)	
0.00	0.00	5263.00	Principal Spillway / Low Flow
0.06	0.25	5263.50	
0.46	0.51	5264.00	
1.48	0.83	5264.50	
3.31	1.15	5265.00	
6.04	1.50	5265.50	
9.66	1.85	5266.00	
14.01	2.22	5266.50	
18.71	2.59	5267.00	
23.07	2.99	5267.50	
25.83	3.39	5268.00	
24.31	3.81	5268.50	
235.80	4.23	5269.00	
254.70	4.68	5269.50	
272.28	5.13	5270.00	
288.80	5.60	5270.50	
304.42	6.08	5271.00	
319.28	6.58	5271.50	
333.47	7.09	5272.00	
347.09	7.62	5272.50	
360.19	8.16	5273.00	
372.84	8.72	5273.50	
385.06	9.29	5274.00	
396.91	10.08	5274.50	TOP OF 9.5 FT CMP PRINCIPAL SPILLWAY PIPE
408.42	10.87	5275.00	
419.61	12.09	5275.50	
430.51	13.31	5276.00	
441.14	14.84	5276.50	
451.53	16.36	5277.00	
461.67	18.00	5277.50	
471.60	19.63	5278.00	
481.33	21.33	5278.50	
490.86	23.02	5279.00	
500.21	24.72	5279.50	
509.39	26.41	5280.00	Top of Bank - Emergency Spillway

```
*
PRINT HYD         ID=2   CODE=1
*
*
*S *************DIVIDE HYD TO UNBULK BY 3% **********************
DIVIDE HYD           ID=2    %=-97   ID I=2   HYD=P.Out.3
                               ID II=51 HYD=SEDIMENT
*
*
*S  Route unbulked pond outflow at 17 to east end of 15
*S  through a 60" pipe
```

GATEWAY POND DRAINAGE ANALYSIS REPORT



NOVEMBER 4, 2010

Prepared for:

SSCAFCA
1041 Commercial Dr. S.E.
Rio Rancho, NM 87124

Bohannan ▲ Huston Inc.

ENGINEERING ▲
SPATIAL DATA ▲
ADVANCED TECHNOLOGIES ▲

Gateway Dam Elevation-Storage-Discharge Table

Elevation (FT)	Storage (AC-FT, see note 1)	Existing Discharge (CFS, see note 2)
5263	0.000	0.000
5264	0.871	58.161
5265	1.976	88.423
5266	3.326	168.753
5267	5.343	244.421
5268	8.507	303.831
5269	11.987	340.404
5270	17.216	371.140
5271	21.619	399.865

Notes:

1) DTM created from proposed contours provided by Goodwin, 9/9/10

2) 3 Existing 57" x 38" CMP Pipes

TABLE SR 1 CORRECT

ELEVATION - STORAGE-DISCHARGE DATA

SUGAR RIDGE SUBDIVISION DETENTION POND

(Elevations, contours, principal and emergency spillway measurements are based on the "as-built" condition as surveyed by Smith Engineering Company, October 2009)

Contour Elevation	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	Principal Spillway - Orifice Flow Discharge Curve	Emergency Spillway Discharge	Total Discharge	Comments
	Principal Spillway Orifice Diameter (inches)				36			See Figure For sketch of
	Number of Orifices				1			pond principal and emergency
(ft)	(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	spillways
	0			0.0000	(a) (c)	(b)		
5560	175	0	0.0000	0.0000	0.00	0.0	0.00	The storage volume below the vertical 5 ft. dia. principal spillway crest elevation 5564.42 is dead storage . The 3 ft. dia. CMP horizontal pipe is joined to the 5 ft. dia. vertical pipe. The 3 ft. dia. pipe invert elevation = 5561.13
5561	2633	1404	0.0322	0.0322	0.01	0.0	0.01	
5561.13	2919	361	0.0083	0.0405	0.02	0.0	0.02	
5562	4830	3371	0.0774	0.1179	0.03	0.0	0.03	
5563	6570	5700	0.1309	0.2488	0.04	0.0	0.04	
5564	7958	7264	0.1668	0.4155	0.05	0.0	0.05	
5564.42	8564	3470	0.0797	0.4952	0.06	0.0	0.06	After water overtops the 5 ft. dia CMP, the 3 ft. dia. CMP outfall pipe joined to 5 ft. CMP will control the discharge. Crest elev. Of emergency spillway is 5567.26
5565	9401	5210	0.1196	0.6148	7.5	0.0	7.5	
5566	10933	10167	0.2334	0.8482	30.1	0.0	30.1	
5567	12980	11957	0.2745	1.1227	55.9	0.0	55.9	
5567.26	13643	3461	0.0795	1.2021	83.0	0.0	83.0	
5568	15529	10794	0.2478	1.4499	87.9	72.6	160.4	
5569	17102	16316	0.3746	1.8244	94.0	261.7	355.7	
5570	18551	17827	0.4092	2.2337	99.8	517.0	616.9	
5571	19977	19264	0.4422	2.6759	105.3	824.5	929.9	
Total Volume (ft^3) =		116563						
Total Volume (ac-ft) =		2.6759						

Principal Spillway

Emergency Spillway

Top of bank

TABLE SR 1

(a) Orfice flows were obtained from the use of Equation 4-10 and Table 4-3 from "Handbook of Hydraulics, Sixth Edition, by Brater and King" 1982."
$Q = Ca\ (2gh)^{1.5}$ C=0.591, g=32.2 ft/sec^2, a=area (sq ft) h=head (ft)
Principal Spillway Elevation is 5561.13

(b) Emergency Spillway flows were computed friom the use of equation 5-10 and Table 5-3 from "Handbook of Hydraulics" Sixth Edition, by Brater and King" 1982, and the following data
$Q = CLH^{1.5}$ C = discharge coeffient, L = spillway length perp. To flow, H = head (ft)

C = 3 L = 38.0000 Spillway Elev. 5567.26

(c) 36-inch CMP principal spillway pipe water areas when the pipe is not full (for orifice equation)

elev.	water depth	flow area		
	ft	sq ft		See Note regarding shaded area
5561.13	0.00	0.00		
5562.00	0.87	1.69		
5563.00	1.87	4.64		
5564.00	2.87	6.96	3 ft depth full pipe area = 7.07 sq ft	

Note - the principal spillway flows in the shaded area were computed in TABLE SR 2 which computes the discharge as if the 36-inch cmp has head on it from the invert elev.. However, the 36-inch cmp will not take in water until the water depth exceeds the top of the 5 ft. dia. cmp vertical pipe elevation of 5564.42. As water overtops the crest elevation of the 5 ft. dia. cmp, the head on the invert of the 36-inch cmp will increase gradually until the water depth submerges the 5 ft. dia. cmp. Therefore the values from TABLE SR2 were inserted in the shaded area. At elevations greater than the crest of the 5 ft. dia. and greater, assume the full head is available on the 36-inch cmp.

PROJECT CONTROL NUMBER: A300060

PURPOSE OF THIS POND AS-BUILT SURVEY WAS TO ASSIST IN DEVELOPMENT OF THE HYDROLOGIC MODEL FOR THE TRIBUTARY ARROYO FOR WHICH THE LOMR APPLIES BEGINNING DOWNSTREAM OF BALI ROAD

NOTES:
ELEVATIONS SHOWN ARE NAVD 88 BASED UPON STATIC G.P.S. OBSERVATION OF N.G.S. CONTROL POINT "SAGE", ELEVATION = 5676.17'.

THIS IS NOT A BOUNDARY SURVEY.

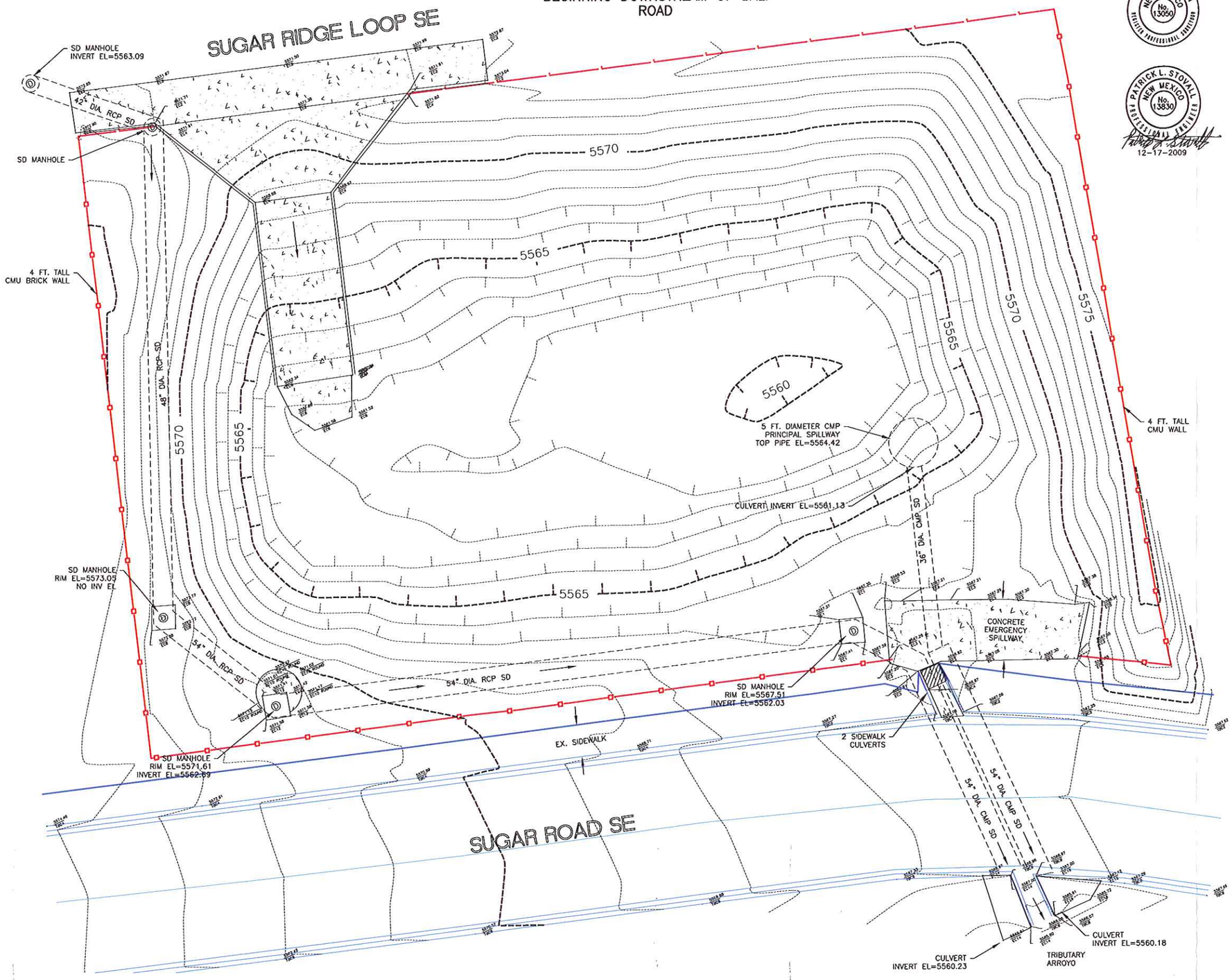
CERTIFICATION

I W. DANIEL BOWN, NMPS NO. 13050, CERTIFY THAT THE TOPOGRAPHIC MAP WAS DEVELOPED BY ME OR UNDER MY DIRECT SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE.

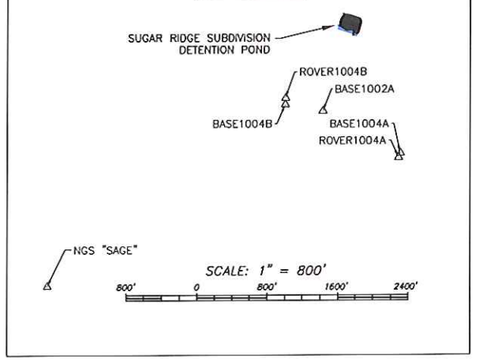
W. DANIEL BOWN P.S. NO. 13050 DATE:
2201 SAN PEDRO DR. NE
BUILDING 4, SUITE 200
ALBUQUERQUE, NM 87110
DATE OF SURVEY: 10/07/2009

W. DANIEL BOWN NEW MEXICO No. 13050 REGISTERED PROFESSIONAL SURVEYOR

PATRICK L. STOVALL NEW MEXICO No. 13830 PROFESSIONAL ENGINEER
12-17-2009



BENCHMARKS



BENCHMARK COORDINATE TABLE

NAME	GROUND N (FT)	GROUND E (FT)	ELEV (FT)
NGS "SAGE"	1546139.353	1499776.710	5676.170
BASE1002A	1548107.370	1502899.131	5559.812
BASE1004B	1548182.352	1502473.570	5571.354
ROVER1004B	1548257.660	1502476.980	5574.178
BASE1004A	1547631.516	1547631.516	5533.270
ROVER1004A	1547583.462	1503758.284	5532.204

COORDINATES SHOWN ARE BASED UPON NEW MEXICO STATE PLANE COORDINATE SYSTEM, GRID ZONE CENTRAL, COMBINED SCALE FACTOR = 1.00034146.

LEGEND

- CURB AND GUTTER
- CENTERLINE OF ROAD
- SIDEWALK
- FENCE
- MAJOR CONTOUR
- MINOR CONTOUR
- EDGE OF CONCRETE
- CHAINLINK FENCE
- BLOCK FENCE
- STORM SEWER MANHOLE
- CONCRETE

SCALE: 1" = 10'
10' 0 10' 20' 30'

DECEMBER-2009
Smith Engineering Company
Solutions for today... Vision for tomorrow
[illegible]

NO.	DESCRIPTION	DATE	BY
6			
5			
4			
3			
2			
1			

REVISIONS (OR CHANGE NOTICES)

LETTER OF MAP REVISION
FOR
SUGAR CHANNEL
RIO RANCHO, NEW MEXICO

CITY OF RIO RANCHO

SUGAR RIDGE SUBDIVISION
DETENTION POND
AS BUILT SURVEY
BY SMITH ENGINEERING COMPANY

FIGURE 4

SHEET NO. ____

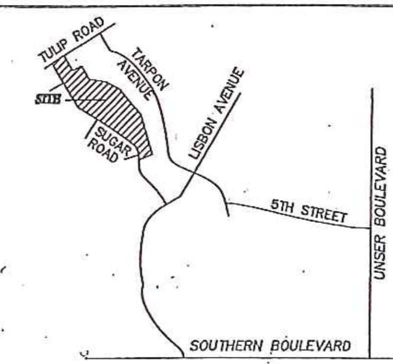
Q:\SEC---PROJECTS\PROJECTS\109119 CORR SUGAR CHAN LOMR REVISION\LOMR APPLICATIONS\MAP POCKET\CD\APP. F2.1 CAD FILES\FIGURE 4\FIGURE 4.DWG

SUGAR RIDGE SUBDIVISION

CITY OF RIO RANCHO, SANDOVAL COUNTY, NEW MEXICO

IMPROVEMENTS FOR

GRADING, DRAINAGE, PAVING, AND UTILITIES



VICINITY MAP

INDEX TO DRAWINGS

APPROVED FOR CONSTRUCTION

DEPARTMENT OF PUBLIC SAFETY	DATE 11-13-02
CITY ENGINEER	DATE 12/9/02
WATER AND WASTEWATER DEPT.	DATE 11-12-02

COVER SHEET AND INDEX TO DRAWINGS

SUGAR RIDGE SUBDIVISION
SANDOVAL COUNTY, NEW MEXICO

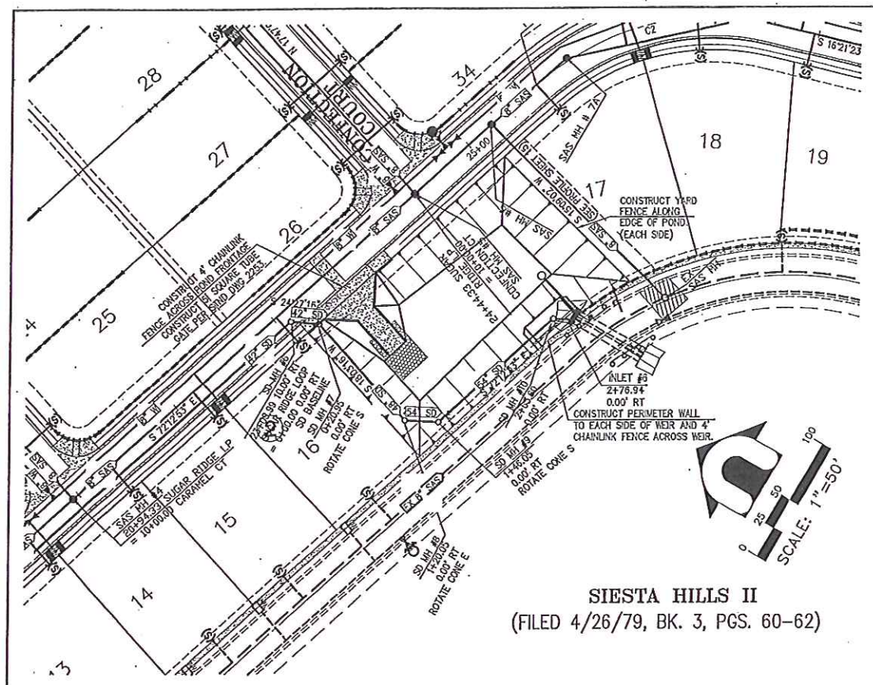
Sugar Ridge
Hanging File Set

BEAM DESIGNS
BUILDING ENGINEERING AND MUNICIPAL DESIGNS
855 POLARIS BLVD., SE
RIO RANCHO, NM 87124
PHONE (505) 896-0301
FAX (505) 994-3952
beamdesigns@qwest.net

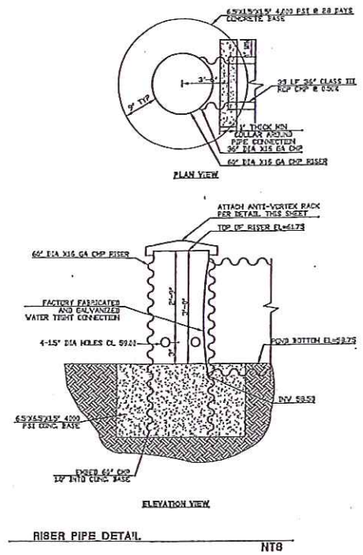
PROJECT NUMBER: AMRP0002

SHEET NO. 1 OF 22

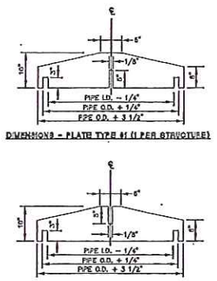
H-File_145



SIESTA HILLS II
(FILED 4/26/79, BK. 3, PGS. 60-62)



RISER PIPE DETAIL
NTS



ANTI-VORTEX RACK
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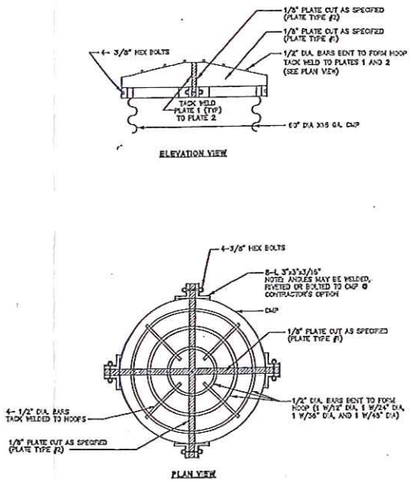
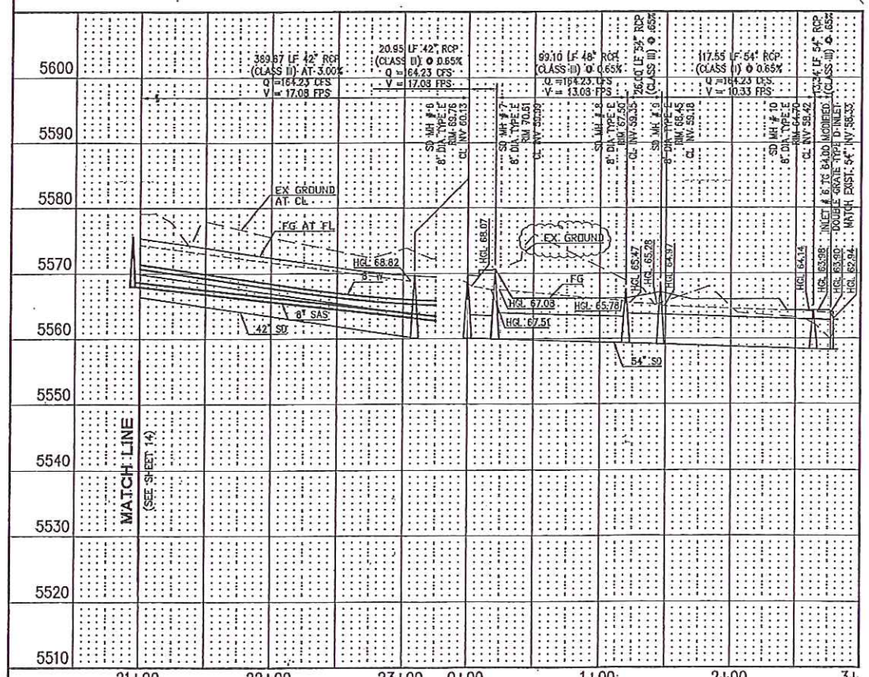
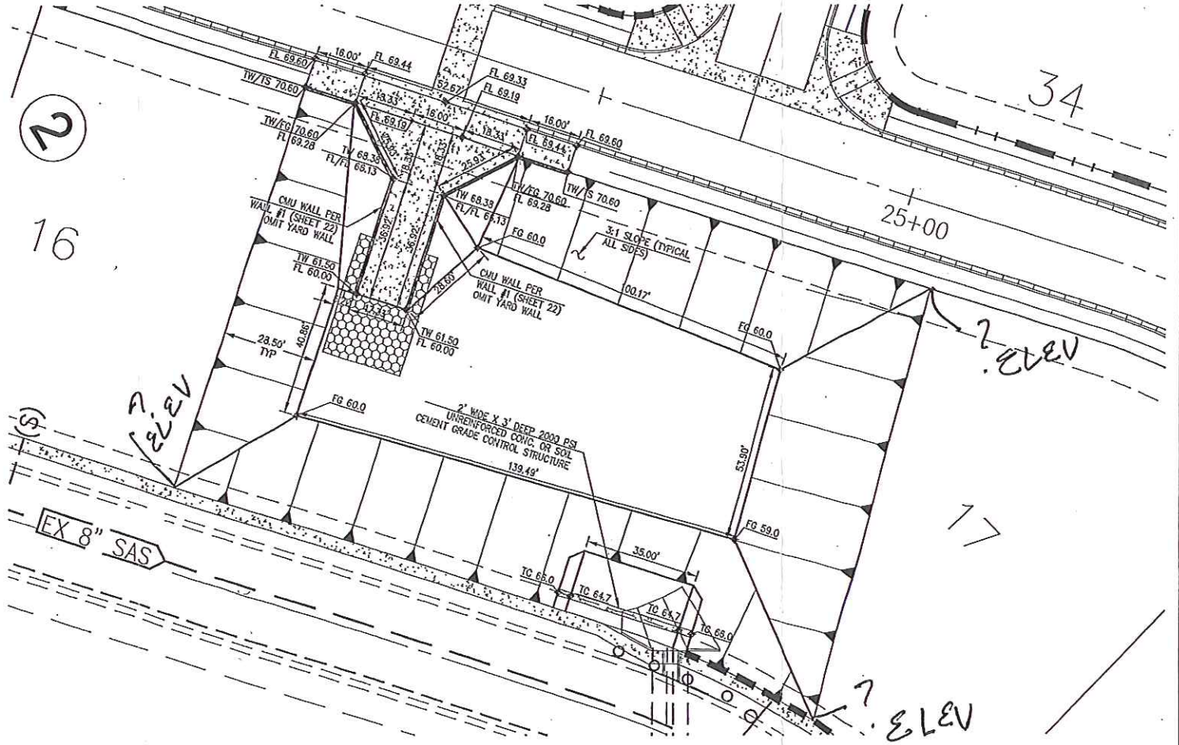


POND OUTLET STRUCTURE
NTS



SUGAR RIDGE LOOP/STORM DRAIN BASELINE



DETENTION BASIN PLAN VIEW
(SEE SHEET 7 FOR CROSS SECTION & SHEET 6 FOR ELEVATIONS)
SCALE: 1" 20'

GRADING AND DRAINAGE DETAILS

SUGAR RIDGE SUBDIVISION
SANDOVAL COUNTY, NEW MEXICO

855 POLARIS BLVD., SE
RIO RANCHO, NM 87124
PHONE (505) 994-0351
FAX (505) 994-0352
bcmmunicipal@qwestmail.net

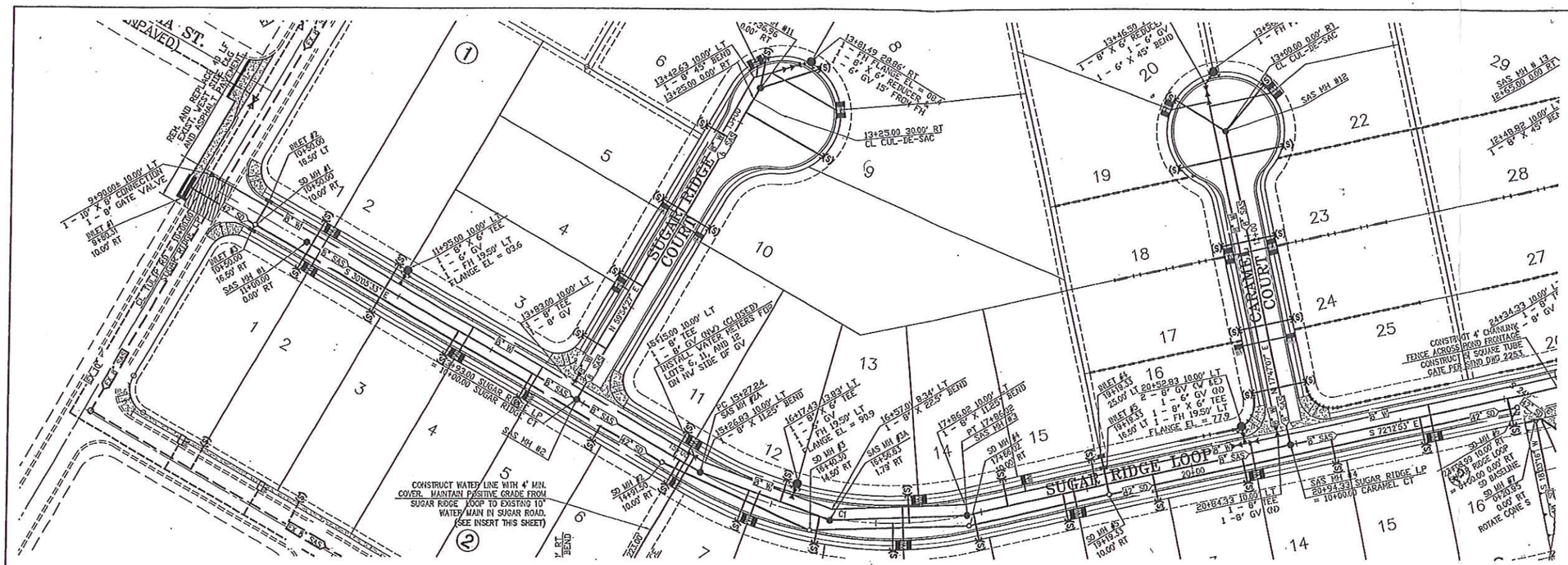
BEAM DESIGNS
BUILDING ENGINEERING & MUNICIPAL DESIGNING

NEW MEXICO REGISTERED PROFESSIONAL ENGINEER

PROJECT NUMBER:
AMRP0002

SHEET NO.
8
OF 22

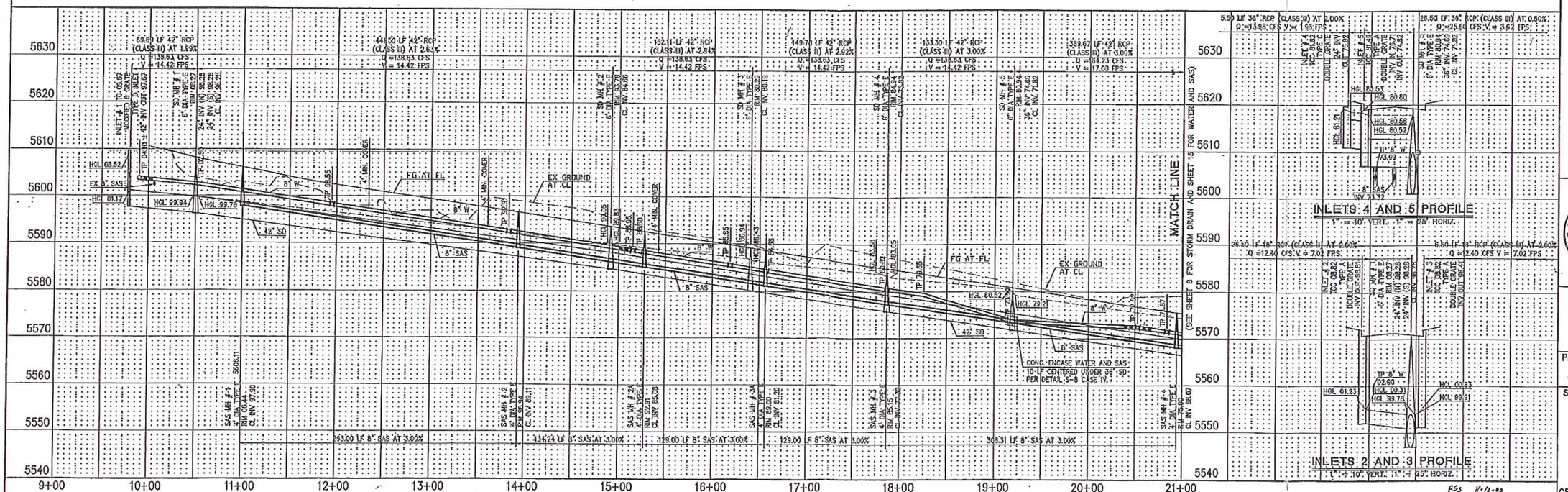
RCS



CENTERLINE CURVE DATA					
CURVE	ARC (FT)	DELTA	RADIUS (FT)	CH. LENGTH (FT)	CH. BRNG
C1	258.78	42°07'20"	352.00	252.99	S 51°09'13" E

SUGAR RIDGE LOOP

WATER LINE CONNECTION TO SUGAR ROAD



SUGAR RIDGE LOOP
UTILITY PLAN AND PROFILE

SUGAR RIDGE SUBDIVISION
SANDOVAL COUNTY, NEW MEXICO

BOHANNAN HUSTON, INC.
BUILDING ENGINEERING AND MUNICIPAL DESIGNS
865 POJOAQUE BLVD., SE
RIO RANCHO, NM 87124
PHONE (505) 896-2301
FAX (505) 994-3022
bohannanhuston@gmail.com

PROJECT NUMBER: AMRP0002

SHEET NO. 14 OF 22

RBS 11-12-02

TABLE WP

ELEVATION - STORAGE-DISCHARGE DATA
WALLEN PARK SUBDIVISION DETENTION POND

(Elevations, principal and emergency spillway measurements are based on the "as-built" plans (included in this LOMR)

Contour Elevation	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	Principal Spillway - Orifice Flow Discharge Curve	Emergency Spillway Discharge	Total Discharge	Comments
	Principal Spillway Orifice Diameter (inches)				6			
	Number of Orifices				1			
(ft)	(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	
	0			0.0000	(a)	(b)		
5655.88	0	0	0.0000	0.0000	0.0	0.0	0.00	Invert elev. Of 6 - in. dia. PVC principal spillway pipe is 5655.88. Emergency Spillway elevation is 5660
5656	16972	1018	0.0234	0.0234	0.3	0.0	0.3	
5657	16972	16972	0.3896	0.4130	1.0	0.0	1.0	
5658	16972	16972	0.3896	0.8026	1.4	0.0	1.4	
5659	16972	16972	0.3896	1.1922	1.6	0.0	1.6	
5660	16972	16972	0.3896	1.5819	1.9	0.0	1.9	
5661	39204	28088	0.6448	2.2267	2.1	36.0	38.1	Lowest top of outer 6 ft. tall CMU wall at SE corner of pond elev. = 5662
5662	39204	39204	0.9000	3.1267	2.3	101.8	104.1	
5663	39204	39204	0.9000	4.0267	2.5	187.1	189.5	
5664	39204	39204	0.9000	4.9267	2.7	288.0	290.7	
5665	39204	39204	0.9000	5.8267	2.8	402.5	405.3	
Total Volume (ft^3) =		253810						
Total Volume (ac-ft) =		5.8267						

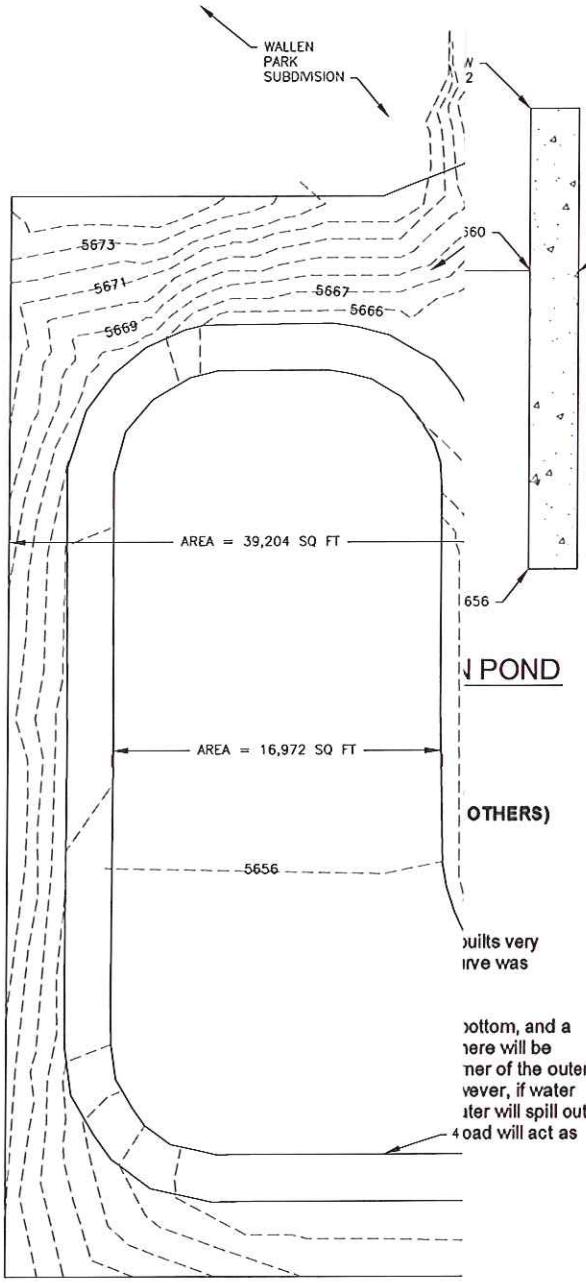
(a) Orfice flows were obtained from the use of Equation 4-10 and Table 4-3 from "Handbook of Hydraulics, Sixth Edition, by Brater and King" 1982."
$Q = Ca\ (2gh)^{1.5}$ C=0.591, g=32.2 ft/sec^2, a=area (sq ft) h=head (ft)
Principal Spillway Elevation is 5561.13

TABLE WP

(b) Emergency Spillway flows were computed friom the use of equation 5-10 and Table 5-3 from "Handbook of Hydraulics" Sixth Edition, by Brater and King" 1982, and the following data

Q = CLH^ 1.5 C = discharge coeffient, L = spillway length perp. To flow, H = head (ft)

C = 3 L = 12.0000 Spillway Elev. 5660



NOTE:
WATER ELEVATION ABOVE 5660
WILL SPILL OUT AT GATE OPENING
BY MAINTENANCE ROAD

2 AREAS

< 5660 TO 5656 = 16,972 SQ FT
5660 TO 5662 = 39,204 SQ FT

N POND

OTHERS)

uilts very
rve was

ottom, and a
here will be
ner of the outer
vever, if water
ter will spill out
oad will act as

PLAN VIEW - WALLEI

12 - 2009

Smith Engineering Company
Solutions for Today... Vision for Tomorrow

SEC PROJECT #109119

NO.	DESCRIPTION	DATE	BY
6			
5			
4			
3			
2			
1			

REVISIONS (OR CHANGE NOTICES)

LETTER OF MAP REVISION
FOR
SUGAR CHANNEL
RIO RANCHO, NEW MEXICO

CITY OF RIO RANCHO

WALLEN PARK SUBDIVISION
DETENTION POND

FIGURE 3

SHEET NO.

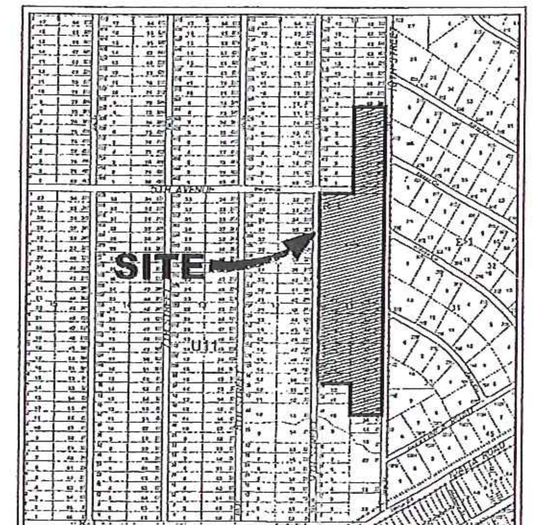
RICK STOVALL, PE

Q:\SEC---PROJECTS\2(OJECTS\109119 CORR SUGAR CHAN LOMR REVISION\SEC TOPO SURVEY SUGAR RIDGE POND\WALLENPARKSUP NPOND.DWG

WALLEN PARK SUBDIVISION

CITY OF RIO RANCHO, SANDOVAL COUNTY, NEW MEXICO IMPROVEMENTS FOR PAVING, DRAINAGE, AND UTILITIES

INDEX TO DRAWINGS



VICINITY MAP
VIC. MAP PAGE NUMBER 62

CERTIFICATE OF SUBSTANTIAL COMPLIANCE OF PLANS

I, Christopher A. Perea of the firm Wilson & Company, a Registered Professional Engineer in the State of New Mexico, NMPE Number 13686, do hereby certify, to the best of my knowledge and belief, that the infrastructure installed as part of this project has been inspected by me or by a qualified person under my direct supervision and has been constructed in accordance with the plans and specifications approved by the City of Rio Rancho Engineer and the original design intent of the approved plans has been met, except as noted by me on the as-built construction drawings. This Certification is based on site inspections by me or personnel under my direction and survey information provided by Timothy Aldrich NMPS Number 7719.

Christopher A. Perea, PE 8·13·8
Date

CHRISTOPHER A. PEREA — NEW MEXICO — 13686 — REGISTERED PROFESSIONAL ENGINEER

SURVEYOR'S CERTIFICATION

"I, Timothy Aldrich, a duly qualified Registered Professional Land Surveyor under the laws of the State of New Mexico, do hereby certify that the 'as-built' information shown on these drawings was obtained from field construction and 'as-built' surveys performed by me or under my supervision, that the 'as-built' information shown on these drawings was ... or under my supervision, and ... the best of my knowledge and that this 'as-built' information is true ... for any of the design concepts, belief." Aldrich Land Surveying is not ... calculations, engineering, or intent of the record drawings.

Timothy Aldrich, P.S. No. 7719 2-26-08
Date

BRIAN L. SPEICHER — NEW MEXICO — 12892 — PROFESSIONAL ENGINEER 5-4-07

... DRAWING 8-13-08

DEVELOPER:	WALLEN DEVELOPMENT	DATE:	5/8/07
CITY OF RIO RANCHO:	DEPARTMENT OF PUBLIC INFRASTRUCTURE	DATE:	5-24-07
CITY OF RIO RANCHO:	DEPARTMENT OF PUBLIC SAFETY TRAFFIC DIVISION	DATE:	05/11/07
CITY OF RIO RANCHO:	DEPARTMENT OF PUBLIC SAFETY FIRE	DATE:	05/11/07
CITY OF RIO RANCHO:	DEPARTMENT OF CULTURAL ENRICHMENT	DATE:	5/23/07
SSCAFCA:	EXECUTIVE DIRECTOR	DATE:	5-22-07

NOTES:

THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, ARE INTENDED FOR USE ON THIS PROJECT AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF COMMUNITY SCIENCES CORPORATION. IN THE EVENT OF UNAUTHORIZED USE, THE USER ASSUMES ALL RESPONSIBILITY AND LIABILITY WHICH RESULTS.

THE ENGINEER HAS UNDERTAKEN NO FIELD VERIFICATION OF THE LOCATION, DEPTH, SIZE, OR TYPE OF EXISTING UNDERGROUND UTILITY LINES, MAKES NO REPRESENTATION PERTAINING THERETO AND ASSUMES NO RESPONSIBILITY OR LIABILITY THEREFORE. THE CONTRACTOR SHALL INFORM ITSELF 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. THE CONTRACTOR SHALL COMPLY WITH STATE STATUTES, MUNICIPAL AND LOCAL ORDINANCES, RULES AND REGULATIONS PERTAINING TO THE LOCATION OF THESE LINES AND FACILITIES IN PLANNING AND CONDUCTING EXCAVATION, WHETHER BY CALLING OR NOTIFYING THE UTILITIES, COMPLYING WITH NEW MEXICO ONE CALL PROCEDURES, OR OTHERWISE.

CALL BEFORE YOU DIG!
STATEWIDE
1-800-321-ALERT
NM ONE CALL
260-1990

Wallen Builders
204 B FRONTAGE ROAD
RIO RANCHO, NM 87124
OFFICE: 505-892-2538
FAX: 505-891-8383

REVISIONS	DATE	DESCRIPTION	BY
1	2/06	CORR/SSCAFCA COMMENTS	RLE
2	7/06	CORR/SSCAFCA COMMENTS	RLE
3	9/06	CORR/SSCAFCA COMMENTS	RLE
4	1/07	CORR COMMENTS	RLE

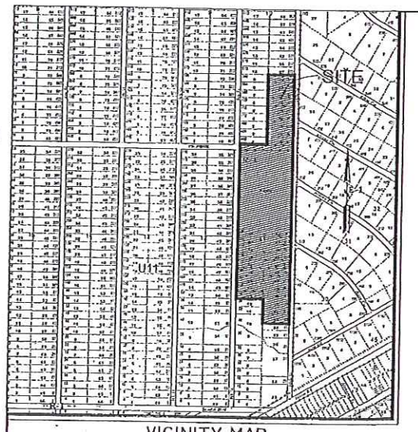
WALLEN PARK SUBDIVISION
COVER SHEET AND INDEX TO DRAWINGS

DATE: May 7, 2007
SCALE: AS SHOWN
DESIGNED: REH
DRAWN: MVH/RLE
JOB NO.: N701-02

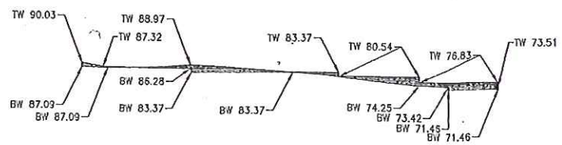
community sciences corporation
LAND PLANNING ENGINEERING SURVEYING

SHEET 1 / 29

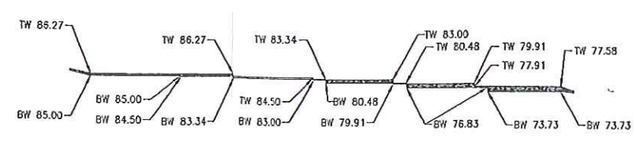
COMMUNITY SCIENCES CORPORATION - CORRALES, NEW MEXICO - (505) 897-0000



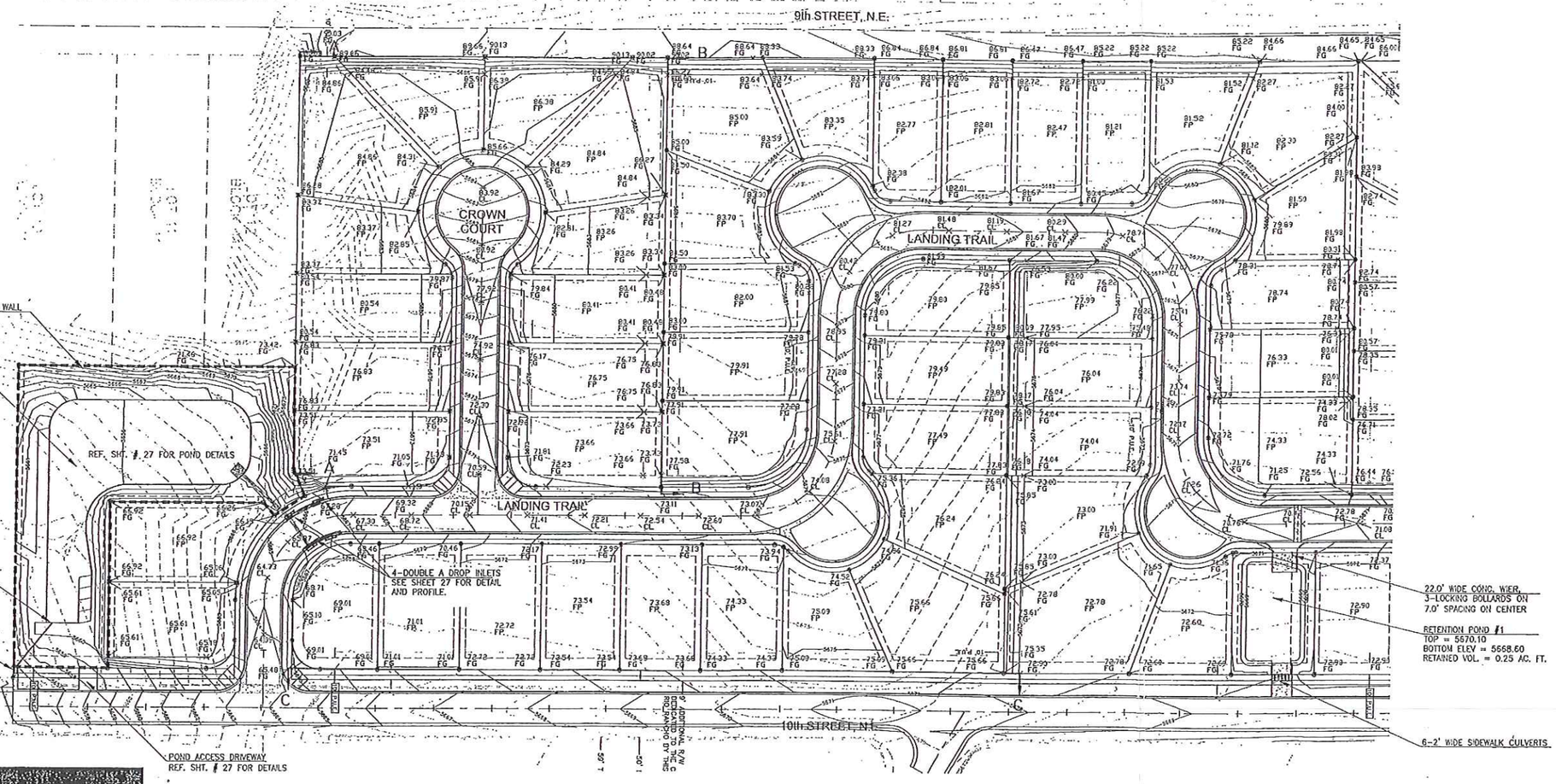
VICINITY MAP
ZONE ATLAS GRID #62
NOT TO SCALE

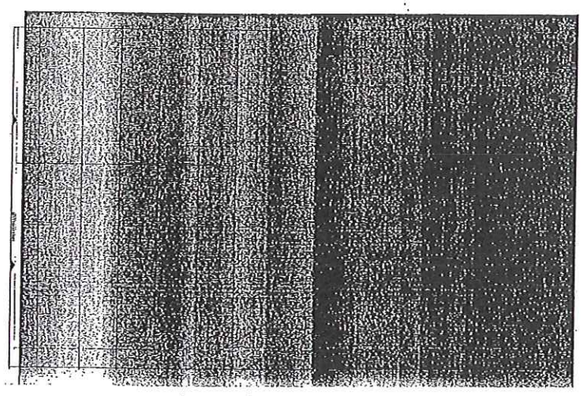


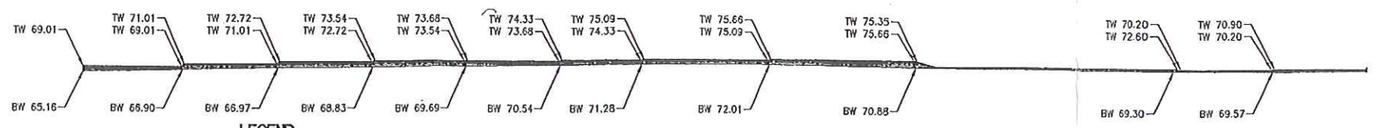
RETAINING WALL ELEVATION A-A
N.T.S.



RETAINING WALL ELEVATION B-B
N.T.S.







RETAINING WALL ELEVATION C-C
N.T.S.

LEGEND

- ×5295.99 PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION (GRND & TC)
- PROPOSED CONCRETE VALLEY GUTTER
- PROPOSED CURB & GUTTER
- EXISTING CONTOUR W/ INDEX ELEVATION
- PROPOSED MANHOLE
- EXISTING STORM DRAIN
- SD PROPOSED STORM DRAIN
- PROPOSED STORM SEWER CATCH BASIN
- BOUNDARY LINE

GRAPHIC SCALE
50 0 25 50 100
(IN FEET)
1 inch = 50 ft.

BRIAN L. SPEICHER NEW MEXICO 15392 REGISTERED PROFESSIONAL ENGINEER
DAT 8-13-08

NO.	DATE	DESCRIPTION	BY
1	12/06	CORR./SCI./CPA COMMENTS	RLE
2	17/06	CORR./SCI./CPA COMMENTS	RLE
3	9/06	CORR./SCI./CPA COMMENTS	RLE
4	11/07	CORR COMMENTS	RLE

WALLEN PARK SUBDIVISION

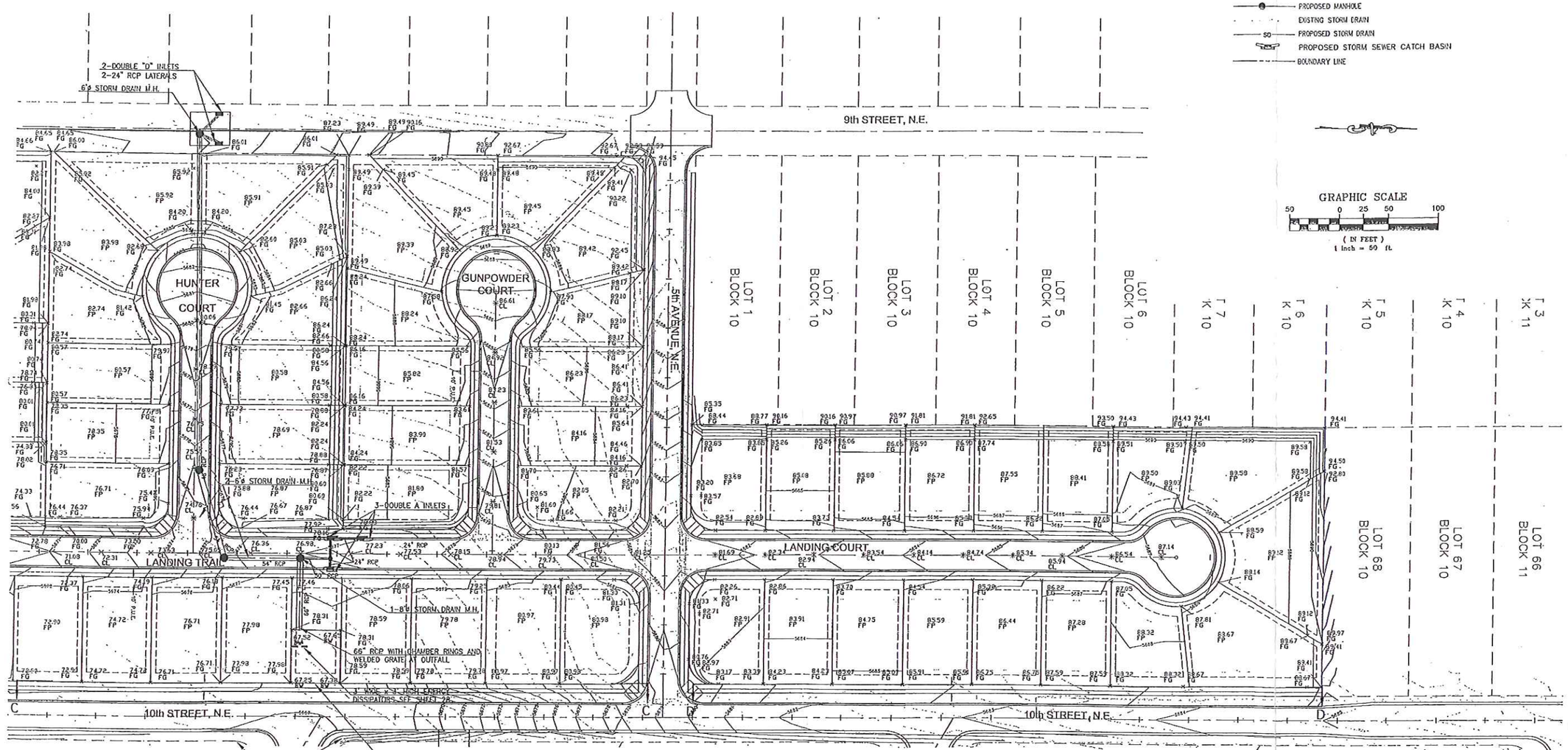
GRADING AND DRAINAGE

DATE: May 4, 2007
SCALE: AS SHOWN
DESIGNER: REH
DRAWN: MVH/RLE
JOB NO.: N701-02

community sciences corporation
LAND PLANNING ENGINEERING SURVEYING

SHEET 6 / 29

FILE: F:\N701 - WALLEN\02 - Wallen Park\CIVIL\030 G & D\Sheets\701-02 G&D.dwg



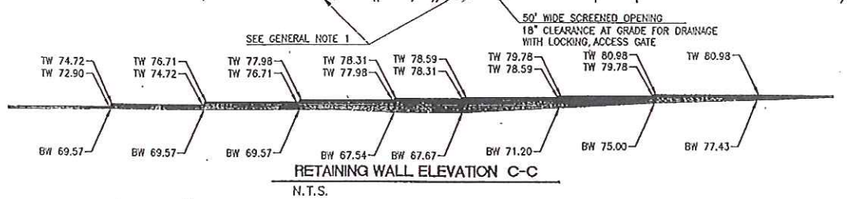
LEGEND

- ×5295.95 PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION (GRND & TC)
- PROPOSED CONCRETE VALLEY GUTTER
- PROPOSED CURB & GUTTER
- EXISTING CONTOUR W/ INDEX ELEVATION
- PROPOSED MANHOLE
- EXISTING STORM DRAIN
- SD PROPOSED STORM DRAIN
- PROPOSED STORM SEWER CATCH BASIN
- BOUNDARY LINE

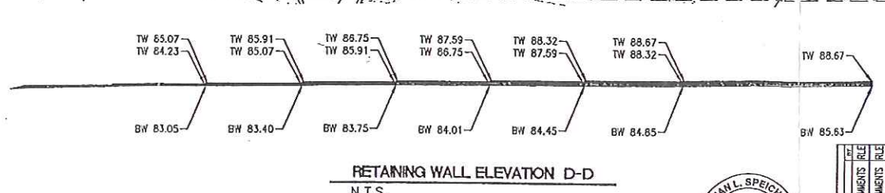
GRAPHIC SCALE

50 0 25 50 100

(IN FEET)
1 inch = 50 ft.



RETAINING WALL ELEVATION C-C
N.T.S.



RETAINING WALL ELEVATION D-D
N.T.S.

RELEASED FOR PERMIT
DATE 8-13-08

GENERAL NOTES

. The Contractor and Developer shall coordinate with the property owners to provide a constructed driveway :o connect to the finished roadway.

BRIAN L. SPEICHER NEW MEXICO 5.4.07 LICENSED PROFESSIONAL ENGINEER

PWW 8/24/07

NO.	DATE	DESCRIPTION	BY
1	12/06	CORR./SDCAFCA COMMENTS	RLE
2	7/06	CORR./SDCAFCA COMMENTS	RLE
3	9/06	CORR./SDCAFCA COMMENTS	RLE
4	1/07	CORR. COMMENTS	RLE

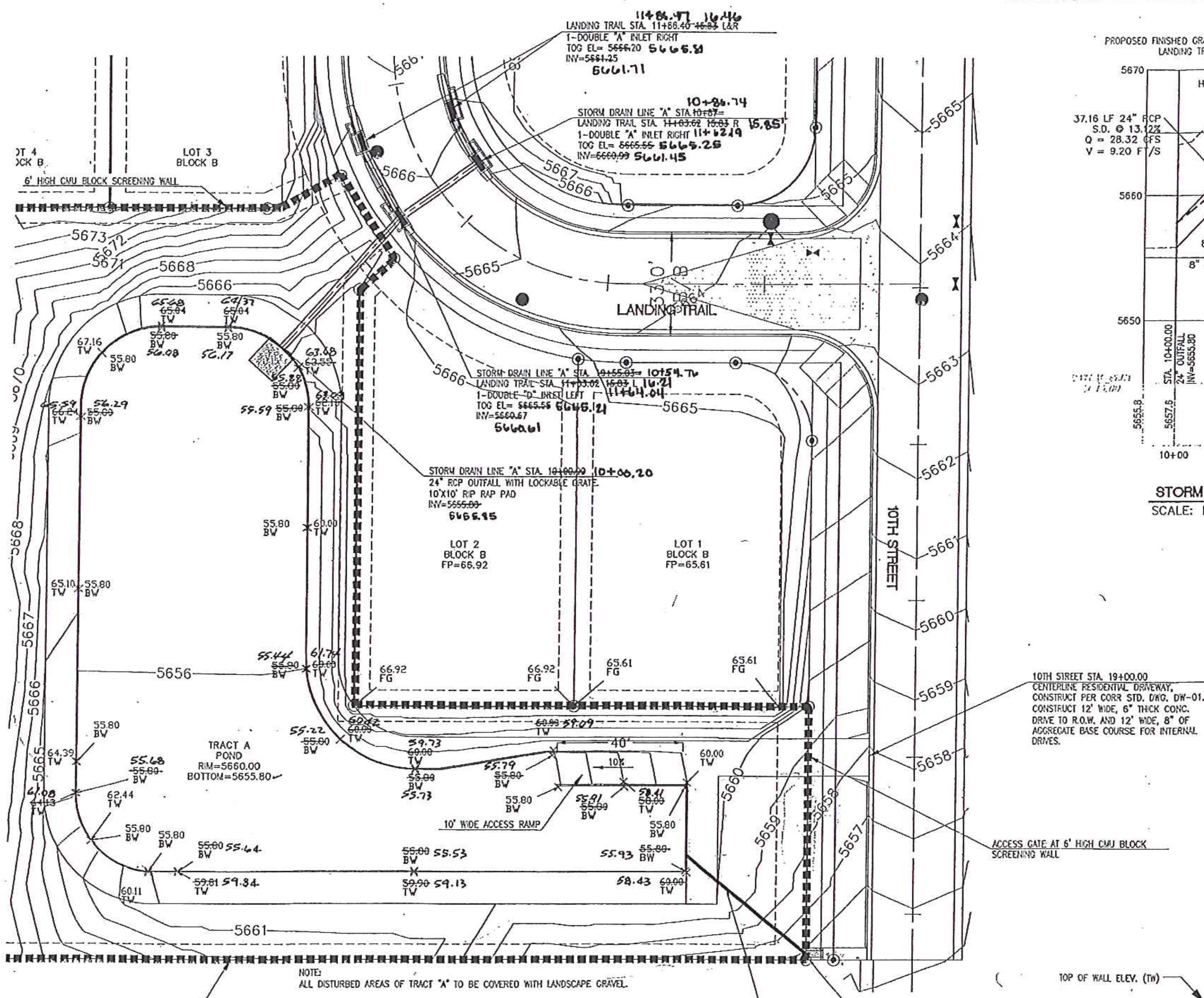
WALLEN PARK SUBDIVISION

GRADING AND DRAINAGE

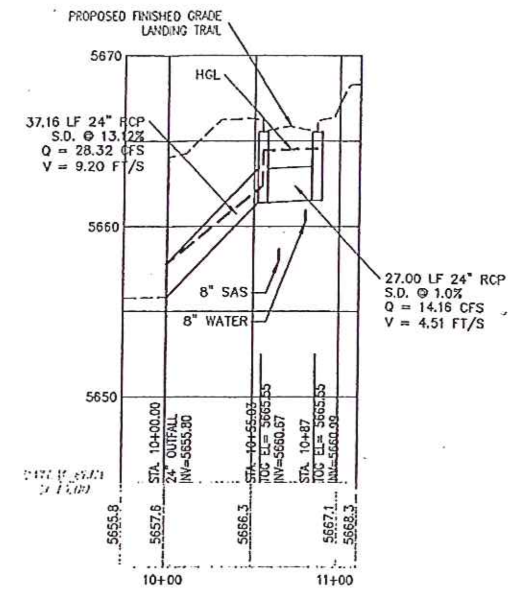
DATE: May 3, 2007
SCALE: AS SHOWN
DESIGNED: REH
DRAWN: MVH/RLE
JOB NO.: N701-02

community sciences corporation
LAND PLANNING ENGINEERING SURVEYING

SHEET 7 / 29



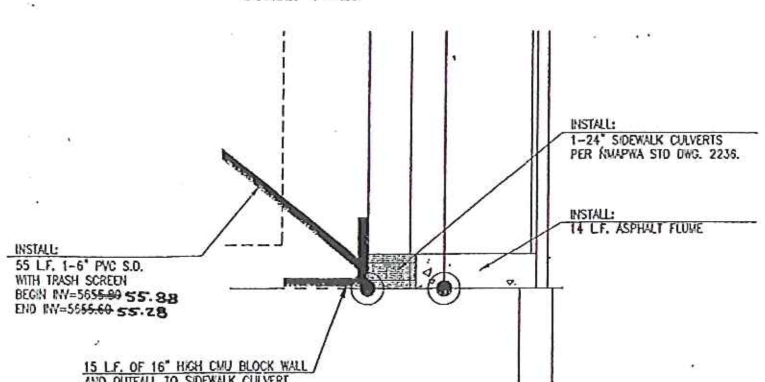
TRACT 'A' DETAILED POND GRADING
SCALE: 1"=20'



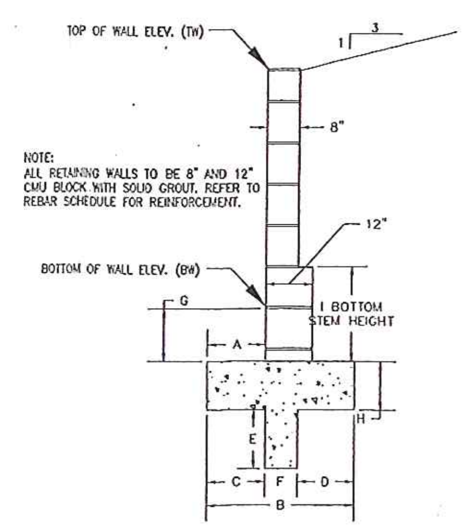
STORM DRAIN LINE 'A'
SCALE: H:1"=50', V:1"=5'

	REBAR SCHEDULE				
	8" WALL REBAR	12" CONC. REBAR	14" WALL REBAR	12" WALL REBAR	FOOTING REBAR
1'-8"	#4 @ 48" O.C.	N/A	N/A	N/A	#4 @ 18" O.C.
2'-4"	#4 @ 48" O.C.	N/A	N/A	N/A	#4 @ 18" O.C.
3'-0"	#4 @ 48" O.C.	N/A	N/A	N/A	#4 @ 18" O.C.
3'-8"	#4 @ 32" O.C.	N/A	N/A	N/A	#4 @ 18" O.C.
4'-4"	#4 @ 16" O.C.	N/A	N/A	N/A	#4 @ 18" O.C.
5'-0"	#5 @ 8" O.C.	N/A	N/A	N/A	#4 @ 18" O.C.
5'-8"	#4 @ 8" VERT. #4 @ 24" HOR.	N/A	N/A	#4 @ 8" VERT. #4 @ 24" HOR.	#4 @ 18" O.C.
6'-4"	#4 @ 8" VERT. #4 @ 24" HOR.	N/A	N/A	#4 @ 8" VERT. #4 @ 24" HOR.	#4 @ 18" O.C.
7'-0"	#4 @ 8" VERT. #4 @ 24" HOR.	N/A	N/A	#5 @ 8" VERT. #4 @ 24" HOR.	#4 @ 9" O.C.
7'-8"	#4 @ 8" VERT. #4 @ 16" HOR.	N/A	#4 @ 8" VERT. #4 @ 16" HOR.	N/A	#4 @ 9" O.C.
8'-4"	#4 @ 8" VERT. #4 @ 16" HOR.	N/A	#6 @ 8" VERT. #4 @ 16" HOR.	N/A	#4 @ 9" O.C.
9'-0"	#4 @ 8" VERT. #4 @ 16" HOR.	#4 @ 8" VERT. #4 @ 16" HOR.	N/A	#4 @ 8" VERT. #4 @ 16" HOR.	#4 @ 9" O.C.
9'-8"	#5 @ 8" VERT. #5 @ 16" HOR.	#5 @ 8" VERT. #4 @ 16" HOR.	N/A	#5 @ 8" VERT. #4 @ 16" HOR.	#4 @ 9" O.C.
10'-4"	#5 @ 8" VERT. #5 @ 16" HOR.	#5 @ 8" VERT. #5 @ 16" HOR.	N/A	#5 @ 8" VERT. #4 @ 16" HOR.	#5 @ 9" O.C.
11'-0"	#5 @ 8" VERT. #5 @ 16" HOR.	#5 @ 8" VERT. #5 @ 16" HOR.	N/A	#5 @ 8" VERT. #8 @ 16" HOR.	#5 @ 9" O.C.

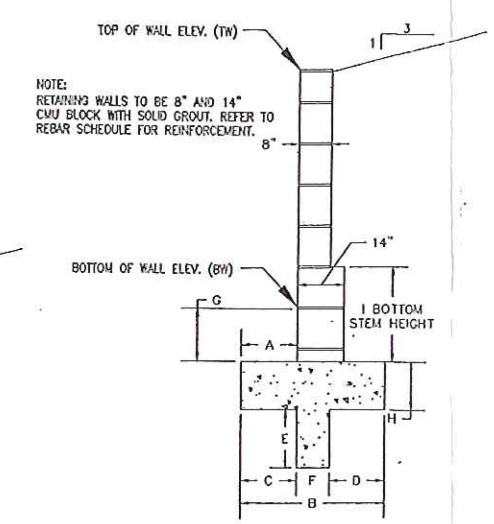
	WALL DIMENSIONS TW-BW ≤ (HEIGHT LISTED BELOW)															
	1'-8"	2'-4"	3'-0"	3'-8"	4'-4"	5'-0"	5'-8"	6'-4"	7'-0"	7'-0"	7'-8"	8'-4"	9'-0"	9'-8"	10'-4"	11'-0"
A	5"	1'-0"	1'-0"	1'-0"	1'-6"	2'-0"	2'-3"	1'-10½"	2'-1½"	2'-1½"	2'-0"	2'-6"	2'-9"	3'-3"	4'-3"	4'-3"
B	1'-6"	1'-8"	2'-2"	2'-6"	3'-0"	3'-6"	3'-6"	4'-9"	5'-3"	5'-3"	5'-0"	5'-3"	5'-9"	6'-3"	6'-6"	7'-3"
C	N/A	N/A	N/A	N/A	N/A	2'-0"	2'-3"	1'-10½"	1'-10½"	1'-10½"	2'-1½"	2'-1½"	2'-10½"	2'-10½"	4'-1½"	4'-1½"
D	N/A	N/A	N/A	N/A	N/A	1'-0"	3"	1'-10½"	2'-4½"	2'-4½"	1'-10½"	2'-1½"	1'-10½"	2'-4½"	1'-4½"	2'-1½"
E	N/A	N/A	N/A	N/A	N/A	4"	1'-0"	8"	1'-0"	1'-0"	1'-3"	1'-6"	1'-9"	2'-0"	2'-2"	2'-4"
F	N/A	N/A	N/A	N/A	N/A	6"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"
G	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"
H	1'-0"	1'-0"	1'-0"	1'-0"	1'-3"	1'-3"	1'-3"	1'-3"	1'-3"	1'-3"	1'-3"	1'-3"	1'-3"	1'-3"	1'-4"	1'-4"
I	N/A	N/A	N/A	N/A	N/A	N/A	1'-4"	2'-0"	2'-8"	2'-8"	3'-4"	4'-0"	2'-8"	2'-8"	4'-0"	4'-0"
J	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2'-0"	2'-0"	2'-0"	2'-0"



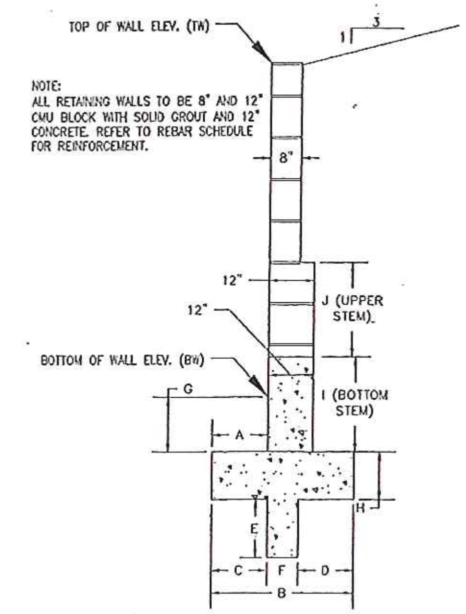
TRACT 'A' POND OUTFALL DETAIL
SCALE: 1"=10'



RETAINING WALL HEIGHT 1'-8' TO 7'-0'
N.T.S.



RETAINING WALL HEIGHT 7'-8' TO 8'-4'
N.T.S.



RETAINING WALL HEIGHT 9'-0' TO 11'-0'
N.T.S.

8-13-08

BRIAN L. SPEICHER NEW MEXICO LICENSED PROFESSIONAL ENGINEER 5-4-07

1	2/06	COBB/SSCAFCA COMMENTS RLE
2	7/06	COBB/SSCAFCA COMMENTS RLE
3	9/06	COBB/SSCAFCA COMMENTS RLE
4	1/07	COBB COMMENTS RLE

WALLEN PARK SUBDIVISION

STORM SEWER DETAILS

DATE May 4, 2007
SCALE AS SHOWN
DESIGNER REH
DRAWN MVH/RLE
JOB NO. N701-02

community sciences corporation
LAND PLANNING ENGINEERING SURVEYING

SHEET 27 of 29

1.48

(SEE PLANS FOR ITEMS WITHIN THIS PROJECT)

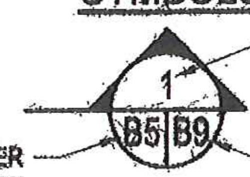
LEGEND

- SURVEY MONUMENT
- FOUND MONUMENT AS NOTED
- EXISTING GAS LINE MARKER
- EXISTING WATER VALVE
- EXISTING JUNIPER BUSH/TREE
- EXISTING HYDRANT
- EXISTING CATV PEDESTAL
- EXISTING TELEPHONE PEDESTAL
- 10"G — EXISTING GAS
- 10"W — LINE EXISTING WATER LINE
- EXISTING ELECTRICAL TRANSFORMER
- EXISTING SURVEY MONUMENT
- EXSITING TELEPHONE PEDESTAL
- EXSITING WATER METER
- EXISTING MAIL BOX
- EXISTING EXISTING TV CABLE PEDESTAL
- 5640 — DESIGN MAJOR CONTOUR
- DESIGN MINOR CONTOUR
- 5640 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- RIGHT OF WAY LINE
- EASEMENT LINE
- LOT LINE
- FENCE LINE
- GRADE/SLOPE
- NATURAL GROUND
- COMPACTED SUBGRADE
- RIPRAP / COBBLES / STONE
- CONCRETE
- SELECT SOIL MATERIAL
- SOIL CEMENT
- GRADED DIRT PATH W/ DRAINAGE SWALE
- GRADED DIRT PATH
- SANDSTONE FINISH
- AGGREGATE BASE COURSE PATH
- EXISTING PAVEMENT
- REMOVE AND REPLACE

ABBREVIATIONS

BOW	BOTTOM OF WALL
℄ or CL	CENTERLINE
COA	CITY OF ALBUQUERQUE
CORR	CITY OF RIO RANCHO
CONST	CONSTRUCTION
CMP	CORRUGATED METAL PIPE
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
E	EASTING
EL/ELEV	ELEVATION
EX	EXISTING
FL	FLOW LINE
HORIZ	HORIZONTAL
HP	HIGH POINT
INV	INVERT
L	LENGTH
LP	LOW POINT
LT	LEFT
NAVD	NORTH AMERICA VERTICAL DATUM
N	NORTHING
OC	ON CENTER
ℙ	PROPERTY LINE
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT OF WAY
RT	RIGHT
SD	STORM DRAIN
ST	STREET
STA	STATION
SW	SIDEWALK
SWPPP	STORM WATER POLLUTION PREVENTION PLAN
SWP3	STORM WATER POLLUTION PREVENTION PLAN
T	TANGENT
TBM	TEMPORARY BENCH MARK
TOC	TOP OF CURB
TOW	TOP OF WALL
TYP	TYPICAL
SSCAFCA	SOUTHERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY
VERT	VERTICAL
VC	VERTICAL CURVE

SYMBOLS



SUNSET POND PROPERTIES:

CREST WIDTH : RETAINING WALL - 1' - 4"
SLOPE UPSTREAM FACE: 17% (6:1)
SLOPE DOWNSTREAM FACE : VERTICAL @ 3' RETAINING WALL - 3% TO 5% DOWNSTREAM
ELEVATION AT EMERGENCY SPILLWAY CREST: 5620
ELEVATION OF PRINCIPAL OUTLET (FINISH GRADE OF POND) : 5608
WIDTH OF EMERGENCY SPILLWAY CREST: 380'
DISCHARGE CAPACITY OF EMERGENCY SPILLWAY : 2330 CFS
OUTLET CONDUIT SIZE AND TYPE: 24" DIP
OUTLET CONDUIT CAPACITY (ORIFICE CONTROL): 39 CFS
EVACUATION TIME: 11 HOURS
STORAGE CAPACITY @ EMERGENCY SPILLWAY: ~~17.7 ACRE FEET~~ 15.8 AF (1)
STORAGE CAPACITY @ ELEVATION 5617 (DOWNSTREAM NATURAL GROUND): ~~10.9 AF~~ 8.93 AF (1)
STORAGE CAPACITY @ BETWEEN NATURAL GROUND AND SPILLWAY: ~~7.4 AF~~ 6.9AF (1)
100 YEAR DRAINAGE AREA: 190 ACRES
100 YEAR 24 HOUR DESIGN RAINFALL: 2.8"
100 YEAR PEAK INFLOW TO POND: ~~478 CFS~~ 454 CFS (1)
100YEAR DETAINED VOLUME: ~~11.8 AC. FT.~~ 10.9 AF (1) (2)
100 YEAR WATER SURFACE ELEVATION:5618 (3)
100 YEAR PEAK OUTFLOW: 36 CFS (4)
100 YEAR FREEBOARD: 2'

NOTE: THE SUNSET POND IS NOT A STATE ENGINEER PERMITTED FACILITY.

SUNSET POND RATING DATA

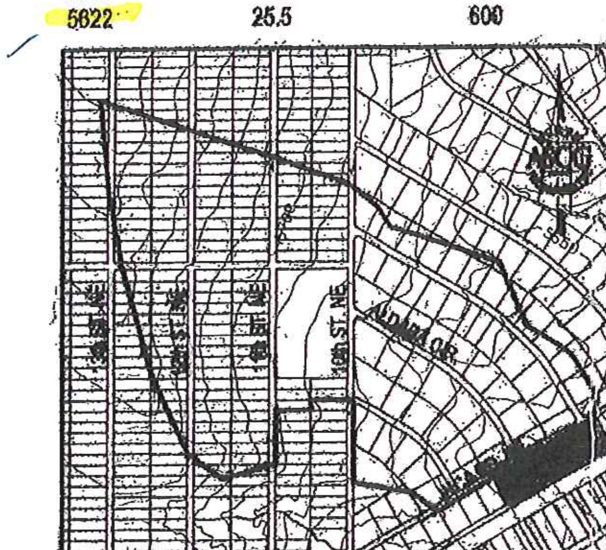
ELEVATION	STORAGE (AF)	OUTFLOW (cfs)
5606 (Pond Invert)	0	0
5608	~~0.14~~ 0.01	15
5610	~~1.13~~ 0.37	20.5
5612	~~2.00~~ 1.72 (1)	25
5614	~~4.79~~ 4.11	29
5616	~~8.32~~ 7.16	33
5618	~~12.7~~ 11.01	36
5620 (E Emergency Spillway)	~~17.7~~ 15.82	39
5621	20.5	200
5622 (Top of Pond)	25.5	600

(1) **RECORD DRAWING**
Date: February, 2009
These drawings have been revised to reflect the best information available. Do not use without field verification.

(2) Note: Design 100yr detained volume was 11.08 ac. ft.

(3) Note: Design 100yr WSEL was 5617.3.

(4) Note: Design 100yr Peak Outflow was 35 cfs.



SUNSET POND DRAINAGE AREA MAP

SCALE: NONE

THIS SHEET HAS BEEN REDRAWN FOR RECORD PURPOSES. SEE ORIGINAL DRAWING FOR ENGINEER'S SIGNATURE AND SEAL.

THIS SHEET HAS BEEN REDRAWN FOR RECORD PURPOSES. SEE ORIGINAL DRAWING FOR ENGINEER'S SIGNATURE AND SEAL.

ASCG INCORPORATED

SOUTHERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY

SUNSET POND AND STORM DRAIN
LEGEND, ABBREVIATIONS AND DRAINAGE DATA

REVISIONS
NUMBER | DATE

JOB NO: 277207
DATE: JAN., 2008
DRAWN BY: RRB
CHECKED BY: CD
DRAWING NO: G2

DEVELOPED

CONDITIONS

AHYMO

INPUT

DATA

WEXFORD DETENTION POND

FROM

ASCG

BLACK

ARROYO

WATERSHED

MANAGEMENT

PLAN

ASCG

Final

August ,

2002

1 OF 3

DEVELOPED CONDITIONS AHYMO INPUT DATA FILE PRINTOUT

FUTURE COND. AHYMO

WEXFORD POND

2 OF 3


```
START                0.0 HRS   PUNCH CODE=0   PRINT LINES=-1
*
*       -------HYDROLOGY MODEL-----------
*S * * * FUTURE CONDITIONS MODEL - ALTERNATE B * * * * * * * * * * * * * * * * * *
*S * * * 3 DAMS ON THE WEST BRANCH                                * * * * * * * * * *
*S * * * UNSER GATEWAY DAM, AND WATER QUALITY DIVERSIONS           * * * * * * * * * *
*S * * * ROUTING WITH MCUNGE METHOD AFTER WATER QUALITY DIVERSIONS ARE  * * * * * *
*S * * * UTILIZED TO ADJUST FOR THE UNSTABLE HYDROGRAPHS WITH A STEEP SLOPE * * * *
*S * * * AFTER MODIFICATION TO REDIRECT THE FIRST FLUSH OF 0.25" RUNOFF FOR SWQ *
* LH ********************************************************************** * * *
* LH FILE MODIFIED BY LH/ASCG TO REFLECT FULL DEVELOPMENT WITHIN THE BLACK      *
* LH ARROYO WATERSHED USING THE SSCAFCA LAND TREATMENTS FOR LOTS AND            *
* LH ZONING DEVELOPED FOR THE MONTOYAS ARROYO STUDY.                           *
* LH THIS MODEL IS INTENDED TO PROVIDE A BIG PICTURE STUDY FOR THE BLACK       *
* LH ARROYO AND SHOULD NOT BE USED TO DEVELOP DETAILED SOLUTIONS.              *
* LH THE FEMA RESTUDY MODEL HAS BEEN ADDED TO IVORY AND LISBON CROSSING DESIGN *
* LH MODEL AND CHANGED TO DEVELOPED CONDITIONS.                                *
* LH                                                                           *
* LH THE FOLLOWING THINGS WERE CHANGED IN THE MODEL:                           *
* LH                                                                           *
* LH MODIFIED PRINT LINE COMMAND AND ROUTES CHANGED TO MANNINGS ROUTE FOR      *
* LH ALL WELL DEFINED CHANNELS (ALSO CHANGED IN RESTUDY MODEL PORTION)         *
* LH MODIFIED SLOPE FOR ROUTING THRU BASIN 103 FROM 0.0179 TO 0.0214 FT/FT.    *
* LH SEE RUN CHRONOLOGY FOR OTHER CHANGES IN THE MODEL.                        *
* LH********************************************************************** * * *
*  ORIGINAL AHYMO MODEL DEVELOPED FOR:
*  FEMA RE-STUDY
*  SANDOVAL COUNTY, NEW MEXICO
*
*  RESTUDY AREA:  CITY OF RIO RANCHO
*  FLOODING SOURCE: BLACK ARROYO
*
*************************************************************************
* LH   ALL SEDIMENT BULKING WAS MODIFIED TO USE THE SEDIMENT BULK COMMAND AND
*  NOT THE DIVIDE HYD COMMANDS IN THE PREVIOUS FEMA RESTUDY MODELS.
*  SEE RUNCHRONOLOGY FOR AN EXPLANATION OF THE BULKING FACTORS.
*
*
RAINFALL             TYPE=2  RAIN QUARTER=0.0  RAIN ONE=1.799
                     RAIN SIX=2.205      RAIN DAY=2.703      DT=.05
*
*S*************************************************************************
*S  BEGINNING OF THE BLACK ARROYO WEST BRANCH
*S*************************************************************************
*S  LISBON CHANNEL NORTH OF TULIP
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
* BULK FOR SEDIMENT
SEDIMENT BULK          CODE=1  BULK FACTOR=1.18
*
COMPUTE LT TP          LCODE=1   NK=4   ISLOPE=0
                       L=400   S=0.025         K=1
                       L=1300  S=0.014         K=2
                       L=1100  S=0.029         K=3
                       L=2200  S=0.023         K=4
                       KN=0.0  CD=0.0  Qp=420 cfs
*
COMPUTE NM HYD         ID=1    HYD=101      DA=0.3397   SQ MI
                       PER A=17    B=16    C=17    D=50
                       TP=0.0 HRS        RAIN=-1
*
PRINT HYD              ID=1    CODE=1
*
*C   ROUTE HYD.   101   TO  101.90
*
COMPUTE RATING CURVE CID=1   VS NO=1   NSEGS=3
                     ELMIN=0  ELMAX=6.3  CH SLP=.015 ft/ft  FP SLP=.015ft/ft
                     N=.045 DIST=15 N=-0.013 DIST=49  N=.045 DIST=64
                        DIST    ELEV
                        0       6.3
                        15      6.0
                        27      0.0
                        37      0.0
                        49      6.0
                        64      6.3
```

CROSS-SECTION

```
COMPUTE RATING CURVE CID=1  VALLEY SECTION=1  NUMBER OF SEGMENTS=3
                    MINIMUM ELEV=0.0 FT  MAXIMUM ELEV=1.5 FT
                    CHANNEL SLOPE=0.0043  FLOOD PLAIN SLOPE=0.0043
                    N=0.030  DIST=16.7  N=-0.017  DIST=48.1 N=0.030 DIST=64
                    DIST  ELEV    DIST   ELE    DIST   ELEV   DIST   ELEV
                    0.0   1.5     8.0    .9     16.7    .7    16.9   0.0
                    18.9   0.1    32.0   0.4     45.1   0.1    47.9   0.0
                    48.1   0.7    56.0   0.9     64.0   1.5
COMPUTE TRAVEL TIME ID=3  REACH NO=1  VALLEY SECTIONS=1
                    LENGTH=875 FT  SLOPE=0.0043
ROUTE               ID=3 HYD NO=320.90 INFLOW ID=10 DT=0.0
PRINT HYD           ID=3  CODE=1
** ADD THE ROUTED FLOW FROM BASIN 320 TO THE FLOW AT THE INTERSECTION OF
** WEXFORD AND ARCTURUS
ADD HYD             ID=4  HYD=320.10  ID I=4   ID II=3
PRINT HYD           ID=4  CODE=1
** COMPUTE HYDROGRAPH FOR BASIN 400 THE DETENTION POND SITE
COMPUTE NM HYD      ID=2  HYD=400  DA==0.0041 SM
                    %A=0.0  %B=50.0  %C=50.0  %D=0.0  TP=0.13333
                    MASS RAINFALL=-1
PRINT HYD           ID=2  CODE=1
** ADD THE FLOW IN WEXFORD AT THE INTERSECTION WITH ARCTURUS TO THE DETENTION
** POND TO BE LOCATED ON THE SOUTH SIDE OF WEXFORD
ADD HYD             ID=4  HYD=400.1  ID I=4   ID II=2
PRINT HYD           ID=4  CODE=1
** ROUTE THE FLOW THROUGH THE DETENTION  POND
*S ********  AP 400.30 ***********INFLOW INTO WEXFORD POND**********************
*S*************************************************************************
ROUTE RESERVOIR     ID=5 HYD NO=400.90  INFLOW ID=4  CODE=24
                     OUTFLOW(cfs)    STORAGE(ac ft)    ELEV(ft)
                            0            0.0            31.5
                          10.00          0.01           32
                          60.0           0.19           33
                          78.0           0.60           34
                          92.0           1.23           35
                         102.0           2.35           36
                         120.0           5.52           38
  FLOW OVER SPILLWAY NIC  135.0           9.19           40
                         142.0          11.25           41
                         145.0          12.50           41.5
*S ******************  AP 400.OUT  (BEFORE DIVIDE) ****************************
PRINT HYD           ID=5  CODE=1
*
*S *************DIVIDE HYD TO UNBULK TO 3% **********************
DIVIDE HYD          ID=5   %=-97        ID I=1  HYD=UNBULK
                                        ID II=53 HYD=SEDIMENT
*S DIVIDE INTO PIPE AND SPILLWAY FLOWS  AP 400.OUT PIPE AND SPILL **************
DIVIDE HYD          ID=1  Q=135   ID  I=1  HYD NO=400.81 PIPE
                                  ID II=3  HYD NO=400.82 SPILL
*
** ROUTE THE OUTFLOW FROM THE POND (400.81) THROUGH A 42" STORM DRAIN
** TO THE CHANNEL ADJACENT TO 20TH. OUTFALL TO CHANNEL BELOW  ZARAGOSA ST.
COMPUTE RATING CURVE CID=1  VALLEY SECTION NO=1  CODE=-1  SLOPE=0.018
                    PIPE DIA=42  N=0.013
COMPUTE TRAVEL TIME ID=6  REACH=1  NUMBER OF VALLEY SECTIONS=1
                    LENGTH=900 FT  SLOPE=0.018
ROUTE               ID=6 HYD NO=400.9  INFLOW ID=1  DT=0.0
PRINT HYD           ID=6 CODE=1
* ROUTE THE FLOW OVER THE SPILLWAY (400.82) THROUGH THE STREET TILL IT DUMPS
* INTO THE STORM DRAIN
COMPUTE RATING CURVE CID=1  VALLEY SECTION=1  NUMBER OF SEGMENTS=3
                    MINIMUM ELEV=0.0 FT  MAXIMUM ELEV=1.5 FT
                    CHANNEL SLOPE=0.0330  FLOOD PLAIN SLOPE=0.0330
                    N=0.030  DIST=16.7  N=-0.017  DIST=48.1 N=0.030 DIST=64
                    DIST  ELEV    DIST   ELE    DIST   ELEV   DIST   ELEV
                    0.0   1.5     8.0    .9     16.7    .7    16.9   0.0
                    18.9   0.1    32.0   0.4     45.1   0.1    47.9   0.0
                    48.1   0.7    56.0   0.9     64.0   1.5
COMPUTE TRAVEL TIME ID=2  REACH NO=1  VALLEY SECTIONS=1
                    LENGTH=900 FT  SLOPE=0.0330
ROUTE               ID=2 HYD NO=400.91 INFLOW ID=3 DT=0.0
PRINT HYD           ID=2  CODE=1
*
ADD HYD             ID=6  HYD=400.20  ID I=2   ID II=6
```


3 OF 3

PAT
ELIM. POND
WEX. & 7th
BASIN 400

320.90

Wexford
Det. Pond

WEXFORD
POND

NO channel
NOW

ADDED
PIPE Flow
ID=6 TO
EM. SPILL. FLOW
ID=2
NOW TOTAL ID=6

Smith Engineering Company

5/1?/2013

TABLE

Stone Bridge Det. Pond

ELEVATION-STORAGE-DISCHARGE DATA

grey box means must input data

Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	Principal Spillway	Emergency Spillway Discharge	Total Discharge	Comment
		Principal Spillway Orifice Diameter (inches)				24			
		Number of Orifices				1			
(ft)	(ft)	(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	
(d)						(a)	(b)		
5246.00	0	0	0	0.0000	0.0000	0.0	0.0	0.0	Pond bottom. 24" SD pipe invert from field observation
5248.00	2.0	53162	53162	1.2204	1.2204	21.1	0.0	21.1	
5250.00	4.0	76682	129844	2.9808	4.2012	29.9	0.0	29.9	Emergency spillway (f)
5252.00	6.0	76823	153505	3.5240	7.7252	36.6	916.4	953.0	(f) Length assumed along top of pond and elevations extended above emergency spillway to allow for rating curve to function if flow spills over top
		Total Volume (ft^3) =	336511						
		Total Volume (ac-ft) =	7.73						

(a) Orifice flows based on Equation 4-10 and Table 4 from Hydraulics 6th Edition, Brater King, 1976

$$Q = Ca\sqrt{2gh}$$

C = 0.591 g=32.2 ft/sec^2, a=area (sq ft) h=head (ft)
d = depth of water in the pipe in feet

$$a = \pi D^2/4$$

(full area formula)

(b) Emergency Spillway flows were computed based on the following data used in the weir equation

Q = CLH^ 1.5 C = discharge coeffient, L = spillway length perp. To flow in ft, H = head (ft)

C = 3 L = 216

(d) Data Source 2010 Lidar topography and Field Observation and Measurements by Smith Engineering Company

TABLE
19 th Ave. RETENTION POND (Existing)
ELEVATION-STORAGE-DISCHARGE DATA (c)

grey box means must input data

Contour Elevation	Depth	Incremental Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	Comment
(ft)	(ft)	(ft)	(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	
0			0			0.0000	
5218	0	0	0	0	0.0000	0.0000	Invert elevation of pond (d)
5220	2	2	38146	38146	0.8757	0.8757	
5222	4	2	42518	80664	1.8518	2.7275	
5224	6	2	51049	93567	2.1480	4.8755	
5226	8	2	55204	106253	2.4392	7.3147	
5228	10	2	59430	114634	2.6316	9.9464	
5230	12	2	63660	123090	2.8258	12.7721	
5232	14	2	69960	133620	3.0675	15.8396	Emerg. Spill. Elev. (only soil top of pond)

(d) This pond has no principal spillway pipe and acts as full retention

(C) Area - Elevation Data obtained from contours on the drainage basin map (generated from 2010 Lidar topography)

Proposed or Possible Detention Ponds

1. **Sugar Pond –** Source : Proposed Construction Plans – Prepared for SSCAFCA, prepared by WH Pacific, June 2011.
2. **Lisbon Pond –** Source : Conceptual Design by Smith Engineering Company, July 2013
3. **19th Ave. Dam (West Branch at west side of Unser Blvd.) –** Source : Conceptual Design by Smith Engineering Company, July 2013

Proposed or Possible Detention Ponds

1. Sugar Pond –

Source of Grading Plan:
Proposed Construction Plans – Prepared for SSCAFCA, prepared by WH Pacific, June 2011.

This Section Contains:

Copies of Select Sheets from the Sugar Pond Plans, WH Pacific, June 2011 as follows:

- Cover Sheet
- Sheet C2
- Sheet C3
- Sheet G3

Table S1 – Sugar Pond Proposed - Elevation – Volume – Discharge Data and Computations (computed by Smith Engineering Company, April 2013)

Table S2 – Sugar Pond Very Conceptual Grading Plan Elevation – Area Data (computed by Smith Engineering Company, April 2013)

SOUTHERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY (SSCAFCA)

SUGAR POND OUTFALL

RIO RANCHO
SANDOVAL COUNTY, NEW MEXICO

Most Recent Plans. Use This. 11/5/12

JUNE 2011

NOTE:
THESE PLANS WERE PREPARED JUNE 2011 TO BE PLACED ON HOLD UNTIL FUNDING IS AVAILABLE. REVIEW AND UPDATE TO CURRENT CONDITIONS AT THE TIME OF CONSTRUCTION.

INDEX OF DRAWINGS

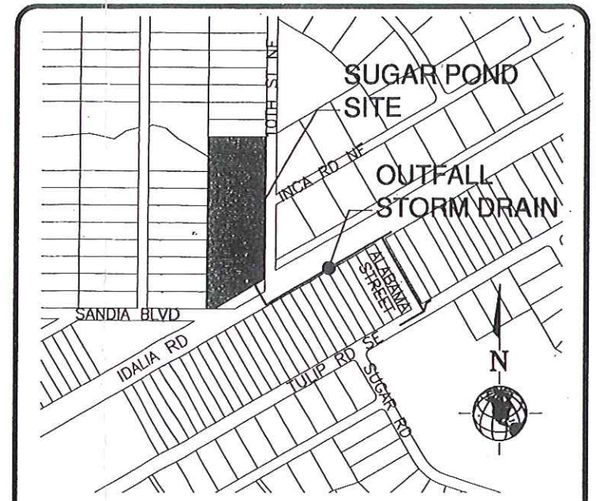
STANTON BOONE NEW MEXICO 9878 REGISTERED PROFESSIONAL ENGINEER

APPROVED FOR CONSTRUCTION

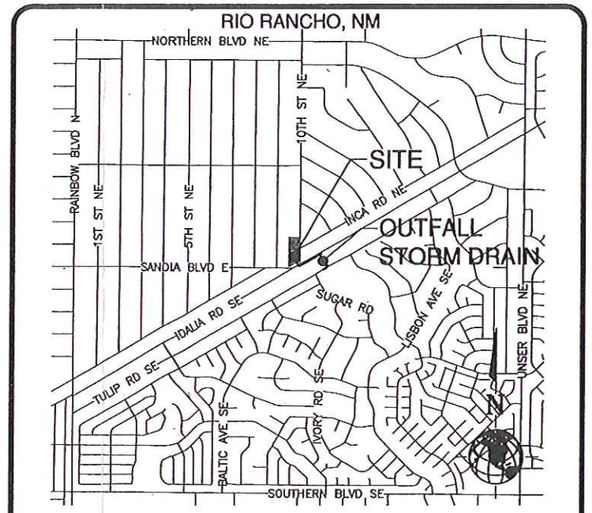
SSCAFCA EXECUTIVE ENGINEER DATE

APPROVED FOR CONSTRUCTION

CITY OF RIO RANCHO DATE



LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

WHPacific
6501 Americas Pkwy NE, Suite 400
Albuquerque, NM 87110
505-247-0294 Fax 505-242-4845
www.whpacific.com

Q_{100} = 40cfs

Q_{100} = 15cfs

Q_{100} = 77cfs

Q_{100} = 12cfs

POND OUTLET
SEE SHEET C3

15' MAXIMUM FROM TOP OF SLOPE

DO NOT DISTURB NATIVE VEGETATION OUTSIDE OF CONSTRUCTION LIMITS

INSTALL, MAINTAIN & REMOVE CONSTRUCTION ACCESS CONTROL FENCE @ LIMIT OF CONSTRUCTION
MIN. HEIGHT = 3'

RUNDOWN SWALE

5.48%

2%

310'

50'

LIMIT OF CONSTRUCTION

5' WIDE BERM @
EL 5647

12' C1 ACCESS

TICAL AREA
EET G2

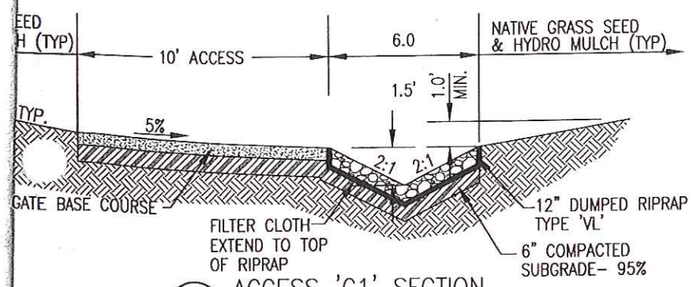
10th STREET

INCA RD

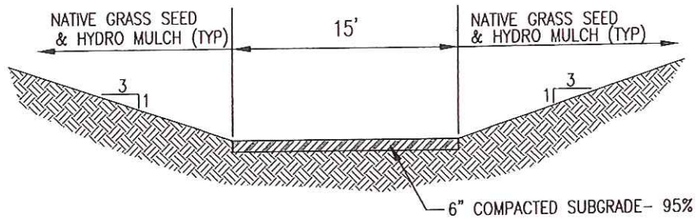
SCALE
-30' 0 15' 30' 60'
(FEET)

N

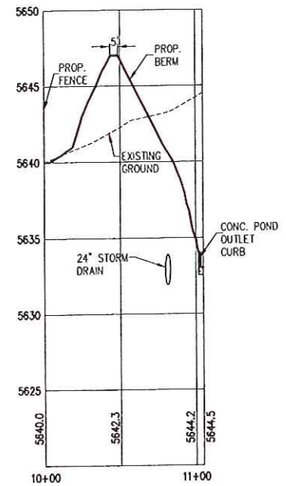
TOR LAYOUT CONTROL.
FOR FENCE LAYOUT.
MODEL WILL BE PROVIDED.
DEVELOPED CONDITION FLOW.



1 C2 ACCESS 'C1' SECTION
SCALE: NOT TO SCALE



2 C2 RUNDOWN SWALE SECTION
SCALE: NOT TO SCALE



3 C2 DAM SECTION
SCALE: HORIZ: 1"= 50'
VERT: 1"= 5'

SOUTHERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY

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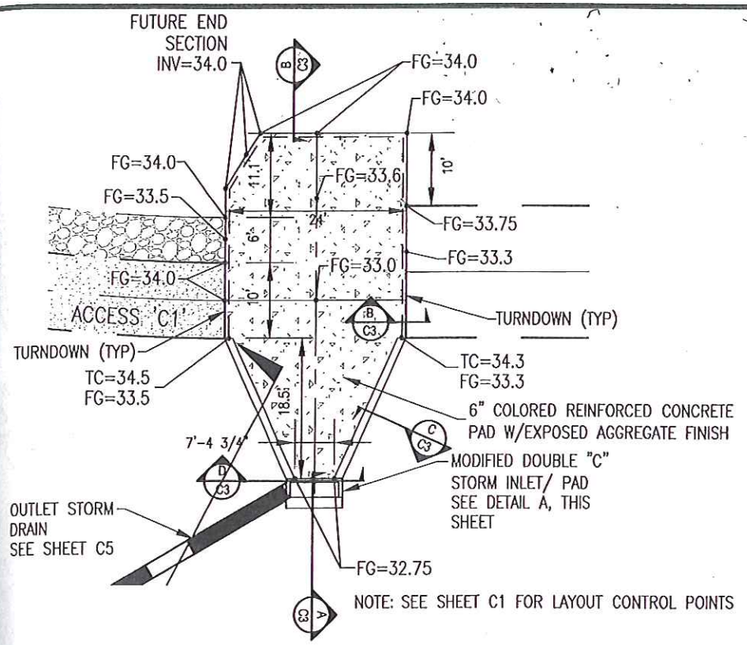
SUGAR POND OUTFALL

POND GRADING PLAN

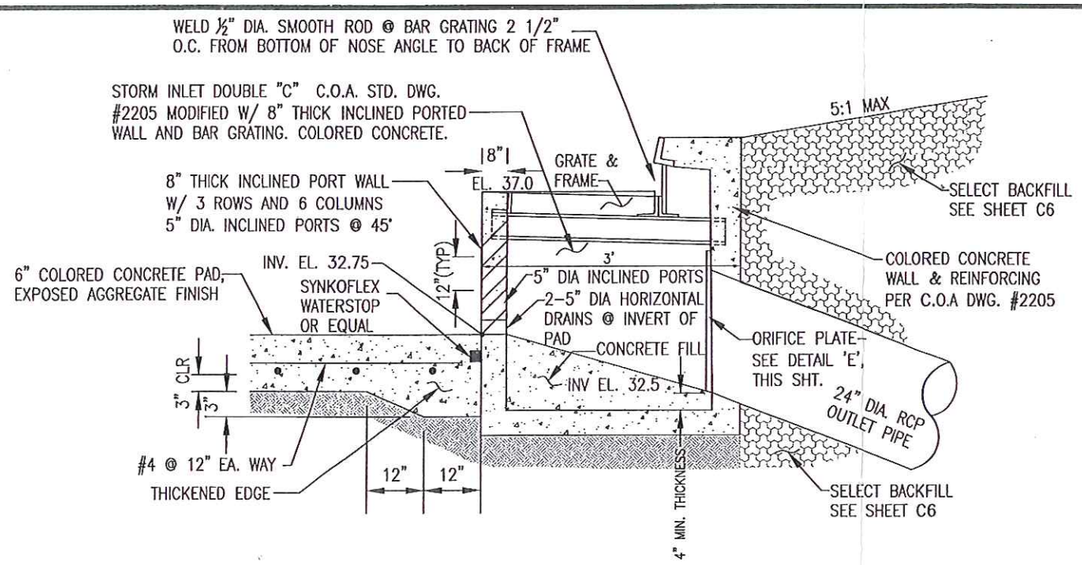
REVISIONS

NUMBER:	DATE:

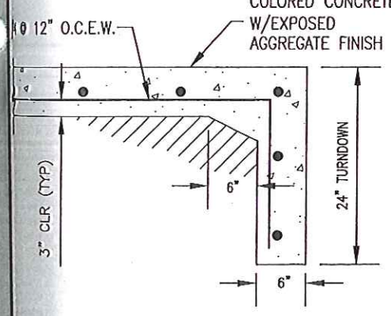
JOB NO:	212821
DATE:	JUNE 2011
DRAWN BY:	KLF
CHECKED BY:	CD
DRAWING NO:	C2



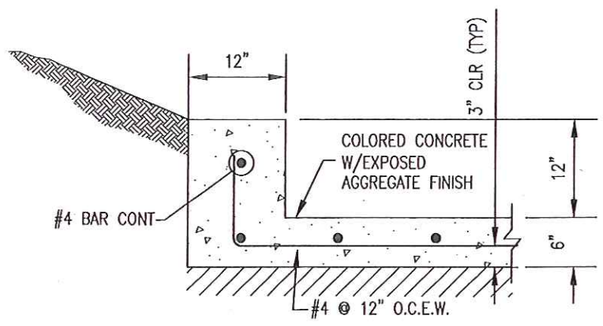
1 C3 POND OUTLET PLAN
SCALE: 1"=10'



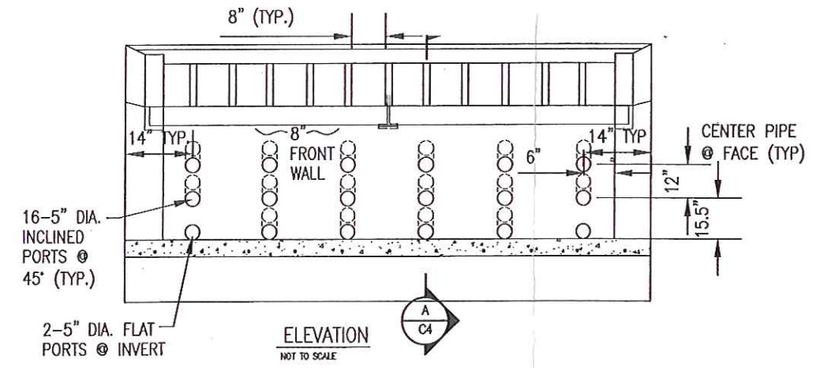
A C3 MODIFIED DOUBLE "C" STORM INLET/ PAD SECTION
SCALE: NOT TO SCALE



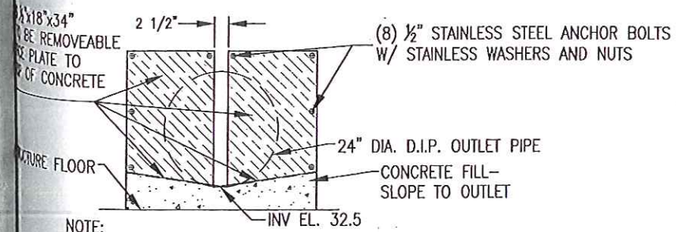
CONCRETE EDGE DETAIL W/O CURB
SCALE: NOT TO SCALE



C C3 EDGE CURB DETAIL
SCALE: NOT TO SCALE



D C3 MODIFIED DOUBLE "C" STORM INLET ELEVATION
SCALE: NOT TO SCALE



NOTE:
PROVIDE ORIFICE PLATE WITH HARDWARE TO SSCAFCA.
DO NOT INSTALL AS PART OF THIS PROJECT.

E C3 ORIFICE PLATE DETAIL
SCALE: NOT TO SCALE

SOUTHERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY

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8501 American Pkwy NE, Suite 400
Albuquerque, NM 87113
505-247-0004 Fax 505-242-4845
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SUGAR POND OUTFALL

POND OUTLET DETAILS

REVISIONS	
NUMBER:	DATE:

JOB NO:	212821
DATE:	JUNE 2011
DRAWN BY:	KLF
CHECKED BY:	CD

DRAWING NO:
C3

LEGEND

- SURVEY MONUMENT
- FOUND MONUMENT AS NOTED
- EXISTING GAS LINE MARKER
- EXISTING WATER VALVE
- EXISTING JUNIPER BUSH/TREE
- G —— EXISTING GAS LINE
- W —— EXISTING WATER LINE
- S —Ⓢ— EXISTING SANITARY SEWER LINE W/ MANHOLE
- 40 — EXISTING MAJOR CONTOUR
- 40 EXISTING MINOR CONTOUR
- LOT LINE
- RIGHT OF WAY LINE
- EASEMENT LINE
- EXISTING DIRT/ACCESS ROAD
- FENCE LINE
- NEW STORM DRAIN LINE W/ MANHOLE
- NEW PATH CENTERLINE
- 40 NEW MAJOR CONTOUR
- NEW MINOR CONTOUR
- NEW BUSH/TREE
- NATURAL GROUND
- COMPACTED SUBGRADE
- COMPACTED SUBGRADE PATH
- RIPRAP
- CONCRETE
- AGGREGATE BASE COURSE SURFACE
- SELECT SOIL MATERIAL
- CRUSHER FINES
- GAS LINE CRITICAL AREA
- ASPHALT

SYMBOLS

- SECTION NUMBER
- SHEET NUMBER WHERE SECTION IS DRAWN

DRAINAGE BASIN DATA:

AREA (AC)	DESIGN DISCHARGE (CFS)	DRAINS TO
22.4	72	SUGAR POND
4.2	15	SUGAR POND
11.5	40	SUGAR POND
15.2	52	SUGAR POND/SD (FUTURE)
5.6	30	SUGAR POND SITE
8.6	3.5	WALLEN POND TO 10TH TO SUGAR POND
–	8	SUGAR POND
13.8	32	SD @ IDALIA
9.6	33	SD @ TULIP
6.2	21	SD @ TULIP

ABBREVIATIONS

AP	ANALYSIS POINT
@	AT
BC	BEGIN CURVE
BCR	BEGIN CURB RETURN
BK	BOOK
BLDG	BUILDING
BM	BENCH MARK
BOP	BEGINNING OF PROJECT
BVC	BEGIN VERTICAL CURVE
BW	BASE OF WALL
CATV	CABLE TV LINE
CB	CATCH BASIN
CF	CURB FACE
CG	CURB AND GUTTER
CL	CHAIN LINK
℄	CENTERLINE
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT
CONC	CONCRETE
CORR	CITY OF RIO RANCHO
CP	CONTROL POINT
CY	CUBIC YARDS
DUE	DRAINAGE UTILITY EASEMENT
DI	DROP INLET
DIA	DIAMETER
Δ	DELTA
EA	EACH
EC	END CURVE
ECR	END CURB RETURN
ELEV	ELEVATION
EOP	END OF PROJECT
EP	EDGE OF PAVEMENT
ESMT	EASEMENT
EVC	END VERTICAL CURVE
EW	EACH WAY
EXIST	EXISTING
FF	FINISH FLOOR
FG	FINISH GRADE
FH	FIRE HYDRANT
℄	FLOW LINE
FOC	FACE OF CURB
FP	FINISHED PAD
G	GAS
GB	GRADE BREAK
GM	GAS METER
GV	GATE VALVE
HORIZ	HORIZONTAL
INT	INTERSECTION
INV	INVERT
INV EL	INVERT ELEVATION
LF	LINEAR FEET
LP	LIGHT POLE
LT	LEFT
MH	MANHOLE
NG	NATURAL GROUND
OC	ON CENTER
PB	PULL BOX
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PG	PAGE
PGL	PROFILE GRADE LINE PER TYPICAL SECTION
PI	POINT OF INTERSECTION
ℙ	PROPERTY LINE
PRC	POINT OF REVERSE CURVATURE
PT	POINT OF TANGENCY
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE PIPE
PVMT	PAVEMENT
RAD	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
REF	REFERENCE
RT	RIGHT
R/W, ROW	RIGHT-OF-WAY
S	SLOPE
SAS	SANITARY SEWER LINE
SD	STORM DRAIN
SF	SQUARE FEET
STA	STATION
STD	STANDARD
SW	SIDEWALK
SY	SQUARE YARDS
T	TANGENT
TA	TOP OF ASPHALT
TAC	TOP OF ASPHALT CURB
TBC	TOP BACK OF CURB
TC	TOP OF CONCRETE
TEL	TELEPHONE LINE, RISER OR BOX
TP	TOP OF PIPE
TRANS	TRANSVERSE
TW	TOP OF WALL
TYP	TYPICAL
UE	UNDERGROUND ELECTRICAL LINE
UT	UNDERGROUND TELEPHONE LINE
VC	VERTICAL CURVE
VERT	VERTICAL
VPI	VERTICAL POINT OF INTERSECTION
W	WATERLINE
WM	WATER METER
WSEL	WATER SURFACE ELEVATION
WV	WATER VALVE

FUTURE SUGAR POND PROPERTIES:

(NOT PART OF THIS PROJECT)

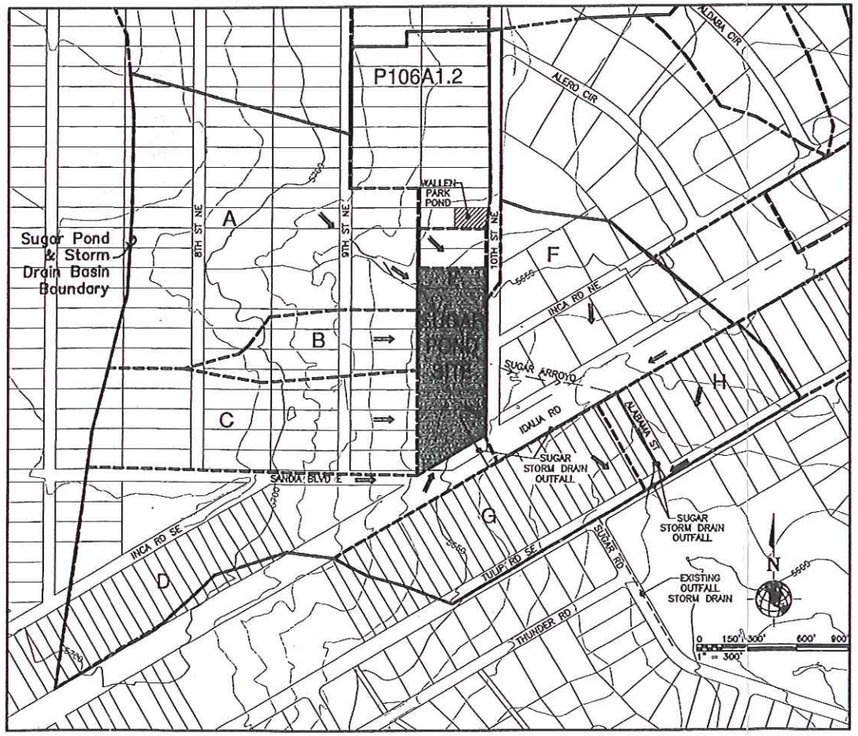
CREST WIDTH	6 FEET RIPRAP
SLOPE UPSTREAM FACE	6H:1V (VARIES)
SLOPE DOWNSTREAM FACE	20H:1V (VARIES)
ELEVATION AT EMERGENCY SPILLWAY CREST	5644 FEET
ELEVATION OF PRINCIPAL OUTLET	5633 FEET
WIDTH OF EMERGENCY SPILLWAY CREST	100 FEET
DISCHARGE CAPACITY OF EMERGENCY SPILLWAY W 2' FB	350 CFS
OUTLET CONDUIT SIZE AND TYPE	24" DIP
OUTLET CONDUIT CAPACITY (W/ ORIFICE)	7.1 CFS
EVACUATION TIME	46 HOURS
STORAGE CAPACITY @ ELEV: 5644	9.9 ACRE FEET
100 YEAR DRAINAGE AREA	75 ACRES
100 YEAR 24 HOUR DESIGN RAINFALL	2.8" IN 24 HOURS
100 YEAR PEAK INFLOW TO POND	220 CFS
100 YEAR OUTLET FLOW FROM POND	6.5 CFS
100 YEAR DETAINED VOLUME	6.5 ACRE FEET
100 YEAR WATER SURFACE ELEVATION	5642

FOR DETAILED INFORMATION SEE "SUGAR POND DESIGN ANALYSIS REPORT" DATED JANUARY, 2006. REVISED JANUARY 2009.

RATING DATA:

ELEV.	AREA (AC)	DISCHARGE (CFS)	VOLUME (AF)	NOTES
5633	0	0	0	OUTLET POND
5634	0.15	2.1	0	POND BOTTOM
5635	0.34	3.0	0	SEDIMENT POOL
5636	0.55	3.7	0.4	X
5637	0.69	4.3	1.1	X
5638	0.84	4.8	1.8	X
5639	1.00	5.3	2.7	X
5640	1.16	5.7	3.8	X
5641	1.33	6.1	5.1	X
5642	1.52	6.5	6.5	100 YR WSEL
5643	1.70	6.8	8.1	X
5644	1.88	7.1	9.9	SPILLWAY CREST
5645	2.06	350	11.9	X
5646	2.24	1000	14.0	X
5647	2.44	2000	16.4	EMBANKMENT TOP

NOTE: ASSUMES 1'± SEDIMENT (EL 35.0 +/-).



DRAINAGE BASIN MAP

CLINTON BOOKS NEW MEXICO 6910 REGISTERED PROFESSIONAL ENGINEER

SOUTHERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY

WHPacific
6501 Americas Pkwy NE, Suite 400
Albuquerque, NM 87110
505-247-0204 Fax 505-342-4845
www.whpacific.com

SUGAR POND OUTFALL

LEGEND, ABBREVIATIONS AND DRAINAGE DATA

REVISIONS

NUMBER:	DATE:

JOB NO:	212821
DATE:	JUNE 2011
DRAWN BY:	KLF
CHECKED BY:	CD

DRAWING NO: G3

Smith Engineering Company

/2013

TABLE S1

SUGAR POND (Proposed) OPTION 2

Elevation - Volume - Discharge Data and Computations

grey box means must input data

Option Description - Developed approximate elev. - data from WH Pacific June 2011 Plans. See Table S2 for computations and additional information regarding assumptions. See below for Principal, Emergency and Outfall Pipe information. NOTE - to attain more attenuation of peak discharge, assume an 18-in. orifice plate is installed on the 24-in. outfall pipe designed by WH Pacific, June 2011.

Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	(A) 1st Row of Reverse Incline Ports Discharge	(A) 2nd Row of Reverse Incline Ports Discharge	(A) Principal Spillway Grate Discharge	Principal Spillway Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				6	6		18				
		Number of Orifices				4	4		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(d) (g)		(g)				(a)	(a)	(b)	(a)	(e)	(b)		
5633	0	300	0	0.0000	0.0000	0.0	0.0	0.0	0.0	0	0	0	Pond bottom and principal spillway structure invert
5634	1.0	3885	2093	0.0480	0.0480	0.0	0.0	0.0	5.9	0	0	0	Invert 1st row of reverse incline ports
5634.5	1.5	4521	2102	0.0482	0.0963	2.6	0.0	0.0	10.2	3	1	4	Assume an 18-in. orifice plate on the 24-in. outfall pipe
5635	2.0	5157	2420	0.0555	0.1518	3.7	0.0	0.0	11.8	4	0	4	Invert of 2nd row of reverse incline ports
5636	3.0	6501	5829	0.1338	0.2856	5.3	3.7	0.0	14.5	9	0	9	
5637	4.0	7917	7209	0.1655	0.4511	6.4	5.3	0.0	16.7	12	0	12	Top of principal spillway grate
5638	5.0	9405	8661	0.1988	0.6500	7.4	6.4	45.0	18.7	19	0	19	
5639	6.0	10965	10185	0.2338	0.8838	8.3	7.4	127.3	20.5	20	0	20	
5640	7.0	12597	11781	0.2705	1.1542	9.1	8.3	233.8	22.1	22	0	22	
5641	8.0	14301	13449	0.3087	1.4630	9.8	9.1	360.0	23.7	24	0	24	
5642	9.0	16077	15189	0.3487	1.8117	10.5	9.8	503.1	25.1	25	0	25	
5643	10.0	17925	17001	0.3903	2.2020	11.2	10.5	661.4	26.5	26	0	26	
5644	11.0	19845	18885	0.4335	2.6355	11.8	11.2	833.4	27.8	28	0	28	
5645	12.0	21837	20841	0.4784	3.1139	12.3	11.8	1018.2	29.0	29	0	29	
5646	13.0	23901	22869	0.5250	3.6389	12.9	12.3	1215.0	30.2	30	0	30	
5647	14.0	26037	24969	0.5732	4.2122	13.4	12.9	1423.0	31.3	31	0	31	Emergency spill. Elev. = lowest top of embankment
5647.5	14.5	26038	13019	0.2989	4.5110	13.7	13.1	1531.1	31.9	32	239	271	Add 0.5 foot to extend routing for spill over emergency spillway

(a) Orfice equation and coefficient were obtained from Equation 4-10 and Table 4-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.

$Q = Ca\sqrt{2gh}$ C = 0.590 g=32.2 ft/sec^2, a=area (sq ft) h=head (ft)

$a = \pi D^2/4$ (full area formula)

(a) Partial Area formula $a = \frac{1}{2}r^2\left\{\left[2\cos^{-1}\left(\frac{r-d}{r}\right)\right]\frac{\pi}{180} - \sin\left[\left[2\cos^{-1}\left(\frac{r-d}{r}\right)\right]\frac{\pi}{180}\right]\right\}$

Principal Spill. Pipe radius r in feet = 0.75

d = depth of water in the pipe in feet

(b) Emergency Spillway flows were computed based on the following data used in the weir equation

(b) Q = CLH^ 1.5 C = discharge coeffient, L = spillway length perp. to flow (ft), H = head (ft)

(b)Emergergency Spillway	C =	2.60	L =	260	Emer. Spill. El	5647
(b) Grate / Weir	C =	3.00	L =	15	El. 5'x5' grate	5637

(e) The combined discharge of the reverse incline ports and the grate (A), will govern the discharge until the principal spillway outfall pipe becomes fully submerged. When the sum of (A)s is greater than outfall pipe capacity then outfall pipe capacity governs the discharge

(partial area formula)

(b) Weir equation and "C" coefficients were obtained from Equation 5-10 and Table 5-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.

(g) Data Source : See Table S2 for Rectangular Pond 1V:3H computations for contour area calculations and Sheet C2 Grading Plan from WH Pacific Sugar Pond Plans dated June 2011.

TABLE S2

Sugar Pond Very Conceptual Grading Plan (See Note "A" below)
Elevation - Area Data

Assume Rectangular Pond Shape with 1V:3H side slopes -

Generally Following the WH Pacific June 2011 Sugar Pond Grading Plan (Sheet C2) attached. Note that Sheet C2 is drawn to scale and was used as the basis to set up this spreadsheet to generally follow the contour shape of this pond on Sheet C2.

Elevation	Length	Width	Contour Area	Contour Area	COMMENT
ft	ft	ft	sq ft	acres	
5632.75	0	0	0	0.0000	Invert Elevation at Modified Double C storm inlet as shown on Sheet C3 of WH Pacific Plans (June 2011)
5633	20	15	300	0.0069	ASSUME Starting Elevation as 5633 for this Conceptual Level Pond Routing
5634	185	21	3,885	0.0892	
5635	191	27	5,157	0.1184	
5636	197	33	6,501	0.1492	
5637	203	39	7,917	0.1817	
5638	209	45	9,405	0.2159	
5639	215	51	10,965	0.2517	
5640	221	57	12,597	0.2892	
5641	227	63	14,301	0.3283	
5642	233	69	16,077	0.3691	
5643	239	75	17,925	0.4115	
5644	245	81	19,845	0.4556	
5645	251	87	21,837	0.5013	
5646	257	93	23,901	0.5487	
5647	263	99	26,037	**0.5977**	**SEE NOTE "A" - BELOW**

A - The WH Pacific Plans presents Rating Curve Data on Sheet G3 (attached). The area shown at the 5647 contour = 2.44 acres and this is much to large compared to measurement on Sheet C2. At SSCAFCA's direction, Smith Engineering was directed to spend very little effort refining the Sugar Pond design or pond routing. Therefore, the simplifed rectangular pond assumptions / computations were developed and computed in this spreadsheet. These values are adopted for the Ultimate conditions Sugar Pond detention pond routing and are included in Table S1

Proposed or Possible Detention Ponds

2. Lisbon Pond –

Lisbon Pond Conceptual Design (Conceptual Level Grading Plan)
(prepared by Smith Engineering Company, July 2013)

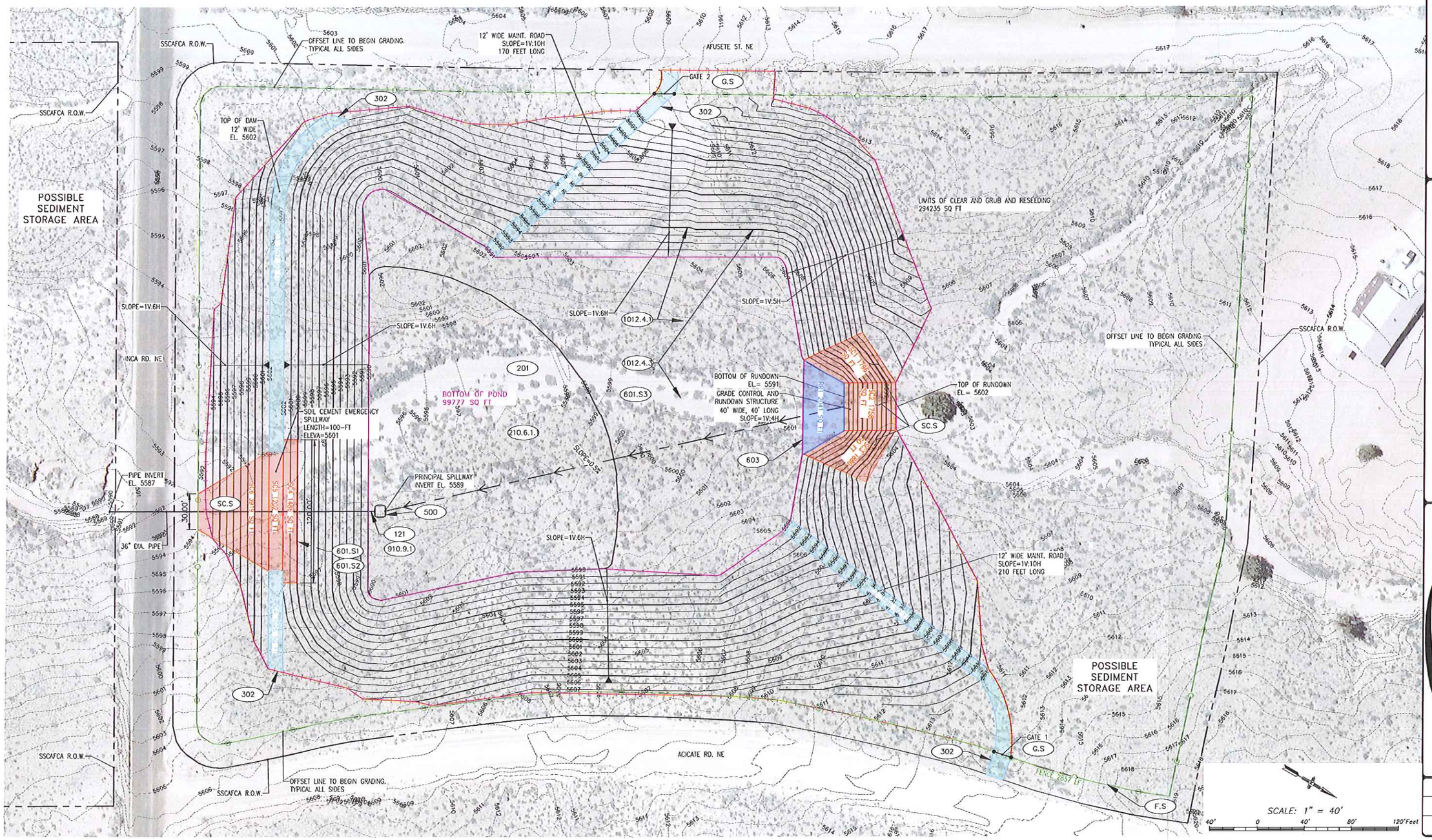
Table L1 - Lisbon Pond - Elevation – Volume – Discharge Data and Computations
(computed by Smith Engineering Company, July 2013)

LEGEND

- THREE STRAND NON-BARB WIRE FENCE
- SEEDING LIMIT
- CLEAR AND GRUB
- RIP RAP–TYPE M 2–FT THICK
- BASE COURSE 6–IN THICK
- SOIL CEMENT 1–FT THICK X 8–FT WIDE FOR 1V:4H AND 1V:6H SLOPES, STAGGERED OVERLAPPED LAYERS TO ACHIEVE SLOPES.

BUILD/PAY NOTES

121	36-INCH DIA. HDPE PIPE: Pipe material, joint welding, trenching, backfill & compaction. CIP.
201	CLEARING & GRUBBING: Compl.
210.6.1	ROUGH GRADING: Pond bottom areas and areas outside the top of pond cut slopes, and outside the toe of dam slopes. Finished grades shall match plan grades or contours within 0.5 ft. Compl.
302	AGGREGATE BASE COURSE: Install 6-inch thick within areas shown on plans. CIP.
500	REINFORCED CONCRETE STRUCTURES: Colored reinforced concrete (4,000 psi) incl. all rebar, (principal spillway). CIP
601.S1	SELECT BACKFILL MATERIAL: The Keyway Trench subgrade clay layer. All materials, the clay/m aterial, proper soil, and clay/ soil mixing to obtain gradation, and subgrade preparation are included with this item. CIP.
601.S2	FILL SOIL: Fill soil material for dam embankment when obtained from within the limits of construction, includes, blending/ mixing to obtain homogenous material/ construction in lifts, rough & final grading of dam embankment slopes. CIP.
601.S3	UNCLASSIFIED EXCAVATION: Dispose of excess soils off-site to SSCAFCA designated location within 6 mi radius, compaction not required. Compl.
603	RIP-RAP: Type M Rip-Rap (Std. Spec. Section 109 Table 109.A) Install 2 feet thick within areas shown on plans. Assume filter fabric is incidental to rip-rap. CIP.
910.9.1	TRENCH and BACKFILL 36-in. DIA. PIPE, 8-FT to 12-FT DEPTH: Trenching, backfill and compaction. CIP.
1012.4.1	NATIVE SEEDS: All disturbed areas including pond bottom and pond side slopes, CIP.
1012.4.3	SANTA FE BROWN GRAVEL MULCH: All disturbed areas including pond bottom and pond side slopes, CIP.
G.S	Gate: Install 12 ft. square tube drainage gate, O/P.
F.S	FENCING: Install 5 strand barbless wood post fence, O/P.
SC.S	SOIL CEMENT: Include all materials (portland cement, native soil) labor, equipment, and placement in 1-foot thick lifts. O/P.
CS.S	CONSTRUCTION STAKING: Includes topographic survey of over excavated surface and final as-built survey preparation, Setting monuments on top of dam. Comp.
NP.S	NPDES PERMITTING: SWPPP preparation, implementation, monitoring, record keeping, including silt fencing (3 ft tall with 5-ft steel posts at 10 ft on center) and all BMPs including initial installation and and maintenance as required. CIP.
T. S	TESTING: Testing and Approval of all Soil Fill, concrete, soil cement, materials, compl.
PE.S	PROFESSIONAL GEOTECHNICAL ENGINEER: Professional Geotechnical Engineer for 2 hours / day during excavation, backfill and compaction of all soils work related to dam and principal spillway construction. Compl.
M. S	MOBILIZATION:
DM.S	DEMOBILIZATION:



PREPARED FOR SSCAFCA

PRELIMINARY NOT FOR CONSTRUCTION

ADDENDUM 1

BLACK ARROYO WATERSHED MANAGEMENT PLAN

LISBON POND
CONCEPTUAL DESIGN

SMITH ENGINEERING COMPANY
TEXAS
NEW MEXICO

JOB NO: 112136

DATE: June 2013

G:\SEC----PROJECTS\2012 Projects\112136 SSCAFCA - 1, Black Arroyo\ENGINEERING\CADD\PLANSET\LISBOND POND GRADING.dwg Jun 26, 2013 - 8:27pm Saved By: victorian

Smith Engineering Company

./2013

Revision 1

TABLE L1 **5/30/2013**

LISBON POND (Proposed) REVISED -36-in cul mas rat curve/ new areas

Elevation - Volume - Discharge Data and Computations

grey box means must input data

Option Description - Embankment height 8 ft. tall relative to Inca Rd. Max. pond depth to top emankment = 13 ft. Pond bottom slope = 0.5 %, Pond inside side slopes mainly 1V:6H. See below for Principal, Emergency and Outfall Pipe information.

Contour Elevation NAVD 1988	Depth	Contour Area (grading plan of 5-30-13)	Incremental Volume	Incremental Volume	Cumulative Volume	(A) 1st Row of Reverse Incline Ports Discharge	(A) 2nd Row of Reverse Incline Ports Discharge	(A) Principal Spillway Grate Discharge	Principal Spillway 36-in. Outfall Pipe Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				8	8		36				
		Number of Orifices				12	12		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(d)						(a)	(a)	(b)	(c)	(e)	(b)		
5589.00	0	0	0	0.0000	0.0000	0.0	0.0	0.0	0.0	0.0	0.0	0	Pond bottom and principal spillway structure invert
5590.00	1	46,585	23,293	0.5347	0.5347	0.0	0.0	0.0	4.0	0.0	0.0	0	Highest Invert 1st row of reverse incline ports
5591.00	2	105,063	75,824	1.7407	2.2754	19.8	0.0	0.0	16.0	16.0	0.0	16	
5592.00	3	113,329	109,196	2.5068	4.7822	28.0	0.0	0.0	32.0	28.0	0.0	28	Highest Invert of 2nd row of reverse incline ports
5593.00	4	121,734	117,532	2.6982	7.4803	34.4	19.8	0.0	50.0	50.0	0.0	50	
5594.00	5	130,334	126,034	2.8933	10.3737	39.7	28.0	0.0	61.0	61.0	0.0	61	
5595.00	6	139,113	134,724	3.0928	13.4665	44.3	34.4	0.0	64.0	64.0	0.0	64	Top of principal spillway grate
5596.00	7	148,116	143,615	3.2969	16.7635	48.6	39.7	96.0	67.0	67.0	0.0	67	
5597.00	8	157,339	152,728	3.5061	20.2696	52.5	44.3	271.5	70.0	70.0	0.0	70	
5598.00	9	166,790	162,065	3.7205	23.9901	56.1	48.6	498.8	72.0	72.0	0.0	72	
5599.00	10	176,505	171,648	3.9405	27.9306	59.5	52.5	768.0	74.0	74.0	0.0	74	
5600.00	11	186,425	181,465	4.1659	32.0964	62.7	56.1	1073.3	77.0	77.0	0.0	77	
5601.00	12	196,606	191,516	4.3966	36.4930	65.8	59.5	1410.9	79.0	79.0	0.0	79	Emergency spillway Elevation
5601.20	12.2	207,079	40,368	0.9267	37.4198	66.4	60.2	1482.0	81.0	81.0	23.3	104	
5601.40	12.4	207,080	41,416	0.9508	38.3705	67.0	60.8	1554.3	82.0	82.0	65.8	148	
5601.60	12.6	207,081	41,416	0.9508	39.3213	67.5	61.4	1627.7	83.0	83.0	120.8	204	
5601.80	12.8	207,082	41,416	0.9508	40.2721	68.1	62.1	1702.3	84.0	84.0	186.0	270	
5602.00	13.0	207,083	201,845	4.6337	41.1267	68.7	62.7	1777.9	85.0	85.0	260.0	345	**Top of Dam**

(a) Orfice equation and coefficient were obtained from Equation 4-10 and Table 4-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.

$Q = Ca\sqrt{2gh}$ C = 0.590 g=32.2 ft/sec^2, a=area (sq ft) h=head (ft)

$a = \pi D^2/4$ (full area formula)

Principal Spill. Pipe radius r in feet = 1.50

(b) Emergency Spillway flows were computed based on the following data used in the weir equation

Q = CLH^ 1.5 C = discharge coeffient, L = spillway length perp. to flow (ft), H = head (ft)

(b) Emergergency Spillway C =	2.6	L =	100	Emer. Spill. El	5601
(b) Grate / Weir C =	3	L =	32	El. 8'x8' grate	5595

(d) Data Source : Lidar Contours provided by SSCAFCA

(c) Rating curve computed with Culvert Master - output is attached

(e) The combined discharge of the reverse incline ports and the grate (A), will govern the discharge until the principal spillway outfall pipe becomes fully submerged. When the sum of (A)s is greater than outfall pipe capacity then outfall pipe capacity governs the discharge

(b) Weir equation and "C" coefficients were obtained from Equation 5-10 and Table 5-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.

Table R1

Rating Curve Parameters for Lisbon Pond Outfall Pipe

Depth	Upstream Invert Elevation	Headwater Elevation	Downstream Invert Elevation	Tailwater Elevation	Length	Slope	Manning's 'n'	Pipe Size	Pipe Shape	Computed Discharge from Culvert Master for 1 Box Culvert
ft	ft	ft	ft	ft	ft	ft/ft		ft		cfs
	a	b	c	d	a	a				e
0	5589	5589	5587	5587.0	225	0.01	0.013	3	circular	0
1		5590		5587.7						4
2		5591		5588.3						16
3		5592		5589.0						32
4		5593		5589.7						50
5		5594		5590.3						61
6		5595		5591.0						64
7		5596		5591.7						67
8		5597		5592.3						70
9		5598		5593.0						72
10		5599		5593.7						74
11		5600		5594.3						77
12		5601		5595.0						79
13		5602		5595.7						81

a- Based on SSCAFCA approved conceptual grading plan for Lisbon Pond
b- Headwater elevation = depth + upstream invert elevation
c- Based on 2ft contour map provided by SSCAFCA
d- Tailwater Elevation Assumption = (2/3*depth) + Downstream Invert Elevation
e- Based on Culvert Master calulations- see output in Appendix I

Culvert Calculator Report
HW 1ft

olve For: Discharge

Culvert Summary					
Allowable HW Elevation	5,590.00	ft	Headwater Depth/Height	0.33	
Computed Headwater Elev	5,590.00	ft	Discharge	4.39	cfs
Inlet Control HW Elev.	5,589.88	ft	Tailwater Elevation	5,587.70	ft
Outlet Control HW Elev.	5,590.00	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	5,589.00	ft	Downstream Invert	5,587.00	ft
Length	225.00	ft	Constructed Slope	0.008889	ft/ft

Hydraulic Profile					
Profile	CompositeS1S2		Depth, Downstream	0.70	ft
Slope Type	Steep		Normal Depth	0.54	ft
Flow Regime	N/A		Critical Depth	0.65	ft
Velocity Downstream	3.50	ft/s	Critical Slope	0.003969	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	3.00	ft
Section Size	36 inch		Rise	3.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,590.00	ft	Upstream Velocity Head	0.23	ft
Ke	0.50		Entrance Loss	0.12	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,589.88	ft	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	7.1	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
HW 2ft

olve For: Discharge

Culvert Summary					
Allowable HW Elevation	5,591.00	ft	Headwater Depth/Height	0.67	
Computed Headwater Elev	5,591.00	ft	Discharge	15.96	cfs
Inlet Control HW Elev.	5,590.80	ft	Tailwater Elevation	5,588.30	ft
Outlet Control HW Elev.	5,591.00	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	5,589.00	ft	Downstream Invert	5,587.00	ft
Length	225.00	ft	Constructed Slope	0.008889	ft/ft

Hydraulic Profile					
Profile	CompositeS1S2		Depth, Downstream	1.30	ft
Slope Type	Steep		Normal Depth	1.03	ft
Flow Regime	N/A		Critical Depth	1.28	ft
Velocity Downstream	5.44	ft/s	Critical Slope	0.004040	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	3.00	ft
Section Size	36 inch		Rise	3.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,591.00	ft	Upstream Velocity Head	0.48	ft
Ke	0.50		Entrance Loss	0.24	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,590.80	ft	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	7.1	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
HW 3ft

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	5,592.00	ft	Headwater Depth/Height	1.00	
Computed Headwater Elev	5,592.00	ft	Discharge	32.04	cfs
Inlet Control HW Elev.	5,591.80	ft	Tailwater Elevation	5,589.00	ft
Outlet Control HW Elev.	5,592.00	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	5,589.00	ft	Downstream Invert	5,587.00	ft
Length	225.00	ft	Constructed Slope	0.008889	ft/ft

Hydraulic Profile					
Profile	CompositeS1S2		Depth, Downstream	2.00	ft
Slope Type	Steep		Normal Depth	1.52	ft
Flow Regime	N/A		Critical Depth	1.84	ft
Velocity Downstream	6.40	ft/s	Critical Slope	0.004810	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	3.00	ft
Section Size	36 inch		Rise	3.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,592.00	ft	Upstream Velocity Head	0.78	ft
Ke	0.50		Entrance Loss	0.39	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,591.80	ft	Flow Control	Unsubmerged	
Inlet Type	Square edge w/headwall		Area Full	7.1	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
HW 4ft

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	5,593.00	ft	Headwater Depth/Height	1.33	
Computed Headwater Elev	5,593.00	ft	Discharge	49.61	cfs
Inlet Control HW Elev.	5,592.96	ft	Tailwater Elevation	5,589.70	ft
Outlet Control HW Elev.	5,593.00	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	5,589.00	ft	Downstream Invert	5,587.00	ft
Length	225.00	ft	Constructed Slope	0.008889	ft/ft

Hydraulic Profile					
Profile	CompositeS1S2		Depth, Downstream	2.70	ft
Slope Type	Steep		Normal Depth	2.01	ft
Flow Regime	N/A		Critical Depth	2.29	ft
Velocity Downstream	7.40	ft/s	Critical Slope	0.006374	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	3.00	ft
Section Size	36 inch		Rise	3.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,593.00	ft	Upstream Velocity Head	1.14	ft
Ke	0.50		Entrance Loss	0.57	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,592.96	ft	Flow Control	Submerged	
Inlet Type	Square edge w/headwall		Area Full	7.1	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
HW 5ft

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	5,594.00	ft	Headwater Depth/Height	1.67	
Computed Headwater Elev	5,594.00	ft	Discharge	61.40	cfs
Inlet Control HW Elev.	5,594.00	ft	Tailwater Elevation	5,590.30	ft
Outlet Control HW Elev.	5,593.97	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	5,589.00	ft	Downstream Invert	5,587.00	ft
Length	225.00	ft	Constructed Slope	0.008889	ft/ft

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	2.40	ft
Slope Type	N/A		Normal Depth	2.40	ft
Flow Regime	N/A		Critical Depth	2.53	ft
Velocity Downstream	10.14	ft/s	Critical Slope	0.008097	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	3.00	ft
Section Size	36 inch		Rise	3.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,593.97	ft	Upstream Velocity Head	1.45	ft
Ke	0.50		Entrance Loss	0.59	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,594.00	ft	Flow Control	Submerged	
Inlet Type	Square edge w/headwall		Area Full	7.1	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
HW 6ft

'olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,595.00 ft	Headwater Depth/Height	2.00
Computed Headwater Elev	5,595.00 ft	Discharge	64.14 cfs
Inlet Control HW Elev.	5,594.27 ft	Tailwater Elevation	5,591.00 ft
Outlet Control HW Elev.	5,595.00 ft	Control Type	Outlet Control

Grades			
Upstream Invert	5,589.00 ft	Downstream Invert	5,587.00 ft
Length	225.00 ft	Constructed Slope	0.008889 ft/ft

Hydraulic Profile			
Profile	PressureProfile	Depth, Downstream	4.00 ft
Slope Type	N/A	Normal Depth	2.52 ft
Flow Regime	N/A	Critical Depth	2.57 ft
Velocity Downstream	9.07 ft/s	Critical Slope	0.008603 ft/ft

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.00 ft
Section Size	36 inch	Rise	3.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,595.00 ft	Upstream Velocity Head	1.28 ft
Ke	0.50	Entrance Loss	0.64 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,594.27 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	7.1 ft²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report
HW 7ft

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	5,596.00	ft	Headwater Depth/Height	2.33	
Computed Headwater Elev	5,596.00	ft	Discharge	66.50	cfs
Inlet Control HW Elev.	5,594.52	ft	Tailwater Elevation	5,591.70	ft
Outlet Control HW Elev.	5,596.00	ft	Control Type	Outlet Control	

Grades					
Upstream Invert	5,589.00	ft	Downstream Invert	5,587.00	ft
Length	225.00	ft	Constructed Slope	0.008889	ft/ft

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	4.70	ft
Slope Type	N/A		Normal Depth	2.66	ft
Flow Regime	N/A		Critical Depth	2.61	ft
Velocity Downstream	9.41	ft/s	Critical Slope	0.009075	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	3.00	ft
Section Size	36 inch		Rise	3.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,596.00	ft	Upstream Velocity Head	1.38	ft
Ke	0.50		Entrance Loss	0.69	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,594.52	ft	Flow Control	Submerged	
Inlet Type	Square edge w/headwall		Area Full	7.1	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
HW 8ft

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,597.00 ft	Headwater Depth/Height	2.67
Computed Headwater Elev	5,597.00 ft	Discharge	69.52 cfs
Inlet Control HW Elev.	5,594.85 ft	Tailwater Elevation	5,592.30 ft
Outlet Control HW Elev.	5,597.00 ft	Control Type	Outlet Control

Grades			
Upstream Invert	5,589.00 ft	Downstream Invert	5,587.00 ft
Length	225.00 ft	Constructed Slope	0.008889 ft/ft

Hydraulic Profile			
Profile	PressureProfile	Depth, Downstream	5.30 ft
Slope Type	N/A	Normal Depth	N/A ft
Flow Regime	N/A	Critical Depth	2.65 ft
Velocity Downstream	9.84 ft/s	Critical Slope	0.009732 ft/ft

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.00 ft
Section Size	36 inch	Rise	3.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,597.00 ft	Upstream Velocity Head	1.50 ft
Ke	0.50	Entrance Loss	0.75 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,594.85 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	7.1 ft²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report
HW 9ft

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,598.00 ft	Headwater Depth/Height	3.00
Computed Headwater Elev	5,598.00 ft	Discharge	71.71 cfs
Inlet Control HW Elev.	5,595.09 ft	Tailwater Elevation	5,593.00 ft
Outlet Control HW Elev.	5,598.00 ft	Control Type	Outlet Control

Grades			
Upstream Invert	5,589.00 ft	Downstream Invert	5,587.00 ft
Length	225.00 ft	Constructed Slope	0.008889 ft/ft

Hydraulic Profile			
Profile	PressureProfile	Depth, Downstream	6.00 ft
Slope Type	N/A	Normal Depth	N/A ft
Flow Regime	N/A	Critical Depth	2.68 ft
Velocity Downstream	10.14 ft/s	Critical Slope	0.010243 ft/ft

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.00 ft
Section Size	36 inch	Rise	3.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,598.00 ft	Upstream Velocity Head	1.60 ft
Ke	0.50	Entrance Loss	0.80 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,595.09 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	7.1 ft²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report
HW 10ft

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	5,599.00	ft	Headwater Depth/Height	3.33	
Computed Headwater Elev	5,599.00	ft	Discharge	73.83	cfs
Inlet Control HW Elev.	5,595.34	ft	Tailwater Elevation	5,593.70	ft
Outlet Control HW Elev.	5,599.00	ft	Control Type	Outlet Control	

Grades					
Upstream Invert	5,589.00	ft	Downstream Invert	5,587.00	ft
Length	225.00	ft	Constructed Slope	0.008889	ft/ft

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	6.70	ft
Slope Type	N/A		Normal Depth	N/A	ft
Flow Regime	N/A		Critical Depth	2.71	ft
Velocity Downstream	10.44	ft/s	Critical Slope	0.010769	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	3.00	ft
Section Size	36 inch		Rise	3.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,599.00	ft	Upstream Velocity Head	1.70	ft
Ke	0.50		Entrance Loss	0.85	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,595.34	ft	Flow Control	Submerged	
Inlet Type	Square edge w/headwall		Area Full	7.1	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Calculator Report
HW 11ft

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,600.00 ft	Headwater Depth/Height	3.67
Computed Headwater Elev	5,600.00 ft	Discharge	76.56 cfs
Inlet Control HW Elev.	5,595.67 ft	Tailwater Elevation	5,594.30 ft
Outlet Control HW Elev.	5,600.00 ft	Control Type	Outlet Control

Grades			
Upstream Invert	5,589.00 ft	Downstream Invert	5,587.00 ft
Length	225.00 ft	Constructed Slope	0.008889 ft/ft

Hydraulic Profile			
Profile	PressureProfile	Depth, Downstream	7.30 ft
Slope Type	N/A	Normal Depth	N/A ft
Flow Regime	N/A	Critical Depth	2.74 ft
Velocity Downstream	10.83 ft/s	Critical Slope	0.011492 ft/ft

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.00 ft
Section Size	36 inch	Rise	3.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,600.00 ft	Upstream Velocity Head	1.82 ft
Ke	0.50	Entrance Loss	0.91 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,595.67 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	7.1 ft²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report
HW 12ft

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,601.00 ft	Headwater Depth/Height	4.00
Computed Headwater Elev	5,601.00 ft	Discharge	78.55 cfs
Inlet Control HW Elev.	5,595.91 ft	Tailwater Elevation	5,595.00 ft
Outlet Control HW Elev.	5,601.00 ft	Control Type	Outlet Control

Grades			
Upstream Invert	5,589.00 ft	Downstream Invert	5,587.00 ft
Length	225.00 ft	Constructed Slope	0.008889 ft/ft

Hydraulic Profile			
Profile	PressureProfile	Depth, Downstream	8.00 ft
Slope Type	N/A	Normal Depth	N/A ft
Flow Regime	N/A	Critical Depth	2.76 ft
Velocity Downstream	11.11 ft/s	Critical Slope	0.012049 ft/ft

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.00 ft
Section Size	36 inch	Rise	3.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,601.00 ft	Upstream Velocity Head	1.92 ft
Ke	0.50	Entrance Loss	0.96 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,595.91 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	7.1 ft²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Culvert Calculator Report
HW 13ft

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,602.00 ft	Headwater Depth/Height	4.33
Computed Headwater Elev	5,602.00 ft	Discharge	80.49 cfs
Inlet Control HW Elev.	5,596.16 ft	Tailwater Elevation	5,595.70 ft
Outlet Control HW Elev.	5,602.00 ft	Control Type	Outlet Control

Grades			
Upstream Invert	5,589.00 ft	Downstream Invert	5,587.00 ft
Length	225.00 ft	Constructed Slope	0.008889 ft/ft

Hydraulic Profile			
Profile	PressureProfile	Depth, Downstream	8.70 ft
Slope Type	N/A	Normal Depth	N/A ft
Flow Regime	N/A	Critical Depth	2.77 ft
Velocity Downstream	11.39 ft/s	Critical Slope	0.012618 ft/ft

Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.00 ft
Section Size	36 inch	Rise	3.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,602.00 ft	Upstream Velocity Head	2.02 ft
Ke	0.50	Entrance Loss	1.01 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,596.16 ft	Flow Control	Submerged
Inlet Type	Square edge w/headwall	Area Full	7.1 ft²
K	0.00980	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Proposed or Possible Detention Ponds

3. 19th Ave. Dam (West Branch at west side of Unser Blvd.) –

19th Ave. Dam - Conceptual Design (Conceptual Level Grading Plan)
(prepared by Smith Engineering Company, July 2013)

Table - 19th. Ave. Dam - Elevation – Volume – Discharge Data and Computations
(computed by Smith Engineering Company, July 2013)

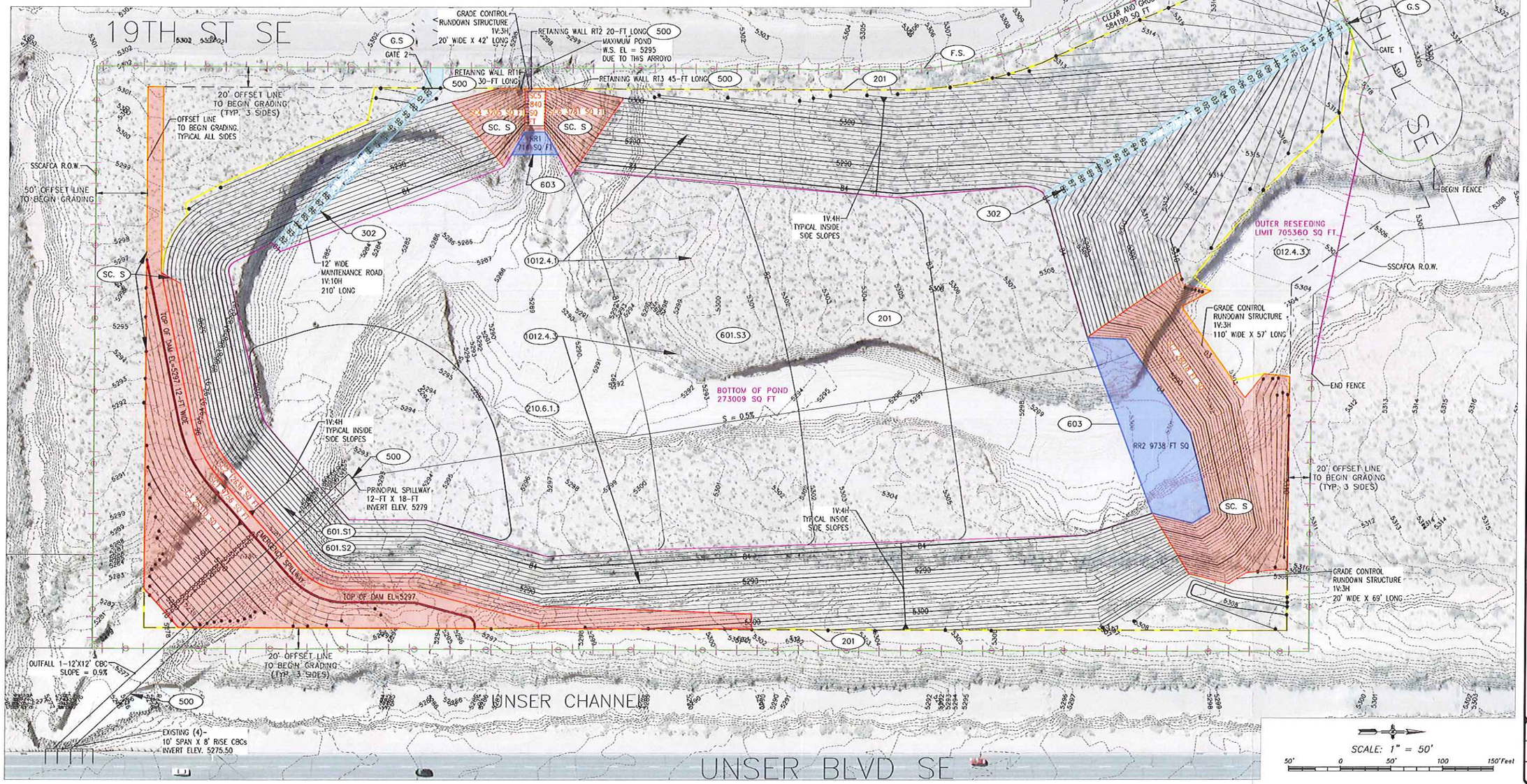
LEGEND

- THREE STRAND NON-BARB WIRE FENCE
- SEEDING LIMIT
- CLEAR AND GRUB
- RIP RAP--TYPE M 2-FT THICK
- BASE COURSE 6-IN THICK
- SOIL CEMENT 1-FT THICK X 8-FT WIDE FOR 1V:4H AND 1V:6H SLOPE AND 6-FT WIDE FOR 1V:3H SLOPES, STAGGERED OVERLAPPED LAYERS TO ACHIEVE SLOPES.

BUILD/PAY NOTES

201	CLEARING & GRUBBING: Compl.
210.6.1.1	ROUGH GRADING : Pond bottom area and areas outside the top of pond cut slopes, and outside the toe of dam slopes. Finished grades shall match plan grades or contours within 0.5 ft. Compl.
302	AGGREGATE BASE COURSE. Install 6-inch thick within areas shown on plans. CIP.
500	REINFORCED CONCRETE STRUCTURES: Colored reinforced concrete (4,000 psi) including all rebar, (principal spillway and concrete boxculvert). CIP
601.S1	SELECT BACKFILL MATERIAL : The Keyway Trench subgrade clay layer. All materials, the clay material, proper soil, and clay/soil mixing to obtain gradation, and subgrade preparation are included with this item. CIP.
601.S2	FILL SOIL : Fill soil material for dam embankment when obtained from within the limits of construction, includes, blending / mixing to obtain homogenous material / construction in lifts, rough & final grading of dam embankment slopes. CIP.
601.S3	UNCLASSIFIED EXCAVATION : Dispose of excess soil s off-site to SSCAFCA designated location within 6 mi radius, compaction not required. Compl.
603	RIP-RAP : Type M Rip-Rap (Std. Spec. Section 109 Table 109.A) Install 2 feet thick within areas shown on plans. Assume filter fabric is incidental to rip-rap. CIP.
1012.4.1	NATIVE SEEDS: All disturbed areas incuding pond bottom and pond side slopes, CIP.
1012.4.3	SANTA FE BROWN GRAVEL MULCH: All disturbed areas incuding pond bottom and pond side slopes, CIP.
G.S	Gate : Install 12 ft. square tube drainage gate, CIP.
F.S	FENONG : Install 5 strand barbless wood post fence, CIP.
SC.S	SOIL CEMENT : Includes all materials (portland cement, native soil) labor, equipment, and placement in 1-foot thick lifts. CIP.

CS.S	CONSTRUCTION STAKING : Includes topographic survey of overexcavated surface and final as-built survey preparation, Setting monuments on top of dam. Comp.
NP.S	NPDES PERMITTING : SWPPP preparation, implementation, monitoring, record keeping, including silt fencing (3 ft tall w/ 5-ft steel posts at 10 ft on center) and all BMPs including initial installation and and maintenance as required. CIP.
T.S	TESTING : Testing and Approval of all Soil Fill, concrete, soil cement, materials, compl.
PE.S	PROFESSIONAL GEOTECHNICAL ENGINEER : Professional Geotechnical Engineer for 2 hours / day during excavation, backfill and compaction of all soils work related to dam and box culvert construction. Compl.
MI.S	MOBILIZATION:
DM.S	DEMOBILIZATION:



SCALE: 1" = 50'

50' 0 50' 100 150' Feet

PREPARED FOR SSCAFCA

PRELIMINARY NOT FOR CONSTRUCTION

RV	

ADDENDUM 1

BLACK ARROYO WATERSHED MANAGEMENT PLAN

19TH AVE. POND CONCEPTUAL DESIGN

SMITH ENGINEERING COMPANY
NEW MEXICO TEXAS

JOB NO. 112138

DATE: June 2013

Q:\SEC----PROJECTS\2012 Projects\112138 SSCAFCA - 1, Black Arroyo\ENGINEERING\CADD\PLANSET\19 AVE POND GRADING.dwg Jun 26, 2013 - 8:20am Saved By: victorlen

Smith Engineering Company

J/2013

TABLE

19th Ave. POND (Proposed) OPTION 6

Elevation - Volume - Discharge Data and Computations

grey box means must input data

Description - Max. dam height = 19 ft. (5297-5278) Pond bottom slope = 0.5 %, Pond inside side slopes mainly 1V:4H. See below for Principal, Emergency and Outfall Pipe information. Outfall Conduit through dam embankment may be a 12' rise X 12' span or equilvalent. This was required to attain approximately 3 feet of freeboard to top of dam as requested by SSCAFCA.

Contour Elevation NAVD 1988	Depth	Contour Area	Incremental Volume	Incremental Volume	Cumulative Volume	(A) 1st Row of Reverse Incline Ports Discharge	(A) 2nd Row of Reverse Incline Ports Discharge	(A) Principal Spillway Grate Discharge	Principal Spillway Outfall 12' X 12' CBC Discharge	Total Principal Spillway / Outfall Pipe Discharge	Emergency Spillway Discharge	Total Discharge Rating Curve	Comment
		Principal Spillway Orifice Diameter (inches)				10	10		-----				
		Number of Orifices OR openings				24	24		1				
(ft)		(sq ft)	(cu ft)	(ac-ft)	(ac-ft)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
(d)						(a)	(a)	(b)	(c)	(e)	(b)		
5279	0	0	0	0.0000	0.0000	0.0	0.0	0.0	0	0.0	0.0	0	Pond bottom and principal spillway structure invert
5280	1	36,652	18,326	0.4207	0.4207	0.0	0.0	0.0	27	0.0	0.0	0	Highest Invert - 1st row of reverse incline ports
5281	2	117,745	77,199	1.7722	2.1929	62.0	0.0	0.0	77	62.0	0.0	62	
5282	3	176,244	146,995	3.3745	5.5675	87.6	0.0	0.0	141	87.6	0.0	88	Highest Invert - of 2nd row of reverse incline ports
5283	4	234,224	205,234	4.7115	10.2790	107.3	62.0	0.0	216	169.3	0.0	169	
5284	5	301,658	267,941	6.1511	16.4301	124.0	87.6	0.0	302	211.6	0.0	212	Top of principal spillway grate
5285	6	311,030	306,344	7.0327	23.4628	138.6	107.3	144.0	398	389.9	0.0	390	
5286	7	320,502	315,766	7.2490	30.7118	151.8	124.0	407.3	501	501.0	0.0	501	
5287	8	330,122	325,312	7.4681	38.1799	164.0	138.6	748.2	612	612.0	0.0	612	
5288	9	339,857	334,989	7.6903	45.8702	175.3	151.8	1,152.0	730	730.0	0.0	730	
5289	10	348,274	344,065	7.8987	53.7689	185.9	164.0	1,610.0	855	855.0	0.0	855	
5290	11	359,680	353,977	8.1262	61.8950	196.0	175.3	2,116.4	987	987.0	0.0	987	
5291	12	369,767	364,723	8.3729	70.2679	205.6	185.9	2,666.9	1125	1,125.0	0.0	1125	
5292	13	379,979	374,873	8.6059	78.8738	214.7	196.0	3,258.3	1268	1,268.0	0.0	1268	
5293	14	390,291	385,135	8.8415	87.7153	223.5	205.6	3,888.0	1417	1,417.0	0.0	1417	
5294	15	400,717	395,504	9.0795	96.7948	231.9	214.7	4,553.7	1572	1,572.0	0.0	1572	
5295	16	411,260	405,989	9.3202	106.1151	240.0	223.5	5,253.5	1731	1,731.0	0.0	1731	
5296	17	421,871	416,566	9.5630	115.6781	247.9	231.9	5,986.0	1896	1,896.0	0.0	1896	
5297	18	432,426	427,149	9.8060	125.4841	255.5	240.0	6,749.6	2007	2,007.0	0.0	2007	**Emergency spill. Elev. = lowest top of embankment (f)**
5298	19	432,427	432,426	9.9271	135.4112	262.9	247.9	7,543.2	2008	2,008.0	598.0	2606	
5299	20	432,428	432,427	9.9272	145.3384	270.2	255.5	8,365.6	2009	2,009.0	1,691.4	3700	
5300	21	432,429	432,428	9.9272	155.2656	277.2	262.9	9,216.0	2010	2,010.0	3,107.3	5117	

Orfice equation and coefficient C were obtained from Equation 4-10 and Table 4-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.

(a) $Q = Ca\sqrt{2gh}$ C = 0.590 g=32.2 ft/sec^2, a=area (sq ft) h=head (ft)

(a) $a = \pi D^2/4$ (full area formula)

(b) Emergency Spillway flows were computed based on the following data used in the weir equation

(b) Q = CLH^ 1.5 C = discharge coeffient, L = spillway length perp. to flow (ft), H = head (ft)

(b) Emergergency Spillway	C =	2.6	L =	230	Emer. Spill. Elev.=	5297
(b) Grate / Weir	C =	3	L =	48	El. 12' X18' grate	5284

(c) Rating curve obtained from Culvert Master and output is attached

(d) Data Source : Lidar Contours provided by SSCAFCA

(e) The combined discharge of the reverse incline ports and the grate (A), will govern the discharge until the principal spillway outfall pipe becomes fully submerged. When the sum of (A)s is greater than outfall pipe capacity then outfall pipe capacity governs the discharge

(b) Weir equation and "C" coefficients were obtained from Equation 5-10 and Table 5-3 from "Handbook of Hydraulics" Sixth Edition, by Brater & King, 1976.

(f) Length assumed along top of pond embankment and elevations extended above emergency spillway to allow for rating curve to function if flow spills over top

Table R

Rating Curve Parameters for 19th Ave Dam Outfall Pipe

Depth	Upstream Invert Elevation	Headwater Elevation	Downstream Invert Elevation	Tailwater Elevation	Length	Slope	Manning's 'n'	Pipe Size	Pipe Shape	Computed Discharge from Culvert Master for 1 Box Culvert
ft	ft	ft	ft	ft	ft	ft/ft		ft		cfs
	a	b	c	d	a	a				e
0	5279	5279	5275.5	5275.5	375	0.009	0.013	12 X 12	Box	0
1		5280		5276.2						27
2		5281		5276.8						77
3		5282		5277.5						141
4		5283		5278.2						216
5		5284		5278.8						302
6		5285		5279.5						398
7		5286		5280.2						501
8		5287		5280.8						612
9		5288		5281.5						730
10		5289		5282.2						855
11		5290		5282.8						987
12		5291		5283.5						1125
13		5292		5284.2						1268
14		5293		5284.8						1417
15		5294		5285.5						1572
16		5295		5286.2						1731
17		5296		5286.8						1896
18		5297		5287.5						2007

a- Based on SSCAFCA approved conceptual grading plan for 19th Ave Dam
b- Headwater elevation = depth + upstream invert elevation
c- Based on LOMR for West Branch Unser Box Culverts June,2009
d- Tailwater Elevation Assumption = (2/3*depth) + Downstream Invert Elevation
e- Based on Culvert Master calulations- see output in Appendix I

Culvert Calculator Report
1 ft HW

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	5,280.00	ft	Headwater Depth/Height	0.08	
Computed Headwater Elev	5,280.00	ft	Discharge	27.05	cfs
Inlet Control HW Elev.	5,279.84	ft	Tailwater Elevation	5,276.20	ft
Outlet Control HW Elev.	5,280.00	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	5,279.00	ft	Downstream Invert	5,275.50	ft
Length	375.00	ft	Constructed Slope	0.009333	ft/ft

Hydraulic Profile					
Profile	CompositeS1S2		Depth, Downstream	0.70	ft
Slope Type	Steep		Normal Depth	0.40	ft
Flow Regime	N/A		Critical Depth	0.54	ft
Velocity Downstream	3.22	ft/s	Critical Slope	0.003392	ft/ft

Section					
Section Shape	Box		Mannings Coefficient	0.013	
Section Material	Concrete		Span	12.00	ft
Section Size	12 x 12 ft		Rise	12.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,280.00	ft	Upstream Velocity Head	0.27	ft
Ke	0.70		Entrance Loss	0.19	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,279.84	ft	Flow Control	N/A	
Inlet Type	0° wingwall flares		Area Full	144.0	ft²
K	0.06100		HDS 5 Chart	8	
M	0.75000		HDS 5 Scale	3	
C	0.04230		Equation Form	1	
Y	0.82000				

Culvert Calculator Report
2 ft HW

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,281.00 ft	Headwater Depth/Height	0.17
Computed Headwater Elev	5,281.00 ft	Discharge	76.51 cfs
Inlet Control HW Elev.	5,280.75 ft	Tailwater Elevation	5,276.80 ft
Outlet Control HW Elev.	5,281.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	1.30 ft
Slope Type	Steep	Normal Depth	0.75 ft
Flow Regime	N/A	Critical Depth	1.08 ft
Velocity Downstream	4.90 ft/s	Critical Slope	0.002993 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 12 ft	Rise	12.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,281.00 ft	Upstream Velocity Head	0.54 ft
Ke	0.70	Entrance Loss	0.38 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,280.75 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	144.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Culvert Calculator Report
3ft HW

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,282.00 ft	Headwater Depth/Height	0.25
Computed Headwater Elev	5,282.00 ft	Discharge	140.56 cfs
Inlet Control HW Elev.	5,281.66 ft	Tailwater Elevation	5,277.50 ft
Outlet Control HW Elev.	5,282.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	2.00 ft
Slope Type	Steep	Normal Depth	1.11 ft
Flow Regime	N/A	Critical Depth	1.62 ft
Velocity Downstream	5.86 ft/s	Critical Slope	0.002884 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 12 ft	Rise	12.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,282.00 ft	Upstream Velocity Head	0.81 ft
Ke	0.70	Entrance Loss	0.57 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,281.66 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	144.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Culvert Calculator Report
4 ft HW

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,283.00 ft	Headwater Depth/Height	0.33
Computed Headwater Elev	5,283.00 ft	Discharge	216.40 cfs
Inlet Control HW Elev.	5,282.58 ft	Tailwater Elevation	5,278.20 ft
Outlet Control HW Elev.	5,283.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	2.70 ft
Slope Type	Steep	Normal Depth	1.46 ft
Flow Regime	N/A	Critical Depth	2.16 ft
Velocity Downstream	6.68 ft/s	Critical Slope	0.002871 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 12 ft	Rise	12.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,283.00 ft	Upstream Velocity Head	1.08 ft
Ke	0.70	Entrance Loss	0.76 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,282.58 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	144.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Culvert Calculator Report
5 ft HW

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,284.00 ft	Headwater Depth/Height	0.42
Computed Headwater Elev	5,284.00 ft	Discharge	302.43 cfs
Inlet Control HW Elev.	5,283.50 ft	Tailwater Elevation	5,278.80 ft
Outlet Control HW Elev.	5,284.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	3.30 ft
Slope Type	Steep	Normal Depth	1.82 ft
Flow Regime	N/A	Critical Depth	2.70 ft
Velocity Downstream	7.64 ft/s	Critical Slope	0.002903 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 12 ft	Rise	12.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,284.00 ft	Upstream Velocity Head	1.35 ft
Ke	0.70	Entrance Loss	0.95 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,283.50 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	144.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Culvert Calculator Report
6 ft HW

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,285.00 ft	Headwater Depth/Height	0.50
Computed Headwater Elev	5,285.00 ft	Discharge	397.56 cfs
Inlet Control HW Elev.	5,284.43 ft	Tailwater Elevation	5,279.50 ft
Outlet Control HW Elev.	5,285.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	4.00 ft
Slope Type	Steep	Normal Depth	2.19 ft
Flow Regime	N/A	Critical Depth	3.24 ft
Velocity Downstream	8.28 ft/s	Critical Slope	0.002960 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 12 ft	Rise	12.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,285.00 ft	Upstream Velocity Head	1.62 ft
Ke	0.70	Entrance Loss	1.14 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,284.43 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	144.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

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Culvert Calculator Report
7 ft HW

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	5,286.00	ft	Headwater Depth/Height	0.58	
Computed Headwater Elev	5,286.00	ft	Discharge	500.98	cfs
Inlet Control HW Elev.	5,285.35	ft	Tailwater Elevation	5,280.20	ft
Outlet Control HW Elev.	5,286.00	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	5,279.00	ft	Downstream Invert	5,275.50	ft
Length	375.00	ft	Constructed Slope	0.009333	ft/ft

Hydraulic Profile					
Profile	CompositeS1S2		Depth, Downstream	4.70	ft
Slope Type	Steep		Normal Depth	2.56	ft
Flow Regime	N/A		Critical Depth	3.78	ft
Velocity Downstream	8.88	ft/s	Critical Slope	0.003033	ft/ft

Section					
Section Shape	Box		Mannings Coefficient	0.013	
Section Material	Concrete		Span	12.00	ft
Section Size	12 x 12 ft		Rise	12.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,286.00	ft	Upstream Velocity Head	1.89	ft
Ke	0.70		Entrance Loss	1.32	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,285.35	ft	Flow Control	N/A	
Inlet Type	0° wingwall flares		Area Full	144.0	ft²
K	0.06100		HDS 5 Chart	8	
M	0.75000		HDS 5 Scale	3	
C	0.04230		Equation Form	1	
Y	0.82000				

Culvert Calculator Report
8 ft HW

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,287.00 ft	Headwater Depth/Height	0.67
Computed Headwater Elev	5,287.00 ft	Discharge	612.08 cfs
Inlet Control HW Elev.	5,286.28 ft	Tailwater Elevation	5,280.80 ft
Outlet Control HW Elev.	5,287.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	5.30 ft
Slope Type	Steep	Normal Depth	2.94 ft
Flow Regime	N/A	Critical Depth	4.32 ft
Velocity Downstream	9.62 ft/s	Critical Slope	0.003117 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 12 ft	Rise	12.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,287.00 ft	Upstream Velocity Head	2.16 ft
Ke	0.70	Entrance Loss	1.51 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,286.28 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	144.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Culvert Calculator Report
9 ft HW

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,288.00 ft	Headwater Depth/Height	1.00
Computed Headwater Elev	5,288.00 ft	Discharge	730.36 cfs
Inlet Control HW Elev.	5,287.27 ft	Tailwater Elevation	5,281.50 ft
Outlet Control HW Elev.	5,288.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	6.00 ft
Slope Type	Steep	Normal Depth	3.32 ft
Flow Regime	N/A	Critical Depth	4.86 ft
Velocity Downstream	10.14 ft/s	Critical Slope	0.003208 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 9 ft	Rise	9.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,288.00 ft	Upstream Velocity Head	2.43 ft
Ke	0.70	Entrance Loss	1.70 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,287.27 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	108.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Culvert Calculator Report
10 ft HW

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,289.00 ft	Headwater Depth/Height	0.83
Computed Headwater Elev	5,289.00 ft	Discharge	855.41 cfs
Inlet Control HW Elev.	5,288.15 ft	Tailwater Elevation	5,282.20 ft
Outlet Control HW Elev.	5,289.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	6.70 ft
Slope Type	Steep	Normal Depth	3.71 ft
Flow Regime	N/A	Critical Depth	5.41 ft
Velocity Downstream	10.64 ft/s	Critical Slope	0.003304 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 12 ft	Rise	12.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,289.00 ft	Upstream Velocity Head	2.70 ft
Ke	0.70	Entrance Loss	1.89 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,288.15 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	144.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Culvert Calculator Report
11 ft HW

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,290.00 ft	Headwater Depth/Height	0.92
Computed Headwater Elev	5,290.00 ft	Discharge	986.88 cfs
Inlet Control HW Elev.	5,289.08 ft	Tailwater Elevation	5,282.80 ft
Outlet Control HW Elev.	5,290.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	7.30 ft
Slope Type	Steep	Normal Depth	4.11 ft
Flow Regime	N/A	Critical Depth	5.95 ft
Velocity Downstream	11.27 ft/s	Critical Slope	0.003405 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 12 ft	Rise	12.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,290.00 ft	Upstream Velocity Head	2.97 ft
Ke	0.70	Entrance Loss	2.08 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,289.08 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	144.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Culvert Calculator Report
12 ft HW

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,291.00 ft	Headwater Depth/Height	1.00
Computed Headwater Elev	5,291.00 ft	Discharge	1,124.47 cfs
Inlet Control HW Elev.	5,290.02 ft	Tailwater Elevation	5,283.50 ft
Outlet Control HW Elev.	5,291.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	8.00 ft
Slope Type	Steep	Normal Depth	4.52 ft
Flow Regime	N/A	Critical Depth	6.49 ft
Velocity Downstream	11.71 ft/s	Critical Slope	0.003508 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 12 ft	Rise	12.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,291.00 ft	Upstream Velocity Head	3.24 ft
Ke	0.70	Entrance Loss	2.27 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,290.02 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	144.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Culvert Calculator Report
13 ft HW

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	5,292.00	ft	Headwater Depth/Height	1.08	
Computed Headwater Elev	5,292.00	ft	Discharge	1,267.92	cfs
Inlet Control HW Elev.	5,290.96	ft	Tailwater Elevation	5,284.20	ft
Outlet Control HW Elev.	5,292.00	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	5,279.00	ft	Downstream Invert	5,275.50	ft
Length	375.00	ft	Constructed Slope	0.009333	ft/ft

Hydraulic Profile					
Profile	CompositeS1S2		Depth, Downstream	8.70	ft
Slope Type	Steep		Normal Depth	4.93	ft
Flow Regime	N/A		Critical Depth	7.03	ft
Velocity Downstream	12.14	ft/s	Critical Slope	0.003615	ft/ft

Section					
Section Shape	Box		Mannings Coefficient	0.013	
Section Material	Concrete		Span	12.00	ft
Section Size	12 x 12 ft		Rise	12.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,292.00	ft	Upstream Velocity Head	3.51	ft
Ke	0.70		Entrance Loss	2.46	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,290.96	ft	Flow Control	N/A	
Inlet Type	0° wingwall flares		Area Full	144.0	ft²
K	0.06100		HDS 5 Chart	8	
M	0.75000		HDS 5 Scale	3	
C	0.04230		Equation Form	1	
Y	0.82000				

Culvert Calculator Report
14 ft HW

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,293.00 ft	Headwater Depth/Height	1.17
Computed Headwater Elev	5,293.00 ft	Discharge	1,416.99 cfs
Inlet Control HW Elev.	5,291.90 ft	Tailwater Elevation	5,284.80 ft
Outlet Control HW Elev.	5,293.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	9.30 ft
Slope Type	Steep	Normal Depth	5.35 ft
Flow Regime	N/A	Critical Depth	7.57 ft
Velocity Downstream	12.70 ft/s	Critical Slope	0.003723 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 12 ft	Rise	12.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,293.00 ft	Upstream Velocity Head	3.78 ft
Ke	0.70	Entrance Loss	2.65 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,291.90 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	144.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Culvert Calculator Report
15 ft HW

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	5,294.00	ft	Headwater Depth/Height	1.25	
Computed Headwater Elev	5,294.00	ft	Discharge	1,571.50	cfs
Inlet Control HW Elev.	5,292.84	ft	Tailwater Elevation	5,285.50	ft
Outlet Control HW Elev.	5,294.00	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	5,279.00	ft	Downstream Invert	5,275.50	ft
Length	375.00	ft	Constructed Slope	0.009333	ft/ft

Hydraulic Profile					
Profile	CompositeS1S2		Depth, Downstream	10.00	ft
Slope Type	Steep		Normal Depth	5.78	ft
Flow Regime	N/A		Critical Depth	8.11	ft
Velocity Downstream	13.10	ft/s	Critical Slope	0.003833	ft/ft

Section					
Section Shape	Box		Mannings Coefficient	0.013	
Section Material	Concrete		Span	12.00	ft
Section Size	12 x 12 ft		Rise	12.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,294.00	ft	Upstream Velocity Head	4.05	ft
Ke	0.70		Entrance Loss	2.84	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,292.84	ft	Flow Control	N/A	
Inlet Type	0° wingwall flares		Area Full	144.0	ft²
K	0.06100		HDS 5 Chart	8	
M	0.75000		HDS 5 Scale	3	
C	0.04230		Equation Form	1	
Y	0.82000				

Culvert Calculator Report
16 ft HW

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,295.00 ft	Headwater Depth/Height	1.33
Computed Headwater Elev	5,295.00 ft	Discharge	1,731.24 cfs
Inlet Control HW Elev.	5,293.78 ft	Tailwater Elevation	5,286.20 ft
Outlet Control HW Elev.	5,295.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	10.70 ft
Slope Type	Steep	Normal Depth	6.21 ft
Flow Regime	N/A	Critical Depth	8.65 ft
Velocity Downstream	13.48 ft/s	Critical Slope	0.003944 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 12 ft	Rise	12.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,295.00 ft	Upstream Velocity Head	4.32 ft
Ke	0.70	Entrance Loss	3.03 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,293.78 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	144.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

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Project Engineer: chrisn

Culvert Calculator Report
17 ft HW

olve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,296.00 ft	Headwater Depth/Height	1.42
Computed Headwater Elev	5,296.00 ft	Discharge	1,896.05 cfs
Inlet Control HW Elev.	5,295.69 ft	Tailwater Elevation	5,286.80 ft
Outlet Control HW Elev.	5,296.00 ft	Control Type	Entrance Control

Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	11.30 ft
Slope Type	Steep	Normal Depth	6.65 ft
Flow Regime	N/A	Critical Depth	9.19 ft
Velocity Downstream	13.98 ft/s	Critical Slope	0.004057 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 12 ft	Rise	12.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,296.00 ft	Upstream Velocity Head	4.59 ft
Ke	0.70	Entrance Loss	3.22 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,295.69 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	144.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		

Culvert Calculator Report
18 ft HW

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	5,297.00 ft	Headwater Depth/Height	1.50
Computed Headwater Elev	5,297.00 ft	Discharge	2,006.89 cfs
Inlet Control HW Elev.	5,297.00 ft	Tailwater Elevation	5,287.50 ft
Outlet Control HW Elev.	5,296.66 ft	Control Type	Inlet Control

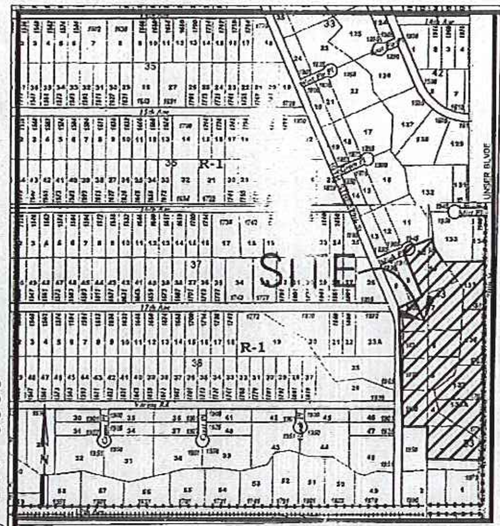
Grades			
Upstream Invert	5,279.00 ft	Downstream Invert	5,275.50 ft
Length	375.00 ft	Constructed Slope	0.009333 ft/ft

Hydraulic Profile			
Profile	CompositeS1S2	Depth, Downstream	7.42 ft
Slope Type	Steep	Normal Depth	6.95 ft
Flow Regime	N/A	Critical Depth	9.54 ft
Velocity Downstream	22.54 ft/s	Critical Slope	0.004131 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	12.00 ft
Section Size	12 x 12 ft	Rise	12.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	5,296.66 ft	Upstream Velocity Head	4.77 ft
Ke	0.70	Entrance Loss	3.34 ft

Inlet Control Properties			
Inlet Control HW Elev.	5,297.00 ft	Flow Control	N/A
Inlet Type	0° wingwall flares	Area Full	144.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	3
C	0.04230	Equation Form	1
Y	0.82000		



VICINITY MAP   ZONE ATL. MAP 37 & 38
NOT TO SCALE

NOTES

1. BASIS OF BEARINGS FOR THIS SURVEY IS THE VECTORS, INC. GPS REAL TIME NETWORK. BEARINGS ARE NEW MEXICO STATE PLANE GRID BEARINGS (CENTR'L ZONE, NAD 83): DISTANCES ARE GROUND DISTANCES.

2. BEARINGS AND DISTANCES SHOWN ON THIS SURVEY IN PARENTHESIS ( ) ARE PER THE RIO RANCHO ESTATES PLAT OF UNIT 10 FILED ON MAY 6, 1968, IN BOOK 1, PAGE 73.

3. BEARING AND DISTANCES SHOWN ON THIS SURVEY IN BRACKETS [ ] ARE PER THE SUMMARY PLAT OF LOTS 1-A,3-A,138-A AND LOT A, RIO RANCHO ESTATES UNIT 10 FILED ON JUNE 17, 1994, PLAT IN BOOK 7, PAGE 44.

4. DOCUMENTS USED:
   a. PLAT OF RIO RANCHO ESTATE UNIT 10, FILED ON MAY 6, 1966, IN BOOK 1, PAGE 73.
   b. SUMMARY PLAT OF LOTS 1-A, 3-A, 138-A AND LOT A, BLOCK 33, RIO RANCHO ESTATES UNIT 10. FILED JUNE 17, 1994, IN BOOK 7, PAGE 49.
   c. SUMMARY PLAT OF LOTS 1-A-1 AND 2-A, BLOCK 33, RIO RANCHO ESTATES UNIT 10, CREATED BY COMMUNITY SCIENCES CORPORATION, OCTOBER, 2008.
   d. PLAT OF LOT A 19TH AVENUE DAM RIO RANCHO ESTATES UNIT 1 FILED MAY 24, 2011, IN BOOK 3, PAGE 3378.

CONSENT STATEMENT

The undersigned owners and proprietors of the properties represented hereon do hereby certify and affirm that this replat is created with our free will and consent in accordance with our expressed wishes and desires, and do hereby grant new Public Utility Easements and vacate existing drainage and utility easements and lot lines as shown hereon.

by: [signature]   12-20-11
CHARLES THOMAS   Date
S.S.C.A.F.C.A. EXECUTIVE ENGINEER

ACKNOWLEDGEMENT

State of New Mexico }
County of Sandoval } ss

This instrument was acknowledged before me this 20th day of December, 2011,

by: Charles Thomas

Thomas W Patrick
Notary Public

OFFICIAL SEAL
THOMAS W. PATRICK
NOTARY PUBLIC-STATE OF NEW MEXICO
My commission expires 10-06-2014

My Commission Expires: 10-06-2014

JURISDICTIONAL AFFIDAVIT:

I, THOMAS W. PATRICK, NEW MEXICO PROFESSIONAL SURVEYOR NO. 12651, HEREBY AFFIRM THAT THE PROPERTY DESCRIBED DOES LIE WITHIN THE PLATTING AND SUBDIVISION JURISDICTION OF THE CITY OF RIO RANCHO.

Thomas W Patrick   12-20-2011
THOMAS W. PATRICK,   DATE
NEW MEXICO PROFESSIONAL SURVEYOR NO. 12651

SURVEYOR'S CERTIFICATION:

I, THOMAS W. PATRICK, NEW MEXICO PROFESSIONAL SURVEYOR NO. 12651, HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM AN ACTUAL GROUND SURVEY PERFORMED BY ME OR UNDER MY SUPERVISION, THAT I AM RESPONSIBLE FOR THIS PLAT AND THAT THIS PLAT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THIS PLAT CONFORMS TO THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO AS ADOPTED BY THE NEW MEXICO BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND SURVEYORS AND TO THE CITY OF RIO RANCHO SUBDIVISION ORDINANCE.

Thomas W Patrick   12-20-2011
THOMAS W. PATRICK,   DATE
NEW MEXICO PROFESSIONAL SURVEYOR NO. 12651

THOMAS W. PATRICK — NEW MEXICO — 12651 — LICENSED PROFESSIONAL SURVEYOR

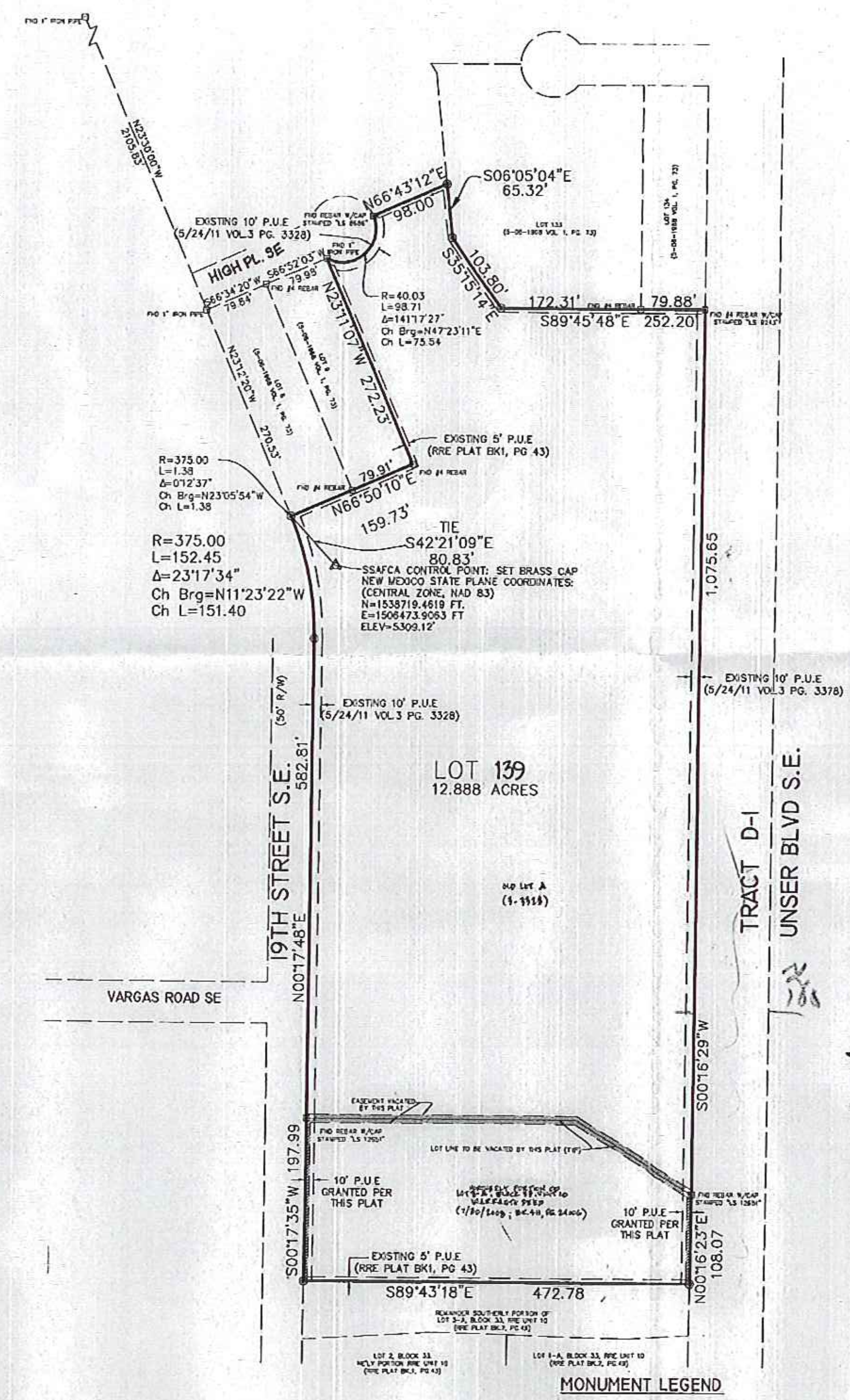
SUBJECT PROPERTY DESCRIPTION

LOT A, RIO RANCHO ESTATE UNIT 10, AS THE SAME ARE SHOWN AND DESIGNATED ON THE PLAT THEREOF FILED IN THE OFFICE OF THE COUNTY CLERK OF SANDOVAL COUNTY, NEW MEXICO, ON MAY 24, 2011, PLAT BOOK 3, PAGE 3328.
AND THAT NORTHERLY PORTION OF
LOT 3-A, BLOCK 33 RIO RANCHO ESTATES, AS THE SAME IS SHOWN AND DESIGNATED ON THE PLAT THEREOF FILED IN THE OFFICE OF THE COUNTY CLERK OF SANDOVAL COUNTY, NEW MEXICO ON JUNE 17, 1994, PLAT BOOK 7, PAGE 49, SAID NORTHERLY PORTION BEING CONVEYED TO SSCAFCA BY WARRANTY DEED RECORDED JULY 30, 2008 IN BK411, PG 24006.

CONTAINS 12.888 ACRES, MORE OR LESS.

DISCLOSURE STATEMENT:

THE PURPOSE OF THIS PLAT IS TO COMBINE 2 EXISTING LOTS INTO ONE NEW LOT, TO GRANT NEW PUBLIC UTILITY EASEMENT AND TO VACATE EXISTING DRAINAGE AND UTILITY EASEMENTS AND EXISTING LOT LINES AS SHOWN HEREON.



PUBLIC UTILITY EASEMENTS

PUBLIC UTILITY EASEMENTS shown on this plat are granted for the common and joint use of:

1. New Mexico Gas Company for installation, maintenance and service of natural gas lines, valves and other equipment and facilities reasonably necessary to provide natural gas.
2. Public Service Company of New Mexico for the installation, maintenance, and service of overhead and underground electrical lines, transformers, and other equipment, fixtures, structures and related facilities reasonable necessary to provide electrical service.
3. Qwest for installation, maintenance and service of all buried and aerial communication lines and other related equipment and facilities reasonably necessary to provide communication services, including but not limited to above ground pedestals and closures.
4. Cable TV for installation, maintenance and service of such lines, cable and other related equipment and facilities reasonably necessary to provide Cable TV service.

Included, is the right to build, rebuild, construct, reconstruct, locate, relocate, change, remove, modify, renew, operate and maintain facilities for the purposes described above, together with free access to, from, and over said right of way and easement, with the right and privilege of going upon, over and across adjoining lands of Grantor for the purposes set forth herein and with the right to utilize the right of way and easement to extend services to customers of Grantee, and to trim and remove trees, shrubs or bushes which interfere with the purposes set forth herein. No building, sign, pool (above ground or subsurface), hot tub, concrete or wood pool decking, or other structure shall be erected or constructed on said easements, nor shall any well be drilled or operated thereon.

Disclaimer

In approving this plat, the utility companies did not conduct a Title Search of the properties shown hereon. Consequently, the utility companies do not waive or release any easement or easement rights which may have been granted by prior plat, replat or other document and which are not shown on this plat.

New Mexico Gas Company Easement Release Approval

New Mexico Gas Company, Inc., a Delaware corporation, does hereby release, waive quitclaim and discharge its right, title and interest in the easement(s) (granted by prior plat, replat or document) shown to be vacated on this plat.

New Mexico Gas Company

By: [signature]

State of New Mexico
County of Bernalillo

This instrument was acknowledged before me on DECEMBER 15, 2011.

My Commission Expires: 03-25-2013

OFFICIAL SEAL
Brandon Kauffman
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires 03-25-2013

Notary Public

STATE OF NEW MEXICO) SS.
COUNTY OF SANDOVAL)

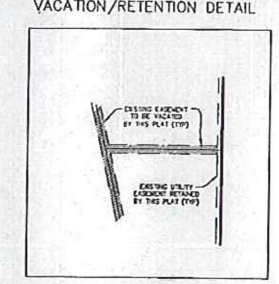
THIS INSTRUMENT WAS FILED FOR RECORD ON THIS 16th DAY OF February, 2012 AT 12:35 P M,

RECORDED IN VOLUME 3, FOLIO 3422 OF RECORDS OF SANDOVAL COUNTY.

[signature]
COUNTY CLERK AND RECORDER

BY: [signature]

TYPICAL UTILITY EASEMENT
VACATION/RETENTION DETAIL



MONUMENT LEGEND

- FOUND MONUMENT AS NOTED
- SET #5 REBAR W/2" ALUMINUM CAP STAMPED "CSC PS12651"

SCALE: 1"= 100'

BOOK 24, PAGE 42

SUMMARY PLAT OF LOT 139 S.S.C.A.F.C.A. 19TH AVENUE DAM RIO RANCHO ESTATES UNIT 10

BEING A REPLAT OF
LOT A AND THE NORTHERLY PORTION OF LOT 3-A, BLOCK 33
RIO RANCHO ESTATES, UNIT 10

SITUATE WITHIN
TOWN OF ALAMEDA GRANT
CITY OF RIO RANCHO
SANDOVAL COUNTY, NEW MEXICO
SEPTEMBER, 2011

SITE DATA

CASE NUMBERS	12-200-00004
FEMA MAP NO.	35043C2102 D
FLOOD ZONE DESIGNATION	ZONE "X"
ZONING	R-1
MILES OF DEDICATED RIGHT OF WAY CREATED	NONE
NO. OF EXISTING LOTS	2
NO. OF LOTS CREATED	1
TOTAL AREA	12.888 ACRES
ACREAGE OF DEDICATED RIGHT-OF-WAY	N/A
PROPOSED LAND USE	R-1

2012P00419 02/16/2012 12:35:44 PM P: 3422
PLAT Pg 1 of 1
Sally G. Padilla, Sandoval County Clerk

UTILITY APPROVALS

PNM ELECTRIC SERVICES	12-14-11 DATE
NEW MEXICO GAS COMPANY	12-15-2011 DATE
CABLEONE	12-15-11 DATE
QWEST CORPORATION d/b/a CENTURYLINK QC	12.14.11 DATE
CITY OF RIO RANCHO	2-13-12 DATE

RIO RANCHO DEVELOPMENT SERVICES DEPARTMENT

APPROVED THIS 13 DAY OF FEBRUARY, 2011.

DIRECTOR

CITY CLERKS CERTIFICATE

I, ROMAN MONTOYA, CITY CLERK OF THE CITY OF RIO RANCHO, NEW MEXICO DO HEREBY CERTIFY THAT THE PLAT SHOWN HEREON WAS APPROVED ADMINISTRATIVELY BY THE CITY OF RIO RANCHO DEVELOPMENT SERVICES DEPARTMENT DIRECTOR ON

THIS 14th DAY OF February 2012.

By: [signature]

TREASURER'S CERTIFICATE

I, Lorraine Dominguez TREASURER OF SANDOVAL COUNTY, NEW MEXICO DO HEREBY CERTIFY THAT THE PREVIOUS TEN (10) YEARS PROPERTY TAXES HAVE BEEN PAID IN FULL.

By: SANDOVAL COUNTY TREASURER   2/16/12 DATE

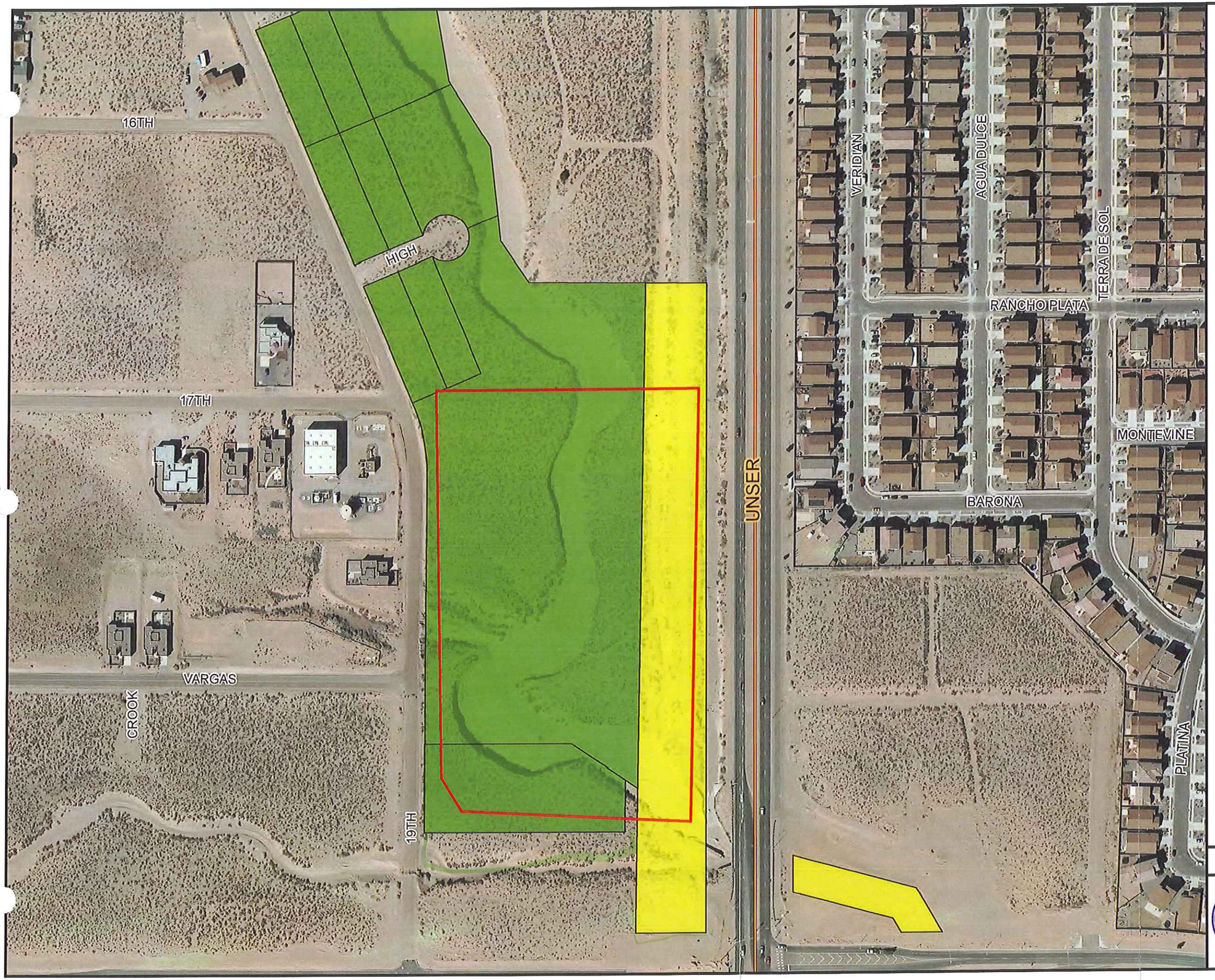
SHEET 1 OF 1

SUMMARY PLAT
LOT 139
19TH AVENUE DAM
RIO RANCHO ESTATES UNIT 10

DATE: 09/29/11
SCALE: 1"= 100'
DRAWN: SLH/TWP
JOB NO.: N337-01-600

community sciences corporation
LAND PLANNING · ENGINEERING · SURVEYING
P.O.Box 1328 Corrales, N.M. 87048 (505)897-0000

F:\N367 SPRINGER\01 REPLAT OF 19TH AVE. PLAT\SURVEY\REPLAT OF 19TH AVE PLAT 2011.DWG



Legend

- SSCAFCA Fee Simple
- SSCAFCA Easement

N

1 inch = 200 feet

0 100 200 Feet

ROW

Southern Sandoval County Arroyo Flood Control Authority

Date: November 2012

Figure 1 of 1

Path: C:\Users\gschoener\Desktop\ROW_temp.mxd

HEC-HMS Output for

Existing Conditions

Detention Pond Routings

Project: Tp Model
Simulation Run: Run 1 Reservoir: Wallen Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	Existing Conditions
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:11:25	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	18.6 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:30
Peak Outflow :	1.0 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:09
Total Inflow :	0.5685 (AC-FT)	Peak Storage :	0.4589 (AC-FT)
Total Outflow :	0.5676 (AC-FT)	Peak Elevation :	5657.12 (FT)

Project: Tp Model

Simulation Run: Run 1 Reservoir: Sunset Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	Existing Conditions
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:11:25	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	296.8 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:36
Peak Outflow :	34.6 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:21
Total Inflow :	15.1475 (AC-FT)	Peak Storage :	9.2063 (AC-FT)
Total Outflow :	15.1470 (AC-FT)	Peak Elevation :	5617.06 (FT)

Project: Tp Model

Simulation Run: Run 1 Reservoir: Sugar Ridge Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	Existing Conditions
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:11:25	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	105.2 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:30
Peak Outflow :	93.8 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 10:36
Total Inflow :	5.1478 (AC-FT)	Peak Storage :	1.2368 (AC-FT)
Total Outflow :	4.6488 (AC-FT)	Peak Elevation :	5567.36 (FT)

Project: Tp Model

Simulation Run: Run 1 Reservoir: Wexford Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	Existing Conditions
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:11:25	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	368.3 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:36
Peak Outflow :	135.3 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:06
Total Inflow :	27.7897 (AC-FT)	Peak Storage :	9.2655 (AC-FT)
Total Outflow :	27.7879 (AC-FT)	Peak Elevation :	40.04 (FT)

Project: Tp Model
Simulation Run: Run 1 Reservoir: Gateway Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	Existing Conditions
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:11:25	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	503.4 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:33
Peak Outflow :	264.5 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 10:45
Total Inflow :	19.3400 (AC-FT)	Peak Storage :	6.4103 (AC-FT)
Total Outflow :	19.3330 (AC-FT)	Peak Elevation :	5267.34 (FT)

Project: Tp Model
Simulation Run: Run 1 Reservoir: Tract 17 Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	Existing Conditions
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:11:25	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	620.0 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:39
Peak Outflow :	403.6 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 10:54
Total Inflow :	45.5576 (AC-FT)	Peak Storage :	10.5393 (AC-FT)
Total Outflow :	44.3973 (AC-FT)	Peak Elevation :	5274.79 (FT)

Project: Tp Model

Simulation Run: Run 1 Reservoir: Stonebridge Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	Existing Conditions
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:11:25	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	150.1 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:33
Peak Outflow :	29.3 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:06
Total Inflow :	7.7799 (AC-FT)	Peak Storage :	3.9985 (AC-FT)
Total Outflow :	7.7509 (AC-FT)	Peak Elevation :	5249.86 (FT)

Project: Tp Model
Simulation Run: Run 1 Reservoir: BLACK DAM

Start of Run:	01Nov2012, 09:00	Basin Model:	Existing Conditions
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	21Aug2013, 17:34:49	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	8539.2 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:48
Peak Outflow :	3045.2 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:24
Total Inflow :	709.3905 (AC-FT)	Peak Storage :	286.6820 (AC-FT)
Total Outflow :	708.1810 (AC-FT)	Peak Elevation :	5165.61 (FT)

Project: Tp Model
Simulation Run: Run 1 Sink: 19th Ave. Ret. Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	Existing Conditions
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:11:25	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Outflow :	691.9 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 10:39
Total Outflow :	43.9782 (AC-FT)		

HEC-HMS Output for

DEVEX Conditions

Detention Pond Routings

Project: Tp Model
Simulation Run: Run 1 Reservoir: Sunset Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	DEVEX
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:13:17	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	349.4 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:36
Peak Outflow :	36.5 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:21
Total Inflow :	20.3148 (AC-FT)	Peak Storage :	11.8589 (AC-FT)
Total Outflow :	20.3244 (AC-FT)	Peak Elevation :	5618.35 (FT)

Project: Tp Model
Simulation Run: Run 1 Reservoir: Wallen Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	DEVEX
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:13:17	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	31.5 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:30
Peak Outflow :	1.5 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:12
Total Inflow :	1.3603 (AC-FT)	Peak Storage :	0.9634 (AC-FT)
Total Outflow :	1.3537 (AC-FT)	Peak Elevation :	5658.41 (FT)

Project: Tp Model

Simulation Run: Run 1 Reservoir: Sugar Ridge Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	DEVEX
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:13:17	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	**130.9 (CFS)**	**Date/Time of Peak Inflow :**	**01Nov2012, 10:33**
Peak Outflow :	**119.6 (CFS)**	**Date/Time of Peak Outflow :**	**01Nov2012, 10:36**
Total Inflow :	**5.2215 (AC-FT)**	**Peak Storage :**	**1.3191 (AC-FT)**
Total Outflow :	**4.7223 (AC-FT)**	**Peak Elevation :**	**5567.61 (FT)**

Project: Tp Model
Simulation Run: Run 1 Reservoir: Wexford Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	DEVEX
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:13:17	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	368.3 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:36
Peak Outflow :	135.2 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:06
Total Inflow :	27.6672 (AC-FT)	Peak Storage :	9.2614 (AC-FT)
Total Outflow :	27.6653 (AC-FT)	Peak Elevation :	40.03 (FT)

Project: Tp Model
Simulation Run: Run 1 Reservoir: Tract 17 Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	DEVEX
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:13:17	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	683.5 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:36
Peak Outflow :	420.1 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 10:54
Total Inflow :	50.7490 (AC-FT)	Peak Storage :	12.1417 (AC-FT)
Total Outflow :	49.5170 (AC-FT)	Peak Elevation :	5275.52 (FT)

Project: Tp Model
Simulation Run: Run 1 Reservoir: Gateway Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	DEVEX
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:13:17	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	783.1 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:33
Peak Outflow :	345.3 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 10:51
Total Inflow :	42.8537 (AC-FT)	Peak Storage :	12.8145 (AC-FT)
Total Outflow :	42.8100 (AC-FT)	Peak Elevation :	5269.16 (FT)

Project: Tp Model
Simulation Run: Run 1 Reservoir: Stonebridge Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	DEVEX
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 14:13:17	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	161.3 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:33
Peak Outflow :	49.1 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 10:57
Total Inflow :	8.7817 (AC-FT)	Peak Storage :	4.2745 (AC-FT)
Total Outflow :	8.7462 (AC-FT)	Peak Elevation :	5250.04 (FT)

Project: Tp Model
Simulation Run: Run 1 Reservoir: BLACK DAM

Start of Run:	01Nov2012, 09:00	Basin Model:	DEVEX
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	21Aug2013, 17:09:05	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	9863.6 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:48
Peak Outflow :	4649.3 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:15
Total Inflow :	867.4591 (AC-FT)	Peak Storage :	328.3439 (AC-FT)
Total Outflow :	865.7380 (AC-FT)	Peak Elevation :	5167.33 (FT)

HEC-HMS Output for

Ultimate Conditions

Detention Pond Routings

Project: Tp Model
Simulation Run: 100yr-24hr Reservoir: LISBON

Start of Run:	01Nov2012, 09:00	Basin Model:	Ultimate 3
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 16:19:00	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	754.8 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:39
Peak Outflow :	73.9 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:27
Total Inflow :	41.8619 (AC-FT)	Peak Storage :	27.7657 (AC-FT)
Total Outflow :	41.1739 (AC-FT)	Peak Elevation :	5598.96 (FT)

Project: Tp Model
Simulation Run: 500yr-24hr Reservoir: LISBON

Start of Run:	01Nov2012, 09:00	Basin Model:	Ultimate 3
End of Run:	02Nov2012, 09:00	Meteorologic Model:	500yr-24hr
Compute Time:	30May2013, 16:19:35	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	1088.7 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:39
Peak Outflow :	221.8 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:15
Total Inflow :	58.7775 (AC-FT)	Peak Storage :	39.5777 (AC-FT)
Total Outflow :	58.0762 (AC-FT)	Peak Elevation :	5601.65 (FT)

Project: Tp Model
Simulation Run: 100yr-24hr Reservoir: SUGAR POND

Start of Run:	01Nov2012, 09:00	Basin Model:	Ultimate 3
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 16:19:00	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	121.8 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:33
Peak Outflow :	37.2 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 10:54
Total Inflow :	6.9582 (AC-FT)	Peak Storage :	2.6549 (AC-FT)
Total Outflow :	6.8791 (AC-FT)	Peak Elevation :	5640.39 (FT)

Project: Tp Model
Simulation Run: 500yr-24hr Reservoir: SUGAR POND

Start of Run:	01Nov2012, 09:00	Basin Model:	Ultimate 3
End of Run:	02Nov2012, 09:00	Meteorologic Model:	500yr-24hr
Compute Time:	30May2013, 16:19:35	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	170.1 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:33
Peak Outflow :	42.1 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:00
Total Inflow :	9.6154 (AC-FT)	Peak Storage :	4.1769 (AC-FT)
Total Outflow :	9.5310 (AC-FT)	Peak Elevation :	5642.03 (FT)

Project: Tp Model
Simulation Run: 100yr-24hr Reservoir: 19th Ave Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	Ultimate 3
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	30May2013, 16:19:00	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	3407.8 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:48
Peak Outflow :	1499.3 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:12
Total Inflow :	288.4143 (AC-FT)	Peak Storage :	92.5388 (AC-FT)
Total Outflow :	287.5536 (AC-FT)	Peak Elevation :	5293.53 (FT)

Project: Tp Model

Simulation Run: 500yr-24hr Reservoir: 19th Ave Pond

Start of Run:	01Nov2012, 09:00	Basin Model:	Ultimate 3
End of Run:	02Nov2012, 09:00	Meteorologic Model:	500yr-24hr
Compute Time:	30May2013, 16:19:35	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	4983.4 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:45
Peak Outflow :	2421.4 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:09
Total Inflow :	401.4429 (AC-FT)	Peak Storage :	132.3510 (AC-FT)
Total Outflow :	400.5521 (AC-FT)	Peak Elevation :	5297.69 (FT)

Project: Tp Model
Simulation Run: 100yr-24hr Reservoir: BLACK DAM

Start of Run:	01Nov2012, 09:00	Basin Model:	Ultimate 3
End of Run:	02Nov2012, 09:00	Meteorologic Model:	100yr-24hr
Compute Time:	21Aug2013, 17:14:42	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	6923.0 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:45
Peak Outflow :	2955.6 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:30
Total Inflow :	865.8519 (AC-FT)	Peak Storage :	265.8398 (AC-FT)
Total Outflow :	864.1184 (AC-FT)	Peak Elevation :	5164.73 (FT)

Project: Tp Model

Simulation Run: 500yr-24hr Reservoir: BLACK DAM

Start of Run:	01Nov2012, 09:00	Basin Model:	Ultimate.3
End of Run:	02Nov2012, 09:00	Meteorologic Model:	500yr-24hr
Compute Time:	21Aug2013, 17:15:18	Control Specifications:	Control 1

Volume Units: AC-FT

Computed Results

Peak Inflow :	9497.5 (CFS)	Date/Time of Peak Inflow :	01Nov2012, 10:45
Peak Outflow :	5685.9 (CFS)	Date/Time of Peak Outflow :	01Nov2012, 11:18
Total Inflow :	1156.2996 (AC-FT)	Peak Storage :	345.4586 (AC-FT)
Total Outflow :	1154.4623 (AC-FT)	Peak Elevation :	5168.02 (FT)