IN THE SUPREME COURT OF THE STATE OF NEVADA

Case No. 84345
and
Case No. 84640

CITY OF LAS VEGAS, a political subdivision of the State of Nevada,

Appellant

v.

180 LAND CO, LLC, a Nevada limited-liability company, FORE STARS LTD., a Nevada limited liability company,

Respondents

District Court Case No.: A-17-758528-J
Eighth Judicial District Court of Nevada

CITY OF LAS VEGAS' REPLY APPENDIX
VOLUME 6

LAS VEGAS CITY ATTORNEY'S OFFICE Bryan K. Scott (#4381) Jeffrey Galliher (#8078) Rebecca Wolfson (#14132) 495 S. Main Street, 6th Floor Las Vegas, NV 89101 Phone: 702.229.6629 Fax: 702.386.1749 bscott@lasvegasnevada.gov jgalliher@lasvegasnevada.gov rwolfson@lasvegasnevada.gov	McDONALD CARANO LLP George F. Ogilvie III (#3552) Amanda C. Yen (#9726) Christopher Molina (#14092) 2300 W. Sahara Ave, Suite 1200 Las Vegas, NV 89102 Phone: 702.873.4100 Fax: 702.873.9966 gogilvie@mcdonaldcarano.com ayen@mcdonaldcarano.com cmolina@mcdonaldcarano.com

LEONARD LAW, PC Debbie Leonard (#8260) 955 S. Virginia St., Suite #220 Reno, NV 89502 775-964-4656 debbie@leonardlawpc.com	SHUTE, MIHALY & WEINBERGER, LLP Andrew W. Schwartz (CA Bar No. 87699) (Admitted pro hac vice) Lauren M. Tarpey (CA Bar No. 321775) (Admitted pro hac vice) 396 Hayes Street San Francisco, California 94102

CHRONOLOGICAL INDEX TO CITY'S REPLY APPENDIX

DATE	DOCUMENT	VOLUME	PAGE RANGE
2022-09-13	Defendant City of Las Vegas' Second Supplemental Appendix of Exhibits in Support of City's Renewed Motion for Summary Judgment and Motions in Limine Volume 32, Case No. A-18-773268-C	2	REPLY APP 0396 - REPLY APP 0432
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 34, Case No. A-18-773268-C	3	REPLY APP 0433 - REPLY APP 0652
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 35, Case No. A-18-773268-C	4 5	REPLY APP 0653 - REPLY APP 0902 REPLY APP 0903 - REPLY APP 0907
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 36, Case No. A-18-773268-C	5	REPLY APP 0908 - REPLY APP 1096
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 37, Case No. A-18-773268-C	6	REPLY APP 1097 - REPLY APP 1240

DATE	DOCUMENT	VOLUME	PAGE RANGE
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 38, Case No. A-18-773268-C	7	REPLY APP 1241 - REPLY APP 1406
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 39, Case No. A-18-773268-C	7	REPLY APP 1407 - REPLY APP 1476
2023-01-23	Defendant City of Las Vegas' Appendix of Exhibits in Support of Motion to Retax Memorandum of Costs, Volume 1, Exhibits B - C, Case No. A-18-773268-C	8	REPLY APP 1477 - REPLY APP 1667
2022-09-12	Plaintiff Landowners Second Supplement to Appendix of Exhibits in Support of Motion to Determine Take and for Summary Judgment on the Third and Fifth Claims for Relief Volume 24, Excerpt from Exhibit 228, Case No. A-18-773268-C	9	REPLY APP 1668 - REPLY APP 1742

ALPHABETICAL INDEX TO CITY'S REPLY APPENDIX

DATE	DOCUMENT	VOLUME	PAGE RANGE
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 36, Case No. A-18-773268-C	5	REPLY APP 0908 - REPLY APP 1096
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 37, Case No. A-18-773268-C	6	REPLY APP 1097 - REPLY APP 1240
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 38, Case No. A-18-773268-C	7	REPLY APP 1241 - REPLY APP 1406
2022-11-23	Defendant City of Las Vegas' Supplemental Appendix of Exhibits in Support of City's Countermotion for Summary Judgment on Just Compensation Volume 39, Case No. A-18-773268-C	7	REPLY APP 1407 - REPLY APP 1476
2022-09-12	Plaintiff Landowners Reply Re: Plaintiff Landowners' Motion to Determine Take and For Summary Judgment on the Third and Fifth Claims for Relief, Case No. A-18-773268-C	2	REPLY APP 0365 - REPLY APP 0395

DATE	DOCUMENT	VOLUME	PAGE RANGE
2022-09-12	Plaintiff Landowners Second Supplement to Appendix of Exhibits in Support of Motion to Determine Take and for Summary Judgment on the Third and Fifth Claims for Relief Volume 24, Excerpt from Exhibit 228, Case No. A-18-773268-C	9	REPLY APP 1668 - REPLY APP 1742
2022-08-11	Plaintiff Landowners' Appendix of Exhibits in Support of: Plaintiff Landowners' Motion to Determine Take and for Summary Judgment on the Third and Fifth Claims for Relief, Volume 22, Exhibit 214, Case No. A-18-773268-C	1	REPLY APP 0031 - REPLY APP 0227
2022-08-10	Plaintiff Landowners' Motion to Determine Take and for Summary Judgment on the Third and Fifth Claims for Relief, Case No. A-18-773268-C	1	REPLY APP 0001 - REPLY APP 0030

DATED this 2nd day of May, 2023.

BY: /s/ Debbie Leonard

LAS VEGAS CITY ATTORNEY'S OFFICE Bryan K. Scott (#4381) Jeffrey Galliher (#8078) Rebecca Wolfson (#14132) 495 S. Main Street, 6th Floor Las Vegas, NV 89101 Phone: 702.229.6629 Fax: 702.386.1749 bscott@lasvegasnevada.gov jgalliher@lasvegasnevada.gov rwolfson@lasvegasnevada.gov	McDONALD CARANO LLP George F. Ogilvie III (#3552) Amanda C. Yen (#9726) Christopher Molina (#14092) 2300 W. Sahara Ave, Suite 1200 Las Vegas, NV 89102 Phone: 702.873.4100 Fax: 702.873.9966 gogilvie@mcdonaldcarano.com ayen@mcdonaldcarano.com cmolina@mcdonaldcarano.com
LEONARD LAW, PC Debbie Leonard (#8260) 955 S. Virginia St., Suite #220 Reno, NV 89502 775-964-4656 debbie@leonardlawpc.com	SHUTE, MIHALY & WEINBERGER, LLP Andrew W. Schwartz (CA Bar No. 87699) (Admitted pro hac vice) Lauren M. Tarpey (CA Bar No. 321775) (Admitted pro hac vice) 396 Hayes Street San Francisco, California 94102

Attorneys for City of Las Vegas

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that I am an employee of Leonard Law, PC, and that on this date a copy of Appendix Volumes 2-9 were electronically filed with the Clerk of the Court for the Nevada Supreme Court by using the Nevada Supreme Court's E-Filing system (E-Flex). Participants in the case who are registered with E-Flex as users will be served by the E-Flex system. All others will be served by U.S. mail.

Kermitt L. Waters
James J. Leavitt
Michael A. Schneider
Autumn L. Waters
Law Offices of Kermitt L. Waters
704 South Ninth Street
Las Vegas, Nevada 89101
Attorneys for Landowners

Micah S. Echols
Claggett & Sykes Law Firm
4101 Meadows Lane, Suite 100
Las Vegas, Nevada 89107
Attorneys for Landowners

Elizabeth Ham
EHB Companies
1215 S. Fort Apache Road, Suite 120
Las Vegas, NV 89117
Attorneys for Landowners

Karl Hall
Jonathan Shipman
City of Reno
1 E. First Street
P. O. Box 1900
Reno, NV 89505
Attorneys for Amicus Curiae

Steven M. Silva
Nossaman, LP
895 Pinebrook Road
Reno, NV 89509
Attorneys for Amicus Curiae

Brandon P. Kemble
Amanda B. Kern
Nicholas G. Vaskov
Henderson City Attorney's Office
P.O. Box 95050, MSC 144
Henderson, NV 89009
Attorneys for Amicus Curiae

Micaela Moore
North Las Vegas City Attorney's Office
2250 Las Vegas Blvd. North, #810
North Las Vegas, NV 89030
Attorneys for Amicus Curiae

Robert D. Sweetin
Davison Van Cleve
300 South 4th Street, Suite 1400
Las Vegas, NV 89101
Attorneys for Amicus Curiae

Nancy Porter
Lauren A. Landa
Goicoechea, Di Grazia, Coyle & Stanton, Ltd.
530 Idaho Street
Elko, NV 89801
Attorneys for Amicus Curiae

Leo Cahoon
501 Mill Street
Ely, NV 89301
Attorneys for Amicus Curiae

Dated: May 2, 2023

/s/ Tricia Trevino

Tricia Trevino

Electronically Filed
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Steven D. Grierson
CLERK OF THE COURT

APEN
Bryan K. Scott (NV Bar No. 4381)
Philip R. Byrnes (NV Bar No. 166)
Rebecca Wolfson (NV Bar No. 14132)
LAS VEGAS CITY ATTORNEY'S OFFICE
495 South Main Street, 6th Floor
Las Vegas, Nevada 89101
Telephone: (702) 229-6629
Facsimile: (702) 386-1749
bscott@lasvegasnevada.gov
pbyrnes@lasvegasnevada.gov

(Additional Counsel Identified on Signature Page)

Attorneys for Defendant City of Las Vegas

DISTRICT COURT

CLARK COUNTY, NEVADA

FORE STARS, LTD, SEVENTY ACRES, LLC, a Nevada limited liability company, DOE INDIVIDUALS I through X, DOE CORPORATIONS I through X, DOE LIMITED LIABILITY COMPANIES I through X, Plaintiffs, CITY OF LAS VEGAS, political subdivision of the State of Nevada, THE EIGHTH JUDICIAL DISTRICT COURT, County of Clark, State of Nevada, DEPARTMENT 24 (the HONORABLE JIM CROCKETT, DISTRICT COURT JUDGE, IN HIS OFFICIAL CAPACITY), ROE government entities I through X, ROE Corporations I through X, ROE INDIVIDUALS I through X, ROE LIMITED LIABILITY COMPANIES I through X, ROE quasi-governmental entities I through X, Defendants.	Case No. A-18-773268-C Dept. No. XXIX **SUPPLEMENTAL APPENDIX OF EXHIBITS IN SUPPORT OF CITY'S COUNTERMOTION FOR SUMMARY JUDGMENT ON JUST COMPENSATION** **VOLUME 37**

The City of Las Vegas ("City") submits this Supplemental Appendix of Exhibits in support of its Countermotion for Summary Judgment on Just Compensation. This appendix supplements the Appendix of Exhibits in Support of City's Renewed Motion for Summary Judgment and Motions in Limine filed August 11, 2022 (Volumes 1 through 25); the Supplemental Appendix of Exhibits in Support of City's Renewed Motion for Summary Judgment and Motions in Limine filed August 24, 2022 (Volumes 26

through 27); the Second Supplemental Appendix of Exhibits in Support of City's Renewed Motion for Summary Judgment and Motions in Limine filed September 12, 2022 (Volumes 28 through 32); and the Third Supplemental Appendix of Exhibits in Support of City's Renewed Motion for Summary Judgment and Motions in Limine filed September 14, 2022 (Volume 33).

Exhibit	Exhibit Description	Vol.	Bates No.
A	City records regarding William Peccole's Petition to Annex 2,246 acres to the City of Las Vegas	1	0001-0011
B	City records regarding the Peccole Land Use Plan and the Z-34-81 rezoning application	1	0012-0030
C	City records regarding the Venetian Foothills Master Plan and the Z-30-86 rezoning application	1	0031-0050
D	Excerpts of the 1985 City of Las Vegas General Plan	1	0051-0061
E	City records regarding Peccole Ranch Master Plan and phase I rezoning application (Z-139-88)	1	0062-0106
F	City records regarding Z-40-89 rezoning application	1	0107-0113
G	Ordinance No. 3472 (establishing the Gaming Enterprise District) and related records	1	0114-0137
H	City records regarding the Amended Peccole Ranch Master Plan and phase II rezoning application (Z-17-90)	1	0138-0194
I	Excerpts of 1992 City of Las Vegas General Plan	2	0195-0248
J	City records related to Badlands Golf Course expansion	2	0249-0254
K	Excerpt of land use case files for GPA-24-98 and GPA-6199	2	0255-0257
L	Ordinance No. 5250 and Excerpts of Las Vegas 2020 Master Plan	2	0258-0273
M	Miscellaneous Southwest Sector Land Use Maps from 2002-2005	2	0274-0277
N	Ordinance No. 5787 and Excerpts of 2005 Land Use Element	2	0278-0291
O	Ordinance No. 6056 and Excerpts of 2009 Land Use & Rural Neighborhoods Preservation Element	2	0292-0301
P	Ordinance No. 6152 and Excerpts of 2012 Land Use & Rural Neighborhoods Preservation Element	2	0302-0317
Q	Ordinance No. 6622 and Excerpts of 2018 Land Use & Rural Neighborhoods Preservation Element	2	0318-0332
R	Ordinance No. 1582	2	0333-0339
S	Ordinance No. 4073 and Excerpt of the 1997 City of Las Vegas Zoning Code	2	0340-0341

Exhibit	Exhibit Description	Vol.	Bates No.
T	Ordinance No. 5353	2	0342-0361
U	Ordinance No. 6135 and Excerpts of City of Las Vegas Unified Development Code adopted March 16, 2011	2	0362-0364
V	Deeds transferring ownership of the Badlands Golf Course	2	0365-0377
W	Third Revised Justification Letter regarding the Major Modification to the 1990 Conceptual Peccole Ranch Master Plan	2	0378-0381
X	Parcel maps recorded by the Developer subdividing the Badlands Golf Course	3	0382-0410
Y	EHB Companies promotional materials	3	0411-0445
Z	General Plan Amendment (GPA-62387), Rezoning (ZON-62392) and Site Development Plan Review (SDR-62393) applications	3	0446-0466
AA	Staff Report regarding 17-Acre Applications	3	0467-0482
BB	Major Modification (MOD-63600), Rezoning (ZON-63601), General Plan Amendment (GPA-63599), and Development Agreement (DIR-63602) applications	3	0483-0582
CC	Letter requesting withdrawal of MOD-63600, GPA-63599, ZON-63601, DIR-63602 applications	4	0583
DD	Transcript of February 15, 2017 City Council meeting	4	0584-0597
EE	Judge Crockett's March 5, 2018 order granting Queensridge homeowners' petition for judicial review, Case No. A-17-752344-J	4	0598-0611
FF	Docket for NSC Case No. 75481	4	0612-0623
GG	Complaint filed by Fore Stars Ltd. and Seventy Acres LLC, Case No. A-18-773268-C	4	0624-0643
HH	General Plan Amendment (GPA-68385), Site Development Plan Review (SDR-68481), Tentative Map (TMP-68482), and Waiver (68480) applications	4	0644-0671
II	June 21, 2017 City Council meeting minutes and transcript excerpt regarding GPA-68385, SDR-68481, TMP-68482, and 68480.	4	0672-0679
JJ	Docket for Case No. A-17-758528-J	4	0680-0768
KK	Judge Williams' Findings of Fact and Conclusions of Law, Case No. A-17-758528-J	5	0769-0793
LL	Development Agreement (DIR-70539) application	5	0794-0879
MM	August 2, 2017 City Council minutes regarding DIR-70539	5	0880-0882

Exhibit	Exhibit Description	Vol.	Bates No.
NN	Judge Sturman's February 15, 2019 minute order granting City's motion to dismiss, Case No. A-18-775804-J	5	0883
OO	Excerpts of August 2, 2017 City Council meeting transcript	5	0884-0932
PP	Final maps for Amended Peccole West and Peccole West Lot 10	5	0933-0941
QQ	Excerpt of the 1983 Edition of the Las Vegas Municipal Code	5	0942-0951
RR	Ordinance No. 2185	5	0952-0956
SS	1990 aerial photograph identifying Phase I and Phase II boundaries, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0957
TT	1996 aerial photograph identifying Phase I and Phase II boundaries, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0958
UU	1998 aerial photograph identifying Phase I and Phase II boundaries, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0959
VV	2015 aerial photograph identifying Phase I and Phase II boundaries, retail development, hotel/casino, and Developer projects, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0960
WW	2015 aerial photograph identifying Phase I and Phase II boundaries, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0961
XX	2019 aerial photograph identifying Phase I and Phase II boundaries, and current assessor parcel numbers for the Badlands property, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0962
YY	2019 aerial photograph identifying Phase I and Phase II boundaries, and areas subject to inverse condemnation litigation, produced by the City's Planning & Development Department, Office of Geographic Information Systems (GIS)	5	0963
ZZ	2019 aerial photograph identifying areas subject to proposed development agreement (DIR-70539), produced by the City's Planning & Development	5	0964

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AAA	Membership Interest Purchase and Sale Agreement	6	0965-0981
BBB	Transcript of May 16, 2018 City Council meeting	6	0982-0998
CCC	City of Las Vegas' Amicus Curiae Brief, *Seventy Acres, LLC v. Binion*, Nevada Supreme Court Case No. 75481	6	0999-1009
DDD	Nevada Supreme Court March 5, 2020 Order of Reversal, *Seventy Acres, LLC v. Binion*, Nevada Supreme Court Case No. 75481	6	1010-1016
EEE	Nevada Supreme Court August 24, 2020 Remittitur, *Seventy Acres, LLC v. Binion*, Nevada Supreme Court Case No. 75481	6	1017-1018
FFF	March 26, 2020 Letter from City of Las Vegas Office of the City Attorney to Counsel for the Developer Re: Entitlements on 17 Acres	6	1019-1020
GGG	September 1, 2020 Letter from City of Las Vegas Office of the City Attorney to Counsel for the Developer Re: Final Entitlements for 435-Unit Housing Development Project in Badlands	6	1021-1026
HHH	Complaint Pursuant to 42 U.S.C. § 1983, *180 Land Co. LLC et al. v. City of Las Vegas, et al.*, 18-cv-00547 (2018)	6	1027-1122
III	9th Circuit Order in *180 Land Co. LLC; et al v. City of Las Vegas, et al.*, 18-cv-0547 (Oct. 19, 2020)	6	1123-1127
JJJ	Plaintiff Landowners' Second Supplement to Initial Disclosures Pursuant to NRCP 16.1 in 65-Acre case	6	1128-1137
LLL	Bill No. 2019-48: Ordinance No. 6720	7	1138-1142
MMM	Bill No. 2019-51: Ordinance No. 6722	7	1143-1150
NNN	March 26, 2020 Letter from City of Las Vegas Office of the City Attorney to Counsel for the Developer Re: Entitlement Requests for 65 Acres	7	1151-1152
OOO	March 26, 2020 Letter from City of Las Vegas Office of the City Attorney to Counsel for the Developer Re: Entitlement Requests for 133 Acres	7	1153-1155

Exhibit	Exhibit Description	Vol.	Bates No.
PPP	April 15, 2020 Letter from City of Las Vegas Office of the City Attorney to Counsel for the Developer Re: Entitlement Requests for 35 Acres	7	1156-1157
QQQ	Valbridge Property Advisors, Lubawy & Associates Inc., Appraisal Report (Aug. 26, 2015)	7	1158-1247
RRR	Notice of Entry of Order Adopting the Order of the Nevada Supreme Court and Denying Petition for Judicial Review	7	1248-1281
SSS	Letters from City of Las Vegas Approval Letters for 17-Acre Property (Feb. 16, 2017)	8	1282-1287
TTT	Reply Brief of Appellants 180 Land Co. LLC, Fore Stars, LTD,, Seventy Acres LLC, and Yohan Lowie in *180 Land Co LLC et al v. City of Las Vegas*, Court of Appeals for the Ninth Circuit Case No. 19-16114 (June 23, 2020)	8	1288-1294
UUU	Excerpt of Reporter's Transcript of Hearing on City of Las Vegas' Motion to Compel Discovery Responses, Documents and Damages Calculation and Related Documents on Order Shortening Time in *180 Land Co. LLC v. City of Las Vegas*, Eighth Judicial District Court Case No. A-17-758528-J (Nov. 17, 2020)	8	1295-1306
VVV	Plaintiff Landowners' Sixteenth Supplement to Initial Disclosures in *180 Land Co., LLC v. City of Las Vegas*, Eighth Judicial District Court Case No. A-17-758528-J (Nov. 10, 2020)	8	1307-1321
WWW	Excerpt of Transcript of Las Vegas City Council Meeting (Aug. 2, 2017)	8	1322-1371
XXX	Notice of Entry of Findings of Facts and Conclusions of Law on Petition for Judicial Review in *180 Land Co. LLC v. City of Las Vegas*, Eighth Judicial District Court Case No.A-17-758528-J (Nov. 26, 2018)	8	1372-1399
YYY	Notice of Entry of Order *Nunc Pro Tunc* Regarding Findings of Fact and Conclusion of Law Entered November 21, 2019 in *180 Land Co. LLC v. City of Las Vegas*, Eighth Judicial District Court Case No.A-17-758528 (Feb. 6, 2019)	8	1400-1405
ZZZ	City of Las Vegas Agenda Memo – Planning, for City Council Meeting June 21, 2017, Re: GPA-68385, WVR-68480, SDR-68481, and TMP-68482 [PRJ-67184]	8	1406-1432

Exhibit	Exhibit Description	Vol.	Bates No.
AAAA	Excerpts from the Land Use and Rural Neighborhoods Preservation Element of the City's 2020 Master Plan adopted by the City Council of the City on September 2, 2009	8	1433-1439
BBBB	Summons and Complaint for Declaratory Relief and Injunctive Relief, and Verified Claims in Inverse Condemnation in *180 Land Co. LLC v. City of Las Vegas*, Eighth Judicial District Court Case No.A-18-780184-C	8	1440-1477
CCCC	Notice of Entry of Findings of Fact and Conclusions of Law Granting City of Las Vegas' Motion for Summary Judgment in *180 Land Co. LLC v. City of Las Vegas*, Eighth Judicial District Court Case No.A-18-780184-C (Dec. 30, 2020)	8	1478-1515
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DDDD-5	Exhibit 5 to Peter Lowenstein Declaration: August 24, 2017 Letter from City Department of Planning	9	1537
DDDD-6	Exhibit 6 to Peter Lowenstein Declaration: July 26, 2017 Email from Peter Lowenstein re Wall Fence	9	1538
DDDD-7	Exhibit 7 to Peter Lowenstein Declaration: August 10, 2017 Application for Walls, Fences, or Retaining Walls; related materials	9	1539-1546
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FFFF-2	Summary of Communications between Developer and Peccole family regarding acquisition of Badlands Property	9	1623-1629
FFFF-3	Reference map of properties involved in transactions between Developer and Peccole family	9	1630
FFFF-4	Excerpt of appraisal for One Queensridge place dated October 13, 2005	9	1631-1632
FFFF-5	Site Plan Approval for One Queensridge Place (SDR-4206)	9	1633-1636
FFFF-6	Securities Redemption Agreement dated September 14, 2005	9	1637-1654
FFFF-7	Securities Purchase Agreement dated September 14, 2005	9	1655-1692
FFFF-8	Badlands Golf Course Clubhouse Improvement Agreement dated September 6, 2005	9	1693-1730
FFFF-9	Settlement Agreement and Mutual Release dated June 28, 2013	10	1731-1782
FFFF-10	June 12, 2014 emails and Letter of Intent regarding the Badlands Golf Course	10	1783-1786
FFFF-11	July 25, 2014 email and initial draft of Golf Course Purchase Agreement	10	1787-1813
FFFF-12	August 26, 2014 email from Todd Davis and revised purchase agreement	10	1814-1843
FFFF-13	August 27, 2014 email from Billy Bayne regarding purchase agreement	10	1844-1846
FFFF-14	September 15, 2014 email and draft letter to BGC Holdings LLC regarding right of first refusal	10	1847-1848

Exhibit	Exhibit Description	Vol.	Bates No.
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FFFF-23	Fully executed Membership Interest Purchase Agreement for WRL LLC	10	1883-1890
FFFF-24	June 12, 2015 email regarding clubhouse parcel and recorded parcel map	10	1891-1895
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FFFF-27	Deed from Hualapai Commons Ltd. to EHC Hualapai LLC	10	1902-1914
FFFF-28	Purchase Agreement between Hualapai Commons Ltd. and EHC Hualapai LLC	10	1915-1931
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FFFF-30	Plaintiff 180 Land Company LLC's Responses to City of Las Vegas' First Set of Interrogatories to Plaintiff, 3rd Supplement	10	1946-1973
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FFFF-34	First Supplement to Plaintiff Landowners Response to Defendant City of Las Vegas' Second Set of Requests for Production of Documents to Plaintiff	11	1995-2002
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VVVV-2	10/10/1991 Planning Commission Minutes	21	3955-3957
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BBBBB	December 23, 2021 letter from Seth Floyd re Entitlements on 17-acre Property; Applications for development of other segments of former Badlands Golf Course	22	4236-4238
CCCCC	July 19, 2022 letter from Seth Floyd re Entitlements on 17-acre portion of Badlands	22	4239-4240
DDDDD	Appraisal of Real Property prepared by The DiFederico Group re the 17-Acre Property	23	4241-4394
EEEEE	Affidavit of Donald Richards (Ex. 50 to Plaintiff Landowners' Reply in Support of Countermotion for Discovery Pursuant to NRCP 56(d) filed 7/7/2021)	23	4395-4396
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IIIII	Declaration of Kevin McOsker	25	4608-4609
JJJJJ	Videotaped Deposition of Tio Stephan DiFederico, MAI	25	4610-4711
KKKKK	Appellant's Opening Brief filed 11/6/18 in Nevada Supreme Court Case No. 75481	26	4712-4791
LLLLL	Appellant's Amended Reply Brief filed 5/1/19 in Nevada Supreme Court Case No. 75481	26	4792-4829
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Exhibit	Exhibit Description	Vol.	Bates No.
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TTTTT	Order Granting the City of Las Vegas' Objection to the Discovery Commissioner's Report and Recommendation in the 35-Acre Case (No. A-17-758528-J)	30	5417-5422
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VVVVV	Excerpts of Deposition Transcript of Yohan Lowie	31	5559-5566
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XXXXX	Order Granting Stay	33	5584-5588
YYYYY	**Declaration of Oh-Sang Kwon**	**34**	**5589-5595**
YYYYY-1	**Technical Drainage Study for the Seventy 840-050 March 2016**	**34-35**	**5596-5982**
YYYYY-2	**Supplement to Technical Drainage Study for the Seventy 840-050 March 2016**	**35**	**5983-6024**
YYYYY-3	**March 24, 2016 City of Las Vegas Inter-Office Memorandum re Drainage Study for The Seventy**	**36**	**6025-6028**
YYYYY-4	**September 2017 Response to 1st CLV Comments on the Technical Drainage Study for the 435 (Formerly "The Seventy")**	**36**	**6029-6193**
YYYYY-5	**September 14, 2017 - Improvement Plans for the 435**	**37**	**6194-6210**
YYYYY-6	**March 24, 2016 City of Las Vegas Inter-Office Memorandum re Drainage Study for The Seventy**	**37**	**6211-6215**
YYYYY-7	**January 2018 Response to 2nd CLV Comments on the Technical Drainage Study for the 435 (Formerly "The Seventy")**	**37**	**6216-6292**

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YYYYY-9	February 1, 2018 City of Las Vegas Inter-Office Memorandum re Drainage Study for the 435 formerly the SEVENTY	37	6310-6314
YYYYY-10	June 2018 Response to 3rd CLV Comments on the Technical Drainage Study for the 435 (Formerly "The Seventy")	38	6315-6461
YYYYY-11	Improvement Plans for the 435	39	6462-6483
YYYYY-12	July 26, 2018 City of Las Vegas Inter-Office Memorandum re Drainage Study for the 435 formerly the Seventy	39	6484-6489
YYYYY-13	August 13, 2016 GCW Engineers Meeting Minutes	39	6490-6495
YYYYY-14	Email re The 435 TD5 Comments Review Meeting	39	6496-6499
ZZZZZ	Declaration of Michael Cunningham	39	6500
ZZZZZ-1	Administrative Code, 2019 Edition	39	6501-6507

Dated this 23rd day of November, 2022.

McDONALD CARANO LLP

By: */s/ George F. Ogilvie III*

George F. Ogilvie III (NV Bar No. 3552)
Christopher Molina (NV Bar No. 14092)
2300 W. Sahara Avenue, Suite 1200
Las Vegas, Nevada 89102

LAS VEGAS CITY ATTORNEY'S OFFICE
Bryan K. Scott (NV Bar No. 4381)
Philip R. Byrnes (NV Bar No. 166)
Rebecca Wolfson (NV Bar No. 14132)
495 South Main Street, 6th Floor
Las Vegas, Nevada 89101

SHUTE, MIHALY & WEINBERGER, LLP
Andrew W. Schwartz (CA Bar No. 87699)
(Admitted *pro hac vice*)
Lauren M. Tarpey (CA Bar No. 321775)
(Admitted *pro hac vice*)
396 Hayes Street
San Francisco, California 94102

Attorneys for City of Las Vegas

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that I am an employee of McDonald Carano LLP, and that on the 23rd day of November, 2022, I caused a true and correct copy of the foregoing **FOURTH SUPPLEMENTAL APPENDIX OF EXHIBITS IN SUPPORT OF CITY'S COUNTERMOTION FOR SUMMARY JUDGMENT ON JUST COMPENSATION – VOLUME 37** to be electronically served with the Clerk of the Court via the Clark County District Court Electronic Filing Program which will provide copies to all counsel of record registered to receive such electronic notification.

/s/ Jelena Jovanovic
An employee of McDonald Carano LLP

EXHIBIT “YYYYY-5”

IMPROVEMENT PLANS

FOR

SEVENTY ACRES LLC
FORE STARS LTD
THE 435

RAMPART BOULEVARD
LAS VEGAS, NEVADA 89145

APN: 138-32-301-005
APN: 138-32-301-007

INDEX OF DRAWINGS

APPROVALS

APPROVAL OF THESE PLANS IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHTS-OF-WAY AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND/OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER "DEVIATIONS FROM STANDARDS". THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN "DEVIATIONS FROM STANDARDS" IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS CLARK COUNTY AREA NEVADA.

ALLEN PAVELKA, PE # 9029 — DATE
CITY ENGINEER

LAS VEGAS FIRE & RESCUE — DATE

CHRIS KNIGHT, DIRECTOR, BUILDING AND SAFETY — DATE

THIS PLAN CONFORMS TO THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT.

UTILITY/AGENCY APPROVALS

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

THE AFFIXED CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS.

CENTRAL TELEPHONE CO., DBA CENTURYLINK — DATE

NV ENERGY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NV ENERGY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS.

NV ENERGY — DATE

SOUTHWEST GAS CORP. — DATE

LEGAL DESCRIPTION

LOTS 1 AND 2 AS SHOWN IN FILE 120, PAGE 91 OF PARCEL MAPS, AND LOT 2 AS SHOWN IN FILE 120, PAGE 44 OF PARCEL MAPS, AND LOT 1 AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS-XXXXX ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

MARK J. FAKLER P.E. 9911 — DATE

OWNER/DEVELOPER

SEVENTY ACRES LLC AND
FORE STARS LTD
1215 S. FORT APACHE RD.
SUITE #120
LAS VEGAS NV. 89117

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-108NW8	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLV108NW8"; BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

STATE OF NEVADA — PROFESSIONAL ENGINEER — THOMAS P. DYSON — No. 14704 — 09/14/2017

TDS SUBMITTAL

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	CCW APP	DATE

PROJECT NO. 840-050

DESIGN: TD
DRAWN: TD
CHECK: MP
PLOT DATE: 09-14-17
PLOT TIME: 23:08:54

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\PROJECTS\800\840-050\DWG\PRODUCTION\PHASE-1\A\050-1AA001_C1.DWG
PAUL BRENNAN

SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

COVER SHEET

DRAWING
C1.01
1 OF 17 SHTS

REPLY APP 1116

CLV295640

6194

ABBREVIATIONS

A	AIR, ANODE
A.E.	ACCESS EASEMENT
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AB,AGG	AGGREGATE BASE
ABAN	ABANDON
AC	ASPHALT CONCRETE, ACRE
ACP	ASBESTOS CEMENT PIPE
ADD'L	ADDITIONAL
ARP	ABANDONINPLACE
ALT	ALTERNATE
AP	ANGLE POINT
APN	ASSESSOR'S PARCEL NUMBER
APPROX	APPROXIMATELY
APT	APARTMENT
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AVAR	AIR VALVE, AIR RELEASE ASSEMBLY
AVE	AVENUE
AWWA	AMERICAN WATERWORKS ASSOCIATION
BC	BACK OF CURB
BCR	BEGIN CURB RETURN, BACK OF CURB RADIUS
BDRY	BOUNDARY
BLDG	BUILDING
BLM	BUREAU OF LAND MANAGEMENT
BLVD	BOULEVARD
BM	BENCHMARK
BO	BLOW-OFF
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE STATION
BW	BACK OF SIDEWALK
BWV	BACKWATER VALVE
C&G	CURB AND GUTTER
C,h	CENTERLINE
CATV	UNDERGROUND CABLE TV
CBC	CITY OF BOULDER CITY
CC	CLARK COUNTY
C-C	CENTER TO CENTER
CCBM	CLARK COUNTY BENCHMARK
CCPW	CLARK COUNTY PUBLIC WORKS
CORFCD	CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
CCTV	CLOSED-CIRCUIT TELEVISION
CCWRD	CLARK COUNTY WATER RECLAMATION DISTRICT
CE	COMMON ELEMENT
CF	CUBIC FEET, CURB FACE
CFS	CUBIC FEET PER SECOND
CIP	CAPITAL IMPROVEMENTS PROJECT, CORRUGATED IRON PIPE
CIPM	CURED-IN-PLACE MANHOLE
CIPP	CURED-IN-PLACE PIPE
CIR	CIRCLE
CL	CLASS
CLR	CLEAR OR CLEARANCE
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CLV	CITY OF LAS VEGAS
CM	CITY OF MESQUITE
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CNLV	CITY OF NORTH LAS VEGAS
CO	CLEANOUT
COH	CITY OF HENDERSON
COL	COLUMN
COMM	COMMERCIAL
CONC,PCC	CONCRETE
COND	CONDUIT
CONST	CONSTRUCT OR CONSTRUCTION
COORD	COORDINATE
COR	CORNER
CPEP	CORRUGATED POLYETHELYNE PIPE
CPR	COPPER WATER LINE
CT	COURT
CULV	CULVERT
CY	CUBIC YARD(S)
D,d	DELTA
DBL	DOUBLE
DCS	DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEM (LATESTEDITION)
DE	DRAINAGE EASEMENT
DEFL	DEFLECTION
DEPT	DEPARTMENT
DG	DESIGN GRADE
DI	DROP INLET
DIA,ø	DIAMETER
DIP	DUCTILE IRON PIPE
DIST	DISTANCE
DOM	DOMESTIC
DP	DUPLEX
DR	DRIVE
DS	DOWNSPOUT
D'TL	DETAIL
DWG	DRAWING
DWY	DRIVEWAY
E	EAST, ELECTRIC
EAE	EMERGENCY ACCESS EASEMENT
EBS	CATHODIC PROTECTION BOND STATION
ECR	END CURB RETURN
ELE,ELEC	ELECTRICAL
ELEV	ELEVATION
EMBK	EMBANKMENT
EP,EOP	EDGE OF PAVEMENT
ESMT	EASEMENT
ETS	CATHODIC PROTECTION TEST STATION
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE STATION
EXIST,EX	EXISTING
EXP	EXPANSION JOINT
FA	FIRE ALARM
FC	FACE OF CURB
FF,FFE	FINISH FLOOR ELEVATION
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOWLINE
FLG	FLANGE
FO	FIBEROPTIC
FRP	FIBERGLASS REINFORCED PLASTIC
FS	FINISH SURFACE
FT	FOOT/FEET
FTG	FOOTING
FUT	FUTURE
G	GAS
GA	GAGE ,GUY ANCHOR
GB	GRADE BREAK
GFF	GARAGE FINISHED FLOOR
GND	GROUND
GRD	GRADE, GROUND
GUT	GUTTER
H,HGT	HEIGHT
HDWL	HEADWALL
HERCP	HORIZONTAL ELLIPTICAL REINFORCED CONCRETE PIPE
HGL	HYDRAULIC GRADELINE
HOA	HOMEOWNERS ASSOCIATION
HORIZ	HORIZONTAL
HP	HIGH POINT, HIGH PRESSURE
HPS	HIGH PRESSURE SODIUM
IBC	INTERNATIONAL BUILDING CODE
IN	INCH
INT	INTERSECTION, INTERIM
INV	INVERT
ISL	ISLAND
JB	JUCNTION BOX
JT	JOINT
L	LENGTH
LFT	LEFT
LF	LINEAR FEET
LIP	LIP OF GUTTER
LN	LANE
LOC	LENGTH OF CURB
LP	LIGHT POLE
LSLSCP	LANDSCAPE
LVVWD	LAS VEGAS VALLEY WATER DISTRICT
MAX	MAXIMUM
ME	MATCH EXISTING
MH	MANHOLE
MIN	MINIMUM
MLCP	MORTAR LINED AND COATED PIPE
MOD	MODIFY/MODIFIED
MON	MONUMENT, MONOLITHIC
MP	MESAPARK
MPH	MILES PER HOUR
MSM	MINOR SUBDIVISION MAP
N	NORTH
NAP	NOT A PART
NDOT	NEVADA DEPARTMENT OF TRANSPORTATION
NO	NUMBER
NOSHA	STATE OF NEVADA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
NPC	NEVADA POWER COMPANY
NTS	NOT TO SCALE
NVE	NEVADA ENERGY
OB	OVERBUILD
OC	ON CENTER
OG	OPEN GRADE, ORIGINAL GROUND
OHC	OVERHEAD COX COMMUNICATION
OHP	OVERHEAD POWERLINE
P	POWER
PAE	PEDESTRIAN ACCESS EASEMENT
PB	PULL BOX
PBS	PLANTMIX BITUMINOUS SURFACE
PC	POINT OF CURVATURE, PRESSURE CLASS
PCC	POINT OF COMPOUND CURVE, PORTLAND CEMENT CONCRETE
PDE	PUBLIC DRAINAGE EASEMENT
PE	PROJECT ENGINEER OR POLYETHYLENE
PED	PEDESTRIAN
PGL	PROFILE GRADE LINE
PH	POTHOLE
PI	POINT OF INTERSECTION
PIP	PROTECT IN PLACE
PIV	POST INDICATOR VALVE
PL,P/L	PROPERTY LINE
PLCP	POLYURETHANE LINED AND COATED STEEL PIPE
PMF	PAVEMENT MARKING FILM
PO	PUSH-ON
POB	POINT OF BEGINNING
POC	POINT OF CONNECTION
POT	POINT ON TANGENT
PP	POWER POLE
PRC	POINT OF REVERSE CURVE
PROP	PROPOSED
PRVC	POINT OF REVERSE VERTICAL CURVE
PSE	PUBLIC SEWER EASEMENT TO BE PRIVATELY MAINTAINED BY HOA
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENCY
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYLCHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
PVT	PRIVATE
PW	PRODUCT WALL
PZ	PRESSURE ZONE
R,RAD	RADIAL, RADIUS
R,RT	RIGHT
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REC	RECTANGULAR
REF	REFERENCE
REINF	REINFORCED
RELOC	RELOCATE
REQD	REQUIRED
RET	RETAINING
RIM	TOP OF RIM ELEVATION
RND	ROUND
ROW,R/W	RIGHT OF WAY
RP	RADIUS POINT
RPM	RAISED PAVEMENT MARKERS
RPPA	REDUCED PRESSURE PRINCIPAL ASSEMBLY
RR	RAILROAD
RSGV	RESILIENT SEAT GATE VALVE
RTW	RETAINING WALL
RW	REUSE WATER
S	SEWER, SOUTH
SC	STAIRCASE
SCH	SCHEDULE
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SECT	SECTION
SF	SQUARE FOOT/FEET
SHLDR	SHOULDER
SHT	SHEET
SIS	SUNNERUN IMPROVEMENT STANDARDS
SL, STLT	STREET LIGHT
SP	SERVICE POINT
SQ	SQUARE
SS	SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
ST	STREET
STA	STATION
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURE
SURV	SURVEY
SVZ	SIGHT VISIBILITY ZONE
SW	SIDEWALK
SWG	SOUTHWEST GAS
SY	SQUARE YARD
T	TELEPHONE OR TOP
TAN	TANGENT
TB	TOP OF BERM
TBA	TO BE ADJUSTED
TBR	TO BE REMOVED
TC	TOP OF CURB
TCD	TRAFFIC CONTROL DEVICE
TCE	TEMPORARY CONSTRUCTION ESMT
TEL,TELE	TELEPHONE
TEMP	TEMPORARY
TF	TOP OF FOOTING
TG	TOP OF GRATE
TMH	TOP OF MANHOLE
TOP	TOP OF PIPE
TP	TELEPHONE POLE, TOP OF PIPE
TRANS	TRANSITION
TRW	TOP OF RETAINING WALL
TS	TRAFFIC SIGNAL
TSI	TRAFFIC SIGNAL INTERCONNECT
TSW	TOP OF SIDEWALK
TW	TOP OF WALL
TYP,(TYP)	TYPICAL
UDACS	UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR WATER DISTRIBUTION SYSTEMS(LATESTEDITION)
UG	UNDERGROUND
ULT	ULTIMATE
UNO	UNLESS NOTED OTHERWISE
USDCCA	UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY AREA, NEVADA(LATESTEDITION)
UT	UNDERGROUND TELEPHONE
UTIL	UTILITY
VAR	VARIABLE/VARIES
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VG	VALLEY GUTTER
VOL	VOLUME
W	WATER, WEST, WATT
w/	WITH
WI	WROUGHT IRON
WM	WATER METER
WMH	WATER MANHOLE
WS	WATER SUPPLY
WT	WEIGHT
WTR	WATER
XING	CROSSING
YD	YARD, YARD DRAIN

LEGEND

PROPOSED UTILITIES	DRAWING NUMBER FOR DETAIL W/ REF. TO THE SHEET WHERE IT IS SHOWN
EXISTING UTILITIES	EXISTING DROP INLET
FUTURE UTILITIES	PROPOSED DROP INLET
SECTION LINE	EXISTING GATE VALVE
EASEMENT LINE	EXISTING POWER POLE
RIGHT-OF-WAY LINE	EXISTING ELEC MARKER
PROPERTY LINE	EXISTING TRAFFIC SIGNAL
CENTERLINE	EXISTING FIRE HYDRANT
100 YR HYDRAULIC GRADE LINE	EXISTING UTILITY BOX
EXISTING STORM DRAIN	EXISTING METER BOX
FUTURE STORM DRAIN	PROPOSED CONTOUR
PROPOSED SWALE	EXISTING CONTOUR
VIEW FENCE	SPOT ELEVATION
NEW ABANDONED PIPE	EXISTING SPOT ELEVATION
SAWCUT	SLOPE
RETAINING WALL	EXISTING STREET LIGHT (STLT)
ROUGH GRADE PAD LIMITS	3:1 SLOPE UNLESS OTHERWISE NOTED ON PLAN
FLOOD ZONE "A" LIMITS	
LIMITS OF CONSTUCTION	
LIMITS OF GRADED ACCESS WAY	
EXISTING DRAINAGE EASEMENT	
PROPOSED DRAINAGE EASEMENT	
EXISTING REANING WALL	

STATE OF NEVADA PROFESSIONAL ENGINEER THOMAS P. DYSON No. 15704 Date Signed 9/14/2017

TDS SUBMITTAL

REV	DATE	DESCRIPTION	DATE	ASSN. APP	DATE	SCW APP

PROJECT NO. 840-050

DESIGN: TD
DRAWN: TD
CHECK: MP
PLOT DATE: 09-14-17
PLOT TIME: 3:5:56 AM

GCW ENGINEERS'S SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\PROJECTS\800\840-050\DWG\PRODUCTION\PHASE-1\A\050-1A4C01_CV17.DWG
PAUL BRENNAN

SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

PROJECT DATA

DRAWING
C1.02
2 OF 17 SHTS

REPLY APP 1117

CLV295641
6195

CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE'S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO aAVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.
6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB.
8. AC PAVEMENT TO BE ONE-HALF INCH (½") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY THE (COMPANY ________ REPORT # ____ DATE ____) APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.

WALL NOTES:

16. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC, THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO THE OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.
21. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE CITY AND APPROVED PRIOR TO ACCEPTANCE OF FACILITY VIDEO INSPECTION. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES AND TRANSITION STRUCTURES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXIT THE PUBLIC RIGHT-OF-WAY, AND STORM DRAIN MAIN ALIGNMENT, INCLUDING DEFLECTION POINTS. THE LOCATION SHALL BE DESCRIBED BY COORDINATES WHICH SHALL BE BASED ON THE OFFICIAL HORIZONTAL AND VERTICAL CONTROL NETWORKS OF THE CITY OF LAS VEGAS. FINAL LOCATION MAPS MUST BE SEALED AND CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINTIES OF ± 0.09 METERS (± 0.3 FEET) HORIZONTALLY AND VERTICALLY. A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).

OR

- SANITARY SEWER AND STORM DRAIN FACILITIES SHOWN ON THESE PLANS SHALL BE USED TO MEET THE REQUIREMENTS ON NRS 455 AND SHALL SHOW AT A MINIMUM THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, AND THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXIT THE PUBLIC RIGHT-OF-WAY. ANY DEVIATIONS FROM THE INFORMATION SHOWN SHALL BE NOTED AND SUBMITTED AS A REVISION TO THE PLANS AND APPROVED PRIOR TO ACCEPTANCE OF FACILITY VIDEO INSPECTION.

22. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST EDITION.
23. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

REVISED 02/03/15

DEVIATION FROM STANDARDS

NONE

CITY OF LAS VEGAS GRADING NOTES

1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THIS PROJECT AND THE RELATED OFF-SITE WORK, SO AS TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES AND SLOPES SHOWN.
3. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL EXCAVATION. ADEQUATE SHORING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAVING OF THE EXCAVATION.
4. THE CONTRACTOR IS WARNED THAT AN EARTHWORK BALANCE WAS NOT NECESSARILY THE INTENT OF THIS PROJECT. ANY ADDITIONAL MATERIAL REQUIRED OR LEFTOVER MATERIAL FOLLOWING EARTHWORK OPERATIONS BECOMES THE RESPONSIBILITY OF THE CONTRACTOR.
5. THE GRADING CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE OWNER TO PROVIDE FOR THE REQUIREMENTS OF THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND ASSOCIATED PERMIT.
6. CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION, IN THE AREAS INDICATED:

		HORIZONTAL/VERTICAL		COMPACTION
A.	PAVEMENT AREA SUBGRADE	0.1'±	+0.0' TO −0.1'	SEE SOILS REPORT
B.	ENGINEERED FILL	0.5'±	+0.1' TO −0.1'	SEE SOILS REPORT

- REPORT COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE.

7. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.
8. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.
9. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PUBLICLY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.
10. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIW OWN EXPENSE AND AT THE DIRECTION OF THE CITY ENGINEER. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

REVISED 4/15/10

LAS VEGAS VALLEY WATER DISTRICT
LVVWD PROJECT # 124110

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICATION SUPPORT CENTER (258-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVVWD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
2. ALL WORK SHALL CONFORM TO LVVWD STANDARD PLATES, DRAWINGS, AND SPECIFICATIONS, AND TO THE 2010 EDITION OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS). THE LATEST EDITION OF UDACS SHALL SUPERSEDE ANY CONFLICTS CONTAINED IN THE APPROVED DRAWINGS AND/OR SPECIFICATIONS.
3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2 ABOVE, SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT DRAFT OR EDITION OF THE UNIFORM SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.
4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
8. ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS SHALL CONFORM TO SECTION 2.22 OF THE 2010 EDITION OF THE UDACS.
9. ALL WATER FACILITIES SHALL BE FILLED, DISINFECTED, PRESSURE TESTED, FLUSHED, FILLED, AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION TO THE LVVWD DISTRIBUTION SYSTEM.
10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802, TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
11. ANY INTERRUPTION OF SERVICE MUST BE PERFORMED IN ACCORDANCE WITH UDACS SECTION 3.14.01, AND APPROVED BY THE LVVWD INSPECTION DIVISION PRIOR TO SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.
12. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE LISTED ON THE LVVWD PRE-APPROVED MATERIALS AND MANUFACTURER'S LISTING FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS.
13. TELEPHONE "CALL BEFORE YOU DIG" AT 811 OR 1-800-227-2600
14. THE INSTALLATION OF LAS VEGAS VALLEY WATER DISTRICT (LVVWD) MUNICIPAL WATER FACILITIES WITHIN ALL STREETS IS ASSUMED TO BE IN COMPLIANCE WITH THE UNIFORMED STANDARDS, INCLUDING THE PLACEMENT OF ASPHALT PAVING STREET SURFACES. ANY REPAIR WORK DONE BY THE LVVWD TO THE MUNICIPAL WATER FACILITIES WILL INCLUDE THE PLACEMENT OF AN APPROPRIATELY SIZED ASPHALT REPAIR ON THE STREET SURFACE.

    ANY DECORATIVE PAVING SURFACE WITHIN THE STREET IS THE RESPONSIBILITY OF THE OWNER'S ASSOCIATION, OR THE INDIVIDUAL PROPERTY OWNERS IF NO OWNER'S ASSOCIATION IS IN EXISTENCE, OR THE AGENCY HAVING JURISDICTION. DECORATIVE SURFACE MATERIALS PLACED WITHIN THE TEN FOOT EASEMENT ABUTTING A PUBLIC OR PRIVATE STREET, IF DISTURBED BY THE LVVWD DURING THE REPAIR OR OPERATION OF ITS FACILITIES, WILL BE REPLACED BY LVVWD WITH AN APPROPRIATELY SIZED PLAIN FINISH CONCRETE PATCH. THE LVVWD WILL NOT RESTORE, AND WILL NOT BE RESPONSIBLE FOR THE RESTORATION OF, ANY DECORATIVE PAVING SURFACE WITHIN THE STREET. THE LVVWD WILL NOT ATTEMPT TO MATCH COLOR OR FINISH OF ANY ADJACENT MATERIALS.
15. NO LEAD COMPLIANCE NOTE:
    TO COMPLY WITH THE FEDERAL SAFE DRINKING WATER ACT, ALL WATER WORK BRASS PRODUCTS PORPOSED TO BE RELOCATED, OR INSTALLED AS NEW MUST BE INSTALLED WITH THE LEAD FREE APPROVED PRODUCT. THE OLD LEADED PRODUCT MAY NOT BE REUSED.

FLOOD ZONE NOTE

NO PORTION OF THE SITE FALLS WITHIN A FEMA DESIGNATED SPECIAL FLOOD HAZARD AREA. SITE LOCATED ON PANEL 32003C2150E, DATED SEPTEMBER 27, 2002, AND PANEL 32003C2145F, DATED NOVEMBER 16, 2011. THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN A ZONE X AND NOT LOCATED WITHIN A FEMA DESIGNATED 100-YEAR ZONE A OR SPECIAL FLOOD HAZARD AREA.

CITY OF LAS VEGAS SEWER NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS. ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.
3. CHISEL "S" OR "G" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.
4. POLYVINYL (PVC) SEWER PIPE SHALL MEET ASTM D-3034 SDR 35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE II AGGREGATE BASE.
5. ALL MANHOLES PAVED IN STREETS EIGHTY (80') FOOT R/W AND LARGER SHALL HAVE CONCRETE COLLARS. STREETS LESS THAN EIGHTY (80') FOOT R/W WILL REQUIRE RETROFIT IF PAVING DOES NOT CONFORM TO CITY STANDARDS AT THE MANHOLE.
6. TEE SADDLES SHALL BE USED TO CONNECT SEWER LATERALS TO EXISTING MAIN LINES UP TO TWELVE INCH (12") DIAMETER. CONNECTIONS TO FIFTEEN INCH (15") OR LARGER MAINS SHALL REQUIRE SPECIAL PROCEDURES. IN LINE "Y" 'S SHALL BE USED ON LINES TWELVE INCHES (12") OR ABOVE.
7. WATER MAINS SHALL BE PROTECTED IN ACCORDANCE WITH LVVWD STANDARDS WHENEVER A SEWER MAIN CROSSES OVER A WATER MAIN OR THE SEWER IS LESS THAN EIGHTEEN INCH (18") UNDER A WATER MAIN.
8. ALL CONTRACTORS INSTALLING SEWER MAINS THAT WILL BE UNDER THE JURISDICTION OF THE CITY OF LAS VEGAS MUST BE STATE OF NEVADA CLASS "A" CONTRACTORS.
9. THE CITY OF LAS VEGAS WILL NOT ACCEPT ANY SEWER MAINS WHICH HAVE A VERTICAL DEFLECTION OF MORE THAN ONE TENTH (0.1) OF A FOOT FROM THE APPROVED CONSTRUCTION PLANS AT ANY LOCATION. SEWER MAINS FOUND TO EXCEED THIS TOLERANCE WILL HAVE TO BE REPAIRED OR REMOVED OR REPLACED TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO ACCEPTANCE BY THE CITY OF LAS VEGAS.
10. INSTALLATION OF CURVED SEWER REQUIRES THE USE OF C-900 PIPE WHICH ALLOWS FOR PIPE DEFLECTION AT THE JOINTS.

REVISED 04/15/10

STORMWATER RUNOFF MANAGEMENT

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS OF THE CITY OF LAS VEGAS AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN THE CITY OF LAS VEGAS AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS, AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER ANY RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

CITY OF LAS VEGAS STREETLIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION (USS), AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" (USD), LATEST REVISION.
2. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS, ETC., LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE TRAFFIC ENGINEER AND THE CITY ENGINEER. ANY DEVIATION FROM THE PLAN LOCATION WILL REQUIRE COMPLIANCE WITH SECTION 623 OF THE USS.
3. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION IN ACCORDANCE WITH SECTION 623 G.03.01 OF THE USS.
4. ALL EMPTY CONDUIT SHALL HAVE AT LEAST ONE GREEN NO. #8 AWG WIRE INSTALLED AS TRACER WIRE IN ACCORDANCE WITH SECTION 623 G.02.01 OF THE USS PRIOR TO BACKFILLING AND FINAL INSPECTION.
5. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN COMPLIANCE WITH USD NO. 320A WHEN POLE IS INSTALLED BEHIND SIDEWALK, AND SHALL AT NO TIME COMPLETELY ENCLOSE THE STREET LIGHTING POLE.
6. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TRAFFIC ENGINEERING DIVISION PRIOR TO ANY PRE-FINAL INSPECTION. THE AS-BUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.
7. SERVICE POINT SHALL BE COORDINATED WITH NV ENERGY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICE POINTS SHALL BE SHOWN ON THE PLANS.
8. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREET LIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITIES INVOLVED BEFORE STREETLIGHT BASES ARE INSTALLED AT NO EXPENSE TO THE CITY OF LAS VEGAS.
9. THE CONTRACTOR SHALL FURNISH COMPLETE CONDUIT, WIRE, ETC. FROM SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON THE PLANS.

REVISED 06/28/16 (LD VERSION)

CITY OF LAS VEGAS FIRE AND RESCUE
GENERAL NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE #6325 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS.
2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALLEY WATER DISTRICTS – APPROVED PRODUCTS LIST ARE ALLOWED TO BE INSTALLED.
3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK. [IFC SECTION 105.7.12]
4. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. [IFC SECTION 3310, SECTION 3312]
5. TO IDENTIFY FIRE HYDRANT LOCATIONS, CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF STREET ADJACENT TO THE FIRE HYDRANTS. [IFC SECTION 507.5.7.3]
6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. [IFC SECTION 106.3]
7. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A. APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. [IFC SECTION 507.2.1, NFPA 24]
8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. [IFC SECTION 507]
9. PRIVATE FIRE HYDRANTS SHALL BE PAINTED RED. [IFC SECTION 507.5.7.1]
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. [IFC SECTION 507]
11. FIRE HYDRANTS SPACING SHALL BE AS FOLLOWS: [IFC SECTION C102]
    RESIDENTIAL – 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
    COMMERCIAL – 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
12. WHERE NEW WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1,000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. [IFC SECTION C102.8]
13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.
14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. [IFC SECTION C102.12]
15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. [IFC SECTION C102.4]
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. [IFC SECTION C102.7]
17. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. [IFC SECTION C102.6]
18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN. [IFC SECTION C104]
19. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. [IFC SECTION 503.2.3]
20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12% ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6% [IFC SECTION 503.2.7, 503.2.8]
21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. [IFC 503.2.4]
22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13 FT 6 IN. [IFC SECTION 503.2.1]
23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 40 FT FLOW-LINE TO FLOW-LINE WITH PARALLEL PARKING PERMITTED ON BOTH SIDES. NOT LESS THAN 32 FT WIDE, FLOW-LINE TO FLOW -LINE, WHERE PARKING IS PERMITTED ONLY ON ONE SIDE OF THE FIRE APPARATUS ACCESS ROAD. NOT LESS THAN 24 FT WIDE, FLOW-LINE TO FLOW-LINE, WHERE NO PARKING IS PERMITTED ON EITHER SIDE. FIRE LANES THROUGH PARKING LOTS SHALL NOT BE LESS THAN 24 FT. [IFC SECTION 503.2.1.1]
24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL FO THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. THIS DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. [IFC SECTION 503.1.1]
25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-EANDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. COMMERCIAL AND INDUSTRIAL DEVELOPMENTS WHERE BUILDINGS EXCEED 2 STORIES OR 30 FEET IN HEIGHT, OR EXCEEDING 62,000 SQUARE FEET IN AREA. [IFC SECTION 503.1.2]
26. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. [IFC SECTION 503.2.5]
27. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS OF 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. [IFC SECTION 503.3]
28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE IFC SECTION 503.6 AND IFC APPENDIX M.

REVISED MARCH 1, 2016

CITY OF LAS VEGAS TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.
3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCED WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
4. WHEN A DESIGNATED "SUGGESTED ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.
5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW SIGNS SHALL UTILIZE TYPE XI RETROREFLECTIVE SHEETING IN ACCORDANCE WITH CCAUSS 627 AND 716 AND SHALL HAVE AN ANTI-GRAFFITI PROTECTIVE OVERLAY FILM THAT IS A MATCHING COMPONENT, TO, AND OF THE SAME MANUFACTURER AS THE RETROREFLECTIVE SHEETING TO WHICH IT IS APPLIED. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.
7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.
8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
9. STREET SIGNS AND STOP SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.
10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK AREA. THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR IMSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT-OF-WAY.
11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CITIZENS AREA TRANSIT (C.A.T.) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE #828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS OTHERWISE DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.
15. CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

REVISED 7/3/13

THOMAS P. DYSON

DATE: 08/14/2017

TDS SUBMITTAL

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP	DATE

PROJECT NO.
840-050

DESIGN: TD
DRAWN: TD
CHECK: MF
PLOT DATE: 08-14-17
PLOT TIME: 15:08:38

GCW
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com
ENGINEERS \ SURVEYORS

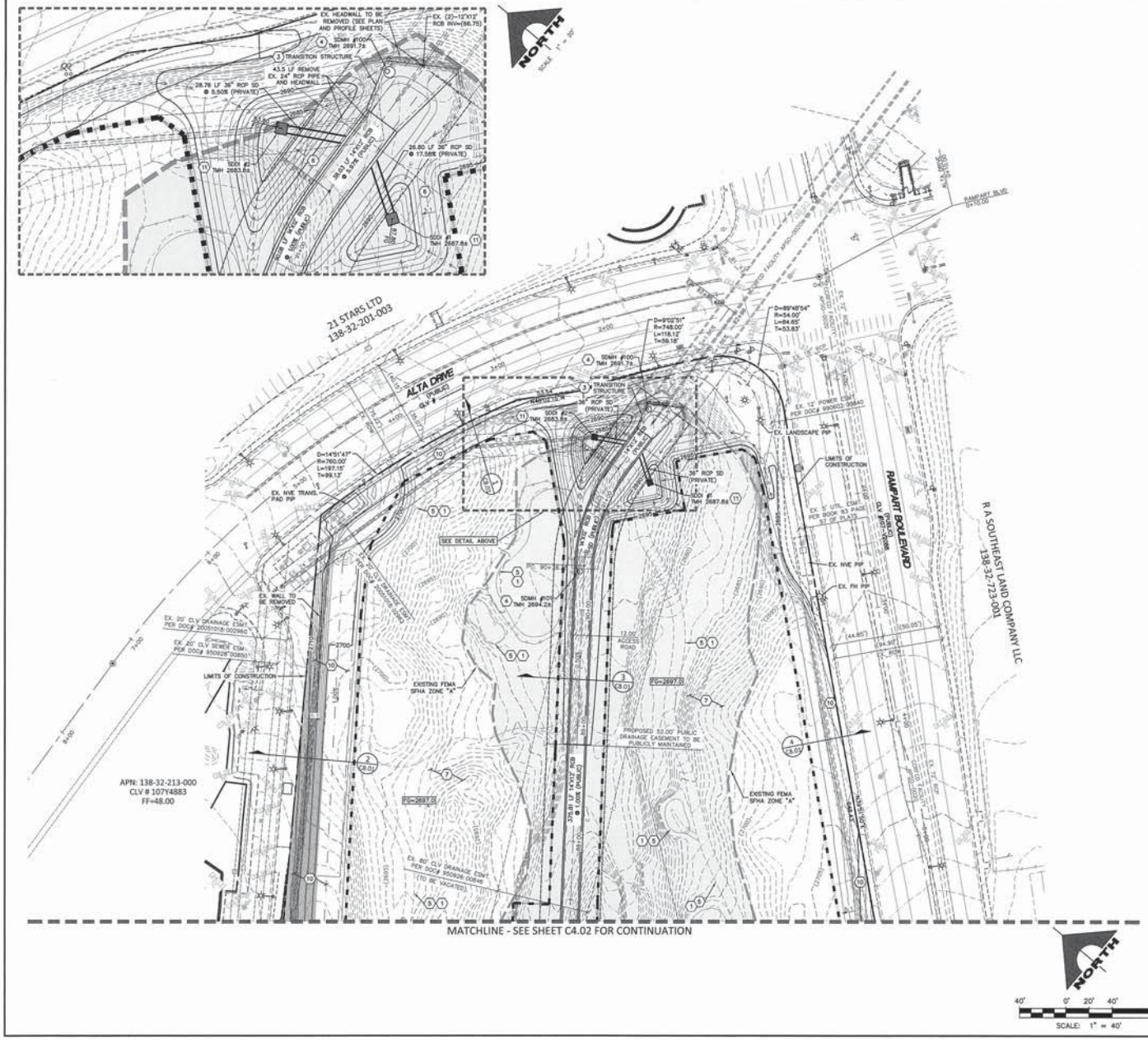
PAUL BRENNAND

SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

GENERAL NOTES

DRAWING
C1.03
3 OF 17 SHTS



NORTH
NOT TO SCALE

KEY MAP

Call before you Dig
Call 811 or 1-800-227-2600

FAST
Call 811 before you UnderGround
1-702-432-5300

CALL BEFORE YOU DIG OVERHEAD
1-702-227-2929

BENCHMARK

BM #	DESCRIPTION	NAVD 88 (FEET)	NAVD 88 (METERS)
SLV-106WB	CITY OF LAS VEGAS VERTICAL CONTROL POINT "SLV106WB". BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54	888.355

DATUM NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 48 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITIES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WEIR SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITIES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
8. INSTALL RIP-RAP SEE PLAN FOR SIZE.
9. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
10. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1
11. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
12. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
13. INSTALL SEDIMENT BERM PER DETAIL

FLOOD ZONE NOTE:

THE SITE IS LOCATED ON FEDERAL EMERGENCY AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) CONTAINING COMMUNITY PANEL 32003C 2145F, DATED NOVEMBER 16, 2011, AND 32003C 2150E DATED SEPTEMBER 27, 2002. LOMR 06-09-B463P DATED SEPTEMBER 21, 2006 AND LOMR 06-09-BF86P DATED OCTOBER 19, 2006.
THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN ZONE "A".

NOTES:

1. ALL PROPOSED ONSITE STORM DRAIN LATERALS ARE PRIVATE-TO BE PRIVATELY MAINTAINED. ALL ON-SITE SURFACE DRAINAGE FACILITIES ARE TO BE PRIVATELY MAINTAINED.
2. PROPERTY OWNER IS RESPONSIBLE TO MAINTAIN THE BEST MANAGEMENT PRACTICES SUCH AS BUT NOT LIMITED TO THE REMOVAL OF ACCUMULATED SEDIMENT AND DEBRIS AND CARE OF THE VEGETATION.

GEOTECHNICAL REPORT

ALL GRADING WORK WILL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "EHR COMPANIES (THE SEVENTY)" LOCATED AT RAMPART BOULEVARD, AND ALTA DRIVE.

PROJECT NO.: XXXXXXXXXX, DATED JAN 01, 20XX
PREPARED BY:
XXXXXX CONSULTANTS
XXXX LAS VEGAS BLVD.
LAS VEGAS, NV 89XXX
PHONE NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS-4787 ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

THOMAS P. DYSON P.E. 11306 DATE

STATE OF NEVADA PROFESSIONAL ENGINEER THOMAS P. DYSON No. 11306 09/14/2017

REV	DATE	DESCRIPTION	DATE	ACEN. APP	DATE	CCW APP

TDS SUBMITTAL

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MP
PLOT DATE: 09-15-14-17
PLOT SCALE: 1:1
F:\PROJECTS\800\840-050\DWG\PRODUCTION\PHASE-1\MAX050-1MASTER_GRADING.DWG
PAUL BRENNAN

GCW
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com
ENGINEERS \ SURVEYORS

SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

GRADING PLAN 1

DRAWING
C4.01
4 OF 17 SHTS

REPLY APP 1119

CLV295643
6197

KEY MAP

NORTH
NOT TO SCALE

Call before you D⁻ig
Avoid cutting underground utility lines on your society
Call 811
or
1-800-227-2600

FAST
Call before you UnderGround
1-702-432-5300
FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AVOID VISITING OVERHEAD POWER LINES ITS DEADLY
CALL BEFORE YOU DIG OVERHEAD
1-702-227-2929

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-109WB	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLV109WB", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

DATUM NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WEIR SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
8. INSTALL RIP-RAP SEE PLAN FOR SIZE.
9. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
10. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1
11. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
12. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
13. INSTALL SEDIMENT BERM PER DETAIL

FLOOD ZONE NOTE:

THE SITE IS LOCATED ON FEDERAL EMERGENCY AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) CONTAINING COMMUNITY PANEL 32003C 2145F, DATED NOVEMBER 16, 2011, AND 32003C 2150E DATED SEPTEMBER 27, 2002. LOMR 06-09-B463P DATED SEPTEMBER 21, 2006 AND LOMR 06-09-BF86P DATED OCTOBER 19, 2006.
THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN ZONE "A".

NOTES:

1. ALL PROPOSED ONSITE STORM DRAIN LATERALS ARE PRIVATE-TO BE PRIVATELY MAINTAINED. ALL ON-SITE SURFACE DRAINAGE FACILITES ARE TO BE PRIVATELY MAINTAINED.
2. PROPERTY OWNER IS RESPONSIBLE TO MAINTAIN THE BEST MANAGEMENT PRACTICES SUCH AS BUT NOT LIMITED TO THE REMOVAL OF ACCUMULATED SEDIMENT AND DEBRIS AND CARE OF THE VEGETATION.

GEOTECHNICAL REPORT

ALL GRADING WORK WILL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "EHB COMPANIES ("THE SEVENTY)" LOCATED AT RAMPART BOULEVARD, AND ALTA DRIVE.

PROJECT NO.: XXXXXXXXXX, DATED JAN 01, 20XX
PREPARED BY:
XXXXXX CONSULTANTS
XXXX LAS VEGAS BLVD.
LAS VEGAS, NV 89XXX
PHONE NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS-4787 ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

THOMAS P. DYSON P.E. 11306 DATE

40' 0' 20' 40' 80'
SCALE: 1" = 40'

NORTH

STATE OF NEVADA
THOMAS P. DYSON
No. 11306
PROFESSIONAL ENGINEER
09/14/2017

TDS SUBMITTAL

REV	DATE	DESCRIPTION	ACCD. APP	DATE	SCW APP	DATE

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MT
DATE: 03-14-17
PLOT DWG: 13.BB.13

GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

GRADING PLAN 2

DRAWING
C4.02
5 OF 17 SHTS

REPLY APP 1120

CLV295644

NORTH
NOT TO SCALE

KEY MAP

Call before you D⁻g
Call 811
or
1-800-227-2600

FAST
Call before you UnderGround
1-702-632-5300
PRIVATE AND INTERNAL SYSTEM OF COMMUNICATION

CALL BEFORE YOU DIG OVERHEAD
1-702-227-2929

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-109WNS	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLV109WNS", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

DATUM NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WEIR SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
8. INSTALL RIP-RAP SEE PLAN FOR SIZE.
9. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
10. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1
11. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
12. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
13. INSTALL SEDIMENT BERM PER DETAIL

FLOOD ZONE NOTE:

THE SITE IS LOCATED ON FEDERAL EMERGENCY AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) CONTAINING COMMUNITY PANEL 32003C 2145F, DATED NOVEMBER 16, 2011, AND 32003C 2150E DATED SEPTEMBER 27, 2002. LOMR 06-09-B463P DATED SEPTEMBER 21, 2006 AND LOMR 06-09-B786P DATED OCTOBER 19, 2006.
THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN ZONE "A".

NOTES:

1. ALL PROPOSED ONSITE STORM DRAIN LATERALS ARE PRIVATE-TO BE PRIVATELY MAINTAINED. ALL ON-SITE SURFACE DRAINAGE FACILITES ARE TO BE PRIVATELY MAINTAINED.
2. PROPERTY OWNER IS RESPONSIBLE TO MAINTAIN THE BEST MANAGEMENT PRACTICES SUCH AS BUT NOT LIMITED TO THE REMOVAL OF ACCUMULATED SEDIMENT AND DEBRIS AND CARE OF THE VEGETATION.

GEOTECHNICAL REPORT

ALL GRADING WORK WILL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "EHB COMPANIES ("THE SEVENTY") LOCATED AT RAMPART BOULEVARD, AND ALTA DRIVE.

PROJECT NO.: XXXXXXXXXX, DATED JAN 01, 20XX
PREPARED BY:
XXXXXX CONSULTANTS
XXXX LAS VEGAS BLVD.
LAS VEGAS, NV 89XXX
PHONE NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS-4787 ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

THOMAS P. DYSON P.E. 11306 DATE

STATE OF NEVADA
THOMAS P. DYSON
No. 11306
PROFESSIONAL ENGINEER
09/14/2017

TDS SUBMITTAL

REV	DATE	DESCRIPTION	DATE	FACIL. APP	DATE	GCW APP

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MP
PLOT DATE: 09-14-17
PLOT TIME: 13:57:38
P:\PROJECTS\2017\840-050\DWG\PRODUCTION\PHASE-1-MAJ\050-1MAJOR_GD.DWG
PAUL BRENNAN

GCW
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
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gcwengineering.com

SEVENTY ACRES, LLC
FORE STARS, LTD

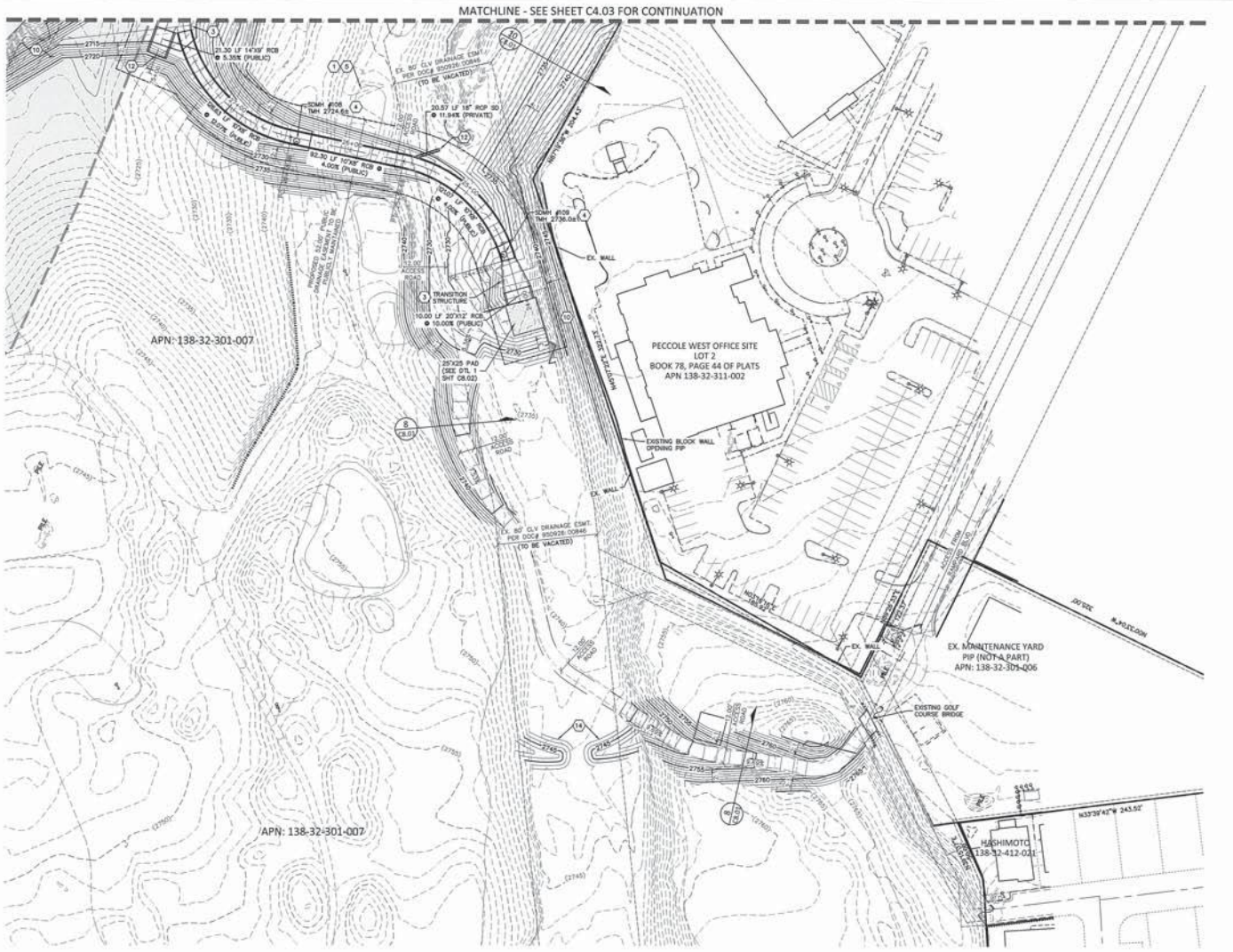
THE 435

GRADING PLAN 3

DRAWING
C4.03
6 OF 17 SHTS

REPLY APP 1121

CLV295645
6199



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BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
SLV-108NW6	CITY OF LAS VEGAS VERTICAL CONTROL POINT 'SLV108NW6', BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.353 (METERS)

DATUM NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITIES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WEIR SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITIES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
8. INSTALL RIP-RAP SEE PLAN FOR SIZE.
10. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
11. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1
12. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
13. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
14. INSTALL SEDIMENT BERM PER DETAIL

FLOOD ZONE NOTE:

THE SITE IS LOCATED ON FEDERAL EMERGENCY AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) CONTAINING COMMUNITY PANEL 32003C 2145F, DATED NOVEMBER 16, 2011, AND 32003C 2150E DATED SEPTEMBER 27, 2002, LOMR 06-09-B453P DATED SEPTEMBER 21, 2006 AND LOMR 08-09-BF88P DATED OCTOBER 19, 2006. THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN ZONE "A".

NOTES:

1. ALL PROPOSED ONSITE STORM DRAIN LATERALS ARE PRIVATE-TO BE PRIVATELY MAINTAINED. ALL ON-SITE SURFACE DRAINAGE FACILITIES ARE TO BE PRIVATELY MAINTAINED.
2. PROPERTY OWNER IS RESPONSIBLE TO MAINTAIN THE BEST MANAGEMENT PRACTICES SUCH AS BUT NOT LIMITED TO THE REMOVAL OF ACCUMULATED SEDIMENT AND DEBRIS AND CARE OF THE VEGETATION.

GEOTECHNICAL REPORT

ALL GRADING WORK WILL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "EHB COMPANIES (THE SEVENTY)" LOCATED AT RAMPART BOULEVARD, AND ALTA DRIVE.

PROJECT NO.: XXXXXXXXXX, DATED JAN 01, 20XX
PREPARED BY:
XXXXXX CONSULTANTS
XXXX LAS VEGAS BLVD.
LAS VEGAS, NV 89XXX
PHONE NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS-4787 ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

THOMAS P. DYSON P.E. 11306 DATE

REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA
THOMAS P. DYSON No. 11306
DATE: 09/14/2017
TDS SUBMITTAL

REV.	DATE	DESCRIPTION	DATE	APP.	DATE	CCW APP

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MP
PLOT DATE: 09-14-17
PLOT SCALE: 1:1
FILE: 15-07.dwg

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PAUL BRENNAN

SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

GRADING PLAN 4

DRAWING
C4.04
7 OF 17 SHTS

REPLY APP 1122

CLV295646

SEVENTY ACRES, LLC
FORE STARS, LTD
THE 435
PLAN & PROFILE OVERALL
DRAWING
C5.00
8 OF 17 SHTS
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LAS VEGAS, NV 89146
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F: 702.804.2299
gcwengineering.com
840-050
PROJECT NO
NORTH
SCALE: 1" = 80'
RAMPART BOULEVARD
ALTA DRIVE
POINT OF ACCESS
C7.01
C7.02
C7.03
C7.04
PROPOSED 52.00' WIDE PUBLIC DRAINAGE EASEMENT TO BE PUBLICLY MAINTAINED
EX. 20' CLV DRAINAGE ESMT. PER DOC# 20051018-002960
EX. 20' CLV SEWER ESMT. PER DOC# 950928-00850
EX. 80' CLV DRAINAGE ESMT. PER DOC# 950928-00846 TO BE VACATED
THOMAS P. DYSON
No. 11326
09/14/2017
TDS SUBMITTAL
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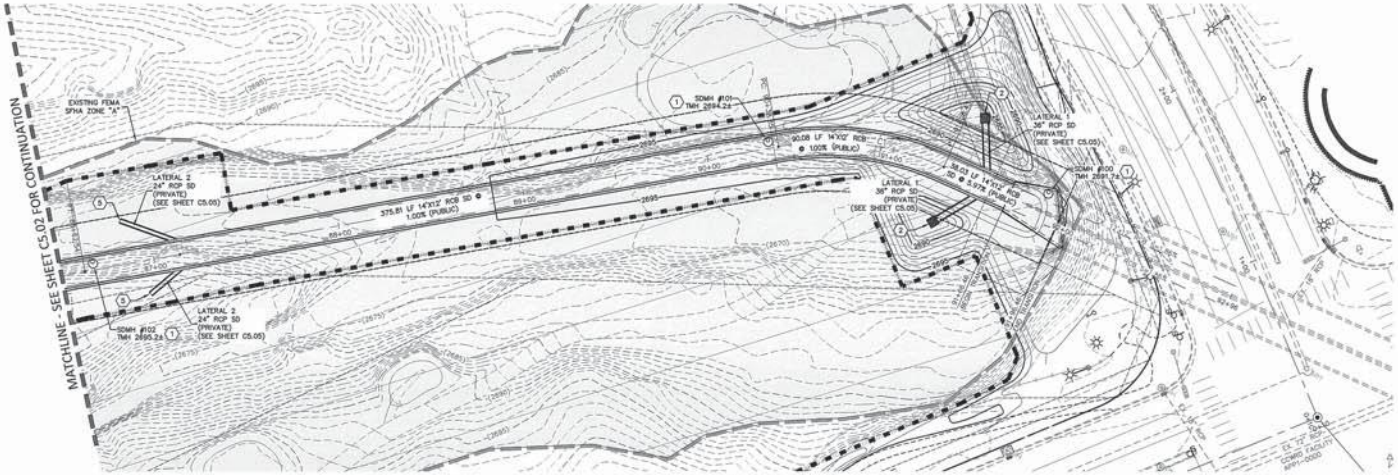
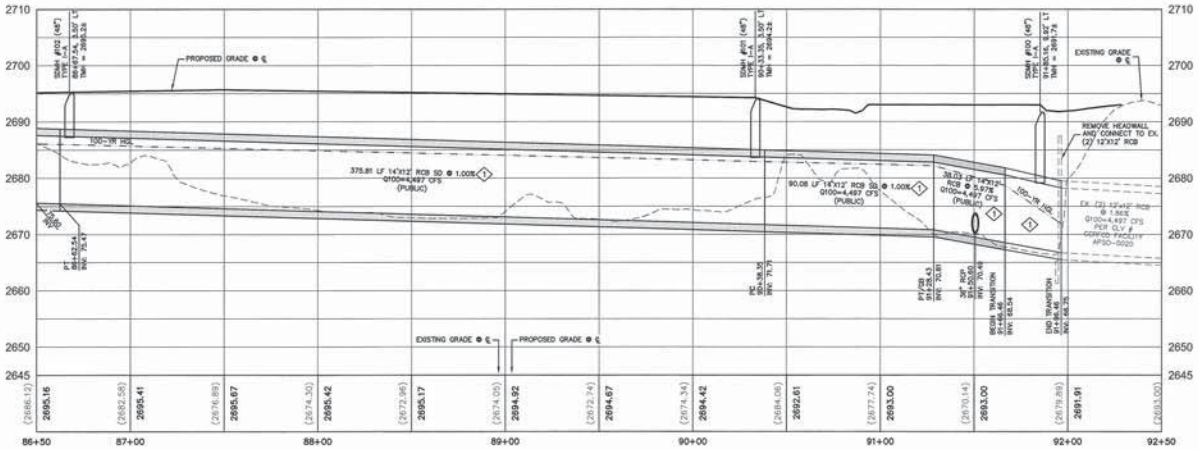
CLV295647

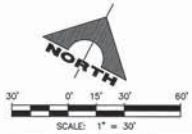


STORM DRAIN PLAN

SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

CL CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C1	34°24'33"	150.00'	90.08'	46.45'





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BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
GLV-106NWS	CITY OF LAS VEGAS VERTICAL CONTROL POINT "GLV106NWS", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL TYPE I-A 48" ACCESS MANHOLE PER USDCCA 401, 403 AND 403.1
2. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
3. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
4. INSTALL HEADWALL, SEE STRUCTURAL PLANS
5. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE

DRAINAGE CONSTRUCTION NOTES

1. 1" ADDITIONAL CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET 8.02)
2. 3" ADDITIONAL CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET 8.02)

STATE OF NEVADA PROFESSIONAL ENGINEER — THOMAS P. DYSON — No. 10711 — PROFESSIONAL ENGINEER — 09/14/2017

TDS SUBMITTAL

REV #	DATE	DESCRIPTION	DATE	ASCN. APP	DATE	GCW APP

PROJECT NO. 840-050

DESIGN: TD
DRAWN: TD
CHECK: MP
APP DATE: 09-14-17
REV. DWG.: 08-01-08

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SEVENTY ACRES, LLC
FORE STARS, LTD

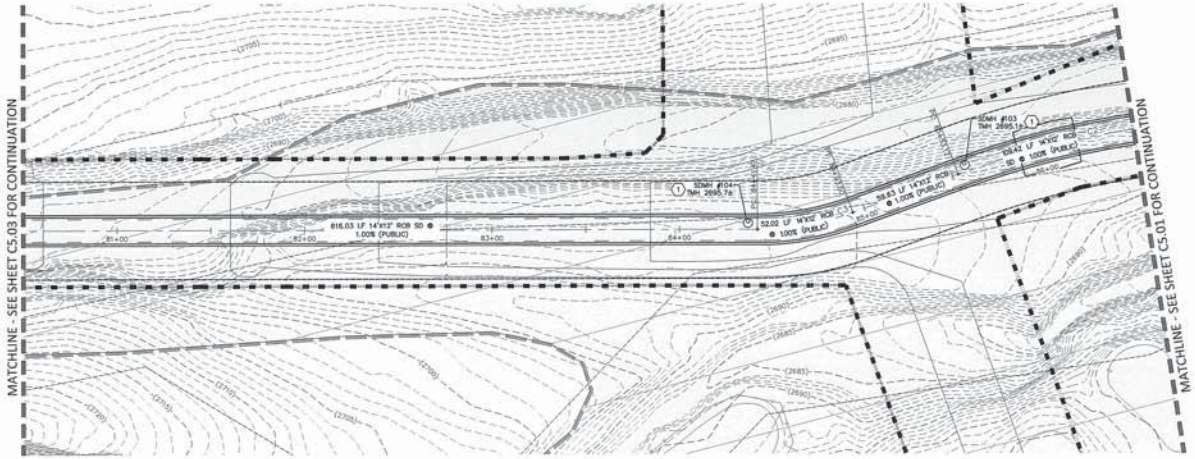
THE 435

PLAN & PROFILE 1

DRAWING
C5.01
9 OF 17 SHTS

REPLY APP 1124

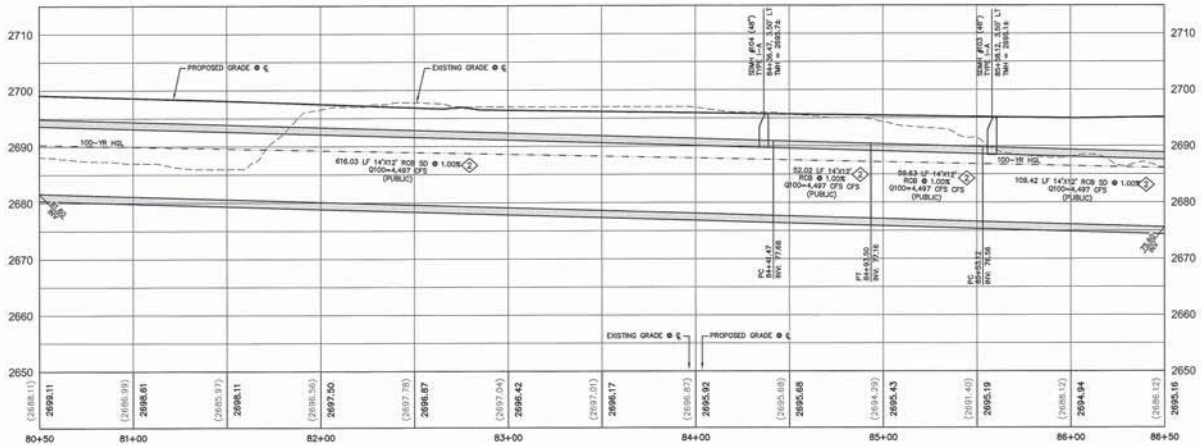
CLV295648

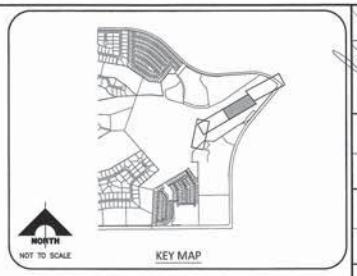


STORM DRAIN PLAN

SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

CL CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C2	12°32'19"	500.00'	109.42'	54.93'
C3	19°52'14"	150.00'	52.02'	26.27'





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BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-109WB	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLV109WB", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL TYPE I-A 48" ACCESS MANHOLE PER USDCCA 401, 403 AND 403.1
2. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
3. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
4. INSTALL HEADWALL, SEE STRUCTURAL PLANS
5. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE

DRAINAGE CONSTRUCTION NOTES

1. 1" ADDITIONAL CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET 8.02)
2. 3" ADDITIONAL CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET 8.02)

STATE OF NEVADA PROFESSIONAL ENGINEER THOMAS P. DYSON No. 10701 DATE 09/14/2017

TDS SUBMITTAL

REV	DATE	DESCRIPTION	PLAN APP	DATE	PLAN APP	DATE	SCW APP

PROJECT NO. 840-050

DESIGN: TD
DRAWN: TD
CHECK: MP
PLOT DATE: 09-14-17
PLOT TIME: 13:36:37

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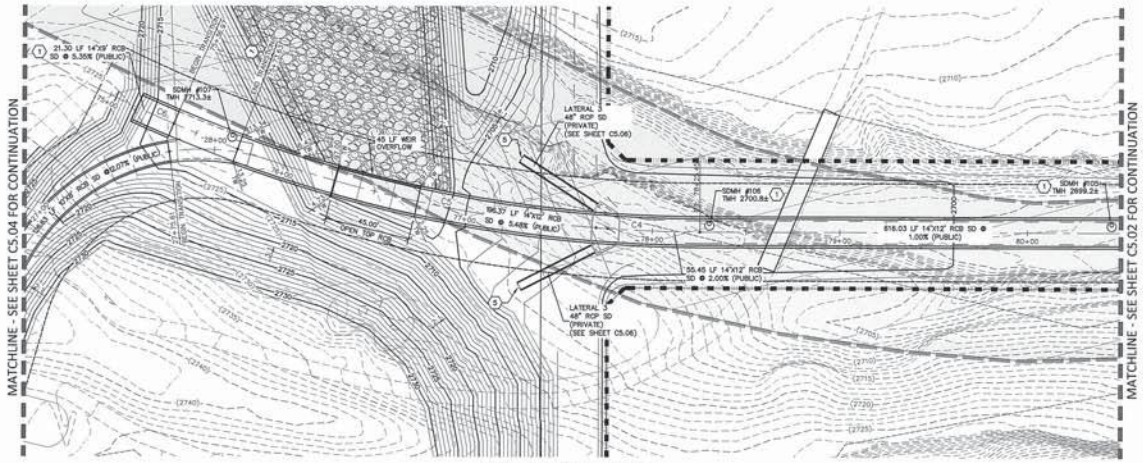
THE 435

PLAN & PROFILE 2

DRAWING
C5.02
10 OF 17 SHTS

REPLY APP 1125

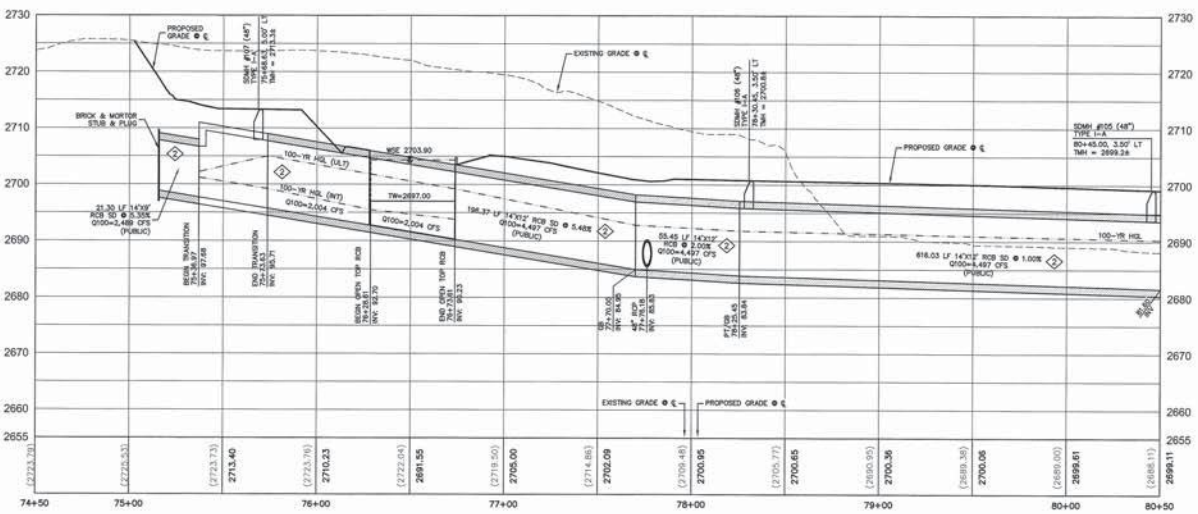
CLV295649

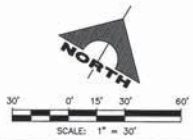


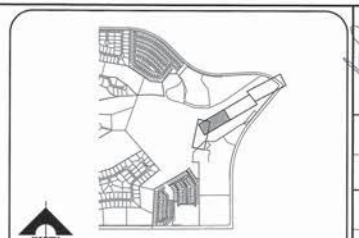
STORM DRAIN PLAN

SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

CL CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C4	49°55'20"	720.00'	627.34'	335.15'
C5	49°55'20"	720.00'	627.34'	335.15'
C6	49°55'20"	720.00'	627.34'	335.15'







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BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-109NWG	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLVIGBNWG", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL TYPE I-A 48" ACCESS MANHOLE PER USDCCA 401, 403 AND 403.1
2. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
3. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
4. INSTALL HEADWALL, SEE STRUCTURAL PLANS
5. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE

DRAINAGE CONSTRUCTION NOTES

1. 1" ADDITIONAL CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET 8.02)
2. 3" ADDITIONAL CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET 8.02)

REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA
THOMAS R. DYSON
No. 15797
DATE: 09/14/2017
TDS SUBMITTAL

REV.	DATE	DESCRIPTION	DATE	PREP. APP.	DATE	CCW APP.

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MF
PROJ. DATE: 09-14-17
SCALE: 1" = 30'

GCW
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PAUL BRENNAN

SEVENTY ACRES, LLC
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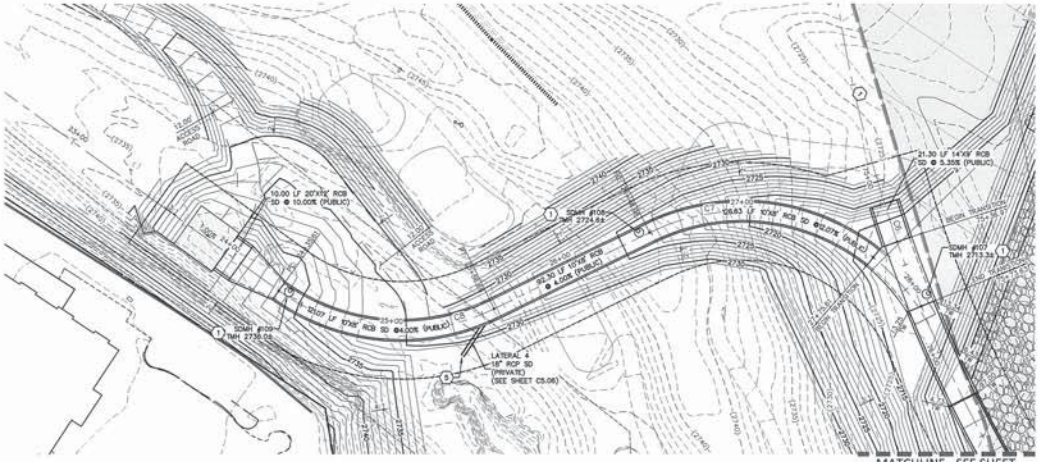
THE 435

PLAN & PROFILE 3

DRAWING
C5.03
11 OF 17 SHTS

REPLY APP 1126

CLV295650
6204

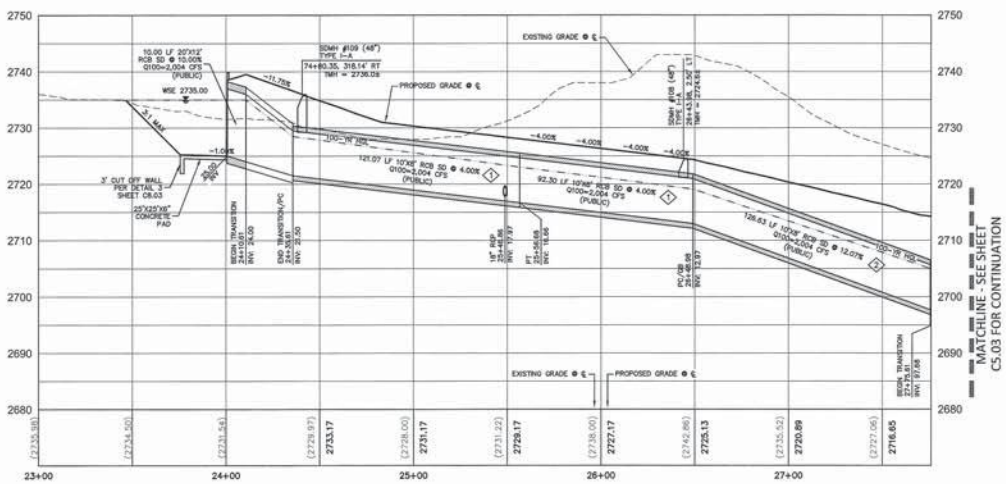


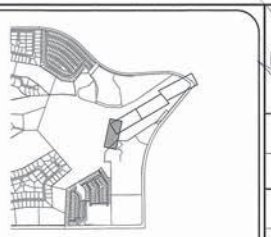
STORM DRAIN PLAN

SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

MATCHLINE - SEE SHEET C5.03 FOR CONTINUATION

CL CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C7	92°31'33"	112.00'	180.87'	117.05'
C8	61°56'14"	112.00'	121.07'	67.21'





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KEY MAP

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BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-105NWB	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLV105NWB"; BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL TYPE I-A 48" ACCESS MANHOLE PER USDCCA 401, 403 AND 403.1
2. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
3. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
4. INSTALL HEADWALL, SEE STRUCTURAL PLANS
5. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE

DRAINAGE CONSTRUCTION NOTES

1. 1" ADDITIONAL CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET 8.02)
2. 3" ADDITIONAL CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET 8.02)

NORTH
30' 0' 15' 30' 60'
SCALE: 1" = 30'

STATE OF NEVADA PROFESSIONAL ENGINEER THOMAS P. DYSON No. 10704 — DATE: 09/14/2017

TDS SUBMITTAL

REV #	DATE	DESCRIPTION	ASSD. APP	DATE	GCW APP	DATE

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MP
APP: MP
DATE: 09-14-17
SCALE: 1" = 30'
TMS: 3.35.32

GCW
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com
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F:\PROJECTS\800\840-050\DWG\PRODUCTION\PHASE-1\4A\050-1A4C05L.DWG
PAUL BRENNAN

SEVENTY ACRES, LLC
FORE STARS, LTD

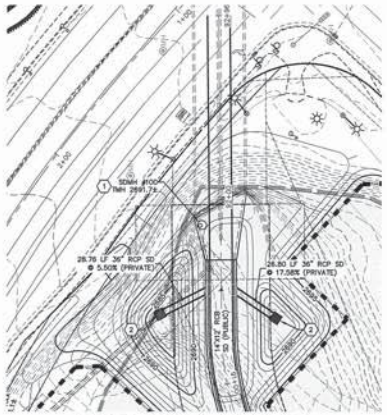
THE 435

PLAN & PROFILE 4

DRAWING
C5.04
12 OF 17 SHTS

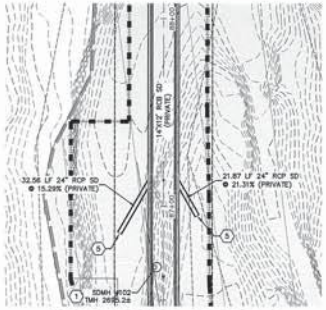
REPLY APP 1127

CLV295651
6205



STORM DRAIN - LATERAL 1

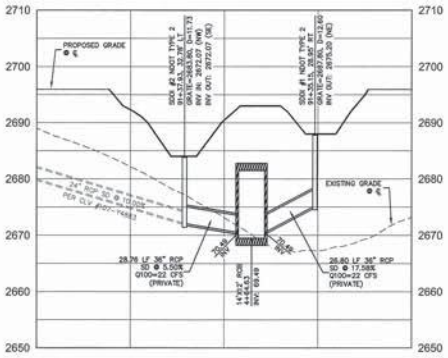
SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

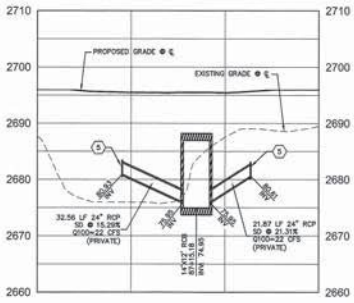


STORM DRAIN - LATERAL 2

SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

30' 0' 15' 30' 60'
SCALE: 1" = 30'





NORTH
NOT TO SCALE

KEY MAP

Call before you Dig
Call 811
1-800-227-2600
OR
1-702-455-6008

FAST
Call before you UnderGround
1-702-432-5300

CALL BEFORE YOU DIG
1-702-227-2929

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-106(NW)	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLVI06NW5", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL TYPE I-A 48" ACCESS MANHOLE PER USDCCA 401, 403 AND 403.1
2. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
3. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
4. INSTALL HEADWALL, SEE STRUCTURAL PLANS
5. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE

DRAINAGE CONSTRUCTION NOTES

1. 1" ADDITIONAL CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET 8.02)
2. 3" ADDITIONAL CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET 8.02)

STATE OF NEVADA
THOMAS P. DYSON
No. 15278
PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	DATE	ACEN APP	DATE	GCW APP

DATE: 09/14/2017
TDS SUBMITTAL

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MP
DATE: 09-14-17
SCALE: 1" = 30'

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gcwengineering.com

F:\PROJECTS\800\840-050\DWG\PRODUCTION\PHASE-1\A\050-1AA008.DWG
PAUL BRENNAN

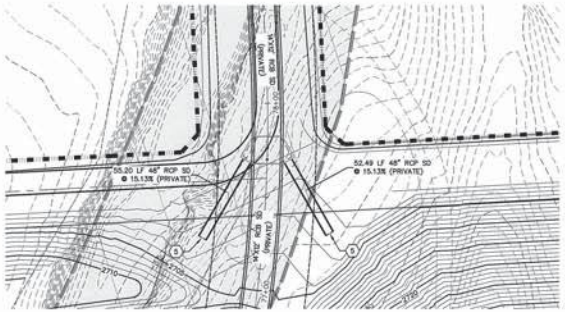
SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

LATERAL PROFILE 1

DRAWING
C5.05
13 OF 17 SHTS

HTE: 00-00000

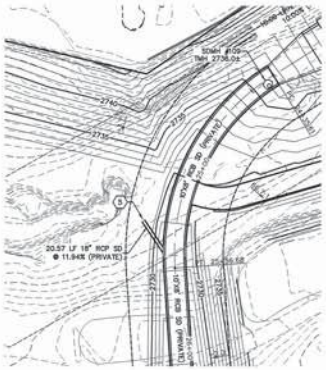


STORM DRAIN - LATERAL 3

SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

NORTH
SCALE 1" = 30'

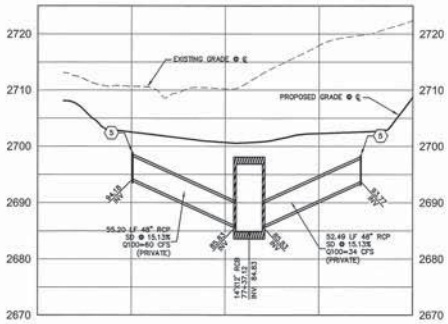
30' 0' 15' 30' 60'
SCALE: 1" = 30'

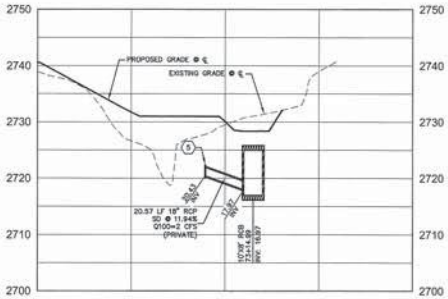


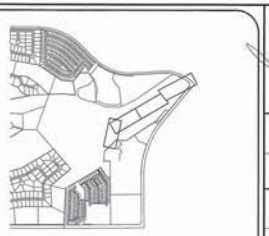
STORM DRAIN - LATERAL 4

SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

NORTH
SCALE 1" = 30'







NORTH
NOT TO SCALE

KEY MAP

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Call 811
1-800-227-2600
CLARK COUNTY AND SOUTHERN NEVADA
1-702-455-6000

FAST
Call before you UnderGround
1-702-432-5300
PRIVATELY OWNED INTERNAL SYSTEM OF IRRIGATION

AVOID POTENTIAL DAMAGE!
REMEMBER! IT'S LEGAL!
CALL BEFORE YOU DIG OVERHEAD
1-702-227-2929

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-106NWD	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLVD06NWD", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

STORM DRAIN CONSTRUCTION NOTES

1. INSTALL TYPE I-A 48" ACCESS MANHOLE PER USDCCA 401, 403 AND 403.1
2. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
3. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
4. INSTALL HEADWALL, SEE STRUCTURAL PLANS
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DRAINAGE CONSTRUCTION NOTES

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2. 3" ADDITIONAL CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET 8.02)

STATE OF NEVADA
PROFESSIONAL ENGINEER
THOMAS F. DYSON
No. 10976
DATE: 09/14/2017
TDS SUBMITTAL

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GOV APP

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MF
PLOT DATE: 09-14-17
PLOT TIME: 15:05:54

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1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
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F: 702.804.2299
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PAUL BRENNAN

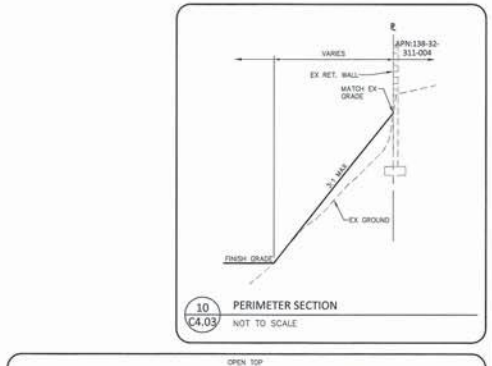
SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

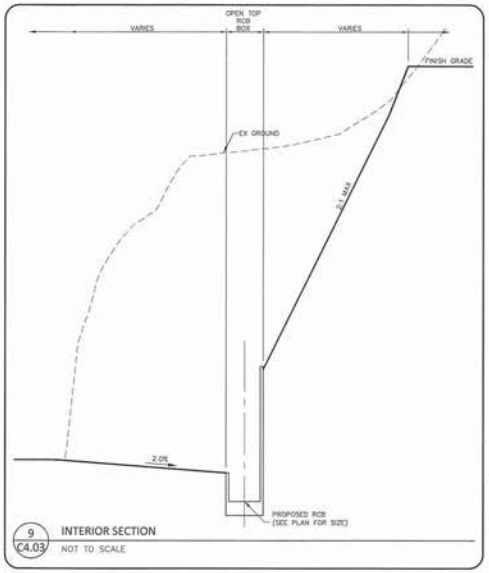
LATERAL PROFILE 2

DRAWING
C5.06
14 OF 17 SHTS

HTE: 00-00000



10 C4.03 PERIMETER SECTION
NOT TO SCALE



9 C4.03 INTERIOR SECTION
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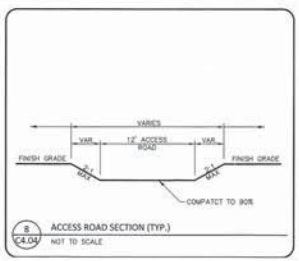

8 C4.04 ACCESS ROAD SECTION (TYP.)
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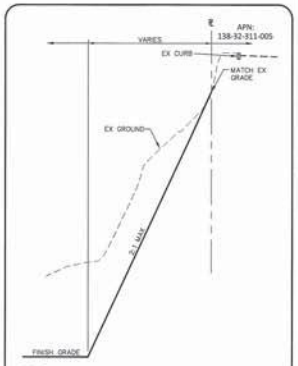

7 C4.02 PERIMETER SECTION
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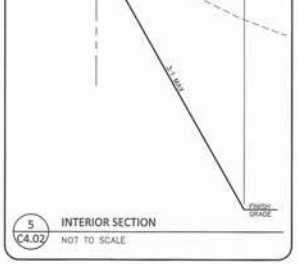

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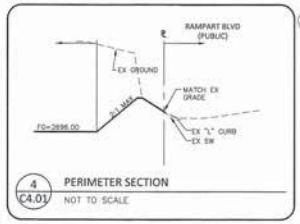
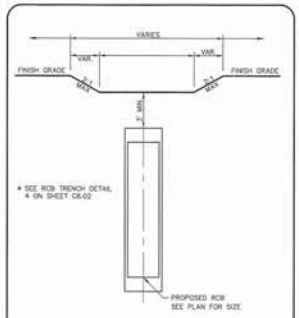
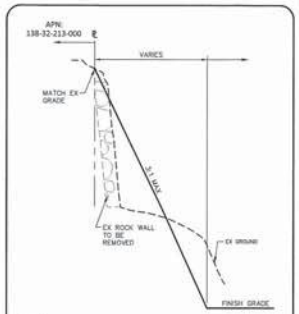
NOT TO SCALE



4 C4.01 PERIMETER SECTION
NOT TO SCALE



3 C4.02 SECTION (TYP.)
NOT TO SCALE



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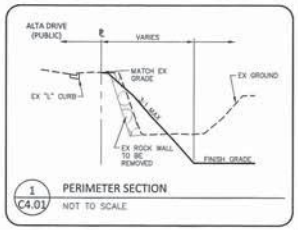
NOT TO SCALE



1 C4.01 PERIMETER SECTION
NOT TO SCALE

STATE OF NEVADA
PROFESSIONAL ENGINEER
THOMAS F. DYSON
No. 16,976
NEVADA, U.S.A.

REV	DATE	DESCRIPTION	DATE	ADEN APP	DATE	GCW APP

DATE 09/14/2017
TDS SUBMITTAL

PROJECT NO. 840-050
DESIGN TD
DRAWN TD
CHECK MF
PLOT DATE 09-14-17
PLOT TIME 15:05:21

GCW
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LAS VEGAS, NV 89146
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PAUL BRENNAN

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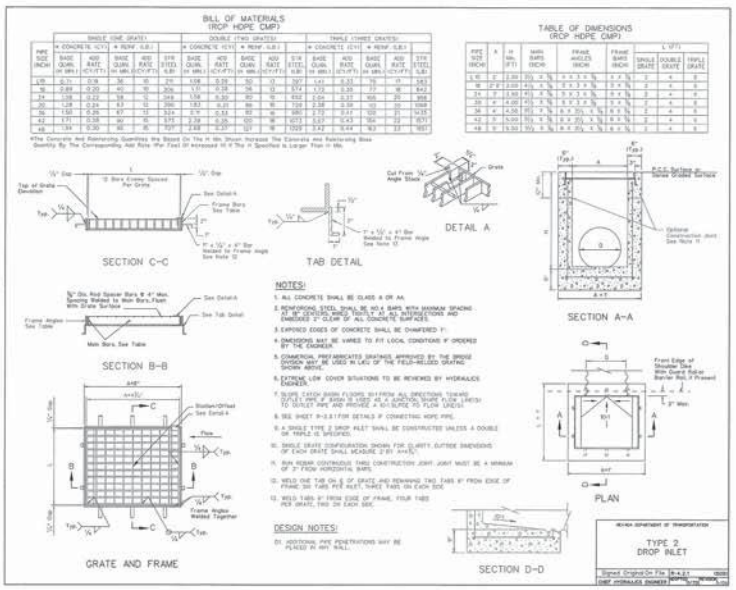
THE 435

SECTIONS & DETAILS 1

DRAWING
C8.01
15 OF 17 SHTS

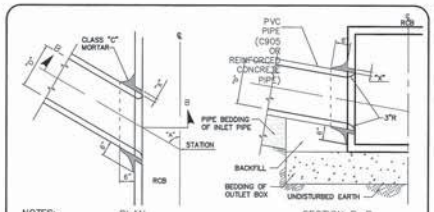
REPLY APP 1130

CLV295654



6 NDOT TYPE 2A DROP INLET DETAIL

NOT TO SCALE

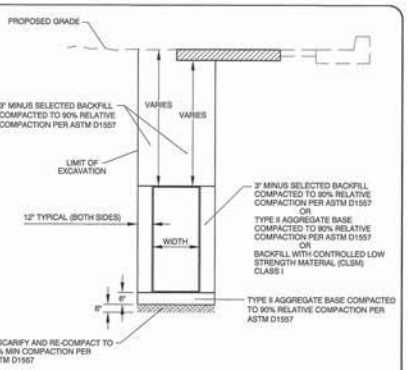


NOTES:

1. ANGLE "A" SHALL BE BETWEEN 60°.
2. DIMENSION "Y" SHALL BE EQUAL TO OR LESS THAN 1/2 THE INSIDE DIMENSION OF THE MAINLINE BOX.
3. DIMENSION "X" SHALL BE 1" MINIMUM AND 3" MAXIMUM.
4. BURN OR CHIP END OF INLET PIPE FLUSH WITH INNER SURFACE OF MAINLINE. ROUND EDGES OF MAINLINE AND INLET PIPE.

5 BOX PENETRATION DETAIL

NOT TO SCALE

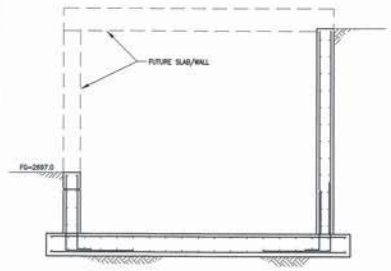


NOTES:

1. NO STONES OR LUMPS GREATER THAN 3" PERMITTED IN TRENCH.
2. TRENCH WIDTH, BEDDING, SUBGRADE AND RCB TRENCH REQUIREMENTS FOR INSTALLATIONS SHALL CONFORM TO OSHA REGULATIONS AND SPECIAL PROVISIONS.

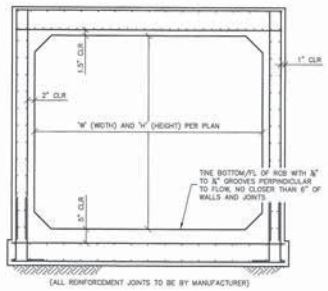
4 RCB TRENCH DETAIL (TYP.)

NOT TO SCALE



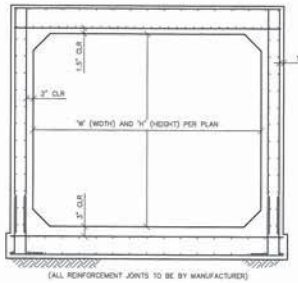
3 CUT-OFF RCB PIPE (WEIR ELEVATION)

NOT TO SCALE



2 RCB ADDITIONAL BASE CONCRETE - 5" CLR FOR HIGH VELCOTIES (ABOVE 35 FPS)

NOT TO SCALE
(NOT INTENDED FOR CONSTRUCTION PURPOSES)



1 RCB ADDITIONAL BASE CONCRETE - 3" CLR FOR HIGH VELCOTIES (BETWEEN 25 FPS TO 35 FPS)

NOT TO SCALE
(NOT INTENDED FOR CONSTRUCTION PURPOSES)

STATE OF NEVADA PROFESSIONAL ENGINEER THOMAS P. DYSON

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GOV APP	DATE

DATE 09/14/2017 TDS SUBMITTAL

PROJECT NO. 840-050

DESIGN: TD
DRAWN: TD
CHECK: MP
DATE: 09-14-17
PLOT DATE: 09-15-21

GCV
1555 S. RAINBOW BLVD
LAS VEGAS, NV 89146
T: 702.804.2000
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gcvengineering.com
ENGINEERS \ SURVEYORS

SEVENTY ACRES, LLC
FORE STAIRS, LTD

THE 435

SECTIONS & DETAILS 2

DRAWING
C8.02
16 OF 17 SHTS

REPLY APP 1131

CLV295655

CUT-OFF WALL
NOT TO SCALE
CUT-OFF WALL
NOT TO SCALE
TYPICAL SEDIMENTATION BERM
NOT TO SCALE
PLAN VIEW
SECTION VIEW
CONSTRUCTION NOTES
SEVENTY ACRES, LLC
FORE STARS, LTD
THE 435
SECTIONS & DETAILS 3
DRAWING
C8.03
17 OF 17 SHTS
GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD
LAS VEGAS, NV 89146
T: 702.804.2000
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gcwengineering.com
PROJECT NO.
840-050
TDS SUBMITTAL
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CLV295656

EXHIBIT “YYYYY-6”

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM	DATE: November 9, 2017
TO: **Land Development Services** Department of Building & Safety	**FROM:** Albert Sung, P.E. Flood Control Project Engineer Department of Public Works

SUBJECT:	Drainage Study for:			**COPIES TO:**
The 435 formerly The SEVENTY				GCW Engineers
Cross Streets:	SWC of Rampart & Alta			Seventy Acres LLC
File Number:	F:\Depot\DSMemos\DS4787B.ZNA.doc			Bart Anderson, P.E., DevCo
Parcel Number:	138-32-301-005, 006, 210-008			CCRFCD
Zoning Action:	SDR-62393; GPA-62387; ZON-62392			
FEMA Flood Zone	YES	**X**	NO	
Proposed Storm Drain	YES	**X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	3/3/2016 & 3/9/2016	3/23/2016	See Comments Below	$400.00	425231: $400
2nd Submittal	9/18/17	11/9/2017	See Comments Below	$400.00	490193: $400
			TOTAL FEES (LDDRS):	**$800.00**	**----**

REMARKS: This site development is within a FEMA SPECIAL FLOOD HAZARD AREA, Zone A. No permits of any kind will be issued for this project until a Conditional Letter of Map Revision (CLOMR/CLOMR-F) is received from FEMA.

The Drainage Study for the subject project has been reviewed and:

	is approved subject to conformance to all City standards and the following conditions:
X	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to NDOT concurrence.

1. This site development is located within a FEMA SPECIAL FLOOD HAZARD AREA, Zone A. **No permits will be issued until a Conditional Letter of Map Revision (CLOMR/CLOMR-F) is received from FEMA. Permits may be issued upon the receipt of Conditional Letter of Map Revision (CLOMR or CLOMR-F) from FEMA.**

2. A Letter of Map Revision (LOMR/LOMR-F) must be obtained from FEMA after the completion of any project within a FEMA Special Flood Hazard Area, Flood Zone “A”. The bonded improvements shall include a line item of **$50,000.00** for the LOMR. The bonded improvements will not be released until the LOMR/LOMR-F is obtained from FEMA and filed with the City of Las Vegas.

3. Sites with a grade difference of 2 feet above or below existing are required to have approval from the *City Planning and Development Department*. The engineer must submit copies of the grading plans and detail sheet with a letter justifying the grade difference to the *City Planning Department* (229-6301). The submitted letter did not include the Planning Department approval. The engineer must provide Planning approval with the next submittal.

4. The site is located within the Flood Zone A and is adjacent to an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

5. Please obtain necessary 404 permits from US Army Corps of Engineers and provide a copy of the permit to City of Las Vegas Flood Control Section prior to issuance of the grading permit. Contact the St. George Field Office of the US Army Corps of Engineers for permit information.

6. The provided WSPG model shall be extended further downstream incorporating the FEMA approved analysis for the Village at Queensridge LOMR with your update and slightly higher flow rates. Revise the WSPG Exhibit to include extending the WSPG Stations shown on the plan to the downstream limits shown with the previous LOMR.

7. The provided WSPG analysis used a *n-values* of 0.013 and 0.015. Provide an additional WSPG analysis of the two main line RCB's using an appropriate *n-values* to reflect the rougher, tined bottom surface within the boxes in order to analyze the effects it will have on the HGLs and freeboard requirements. Any velocities above 35 feet per second with proposed mitigation measures may require additional mitigation measures to reduce the velocities and are subject to further comment by the City as well as CCRFCD review and acceptance. Provide a summary table showing the different n-values used and the resulting velocities, HGLs and minimum freeboard elevations. Revise the plans to reflect the HGLs during the worst case scenario and provide supporting freeboard calculations.

8. Provide a HEC-RAS analysis that incorporates the interim channel and entry structure flows. Extend the analysis sufficiently upstream to model the existing natural channel sections. Extend the analysis sufficiently downstream to model the concrete channel structure and extend the channel into the RCB area to normalize the flows to match the WSPG analysis. The combined HEC-RAS & WSPG analysis needs to verify that the interim entry structure has adequate freeboard. Include an Exhibit showing new cross sections that incorporate the detailed grading plans for the inlet structures within the HEC-RAS analysis.

9. Provide complete *Plans and Project Specifications* for approval by the *City of Las Vegas*. The Structural Plans and Details shall be a part of the Civil Improvement Plan set. This project is considered as a *Capital Improvement Project* (CIP) with developer funding.

10. Structural plans for the proposed storm drain improvements and pertinent flood control facilities must be submitted for review. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the *Building Department* for processing. The engineer must provide a copy of *Building Department* approval of the structures to Regional Flood prior to their concurrence and to *Flood Control* prior to final acceptance of the drainage study.

11. All proposed improvements associated with the Storm Drain facilities shall be bonded and inspected. This project shall require Special Inspection. Coordinate the requirements of and the Agreements needed for Special Inspection with the Building Department.

12. The proposed improvements show drainage facilities of a size that must be reviewed for access and maintenance concerns. The engineer must submit an extra set of improvement plans to the *City Streets & Sanitation Department* for their review and comments. *Streets & Sanitation Department's* approval must be secured prior to the conditional drainage study approval.

13. Provide plans and sections of the proposed interim open channel section. Include fall protection, access ladders, and a conceptual section to make this channel a future Box Structure.

14. The provided access roads shall be included within easements dedicated to the City and clearly labeled on the plans. Provide details and show any access gates (16-foot minimum gate width) as necessary to accommodate the 12-foot wide access roads.

15. Revise the access road detail to provide a minimum of 6" Type II. Show turnaround areas for dead end segments. In addition, provide an access road to the interim channel area to the west.

16. Storm Drain Construction Note 1 does not match Construction Note 4. Revise accordingly.

17. Construction Note 10 indicates a 2:1 maximum slope but a 1:1 slope is shown on the plans. Revise accordingly.

18. Provide a list of estimated quantities on the plans for both public and private drainage facilities.

19. Revise Drainage Construction Notes 1 and 2 to match the dimensions of additional concrete clearance indicated in Details 1 and 2 on Sheet C8.02.

20. Provide new public drainage easements for the area of the site impacted by the proposed MPU facility improvements. The easement shall note that the public drainage improvements (MPU facilities) are publicly maintained and all onsite storm drain and surface improvements are privately maintained and the easement must be dedicated and recorded by separate document prior to the final acceptance of the improvement plans. Provide legal description and an exhibit of the drainage easement to Flood Control and *Rae Heller* (702-229-2139) of *City of Las Vegas Right of Way Section* for the recordation process after the subject drainage study is conceptually approved. The existing drainage easements shall be vacated by separate action and the recording of the new easements shall be done consecutively.

21. Provide a detail of the proposed riprap areas that include the Type II and geotextile fabric in the detail section. Revise all pertinent plans and callouts accordingly.

22. Detail 9 on Sheet C8.01 shows a 2.0% slope while the plans and FlowMaster model reflect a 1.0% slope. Revise detail to match plan and hydraulic model. In addition, add dimensions, show rip rap, rip rap size and construction on Detail 9.

23. Provide a cross sectional detail of the rip rap channel just upstream of the weir to show the construction of the rip rap and provide detailed grading plans of the interim improvements that include sufficient spot grades to indicate extents of the rip rap.

24. Indicate the minimum Finished Floor Elevations on the plans of the rough graded pads adjacent to the storm drain facilities.

25. Technical drainage studies are required for each of the future development super pads. The technical drainage studies for the developments may not be submitted until the conditional approval of this pertinent infrastructure drainage study is obtained. Final approval for the infrastructure study must be obtained prior to conditional approval of the impacted development super pad drainage studies.

26. Complete the Construction Notes on the Grading Plan including pavement section and reference details for the call-outs of proposed improvements, i.e. RCB's, rip-rap, structure details, manholes, inlets, etc.

27. This project currently has no Proposed Buildings or Structures. Should the project propose changes to this design assumption, then the Engineer is to update the drainage study detailing the flood zone impacts and provide addresses for each building in a FEMA Flood Hazard Zone prior to obtaining a grading permit. This information is necessary to insure that the elevation certificates are provided for each address prior to completion of construction. This information is required until such time as a LOMR is approved that removes the development from the SFHA.

Flood Control understands that this overall project will be developed in Phases. The following comments are repeated to reflect items that shall be addressed in future study updates as the Phases develop.

28. Proposed storm drain laterals have been identified to collect flows from Peccole West Lot 9 and Queensridge Fairway Homes. Extend the storm drain system to collect the 100-year flows from these adjacent subdivisions.

29. Continue to coordinate the MPU facility changes that are proposed with this development.

30. Storm drain facilities are located on cut/fill slopes. Revise the slopes and/or the storm drain alignment to maintain 12-foot access roads. Provide a cross section detail of the maintenance access.

31. Provide a concrete pad and maintenance access to the inlet structures for the local storm drains. Show the needed drainage easements for these facilities.

32. The existing and proposed utility crossings of the storm drain must be shown on the storm drain plan and profiles sheets and on the lateral profiles. Indicate the type of pipe material for water and sewer lines. Review separation requirements between utilities and show all of the utility crossings of the storm drains.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the *Nevada Division of Environmental Protection* a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm or call (775) 687-9429.

NOTE: The engineer must submit the drainage study to FEMA for a Conditional Letter of Map Revision (CLOMR). A favorable CLOMR must be obtained prior to the issuance of any permits. This site is located in a **FEMA Zone A**. *Clark County Regional Flood Control District* (CCRFCD) review and approval is required prior to recordation of final map or issuance of building/grading permits. The Engineer must send a copy of the report to the CCRFCD for review. **The developer/engineer must also obtain a Letter of Map Revision (LOMR) using the approved drainage study as technical support to inform FEMA of the modifications within the flood zone. The approved LOMR must be submitted to the *City of Las Vegas* prior to the release of the bond.** FEMA Elevation Certificates, showing as-built finish floor elevations, must be completed for each building in the FEMA A Zone. The certificate must be submitted to the *City of Las Vegas Flood Control Section* prior to scheduling a framing inspection.

END OF REMARKS T/R/S: T20S/R60E/12
JKN/PBJ AREA L-32

EXHIBIT “YYYYY-7”

RESPONSE TO 2ND CLV COMMENTS ON THE TECHNICAL DRAINAGE STUDY FOR THE 435 (FORMERLY "THE SEVENTY")

840-050

January 2018

GCW
ENGINEERS \ SURVEYORS

Prepared for:

Seventy Acres LLC, Fore Stars LTD, and 180 Land Co LLC
9775 West Charleston Boulevard
Las Vegas, Nevada 89117
Phone: (702) 940-6930
Fax: (702) 940-6931

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: The 435 (formerly known as The Seventy) Date: January 2018

Location of Development: a) Descriptive (Cross Streets) North/South: Hualapai Way

East/West: Rampart Boulevard

b) Section: 32 Township: 20S Range: 60E

c) APN : 138-32-301-005

Name of Owner: Seventy Acres LLC

Telephone No.: (702) 940-6930 Fax No.: (702) 940-6931 E-Mail Address: frank@EHBcompanies.com

Address: 9775 W. Charleston Blvd., Las Vegas, Nevada 89117

Contact Person-Name: Steve Jones, P.E. **Telephone No.:** (702) 804-2000

* **E-Mail Address:** SJones@gcwengineering.com **Fax No.:** (702) 804-2299

Firm: GCW, Inc.

Address: 1555 South Rainbow Blvd, Las Vegas, NV 89146

Type of Land Development/Land Disturbance Process:

	Rezoning		Subdivision Map		Clearing and Grading Only
	Parcel Map		Planned Unit Development	X	Other (Please specify below)
	Large Parcel Map		Building Permit	Conceptual Drianage, Rough Grade, SD	

1. Total Owned Land Area: At Site: +/- 70.52 acres Being Developed/Disturbed: +/- 17.5 acres
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☒ **Yes**** ☐ **No**
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☒ **Yes**** ☐ **No**
4. Proposed type of development (Residential, Commercial, Etc.): Conceptual Drainage, Rough Grade, and Storm Drain Improvements
5. Approximate upstream land area which drains to the subject site: +/- 3.73 sq. mi.
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Peccole Ranch West Master Study, Queensridge LOMR, Queens Borough Culvert Study
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Existing dual (2) - 12'X 12' RCB at northeast corner of site
8. Briefly describe your proposed schedule for the subject project: Phase 1 Infrastructure (This Study), Phase 1 Improvements (Future Study), Phase 2 - Remaining 52.1 acres (Future Studies)

PROFESSIONAL ENGINEER - STATE OF NEVADA
STEPHEN M. JONES
EXP. 6-30-19
CIVIL
No. 19638
1/5/2018

Engineer's Seal

Submit this form as part of the required drainage study to the local entity which has jurisdiction over the subject property. This form may provide sufficient information to serve as the Conceptual Drainage Study.

***New Required Field**

****Review and concurrence of the Clark County Regional Flood Control District is required.**

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

T:\Flood_Control\ADMIN\Forms\SF-1.docx

Updated 05/01/2008

RESPONSE TO 2ND CLV COMMENTS ON THE TECHNICAL DRAINAGE STUDY FOR THE 435 (FORMERLY "THE SEVENTY")

840-050

January 2018

Prepared for:

Seventy Acres LLC, Fore Stars LTD, and 180 Land Co LLC
9775 West Charleston Boulevard
Las Vegas, Nevada 89117
Phone: (702) 940-6930
Fax: (702) 940-6931

Prepared By:

GCW, Inc.
1555 S. Rainbow Blvd.
Las Vegas, Nevada 89146
Phone: (702) 804-2000
Fax: (702) 804-2299

GCW
ENGINEERS \ SURVEYORS

840-050

January 8, 2018

Albert Sung, PE
City of Las Vegas – Department of Public Works
333 N. Rancho Drive – 7th Floor
Las Vegas, NV 89106

Re: 2nd Response to City of Las Vegas Comments on the Technical Drainage Study for "The 435" (DS4787)

Dear Mr. Sung:

This letter addresses City of Las Vegas (CLV) second review comments dated November 9, 2017, regarding the project in its entirety. The CLV comment letter has been included in Appendix A for reference. Below are individual responses to each comment included in the review letter.

Comment: "1. This site development is located within a FEMA SPECIAL FLOOD HAZARD AREA, Zone A. **No permits will be issued until a Conditional Letter of Map Revision (CLOMR/CLOMR-F) is received from FEMA. Permits may be issued upon the receipt of Conditional Letter of Map Revision (CLOMR or CLOMR-F) from FEMA**."

Response: The requirement for FEMA coordination to receive permits is acknowledged.

Comment: "2. A Letter of Map Revision (LOMR/LOMR-F) must be obtained from FEMA after the completion of any project within a FEMA Special Flood Hazard Area, Flood Zone "A". The bonded improvements shall include a line item of **$50,000.00** for the LOMR. The bonded improvements will not be released until the LOMR/LOMR-F is obtained from FEMA and filed with the City of Las Vegas."

Response: The requirement for an additional bond with regards to LOMR approval is acknowledged.

Comment: "3. Sites with a grade difference of 2 feet above or below existing are required to have approval from the *City Planning and Development Department*. The engineer must submit copies of the grading plans and detail sheet with a letter justifying the grade difference to the *City Planning Department* (229-6301). The submitted letter did not include the Planning Department approval. The engineer must provide Planning approval with the next submittal."

Response: Planning approval has been provided in Appendix D.

1555 South Rainbow Boulevard
Las Vegas, Nevada 89146
O 702.804.2000
F 702.804.2299
info@gcwengineering.com
gcwengineering.com

Comment: "4. The site is located within the Flood Zone A and is adjacent to an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study."

Response: The requirement of CCRFCD concurrence prior to final approval is acknowledged.

Comment: "5. Please obtain necessary 404 permits from US Army Corps of Engineers and provide a copy of the permit to City of Las Vegas Flood Control Section prior to issuance of the grading permit. Contact the St. George Field Office of the US Army Corps of Engineers for permit information."

Response: It is acknowledged that necessary 404 permits are required prior to issuance of the grading permit.

Comment: "6. The provided WSPG model shall be extended further downstream incorporating the FEMA approved analysis for the Village at Queensridge LOMR with your update and slightly higher flow rates. Revise the WSPG Exhibit to include extending the WSPG Stations shown on the plan to the downstream limits shown with the previous LOMR."

Response: The WSPG model and Figure 8R have been extended downstream and are included in the appendix. Note that per Response to Comment No. 7, only one WSPG model has been included that uses the most conservative n-values and extends through the Queensridge LOMR. Pertinent reference material from the Queensridge LOMR has been included in Appendix E. Figure 8R has been updated through Queensridge and shows that criteria is met in the summary table.

Comment: "7. The provided WSPG analysis used a *n-values* of 0.013 and 0.015. Provide an additional WSPG analysis of the two main line RCB's using an appropriate n-values to reflect the rougher, tined bottom surface within the boxes in order to analyze the effects it will have on the HGLs and freeboard requirements. Any velocities above 35 feet per second with proposed mitigation measures may require additional mitigation measures to reduce the velocities and are subject to further comment by the City as well as CCRFCD review and acceptance. Provide a summary table showing the different n-values used and the resulting velocities, HGLs and minimum freeboard elevations. Revise the plans to reflect the HGLs during the worst case scenario and provide supporting freeboard calculations."

Response: A WSPG analysis for Mainline 1 and Mainline 2 using n-values of 0.015 for sections of the RCB with 1-inch of sacrificial concrete and n-values of 0.020 for

sections of the RCB with 3-inches of sacrificial concrete and tined groove bottoms have been included in the appendix. The 0.020 coefficient was taken from the CCRFCD Manual since the 3-inch sacrificial concrete and tined grooves are representative of an unfinished surface. A summary table located on Figure 8R showing n-values, velocities, HGLs, FG elevations, and a HGL criteria check has been included in the appendix. The plans have been revised to reflect the worst case scenario HGLs. Note that locations of 1-inch and 3-inch sacrificial concrete have been revised based on the new models velocities. The velocities of the Mainline 1 and Mainline 2 models exceed 35 ft/s in 2 places. The first place is for approximately 20-feet between WSPG station 7710 and 7691 within the open box section in the Mainline 1 model. The second place is for less than 40-feet between WSPG stations 2775 and 2738 in the Mainline 2 model and at station 7536 in the Mainline 1 model. Both of these locations are located just upstream of the open box junction. Since the stretches where the model exceeds 35 ft/s are brief, only slightly exceed it by 3 ft/s in the worst location, and all the places where it exceeds 35 ft/s are located within sections that will have 3-inches of sacrificial concrete the design is considered adequate.

Comment: "8. Provide a HEC-RAS analysis that incorporates the interim channel and entry structure flows. Extend the analysis sufficiently upstream to model the existing natural channel sections. Extend the analysis sufficiently downstream to model the concrete channel structure and extend the channel into the RCB area to normalize the flows to match the WSPG analysis. The combined HEC-RAS & WSPG analysis needs to verify that the interim entry structure has adequate freeboard. Include an Exhibit showing new cross sections that incorporate the detailed grading plans for the inlet structures within the HEC-RAS analysis."

Response: A HEC-RAS analysis incorporating the interim channel, entry structure, and RCB along with Figure 14 showing the cross sections have been included in the appendix. A HEC-RAS summary table showing required freeboard has also been provided on Figure 14. Note that the water surface elevations in the HEC-RAS and WSPG model are approximately 0.96-feet different at HEC-RAS station 800 due to differences in methodology between the two programs. Since the flow is near the top of box and WSPG can accurately model pressurized flow, the HGL from the WSPG model has been chosen for design purposes. Note that in the HEC-RAS model flow still remains around the top of box with adequate cover to meet HGL criteria.

Note that the open channel entry structure has been revised to allow for flow to better transition into the RCB, by elongating the open portion and modifying the walls to gradually contain the flow. An embankment with access to the top has been proposed to direct the water into the entry structure. A Blow-up detail on how to construct the embankment has been included on the improvement plans with this submittal. Riprap has been proposed throughout the entry structure and

grading up to minimum the water surface elevation that has been determined by the HEC-RAS model. Access to the open channel portion of the improvements remains drive-able through the RCB.

Figure 8R shows WSPG data for the RCB storm drain and the new Figure 14 shows the hydraulics and the proposed flood zone delineation at the entry structure; therefore, for consolidation purposes, Figure 11R has not been re-included with this submittal.

Comment: "9. Provide complete *Plans and Project Specifications* for approval by the *City of Las Vegas*. The Structural Plans and Details shall be a part of the Civil Improvement Plan set. This project is considered as a *Capital Improvement Project* (CIP) with developer funding."

Response: Complete Plans and Project Specifications will be provided to the City of Las Vegas for approval after the approval of the technical drainage study. It is acknowledged that the structural plans and details will be part of the Civil Improvement Plan set and that the project is considered a CIP project.

Comment: "10. Structural plans for the proposed storm drain improvements and pertinent flood control facilities must be submitted for review. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the *Building Department* for processing. The engineer must provide a copy of *Building Department* approval of the structures to Regional Flood prior to their concurrence and to *Flood Control* prior to final acceptance of the drainage study."

Response: Structural plans for the proposed storm drain improvements and pertinent flood control facilities will be submitted for review after the approval of the technical drainage study. A soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan will be provided to the *Building Department* for processing. It is acknowledged that Building Department approval must be provided to Regional Flood for concurrence and to Flood Control prior to final acceptance.

Comment: "11. All proposed improvements associated with the Storm Drain facilities shall be bonded and inspected. This project shall require Special Inspection. Coordinate the requirements of and the Agreements needed for Special Inspection with the Building Department."

Response: It is acknowledged that the storm drain facilities must be bonded and inspected and that the project will require special inspection. The requirements and agreements needed for special inspection will be coordinated with the building department.

Comment: "12. The proposed improvements show drainage facilities of a size that must be reviewed for access and maintenance concerns. The engineer must submit an extra set of improvement plans to the *City Streets & Sanitation Department* for their review and comments. *Streets & Sanitation Department's* approval must be secured prior to the conditional drainage study approval."

Response: Improvement plans were submitted to the City Streets and Sanitation Department for review and comments on November 20, 2017. Due to the changes with the entry structure, an updated copy of the improvement plans will be forwarded with this drainage study submittal for Maintenance review.

Comment: "13. Provide plans and sections of the proposed interim open channel section. Include fall protection, access ladders, and a conceptual section to make this channel a future Box Structure."

Response: Fall protection and access ladders have been added to the pertinent detail in the improvement plans. Locations of post and cable have been properly shown where applicable. Note that structural design will be provided with the improvement plans that shows the design of the open channel, including how the channel can be constructed as a RCB at a later date.

Comment: "14. The provided access roads shall be included within easements dedicated to the City and clearly labeled on the plans. Provide details and show any access gates (16-foot minimum gate width) as necessary to accommodate the 12-foot wide access roads."

Response: Easements dedicated to the City have been provided for all access roads and are labeled on the plans.

Comment: "15. Revise the access road detail to provide a minimum of 6" Type II. Show turnaround areas for dead end segments. In addition, provide an access road to the interim channel area to the west."

Response: The access road detail has been revised to show a minimum of 6" Type II. Turn around areas for dead end segments are now shown on plans.

Comment: "16. Storm Drain Construction Note 1 does not match Construction Note 4. Revise accordingly."

Response: Construction notes have been reviewed and cross-checked for accuracy.

Comment: "17. Construction Note 10 indicates a 2:1 maximum slope but a 1:1 slope is shown on the plans. Revise accordingly."

Response: The plans have been revised to show the maximum engineered slope as 2:1. Note that along the northern boundary of the site, retaining walls are now proposed to assist in making up the grade difference.

Comment: "18. Provide a list of estimated quantities on the plans for both public and private drainage facilities."

Response: A list of estimated quantities for public and private drainage facilities has been added to sheet C1.02

Comment: "19. Revise Drainage Construction Notes 1 and 2 to match the dimensions of additional concrete clearance indicated in Details 1 and 2 on Sheet C8.02."

Response: Notes 1 and 2 indicate the 1" and 3" clearance needed in addition to the 2" clearance required from the rebar as shown in the included NDOT RCB culvert standard drawing. Detail 1 and 2 on Sheet C8.02 show the total clearance from the rebar needed taking into consideration the 2" clearance and the additional either 1" or 3" clearance.

Comment: "20. Provide new public drainage easements for the area of the site impacted by the proposed MPU facility improvements. The easement shall note that the public drainage improvements (MPU facilities) are publicly maintained and all onsite storm drain and surface improvements are privately maintained and the easement must be dedicated and recorded by separate document prior to the final acceptance of the improvement plans. Provide legal description and an exhibit of the drainage easement to Flood Control and *Mary Wulff* (702-229-2139) of *City of Las Vegas Right of Way Section* for the recordation process after the subject drainage study is conceptually approved. The existing drainage easements shall be vacated by separate action and the recording of the new easements shall be done consecutively."

Response: New public drainage easements with the note that the MPU facilities are publically maintained and onsite storm drain and surface improvements are privately maintained have been provided. It is acknowledged that the easement must be dedicated and recorded prior to final acceptance of the improvement plans. A legal description and exhibit will be provided to Flood Control and Mary Wulff for the recordation process after conceptual approval. It is acknowledged that the existing drainage easements shall be vacated by separate action and the recording of new easement will be done consecutively.

Comment: "21. Provide a detail of the proposed riprap areas that include the Type II and geotextile fabric in the detail section. Revise all pertinent plans and callouts accordingly."

Response: Further detail regarding the installation of riprap including callout for the bedding under the riprap has been added to the applicable details on the plans.

Comment: "22. Detail 9 on Sheet C8.01 shows a 2.0% slope while the plans and FlowMaster model reflect a 1.0% slope. Revise detail to match plan and hydraulic model. In addition, add dimensions, show rip rap, rip rap size and construction on Detail 9."

Response: The slope shown on the detail has been corrected to 1.0%. Dimensions, riprap, and riprap size have been added..

Comment: "23. Provide a cross sectional detail of the rip rap channel just upstream of the weir to show the construction of the rip rap and provide detailed grading plans of the interim improvements that include sufficient spot grades to indicate extents of the rip rap."

Response: Further detail regarding the grading and the installation of the interim open channel entry structure has been included on the plans.

Comment: "24. Indicate the minimum Finished Floor Elevations on the plans of the rough graded pads adjacent to the storm drain facilities."

Response: Minimum finished floor elevations of the rough graded pads adjacent to storm drain facilities have been added to the plans

Comment: "25. Technical drainage studies are required for each of the future development super pads. The technical drainage studies for the developments may not be submitted until the conditional approval of this pertinent infrastructure drainage study is obtained. Final approval for the infrastructure study must be obtained prior to conditional approval of the impacted development super pad drainage studies."

Response: It is acknowledged that technical drainage studies are needed for future development of the super pads. It is also noted that conditional approval of this study is required before the submittal of the technical drainage studies for the future developments and that final approval of this study is required prior to conditional approval of the future development studies.

Comment: "26. Complete the Construction Notes on the Grading Plan including pavement section and reference details for the call-outs of proposed improvements, i.e. RCB's, rip-rap, structure details, manholes, inlets, etc."

Response: Construction notes on the grading plan have been completed.

Comment: "27. This project currently has no Proposed Buildings or Structures. Should the project propose changes to this design assumption, then the Engineer

is to update the drainage study detailing the flood zone impacts and provide addresses for each building in a FEMA Flood Hazard Zone prior to obtaining a grading permit. This information is necessary to insure that the elevation certificates are provided for each address prior to completion of construction. This information is required until such time as a LOMR is approved that removes the development from the SFHA."

Response: Comment acknowledged.

The following comments are deferred to future technical drainage studies and no response to comment has been completed as a part of this submittal.

Comment: "28. Proposed storm drain laterals have been identified to collect flows from Peccole West Lot 9 and Queensridge Fairway Homes. Extend the storm drain system to collect the 100-year flows from these adjacent subdivisions."

Comment: "29. Continue to coordinate the MPU facility changes that are proposed with this development."

Comment: "30. Storm drain facilities are located on cut/fill slopes. Revise the slopes and/or the storm drain alignment to maintain 12-foot access roads. Provide a cross section detail of the maintenance access."

Comment: "31. Provide a concrete pad and maintenance access to the inlet structures for the local storm drains. Show the needed drainage easements for these facilities."

Comment: "32. The existing and proposed utility crossings of the storm drain must be shown on the storm drain plan and profiles sheets and on the lateral profiles. Indicate the type of pipe material for water and sewer lines. Review separation requirements between utilities and show all of the utility crossings of the storm drains."

If you have any questions or require additional information, please do not hesitate to contact me at 804-2130.

Respectfully,

GCW, INC.

Nelson Baggs, E.I.
Flood Control Division

Enclosures

c: Tom Dyson, GCW
James Duddlesten, GCW

THE 435 – 2nd CLV Response to Comments
APPENDIX LAYOUT

Appendix A. City of Las Vegas Comments
1. November 9, 2017 CLV Comments

Appendix B. Hydraulic Calculations
1. Extended WSPG Model
2. HEC-RAS Model

Appendix C. Drainage Exhibits
1. Figure 8R - WSPG Exhibit
2. Figure 14 - HEC-RAS Exhibit

Appendix D. Additional Documents and Reference Material
1. Planning Approval (grade difference)
2. Table 702 – Manning's Roughness Coefficients
3. NDOT RCB Culvert Standard Drawing
4. Queensridge Culvert Reference Material

Appendix E. Improvement Plans (Folded Separately)

APPENDIX A

City of Las Vegas Comments

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: November 9, 2017
TO: **Land Development Services** Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for:			**COPIES TO:**
The 435 formerly The SEVENTY				GCW Engineers
Cross Streets:	SWC of Rampart & Alta			Seventy Acres LLC
File Number:	F:\Depot\DSMemos\DS4787B.ZNA.doc			Bart Anderson, P.E., DevCo
Parcel Number:	138-32-301-005, 006, 210-008			CCRFCD
Zoning Action:	SDR-62393; GPA-62387; ZON-62392			
FEMA Flood Zone	YES	**X**	NO	
Proposed Storm Drain	YES	**X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	3/3/2016 & 3/9/2016	3/23/2016	See Comments Below	$400.00	425231: $400
2nd Submittal	9/18/17	11/9/2017	See Comments Below	$400.00	490193: $400
			TOTAL FEES (LDDRS):	**$800.00**	----

REMARKS: This site development is within a FEMA SPECIAL FLOOD HAZARD AREA, Zone A. No permits of any kind will be issued for this project until a Conditional Letter of Map Revision (CLOMR/CLOMR-F) is received from FEMA.

The Drainage Study for the subject project has been reviewed and:

	is approved subject to conformance to all City standards and the following conditions:
X	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to NDOT concurrence.

1. This site development is located within a FEMA SPECIAL FLOOD HAZARD AREA, Zone A. **No permits will be issued until a Conditional Letter of Map Revision (CLOMR/CLOMR-F) is received from FEMA. Permits may be issued upon the receipt of Conditional Letter of Map Revision (CLOMR or CLOMR-F) from FEMA.**

2. A Letter of Map Revision (LOMR/LOMR-F) must be obtained from FEMA after the completion of any project within a FEMA Special Flood Hazard Area, Flood Zone "A". The bonded improvements shall include a line item of **$50,000.00** for the LOMR. The bonded improvements will not be released until the LOMR/LOMR-F is obtained from FEMA and filed with the City of Las Vegas.

3. Sites with a grade difference of 2 feet above or below existing are required to have approval from the *City Planning and Development Department*. The engineer must submit copies of the grading plans and detail sheet with a letter justifying the grade difference to the *City Planning Department* (229-6301). The submitted letter did not include the Planning Department approval. The engineer must provide Planning approval with the next submittal.

4. The site is located within the Flood Zone A and is adjacent to an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

5. Please obtain necessary 404 permits from US Army Corps of Engineers and provide a copy of the permit to City of Las Vegas Flood Control Section prior to issuance of the grading permit. Contact the St. George Field Office of the US Army Corps of Engineers for permit information.

6. The provided WSPG model shall be extended further downstream incorporating the FEMA approved analysis for the Village at Queensridge LOMR with your update and slightly higher flow rates. Revise the WSPG Exhibit to include extending the WSPG Stations shown on the plan to the downstream limits shown with the previous LOMR.

7. The provided WSPG analysis used a *n-values* of 0.013 and 0.015. Provide an additional WSPG analysis of the two main line RCB's using an appropriate *n-values* to reflect the rougher, tined bottom surface within the boxes in order to analyze the effects it will have on the HGLs and freeboard requirements. Any velocities above 35 feet per second with proposed mitigation measures may require additional mitigation measures to reduce the velocities and are subject to further comment by the City as well as CCRFCD review and acceptance. Provide a summary table showing the different n-values used and the resulting velocities, HGLs and minimum freeboard elevations. Revise the plans to reflect the HGLs during the worst case scenario and provide supporting freeboard calculations.

8. Provide a HEC-RAS analysis that incorporates the interim channel and entry structure flows. Extend the analysis sufficiently upstream to model the existing natural channel sections. Extend the analysis sufficiently downstream to model the concrete channel structure and extend the channel into the RCB area to normalize the flows to match the WSPG analysis. The combined HEC-RAS & WSPG analysis needs to verify that the interim entry structure has adequate freeboard. Include an Exhibit showing new cross sections that incorporate the detailed grading plans for the inlet structures within the HEC-RAS analysis.

9. Provide complete *Plans and Project Specifications* for approval by the *City of Las Vegas*. The Structural Plans and Details shall be a part of the Civil Improvement Plan set. This project is considered as a *Capital Improvement Project* (CIP) with developer funding.

10. Structural plans for the proposed storm drain improvements and pertinent flood control facilities must be submitted for review. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the *Building Department* for processing. The engineer must provide a copy of *Building Department* approval of the structures to Regional Flood prior to their concurrence and to *Flood Control* prior to final acceptance of the drainage study.

11. All proposed improvements associated with the Storm Drain facilities shall be bonded and inspected. This project shall require Special Inspection. Coordinate the requirements of and the Agreements needed for Special Inspection with the Building Department.

12. The proposed improvements show drainage facilities of a size that must be reviewed for access and maintenance concerns. The engineer must submit an extra set of improvement plans to the *City Streets & Sanitation Department* for their review and comments. *Streets & Sanitation Department's* approval must be secured prior to the conditional drainage study approval.

13. Provide plans and sections of the proposed interim open channel section. Include fall protection, access ladders, and a conceptual section to make this channel a future Box Structure.

14. The provided access roads shall be included within easements dedicated to the City and clearly labeled on the plans. Provide details and show any access gates (16-foot minimum gate width) as necessary to accommodate the 12-foot wide access roads.

15. Revise the access road detail to provide a minimum of 6" Type II. Show turnaround areas for dead end segments. In addition, provide an access road to the interim channel area to the west.

16. Storm Drain Construction Note 1 does not match Construction Note 4. Revise accordingly.

17. Construction Note 10 indicates a 2:1 maximum slope but a 1:1 slope is shown on the plans. Revise accordingly.

18. Provide a list of estimated quantities on the plans for both public and private drainage facilities.

19. Revise Drainage Construction Notes 1 and 2 to match the dimensions of additional concrete clearance indicated in Details 1 and 2 on Sheet C8.02.

20. Provide new public drainage easements for the area of the site impacted by the proposed MPU facility improvements. The easement shall note that the public drainage improvements (MPU facilities) are publicly maintained and all onsite storm drain and surface improvements are privately maintained and the easement must be dedicated and recorded by separate document prior to the final acceptance of the improvement plans. Provide legal description and an exhibit of the drainage easement to Flood Control and *Mary Wulff* (702-229-2139) of *City of Las Vegas Right of Way Section* for the recordation process after the subject drainage study is conceptually approved. The existing drainage easements shall be vacated by separate action and the recording of the new easements shall be done consecutively.

21. Provide a detail of the proposed riprap areas that include the Type II and geotextile fabric in the detail section. Revise all pertinent plans and callouts accordingly.

22. Detail 9 on Sheet C8.01 shows a 2.0% slope while the plans and FlowMaster model reflect a 1.0% slope. Revise detail to match plan and hydraulic model. In addition, add dimensions, show rip rap, rip rap size and construction on Detail 9.

23. Provide a cross sectional detail of the rip rap channel just upstream of the weir to show the construction of the rip rap and provide detailed grading plans of the interim improvements that include sufficient spot grades to indicate extents of the rip rap.

24. Indicate the minimum Finished Floor Elevations on the plans of the rough graded pads adjacent to the storm drain facilities.

25. Technical drainage studies are required for each of the future development super pads. The technical drainage studies for the developments may not be submitted until the conditional approval of this pertinent infrastructure drainage study is obtained. Final approval for the infrastructure study must be obtained prior to conditional approval of the impacted development super pad drainage studies.

26. Complete the Construction Notes on the Grading Plan including pavement section and reference details for the call-outs of proposed improvements, i.e. RCB's, rip-rap, structure details, manholes, inlets, etc.

27. This project currently has no Proposed Buildings or Structures. Should the project propose changes to this design assumption, then the Engineer is to update the drainage study detailing the flood zone impacts and provide addresses for each building in a FEMA Flood Hazard Zone prior to obtaining a grading permit. This information is necessary to insure that the elevation certificates are provided for each address prior to completion of construction. This information is required until such time as a LOMR is approved that removes the development from the SFHA.

Flood Control understands that this overall project will be developed in Phases. The following comments are repeated to reflect items that shall be addressed in future study updates as the Phases develop.

28. Proposed storm drain laterals have been identified to collect flows from Peccole West Lot 9 and Queensridge Fairway Homes. Extend the storm drain system to collect the 100-year flows from these adjacent subdivisions.

29. Continue to coordinate the MPU facility changes that are proposed with this development.

30. Storm drain facilities are located on cut/fill slopes. Revise the slopes and/or the storm drain alignment to maintain 12-foot access roads. Provide a cross section detail of the maintenance access.

31. Provide a concrete pad and maintenance access to the inlet structures for the local storm drains. Show the needed drainage easements for these facilities.

32. The existing and proposed utility crossings of the storm drain must be shown on the storm drain plan and profiles sheets and on the lateral profiles. Indicate the type of pipe material for water and sewer lines. Review separation requirements between utilities and show all of the utility crossings of the storm drains.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the *Nevada Division of Environmental Protection* a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm or call (775) 687-9429.

NOTE: The engineer must submit the drainage study to FEMA for a Conditional Letter of Map Revision (CLOMR). A favorable CLOMR must be obtained prior to the issuance of any permits. This site is located in a **FEMA Zone A**. *Clark County Regional Flood Control District* (CCRFCD) review and approval is required prior to recordation of final map or issuance of building/grading permits. The Engineer must send a copy of the report to the CCRFCD for review. **The developer/engineer must also obtain a Letter of Map Revision (LOMR) using the approved drainage study as technical support to inform FEMA of the modifications within the flood zone. The approved LOMR must be submitted to the *City of Las Vegas* prior to the release of the bond.** FEMA Elevation Certificates, showing as-built finish floor elevations, must be completed for each building in the FEMA A Zone. The certificate must be submitted to the *City of Las Vegas Flood Control Section* prior to scheduling a framing inspection.

END OF REMARKS
JKN/PBJ

T/R/S: T20S/R60E/12
AREA L-32

APPENDIX B

Hydraulic Calculations

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T1 THE SEVENTY - THE 435 (PHASE 1), GCW JOB NO. 840-050                        0
T2 2ND RESPONSE TO CLV COMMENTS
T3 MAIN1 FACILITY (CCRFCD 'APSO' MPU FACILITY)EXTENDED THROUGH QUEENSRIDGE LOMR
SO -11897.2702621.300 14      .015                2623.822
TS -11872.4102621.650 15      .015                                    .000
TS -11862.4102621.810 10      .015                                    .000
R  -11772.1002623.180 10      .015                                    .000
R  -11769.7802623.000 10      .015                                    .000    .000 0
R  -11699.1602625.000 10      .015                                 -40.463
R  -11681.7502625.480 10      .015                                    .000
R  -11596.4502627.860 10      .015                                  48.868
R  -11452.9802631.860 10      .015                                    .000
R  -10980.0902645.025 10      .015                                  13.909
R  -10864.6802648.238 10      .015                                 -66.125
R  -10746.4602651.530 10      .015                                    .000
R  -10280.3202655.259 10      .015                                    .000    .000 0
R  -10111.4602656.610 10      .015                                  90.000

R   -9546.4602659.440 10      .015                                    .000    .000 0
R   -9401.3002662.940  1      .015                                    .000    .000 0
JX  -9391.3002663.130  1  6   .015  188.000         2663.420        -60.0         .000
R   -9196.4602666.750  1      .015                                    .000    .000 0

TS  -9166.4602668.540  2      .020                                    .000
R   -9128.4302670.810  2      .020                                    .000    .000 0
R   -9038.3502671.710  2      .015                                  34.408    .000 0
R   -8662.5402675.470  2      .015                                    .000    .000 0
R   -8553.1202676.560  2      .015                                  12.539    .000 0
R   -8493.5002677.160  2      .015                                    .000    .000 0
R   -8441.4702677.683  2      .015                                 -19.874    .000 0
R   -7825.4502683.840  2      .015                                    .000    .000 0
R   -7710.0002685.000  2      .020                                  -4.535    .000 0
R   -7573.6402695.000  2      .020                                 -16.076    .000 0
JX  -7536.9702697.680  4  3   .020 2008.000         2697.680        -15.0         .000
R   -7441.1002704.768  4      .020                                    .000    .000 0
R   -7361.1002710.680  4      .020                                 -17.196    .000 0
R   -7235.1202715.420  4      .020                                 -12.318    .000 0
R   -6922.5702727.190  4      .020                                    .000    .000 0
R   -6751.4802729.550  4      .020                                    .000    .000 0
JX  -6741.4802729.650  4  5  5.015    9.000   17.0002729.6502729.650 45.0-45.0    .000
R   -6181.4602735.100  4      .015                                    .000    .000 0
JX  -6171.4602735.200  4  6  6.015   51.000   28.0002735.1502735.150 45.0-45.0    .000
R   -6138.2902735.531  4      .015                                    .000    .000 0
R   -6058.1802735.820  4      .015                                  40.982    .000 0
R   -5813.2102738.240  4      .015                                    .000    .000 0
SH  -5813.2102738.240  4                              .000
CD   1  3   1   1.000  12.000   25.000  .000  .000   .00
CD   2  3   0    .000  12.000   14.000  .000  .000   .00
CD   3  3   0    .000   8.000   10.000  .000  .000   .00
CD   4  3   0    .000   9.000   14.000  .000  .000   .00
CD   5  4   1    .000   4.000     .000  .000  .000   .00

CD   6  4   1    .000   6.000     .000  .000  .000   .00
CD  10  3   1   1.000  12.000   25.000  .000  .000   .00
CD  14  5   0    .000             .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
CD  15  5   0    .000             .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
PTS 14 8   .000 48.000 19.090 48.000 50.850 45.000111.110 21.000159.240 21.000
PTS     159.240 21.000186.970 35.980248.780 40.000
PTS 15 6   .000 49.000 11.030 48.000 54.930 38.000 84.460 22.000136.390 22.000
PTS     173.210 40.000
Q          2384.000   .0
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                            2ND RESPONSE TO CLV COMMENTS
                              MAIN1 FACILITY (CCRFCD 'APSO' MPU FACILITY)EXTENDED THROUGH QUEENSRIDG
 ********************************************************************************************************************** ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
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  L/Elem  |Ch Slope |        |         |         |       SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
 *********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
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 TRANS STR   .0141                                        .0409      1.02    2.59    3.87            .015                IR-OPEN
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-11872.410  2621.650    2.388  2624.038   4685.00   34.68   18.67  2642.71     .00    5.85    61.22                15        0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-    -|
 TRANS STR   .0160                                        .0337       .34    2.39    4.11            .015                IR-OPEN
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                              MAIN1 FACILITY (CCRFCD 'APSO' MPU FACILITY)EXTENDED THROUGH QUEENSRIDG
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          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-       -|-      -|-      -|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |       SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
 *********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |         |         |       |       |         |       |        |        |       |       |     |
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   164.674    .0278                                        .0213      3.50    6.60    2.26    5.76    .015       .00   .00  BOX
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-11083.780  2642.138    6.530  2648.668   4685.00   29.90   13.88  2662.55     .34   10.58    25.00   12.000   25.000   .00   1  1.0
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   103.687    .0278                                        .0187      1.94    6.87    2.10    5.76    .015       .00   .00  BOX
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-10980.090  2645.025    6.848  2651.873   4685.00   28.50   12.62  2664.49   12.00   10.58    25.00   12.000   25.000   .00   1  1.0
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-10920.180  2646.693    7.117  2653.810   4685.00   27.43   11.68  2665.49   12.00   10.58    25.00   12.000   25.000   .00   1  1.0
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         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
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 ********************************************************************************************************************** ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width |Dia.-FT|or I.D.|  ZL  |Prs/Pip
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  L/Elem  |Ch Slope |        |        |        |         SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
 *********|*********|********|********|********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |        |        |       |       |         |       |        |        |       |       |     |
-10746.460  2651.530    9.299  2660.829   4685.00   20.99    6.84  2667.67     .00   10.58    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
    17.447    .0080                                          .0080      .14     9.30    1.24    9.30    .015       .00   .00  BOX
          |         |        |        |        |        |        |        |      |       |       |       |       |       |       |
-10729.010  2651.670    9.299  2660.968   4685.00   20.99    6.84  2667.81     .00   10.58    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
   448.692    .0080                                          .0081     3.64     9.30    1.24    9.30    .015       .00   .00  BOX
          |         |        |        |        |        |        |        |      |       |       |       |       |       |       |
-10280.320  2655.259    9.193  2664.452   4685.00   21.24    7.00  2671.45   12.00   10.58    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
   168.860    .0080                                          .0084     1.41    12.00    1.26    9.30    .015       .00   .00  BOX
          |         |        |        |        |        |        |        |      |       |       |       |       |       |       |
-10111.460  2656.610    9.082  2665.692   4685.00   21.49    7.17  2672.87     .00   10.58    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
    64.780    .0050                                          .0090      .58     9.08    1.28   11.22    .015       .00   .00  BOX
          |         |        |        |        |        |        |        |      |       |       |       |       |       |       |
-10046.680  2656.935    8.706  2665.641   4685.00   22.42    7.81  2673.45     .00   10.58    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
    74.290    .0050                                          .0101      .75     8.71    1.37   11.22    .015       .00   .00  BOX
          |         |        |        |        |        |        |        |      |       |       |       |       |       |       |
 -9972.390  2657.307    8.301  2665.608   4685.00   23.52    8.59  2674.19     .00   10.58    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
    74.278    .0050                                          .0114      .84     8.30    1.47   11.22    .015       .00   .00  BOX
          |         |        |        |        |        |        |        |      |       |       |       |       |       |       |
 -9898.111  2657.679    7.915  2665.593   4685.00   24.66    9.45  2675.04     .00   10.58    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
    73.460    .0050                                          .0129      .94     7.91    1.58   11.22    .015       .00   .00  BOX
          |         |        |        |        |        |        |        |      |       |       |       |       |       |       |
 -9824.651  2658.047    7.546  2665.593   4685.00   25.87   10.39  2675.98     .00   10.58    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
    72.150    .0050                                          .0145     1.05     7.55    1.69   11.22    .015       .00   .00  BOX
          |         |        |        |        |        |        |        |      |       |       |       |       |       |       |
 -9752.501  2658.408    7.195  2665.603   4685.00   27.13   11.43  2677.03     .00   10.58    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
    70.532    .0050                                          .0165     1.16     7.20    1.82   11.22    .015       .00   .00  BOX
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 ********************************************************************************************************************** ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-
  L/Elem  |Ch Slope |        |        |        |         SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
 *********|*********|********|********|********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |        |        |       |       |         |       |        |        |       |       |     |
 -9681.969  2658.761    6.860  2665.622   4685.00   28.45   12.57  2678.19     .00   10.58    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
    68.721    .0050                                          .0187     1.28     6.86    1.95   11.22    .015       .00   .00  BOX
          |         |        |        |        |        |        |        |      |       |       |       |       |       |       |
 -9613.248  2659.105    6.541  2665.646   4685.00   29.84   13.83  2679.48     .00   10.58    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
    66.788    .0050                                          .0212     1.41     6.54    2.10   11.22    .015       .00   .00  BOX
          |         |        |        |        |        |        |        |      |       |       |       |       |       |       |
 -9546.460  2659.440    6.237  2665.677   4685.00   31.30   15.21  2680.89     .00   10.58    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
   145.160    .0241                                          .0221     3.21     6.24    2.25    6.08    .015       .00   .00  BOX
          |         |        |        |        |        |        |        |      |       |       |       |       |       |       |
 -9401.300  2662.940    6.312  2669.252   4685.00   30.93   14.85  2684.10     .00   10.58    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
 JUNCT STR   .0190                                          .0239      .24     6.31    2.21            .015       .00   .00  BOX
          |         |        |        |        |        |        |        |      |       |       |       |       |       |       |
 -9391.300  2663.130    5.724  2668.854   4497.00   32.74   16.64  2685.49     .00   10.29    25.00   12.000   25.000   .00   1  1.0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-     |-
    55.894    .0186                                          .0266     1.49     5.72    2.46    6.50    .015       .00   .00  BOX
          |         |        |        |        |        |        |        |      |       |       |       |       |       |       |
 -9335.406  2664.168    5.633  2669.802   4497.00   33.26   17.18  2686.98     .00   10.29    25.00   12.000   25.000   .00   1  1.0
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        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
  138.946    .0186                                                .0291     4.04     5.63    2.52    6.50    .015       .00   .00  BOX
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-9196.460  2666.750    5.371  2672.121   4497.00   34.89   18.90  2691.02     .00   10.29    25.00   12.000   25.000   .00   1  1.0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
TRANS STR   .0597                                                .0395     1.18    5.37    2.71            .020       .00   .00  BOX
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-9166.459  2668.540   10.672  2679.212   4497.00   30.10   14.07  2693.28     .00   12.00    14.00   12.000   14.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
    3.481    .0597                                                .0238      .08   10.67    1.62    7.50    .020       .00   .00  BOX
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-9162.978  2668.748   10.750  2679.498   4497.00   29.88   13.86  2693.36     .00   12.00    14.00   12.000   14.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
   19.645    .0597                                                .0222      .44   10.75    1.61    7.50    .020       .00   .00  BOX
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                    Program Package Serial Number: 3074
                                WATER SURFACE PROFILE LISTING          Date:12-18-2017  Time: 9:43:43
              THE SEVENTY - THE 435 (PHASE 1), GCW JOB NO. 840-050
                2ND RESPONSE TO CLV COMMENTS
                  MAIN1 FACILITY (CCRFCD 'APSO' MPU FACILITY)EXTENDED THROUGH QUEENSRIDG
*************************************************************************************************************************** ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |
 L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-9143.333  2669.920   11.275  2681.195   4497.00   28.49   12.60  2693.80     .00   12.00    14.00   12.000   14.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
   14.903    .0597                                                .0197      .29   11.27    1.50    7.50    .020       .00   .00  BOX
                        -------------------- WARNING - Flow depth near top of box conduit --------------------
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-9128.430  2670.810   11.825  2682.635   4497.00   27.16   11.46  2694.09   12.00   12.00    14.00   12.000   14.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
   90.080    .0100                                                .0105      .94   12.00    1.39   12.00    .015       .00   .00  BOX
                        -------------------- WARNING - Flow depth near top of box conduit --------------------
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-9038.350  2671.710   11.777  2683.487   4497.00   27.27   11.55  2695.04     .00   12.00    14.00   12.000   14.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
  375.810    .0100                                                .0109     4.11   11.78    1.40   12.00    .015       .00   .00  BOX
                        -------------------- WARNING - Flow depth near top of box conduit --------------------
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-8662.540  2675.470   11.443  2686.913   4497.00   28.07   12.24  2699.15     .34   12.00    14.00   12.000   14.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
  109.420    .0100                                                .0115     1.26   11.79    1.46   12.00    .015       .00   .00  BOX
                        -------------------- WARNING - Flow depth near top of box conduit --------------------
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-8553.120  2676.560   11.298  2687.858   4497.00   28.43   12.55  2700.41     .00   12.00    14.00   12.000   14.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
   59.620    .0101                                                .0118      .70   11.30    1.49   12.00    .015       .00   .00  BOX
                        -------------------- WARNING - Flow depth near top of box conduit --------------------
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                    Program Package Serial Number: 3074
                                WATER SURFACE PROFILE LISTING          Date:12-18-2017  Time: 9:43:43
              THE SEVENTY - THE 435 (PHASE 1), GCW JOB NO. 840-050
                2ND RESPONSE TO CLV COMMENTS
                  MAIN1 FACILITY (CCRFCD 'APSO' MPU FACILITY)EXTENDED THROUGH QUEENSRIDG
*************************************************************************************************************************** ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |
 L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|***** |*******
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-8493.500  2677.160   11.214  2688.374   4497.00   28.64   12.74  2701.11   12.00   12.00    14.00   12.000   14.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
   52.030    .0101                                                .0120      .63   12.00    1.51   12.00    .015       .00   .00  BOX
                        -------------------- WARNING - Flow depth near top of box conduit --------------------
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-8441.471  2677.683   11.135  2688.818   4497.00   28.85   12.92  2701.74     .00   12.00    14.00   12.000   14.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
  233.027    .0100                                                .0128     2.98   11.13    1.52   12.00    .015       .00   .00  BOX
                        -------------------- WARNING - Flow depth near top of box conduit --------------------
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-8208.443  2680.012   10.691  2690.703   4497.00   30.05   14.02  2704.72     .00   12.00    14.00   12.000   14.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
  209.615    .0100                                                .0143     3.00   10.69    1.62   12.00    .015       .00   .00  BOX
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-7998.828  2682.107   10.193  2692.300   4497.00   31.51   15.42  2707.72     .00   12.00    14.00   12.000   14.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
  173.378    .0100                                                .0162     2.80   10.19    1.74   12.00    .015       .00   .00  BOX
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-7825.450  2683.840    9.719  2693.559   4497.00   33.05   16.96  2710.52     .16   12.00    14.00   12.000   14.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
    6.403    .0100                                                .0307      .20    9.88    1.87   12.00    .020       .00   .00  BOX
          |         |        |         |         |         |         |         |        |        |        |        |        |        |
-7819.047  2683.905    9.666  2693.571   4497.00   33.23   17.15  2710.72     .16   12.00    14.00   12.000   14.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-      -|-     -|-     -|-     |-
   55.361    .0100                                                .0329     1.82    9.83    1.88   12.00    .020       .00   .00  BOX
```

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FILE: MAIN1_ExtendedModel.WSW              W S P G W - CIVILDESIGN Version 14.08                                    PAGE    7
                                   Program Package Serial Number: 3074
                                              WATER SURFACE PROFILE LISTING                    Date:12-18-2017  Time: 9:43:43
                            THE SEVENTY - THE 435 (PHASE 1), GCW JOB NO. 840-050
                              2ND RESPONSE TO CLV COMMENTS
                                MAIN1 FACILITY (CCRFCD 'APSO' MPU FACILITY)EXTENDED THROUGH QUEENSRIDG
*********************************************************************************************************************** ********
         | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
 L/Elem  |Ch Slope |        |         |         |         |  SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |        |       |        |        |       |       |     |
-7763.686  2684.461    9.216  2693.677   4497.00   34.85   18.86  2712.54    .18   12.00    14.00   12.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
   53.686    .0100                                        .0372     2.00    9.40    2.02   12.00    .020      .00  .00  BOX
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7710.000  2685.000    8.788  2693.788   4497.00   36.55   20.75  2714.54   1.20   12.00    14.00   12.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
   18.829    .0733                                        .0384      .72    9.98    2.17    6.94    .020      .00  .00  BOX
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7691.171  2686.381    8.971  2695.352   4497.00   35.81   19.91  2715.26   1.15   12.00    14.00   12.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
   36.032    .0733                                        .0353     1.27   10.12    2.11    6.94    .020      .00  .00  BOX
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7655.139  2689.023    9.409  2698.432   4497.00   34.14   18.10  2716.53   1.04   12.00    14.00   12.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
   28.146    .0733                                        .0312      .88   10.45    1.96    6.94    .020      .00  .00  BOX
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7626.993  2691.087    9.868  2700.956   4497.00   32.55   16.45  2717.41    .95   12.00    14.00   12.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
   22.183    .0733                                        .0276      .61   10.82    1.83    6.94    .020      .00  .00  BOX
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7604.810  2692.714   10.350  2703.064   4497.00   31.04   14.96  2718.02    .86   12.00    14.00   12.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
   17.490    .0733                                        .0245      .43   11.21    1.70    6.94    .020      .00  .00  BOX
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7587.319  2693.997   10.855  2704.852   4497.00   29.59   13.60  2718.45    .78   12.00    14.00   12.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
   13.679    .0733                                        .0217      .30   11.64    1.58    6.94    .020      .00  .00  BOX
                          -------------------- WARNING - Flow depth near top of box conduit --------------------
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7573.640  2695.000   11.385  2706.385   4497.00   28.21   12.36  2718.75    .00   12.00    14.00   12.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
JUNCT STR   .0731                                        .0380     1.39   11.38    1.47            .020      .00  .00  BOX
                          -------------------- WARNING - Flow depth near top of box conduit --------------------
FILE: MAIN1_ExtendedModel.WSW              W S P G W - CIVILDESIGN Version 14.08                                    PAGE    8
                                   Program Package Serial Number: 3074
                                              WATER SURFACE PROFILE LISTING                    Date:12-18-2017  Time: 9:43:43
                            THE SEVENTY - THE 435 (PHASE 1), GCW JOB NO. 840-050
                              2ND RESPONSE TO CLV COMMENTS
                                MAIN1 FACILITY (CCRFCD 'APSO' MPU FACILITY)EXTENDED THROUGH QUEENSRIDG
*********************************************************************************************************************** ********
         | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
 L/Elem  |Ch Slope |        |         |         |         |  SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|********|*******|********|********|*******|*******|*****|*******
         |         |        |         |         |       |       |        |       |        |        |       |       |     |
-7536.970  2697.680    4.981  2702.661   2489.00   35.69   19.78  2722.44    .00    9.00    14.00    9.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
   36.618    .0739                                        .0539     1.97    4.98    2.82    4.50    .020      .00  .00  BOX
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7500.352  2700.387    5.090  2705.478   2489.00   34.93   18.94  2724.42    .00    9.00    14.00    9.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
   59.252    .0739                                        .0491     2.91    5.09    2.73    4.50    .020      .00  .00  BOX
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7441.100  2704.768    5.339  2710.107   2489.00   33.30   17.22  2727.33   1.81    9.00    14.00    9.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
   10.289    .0739                                        .0452      .47    7.15    2.54    4.50    .020      .00  .00  BOX
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7430.811  2705.528    5.393  2710.922   2489.00   32.96   16.87  2727.79   1.77    9.00    14.00    9.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
   39.631    .0739                                        .0418     1.66    7.17    2.50    4.50    .020      .00  .00  BOX
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7391.180  2708.457    5.657  2714.114   2489.00   31.43   15.34  2729.45   1.61    9.00    14.00    9.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
   30.080    .0739                                        .0367     1.10    7.27    2.33    4.50    .020      .00  .00  BOX
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7361.100  2710.680    5.933  2716.613   2489.00   29.97   13.94  2730.56    .67    9.00    14.00    9.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
  125.980    .0376                                        .0331     4.17    6.60    2.17    5.74    .020      .00  .00  BOX
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7235.121  2715.420    6.094  2721.514   2489.00   29.18   13.22  2734.73    .00    9.00    14.00    9.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
   53.761    .0377                                        .0312     1.68    6.09    2.08    5.74    .020      .00  .00  BOX
         |         |        |         |         |         |        |       |        |        |       |       |     |
-7181.360  2717.444    6.201  2723.646   2489.00   28.67   12.76  2736.41    .00    9.00    14.00    9.000   14.000  .00   0   .0
        -|       -|      -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|    -|
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   94.790    .0377                                   .0286     2.71     6.20    2.03    5.74    .020       .00   .00  BOX
FILE: MAIN1_ExtendedModel.WSW              W S P G W - CIVILDESIGN Version 14.08                                    PAGE    9
                                Program Package Serial Number: 3074
                                              WATER SURFACE PROFILE LISTING                    Date:12-18-2017  Time: 9:43:43
                         THE SEVENTY - THE 435 (PHASE 1), GCW JOB NO. 840-050
                           2ND RESPONSE TO CLV COMMENTS
                             MAIN1 FACILITY (CCRFCD 'APSO' MPU FACILITY)EXTENDED THROUGH QUEENSRIDG
 ********************************************************************************************************************** ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|    -|
 L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-7086.570  2721.014    6.504  2727.518   2489.00   27.33   11.60  2739.12     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
   59.026    .0377                                   .0252     1.49     6.50    1.89    5.74    .020       .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-7027.544  2723.237    6.821  2730.058   2489.00   26.06   10.55  2740.61     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
   40.372    .0377                                   .0222      .89     6.82    1.76    5.74    .020       .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-6987.173  2724.757    7.154  2731.911   2489.00   24.85    9.59  2741.50     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
   28.802    .0377                                   .0195      .56     7.15    1.64    5.74    .020       .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-6958.371  2725.842    7.504  2733.345   2489.00   23.69    8.72  2742.06     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
   20.840    .0377                                   .0172      .36     7.50    1.52    5.74    .020       .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-6937.531  2726.626    7.870  2734.496   2489.00   22.59    7.92  2742.42     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
   14.961    .0377                                   .0152      .23     7.87    1.42    5.74    .020       .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-6922.570  2727.190    8.254  2735.444   2489.00   21.54    7.20  2742.65     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
  171.090    .0138                                   .0147     2.51     8.25    1.32    8.35    .020       .00   .00  BOX
                          -------------------- WARNING - Flow depth near top of box conduit --------------------
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-6751.480  2729.550    8.068  2737.618   2489.00   22.04    7.54  2745.16     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
 JUNCT STR   .0100                                   .0089      .09    8.07    1.37            .015       .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-6741.480  2729.650    7.748  2737.397   2463.00   22.71    8.01  2745.40     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
   98.917    .0097                                   .0092      .91     7.75    1.44    7.60    .015       .00   .00  BOX
FILE: MAIN1_ExtendedModel.WSW              W S P G W - CIVILDESIGN Version 14.08                                    PAGE   10
                                Program Package Serial Number: 3074
                                              WATER SURFACE PROFILE LISTING                    Date:12-18-2017  Time: 9:43:43
                         THE SEVENTY - THE 435 (PHASE 1), GCW JOB NO. 840-050
                           2ND RESPONSE TO CLV COMMENTS
                             MAIN1 FACILITY (CCRFCD 'APSO' MPU FACILITY)EXTENDED THROUGH QUEENSRIDG
 ********************************************************************************************************************** ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station  |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|    -|
 L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|*****|*******
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-6642.563  2730.613    7.800  2738.413   2463.00   22.55    7.90  2746.31     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
  287.478    .0097                                   .0086     2.46     7.80    1.42    7.60    .015       .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-6355.085  2733.410    8.181  2741.591   2463.00   21.50    7.18  2748.77     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
  116.480    .0097                                   .0076      .88     8.18    1.32    7.60    .015       .00   .00  BOX
                          -------------------- WARNING - Flow depth near top of box conduit --------------------
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-6238.604  2734.544    8.580  2743.124   2463.00   20.50    6.53  2749.65     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
   57.145    .0097                                   .0067      .38     8.58    1.23    7.60    .015       .00   .00  BOX
                          -------------------- WARNING - Flow depth near top of box conduit --------------------
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-6181.460  2735.100    9.000  2744.100   2463.00   19.55    5.93  2750.03     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
 JUNCT STR   .0100                                   .0095      .10    9.00    1.15            .015       .00   .00  BOX
                          -------------------- WARNING - Flow depth near top of box conduit --------------------
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-6171.460  2735.200    9.707  2744.907   2384.00   18.92    5.56  2750.47     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
   33.170    .0100                                   .0095      .32     9.71    1.11    7.35    .015       .00   .00  BOX
          |         |        |         |         |       |       |         |       |        |        |       |       |      |
-6138.290  2735.531    9.692  2745.223   2384.00   18.92    5.56  2750.78     .00    9.00    14.00    9.000   14.000  .00   0   .0
         -|       -|      -|       -|       -|       -|     -|     -|       -|     -|      -|      -|     -|     -|     -|     |-
   80.110    .0036                                   .0095      .76      .00    1.11    9.00    .015       .00   .00  BOX
FILE: MAIN1_ExtendedModel.WSW              W S P G W - CIVILDESIGN Version 14.08                                    PAGE   11
                                Program Package Serial Number: 3074
                                              WATER SURFACE PROFILE LISTING                    Date:12-18-2017  Time: 9:43:43
                         THE SEVENTY - THE 435 (PHASE 1), GCW JOB NO. 840-050
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2ND RESPONSE TO CLV COMMENTS
MAIN1 FACILITY (CCRFCD 'APSO' MPU FACILITY)EXTENDED THROUGH QUEENSRIDG

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-6058.180	2735.820	10.916	2746.736	2384.00	18.92	5.56	2752.29	.00	9.00	14.00	9.000	14.000	.00	0 .0
244.970	.0099					.0095	2.33	10.92	1.11	7.37	.015	.00	.00	BOX
-5813.210	2738.240	10.827	2749.067	2384.00	18.92	5.56	2754.63	.00	9.00	14.00	9.000	14.000	.00	0 .0

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FILE: MAIN1_ExtendedModel.WSW              W S P G W  - EDIT LISTING - Version 14.10              Date:12-18-2017  Time: 9:43:39
                                   WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                                   PAGE    1
 CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE    ZL    ZR   INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE   NO   TYPE PIER/PIP WIDTH    DIAMETER  WIDTH              DROP

 CD      1    3      1    1.000   12.000   25.000    .000   .000    .00
 CD      2    3      0     .000   12.000   14.000    .000   .000    .00
 CD      3    3      0     .000    8.000   10.000    .000   .000    .00
 CD      4    3      0     .000    9.000   14.000    .000   .000    .00
 CD      5    4      1             4.000
 CD      6    4      1             6.000
 CD     10    3      1    1.000   12.000   25.000    .000   .000    .00
 CD     14    5      0        .000
 CD     15    5      0        .000
FILE:                                      W S P G W  - EDIT LISTING - Version 14.10              Date:12-18-2017  Time: 9:43:39
                                   WATER SURFACE PROFILE - CROSS SECTION POINT LISTING                                  PAGE    2
   CARD  SECT  NO OF    X(1) , Y(1)    X(2) , Y(2)    X(3) , Y(3)    X(4) , Y(4)    X(5) , Y(5)    X(6) , Y(6)    X(7) , Y(7)
   CODE   NO   POINTS   X(8) , Y(8)    X(9) , Y(9)   X(10) ,Y(10)   X(11) ,Y(11)    X(N) , Y(N)   X(N+1),Y(N+1)  X(35) ,Y(35)

   PTS    14     8        .000  48.000   19.090  48.000   50.850  45.000  111.110  21.000  159.240  21.000  159.240  21.000  186.970  35.980
   PTS                 248.780  40.000
   PTS    15     6        .000  49.000   11.030  48.000   54.930  38.000   84.460  22.000  136.390  22.000  173.210  40.000
                                                W S P G W                                                                PAGE NO   1
                          WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                            THE SEVENTY - THE 435 (PHASE 1), GCW JOB NO. 840-050
HEADING LINE NO 2 IS -
                            2ND RESPONSE TO CLV COMMENTS
HEADING LINE NO 3 IS -
                            MAIN1 FACILITY (CCRFCD 'APSO' MPU FACILITY)EXTENDED THROUGH QUEENSRIDGE LO
                                                W S P G W                                                                PAGE NO   2
                          WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO   1 IS A SYSTEM OUTLET     *         *     *
                    U/S DATA   STATION    INVERT  SECT                                    W S ELEV
                            -11897.270 2621.300   14                                       2623.822
 ELEMENT NO   2 IS A TRANSITION        *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS   ANGLE
                            -11872.410 2621.650   15              .015                          .000     .000
 ELEMENT NO   3 IS A TRANSITION        *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS   ANGLE
                            -11862.410 2621.810   10              .015                          .000     .000
 ELEMENT NO   4 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                            -11772.100 2623.180   10              .015                          .000     .000      .000     0
 ELEMENT NO   5 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                            -11769.780 2623.000   10              .015                          .000     .000      .000     0
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO   6 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                            -11699.160 2625.000   10              .015                        99.998  -40.463      .000     0
 ELEMENT NO   7 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                            -11681.750 2625.480   10              .015                          .000     .000      .000     0
 ELEMENT NO   8 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                            -11596.450 2627.860   10              .015                       100.011   48.868      .000     0
 ELEMENT NO   9 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                            -11452.980 2631.860   10              .015                          .000     .000      .000     0
 ELEMENT NO  10 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                            -10980.090 2645.025   10              .015                      1947.993   13.909      .000     0
 ELEMENT NO  11 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                            -10864.680 2648.238   10              .015                       100.000  -66.125      .000     0
 ELEMENT NO  12 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                            -10746.460 2651.530   10              .015                          .000     .000      .000     0
 ELEMENT NO  13 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                            -10280.320 2655.259   10              .015                          .000     .000      .000     0
                                                W S P G W                                                                PAGE NO   3
                          WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO  14 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                            -10111.460 2656.610   10              .015                       107.500   90.000      .000     0
 ELEMENT NO  15 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             -9546.460 2659.440   10              .015                          .000     .000      .000     0
WARNING - ADJACENT SECTIONS ARE NOT IDENTICAL - SEE SECTION NUMBERS AND CHANNEL DEFINITIONS
 ELEMENT NO  16 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             -9401.300 2662.940    1              .015                          .000     .000      .000     0
 ELEMENT NO  17 IS A JUNCTION          *         *     *     *                 *                 *                *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             -9391.300 2663.130    1     6     0   .015   188.000      .000  2663.420      .000 -60.000     .000
                                                                                                RADIUS    ANGLE
                                                                                                  .000    .000
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ELEMENT NO  18 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -9196.460 2666.750    1              .015                           .000     .000      .000     0
ELEMENT NO  19 IS A TRANSITION       *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS   ANGLE
                          -9166.460 2668.540    2              .020                           .000     .000
ELEMENT NO  20 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -9128.430 2670.810    2              .020                           .000     .000      .000     0
ELEMENT NO  21 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -9038.350 2671.710    2              .015                        150.000   34.408      .000     0
ELEMENT NO  22 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -8662.540 2675.470    2              .015                           .000     .000      .000     0
ELEMENT NO  23 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -8553.120 2676.560    2              .015                        499.984   12.539      .000     0
ELEMENT NO  24 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -8493.500 2677.160    2              .015                           .000     .000      .000     0
                                                   W S P G W                                                                PAGE NO   4
                       WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  25 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -8441.470 2677.683    2              .015                        150.001  -19.874      .000     0
ELEMENT NO  26 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -7825.450 2683.840    2              .015                           .000     .000      .000     0
ELEMENT NO  27 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -7710.000 2685.000    2              .020                       1458.613   -4.535      .000     0
ELEMENT NO  28 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -7573.640 2695.000    2              .020                        485.994  -16.076      .000     0
ELEMENT NO  29 IS A JUNCTION         *         *     *     *                *                *                *
                U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                          -7536.970 2697.680    4     3     0   .020  2008.000      .000  2697.680      .000 -15.000     .000
                                                                                            RADIUS    ANGLE
                                                                                              .000     .000
ELEMENT NO  30 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -7441.100 2704.768    4              .020                           .000     .000      .000     0
ELEMENT NO  31 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -7361.100 2710.680    4              .020                        266.554  -17.196      .000     0
ELEMENT NO  32 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -7235.120 2715.420    4              .020                        585.982  -12.318      .000     0
ELEMENT NO  33 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -6922.570 2727.190    4              .020                           .000     .000      .000     0
ELEMENT NO  34 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -6751.480 2729.550    4              .020                           .000     .000      .000     0
ELEMENT NO  35 IS A JUNCTION         *         *     *     *                *                *                *
                U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                          -6741.480 2729.650    4     5     5   .015     9.000    17.000  2729.650  2729.650  45.000  -45.000
                                                                                            RADIUS    ANGLE
                                                                                              .000     .000
                                                   W S P G W                                                                PAGE NO   5
                       WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO  36 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -6181.460 2735.100    4              .015                           .000     .000      .000     0
ELEMENT NO  37 IS A JUNCTION         *         *     *     *                *                *                *
                U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                          -6171.460 2735.200    4     6     6   .015    51.000    28.000  2735.150  2735.150  45.000  -45.000
                                                                                            RADIUS    ANGLE
                                                                                              .000     .000
ELEMENT NO  38 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -6138.290 2735.531    4              .015                           .000     .000      .000     0
ELEMENT NO  39 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -6058.180 2735.820    4              .015                        111.999   40.982      .000     0
ELEMENT NO  40 IS A REACH            *         *     *
                U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                          -5813.210 2738.240    4              .015                           .000     .000      .000     0
ELEMENT NO  41 IS A SYSTEM HEADWORKS                 *                     *
                U/S DATA   STATION    INVERT  SECT                                     W S ELEV
                          -5813.210 2738.240    4                                          .000
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T1 THE SEVENTY - THE 435 (PHASE 1), GCW JOB NO. 840-050                        0
T2 1ST RESPONSE TO CLV COMMENTS
T3 MAIN2 FACILITY (CCRFCD 'APP2' MPU FACILITY)
SO  -2775.6102697.680  1                          2702.661
R   -2648.9802712.970  1      .020                                 64.780    .000 0
R   -2556.6802716.660  1      .020                                   .000    .000 0
R   -2435.6102721.500  1      .020                                -61.936    .000 0
R   -2218.9802726.000  1      .020                                   .000    .000 0
R   -2160.3602727.220  1      .015                                 29.988    .000 0
R   -1847.1002733.740  1      .015                                   .000    .000 0
R   -1764.2102734.560  1      .015                                -42.404    .000 0
R   -1468.1802740.500  1      .015                                   .000    .000 0
SH  -1468.1802740.500  1                              .000
CD   1  3   0    .000   8.000   10.000  .000  .000   .00
Q          2004.000   .0
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Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-2775.610	2697.680	5.269	2702.949	2004.00	38.04	22.46	2725.41	8.00	8.00	10.00	8.000	10.000	.00	0 .0
2.885	.1207					.0743	.21	8.00	2.92	4.40	.020	.00	.00	BOX
-2772.726	2698.028	5.286	2703.315	2004.00	37.91	22.31	2725.63	8.00	8.00	10.00	8.000	10.000	.00	0 .0
34.610	.1207					.0696	2.41	8.00	2.91	4.40	.020	.00	.00	BOX
-2738.115	2702.207	5.544	2707.752	2004.00	36.14	20.29	2728.04	8.00	8.00	10.00	8.000	10.000	.00	0 .0
26.507	.1207					.0614	1.63	8.00	2.71	4.40	.020	.00	.00	BOX
-2711.608	2705.408	5.815	2711.223	2004.00	34.46	18.44	2729.66	8.00	8.00	10.00	8.000	10.000	.00	0 .0
20.924	.1207					.0542	1.13	8.00	2.52	4.40	.020	.00	.00	BOX
-2690.684	2707.934	6.099	2714.033	2004.00	32.86	16.77	2730.80	8.00	8.00	10.00	8.000	10.000	.00	0 .0
16.829	.1207					.0479	.81	8.00	2.34	4.40	.020	.00	.00	BOX
-2673.856	2709.966	6.397	2716.363	2004.00	31.33	15.24	2731.60	8.00	8.00	10.00	8.000	10.000	.00	0 .0
13.686	.1207					.0423	.58	8.00	2.18	4.40	.020	.00	.00	BOX
-2660.170	2711.619	6.709	2718.328	2004.00	29.87	13.86	2732.18	8.00	8.00	10.00	8.000	10.000	.00	0 .0
11.190	.1207					.0374	.42	8.00	2.03	4.40	.020	.00	.00	BOX
-2648.980	2712.970	7.036	2720.006	2004.00	28.48	12.60	2732.60	.00	8.00	10.00	8.000	10.000	.00	0 .0
92.300	.0400					.0337	3.11	7.04	1.89	6.69	.020	.00	.00	BOX
-2556.680	2716.660	7.276	2723.936	2004.00	27.54	11.78	2735.71	8.00	8.00	10.00	8.000	10.000	.00	0 .0
74.553	.0400					.0305	2.27	8.00	1.80	6.69	.020	.00	.00	BOX

---------- WARNING - Flow depth near top of box conduit ----------

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-2482.127	2719.640	7.627	2727.267	2004.00	26.28	10.72	2737.99	8.00	8.00	10.00	8.000	10.000	.00	0 .0
46.517	.0400					.0339	1.58	8.00	1.68	6.69	.020	.00	.00	BOX

---------- WARNING - Flow depth near top of box conduit ----------

-2435.610	2721.500	8.000	2729.500	2004.00	25.05	9.74	2739.24	.00	8.00	10.00	8.000	10.000	.00	0 .0
216.630	.0208					.0392	8.49	8.00	1.56	8.00	.020	.00	.00	BOX
-2218.980	2726.000	11.991	2737.991	2004.00	25.05	9.74	2747.74	.00	8.00	10.00	8.000	10.000	.00	0 .0
58.620	.0208					.0220	1.29	.00	1.56	6.90	.015	.00	.00	BOX
-2160.360	2727.220	13.189	2740.409	2004.00	25.05	9.74	2750.15	.00	8.00	10.00	8.000	10.000	.00	0 .0
313.260	.0208					.0220	6.91	13.19	1.56	6.90	.015	.00	.00	BOX
-1847.100	2733.740	13.576	2747.316	2004.00	25.05	9.74	2757.06	.00	8.00	10.00	8.000	10.000	.00	0 .0
82.890	.0099					.0220	1.83	.00	1.56	8.00	.015	.00	.00	BOX
-1764.210	2734.560	15.921	2750.481	2004.00	25.05	9.74	2760.22	.00	8.00	10.00	8.000	10.000	.00	0 .0
296.030	.0201					.0220	6.53	15.92	1.56	7.00	.015	.00	.00	BOX
-1468.180	2740.500	16.508	2757.008	2004.00	25.05	9.74	2766.75	.00	8.00	10.00	8.000	10.000	.00	0 .0

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FILE: MAIN2-020.WSW                    W S P G W  - EDIT LISTING - Version 14.10          Date:12-21-2017  Time: 8:30:16
                                 WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING                          PAGE    1
 CARD  SECT  CHN   NO OF  AVE PIER  HEIGHT 1  BASE    ZL    ZR   INV   Y(1)  Y(2)  Y(3)  Y(4)  Y(5)  Y(6)  Y(7)  Y(8)  Y(9)  Y(10)
 CODE   NO   TYPE PIER/PIP WIDTH    DIAMETER  WIDTH              DROP

 CD      1    3      0     .000    8.000   10.000    .000   .000    .00
                                          W S P G W                                                          PAGE NO   1
                            WATER SURFACE PROFILE - TITLE CARD LISTING
HEADING LINE NO 1 IS -
                              THE SEVENTY - THE 435 (PHASE 1), GCW JOB NO. 840-050
HEADING LINE NO 2 IS -
                              1ST RESPONSE TO CLV COMMENTS
HEADING LINE NO 3 IS -
                              MAIN2 FACILITY (CCRFCD 'APP2' MPU FACILITY)
                                          W S P G W                                                          PAGE NO   2
                            WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO   1 IS A SYSTEM OUTLET     *         *     *
                    U/S DATA   STATION    INVERT  SECT                                    W S ELEV
                              -2775.610 2697.680    1                                     2702.661
 ELEMENT NO   2 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                              -2648.980 2712.970    1              .020                     112.000   64.780      .000     0
 ELEMENT NO   3 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                              -2556.680 2716.660    1              .020                        .000     .000      .000     0
 ELEMENT NO   4 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                              -2435.610 2721.500    1              .020                     111.999  -61.936      .000     0
 ELEMENT NO   5 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                              -2218.980 2726.000    1              .020                        .000     .000      .000     0
 ELEMENT NO   6 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                              -2160.360 2727.220    1              .015                     112.001   29.988      .000     0
 ELEMENT NO   7 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                              -1847.100 2733.740    1              .015                        .000     .000      .000     0
 ELEMENT NO   8 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                              -1764.210 2734.560    1              .015                     112.000  -42.404      .000     0
 ELEMENT NO   9 IS A REACH             *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                        RADIUS    ANGLE     ANG PT  MAN H
                              -1468.180 2740.500    1              .015                        .000     .000      .000     0
 ELEMENT NO  10 IS A SYSTEM HEADWORKS                *                        *
                    U/S DATA   STATION    INVERT  SECT                                    W S ELEV
                              -1468.180 2740.500    1                                        .000
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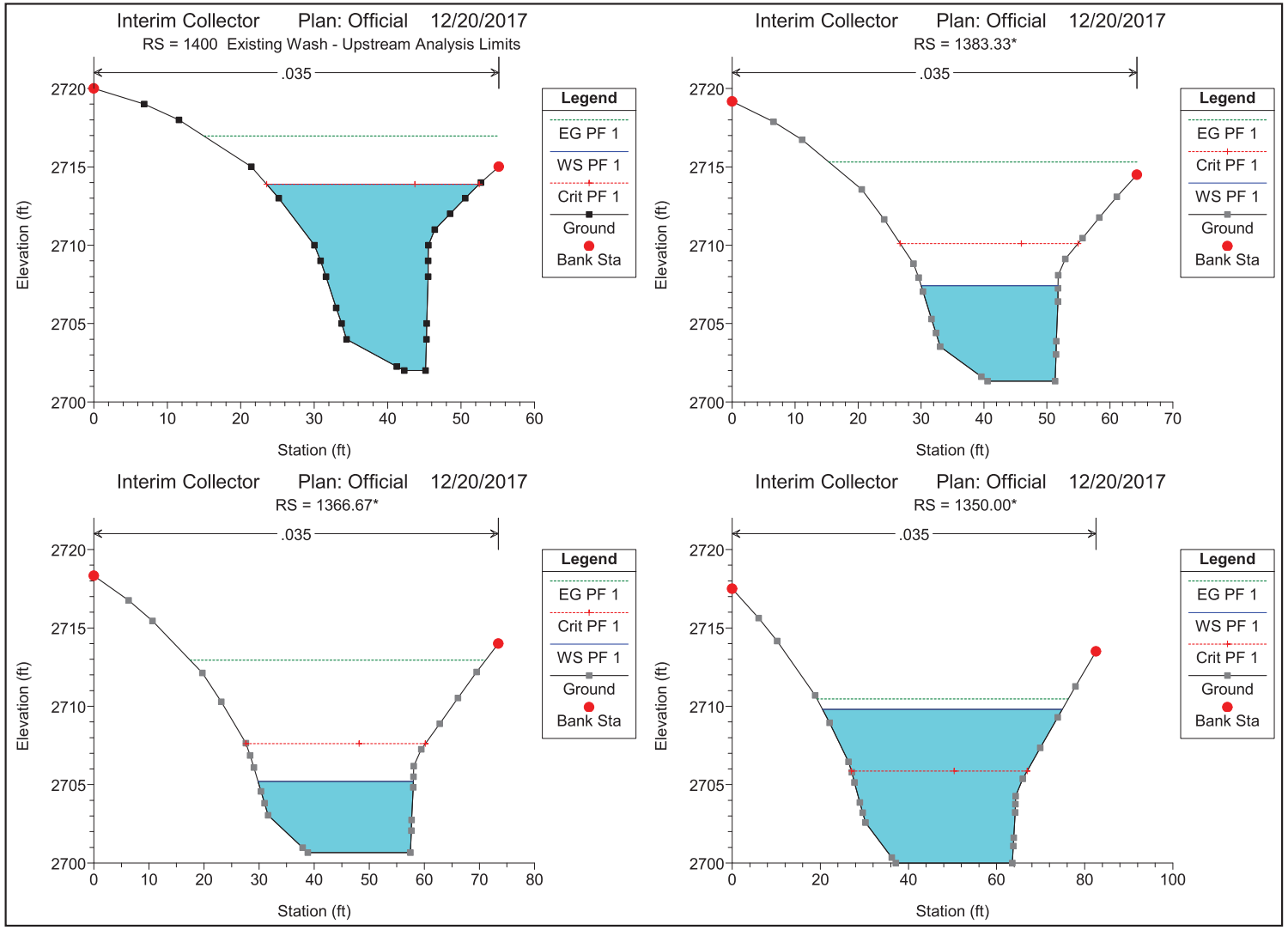
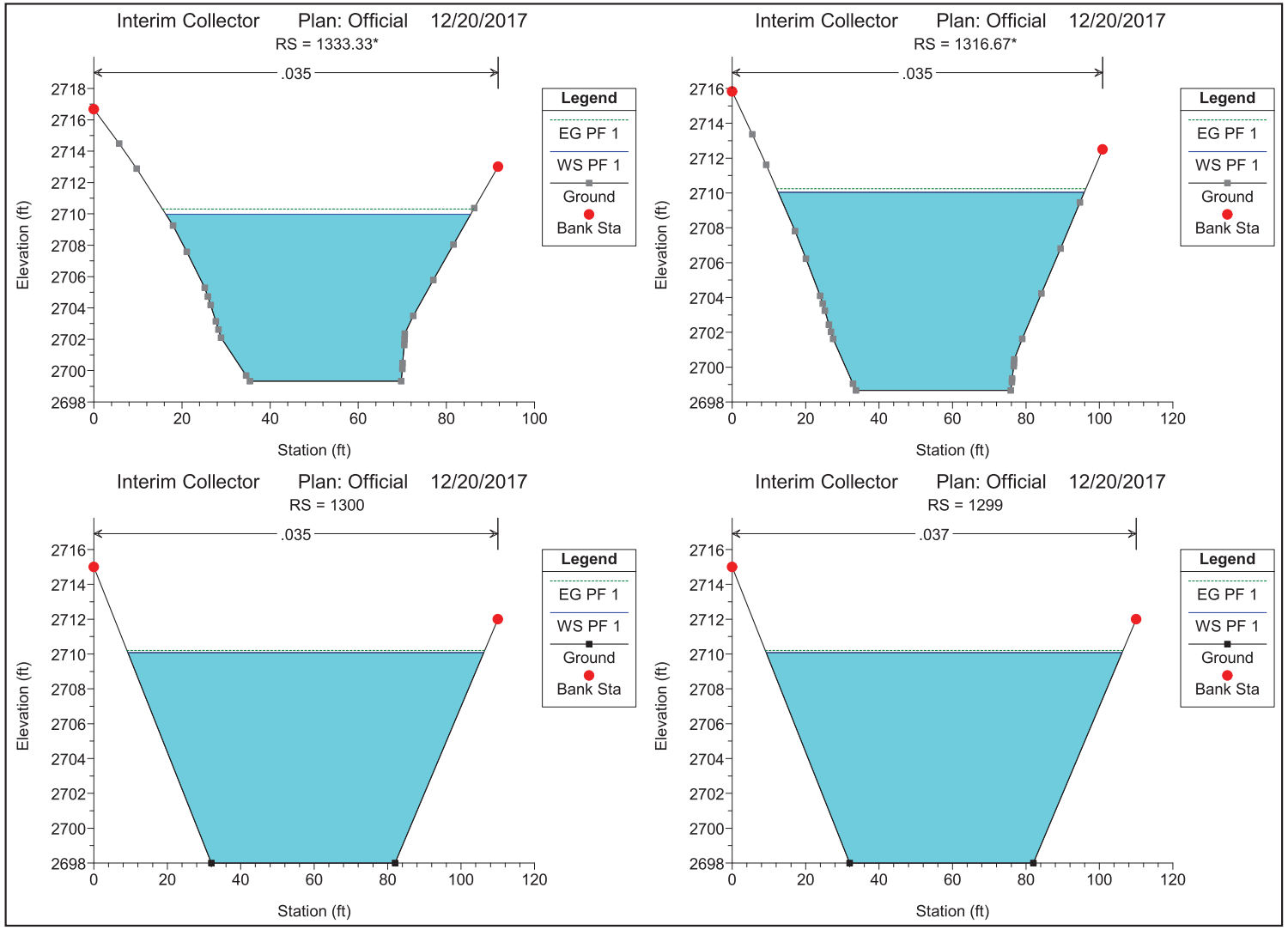
HEC-RAS Plan: PLAN02 River: FEMA Wash Reach: MAIN1 Profile: PF 1

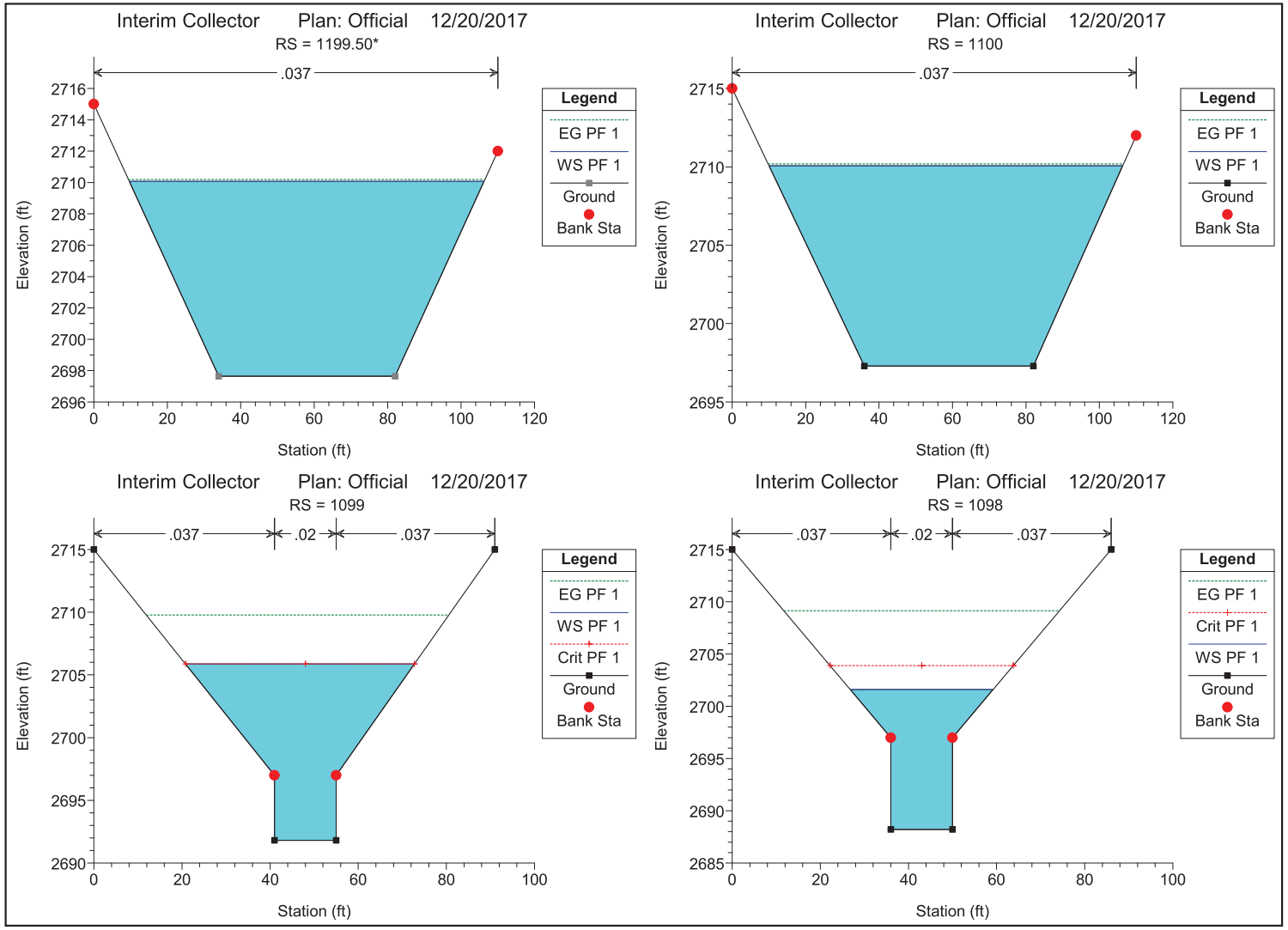
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Vel Left	Vel Right	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(ft/s)	(ft/s)	(sq ft)	(ft)	
MAIN1	1400	PF 1	2489.00	2702.00	2713.89	11.89	2713.89	2716.96	0.016165	14.07			176.93	28.94	1.00
MAIN1	1383.33*	PF 1	2489.00	2701.33	2707.42	6.09	2710.11	2715.32	0.048728	22.53			110.46	21.74	1.76
MAIN1	1366.67*	PF 1	2489.00	2700.67	2705.20	4.53	2707.62	2712.94	0.055747	22.31			111.55	28.20	1.98
MAIN1	1350.00*	PF 1	2489.00	2700.00	2709.80	9.80	2705.86	2710.47	0.002108	6.52			381.64	54.41	0.43
MAIN1	1333.33*	PF 1	2489.00	2699.33	2709.97	10.64		2710.31	0.000911	4.68			531.90	69.15	0.30
MAIN1	1316.67*	PF 1	2489.00	2698.67	2710.04	11.37		2710.24	0.000453	3.56			699.93	83.39	0.22
MAIN1	1300	PF 1	2489.00	2698.00	2710.08	12.08		2710.20	0.000247	2.81			887.13	96.89	0.16
MAIN1	1299	PF 1	2489.00	2698.00	2710.08	12.08		2710.20	0.000276	2.81			887.13	96.89	0.16
MAIN1	1199.50*	PF 1	2489.00	2697.65	2710.07	12.42		2710.19	0.000264	2.77			897.95	96.58	0.16
MAIN1	1100	PF 1	2489.00	2697.30	2710.07	12.76		2710.18	0.000254	2.74			908.05	96.28	0.16
MAIN1	1099	PF 1	4497.00	2691.81	2705.87	14.06	2705.87	2709.77	0.003504	17.70	6.05	5.96	365.25	51.95	0.83
MAIN1	1098	PF 1	4497.00	2688.22	2701.60	13.38	2703.89	2709.15	0.008650	22.65	6.04	6.04	229.55	32.39	1.09
MAIN1	1000	PF 1	4497.00	2685.00	2696.89	11.89	2699.71	2708.23	0.018310	27.02			166.44	14.00	1.38
MAIN1	966.67*	PF 1	4497.00	2684.61	2696.78	12.17	2699.32	2707.61	0.014006	26.40			170.31	14.00	1.33
MAIN1	933.33*	PF 1	4497.00	2684.23	2696.57	12.33	2698.94	2707.10	0.012070	26.04			172.69	14.00	1.31
MAIN1	900	PF 1	4497.00	2683.84	2696.20	12.36	2698.55	2706.70	0.009354	25.99			173.01	14.00	1.30
MAIN1	892.31*	PF 1	4497.00	2683.37	2695.69	12.32	2698.08	2706.26	0.009426	26.07			172.47	14.00	1.31
MAIN1	884.62*	PF 1	4497.00	2682.89	2695.16	12.27	2697.60	2705.81	0.009520	26.18			171.78	14.00	1.32
MAIN1	876.92*	PF 1	4497.00	2682.42	2694.66	12.24	2697.13	2705.36	0.009571	26.23			171.42	14.00	1.32
MAIN1	869.23*	PF 1	4497.00	2681.94	2694.15	12.21	2696.65	2704.91	0.009641	26.31			170.91	14.00	1.33
MAIN1	861.54*	PF 1	4497.00	2681.47	2693.66	12.19	2696.18	2704.45	0.009675	26.35			170.67	14.00	1.33
MAIN1	853.85*	PF 1	4497.00	2681.00	2693.18	12.17	2695.71	2703.99	0.009707	26.38			170.44	14.00	1.33
MAIN1	846.15*	PF 1	4497.00	2680.52	2692.67	12.15	2695.23	2703.53	0.009759	26.44			170.08	14.00	1.34
MAIN1	838.46*	PF 1	4497.00	2680.05	2692.19	12.14	2694.76	2703.07	0.009779	26.46			169.94	14.00	1.34
MAIN1	830.77*	PF 1	4497.00	2679.58	2691.71	12.13	2694.29	2702.61	0.009794	26.48			169.84	14.00	1.34
MAIN1	823.08*	PF 1	4497.00	2679.10	2691.21	12.11	2693.81	2702.14	0.009836	26.52			169.55	14.00	1.34
MAIN1	815.38*	PF 1	4497.00	2678.63	2690.75	12.12	2693.34	2701.67	0.009825	26.51			169.62	14.00	1.34
MAIN1	807.69*	PF 1	4497.00	2678.15	2690.25	12.10	2692.86	2701.20	0.009861	26.55			169.37	14.00	1.35
MAIN1	800	PF 1	4497.00	2677.68	2689.78	12.10	2692.39	2700.73	0.009854	26.54			169.42	14.00	1.35



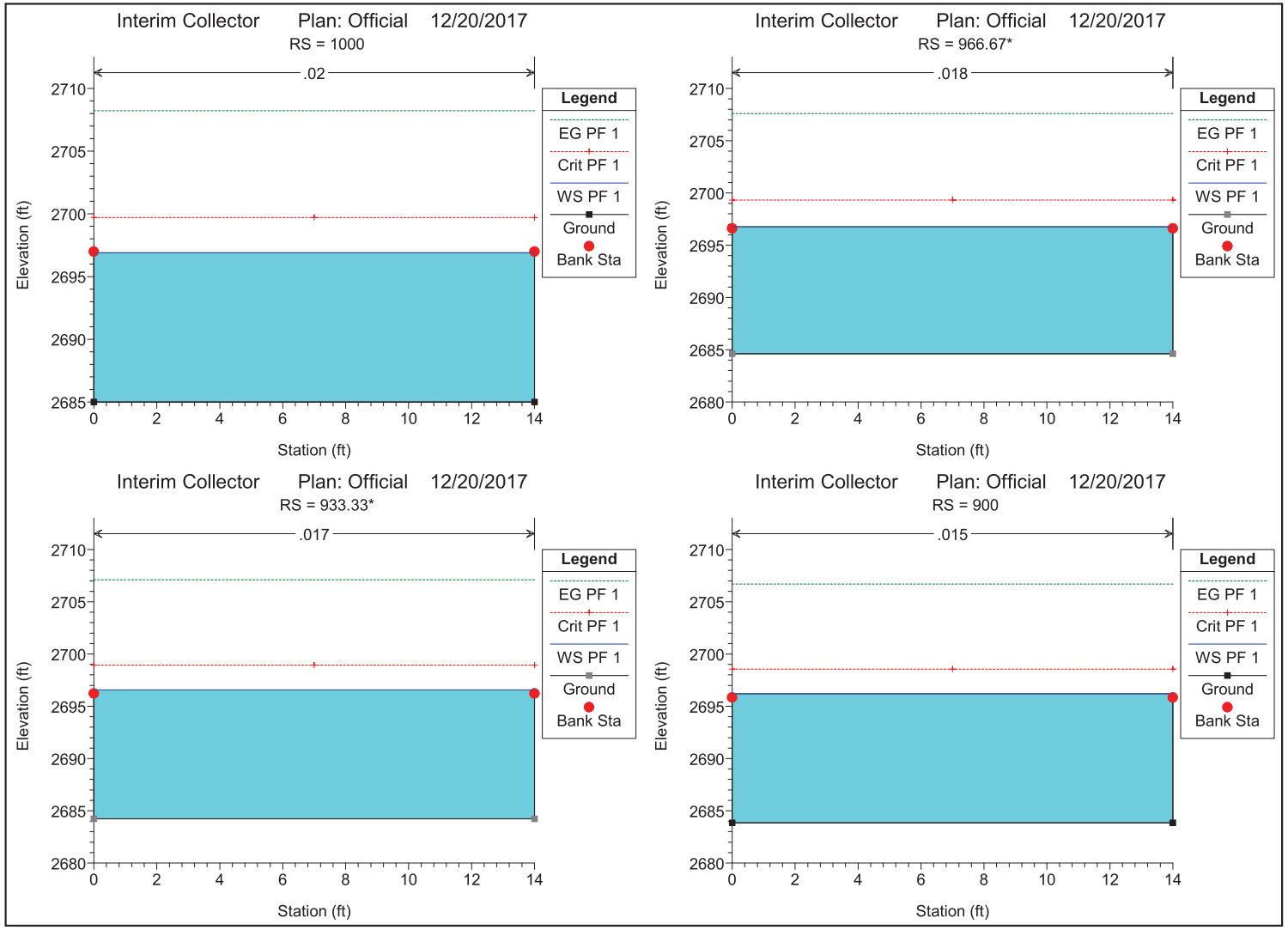
REPLY APP 1173



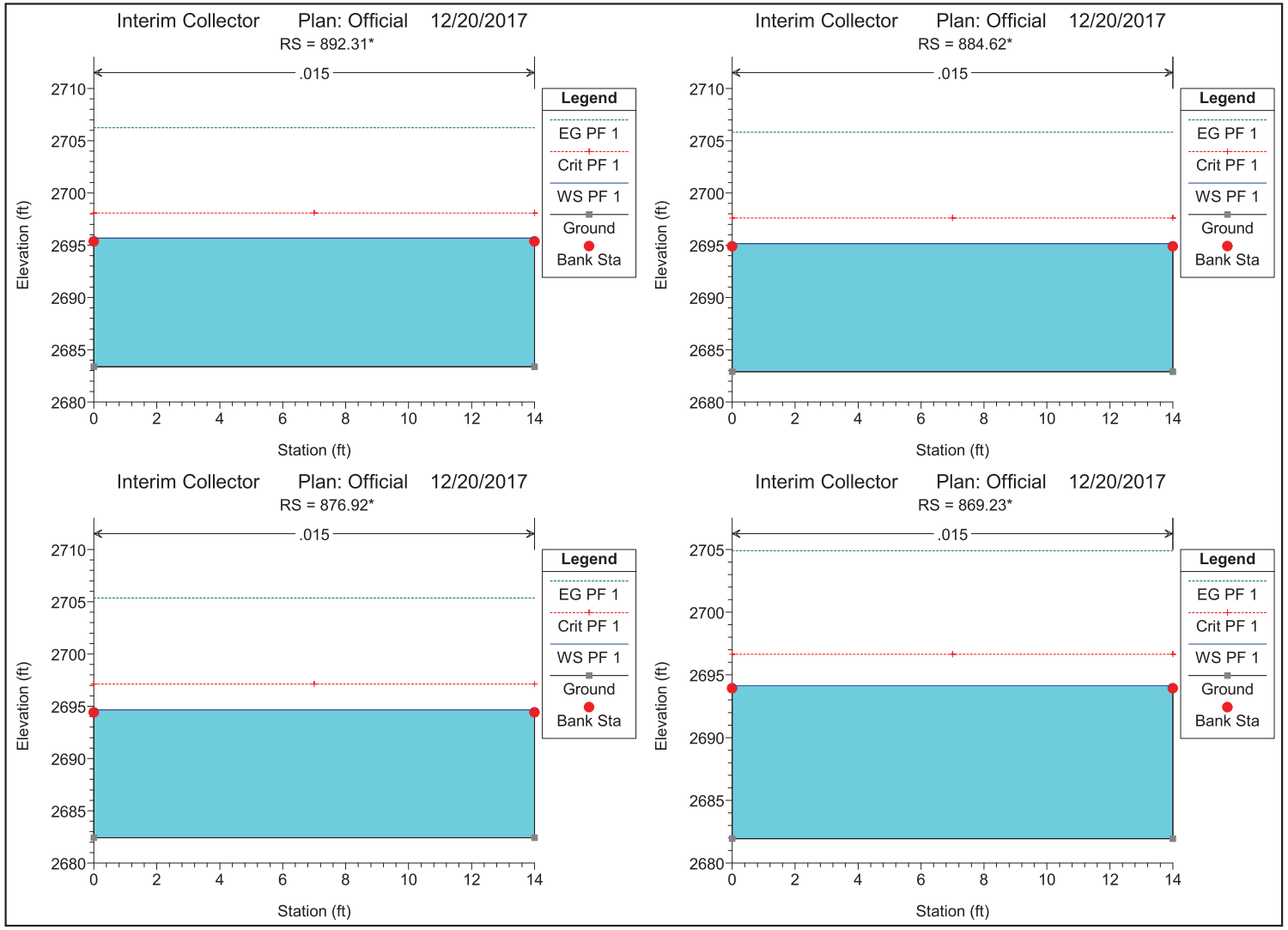
REPLY APP 1174



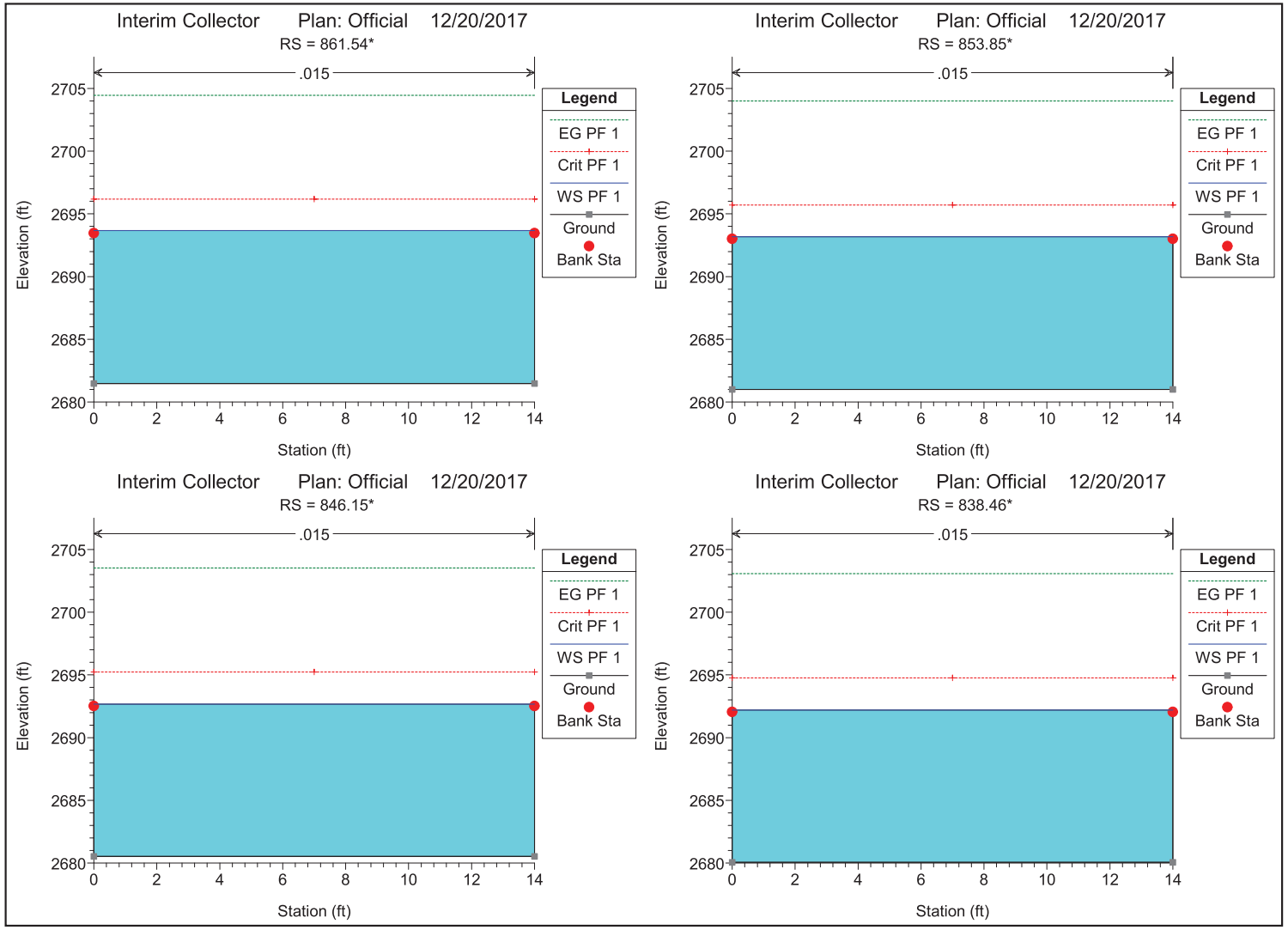
REPLY APP 1175



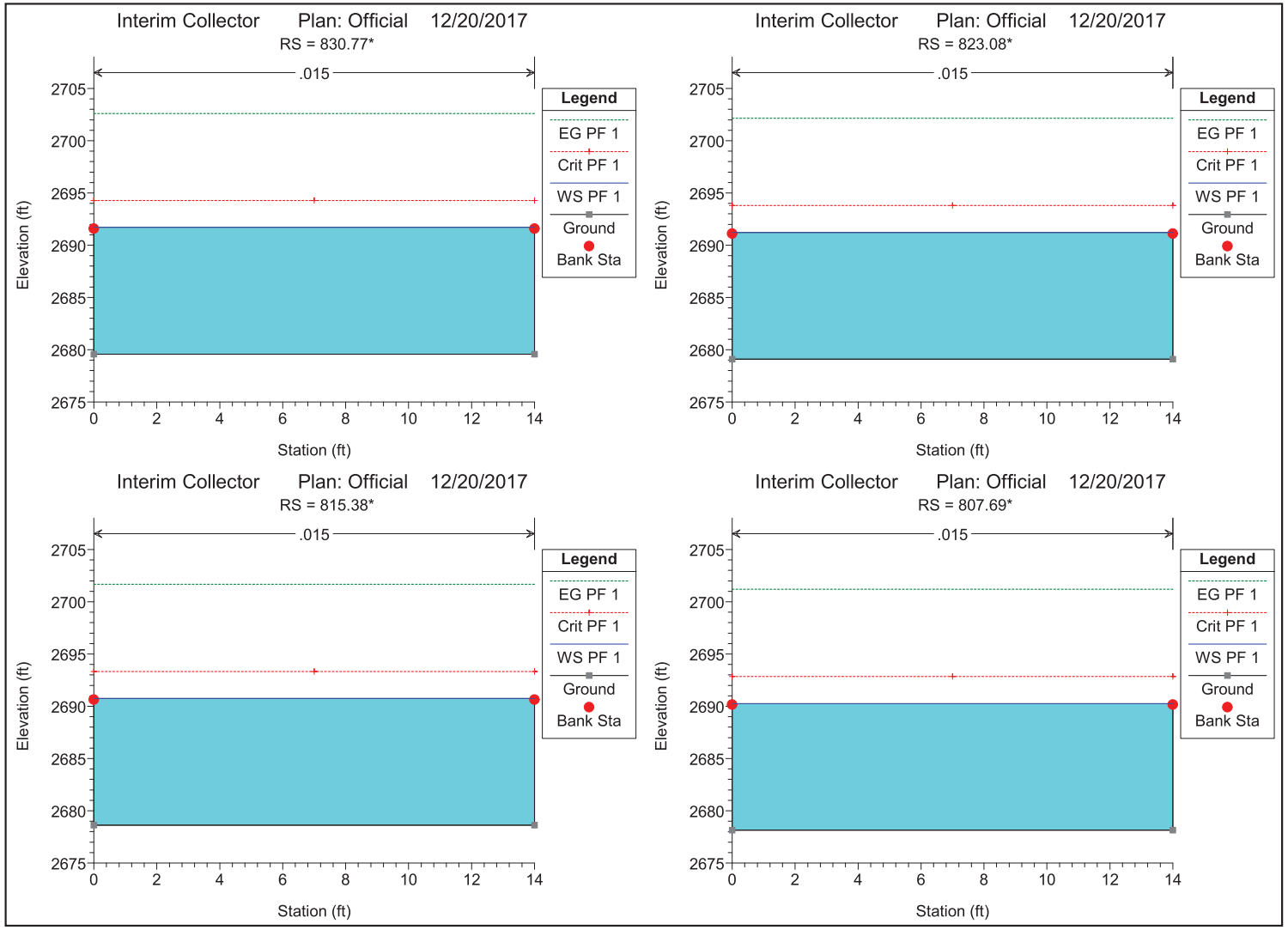
REPLY APP 1176



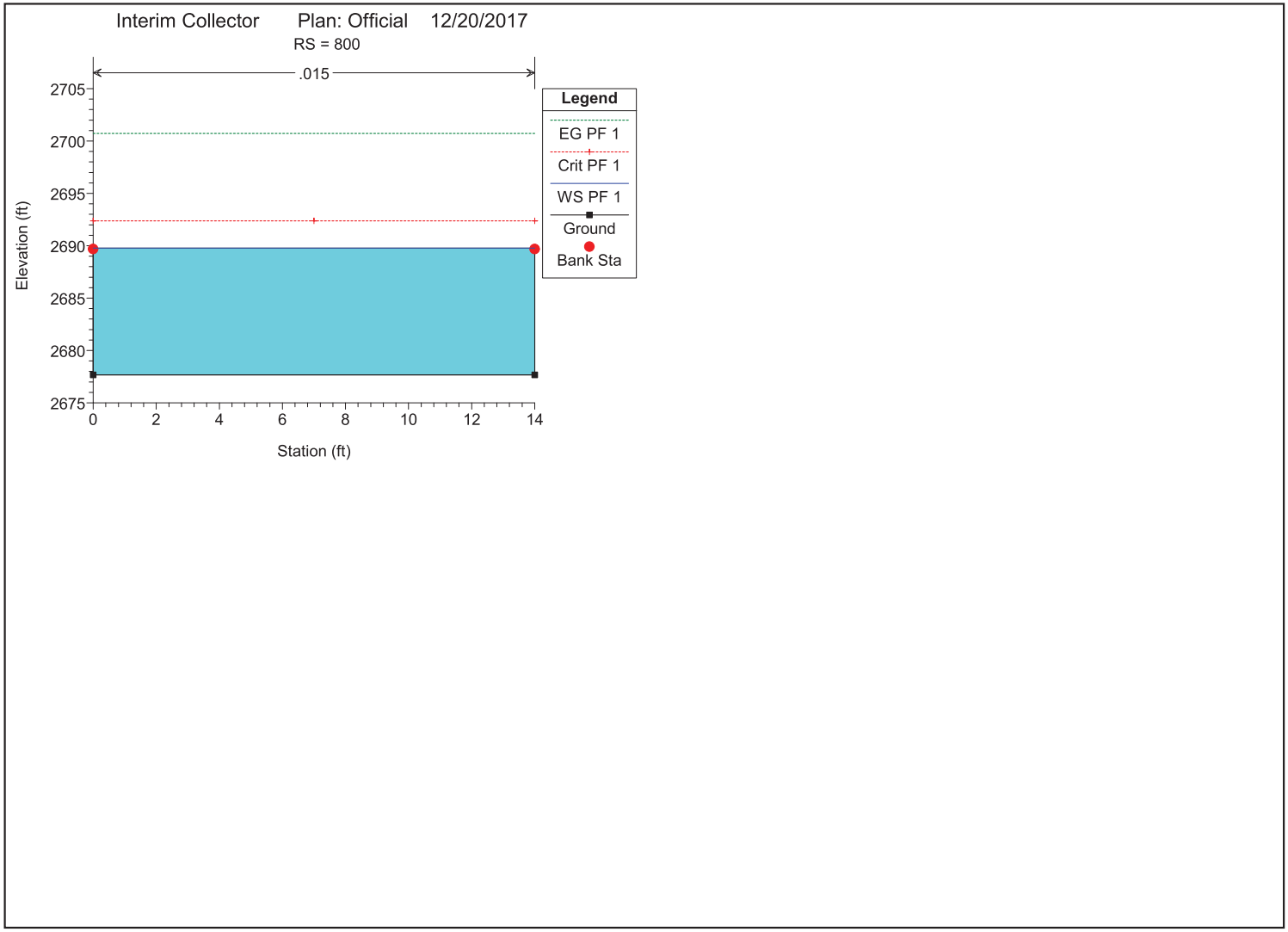
REPLY APP 1177



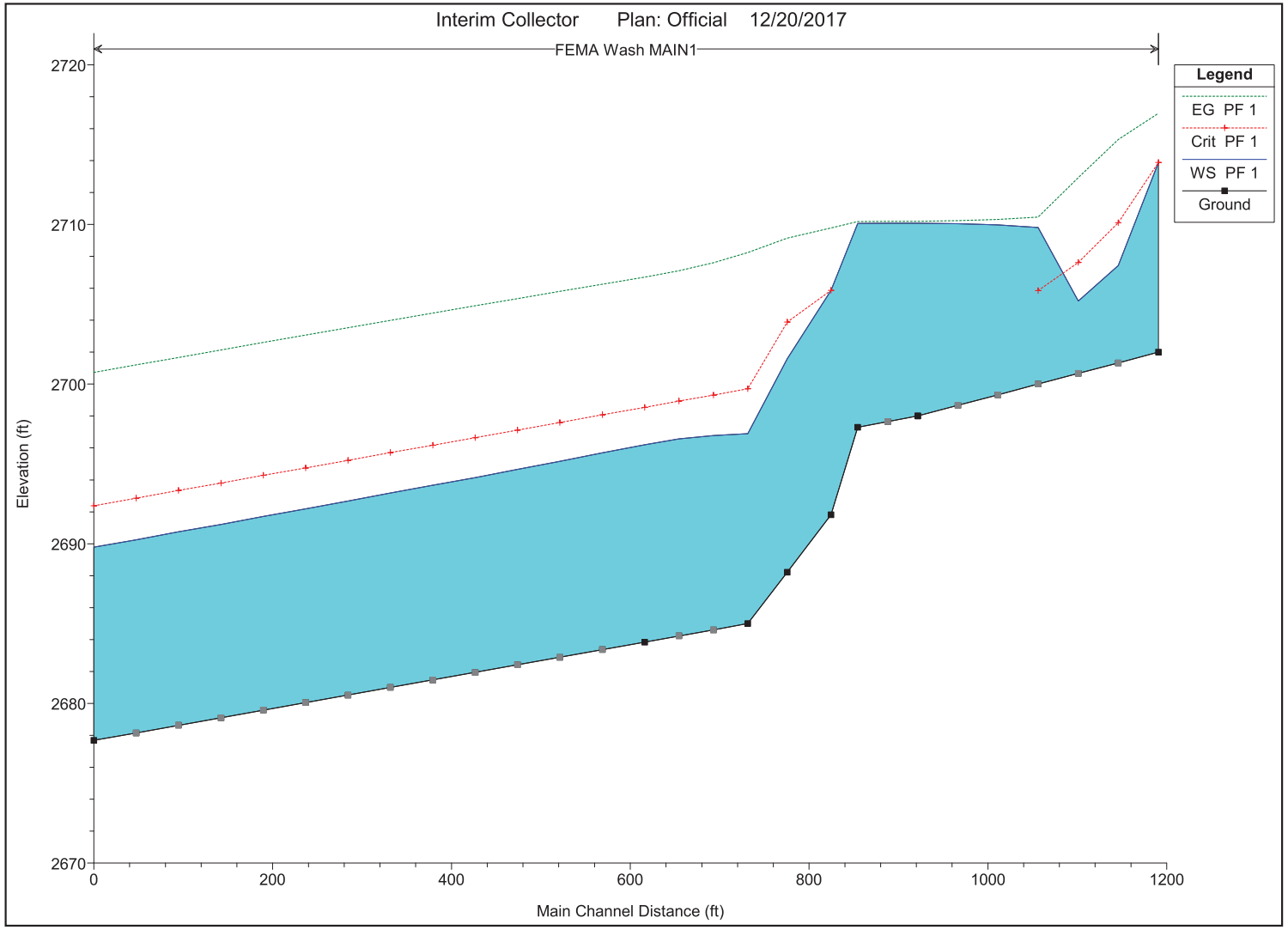
REPLY APP 1178



REPLY APP 1179



REPLY APP 1180



REPLY APP 1181

```
                    HEC-RAS HEC-RAS 5.0.3 September 2016
                      U.S. Army Corps of Engineers
                     Hydrologic Engineering Center
                           609 Second Street
                           Davis, California


          X     X  XXXXXX    XXXX        XXXX       XX      XXXX
          X     X  X        X    X       X   X     X  X    X
          X     X  X        X            X   X    X    X   X
          XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
          X     X  X        X            X  X     X    X        X
          X     X  X        X    X       X   X    X    X        X
          X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Interim Collector
Project File : InterimCollector.prj
Run Date and Time: 12/20/2017 05:45:17 PM

Project in English units

PLAN DATA

Plan Title: Official
Plan File : f:\Projects\800\840-050\Division\Fctl\Calcs\RTC2\HECRAS\InterimCollector.p02

Geometry Title: Official
Geometry File : f:\Projects\800\840-050\Division\Fctl\Calcs\RTC2\HECRAS\InterimCollector.g02

Flow Title : Official
Flow File : f:\Projects\800\840-050\Division\Fctl\Calcs\RTC2\HECRAS\InterimCollector.f01

Plan Summary Information:

Number of:	Cross Sections	= 29	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: Official
Flow File : f:\Projects\800\840-050\Division\Fctl\Calcs\RTC2\HECRAS\InterimCollector.f01

Flow Data (cfs)

River	Reach	RS	PF 1
FEMA Wash	MAIN1	1400	2489
FEMA Wash	MAIN1	1099	4497

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
FEMA Wash	MAIN1	PF 1	Normal S = 0.015	Normal S = 0.01

GEOMETRY DATA

Geometry Title: Official
Geometry File : f:\Projects\800\840-050\Division\Fctl\Calcs\RTC2\HECRAS\InterimCollector.g02

CROSS SECTION

RIVER: FEMA Wash
REACH: MAIN1 RS: 1400

INPUT
Description: Existing Wash - Upstream Analysis Limits
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2720	6.86	2719	11.59	2718	21.44	2715	25.17	2713
30.02	2710	30.88	2709	31.6	2708	33	2706	33.73	2705
34.42	2704	41.24	2702.26	42.26	2702	45.17	2702	45.29	2704
45.32	2705	45.5	2708	45.52	2709	45.55	2710	46.41	2711
48.5	2712	50.57	2713	52.69	2714	55.15	2715		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	55.15	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	55.15	47.29	44.84	43.76	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2716.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.08	Wt. n-Val.		0.035	
W.S. Elev (ft)	2713.89	Reach Len. (ft)	47.29	44.84	43.76
Crit W.S. (ft)	2713.89	Flow Area (sq ft)		176.93	
E.G. Slope (ft/ft)	0.016165	Area (sq ft)		176.93	
Q Total (cfs)	2489.00	Flow (cfs)		2489.00	
Top Width (ft)	28.94	Top Width (ft)		28.94	
Vel Total (ft/s)	14.07	Avg. Vel. (ft/s)		14.07	
Max Chl Dpth (ft)	11.89	Hydr. Depth (ft)		6.11	
Conv. Total (cfs)	19576.8	Conv. (cfs)		19576.8	
Length Wtd. (ft)	44.84	Wetted Per. (ft)		42.05	
Min Ch El (ft)	2702.00	Shear (lb/sq ft)		4.25	
Alpha	1.00	Stream Power (lb/ft s)		59.73	
Frctn Loss (ft)	1.17	Cum Volume (acre-ft)	0.11	7.46	0.12
C & E Loss (ft)	0.48	Cum SA (acres)	0.03	0.78	0.03

Warning: Slope too shallow for slope area to converge during supercritical flow calculations (normal depth is above critical depth). Water surface set to critical depth.

CROSS SECTION

RIVER: FEMA Wash
REACH: MAIN1 RS: 1383.33*

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2719.17	6.58	2717.87	11.12	2716.72	20.57	2713.56	24.15	2711.65
28.81	2708.82	29.63	2707.93	30.32	2707.05	31.66	2705.29	32.37	2704.41
33.03	2703.53	39.57	2701.62	40.55	2701.33	51.31	2701.33	51.46	2703.03
51.5	2703.87	51.74	2706.41	51.76	2707.25	51.8	2708.09	52.92	2709.12
55.64	2710.45	58.33	2711.76	61.09	2713.09	64.29	2714.5		

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.035	64.29	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	64.29	47.29	44.84	43.76	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2715.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.89	Wt. n-Val.		0.035	
W.S. Elev (ft)	2707.42	Reach Len. (ft)	47.29	44.84	43.76
Crit W.S. (ft)	2710.11	Flow Area (sq ft)		110.46	
E.G. Slope (ft/ft)	0.048728	Area (sq ft)		110.46	
Q Total (cfs)	2489.00	Flow (cfs)		2489.00	
Top Width (ft)	21.74	Top Width (ft)		21.74	
Vel Total (ft/s)	22.53	Avg. Vel. (ft/s)		22.53	
Max Chl Dpth (ft)	6.09	Hydr. Depth (ft)		5.08	
Conv. Total (cfs)	11275.5	Conv. (cfs)		11275.5	
Length Wtd. (ft)	44.84	Wetted Per. (ft)		29.63	
Min Ch El (ft)	2701.33	Shear (lb/sq ft)		11.34	
Alpha	1.00	Stream Power (lb/ft s)		255.58	
Frctn Loss (ft)	2.33	Cum Volume (acre-ft)	0.11	7.31	0.12
C & E Loss (ft)	0.05	Cum SA (acres)	0.03	0.75	0.03

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate

the need for additional cross sections.

CROSS SECTION

RIVER: FEMA Wash
REACH: MAIN1 RS: 1366.67*

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2718.33	6.3	2716.75	10.65	2715.45	19.7	2712.12	23.13	2710.29
27.59	2707.64	28.38	2706.86	29.04	2706.1	30.33	2704.57	31	2703.81
31.63	2703.05	37.9	2700.98	38.84	2700.67	57.45	2700.67	57.64	2702.06
57.69	2702.74	57.98	2704.82	58.01	2705.5	58.06	2706.18	59.43	2707.25
62.78	2708.89	66.1	2710.53	69.49	2712.18	73.43	2714		

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.035	73.43	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	73.43	47.29	44.84	43.76	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2712.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.74	Wt. n-Val.		0.035	
W.S. Elev (ft)	2705.20	Reach Len. (ft)	47.29	44.84	43.76
Crit W.S. (ft)	2707.62	Flow Area (sq ft)		111.55	
E.G. Slope (ft/ft)	0.055747	Area (sq ft)		111.55	
Q Total (cfs)	2489.00	Flow (cfs)		2489.00	
Top Width (ft)	28.20	Top Width (ft)		28.20	
Vel Total (ft/s)	22.31	Avg. Vel. (ft/s)		22.31	
Max Chl Dpth (ft)	4.53	Hydr. Depth (ft)		3.96	
Conv. Total (cfs)	10541.8	Conv. (cfs)		10541.8	
Length Wtd. (ft)	44.84	Wetted Per. (ft)		33.59	
Min Ch El (ft)	2700.67	Shear (lb/sq ft)		11.56	
Alpha	1.00	Stream Power (lb/ft s)		257.92	
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	0.11	7.20	0.12
C & E Loss (ft)	0.29	Cum SA (acres)	0.03	0.73	0.03

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: FEMA Wash
REACH: MAIN1 RS: 1350.00*

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2717.5	6.03	2715.62	10.18	2714.17	18.84	2710.69	22.11	2708.94
26.38	2706.46	27.13	2705.79	27.76	2705.14	28.99	2703.86	29.64	2703.22
30.24	2702.58	36.23	2700.34	37.13	2700	63.58	2700	63.81	2701.08
63.87	2701.61	64.21	2703.23	64.25	2703.75	64.31	2704.27	65.94	2705.37
69.92	2707.34	73.86	2709.29	77.89	2711.27	82.57	2713.5		

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.035	82.57	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	82.57	47.29	44.84	43.76	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2710.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.		0.035	
W.S. Elev (ft)	2709.80	Reach Len. (ft)	47.29	44.84	43.76
Crit W.S. (ft)	2705.86	Flow Area (sq ft)		381.64	
E.G. Slope (ft/ft)	0.002108	Area (sq ft)		381.64	
Q Total (cfs)	2489.00	Flow (cfs)		2489.00	
Top Width (ft)	54.41	Top Width (ft)		54.41	
Vel Total (ft/s)	6.52	Avg. Vel. (ft/s)		6.52	
Max Chl Dpth (ft)	9.80	Hydr. Depth (ft)		7.01	
Conv. Total (cfs)	54209.1	Conv. (cfs)		54209.1	
Length Wtd. (ft)	44.84	Wetted Per. (ft)		62.36	
Min Ch El (ft)	2700.00	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)		5.25	
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	0.11	6.94	0.12
C & E Loss (ft)	0.10	Cum SA (acres)	0.03	0.69	0.03

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: FEMA Wash
REACH: MAIN1 RS: 1333.33*

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2716.67	5.75	2714.49	9.71	2712.89	17.97	2709.25	21.1	2707.58
25.16	2705.28	25.88	2704.72	26.49	2704.19	27.66	2703.15	28.27	2702.62
28.85	2702.1	34.57	2699.69	35.42	2699.33	69.72	2699.33	69.99	2700.11
70.05	2700.47	70.45	2701.64	70.49	2701.99	70.56	2702.36	72.46	2703.49
77.06	2705.78	81.62	2708.05	86.3	2710.37	91.72	2713		

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.035	91.72	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	91.72	47.29	44.84	43.76	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2710.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.035	
W.S. Elev (ft)	2709.97	Reach Len. (ft)	47.29	44.84	43.76
Crit W.S. (ft)		Flow Area (sq ft)		531.90	
E.G. Slope (ft/ft)	0.000911	Area (sq ft)		531.90	
Q Total (cfs)	2489.00	Flow (cfs)		2489.00	
Top Width (ft)	69.15	Top Width (ft)		69.15	
Vel Total (ft/s)	4.68	Avg. Vel. (ft/s)		4.68	
Max Chl Dpth (ft)	10.64	Hydr. Depth (ft)		7.69	
Conv. Total (cfs)	82466.0	Conv. (cfs)		82466.0	
Length Wtd. (ft)	44.84	Wetted Per. (ft)		76.22	
Min Ch El (ft)	2699.33	Shear (lb/sq ft)		0.40	
Alpha	1.00	Stream Power (lb/ft s)		1.86	
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.11	6.47	0.12
C & E Loss (ft)	0.04	Cum SA (acres)	0.03	0.62	0.03

CROSS SECTION

RIVER: FEMA Wash
REACH: MAIN1 RS: 1316.67*

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2715.83	5.47	2713.37	9.25	2711.61	17.1	2707.81	20.08	2706.23
23.95	2704.1	24.63	2703.65	25.21	2703.24	26.32	2702.44	26.91	2702.03
27.46	2701.63	32.9	2699.05	33.71	2698.67	75.86	2698.67	76.16	2699.14
76.24	2699.34	76.69	2700.05	76.74	2700.24	76.81	2700.44	78.97	2701.62
84.2	2704.23	89.39	2706.81	94.7	2709.46	100.86	2712.5		

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.035	100.86	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	100.86	47.29	44.84	43.76	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2710.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.035	
W.S. Elev (ft)	2710.04	Reach Len. (ft)	47.29	44.84	43.76
Crit W.S. (ft)		Flow Area (sq ft)		699.93	
E.G. Slope (ft/ft)	0.000453	Area (sq ft)		699.93	
Q Total (cfs)	2489.00	Flow (cfs)		2489.00	
Top Width (ft)	83.39	Top Width (ft)		83.39	
Vel Total (ft/s)	3.56	Avg. Vel. (ft/s)		3.56	
Max Chl Dpth (ft)	11.37	Hydr. Depth (ft)		8.39	
Conv. Total (cfs)	116953.4	Conv. (cfs)		116953.4	
Length Wtd. (ft)	44.84	Wetted Per. (ft)		89.64	
Min Ch El (ft)	2698.67	Shear (lb/sq ft)		0.22	
Alpha	1.00	Stream Power (lb/ft s)		0.79	
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	0.11	5.84	0.12
C & E Loss (ft)	0.02	Cum SA (acres)	0.03	0.54	0.03

CROSS SECTION

```
RIVER: FEMA Wash
REACH: MAIN1              RS: 1300

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    2715      32    2698      82    2698     110    2712

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .035       0    .035     110    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0     110               .1      .1      .1             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2710.20    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.12    Wt. n-Val.                            0.035
  W.S. Elev (ft)           2710.08    Reach Len. (ft)             0.10       0.10      0.10
  Crit W.S. (ft)                      Flow Area (sq ft)                    887.13
  E.G. Slope (ft/ft)      0.000247    Area (sq ft)                         887.13
  Q Total (cfs)            2489.00    Flow (cfs)                          2489.00
  Top Width (ft)             96.89    Top Width (ft)                        96.89
  Vel Total (ft/s)            2.81    Avg. Vel. (ft/s)                       2.81
  Max Chl Dpth (ft)          12.08    Hydr. Depth (ft)                       9.16
  Conv. Total (cfs)       158505.3    Conv. (cfs)                       158505.3
  Length Wtd. (ft)            0.10    Wetted Per. (ft)                     102.75
  Min Ch El (ft)           2698.00    Shear (lb/sq ft)                       0.13
  Alpha                       1.00    Stream Power (lb/ft s)                 0.37
  Frctn Loss (ft)             0.00    Cum Volume (acre-ft)        0.11       5.02      0.12
  C & E Loss (ft)             0.00    Cum SA (acres)              0.03       0.45      0.03


CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 1299

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    2715      32    2698      82    2698     110    2712

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .037       0    .037     110    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0     110             49.33    33.5   28.05             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2710.20    Element                   Left OB    Channel   Right OB
  Vel Head (ft)               0.12    Wt. n-Val.                            0.037
  W.S. Elev (ft)           2710.08    Reach Len. (ft)            49.33      33.50     28.05
  Crit W.S. (ft)                      Flow Area (sq ft)                    887.13
  E.G. Slope (ft/ft)      0.000276    Area (sq ft)                         887.13
  Q Total (cfs)            2489.00    Flow (cfs)                          2489.00
  Top Width (ft)             96.89    Top Width (ft)                        96.89
  Vel Total (ft/s)            2.81    Avg. Vel. (ft/s)                       2.81
  Max Chl Dpth (ft)          12.08    Hydr. Depth (ft)                       9.16
  Conv. Total (cfs)       149937.5    Conv. (cfs)                       149937.5
  Length Wtd. (ft)           33.50    Wetted Per. (ft)                     102.75
  Min Ch El (ft)           2698.00    Shear (lb/sq ft)                       0.15
  Alpha                       1.00    Stream Power (lb/ft s)                 0.42
  Frctn Loss (ft)             0.01    Cum Volume (acre-ft)        0.11       5.02      0.12
  C & E Loss (ft)             0.00    Cum SA (acres)              0.03       0.45      0.03


CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 1199.50*

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    2715      34 2697.65      82 2697.65     110    2712

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
```

```
       0    .037     110    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0     110            49.33    33.5   28.05             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2710.19    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.12    Wt. n-Val.                           0.037
  W.S. Elev (ft)           2710.07    Reach Len. (ft)           49.33      33.50      28.05
  Crit W.S. (ft)                      Flow Area (sq ft)                   897.95
  E.G. Slope (ft/ft)      0.000264    Area (sq ft)                        897.95
  Q Total (cfs)            2489.00    Flow (cfs)                         2489.00
  Top Width (ft)             96.58    Top Width (ft)                       96.58
  Vel Total (ft/s)            2.77    Avg. Vel. (ft/s)                      2.77
  Max Chl Dpth (ft)          12.42    Hydr. Depth (ft)                      9.30
  Conv. Total (cfs)       153187.6    Conv. (cfs)                      153187.6
  Length Wtd. (ft)           33.50    Wetted Per. (ft)                    102.56
  Min Ch El (ft)           2697.65    Shear (lb/sq ft)                      0.14
  Alpha                       1.00    Stream Power (lb/ft s)                0.40
  Frctn Loss (ft)             0.01    Cum Volume (acre-ft)        0.11      4.33       0.12
  C & E Loss (ft)             0.00    Cum SA (acres)              0.03      0.38       0.03


CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 1100

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    2715      36  2697.3      82  2697.3     110    2712

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .037       0    .037     110    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0     110            38.24      30      60             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2710.18    Element                  Left OB    Channel   Right OB
  Vel Head (ft)               0.12    Wt. n-Val.                           0.037
  W.S. Elev (ft)           2710.07    Reach Len. (ft)           38.24      30.00      60.00
  Crit W.S. (ft)                      Flow Area (sq ft)                   908.05
  E.G. Slope (ft/ft)      0.000254    Area (sq ft)                        908.05
  Q Total (cfs)            2489.00    Flow (cfs)                         2489.00
  Top Width (ft)             96.28    Top Width (ft)                       96.28
  Vel Total (ft/s)            2.74    Avg. Vel. (ft/s)                      2.74
  Max Chl Dpth (ft)          12.76    Hydr. Depth (ft)                      9.43
  Conv. Total (cfs)       156243.5    Conv. (cfs)                      156243.5
  Length Wtd. (ft)           32.65    Wetted Per. (ft)                    102.39
  Min Ch El (ft)           2697.30    Shear (lb/sq ft)                      0.14
  Alpha                       1.00    Stream Power (lb/ft s)                0.39
  Frctn Loss (ft)             0.03    Cum Volume (acre-ft)        0.11      3.64       0.12
  C & E Loss (ft)             0.38    Cum SA (acres)              0.03      0.30       0.03


Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross
         sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
         1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 1099

INPUT
Description:
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    2715      41    2697      41 2691.81      55 2691.81      55    2697
      91    2715

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .037      41     .02      55    .037

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            41      55               49      49      49             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
```

E.G. Elev (ft)	2709.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.90	Wt. n-Val.	0.037	0.020	0.037
W.S. Elev (ft)	2705.87	Reach Len. (ft)	49.00	49.00	49.00
Crit W.S. (ft)	2705.87	Flow Area (sq ft)	89.66	196.88	78.72
E.G. Slope (ft/ft)	0.003504	Area (sq ft)	89.66	196.88	78.72
Q Total (cfs)	4497.00	Flow (cfs)	542.64	3485.28	469.08
Top Width (ft)	51.95	Top Width (ft)	20.21	14.00	17.75
Vel Total (ft/s)	12.31	Avg. Vel. (ft/s)	6.05	17.70	5.96
Max Chl Dpth (ft)	14.06	Hydr. Depth (ft)	4.44	14.06	4.44
Conv. Total (cfs)	75965.0	Conv. (cfs)	9166.5	58874.7	7923.8
Length Wtd. (ft)	49.00	Wetted Per. (ft)	22.07	24.38	19.84
Min Ch El (ft)	2691.81	Shear (lb/sq ft)	0.89	1.77	0.87
Alpha	1.66	Stream Power (lb/ft s)	5.38	31.28	5.17
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	0.07	3.26	0.07
C & E Loss (ft)	0.37	Cum SA (acres)	0.02	0.26	0.02

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: FEMA Wash
REACH: MAIN1 RS: 1098

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2715	36	2697	36	2688.22	50	2688.22	50	2697
86	2715								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.037	36	.02	50	.037

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
36	50	44	44	44	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2709.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.55	Wt. n-Val.	0.037	0.020	0.037
W.S. Elev (ft)	2701.60	Reach Len. (ft)	44.00	44.00	44.00
Crit W.S. (ft)	2703.89	Flow Area (sq ft)	21.13	187.28	21.13
E.G. Slope (ft/ft)	0.008650	Area (sq ft)	21.13	187.28	21.13
Q Total (cfs)	4497.00	Flow (cfs)	127.63	4241.74	127.63
Top Width (ft)	32.39	Top Width (ft)	9.19	14.00	9.19
Vel Total (ft/s)	19.59	Avg. Vel. (ft/s)	6.04	22.65	6.04
Max Chl Dpth (ft)	13.38	Hydr. Depth (ft)	2.30	13.38	2.30
Conv. Total (cfs)	48351.3	Conv. (cfs)	1372.3	45606.7	1372.3
Length Wtd. (ft)	44.00	Wetted Per. (ft)	10.28	31.56	10.28
Min Ch El (ft)	2688.22	Shear (lb/sq ft)	1.11	3.20	1.11
Alpha	1.27	Stream Power (lb/ft s)	6.71	72.58	6.71
Frctn Loss (ft)	0.53	Cum Volume (acre-ft)	0.01	3.04	0.01
C & E Loss (ft)	0.38	Cum SA (acres)	0.00	0.25	0.00

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Note: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: FEMA Wash
REACH: MAIN1 RS: 1000

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2697	0	2685	14	2685	14	2697

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.02	0	.02	14	.02

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.

```
            0      14            38.48   38.48   38.48            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2708.23    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              11.34    Wt. n-Val.                           0.020
  W.S. Elev (ft)           2696.89    Reach Len. (ft)           38.48      38.48      38.48
  Crit W.S. (ft)           2699.71    Flow Area (sq ft)                   166.44
  E.G. Slope (ft/ft)      0.018310    Area (sq ft)                        166.44
  Q Total (cfs)            4497.00    Flow (cfs)                         4497.00
  Top Width (ft)             14.00    Top Width (ft)                       14.00
  Vel Total (ft/s)           27.02    Avg. Vel. (ft/s)                     27.02
  Max Chl Dpth (ft)          11.89    Hydr. Depth (ft)                     11.89
  Conv. Total (cfs)        33233.8    Conv. (cfs)                       33233.8
  Length Wtd. (ft)           38.48    Wetted Per. (ft)                     37.78
  Min Ch El (ft)           2685.00    Shear (lb/sq ft)                      5.04
  Alpha                       1.00    Stream Power (lb/ft s)               136.07
  Frctn Loss (ft)             0.61    Cum Volume (acre-ft)                   2.87
  C & E Loss (ft)             0.02    Cum SA (acres)                         0.24


Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross
         sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than
         1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 966.67*

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 2696.61       0 2684.61      14 2684.61      14 2696.61

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .018      14    .018

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      14            38.48   38.48   38.48            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2707.61    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              10.83    Wt. n-Val.                           0.018
  W.S. Elev (ft)           2696.78    Reach Len. (ft)           38.48      38.48      38.48
  Crit W.S. (ft)           2699.32    Flow Area (sq ft)                   170.31
  E.G. Slope (ft/ft)      0.014006    Area (sq ft)                        170.31
  Q Total (cfs)            4497.00    Flow (cfs)                         4497.00
  Top Width (ft)             14.00    Top Width (ft)                       14.00
  Vel Total (ft/s)           26.40    Avg. Vel. (ft/s)                     26.40
  Max Chl Dpth (ft)          12.17    Hydr. Depth (ft)                     12.17
  Conv. Total (cfs)        37998.4    Conv. (cfs)                       37998.4
  Length Wtd. (ft)           38.48    Wetted Per. (ft)                     38.33
  Min Ch El (ft)           2684.61    Shear (lb/sq ft)                      3.89
  Alpha                       1.00    Stream Power (lb/ft s)               102.59
  Frctn Loss (ft)             0.50    Cum Volume (acre-ft)                   2.72
  C & E Loss (ft)             0.01    Cum SA (acres)                         0.22


Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross
         sections.

CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 933.33*

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 2696.23       0 2684.23      14 2684.23      14 2696.23

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .017      14    .017

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      14            38.48   38.48   38.48            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1
```

```
  E.G. Elev (ft)           2707.10    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              10.54    Wt. n-Val.                           0.017
  W.S. Elev (ft)           2696.57    Reach Len. (ft)           38.48      38.48      38.48
  Crit W.S. (ft)           2698.94    Flow Area (sq ft)                   172.69
  E.G. Slope (ft/ft)      0.012070    Area (sq ft)                        172.69
  Q Total (cfs)            4497.00    Flow (cfs)                         4497.00
  Top Width (ft)             14.00    Top Width (ft)                       14.00
  Vel Total (ft/s)           26.04    Avg. Vel. (ft/s)                     26.04
  Max Chl Dpth (ft)          12.33    Hydr. Depth (ft)                     12.33
  Conv. Total (cfs)        40933.0    Conv. (cfs)                       40933.0
  Length Wtd. (ft)           38.48    Wetted Per. (ft)                     38.67
  Min Ch El (ft)           2684.23    Shear (lb/sq ft)                      3.36
  Alpha                       1.00    Stream Power (lb/ft s)               87.63
  Frctn Loss (ft)             0.41    Cum Volume (acre-ft)                  2.56
  C & E Loss (ft)             0.00    Cum SA (acres)                        0.21


Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 900

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 2695.84       0 2683.84      14 2683.84      14 2695.84

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015       0    .015      14    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      14            47.39   47.39   47.39            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2706.70    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              10.50    Wt. n-Val.                           0.015
  W.S. Elev (ft)           2696.20    Reach Len. (ft)           47.39      47.39      47.39
  Crit W.S. (ft)           2698.55    Flow Area (sq ft)                   173.01
  E.G. Slope (ft/ft)      0.009354    Area (sq ft)                        173.01
  Q Total (cfs)            4497.00    Flow (cfs)                         4497.00
  Top Width (ft)             14.00    Top Width (ft)                       14.00
  Vel Total (ft/s)           25.99    Avg. Vel. (ft/s)                     25.99
  Max Chl Dpth (ft)          12.36    Hydr. Depth (ft)                     12.36
  Conv. Total (cfs)        46496.8    Conv. (cfs)                       46496.8
  Length Wtd. (ft)           47.39    Wetted Per. (ft)                     38.72
  Min Ch El (ft)           2683.84    Shear (lb/sq ft)                      2.61
  Alpha                       1.00    Stream Power (lb/ft s)               67.83
  Frctn Loss (ft)             0.44    Cum Volume (acre-ft)                  2.41
  C & E Loss (ft)             0.00    Cum SA (acres)                        0.20


Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 892.31*

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 2695.37       0 2683.37      14 2683.37      14 2695.37

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015      14    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      14            47.39   47.39   47.39            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2706.26    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              10.56    Wt. n-Val.                           0.015
  W.S. Elev (ft)           2695.69    Reach Len. (ft)           47.39      47.39      47.39
  Crit W.S. (ft)           2698.08    Flow Area (sq ft)                   172.47
  E.G. Slope (ft/ft)      0.009426    Area (sq ft)                        172.47
  Q Total (cfs)            4497.00    Flow (cfs)                         4497.00
  Top Width (ft)             14.00    Top Width (ft)                       14.00
  Vel Total (ft/s)           26.07    Avg. Vel. (ft/s)                     26.07
  Max Chl Dpth (ft)          12.32    Hydr. Depth (ft)                     12.32
```

```
  Conv. Total (cfs)        46319.0    Conv. (cfs)                        46319.0
  Length Wtd. (ft)           47.39    Wetted Per. (ft)                     38.64
  Min Ch El (ft)           2683.37    Shear (lb/sq ft)                      2.63
  Alpha                       1.00    Stream Power (lb/ft s)               68.49
  Frctn Loss (ft)             0.45    Cum Volume (acre-ft)                  2.22
  C & E Loss (ft)             0.00    Cum SA (acres)                        0.18


Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 884.62*

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 2694.89       0 2682.89      14 2682.89      14 2694.89

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015      14    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      14            47.39   47.39   47.39            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2705.81    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              10.65    Wt. n-Val.                           0.015
  W.S. Elev (ft)           2695.16    Reach Len. (ft)           47.39      47.39      47.39
  Crit W.S. (ft)           2697.60    Flow Area (sq ft)                   171.78
  E.G. Slope (ft/ft)      0.009520    Area (sq ft)                        171.78
  Q Total (cfs)            4497.00    Flow (cfs)                         4497.00
  Top Width (ft)             14.00    Top Width (ft)                       14.00
  Vel Total (ft/s)           26.18    Avg. Vel. (ft/s)                     26.18
  Max Chl Dpth (ft)          12.27    Hydr. Depth (ft)                     12.27
  Conv. Total (cfs)        46088.8    Conv. (cfs)                       46088.8
  Length Wtd. (ft)           47.39    Wetted Per. (ft)                     38.54
  Min Ch El (ft)           2682.89    Shear (lb/sq ft)                      2.65
  Alpha                       1.00    Stream Power (lb/ft s)               69.35
  Frctn Loss (ft)             0.45    Cum Volume (acre-ft)                  2.04
  C & E Loss (ft)             0.00    Cum SA (acres)                        0.17


Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 876.92*

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 2694.42       0 2682.42      14 2682.42      14 2694.42

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015      14    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      14            47.39   47.39   47.39            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2705.36    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              10.70    Wt. n-Val.                           0.015
  W.S. Elev (ft)           2694.66    Reach Len. (ft)           47.39      47.39      47.39
  Crit W.S. (ft)           2697.13    Flow Area (sq ft)                   171.42
  E.G. Slope (ft/ft)      0.009571    Area (sq ft)                        171.42
  Q Total (cfs)            4497.00    Flow (cfs)                         4497.00
  Top Width (ft)             14.00    Top Width (ft)                       14.00
  Vel Total (ft/s)           26.23    Avg. Vel. (ft/s)                     26.23
  Max Chl Dpth (ft)          12.24    Hydr. Depth (ft)                     12.24
  Conv. Total (cfs)        45967.0    Conv. (cfs)                       45967.0
  Length Wtd. (ft)           47.39    Wetted Per. (ft)                     38.49
  Min Ch El (ft)           2682.42    Shear (lb/sq ft)                      2.66
  Alpha                       1.00    Stream Power (lb/ft s)               69.81
  Frctn Loss (ft)             0.46    Cum Volume (acre-ft)                  1.85
  C & E Loss (ft)             0.00    Cum SA (acres)                        0.15


Warning: The cross-section end points had to be extended vertically for the computed water surface.
```

CROSS SECTION

RIVER: FEMA Wash
REACH: MAIN1 RS: 869.23*

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2693.94	0	2681.94	14	2681.94	14	2693.94

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.015	14	.015

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	14	47.39	47.39	47.39	.01	.03

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2704.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.76	Wt. n-Val.		0.015	
W.S. Elev (ft)	2694.15	Reach Len. (ft)	47.39	47.39	47.39
Crit W.S. (ft)	2696.65	Flow Area (sq ft)		170.91	
E.G. Slope (ft/ft)	0.009641	Area (sq ft)		170.91	
Q Total (cfs)	4497.00	Flow (cfs)		4497.00	
Top Width (ft)	14.00	Top Width (ft)		14.00	
Vel Total (ft/s)	26.31	Avg. Vel. (ft/s)		26.31	
Max Chl Dpth (ft)	12.21	Hydr. Depth (ft)		12.21	
Conv. Total (cfs)	45798.4	Conv. (cfs)		45798.4	
Length Wtd. (ft)	47.39	Wetted Per. (ft)		38.42	
Min Ch El (ft)	2681.94	Shear (lb/sq ft)		2.68	
Alpha	1.00	Stream Power (lb/ft s)		70.46	
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)		1.66	
C & E Loss (ft)	0.00	Cum SA (acres)		0.14	

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: FEMA Wash
REACH: MAIN1 RS: 861.54*

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2693.47	0	2681.47	14	2681.47	14	2693.47

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.015	14	.015

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	14	47.39	47.39	47.39	.01	.03

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2704.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.79	Wt. n-Val.		0.015	
W.S. Elev (ft)	2693.66	Reach Len. (ft)	47.39	47.39	47.39
Crit W.S. (ft)	2696.18	Flow Area (sq ft)		170.67	
E.G. Slope (ft/ft)	0.009675	Area (sq ft)		170.67	
Q Total (cfs)	4497.00	Flow (cfs)		4497.00	
Top Width (ft)	14.00	Top Width (ft)		14.00	
Vel Total (ft/s)	26.35	Avg. Vel. (ft/s)		26.35	
Max Chl Dpth (ft)	12.19	Hydr. Depth (ft)		12.19	
Conv. Total (cfs)	45718.8	Conv. (cfs)		45718.8	
Length Wtd. (ft)	47.39	Wetted Per. (ft)		38.38	
Min Ch El (ft)	2681.47	Shear (lb/sq ft)		2.69	
Alpha	1.00	Stream Power (lb/ft s)		70.77	
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)		1.48	
C & E Loss (ft)	0.00	Cum SA (acres)		0.12	

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: FEMA Wash
REACH: MAIN1 RS: 853.85*

INPUT
Description:

```
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    2693       0    2681      14    2681      14    2693

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015      14    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      14            47.39   47.39   47.39            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2703.99    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              10.82    Wt. n-Val.                           0.015
  W.S. Elev (ft)           2693.18    Reach Len. (ft)           47.39      47.39      47.39
  Crit W.S. (ft)           2695.71    Flow Area (sq ft)                   170.44
  E.G. Slope (ft/ft)      0.009707    Area (sq ft)                        170.44
  Q Total (cfs)            4497.00    Flow (cfs)                         4497.00
  Top Width (ft)             14.00    Top Width (ft)                       14.00
  Vel Total (ft/s)           26.38    Avg. Vel. (ft/s)                     26.38
  Max Chl Dpth (ft)          12.17    Hydr. Depth (ft)                     12.17
  Conv. Total (cfs)        45642.5    Conv. (cfs)                       45642.5
  Length Wtd. (ft)           47.39    Wetted Per. (ft)                     38.35
  Min Ch El (ft)           2681.00    Shear (lb/sq ft)                      2.69
  Alpha                       1.00    Stream Power (lb/ft s)               71.07
  Frctn Loss (ft)             0.46    Cum Volume (acre-ft)                  1.29
  C & E Loss (ft)             0.00    Cum SA (acres)                        0.11


Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 846.15*

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 2692.52       0 2680.52      14 2680.52      14 2692.52

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015      14    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      14            47.39   47.39   47.39            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2703.53    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              10.86    Wt. n-Val.                           0.015
  W.S. Elev (ft)           2692.67    Reach Len. (ft)           47.39      47.39      47.39
  Crit W.S. (ft)           2695.23    Flow Area (sq ft)                   170.08
  E.G. Slope (ft/ft)      0.009759    Area (sq ft)                        170.08
  Q Total (cfs)            4497.00    Flow (cfs)                         4497.00
  Top Width (ft)             14.00    Top Width (ft)                       14.00
  Vel Total (ft/s)           26.44    Avg. Vel. (ft/s)                     26.44
  Max Chl Dpth (ft)          12.15    Hydr. Depth (ft)                     12.15
  Conv. Total (cfs)        45520.8    Conv. (cfs)                       45520.8
  Length Wtd. (ft)           47.39    Wetted Per. (ft)                     38.30
  Min Ch El (ft)           2680.52    Shear (lb/sq ft)                      2.71
  Alpha                       1.00    Stream Power (lb/ft s)               71.55
  Frctn Loss (ft)             0.46    Cum Volume (acre-ft)                  1.11
  C & E Loss (ft)             0.00    Cum SA (acres)                        0.09


Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 838.46*

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 2692.05       0 2680.05      14 2680.05      14 2692.05

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015      14    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

```
            0      14            47.39   47.39   47.39            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2703.07    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              10.88    Wt. n-Val.                           0.015
  W.S. Elev (ft)           2692.19    Reach Len. (ft)           47.39      47.39      47.39
  Crit W.S. (ft)           2694.76    Flow Area (sq ft)                   169.94
  E.G. Slope (ft/ft)      0.009779    Area (sq ft)                        169.94
  Q Total (cfs)            4497.00    Flow (cfs)                         4497.00
  Top Width (ft)             14.00    Top Width (ft)                       14.00
  Vel Total (ft/s)           26.46    Avg. Vel. (ft/s)                     26.46
  Max Chl Dpth (ft)          12.14    Hydr. Depth (ft)                     12.14
  Conv. Total (cfs)        45476.4    Conv. (cfs)                       45476.4
  Length Wtd. (ft)           47.39    Wetted Per. (ft)                     38.28
  Min Ch El (ft)           2680.05    Shear (lb/sq ft)                      2.71
  Alpha                       1.00    Stream Power (lb/ft s)               71.72
  Frctn Loss (ft)             0.46    Cum Volume (acre-ft)                  0.92
  C & E Loss (ft)             0.00    Cum SA (acres)                        0.08


Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 830.77*

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 2691.58       0 2679.58      14 2679.58      14 2691.58

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015      14    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      14            47.39   47.39   47.39            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2702.61    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              10.90    Wt. n-Val.                           0.015
  W.S. Elev (ft)           2691.71    Reach Len. (ft)           47.39      47.39      47.39
  Crit W.S. (ft)           2694.29    Flow Area (sq ft)                   169.84
  E.G. Slope (ft/ft)      0.009794    Area (sq ft)                        169.84
  Q Total (cfs)            4497.00    Flow (cfs)                         4497.00
  Top Width (ft)             14.00    Top Width (ft)                       14.00
  Vel Total (ft/s)           26.48    Avg. Vel. (ft/s)                     26.48
  Max Chl Dpth (ft)          12.13    Hydr. Depth (ft)                     12.13
  Conv. Total (cfs)        45440.0    Conv. (cfs)                       45440.0
  Length Wtd. (ft)           47.39    Wetted Per. (ft)                     38.26
  Min Ch El (ft)           2679.58    Shear (lb/sq ft)                      2.71
  Alpha                       1.00    Stream Power (lb/ft s)               71.86
  Frctn Loss (ft)             0.47    Cum Volume (acre-ft)                  0.74
  C & E Loss (ft)             0.00    Cum SA (acres)                        0.06


Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 823.08*

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  2691.1       0  2679.1      14  2679.1      14  2691.1

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015      14    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      14            47.39   47.39   47.39            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2702.14    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              10.93    Wt. n-Val.                           0.015
  W.S. Elev (ft)           2691.21    Reach Len. (ft)           47.39      47.39      47.39
  Crit W.S. (ft)           2693.81    Flow Area (sq ft)                   169.55
  E.G. Slope (ft/ft)      0.009836    Area (sq ft)                        169.55
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  Q Total (cfs)            4497.00    Flow (cfs)                          4497.00
  Top Width (ft)             14.00    Top Width (ft)                        14.00
  Vel Total (ft/s)           26.52    Avg. Vel. (ft/s)                      26.52
  Max Chl Dpth (ft)          12.11    Hydr. Depth (ft)                      12.11
  Conv. Total (cfs)        45344.4    Conv. (cfs)                         45344.4
  Length Wtd. (ft)           47.39    Wetted Per. (ft)                      38.22
  Min Ch El (ft)           2679.10    Shear (lb/sq ft)                       2.72
  Alpha                       1.00    Stream Power (lb/ft s)                72.25
  Frctn Loss (ft)             0.47    Cum Volume (acre-ft)                   0.55
  C & E Loss (ft)             0.00    Cum SA (acres)                         0.05


Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 815.38*

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 2690.63       0 2678.63      14 2678.63      14 2690.63

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015      14    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      14            47.39   47.39   47.39            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2701.67    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              10.92    Wt. n-Val.                           0.015
  W.S. Elev (ft)           2690.75    Reach Len. (ft)           47.39      47.39      47.39
  Crit W.S. (ft)           2693.34    Flow Area (sq ft)                   169.62
  E.G. Slope (ft/ft)      0.009825    Area (sq ft)                        169.62
  Q Total (cfs)            4497.00    Flow (cfs)                          4497.00
  Top Width (ft)             14.00    Top Width (ft)                        14.00
  Vel Total (ft/s)           26.51    Avg. Vel. (ft/s)                      26.51
  Max Chl Dpth (ft)          12.12    Hydr. Depth (ft)                      12.12
  Conv. Total (cfs)        45368.3    Conv. (cfs)                         45368.3
  Length Wtd. (ft)           47.39    Wetted Per. (ft)                      38.23
  Min Ch El (ft)           2678.63    Shear (lb/sq ft)                       2.72
  Alpha                       1.00    Stream Power (lb/ft s)                72.15
  Frctn Loss (ft)             0.47    Cum Volume (acre-ft)                   0.37
  C & E Loss (ft)             0.00    Cum SA (acres)                         0.03


Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION


RIVER: FEMA Wash
REACH: MAIN1              RS: 807.69*

INPUT
Description:
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 2690.15       0 2678.15      14 2678.15      14 2690.15

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015      14    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             0      14            47.39   47.39   47.39            .01      .03

CROSS SECTION OUTPUT  Profile #PF 1

  E.G. Elev (ft)           2701.20    Element                  Left OB    Channel   Right OB
  Vel Head (ft)              10.96    Wt. n-Val.                           0.015
  W.S. Elev (ft)           2690.25    Reach Len. (ft)           47.39      47.39      47.39
  Crit W.S. (ft)           2692.86    Flow Area (sq ft)                   169.37
  E.G. Slope (ft/ft)      0.009861    Area (sq ft)                        169.37
  Q Total (cfs)            4497.00    Flow (cfs)                          4497.00
  Top Width (ft)             14.00    Top Width (ft)                        14.00
  Vel Total (ft/s)           26.55    Avg. Vel. (ft/s)                      26.55
  Max Chl Dpth (ft)          12.10    Hydr. Depth (ft)                      12.10
  Conv. Total (cfs)        45285.3    Conv. (cfs)                         45285.3
  Length Wtd. (ft)           47.39    Wetted Per. (ft)                      38.20
  Min Ch El (ft)           2678.15    Shear (lb/sq ft)                       2.73
  Alpha                       1.00    Stream Power (lb/ft s)                72.48
  Frctn Loss (ft)             0.47    Cum Volume (acre-ft)                   0.18
```

C & E Loss (ft)	0.00	Cum SA (acres)	0.02

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION

RIVER: FEMA Wash
REACH: MAIN1 RS: 800

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	2689.68	0	2677.68	14	2677.68	14	2689.68

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	14	.015

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
0	14	0	0	0	.01	.03

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2700.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.95	Wt. n-Val.		0.015	
W.S. Elev (ft)	2689.78	Reach Len. (ft)			
Crit W.S. (ft)	2692.39	Flow Area (sq ft)		169.42	
E.G. Slope (ft/ft)	0.009854	Area (sq ft)		169.42	
Q Total (cfs)	4497.00	Flow (cfs)		4497.00	
Top Width (ft)	14.00	Top Width (ft)		14.00	
Vel Total (ft/s)	26.54	Avg. Vel. (ft/s)		26.54	
Max Chl Dpth (ft)	12.10	Hydr. Depth (ft)		12.10	
Conv. Total (cfs)	45301.2	Conv. (cfs)		45301.2	
Length Wtd. (ft)		Wetted Per. (ft)		38.20	
Min Ch El (ft)	2677.68	Shear (lb/sq ft)		2.73	
Alpha	1.00	Stream Power (lb/ft s)		72.42	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: The cross-section end points had to be extended vertically for the computed water surface.

SUMMARY OF MANNING'S N VALUES

River:FEMA Wash

Reach	River Sta.	n1	n2	n3
MAIN1	1400	.035	.035	.035
MAIN1	1383.33*	.035	.035	
MAIN1	1366.67*	.035	.035	
MAIN1	1350.00*	.035	.035	
MAIN1	1333.33*	.035	.035	
MAIN1	1316.67*	.035	.035	
MAIN1	1300	.035	.035	.035
MAIN1	1299	.037	.037	.037
MAIN1	1199.50*	.037	.037	
MAIN1	1100	.037	.037	.037
MAIN1	1099	.037	.02	.037
MAIN1	1098	.037	.02	.037
MAIN1	1000	.02	.02	.02
MAIN1	966.67*	.018	.018	
MAIN1	933.33*	.017	.017	
MAIN1	900	.015	.015	.015
MAIN1	892.31*	.015	.015	
MAIN1	884.62*	.015	.015	
MAIN1	876.92*	.015	.015	
MAIN1	869.23*	.015	.015	
MAIN1	861.54*	.015	.015	
MAIN1	853.85*	.015	.015	
MAIN1	846.15*	.015	.015	
MAIN1	838.46*	.015	.015	
MAIN1	830.77*	.015	.015	
MAIN1	823.08*	.015	.015	
MAIN1	815.38*	.015	.015	
MAIN1	807.69*	.015	.015	
MAIN1	800	.015	.015	.015

SUMMARY OF REACH LENGTHS

River: FEMA Wash

Reach	River Sta.	Left	Channel	Right
MAIN1	1400	47.29	44.84	43.76
MAIN1	1383.33*	47.29	44.84	43.76
MAIN1	1366.67*	47.29	44.84	43.76
MAIN1	1350.00*	47.29	44.84	43.76
MAIN1	1333.33*	47.29	44.84	43.76
MAIN1	1316.67*	47.29	44.84	43.76
MAIN1	1300	.1	.1	.1
MAIN1	1299	49.33	33.5	28.05
MAIN1	1199.50*	49.33	33.5	28.05
MAIN1	1100	38.24	30	60
MAIN1	1099	49	49	49
MAIN1	1098	44	44	44
MAIN1	1000	38.48	38.48	38.48
MAIN1	966.67*	38.48	38.48	38.48
MAIN1	933.33*	38.48	38.48	38.48
MAIN1	900	47.39	47.39	47.39
MAIN1	892.31*	47.39	47.39	47.39
MAIN1	884.62*	47.39	47.39	47.39
MAIN1	876.92*	47.39	47.39	47.39
MAIN1	869.23*	47.39	47.39	47.39
MAIN1	861.54*	47.39	47.39	47.39
MAIN1	853.85*	47.39	47.39	47.39
MAIN1	846.15*	47.39	47.39	47.39
MAIN1	838.46*	47.39	47.39	47.39
MAIN1	830.77*	47.39	47.39	47.39
MAIN1	823.08*	47.39	47.39	47.39
MAIN1	815.38*	47.39	47.39	47.39
MAIN1	807.69*	47.39	47.39	47.39
MAIN1	800	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: FEMA Wash

Reach	River Sta.	Contr.	Expan.
MAIN1	1400	.1	.3
MAIN1	1383.33*	.1	.3
MAIN1	1366.67*	.1	.3
MAIN1	1350.00*	.1	.3
MAIN1	1333.33*	.1	.3
MAIN1	1316.67*	.1	.3
MAIN1	1300	.1	.3
MAIN1	1299	.1	.3
MAIN1	1199.50*	.1	.3
MAIN1	1100	.1	.3
MAIN1	1099	.1	.3
MAIN1	1098	.1	.3
MAIN1	1000	.01	.03
MAIN1	966.67*	.01	.03
MAIN1	933.33*	.01	.03
MAIN1	900	.01	.03
MAIN1	892.31*	.01	.03
MAIN1	884.62*	.01	.03
MAIN1	876.92*	.01	.03
MAIN1	869.23*	.01	.03
MAIN1	861.54*	.01	.03
MAIN1	853.85*	.01	.03
MAIN1	846.15*	.01	.03
MAIN1	838.46*	.01	.03
MAIN1	830.77*	.01	.03
MAIN1	823.08*	.01	.03
MAIN1	815.38*	.01	.03
MAIN1	807.69*	.01	.03
MAIN1	800	.01	.03

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : PLAN02

River: FEMA Wash Reach: MAIN1 RS: 1400 Profile: PF 1
Warning:Slope too shallow for slope area to converge during supercritical flow calculations (normal depth is above critical depth). Water surface set to critical depth.
River: FEMA Wash Reach: MAIN1 RS: 1383.33* Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: FEMA Wash Reach: MAIN1 RS: 1366.67* Profile: PF 1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate

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            the need for additional cross sections.
River: FEMA Wash  Reach: MAIN1     RS: 1350.00*     Profile: PF 1
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Hydraulic jump has occurred between this cross section and the previous upstream section.
River: FEMA Wash  Reach: MAIN1     RS: 1100     Profile: PF 1
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
             This may indicate the need for additional cross sections.
River: FEMA Wash  Reach: MAIN1     RS: 1099     Profile: PF 1
     Warning:The energy equation could not be balanced within the specified number of iterations.  The program used critical depth
             for the water surface and continued on with the calculations.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
     Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.  This may indicate
             the need for additional cross sections.
     Warning:During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated
             water surface came back below critical depth.  This indicates that there is not a valid subcritical answer.  The
             program defaulted to critical depth.
River: FEMA Wash  Reach: MAIN1     RS: 1098     Profile: PF 1
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
             This may indicate the need for additional cross sections.
     Note:   Program found supercritical flow starting at this cross section.
River: FEMA Wash  Reach: MAIN1     RS: 1000     Profile: PF 1
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
     Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
             This may indicate the need for additional cross sections.
River: FEMA Wash  Reach: MAIN1     RS: 966.67*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
     Warning:The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for additional cross sections.
River: FEMA Wash  Reach: MAIN1     RS: 933.33*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 900     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 892.31*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 884.62*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 876.92*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 869.23*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 861.54*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 853.85*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 846.15*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 838.46*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 830.77*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 823.08*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 815.38*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 807.69*     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
River: FEMA Wash  Reach: MAIN1     RS: 800     Profile: PF 1
     Warning:The cross-section end points had to be extended vertically for the computed water surface.
```
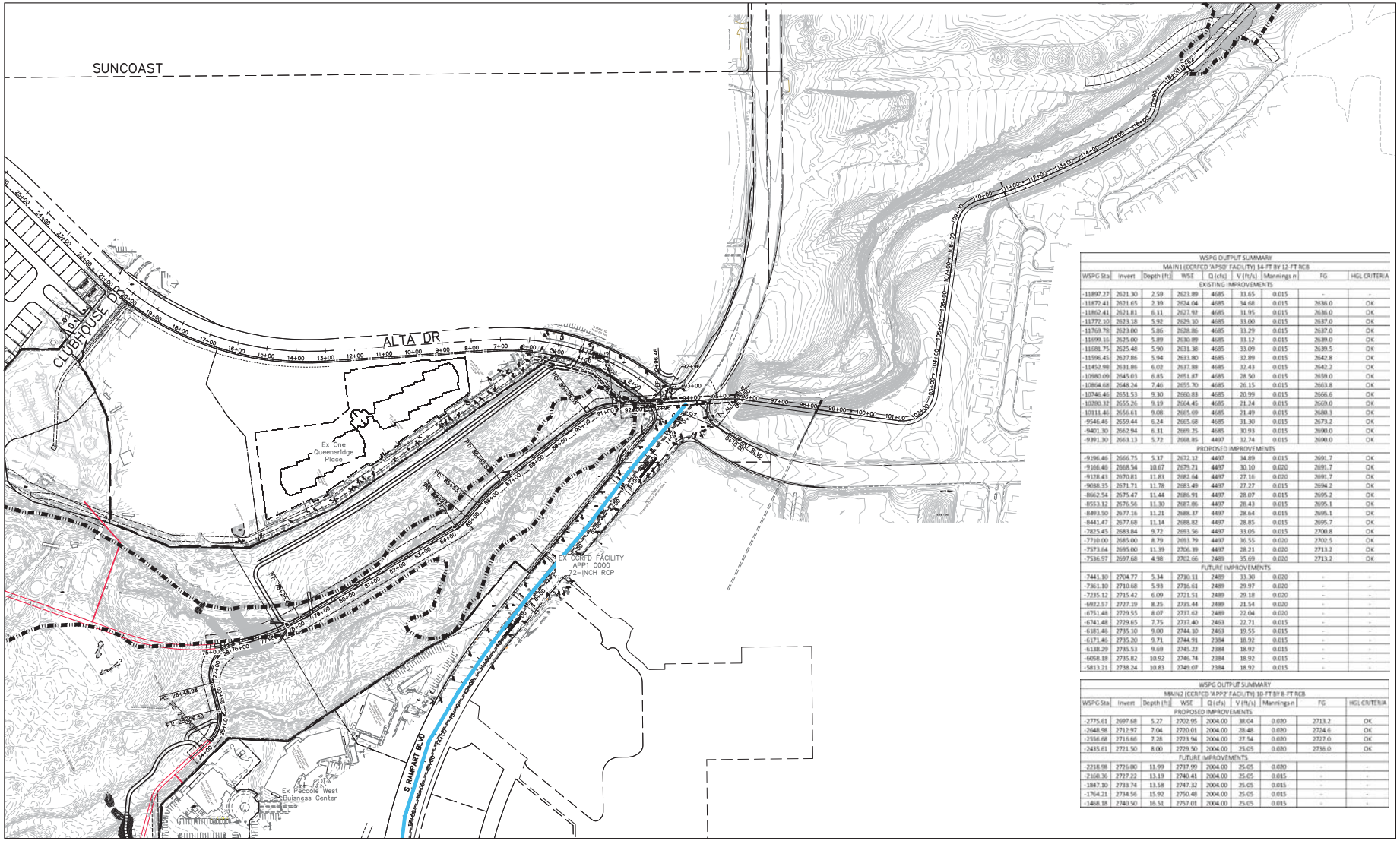

APPENDIX C

Drainage Exhibits



WSPG OUTPUT SUMMARY

MAIN1 (CCRFCD 'APSO' FACILITY) 14-FT BY 12-FT RCB

WSPG Sta	Invert	Depth (ft)	WSE	Q (cfs)	V (ft/s)	Mannings n	FG	HGL CRITERIA
EXISTING IMPROVEMENTS								
-11897.27	2621.30	2.59	2623.89	4685	33.65	0.015	-	-
-11872.41	2621.65	2.39	2624.04	4685	34.68	0.015	2636.0	OK
-11862.41	2621.81	6.11	2627.92	4685	31.95	0.015	2636.0	OK
-11772.10	2623.18	5.92	2629.10	4685	33.00	0.015	2637.0	OK
-11769.78	2623.00	5.86	2628.86	4685	33.29	0.015	2637.0	OK
-11699.16	2625.00	5.89	2630.89	4685	33.12	0.015	2639.0	OK
-11681.75	2625.48	5.90	2631.38	4685	33.09	0.015	2639.5	OK
-11596.45	2627.86	5.94	2633.80	4685	32.89	0.015	2642.8	OK
-11452.98	2631.86	6.02	2637.88	4685	32.43	0.015	2642.2	OK
-10980.09	2645.03	6.85	2651.87	4685	28.50	0.015	2659.0	OK
-10864.68	2648.24	7.46	2655.70	4685	26.15	0.015	2663.8	OK
-10746.46	2651.53	9.30	2660.83	4685	20.99	0.015	2666.6	OK
-10280.32	2655.26	9.19	2664.45	4685	21.24	0.015	2669.0	OK
-10111.46	2656.61	9.08	2665.69	4685	21.49	0.015	2680.3	OK
-9546.46	2659.44	6.24	2665.68	4685	31.30	0.015	2673.2	OK
-9401.30	2662.94	6.31	2669.25	4685	30.93	0.015	2690.0	OK
-9391.30	2663.13	5.72	2668.85	4497	32.74	0.015	2690.0	OK
PROPOSED IMPROVEMENTS								
-9196.46	2666.75	5.37	2672.12	4497	34.89	0.015	2691.7	OK
-9166.46	2668.54	10.67	2679.21	4497	30.10	0.020	2691.7	OK
-9128.43	2670.81	11.83	2682.64	4497	27.16	0.020	2691.7	OK
-9038.35	2671.71	11.78	2683.49	4497	27.27	0.015	2694.2	OK
-8662.54	2675.47	11.44	2686.91	4497	28.07	0.015	2695.2	OK
-8553.12	2676.56	11.30	2687.86	4497	28.43	0.015	2695.1	OK
-8493.50	2677.16	11.21	2688.37	4497	28.64	0.015	2695.1	OK
-8441.47	2677.68	11.14	2688.82	4497	28.85	0.015	2695.7	OK
-7825.45	2683.84	9.72	2693.56	4497	33.05	0.015	2700.8	OK
-7710.00	2685.00	8.79	2693.79	4497	36.55	0.020	2702.5	OK
-7573.64	2695.00	11.39	2706.39	4497	28.21	0.020	2713.2	OK
-7536.97	2697.68	4.98	2702.66	2489	35.69	0.020	2713.2	OK
FUTURE IMPROVEMENTS								
-7441.10	2704.77	5.34	2710.11	2489	33.30	0.020	-	-
-7361.10	2710.68	5.93	2716.61	2489	29.97	0.020	-	-
-7235.12	2715.42	6.09	2721.51	2489	29.18	0.020	-	-
-6922.57	2727.19	8.25	2735.44	2489	21.54	0.020	-	-
-6751.48	2729.55	8.07	2737.62	2489	22.04	0.020	-	-
-6741.48	2729.65	7.75	2737.40	2463	22.71	0.015	-	-
-6181.46	2735.10	9.00	2744.10	2463	19.55	0.015	-	-
-6171.46	2735.20	9.71	2744.91	2384	18.92	0.015	-	-
-6138.29	2735.53	9.69	2745.22	2384	18.92	0.015	-	-
-6058.18	2735.82	10.92	2746.74	2384	18.92	0.015	-	-
-5813.21	2738.24	10.83	2749.07	2384	18.92	0.015	-	-

WSPG OUTPUT SUMMARY

MAIN2 (CCRFCD 'APP2' FACILITY) 10-FT BY 8-FT RCB

WSPG Sta	Invert	Depth (ft)	WSE	Q (cfs)	V (ft/s)	Mannings n	FG	HGL CRITERIA
PROPOSED IMPROVEMENTS								
-2775.61	2697.68	5.27	2702.95	2004.00	38.04	0.020	2713.2	OK
-2648.98	2712.97	7.04	2720.01	2004.00	28.48	0.020	2724.6	OK
-2556.68	2716.66	7.28	2723.94	2004.00	27.54	0.020	2727.0	OK
-2435.61	2721.50	8.00	2729.50	2004.00	25.05	0.020	2736.0	OK
FUTURE IMPROVEMENTS								
-2218.98	2726.00	11.99	2737.99	2004.00	25.05	0.020	-	-
-2160.36	2727.22	13.19	2740.41	2004.00	25.05	0.015	-	-
-1847.10	2733.74	13.58	2747.32	2004.00	25.05	0.015	-	-
-1764.21	2734.56	15.92	2750.48	2004.00	25.05	0.015	-	-
-1468.18	2740.50	16.51	2757.01	2004.00	25.05	0.015	-	-

LEGEND

FUTURE PHASE 2 FACILITY

EXISTING FEMA ZONE A BOUNDARY

REV	DATE	DESCRIPTION	DATE	AGEN.	APP	DATE	ENG.	APP	DATE

DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 01-11-18
PLOT TIME: 12:28:11

GCW
ENGINEERS & SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\840-060\Helen Ycil\Figures\FIG2\Fig8R.dwg dbogge

SEVENTY ACRES LLC, FORE STARS LTD, AND 180 LAND CO LLC

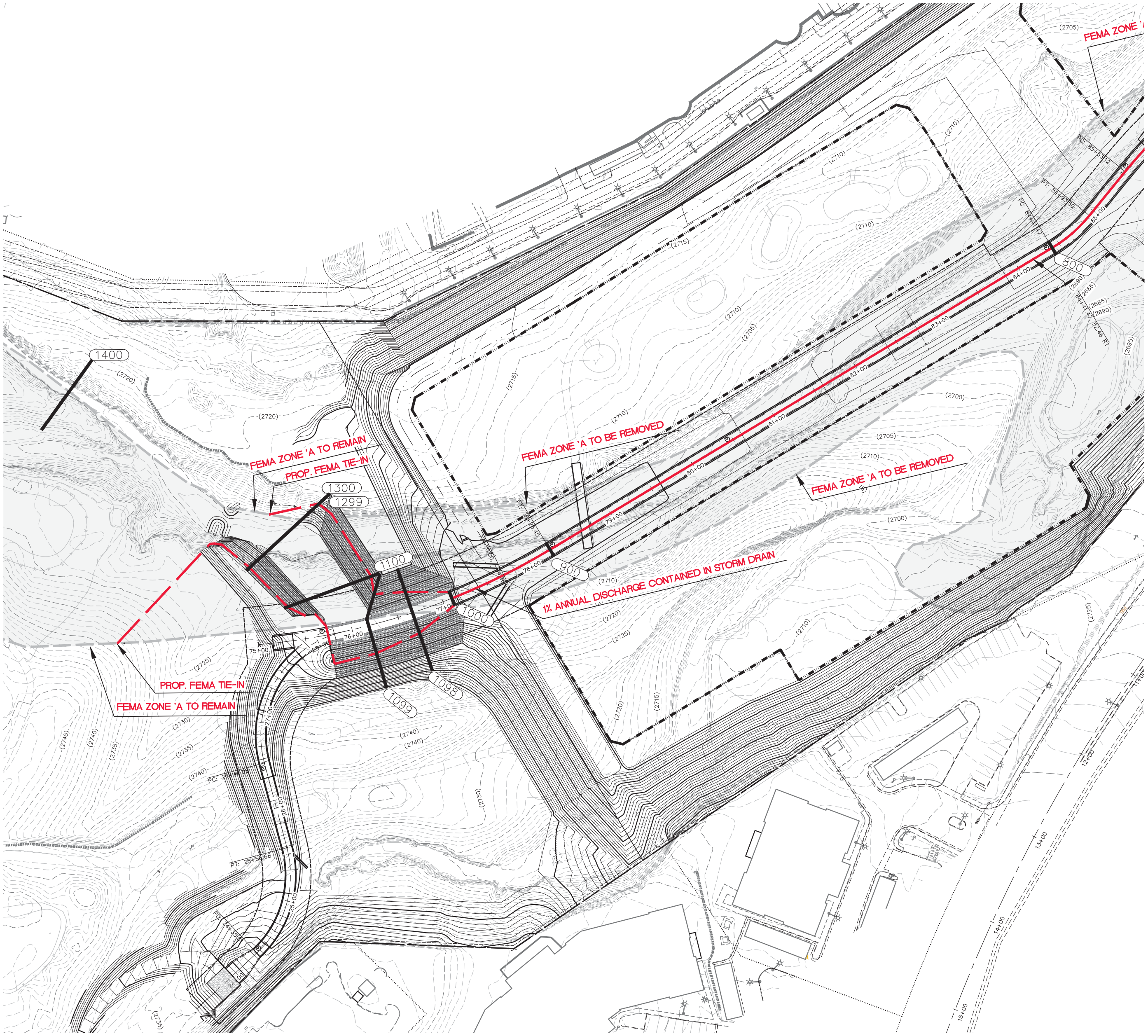
THE 435

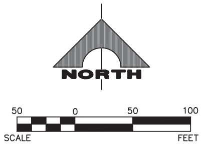
WSPGW EXHIBIT

DRAWING
FIG8R
OF SHTS

REPLY APP 1200

CLV295907





LEGEND

- – – – EXISTING FEMA ZONE 'A'
- 🟥 PROPOSED FEMA ZONE 'A'
- (1000) HEC–RAS CROSS SECTION

River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Depth (ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width	Froude #	Freeboard (ft)
1400[1]	PF 1	2489	2702.00	2713.89	11.89	14.07	176.93	28.94	1.00	-
1300	PF 1	2489	2698.00	2710.08	12.08	2.81	887.13	96.89	0.16	1.00
1299	PF1	2489	2698.00	2710.08	12.08	2.81	887.13	96.89	0.16	1.00
1100	PF 1	2489	2697.30	2710.07	12.77	2.74	908.05	96.28	0.16	1.00
1099	PF1	4497	2691.81	2705.87	14.06	17.70	365.25	51.95	0.83	5.36
1098	PF1	4497	2688.22	2701.60	13.38	22.65	229.55	32.39	1.09	2.34
1000	PF1	4497	2685.00	2696.89	11.89	27.02	166.44	14.00	1.38	2.54
900[2]	PF 1	4497	2683.84	2696.20	12.36	25.99	173.01	14.00	1.30	-
800[2]	PF 1	4497	2677.68	2689.78	12.10	26.54	169.42	14.00	1.35	-

[1] Existing condition wash not analyzed for freeboard

[2] Refer to Figure 8R and WSPG Model for HGL Criteria

FREEBOARD EQUATIONS PER MANUAL

SUB–CRITICAL FLOW $F_b = 0.5 + V^2/2*g$

SUPER–CRITICAL FLOW $F_b = 1.0 + 0.025*V*(d)^{1/3}$

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP	DATE:

PROJECT NO.
840-050

DESIGN:
DRAWN:
CHECK:
PLOT DATE: 01-08-18
PLOT TIME: 09:15:25

GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\800\840-050\Division\Fctl\Figures\RTC2\050-1AA-11R.dwg
Nelson Baggs

SEVENTY ACRES LLC, FORE STARS LTD,
AND 180 LAND CO LLC

THE 435

ENTRY STRUCTURE HEC-RAS CROSS SECTION EXHIBIT

DRAWING
FIG 14
1 OF 1 SHTS

APPENDIX D

Additional Documents and Reference Material

December 28, 2017

GCW
ENGINEERS \ SURVEYORS

Mr. John Alabado and Ms. Linda Maynard
City Planning and Development
City of Las Vegas
333 North Rancho Drive
Las Vegas, NV 89106

RE: 17.49-Acre Parcel (APNs 138-32-301-005 and a portion of 138-32-301-007))
GCW Project # 840-050

Dear Mr. Alabado and Ms. Maynard:

GCW, Inc. is currently preparing mass grading plans and flood control facilities (storm drain boxes and pipe) for the 17.49-acre parcel zoned for 435 condominium units adjacent to Alta Drive and Rampart Boulevard. We have submitted and received comments to the Technical Drainage Study (DS4787A.ZNA.doc); Comment #3 to the Technical Drainage Study referenced the need for an approval of the grade differential relative to our site and the properties adjacent to the perimeter of the 70-acre proposed mass grading site.

The project is bounded by existing and proposed multi-family development (PD) to the north; Alta Drive to the northeast; Rampart Boulevard and C-1 commercial development to the south and east; and an undeveloped portion of the old golf course with an R-PD7 use, owned by Seventy Acres LLC, to the southwest. The site is presently developed as a golf course with washes and gentle to steep ridges throughout the site. The elevation differential from the west limit of the mass grading area to the low point of the project near the intersection of Alta Drive and Rampart Boulevard is in excess of 45 feet.

Our grading plan has been developed to match the existing conditions of the surrounding properties, and to keep future finish floor elevations below grade of adjacent properties. We have worked very hard to minimize the impact of our project and would ask for your support and approval of our grading plan, included with this package.

Thank you for your consideration.

Cordially,
GCW, Inc.

Thomas P. Dyson, PE
Senior Project Manager

PLANS APPROVED
PLANNING
Building & Safety Dept.
City of Las Vegas, Nevada
2FT GRADE DIFFERENCE ONLY
LHM JAN 10 2018

Conforms to the minimum requirements of LVMC Title 19, applicable Master Plan development standards and/or Conditions of Approval. Make No Change Without Approval. Plan is Not a Permit to Violate Any Ordinance.

1555 South Rainbow Boulevard
Las Vegas, Nevada 89146
O 702.804.2000
F 702.804.2299
info@gcwengineering.com
gcwengineering.com

F:\Projects\800\840-050\Admin\Letters\GradeDiffLtr-170913.docx

MANNING'S ROUGHNESS COEFFICIENTS FOR CHANNEL LINING TYPES

Channel Material	Roughness Coefficient (n)	
	Normal	Maximum
Corrugated Metal	0.025	0.030
Concrete**		
1) Trowel finish	0.013	0.015
2) Float finish	0.015	0.016
3) Unfinished	0.017	0.020
4) Shotcrete, Good section	0.019	0.023
5) Shotcrete, wavy section	0.122	0.025
Asphalt (use maximum value when cars are present)	0.016	0.020
Soil-Cement	0.020	0.025
Constructed channels with earth or sand bottom, sides of		
1) Clean earth; straight	0.022	0.025
2) Earth with grass and weeds	0.025	0.030
3) Earth with trees and shrubs	0.032	0.040
4) Shotcrete	0.022	0.025
5) Soil-cement	0.025	0.028
6) Concrete	0.020	0.024
7) Dry rubble or riprap	0.033	0.036
Natural channels with sand bottom, sides of		
1) Trees and shrubs	0.035	0.045
2) Rock	0.032	0.040
Natural channel with rock bottom	0.060	0.090
Overbank floodplains		
1) Desert brush, normal density	0.060	0.080
2) Dense vegetation	0.100	0.160

- Adapted from Chow (1959) and Aldridge and Garrett (1973).

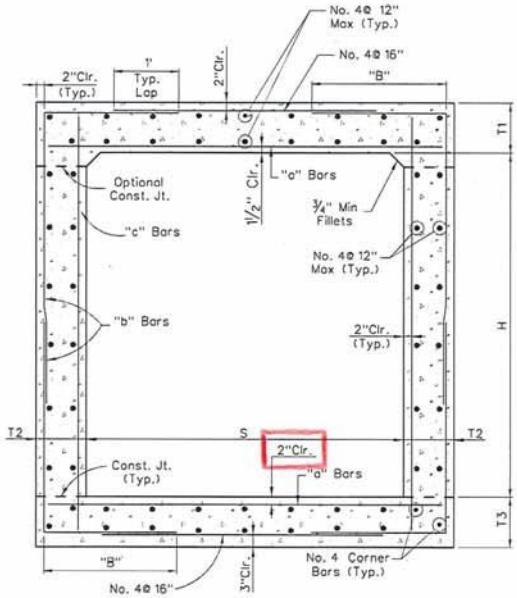
** Manning's Coefficients for Clear Water Only

__ City of Tucson Standards Manual for Drainage Design

Revision	Date

REFERENCE:

TABLE 702



TYPICAL SECTION

NOTES:

1. DESIGN SPECIFICATIONS: "AASHTO LRFD Bridge Design Specifications 2012"

2. CONSTRUCTION SPECIFICATIONS: "State of Nevada Department of Transportation Standard Specifications for Road and Bridge Construction 2014"

3. LIVE LOADS:
   HL-93 Design Truck (32.0 KIP Axle)
   HL-93 Design Tandem (Two 25.0 KIP Axles Spaced 4 Feet Apart)
   (Live Load Impact Factor for Top Slab is 33% up to 2 Feet of Cover)

   LATERAL LIVE LOAD PRESSURE:
   Equivalent to 2 Feet of Earth Surcharge Applied Horizontally = 240 PSF

   DEAD LOADS:
   Soil Unit Weight = 120 PCF
   Min Lateral Earth Pressure = 30 PCF
   Max Lateral Earth Pressure = 60 PCF

4. CONCRETE: Class DA Modified (Major) F'C=4,500 PSI @ 28 Days. (Class D in Clark County)

5. REINFORCING STEEL: All reinforcing steel to be ASTM A615 grade 60 or A706. Dimension relating to bar spacing are center to center

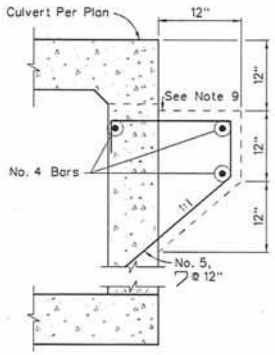
6. DESIGNATION: Box culverts are shown on plans as span times height times length (10' x 8' x 196' RCB).

7. Where traffic loads will be placed directly on the top surface of the culvert, (and/or up to 2 feet of fill), increase top slab thickness by ½ inch and cover for top reinforcement from 2 inches to 2½ inches. Provide epoxy coated reinforcement in top slab (except in Clark County). Decrease spacing of top slab bottom longitudinal bars (#4 @ 12) to 6 inch spacing. Use EA Modified Major concrete (Class E in Clark County) in lieu of Class DA. Adjust quantities accordingly.

8. Provide 2 foot wide Type 1 or Type 2 drain backfill wrapped in Class 1 or Class 2 non-woven geotextile along full height of each culvert exterior wall face.

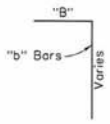
9. Provide paving notch when top slab is exposed and when pavement is concrete. Adjust quantities accordingly.

10. For additional notes, see sheet B-20.1.1



PAVING NOTCH DETAIL

BENT BARS



SHEET 1 OF 2

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

RCB CULVERTS
SINGLE

B-20.1.2	(502,505)	Signed Original On File
ADOPTED 11/70	REVISED 10/15	CHIEF BRIDGE ENGR.

* 308.41

SUPPLEMENT NO. 1 TO THE 2nd UPDATE TO THE TECHNICAL DRAINAGE STUDY FOR QUEENS BOROUGH CULVERT

619.295

MARCH 2006

Prepared for:

JMA Architecture Studios
10150 Covington Cross Drive
Las Vegas, Nevada 89144
Phone: (702) 731- 2033
Fax: (702) 731- 2039

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

~~619.295~~

RECEIVED

APR 26 2006

G.C. WALLACE

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: April 21, 2006
TO: **Land Development Services** Department of Public Works				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Technical Drainage Study for:			**COPIES TO:**
Queens Borrough Culvert **(Plans AKA : The Village at Queensridge Culvert)**				G. C. Wallace, Inc.
Cross Streets:	NEC of Alta Drive & Rampart Boulevard			JMA Architecture
File Number:	F:\Depot\DSMEMOS\DS3674F.ZNA.doc			Bart Anderson, P.E., DevCo
Parcel Number:	138-32-601-003			CCRFCD
FEMA Flood Zone	YES	**X**	NO	
Proposed Storm Drain	YES	**X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Trn. No.
1st Submittal	10/25/2004	11/9/2004	Not Approved	$400.00	11413: $400
2nd Submittal	12/6/2004	12/20/2004	See Comments Below	$400.00	13199: $400
3rd Submittal	3/4/2005	3/18/2005	Conditionally Approved	N/C	--
4th Submittal	8/9/2005	8/23/2005	See Comments Below	$400.00	27281: $400
5th Submittal	12/15/2005	12/30/2005	See Comments Below	$400.00	35359: $400
6th Submittal	2/28/2006 3/30/2006 & 4/20/2006	4/21/2006	See Comments Below	N/C	N/C
			TOTAL FEES (LDDRS):	**$1,600.00**	**----**

REMARKS: 6th Submittal: Revised the on-site RCB alignment at the northeast corner of the site. Revised the RCB outfall structure, to include additional grading within Angel Park and the relocation of the concrete access road.

The Drainage Study for the subject project has been reviewed and:

X	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.

1. The existing 48'-public drainage easement (Doc # 20051129:04185) must be vacated and a new easement dedicated to reflect the revised storm drain location. Provide a new legal description and exhibit to the Right-of-Way Section with a copy to Flood Control for review and approval. The revised easement must record concurrently with the vacated easement. The new easement must record prior to the final approval of the future technical drainage study needed for onsite development or approval of any final maps. **It is noted that the public drainage easement must be privately maintained both on the surface and within the box culvert.**

2. The revised plans for the storm drain system (CLV # 107y4889-CUL) must be submitted to Land Development for approval of this proposed revision.

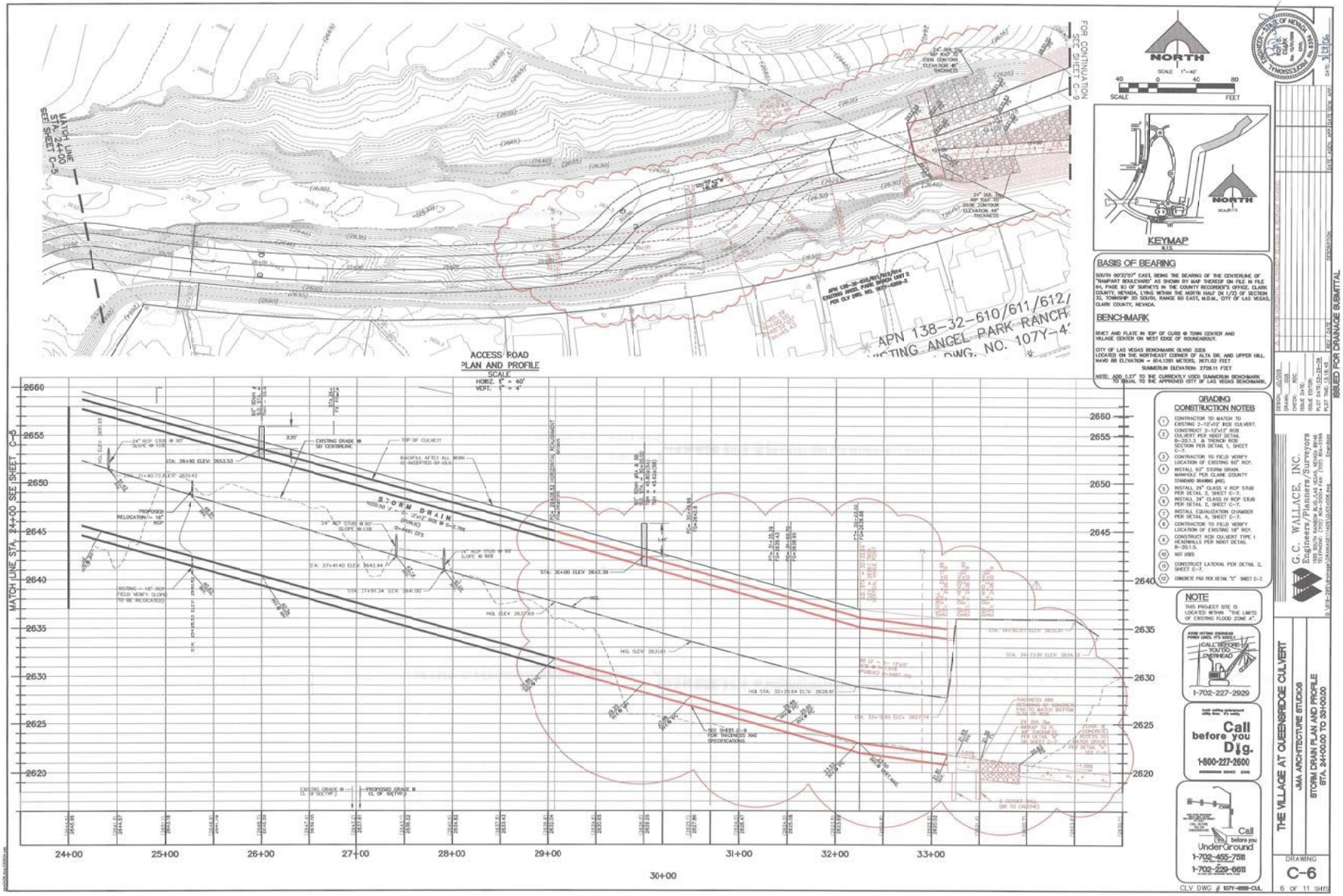
3. The engineer has provided a copy of the FEMA Conditional Letter of Map Revision (CLOMR), Case No. 05-09-0420R for the subject project. The engineer is advised that they are required to obtain FEMA approval for this revision as well as the completed "As-Built" condition in order to obtain the Letter of Map Revision (LOMR). **The approved LOMR must be submitted to the City of Las Vegas prior to the release of the bond.**

NOTE: The engineer must submit the drainage study to FEMA for a Conditional Letter of Map Revision (CLOMR). A favorable CLOMR must be obtained prior to the issuance of any permits. This site is located in a **FEMA Zone A**. Clark County Regional Flood Control District (CCRFCD) review and approval is required prior to recordation of final map or issuance of building/grading permits. The Engineer must send a copy of the report to the CCRFCD for review. **The developer/engineer must also obtain a Letter of Map Revision (LOMR) using the approved drainage study as technical support to inform FEMA of the modifications within the flood zone. The approved LOMR must be submitted to the City of Las Vegas prior to the release of the bond.** FEMA Elevation Certificates, showing as-built finish floor elevations, must be completed for each building in the FEMA A Zone. The certificate must be submitted to the City of Las Vegas Flood Control Section prior to scheduling a framing inspection.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm or call (775) 687-9429.

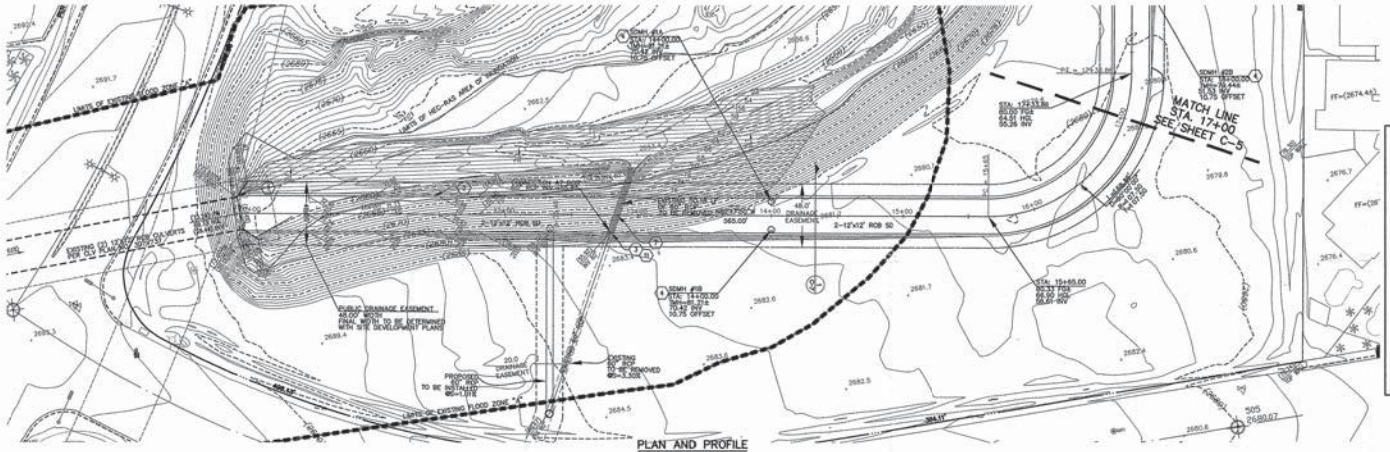
END OF REMARKS
B&H/ays/pbj

T/R/S: T20S/R60E/32
AREA L-32

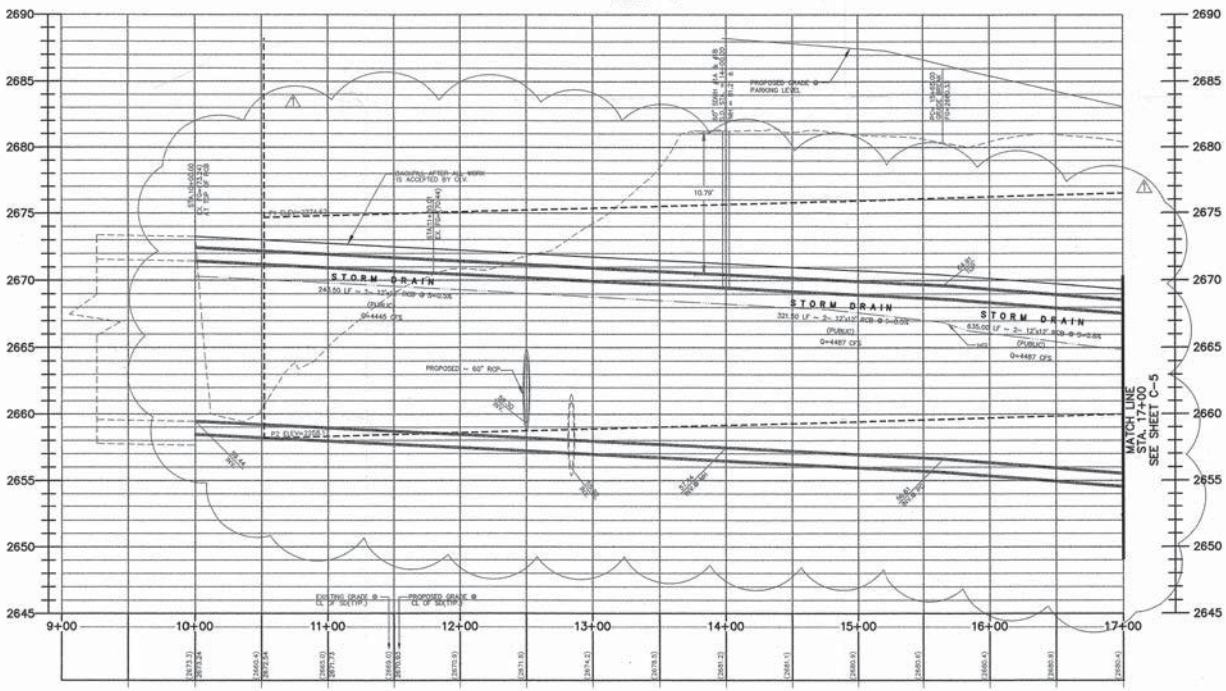


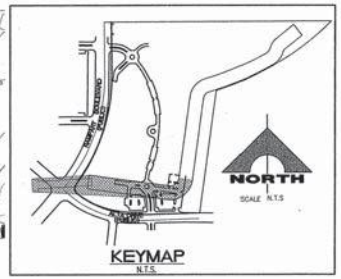
REPLY APP 1209

CLV2295916



PLAN AND PROFILE
SCALE
HORIZ. 1" = 40'
VERT. 1" = 4'





KEYMAP
N.T.S.

NORTH
SCALE 1"=40'

BASIS OF BEARING

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF "RAMPART BOULEVARD" AS SHOWN BY MAP THEREOF ON FILE IN FILE 64, PAGE 93 OF SURVEYS IN THE COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA, LYING WITHIN THE NORTH HALF (N 1/2) OF SECTION 32, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

BENCHMARK

RIVET AND PLATE IN TOP OF CURB @ TOWN CENTER AND VILLAGE CENTER ON WEST EDGE OF ROUNDABOUT.

CITY OF LAS VEGAS BENCHMARK OLVDD 32E6
LOCATED ON THE NORTHEAST CORNER OF ALTA DR. AND UPPER HILL.
NAVD 88 ELEVATION = 814.1281 METERS, 2671.02 FEET

SUMMERLIN ELEVATION: 2726.11 FEET

NOTE: ADD 2.27' TO THE CURRENTLY USED SUMMERLIN BENCHMARK TO EQUAL TO THE APPROVED CITY OF LAS VEGAS BENCHMARK.

GRADING CONSTRUCTION NOTES

1. CONTRACTOR TO MATCH TO EXISTING 3-12'x12' RCB CULVERT.
2. CONSTRUCT 2-12'x12' RCB CULVERT PER NDOT DETAIL B-20.1.3 & TRENCH RCB SECTION PER DETAIL 1, SHEET C-7.
3. CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING 60" RCP.
4. INSTALL 60" STORM DRAIN MANHOLE PER CLARK COUNTY STANDARD DRAWING #403.
5. INSTALL 24" CLASS V RCP STUB PER DETAIL 2, SHEET C-7.
6. INSTALL 24" CLASS IV RCP STUB PER DETAIL 2, SHEET C-7.
7. INSTALL EQUALIZATION CHAMBER PER DETAIL A, SHEET C-7.
8. CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING 18" RCP.
9. CONSTRUCT RCB CULVERT TYPE I HEADWALLS PER NDOT DETAIL B-20.1.3.
10. NOT USED
11. CONSTRUCT LATERAL PER DETAIL 2, SHEET C-7.
12. CONCRETE PAD PER DETAIL "C" SHEET C-7.

NOTE

THIS PROJECT SITE IS LOCATED WITHIN "THE LIMITS OF EXISTING FLOOD ZONE A"

AVOID HITTING OVERHEAD POWER LINES. IT'S SIMPLE.
CALL BEFORE YOU DIG OVERHEAD
1-702-227-2929

AVOID HITTING UNDERGROUND UTILITIES. IT'S SIMPLE.
Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE (USA)

NOTIFY NEIGHBORS BEFORE WORK BEGINS
CALL WORK MANAGEMENT
Call before you UnderGround
1-702-455-7511
1-702-229-6611

CLV DWG #

STATE OF NEVADA
PROFESSIONAL ENGINEER
PAUL D. CLARK
No. 9370
DATE: 12/14/05

REV.	DATE	DESCRIPTION	DATE	APP	DATE	BOOK	APP
A	12/13/05	ISSUE SPEC. OR SUBMIT.					

ISSUED FOR DRAINAGE SUBMITTAL

DESIGN: JLC/DS
DRAWN: DS
CHECK: RDC
ISSUE DATE:
LAST REVISION:
PLOT DATE: 12-13-05
PLOT TIME: 11:31:45

G. C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 South Rainbow Blvd./Las Vegas, Nevada 89146
(702) 364-1723 • FAX: (702) 364-1826
G:\819-2997\dwg\Drainage\DRAINAGE\C05-Dwg

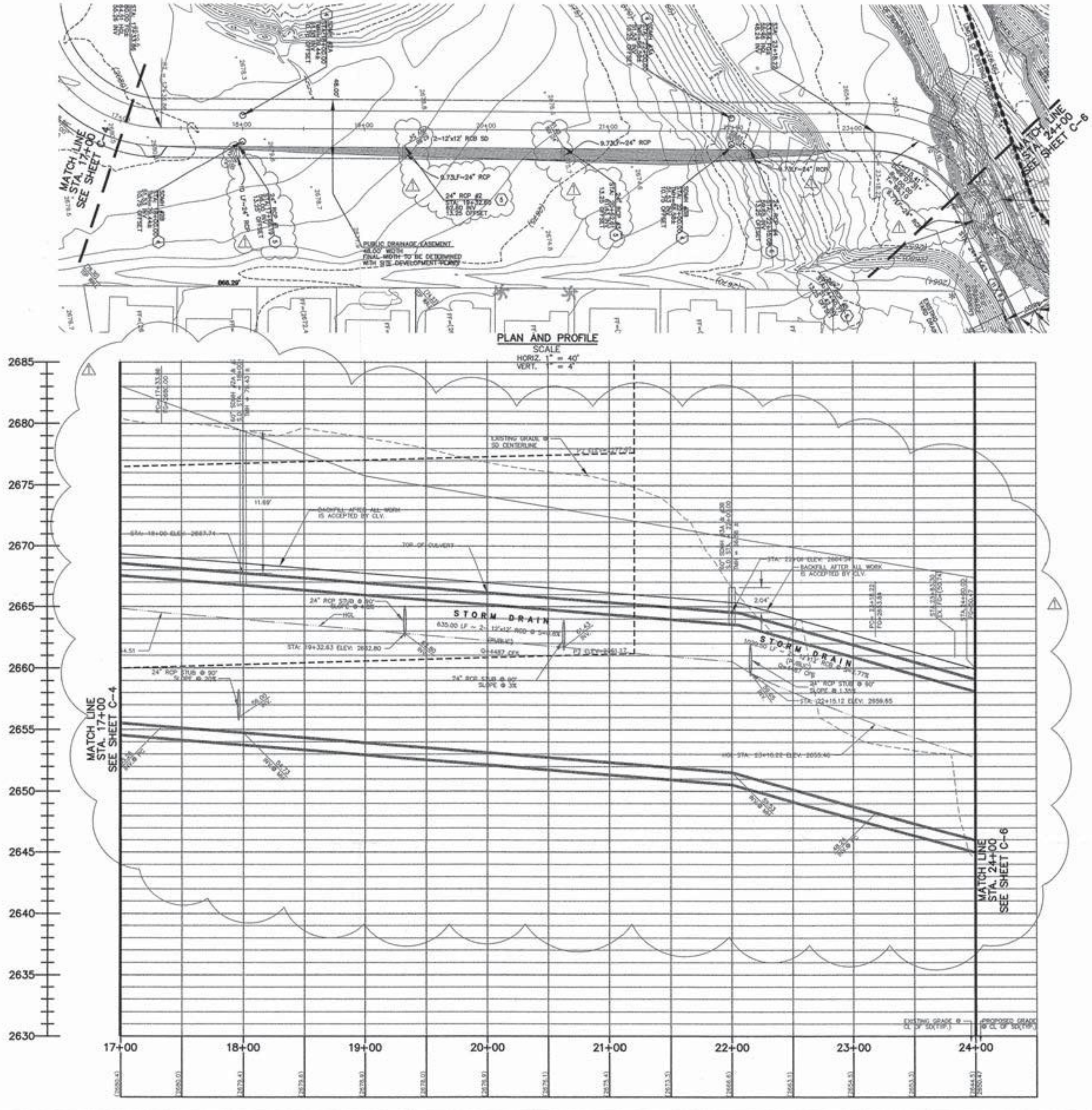
THE VILLAGE AT QUEENSRIDGE CULVERT
JMA ARCHITECTURE STUDIOS
STORM DRAIN PLAN AND PROFILE
STA. 10+00.00 TO 17+00.00

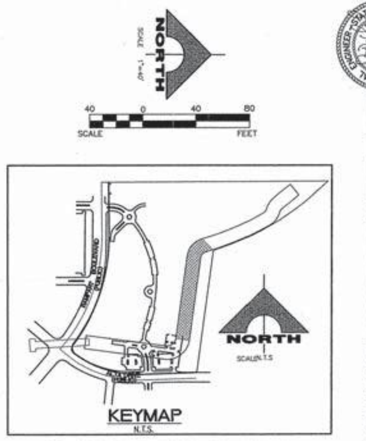
DRAWING
C-4
4 OF 11 SHTS

REPLY APP 1210

CLV295917

6286





KEYMAP

N.T.S.

BASIS OF BEARING

SOUTH 00°32'07" EAST, BEING THE BEARING OF THE CENTERLINE OF "RAMPART BOULEVARD" AS SHOWN BY MAP THEREOF ON FILE IN FILE 64, PAGE 93 OF SURVEYS IN THE COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA, LYING WITHIN THE NORTH HALF (N 1/2) OF SECTION 32, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

BENCHMARK

RIVET AND PLATE IN TOP OF CURB @ TOWN CENTER AND VILLAGE CENTER ON WEST EDGE OF ROUNDABOUT.

CITY OF LAS VEGAS BENCHMARK GLVDO 3206
LOCATED ON THE NORTHEAST CORNER OF ALTA DR. AND UPPER HILL.
NAVD 88 ELEVATION = 814.1281 METERS, 2671.02 FEET
SUMMERLIN ELEVATION: 2728.11 FEET

NOTE: ADD 2.27' TO THE CURRENTLY USED SUMMERLIN BENCHMARK TO EQUAL TO THE APPROVED CITY OF LAS VEGAS BENCHMARK.

GRADING CONSTRUCTION NOTES

① CONTRACTOR TO MATCH TO EXISTING 2-12'x12' RCB CULVERT.
② CONSTRUCT 2-12'x12' RCB CULVERT PER NDOT DETAIL B-20.1.3 & TRENCH RCB SECTION PER DETAIL 1, SHEET C-7.
③ CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING 60" RCP.
④ INSTALL 60" STORM DRAIN MANHOLE PER NDOT DETAIL R-4.7.1. OR CLARK COUNTY STANDARD DRAWING #403.
⑤ INSTALL 24" CLASS V RCP STUB PER DETAIL 2, SHEET C-7.
⑥ INSTALL 24" CLASS IV RCP STUB PER DETAIL 2, SHEET C-7.
⑦ INSTALL EQUALIZATION CHAMBER PER DETAIL A, SHEET C-7.
⑧ CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING 18" RCP.
⑨ CONSTRUCT RCB CULVERT TYPE I HEADWALLS PER NDOT DETAIL B-20.1.5.
⑩ NOT USED
⑪ CONSTRUCT LATERAL PER DETAIL 2, SHEET C-7.
⑫ CONCRETE PAD PER DETAIL "C" SHEET C-7.

NOTE

12' X 12' BOX IS DESIGNED FOR MAX 20' OF FILL PER NEVADA DEPARTMENT OF TRANSPORTATION STANDARDS.

NOTE

THIS PROJECT SITE IS LOCATED WITHIN "THE LIMITS OF EXISTING FLOOD ZONE A".

1-702-227-2929

Call before you Dig.
1-800-227-2600

Call before you UnderGround
1-702-455-7511
1-702-229-6611

CLV DWG #

THE VILLAGE AT QUEENSRIDGE CULVERT
JMA ARCHITECTURE STUDIOS
STORM DRAIN PLAN AND PROFILE
STA. 17+00.00 TO 24+00.00

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

DESIGNED: DGS/EMEN
DRAWN: DGS/EMEN
CHECK: RDC
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 12-13-05
PLOT TIME: 11:30:45

ISSUED FOR DRAINAGE SUBMITTAL

DRAWING
C-5
5 OF 11 SHTS

RAY D. CLARK
No. 8354
DATE: 12/14/05

FILE: QB12X12-U2.WSW

W S P G W - CIVILDESIGN Version 14.06
Program Package Serial Number: 1622
WATER SURFACE PROFILE LISTING

Date: 3-16-2006 Time:10: 6: 6

QUEENSBOROUGH CULVERT - JMA ARCH STUDIOS
GCWALLACE PROJECT # 619.295
FILENAME: QB12X12-U2.WSW CJK

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-3625.000	14.000	7.834	21.834	4497.00	17.38	4.69	26.53	.00	9.28	62.96		1		0 .0
TRANS STR	.0400					.0187	1.41	7.83	1.51		.035			IR-
OPEN														
-3550.000	17.000	8.266	25.266	4497.00	13.55	2.85	28.12	.00	8.27	58.19		2		0 .0
TRANS STR	.0100					.0070	.35	8.27	1.00		.035			IR-
OPEN														
-3500.000	17.500	10.031	27.531	4497.00	8.46	1.11	28.64	.00	7.33	75.12		3		0 .0
TRANS STR	.0328							10.031	.561		.040			IR-
OPEN														
-3401.010	20.750	2.481	23.231	4497.00	31.66	15.56	38.79	.00	5.67	63.50		4		0 .0
TRANS STR	.0110					.0371	1.86	2.48	3.73		.015			IR-
OPEN														
-3350.810	21.300	2.522	23.822	4497.00	33.25	17.16	40.99	.00	5.89	59.13		5		0 .0
TRANS STR	.0141					.0413	1.03	2.52	3.87		.015			IR-
OPEN														
-3325.950	21.650	2.323	23.973	4497.00	34.29	18.26	42.23	.00	5.71	60.97		6		0 .0
TRANS STR	.0160					.0340	.34	2.32	4.12		.015			IR-
OPEN														
-3315.950	21.810	5.925	27.735	4497.00	31.62	15.53	43.26	.00	10.29	25.00	12.000	25.000	.00	1 1.0
90.310	.0152					.0249	2.24	5.93	2.34	7.02	.015	.00	.00	BOX
-3225.640	23.180	5.731	28.911	4497.00	32.69	16.60	45.51	.00	10.29	25.00	12.000	25.000	.00	1 1.0
2.320	-.0776					.0263	.06	5.73	2.46	.00	.015	.00	.00	BOX
-3223.320	23.000	5.682	28.682	4497.00	32.98	16.89	45.57	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
70.620	.0283					.0264	1.86	12.00	2.49	5.55	.015	.00	.00	BOX

Starting WSE

Program Package Serial Number: 1622

WATER SURFACE PROFILE LISTING

Date: 3-16-2006 Time:10: 6: 6

QUEENSBOROUGH CULVERT - JMA ARCH STUDIOS

GCWALLACE PROJECT # 619.295

FILENAME: QB12X12-U2.WSW CJK

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-3152.700	25.000	5.709	30.709	4497.00	32.82	16.73	47.44	.00	10.29	25.00	12.000	25.000	.00	1 1.0
17.410	.0276					.0262	.46	5.71	2.47	5.60	.015	.00	.00	BOX
-3135.290	25.480	5.714	31.194	4497.00	32.79	16.70	47.89	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
85.300	.0279					.0260	2.21	12.00	2.47	5.58	.015	.00	.00	BOX
-3049.990	27.860	5.748	33.608	4497.00	32.60	16.50	50.11	.00	10.29	25.00	12.000	25.000	.00	1 1.0
143.470	.0279					.0253	3.63	5.75	2.45	5.58	.015	.00	.00	BOX
-2906.520	31.860	5.829	37.689	4497.00	32.15	16.05	53.73	.40	10.29	25.00	12.000	25.000	.00	1 1.0
203.401	.0278					.0238	4.83	6.22	2.39	5.58	.015	.00	.00	BOX
-2703.119	37.523	6.024	43.546	4497.00	31.11	15.02	58.57	.37	10.29	25.00	12.000	25.000	.00	1 1.0
165.794	.0278					.0214	3.54	6.39	2.28	5.58	.015	.00	.00	BOX
-2537.325	42.138	6.318	48.456	4497.00	29.66	13.66	62.11	.34	10.29	25.00	12.000	25.000	.00	1 1.0
103.695	.0278					.0188	1.95	6.65	2.12	5.58	.015	.00	.00	BOX
-2433.630	45.025	6.626	51.651	4497.00	28.28	12.42	64.07	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
60.182	.0278					.0168	1.01	12.00	1.98	5.58	.015	.00	.00	BOX
-2373.448	46.700	6.888	53.588	4497.00	27.20	11.49	65.08	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
55.228	.0278					.0150	.83	12.00	1.86	5.58	.015	.00	.00	BOX
-2318.220	48.238	7.224	55.462	4497.00	25.94	10.45	65.91	.00	10.29	25.00	12.000	25.000	.00	1 1.0
26.702	.0278					.0136	.36	7.22	1.74	5.58	.015	.00	.00	BOX

Program Package Serial Number: 1622

WATER SURFACE PROFILE LISTING

Date: 3-16-2006 Time:10: 6: 6

QUEENSBOROUGH CULVERT - JMA ARCH STUDIOS

GCWALLACE PROJECT # 619.295

FILENAME: QB12X12-U2.WSW CJK

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-2291.518	48.982	7.440	56.421	4497.00	25.19	9.85	66.27	.00	10.29	25.00	12.000	25.000	.00	1 1.0
34.206	.0278					.0123	.42	7.44	1.66	5.58	.015	.00	.00	BOX
-2257.313	49.934	7.803	57.737	4497.00	24.01	8.95	66.69	.00	10.29	25.00	12.000	25.000	.00	1 1.0
25.506	.0278					.0109	.28	7.80	1.55	5.58	.015	.00	.00	BOX
-2231.807	50.644	8.184	58.828	4497.00	22.90	8.14	66.97	.00	10.29	25.00	12.000	25.000	.00	1 1.0
18.679	.0278					.0096	.18	8.18	1.44	5.58	.015	.00	.00	BOX
-2213.128	51.164	8.583	59.748	4497.00	21.83	7.40	67.15	.00	10.29	25.00	12.000	25.000	.00	1 1.0
13.128	.0278					.0085	.11	8.58	1.34	5.58	.015	.00	.00	BOX
-2200.000	51.530	9.002	60.532	4497.00	20.81	6.73	67.26	.00	10.29	25.00	12.000	25.000	.00	1 1.0
60.785	.0080					.0080	.49	9.00	1.25	9.00	.015	.00	.00	BOX
-2139.215	52.016	9.002	61.018	4497.00	20.81	6.73	67.75	.00	10.29	25.00	12.000	25.000	.00	1 1.0
405.355	.0080					.0077	3.13	9.00	1.25	9.00	.015	.00	.00	BOX
-1733.860	55.259	9.255	64.514	4497.00	20.24	6.36	70.88	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
54.700	.0080					.0074	.40	12.00	1.20	9.00	.015	.00	.00	BOX
-1679.160	55.697	9.355	65.051	4497.00	20.03	6.23	71.28	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
95.423	.0080					.0069	.65	12.00	1.18	9.00	.015	.00	.00	BOX
-1583.737	56.460	9.811	66.271	4497.00	19.10	5.66	71.93	12.00	10.29	25.00	12.000	25.000	.00	1 1.0
18.737	.0080					.0061	.11	12.00	1.10	9.00	.015	.00	.00	BOX

Program Package Serial Number: 1622

WATER SURFACE PROFILE LISTING Date: 3-16-2006 Time:10: 6: 6

QUEENSBOROUGH CULVERT - JMA ARCH STUDIOS

GCWALLACE PROJECT # 619.295

FILENAME: QB12X12-U2.WSW CJK

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-1565.000	56.610	10.291	66.901	4497.00	18.21	5.15	72.05	.00	10.29	25.00	12.000	25.000	.00	1 1.0
88.377	.0050					.0051	.45	10.29	1.02	10.85	.015	.00	.00	BOX
-1476.623	57.053	10.793	67.846	4497.00	17.36	4.68	72.53	.00	10.29	25.00	12.000	25.000	.00	1 1.0
257.531	.0050					.0050	1.29	10.79	.95	10.85	.015	.00	.00	BOX
-1219.092	58.343	10.853	69.196	4497.00	17.26	4.63	73.82	.00	10.29	25.00	12.000	25.000	.00	1 1.0
219.092	.0050					.0050	1.10	10.85	.94	10.85	.015	.00	.00	BOX
---------- WARNING - Flow depth near top of box conduit ----------														
-1000.000	59.440	10.853	70.293	4497.00	17.26	4.63	74.92	.00	10.29	25.00	12.000	25.000	.00	1 1.0

APPENDIX E

Improvement Plans

EXHIBIT “YYYYY-8”

IMPROVEMENT PLANS

FOR

SEVENTY ACRES LLC
FORE STARS LTD
THE 435

RAMPART BOULEVARD
LAS VEGAS, NEVADA 89145

APN: 138-32-301-005
APN: 138-32-301-007

INDEX OF DRAWINGS

APPROVALS

APPROVAL OF THESE PLANS IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHTS-OF-WAY AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND/OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER "DEVIATIONS FROM STANDARDS". THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN "DEVIATIONS FROM STANDARDS" IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS CLARK COUNTY AREA NEVADA.

ALLEN PAWELKA PE # 9029 — DATE
CITY ENGINEER

LAS VEGAS FIRE & RESCUE — DATE

CHRIS KNIGHT, DIRECTOR, BUILDING AND SAFETY — DATE

THIS PLAN CONFORMS TO THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT.

UTILITY/AGENCY APPROVALS

COX COMMUNICATIONS LAS VEGAS, INC. — DATE

THE AFFIXED CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS.

CENTRAL TELEPHONE CO., DBA CENTURYLINK — DATE

NV ENERGY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NV ENERGY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS.

NV ENERGY — DATE

SOUTHWEST GAS CORP. — DATE

LEGAL DESCRIPTION

LOTS 1 AND 2 AS SHOWN IN FILE 120, PAGE 91 OF PARCEL MAPS, AND LOT 2 AS SHOWN IN FILE 120, PAGE 44 OF PARCEL MAPS, AND LOT 1 AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS.

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS-XXXXX ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

MARK J. FAKLER P.E. 9911 — DATE

OWNER/DEVELOPER

SEVENTY ACRES LLC AND
FORE STARS LTD
1215 S. FORT APACHE RD.
SUITE #120
LAS VEGAS NV. 89117

BENCHMARK

BM #	DESCRIPTION	NAVD 88 (FEET)	NAVD 88 (METERS)
SLV-106NW6	CITY OF LAS VEGAS VERTICAL CONTROL POINT "SLV106NW6", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP	2914.54	888.355

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

STATE OF NEVADA — PROFESSIONAL ENGINEER — THOMAS P. DYSON — No. 13705 — CIVIL — DATE: 07/10/2018

TDS SUBMITTAL

REV	DATE	DESCRIPTION	DATE	ENGR APP	DATE	CONV APP

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MF
PLOT DATE: 07-10-18
PLOT TIME: 18:22:11

GCW ENGINEERS\SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

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DANIEL LEE

SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

COVER SHEET

DRAWING
C1.01
1 OF 17 SHTS

REPLY APP 1218

CLV295828

ABBREVIATIONS

A	AIR, ANODE
A.E.	ACCESS EASEMENT
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AB,AGG	AGGREGATE BASE
ABAN	ABANDON
AC	ASPHALT CONCRETE, ACRE
ACP	ASBESTOS CEMENT PIPE
ADD'L	ADDITIONAL
ABP	ABANDONINPLACE
ALT	ALTERNATE
AP	ANGLE POINT
APN	ASSESSOR'S PARCEL NUMBER
APPROX	APPROXIMATELY
APT	APARTMENT
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AVAR	AIR VALVE, AIR RELEASE ASSEMBLY
AVE	AVENUE
AWWA	AMERICAN WATERWORKS ASSOCIATION
BC	BACK OF CURB
BCR	BEGIN CURB RETURN, BACK OF CURB RADIUS
BDRY	BOUNDARY
BLDG	BUILDING
BLM	BUREAU OF LAND MANAGEMENT
BLVD	BOULEVARD
BM	BENCHMARK
BO	BLOW-OFF
BVCE	BEGIN VERTICAL CURVE ELEVATION
BVCS	BEGIN VERTICAL CURVE STATION
BW	BACK OF SIDEWALK
BWV	BACKWATER VALVE
C&G	CURB AND GUTTER
C/L	CENTERLINE
CATV	UNDERGROUND CABLE TV
CBC	CITY OF BOULDER CITY
CC	CLARK COUNTY
C-C	CENTER TO CENTER
CCBM	CLARK COUNTY BENCHMARK
CCPW	CLARK COUNTY PUBLIC WORKS
CCRFCD	CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT
CCTV	CLOSED-CIRCUIT TELEVISION
CCWRD	CLARK COUNTY WATER RECLAMATION DISTRICT
CE	COMMON ELEMENT
CF	CUBIC FEET, CURB FACE
CFS	CUBIC FEET PER SECOND
CIP	CAPITAL IMPROVEMENTS PROJECT, CORRUGATED IRON PIPE
CIPM	CURED-IN-PLACE MANHOLE
CIPP	CURED-IN-PLACE PIPE
CIR	CIRCLE
CL	CLASS
CLR	CLEAR OR CLEARANCE
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CLV	CITY OF LAS VEGAS
CM	CITY OF MESQUITE
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CNLV	CITY OF NORTH LAS VEGAS
CO	CLEANOUT
COH	CITY OF HENDERSON
COL	COLUMN
COMM	COMMERCIAL
CONC,PCC	CONCRETE
COND	CONDUIT
CONST	CONSTRUCT OR CONSTRUCTION
COORD	COORDINATE
COR	CORNER
CPEP	CORRUGATED POLYETHELYNE PIPE
CPR	COPPER WATER LINE
CT	COURT
CULV	CULVERT
CY	CUBIC YARD(S)
D,Δ	DELTA
DBL	DOUBLE
DCS	DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEM (LATESTEDITION)
DE	DRAINAGE EASEMENT
DEFL	DEFLECTION
DEPT	DEPARTMENT
DG	DESIGN GRADE
DI	DROP INLET
DIA,ø	DIAMETER
DIP	DUCTILE IRON PIPE
DIST	DISTANCE
DOM	DOMESTIC
DP	DUPLEX
DR	DRIVE
DS	DOWNSPOUT
DTL	DETAIL
DWG	DRAWING
DWY	DRIVEWAY
E	EAST, ELECTRIC
EAE	EMERGENCY ACCESS EASEMENT
EBS	CATHODIC PROTECTION BOND STATION
ECR	END CURB RETURN
ELE,ELEC	ELECTRICAL
ELEV	ELEVATION
EMBK	EMBANKMENT
EP,ECP	EDGE OF PAVEMENT
ESMT	EASEMENT
ETS	CATHODIC PROTECTION TEST STATION
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VETICAL CURVE STATION
EXIST,EX	EXISTING
EXP	EXPANSION JOINT
FA	FIRE ALARM
FC	FACE OF CURB
FF,FFE	FINISH FLOOR ELEVATION
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOWLINE
FLG	FLANGE
FO	FIBEROPTIC
FRP	FIBERGLASS REINFORCED PLASTIC
FS	FINISH SURFACE
FT	FOOT/FEET
FTG	FOOTING
FUT	FUTURE
G	GAS
GA	GAGE ,GUY ANCHOR
GB	GRADE BREAK
GFF	GARAGE FINISHED FLOOR
GND	GROUND
GRD	GRADE, GROUND
GUT	GUTTER
H,HGT	HEIGHT
HDWL	HEADWALL
HDRCP	HORIZONTAL ELLIPTICAL REINFORCED CONCRETE PIPE
HGL	HYDRAULIC GRADELINE
HOA	HOMEOWNERS ASSOCIATION
HORIZ	HORIZONTAL
HP	HIGH POINT, HIGH PRESSURE
HPS	HIGH PRESSURE SODIUM
IBC	INTERNATIONAL BUILDING CODE
IN	INCH
INT	INTERSECTION, INTERIM
INV	INVERT
ISL	ISLAND
JB	JUCNTION BOX
JT	JOINT
L	LENGTH
L,LT	LEFT
LF	LINEAR FEET
LIP	LIP OF GUTTER
LN	LANE
LOC	LENGTH OF CURB
LP	LIGHT POLE
LSLSCP	LANDSCAPE
LVVWD	LAS VEGAS VALLEY WATER DISTRICT
MAX	MAXIMUM
ME	MATCH EXISTING
MH	MANHOLE
MIN	MINIMUM
MLCP	MORTAR LINED AND COATED PIPE
MOD	MODIFY/MODIFIED
MON	MONUMENT, MONOLITHIC
MP	MESAPARK
MPH	MILES PER HOUR
MSM	MINOR SUBDIVISION MAP
N	NORTH
NAP	NOT A PART
NDOT	NEVADA DEPARTMENT OF TRANSPORTATION
NO	NUMBER
NOSHA	STATE OF NEVADA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
NPC	NEVADA POWER COMPANY
NTS	NOT TO SCALE
NVE	NEVADA ENERGY
OB	OVERBUILD
OC	ON CENTER
OG	OPEN GRADE, ORIGINAL GROUND
OHC	OVERHEAD COX COMMUNICATION
OHP	OVERHEAD POWERLINE
P	POWER
PAE	PEDESTRIAN ACCESS EASEMENT
PB	PULL BOX
PBS	PLANTMIX BITUMINOUS SURFACE
PC	POINT OF CURVATURE, PRESSURE CLASS
PCC	POINT OF COMPOUND CURVE, PORTLAND CEMENT CONCRETE
PDE	PUBLIC DRAINAGE EASEMENT
PE	PROJECT ENGINEER OR POLYETHYLENE
PED	PEDESTRIAN
PGL	PROFILE GRADE LINE
PH	POTHOLE
PI	POINT OF INTERSECTION
PIP	PROTECT IN PLACE
PIV	POST INDICATOR VALVE
PL,P/L	PROPERTY LINE
PLDP	POLYURETHANE LINED AND COATED STEEL PIPE
PMF	PAVEMENT MARKING FILM
PO	PUSH-ON
POB	POINT OF BEGINNING
POC	POINT OF CONNECTION
POT	POINT ON TANGENT
PP	POWER POLE
PRC	POINT OF REVERSE CURVE
PROP	PROPOSED
PRVC	POINT OF REVERSE VERTICAL CURVE
PSE	PUBLIC SEWER EASEMENT TO BE PRIVATELY MAINTAINED BY HOA
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENCY
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYLCHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
PVT	PRIVATE
PW	PRODUCT WALL
PZ	PRESSURE ZONE
R,RAD	RADIAL, RADIUS
R,RT	RIGHT
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REC	RECTANGULAR
REF	REFERENCE
REINF	REINFORCED
RELOC	RELOCATE
REQD	REQUIRED
RET	RETAINING
RIM	TOP OF RIM ELEVATION
RND	ROUND
ROW,R/W	RIGHT OF WAY
RP	RADIUS POINT
RPM	RAISED PAVEMENT MARKERS
RPPA	REDUCED PRESSURE PRINCIPAL ASSEMBLY
RR	RAILROAD
RSGV	RESILIENT SEAT GATE VALVE
RTW	RETAINING WALL
RW	REUSE WATER
S	SEWER, SOUTH
SC	STAIRCASE
SCH	SCHEDULE
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SECT	SECTION
SF	SQUARE FOOT/FEET
SHLDR	SHOULDER
SHT	SHEET
SIS	SUMMERLIN IMPROVEMENT STANDARDS
SL, STLT	STREET LIGHT
SP	SERVICE POINT
SQ	SQUARE
SS	SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
ST	STREET
STA	STATION
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURE
SURV	SURVEY
SVZ	SIGHT VISIBILITY ZONE
SW	SIDEWALK
SWG	SOUTHWEST GAS
SY	SQUARE YARD
T	TELEPHONE OR TOP
TAN	TANGENT
TB	TOP OF BERM
TBA	TO BE ADJUSTED
TBR	TO BE REMOVED
TC	TOP OF CURB
TCD	TRAFFIC CONTROL DEVICE
TCE	TEMPORARY CONSTRUCTION ESMT
TEL,TELE	TELEPHONE
TEMP	TEMPORARY
TF	TOP OF FOOTING
TG	TOP OF GRATE
TMH	TOP OF MANHOLE
TOP	TOP OF PIPE
TP	TELEPHONE POLE, TOP OF PIPE
TRANS	TRANSITION
TRW	TOP OF RETAINING WALL
TS	TRAFFIC SIGNAL
TSI	TRAFFIC SIGNAL INTERCONNECT
TSW	TOP OF SIDEWALK
TW	TOP OF WALL
TYP,(TYP)	TYPICAL
UDACS	UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR WATER DISTRIBUTION SYSTEMS(LATESTEDITION)
UG	UNDERGROUND
ULT	ULTIMATE
UNO	UNLESS NOTED OTHERWISE
USDCCA	UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS CLARK COUNTY AREA, NEVADA(LATESTEDITION)
UT	UNDERGROUND TELEPHONE
UTIL	UTILITY
VAR	VARIABLE/VARIES
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VG	VALLEY GUTTER
VOL	VOLUME
W	WATER, WEST, WATT
W/	WITH
WI	WROUGHT IRON
WM	WATER METER
WMH	WATER MANHOLE
WS	WATER SUPPLY
WT	WEIGHT
WTR	WATER
XING	CROSSING
YD	YARD, YARD DRAIN

LEGEND

PROPOSED UTILITIES	DRAWING NUMBER FOR DETAIL W/ REF. TO THE SHEET WHERE IT IS SHOWN
EXISTING UTILITIES	EXISTING DROP INLET
FUTURE UTILITIES	PROPOSED DROP INLET
SECTION LINE	EXISTING GATE VALVE
EASEMENT LINE	EXISTING POWER POLE
RIGHT-OF-WAY LINE	EXISTING ELEC MARKER
PROPERTY LINE	EXISTING TRAFFIC SIGNAL
CENTERLINE	EXISTING FIRE HYDRANT
100 YR HYDRAULIC GRADE LINE	EXISTING UTILITY BOX
EXISTING STORM DRAIN	EXISTING METER BOX
FUTURE STORM DRAIN	PROPOSED CONTOUR
PROPOSED SWALE	EXISTING CONTOUR
VIEW FENCE	SPOT ELEVATION
NEW ABANDONED PIPE	EXISTING SPOT ELEVATION
SAWCUT	SLOPE
RETAINING WALL	EXISTING STREET LIGHT (STLT)
ROUGH GRADE PAD LIMITS	3:1 SLOPE UNLESS OTHERWISE NOTED ON PLAN
FLOOD ZONE "A" LIMITS	
LIMITS OF CONSTUCTION	
LIMITS OF GRADED ACCESS WAY	
EXISTING DRAINAGE EASEMENT	
PROPOSED DRAINAGE EASEMENT	
EXISTING REAINING WALL	

ESTIMATE OF QUANTITIES

NOTE: CONTRACTOR TO VERIFY QUANTITIES FOR BIDDING PURPOSES

STORM DRAIN QUANTITIES (PRIVATE)

DESCRIPTION	UNIT	TOTAL
48" TYPE I-A SDMH PER USDCCA 401 & 404.1	EA	10
48" TYPE 2 SD DROP INLET PER NDOT DWG NO. R-4.2.1	EA	2
18" RCB STORM DRAIN	LF	21
24" RCB STORM DRAIN	LF	55
36" RCB STORM DRAIN	LF	56
48" RCB STORM DRAIN	LF	108
120" RCB STORM DRAIN	LF	340
168" RCB STORM DRAIN	LF	1815
14'x12' DRAINAGE OPEN CHANNEL	LF	137
TRANSITION STRUCTURE	LF	92
DRAINAGE RIP-RAP AREA	SF	14,832

STATE OF NEVADA PROFESSIONAL ENGINEER — THOMAS P. GOWING — No. 11340 — EXP. 12/31/2019

TDS SUBMITTAL

REV	DATE	DESCRIPTION	DATE	PLAN APP	DATE	CONV APP

PROJECT NO. 840-050
DESIGN: TG
DRAWN: TG
CHECK: MF
PLOT DATE: 05-10-18
PLOT TIME: 08:32:43

GCW ENGINEERS\SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

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SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

PROJECT DATA

DRAWING
C1.02
2 OF 17 SHTS

REPLY APP 1219

CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE. EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE'S WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO aAVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.
6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB.
8. AC PAVEMENT TO BE ONE-HALF INCH (½") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 218.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY THE (COMPANY ____ REPORT # ____ DATE ____) APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.

WALL NOTES:

16. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC. THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO THE OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.
21. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE CITY AND APPROVED PRIOR TO ACCEPTANCE OF FACILITY VIDEO INSPECTION. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES AND TRANSITION STRUCTURES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXIT THE PUBLIC RIGHT-OF-WAY, AND STORM DRAIN MAIN ALIGNMENT, INCLUDING DEFLECTION POINTS. THE LOCATION SHALL BE DESCRIBED BY COORDINATES WHICH SHALL BE BASED ON THE OFFICIAL HORIZONTAL AND VERTICAL CONTROL NETWORKS OF THE CITY OF LAS VEGAS. FINAL LOCATION MAPS MUST BE SEALED AND CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINTIES OF ± 0.09 METERS (± 0.3 FEET) HORIZONTALLY AND VERTICALLY. A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).

OR

- SANITARY SEWER AND STORM DRAIN FACILITIES SHOWN ON THESE PLANS SHALL BE USED TO MEET THE REQUIREMENTS ON NRS 455 AND SHALL SHOW AT A MINIMUM THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, AND THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXIT THE PUBLIC RIGHT-OF-WAY. ANY DEVIATIONS FROM THE INFORMATION SHOWN SHALL BE NOTED AND SUBMITTED AS A REVISION TO THE PLANS AND APPROVED PRIOR TO ACCEPTANCE OF FACILITY VIDEO INSPECTION.

22. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST EDITION.
23. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

REVISED 02/03/15

DEVIATION FROM STANDARDS

NONE

CITY OF LAS VEGAS GRADING NOTES

1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THIS PROJECT AND THE RELATED OFF-SITE WORK, SO AS TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES AND SLOPES SHOWN.
3. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL EXCAVATION. ADEQUATE SHORING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAVING OF THE EXCAVATION.
4. THE CONTRACTOR IS WARNED THAT AN EARTHWORK BALANCE WAS NOT NECESSARILY THE INTENT OF THIS PROJECT. ANY ADDITIONAL MATERIAL REQUIRED OR LEFTOVER MATERIAL FOLLOWING EARTHWORK OPERATIONS BECOMES THE RESPONSIBILITY OF THE CONTRACTOR.
5. THE GRADING CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE OWNER TO PROVIDE FOR THE REQUIREMENTS OF THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND ASSOCIATED PERMIT.
6. CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION, IN THE AREAS INDICATED:

	HORIZONTAL/VERTICAL		COMPACTION
A. PAVEMENT AREA SUBGRADE	0.1'±	+0.0' TO -0.1'	SEE SOILS REPORT
B. ENGINEERED FILL	0.5'±	+0.1' TO -0.1'	SEE SOILS REPORT

- REPORT COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE.

7. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.
8. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.
9. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PUBLICLY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.
10. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIW OWN EXPENSE AND AT THE DIRECTION OF THE CITY ENGINEER. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

REVISED 4/15/10

LAS VEGAS VALLEY WATER DISTRICT
LVVWD PROJECT # 124110

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICATION SUPPORT CENTER (258-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVVWD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
2. ALL WORK SHALL CONFORM TO LVVWD STANDARD PLATES, DRAWINGS, AND SPECIFICATIONS, AND TO THE 2010 EDITION OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS). THE LATEST EDITION OF UDACS SHALL SUPERSEDE ANY CONFLICTS CONTAINED IN THE APPROVED DRAWINGS AND/OR SPECIFICATIONS.
3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2 ABOVE, SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT DRAFT OR EDITION OF THE UNIFORM SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.
4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
8. ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS SHALL CONFORM TO SECTION 2.22 OF THE 2010 EDITION OF THE UDACS.
9. ALL WATER FACILITIES SHALL BE FILLED, DISINFECTED, PRESSURE TESTED, FLUSHED, FILLED, AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION TO THE LVVWD DISTRIBUTION SYSTEM.
10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802, TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
11. ANY INTERRUPTION OF SERVICE MUST BE PERFORMED IN ACCORDANCE WITH UDACS SECTION 3.14.01, AND APPROVED BY THE LVVWD INSPECTION DIVISION PRIOR TO SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.
12. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE LISTED ON THE LVVWD PRE-APPROVED MATERIALS AND MANUFACTURER'S LISTING FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS.
13. TELEPHONE "CALL BEFORE YOU DIG" AT 811 OR 1-800-227-2600
14. THE INSTALLATION OF LAS VEGAS VALLEY WATER DISTRICT (LVVWD) MUNICIPAL WATER FACILITIES WITHIN ALL STREETS IS ASSUMED TO BE IN COMPLIANCE WITH THE UNIFORMED STANDARDS, INCLUDING THE PLACEMENT OF ASPHALT PAVING STREET SURFACES. ANY REPAIR WORK DONE BY THE LVVWD TO THE MUNICIPAL WATER FACILITIES WILL INCLUDE THE PLACEMENT OF AN APPROPRIATELY SIZED ASPHALT REPAIR ON THE STREET SURFACE.

    ANY DECORATIVE PAVING SURFACE WITHIN THE STREET IS THE RESPONSIBILITY OF THE OWNER'S ASSOCIATION, OR THE INDIVIDUAL PROPERTY OWNERS IF NO OWNER'S ASSOCIATION IS IN EXISTENCE, OR THE AGENCY HAVING JURISDICTION. DECORATIVE SURFACE MATERIALS PLACED WITHIN THE TEN FOOT EASEMENT ABUTTING A PUBLIC OR PRIVATE STREET, IF DISTURBED BY THE LVVWD DURING THE REPAIR OR OPERATION OF ITS FACILITIES, WILL BE REPLACED BY LVVWD WITH AN APPROPRIATELY SIZED PLAIN FINISH CONCRETE PATCH. THE LVVWD WILL NOT RESTORE, AND WILL NOT BE RESPONSIBLE FOR THE RESTORATION OF, ANY DECORATIVE PAVING SURFACE WITHIN THE STREET. THE LVVWD WILL NOT ATTEMPT TO MATCH COLOR OR FINISH OF ANY ADJACENT MATERIALS.

15. NO LEAD COMPLIANCE NOTE:
    TO COMPLY WITH THE FEDERAL SAFE DRINKING WATER ACT, ALL WATER WORK BRASS PRODUCTS PORPOSED TO BE RELOCATED, OR INSTALLED AS NEW MUST BE INSTALLED WITH THE LEAD FREE APPROVED PRODUCT. THE OLD LEADED PRODUCT MAY NOT BE REUSED.

FLOOD ZONE NOTE

NO PORTION OF THE SITE FALLS WITHIN A FEMA DESIGNATED SPECIAL FLOOD HAZARD AREA. SITE LOCATED ON PANEL **32003C2150E**, DATED **SEPTEMBER 27, 2002**, AND PANEL **32003C2145F**, DATED **NOVEMBER 16, 2011**. THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN A ZONE X AND NOT LOCATED WITHIN A FEMA DESIGNATED 100-YEAR ZONE A OR SPECIAL FLOOD HAZARD AREA.

CITY OF LAS VEGAS SEWER NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS. ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.
3. CHISEL "S" OR "G" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.
4. POLYVINYL (PVC) SEWER PIPE SHALL MEET ASTM D-3034 SDR 35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE II AGGREGATE BASE.
5. ALL MANHOLES PAVED IN STREETS EIGHTY (80') FOOT R/W AND LARGER SHALL HAVE CONCRETE COLLARS. STREETS LESS THAN EIGHTY (80') FOOT R/W WILL REQUIRE RETROFIT IF PAVING DOES NOT CONFORM TO CITY STANDARDS AT THE MANHOLE.
6. TEE SADDLES SHALL BE USED TO CONNECT SEWER LATERALS TO EXISTING MAIN LINES UP TO TWELVE INCH (12") DIAMETER. CONNECTIONS TO FIFTEEN INCH (15") OR LARGER MAINS SHALL REQUIRE SPECIAL PROCEDURES. IN LINE "Y" 'S SHALL BE USED ON LINES TWELVE INCHES (12") OR ABOVE.
7. WATER MAINS SHALL BE PROTECTED IN ACCORDANCE WITH LVVWD STANDARDS WHENEVER A SEWER MAIN CROSSES OVER A WATER MAIN OR THE SEWER IS LESS THAN EIGHTEEN INCH (18") UNDER A WATER MAIN.
8. ALL CONTRACTORS INSTALLING SEWER MAINS THAT WILL BE UNDER THE JURISDICTION OF THE CITY OF LAS VEGAS MUST BE STATE OF NEVADA CLASS "A" CONTRACTORS.
9. THE CITY OF LAS VEGAS WILL NOT ACCEPT ANY SEWER MAINS WHICH HAVE A VERTICAL DEFLECTION OF MORE THAN ONE TENTH (0.1) OF A FOOT FROM THE APPROVED CONSTRUCTION PLANS AT ANY LOCATION. SEWER MAINS FOUND TO EXCEED THIS TOLERANCE WILL HAVE TO BE REPAIRED OR REMOVED OR REPLACED TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO ACCEPTANCE BY THE CITY OF LAS VEGAS.
10. INSTALLATION OF CURVED SEWER REQUIRES THE USE OF C-900 PIPE WHICH ALLOWS FOR PIPE DEFLECTION AT THE JOINTS.

REVISED 04/15/10

STORMWATER RUNOFF MANAGEMENT

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS OF THE CITY OF LAS VEGAS AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN THE CITY OF LAS VEGAS AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS, AND ALL BMPS WEEKLY, AND WITHIN 24 HOURS AFTER ANY RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPS SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

CITY OF LAS VEGAS STREETLIGHT NOTES

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION (USS), AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA" (USD), LATEST REVISION.
2. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS, ETC., LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE TRAFFIC ENGINEER AND THE CITY ENGINEER. ANY DEVIATION FROM THE PLAN LOCATION WILL REQUIRE COMPLIANCE WITH SECTION 623 OF THE USS.
3. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION IN ACCORDANCE WITH SECTION 623 0.03.01 OF THE USS.
4. ALL EMPTY CONDUIT SHALL HAVE AT LEAST ONE GREEN NO. #8 AWG WIRE INSTALLED AS TRACER WIRE IN ACCORDANCE WITH SECTION 623 0.02.01 OF THE USS PRIOR TO BACKFILLING AND FINAL INSPECTION.
5. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN COMPLIANCE WITH USD NO. 320A WHEN POLE IS INSTALLED BEHIND SIDEWALK, AND SHALL AT NO TIME COMPLETELY ENCLOSE THE STREET LIGHTING POLE.
6. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TRAFFIC ENGINEERING DIVISION PRIOR TO ANY PRE-FINAL INSPECTION. THE AS-BUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.
7. SERVICE POINT SHALL BE COORDINATED WITH NV ENERGY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICE POINTS SHALL BE SHOWN ON THE PLANS.
8. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREET LIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITIES INVOLVED BEFORE STREETLIGHT BASES ARE INSTALLED AT NO EXPENSE TO THE CITY OF LAS VEGAS.
9. THE CONTRACTOR SHALL FURNISH COMPLETE CONDUIT, WIRE, ETC. FROM SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON THE PLANS.

REVISED 06/28/16 (LD VERSION)

CITY OF LAS VEGAS FIRE AND RESCUE
GENERAL NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE #6325 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS.
2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALLEY WATER DISTRICT'S – APPROVED PRODUCTS LIST ARE ALLOWED TO BE INSTALLED.
3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK. [IFC SECTION 105.7.12]
4. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. [IFC SECTION 3310, SECTION 3312]
5. TO IDENTIFY FIRE HYDRANT LOCATIONS, CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF STREET ADJACENT TO THE FIRE HYDRANTS. [IFC SECTION 507.5.7.3]
6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. [IFC SECTION 108.3]
7. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A. APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. [IFC SECTION 507.2.1, NFPA 24]
8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. [IFC SECTION 507]
9. PRIVATE FIRE HYDRANTS SHALL BE PAINTED RED. [IFC SECTION 507.5.7.1]
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. [IFC SECTION 507]
11. FIRE HYDRANTS SPACING SHALL BE AS FOLLOWS: [IFC SECTION C102]
    RESIDENTIAL – 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
    COMMERCIAL – 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
12. WHERE NEW WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1,000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. [IFC SECTION C102.8]
13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.
14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. [IFC SECTION C102.12]
15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. [IFC SECTION C102.4]
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. [IFC SECTION C102.7]
17. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. [IFC SECTION C102.6]
18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN. [IFC SECTION C104]
19. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. [IFC SECTION 503.2.3]
20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12% ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. [IFC SECTION 503.2.7, 503.2.8]
21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. [IFC 503.2.4]
22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13 FT 6 IN. [IFC SECTION 503.2.1]
23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 40 FT FLOW-LINE TO FLOW-LINE WITH PARALLEL PARKING PERMITTED ON BOTH SIDES. NOT LESS THAN 32 FT WIDE, FLOW-LINE TO FLOW -LINE, WHERE PARKING IS PERMITTED ONLY ON ONE SIDE OF THE FIRE APPARATUS ACCESS ROAD. NOT LESS THAN 24 FT WIDE, FLOW-LINE TO FLOW-LINE, WHERE NO PARKING IS PERMITTED ON EITHER SIDE. FIRE LANES THROUGH PARKING LOTS SHALL NOT BE LESS THAN 24 FT. [IFC SECTION 503.2.1.1]
24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL FO THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. THIS DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. [IFC SECTION 503.1.1]
25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-EANDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. COMMERCIAL AND INDUSTRIAL DEVELOPMENTS WHERE BUILDINGS EXCEED 2 STORIES OR 30 FEET IN HEIGHT, OR EXCEEDING 62,000 SQUARE FEET IN AREA. [IFC SECTION 503.1.2]
26. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. [IFC SECTION 503.2.5]
27. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS OF 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. [IFC SECTION 503.3]
28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE IFC SECTION 503.6 AND IFC APPENDIX M.

REVISED MARCH 1, 2016

CITY OF LAS VEGAS TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.
3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCED WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
4. WHEN A DESIGNATED "SUGGESTED ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.
5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW SIGNS SHALL UTILIZE TYPE XI RETROREFLECTIVE SHEETING IN ACCORDANCE WITH CCAUSS 627 AND 716 AND SHALL HAVE AN ANTI-GRAFFITI PROTECTIVE OVERLAY FILM THAT IS A MATCHING COMPONENT. TO, AND OF THE SAME MANUFACTURER AS THE RETROREFLECTIVE SHEETING TO WHICH IT IS APPLIED. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.
7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.
8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
9. STREET SIGNS AND STOP SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.
10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK AREA. THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR IMSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT-OF-WAY.
11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CITIZENS AREA TRANSIT (C.A.T.) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE #828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS OTHERWISE DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.
15. CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

REVISED 7/3/13

SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

GENERAL NOTES

GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\PROJECTS\800\840-050\DWG\PRODUCTION\PHASE-1AA\050-1AAC01_CV.DWG
DANIEL LEE

PROJECT NO.
840-050

DESIGN: TD
DRAWN: TD
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PLOT DATE: 01-10-18
PLOT TIME: 18:03:22

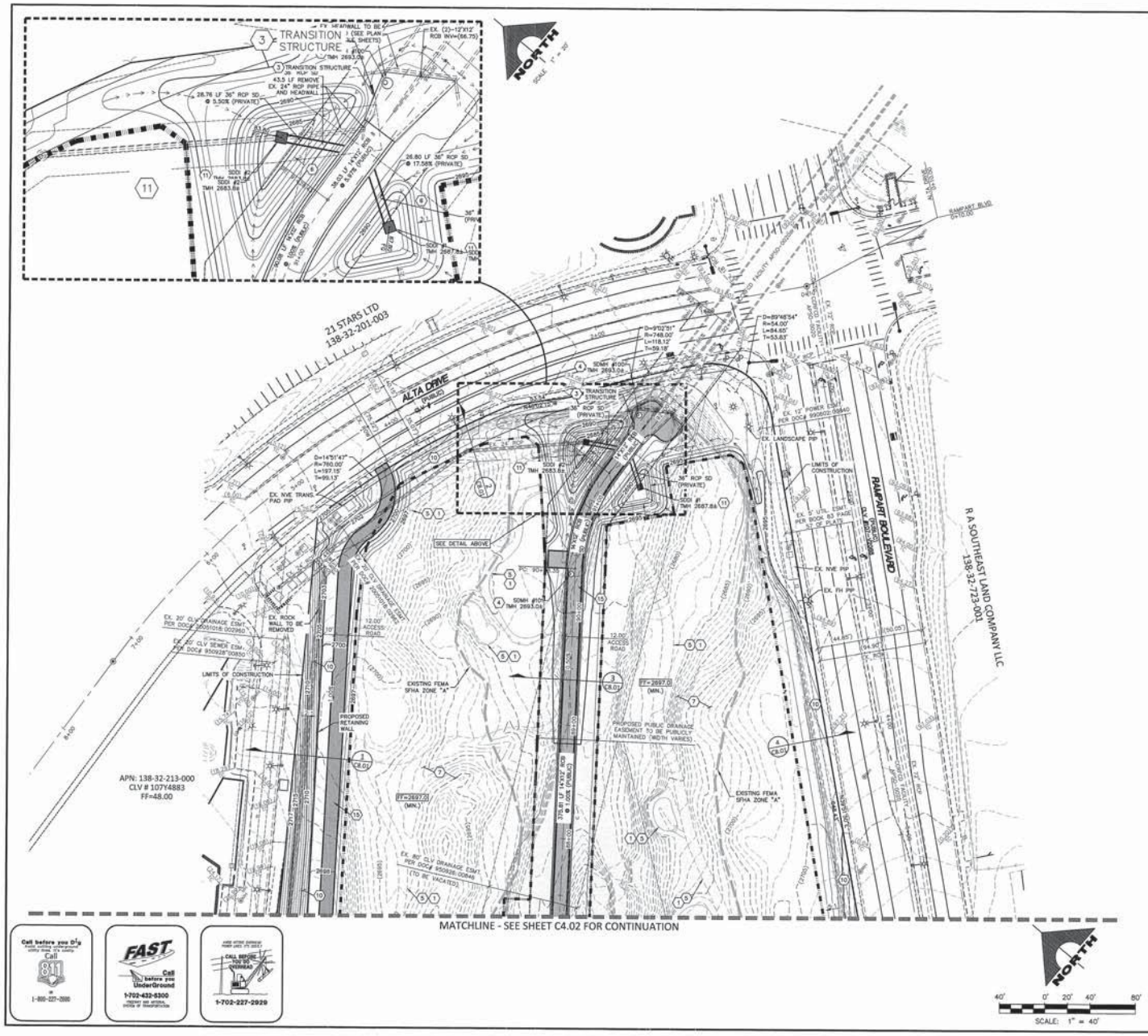
REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

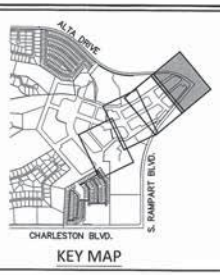
THOMAS P. DYSON
Exp. 12/31/2018
CIVIL
No. 11306

DATE: 01/10/2018

TDS SUBMITTAL

DRAWING
C1.03
3 OF 17 SHTS





KEY MAP

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-108W98	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLV108W98", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

DATUM NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITIES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WEIR SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A 48" MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITIES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
8. INSTALL RIP-RAP, SEE DETAIL 6 ON SHEET C8.01 FOR DETAIL.
9. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
10. INSTALL TYPE 2 DROP INLET PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
11. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
12. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
13. INSTALL SEDIMENT BERM PER DETAIL 3 ON SHEET C8.03
14. ACCESS ROAD, SEE DETAIL 8 ON SHEET C8.01 FOR TYPICAL SECTION
15. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
16. INSTALL HEADWALL, SEE STRUCTURAL PLANS
17. INSTALL HEADWALL, SEE STRUCTURAL PLANS

DRAINAGE CONSTRUCTION NOTES

1. 3" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET C8.02)
2. 5" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET C8.02)

VERIFY LOCATION AND ELEVATION OF EXISTING IMPROVEMENTS. MATCH EXISTING AND PROJECT IN PLACE. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF ONSITE FACILITIES.

FLOOD ZONE NOTE:

THE SITE IS LOCATED ON FEDERAL EMERGENCY AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) CONTAINING COMMUNITY PANEL 32003C 2145F, DATED NOVEMBER 16, 2011, AND 32003C 2150E DATED SEPTEMBER 27, 2002. LOMR 06-09-B483P DATED SEPTEMBER 21, 2006 AND LOMR 06-09-B786P DATED OCTOBER 19, 2006. THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN ZONE "A".

NOTES:

1. ALL PROPOSED ONSITE STORM DRAIN LATERALS ARE PRIVATE-TO BE PRIVATELY MAINTAINED. ALL ON-SITE SURFACE DRAINAGE FACILITIES ARE TO BE PRIVATELY MAINTAINED.
2. PROPERTY OWNER IS RESPONSIBLE TO MAINTAIN THE BEST MANAGEMENT PRACTICES SUCH AS BUT NOT LIMITED TO THE REMOVAL OF ACCUMULATED SEDIMENT AND DEBRIS AND CARE OF THE VEGETATION.

GEOTECHNICAL REPORT

ALL GRADING WORK WILL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "DHB COMPANIES (THE SEVENTY)" LOCATED AT RAMPART BOULEVARD, AND ALTA DRIVE.

PROJECT NO.: XXXXXXXXXX, DATED JAN 01, 20XX
PREPARED BY:
XXXXXX CONSULTANTS
XXXX LAS VEGAS BLVD.
LAS VEGAS, NV 89XXX
PHONE NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS-4787 ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

THOMAS P. DYSON P.E. 11306 DATE

THOMAS P. DYSON — STATE OF NEVADA — PROFESSIONAL ENGINEER — No. 11306 — DATE 01/31/2018

TDS SUBMITTAL

REV	DATE	DESCRIPTION	DATE	PLCH APP	DATE	CCW APP

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MF
PLOT DATE: 01-11-18
PLOT TIME: 09:32:47

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\PROJECTS\800\840-050\DWG\PRODUCTION\PHASE-1AA\050-1AA004_GD.DWG
DANIEL LEE

SEVENTY ACRES, LLC
FORE STARS, LTD

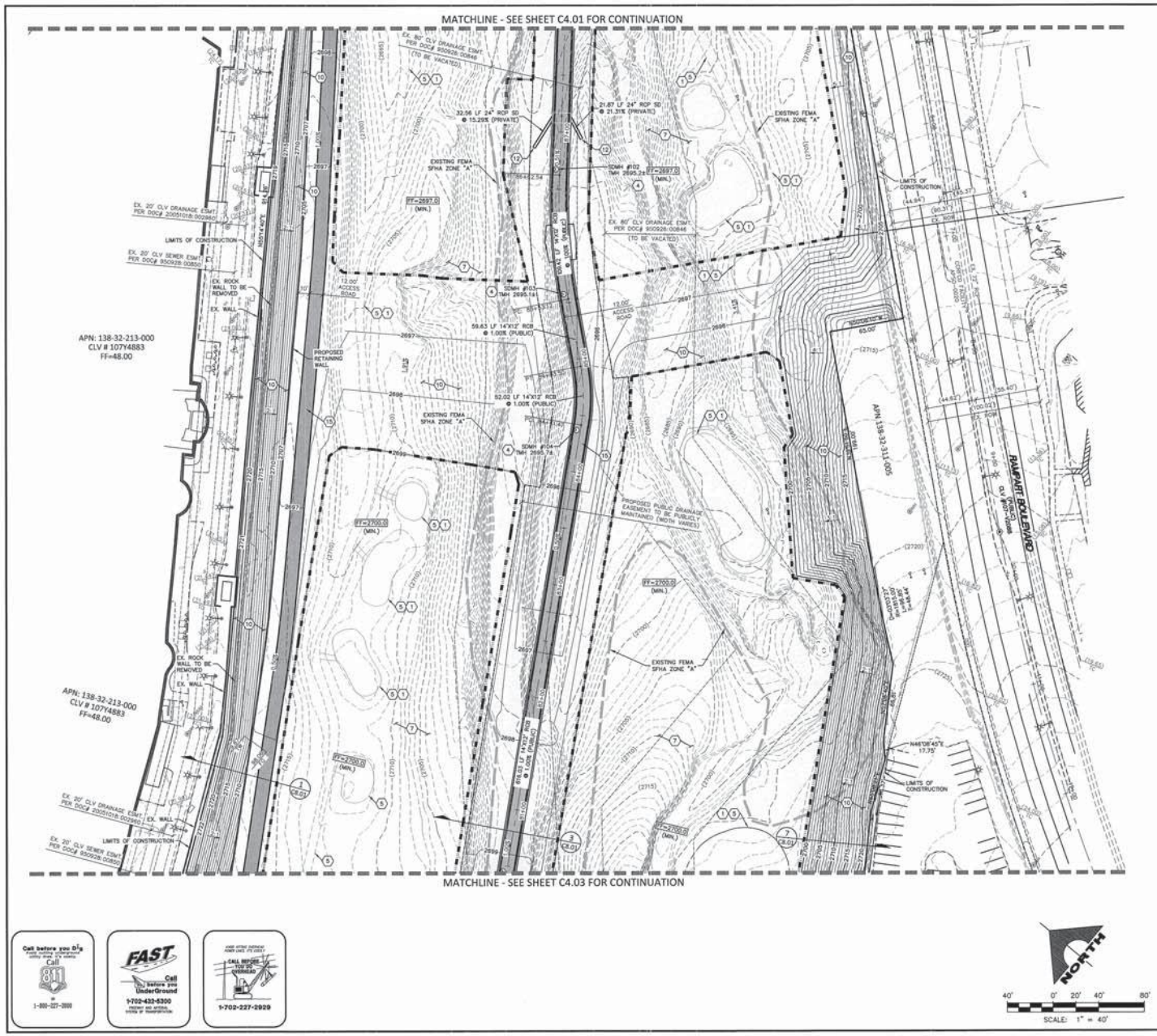
THE 435

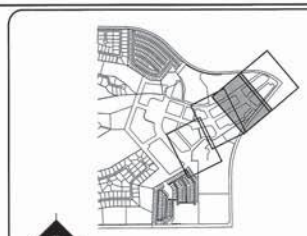
GRADING PLAN 1

DRAWING
C4.01
4 OF 17 SHTS

REPLY APP 1221

CLV295831





KEY MAP

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-106W95	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLV106W95", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

DATUM NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITIES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WDR SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A 48" MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITIES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
9. INSTALL RIP-RAP, SEE DETAIL 6 ON SHEET C8.01 FOR DETAIL.
10. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
11. INSTALL TYPE 2 DROP INLET PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
12. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
13. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
14. INSTALL SEDIMENT BERM PER DETAIL 3 ON SHEET C8.03
15. ACCESS ROAD, SEE DETAIL 8 ON SHEET C8.01 FOR TYPICAL SECTION
16. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
17. INSTALL HEADWALL, SEE STRUCTURAL PLANS

DRAINAGE CONSTRUCTION NOTES

1. 3" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET C8.02)
2. 5" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET C8.02)

VERIFY LOCATION AND ELEVATION OF EXISTING IMPROVEMENTS. MATCH EXISTING AND PROTECT IN PLACE. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF ONSITE FACILITIES.

FLOOD ZONE NOTE:

THE SITE IS LOCATED ON FEDERAL EMERGENCY AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) CONTAINING COMMUNITY PANEL 32003C 2145F, DATED NOVEMBER 16, 2011, AND 32003C 2150E DATED SEPTEMBER 27, 2002. LOMR 06-09-B463P DATED SEPTEMBER 21, 2006 AND LOMR 06-09-BF88P DATED OCTOBER 19, 2006. THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN ZONE "A".

NOTES:

1. ALL PROPOSED ONSITE STORM DRAIN CATCHALS ARE PRIVATE-TO BE PRIVATELY MAINTAINED. ALL ON-SITE SURFACE DRAINAGE FACILITIES ARE TO BE PRIVATELY MAINTAINED.
2. PROPERTY OWNER IS RESPONSIBLE TO MAINTAIN THE BEST MANAGEMENT PRACTICES SUCH AS BUT NOT LIMITED TO THE REMOVAL OF ACCUMULATED SEDIMENT AND DEBRIS AND CARE OF THE VEGETATION.

GEOTECHNICAL REPORT

ALL GRADING WORK WILL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "EHB COMPANIES (THE SEVENTY)" LOCATED AT RAMPART BOULEVARD, AND ALTA DRIVE.

PROJECT NO.: XXXXXXXXXXX, DATED JAN 01, 20XX
PREPARED BY:
XXXXXX CONSULTANTS
XXXX LAS VEGAS BLVD.
LAS VEGAS, NV 89XXX
PHONE NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY 05-4787 ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

THOMAS P. GYSON P.E. 11306 DATE

STATE OF NEVADA — THOMAS P. GYSON — No. 11306 — PROFESSIONAL ENGINEER — DATE: 8/31/2018

TDS SUBMITTAL

REV #	DATE	DESCRIPTION	DRAWN APP	DATE	CHECK APP	DATE	CONC APP	DATE

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MF
PLOT DATE: 01-11-18
PLOT TIME: 09:22:40
DANIEL LEE

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

GRADING PLAN 2

DRAWING
C4.02
5 OF 17 SHTS

Call before you Dig — Call 811 or 1-800-227-2600

FAST — Call before you UnderGround 1-702-432-5300

CALL BEFORE YOU DIG OVERHEAD 1-702-227-2929

REPLY APP 1222

CLV295832

NORTH
NOT TO SCALE

KEY MAP

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-108WWS	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLV108WWS", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

DATUM NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITIES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WEIR SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A 48" MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITIES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
8. INSTALL RIP-RAP, SEE DETAIL 6 ON SHEET C8.01 FOR DETAIL.
9. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
10. INSTALL TYPE 2 DROP INLET PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
11. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
12. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
13. INSTALL SEDIMENT BERM PER DETAIL 3 ON SHEET C8.03
14. ACCESS ROAD, SEE DETAIL 8 ON SHEET C8.01 FOR TYPICAL SECTION
15. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
16. INSTALL HEADWALL, SEE STRUCTURAL PLANS

DRAINAGE CONSTRUCTION NOTES

1. 3" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET C8.02)
2. 5" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET C8.02)

VERIFY LOCATION AND ELEVATION OF EXISTING IMPROVEMENTS. MATCH EXISTING AND PROTECT IN PLACE. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF ONSITE FACILITIES.

FLOOD ZONE NOTE:

THE SITE IS LOCATED ON FEDERAL EMERGENCY AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) CONTAINING COMMUNITY PANEL 3200JC 2145F, DATED NOVEMBER 16, 2011, AND 3200JC 2150E DATED SEPTEMBER 27, 2002. LOMR 06-09-B463P DATED SEPTEMBER 21, 2006 AND LOMR 06-09-BF86P DATED OCTOBER 19, 2006. THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN ZONE "A".

NOTES:

1. ALL PROPOSED ONSITE STORM DRAIN LATERALS ARE PRIVATE-TO BE PRIVATELY MAINTAINED. ALL ON-SITE SURFACE DRAINAGE FACILITIES ARE TO BE PRIVATELY MAINTAINED.
2. PROPERTY OWNER IS RESPONSIBLE TO MAINTAIN THE BEST MANAGEMENT PRACTICES SUCH AS BUT NOT LIMITED TO THE REMOVAL OF ACCUMULATED SEDIMENT AND DEBRIS AND CARE OF THE VEGETATION.

GEOTECHNICAL REPORT

ALL GRADING WORK WILL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "EHB COMPANIES (THE SEVENTY)" LOCATED AT RAMPART BOULEVARD, AND ALTA DRIVE.

PROJECT NO.: XXXXXXXXXX, DATED JAN 01, 20XX
PREPARED BY:
XXXXXX CONSULTANTS
XXXX LAS VEGAS BLVD.
LAS VEGAS, NV 89XXX
PHONE NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS-4787 ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

THOMAS P. DYSON P.E. 11306 DATE

NORTH
40' 0' 20' 40' 80'
SCALE: 1" = 40'

STATE OF NEVADA
THOMAS P. DYSON
No. 11306
PROFESSIONAL ENGINEER
DATE 05/01/2018

TDS SUBMITTAL

REV.	DATE	DESCRIPTION	DATE	ASSN. APP	DATE	CHK APP	DATE

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MF
PLOT DATE: 01-11-18
PLOT TIME: 11:22:05

GCV
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
ENGINEERS \ SURVEYORS gcvengineering.com

F:\PROJECTS\800\840-050\DWG\PRODUCTION\PHASE-1\A\200-1\ACAD_C03.DWG
DWNG. SIZE

SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

GRADING PLAN 3

DRAWING
C4.03
6 OF 17 SHTS.

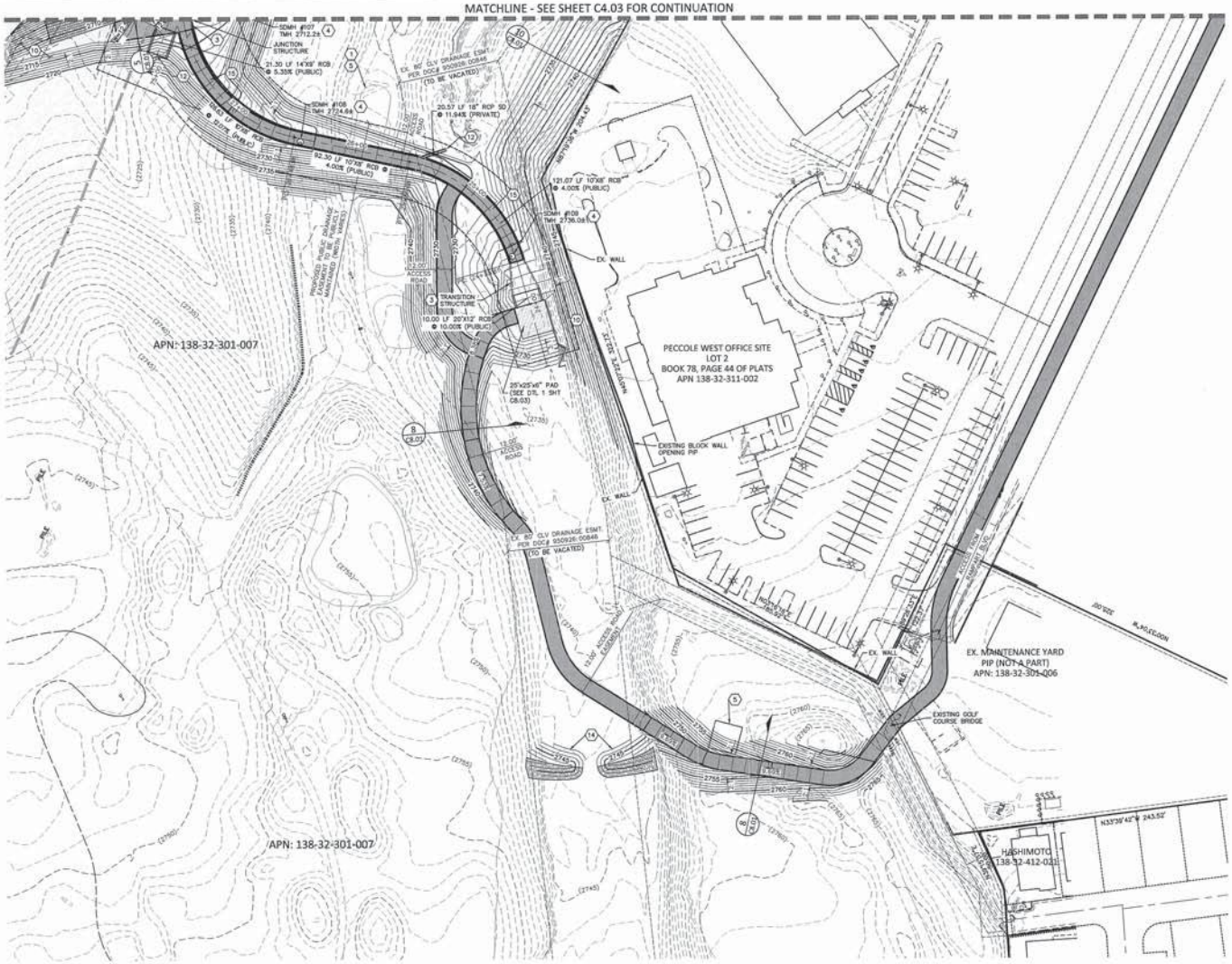
Call before you Dig
Call 811
1-800-227-2600

FAST
Call before you UnderGround
1-702-432-5300

CALL BEFORE YOU DIG
1-702-227-2929

REPLY APP 1223

CLV295833



KEY MAP

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-108NW6	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLV108NW6"; BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN FORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

DATUM NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITIES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WEIR SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A 48" MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITIES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
8. INSTALL RIP-RAP, SEE DETAIL 6 ON SHEET C8.01 FOR DETAIL.
9. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
10. INSTALL TYPE 2 DROP INLET PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
11. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
12. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
13. INSTALL SEDIMENT BERM PER DETAIL 3 ON SHEET C8.03
14. ACCESS ROAD, SEE DETAIL 8 ON SHEET C8.01 FOR TYPICAL SECTION
15. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
16. INSTALL HEADWALL, SEE STRUCTURAL PLANS

DRAINAGE CONSTRUCTION NOTES

1. 3" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET C8.02)
2. 5" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET C8.02)

VERIFY LOCATION AND ELEVATION OF EXISTING IMPROVEMENTS. MATCH EXISTING AND PROTECT IN PLACE. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF ONSITE FACILITIES.

FLOOD ZONE NOTE:

THE SITE IS LOCATED ON FEDERAL EMERGENCY AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) CONTAINING COMMUNITY PANEL 32003C 2145F, DATED NOVEMBER 16, 2011, AND 32003C 2150E DATED SEPTEMBER 27, 2002. LOMR 06-09-B483P DATED SEPTEMBER 21, 2006 AND LOMR 06-09-BF89P DATED OCTOBER 19, 2006. THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN ZONE "A".

NOTES:

1. ALL PROPOSED ONSITE STORM DRAIN LATERALS ARE PRIVATE-TO BE PRIVATELY MAINTAINED. ALL ON-SITE SURFACE DRAINAGE FACILITIES ARE TO BE PRIVATELY MAINTAINED.
2. PROPERTY OWNER IS RESPONSIBLE TO MAINTAIN THE BEST MANAGEMENT PRACTICES SUCH AS BUT NOT LIMITED TO THE REMOVAL OF ACCUMULATED SEDIMENT AND DEBRIS AND CARE OF THE VEGETATION.

GEOTECHNICAL REPORT

ALL GRADING WORK WILL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "EHB COMPANIES (THE SEVENTY)" LOCATED AT RAMPART BOULEVARD, AND ALTA DRIVE.

PROJECT NO.: XXXXXXXXXXX, DATED JAN 01, 20XX
PREPARED BY:
XXXXXX CONSULTANTS
XXXX LAS VEGAS BLVD.
LAS VEGAS, NV 89XXX
PHONE NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLANS ARE IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS-4787 ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

THOMAS P. DYSON P.E. 11306 DATE

STATE OF NEVADA PROFESSIONAL ENGINEER THOMAS P. DYSON Date of Signature No. 11306 CIVIL
DATE: 8/21/2018
TDS SUBMITTAL

REV	DATE	DESCRIPTION	PLAN APP	DATE	CLW APP	DATE

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MP
PLOT DATE: 05-11-18
PLOT TIME: 11:00:07

GCW ENGINEERS\SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\PROJECTS\2017\840-050\DWG\PRODUCTION\PHASE-1AA\C04_GRADING PLAN 4.DWG

SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

GRADING PLAN 4

DRAWING
C4.04
7 OF 17 SHTS

Call before you Dig
Call 811
1-800-227-2600

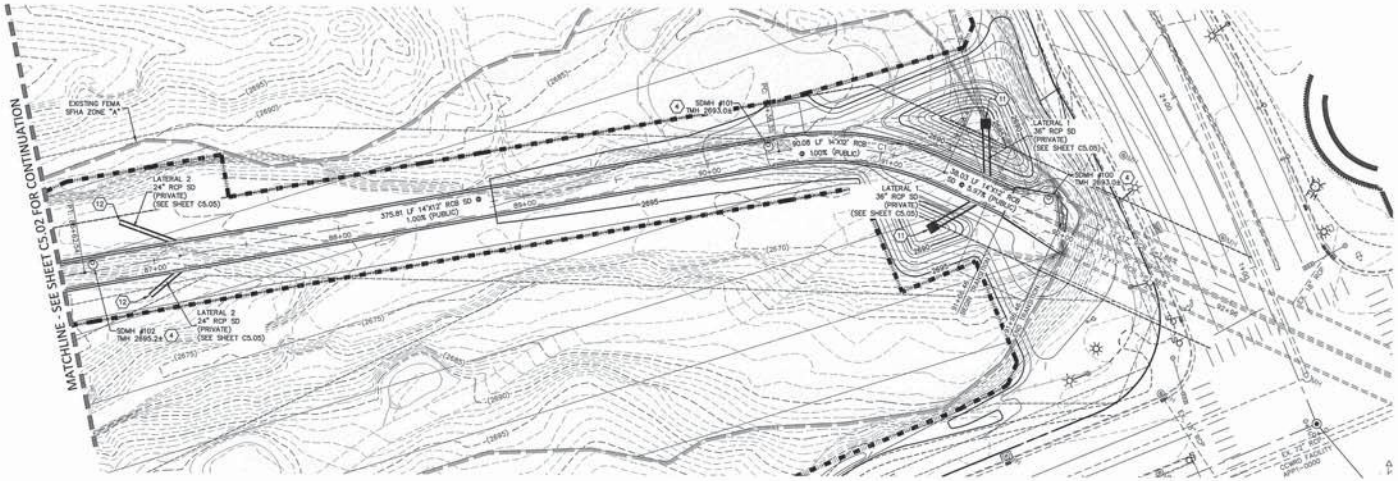
FAST Call before you UnderGround
1-702-432-5300

CALL BEFORE YOU DIG OVERHEAD
1-702-227-2929

REPLY APP 1224

CLV295834

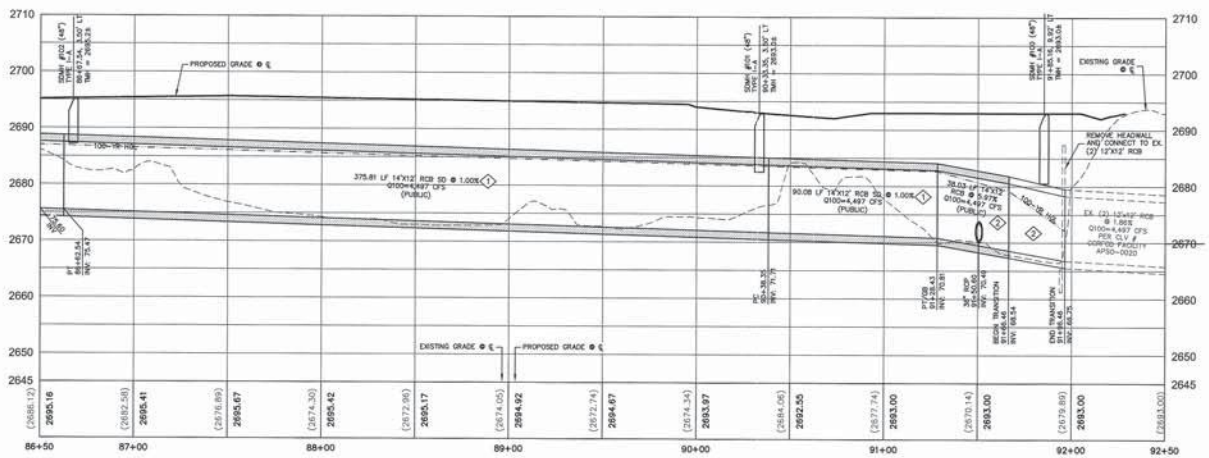
CLV295835

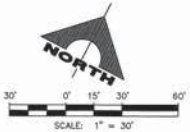


STORM DRAIN PLAN

SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

CL CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C1	34°24'33"	150.00'	90.08'	46.45'





KEY MAP

Call before you Dig — Call 811 — 1-800-227-2600 — 1-702-435-6000

FAST — Call before you UnderGround — 1-702-432-5300

CALL BEFORE YOU DIG — 1-702-227-2929

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-109(NW)	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLV109(NW)", BEING A BYNET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND	2914.54 (FEET)	888.355 (METERS)

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITIES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WEIR SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A 48" MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITIES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
8. INSTALL RIP-RAP, SEE DETAIL 6 ON SHEET C8.01 FOR DETAIL.
9. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
10. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
11. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
12. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
13. INSTALL SEDIMENT BERM PER DETAIL
14. ACCESS ROAD, SEE DETAIL 8 ON SHEET C8.01 FOR TYPICAL SECTION
15. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
16. INSTALL HEADWALL, SEE STRUCTURAL PLANS
17. INSTALL HEADWALL, SEE STRUCTURAL PLANS

DRAINAGE CONSTRUCTION NOTES

1. 3" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET C8.02)
2. 5" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET C8.02)

VERIFY LOCATION AND ELEVATION OF EXISTING IMPROVEMENTS, MATCH EXISTING AND PROTECT IN PLACE. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF ONSITE FACILITIES.

REGISTERED PROFESSIONAL ENGINEER — STATE OF NEVADA — THOMAS F. DYSON — No. 10767 — 09/10/2018

TDS SUBMITTAL

REV.	DATE	DESCRIPTION	DATE	FCDA APP	DATE	ECM APP	DATE

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MF
PLOT DATE: 01-10-18
PLOT TIME: 08:16:07

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1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\PROJECTS\BOS\840-050\DWG\PRODUCTION\PHASE-1A\000-1AMCOS.DWG
DRAWN: LEE

SEVENTY ACRES, LLC
FORE STARS, LTD

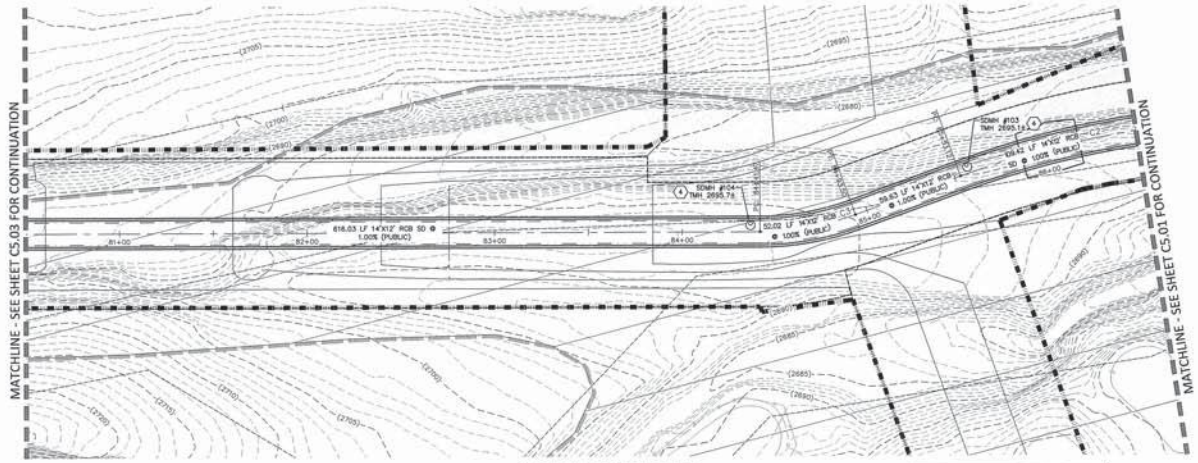
THE 435

PLAN & PROFILE 1

DRAWING
C5.01
9 OF 17 SHTS

REPLY APP 1226

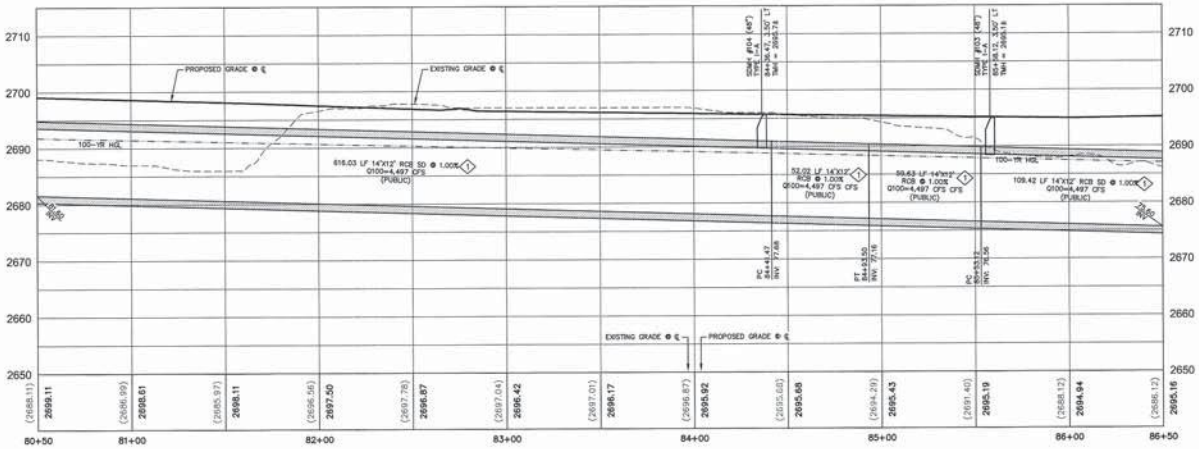
CLV295836

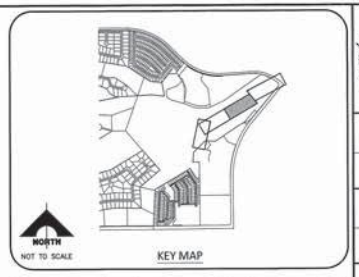


STORM DRAIN PLAN

SCALE: HORIZ. 1" = 30'
VERT. 1" = 10'

CL CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C2	12°32'19"	500.00'	109.42'	54.93'
C3	19°52'14"	150.00'	52.02'	26.27'





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1-800-227-2600
CLARK COUNTY AREA (EXCLUDING LAS VEGAS)
1-702-435-6000

FAST
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1-702-432-9300
PROTECT AND INFORM SYSTEM OF INCORPORATION

AVOID BITING EXPENSIVE POWER LINES, IT'S SAFER!
CALL BEFORE YOU DIG OVERHEAD
1-702-227-2929

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-TOENWG	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLVTOENWG", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITIES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WEIR SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A 48" MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITIES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
8. INSTALL RIP-RAP, SEE DETAIL 6 ON SHEET C8.01 FOR DETAIL.
9. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
10. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
11. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
12. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
13. INSTALL SEDIMENT BERM PER DETAIL
14. ACCESS ROAD, SEE DETAIL 6 ON SHEET C8.01 FOR TYPICAL SECTION
15. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
16. INSTALL HEADWALL, SEE STRUCTURAL PLANS

DRAINAGE CONSTRUCTION NOTES

1. 3" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET C8.02)
2. 5" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET C8.02)

VERIFY LOCATION AND ELEVATION OF EXISTING IMPROVEMENTS. MATCH EXISTING AND PROTECT IN PLACE. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF ONSITE FACILITIES.

STATE OF NEVADA
THOMAS P. GIBSON
Exp. 12/31/2018
CIVIL
No. 11392
PROFESSIONAL ENGINEER
DATE: 8/30/2018

TDS SUBMITTAL

REV	DATE	DESCRIPTION	DATE	FIELD APP	DATE	CITY APP

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MF
PLOT DATE: 01-10-18
PLOT TIME: 08:12:03

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LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
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DANIEL LEE

SEVENTY ACRES, LLC
FORE STARS, LTD

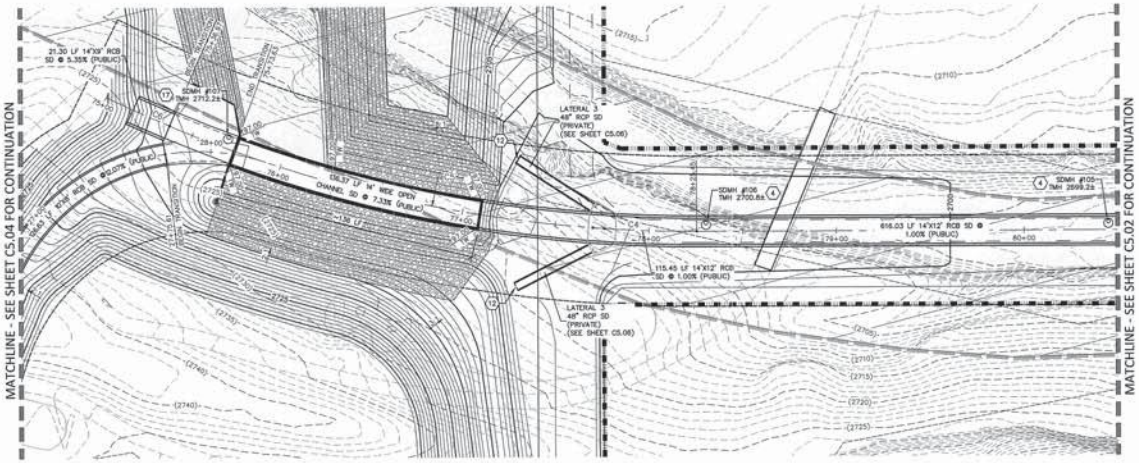
THE 435

PLAN & PROFILE 2

DRAWING
C5.02
10 OF 17 SHTS

REPLY APP 1227

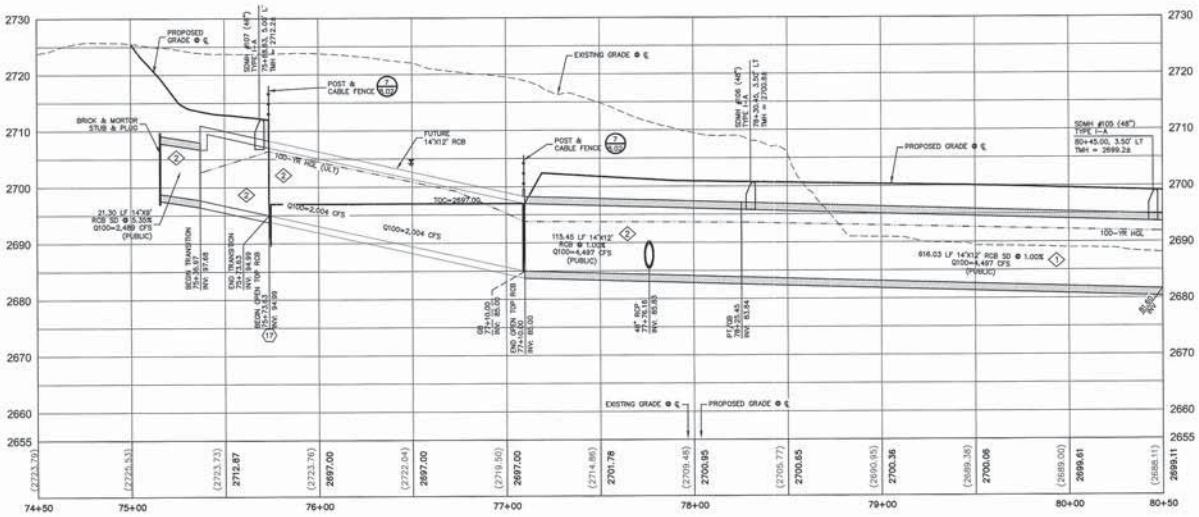
CLV295837
6302

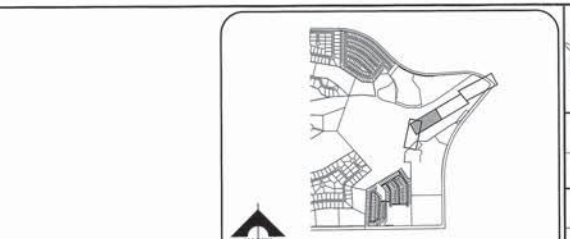


STORM DRAIN PLAN

SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

CL CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C4	49°55'20"	720.00'	627.34'	335.15'
C5	49°55'20"	720.00'	627.34'	335.15'
C6	49°55'20"	720.00'	627.34'	335.15'





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FAST — Call before you UnderGround — 1-702-432-5300

CALL BEFORE YOU DIG OVERHEAD — 1-702-227-2929

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
SLV-1DBW96	CITY OF LAS VEGAS VERTICAL CONTROL POINT SLV1DBW96, BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN FORE CHOP HICAMPO	2914.54 (FEET)	888.355 (METERS)

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WER SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A 48" MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
8. INSTALL RIP-RAP, SEE DETAIL 6 ON SHEET C8.01 FOR DETAIL.
9. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
10. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
11. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
12. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
13. INSTALL SEDIMENT BERM PER DETAIL
14. ACCESS ROAD, SEE DETAIL 8 ON SHEET C8.01 FOR TYPICAL SECTION
15. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
16. INSTALL HEADWALL, SEE STRUCTURAL PLANS
17. INSTALL HEADWALL, SEE STRUCTURAL PLANS

DRAINAGE CONSTRUCTION NOTES

1. 3" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET C8.02)
2. 5" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET C8.02)

VERIFY LOCATION AND ELEVATION OF EXISTING IMPROVEMENTS. MATCH EXISTING AND PROTECT IN PLACE. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF ONSITE FACILITIES.

NORTH
30' 0' 15' 30' 60'
SCALE: 1" = 30'

STATE OF NEVADA — THOMAS P. DIXON — No. 13704 — PROFESSIONAL ENGINEER

DATE: 8/21/2018

TDS SUBMITTAL

REV	DATE	DESCRIPTION	DATE	PLANS APP	DATE	CCW APP

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MP
PLOT DATE: 07-11-18
PLOT TIME: 08:36:41

GCW ENGINEERS\SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\PROJECTS\840\840-050\DWG\PRODUCTION\PHASE-1AA\050-1AA005.DWG
DANIEL LEE

SEVENTY ACRES, LLC
FORE STARS, LTD

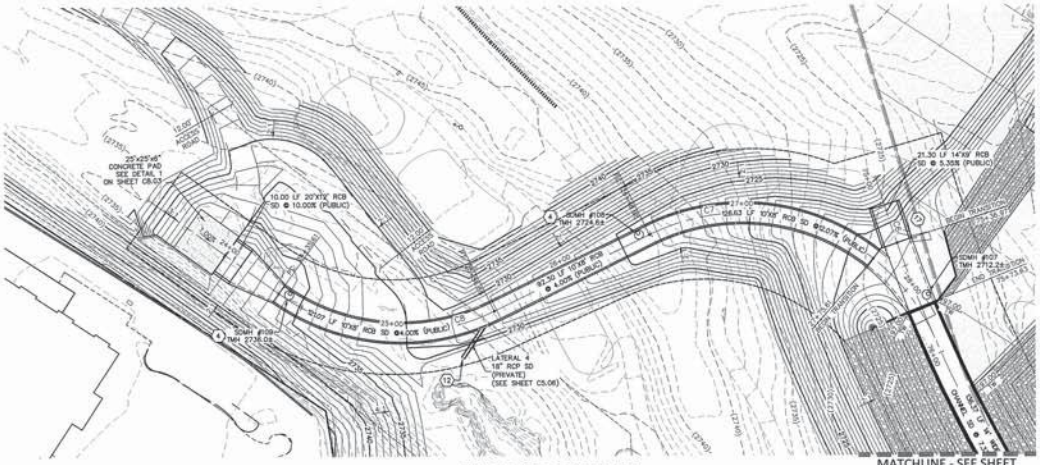
THE 435

PLAN & PROFILE 3

DRAWING
C5.03
11 OF 17 SHTS

REPLY APP 1228

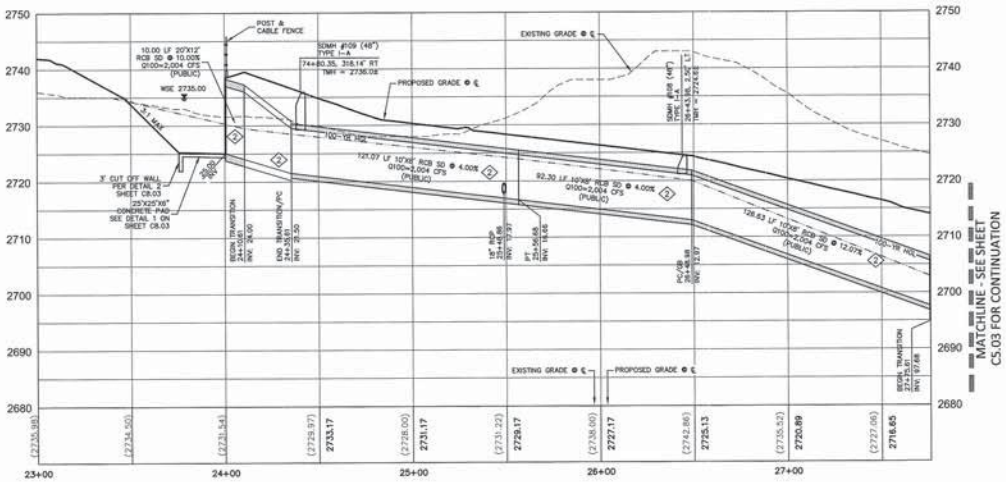
CLV295838

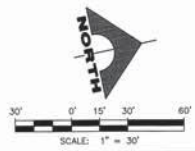


STORM DRAIN PLAN

SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

CL CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C7	92°31'33"	112.00'	180.87'	117.05'
C8	61°56'14"	112.00'	121.07'	67.21'





KEY MAP

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CLARK COUNTY ONLY (NON-MEMBERS)
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FAST
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FREEWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

AREAS WITHIN UNITED PARCEL SERVICE (UPS) FTI SERVICE
CALL BEFORE YOU DIG OVERHEAD
1-702-227-2929

BENCHMARK			
BM #	DESCRIPTION	NAVD 88	NAVD 88
BLV-TOENWG	CITY OF LAS VEGAS VERTICAL CONTROL POINT "BLV-TOENWG", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN FORK CHOP	2914.54 (FEET)	888.355 (METERS)

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITIES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WEIR SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A 48" MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITIES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
8. INSTALL RIP-RAP, SEE DETAIL 6 ON SHEET C8.01 FOR DETAIL.
9. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
10. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
11. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
12. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
13. INSTALL SEDIMENT BERM PER DETAIL
14. ACCESS ROAD, SEE DETAIL 8 ON SHEET C8.01 FOR TYPICAL SECTION
15. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
16. INSTALL HEADWALL, SEE STRUCTURAL PLANS

DRAINAGE CONSTRUCTION NOTES

1. 3" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET C8.02)
2. 5" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET C8.02)

VERIFY LOCATION AND ELEVATION OF EXISTING IMPROVEMENTS. MATCH EXISTING AND PROTECT IN PLACE. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF ONSITE FACILITIES.

STATE OF NEVADA — THOMAS P. GIORDANO — PROFESSIONAL ENGINEER — No. 11316 — EXP. 12/31/2018

DATE: 8/31/2018

TDS SUBMITTAL

REV.	DATE	DESCRIPTION	DATE	FIELD APP	DATE	CIVIL APP

PROJECT NO. 840-050
DESIGN: TG
DRAWN: TG
CHECK: MF
PLOT DATE: 01-11-18
PLOT TIME: 08:49:44

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
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SEVENTY ACRES, LLC
FORE STARS, LTD

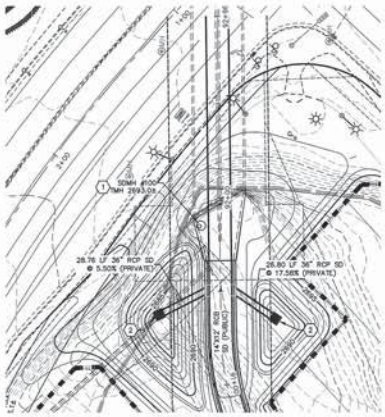
THE 435

PLAN & PROFILE 4

DRAWING
C5.04
12 OF 17 SHTS

REPLY APP 1229

CLV295839

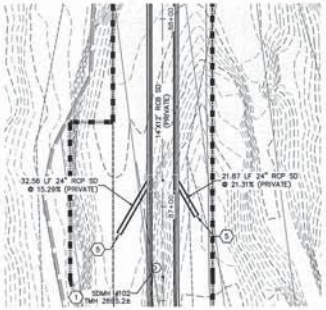


STORM DRAIN - LATERAL 1

SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

NORTH
SCALE 1" = 30'

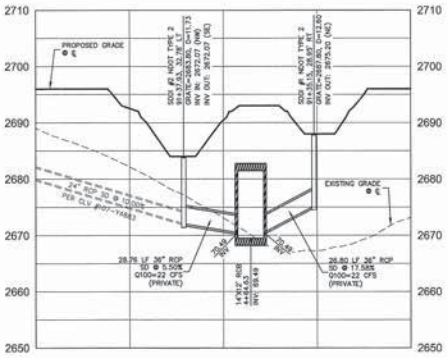
30' 0' 15' 30' 60'
SCALE: 1" = 30'

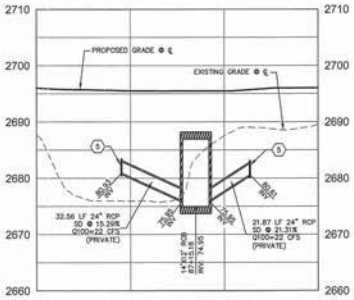


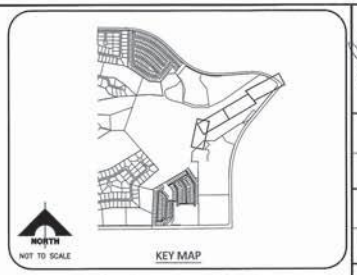
STORM DRAIN - LATERAL 2

SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

NORTH
SCALE 1" = 30'







KEY MAP

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FAST
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FREQUENT AND ACCIDENTAL SYSTEM OF TRANSPORTATION

AVOID ACCIDENTS DURING POWER LINES ITS SAFE!
CALL BEFORE YOU DIG FOR SD PUMPS
1-702-227-2929

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
SLV-106NWB	CITY OF LAS VEGAS VERTICAL CONTROL POINT SLV106NWB, BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2008 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITIES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WEIR SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A 48" MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITIES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
8. INSTALL RIP-RAP, SEE DETAIL 6 ON SHEET C8.01 FOR DETAIL.
9. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
10. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
11. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
12. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
13. INSTALL SEDIMENT BERM PER DETAIL
14. ACCESS ROAD, SEE DETAIL 8 ON SHEET C8.01 FOR TYPICAL SECTION
15. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
16. INSTALL HEADWALL, SEE STRUCTURAL PLANS

DRAINAGE CONSTRUCTION NOTES

1. 3" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET C8.02)
2. 5" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET C8.02)

VERIFY LOCATION AND ELEVATION OF EXISTING IMPROVEMENTS. MATCH EXISTING AND PROTECT IN PLACE. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF ONSITE FACILITIES.

STATE OF NEVADA
THOMAS P. STYSON
No. 13704
PROFESSIONAL ENGINEER
CIVIL
DATE: 09/17/2018

TDS SUBMITTAL

REV'T	DATE	DESCRIPTION	FAS'D APP	DATE	GCW APP	DATE

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MF
PLOT DATE: 01-11-18
PLOT TIME: 11:21:23
FILE: F:\PROJECTS\800\840-050\DWG\PRODUCTION\PHASE-1AA\050-1AACD5_PP2.DWG
SAMEL, LEE

GCW
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com
ENGINEERS \ SURVEYORS

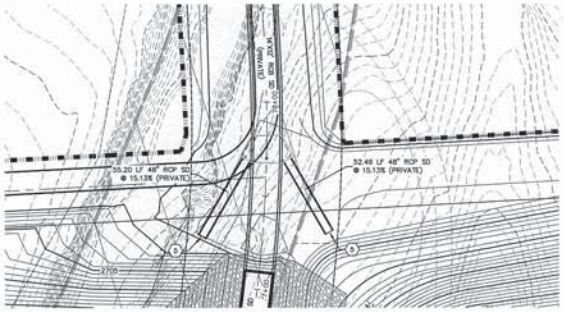
SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

LATERAL PROFILE 1

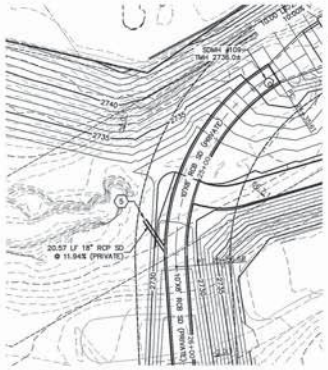
DRAWING
C5.05
13 OF 17 SHTS

HTE: 00-00000



STORM DRAIN - LATERAL 3

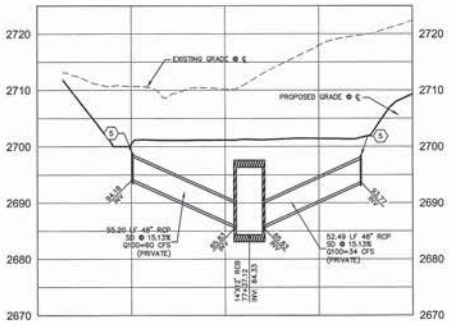
SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

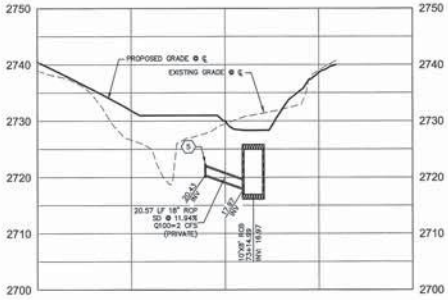


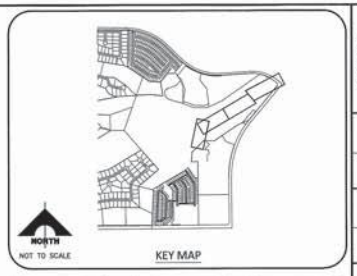
STORM DRAIN - LATERAL 4

SCALE: HORIZ 1" = 30'
VERT. 1" = 10'

30' 0' 15' 30' 60'
SCALE: 1" = 30'







KEY MAP

Call before you Dig
811
1-800-227-2600
CLARK COUNTY REGION (EXCLUDING):
1-702-435-6000

FAST
Call before you UnderGround
1-702-632-5300
PRIVATE AND INTERNAL SYSTEM OF DISCRIPTION

CALL BEFORE YOU DIG OVERHEAD
1-702-227-2929

BENCHMARK

BM #	DESCRIPTION	NAVD 88	NAVD 88
SLV-TOENWB	CITY OF LAS VEGAS VERTICAL CONTROL POINT "SLVTOENWB", BEING A RIVET & PLATE IN TOP OF CURB AT SW CORNER OF CHARLESTON & HUALAPAI IN PORK CHOP ISLAND.	2914.54 (FEET)	888.355 (METERS)

NOTE

CITY OF LAS VEGAS VERTICAL CONTROL 2006 ADJUSTMENT (UPDATED 05/24/2010) BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD'88).

BASIS OF BEARINGS

NORTH 89°40'03" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHEAST QUARTER (SE 1/4) OF SECTION 31, TOWNSHIP 20 SOUTH, RANGE 60 EAST, M.D.M., AS SHOWN IN FILE 120, PAGE 49 OF PARCEL MAPS ON FILE AT THE CLARK COUNTY, NEVADA RECORDER'S OFFICE.

CONSTRUCTION NOTES

1. GOLF COURSE IRRIGATION FACILITIES TO BE REMOVED BY OWNER.
2. OPEN TOP RCB WEIR SECTION PER DETAIL 3 SHEET C8.02
3. DRAINAGE TRANSITION STRUCTURE, SEE STRUCTURAL PLANS FOR DETAIL.
4. TYPE 1-A 48" MANHOLE PER USCCCA DWG NO. 401 AND 404.1
5. EXISTING GOLF COURSE FACILITIES TO BE DEMOLISHED, CLEAR AND GRUB PER SPECIFICATIONS, AND SOILS REPORT.
6. CREATE GRADED SUMP SLOPE AT 2:1 MAX. FINISH GRADE OF SUMP AT INVERT OF STORM DRAIN PIPE AND SEE PLANS FOR MINIMUM DEPTH AND FINISH GRADE.
7. ENGINEERED ROUGH GRADE TO PAD ELEVATION.
8. INSTALL RIP-RAP, SEE DETAIL 6 ON SHEET C8.01 FOR DETAIL.
9. PROVIDE 2:1 MAXIMUM ENGINEERED SLOPE.
10. INSTALL TYPE 2 DROP INLET W/ SLOTTED LID PER NDOT DWG NO. R-4.2.1 & DETAIL 6 ON SHEET C8.02
11. INSTALL TEMPORARY PLUG AND CAP STORM DRAIN LINE
12. DEMOLISH AND REMOVE EXISTING GOLF CART BRIDGE.
13. INSTALL SEDIMENT BERM PER DETAIL
14. ACCESS ROAD, SEE DETAIL 6 ON SHEET C8.01 FOR TYPICAL SECTION
15. INSTALL PIPE PENETRATION PER DETAIL 5 ON SHEET C8.02
16. INSTALL HEADWALL, SEE STRUCTURAL PLANS

DRAINAGE CONSTRUCTION NOTES

1. 3" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 1 SHEET C8.02)
2. 5" CLEARANCE FROM REBAR AT BASE OF RCB (SEE DETAIL 2 SHEET C8.02)

VERIFY LOCATION AND ELEVATION OF EXISTING IMPROVEMENTS. MATCH EXISTING AND PROTECT IN PLACE. NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATION OF ONSITE FACILITIES.

STATE OF NEVADA PROFESSIONAL ENGINEER
THOMAS P. OTSOM
No. 11392
CIVIL
DATE: 8/31/2018

TDS SUBMITTAL

REV	DATE	DESCRIPTION	DATE	FACILITY APP	DATE	CCVW APP

PROJECT NO. 840-050
DESIGN: TO
DRAWN: TO
CHECK: MF
PLOT DATE: 01-11-18
PLOT TIME: 11:22:35

GCW ENGINEERS\SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\PROJECTS\800\840-050\DWG\PRODUCTION\PHASE-1A\050-1AAC05_PP2.DWG
DANIEL LEE

SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

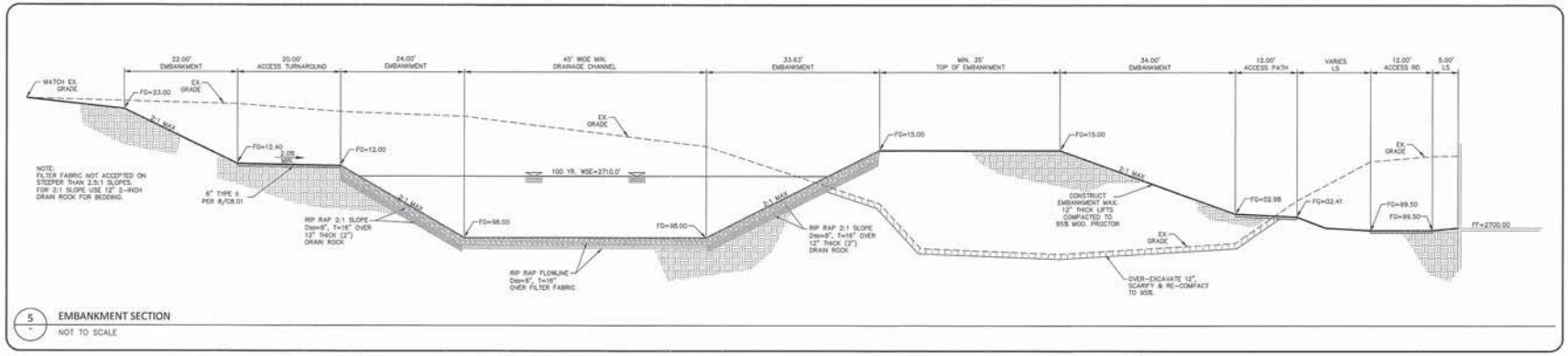
LATERAL PROFILE 2

DRAWING
C5.06
14 OF 17 SHTS

HTE: 00-00000

REPLY APP 1231

CLV295841
6306



5 EMBANKMENT SECTION
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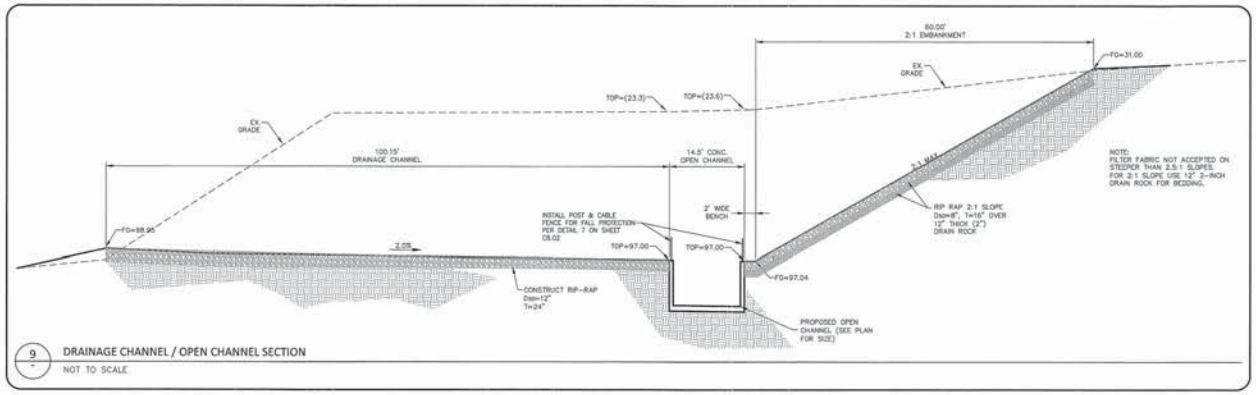
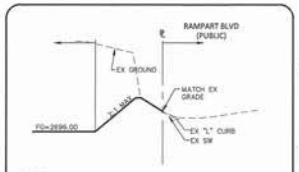


9 DRAINAGE CHANNEL / OPEN CHANNEL SECTION
NOT TO SCALE



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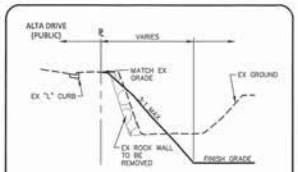

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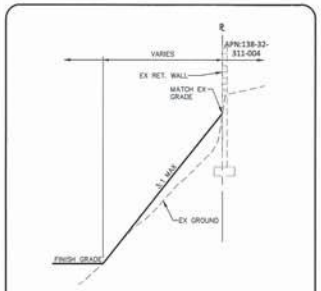

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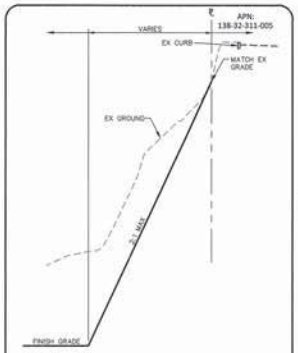

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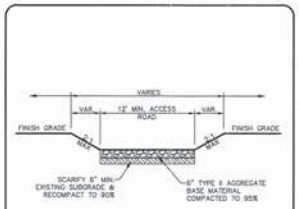

8 ACCESS ROAD SECTION (TYP.)
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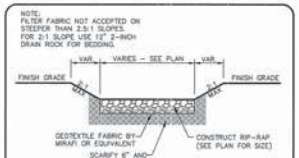

6 RIP RAP SECTION (TYP.)
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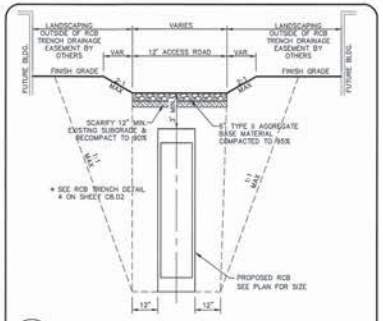

3 SECTION (TYP.)
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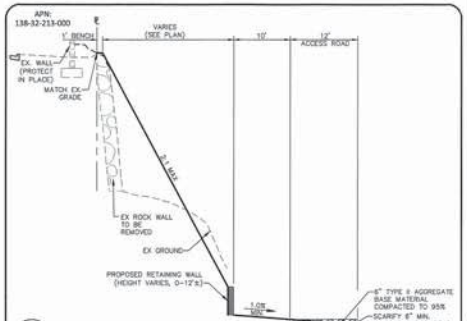


1 PERIMETER SECTION
NOT TO SCALE

THOMAS F. DYSON
STATE OF NEVADA
PROFESSIONAL ENGINEER
No. 12070
DATE 9/10/2018

TDS SUBMITTAL

REV	DATE	DESCRIPTION	DATE	CKD APP	DATE	CKD APP	DATE	CKD APP

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MF
PLOT DATE: 07-10-18
PLOT TIME: 18:20:28

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\PROJECTS\800\840-050\DWG\PRODUCTION\PHASE-1\MX\050-1MAC08_JET.DWG
CHANGE LIST

SEVENTY ACRES, LLC
FORE STARS, LTD

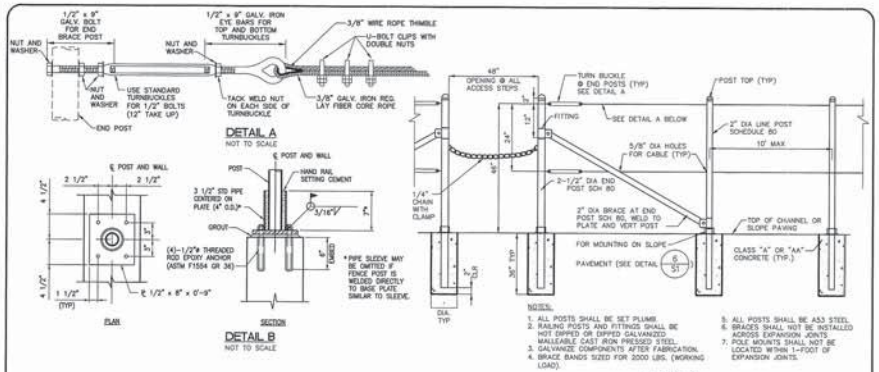
THE 435

SECTIONS & DETAILS 1

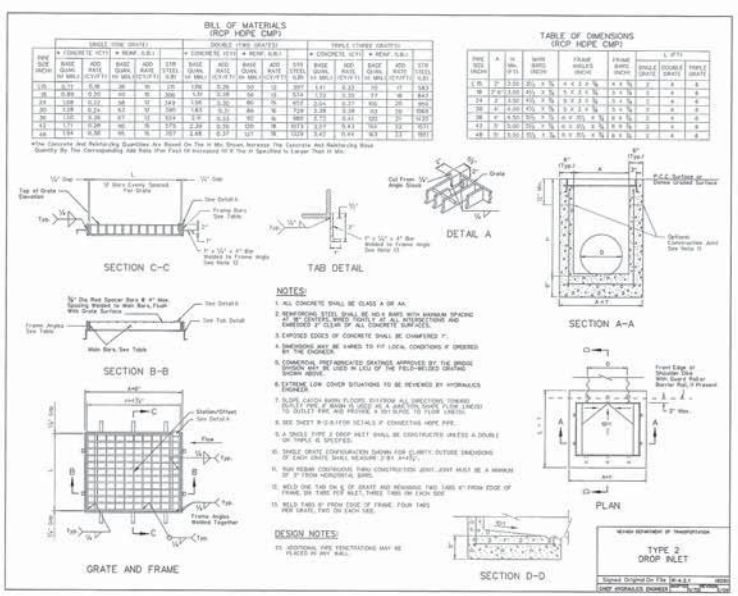
DRAWING
C8.01
15 OF 17 SHTS

REPLY APP 1232

CLV295842
6307

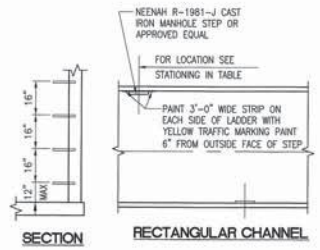


7 POST & CABLE RAILING DETAIL
NOT TO SCALE



6 NDOT TYPE 2A DROP INLET DETAIL
NOT TO SCALE

CHANNEL STEP LOCATION	
RIGHT OFFSET	LEFT OFFSET
76+00	76+00



8 CHANNEL ACCESS STEP DETAIL
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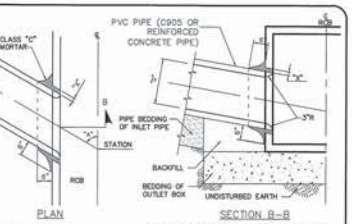

5 BOX PENETRATION DETAIL
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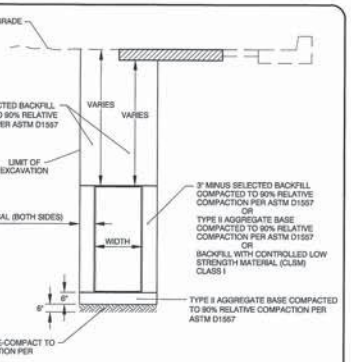

4 RCB TRENCH DETAIL (TYP.)
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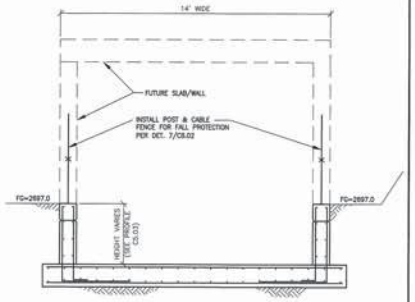
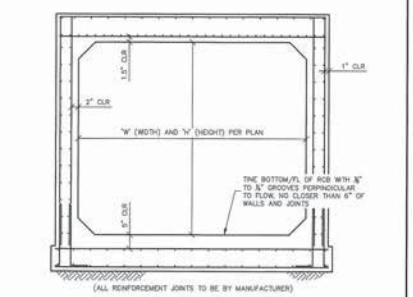
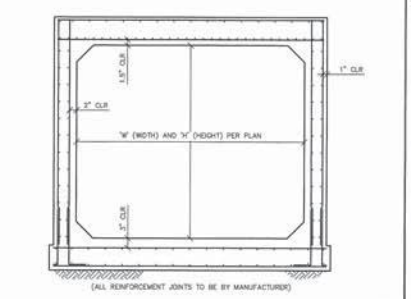


3 TEMPORARY OPEN CHANNEL (FUTURE RCB)
NOT TO SCALE
(DOES NOT CONSTITUTE STRUCTURAL DETAILS.)



2 RCB ADDITIONAL BASE CONCRETE - 5" CLR FOR HIGH VELCOTIES (ABOVE 35 FPS)
NOT TO SCALE
(NOT INTENDED FOR CONSTRUCTION PURPOSES)



1 RCB ADDITIONAL BASE CONCRETE - 3" CLR FOR HIGH VELCOTIES (BETWEEN 25 FPS TO 35 FPS)
NOT TO SCALE
(NOT INTENDED FOR CONSTRUCTION PURPOSES)

STATE OF NEVADA PROFESSIONAL ENGINEER
THOMAS K. DIXON
No. 14797
09/11/2018
TDS SUBMITTAL

REV	DATE	DESCRIPTION	CHK	APP	DATE	PLAN APP	DATE	CLR APP	DATE

PROJECT NO: 840-050
DESIGN: TD
DRAWN: TD
CHECK: AJF
PLOT DATE: 05-11-18
PLOT TIME: 13:13:34
DWGS: LTE
F:\PROJECTS\BOR\840-050\DWG\PRODUCTION\PHASE-1A\050-1A4C08.DTA

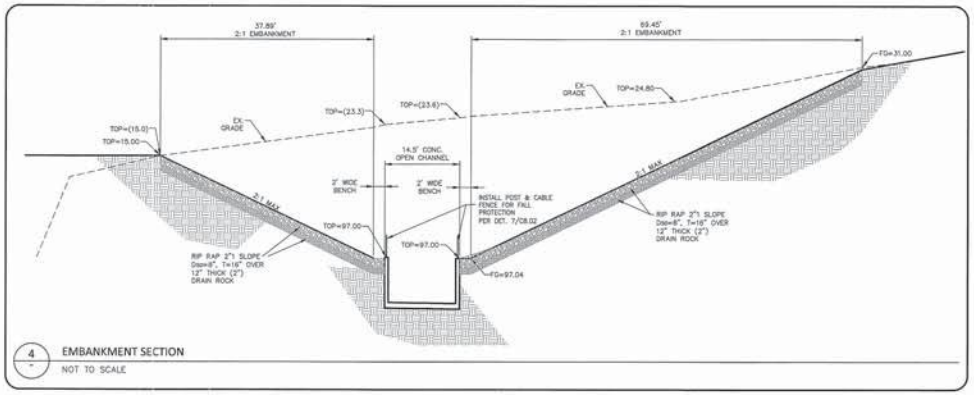
GCV
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcvengineering.com
ENGINEERS \ SURVEYORS

SEVENTY ACRES, LLC
FORE STARS, LTD
THE 435
SECTIONS & DETAILS 2

DRAWING
C8.02
16 OF 17 SHTS

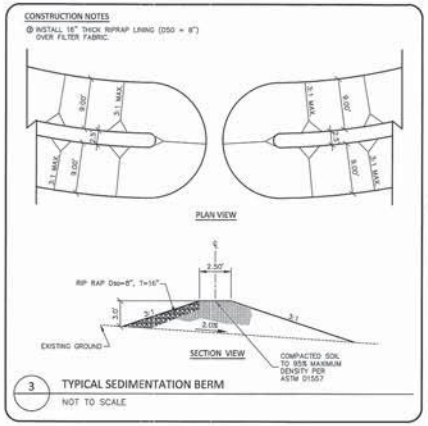
REPLY APP 1233

CLV295843



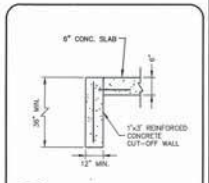
4 EMBANKMENT SECTION

NOT TO SCALE



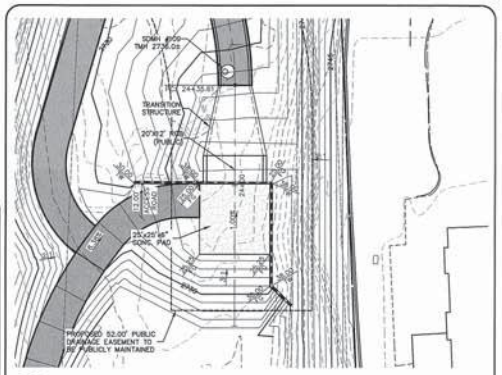
3 TYPICAL SEDIMENTATION BERM

NOT TO SCALE



2 CUT-OFF WALL

NOT TO SCALE



1 CONCRETE PAD DETAIL

NOT TO SCALE

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

PROJECT NO. 840-050
DESIGN: TD
DRAWN: TD
CHECK: MF
PLOT DATE: 01-11-18
PLOT TIME: 09:57:31

SEVENTY ACRES, LLC
FORE STARS, LTD

THE 435

SECTIONS & DETAILS 3

DRAWING
C8.03
17 OF 17 SHTS

REV	DATE	DESCRIPTION	DSN	DRN	CKD	APP

THOMAS P. DYSON
No. 10244
PROFESSIONAL ENGINEER
STATE OF NEVADA
No. 11

DATE: 01/11/2018
TDS SUBMITTAL

REPLY APP 1234

CLV295844

EXHIBIT “YYYYY-9”

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: February 1, 2018
TO: **Land Development Services** Department of Building & Safety				**FROM:** Jennifer Shinn Flood Control Engr. Associate Department of Public Works
SUBJECT:	Drainage Study for:			**COPIES TO:**
The 435 formerly The SEVENTY				GCW Engineers
Cross Streets:	SWC of Rampart & Alta			Seventy Acres LLC
File Number:	F:\Depot\DSMemos\DS4787C.ZNA.doc			Bart Anderson, P.E., DevCo
Parcel Number:	138-32-301-005, 006, 210-008			CCRFCD
Zoning Action:	SDR-62393; GPA-62387; ZON-62392			
FEMA Flood Zone	YES	**X**	NO	
Proposed Storm Drain	YES	**X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	3/3/2016 & 3/9/2016	3/23/2016	See Comments Below	$400.00	425231: $400
2nd Submittal	9/18/17	11/9/2017	See Comments Below	$400.00	490193: $400
3rd Submittal	1/11/18	2/1/2018	See Comments Below	$400.00	492825: $400
			TOTAL FEES (LDDRS):	**$1200.00**	**----**

REMARKS: This site development is within a FEMA SPECIAL FLOOD HAZARD AREA, Zone A. No permits of any kind will be issued for this project until a Conditional Letter of Map Revision (CLOMR/CLOMR-F) is received from FEMA.

The Drainage Study for the subject project has been reviewed and:

	is approved subject to conformance to all City standards and the following conditions:
X	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to NDOT concurrence.

1. An effective HEC-RAS model to determine the existing water surface elevation within the FEMA Special Flood Hazard Area Zone A is required. This model will serve as the base model to develop the duplicate effective model, corrected effective model, pre-project condition model and post-project condition model.

2. Provide a comparison summary of the HEC-RAS results for the existing, interim, and proposed wash conditions.

3. Extend the HEC-RAS model further upstream to analyze the effects of the sedimentation berms.

4. Additional HEC-RAS cross sections are required at the weir (upstream and downstream), at the sediment berms, and the turn within the open RCB. Update the model and exhibits accordingly.

5. For the FEMA flood zone WSE evaluation, the computational flow regime should be “sub-critical flow” not “mix flow” to provide a conservative WSE for floodplain assessment.

6. The hydraulic models do not provide a relationship between Mainline 2 and Mainline 1 at the junction structure. The junction structure acts as a major point of confluence and is a critical section of the system. Revise the WSPG and HEC-RAS models to better demonstrate the interaction of the systems (Mainline 1, Mainline 2, and wash) at the junction.

7. Based on the results of Comment 6, the computed flow depth at the end of the Mainline 2 system should be used as the initial flow condition at Mainline 1 Station -7536.97 and should be applied as the boundary condition for the HEC-RAS model when conducting the WSE evaluation.

8. There is an existing hydraulic jump at the end of the Mainline 1 system per sheet C-6 of the referenced plan for “The Village at Queensridge Culvert”. The WSE of 2635.91 should be used as the downstream boundary condition (SO) to incorporate the hydraulic jump impacting the overall storm drain hydraulic performance and avoid any negative impacts to the downstream condition; Or input parameters should be adjusted to reproduce the hydraulic jump as shown on sheet C-6 to evaluate the proposed storm drain system hydraulic performance.

9. The Mainline 1 system includes an existing 72-inch (Station -9391.3) with a WSE of 2669.252. Provide a comparison between the current design and the previously approved study/design to assess any negative impacts to the upstream and downstream facilities.

10. Include curvature information in the WSPG model for Mainline 2 to estimate super-elevation. Futhermore, with the high flow quantity over 2,000-cfs and a flow velocity of 38.04-fps, which is equal to 22.5-feet of velocity head and super-critical flow condition, roll wave in the straight reach, super-elevation and cross wave along a curve reach and a possible oblique jump should be considered. Ensure the proposed channel cross section provides a stabilized flow condition with sufficient freeboard.

11. Provide headwater calculations at the RCB entrance from the open box section.

12. Provide updated weir calculations for the revised weir length of the open RCB.

13. The future minimum finished floor elevations must be higher than the manholes/road grades of the future road. Revise accordingly.

14. Show 16-foot min. width gates and provide details at maintenance access points from Alta Drive and Rampart Boulevard.

15. Verify the existing golf course bridge has adequate capacity and clearance for maintenance vehicles and equipment.

16. Show a maintenance access road down to the interim channel area.

17. Revise the post and cable details to reflect a 3-cable fence system.

18. A levee is proposed along the northern side of the interim channel, adjacent to southwestern future development lots. Per Section 303.6.2 of the Manual, since the flood control levee is proposed within a FEMA SFHA and a map revision will be requested based on the levee providing protection against the 100-year flood, FEMA’s levee criteria shall be used in order for FEMA to credit the levee. For FEMA to accredit a levee system with 1-percent-annual-chance flood hazard reduction capability on a FIRM, the community/levee owner must submit a package containing the required data and documentation to show that the levee system meets all design and operation requirements of 44 CFR 65.10.

19. It is unclear on the profile on Sheet C5.03 where the bottom of the channel is located and how high the HGL is at this section. It appears that the upstream end of the open box is only 2-feet high which means the western wall of the RCB is not fully constructed. Clarify the design of open box section.

20. Verify the stationing of SDMH #109 on the profile on Sheet C5.04.

21. Revise the call outs on the lateral profile sheets to call out Construction Note 12 to install temporary plug and cap storm drain line.

22. Revise Sections 5 and 9 on Sheet C8.01 to show the same rip rap specifications for the bottom of the interim channel.

23. Revise Sections 3 and 8 on Sheet C8.01 to specify the same scarification extents.

24. Provide details of the proposed walls at the entrance into the 20' x 12' RCB.

The following comments are repeated to reflect routine items previously acknowledged by the Engineer.

25. This site development is located within a FEMA SPECIAL FLOOD HAZARD AREA, Zone A. **No permits will be issued until a Conditional Letter of Map Revision (CLOMR/CLOMR-F) is received from FEMA. Permits may be issued upon the receipt of Conditional Letter of Map Revision (CLOMR or CLOMR-F) from FEMA.**

26. A Letter of Map Revision (LOMR/LOMR-F) must be obtained from FEMA after the completion of any project within a FEMA Special Flood Hazard Area, Flood Zone "A". The bonded improvements shall include a line item of **$50,000.00** for the LOMR. The bonded improvements will not be released until the LOMR/LOMR-F is obtained from FEMA and filed with the City of Las Vegas.

27. The site is located within the Flood Zone A and is adjacent to an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

28. Please obtain necessary 404 permits from US Army Corps of Engineers and provide a copy of the permit to City of Las Vegas Flood Control Section prior to issuance of the grading permit. Contact the St. George Field Office of the US Army Corps of Engineers for permit information.

29. Provide complete *Plans and Project Specifications* for approval by the *City of Las Vegas*. The Structural Plans and Details shall be a part of the Civil Improvement Plan set. This project is considered as a *Capital Improvement Project* (CIP) with developer funding.

30. Structural plans for the proposed storm drain improvements and pertinent flood control facilities must be submitted for review. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the *Building Department* for processing. The engineer must provide a copy of *Building Department* approval of the structures to Regional Flood prior to their concurrence and to *Flood Control* prior to final acceptance of the drainage study.

31. All proposed improvements associated with the Storm Drain facilities shall be bonded and inspected. This project shall require Special Inspection. Coordinate the requirements of and the Agreements needed for Special Inspection with the Building Department.

32. The proposed improvements show drainage facilities of a size that must be reviewed for access and maintenance concerns. The engineer must submit an extra set of improvement plans to the *City Streets & Sanitation Department* for their review and comments. *Streets & Sanitation Department's* approval must be secured prior to the conditional drainage study approval.

33. Provide new public drainage easements for the area of the site impacted by the proposed MPU facility improvements. The easement shall note that the public drainage improvements (MPU

facilities) are publicly maintained and all onsite storm drain and surface improvements are privately maintained and the easement must be dedicated and recorded by separate document prior to the final acceptance of the improvement plans. Provide legal description and an exhibit of the drainage easement to Flood Control and *Rae Heller* (702-229-2139) of *City of Las Vegas Right of Way Section* for the recordation process after the subject drainage study is conceptually approved. The existing drainage easements shall be vacated by separate action and the recording of the new easements shall be done consecutively.

34. Technical drainage studies are required for each of the future development super pads. The technical drainage studies for the developments may not be submitted until the conditional approval of this pertinent infrastructure drainage study is obtained. Final approval for the infrastructure study must be obtained prior to conditional approval of the impacted development super pad drainage studies.

35. This project currently has no Proposed Buildings or Structures. Should the project propose changes to this design assumption, then the Engineer is to update the drainage study detailing the flood zone impacts and provide addresses for each building in a FEMA Flood Hazard Zone prior to obtaining a grading permit. This information is necessary to insure that the elevation certificates are provided for each address prior to completion of construction. This information is required until such time as a LOMR is approved that removes the development from the SFHA.

Flood Control understands that this overall project will be developed in Phases. The following comments are repeated to reflect items that shall be addressed in future study updates as the Phases develop.

36. Proposed storm drain laterals have been identified to collect flows from Peccole West Lot 9 and Queensridge Fairway Homes. Extend the storm drain system to collect the 100-year flows from these adjacent subdivisions.

37. Continue to coordinate the MPU facility changes that are proposed with this development.

38. Storm drain facilities are located on cut/fill slopes. Revise the slopes and/or the storm drain alignment to maintain 12-foot access roads. Provide a cross section detail of the maintenance access.

39. Provide a concrete pad and maintenance access to the inlet structures for the local storm drains. Show the needed drainage easements for these facilities.

40. The existing and proposed utility crossings of the storm drain must be shown on the storm drain plan and profiles sheets and on the lateral profiles. Indicate the type of pipe material for water and sewer lines. Review separation requirements between utilities and show all of the utility crossings of the storm drains.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the *Nevada Division of Environmental Protection* a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm or call (775) 687-9429.

NOTE: The engineer must submit the drainage study to FEMA for a Conditional Letter of Map Revision (CLOMR). A favorable CLOMR must be obtained prior to the issuance of any permits. This site is located in a **FEMA Zone A**. *Clark County Regional Flood Control District* (CCRFCD) review and approval is required prior to recordation of final map or issuance of building/grading permits. The Engineer must send a copy of the report to the CCRFCD for review. **The developer/engineer must also obtain a Letter of Map Revision (LOMR) using the approved drainage study as technical support to inform FEMA of the modifications within the flood zone. The approved LOMR must be submitted to the *City of Las Vegas* prior to the release of the bond.** FEMA Elevation Certificates, showing as-built finish floor elevations, must be completed for each building in the FEMA A Zone. The certificate must be submitted to the *City of Las Vegas Flood Control Section* prior to scheduling a framing inspection.

END OF REMARKS
JKS/PBJ

T/R/S: T20S/R60E/12
AREA L-32