

DS #: 5270.1

APN: 137-01-301-024

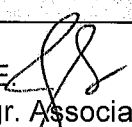
PROJECT: Cliff Shadows S Hickam - Update #1

SUBMITTAL: 3rd

SCANNED BY/DATE:

CHECKED BY/DATE:



|                                                                            |                                               |                                                                                                                                                                                          |
|----------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CITY OF LAS VEGAS</b>                                                   |                                               | <b>DATE:</b>                                                                                                                                                                             |
| <b>INTER-OFFICE MEMORANDUM</b>                                             |                                               | <b>August 13, 2020</b>                                                                                                                                                                   |
| <b>TO:</b><br>Land Development Services<br>Department of Building & Safety |                                               | <b>FROM:</b><br>Jennifer Shinn, P.E. <br>Flood Control, Engr. Associate<br>Department of Public Works |
| <b>SUBJECT:</b>                                                            | Drainage Study for:                           | <b>COPIES TO:</b>                                                                                                                                                                        |
|                                                                            | <b>Cliff Shadows &amp; Hickam – Update #1</b> | Triton Engineering                                                                                                                                                                       |
| <b>Cross Streets:</b>                                                      | Cliff Shadows Pkwy and Hickam Ave             | DR Horton                                                                                                                                                                                |
| <b>File Number:</b>                                                        | F:\Depot\DSMemos\DS5270C.doc                  | Bart Anderson, P.E., DevCo                                                                                                                                                               |
| <b>Parcel Number:</b>                                                      | 137-01-301-024                                |                                                                                                                                                                                          |
| <b>Zoning Action:</b>                                                      | TMP-78025; SDR-78024                          |                                                                                                                                                                                          |
| <b>FEMA Flood Zone</b>                                                     | YES NO <b>X</b>                               |                                                                                                                                                                                          |
| <b>Proposed Storm Drain</b>                                                | YES <b>X</b> NO                               |                                                                                                                                                                                          |

| HISTORY                    | DATE RECEIVED         | DATE REVIEWED         | COMMENTS           | REVIEW FEES     | FEES PAID<br>Payment Trn # |
|----------------------------|-----------------------|-----------------------|--------------------|-----------------|----------------------------|
| 1 <sup>st</sup> Submittal  | 4/16/2020 & 5/20/2020 | 5/12/2020 & 5/20/2020 | See Comments Below | \$400.00        | 3821275: \$400             |
| 2 <sup>nd</sup> Submittal  | 6/11/2020             | 7/6/2020              | See Comments Below | \$100.00        | 3882208: \$100             |
| 3 <sup>rd</sup> Submittal  | 7/29/20               | 8/13/20               | Approved           | \$400.00        | 3933472: \$400             |
| <b>TOTAL FEES (LDDRS):</b> |                       |                       |                    | <b>\$900.00</b> | ----                       |

#### REMARKS:

#### 2<sup>nd</sup> & 3<sup>rd</sup> Submittal: Update #1 – Lowering FFs, offsite berm and inlet pipe

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

|          |                                                                                                |
|----------|------------------------------------------------------------------------------------------------|
| <b>X</b> | 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. |

- The project proposes to build a temporary drainage facility along the western boundary of the subject site. Prior to final plan approval the developer must complete a maintenance and liability agreement for the interim drainage improvements (off-site berms or channels) and post a minimum maintenance bond of \$50,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facility and an exhibit that adequately shows the location and limits of the drainage facility to City of Las Vegas Flood Control for approval. Once the drainage study is conditionally approved, the engineer should contact the City's Land Development Section (229-6371) to begin the agreement process.

In order for the maintenance bond to be released in the future, a drainage update / letter will be required to justify that the offsite berms / channels are no longer necessary and can be removed.

The temporary drainage facilities shall be maintained by the Master Developer and shall not be transferred to any HOAs.

- Although called out on the Grading Plans with a note and a leader, show the proposed storm drain manholes.

**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**

jks

T/R/S: T20S/R59E/01

AREA K-01

**Addendum #1 to Update #1**  
To The  
**TECHNICAL DRAINAGE STUDY**  
FOR  
**Cliff Shadows & Hickam**

City of Las Vegas, Nevada

Prepared for:

**DR Horton**

1081 Whitney Ranch Drive, #141  
Henderson, NV 89014  
Office: (702)635-3600 - Fax: (702)538.0735

Prepared by:

**Triton Engineering**

6757 W. Charleston Blvd., Suite B  
Las Vegas, NV 89146  
Office: (702) 254-1480 - Fax: (702) 254-3062

APN 137-01-301-024

July 2020



# HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

## DRAINAGE STUDY INFORMATION FORM

Name of Development: ADD1 #1 to Update #1 for the TDS for Cliff Shadows & Hickam Date: July 27, 2020

Location of Development: a) Descriptive (Cross Streets) North/South: Cliff Shadows Parkway

East/West: Hickam Avenue

b) Section: 1 Township: 20S Range: 59E

c) APN: 137-01-301-024

Name of Owner: USA (OWNERS) DR Horton (DEVELOPER)

Telephone No.: (702) 672-1939 Fax No.: (702) 538-0735 E-Mail Address: JRGenovese@drhorton.com

Address: 1081 Whitney Ranch Drive #141, Henderson, NV 89014

Contact Person-Name: Kelly J. Wittwer, P.E. Telephone No.: (702) 254-1480

\* E-Mail Address: KWittwer@tritoneng.com Fax No.: (702) 254-3062

Firm: Triton Engineering, LLC

Address: 6757 West Charleston Boulevard, Suite B, Las Vegas NV 89146

Type of Land Development/Land Disturbance Process:

|                          |                  |                                     |                          |                          |                              |
|--------------------------|------------------|-------------------------------------|--------------------------|--------------------------|------------------------------|
| <input type="checkbox"/> | Rezoning         | <input checked="" type="checkbox"/> | Subdivision Map          | <input type="checkbox"/> | Clearing and Grading Only    |
| <input type="checkbox"/> | Parcel Map       | <input type="checkbox"/>            | Planned Unit Development | <input type="checkbox"/> | Other (Please specify below) |
| <input type="checkbox"/> | Large Parcel Map | <input type="checkbox"/>            | Building Permit          | <input type="checkbox"/> |                              |

1. Total Owned Land Area: At Site: 10 ac Being Developed/Disturbed: 10 ac

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

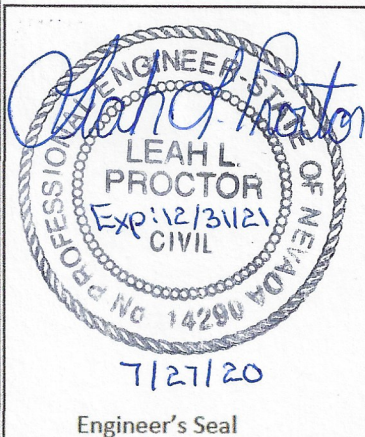
4. Proposed type of development (Residential, Commercial, Etc.): Residential

5. Approximate upstream land area which drains to the subject site: +/- 20 acres

6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: Conceptual Drainage Study for Cliff Shadows & Hickam DS5256A

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Storm drain facility on the northeast side of the property and Hickam Avenue

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



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.**

|                             | Revision | Date |
|-----------------------------|----------|------|
|                             |          |      |
|                             |          |      |
|                             |          |      |
| Local Entity File No. _____ |          |      |

REFERENCE:

STANDARD FORM 1



|                                                                            |                                               |             |                                                                                                      |
|----------------------------------------------------------------------------|-----------------------------------------------|-------------|------------------------------------------------------------------------------------------------------|
| <b>CITY OF LAS VEGAS<br/>INTER-OFFICE MEMORANDUM</b>                       |                                               |             | <b>DATE:</b><br><br>July 8, 2020                                                                     |
| <b>TO:</b><br>Land Development Services<br>Department of Building & Safety |                                               |             | <b>FROM:</b><br>Jennifer Shinn, P.E.<br>Flood Control, Engr. Associate<br>Department of Public Works |
| <b>SUBJECT:</b>                                                            | Drainage Study for:                           |             | <b>COPIES TO:</b>                                                                                    |
|                                                                            | <b>Cliff Shadows &amp; Hickam – Update #1</b> |             | Triton Engineering                                                                                   |
| <b>Cross Streets:</b>                                                      | Cliff Shadows Pkwy and Hickam Ave             |             | DR Horton                                                                                            |
| <b>File Number:</b>                                                        | F:\Depot\DSMemos\DS5270B.doc                  |             | Bart Anderson, P.E., DevCo                                                                           |
| <b>Parcel Number:</b>                                                      | 137-01-301-024                                |             |                                                                                                      |
| <b>Zoning Action:</b>                                                      | TMP-78025; SDR-78024                          |             |                                                                                                      |
| <b>FEMA Flood Zone</b>                                                     | YES                                           | NO <b>X</b> |                                                                                                      |
| <b>Proposed Storm Drain</b>                                                | YES <b>X</b>                                  | NO          |                                                                                                      |

| HISTORY                   | DATE RECEIVED         | DATE REVIEWED         | COMMENTS                   | REVIEW FEES     | FEES PAID<br>Payment Trn # |
|---------------------------|-----------------------|-----------------------|----------------------------|-----------------|----------------------------|
| 1 <sup>st</sup> Submittal | 4/16/2020 & 5/20/2020 | 5/12/2020 & 5/20/2020 | See Comments Below         | \$400.00        | 3821275: \$400             |
| 2 <sup>nd</sup> Submittal | 6/11/2020             | 7/6/2020              | See Comments Below         | \$100.00        | 3882208: \$100             |
|                           |                       |                       | <b>TOTAL FEES (LDDRS):</b> | <b>\$500.00</b> | <b>----</b>                |

#### REMARKS:

#### 2<sup>nd</sup> Submittal: Update #1 – Lowering FFs, offsite berm and inlet pipe

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

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

1. Label Document Number or Book and Page Number for all existing easements on the grading plan, including the BLM Grant along the western boundary of the subject site.
2. Revise the invert elevations in the WSPG models and/or Profiles so that they match.
3. The project proposes to build a temporary drainage facility along the western boundary of the subject site. Prior to final plan approval the developer must complete a maintenance and liability agreement for the interim drainage improvements (off-site berms or channels) and post a minimum maintenance bond of \$50,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facility and an exhibit that adequately shows the location and limits of the drainage facility to City of Las Vegas Flood Control for approval. Once the drainage study is conditionally approved, the engineer should contact the City's Land Development Section (229-6371) to begin the agreement process.

In order for the maintenance bond to be released in the future, a drainage update / letter will be required to justify that the offsite berms / channels are no longer necessary and can be removed.

The temporary drainage facilities shall be maintained by the Master Developer and shall not be transferred to any HOAs.

4. Provide a minimum 12-foot access along the berm and to the inlet pipe. Access to all manholes shall also be provided.

5. Provide a headwall at the inlet pipe as well as a concrete (not shotcrete) pad.
6. Provide a hydraulic section along the western berm to demonstrate the amount of freeboard provided by the berm. Address any erosion mitigation measures if applicable.

**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**

jks

T/R/S: T20S/R59E/01

AREA K-01



July 27, 2020

Jennifer Shinn, P. E.  
Engineering Associate  
City of Las Vegas Department of Public Works  
Las Vegas, NV 89106

**Subject: Addendum #1 to Update #1 to the TDS for Cliff Shadows & Hickam  
DS5270B**

Ms. Shinn:

Triton Engineering has received the review comments dated July 8, 2020 from City of Las Vegas for the above-referenced study. Below is a response to each of the comments:

1. **Label Document Number or Book and Page Number for all existing easements on the grading plan, including the BLM Grant along the western boundary of the subject site.**

Document numbers have been labeled on the grading plan as requested.

2. **Revise the invert elevations in the WSPG models and/or Profiles so that they match.**

This has been corrected. Please see the attached revised WSPG models. Please note that the storm drain size was reduced from a 36" RCP to a 30" RCP which had negligible impacts to the results. A revised nomograph calculation is also attached to estimate the minimum headwater depth necessary to intercept the 40 cfs at the inlet.

3. **The project proposes to build a temporary drainage facility along the western boundary of the subject site. Prior to final plan approval the developer must complete a maintenance and liability agreement for the interim drainage improvements (off-site berms or channels) and post a minimum maintenance bond of \$50,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facility and an exhibit that adequately shows the location and limits of the drainage facility to City of Las Vegas Flood Control for approval. Once the drainage study is conditionally approved, the engineer should contact the City's Land Development Section (229-6371) to begin the agreement process.**

In order for the maintenance bond to be released in the future, a drainage update / letter will be required to justify that the offsite berms / channels are no longer necessary and can be removed. The temporary drainage facilities shall be maintained by the Master Developer and shall not be transferred to any HOAs.

We will comply as requested.

4. Provide a minimum 12-foot access along the berm and to the inlet pipe. Access to all manholes shall also be provided.

A 12-foot access road has been added along the offsite berm and to the inlet pipe and SDMH #1. Access to the onsite SDMH #2 will be from the public drainage easement between lots No. 24 and 25.

5. Provide a headwall at the inlet pipe as well as a concrete (not shotcrete) pad.

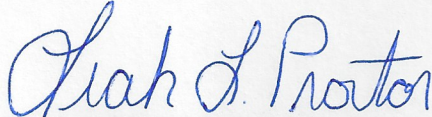
As discussed in a video conference on July 20<sup>th</sup>, 2020, the inlet will remain as designed with a flared end section and shotcrete surrounds.

6. Provide a hydraulic section along the western berm to demonstrate the amount of freeboard provided by the berm. Address any erosion mitigation measures if applicable.

Section F has been to the TDS. The hydraulic results are attached, and the results are shown on the revised Figure 4. Please note the velocity is below 5 fps which will not require additional protection.

We hope that these comment responses are satisfactory and address your concerns. If you have any questions, please contact me at 720-244-5574, email [Leah@MomentumEngineers.com](mailto:Leah@MomentumEngineers.com).

Sincerely,



Momentum Engineers, Ltd.

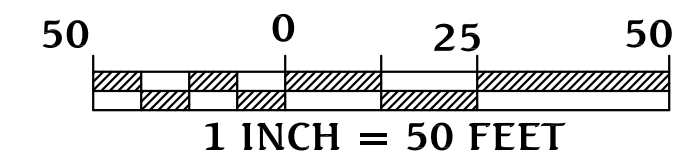
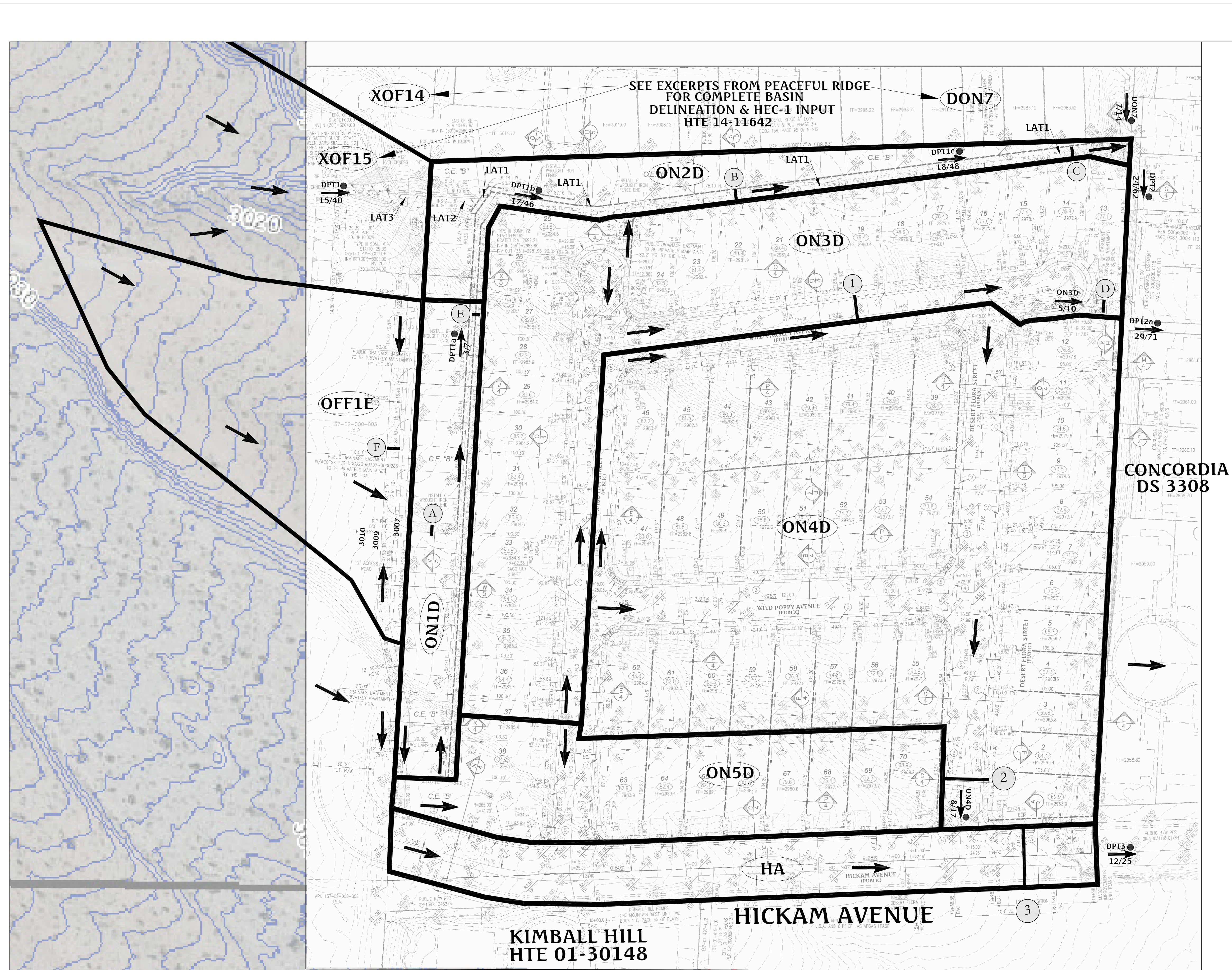
Leah L. Proctor, P.E.

Subcontractor for

Triton Engineering, LLC

# **ATTACHMENTS**





| DRAINAGE LEGEND |                         |
|-----------------|-------------------------|
| <b>XT32</b>     | BASIN IDENTIFICATION    |
|                 | BASIN BOUNDARY          |
| <b>CPT4</b>     | CONCENTRATION POINT     |
|                 | FLOW PATH               |
|                 | HYDRAULIC CROSS SECTION |
| <b>XX/XX</b>    | 10YR/100YR RUNOFF CFS   |

| PEAK FLOW RATES FOR DEVELOPED CONDITIONS<br>TDS CLIFF SHADOWS & HICKAM |                |                |        |       |
|------------------------------------------------------------------------|----------------|----------------|--------|-------|
| CONC. POINT/<br>DRAINAGE AREA                                          | AREA,<br>ACRES | PEAK FLOW, CFS |        | NOTES |
|                                                                        |                | 10-YR          | 100-YR |       |
| XOF14                                                                  |                | 3              | 8      | 1     |
| XOF15                                                                  |                | 12             | 33     | 1     |
| DPT1                                                                   |                | 15             | 40     |       |
| OFF1E                                                                  | 1.67           | 2              | 5      |       |
| ON1D                                                                   | 0.58           | 1              | 2      |       |
| DPT1a                                                                  |                | 3              | 7      |       |
| DPT1b                                                                  |                | 17             | 46     |       |
| ON2D                                                                   | 0.75           | 1              | 3      |       |
| DPT1c                                                                  |                | 18             | 48     |       |
| DON7                                                                   |                | 7              | 14     | 1     |
| DPT2                                                                   |                | 24             | 62     |       |
| ON3D                                                                   | 3.01           | 5              | 10     |       |
| DPT2a                                                                  |                | 29             | 71     |       |
| ON4D                                                                   | 5.07           | 8              | 17     |       |
| ON5D                                                                   | 1.22           | 2              | 4      |       |
| HA                                                                     | 0.98           | 2              | 4      |       |
| DPT3                                                                   |                | 12             | 25     |       |

1. See Excerpts from Peaceful Ridge

| NORMAL DEPTH CALCULATIONS FOR EASEMENTS, CHANNELS, & SWALES |                                 |                      |                         |                                    |                                        |                       |
|-------------------------------------------------------------|---------------------------------|----------------------|-------------------------|------------------------------------|----------------------------------------|-----------------------|
| HYDRAULIC<br>SECTION<br>LABEL                               | DESCRIPTION                     | DEVELOPED CONDITIONS |                         |                                    |                                        |                       |
|                                                             |                                 | SLOPE,<br>PERCENT    | Q <sub>100</sub><br>CFS | D <sub>100</sub><br>NORMAL<br>FEET | V <sub>100</sub><br>NORMAL<br>FEET/SEC | WEIR<br>DEPTH<br>FEET |
| A                                                           | Rip Rap Channel                 | 40                   | 5                       | 0.015                              | 7.67                                   | 0.91                  |
| B                                                           | 10-ft Concrete Easement         | 1.5                  | 48                      | 0.67                               | 8.83                                   | 1.21                  |
| C                                                           | Rip Rap Channel (varying width) | 7.3                  | 48                      | 0.72                               | 8.08                                   | 1.02                  |
| D                                                           | 15-ft Concrete Easement         | 1.33                 | 10                      | 0.24                               | 3.98                                   | 0.25                  |
| F                                                           | Natural Lined Swale             | 1.00                 | 5                       | 0.51                               | 2.7                                    | 0.11                  |

| STREET CAPACITY CALCULATIONS UPDATE #1 TDS CLIFF SHADOWS & HICKAM |             |                       |                                           |                                              |                                             |                                                                            |
|-------------------------------------------------------------------|-------------|-----------------------|-------------------------------------------|----------------------------------------------|---------------------------------------------|----------------------------------------------------------------------------|
| HYDRAULIC SECTION                                                 | SLOPE,<br>% | DEVELOPED CONDITIONS  |                                           |                                              |                                             |                                                                            |
|                                                                   |             | RUNOFF<br>BASIN/POINT | Q <sub>10</sub> / Q <sub>100</sub><br>CFS | D <sub>10</sub> / D <sub>100</sub> ,<br>FEET | V <sub>10</sub> / V <sub>100</sub> ,<br>FPS | V <sub>10</sub> * D <sub>10</sub> /<br>V <sub>100</sub> * D <sub>100</sub> |
| 1 (Half Street Capacity)                                          | 1.22        | *                     | na / 8                                    | na / 0.38                                    | na / 2.84                                   | na / 1.07                                                                  |
| 2                                                                 | 0.5 (min)   | ON4D                  | 8 / 17                                    | 0.35 / 0.44                                  | 1.17 / 2.09                                 | 0.41 / 0.92                                                                |
| 2                                                                 | 4.27 (max)  | ON4D                  | 8 / 17                                    | 0.26 / 0.32                                  | 3.86 / 4.61                                 | 1.00 / 1.47                                                                |
| 3 (Hickam Half Street)                                            | 4.15        | DPT3                  | 12 / 25                                   | 0.43 / 0.55                                  | 5.28 / 5.40                                 | 2.27 / 2.97                                                                |

\* This section was analyzed to estimate the half street capacity only

ADDEUNDUM #1 TO UPDATE #1 TO THE TECHNICAL DRAINAGE STUDY FOR CLIFF SHADOWS & HICKAM  
DEVELOPED CONDITIONS DRAINAGE MAP

FIGURE 5

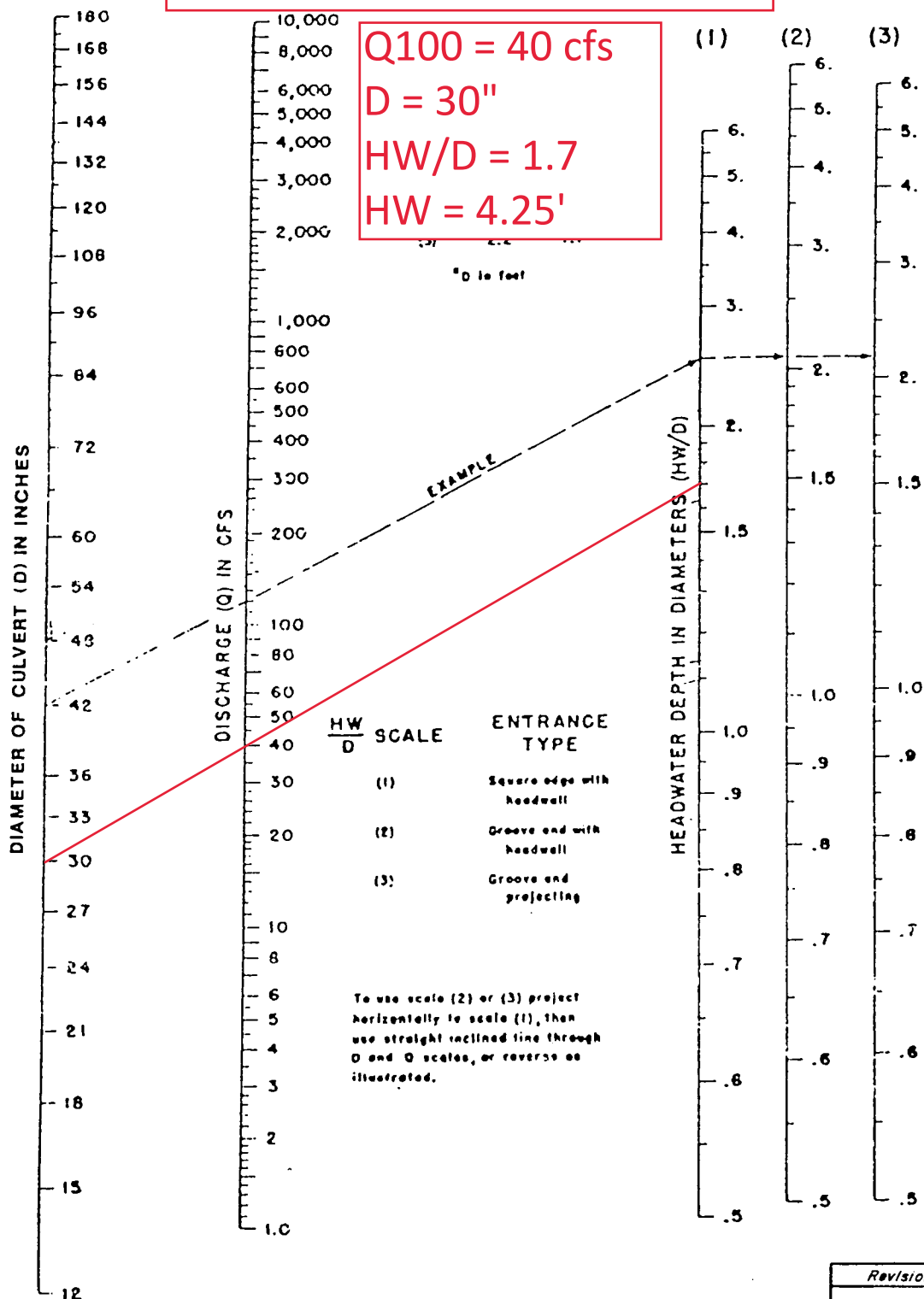




# HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

## NOMOGRAPH - INLET CONTROL RCP

### NOMOGRAPH 30" RCP



| Revision | Date |
|----------|------|
|          |      |
|          |      |
|          |      |



| T1 | LAT1 UPDATE1 ADD1 CLIFF SHADOWS & HICKAM                            |        |       |        |       |      |          |      |        |          | 0 |
|----|---------------------------------------------------------------------|--------|-------|--------|-------|------|----------|------|--------|----------|---|
| T2 | 1                                                                   | 2      | 3     | 4      | 5     | 6    | 7        | 8    | 9      |          |   |
| T3 | 4567890123456789012345678901234567890123456789012345678901234567890 |        |       |        |       |      |          |      |        |          |   |
| SO | -1569.8302973.950                                                   | 1      |       |        |       |      |          |      |        | 2973.950 |   |
| R  | -1207.8302979.600                                                   | 1      |       | .013   |       |      |          | .000 | 15.000 | 0        |   |
| R  | -1097.8302980.240                                                   | 1      |       | .013   |       |      |          | .000 | 00.000 | 0        |   |
| JX | -1097.8302980.240                                                   | 1      | 1     | .013   | 8.000 |      | 2311.59  | 90.0 | 00.000 |          |   |
| WX | -1097.8302980.240                                                   | 2      |       |        |       |      |          |      |        |          |   |
| R  | -1083.1202981.960                                                   | 2      |       | .013   |       |      |          | .000 | 00.000 | 0        |   |
| WE | -1083.1202981.960                                                   | 3      |       |        |       |      |          |      |        |          |   |
| R  | -1078.1202982.160                                                   | 3      |       | .013   |       |      |          |      |        |          |   |
| SH | -1078.1202982.160                                                   | 3      |       |        |       |      | 2982.160 |      |        |          |   |
| CD | 1 3 0                                                               | .000   | 3.000 | 10.000 | .000  | .000 | .00      |      |        |          |   |
| CD | 2 4 0                                                               | .000   | 2.500 | .000   | .000  | .000 | .00      |      |        |          |   |
| CD | 3 4 0                                                               | .000   | 5.000 | .000   | .000  | .000 | .00      |      |        |          |   |
| CD | 4 3 0                                                               | .000   | 4.000 | 3.000  | .000  | .000 | .00      |      |        |          |   |
| CD | 5 4 0                                                               | .000   | 4.000 | 0.000  | .000  | .000 | .00      |      |        |          |   |
| CD | 6 3 0                                                               | .000   | 4.000 | 8.000  | .000  | .000 | .00      |      |        |          |   |
| CD | 8 3 0                                                               | .000   | 5.000 | 3.000  | .000  | .000 | .00      |      |        |          |   |
| Q  |                                                                     | 40.000 | .0    |        |       |      |          |      |        |          |   |

Program Package Serial Number: 7204

## WATER SURFACE PROFILE LISTING

Date: 7-24-2020 Time:12: 4:36

LAT1 UPDATE1 ADD1 CLIFF SHADOWS &amp; HICKAM

0

1 2 3 4 5 6 7

456789012345678901234567890123456789012345678901234567890123

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
        | Elev   | (FT)  | Elev   | (CFS) | (FPS) | Head | Grd.El. | Elev  | Depth  | Width  | Dia.-FT | or I.D. | ZL | Prs/Pip
        |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem | Ch Slope |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
-1169.627 2979.823 .588 2980.410 48.00 8.17 1.04 2981.45 .00 .89 10.00 3.000 10.000 .00 0 .0
        |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
        10.588 .0058 .0130 .14 .59 1.88 .74 .013 .00 .00 BOX
-1159.039 2979.884 .560 2980.444 48.00 8.57 1.14 2981.58 .00 .89 10.00 3.000 10.000 .00 0 .0
        |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
        9.403 .0058 .0152 .14 .56 2.02 .74 .013 .00 .00 BOX
-1149.636 2979.939 .534 2980.473 48.00 8.98 1.25 2981.73 .00 .89 10.00 3.000 10.000 .00 0 .0
        |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
        8.482 .0058 .0177 .15 .53 2.17 .74 .013 .00 .00 BOX
-1141.154 2979.988 .509 2980.497 48.00 9.42 1.38 2981.88 .00 .89 10.00 3.000 10.000 .00 0 .0
        |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
        7.732 .0058 .0206 .16 .51 2.33 .74 .013 .00 .00 BOX
-1133.422 2980.033 .486 2980.519 48.00 9.88 1.52 2982.04 .00 .89 10.00 3.000 10.000 .00 0 .0
        |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
        7.101 .0058 .0240 .17 .49 2.50 .74 .013 .00 .00 BOX
-1126.321 2980.074 .463 2980.537 48.00 10.37 1.67 2982.21 .00 .89 10.00 3.000 10.000 .00 0 .0
        |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
        6.557 .0058 .0280 .18 .46 2.68 .74 .013 .00 .00 BOX
-1119.764 2980.112 .442 2980.554 48.00 10.87 1.84 2982.39 .00 .89 10.00 3.000 10.000 .00 0 .0
        |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
        6.080 .0058 .0326 .20 .44 2.88 .74 .013 .00 .00 BOX
-1113.683 2980.148 .421 2980.569 48.00 11.40 2.02 2982.59 .00 .89 10.00 3.000 10.000 .00 0 .0
        |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
        5.656 .0058 .0380 .22 .42 3.10 .74 .013 .00 .00 BOX
-1108.028 2980.181 .401 2980.582 48.00 11.96 2.22 2982.80 .00 .89 10.00 3.000 10.000 .00 0 .0
        |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
        5.273 .0058 .0444 .23 .40 3.33 .74 .013 .00 .00 BOX

```



Program Package Serial Number: 7204

## WATER SURFACE PROFILE LISTING

Date: 7-24-2020 Time:12: 4:36

LAT1 UPDATE1 ADD1 CLIFF SHADOWS &amp; HICKAM

0

1 2 3 4 5 6 7

456789012345678901234567890123456789012345678901234567890123

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
         | 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
***** | ***** |          |          |          |          | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | *****
-1102.755 2980.211 .383 2980.594 48.00 12.54 2.44 2983.04 .00 .89 10.00 3.000 10.000 .00 0 .0
         |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-
         4.925 .0058          .0518 .26 .38 3.57 .74 .013 .00 .00 BOX
-1097.830 2980.240 .365 2980.605 48.00 13.15 2.69 2983.29 .00 .89 10.00 3.000 10.000 .00 0 .0
         |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-
JUNCT STR .0000          .0943 .00 .36 3.84 .013 .00 .00 BOX
-1097.830 2980.240 .250 2980.490 40.00 16.00 3.98 2984.47 .00 .79 10.00 3.000 10.000 .00 0 .0
         |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-
WALL EXIT
-1097.830 2980.240 1.341 2981.581 40.00 14.92 3.46 2985.04 .00 2.13 2.49 2.500 .000 .00 0 .0
         |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-
         1.936 .1169          .0289 .06 1.34 2.54 .91 .013 .00 .00 PIPE
-1095.895 2980.466 1.374 2981.840 40.00 14.47 3.25 2985.09 .00 2.13 2.49 2.500 .000 .00 0 .0
         |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-
         2.658 .1169          .0262 .07 1.37 2.42 .91 .013 .00 .00 PIPE
-1093.237 2980.777 1.428 2982.205 40.00 13.80 2.96 2985.16 .00 2.13 2.47 2.500 .000 .00 0 .0
         |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-
         2.253 .1169          .0231 .05 1.43 2.25 .91 .013 .00 .00 PIPE
-1090.984 2981.040 1.486 2982.526 40.00 13.16 2.69 2985.21 .00 2.13 2.46 2.500 .000 .00 0 .0
         |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-
         1.903 .1169          .0204 .04 1.49 2.08 .91 .013 .00 .00 PIPE
-1089.080 2981.263 1.547 2982.810 40.00 12.54 2.44 2985.25 .00 2.13 2.43 2.500 .000 .00 0 .0
         |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-
         1.594 .1169          .0181 .03 1.55 1.93 .91 .013 .00 .00 PIPE
-1087.486 2981.449 1.611 2983.061 40.00 11.96 2.22 2985.28 .00 2.13 2.39 2.500 .000 .00 0 .0
         |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-   |-|-
         1.320 .1169          .0161 .02 1.61 1.78 .91 .013 .00 .00 PIPE

```

Program Package Serial Number: 7204

## WATER SURFACE PROFILE LISTING

Date: 7-24-2020 Time:12: 4:36

LAT1 UPDATE1 ADD1 CLIFF SHADOWS &amp; HICKAM

0

1                  2                  3                  4                  5                  6                  7

45678901234567890123456789012345678901234567890123456789012345678901234567890123

[illegible]

|    |                                                                     |        |       |        |      |      |     |      |        |          |   |
|----|---------------------------------------------------------------------|--------|-------|--------|------|------|-----|------|--------|----------|---|
| T1 | LAT2 UPDATE1 ADD1 CLIFF SHADOWS & HICKAM                            |        |       |        |      |      |     |      |        |          | 0 |
| T2 | 1                                                                   | 2      | 3     | 4      | 5    | 6    | 7   | 8    | 9      |          |   |
| T3 | 4567890123456789012345678901234567890123456789012345678901234567890 |        |       |        |      |      |     |      |        |          |   |
| SO | -1078.1202988.900                                                   | 3      |       |        |      |      |     |      |        |          |   |
| WX | -1078.1202988.900                                                   | 3      |       |        |      |      |     |      |        | 2989.150 |   |
| R  | -1031.8902994.020                                                   | 2      | .013  |        |      |      |     | .000 | 00.000 | 0        |   |
| WE | -1031.8902994.020                                                   | 3      |       |        |      |      |     |      |        |          |   |
| R  | -1026.8902994.220                                                   | 3      | .013  |        |      |      |     | .000 | 00.000 | 0        |   |
| SH | -1026.8902994.220                                                   | 3      |       |        |      |      |     |      |        | 2994.220 |   |
| CD | 1 3 0                                                               | .000   | 3.000 | 10.000 | .000 | .000 | .00 |      |        |          |   |
| CD | 2 4 0                                                               | .000   | 2.500 | .000   | .000 | .000 | .00 |      |        |          |   |
| CD | 3 4 0                                                               | .000   | 5.000 | .000   | .000 | .000 | .00 |      |        |          |   |
| CD | 4 3 0                                                               | .000   | 4.000 | 3.000  | .000 | .000 | .00 |      |        |          |   |
| CD | 5 4 0                                                               | .000   | 4.000 | 0.000  | .000 | .000 | .00 |      |        |          |   |
| CD | 6 3 0                                                               | .000   | 4.000 | 8.000  | .000 | .000 | .00 |      |        |          |   |
| CD | 8 3 0                                                               | .000   | 5.000 | 3.000  | .000 | .000 | .00 |      |        |          |   |
| Q  |                                                                     | 40.000 | .0    |        |      |      |     |      |        |          |   |



Date: 7-24-2020 Time:12: 5: 3

## LAT2 UPDATE1 ADD1 CLIFF SHADOWS &amp; HICKAM

| *****     |             |            |            |         |           |          |                |            |                |                |                |                 |       |                | ***** |  |
|-----------|-------------|------------|------------|---------|-----------|----------|----------------|------------|----------------|----------------|----------------|-----------------|-------|----------------|-------|--|
| 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        |       |  |
| *****     | *****       | *****      | *****      | *****   | *****     | *****    | *****          | *****      | *****          | *****          | *****          | *****           | ***** | *****          |       |  |
| -1078.120 | 2988.900    | 1.105      | 2990.005   | 40.00   | 12.41     | 2.39     | 2992.39        | .00        | 1.76           | 4.15           | 5.000          | .000            | .00   | 0 .0           |       |  |
| -         | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| WALL      | EXIT        |            |            |         |           |          |                |            |                |                |                |                 |       |                |       |  |
| -1078.120 | 2988.900    | 1.103      | 2990.003   | 40.00   | 19.15     | 5.69     | 2995.70        | .00        | 2.13           | 2.48           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -         | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| 7.630     | .1108       |            |            |         |           | .0556    | .42            | 1.10       | 3.68           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1070.490 | 2989.745    | 1.139      | 2990.885   | 40.00   | 18.37     | 5.24     | 2996.12        | .00        | 2.13           | 2.49           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -         | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| 7.051     | .1108       |            |            |         |           | .0493    | .35            | 1.14       | 3.46           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1063.439 | 2990.526    | 1.182      | 2991.708   | 40.00   | 17.51     | 4.76     | 2996.47        | .00        | 2.13           | 2.50           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -         | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| 5.759     | .1108       |            |            |         |           | .0433    | .25            | 1.18       | 3.23           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1057.680 | 2991.164    | 1.227      | 2992.390   | 40.00   | 16.70     | 4.33     | 2996.72        | .00        | 2.13           | 2.50           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -         | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| 4.775     | .1108       |            |            |         |           | .0382    | .18            | 1.23       | 3.01           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1052.905 | 2991.693    | 1.273      | 2992.966   | 40.00   | 15.92     | 3.93     | 2996.90        | .00        | 2.13           | 2.50           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -         | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| 4.001     | .1108       |            |            |         |           | .0336    | .13            | 1.27       | 2.80           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1048.904 | 2992.136    | 1.322      | 2993.458   | 40.00   | 15.18     | 3.58     | 2997.04        | .00        | 2.13           | 2.50           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -         | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| 3.373     | .1108       |            |            |         |           | .0296    | .10            | 1.32       | 2.60           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1045.531 | 2992.509    | 1.374      | 2993.883   | 40.00   | 14.47     | 3.25     | 2997.14        | .00        | 2.13           | 2.49           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -         | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| 2.852     | .1108       |            |            |         |           | .0262    | .07            | 1.37       | 2.42           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1042.680 | 2992.825    | 1.428      | 2994.254   | 40.00   | 13.80     | 2.96     | 2997.21        | .00        | 2.13           | 2.47           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -         | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| 2.412     | .1108       |            |            |         |           | .0231    | .06            | 1.43       | 2.25           | .93            | .013           | .00             | .00   | PIPE           |       |  |

Date: 7-24-2020 Time:12: 5: 3

## LAT2 UPDATE1 ADD1 CLIFF SHADOWS &amp; HICKAM

| *****         |             |            |            |         |           |          |                |            |                |                |                |                 |       |                | ***** |  |
|---------------|-------------|------------|------------|---------|-----------|----------|----------------|------------|----------------|----------------|----------------|-----------------|-------|----------------|-------|--|
| 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        |       |  |
| *****         | *****       | *****      | *****      | *****   | *****     | *****    | *****          | *****      | *****          | *****          | *****          | *****           | ***** | *****          |       |  |
| -1040.268     | 2993.092    | 1.486      | 2994.578   | 40.00   | 13.16     | 2.69     | 2997.27        | .00        | 2.13           | 2.46           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -             | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| 2.033         | .1108       |            |            |         |           | .0204    | .04            | 1.49       | 2.08           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1038.234     | 2993.317    | 1.547      | 2994.864   | 40.00   | 12.54     | 2.44     | 2997.31        | .00        | 2.13           | 2.43           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -             | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| 1.700         | .1108       |            |            |         |           | .0181    | .03            | 1.55       | 1.93           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1036.534     | 2993.506    | 1.611      | 2995.117   | 40.00   | 11.96     | 2.22     | 2997.34        | .00        | 2.13           | 2.39           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -             | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| 1.406         | .1108       |            |            |         |           | .0161    | .02            | 1.61       | 1.78           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1035.128     | 2993.661    | 1.680      | 2995.341   | 40.00   | 11.40     | 2.02     | 2997.36        | .00        | 2.13           | 2.35           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -             | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| 1.137         | .1108       |            |            |         |           | .0143    | .02            | 1.68       | 1.64           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1033.990     | 2993.787    | 1.754      | 2995.541   | 40.00   | 10.87     | 1.84     | 2997.38        | .00        | 2.13           | 2.29           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -             | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| .889          | .1108       |            |            |         |           | .0128    | .01            | 1.75       | 1.51           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1033.102     | 2993.886    | 1.834      | 2995.719   | 40.00   | 10.37     | 1.67     | 2997.39        | .00        | 2.13           | 2.21           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -             | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| .651          | .1108       |            |            |         |           | .0114    | .01            | 1.83       | 1.38           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1032.451     | 2993.958    | 1.921      | 2995.878   | 40.00   | 9.88      | 1.52     | 2997.40        | .00        | 2.13           | 2.11           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -             | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| .411          | .1108       |            |            |         |           | .0103    | .00            | 1.92       | 1.26           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1032.040     | 2994.003    | 2.017      | 2996.021   | 40.00   | 9.42      | 1.38     | 2997.40        | .00        | 2.13           | 1.97           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -             | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| .150          | .1108       |            |            |         |           | .0094    | .00            | 2.02       | 1.13           | .93            | .013           | .00             | .00   | PIPE           |       |  |
| -1031.890     | 2994.020    | 2.129      | 2996.148   | 40.00   | 8.98      | 1.25     | 2997.40        | .00        | 2.13           | 1.78           | 2.500          | .000            | .00   | 0 .0           |       |  |
| -             | -           | -          | -          | -       | -         | -        | -              | -          | -              | -              | -              | -               | -     | -              |       |  |
| WALL ENTRANCE |             |            |            |         |           |          |                |            |                |                |                |                 |       |                |       |  |

Program Package Serial Number: 7204

## WATER SURFACE PROFILE LISTING

Date: 7-24-2020 Time:12: 5: 3

LAT2 UPDATE1 ADD1 CLIFF SHADOWS &amp; HICKAM

0

1 2 3 4 5 6 7  
 456789012345678901234567890123456789012345678901234567890123

```

*****
| 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 | | | | | | | | | | | | | | | | |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****
| | | | | | | | | | | | | | | | |
-1031.890 2994.020 4.260 2998.280 40.00 2.24 .08 2998.36 .00 1.76 3.55 5.000 .000 .00 0 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-
5.000 .0400 | | | | | | | | | | | | | | | |
.0002 .00 4.26 .18 .94 .013 .00 .00 PIPE
| | | | | | | | | | | | | | | | |
-1026.890 2994.220 4.054 2998.274 40.00 2.35 .09 2998.36 .00 1.76 3.92 5.000 .000 .00 0 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-

```



|    |                                                                     |        |       |        |      |      |     |      |        |          |   |
|----|---------------------------------------------------------------------|--------|-------|--------|------|------|-----|------|--------|----------|---|
| T1 | LAT3 UPDATE1 ADD1 CLIFF SHADOWS & HICKAM                            |        |       |        |      |      |     |      |        |          | 0 |
| T2 | 1                                                                   | 2      | 3     | 4      | 5    | 6    | 7   | 8    | 9      |          |   |
| T3 | 4567890123456789012345678901234567890123456789012345678901234567890 |        |       |        |      |      |     |      |        |          |   |
| SO | -1026.8903001.060                                                   | 3      |       |        |      |      |     |      |        | 3004.810 |   |
| WX | -1026.8903001.060                                                   | 2      |       |        |      |      |     |      |        |          |   |
| R  | -1000.0003004.000                                                   | 2      | .013  |        |      |      |     | .000 | 00.000 | 0        |   |
| WE | -1000.0003004.000                                                   | 4      |       |        |      |      |     |      |        |          |   |
| R  | -999.9903004.001                                                    | 4      | .013  |        |      |      |     | .000 | 00.000 | 0        |   |
| SH | -999.9903004.001                                                    | 4      |       |        |      |      |     |      |        | 3007.301 |   |
| CD | 1 3 0                                                               | .000   | 3.000 | 10.000 | .000 | .000 | .00 |      |        |          |   |
| CD | 2 4 0                                                               | .000   | 2.500 | .000   | .000 | .000 | .00 |      |        |          |   |
| CD | 3 4 0                                                               | .000   | 5.000 | .000   | .000 | .000 | .00 |      |        |          |   |
| CD | 4 1 0                                                               | .000   | 5.000 | 20.000 | .250 | .250 | .00 |      |        |          |   |
| CD | 5 4 0                                                               | .000   | 4.000 | 0.000  | .000 | .000 | .00 |      |        |          |   |
| CD | 6 3 0                                                               | .000   | 4.000 | 8.000  | .000 | .000 | .00 |      |        |          |   |
| CD | 8 3 0                                                               | .000   | 5.000 | 3.000  | .000 | .000 | .00 |      |        |          |   |
| Q  |                                                                     | 40.000 | .0    |        |      |      |     |      |        |          |   |

Program Package Serial Number: 7204

## WATER SURFACE PROFILE LISTING

Date: 7-24-2020 Time:12: 5:32

LAT3 UPDATE1 ADD1 CLIFF SHADOWS &amp; HICKAM

0

1 2 3 4 5 6 7

456789012345678901234567890123456789012345678901234567890123

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
| 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
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-1026.890 3001.060 3.750 3004.810 40.00 2.53 .10 3004.91 .00 1.76 4.33 5.000 .000 .00 0 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
WALL EXIT
-1026.890 3001.060 3.751 3004.811 40.00 8.15 1.03 3005.84 .00 2.13 .00 2.500 .000 .00 0 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
.940 .1093 .0095 .01 3.75 .00 .93 .013 .00 .00 PIPE
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-1025.950 3001.163 3.656 3004.818 40.00 8.15 1.03 3005.85 .00 2.13 .00 2.500 .000 .00 0 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
HYDRAULIC JUMP
-1025.950 3001.163 1.227 3002.390 40.00 16.69 4.32 3006.71 .00 2.13 2.50 2.500 .000 .00 0 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
4.584 .1093 .0381 .17 1.23 3.00 .93 .013 .00 .00 PIPE
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-1021.366 3001.664 1.273 3002.937 40.00 15.92 3.93 3006.87 .00 2.13 2.50 2.500 .000 .00 0 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
4.076 .1093 .0336 .14 1.27 2.80 .93 .013 .00 .00 PIPE
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-1017.291 3002.110 1.322 3003.432 40.00 15.18 3.58 3007.01 .00 2.13 2.50 2.500 .000 .00 0 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
3.433 .1093 .0296 .10 1.32 2.60 .93 .013 .00 .00 PIPE
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-1013.858 3002.485 1.374 3003.859 40.00 14.47 3.25 3007.11 .00 2.13 2.49 2.500 .000 .00 0 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2.900 .1093 .0262 .08 1.37 2.42 .93 .013 .00 .00 PIPE
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-1010.957 3002.802 1.428 3004.230 40.00 13.80 2.96 3007.19 .00 2.13 2.47 2.500 .000 .00 0 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2.451 .1093 .0231 .06 1.43 2.25 .93 .013 .00 .00 PIPE
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-1008.506 3003.070 1.486 3004.556 40.00 13.16 2.69 3007.24 .00 2.13 2.46 2.500 .000 .00 0 .0
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
2.066 .1093 .0204 .04 1.49 2.08 .93 .013 .00 .00 PIPE

```

Program Package Serial Number: 7204

## WATER SURFACE PROFILE LISTING

Date: 7-24-2020 Time:12: 5:32

LAT3 UPDATE1 ADD1 CLIFF SHADOWS &amp; HICKAM

0

1 2 3 4 5 6 7

456789012345678901234567890123456789012345678901234567890123

```

*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
        | Elev   | (FT)  | Elev   | (CFS) | (FPS) | Head | Grd.El. | Elev  | Depth  | Width  | Dia.-FT | or I.D. | ZL | Prs/Pip
        |-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
L/Elem | Ch Slope |
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|
-1006.440 | 3003.296 | 1.547 | 3004.843 | 40.00 | 12.54 | 2.44 | 3007.29 | .00 | 2.13 | 2.43 | 2.500 | .000 | .00 | 0 | .0
        | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
        | 1.727 | .1093 | | | | | | | | 1.55 | 1.93 | .93 | .013 | .00 | .00 | PIPE
-1004.713 | 3003.485 | 1.611 | 3005.096 | 40.00 | 11.96 | 2.22 | 3007.32 | .00 | 2.13 | 2.39 | 2.500 | .000 | .00 | 0 | .0
        | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
        | 1.428 | .1093 | | | | | | | | 1.61 | 1.78 | .93 | .013 | .00 | .00 | PIPE
-1003.285 | 3003.641 | 1.680 | 3005.321 | 40.00 | 11.40 | 2.02 | 3007.34 | .00 | 2.13 | 2.35 | 2.500 | .000 | .00 | 0 | .0
        | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
        | 1.154 | .1093 | | | | | | | | 1.68 | 1.64 | .93 | .013 | .00 | .00 | PIPE
-1002.131 | 3003.767 | 1.754 | 3005.521 | 40.00 | 10.87 | 1.84 | 3007.36 | .00 | 2.13 | 2.29 | 2.500 | .000 | .00 | 0 | .0
        | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
        | .902 | .1093 | | | | | | | | 1.75 | 1.51 | .93 | .013 | .00 | .00 | PIPE
-1001.229 | 3003.865 | 1.834 | 3005.699 | 40.00 | 10.37 | 1.67 | 3007.37 | .00 | 2.13 | 2.21 | 2.500 | .000 | .00 | 0 | .0
        | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
        | .660 | .1093 | | | | | | | | 1.83 | 1.38 | .93 | .013 | .00 | .00 | PIPE
-1000.569 | 3003.938 | 1.921 | 3005.858 | 40.00 | 9.88 | 1.52 | 3007.38 | .00 | 2.13 | 2.11 | 2.500 | .000 | .00 | 0 | .0
        | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
        | .417 | .1093 | | | | | | | | 1.92 | 1.26 | .93 | .013 | .00 | .00 | PIPE
-1000.152 | 3003.983 | 2.017 | 3006.001 | 40.00 | 9.42 | 1.38 | 3007.38 | .00 | 2.13 | 1.97 | 2.500 | .000 | .00 | 0 | .0
        | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
        | .152 | .1093 | | | | | | | | 2.02 | 1.13 | .93 | .013 | .00 | .00 | PIPE
-1000.000 | 3004.000 | 2.129 | 3006.128 | 40.00 | 8.98 | 1.25 | 3007.38 | .00 | 2.13 | 1.78 | 2.500 | .000 | .00 | 0 | .0
        | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
        | WALL ENTRANCE
-1000.000 | 3004.000 | 4.411 | 3008.410 | 40.00 | .43 | .00 | 3008.41 | .00 | .50 | 22.21 | 5.000 | 20.000 | .25 | 0 | .0
        | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
        | .010 | .0976 | | | | | | | | 4.41 | .04 | .18 | .013 | .00 | .25 | TRAP

```

Program Package Serial Number: 7204

## WATER SURFACE PROFILE LISTING

Date: 7-24-2020 Time:12: 5:32

LAT3 UPDATE1 ADD1 CLIFF SHADOWS &amp; HICKAM

0

1 2 3 4 5 6 7

456789012345678901234567890123456789012345678901234567890123

```

*****
| 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
*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****|*****
| | | | | | | | | | | | | | | | | |
-999.990 3004.001 4.410 3008.411 40.00 .43 .00 3008.41 .00 .50 22.20 5.000 20.000 .25 0 .0
-|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|- -|-

```



## Worksheet for Section F

### Project Description

Friction Method                      Manning Formula  
Solve For                              Normal Depth

### Input Data

Channel Slope                                              0.01000    ft/ft  
Discharge                                                      5.00    ft<sup>3</sup>/s  
Section Definitions

| Station (ft) | Elevation (ft) |
|--------------|----------------|
| 0+00.000     | 1.00           |
| 0+12.000     | 0.00           |
| 0+16.000     | 2.00           |
| 0+22.000     | 2.00           |

### Roughness Segment Definitions

| Start Station    | Ending Station   | Roughness Coefficient |
|------------------|------------------|-----------------------|
| (0+00.000, 1.00) | (0+22.000, 2.00) | 0.022                 |

### Options

Current Roughness Weighted Method              Pavlovskii's Method  
Open Channel Weighting Method                  Pavlovskii's Method  
Closed Channel Weighting Method                Pavlovskii's Method

### Results

Normal Depth                                              0.51    ft  
Elevation Range                                              0.00 to 2.00 ft  
Flow Area                                                      1.85    ft<sup>2</sup>  
Wetted Perimeter                                              7.35    ft  
Hydraulic Radius                                              0.25    ft  
Top Width                                                      7.20    ft  
Normal Depth                                              0.51    ft  
Critical Depth                                              0.50    ft  
Critical Slope                                              0.01148    ft/ft

---

## Worksheet for Section F

---

### Results

|                 |             |      |
|-----------------|-------------|------|
| Velocity        | 2.70        | ft/s |
| Velocity Head   | 0.11        | ft   |
| Specific Energy | 0.63        | ft   |
| Froude Number   | 0.94        |      |
| Flow Type       | Subcritical |      |

### GVF Input Data

|                  |      |    |
|------------------|------|----|
| Downstream Depth | 0.00 | ft |
| Length           | 0.00 | ft |
| Number Of Steps  | 0    |    |

### GVF Output Data

|                     |          |       |
|---------------------|----------|-------|
| Upstream Depth      | 0.00     | ft    |
| Profile Description |          |       |
| Profile Headloss    | 0.00     | ft    |
| Downstream Velocity | Infinity | ft/s  |
| Upstream Velocity   | Infinity | ft/s  |
| Normal Depth        | 0.51     | ft    |
| Critical Depth      | 0.50     | ft    |
| Channel Slope       | 0.01000  | ft/ft |
| Critical Slope      | 0.01148  | ft/ft |

## Cross Section for Section F

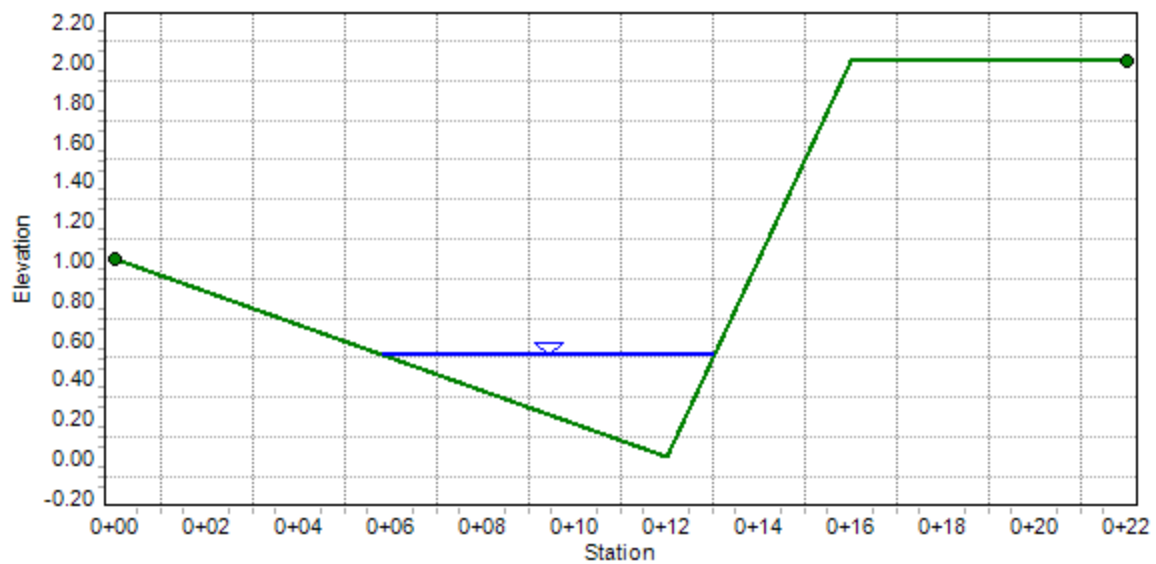
### Project Description

|                 |                 |
|-----------------|-----------------|
| Friction Method | Manning Formula |
| Solve For       | Normal Depth    |

### Input Data

|               |         |                    |
|---------------|---------|--------------------|
| Channel Slope | 0.01000 | ft/ft              |
| Normal Depth  | 0.51    | ft                 |
| Discharge     | 5.00    | ft <sup>3</sup> /s |

### Cross Section Image







| LAND USE TABULATION                                                         |                      |
|-----------------------------------------------------------------------------|----------------------|
| LAND USE DESIGNATION:                                                       |                      |
| EXISTING CLV ZONING                                                         | U/(PF)               |
| PROPOSED CLV ZONING                                                         | MEDIUM - LOW DENSITY |
| MINIMUM LOT SIZE                                                            | 4,000 SF             |
| SITE SUMMARY:                                                               |                      |
| TOTAL UNITS                                                                 | 70 UNITS             |
| GROSS ACREAGE                                                               | 11.18 ACRES          |
| GROSS DENSITY                                                               | 6.26 UNITS/ACRE      |
| NET ACREAGE                                                                 | 10.44 ACRES          |
| NET DENSITY                                                                 | 6.70 UNITS/ACRE      |
| OPEN SPACE REQUIRED<br>(330 SF PER DWELLING UNIT)                           | 25,740 SF            |
| OPEN SPACE PROVIDED<br>(PAYMENT TO BE MADE TO CLV<br>IN LIEU OF OPEN SPACE) | 0 SF                 |
| COMMON ELEMENTS:                                                            | 5,884 SF             |
| PARKING ANALYSIS:                                                           |                      |
| TOTAL LOTS                                                                  | 70 LOTS              |
| REQUIRED SPACES                                                             | 154 SPACES           |
| (2 PER HOUSE PLUS 1 FOR EVERY 5 HOUSES)                                     |                      |
| PROVIDED SPACES:                                                            | 210                  |
| (3 SPACES PER LOT: 2-CAR GARAGE AND 20' DRIVEWAY)                           |                      |

# CLIFF SHADOWS AND HICKAM

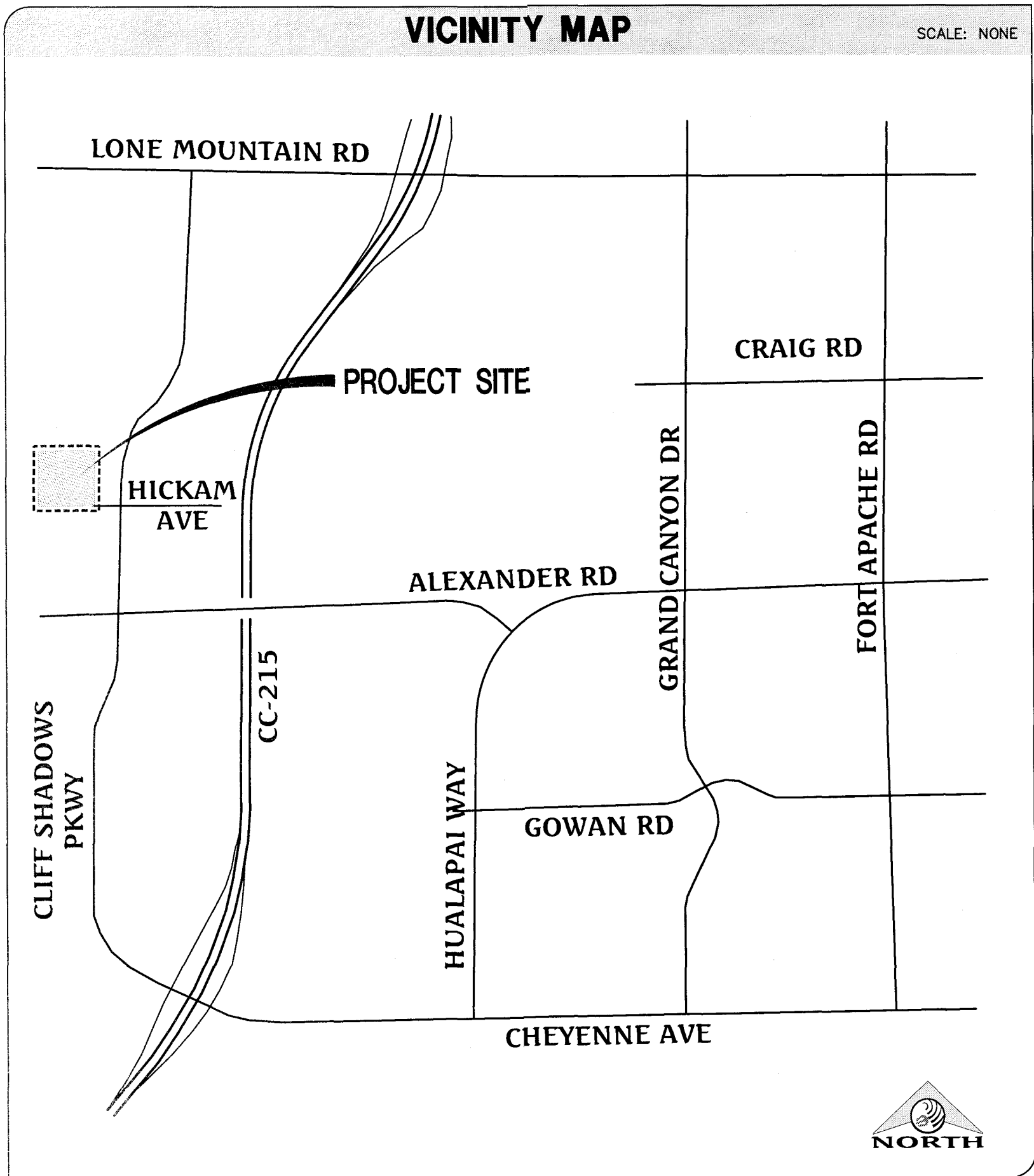
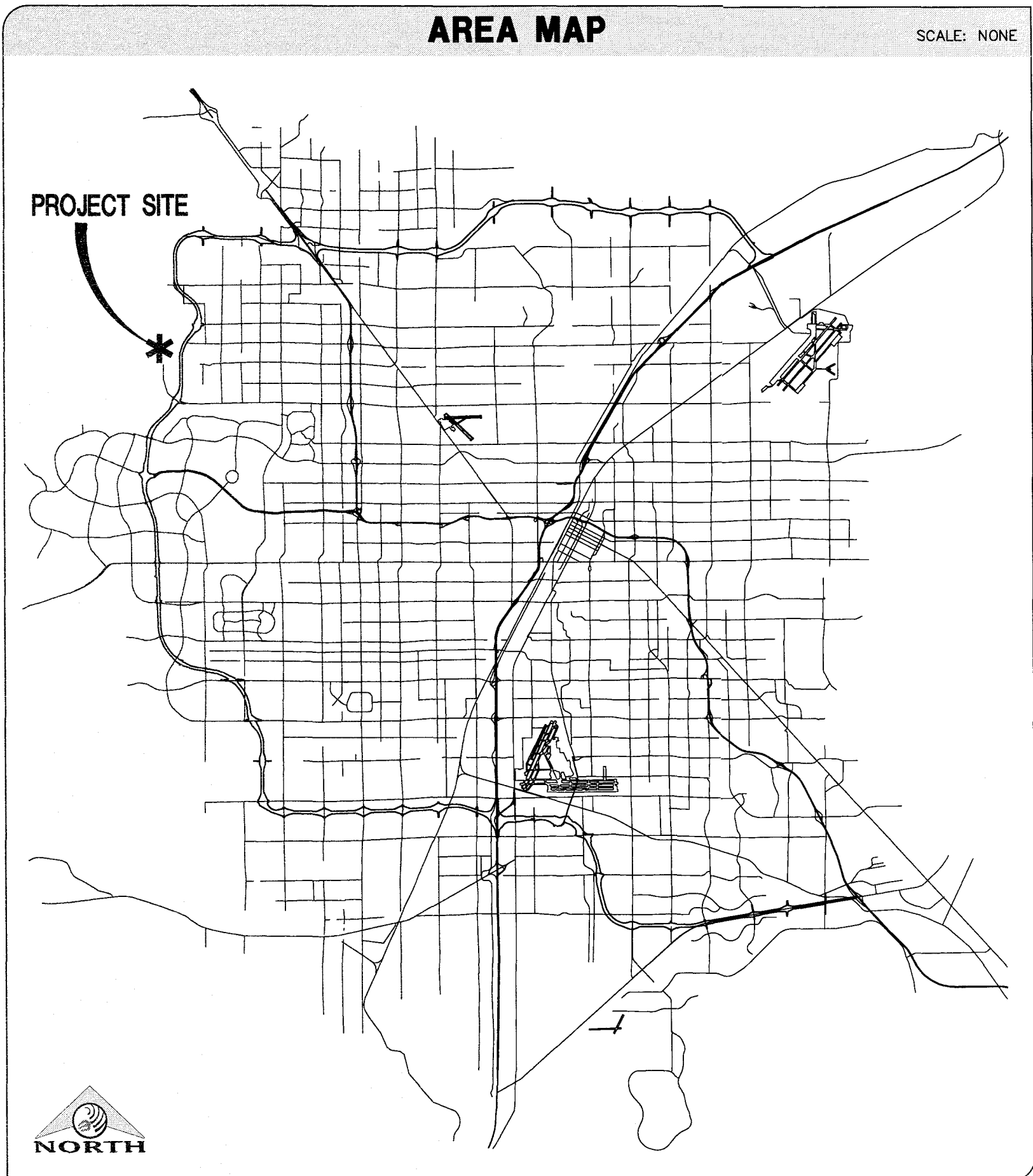
## APN: 137-01-301-024, 70 UNITS

### UPDATE #1

# TECHNICAL DRAINAGE STUDY

#### A RESIDENTIAL SUBDIVISION

#### CITY OF LAS VEGAS, NEVADA



#### LEGAL DESCRIPTION

THE SOUTHWEST QUARTER (SW 1/4) OF THE NORTHWEST QUARTER (NW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 1, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.B. & M., CLARK COUNTY, NEVADA.

#### BASIS OF BEARING

NORTH 87°47'02" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE NORTHWEST QUARTER (NW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 1, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.B. & M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN FILE 88, PAGE 08 OF SURVEYS.

#### BENCHMARK

CITY OF LAS VEGAS BENCHMARK 5LV09 1SW6  
RIVET & PLATE IN TOP OF CURB AT NE CORNER OF CLIFF SHADOWS & HICKAM.  
ELEVATION=897.87 Meters (NAVD'88 v.2003)  
ELEVATION=2945.76 US Survey Feet (NAVD'88 v.2003)

#### NOTES

- ALL INTERIOR STREETS ARE PUBLIC WITH SIDEWALK ON BOTH SIDES OF THE STREET.
- UTILITY SERVICES TO BE PROVIDED BY:  
SEWER CITY OF LAS VEGAS  
WATER LAS VEGAS VALLEY WATER DISTRICT  
WASTE DISPOSAL REPUBLIC SERVICES  
GAS SOUTHWEST GAS COMPANY  
ELECTRIC NV ENERGY  
TELEPHONE CENTURYLINK TELEPHONE
- A HOME OWNERS ASSOCIATION WILL BE ESTABLISHED, (AND WILL MAINTAIN LANDSCAPING AND PRIVATE STREETS), THEREFORE, CC&R'S WILL BE REQUIRED.
- THERE ARE NO OBSERVABLE FAULTS OR FISSURES LOCATED ON THIS SITE.
- AS PROPOSED, DEVELOPMENT IS CONSIDERED FEASIBLE FROM A GEOTECHNICAL STANDPOINT.
- GROUNDWATER WAS NOT OBSERVED DURING EXCAVATIONS AND IS NOT SHOWN ON MAPS OF KNOWN GROUNDWATER ELEVATIONS IN THE AREA TO BE WITHIN 20 FEET OF THE KNOWN GROUND ELEVATION.
- THIS SITE IS LOCATED IN ZONE X PER FEMA MAP #32003C2150e. ZONE X IS DETERMINED TO BE OUTSIDE THE 100-YEAR FLOODPLAIN.
- THE POINTS OF CONNECTION FOR WATER ARE:  
1) WET TAP INTO THE EXISTING 24" WATER MAIN (RUNNING NORTH/SOUTH) LOCATED ON THE EAST SIDE OF CLIFF SHADOWS PARKWAY/HICKAM AVENUE INTERSECTION.  
2) WET TAP INTO THE EXISTING 8" WATER STUB (RUNNING EAST/WEST) LOCATED ON THE NORTH SIDE OF CLIFF SHADOWS PARKWAY/HICKAM AVENUE INTERSECTION.
- THE POINT OF CONNECTION FOR SEWER IS LOCATED AT THE EXISTING SEWER STUB LOCATED ON HICKAM AVENUE AT THE SOUTHEAST END OF THE PROJECT SITE.

#### DEVIATIONS NOTE

NO DEVIATIONS

PROPOSED RESIDENTIAL DRIVEWAY SLOPES SHALL NOT EXCEED TWELVE PERCENT (12%).

#### APN'S / OWNERS

137-01-301-024  
USA

#### DEVELOPER

DR HORTON  
1081 WHITNEY RANCH DRIVE, SUITE #141  
HENDERSON, NEVADA 89014  
PHONE: (702) 635-3600  
CONTACT: JOE GENOVESE

#### ENGINEER

TRITON ENGINEERING  
6757 WEST CHARLESTON BOULEVARD, SUITE B  
LAS VEGAS, NV 89146  
OFFICE: (702) 254-1480  
FAX: (702) 254-3062  
CONTACT: KENNETH YAMADA

#### SURVEYOR

TRI-CORE SURVEYING  
6755 W. CHARLESTON BLVD STE A  
LAS VEGAS, NV 89146  
OFFICE: (702) 524-4085

#### SHEET INDEX

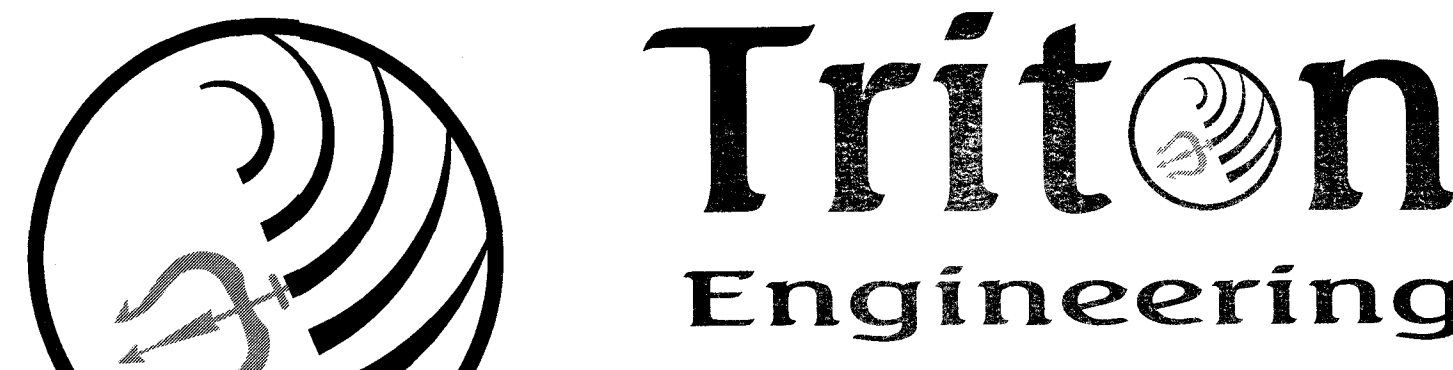
| SHEET NUMBER | DESCRIPTION                  |
|--------------|------------------------------|
| 1            | COVER SHEET                  |
| 2            | GENERAL NOTES AND LEGEND     |
| 3            | GRADING PLAN                 |
| 4            | GRADING DETAIL SHEET         |
| 5            | GRADING DETAIL SHEET         |
| 6            | STORM DRAIN PLAN AND PROFILE |

FOR

# DR HORTON

1081 WHITNEY RANCH DRIVE, SUITE #141  
HENDERSON, NV 89014  
PHONE: (702) 635-3600  
ATTN: JOE GENOVESE

BY



6757 W. Charleston Boulevard  
Suite B  
Las Vegas, Nevada 89146  
Office: (702) 254-1480  
Fax: (702) 254-3062  
www.tritoneng.com

**FAST**  
Call before you Dig  
Underground  
1-702-432-5300  
FREIGHTWAY & ARTERIAL  
SYSTEMS OF TRANSPORTATION

Avoid overhead power line contact. It's costly.  
**Call before you Overhead**  
1-702-227-2929

Call before you Dig  
Avoid cutting underground utility lines. It's costly.  
**CALL 811**  
OR  
1-800-227-2600

DATE: 03/27/20  
PM: K. YAMADA  
DRAWN BY: T.E.  
DESIGNED BY: T.E.  
CHECKED BY: T.E.  
ADA CHECKED: T.E.  
JOB NO.: 007-220  
SCALE: AS NOTED

**Triton Engineering**  
Office: (702) 254-1480  
Fax: (702) 254-3062  
6757 West Charleston Boulevard  
Suite B, Las Vegas, Nevada 89146  
www.tritoneng.com

DR HORTON  
CLIFF SHADOWS AND HICKAM  
COVER SHEET

PROFESSIONAL ENGINEER-STATE OF NEVADA  
KENNETH T. YAMADA  
Exp. 06/30/22  
CIVIL  
NO. 014664  
9-27-20

SHEET  
1  
OF 6



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 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 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 (1/2") ABOVE UP 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 CITY ENGINEER 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 NOTOT 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. AFTER HAUNCHING AND PRIOR TO BACKFILL OPERATIONS WHICH WOULD COVER SANITARY SEWER AND STORM DRAIN FACILITIES, CONTRACTOR IS REQUIRED TO SCHEDULE CLV OPEN-TRENCH UTILITY SURVEY INSPECTION FOR DETERMINATION OF FINAL LOCATION COORDINATES. FACILITIES TO BE LOCATED BY CLV SHALL INCLUDE AT A MINIMUM 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, SEWER AND STORM DRAIN MAIN ALIGNMENT, INCLUDING DEFLECTION POINTS.
- OR
- ( MAY BE USED ONLY ON PROJECTS ASSOCIATED WITH A TENTATIVE MAP CONTAINING 5 LOTS OR MORE)
- 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, SEWER 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 CERTAINITIES 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).
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 06/04/2018

CITY OF LAS VEGAS FIRE DEPARTMENT NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE #631 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 WORK SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK. [IFC § 105.6.15]
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 § 531.0, § 531.2]
5. 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. [IFC § 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 § 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 § 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 § 507]
9. PRIVATE HYDRANTS SHALL BE PAINTED RED. [IFC § 507.5.7.1]
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLY TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. [IFC § 507]
11. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: [IFC § C102]
- RESIDENTIAL - 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
  - COMMERCIAL - 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
12. WHERE THE 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 100 FT 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 § 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 § C102.10]
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 § C102.10]
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 § C102.7]
17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. [IFC § 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. FOR SYSTEMS REQUIRED TO HAVE TWO (2) SOURCES OF WATER SUPPLY, SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS AND/OR FIRE SPRINKLER LEAD-INS CAN BE OUT OF SERVICE DUE TO A SERVICE INTERRUPTION. FOR SYSTEMS PERMITTED TO HAVE ONE SOURCE OF WATER SUPPLY, SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 3 FIRE HYDRANTS AND/OR FIRE SPRINKLER LEAD-INS CAN BE OUT OF SERVICE DUE TO A SERVICE INTERRUPTION. [IFC § 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 § 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 § 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 13FT 6 INS. [IFC § 503.2.1]
23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 33 FT WITH PARKING ON BOTH SIDES MEASURED TO FACE OF CURB, NOT LESS THAN 28 FT WIDE WITH PARKING RESTRICTED TO ONE SIDE MEASURED TO FACE OF CURB. NOT LESS THAN 24 FT WIDE WITH NO PARKING ON EITHER SIDE MEASURED TO FACE OF CURB. FIRE LANES THROUGH PARKING LOTS SHALL BE NOT LESS THAN 24 FT. [IFC § 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 ACCESS. [IFC § 503.1.1]
25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 200 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. CLV REGULATION AND MOU
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. CLV REGULATION
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 § 503.3]
28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM IFC § 503.6
29. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS, OR HAVING FOUR OR MORE TRAVEL LANES AND A TRAFFIC COUNT OF MORE THAN 30,000 VEHICLES PER DAY, ALL HYDRANTS BEING UTILIZED TO DELIVER FIRE FLOW TO THE PROPOSED LOCATION SHALL BE LOCATED ON THE SAME SIDE OF THE STREET AS THE PROPOSED DEVELOPMENT. CLV REGULATION
- EFFECTIVE DATE: FEBRUARY 4, 2019

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 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 LVWMD 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 PVC PIPE WHICH ALLOWS FOR PIPE DEFLECTION AT THE JOINTS.
- REVISED 04/15/10

ABBREVIATIONS

ABAN - ABANDON  
AG - ASPHALT CONCRETE  
AGGR - AGGREGATE  
& - AND  
APN - ASSESSOR PARCEL NUMBER  
APPROX - APPROXIMATE  
ASSY - ASSEMBLY  
AVE - AVENUE  
BC - BACK OF CURB  
BCR - BACK OF CURVE RETURN  
BK - BOOK/BACK  
BLOG - BUILDING  
BLK - BLOCK  
BLM - BUREAU OF LAND MANAGEMENT  
BLVD - BOULEVARD  
BM - BENCHMARK  
BO - BLOW OFF ASSEMBLY  
BOC - BACK OF CURB  
BOT - BOTTOM  
BOW - BACK OF WALK  
BRC - BEARING  
BVC - BEGIN VERTICAL CURVE  
BW - BACK OF WALK  
BWV - BACK WATER VALVE  
C/C - CENTER TO CENTER  
C&G - CURB & GUTTER  
CC - CLARK COUNTY  
CE - COMMON ELEVANT  
CI - CAST IRON  
CIP - CAST IRON PIPE/  
OR - CAST IN PLACE  
CIR - CIRCLE  
CL OR C - CENTERLINE  
CLV - CITY OF LAS VEGAS  
ONLY - CITY OF NOTRA  
LAS VEGAS  
CO - COUNTY  
COV - CITY OF HENDERSON  
CONC - CONCRETE  
CONT - CONTINUOUS  
COORD - COORDINATE  
CTR - CENTER  
CV - CONTROL VALVE  
Δ - DELTA ANGLE  
D/W OR DWY - DRIVEWAY  
DEPT - DEPARTMENT  
DET - DETAIL  
DEV - DEVELOPMENT  
DG - DESIGN GRADE  
DI - DROP INLET/DUCTILE IRON  
DIA OR Ø - DIAMETER  
DM - DIMENSION  
DIP - DUCTILE IRON PIPE  
DIR - DIRECTION  
DIST - DISTANCE  
DNH - DROP MANHOLE  
DN - DOWN  
DR - DRIVE  
DWG - DRAWING  
E - EAST/EDGE  
EA - EACH  
EG - EXISTING GROUND  
ELEV - ELEVATION  
EQP - EDGE OF PAVEMENT  
EOS - EDGE OF SHOULDER  
EQ - EQUAL OR EQUATION  
EQ SP - EQUALLY SPACED  
ESMT - EASEMENT  
EST - ESTIMATE  
END - END OF VERTICAL CURVE  
EW - EACH WAY  
EXIST - EXISTING  
F/T - FACE TO FACE  
FC - FACE OF CURB  
FF - FINISHED FLOOR  
FG - FINISHED GRADE  
FH - FIRE HYDRANT  
FIG - FIGURE  
FL OR F - FLOW LINE  
FLR - FLOOR  
FN - FENCE  
FND - FOUND  
FOW - FACE OF CURB  
FOW - FACE OF WALL  
FPM - FEET PER MINUTE  
FPS - FEET PER SECOND  
FT - FOOT OR FEET  
FTG - FOOTING  
FUT - FUTURE  
G/B - GRADE BREAK  
GALV - GALVANIZED  
GB - GRADE BREAK  
GND - GROUND  
GPD - GALLONS PER DAY  
GPH - GALLONS PER HOUR  
GPM - GALLONS PER MINUTE  
GRD - GRADE  
GRT - GRATE  
GV - GATE VALVE  
HORIZ - HORIZONTAL  
HP - HIGH POINT  
HPC - HIGH PRESSURE GAS  
HT - HEIGHT  
HWY - HIGHWAY  
IN - INCH  
INST - INSTALL  
INT - INTERIOR  
INV - INVERT  
IRR - IRRIGATION  
LB OR # - POUND  
LEN OR L - LENGTH OF CURVATURE  
LF - LINEAR FOOT  
LG - LONG  
LN - LANE  
LT - LEFT/LIGHT  
LVWMD - LAS VEGAS VALLEY  
WATER DISTRICT  
LWR - LOWER  
M - METER  
MATL - MATERIAL  
MAX - MAXIMUM  
MECH - MECHANICAL  
MFR - MANUFACTURER  
MG - MILLION GALLONS  
MGD - MILLION GALLONS PER DAY  
MI - MILE  
MIN - MINIMUM  
MISC - MISCELLANEOUS  
ML - MECHANICAL JOINT  
MKR - MARKER  
ML - MORTAR LINED  
MLC - MORTAR LINED & COATED  
MVC - MIDDLE OF VERTICAL CURVE  
N - NORTH  
N/A - NOT APPLICABLE  
NAP - NOT A PART  
NDOT - NEVADA DEPARTMENT  
OF TRANSPORTATION  
NVE - NEVADA ENERGY  
NE - NORTHWEST  
NF - NORTH FACE  
NAT - NATURAL GROUND  
TMP - TEMPORARY  
NS - NOT TO SCALE  
NRS - NEVADA REVISED STATUTES  
NAC - NEVADA ADMINISTRATIVE  
CODE  
NW - NORTHWEST  
O/O - OUT TO OUT  
O/C - CENTER  
OD - OUTSIDE DIAMETER  
OF - OUTSIDE FACE  
OHP - OVER HEAD POWER  
OHEL - OVER HEAD TELEPHONE  
ORIG - ORIGINAL  
OVEL - OVERFLOW  
PL OR P - PROPERTY LINE  
PAVMT - PAVEMENT  
PB - PULL BOX  
PC - POINT OF CURVE  
PCC - POINT OF COMPOUND CURVE  
PE - POLYETHYLENE  
PED - PESTAL  
PERM - PERMANENT  
PERP - PERPENDICULAR  
PI - PHASE  
PI - POINT OF INTERSECTION  
PKG - PACKAGE  
PKWY - PARKWAY  
PL - PLACE/PLATE/PARCEL LINE  
PLT - PLATE (DRAWING)  
POLY - POLYETHYLENE  
PP - POWER POLE  
PR - PAIR  
PRC - POINT OF REVERSE CURVE/  
PRECAST REINFORCED CONCRETE  
PRELM - PRELIMINARY  
PROP - PROPOSED  
PRV - PRESSURE REGULATING VALVE  
PS - PUMP STATION  
PSF - POUNDS PER SQUARE FOOT  
PSI - POUNDS PER SQUARE INCH  
PT - POINT/POINT OF TANGENT  
PUE - PUBLIC UTILITY EASEMENT  
PV - POINT OF VERTICAL  
INTERSECTION  
PVC - POLYVNYL CHLORIDE PIPE  
QTR - QUARTER  
QTY - QUANTITY  
R - RADIUS  
(R) - RADIAL  
R/W - RIGHT OF WAY  
RCB - REINFORCED CONCRETE BOX  
RCP - REINFORCED CONCRETE PIPE  
RD - ROAD  
RED - REDUCER  
REQD - REQUIRED  
RET - RETURN  
REV - REVISION OR REVERSE  
ROW - RIGHT OF WAY  
RPPA - REDUCED PRESSURE  
PRINCIPLE ASSEMBLY  
S - SOUTH/SLOPE  
S/C - SAW CUT  
SCCP - STEEL CYLINDER CONCRETE  
PIPE  
SDI - SCHEDULE  
SD - STORM DRAIN  
SDMI - STORM DRAIN MANHOLE  
SDWK - SIDEWALK  
SE - SOUTHEAST  
SEC - SECTION/SECOND  
SEG - SEGMENT  
SHDR - SHOULDER  
SHT - SHEET  
SID - SPECIAL IMPROVEMENT  
DISTRICT  
SIG - SIGNAL  
S - SLOPE  
SLV - SLEEVE  
SNWA - SOUTHERN NEVADA WATER  
AUTHORITY  
SPEC(S) - SPECIFICATION(S)  
SQ - SQUARE  
SQ FT - SQUARE FOOT/FEET  
SQ YD - SQUARE YARD  
ST - STREET  
STA - STATION  
STD - STANDARD  
STL - STEEL  
STLT - STREET LIGHT  
SW - SIDEWALK OR SOUTHWEST  
SY - SQUARE YARD  
SYM - SYMBOL  
SYS - SYSTEM  
TAB - TOP & BOTTOM  
TAN - TANGENT  
TBM - TEMPORARY BENCH MARK  
TD - TRENCH DRAIN  
TMP - TEMPORARY  
THK - THICKNESS  
THR BLK - THRUST BLOCK  
TMB - TOP OF MANHOLE  
TOF - TOP OF FOOTING  
TOGR - TOP OF GRATE  
TOP - TOP OF PIPE  
TOP - TOP OF RIM  
TOS - TOP OF SLAB  
TOSW - TOP OF SIDEWALK  
TOT - TOTAL  
TOW - TOP OF WALL  
(TYP) - TYPICAL  
UNO - UNLESS NOTED OTHERWISE  
UPRR - UNION PACIFIC RAILROAD  
USGS - UNITED STATES GEODETIC  
SURVEY  
UTIL - UTILITY  
V - VOLT OR VALVE  
VAR - VARIES  
VB - VALVE BOX  
VCP - VITRIFIED  
VC - VERTICAL CURVE  
VEL - VELOCITY  
VERT - VERTICAL  
VG - VALLEY GUTTER  
VOL - VOLUME  
VPI - VERTICAL POINT OF  
INTERSECTION  
W/ - WITH  
W - WEST/WATER  
W/O - WITH OUT  
WD - WIDTH  
WON - WASTE DRAIN  
WI - WROUGHT IRON  
WL - WASTE LINE  
WP - WORK POINT/WEATHER PROOF  
WS - WATER SURFACE  
WT - WEIGHT  
WTR - WATER  
WV - WATER VALVE  
WNF - WELDED WIRE FABRIC  
WNM - WELDED WIRE MESH  
XFMR - TRANSFORMER  
XFR - TRANSFER  
XSEC - CROSS SECTION  
YD - YARD  
YLD - YIELD

GENERAL LEGEND

CENTERLINE  
UNIT BOUNDARY  
PROPOSED 1' GRADE CONTOUR  
PROPOSED 5' GRADE CONTOUR  
EXISTING 1' GRADE CONTOUR  
EXISTING 5' GRADE CONTOUR  
PROPOSED PROPERTY LINE  
PROPOSED SETBACK LINE  
PROPOSED HINGE LINE  
PROPOSED SWALE  
EXISTING CURB AND GUTTER  
PROPOSED CURB AND GUTTER  
RETAINING WALL  
GARDEN WALL WITH SOLID GROUT  
8" WIDE CMU FLOOD WALL  
EXISTING FENCE  
EXISTING EDGE OF PAVEMENT  
PROPOSED EDGE OF PAVEMENT  
PROPOSED STREETLIGHT CONDUIT  
PROPOSED NO. 3 1/2 CONCRETE  
PULL BOX W/ METAL COVER  
EXISTING GAS  
EXISTING SEWER MAIN  
EXISTING SEWER MAIN  
PROPOSED SEWER MAIN  
PROPOSED SEWER LATERAL  
EXISTING STORM DRAIN  
PROPOSED STORM DRAIN  
EXISTING WATER MAIN  
PROPOSED WATER MAIN  
PROPOSED FIRE HYDRANT  
LOT NUMBER  
PROPOSED FINISH FLOOR  
PROPOSED PAD ELEVATION  
EXISTING STREET LIGHT  
PROPOSED 100w HPS STREET LIGHT  
PROPOSED 150w HPS STREET LIGHT  
PROPOSED 200w HPS STREET LIGHT  
PROPOSED 250w HPS STREET LIGHT  
PROPOSED 400w HPS STREET LIGHT  
PROPOSED HANDICAP RAMP  
PROPOSED CONCRETE DRIVEWAY  
0" LIP DRIVEWAY  
2:1 SCARP  
COURSES OF 8" CMU  
NUMBER OF COURSES  
CUL-DE-SAC BACK  
OF CURB STATION  
KNUCKLE BACK  
OF CURB STATION  
SIGHT VISIBILITY  
ZONE  
PROPOSED RATE & FLOW DIRECTION  
PROPOSED ELEVATION WITH  
DESCRIPTION  
EXISTING ELEVATION WITH  
DESCRIPTION

Triton Engineering  
Office: (702) 254-1480  
6757 West Charleston Boulevard  
Suite B  
Las Vegas, Nevada 89146  
Fax: (702) 254-3062  
www.tritoneng.com

DR HORTON  
CLIFF SHADOWS AND HICKAM  
GENERAL NOTES AND LEGEND

PROFESSIONAL ENGINEER-STATE OF NEVADA  
KENNETH T. YAMADA  
Exp. 06/30/22  
No. 014664  
CIVIL  
2-21-20

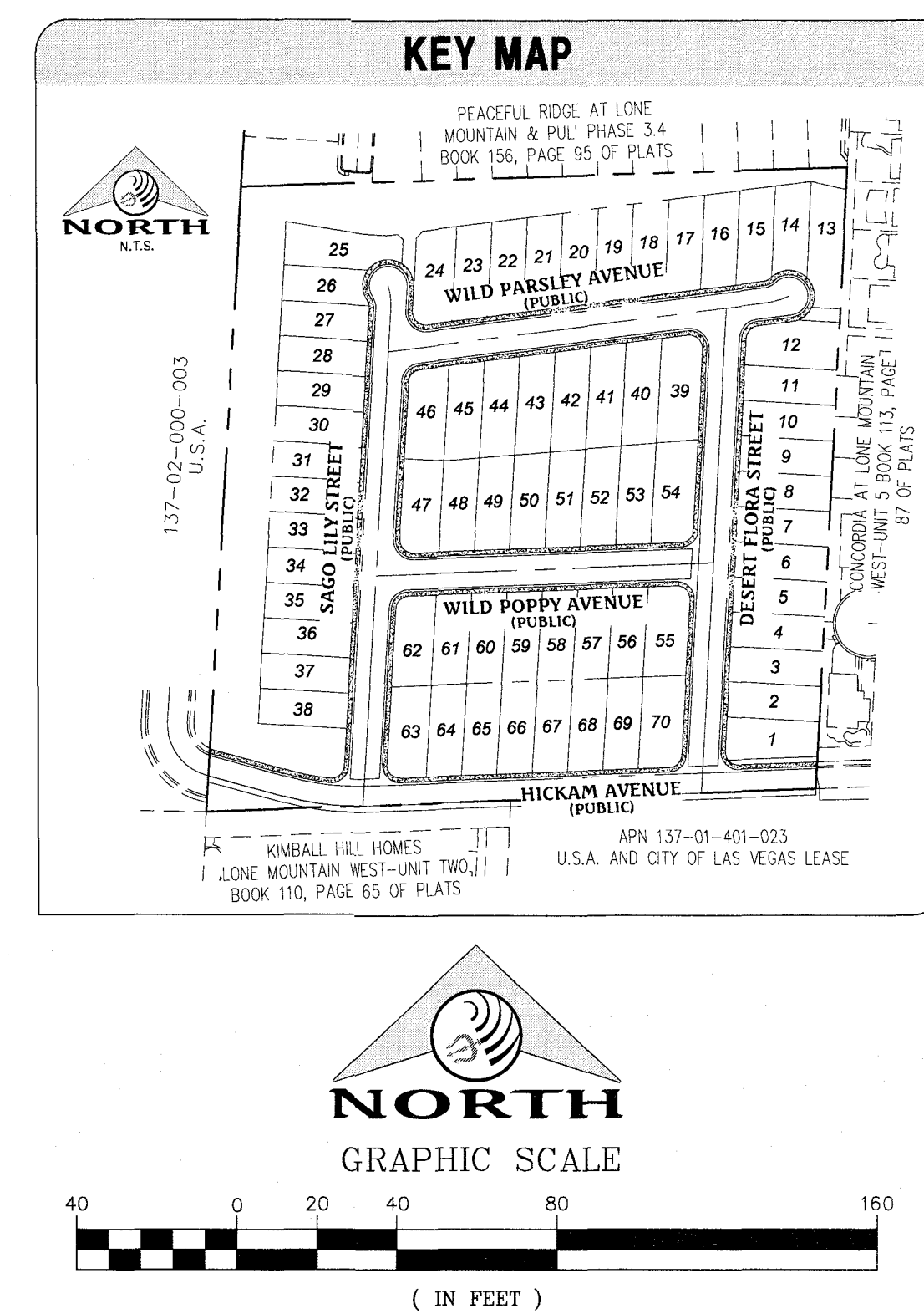
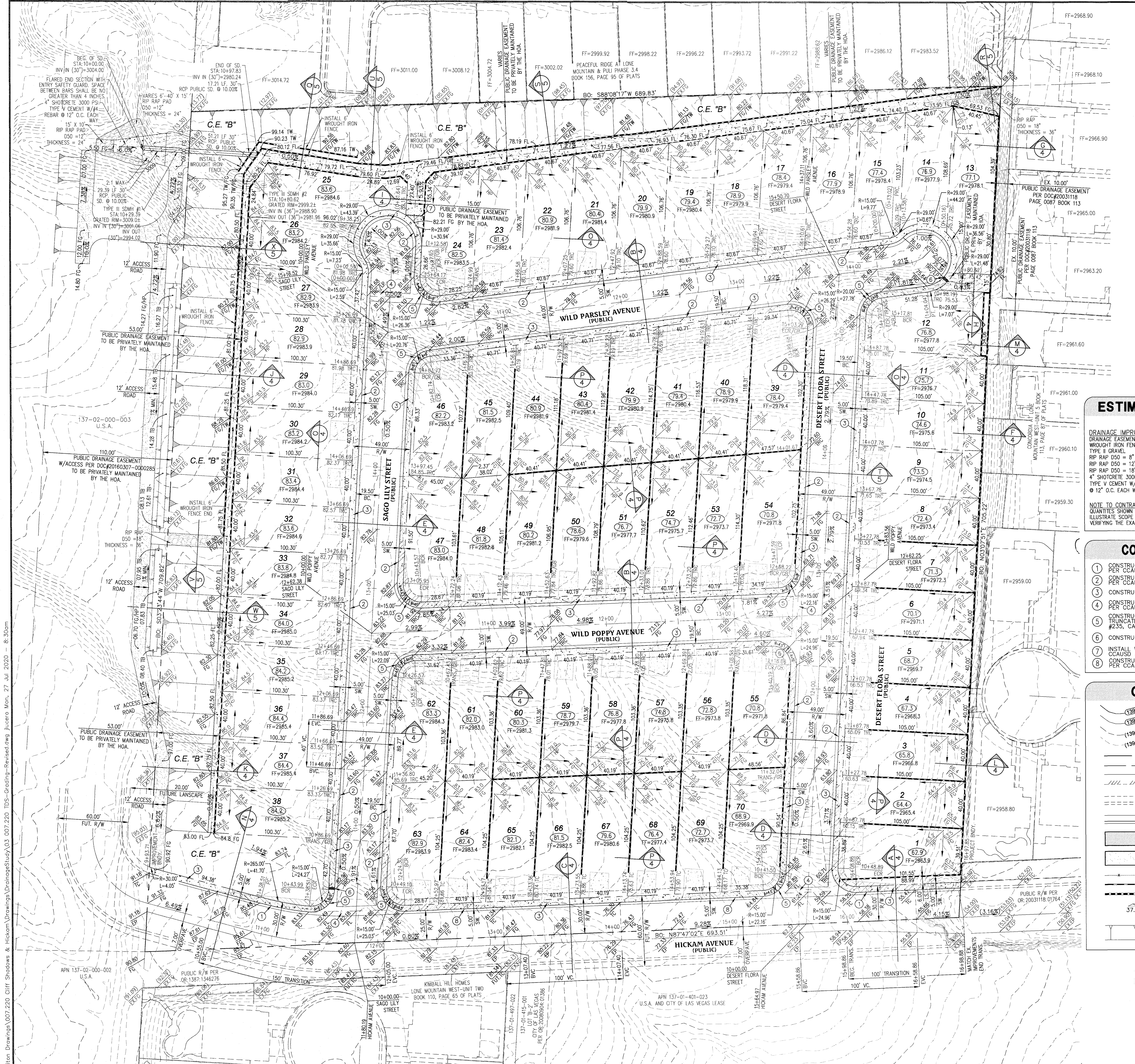
SHEET  
2  
OF 6

**FAST**  
Call before you dig  
Underground  
1-702-432-5300

Avoid overhead power lines. It's costly.  
Call before you dig  
Overhead  
1-702-227-2929

CALL  
811  
OR  
1-800-227-2600





### ESTIMATE OF QUANTITIES

|                              | PUBLIC    | PRIVATE |
|------------------------------|-----------|---------|
| DRAINAGE IMPROVEMENTS:       |           |         |
| DRAINAGE EASEMENT - CONCRETE | 9,412 SF. |         |
| WROUGHT IRON FENCE           | 15 LF.    |         |
| TYPE II GRAVEL               | 175 CY.   |         |
| RIP RAP D50 = 8"             | 480 SF.   |         |
| RIP RAP D50 = 12"            | 150 SF.   |         |
| RIP RAP D50 = 18"            | 940 SF.   |         |
| 4" SHOTCRETE 3000 PSI        | 838 SF.   |         |
| TYPE V CEMENT W/#4 REBAR     |           |         |
| @ 12" O.C. EACH WAY          |           |         |

NOTE TO CONTRACTOR:  
QUANTITIES SHOWN ARE APPROXIMATIONS ONLY AND ARE INTENDED TO ILLUSTRATE SCOPE OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXACT QUANTITIES REQUIRED.

### CONSTRUCTION NOTES

1. CONSTRUCT "L" TYPE CURB AND GUTTER, PER CCAUSD No. 216.
2. CONSTRUCT 30" MODIFIED ROLL CURB AND GUTTER, PER CCAUSD No. 217.
3. CONSTRUCT 5' WIDE SIDEWALK, PER CCAUSD No. 234.
4. CONSTRUCT 8" WIDE CROSS GUTTER, PER CCAUSD No. 228.
5. CONSTRUCT SIDEWALK RAMPS USING ARMOR TILE TRUNCATED DOWNS OR EQUIVALENT PER CCAUSD #235, CASE 1.
6. CONSTRUCT 2' SIDEWALK UNDERDRAIN.
7. INSTALL WROUGHT FENCE WITH ACCESS GATES PER CCAUSD No. 217.3.51.
8. CONSTRUCT "R" TYPE CURB AND GUTTER, PER CCAUSD No. 217.3.51.

### GRADING LEGEND

- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- EX. MAJOR CONTOUR
- EX. MINOR CONTOUR
- BOUNDARY LINE
- RIGHT-OF-WAY LINE
- STREET CENTERLINE
- EDGE OF PAVEMENT
- EXISTING CURB, GUTTER, & SIDEWALK
- PROPOSED CURB, GUTTER, & SIDEWALK
- PROPOSED AC PAVING
- EXISTING AC PAVING
- EX. FENCE
- EX. BLOCK WALL
- PROPOSED RETAINING WALL
- TOP OF FOOTING
- APPROX. WALL LENGTH
- TOP OF RETAINING WALL
- PROPOSED SCARP

### BASIS OF BEARING

NORTH 87°47'02" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE NORTHWEST QUARTER (NW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 1, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA AS SHOWN BY MAP THEREON ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN FILE 88, PAGE 08 OF SURVEYS.

### BENCHMARK

CITY OF LAS VEGAS BENCHMARK 51009 15M  
RIVET & PLATE IN TOP OF CURB AT NE CORNER OF CLIFF SHADOWS & HICKAM.  
ELEVATION=897.87 Meters (NAVD'88 v.2003)  
ELEVATION=2945.76 US Survey Feet (NAVD'88 v.2003)

### FLOOD ZONE NOTE

THE PROJECT SITE IS LOCATED ON FEMA FLOOD INSURANCE RATE MAP #32003C2150E. THE SITE IS LOCATED WITHIN DESIGNATED FLOOD HAZARD ZONE X BEING AN AREA DETERMINED TO BE OUTSIDE THE 100 YEAR FLOOD PLAIN.

### GRADING NOTES

1. ALL PROPOSED PAD ELEVATIONS AND SWALE ELEVATIONS ARE ROUGH GRADES. ALL OTHER PROPOSED ELEVATIONS ARE FINISHED GRADES.
2. THE GRADING PLANS SHALL BE AT THE PROJECT SITE THROUGHOUT THE COURSE OF CONSTRUCTION.
3. ALL GRADING SHALL BE PERFORMED IN CONFORMANCE WITH THE LINES, GRADES AND DETAILS AS SHOWN ON THESE PLANS. ANY DEVIATION FROM THESE PLANS WILL ONLY BE PERMITTED UPON WRITTEN APPROVAL FROM THE ENGINEER.
4. ALL PADS ARE TO BE GRADED WITHIN ±0.3' OF THE ELEVATIONS AS SHOWN ON THE PLANS. GRADING IS NOT COMPLETE UNTIL THE ENGINEER HAS CERTIFIED THAT THE PADS HAVE BEEN GRADED IN SUBSTANTIAL CONFORMANCE TO THE PLANS.
5. ALL PLACEMENT OF OVERSIZED MATERIALS AND/OR FILL MATERIALS SHALL BE PER THE SOILS REPORT REFERENCED ON THIS PLAN.
6. ADD 2200 TO ALL SPOT GRADES AND TOP OF CURB, FLOW LINE AND FINISH GRADE ELEVATIONS.
7. ANY CURVED CURB LESS THAN 1% MUST BE WATER TESTED BY CONTRACTOR AS REQUIRED BY CITY INSPECTOR.

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

KENNETH T. YAMADA, PE No. 014664 DATE

Call before you Dig  
Overhead  
1-702-227-2929

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

FAST  
Underground  
1-702-432-5300

DATE: 03/27/20  
DRAWN BY: K. YAMADA  
DESIGNED BY: T.E.  
CHECKED BY: T.E.  
AD. CHECKED BY: T.E.  
JOB NO.: 007220  
SCALE: AS NOTED

NO. DESCRIPTION  
DATE

DR HORTON  
CLIFF SHADOWS AND HICKAM

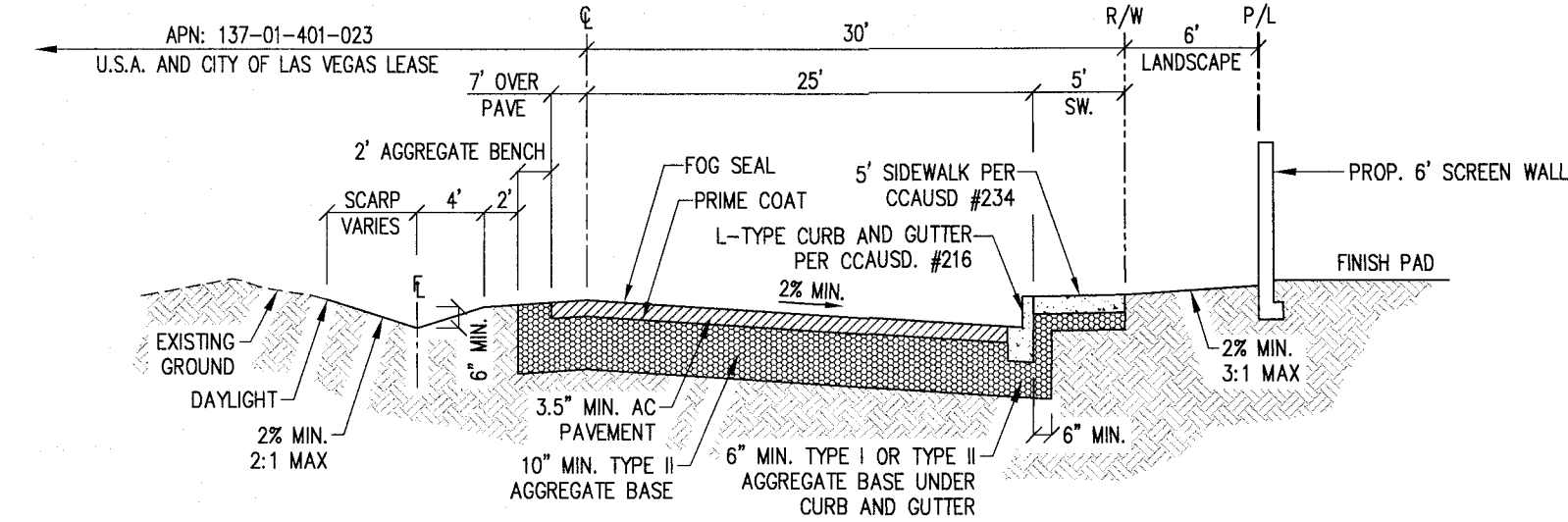
GRADING PLANS

PROFESSIONAL ENGINEER-STATE OF NEVADA  
KENNETH YAMADA  
Exp. 06/30/20  
CIVIL  
No. 014664

SHEET  
3  
OF 6

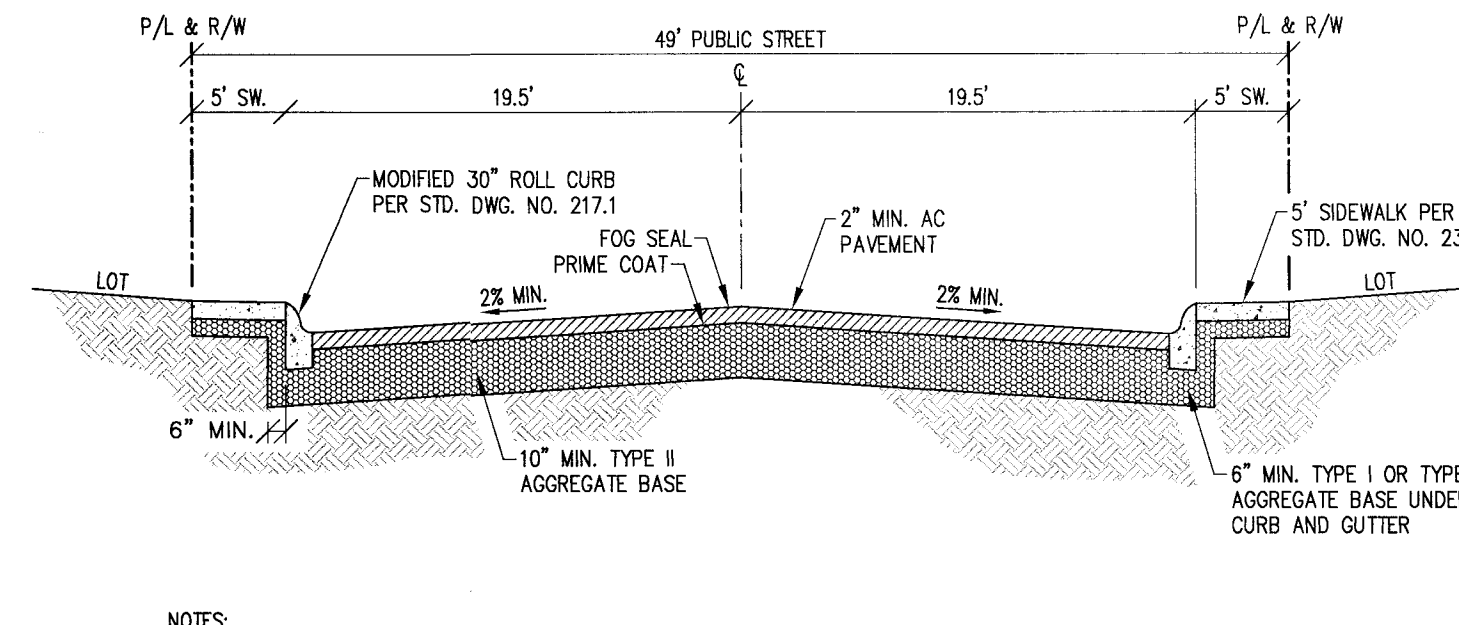


Q:\Triton Drawings\007-220 Cliff Shadows & Hickam\Drawings\Drainage\Study\01\_007-220-Detail Sheet-revised.dwg created Wed, 29 Jul 2020 - 9:35am



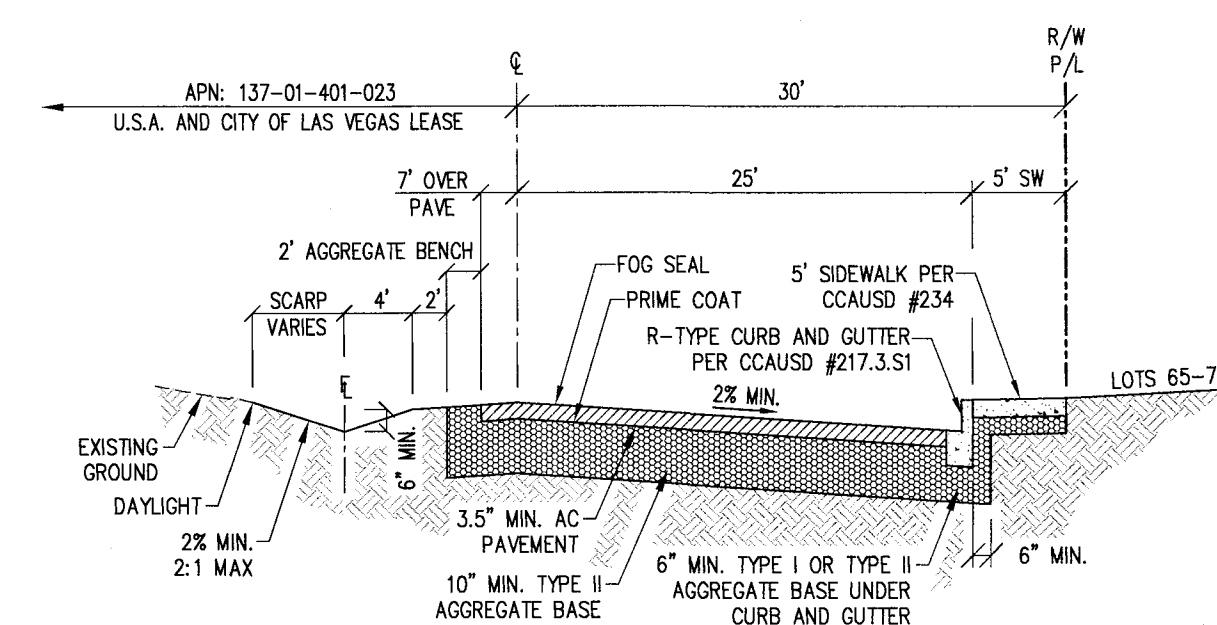
A HICKAM AVENUE - (PUBLIC STREET)

PER CCAUSD #208 MODIFIED  
(NOT TO SCALE)



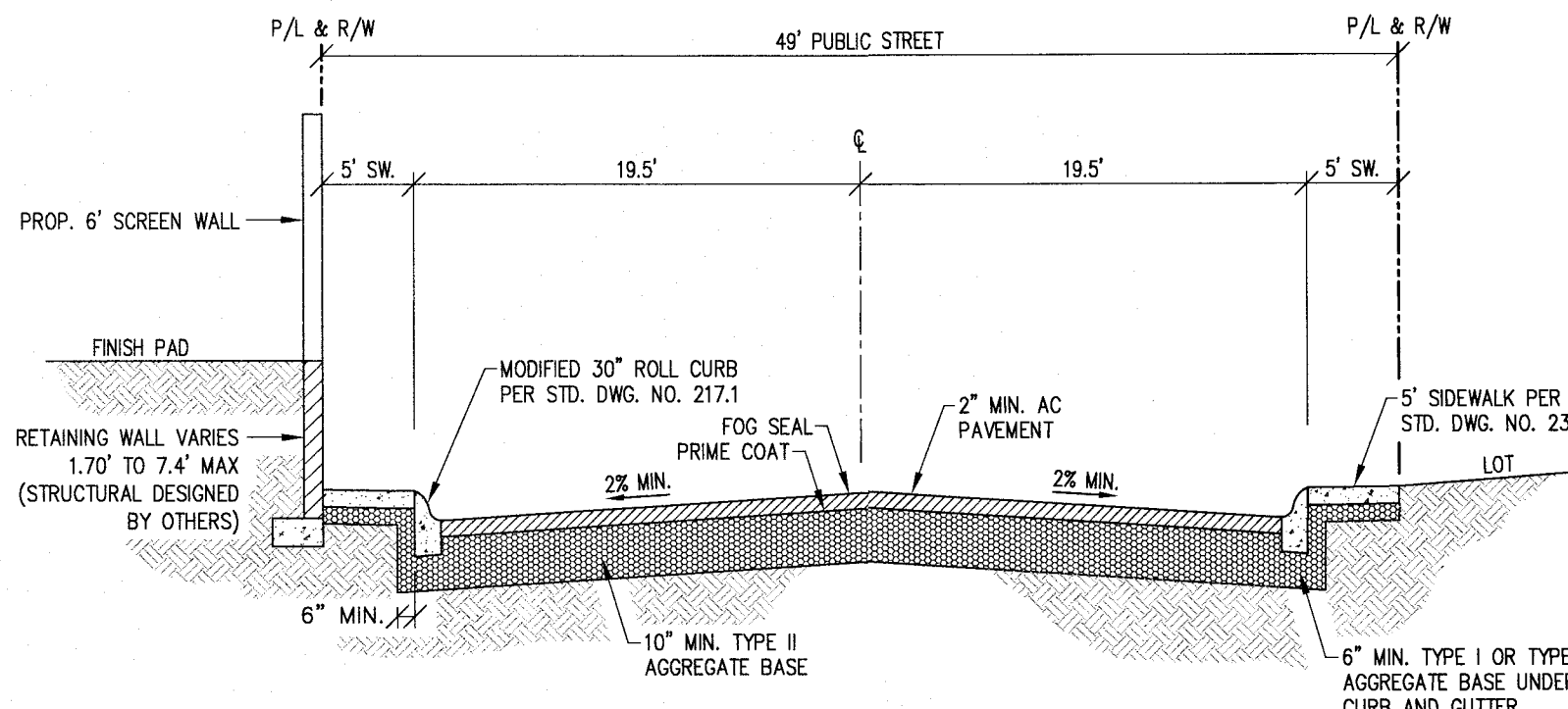
B INTERIOR STREET SECTION - PUBLIC STREET

(NOT TO SCALE)



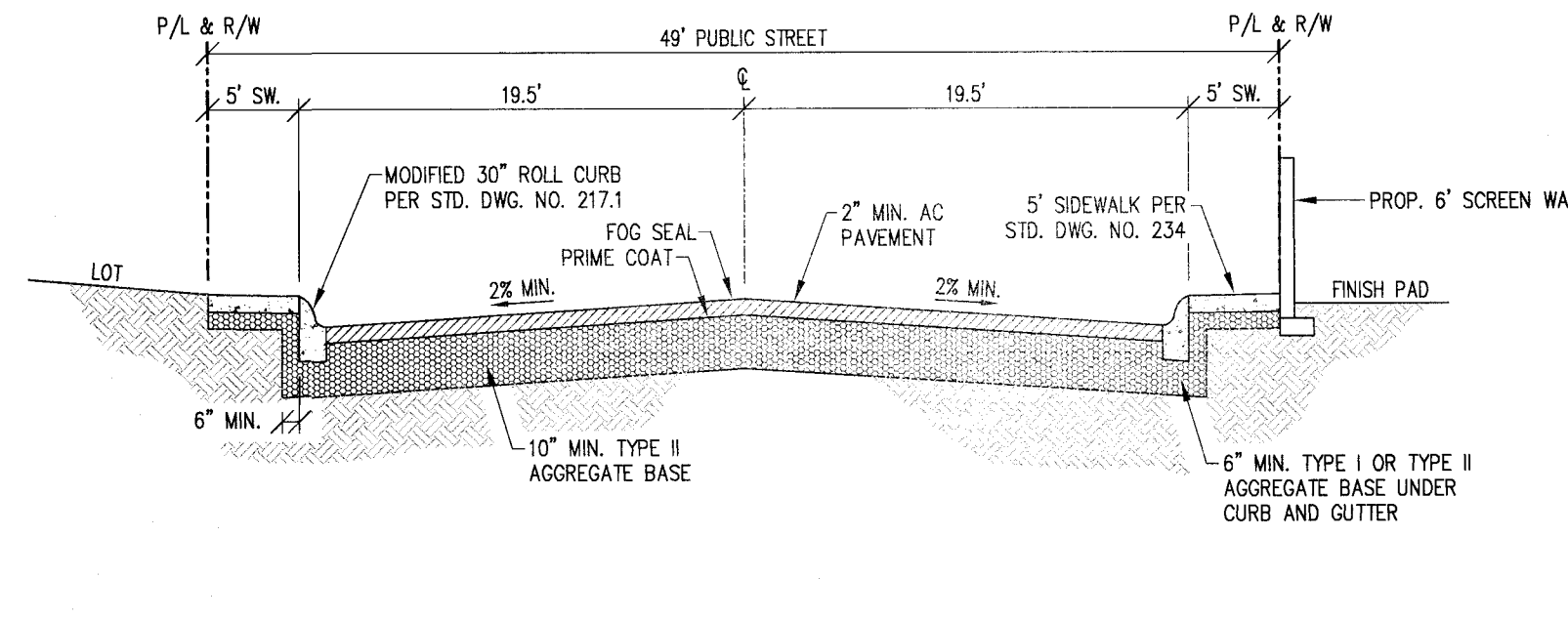
C HICKAM AVENUE - (PUBLIC STREET)

PER CCAUSD #208 MODIFIED  
(NOT TO SCALE)



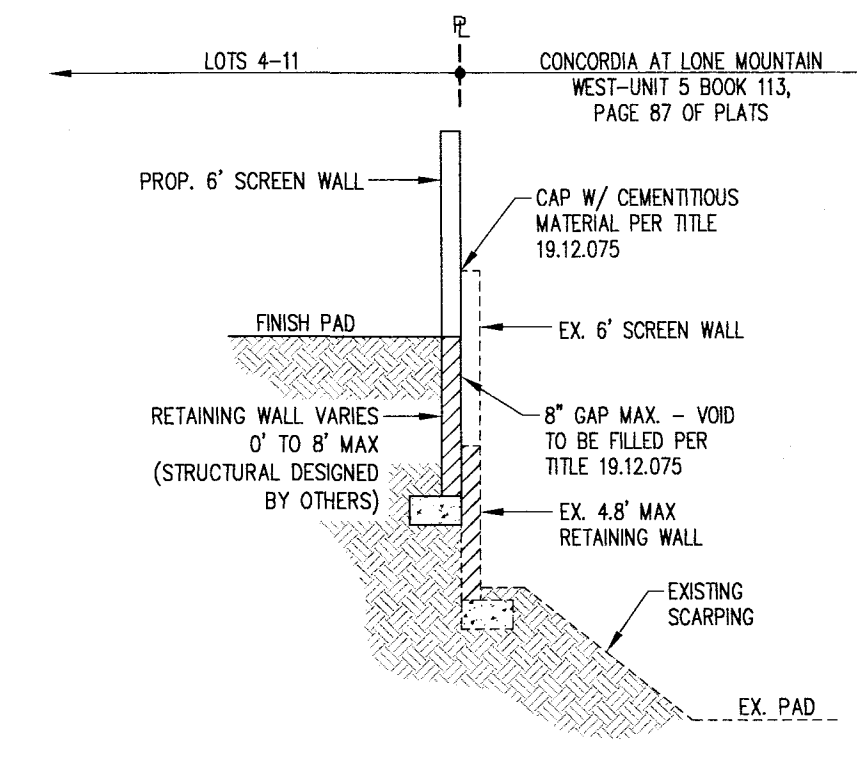
D INTERIOR STREET - (PUBLIC STREET)

PER CCAUSD #208 MODIFIED  
(NOT TO SCALE)



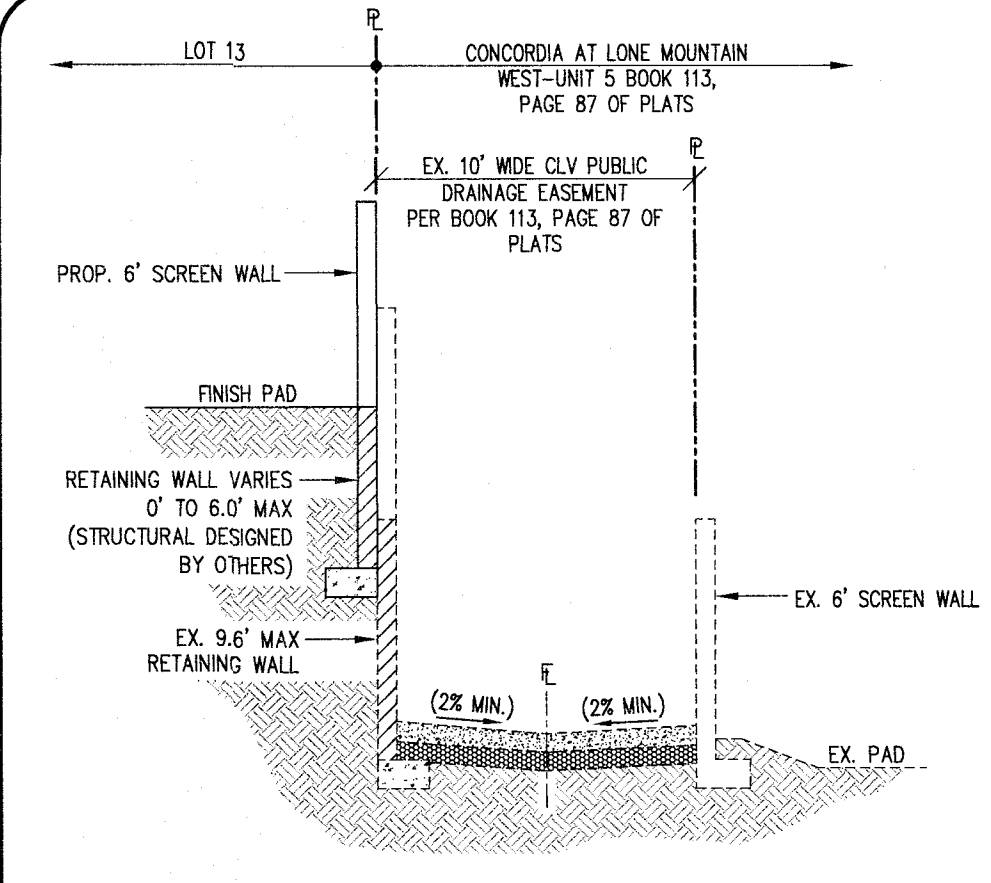
E INTERIOR STREET - (PUBLIC STREET)

PER CCAUSD #208 MODIFIED  
(NOT TO SCALE)



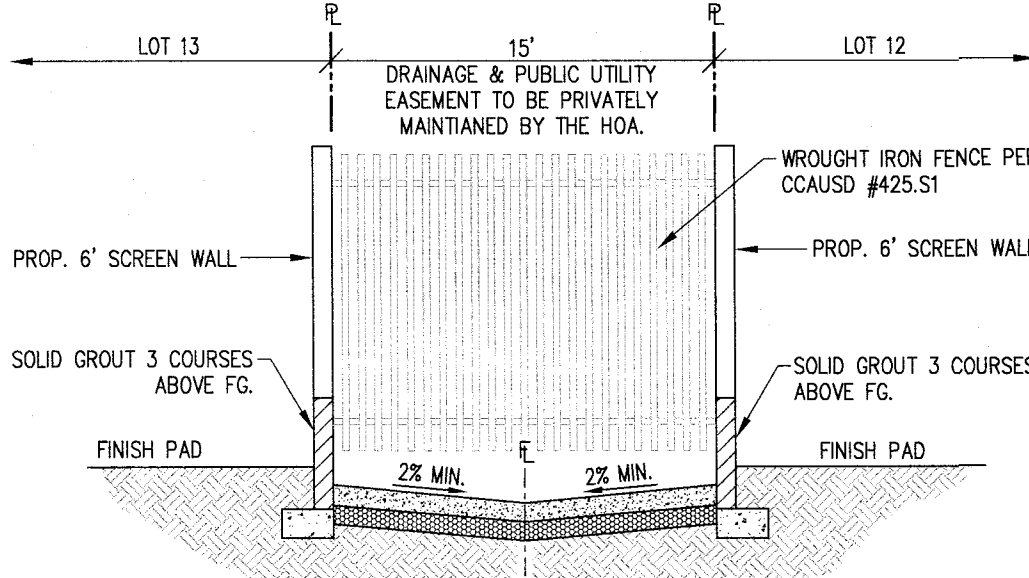
F EAST PERIMETER SECTION

(NOT TO SCALE)



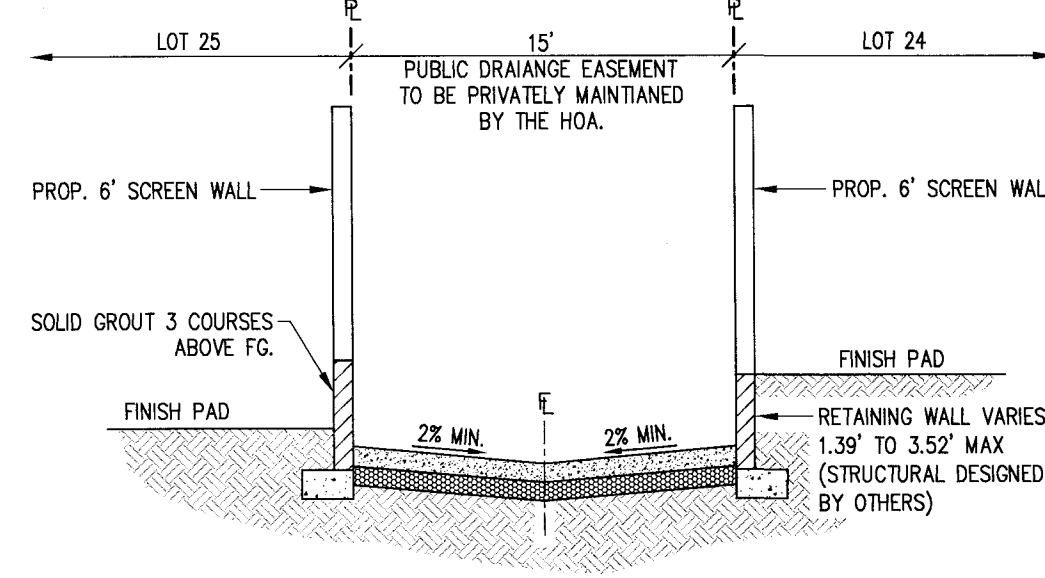
G EAST PERIMETER SECTION

(NOT TO SCALE)



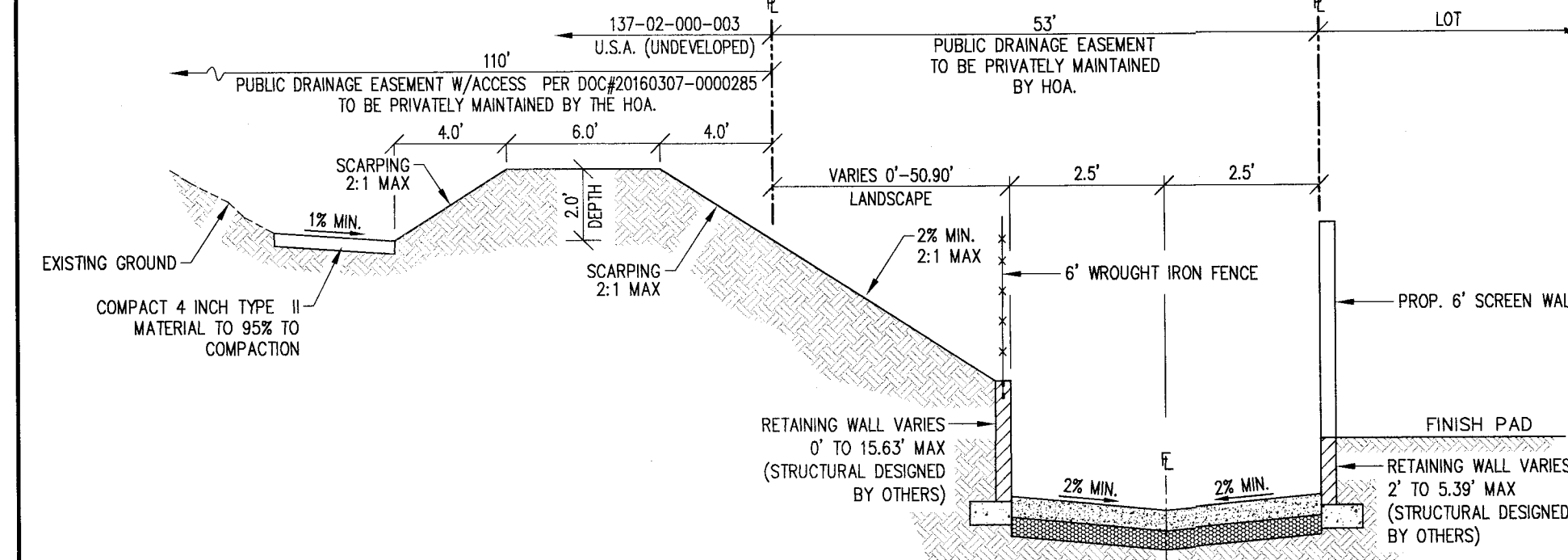
H INTERIOR SECTION

(NOT TO SCALE)



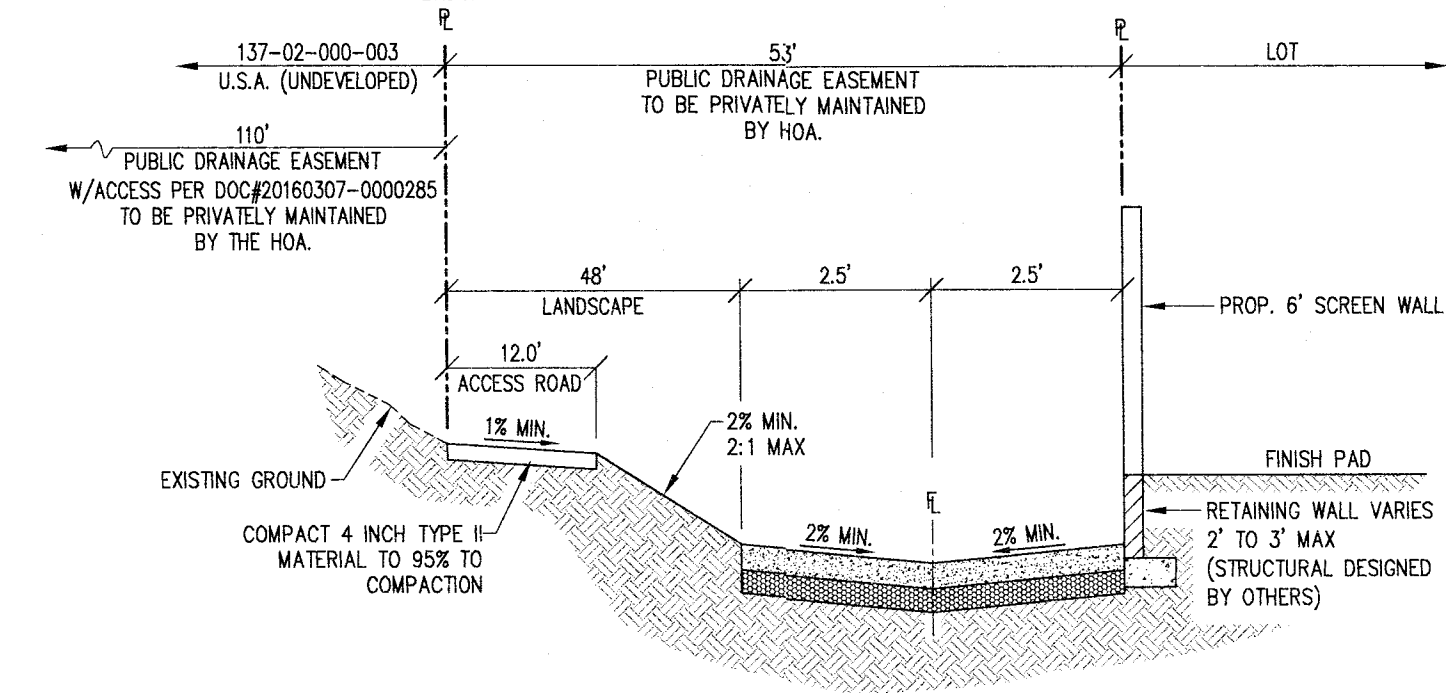
I INTERIOR SECTION

(NOT TO SCALE)



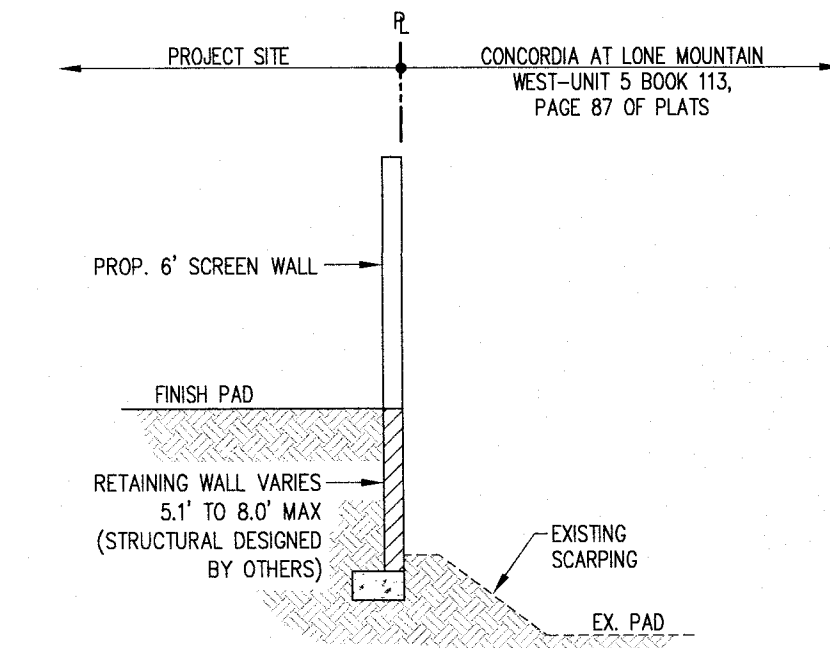
J PERIMETER SECTION

(NOT TO SCALE)



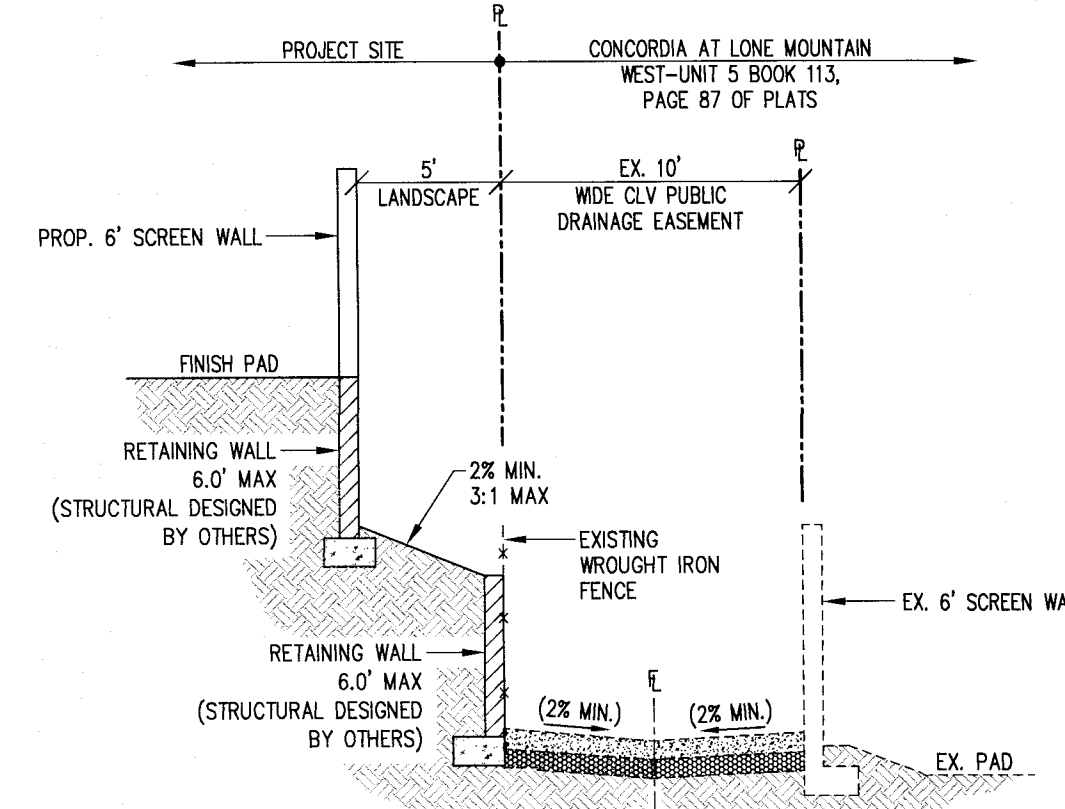
K PERIMETER SECTION

(NOT TO SCALE)



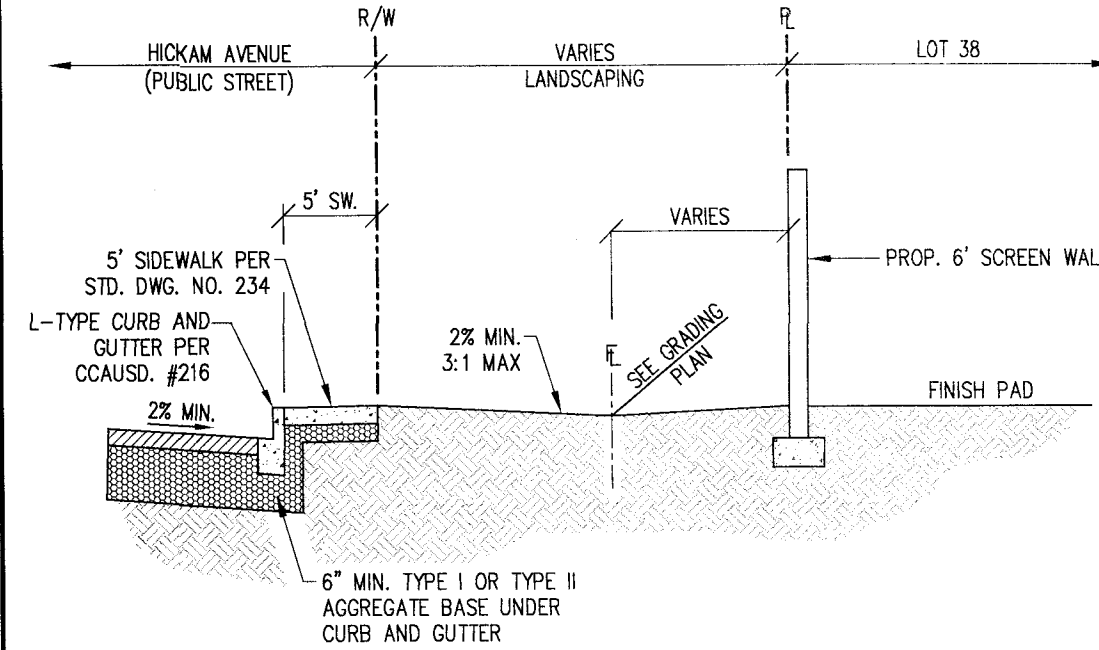
L PERIMETER SECTION

(NOT TO SCALE)



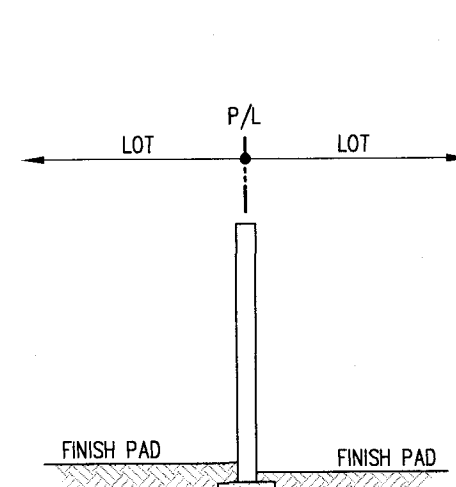
M PERIMETER SECTION

(NOT TO SCALE)



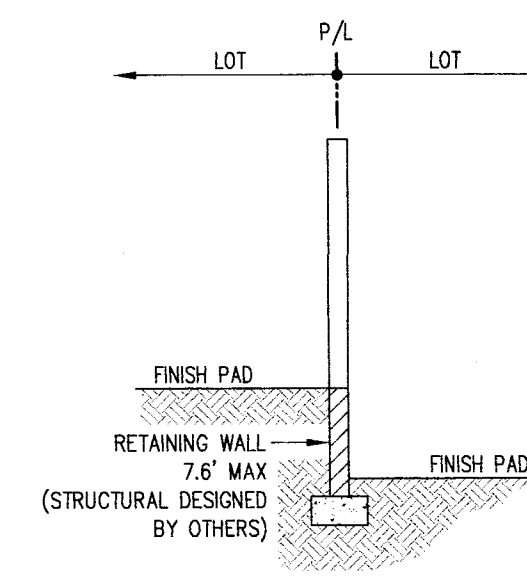
N PERIMETER SECTION

(NOT TO SCALE)



O INTERIOR SECTION

(NOT TO SCALE)



P INTERIOR SECTION

(NOT TO SCALE)

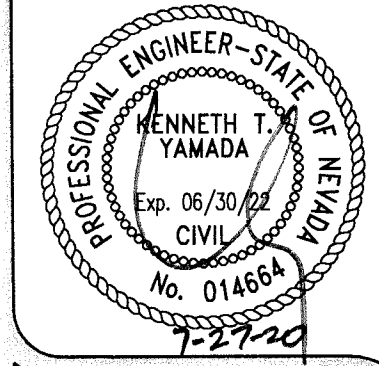
**FAST**  
Call before you  
Underground  
1-702-432-5300  
TRENCH & TRENCH  
SYSTEM OF TRANSPORTATION

Avoid overhead power  
line contact. It's costly.  
**Call before you  
Overhead**  
1-702-227-2929

Call before you dig  
Avoid cutting underground  
utility lines. It's costly.  
**CALL  
811**  
OR  
1-800-227-2600

DR HORTON  
CLIFF SHADOWS AND HICKAM

DETAIL SHEET



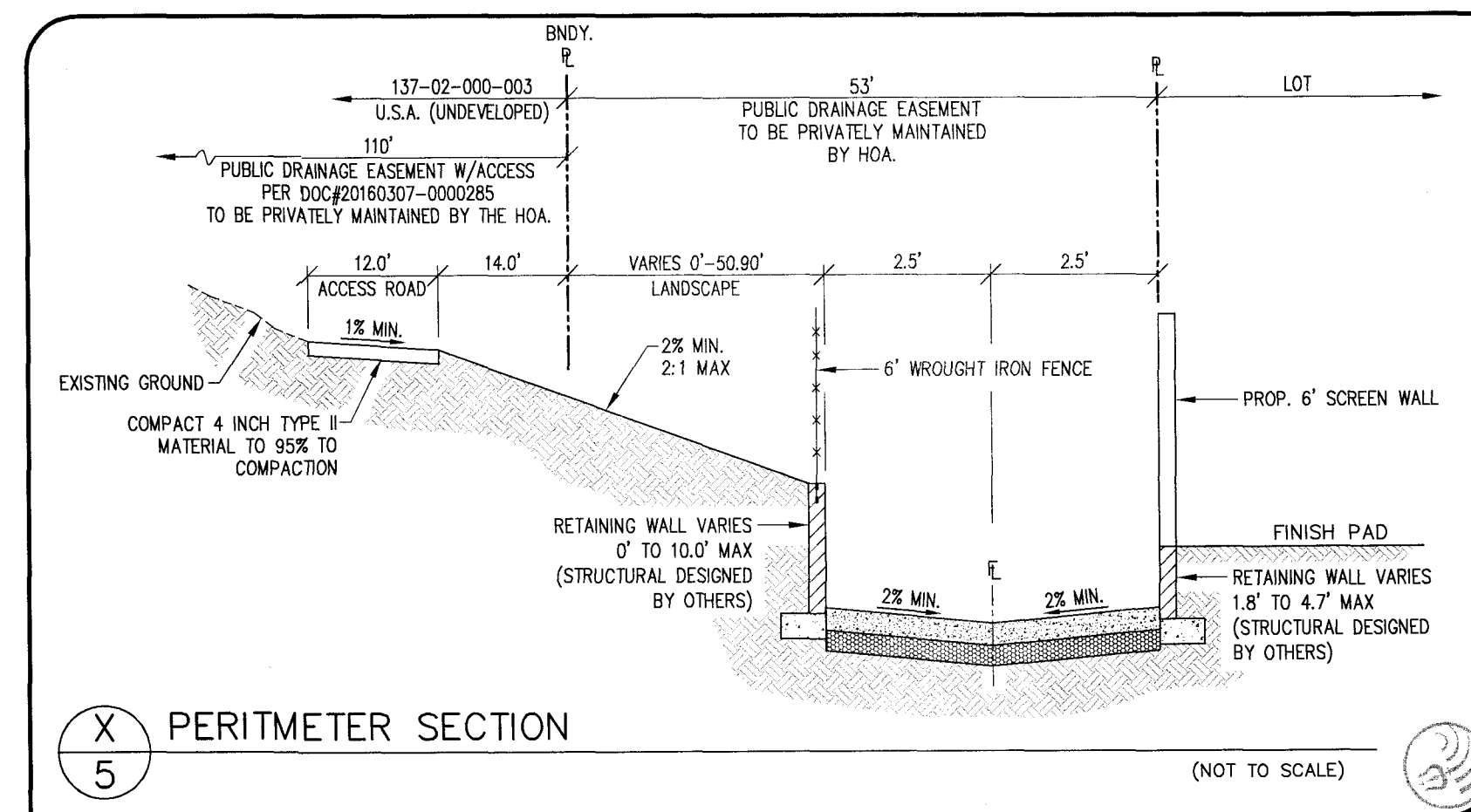
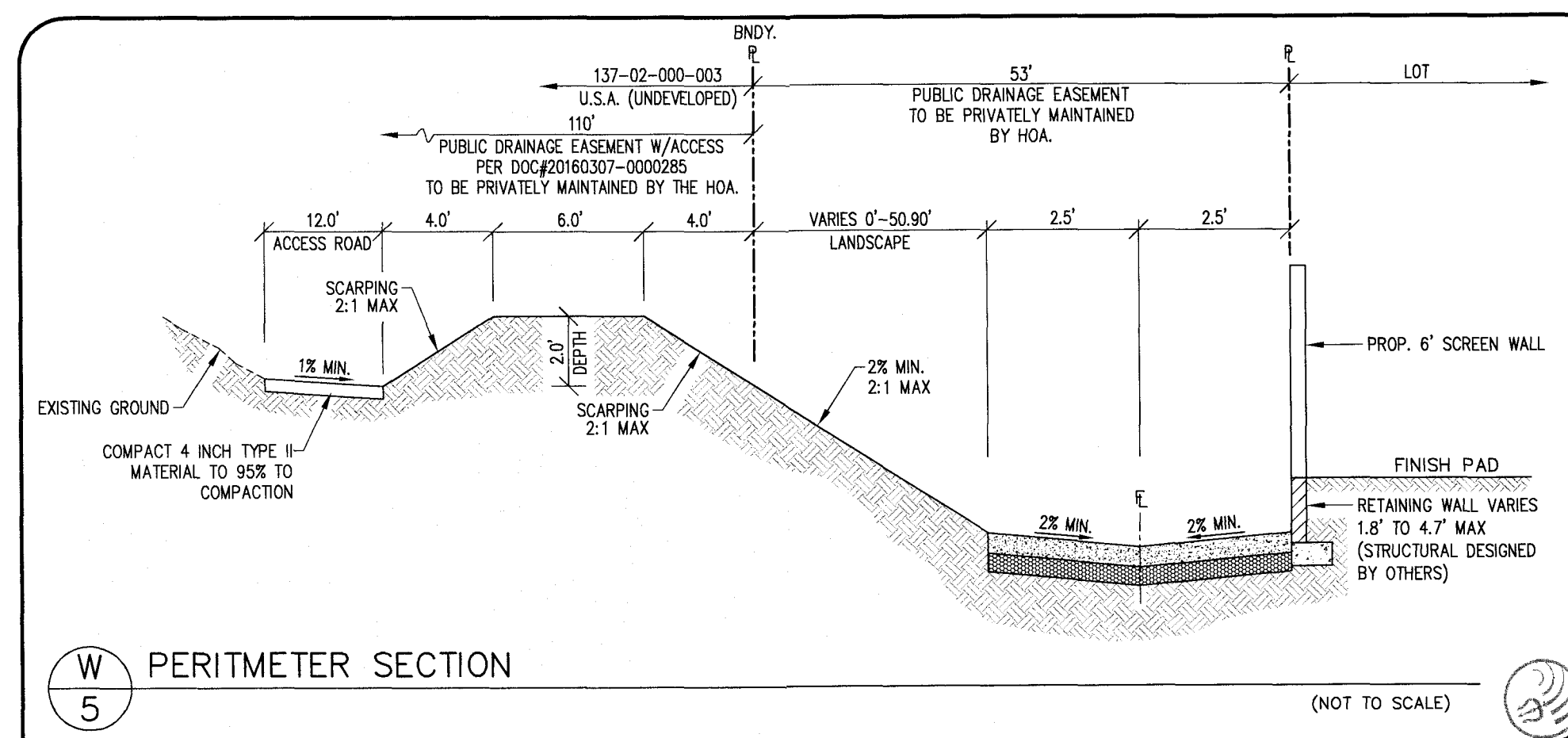
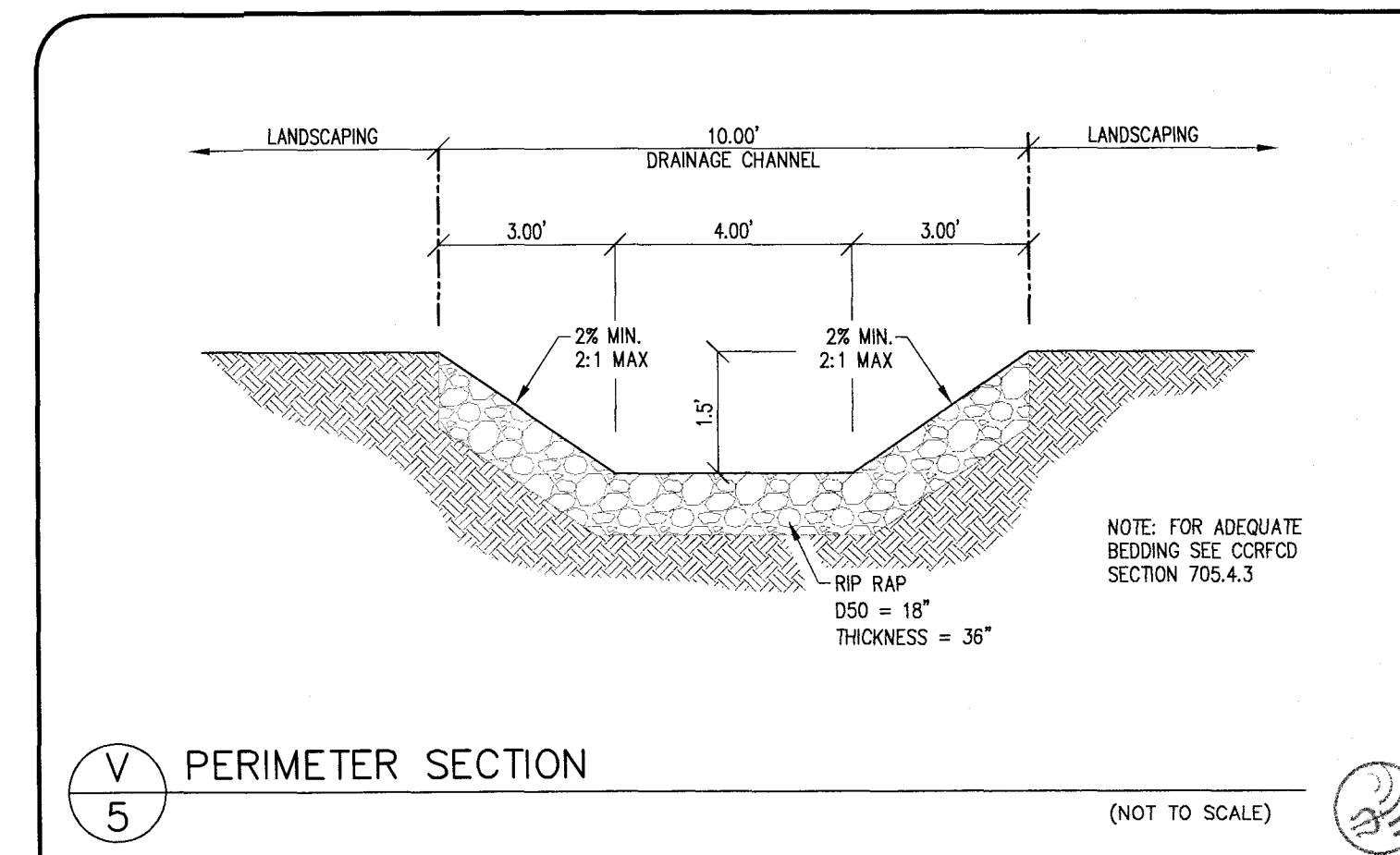
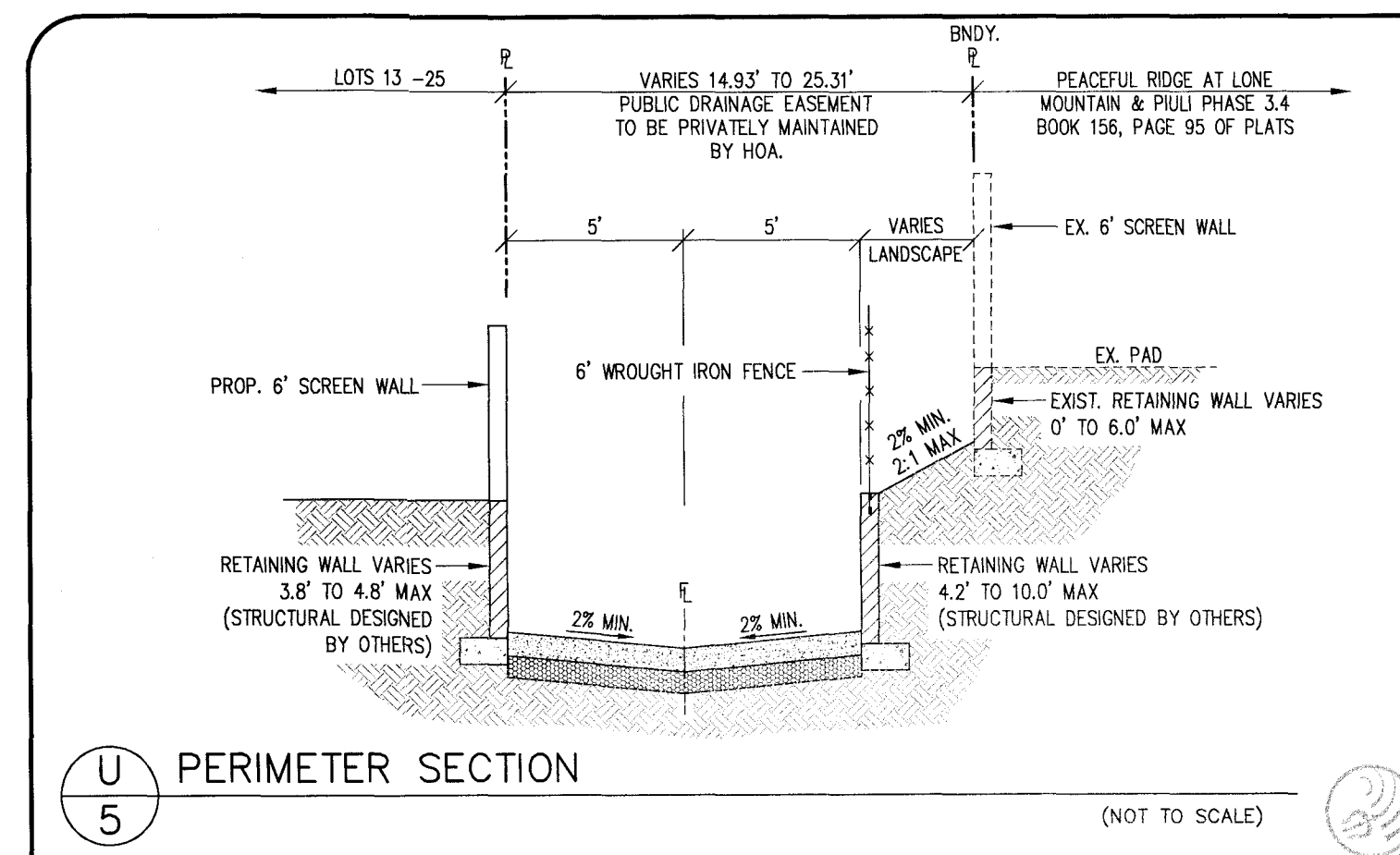
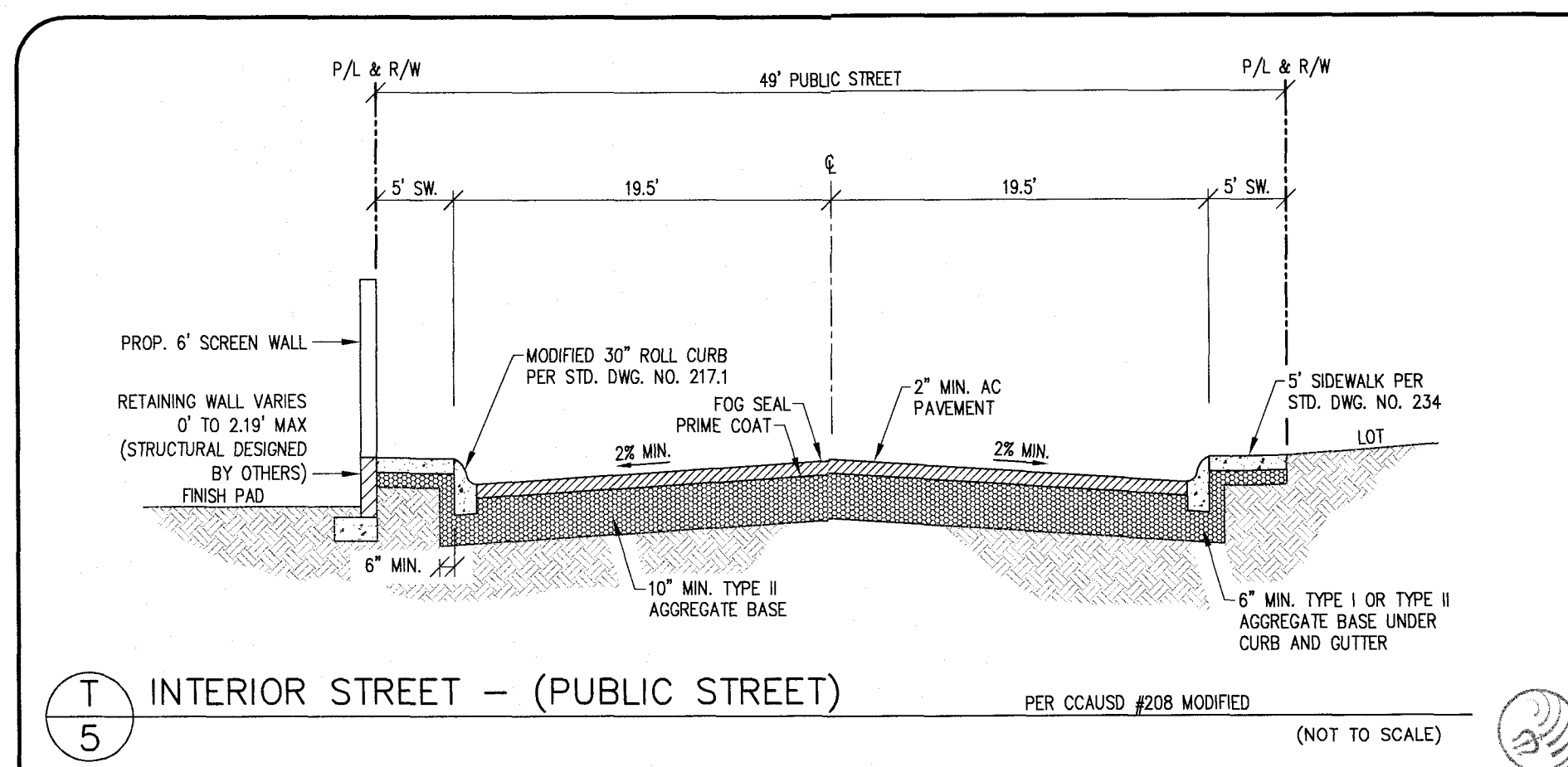
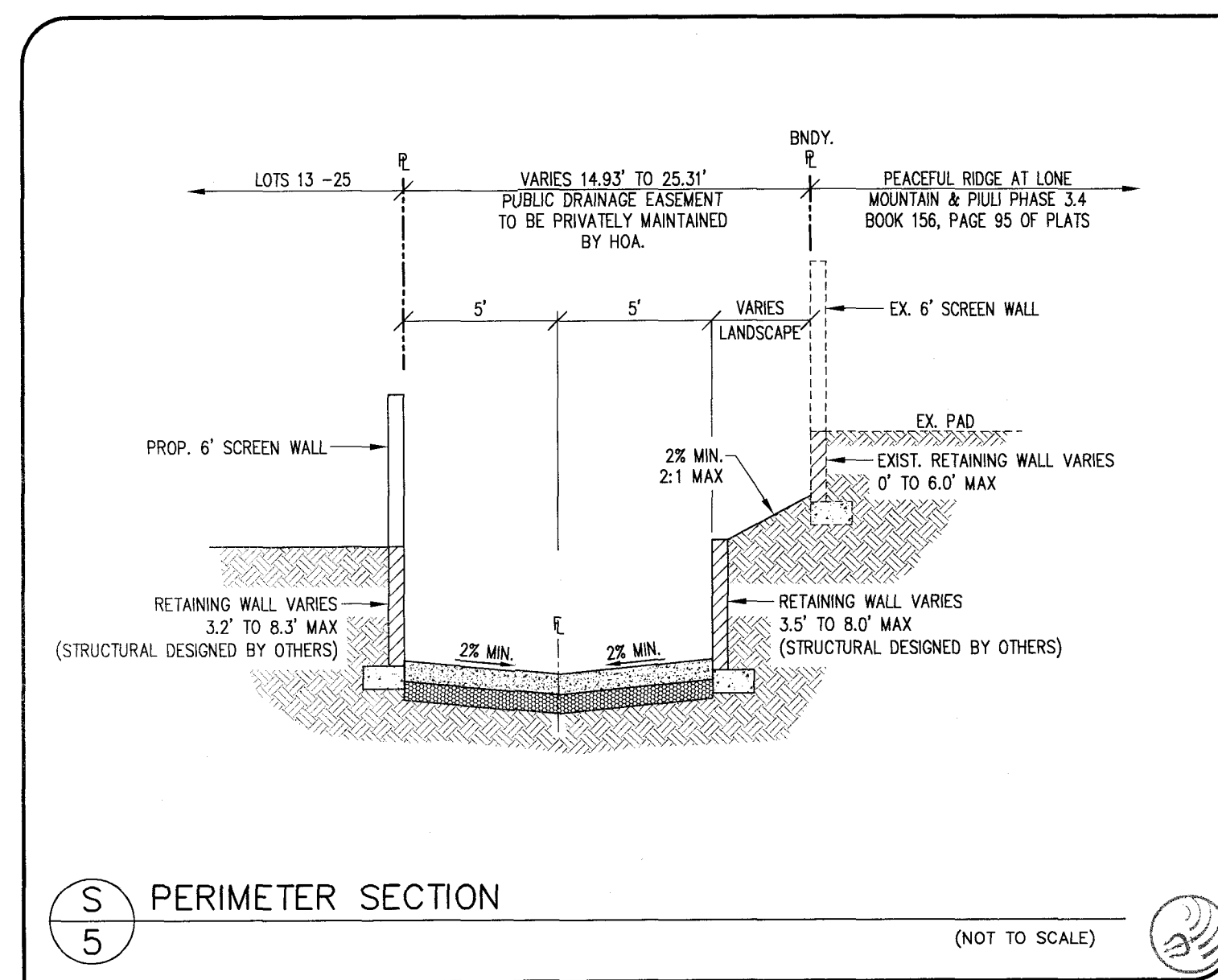
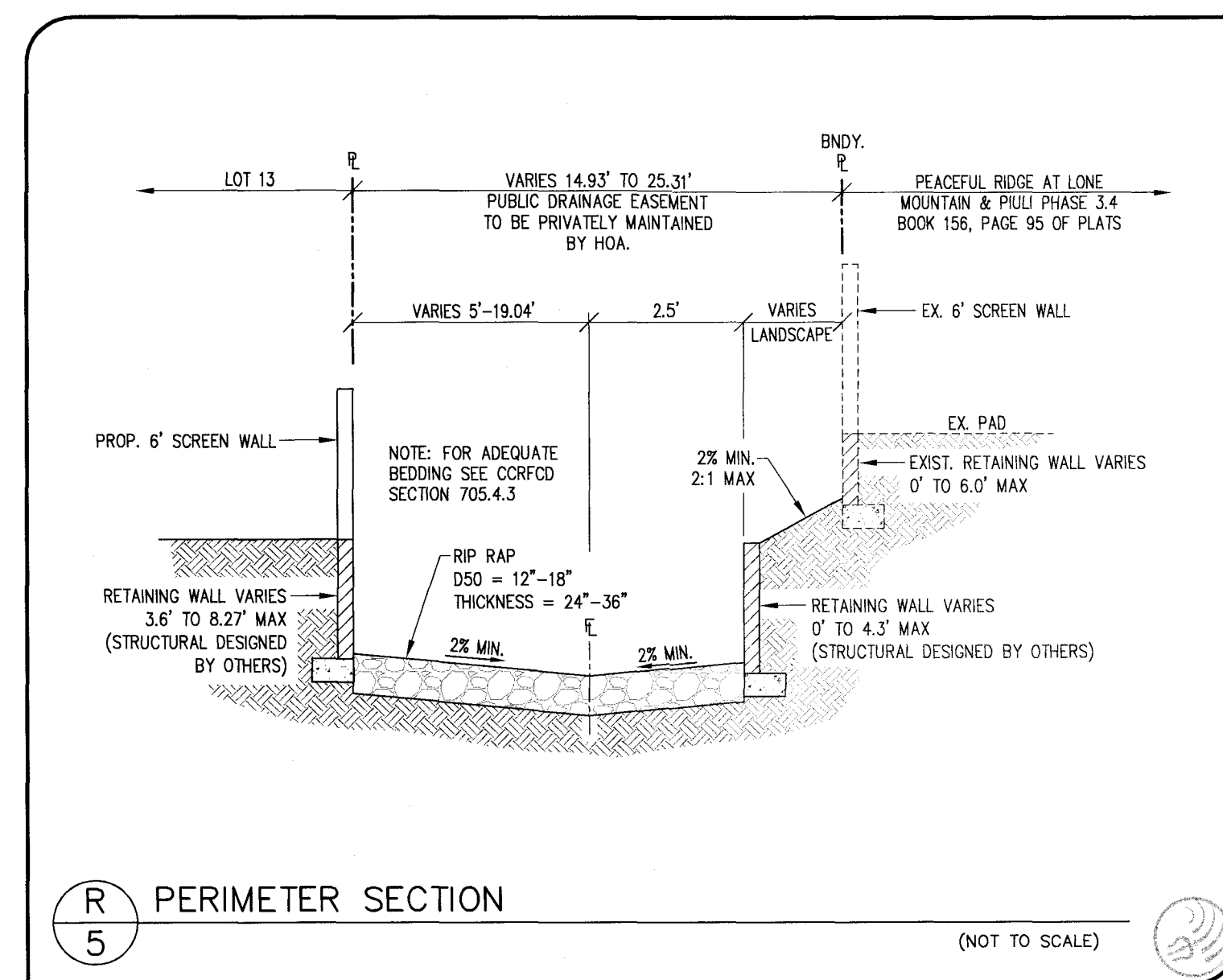
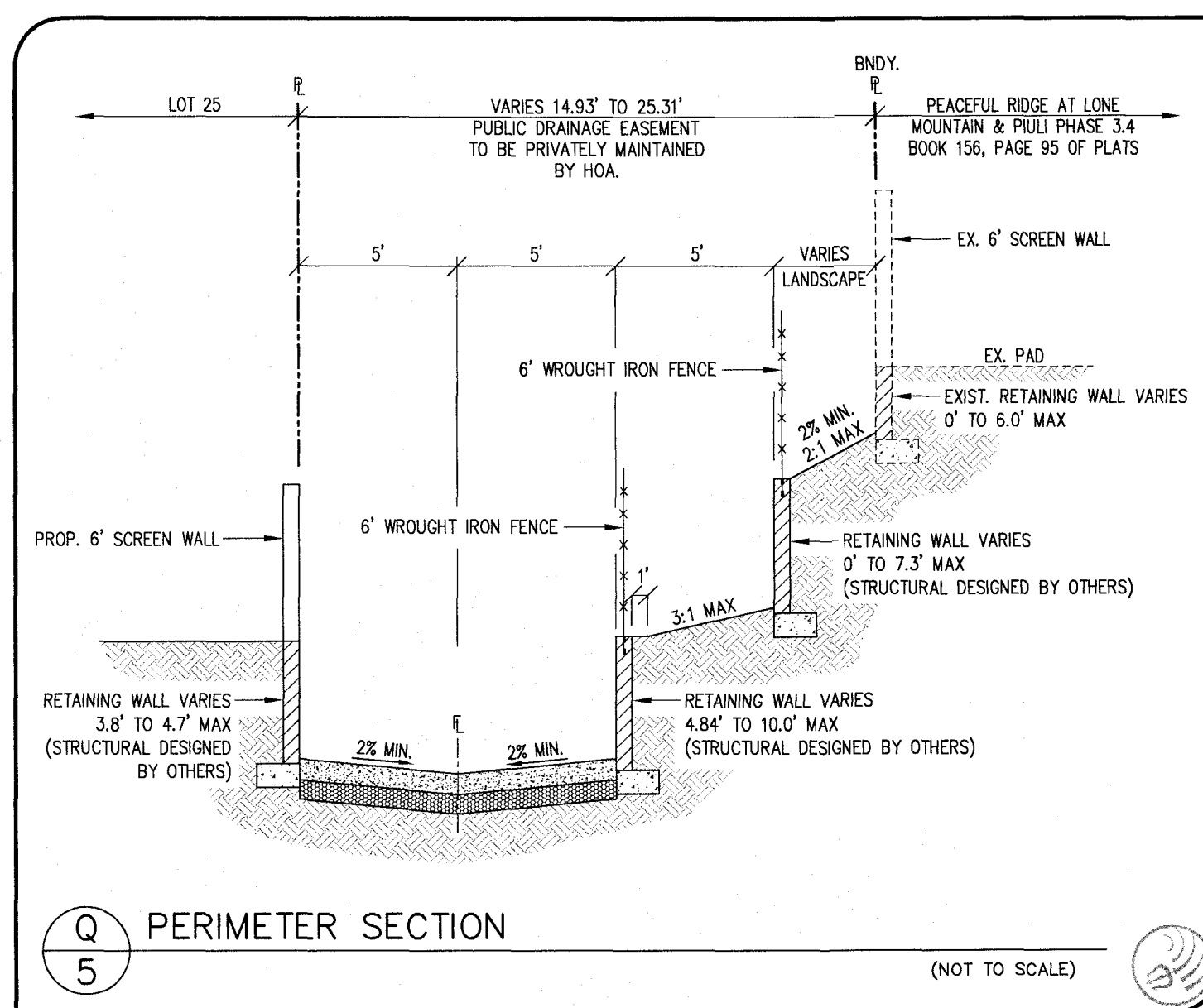
SHEET  
4  
OF 6

DATE: 03/27/20  
PM: K. YAMADA  
DRAWN BY: T.E.  
DESIGNED BY: T.E.  
CHECKED BY: T.E.  
ADA CHECKED: T.E.  
JOB NO.: 007220  
SCALE: AS NOTED

**Triton**  
Engineering  
Office: (702) 254-1480  
Suite B 6757 West Charleston Boulevard  
Las Vegas, Nevada 89146  
www.tritoneng.com  
Fax: (702) 254-3062







**FAST**  
Call  
before you  
**Underground**  
**1-702-432-5300**  
FREWAY & ARTERIAL  
SYSTEM OF TRANSPORTATION

Avoid overhead power line contact. It's costly.

**Call**  
before you  
**Overhead**  
1-702-227-2929

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

CALL

**811**

OR

1-800-227-2600

|               |           |
|---------------|-----------|
| DATE :        | 03/27/20  |
| PM :          | K. YAMADA |
| DRAWN BY :    | T.E.      |
| DESIGNED BY : | T.E.      |
| CHECKED BY :  | T.E.      |
| ADA CHECKED : | T.E.      |
| JOB NO. :     | 007.220   |
| SCALE :       | AS NOTED  |

**Triton**  
  
**Engineering**

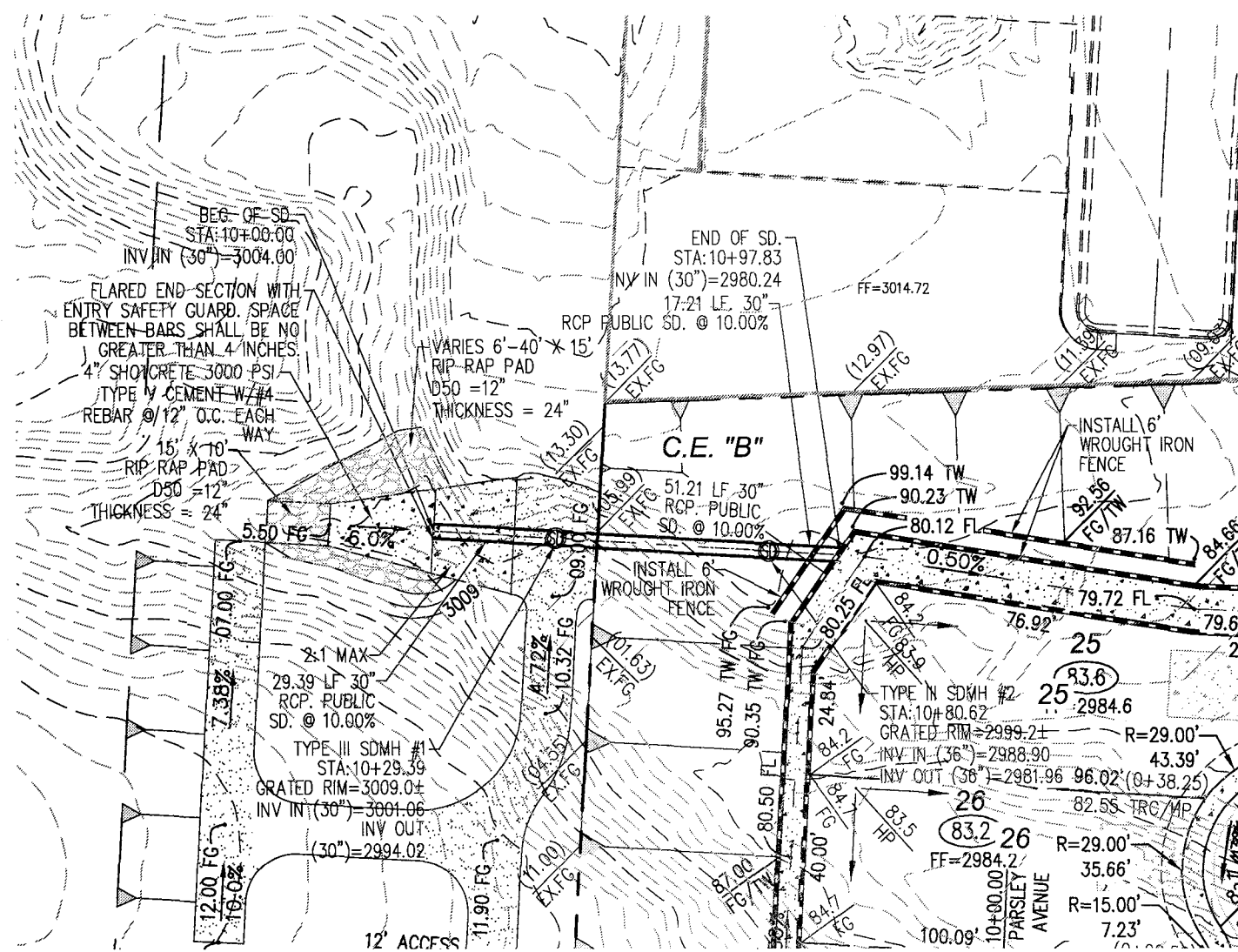
6757 West Charleston Boulevard  
Suite B  
Las Vegas, Nevada 89146

Office: (702) 254-1480  
Fax: (702) 254-3062  
[www.tritonenr.com](http://www.tritonenr.com)

DR HORTON  
CLIFF SHADOWS AND HICKAM  
DETAIL SHEET

PROFESSIONAL ENGINEER-STATE OF NEVADA  
KENNETH T. YAMADA  
Exp. 06/30/22  
CIVIL  
No. 014664

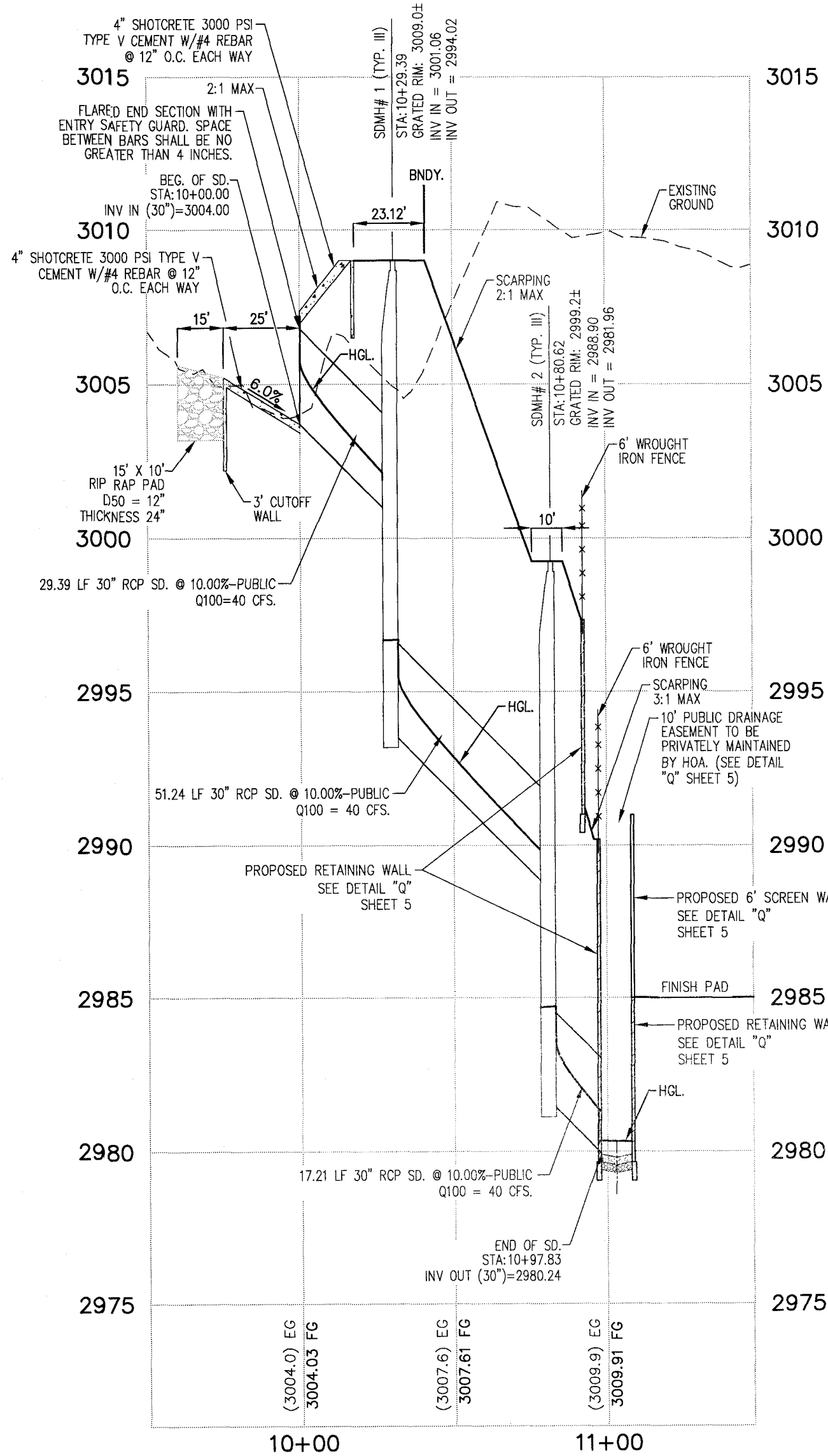




## STORM DRAIN

PLAN

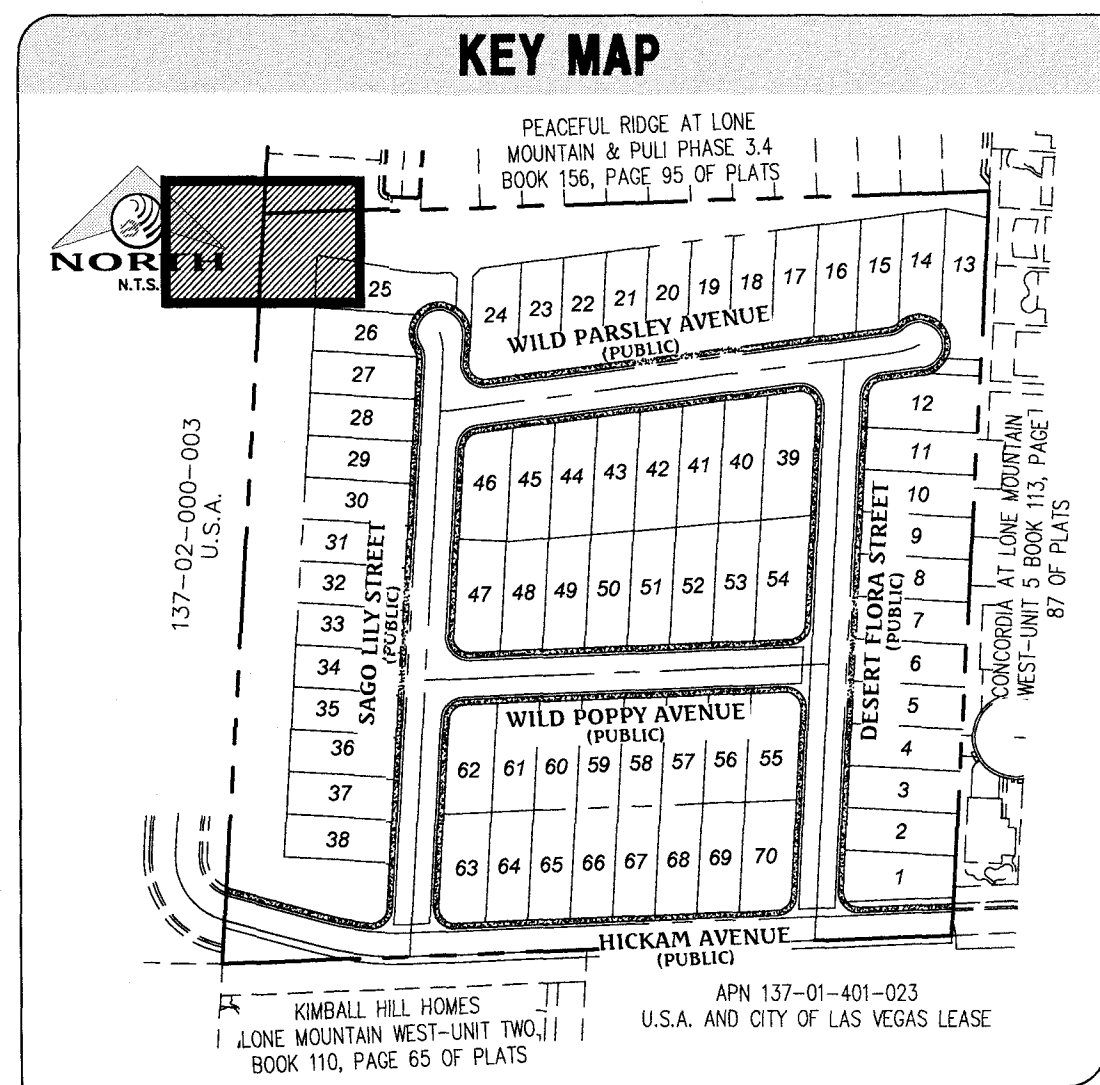
SCALE: HORIZ. 1" = 40'



## STORM DRAIN

PROFILE

SCALE: HORIZ. 1" = 40'  
VERT. 1" = 4'



### BASIS OF BEARING

NORTH 87°47'02" EAST, BEING THE BEARING OF THE SOUTH LINE OF THE NORTHWEST QUARTER (NW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 1, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA AS SHOWN BY MAP THEREOF ON FILE IN THE OFFICE OF THE CLARK COUNTY, NEVADA RECORDER IN FILE 88, PAGE 08 OF SURVEYS.

### BENCHMARK

CITY OF LAS VEGAS BENCHMARK 5LV09 15WB  
RIVET & PLATE IN TOP OF CURB AT NE CORNER OF CLIFF SHADOWS & HICKAM.  
ELEVATION=897.87 Meters (NAVD'88 v.2003)  
ELEVATION=2945.76 US Survey Feet (NAVD'88 v.2003)

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

KENNETH T. YAMADA, PE No. 014664

DATE

Call before you Overhead  
1-702-227-2929

Call before you Dig  
Avoid cutting underground utility lines. It's costly.  
CALL 811  
OR  
1-800-227-2600

FAST  
Call before you Underground  
1-702-432-5300  
FREIGHTWAY AND ARTERIAL SYSTEM OF TRANSPORTATION

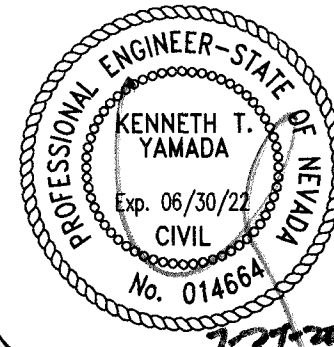
**Triton Engineering**



Office: (702) 254-1480  
Fax: (702) 254-3062  
Las Vegas, Nevada 89146  
www.tritoneng.com

DR HORTON  
CLIFF SHADOWS AND HICKAM

STORM DRAIN  
PLAN AND PROFILE



SHEET

6

OF 6