

DS #: 4663

APN: 125-01-402-009 to -016

PROJECT: GRANITE FALLS 2 SOUTH

SUBMITTAL: SUPPLEMENT

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM

DATE:

July 14, 2014

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:

Granite Falls 2 South

COPIES TO:

Slater Hanifan Group

Cross Streets:

NWC of Iron Mountain Road & Bradley Road

Verlaine LLC / Richmond American

File Number:

F:\Depot\DSMemos\DS4663C.doc

Bart Anderson, P.E., DevCo

Parcel Number:

125-01-402-009 to 125-01-402-016

Zoning Action:

GPA-52122; ZON-52123; VAC-52125 &
TMP-52127

FEMA Flood Zone

YES

NO

X

Proposed Storm Drain

YES

NO

X

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	3/27/2014	4/10/2014	Not Approved	\$400.00	352205: \$400
2 nd Submittal	5/27/2014	6/10/2014	Not Approved	\$400.00	358136: \$400
Supplement	6/30/2014	7/14/2014	See Comments Below	N/C	N/C
TOTAL FEES (LDDRS):				\$800.00	----

REMARKS:

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.
	is conditionally approved subject to Clark County Public Works Department concurrence.

1. The proposed bubbler and the bleeder line encroach into the property of the *Bureau of Land Management* (BLM). Drainage easement grant must be obtained from the BLM prior to the final approval of the improvement plans.
2. It appears that SDMHs #1, #2 and #3 need to be upsized to 60" instead of the proposed 48". Review and revise all pertinent construction notes accordingly.
3. **Sheet PP-9:** Provide one additional cleanout at approximately Sta. 24+00 to maintain a 600'-maximum spacing interval.

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Update and accepted by the *City of Las Vegas Flood Control Section*. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

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

ays

T/R/S: T19S/R60E/01
AREA G-01

 *** FAX TX REPORT ***

TRANSMISSION OK

JOB NO. 4136
 DESTINATION ADDRESS 7022845399
 PSWD/SUBADDRESS
 DESTINATION ID
 ST. TIME 07/14 16:25
 USAGE T 00' 32
 PGS. 2
 RESULT OK

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		July 14, 2014
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: Granite Falls 2 South	COPIES TO: Slater Hanifan Group
Cross Streets:	NWC of Iron Mountain Road & Bradley Road	Verlaine LLC / Richmond American
File Number:	F:\Depot\DSMemos\DS4663C.doc	Bart Anderson, P.E., DevCo
Parcel Number:	125-01-402-009 to 125-01-402-016	
Zoning Action:	GPA-52122; ZON-52123; VAC-52125 & TMP-52127	
FEMA Flood Zone	YES NO X	
Proposed Storm Drain	YES NO X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	3/27/2014	4/10/2014	Not Approved	\$400.00	352205: \$400
2 nd Submittal	5/27/2014	6/10/2014	Not Approved	\$400.00	358136: \$400
Supplement	6/30/2014	7/14/2014	See Comments Below	N/C	N/C
TOTAL FEES (LDDRS):				\$800.00	----

REMARKS:

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

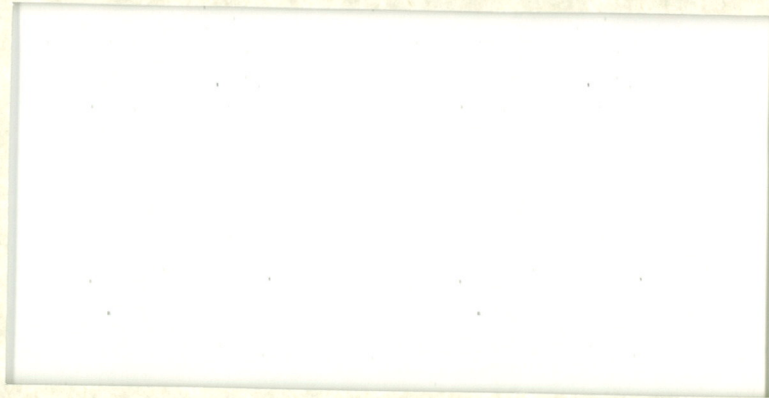
X	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to Clark County Public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

- The proposed bubbler and the bleeder line encroach into the property of the *Bureau of Land Management* (BLM). Drainage easement grant must be obtained from the BLM prior to the final approval of the improvement plans.
- It appears that SDMHs #1, #2 and #3 need to be upsized to 60" instead of the proposed 48". Review and revise all pertinent construction notes accordingly.
- Sheet PP-9:** Provide one additional cleanout at approximately Sta. 24+00 to maintain a 600'.

Rec'd: 6/30/14

DS 4663
G-01

Supp. Info
N/C



S-I-G SLATER
HANIFAN
GROUP

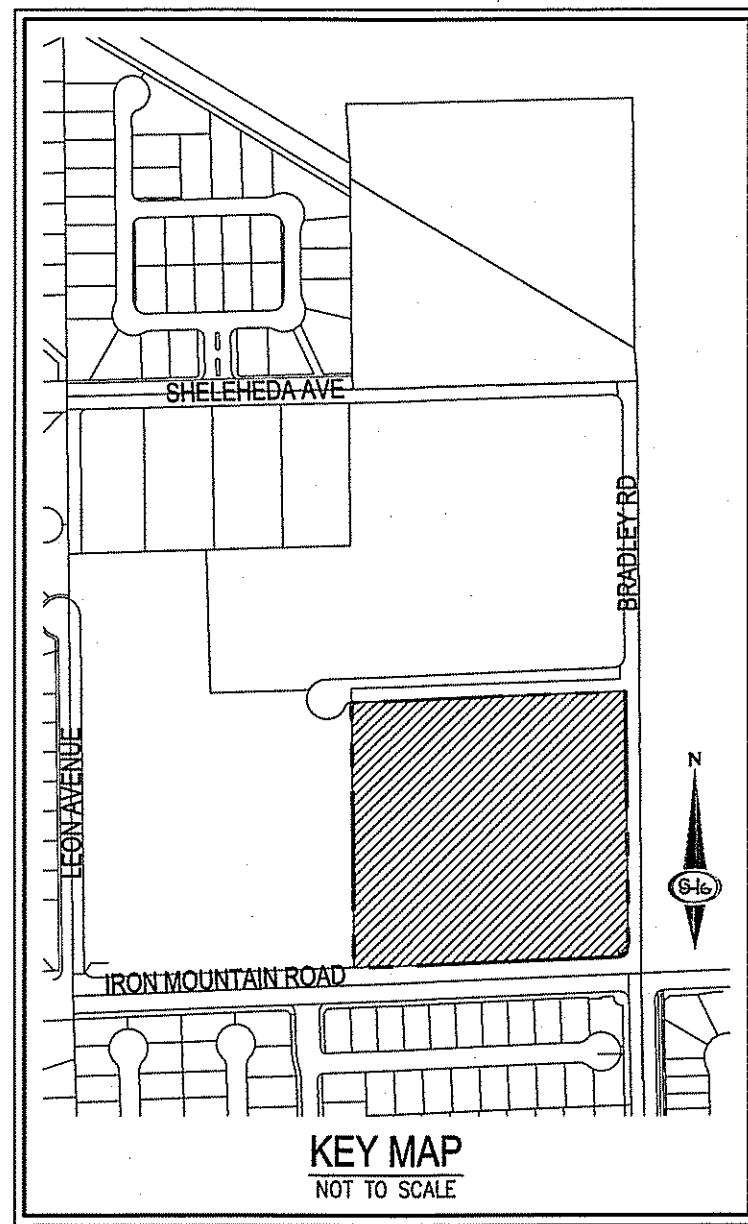
CONSULTING ENGINEERS & PLANNERS

5740 S. ARVILLE STREET, SUITE 216

LAS VEGAS, NEVADA 89118

PHONE: 702-284-5300 • FAX: 702-284-5399

I:\Veh1322-001 Granite Falls 2 South.dwg Veprov\Veh1322-001rev.dwg 6/20/2014 9:09 AM Christopher Zhang



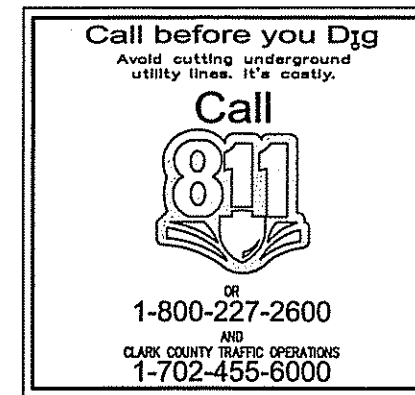
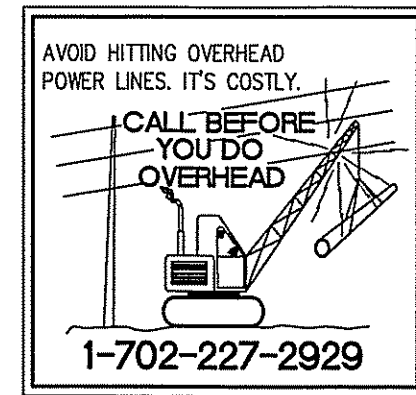
IMPROVEMENT PLANS
FOR
GRANITE FALLS 2 SOUTH
APN 125-01-402-009 THRU 016



CITY ENGINEER-DAVID BOWERS PE, PTCE #16736		DATE
APPROVAL OF THESE PLANS BY THE CITY ENGINEER IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHT-OF-WAY, AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND/OR SPECIFICATIONS EXCEPT THOSE SPECIALLY LISTED UNDER DEVIATIONS FORM 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.		
LAS VEGAS FIRE AND RESCUE		DATE
CHRIS KNIGHT, DIRECTOR BUILDING AND SAFETY DEPARTMENT		
THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT.		
CENTRAL TELEPHONE COMPANY D/B/A CENTURYLINK		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.		
APPROVED FOR CONSTRUCTION		
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER PROJECT NO. XXXXXXXX DATE: SHEETS: C-1, C-2, PP-1 THRU PP-5, AND U-1		
LVWMD APPROVED FLOW: 1500 GPM AT 20 PSI RESIDUAL		
APPROVAL BY THE FIRE DEPARTMENT HAVING JURISDICTION IS REQUIRED PRIOR TO OBTAINING FINAL APPROVAL FROM THE LAS VEGAS VALLEY WATER DISTRICT.		
NV ENERGY		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.		
SOUTHWEST GAS		DATE
COX COMMUNICATIONS LAS VEGAS, INC.		DATE

OWNER RICHMOND AMERICAN HOMES 7770 DEAN MARTIN DR #308 LAS VEGAS, NV 89139	PROJECT INFORMATION EXISTING ZONING: R-E PROPOSED ZONING: R-1 ACREAGE (GROSS): 9.18 AC ACREAGE (NET): 6.97 AC TOTAL DWELLING UNITS: 40 TYP. LOT SIZE: 60'x100' MIN. LOT WIDTH: 60' MIN. LOT SQFT: 6,500 SQFT MAX LOT SQFT: 9,483 SQFT DENSITY (NET ACREAGE): 4.36 DU/AC MAX. LOT COVERAGE: 50%
DEVELOPER RICHMOND AMERICAN HOMES 7770 DEAN MARTIN DR #308 LAS VEGAS, NV 89139 PH (702) 617-8464 FX (702) 617-8499 CONTACT: BRIAN WALSH	

LEGAL DESCRIPTION
LYING WITHIN THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 1, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.



SLATER
HANFAN
GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

APPROVALS
DATE BY DATE
NO. DESCRIPTION

LAS VEGAS, NEVADA

RICHMOND
AMERICAN HOMES

GRANITE FALLS 2 SOUTH
COVER SHEET

DATE: ----
DRAFTER: CZ
DESIGNER: CZ
CHECKED: TJS
PROJECT NO.
RAH1322-001

PROFESSIONAL ENGINEER
CHRISTOPHER
ZHANG
Exp. 06/30/2016
CIVIL
No. 18649
4/30/14

C-1
SHEET 1 OF ----

2.1 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 EDITION, 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. 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 INTERFERENCES WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID 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.

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 INTERFERENCES WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID 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 SATISFACTORILY 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 (1/2") ABOVE TOP OF ALL CUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS CUTTERS.

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 XXXXX, REPORT XXXXXXXX, XXXXXXXXXX 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. 625.320 & 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. ALL AROUND GROUND UTILITY APPEARANCES SHALL CONFORM TO THE REQUIREMENTS OF 18.12.040.

16. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CLV 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 SPECIFICATIONS 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 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 OFFSITE INSPECTION AND TESTING SECTION PRIOR TO PROJECT ACCEPTANCE AND BOND RELEASE. THE MAP(S) SHALL INCLUDE 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 EXISTE THE PUBLIC RIGHT-OF-WAY. THE LOCATION SHALL BE DESCRIBED BY STATE PLANE COORDINATES WHICH SHALL BE BASED ON THE "NEVADA COORDINATE SYSTEM OF 1983, EAST ZONE" AS DEFINED BY THE NEVADA REVISED STATUTES CHAPTER 327, AND TIED TO THE CITY OF LAS VEGAS VERTICAL CONTROL BENCHMARK NETWORK. COORDINATES MUST BE CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINITIES OF +/- 0.1 METER (+/- 0.3 FEET). 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).

22. STORM DRAIN LATERALS REQUIRE THE INSTALLATION OF A MARKER BALL AT THE CONNECTION OF THE STORM DRAIN LATERAL TO THE STORM DRAIN MAIN AND WHERE THE STORM DRAIN LATERAL EXISTE THE PUBLIC RIGHT-OF-WAY OR WHERE THE STORM DRAIN LATERAL CONNECTS TO A DROP INLET. THE MARKER BALL SHALL BE 3M 4" MARKER BALL 1404-JR OR APPROVED EQUAL.

23. 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 ADDITION.

24. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

2.2 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. POLYVNYL (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 SHALL 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 "S" SHALL BE USED ON LINES TWELVE INCHES (12") OR ABOVE.

7. WATER MAINS SHALL BE PROTECTED IN ACCORDANCE WITH LVWD 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 6'-900 PIPE WHICH ALLOWS FOR PIPE DEFLECTION AT THE JOINTS.

2.3 CITY OF LAS VEGAS TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADES, 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 ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY WARNING SIGNS AT THE BEGINNING AND END OF THE CONSTRUCTION ZONE. THE SIGNS MUST BE INSTALLED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAE SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.

4. WHEN A DESIGNATED "SAFE ROUTE TO SCHOOL" IS ENCLOSED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSIGNED 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 THE 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 TRAFFIC SIGNS SHALL BE FABRICATED WITH DIAMOND GRADE VEP CLASS 6 REFLECTIVE SHEETING OR APPROVED EQUAL. ALL NEW TRAFFIC SIGNS, EXCEPT STOP SIGNS, SHALL HAVE 3M SERIES 1150 OR APPROVED EQUIVALENT ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. STOP SIGNS SHALL HAVE 3M SERIES 1150 ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. 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, THE SIGN SHALL BE MOUNTED ON A SIGNPOST. THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE REMOVED.

8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC TO 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 OR AROUND THE WORK AREA. THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL, TECHNICIAN OR MSA 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 REDUCES 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. THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECTS 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 BE RESPONSIBLE FOR OBTAINING APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPENDING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNING. ANY CHANGES TO THE PAVING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SHALL BE APPROVED BY THE CITY ENGINEER.

16. ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE REQUIRED.

2.4 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, AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND ANY ADOPTED SPECIAL AREA STANDARDS.

2. NO DEVIATION OF STREET LIGHT, FULL BOX, CONDUITS (ETC.) LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF TRAFFIC ENGINEERING AND THE CITY ENGINEER.

3. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION.

4. ALL STREET LIGHTING CONDUITS SUB SHALL HAVE AT LEAST ONE GREEN #6 THW WIRE INSTALLED, AS TRAZER WIRE. WHEN "EMPTY" CONDUIT IS COMPLETELY FULL, THE TRAZER WIRE TO PB. IT SHALL HAVE MINIMUMS OF 2 #4 AND 1 #6 THW WIRE WITH THE ENDS TAPED OR "SAFE OFF" PRIOR TO FINAL INSPECTION.

5. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN ACCORDANCE WITH THE UDO NO. 3204.

6. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TEPD PRIOR TO ANY PRE-FINAL INSPECTION. THE AS-BUILT DRAWINGS NEED TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.

7. SERVICE POINT SHALL BE COORDINATED WITH NV ENERGY COMPANY, AND WHENEVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICE POINTS SHALL BE SHOWN ON THE CIVIL PLANS.

8. IT SHALL BE ASSUMED THAT IN THE ABSENCE OF AN EXISTING, WORKABLE CIRCUIT TO ATTACH TO, ALL INSTALLATIONS SHALL REQUIRE A NEW SERVICE FOR OPERATION OF THE CIRCUIT.

9. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREET LIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS WILL BE RESOLVED BY THE PREPARER OF THE PLANS. THE UTILITY INVOLVED, AT NO EXPENSE TO THE CITY OF LAS VEGAS, BEFORE STREETLIGHT BASES ARE INSTALLED.

10. THE CONTRACTOR SHALL FURNISH COMPLETE SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON PLANS.

11. THE DEVELOPER/OWNER WILL BE REQUIRED TO SUPPLY POWER TO ALL NEW PUBLIC STREET LIGHTS INSTALLED UNDER THIS DESIGN. THE OWNER SHALL BE RESPONSIBLE FOR ALL ITEMS ASSOCIATED WITH THE INSTALLATION, CONSTRUCTION, ENERGIZING, MAINTENANCE AND OPERATIONAL COST OF SAID STREET LIGHTS PRIOR TO PROJECT COMPLETION. THE OWNER SHALL BE RESPONSIBLE FOR ANY NEW SERVICE OR THE TRANSFER OF OWNERSHIP FROM THE DEVELOPER/OWNER TO THE CITY OF LAS VEGAS FOR ALL NEW PUBLIC STREET LIGHTS AND/OR SERVICE S INSTALLED UNDER THIS PLAN DESIGN WILL BE IN CONJUNCTION WITH THE PROJECT CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OPERATIONAL TRANSFERS WITH THE CITY OF LAS VEGAS TRAFFIC ENGINEERING DEPARTMENT (TEPD) AT (702) 229-6331.

2.5 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 FOR THE PROJECT, INCLUDING THE 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"	+0.0" TO -0.1"	SEE SOILS REPORT

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

8. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.

9. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF EXISTING OR NEW CONSTRUCTION, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.

10. 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.

11. 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 HIS OWN EXPENSE AND AT THE DIRECTION OF THE CITY ENGINEER. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

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 # 6124 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS. AUTHORIZED FIRE HYDRANTS ARE AS FOLLOWS:

- KENNEDY - GUARDIAN MODELS KB1A AND KB10
- MUELLER - SUPER CONTINENTAL 250, MODEL A-423
- CLOW - MEDALLION MODEL T-2546.10
- U.S. PIPE - METROFLOW/M-03

2. 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.

3. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE HYDRANTS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. SNFC #6124, SECTION 4.12.

4. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. SNFC #6124 SECTION 507.5.7.3

5. 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.

6. 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. SNFC 507.2.1, NFPA 242.

7. 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 GFC 507, SNFC 507.5.7.

8. PRIVATE HYDRANTS SHALL BE PAINTED RED. SNFC 507.5.7.1

9. 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 507, SNFC 507.1.

10. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: SNFC C102

- RESIDENTIAL - 600 FT UNSPRINKLERED; 600 FT SPRINKLERED.
- COMMERCIAL - 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.

11. WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT INSTALLED, THE CONTRACTOR SHALL PROVIDE FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 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 CONTROL SIGNAL, THE CONTRACTOR SHALL PROVIDE FIRE HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. SNFC C102.14

12. 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.

13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. SNFC C102.12

14. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. SNFC 102.4

15. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. SNFC C1 02.7

16. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 220 FT. SNFC 102.6

17. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEADS AND/OR INSTALLED. THE SYSTEM SHALL BE DESIGNED TO PROVIDE A MINIMUM OF TWO SOURCES OF SUPPLY TO EACH FIRE HYDRANT. FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN.

18. 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. SNFC 503.2.3

19. 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 8%. SNFC 503.2.7 / 503.2.8

20. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. SNFC 503.2.4

21. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13 FT 6 INS. SNFC 503.2.1.1 IFC 503

22. FIRE DEPARTMENT ACCESS ROADS IN ALL RESIDENTIAL DEVELOPMENTS (EXCEPT APARTMENT BUILDINGS) SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 36 FT FLOW LINE TO FLOW LINE (THIS WIDTH MAY BE REDUCED TO 24 FT IF ALL BUILDINGS FRONTING THE STREET ARE SPRINKLERED) FOR MAIN TRAVEL LANE. SIDEWAYS WITH PARKING PROVIDED ON ONE SIDE OF THE STREET, PRIVATE DRIVE ALLEYS, DRIVEWAYS, ETC. SHALL BE ALLOWED TO BE REDUCED TO A MINIMUM WIDTH OF 24 FT FLOW LINE TO FLOW LINE WHEN SERVING NO MORE THAN 6 RESIDENTS, AND WHEN ON STREET PARKING IS DISALLOWED. SNFC 503.2.1.1 503.2.11

23. ALL FIRE APPARATUS ACCESS ROADS IN COMMERCIAL, DEVELOPMENTS AND APARTMENT COMPLEXES SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 24 FT FLOW LINE TO FLOW LINE PROVIDED NO PARKING IS ALLOWED ON EITHER SIDE; 32 FT (FLOW LINE TO FLOW LINE), WITH PARALLEL PARKING ON ONE SIDE, AND 36 FT (FLOW LINE TO FLOW LINE), IF PARALLEL PARKING IS ALLOWED ON BOTH SIDES. THESE WIDTHS MAY BE REDUCED TO 24 FT IF SPRINKLERED. SNFC 503.2.1.1

24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE. THIS DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. IFC 503.1.11 SNFC 503.11

25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT, AND FOR ALL COMMERCIAL, INDUSTRIAL, AND MULTI-FAMILY RESIDENTIAL DEVELOPMENTS. SNFC 503.1.2

26. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LINES, 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. SNFC 503.2.3

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 LANE. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY WHEN 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. SNFC 503.3

28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE EXIT 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.

STORMWATER RUNOFF MANAGEMENT

(REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQ.FT.))

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT AND/OR CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS OF CLARK COUNTY 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 ORDINANCE NO. 14.18 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 NVW00000, 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 ACTUAL 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 NVW00000, SECTION III.A.12.

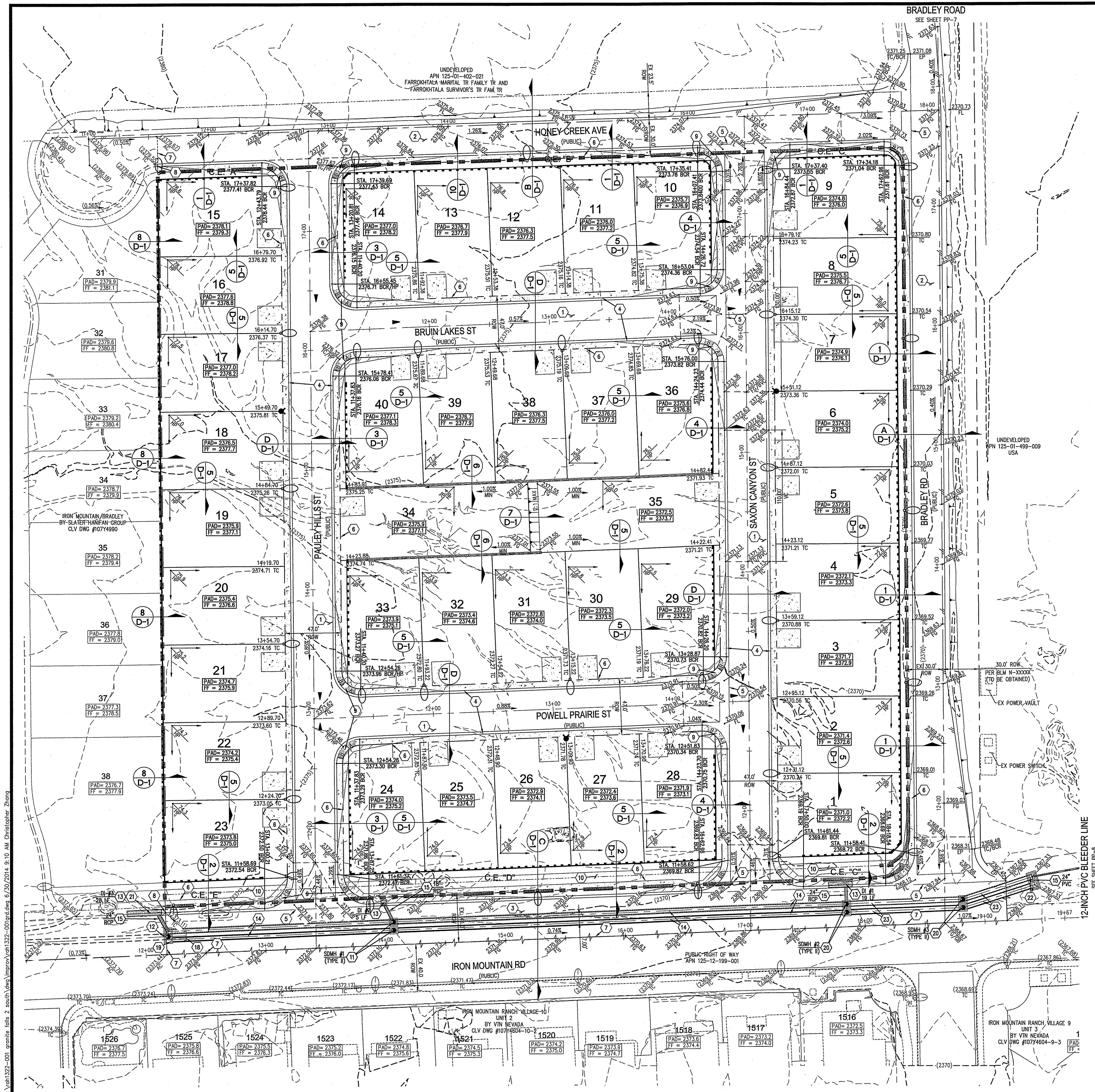
5. ACCUMULATED SEDIMENT IN BMPs SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

UTILITY LOCATION NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS. CALL BEFORE YOU DIG: 1 (800) 227-2600

NOTE TO CONTRACTOR

QUANTITIES SHOWN ARE ESTIMATES ONLY AND ARE INTENDED TO ILLUSTRATE SCOPE OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXACT QUANTITIES INVOLVED.

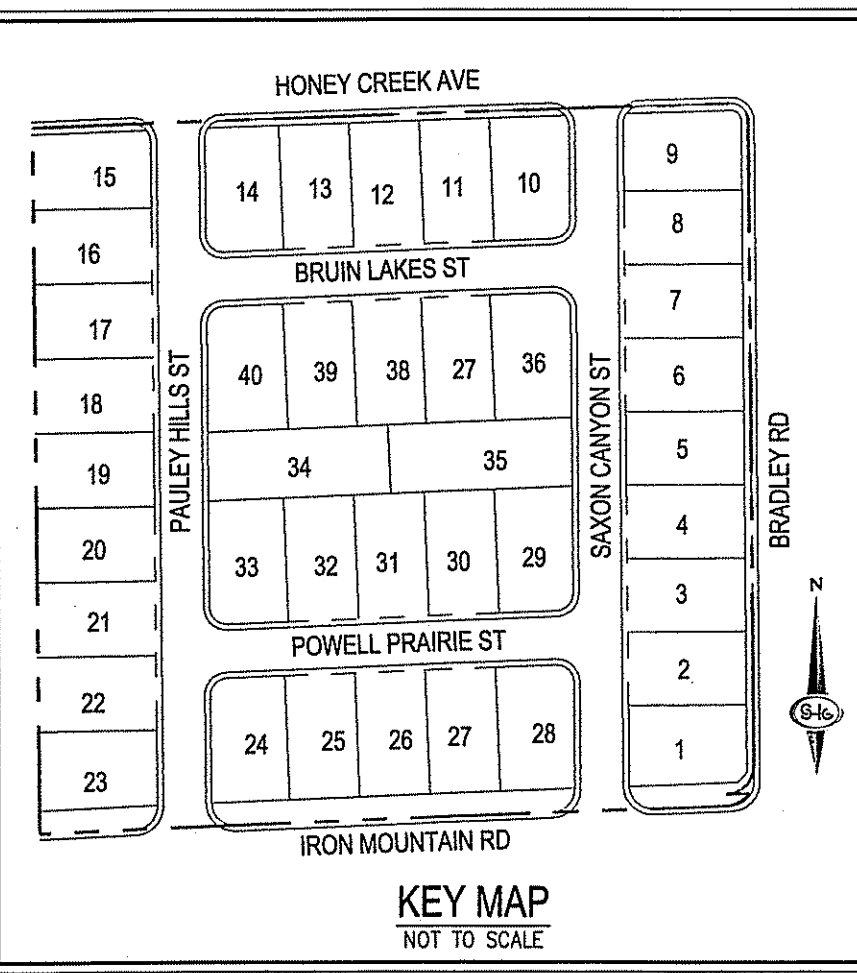


BRADLEY ROAD

SEE SHEET PP-7

GENERAL NOTES

1. FINAL GRASSES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2009, SECTION 2304.11.2.2.
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS OF EXISTING UTILITIES AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
3. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
4. MAXIMUM/MINIMUM SLOPES AND MINIMUM STREET SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
5. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE BONDED FOR AND INSPECTED.
6. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE EROSION CONTROL APPROVAL BY THE CLARK COUNTY BUILDING DEPARTMENT.
7. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITY STRUCTURES AND FACILITIES AND REPORT ANY DISCREPANCIES TO THE ENGINEER. CONTRACTOR TO PROTECT IN PLACE ALL EXISTING CONSTRUCTION, UTILITIES AND FACILITIES. IN THE EVENT OF ANY DISCREPANCY OR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION, CONTRACTOR WILL BE RESPONSIBLE FOR REPAIRS. IF THE UTILITY ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION, CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRS.
8. NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY TYPE SHALL BE PLACED WITHIN 124" INCHES IN HEIGHT (MEASURED FROM THE TOP OF THE ADJACENT CURB IF CURB EXIST) WITHIN THE SIGHT TRIANGLE.



CONSTRUCTION NOTES

- | | |
|--|--|
| 1 | CONSTRUCT 2.5' AC PAVEMENT WITH 6" TYPE II AGGREGATE BASE OVER NATURAL MATERIAL PER SOILS REPORT. |
| 2 | CONSTRUCT 3.5' AC PAVEMENT WITH 7" TYPE II AGGREGATE BASE OVER NATURAL MATERIAL PER SOILS REPORT. |
| 3 | CONSTRUCT 4.5' AC PAVEMENT WITH 12" TYPE II AGGREGATE BASE OVER NATURAL MATERIAL PER SOILS REPORT. |
| 4 | CONSTRUCT 1" TYPE CURB AND GUTTER PER C228 |
| 5 | CONSTRUCT 6" CROSS CURB OVER CAUSAD NO. 228 |
| 6 | CONSTRUCT 5' WIDE SIDEWALK PER CAUSAD NO. 234 |
| 7 | SAWTOOTH AND MATCH EXISTING IMPROVEMENTS |
| 8 | FIELD VERIFY AND CONNECT TO EXISTING CURB, GUTTER AND SIDEWALK |
| 9 | CONSTRUCT SIDEWALK RAMP USING ARMOR TILE PER CAUSAD NO. 235, CASE 1 |
| 10 | INSTALL 48" DIA. 3' CRUSHED FINES EQUESTRIAN TRAIL PER CIVL TRAIL IMPROVEMENT GUIDELINE UOQ-107 |
| 11 | INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CAUSAD NO. 401 & 405 |
| 12 | INSTALL 48" STUB AND CONNECT TO EXISTING STORM DRAIN SUB |
| 13 | INSTALL TYPE C DROP INLET PER CAUSAD NO. 413 & 421. SEE PROFILE SHEET PP-10. |
| 14 | INSTALL 48" RCP CLASS III 30" (PUBLIC) |
| 15 | INSTALL SD LATERALS (PUBLIC), SEE SHEET PP-10 |
| 16 | INSTALL 12" PVC SD BLEEDER LINE (PUBLIC) |
| 17 | INSTALL D-RIM OR CULVERT-OUT PER DETAIL 9, SHEET D-1 |
| 18 | REMOVE EX 48" CLASS III RCP SD |
| 19 | JUNCTION STRUCTURE BY OTHERS |
| 20 | INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CAUSAD NO. 401 & 405 WITH BOLTED GRATE MANHOLE |
| 21 | REMOVE EXISTING DROP INLET |
| 22 | INSTALL 48"x48"x48" JENSEN PRECAST DROP INLET WITH OPTIONAL FRAME CLASS C IN EXTENSION PER DETAIL 11 AND 12, SEE SHEET D-1 |
| 23 | INSTALL 29"x45" CLASS III HERCP SD (PUBLIC) |
| SEE SHEET C-2 FOR ABBREVIATIONS, LEGEND & QUANTITIES | |

LEGEND

- | | |
|--|-------------------------------------|
| | BOUNDARY LINE |
| | ROADWAY CENTERLINE |
| | RIGHT-OF-WAY |
| | PROPERTY LINE |
| | CURB AND GUTTER |
| | EXISTING CURB AND GUTTER |
| | FLOWLINE |
| | EDGE OF PAVEMENT (EP) |
| | SANICUT LINE PER CCAUSD NO. 503 |
| | PROPOSED ELEVATION |
| | EXISTING ELEVATION |
| | FUTURE ELEVATION |
| | EXISTING CONTOUR (5-FT) |
| | EXISTING CONTOUR (1-FT) |
| | CUT/FILL TRANSITION LINE |
| | FIRE HYDRANT ASSEMBLY |
| | SIGHT VISIBILITY ZONE |
| | WROUGHT IRON FENCE |
| | PONY WALL |
| | RETAINING WALL |
| | DECORATIVE PERIMETER WALL |
| | DECORATIVE PERIMETER RETAINING WALL |
- SEE SHEET C-2 FOR ABBREVIATIONS AND QUANTITIES

DISCLAIMER NOTE

1. EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREIN. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN HEREIN.
2. FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED JUMP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

SOILS REPORT BY ANGLE ENGINEERING

PROJECT NO. 26163-1, DATED 11/22/13
EARTHWORK QUANTITIES (RAW):
CUT= 12.483 CU YDS/FILL= 12.629 CU YDS

FEMA FLOOD ZONE DESIGNATION

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE 'X', (OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD), PER FIRM PANEL 32003C1745E, DATED SEPTEMBER 27, 2002.

FLOOD CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED
TECHNICAL DRAINAGE STUDY DS4663A ON FILE AT CITY OF LAS VEGAS FOR THE
SUBJECT PROJECT.

BASIS OF BEARING

SOUTH 00°23'54" EAST, BEING THE BEARING OF THE EAST LINE OF THE SOUTHEAST QUARTER (SE1/4) OF THE SOUTHWEST QUARTER (SW1/4) OF SECTION 1, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN FILE 117, PAGE 43 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

BENCHMARK

CITY OF LAS VEGAS BENCHMARK NUMBER: 6L190120NNW6
ELEVATION AND PLATE TOP OF CURB ON THE SOUTH SIDE OF IRON MOUNTAIN ROAD, 35' ±
EQUIDISTANT OF PI OF LEON DRIVE AND IRON MOUNTAIN ROAD.
ELEVATION: 2378.778 ±1 US SURVEY FEET (NAV88)
725.053 METERS
CITY OF LAS VEGAS BENCHMARKS, 2008 ADJUSTMENT (UPDATED MAY 24, 2010)

SLATER
HANIFAN
SL-G GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

[illegible][illegible]

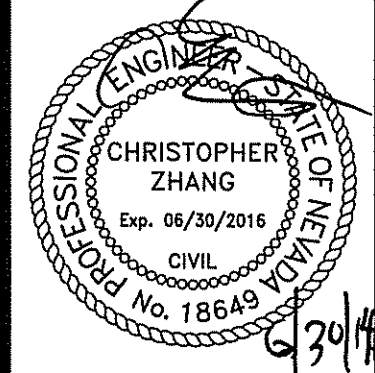
LAS VEGAS, NEVADA	
-------------------	--

RICHMOND
AMERICAN HOMES
GRANITE FALLS 2 SOUTH
GRADING PLAN

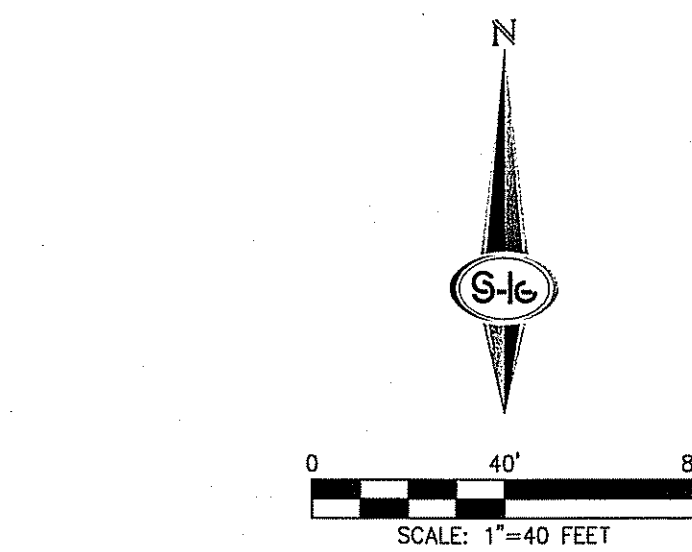
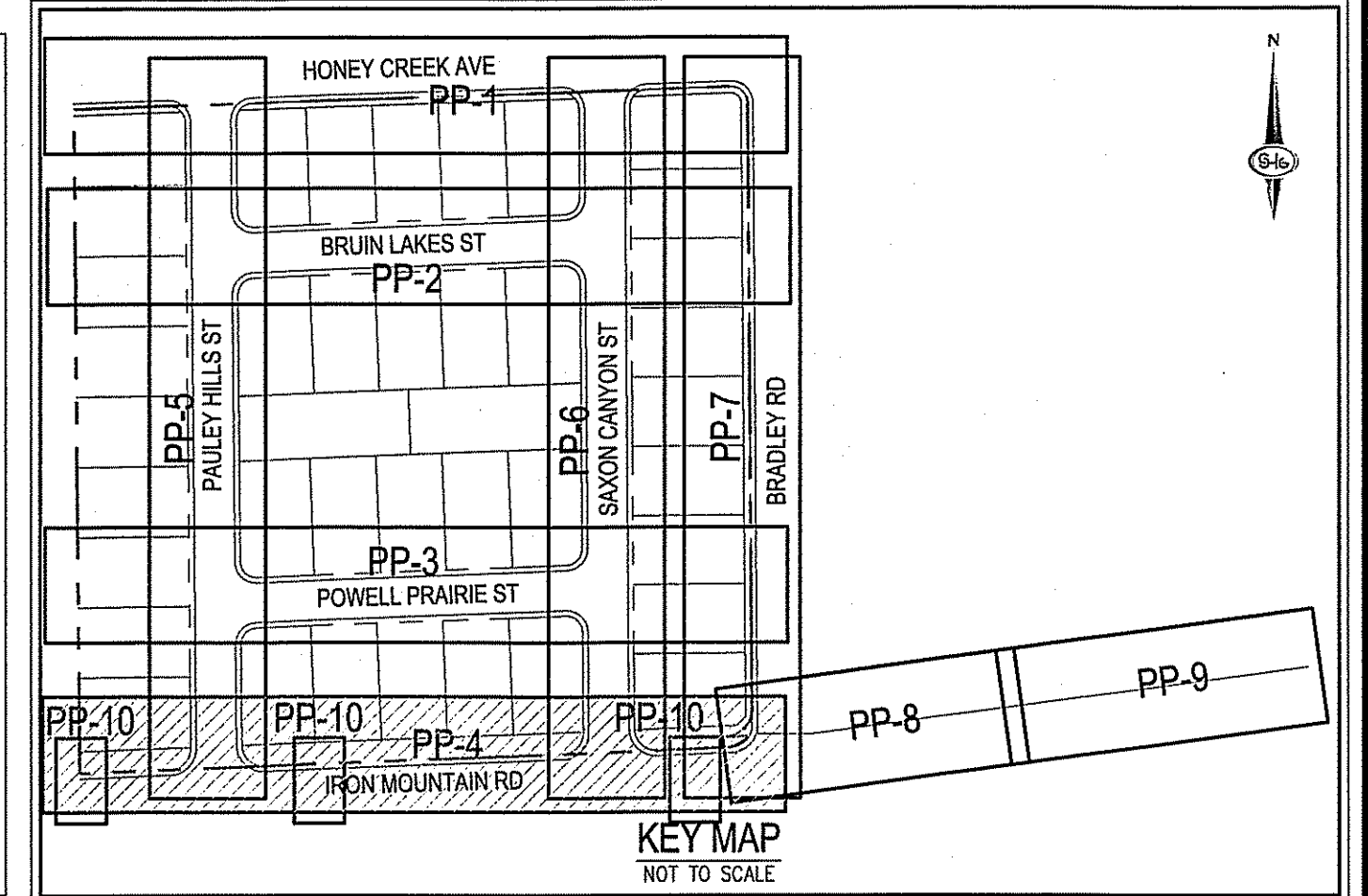
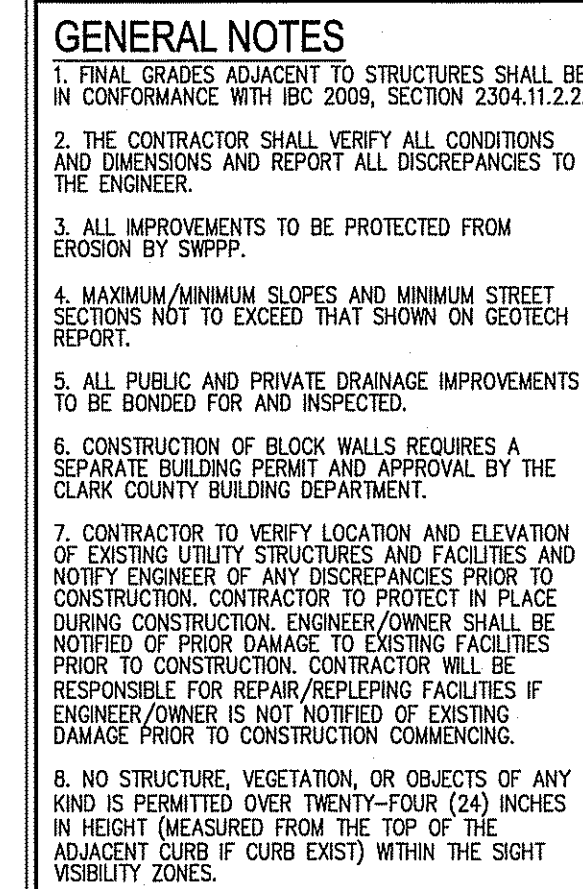
SI 719S R60E	
--------------------	--

DATE: -----
DRAFTER: CZ
DESIGNER: CZ
CHECKED: TJS
PROJECT NO.

RAH1322-001



G-1
SHEET 3 OF ----



- ## CONSTRUCTION NOTES
- | | |
|----|--|
| | CONSTRUCT 3.5" AC PAVEMENT WITH 6" TYPE II AGGREGATE BASE OVER NATIVE MATERIAL PER SOILS REPORT. |
| 2 | CONSTRUCT 3.5" AC PAVEMENT WITH 7" TYPE II AGGREGATE BASE OVER NATIVE MATERIAL PER SOILS REPORT. |
| 3 | CONSTRUCT 4.5" AC PAVEMENT WITH 12" TYPE II AGGREGATE BASE OVER NATIVE MATERIAL PER SOILS REPORT. |
| 4 | CONSTRUCT "L" TYPE CURB AND GUTTER PER CAUSAUD NO. 216 |
| 5 | CONSTRUCT 6" CROSSE GUTTER PER CAUSAUD NO. 228 |
| 6 | CONSTRUCT 5" WIDE SIDEWALK PER CAUSAUD NO. 234 |
| 7 | SAW CUT AND MATCH EXISTING IMPROVEMENTS |
| 8 | FIELD VERIFY AND CONNECT TO EXISTING CURB, FIELD GUTTER AND SIDEWALK |
| 9 | CONSTRUCT SIDEWALK RAMPS USING ARMOR TILE TRUSSED COVERS OR EQUIVALENT PER CAUSAUD NO. 235, CASE I |
| 10 | CONSTRUCT 9" WIDE, 3" CRUSHED FINES EQUISTRIAN TRAIL PER CLV TRAIL IMPROVEMENT GUIDELINE DWG. |
| 11 | INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CAUSAUD NO. 401 & 405 |
| 12 | FIELD VERIFY STUB AND CONNECT TO EXISTING STORM DRAIN STUB |
| 13 | INSTALL TYPE C DROP INLET PER CAUSAUD NO. 413 & 424. SEE PROFILE, SHEET PP-10 |
| 14 | INSTALL 48" RCP CLASS III SD (PUBLIC) |
| 15 | INSTALL SD LATERALS (PUBLIC). SEE SHEET PP-10 |
| 16 | INSTALL 12" PVC SD BLEEDER LINE (PUBLIC) |
| 17 | INSTALL STORM DRAIN CLEAN-OUT PER DETAIL 9, SHEET D-1 |
| 18 | REMOVE EX 48" CLASS III RCP SD |
| 19 | JUNCTION STRUCTURE BY OTHERS |
| 20 | INSTALL 48" TYPE I STORM DRAIN MANHOLE PER CAUSAUD NO. 401 & 405 WITH BOLTED GRATE MANHOLE |
| 21 | REMOVE EXISTING DROP INLET |
| 22 | INSTALL 48"x48" JENSEN PRECAST DROP INLET WITH OPTIONAL FRAME CAST IN EXTENSION PER DETAIL 11 |
| 23 | INSTALL 12" SHEET PILE |
| 24 | INSTALL 29"x45" CLASS III HERCP SD (PUBLIC) |
- SEE SHEET C-2 FOR ABBREVIATIONS, LEGEND & QUANTITIES

- ## LEGEND
- | | |
|--|--------------------------------|
| | BOUNDARY LINE |
| | ROADWAY CENTERLINE |
| | RIGHT-OF-WAY |
| | PROPERTY LINE |
| | CURB AND GUTTER |
| | EXISTING CURB AND GUTTER |
| | FLOWLINE |
| | EDGE OF PAVEMENT (EP) |
| | SAWCUT LINE PER CAAUSD NO. 503 |
| | PROPOSED ELEVATION |
| | EXISTING ELEVATION |
| | FUTURE ELEVATION |
| | EXISTING CONTOUR (5'-FT) |
| | EXISTING CONTOUR (1'-FT) |
| | CUT/FILL TRANSITION LINE |
| | FIRE HYDRANT ASSEMBLY |
| | SIGHT VISIBILITY ZONE |
| | WROUGHT IRON FENCE |
| | PONY WALL |
| | RETAINING WALL |
| | DECORATIVE PERIMETER WALL |
| | DECORATIVE PERIMETER WALL |
| | RETAINING WALL |
- SEE SHEET C-2 FOR ABBREVIATIONS AND QUANTITIES

DISCLAIMER NOTE

1. EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE SHOWN UTILITY PROPER LOCATION.
2. FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED JUMP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

SOILS REPORT BY ANGLE ENGINEERING
PROJECT NO. 26163-1, DATED 11/22/13
EARTHWORK QUANTITIES (RAW):
CUT= 12.483 CU YDS/FILL= 12.629 CU

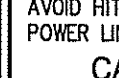
FEMA FLOOD ZONE DESIGNATION

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE 'X', (OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD), PER FIRM PANEL 32003C1745E, DATED SEPTEMBER 27, 2002.

BASIS OF BEARING

SOUTH 00°23'54" EAST, BEING THE BEARING OF THE EAST LINE OF THE SOUTHEAST QUARTER (SE1/4) OF THE SOUTHWEST QUARTER (SW1/4) OF SECTION 1, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN FILE 117, PAGE 43 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

BENCHMARK
CITY OF LAS VEGAS BENCHMARK NUMBER: 6LY9012NNWG
RIVET AND PLATE IN TOP OF CURB ON THE SOUTH SIDE OF IRON MOUNTAIN ROAD, 35' ±
SOUTHEAST OF PI OF LEON DRIVE AND IRON MOUNTAIN ROAD.
ELEVATION: 2378.778,21 US SURVEY FEET (NAVOD88)
725.053 METERS
PER CITY OF LAS VEGAS BENCHMARKS, 2008 ADJUSTMENT (UPDATED MAY 24, 2010)



AVOID HITTING OVERHEAD
POWER LINES. IT'S COSTLY.

**CALL BEFORE
YOU DO
OVERHEAD**

1-702-227-2929

Call before you Dig
Avoid cutting underground utility lines. It's costly.

Call

811

OR
1-800-227-2600

AND
CLARK COUNTY TRAFFIC OPERATIONS
1-702-455-7544

**SLATER
HANIFAN
S-I-G GROUP**

CONSULTING ENGINEERS & PLANNERS

57540 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300
FAX (702) 284-5399

[illegible]

LAS VEGAS, NEVADA

RICHMOND
AMERICAN HOMES

S1 T19S R60E	
--------------------	--

DRAFTER: CZ

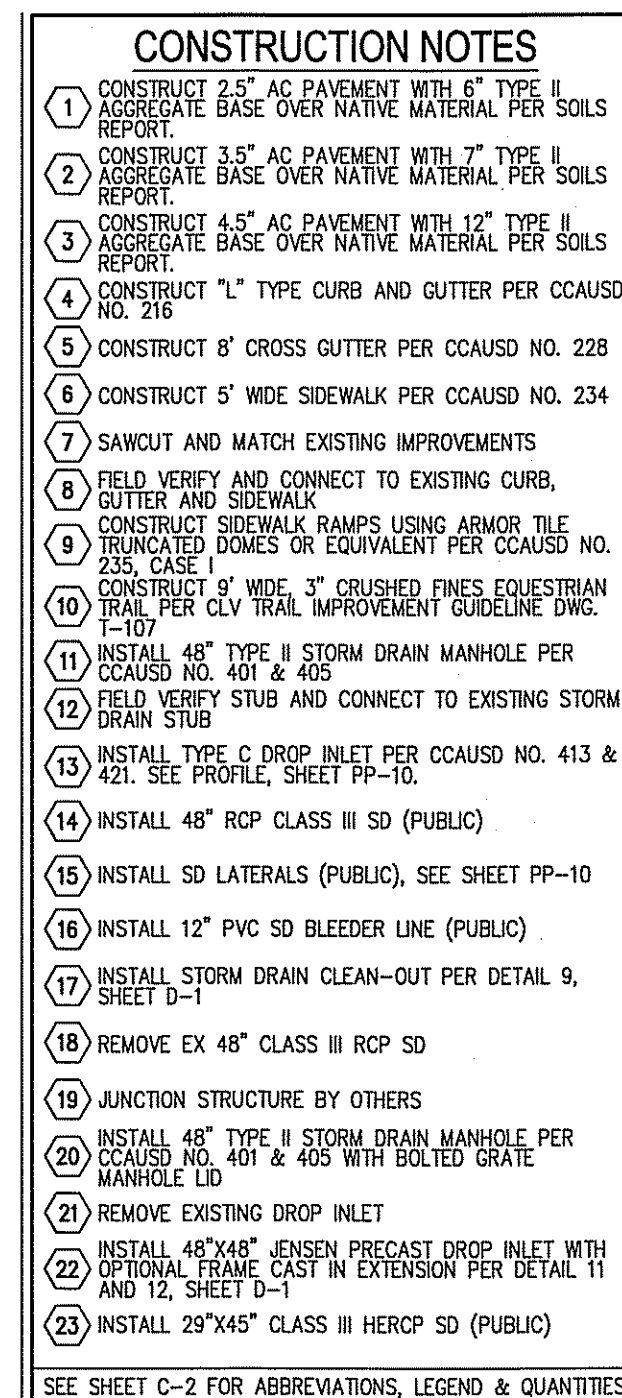
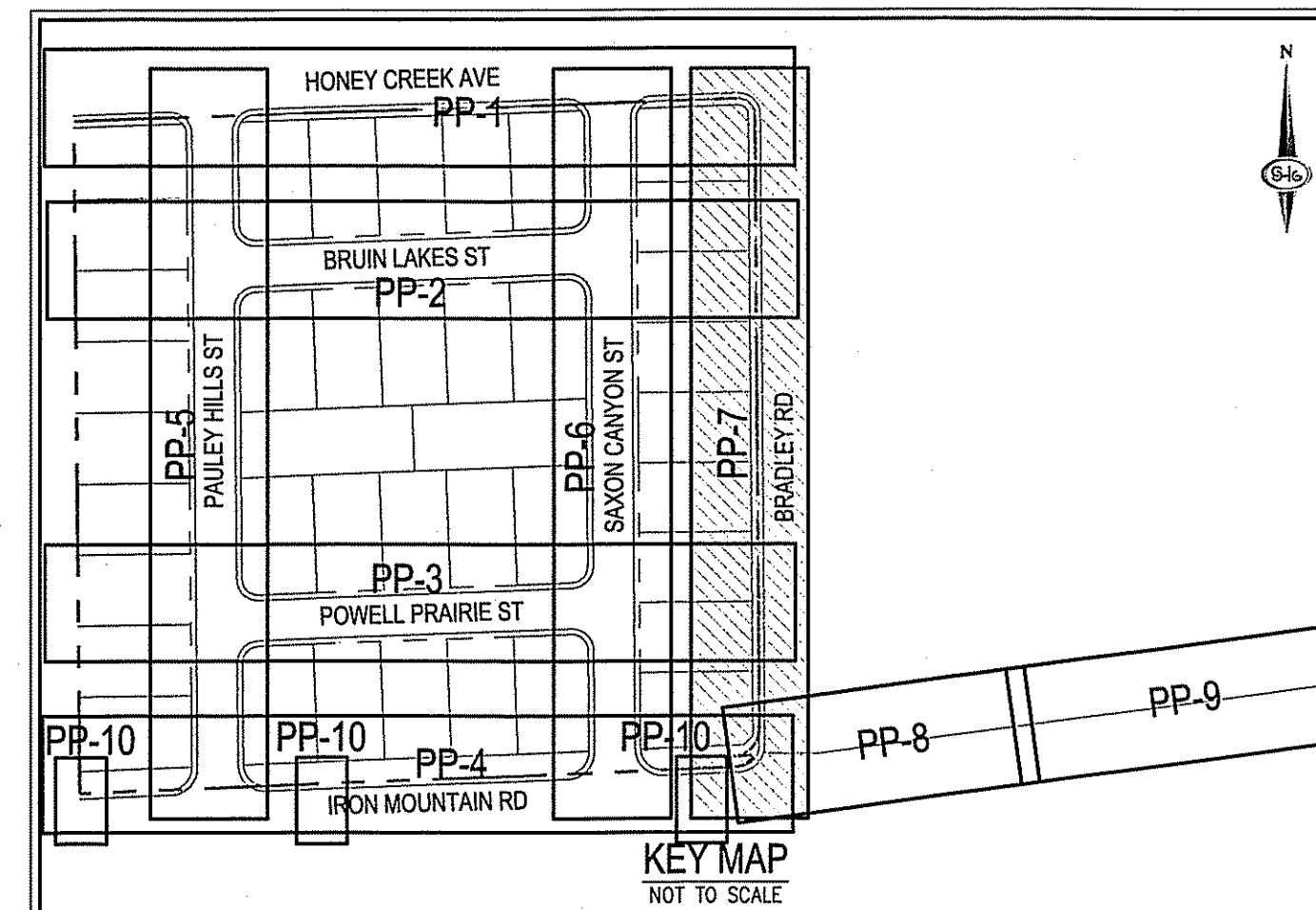
DESIGNER: CZ

CHECKED: TJS

PROJECT NO.

RAH1322-001

PP-4
SHEET 8 OF ----



LEGEND

	BOUNDARY LINE
	ROADWAY CENTERLINE
	RIGHT-OF-WAY
	PROPERTY LINE
	CURB AND GUTTER
	EXISTING CURB AND GUTTER
	FLOWLINE
	EDGE OF PAVEMENT (EP)
	SAWCUT LINE PER CAAUSD NO. 503
	PROPOSED ELEVATION
	EXISTING ELEVATION
	FUTURE ELEVATION
	EXISTING CONTOUR (5-FT)
	EXISTING CONTOUR (1-FT)
	CUT/FILL TRANSITION LINE
	FIRE HYDRANT ASSEMBLY
	SIGHT VISIBILITY ZONE
	WROUGHT IRON FENCE
	PONY WALL
	RETAINING WALL
	DECORATIVE PERIMETER WALL
	DECORATIVE PERIMETER WALL

SEE SHEET C-2 FOR ABBREVIATIONS AND QUANTITIES

DISCLAIMER NOTE

1. EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.
2. FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED JUMP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

SOILS REPORT BY ANGLE ENGINEERING
PROJECT NO. 26163-1, DATED 11/22/13
EARTHWORK QUANTITIES (RAW):
CUT= 12.483 CU YDS/FILL= 12.629 CU YDS

FEMA FLOOD ZONE DESIGNATION

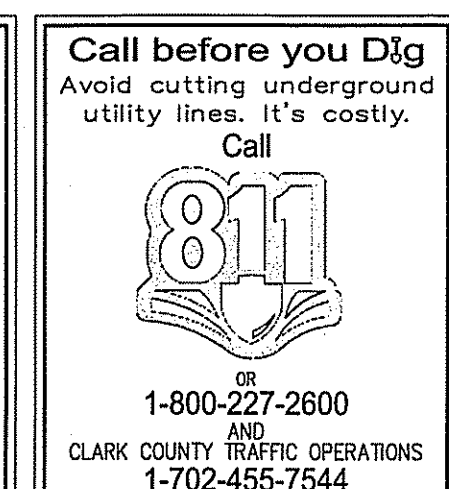
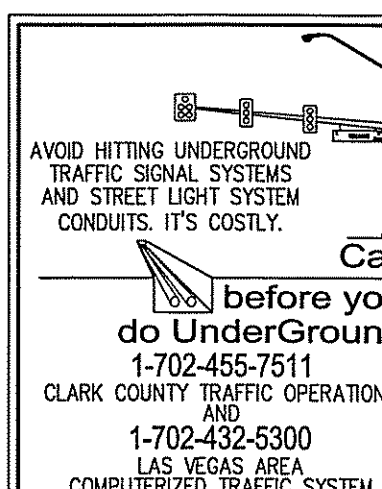
THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE 'X', (OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD), PER FIRM PANEL 32003C1745E, DATED SEPTEMBER 27, 2002.

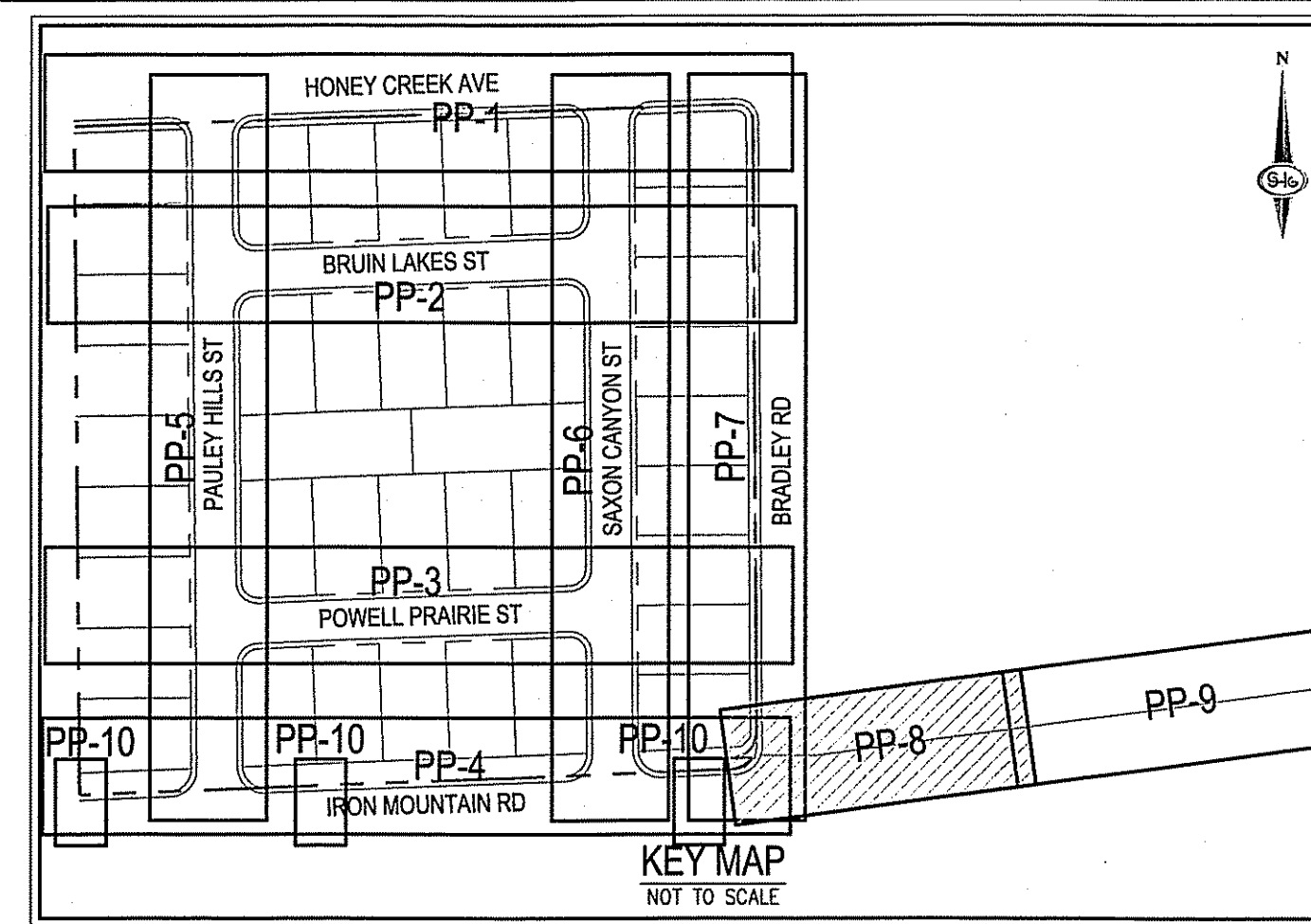
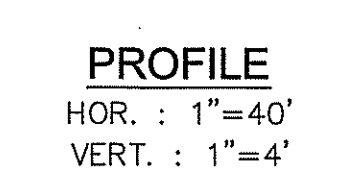
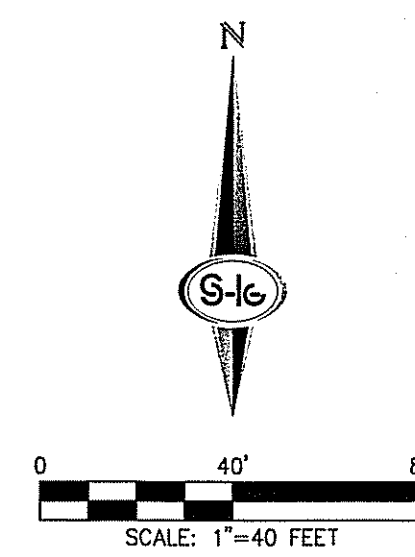
BASIS OF BEARING
SOUTH 02°23'54" EAST, BEING THE BEARING OF THE EAST LINE OF THE
SOUTHEAST QUARTER (SE1/4) OF THE SOUTHWEST QUARTER (SW1/4)
OF SECTION 1, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CITY OF
LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN
FILE 117, PAGE 43 OF PARCEL MAPS IN THE CLARK COUNTY
RECORDER'S OFFICE, NEVADA.

BENCHMARK
CITY OF LAS VEGAS BENCHMARK NUMBER: 6LV9012NNW6
RIVET AND PLATE IN TOP OF CURB ON THE SOUTH SIDE OF IRON MOUNTAIN ROAD, 35' ±
SOUTHEAST OF PI OF LEON DRIVE AND IRON MOUNTAIN ROAD.
ELEVATION: 2378.778 21 US SURVEY FEET (NAVD83)
725.053 METERS
PER CITY OF LAS VEGAS BENCHMARKS, 2008 ADJUSTMENT (UPDATED MAY 24, 2010)

GENERAL NOTES

1. FINAL GRADES ADJUSTED TO MATCH EXISTING STRUCTURES SHALL BE IN ACCORDANCE WITH THE 1982 IBC 2000, SECTION 2034.1.1.2.2.
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
3. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SHIELD.
4. MAXIMUM MINIMUM SLOPES AND MINIMUM STREET CLOSURES TO EXCEED THAT SHOWN ON GEOTECH REPORT.
5. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE BONDED FOR AND INSPECTED.
6. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE EROSION CONTROL PLAN APPROVED BY THE CLARK COUNTY BUILDING DEPARTMENT.
7. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITY STRUCTURES AND FACILITIES AND REPORT ANY DISCREPANCIES PRIOR TO CONSTRUCTION. CONTRACTOR TO PROTECT IN PLACE DURING CONSTRUCTION. ENGINEER/OWNER SHALL BE RESPONSIBLE FOR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR DAMAGE TO EXISTING FACILITIES IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.
8. NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES IN HEIGHT (MEASUREMENT TO TOP OF CURB) IN ANY ADJACENT CURB OR CURB EXIST WITHIN THE SIGHT





- # CONSTRUCTION NOTES
1. CONSTRUCT 2.5" AS/AC PAVEMENT WITH 8" TYPE II AGGREGATE BASE OVER NATIVE MATERIAL PER SOILS REPORT.
 2. CONSTRUCT 3.5" AS/AC PAVEMENT WITH 7" TYPE II AGGREGATE BASE OVER NATIVE MATERIAL PER SOILS REPORT.
 3. CONSTRUCT 4.5" AS/AC PAVEMENT WITH 12" TYPE II AGGREGATE BASE OVER NATIVE MATERIAL PER SOILS REPORT.
 4. CONSTRUCT 1" TYPE CURB AND GUTTER PER CAUSAL NO. 216
 5. CONSTRUCT 8" CROSS GUTTER PER CAUSAL NO. 228
 6. CONSTRUCT 5" WIDE SIDEWALK PER CAUSAL NO. 234
 7. SAWCUT AND MATCH EXISTING IMPROVEMENTS
 8. FIELD VERIFY AND CONNECT TO EXISTING CURB, GUTTER AND SIDEWALK
 9. CONSTRUCT SIDEWALK RAMPS USING ARMOR TILE CONCRETE DOWNS OR EQUIVALENT PER CAUSAL NO. 233, CASE I
 10. CONSTRUCT 4" WIDE "3" CRUSHED PINES EQUESTRIAN TRAIL PER CLV TRAIL IMPROVEMENT GUIDELINE CODED 170
 11. INSTALL 48" TYPE II STORM DRAIN MANHOLE PER CAUSAL NO. 401 & 405
 12. FIELD VERIFY STUB AND CONNECT TO EXISTING STORM DRAIN STUB
 13. INSTALL TYPE C RP INLET PER CAUSAL NO. 413 & 421, SEE PROFILE, SHEET 10.
 14. INSTALL 48" 48" RCP CLASS III SD (PUBLIC)
 15. INSTALL SD LATERALS (PUBLIC), SEE SHEET PP-10
 16. INSTALL 12" PVC SD BLEEDER LINE (PUBLIC)
 17. INSTALL STORM DRAIN CLEAN-OUT PER DETAIL 9, SHEET 10
 18. REMOVE EX 48" CLASS III RCP SD
 19. JUNCTION STRUCTURE BY OTHERS
 20. INSTALL 48" TYPE II STORM DRAIN MANHOLE PER CAUSAL NO. 401 & 405 WITH BOLTED GRATE MANHOLE LID
 21. REMOVE EXISTING DROP INLET
 22. INSTALL 48"x48" JENSEN PRECAST DROP INLET WITH OPTIONAL FRAME, CAST IN EXTENSION PER DETAIL 11
 23. INSTALL 29"x48" CLASS III HRCP SD (PUBLIC)
- SEE SHEET C-2 FOR ABBREVIATIONS, LEGEND & QUANTITIES

- | SYMBOLS | FOR | DESCRIPTION | |
|---------|-----|-------------------------------------|--|
| | | BOUNDARY LINE | |
| | | ROADWAY CENTERLINE | |
| | | RIGHT-OF-WAY | |
| | | PROPERTY LINE | |
| | | CURB AND GUTTER | |
| | | EXISTING CURB AND GUTTER | |
| | | FLOWLINE | |
| | | EDGE OF PAVEMENT (EP) | |
| | | SAW CUT LINE PER CAUSD NO. 503 | |
| | | PROPOSED ELEVATION | |
| | | EXISTING ELEVATION | |
| | | FUTURE ELEVATION | |
| | | EXISTING CONTOUR (5-FT) | |
| | | EXISTING CONTOUR (1-FT) | |
| | | OUT/FILL TRANSITION LINE | |
| | | FIRE HYDRANT ASSEMBLY | |
| | | SIGHT VISIBILITY ZONE | |
| | | WROUGHT IRON FENCE | |
| | | PONY WALL | |
| | | RETAINING WALL | |
| | | DECORATIVE PERIMETER WALL | |
| | | DECORATIVE PERIMETER RETAINING WALL | |

DISCLAIMER NOTE

1. EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.
2. FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAYMENT SAWCUT LINE TO PROPOSED EDGE OF PAYMENT OR PROJECTED UP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

SOILS REPORT BY ANGLE ENGINEERING
PROJECT NO. 26163-1, DATED 11/22/13
EARTHWORK QUANTITIES (RAW):
CUT= 12,483 CU YDS/FILL= 12,629 CU YDS

FEMA FLOOD ZONE DESIGNATION

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE 'X', (OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD), PER FIRM PANEL 32003C1745E, DATED SEPTEMBER 27, 2002.

BASIS OF BEARING

SOUTH 00°23'54" EAST, BEING THE BEARING OF THE EAST LINE OF THE SOUTHEAST QUARTER (SE1/4) OF THE SOUTHWEST QUARTER (SW1/4) OF SECTION 1, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN FILE 117, PAGE 43 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

GENERAL NOTES

1. FINAL GRADINGS AND/OR STRUCTURES SHALL BE IN COMPLIANCE WITH IBC 2009, SECTION 2304.11.2.2.
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS, AND MEASUREMENTS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
3. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SLEPP.
4. MAXIMUM/MINIMUM SLOPES AND MINIMUM SLOPE SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
5. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE BUNDLED FOR AND INSPECTED.
6. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE EROSION CONTROL AND APPROVAL BY THE CLARK COUNTY BUILDING DEPARTMENT.
7. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITY STRUCTURES AND FACILITIES AND REPORT ANY DISCREPANCIES TO THE ENGINEER FOR CONSTRUCTION. CONTRACTOR TO PROTECT IN PLACE ALL EXISTING UTILITY STRUCTURES AND FACILITIES. IF NOTIFIED OF PRIOR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION, CONTRACTOR WILL BE RESPONSIBLE FOR REPAIRS TO EXISTING FACILITIES. IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION CONSEQUENCES WILL BE ASSESSMENT BY THE ENGINEER.
8. NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES IN HEIGHT (MEASURED FROM THE TOP OF THE EXISTING CURB OR CURB EXIST) WITHIN THE SIGHT VISIBILITY ZONE.



AVOID HITTING OVERHEAD
POWER LINES. IT'S COSTLY.

**CALL BEFORE
YOU DO
OVERHEAD**



1-702-227-2929



AVOID HITTING UNDERGROUND
TRAFFIC SIGNAL SYSTEMS
AND STREET LIGHT SYSTEM
CONDUITS. IT'S COSTLY.

Call **1-702-455-7511**
before you
do UnderGround

CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-432-5300
LAS VEGAS AREA
COMPUTERIZED TRAFFIC SYSTEM

Call before you Dig
Avoid cutting underground
utility lines. It's costly.
Call

OR
1-800-227-2600
AND
CLARK COUNTY TRAFFIC OPERATIONS
1-702-455-7544

TECHNICAL DRAINAGE STUDY SUPPLEMENT TO ADDENDUM NO.1

Granite Falls 2 South

City of Las Vegas, Nevada

Job No.: RAH1322.001

Date: June 2014

Prepared By:

Slater-Hanifan Group, Inc.
5740 S. Arville Street, Suite 216
Las Vegas, Nevada 89118
Phone: 702-284-5300 • Fax: 702-284-5399

Prepared For:

Richmond American Homes
7770 S. Dean Martin Drive, Suite 308
Las Vegas, Nevada 89139
Phone: 702-617-8464 • Fax: 702-617-8499



Steve Jones, P.E.
NV Professional Engineer No. 19638

Assisted by: Erick Mata, EI

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Granite Falls 2 – South (Supplement to Addendum No.1) Date: June 2014
 Location of Development: a) Descriptive (Cross Streets): North/South: Bradley Road
East/West: Iron Mountain Road
 b) Section: 1 Township: 19 South Range: 60 East
 c) APN: 125-01-402-009 thru 125-01-402-016

Name of Owner/ Developer: Richmond American Homes
 Telephone No.: 702-617-8464 Fax No.: 702-617-8499 E-mail Address: Brian.Walsh@mdch.com
 Address: 7770 S. Dean Martin Drive, Suite 308 Las Vegas, Nevada 89139

Contact Person – Name: Steve Jones, P.E. Telephone No.: 702-284-5300
 *E-mail Address: sjones@shg-inc.com Fax No.: 702-284-5399
 Firm: Slater Hanifan Group
 Address: 5740 S. Arville Street, Suite 216; Las Vegas, NV 89118

Type of Land Development/Land Disturbance Process:

☐	Rezoning	☐	Subdivision Map	☐	Clearing and grading Only
☐	Parcel Map	☒	Planned Unit Development	☐	Other (Please specify below)
☐	Large Parcel Map	☐	Building Permit	☐	

1. Total Owned Land Area: At Site: 9.2 +/- Acres Being Developed/Disturbed: All
2. Is a portion or all of the subject property located in a 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.): Single-Family Residential
12 acres (North)
5. Approximate upstream land area which drains to the subject site: 50 acres + NWNS Area (Iron Mountain Road)
6. Has the site drainage been evaluated in the past? ☐ Yes ☒ No If yes, please identify documentation:

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site:

Iron Mountain Road

8. Briefly describe your proposed schedule for the subject project: ASAP



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.

***Newly Required Field**

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

Local Entity File No.

Revision

Date

REFERENCE: SHG Job RAH1322.001

STANDARD FORM 1

Updated 05/01/2008

RAH1322.001

June 30, 2014

Albert Sung, P.E.
Flood Control Project Engineer
City of Las Vegas Department of Public Works
333 N. Rancho Drive
Las Vegas, Nevada 89106

Subject: Supplement to Addendum No.1 to the Technical Drainage Study for Granite Falls 2 South (CLV DS4663)

Dear Mr. Sung:

This letter is submitted in response to email comment from you, received on June 18, 2014 regarding the above referenced project. A copy of the City of Las Vegas (CLV) Department of Public Works email has been provided in the appendix of this submittal. The comment has been addressed as follows:

1. **Comment:** *Todd, We need to pass a minimum of 10-year flow through the Bradley intersection and bubbles out at a second bubbler (east of Bradley). If it requires some elliptical pipes (understood it'll be more expensive, but it needs to be done), so be it. Safety is a bigger concern. If we cannot pass the 10-year flow across Bradley, we cannot meet the regional 10-year dry lane criteria etc. Hope this explains our concerns. Thanks.*

Response: The storm drain design has been revised to convey flow across the intersection of Iron Mountain and Bradley Road to meet regional 10-year dry lane criteria. The following adjustments have been made to the storm drain design in order to convey flow across Bradley Road and meet storm drain criteria.

Addendum No.1 provided a storm drain design that ended at the downstream manholes (SDMH #2) with grated lids to act as bubblers in the interim condition. The manholes utilized a temporary PVC lateral to a proposed 19-ft Type C drop inlet that also allowed flows to bubble out and flow downstream in the interim condition. In order to convey flows via storm drain through the intersection, a double barrel 29-inch x 45-inch Horizontal Elliptical Reinforced Concrete Pipe (HERCP) equivalent to a 36-inch round RCP (Documentation provided in Appendix B) is now extended after SDMH #2. The HERCP was necessary in order to meet the required 6-inch cover above an existing sewer line at the intersection of Iron Mountain and Bradley Road. The pipes extend a distance of approximately 97-ft to SDMH #3 then continue and tie into two (2) 48-inch x 48-inch Jensen precast drop inlets with concrete aprons and an 18-inch RCP connection. Any low flow not bubbled out of the drop inlets will be discharged via a 12-inch bleeder line connecting to one of the inlets.

The storm drain model was analyzed using the Water Surface and Pressure Gradient for Windows (WSPGW) Hydraulic Analysis System software by CIVILDESIGN. The water

surface elevation was established by accounting for all the flows conveyed in the north pipe including drop inlet flow contribution. A FlowMaster calculation using a slope of 1.1% obtained from an assumed future HERCP extension resulted in a partial flow depth which allows for a conservative estimation of top of pipe for starting HGL. When introducing flow into the model from proposed drop inlets, WSPGW assumes equal distribution between both pipes. This not being a realistic scenario, flow at two junctions (SDMH #1 and SDMH #2) was doubled in order to correctly account for losses in the storm drain design model. As a result, the Hydraulic Grade Line (HGL) in the mainline was determined to be 1-ft below the finished grade and therefore meet storm drain criteria.

The laterals connecting to the mainline were analyzed utilizing the HGL at their pertinent locations. Computations resulted in the HGL being contained within DI #1 but not meeting the 1-ft requirement below finished grade. Per a discussion with Albert Sung and due to site constraints, SDMH #2 and SDMH #3 were designed to have bolted grated lids and deemed the storm drain design acceptable.

The storm drain design conveys 10-yr flows across Bradley Road and meets the Regional 10-year dry lane criteria therefore concluded acceptable by City of Las Vegas. See Appendix B for relevant computations regarding the storm drain design.

The revised plan and detail sheets adopting the revisions addressed in this supplement have been included in the appendix. If you have any questions or require additional information, please do not hesitate to contact us at 284-5300.

Respectfully Submitted,

SLATER HANIFAN GROUP

Erick Mata, E.I.
Flood Control Division

pc: Mark Failla, P.E., CFM - SHG
Steve Jones, P.E. - SHG
Todd Steadham, P.E., LEED AP - SHG

APPENDIX

Appendix A – City of Las Vegas Email Comment

Appendix B – Response to Comment Computations

- Rinker Equivalent Diameter Sheet
- Starting HGL Assumption
- WSPGW and Lateral Losses

Appendix C – Revised Grading Plan, Profile and Detail Sheets

APPENDIX A

City of Las Vegas Email Comment

Erick Mata

From: Todd Steadham
Sent: Friday, June 27, 2014 2:04 PM
To: Steve Jones; Erick Mata; ematta@shg-inc.com
Subject: FW: Granite Falls 2 South

Follow Up Flag: Follow up
Flag Status: Flagged

Todd Steadham, P.E., LEED AP
Associate/Director of Land Development - Las Vegas

SLATER HANIFAN GROUP

"The Benchmark of Our Profession."

LAS VEGAS
5740 S. ARVILLE STREET #216
LAS VEGAS, NEVADA 89118
PHONE: (702) 284-5300
FAX: (702) 284-5399
www.shg-inc.com

PHOENIX
11801 N. TATUM BLVD. #123
PHOENIX, ARIZONA 85028
PHONE: (602) 687-9664

Any files contained within are to be used for information ONLY. Accuracy and/or design information to be verified from approved original plans. Use of electronic media is at the sole risk of the user.

From: Albert Sung [<mailto:YSung@LasVegasNevada.GOV>]
Sent: Wednesday, June 18, 2014 5:11 PM
To: Todd Steadham
Subject: RE: Granite Falls 2 South

Todd,

We need to pass a minimum of 10-year flow through the Bradley intersection and bubbles out at a second bubbler (east of Bradley). If it requires some elliptical pipes (understood it'll be more expensive, but it needs to be done), so be it. Safety is a bigger concern. If we cannot pass the 10-year flow across Bradley, we cannot meet the regional 10-year dry lane criteria etc. Hope this explains our concerns. Thanks.

Albert Sung, P.E.
Flood Control

From: Todd Steadham [<mailto:tsteadham@shg-inc.com>]
Sent: Tuesday, June 17, 2014 4:07 PM
To: Albert Sung
Subject: Granite Falls 2 South

Hello Albert,

Here is a visual of the vertical and horizontal constraints that we have crossing the sewer at Bradley.

Would you be okay with us using dual 24" and the 12" bleeder line. These will take just over half of the 10-year flow (~45 cfs of the 81 cfs).

Let me know if this is OK with you?

Thanks-

Todd Steadham, P.E., LEED AP
Associate/Director of Land Development - Las Vegas

SLATER HANIFAN GROUP

"The Benchmark of Our Profession."

LAS VEGAS

5740 S. ARVILLE STREET #216

LAS VEGAS, NEVADA 89118

PHONE: (702) 284-5300

FAX: (702) 284-5399

www.shg-inc.com

PHOENIX

11801 N. TATUM BLVD. #123

PHOENIX, ARIZONA 85028

PHONE: (602) 687-9664

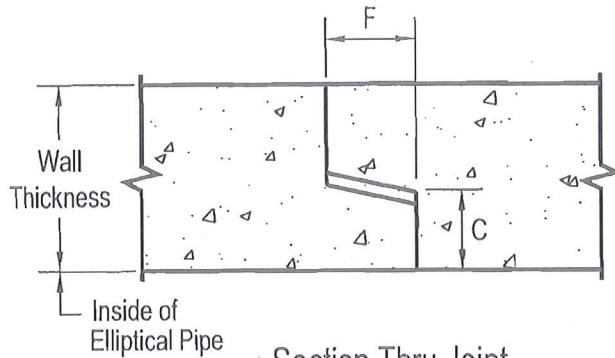
Any files contained within are to be used for information ONLY. Accuracy and/or design information to be verified from approved original plans. Use of electronic media is at the sole risk of the user.

APPENDIX B

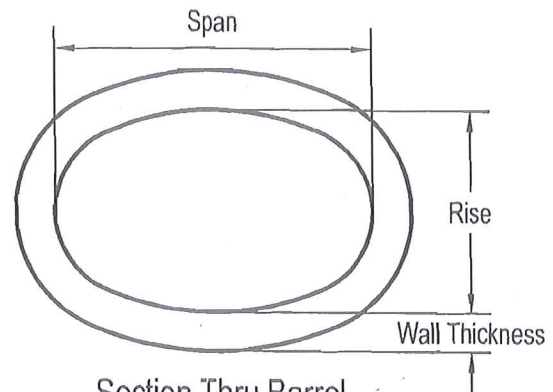
Response to Comment Computations

Rinker Concrete Pipe Division Equivalent Diameter Sheet

Concrete Elliptical Pipe 18" - 144" Equivalent Diameter



Section Thru Joint



Section Thru Barrel

Table Of Dimensions And Weights

Round Equivalent (inches)	Inside Dimension (inches)		Wall Thickness (inches)	C (inches)	F (inches)	Full Flow Water Area (Sq. Ft.)	Approx. Weight (Lbs / Ft.)
	Rise	Span					
18	14	23	2 3/4	1 1/8	2	1.83	200
24	19	30	3 1/4	1 1/4	2	3.28	310
27	22	34	3 1/2	1 3/8	2 1/4	4.12	380
30	24	38	3 3/4	1 3/8	2 1/2	5.10	450
33	27	42	3 3/4	1 3/8	3	6.33	495
36	29	45	4 1/2	1 3/4	3	7.36	650
39	32	49	4 3/4	1 13/16	3 1/4	8.78	750
42	34	53	5	1 7/8	3 1/2	10.2	850
48	38	60	5 1/2	2 3/16	3 3/4	12.9	1,040
54	43	68	6	2 3/8	4	16.7	1,285
60	48	76	6 1/2	2 5/8	4	20.5	1,535
66	53	83	7	2 3/4	5	24.8	1,815
72	58	91	7 1/2	2 7/8	5 1/2	29.4	2,120
78	63	98	8	3	6	34.6	2,440
84	68	106	8 1/2	3 1/4	6	40.1	2,790
90	72	113	9	3 1/2	6	46.1	3,170
96	77	121	9 1/2	3 3/4	6	52.4	3,560
102	82	128	9 3/4	3 7/8	6	59.1	3,880
108	87	136	10	4	6	66.4	4,200
114	92	143	10 1/2	4 1/4	6	73.9	4,650
120	97	151	11	4 1/2	6	82.1	5,130
132	106	166	12	5	6	99.2	6,150
144	116	180	13	5 1/2	6	118	7,300

Pipe dimensions may vary depending upon equipment availability.

Notes:

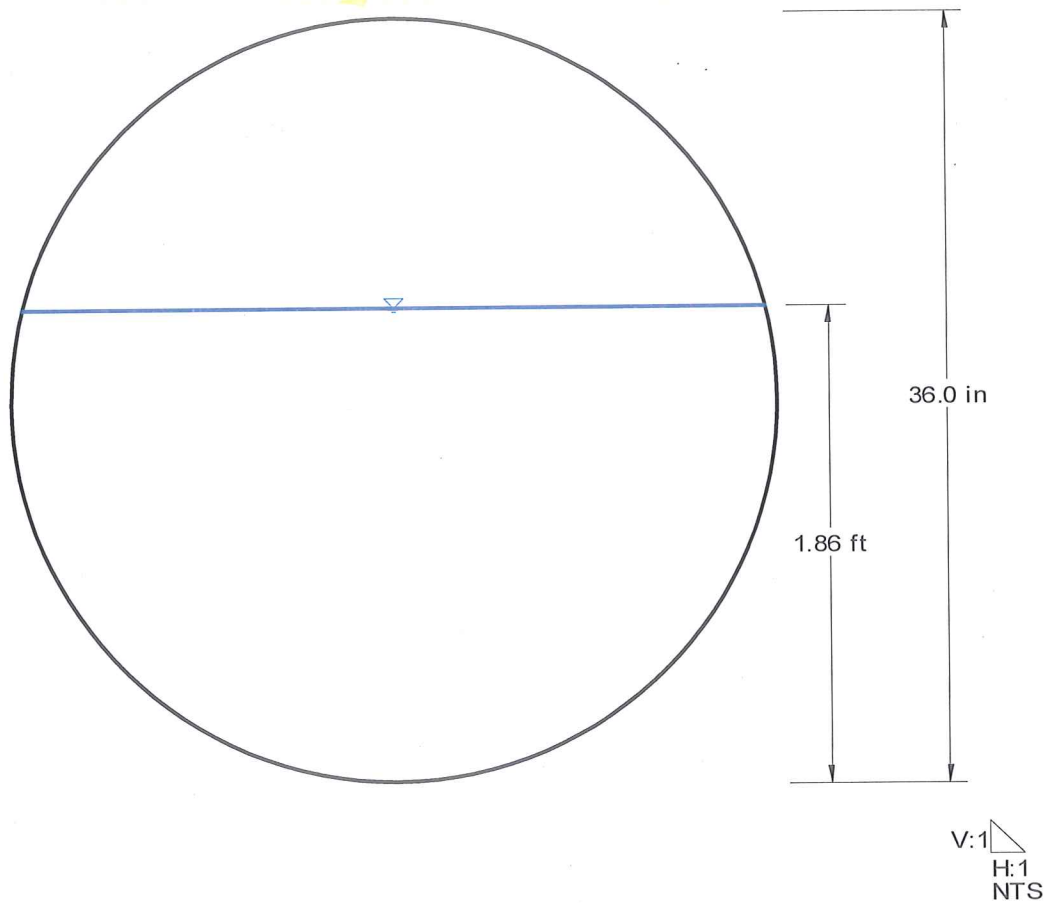
1. Produced to meet ASTM Specifications.
2. Contact a Concrete Pipe Division representative for details not listed on this sheet.

Starting HGL Assumption

Starting HGL Assumption Cross Section for Circular Channel

Project Description	
Worksheet	36-inc RCP
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.013
Channel Slope	1.10 %
Depth	1.86 ft
Diameter	36.0 in
Discharge	49.50 cfs



Starting HGL Assumption Worksheet for Circular Channel

Project Description	
Worksheet	36-inc RCP
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Mannings Coefficient	0.013
Channel Slope	1.10 %
Diameter	36.0 in
Discharge	49.50 cfs

Results	
Depth	1.86 ft
Flow Area	4.6 ft ²
Wetted Perimeter	5.45 ft
Top Width	0.00 ft
Critical Depth	2.29 ft
Percent Full	62.1 %
Critical Slope	0.64 %
Velocity	10.73 ft/s
Velocity Head	1.79 ft
Specific Energy	3.65 ft
Froude Number	1.50
Maximum Discharge	75.25 cfs
Discharge Full	69.95 cfs
Slope Full	0.55 %
Flow Type	Supercritical

WSPGW and Lateral Losses

ITEM	DESCRIPTION	QTY	UNIT	PRICE	TOTAL	AMOUNT
T1	GRANITE FALLS 2 - SOUTH, BY RICHMOND AMERICAN HOMES					
T2	TECHNICAL DRAINAGE STUDY, SUPPLEMENT TO ADDENDUM NO.1 (RAH1322.001)					
T3	PROPOSED IRON MOUNTAIN STORM DRAIN					
SO	-1882.25	64.35	6	.013	16.000	66.21
R	-1785.20	64.69	6	.013	16.000	66.21
JX	-1785.20	64.69	2	.013	16.000	66.21
R	-1407.13	67.34	6	.013	4.000	67.340
JX	-1407.13	67.34	6	.013	4.000	67.340
R	-1223.96	68.63	6	.013	12.000	67.490
JX	-1218.96	68.66	4	.013	12.000	67.490
R	-0988.40	70.07	4	.013	12.000	67.490
R	-0588.40	73.03	4	.013	12.000	67.490
R	-0514.39	73.53	4	.013	12.000	67.490
SH	-0514.39	73.53	4	.013	12.000	67.490
CD	1	1.500	1.500	.000	.000	.000
CD	2	1.500	3.000	.000	.000	.000
CD	3	1.500	4.500	.000	.000	.000
CD	4	1.500	6.000	.000	.000	.000
CD	5	1.500	7.500	.000	.000	.000
CD	6	1.500	9.000	.000	.000	.000
Q						

CARD	SECT	CHN	NO OF PIER	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV	DROP		Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	4	1		1.500																
CD	2	4	1		2.000																
CD	3	4	1		3.000																
CD	4	4	1		3.500																
CD	5	4	1		4.000																
CD	6	4	2		3.000																

W S B C W PAGE NO 1

3.000 W S P G W
WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS - GRANITE FALLS 2 - SOUTH, BY RICHMOND AMERICAN HOMES

HEADING LINE NO 2 IS - TECHNICAL DRAINAGE STUDY SUPPLEMENT TO ADDENDUM NO.1 (RAH1322.001)

PROPOSED IRON MOUNTAIN STORM DRAIN
W S P G W

[illegible]

THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING

THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING

THE ABOVE ELEMENT CONTAINS AN INVENT
ELEMENT NO 4 IS A REACH

ELEMENT NO	4 IS A REACH U/S DATA	STATION -1407.130	INVERT 67.340	SECT 6	N .013	RADIUS .000	ANGLE .000	ANG PT .000	MAN H 1						
ELEMENT NO	5 IS A JUNCTION U/S DATA	STATION -1407.130	INVERT 67.340	SECT 6	LAT-1 1	LAT-2 0	Q3 4.000	Q4 .000	INVERT-3 67.340	INVERT-4 63.000	PHI 3	PHI 4	ANGLE .000	ANGLE .000	RADIUS .000

THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING

THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV

ELEMENT NO	6	IS A REACH
	*	*
	*	*

ELEMENT NO	6	IS A	REACH U/S DATA	*	STATION -1223.960	*	INVERT 68.630	*	SECT 6	*	N .013	RADIUS .000	ANGLE .000	ANG PT .000	MAN H 1
ELEMENT NO	7	IS A	JUNCTION U/S DATA	*	STATION -1218.960	*	INVERT 68.660	*	SECT 4	*	N .013	INVERT-3 67.490	INVERT-4 .000	PHI 3 63.000	PHI 4 .000
												Q4 .000	Q3 12.000	RADIUS .000	ANGLE .000

W S P G W
WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	8	IS A	REACH U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
ELEMENT NO	8	IS A	REACH U/S DATA	STATION -988.400	INVERT 70.070	SECT 4	N .013	RADIUS .000	ANGLE .000	ANG PT .000	MAN H 1
ELEMENT NO	9	IS A	REACH U/S DATA	STATION -588.400	INVERT 73.030	SECT 4	N .013	RADIUS .000	ANGLE .000	ANG PT .000	MAN H 1
ELEMENT NO	10	IS A	REACH								

W S P G W - CIVILDESIGN Version 14.06
Program Package Serial Number: 1704
WATER SURFACE PROFILE LISTING

W S P G W - CIVILDESIGN Version 14.06
Program Package Serial Number: 1704
WATER SURFACE PROFILE LISTING

W S P G W - CIVILDESIGN Version 14.06
Program Package Serial Number: 1704
WATER SURFACE PROFILE LISTING

GRANITE FALLS 2 - SOUTH, BY RICHMOND AMERICAN HOMES
TECHNICAL DRAINAGE STUDY SUPPLEMENT TO ADDENDUM NO.1 (RAH1322.001)

GRANITE FALLS 2 - SOUTH, BY RICHMOND AMERICAN HOMES
TECHNICAL DRAINAGE STUDY SUPPLEMENT TO ADDENDUM NO.1 (RAH1322.001)

GRANITE FALLS 2 - SOUTH, BY RICHMOND AMERICAN HOMES
TECHNICAL DRAINAGE STUDY SUPPLEMENT TO ADDENDUM NO.1 (RAH1322.001)

Station	Invert Elev	Depth (ft)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow width	Top Height/ Base Wt Dia.-Ft or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope						HF	SE Dpth	Froude N	Norm Dp	"N"	ZR	Type Ch
-1882.250	64.350	2.290	66.640	99.00	8.55	1.14	67.78	.00	2.29	2.55	3.000	.00	2 .0
4.275	.0035	-	-	-	-	.0061	.03	2.29	.71	3.00	.013	.00	PIPE
-1877.975	64.365	2.404	66.769	99.00	8.15	1.03	67.80	.00	2.29	2.39	3.000	.00	2 .0
17.712	.0035	-	-	-	-	.0055	.10	2.40	.64	3.00	.013	.00	PIPE
-1860.263	64.427	2.533	66.960	99.00	7.77	.94	67.90	.00	2.29	2.18	3.000	.00	2 .0
45.049	.0035	-	-	-	-	.0051	.23	2.53	.57	3.00	.013	.00	PIPE
-1815.214	64.585	2.688	67.273	99.00	7.41	.85	68.13	.00	2.29	1.83	3.000	.00	2 .0
30.014	.0035	-	-	-	-	.0048	.14	2.69	.48	3.00	.013	.00	PIPE
-1785.200	64.690	2.758	67.448	99.00	7.28	.82	68.27	.00	2.29	1.63	3.000	.00	2 .0
JUNCT STR	.0000	-	-	-	-	.0043	.00	2.76	.44	-	.013	.00	PIPE
-1785.200	64.690	3.280	67.970	83.00	5.87	.54	68.51	.00	2.10	.00	3.000	.00	2 .0
63.849	.0070	-	-	-	-	.0039	.25	3.28	.00	1.93	.013	.00	PIPE
-1721.351	65.138	3.084	68.222	83.00	5.87	.54	68.76	.00	2.10	.00	3.000	.00	2 .0
HYDRAULIC JUMP	-	-	-	-	-	-	-	-	-	-	-	-	-
-1721.351	65.138	1.926	67.064	83.00	8.65	1.16	68.23	.00	2.10	2.88	3.000	.00	2 .0
.922	.0070	-	-	-	-	.0070	.01	1.93	.84	1.93	.013	.00	PIPE
-1720.429	65.144	1.926	67.070	83.00	8.65	1.16	68.23	.00	2.10	2.88	3.000	.00	2 .0
247.584	.0070	-	-	-	-	.0070	1.73	1.93	.84	1.93	.013	.00	PIPE

W S P G W - CIVILDESIGN Version 14.06
Program Package Serial Number: 1704
WATER SURFACE PROFILE LISTING

W S P G W - CIVILDESIGN Version 14.06
Program Package Serial Number: 1704
WATER SURFACE PROFILE LISTING

W S P G W - CIVILDESIGN Version 14.06
Program Package Serial Number: 1704
WATER SURFACE PROFILE LISTING

GRANITE FALLS 2 - SOUTH, BY RICHMOND AMERICAN HOMES
TECHNICAL DRAINAGE STUDY SUPPLEMENT TO ADDENDUM NO.1 (RAH1322.001)

GRANITE FALLS 2 - SOUTH, BY RICHMOND AMERICAN HOMES
TECHNICAL DRAINAGE STUDY SUPPLEMENT TO ADDENDUM NO.1 (RAH1322.001)

GRANITE FALLS 2 - SOUTH, BY RICHMOND AMERICAN HOMES
TECHNICAL DRAINAGE STUDY SUPPLEMENT TO ADDENDUM NO.1 (RAH1322.001)

Station	Invert Elev	Depth (ft)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow width	Top Height/ Base Wt Dia.-Ft or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope						HF	SE Dpth	Froude N	Norm Dp	"N"	ZR	Type Ch
-1472.845	66.879	1.926	68.805	83.00	8.65	1.16	69.97	.00	2.10	2.88	3.000	.00	2 .0
59.367	.0070	-	-	-	-	.0066	.39	1.93	.83	1.93	.013	.00	PIPE
-1413.478	67.296	2.008	69.304	83.00	8.25	1.06	70.36	.00	2.10	2.82	3.000	.00	2 .0
6.348	.0070	-	-	-	-	.0059	.04	2.01	.77	1.93	.013	.00	PIPE
-1407.130	67.340	2.098	69.438	83.00	7.86	.96	70.40	.00	2.10	2.75	3.000	.00	2 .0
JUNCT STR	.0000	-	-	-	-	-	-	-	-	-	.013	.00	PIPE
-1407.130	67.340	1.849	69.189	79.00	8.64	1.16	70.35	.00	2.05	2.92	3.000	.00	2 .0
64.912	.0070	-	-	-	-	.0075	.49	1.85	.86	1.86	.013	.00	PIPE

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Top Dia.-Ft or I.D.	No with Pts/Pip
-1342.218	67.797	1.798	69.595	79.00	8.93	1.24	70.83	.00	2.05	2.94	3.000	.00 2 .0
42.895	.0070	-	-	-	-	.0083	.36	1.80	.91	1.86	.013	.00 PIPE
-1299.322	68.099	1.728	69.827	79.00	9.36	1.36	71.19	.00	2.05	2.97	3.000	.00 2 .0
29.940	.0070	-	-	-	-	.0094	.28	1.73	.98	1.86	.013	.00 PIPE
-1269.382	68.310	1.662	69.972	79.00	9.82	1.50	71.47	.00	2.05	2.98	3.000	.00 2 .0
24.443	.0070	-	-	-	-	.0106	.26	1.66	1.05	1.86	.013	.00 PIPE
-1244.939	68.482	1.600	70.082	79.00	10.30	1.65	71.73	.00	2.05	2.99	3.000	.00 2 .0
20.979	.0070	-	-	-	-	.0121	.25	1.60	1.13	1.86	.013	.00 PIPE
-1223.960	68.630	1.541	70.171	79.00	10.80	1.81	71.98	.00	2.05	3.00	3.000	.00 2 .0
JUNCT STR	.0060	-	-	-	-	.0095	.05	1.54	1.22	-	.013	.00 PIPE
FILE: IRN-S.WSW												PAGE 3

Date: 6-27-2014 Time: 2:26:12

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Top Dia.-Ft or I.D.	No with Pts/Pip
-1218.960	68.660	2.482	71.142	67.00	9.18	1.31	72.45	.00	2.57	3.18	3.500	.00 1 .0
127.753	.0061	-	-	-	-	.0061	.78	2.48	1.07	2.48	.013	.00 PIPE
-1091.207	69.441	2.482	71.924	67.00	9.18	1.31	73.23	.00	2.57	3.18	3.500	.00 1 .0
57.493	.0061	-	-	-	-	.0063	.37	2.48	1.07	2.48	.013	.00 PIPE
-1033.713	69.793	2.412	72.205	67.00	9.47	1.39	73.60	.00	2.57	3.24	3.500	.00 1 .0
45.313	.0061	-	-	-	-	.0070	.32	2.41	1.13	2.48	.013	.00 PIPE
-988.400	70.070	2.313	72.383	67.00	9.93	1.53	73.91	.00	2.57	3.31	3.500	.00 1 .0
301.347	.0074	-	-	-	-	.0074	2.23	2.31	1.23	2.31	.013	.00 PIPE
-687.053	72.300	2.313	74.613	67.00	9.93	1.53	76.14	.00	2.57	3.31	3.500	.00 1 .0
98.653	.0074	-	-	-	-	.0071	.70	2.31	1.23	2.31	.013	.00 PIPE
-588.400	73.030	2.395	75.425	67.00	9.55	1.42	76.84	.00	2.57	3.25	3.500	.00 1 .0
61.389	.0068	-	-	-	-	.0065	.40	2.40	1.15	2.39	.013	.00 PIPE
-527.011	73.445	2.452	75.897	67.00	9.30	1.34	77.24	.00	2.57	3.21	3.500	.00 1 .0
12.621	.0068	-	-	-	-	.0060	.08	2.45	1.09	2.39	.013	.00 PIPE
-514.390	73.530	2.565	76.095	67.00	8.87	1.22	77.32	.00	2.57	3.10	3.500	.00 1 .0

GRANITE FALLS 2 - SOUTH, BY RICHMOND AMERICAN HOMES
 TECHNICAL DRAINAGE STUDY SUPPLEMENT TO ADDENDUM NO.1 (RAH1322.001)
 PROPOSED IRON MOUNTAIN STORM DRAIN

IRN-S.OUT

-1882.25	.I	W	H	E	.	R
-1855.43	.I	CW	H	E	.	R
-1828.61	.I	CW	H	E	.	R
-1801.79	.I	C	W	H	E	R
-1774.97	.I	C	W	H	E	JX
-1748.15	.I	C	H	W	E	R
-1721.33	.I	C	H	E	.	R
-1694.50	.I	W	C	H	.	R
-1667.68	.I	W	C	H	.	R
-1640.86	.				.	
-1614.04	.				.	
-1587.22	.				.	
-1560.40	.				.	
-1533.58	.				.	
-1506.76	.				.	
-1479.94	.				.	
-1453.12	.	I	WC	HE	.	R
-1426.30	.				.	
-1399.48	.	I	W	HE	.	R
-1372.66	.	I	W	H	.	JX
-1345.83	.	I	WC	H	.	R
-1319.01	.	I	W	C	H	R
-1292.19	.	I	W	C	H	R
-1265.37	.	I	W	C	HE	R
-1238.55	.	I	W	C	HE	R

	I	W	H E .	R
-541.21				
-514.39				
64.350	65.647	66.943	68.240	69.536
	70.833	72.130	73.426	74.723
	76.019	77.316		

NOTES

1. GLOSSARY

- GLOSSARY
 I = INVERT ELEVATION
 C = CRITICAL DEPTH
 W = WATER SURFACE ELEVATION
 S = SUPER-ELEVATION
 H = HEIGHT OF CHANNEL
 E = ENERGY GRADE LINE
 X = CURVES CROSSING OVER
 B = BRIDGE ENTRANCE OR EXIT
 Y = WALL ENTRANCE OR EXIT

2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

APPENDIX C

Revised Grading Plan, Profile and Detail Sheets