CITY OF ALBUQUERQUE

Planning Department
David Campbell, Director

Mayor Timothy M. Keller

December 19, 2018

David Soule, P.E.
Rio Grande Engineering
PO Box 93924
Albuquerque, NM 87199

RE: **TPS Hotel at IPCC**
1015 Indian School NE
Grading Plan Stamp Date: 12/15/18
Drainage Report Stamp Date: 12/15/18
Drainage File: H13D112

Dear Mr. Soule:

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Based on the submittal received on 12/26/18, the grading plan and drainage report cannot be approved until the following are corrected:

1. With AHYMO S4, be sure to use NOAA Atlas 14 precipitation depths in conjunction with the NOAA Atlas 14 distribution. Include the location map and tables obtained from the NOAA website.

2. The 3” and 4” orifice plates seem to be flipped in the orifice plate excel table vs the AHYMO model. There also doesn’t seem to be any application for the 4” orifice plate; please recheck and remove if so.

3. Total head loss for the pump station needs to be calculated using Hazen-Williams. What is the outfall elevation for this system? The street elevation at the 9th St inlet is likely sufficient. Please provide legible pump curves and tables from the manufacturer along with your performance curve based on the total head loss.

4. The performance of the entire system needs to be evaluated for three cases: the existing lift station pumping alone, the new pump station pumping alone, and both stations pumping together. Ensure that cleaning velocities are maintained and neither pump reaches shutoff head. Provide system curves for each.

5. The backflow preventers at the junction are unnecessary as each pump has a check valve at its wet well.

6. Ensure any clean-outs are sealed against back pressure, unless you can show that the HGL remains below grade.

7. Provide a design for the wet well and electric control box (specifying pump on, pump off, and alarm) ensuring adequate depth and room for the drawdown, controls, and appurtenances.

8. This project requires an ESC Plan, submitted to the Stormwater Quality Engineer (Curtis Cherne PE, ccherne@cabq.gov or 924-3420).

If you have any questions, please contact me at 924-3695 or dpeterson@cabq.gov.

Sincerely,

Dana Peterson, P.E.
Senior Engineer, Planning Dept.
Development Review Services

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 6/2018)

Project Title: TPS at IPPCC Building Permit #:_____ Hydrology File #: _____

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

Legal Description: A PORTION OF TRACT 84e MRGCD MAP 35 AND ADJ VACATTED 9TH ST

City Address: 1015 INDIAN SCHOOL

Applicant: MARK THOMPSON-IPCC/IPMI Contact: _____

Address: _____

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

Other Contact: RIO GRANDE ENGINEERING Contact: DAVID SOULE

Address: PO BOX 93924 ALB NM 87199

Phone#: 505.321.9099 Fax#: 505.872.0999 E-mail: david@riograndeengineering.com

TYPE OF DEVELOPMENT: ___ PLAT ___ RESIDENCE ___ DRB SITE X ADMIN SITE

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE

___ TRAFFIC/ TRANSPORTATION

TYPE OF SUBMITTAL:

___ ENGINEER/ARCHITECT CERTIFICATION

___ PAD CERTIFICATION

___ CONCEPTUAL G & D PLAN

X GRADING PLAN

___ DRAINAGE REPORT

___ DRAINAGE MASTER PLAN

___ FLOODPLAIN DEVELOPMENT PERMIT APPLIC

___ ELEVATION CERTIFICATE

___ CLOMR/LOMR

___ TRAFFIC CIRCULATION LAYOUT (TCL)

___ TRAFFIC IMPACT STUDY (TIS)

___ STREET LIGHT LAYOUT

___ OTHER (SPECIFY) _____

___ PRE-DESIGN MEETING?

IS THIS A RESUBMITTAL?: ___ Yes X No

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

X BUILDING PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY

___ PRELIMINARY PLAT APPROVAL

___ SITE PLAN FOR SUB'D APPROVAL

___ SITE PLAN FOR BLDG. PERMIT APPROVAL

___ FINAL PLAT APPROVAL

___ SIA/ RELEASE OF FINANCIAL GUARANTEE

X FOUNDATION PERMIT APPROVAL

X GRADING PERMIT APPROVAL

___ SO-19 APPROVAL

___ PAVING PERMIT APPROVAL

___ GRADING/ PAD CERTIFICATION

___ WORK ORDER APPROVAL

___ CLOMR/LOMR

___ FLOODPLAIN DEVELOPMENT PERMIT

___ OTHER (SPECIFY) _____

DATE SUBMITTED: _____ By: _____

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED:_____

FEE PAID:_____

DRAINAGE REPORT

For

TOWNPLACE SUITES HOTEL AT INDIAN PUEBLO CULTURAL CENTER

Albuquerque, New Mexico

Prepared by

Rio Grande Engineering
PO Box 93924
Albuquerque, New Mexico 87194

December 2018

David Soule P.E. No. 14522

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Site Hydrology(AHYMO/BASIN MAP) ..... A

Map Pocket
Site Grading and Drainage Plan

PURPOSE

The purpose of this report is to provide the Drainage Management Plan for the development of a hotel located within the Indian Pueblo Cultural Center property. The site is located on the north ease corner of Eagle Way NW and turquoise Road. The site is part of a larger overall development. This plan was prepared in accordance with the City of Albuquerque design regulations, utilizing the City of Albuquerque's Development Process Manual drainage guidelines. This report will demonstrate that the proposed development does not adversely affect the surrounding properties, nor the upstream or downstream facilities.

INTRODUCTION

The subject of this report, as shown on the Exhibit A, is a 2.53-acre portion of and overall 47.4 acre parcel that has been developed in phases. A master drainage plan for the entire site is not locatable within the City files. Based upon the narrative in approved grading plan for the previous phase (H13D106, H16D098A, H13D106), each phase collects the developed storm water at an inlet/lift station and discharges to the city storm drain located east of the site within 9th street. This storm drain discharges to the public line in Menaul. Since there is no overall discharge rates published within a master drainage plan for the property, the site discharge shall be limited to native conditions as approved within the previous phases will be utilized. The site will drain to a new lift station and discharge to the existing force main at a rate significantly less than native conditions.

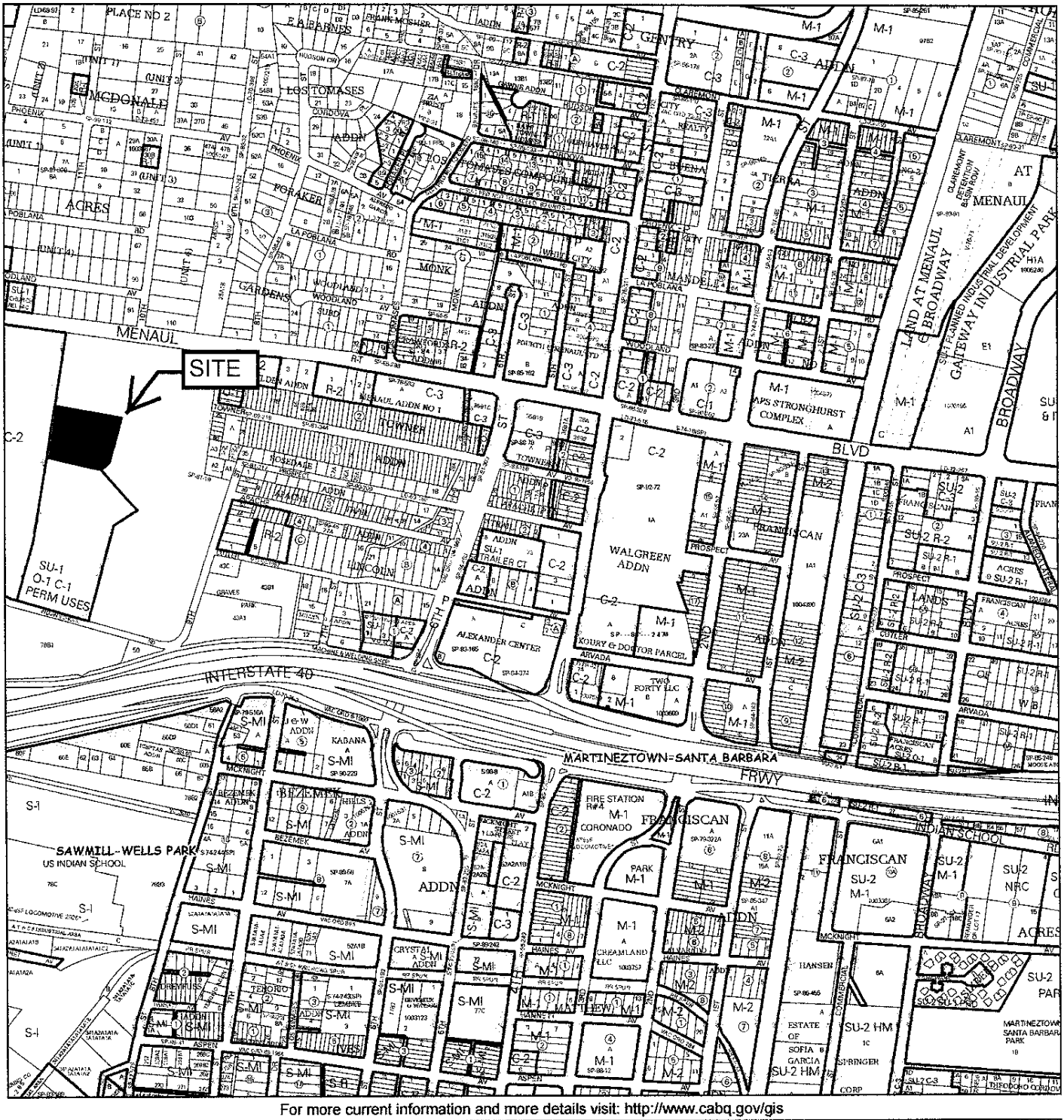
EXISTING CONDITIONS

The site is currently undeveloped, yet has been graded and developed in the past. The site is impacted by 9.51 cfs offsite flows from the surrounding roads as shown in drainage file H13D106, based upon AHYMO model the rate is updated to be 8.06 cfs. This site currently retains the entire developed flow. The site is bisected by a force main from the west. This force

main discharges 1.99 cfs from western portion of this development to an inlet on 9th street as shown in Drainage file H13D106. The site is not impacted by offsite flows, and is surrounded by developed properties and undeveloped land that drains to the east. The site discharges to the existing retention pond. As shown in Appendix A, the existing site, including the adjacent roadway discharges at a peak rate of 6.61cfs in a 100-year, 6-hour event in the native undeveloped condition. Since the site has been developed in the past and include roadways that are paved and a retention pond, the native condition will be used as the base line for any development that will discharge.

PROPOSED CONDITIONS

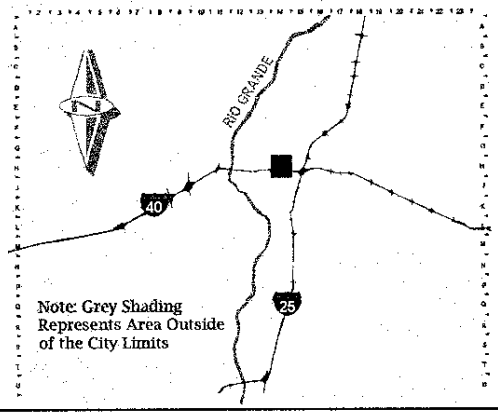
The proposed improvements consist of a Hotel and associated parking area. The site will be graded to create 2 basins. Basin A contains the north half of the buildings and the parking areas. This basin generates 5.51 cfs that will drain to a water harvest pond islands located within the parking area. The flows are captured by inlets and are conveyed to the main pond by a 12" storm drain. The outfall is restricted by a 4" orifice plate placed on the last inlet. The parking lot functions as a detention basin and the routed flow is decreased to 0.84 cfs. The maximum water surface elevation will be 4964.49. The parking lot will discharge to the street at 5965 in the event of clogging. This basin will retain a water quality volume of 1,789 cf, which exceeds the required of 1394 cf. Basin B contains the southern portion of the buildings and the large ponding area. This basin will generate a peak flow rate of 2.59 cfs which drain to the pond. The pond also captures the flow from the surrounding roadways in the amount of 8.06 cfs. The pond will fill to an elevation of 4961.00 and then enter a type D inlet. The inlet contains a submersible pump with a max discharge rate of 1.3 cfs. The pond will retain a water quality volume of 8592 cubic feet which exceed the required volume for the road and hotel basin of 3,864 cubic feet. The



For more current information and more details visit: http://www.cabq.gov/gis

AGIS
Albuquerque Geographic Information System

Map amended through: 2/4/2010



Zone Atlas Page:

H-14-Z

Selected Symbols

SECTOR PLANS
Design Overlay Zones
City Historic Zones
H-1 Buffer Zone
Petroglyph Mon.
Escarpment
2 Mile Airport Zone
Airport Noise Contours
Wall Overlay Zone

0 750 1,500 Feet

peak discharge rate will be 1.3 cfs. The AHYMO Model predicted a lower discharge rate of 1.08 cfs, this is due to the routing function within AHYMO, so the actual water surface elevation will be less than 4961.75. The discharge will connect to the existing force main and drain to the existing outfall inlet in 9th street. The existing force main will be re-routed around the building and check valves shall be added to each leg to prevent back flow between the lines. In the event of clogging, the pond has a total volume of 0.773 acre feet, and the contributing basins generate .704 acre feet during the 100-year, 6 hour event. The surrounding private roadways will become inundated in clogging event in excess of the 6 year event, ultimately discharging to the surrounding public streets. The combined flow leaving the site will be 1.30 cfs compared to the native rate of 6.61 cfs. The volume of retained water exceeds the required water quality amount. The drainage patterns maintain the existing outfall. The downstream collection point remains the inlet at 9th street adjacent to the site

SUMMARY AND RECOMMENDATIONS

This project is an infill project within a completely developed area of the near north Valley Albuquerque. The project is a redevelopment of an existing site. The site currently generates 6.61 cfs. The proposed drainage plan captures the flow and reduces the discharge to 1.3 cfs (.28cfs/acre). The existing force main will be rerouted around the hotel and this site will connects to the main. The existing force main will continue to drain to the existing inlet at 9th street. The first flush volume is retained onsite.

APPENDIX A

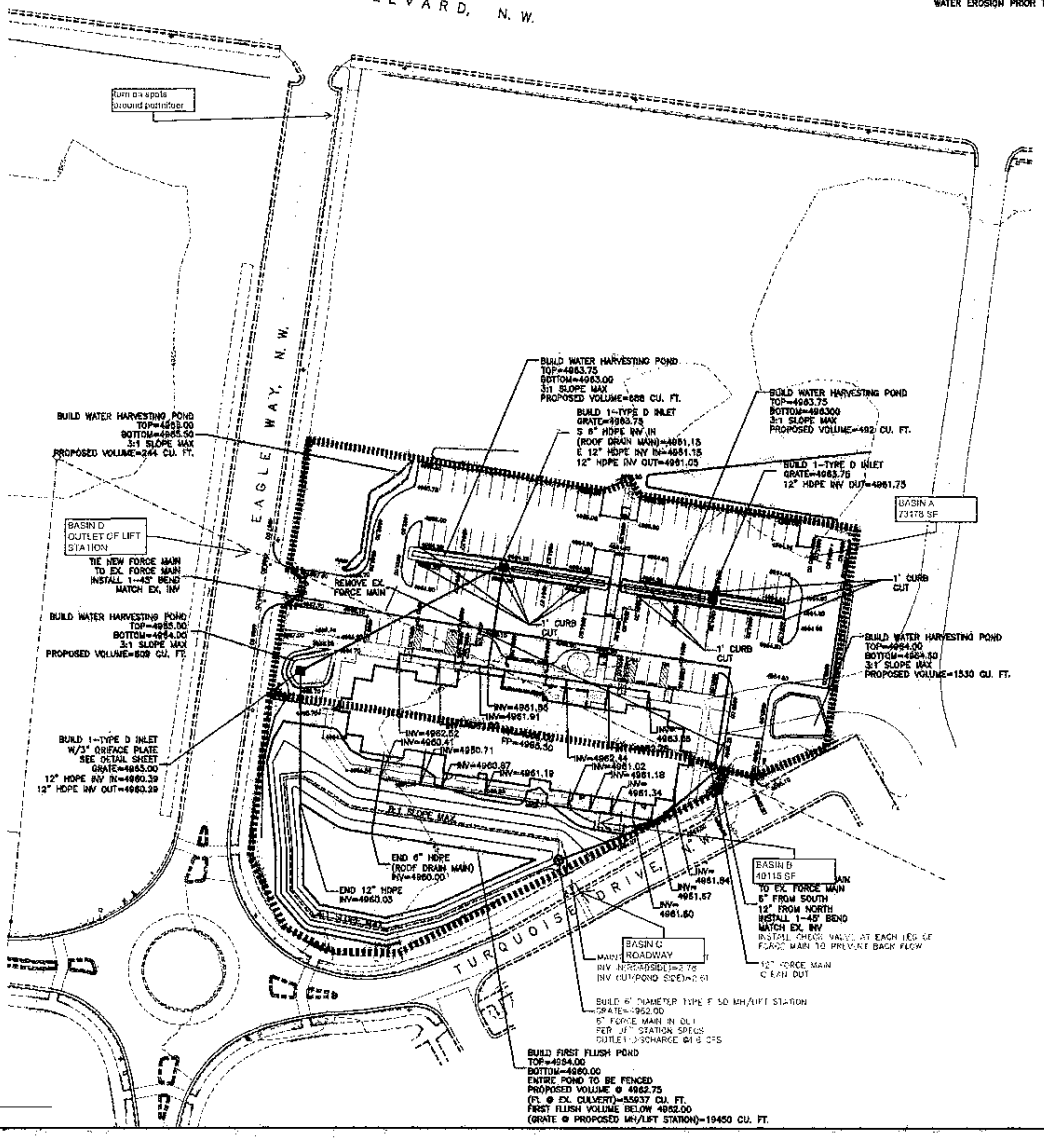
SITE HYDROLOGY

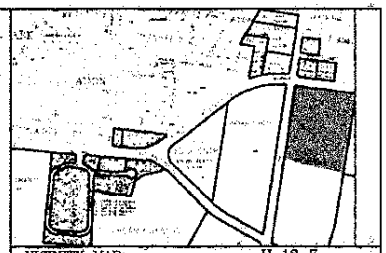
BASIN MAP

CAUTION:
EXISTING UTILITIES ARE NOT SHOWN. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO ANY EXCAVATION TO DETERMINE THE ACTUAL LOCATION OF UTILITIES & OTHER IMPROVEMENTS.

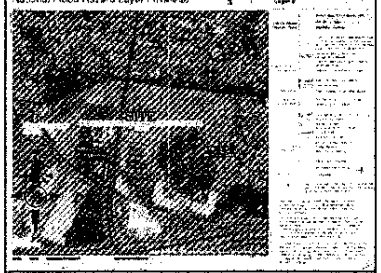
EROSION CONTROL NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.
2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.
3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.
4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.





VICINITY MAP: H-13-Z



FIRM MAP:

LEGAL DESCRIPTION:

NOTES:

1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED.
2. ALL CURB AND GUTTER TO 6" HEADER UNLESS OTHERWISE NOTED.
3. ALL RETAINING WALL DESIGN SHALL BE BY OTHERS.
4. ANY CURBS OR PAVEMENT NEGATIVELY IMPACTED BY CONSTRUCTION ACTIVITY SHALL BE REPLACED TO MATCH EXISTING CONDITIONS.
5. ALL SITE WORK SHALL CONFORM TO CITY OF ALBUQUERQUE STANDARDS FOR PUBLIC WORKS CONSTRUCTION EDITION 9

LEGEND

- EXISTING CONTOUR
- EXISTING INDEX CONTOUR
- PROPOSED CONTOUR
- PROPOSED INDEX CONTOUR
- SLOPE TIE
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- BOUNDARY
- CENTERLINE
- RIGHT-OF-WAY
- PROPOSED CURB
- EXISTING CURB AND GUTTER
- EXISTING SIDEWALK
- EXISTING CONCRETE

N

GRAPHIC SCALE
40 20 0 20 40
SCALE: 1"=40'

ENGINEER'S SEAL
DAVID SOULE NEW MEXICO 14522 REGISTERED PROFESSIONAL ENGINEER
DAVID SOULE P.E. #14522

IPCC-TPS

GRADING AND DRAINAGE PLAN

Rio Grande Engineering
1606 CENTRAL AVENUE SE SUITE 201 ALBUQUERQUE, NM 87106 (505) 975-1060

DRAWN BY: MCMJ
DATE: 11-01-18
SHEET #
JOB # 218153

VOLUME CALCULATIONS

PARKING LOT

outllet

ACTUAL ELEV.	DEPTH (FT)	AREA SF	VOLUME PER UNIT	VOLUME CUMULATIVE	VOLUME AC-FT	Q (CFS)
4960.50	0.00	4.00	4	4	0.000	0.00
4963.75	3.25	420.00	212.00	216	0.001	0.76
4964.00	3.50	3090.00	438.75	654.75	0.015	0.79
4964.50	4.00	13810.00	4225.00	4879.75	0.112	0.84
4965.00	4.50	32106.00	11479.00	16358.75	0.376	0.89

Orifice Equation

Q = CA SQRT(2gH)

C =	0.6
Diameter (in)	4
Area (ft^2)=	0.087266463
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

VOLUME CALCULATIONS

MAIN POND

outlet

ACTUAL ELEV.	DEPTH (FT)	AREA SF	VOLUME PER UNIT	VOLUME CUMULATIVE	VOLUME AC-FT	Q (CFS)
4960.00	0.00	7205.00	0	0	0.000	0.00
4961.00	0.00	9980.00	8592.50	8592.50	0.197	2.00
4962.00	1.00	12636.00	11308.00	19900.50	0.457	2.00
4962.50	1.50	13300.00	6484.00	26384.5	0.606	2.00
4963.00	2.00	15866.00	7291.50	33676.00	0.773	2.00

Orifice Equation

$Q = CA\ SQRT(2gH)$

C =	0.6
Diameter (in)	3
Area (ft^2)=	0.049087385
g =	32.2
H (Ft) =	Depth of water above center of orifice
Q (CFS)=	Flow

```
*S      AHYMO -  DETENTION-LOMAS
*S             POND ROUTING

START                TIME=0.0  PUNCH CODE=0


RAINFALL             TYPE=2
                     QUARTER=0.0    ONE= 1.74 IN
                     SIX=2.23 IN   DAY= 2.52 IN   DT = 0.05 HR



* BASIN A-HOTEL PARKING LOT
COMPUTE NM HYD       ID=1  HYD NO=101  DA= .0022625 SQ MI
                     PER A=0  PER B=10 PER C=12  PER D=78
                     TP=-.165  MASSRAIN=-1


PRINT HYD            ID=1  CODE=3

* ROUTE THE TOTAL FLOW THROUGH THE PROPOSED RESERVOIR
ROUTE RESERVOIR      ID=2   HYD NO=102   INFLOW=1   CODE=3
                     OUTFLOW(CFS)     STORAGE(AC-FT)     ELEV(FT)
                        0.00              0.000           60.50
                        0.76              0.001           63.75
                        0.79              0.015           64.00
                        0.84              0.112           64.50
                        0.89              0.376           65.00


* BASIN B- SOUTH HALF OF HOTEL
COMPUTE NM HYD       ID=3  HYD NO=103  DA= .001438928 SQ MI

                     PER A=0  PER B=33 PER C=35  PER D=32
                     TP=-.165  MASSRAIN=-1

PRINT HYD            ID=3  CODE=3

* BASIN C- SURROUNDING ROAD
COMPUTE NM HYD       ID=4  HYD NO=104  DA= .003453125 SQ MI

                     PER A=0  PER B=10 PER C=10  PER D=80
                     TP=-.150  MASSRAIN=-1

PRINT HYD            ID=4  CODE=3



ADD HYD              ID=5  HYD NO=105  ID I=2  ID II=3
ADD HYD              ID=6  HYD NO=105  ID I=5  ID II=4

PRINT HYD            ID=6  CODE=3

* ROUTE THE TOTAL FLOW THROUGH THE PROPOSED RESERVOIR



ROUTE RESERVOIR      ID=7   HYD NO=107   INFLOW=6   CODE=3
```

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEV(FT)
0.00	0.000	60.00
1.00	0.197	61.00
1.10	0.457	62.00
1.20	0.606	62.50
1.30	0.773	63.00

```
PRINT HYD          ID=7  CODE=3

*ENTIRE SITE PLUS ADJACENT ROADWAYS- NATIVE CONDITION

COMPUTE NM HYD     ID=8  HYD NO=104  DA= .007154553 SQ MI

                   PER A=100  PER B=00 PER C=00  PER D=00
                   TP=-.150  MASSRAIN=-1

PRINT HYD          ID=8  CODE=3

FINISH
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```
      AHYMO PROGRAM (AHYMO-S4)                        - Version: S4.01a - Rel: 01a
           RUN DATE (MON/DAY/YR) = 12/25/2018
           START TIME (HR:MIN:SEC) = 13:18:47     USER NO.=
RioGrandeSingleA41963517
           INPUT FILE = \Owner\Desktop\2018 JOBS\18116-Indian school
hotel\drainage\SITE MODEL122518.txt


    *S      AHYMO -  DETENTION-LOMAS
    *S             POND ROUTING

    START                TIME=0.0  PUNCH CODE=0


    RAINFALL             TYPE=2
                         QUARTER=0.0    ONE= 1.74 IN
                         SIX=2.23 IN   DAY= 2.52 IN   DT = 0.05 HR



                 24-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE
AREAS (NM & AZ) - D1
                  DT =   0.050000 HOURS       END TIME =    24.000002 HOURS
                    0.0000  0.0033  0.0066  0.0102  0.0141  0.0181  0.0227
                    0.0291  0.0393  0.0502  0.0615  0.0738  0.0863  0.0991
                    0.1124  0.1258  0.1408  0.1563  0.1731  0.1955  0.2207
                    0.2544  0.2926  0.3398  0.4027  0.4736  0.5958  0.7860
                    1.1117  1.3407  1.5213  1.6120  1.6916  1.7487  1.7942
                    1.8338  1.8628  1.8895  1.9114  1.9293  1.9451  1.9593
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                    2.3081  2.3089  2.3097  2.3106  2.3114  2.3122  2.3130
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```

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2.3645	2.3653	2.3661	2.3669	2.3677	2.3685	2.3694
2.3702	2.3710	2.3718	2.3726	2.3734	2.3742	2.3750
2.3758	2.3766	2.3774	2.3782	2.3790	2.3798	2.3806
2.3814	2.3822	2.3830	2.3839	2.3847	2.3855	2.3863
2.3871	2.3879	2.3887	2.3895	2.3903	2.3911	2.3919
2.3927	2.3935	2.3943	2.3951	2.3959	2.3967	2.3975
2.3984	2.3992	2.4000	2.4008	2.4016	2.4024	2.4032
2.4040	2.4048	2.4056	2.4064	2.4072	2.4080	2.4088
2.4096	2.4104	2.4112	2.4120	2.4129	2.4137	2.4145
2.4153	2.4161	2.4169	2.4177	2.4185	2.4193	2.4201
2.4209	2.4217	2.4225	2.4233	2.4241	2.4249	2.4257
2.4265	2.4274	2.4282	2.4290	2.4298	2.4306	2.4314
2.4322	2.4330	2.4338	2.4346	2.4354	2.4362	2.4370
2.4378	2.4386	2.4394	2.4402	2.4410	2.4419	2.4427
2.4435	2.4443	2.4451	2.4459	2.4467	2.4475	2.4483
2.4491	2.4499	2.4507	2.4515	2.4523	2.4531	2.4539
2.4547	2.4555	2.4564	2.4572	2.4580	2.4588	2.4596
2.4604	2.4612	2.4620	2.4628	2.4636	2.4644	2.4652
2.4660	2.4668	2.4676	2.4684	2.4692	2.4700	2.4709
2.4717	2.4725	2.4733	2.4741	2.4749	2.4757	2.4765
2.4773	2.4781	2.4789	2.4797	2.4805	2.4813	2.4821
2.4829	2.4837	2.4845	2.4854	2.4862	2.4870	2.4878
2.4886	2.4894	2.4902	2.4910	2.4918	2.4926	2.4934
2.4942	2.4950	2.4958	2.4966	2.4974	2.4982	2.4990
2.4998	2.5007	2.5015	2.5023	2.5031	2.5039	2.5047
2.5055	2.5063	2.5071	2.5079	2.5087	2.5095	2.5103
2.5111	2.5119	2.5127	2.5135	2.5143	2.5152	2.5160
2.5168	2.5176	2.5184	2.5192	2.5200		

```
* BASIN A-HOTEL PARKING LOT
COMPUTE NM HYD       ID=1  HYD NO=101  DA= .0022625 SQ MI
                     PER A=0  PER B=10 PER C=12  PER D=78
                     TP=-.165  MASSRAIN=-1


        K =  0.089925HR    TP =  0.165000HR    K/TP RATIO =  0.545000     SHAPE
CONSTANT, N =  7.106428
        UNIT PEAK =   5.6288    CFS   UNIT VOLUME =   0.9976       B =   526.28
 P60 = 1.7400
        AREA =     0.001765 SQ MI    IA =   0.10000 INCHES    INF =   0.04000
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000


        K =  0.145476HR    TP =  0.165000HR    K/TP RATIO =  0.881674     SHAPE
CONSTANT, N =  4.025312
        UNIT PEAK =   1.0765    CFS   UNIT VOLUME =   0.9888       B =   356.85
 P60 = 1.7400
        AREA =     0.000498 SQ MI    IA =   0.41818 INCHES    INF =   1.02091
INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =
0.050000

    PRINT HYD            ID=1  CODE=3

                                        PARTIAL HYDROGRAPH   101.00

        TIME      FLOW          TIME      FLOW          TIME      FLOW
TIME     FLOW          TIME     FLOW
        HRS       CFS           HRS       CFS           HRS       CFS
HRS      CFS           HRS      CFS
        0.000       0.0         4.950       0.0         9.900       0.0
```

14.850	0.0	19.800	0.0	5.100	0.0	10.050	0.0
0.150	0.0						
15.000	0.0	19.950	0.0	5.250	0.0	10.200	0.0
0.300	0.0						
15.150	0.0	20.100	0.0	5.400	0.0	10.350	0.0
0.450	0.0						
15.300	0.0	20.250	0.0	5.550	0.0	10.500	0.0
0.600	0.0						
15.450	0.0	20.400	0.0	5.700	0.0	10.650	0.0
0.750	0.0						
15.600	0.0	20.550	0.0	5.850	0.0	10.800	0.0
0.900	0.2						
15.750	0.0	20.700	0.0	6.000	0.0	10.950	0.0
1.050	0.3						
15.900	0.0	20.850	0.0	6.150	0.0	11.100	0.0
1.200	0.7						
16.050	0.0	21.000	0.0	6.300	0.0	11.250	0.0
1.350	1.5						
16.200	0.0	21.150	0.0	6.450	0.0	11.400	0.0
1.500	4.7						
16.350	0.0	21.300	0.0	6.600	0.0	11.550	0.0
1.650	3.8						
16.500	0.0	21.450	0.0	6.750	0.0	11.700	0.0
1.800	1.9						
16.650	0.0	21.600	0.0	6.900	0.0	11.850	0.0
1.950	1.1						
16.800	0.0	21.750	0.0	7.050	0.0	12.000	0.0
2.100	0.7						
16.950	0.0	21.900	0.0	7.200	0.0	12.150	0.0
2.250	0.5						
17.100	0.0	22.050	0.0	7.350	0.0	12.300	0.0
2.400	0.3						
17.250	0.0	22.200	0.0	7.500	0.0	12.450	0.0
2.550	0.2						
17.400	0.0	22.350	0.0	7.650	0.0	12.600	0.0
2.700	0.1						
17.550	0.0	22.500	0.0	7.800	0.0	12.750	0.0
2.850	0.1						
17.700	0.0	22.650	0.0	7.950	0.0	12.900	0.0
3.000	0.1						
17.850	0.0	22.800	0.0	8.100	0.0	13.050	0.0
3.150	0.0						
18.000	0.0	22.950	0.0	8.250	0.0	13.200	0.0
3.300	0.0						
18.150	0.0	23.100	0.0	8.400	0.0	13.350	0.0
3.450	0.0						
18.300	0.0	23.250	0.0	8.550	0.0	13.500	0.0
3.600	0.0						
18.450	0.0	23.400	0.0	8.700	0.0	13.650	0.0
3.750	0.0						
18.600	0.0	23.550	0.0	8.850	0.0	13.800	0.0
3.900	0.0						
18.750	0.0	23.700	0.0	9.000	0.0	13.950	0.0
4.050	0.0						
18.900	0.0	23.850	0.0	9.150	0.0	14.100	0.0
4.200	0.0						
19.050	0.0	24.000	0.0	9.300	0.0	14.250	0.0
4.350	0.0						
19.200	0.0	24.150	0.0	9.450	0.0	14.400	0.0
4.500	0.0						
19.350	0.0	24.300	0.0	9.600	0.0	14.550	0.0
4.650	0.0						
19.500	0.0	24.450	0.0	9.750	0.0	14.700	0.0
4.800	0.0						
19.650	0.0						

RUNOFF VOLUME = 1.96374 INCHES = 0.2370 ACRE-FEET
PEAK DISCHARGE RATE = 5.12 CFS AT 1.550 HOURS BASIN AREA = 0.0023 SQ. MI.

* ROUTE THE TOTAL FLOW THROUGH THE PROPOSED RESERVOIR
ROUTE RESERVOIR ID=2 HYD NO=102 INFLOW=1 CODE=3

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEV(FT)	
0.00	0.000	60.50	
0.76	0.001	63.75	
0.79	0.015		64.00
0.84	0.112	64.50	
0.89	0.376	65.00	

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TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	60.50	0.000	0.00
0.15	0.00	60.50	0.000	0.00
0.30	0.00	60.50	0.000	0.00
0.45	0.00	60.50	0.000	0.00
0.60	0.00	60.50	0.000	0.00
0.75	0.03	60.59	0.000	0.02
0.90	0.20	61.32	0.000	0.19
1.05	0.35	61.89	0.000	0.33
1.20	0.65	63.11	0.001	0.61
1.35	1.47	63.80	0.004	0.77
1.50	4.74	64.08	0.031	0.80
1.65	3.84	64.33	0.079	0.82
1.80	1.89	64.45	0.103	0.84
1.95	1.08	64.49	0.110	0.84
2.10	0.68	64.49	0.111	0.84
2.25	0.46	64.48	0.107	0.84
2.40	0.33	64.45	0.102	0.83
2.55	0.19	64.41	0.095	0.83
2.70	0.12	64.37	0.086	0.83
2.85	0.09	64.32	0.077	0.82
3.00	0.06	64.27	0.068	0.82
3.15	0.05	64.22	0.059	0.81
3.30	0.04	64.18	0.049	0.81
3.45	0.04	64.13	0.040	0.80
3.60	0.03	64.08	0.030	0.80
3.75	0.03	64.03	0.021	0.79
3.90	0.03	63.93	0.011	0.78
4.05	0.03	63.77	0.002	0.76
4.20	0.03	60.67	0.000	0.04
4.35	0.03	60.64	0.000	0.03
4.50	0.03	60.64	0.000	0.03
4.65	0.03	60.64	0.000	0.03
4.80	0.03	60.64	0.000	0.03
4.95	0.03	60.65	0.000	0.03
5.10	0.04	60.65	0.000	0.04
5.25	0.04	60.65	0.000	0.04
5.40	0.04	60.66	0.000	0.04
5.55	0.04	60.66	0.000	0.04
5.70	0.04	60.67	0.000	0.04
5.85	0.04	60.67	0.000	0.04
6.00	0.04	60.68	0.000	0.04

6.15	0.03	60.65	0.000	0.03
6.30	0.02	60.60	0.000	0.02
6.45	0.02	60.59	0.000	0.02
6.60	0.02	60.59	0.000	0.02
6.75	0.02	60.58	0.000	0.02
6.90	0.02	60.58	0.000	0.02
7.05	0.02	60.58	0.000	0.02
7.20	0.02	60.58	0.000	0.02
7.35	0.02	60.58	0.000	0.02
7.50	0.02	60.58	0.000	0.02
7.65	0.02	60.58	0.000	0.02
7.80	0.02	60.58	0.000	0.02
7.95	0.02	60.58	0.000	0.02
8.10	0.02	60.58	0.000	0.02
8.25	0.02	60.58	0.000	0.02

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
8.40	0.02	60.58	0.000	0.02
8.55	0.02	60.58	0.000	0.02
8.70	0.02	60.58	0.000	0.02
8.85	0.02	60.58	0.000	0.02
9.00	0.02	60.58	0.000	0.02
9.15	0.02	60.58	0.000	0.02
9.30	0.02	60.58	0.000	0.02
9.45	0.02	60.58	0.000	0.02
9.60	0.02	60.58	0.000	0.02
9.75	0.02	60.58	0.000	0.02
9.90	0.02	60.58	0.000	0.02
10.05	0.02	60.58	0.000	0.02
10.20	0.02	60.58	0.000	0.02
10.35	0.02	60.58	0.000	0.02
10.50	0.02	60.58	0.000	0.02
10.65	0.02	60.58	0.000	0.02
10.80	0.02	60.58	0.000	0.02
10.95	0.02	60.58	0.000	0.02
11.10	0.02	60.58	0.000	0.02
11.25	0.02	60.58	0.000	0.02
11.40	0.02	60.58	0.000	0.02
11.55	0.02	60.58	0.000	0.02
11.70	0.02	60.58	0.000	0.02
11.85	0.02	60.58	0.000	0.02
12.00	0.02	60.58	0.000	0.02
12.15	0.02	60.58	0.000	0.02
12.30	0.02	60.58	0.000	0.02
12.45	0.02	60.58	0.000	0.02
12.60	0.02	60.58	0.000	0.02
12.75	0.02	60.58	0.000	0.02
12.90	0.02	60.58	0.000	0.02
13.05	0.02	60.58	0.000	0.02
13.20	0.02	60.58	0.000	0.02
13.35	0.02	60.58	0.000	0.02
13.50	0.02	60.58	0.000	0.02
13.65	0.02	60.58	0.000	0.02
13.80	0.02	60.58	0.000	0.02
13.95	0.02	60.58	0.000	0.02
14.10	0.02	60.58	0.000	0.02
14.25	0.02	60.58	0.000	0.02
14.40	0.02	60.58	0.000	0.02
14.55	0.02	60.58	0.000	0.02
14.70	0.02	60.58	0.000	0.02
14.85	0.02	60.58	0.000	0.02
15.00	0.02	60.58	0.000	0.02
15.15	0.02	60.58	0.000	0.02
15.30	0.02	60.58	0.000	0.02

15.45	0.02	60.58	0.000	0.02
15.60	0.02	60.58	0.000	0.02
15.75	0.02	60.58	0.000	0.02
15.90	0.02	60.58	0.000	0.02
16.05	0.02	60.58	0.000	0.02
16.20	0.02	60.58	0.000	0.02
16.35	0.02	60.58	0.000	0.02
16.50	0.02	60.58	0.000	0.02
16.65	0.02	60.58	0.000	0.02

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
16.80	0.02	60.58	0.000	0.02
16.95	0.02	60.58	0.000	0.02
17.10	0.02	60.58	0.000	0.02
17.25	0.02	60.58	0.000	0.02
17.40	0.02	60.58	0.000	0.02
17.55	0.02	60.58	0.000	0.02
17.70	0.02	60.58	0.000	0.02
17.85	0.02	60.58	0.000	0.02
18.00	0.02	60.58	0.000	0.02
18.15	0.02	60.58	0.000	0.02
18.30	0.02	60.58	0.000	0.02
18.45	0.02	60.58	0.000	0.02
18.60	0.02	60.58	0.000	0.02
18.75	0.02	60.58	0.000	0.02
18.90	0.02	60.58	0.000	0.02
19.05	0.02	60.58	0.000	0.02
19.20	0.02	60.58	0.000	0.02
19.35	0.02	60.58	0.000	0.02
19.50	0.02	60.58	0.000	0.02
19.65	0.02	60.58	0.000	0.02
19.80	0.02	60.58	0.000	0.02
19.95	0.02	60.58	0.000	0.02
20.10	0.02	60.58	0.000	0.02
20.25	0.02	60.58	0.000	0.02
20.40	0.02	60.58	0.000	0.02
20.55	0.02	60.58	0.000	0.02
20.70	0.02	60.58	0.000	0.02
20.85	0.02	60.58	0.000	0.02
21.00	0.02	60.58	0.000	0.02
21.15	0.02	60.58	0.000	0.02
21.30	0.02	60.58	0.000	0.02
21.45	0.02	60.58	0.000	0.02
21.60	0.02	60.58	0.000	0.02
21.75	0.02	60.58	0.000	0.02
21.90	0.02	60.58	0.000	0.02
22.05	0.02	60.58	0.000	0.02
22.20	0.02	60.58	0.000	0.02
22.35	0.02	60.58	0.000	0.02
22.50	0.02	60.58	0.000	0.02
22.65	0.02	60.58	0.000	0.02
22.80	0.02	60.58	0.000	0.02
22.95	0.02	60.58	0.000	0.02
23.10	0.02	60.58	0.000	0.02
23.25	0.02	60.58	0.000	0.02
23.40	0.02	60.58	0.000	0.02
23.55	0.02	60.58	0.000	0.02
23.70	0.02	60.58	0.000	0.02
23.85	0.02	60.58	0.000	0.02
24.00	0.02	60.58	0.000	0.02
24.15	0.01	60.55	0.000	0.01
24.30	0.00	60.52	0.000	0.00

PEAK DISCHARGE = 0.840 CFS - PEAK OCCURS AT HOUR 2.05
MAXIMUM WATER SURFACE ELEVATION = 64.496

MAXIMUM STORAGE = 0.1112 AC-FT INCREMENTAL TIME= 0.050000HRS

* BASIN B- SOUTH HALF OF HOTEL
COMPUTE NM HYD ID=3 HYD NO=103 DA= .001438928 SQ MI
PER A=0 PER B=33 PER C=35 PER D=32
TP=-.165 MASSRAIN=-1

K = 0.089925HR TP = 0.165000HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 1.4686 CFS UNIT VOLUME = 0.9924 B = 526.28 P60 = 1.7400
AREA = 0.000460 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

K = 0.146575HR TP = 0.165000HR K/TP RATIO = 0.888336 SHAPE CONSTANT, N = 3.992855
UNIT PEAK = 2.1034 CFS UNIT VOLUME = 0.9945 B = 354.70 P60 = 1.7400
AREA = 0.000978 SQ MI IA = 0.42279 INCHES INF = 1.03382 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD ID=3 CODE=3

PARTIAL HYDROGRAPH 103.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	4.950	0.0	9.900	0.0
14.850	0.0	19.800	0.0		
0.150	0.0	5.100	0.0	10.050	0.0
15.000	0.0	19.950	0.0		
0.300	0.0	5.250	0.0	10.200	0.0
15.150	0.0	20.100	0.0		
0.450	0.0	5.400	0.0	10.350	0.0
15.300	0.0	20.250	0.0		
0.600	0.0	5.550	0.0	10.500	0.0
15.450	0.0	20.400	0.0		
0.750	0.0	5.700	0.0	10.650	0.0
15.600	0.0	20.550	0.0		
0.900	0.1	5.850	0.0	10.800	0.0
15.750	0.0	20.700	0.0		
1.050	0.1	6.000	0.0	10.950	0.0
15.900	0.0	20.850	0.0		
1.200	0.2	6.150	0.0	11.100	0.0
16.050	0.0	21.000	0.0		
1.350	0.6	6.300	0.0	11.250	0.0
16.200	0.0	21.150	0.0		
1.500	2.4	6.450	0.0	11.400	0.0
16.350	0.0	21.300	0.0		
1.650	2.0	6.600	0.0	11.550	0.0
16.500	0.0	21.450	0.0		
1.800	0.9	6.750	0.0	11.700	0.0
16.650	0.0	21.600	0.0		
1.950	0.4	6.900	0.0	11.850	0.0
16.800	0.0	21.750	0.0		
2.100	0.3	7.050	0.0	12.000	0.0
16.950	0.0	21.900	0.0		
2.250	0.2	7.200	0.0	12.150	0.0

17.100	0.0	22.050	0.0				
	2.400	0.1	7.350	0.0	12.300	0.0	
17.250	0.0	22.200	0.0				
	2.550	0.1	7.500	0.0	12.450	0.0	
17.400	0.0	22.350	0.0				
	2.700	0.1	7.650	0.0	12.600	0.0	
17.550	0.0	22.500	0.0				
	2.850	0.0	7.800	0.0	12.750	0.0	
17.700	0.0	22.650	0.0				
	3.000	0.0	7.950	0.0	12.900	0.0	
17.850	0.0	22.800	0.0				
	3.150	0.0	8.100	0.0	13.050	0.0	
18.000	0.0	22.950	0.0				
	3.300	0.0	8.250	0.0	13.200	0.0	
18.150	0.0	23.100	0.0				
	3.450	0.0	8.400	0.0	13.350	0.0	
18.300	0.0	23.250	0.0				
	3.600	0.0	8.550	0.0	13.500	0.0	
18.450	0.0	23.400	0.0				
	3.750	0.0	8.700	0.0	13.650	0.0	
18.600	0.0	23.550	0.0				
	3.900	0.0	8.850	0.0	13.800	0.0	
18.750	0.0	23.700	0.0				
	4.050	0.0	9.000	0.0	13.950	0.0	
18.900	0.0	23.850	0.0				
	4.200	0.0	9.150	0.0	14.100	0.0	
19.050	0.0	24.000	0.0				
	4.350	0.0	9.300	0.0	14.250	0.0	
19.200	0.0	24.150	0.0				
	4.500	0.0	9.450	0.0	14.400	0.0	
19.350	0.0						
	4.650	0.0	9.600	0.0	14.550	0.0	
19.500	0.0						
	4.800	0.0	9.750	0.0	14.700	0.0	
19.650	0.0						

RUNOFF VOLUME = 1.32124 INCHES = 0.1014 ACRE-FEET
PEAK DISCHARGE RATE = 2.59 CFS AT 1.550 HOURS BASIN AREA = 0.0014 SQ. MI.

* BASIN C- SURROUNDING ROAD
COMPUTE NM HYD ID=4 HYD NO=104 DA= .003453125 SQ MI
PER A=0 PER B=10 PER C=10 PER D=80
TP=-.150 MASSRAIN=-1

K = 0.081750HR TP = 0.150000HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 9.6922 CFS UNIT VOLUME = 0.9994 B = 526.28 P60 = 1.7400
AREA = 0.002762 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

K = 0.133728HR TP = 0.150000HR K/TP RATIO = 0.891522 SHAPE CONSTANT, N = 3.977611
UNIT PEAK = 1.6284 CFS UNIT VOLUME = 0.9921 B = 353.68 P60 = 1.7400
AREA = 0.000691 SQ MI IA = 0.42500 INCHES INF = 1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =

0.050000

PRINT HYD ID=4 CODE=3

PARTIAL HYDROGRAPH 104.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	14.850	0.0	19.800	0.0	4.950	0.1	9.900	0.0
0.150	0.0	15.000	0.0	19.950	0.0	5.100	0.1	10.050	0.0
0.300	0.0	15.150	0.0	20.100	0.0	5.250	0.1	10.200	0.0
0.450	0.0	15.300	0.0	20.250	0.0	5.400	0.1	10.350	0.0
0.600	0.0	15.450	0.0	20.400	0.0	5.550	0.1	10.500	0.0
0.750	0.1	15.600	0.0	20.550	0.0	5.700	0.1	10.650	0.0
0.900	0.3	15.750	0.0	20.700	0.0	5.850	0.1	10.800	0.0
1.050	0.6	15.900	0.0	20.850	0.0	6.000	0.1	10.950	0.0
1.200	1.1	16.050	0.0	21.000	0.0	6.150	0.0	11.100	0.0
1.350	2.5	16.200	0.0	21.150	0.0	6.300	0.0	11.250	0.0
1.500	7.9	16.350	0.0	21.300	0.0	6.450	0.0	11.400	0.0
1.650	5.5	16.500	0.0	21.450	0.0	6.600	0.0	11.550	0.0
1.800	2.7	16.650	0.0	21.600	0.0	6.750	0.0	11.700	0.0
1.950	1.6	16.800	0.0	21.750	0.0	6.900	0.0	11.850	0.0
2.100	1.0	16.950	0.0	21.900	0.0	7.050	0.0	12.000	0.0
2.250	0.6	17.100	0.0	22.050	0.0	7.200	0.0	12.150	0.0
2.400	0.5	17.250	0.0	22.200	0.0	7.350	0.0	12.300	0.0
2.550	0.3	17.400	0.0	22.350	0.0	7.500	0.0	12.450	0.0
2.700	0.2	17.550	0.0	22.500	0.0	7.650	0.0	12.600	0.0
2.850	0.1	17.700	0.0	22.650	0.0	7.800	0.0	12.750	0.0
3.000	0.1	17.850	0.0	22.800	0.0	7.950	0.0	12.900	0.0
3.150	0.1	18.000	0.0	22.950	0.0	8.100	0.0	13.050	0.0
3.300	0.1	18.150	0.0	23.100	0.0	8.250	0.0	13.200	0.0
3.450	0.1	18.300	0.0	23.250	0.0	8.400	0.0	13.350	0.0
3.600	0.1	18.450	0.0	23.400	0.0	8.550	0.0	13.500	0.0
3.750	0.1	18.600	0.0	23.550	0.0	8.700	0.0	13.650	0.0
3.900	0.0	18.750	0.0	23.700	0.0	8.850	0.0	13.800	0.0
4.050	0.0	18.900	0.0	23.850	0.0	9.000	0.0	13.950	0.0

	4.200	0.1		9.150	0.0	14.100	0.0
19.050	0.0		24.000	0.0			
	4.350	0.1		9.300	0.0	14.250	0.0
19.200	0.0		24.150	0.0			
	4.500	0.1		9.450	0.0	14.400	0.0
19.350	0.0		24.300	0.0			
	4.650	0.1		9.600	0.0	14.550	0.0
19.500	0.0		24.450	0.0			
	4.800	0.1		9.750	0.0	14.700	0.0
19.650	0.0		24.600	0.0			

RUNOFF VOLUME = 1.98943 INCHES = 0.3664 ACRE-FEET
PEAK DISCHARGE RATE = 8.06 CFS AT 1.550 HOURS BASIN AREA = 0.0035 SQ. MI.

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ADD HYD          ID=5  HYD NO=105  ID I=2  ID II=3
ADD HYD          ID=6  HYD NO=105  ID I=5  ID II=4

PRINT HYD        ID=6  CODE=3
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PARTIAL HYDROGRAPH 105.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	14.850	0.1	19.800	0.1	4.950	0.1
0.150	0.0	15.000	0.1	19.950	0.1	5.100	0.1
0.300	0.0	15.150	0.1	20.100	0.1	5.250	0.1
0.450	0.0	15.300	0.1	20.250	0.1	5.400	0.1
0.600	0.0	15.450	0.1	20.400	0.1	5.550	0.1
0.750	0.1	15.600	0.1	20.550	0.1	5.700	0.1
0.900	0.6	15.750	0.1	20.700	0.1	5.850	0.1
1.050	1.0	15.900	0.1	20.850	0.1	6.000	0.1
1.200	1.9	16.050	0.1	21.000	0.1	6.150	0.1
1.350	3.9	16.200	0.1	21.150	0.1	6.300	0.1
1.500	11.1	16.350	0.1	21.300	0.1	6.450	0.1
1.650	8.3	16.500	0.1	21.450	0.1	6.600	0.1
1.800	4.4	16.650	0.1	21.600	0.1	6.750	0.1
1.950	2.8	16.800	0.1	21.750	0.1	6.900	0.1
2.100	2.1	16.950	0.1	21.900	0.1	7.050	0.1
2.250	1.7	17.100	0.1	22.050	0.1	7.200	0.1
2.400	1.4	17.250	0.1	22.200	0.1	7.350	0.1
7.500	0.1	12.000	0.1	16.500	0.1	21.000	0.1
7.650	0.1	12.150	0.1	16.650	0.1	21.150	0.1
7.800	0.1	12.300	0.1	16.800	0.1	21.300	0.1
7.950	0.1	12.450	0.1	16.950	0.1	21.450	0.1
8.100	0.1	12.600	0.1	17.100	0.1	21.600	0.1
8.250	0.1	12.750	0.1	17.250	0.1	21.750	0.1
8.400	0.1	12.900	0.1	17.400	0.1	21.900	0.1
8.550	0.1	13.050	0.1	17.550	0.1	22.050	0.1
8.700	0.1	13.200	0.1	17.700	0.1	22.200	0.1
8.850	0.1	13.350	0.1	17.850	0.1	22.350	0.1
9.000	0.1	13.500	0.1	18.000	0.1	22.500	0.1
9.150	0.1	13.650	0.1	18.150	0.1	22.650	0.1
9.300	0.1	13.800	0.1	18.300	0.1	22.800	0.1
9.450	0.1	13.950	0.1	18.450	0.1	22.950	0.1
9.600	0.1	14.100	0.1	18.600	0.1	23.100	0.1
9.750	0.1	14.250	0.1	18.750	0.1	23.250	0.1
9.900	0.1	14.400	0.1	18.900	0.1	23.400	0.1
10.050	0.1	14.550	0.1	19.050	0.1	23.550	0.1
10.200	0.1	14.700	0.1	19.200	0.1	23.700	0.1
10.350	0.1	14.850	0.1	19.350	0.1	23.850	0.1
10.500	0.1	15.000	0.1	19.500	0.1	24.000	0.1
10.650	0.1	15.150	0.1	19.650	0.1	24.150	0.1
10.800	0.1	15.300	0.1	19.800	0.1	24.300	0.1
10.950	0.1	15.450	0.1	19.950	0.1	24.450	0.1
11.100	0.1	15.600	0.1	20.100	0.1	24.600	0.1
11.250	0.1	15.750	0.1	20.250	0.1		
11.400	0.1	15.900	0.1	20.400	0.1		
11.550	0.1	16.050	0.1	20.550	0.1		
11.700	0.1	16.200	0.1	20.700	0.1		
11.850	0.1	16.350	0.1	20.850	0.1		

	2.550	1.2		7.500	0.1	12.450	0.1
17.400	0.1		22.350	0.1			
	2.700	1.0		7.650	0.1	12.600	0.1
17.550	0.1		22.500	0.1			
	2.850	1.0		7.800	0.1	12.750	0.1
17.700	0.1		22.650	0.1			
	3.000	0.9		7.950	0.1	12.900	0.1
17.850	0.1		22.800	0.1			
	3.150	0.9		8.100	0.1	13.050	0.1
18.000	0.1		22.950	0.1			
	3.300	0.9		8.250	0.1	13.200	0.1
18.150	0.1		23.100	0.1			
	3.450	0.9		8.400	0.1	13.350	0.1
18.300	0.1		23.250	0.1			
	3.600	0.9		8.550	0.1	13.500	0.1
18.450	0.1		23.400	0.1			
	3.750	0.9		8.700	0.1	13.650	0.1
18.600	0.1		23.550	0.1			
	3.900	0.8		8.850	0.1	13.800	0.1
18.750	0.1		23.700	0.1			
	4.050	0.8		9.000	0.1	13.950	0.1
18.900	0.1		23.850	0.1			
	4.200	0.1		9.150	0.1	14.100	0.1
19.050	0.1		24.000	0.1			
	4.350	0.1		9.300	0.1	14.250	0.1
19.200	0.1		24.150	0.0			
	4.500	0.1		9.450	0.1	14.400	0.1
19.350	0.1		24.300	0.0			
	4.650	0.1		9.600	0.1	14.550	0.1
19.500	0.1		24.450	0.0			
	4.800	0.1		9.750	0.1	14.700	0.1
19.650	0.1		24.600	0.0			

RUNOFF VOLUME = 1.84680 INCHES = 0.7047 ACRE-FEET
PEAK DISCHARGE RATE = 11.46 CFS AT 1.550 HOURS BASIN AREA = 0.0072 SQ. MI.

* ROUTE THE TOTAL FLOW THROUGH THE PROPOSED RESERVOIR

ROUTE RESERVOIR ID=7 HYD NO=107 INFLOW=6 CODE=3

OUTFLOW(CFS)	STORAGE(AC-FT)	ELEV(FT)
0.00	0.000	60.00
1.00	0.197	61.00
1.10	0.457	62.00
1.20	0.606	62.50
1.30	0.773	63.00

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TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)

0.00	0.00	60.00	0.000	0.00
0.15	0.00	60.00	0.000	0.00
0.30	0.00	60.00	0.000	0.00
0.45	0.00	60.00	0.000	0.00
0.60	0.00	60.00	0.000	0.00
0.75	0.10	60.00	0.000	0.00
0.90	0.59	60.02	0.005	0.02
1.05	0.99	60.07	0.014	0.07
1.20	1.88	60.15	0.030	0.15
1.35	3.85	60.31	0.060	0.31
1.50	11.07	60.74	0.145	0.74
1.65	8.33	61.25	0.263	1.03
1.80	4.43	61.50	0.326	1.05
1.95	2.84	61.62	0.357	1.06
2.10	2.08	61.68	0.374	1.07
2.25	1.68	61.72	0.384	1.07
2.40	1.44	61.74	0.390	1.07
2.55	1.17	61.75	0.392	1.08
2.70	1.05	61.75	0.393	1.08
2.85	0.98	61.75	0.392	1.07
3.00	0.93	61.74	0.390	1.07
3.15	0.90	61.74	0.389	1.07
3.30	0.88	61.73	0.386	1.07
3.45	0.87	61.72	0.384	1.07
3.60	0.86	61.71	0.381	1.07
3.75	0.85	61.70	0.379	1.07
3.90	0.84	61.69	0.376	1.07
4.05	0.82	61.68	0.373	1.07
4.20	0.10	61.64	0.363	1.06
4.35	0.09	61.59	0.351	1.06
4.50	0.09	61.55	0.339	1.05
4.65	0.09	61.50	0.327	1.05
4.80	0.10	61.45	0.315	1.05
4.95	0.10	61.41	0.303	1.04
5.10	0.10	61.36	0.292	1.04
5.25	0.10	61.32	0.280	1.03
5.40	0.10	61.28	0.269	1.03
5.55	0.11	61.23	0.257	1.02
5.70	0.11	61.19	0.246	1.02
5.85	0.11	61.14	0.235	1.01
6.00	0.12	61.10	0.224	1.01
6.15	0.09	61.06	0.212	1.01
6.30	0.06	61.02	0.201	1.00
6.45	0.06	60.96	0.189	0.96
6.60	0.06	60.91	0.179	0.91
6.75	0.05	60.85	0.168	0.85
6.90	0.05	60.81	0.159	0.81
7.05	0.05	60.76	0.150	0.76
7.20	0.05	60.72	0.141	0.72
7.35	0.05	60.68	0.133	0.68
7.50	0.05	60.64	0.126	0.64
7.65	0.05	60.60	0.119	0.60
7.80	0.05	60.57	0.112	0.57
7.95	0.05	60.54	0.106	0.54
8.10	0.05	60.51	0.100	0.51
8.25	0.05	60.48	0.094	0.48

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
8.40	0.05	60.45	0.089	0.45
8.55	0.05	60.43	0.085	0.43
8.70	0.05	60.41	0.080	0.41
8.85	0.05	60.38	0.076	0.38
9.00	0.05	60.36	0.072	0.36

9.15	0.05	60.35	0.068	0.35
9.30	0.05	60.33	0.064	0.33
9.45	0.05	60.31	0.061	0.31
9.60	0.05	60.29	0.058	0.29
9.75	0.05	60.28	0.055	0.28
9.90	0.05	60.27	0.052	0.27
10.05	0.05	60.25	0.050	0.25
10.20	0.05	60.24	0.047	0.24
10.35	0.05	60.23	0.045	0.23
10.50	0.05	60.22	0.043	0.22
10.65	0.05	60.21	0.041	0.21
10.80	0.05	60.20	0.039	0.20
10.95	0.05	60.19	0.037	0.19
11.10	0.05	60.18	0.036	0.18
11.25	0.05	60.17	0.034	0.17
11.40	0.05	60.17	0.033	0.17
11.55	0.05	60.16	0.031	0.16
11.70	0.05	60.15	0.030	0.15
11.85	0.05	60.15	0.029	0.15
12.00	0.05	60.14	0.028	0.14
12.15	0.05	60.14	0.027	0.14
12.30	0.05	60.13	0.026	0.13
12.45	0.05	60.13	0.025	0.13
12.60	0.05	60.12	0.024	0.12
12.75	0.05	60.12	0.023	0.12
12.90	0.05	60.11	0.022	0.11
13.05	0.05	60.11	0.021	0.11
13.20	0.05	60.11	0.021	0.11
13.35	0.05	60.10	0.020	0.10
13.50	0.05	60.10	0.020	0.10
13.65	0.05	60.10	0.019	0.10
13.80	0.05	60.09	0.018	0.09
13.95	0.05	60.09	0.018	0.09
14.10	0.05	60.09	0.017	0.09
14.25	0.05	60.09	0.017	0.09
14.40	0.05	60.08	0.017	0.08
14.55	0.05	60.08	0.016	0.08
14.70	0.05	60.08	0.016	0.08
14.85	0.05	60.08	0.015	0.08
15.00	0.05	60.08	0.015	0.08
15.15	0.05	60.08	0.015	0.08
15.30	0.05	60.07	0.015	0.07
15.45	0.05	60.07	0.014	0.07
15.60	0.05	60.07	0.014	0.07
15.75	0.05	60.07	0.014	0.07
15.90	0.05	60.07	0.014	0.07
16.05	0.05	60.07	0.013	0.07
16.20	0.05	60.07	0.013	0.07
16.35	0.05	60.07	0.013	0.07
16.50	0.05	60.07	0.013	0.07
16.65	0.05	60.06	0.013	0.06

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
16.80	0.05	60.06	0.013	0.06
16.95	0.05	60.06	0.012	0.06
17.10	0.05	60.06	0.012	0.06
17.25	0.05	60.06	0.012	0.06
17.40	0.05	60.06	0.012	0.06
17.55	0.05	60.06	0.012	0.06
17.70	0.05	60.06	0.012	0.06
17.85	0.05	60.06	0.012	0.06
18.00	0.05	60.06	0.012	0.06
18.15	0.05	60.06	0.012	0.06
18.30	0.05	60.06	0.011	0.06

18.45	0.05	60.06	0.011	0.06
18.60	0.05	60.06	0.011	0.06
18.75	0.05	60.06	0.011	0.06
18.90	0.05	60.06	0.011	0.06
19.05	0.05	60.06	0.011	0.06
19.20	0.05	60.06	0.011	0.06
19.35	0.05	60.06	0.011	0.06
19.50	0.05	60.06	0.011	0.06
19.65	0.05	60.06	0.011	0.06
19.80	0.05	60.06	0.011	0.06
19.95	0.05	60.05	0.011	0.05
20.10	0.05	60.05	0.011	0.05
20.25	0.05	60.05	0.011	0.05
20.40	0.05	60.05	0.011	0.05
20.55	0.05	60.05	0.011	0.05
20.70	0.05	60.05	0.011	0.05
20.85	0.05	60.05	0.011	0.05
21.00	0.05	60.05	0.011	0.05
21.15	0.05	60.05	0.011	0.05
21.30	0.05	60.05	0.011	0.05
21.45	0.05	60.05	0.011	0.05
21.60	0.05	60.05	0.011	0.05
21.75	0.05	60.05	0.010	0.05
21.90	0.05	60.05	0.010	0.05
22.05	0.05	60.05	0.010	0.05
22.20	0.05	60.05	0.010	0.05
22.35	0.05	60.05	0.010	0.05
22.50	0.05	60.05	0.010	0.05
22.65	0.05	60.05	0.010	0.05
22.80	0.05	60.05	0.010	0.05
22.95	0.05	60.05	0.010	0.05
23.10	0.05	60.05	0.010	0.05
23.25	0.05	60.05	0.010	0.05
23.40	0.05	60.05	0.010	0.05
23.55	0.05	60.05	0.010	0.05
23.70	0.05	60.05	0.010	0.05
23.85	0.05	60.05	0.010	0.05
24.00	0.05	60.05	0.010	0.05
24.15	0.03	60.05	0.010	0.05
24.30	0.01	60.05	0.010	0.05
24.45	0.00	60.05	0.009	0.05
24.60	0.00	60.04	0.009	0.04
24.75	0.00	60.04	0.008	0.04
24.90	0.00	60.04	0.008	0.04
25.05	0.00	60.04	0.007	0.04

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
25.20	0.00	60.03	0.007	0.03
25.35	0.00	60.03	0.006	0.03
25.50	0.00	60.03	0.006	0.03
25.65	0.00	60.03	0.006	0.03
25.80	0.00	60.03	0.005	0.03
25.95	0.00	60.03	0.005	0.03
26.10	0.00	60.02	0.005	0.02
26.25	0.00	60.02	0.004	0.02
26.40	0.00	60.02	0.004	0.02
26.55	0.00	60.02	0.004	0.02
26.70	0.00	60.02	0.004	0.02
26.85	0.00	60.02	0.003	0.02
27.00	0.00	60.02	0.003	0.02
27.15	0.00	60.02	0.003	0.02
27.30	0.00	60.01	0.003	0.01
27.45	0.00	60.01	0.003	0.01
27.60	0.00	60.01	0.002	0.01

27.75	0.00	60.01	0.002	0.01
27.90	0.00	60.01	0.002	0.01
28.05	0.00	60.01	0.002	0.01
28.20	0.00	60.01	0.002	0.01
28.35	0.00	60.01	0.002	0.01
28.50	0.00	60.01	0.002	0.01
28.65	0.00	60.01	0.002	0.01
28.80	0.00	60.01	0.002	0.01
28.95	0.00	60.01	0.001	0.01
29.10	0.00	60.01	0.001	0.01
29.25	0.00	60.01	0.001	0.01
29.40	0.00	60.01	0.001	0.01
29.55	0.00	60.01	0.001	0.01
29.70	0.00	60.01	0.001	0.01
29.85	0.00	60.00	0.001	0.00

PEAK DISCHARGE = 1.075 CFS - PEAK OCCURS AT HOUR 2.65
MAXIMUM WATER SURFACE ELEVATION = 61.753
MAXIMUM STORAGE = 0.3927 AC-FT INCREMENTAL TIME= 0.050000HRS

PRINT HYD ID=7 CODE=3

PARTIAL HYDROGRAPH 107.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	6.750	0.9	13.500	0.1
20.250	0.1	27.000	0.0		
0.150	0.0	6.900	0.8	13.650	0.1
20.400	0.1	27.150	0.0		
0.300	0.0	7.050	0.8	13.800	0.1
20.550	0.1	27.300	0.0		
0.450	0.0	7.200	0.7	13.950	0.1
20.700	0.1	27.450	0.0		
0.600	0.0	7.350	0.7	14.100	0.1
20.850	0.1	27.600	0.0		
0.750	0.0	7.500	0.6	14.250	0.1
21.000	0.1	27.750	0.0		
0.900	0.0	7.650	0.6	14.400	0.1
21.150	0.1	27.900	0.0		
1.050	0.1	7.800	0.6	14.550	0.1
21.300	0.1	28.050	0.0		
1.200	0.2	7.950	0.5	14.700	0.1
21.450	0.1	28.200	0.0		
1.350	0.3	8.100	0.5	14.850	0.1
21.600	0.1	28.350	0.0		
1.500	0.7	8.250	0.5	15.000	0.1
21.750	0.1	28.500	0.0		
1.650	1.0	8.400	0.5	15.150	0.1
21.900	0.1	28.650	0.0		
1.800	1.0	8.550	0.4	15.300	0.1
22.050	0.1	28.800	0.0		
1.950	1.1	8.700	0.4	15.450	0.1
22.200	0.1	28.950	0.0		
2.100	1.1	8.850	0.4	15.600	0.1
22.350	0.1	29.100	0.0		
2.250	1.1	9.000	0.4	15.750	0.1
22.500	0.1	29.250	0.0		
2.400	1.1	9.150	0.3	15.900	0.1
22.650	0.1	29.400	0.0		
2.550	1.1	9.300	0.3	16.050	0.1
22.800	0.1	29.550	0.0		
2.700	1.1	9.450	0.3	16.200	0.1
22.950	0.1	29.700	0.0		
2.850	1.1	9.600	0.3	16.350	0.1

23.100	0.1	29.850	0.0				
	3.000	1.1	9.750	0.3	16.500	0.1	
23.250	0.1	30.000	0.0				
	3.150	1.1	9.900	0.3	16.650	0.1	
23.400	0.1	30.150	0.0				
	3.300	1.1	10.050	0.3	16.800	0.1	
23.550	0.1	30.300	0.0				
	3.450	1.1	10.200	0.2	16.950	0.1	
23.700	0.1	30.450	0.0				
	3.600	1.1	10.350	0.2	17.100	0.1	
23.850	0.1	30.600	0.0				
	3.750	1.1	10.500	0.2	17.250	0.1	
24.000	0.1	30.750	0.0				
	3.900	1.1	10.650	0.2	17.400	0.1	
24.150	0.1	30.900	0.0				
	4.050	1.1	10.800	0.2	17.550	0.1	
24.300	0.0	31.050	0.0				
	4.200	1.1	10.950	0.2	17.700	0.1	
24.450	0.0	31.200	0.0				
	4.350	1.1	11.100	0.2	17.850	0.1	
24.600	0.0	31.350	0.0				
	4.500	1.1	11.250	0.2	18.000	0.1	
24.750	0.0	31.500	0.0				
	4.650	1.0	11.400	0.2	18.150	0.1	
24.900	0.0	31.650	0.0				
	4.800	1.0	11.550	0.2	18.300	0.1	
25.050	0.0	31.800	0.0				
	4.950	1.0	11.700	0.2	18.450	0.1	
25.200	0.0	31.950	0.0				
	5.100	1.0	11.850	0.1	18.600	0.1	
25.350	0.0	32.100	0.0				
	5.250	1.0	12.000	0.1	18.750	0.1	
25.500	0.0	32.250	0.0				
	5.400	1.0	12.150	0.1	18.900	0.1	
25.650	0.0	32.400	0.0				
	5.550	1.0	12.300	0.1	19.050	0.1	
25.800	0.0	32.550	0.0				
	5.700	1.0	12.450	0.1	19.200	0.1	
25.950	0.0	32.700	0.0				
	5.850	1.0	12.600	0.1	19.350	0.1	
26.100	0.0	32.850	0.0				
	6.000	1.0	12.750	0.1	19.500	0.1	
26.250	0.0	33.000	0.0				
	6.150	1.0	12.900	0.1	19.650	0.1	
26.400	0.0	33.150	0.0				
	6.300	1.0	13.050	0.1	19.800	0.1	
26.550	0.0	33.300	0.0				
	6.450	1.0	13.200	0.1	19.950	0.1	
26.700	0.0	33.450	0.0				
	6.600	0.9	13.350	0.1	20.100	0.1	
26.850	0.0	33.600	0.0				

RUNOFF VOLUME = 1.84680 INCHES = 0.7047 ACRE-FEET
PEAK DISCHARGE RATE = 1.08 CFS AT 2.650 HOURS BASIN AREA = 0.0072 SQ. MI.

*ENTIRE SITE PLUS ADJACENT ROADWAYS- NATIVE CONDITION

COMPUTE NM HYD ID=8 HYD NO=104 DA= .007154553 SQ MI
PER A=100 PER B=00 PER C=00 PER D=00
TP=-.150 MASSRAIN=-1

K = 0.187878HR TP = 0.150000HR K/TP RATIO = 1.252521 SHAPE CONSTANT, N = 2.848355

UNIT PEAK = 12.841 CFS UNIT VOLUME = 0.9978 B = 269.22 P60 = 1.7400

AREA = 0.007155 SQ MI IA = 0.65000 INCHES INF = 1.67000 INCHES PER HOUR

RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.050000

PRINT HYD ID=8 CODE=3

PARTIAL HYDROGRAPH 104.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	3.150	0.1	4.200	0.0	1.050	0.0
0.150	0.0	3.300	0.1	4.350	0.0	1.200	0.0
0.300	0.0	3.450	0.1	4.500	0.0	1.350	0.4
0.450	0.0	3.600	0.0	4.650	0.0	1.500	6.2
0.600	0.0	3.750	0.0	4.800	0.0	1.650	4.9
0.750	0.0	3.900	0.0			1.800	2.2
0.900	0.0	4.050	0.0			1.950	1.0
2.100	0.6						
2.250	0.5						
2.400	0.4						
2.550	0.3						
2.700	0.2						
2.850	0.2						
3.000	0.1						

RUNOFF VOLUME = 0.56829 INCHES = 0.2168 ACRE-FEET

PEAK DISCHARGE RATE = 6.61 CFS AT 1.550 HOURS BASIN AREA = 0.0072 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 13:18:47

CAUTION:

EXISTING UTILITIES ARE NOT SHOWN. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO ANY EXCAVATION TO DETERMINE THE ACTUAL LOCATION OF UTILITIES & OTHER IMPROVEMENTS.

EROSION CONTROL NOTES:

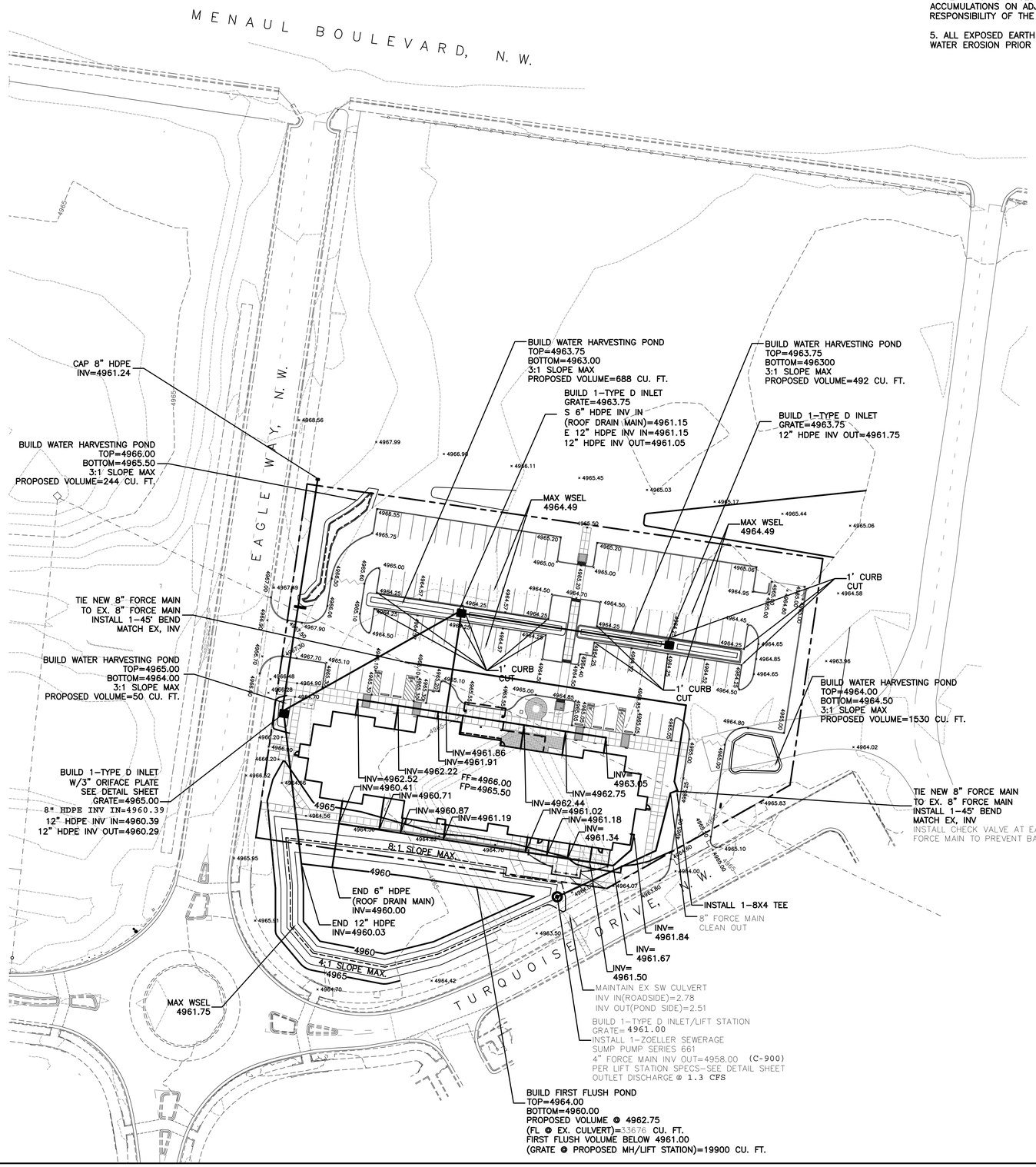
1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.

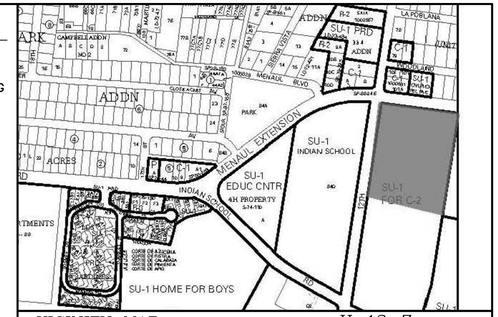
2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.

3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.

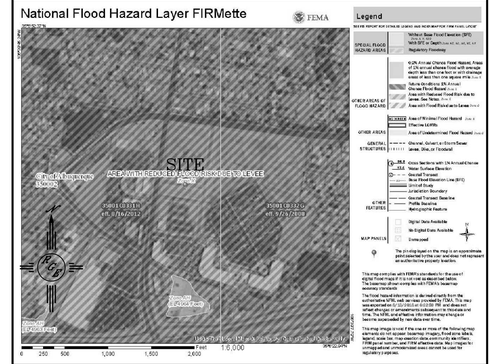
4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.

5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF ANY PROJECT.





VICINITY MAP: H-13-Z



FIRM MAP:

LEGAL DESCRIPTION:

-

NOTES:

1. ALL SPOT ELEVATIONS REPRESENT FLOWLINE ELEVATION UNLESS OTHERWISE NOTED.

2. ALL CURB AND GUTTER TO 6" HEADER UNLESS OTHERWISE NOTED.

3. ALL RETAINING WALL DESIGN SHALL BE BY OTHERS.

4. ANY CURBS OR PAVEMENT NEGATIVELY IMPACTED BY CONSTRUCTION ACTIVITY SHALL BE REPLACED TO MATCH EXISTING CONDITIONS.

5. ALL SITE WORK SHALL CONFORM TO CITY OF ALBUQUERQUE STANDARDS FOR PUBLIC WORKS CONSTRUCTION EDITION 9

LEGEND

- 5414 — EXISTING CONTOUR
- 5415 — EXISTING INDEX CONTOUR
- 5414 — PROPOSED CONTOUR
- **5415** — PROPOSED INDEX CONTOUR
- SLOPE TIE
- × 4048.25 — EXISTING SPOT ELEVATION
- × 4048.25 — PROPOSED SPOT ELEVATION
- BOUNDARY
- CENTERLINE
- RIGHT-OF-WAY
- PROPOSED CURB
- EXISTING CURB AND GUTTER
- EXISTING SIDEWALK
- EXISTING CONCRETE

N

GRAPHIC SCALE

40 20 0 20 40

SCALE: 1"=40'

ENGINEER'S SEAL

DAVID SOULE NEW MEXICO 14522 REGISTERED PROFESSIONAL ENGINEER

12/15/18

DAVID SOULE
P.E. #14522

12th AND MENAUL
GRADING AND DRAINAGE PLAN

Rio Grande Engineering
1606 CENTRAL AVENUE SE
SUITE 201
ALBUQUERQUE, NM 87106
(505) 872-0999

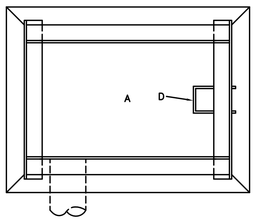
DRAWN BY WCWJ

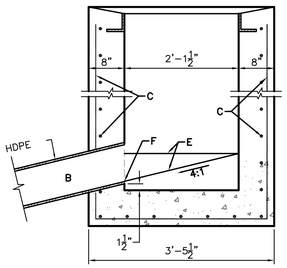
DATE 11-01-18

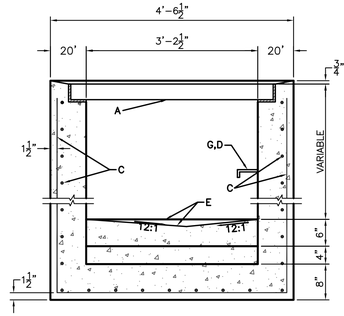
218153-LAYOUT-11-01-18

SHEET #

JOB # 218153







GENERAL NOTES:

1. STORM INLET CUTTER TRANSITION WILL BE SHOWN ON THE CONSTRUCTION PLANS.
2. OUTLET PIPE, PER DESIGN REQUIREMENT.
3. FOR FRAME & GRATING, SEE DWG. 2216, 2220 & 2221

CONSTRUCTION NOTES:

A. FRAME & GRATE

B. CUT ONE HORIZONTAL AND ONE VERTICAL BAR MAX. AT PIPE OPENING.

C. NO. 4 BARS @ 6" O.C. EACH WAY

D. USE STANDARD STEPS, SEE DWG 2229.

E. CONC. FILL, SEE NOTE C DWG 2201

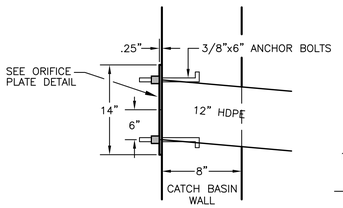
F. INVERT PER DESIGN

G. INSTALL STEPS ON DOWNSTREAM FACE

H. CENTER SUPPORT ASSEMBLY

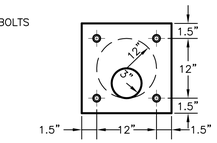
TYPE D INLET DETAIL

N.T.S.



DETAIL A

TO BE INSTALLED @ THE OUTFLOW OF THE CATCH BASINS (SEE THIS PLAN FOR ORIFICE PLATE SIZES)



TYP. ORIFICE PLATE DETAIL

N.T.S.

Trusted. Tested. Tough.™

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

ZOELLER. PUMP COMPANY

SECTION: 2.28.689
FM2794
0318
Supersedes
0318

TECHNICAL DATA SHEET
SEWAGE WASTE SERIES
Models 611, 621, 631, 641, 651, 661 Submersible Sewage Pumps

PRODUCT SPECIFICATIONS

MOTOR	Horse Power	1 (611), 1-1/2 (621), 2 (631), 3 (641), 5 (651), 7-1/2 (661)
	Voltage	230, 200 - 575
	Phase	1, 3 Ph
	Hertz	60 Hz
	RPM	1760
	Type	Capacitor start capacitor run or 3 Ph
	Insulation	Class F
	Amps	1.7 - 28.0
PUMP	Operation	Nonautomatic
	Discharge Size	3" NPT (optional 3" or 4" flange available)
	Solids Handling	2-1/2" (63 mm) spherical solids
	Cord Length	25' (8 m) standard
	Cord Type	UL listed 3-wire cord
	Max. Head	95' (19.0 m)
	Max. Flow Rate	590 GPM (2,233 LPM)
	Max. Operating Temp.	104 °F (40 °C)
	Cooling	Oil-filled
	Motor Protection	Thermal sensors with automatic reset

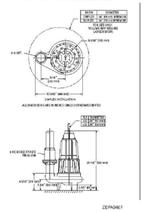
MATERIALS	Upper Bearing	Ball bearing
	Lower Bearing	Ball bearing
	Mechanical Seals	Tandem carbon and ceramic
	Impeller Type	Semi-open
	Impeller	Ductile iron
	Hardware	Stainless steel
	Motor Shaft	Stainless steel
	Gasket	Buna-N square ring seals

All Class 30 cast iron construction.

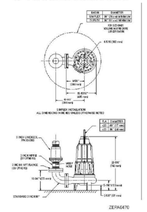
NOTE: See model comparison chart for specific details.

Suitable UL 778 and CSA C22.2 No. 108

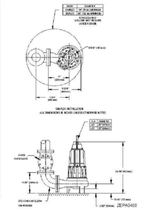
3" NPT DISCHARGE



3" FLANGED DISCHARGE



4" FLANGED DISCHARGE



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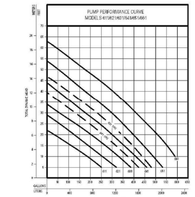
TOTAL DYNAMIC HEAD FLOW PER MINUTE

MODEL	611		621		631		641 (3PH)	
Feet	Meters	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM
95	29	0	0	0	0	0	0	0	0
90	27	50	190	100	380	120	455	120	455
85	26	100	380	150	570	180	680	180	680
80	24	140	530	190	720	230	870	240	910
75	23	170	645	230	870	280	1060	290	1100
70	21	200	760	270	1020	320	1210	340	1290
65	20	230	870	310	1170	370	1400	390	1480
60	18	260	980	350	1320	410	1550	430	1630
55	17	280	1060	380	1440	450	1700	470	1780
50	15	300	1140	410	1550	480	1820	500	1890
45	14	320	1210	430	1630	510	1930	530	2010
40	12	340	1290	450	1700	530	2010	550	2080
35	11	350	1320	470	1780	550	2080	570	2160
30	9	360	1360	480	1820	570	2160	590	2230
25	8	370	1400	490	1850	580	2200	600	2270
20	6	380	1440	500	1890	590	2230	610	2310
15	5	385	1460	510	1930	600	2270	620	2350
10	3	390	1480	515	1950	610	2310	630	2380
5	2	395	1500	520	1970	615	2330	635	2400
2 feet of head		400 GPM		525 GPM		620 GPM		640 GPM	

MODEL	641		651 (3PH)		651		661	
Feet	Meters	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM
95	29	0	0	0	0	0	0	0	0
90	27	120	455	120	455	120	455	120	455
85	26	180	680	180	680	180	680	180	680
80	24	240	910	240	910	240	910	240	910
75	23	290	1100	290	1100	290	1100	290	1100
70	21	340	1290	340	1290	340	1290	340	1290
65	20	390	1480	390	1480	390	1480	390	1480
60	18	430	1630	430	1630	430	1630	430	1630
55	17	470	1780	470	1780	470	1780	470	1780
50	15	500	1890	500	1890	500	1890	500	1890
45	14	530	2010	530	2010	530	2010	530	2010
40	12	550	2080	550	2080	550	2080	550	2080
35	11	570	2160	570	2160	570	2160	570	2160
30	9	590	2230	590	2230	590	2230	590	2230
25	8	600	2270	600	2270	600	2270	600	2270
20	6	610	2310	610	2310	610	2310	610	2310
15	5	620	2350	620	2350	620	2350	620	2350
10	3	630	2380	630	2380	630	2380	630	2380
5	2	635	2400	635	2400	635	2400	635	2400
2 feet of head		640 GPM		640 GPM		640 GPM		640 GPM	



Model	MODEL COMPARISON								
	Seal	Mode	Volts	Ph	Amps	HP	Hz	Lbs	Kg
*E611	Double	Non	230	1	6.9	1	60	245	111
J611	Double	Non	200	3	4.0	1	60	245	111
F611	Double	Non	230	3	4.2	1	60	245	111
G611	Double	Non	460	3	2.1	1	60	245	111
BA611	Double	Non	575	3	1.7	1	60	245	111
*E621	Double	Non	230	1	9.0	1-1/2	60	245	111
J621	Double	Non	200	3	5.9	1-1/2	60	245	111
F621	Double	Non	230	3	5.1	1-1/2	60	245	111
G621	Double	Non	460	3	2.6	1-1/2	60	245	111
BA621	Double	Non	575	3	2.0	1-1/2	60	245	111
*E631	Double	Non	230	1	14.5	2	60	245	111
J631	Double	Non	200	3	7.8	2	60	245	111
F631	Double	Non	230	3	6.8	2	60	245	111
G631	Double	Non	460	3	3.4	2	60	245	111
BA631	Double	Non	575	3	2.7	2	60	245	111
*E641	Double	Non	230	1	17.0	3	60	245	111
J641	Double	Non	200	3	11.0	3	60	245	111
F641	Double	Non	230	3	9.6	3	60	245	111
G641	Double	Non	460	3	4.8	3	60	245	111
BA641	Double	Non	575	3	3.9	3	60	245	111
*E651	Double	Non	230	1	28.0	5	60	245	111
J651	Double	Non	200	3	17.5	5	60	245	111
F651	Double	Non	230	3	15.2	5	60	245	111
G651	Double	Non	460	3	7.6	5	60	245	111
BA651	Double	Non	575	3	6.1	5	60	245	111
J661	Double	Non	200	3	25.3	7-1/2	60	245	111
F661	Double	Non	230	3	22.0	7-1/2	60	245	111
G661	Double	Non	460	3	11.0	7-1/2	60	245	111
BA661	Double	Non	575	3	9.0	7-1/2	60	245	111

* All single phase units require external starting capacitor and relay circuits.
Additional cord lengths are available in 25' (11 m) and 50' (15 m).

CAUTION All installation of controls, protection devices and wiring should be done by a qualified licensed electrician. All electrical and safety codes should be followed including the most recent National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).

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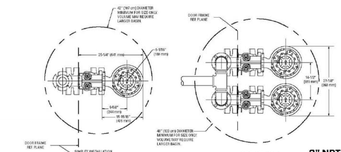
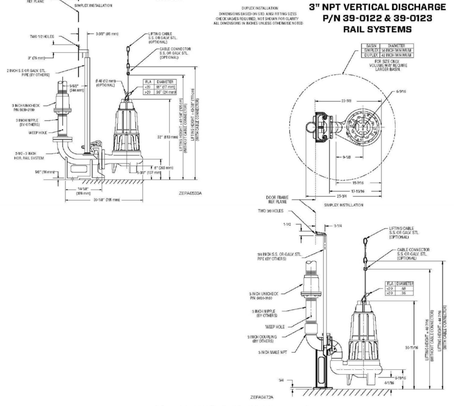
RAIL SYSTEM DIMENSIONAL DATA

3" FLANGED HORIZONTAL DISCHARGE
P/N 39-0094 RAIL SYSTEM



3" NPT VERTICAL DISCHARGE
P/N 39-0122 & 39-0123
RAIL SYSTEMS



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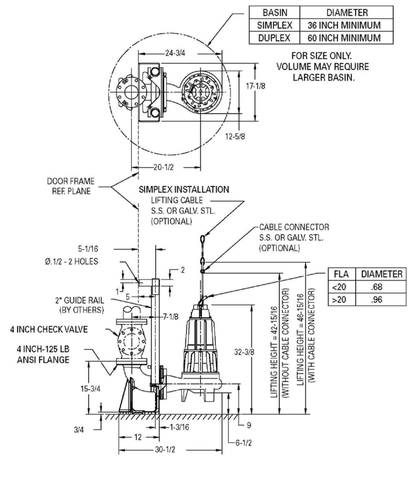
RAIL SYSTEM DIMENSIONAL DATA, continued

4" FLANGED HORIZONTAL DISCHARGE
P/N 39-0154 RAIL SYSTEM

BASIN	DIAMETER
SIMPLEX	36 INCH MINIMUM
DUPLEX	60 INCH MINIMUM

FOR SIZE ONLY. VOLUME MAY REQUIRE LARGER BASIN.



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Rio Grande Engineering
1606 CENTRAL AVENUE SE
SUITE 201
ALBUQUERQUE, NM 87106
(505) 872-0999