

DS #: 5209

APN: 137-35-714-001

PROJECT: Costco Expansion (aka Costco Wholesale at Canyon Pointe)

SUBMITTAL: Supplement

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		December 23, 2019
TO: Land Development Services Department of Building & Safety		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for:	
	Costco Expansion (aka Costco Wholesale at Canyon Pointe)	
Cross Streets:	NWC of Pavilion Center Dr. & Park Run Dr.	
File Number:	F:\Depot\DSMemos\DS5209B.doc	
Parcel Number:	137-35-714-001	
Zoning Action:	CRG-77888	
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES	NO X
COPIES TO:		Lochsa Engineering
		Costco Wholesale Corporation
		Bart Anderson, P.E., DevCo

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	10/28/2019	11/5/2019	Not Approved	\$400.00	3622765: \$400
Supplement	12/18/2019	12/23/2019	CRG-77888 Approved	N/C	N/C
			TOTAL FEES (LDDRS):	\$400.00	----

REMARKS:

Update to address a Food Service Addition to the main building

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

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

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

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

END OF REMARKS

ays

T/R/S: T20S/R59E/35
AREA K-35



**LAS VEGAS
CITY COUNCIL**

CAROLYN G. GOODMAN
Mayor

MICHELE FIORE
Mayor Pro Tem

STAVROS S. ANTHONY
CEDRIC CREAR
BRIAN KNUDSEN
VICTORIA SEAMAN
OLIVIA DIAZ

SCOTT D. ADAMS
City Manager

DEPARTMENT OF PLANNING
ROBERT SUMMERFIELD
DIRECTOR

**DEVELOPMENT
SERVICES CENTER**

333 N. RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NV 89106
702.229.6301 | VOICE
702.474.7463 | FAX
711 | TTY



cityoflasvegas
lasvegasnevada.gov

Rec'd: 12/18/19

December 18, 2019

Costco Wholesale Corporation
999 Lake Drive
Issaquah, Washington 98027

Re: CRG-77888 [PRJ-77784] - CITY REFERRAL GROUP

Dear Applicant:

The City Referral Group at a meeting held on December 18, 2019 voted to **APPROVE** your request for a Minor Amendment to an approved Site Development Plan Review (SV-0022-00) FOR A PROPOSED 1,497 SQUARE-FOOT EXPANSION TO AN EXISTING SHOPPING CENTER on 16.93 acres at 801 South Pavillion Center Drive (APN 137-35-714-001), P-C (Planned Community) Zone, Ward 2 (Seaman) [PRJ-77884].

This approval is subject to the following conditions:

Planning

1. This approval shall be void two years from the date of final approval, unless exercised pursuant to the provisions of LVMC Title 19.16. An Extension of Time may be filed for consideration by the City of Las Vegas.
2. Conformance to the Conditions of Approval outlined in the Summerlin Non-Residential Design Review Committee approval letter date stamped, 11/13/19 shall be required.
3. All development shall be in conformance with the site plan, landscape plan, and building elevations, date stamped 11/13/19, except as amended by conditions herein.
4. All necessary building permits shall be obtained and final inspections shall be completed in compliance with Title 19 and all codes as required by the Department of Building and Safety.
5. These Conditions of Approval shall be affixed to the cover sheet of any plan set submitted for building permit.
6. A technical landscape plan, signed and sealed by a Registered Architect, Landscape Architect, Residential Designer or Civil Engineer, must be submitted prior to or at the same time application is made for a building permit. A permanent underground sprinkler system is required, and shall be permanently maintained in a satisfactory manner; the landscape plan shall include irrigation specifications. Installed landscaping shall not impede visibility of any traffic control device.

Costco Wholesale Corporation
CRG-77888 [PRJ-77784] – Page Two
December 18, 2019

7. A fully operational fire protection system, including fire apparatus roads, fire hydrants and water supply, shall be installed and shall be functioning prior to construction of any combustible structures.
8. All City Code requirements and design standards of all City Departments must be satisfied, except as modified herein.

Public Works

9. An update to the previously approved Drainage Plan and Technical Drainage Study must be submitted to and approved by the Department of Public Works prior to submittal of any construction drawings or the issuance of any building or grading permits, whichever may occur first. Provide and improve all drainageways recommended in the approved drainage study update.
10. Site development to comply with all applicable conditions of approval for Site Development Plan Review SV-22-00 and all other applicable site-related actions.

This action by the City Referral Group on December 18, 2019 is final unless a written appeal is filed with the Director of the Department of Planning within ten (10) days of the date of the City Referral Group's decision.

Sincerely,



Courey Stewart
Planner II
Department of Planning
Case Planning Division

CS:clb

cc: Ms. Jenny Nguyen
MG2 Corporation
3333 Michelson Drive, Suite #100
Irvine, California 92612

Technical Drainage Study Update #2

For

Costco Expansion

**(AKA: Costco Wholesale at Canyon Pointe –
DS #2805)**

JOB# 191022

October 2019

Prepared for:

Renee Krause
3333 Michelson Dr., Suite 100
Irvine, CA 92612
(949) 705-0775

Prepared By:
LOCHSA ENGINEERING
6345 South Jones Boulevard, Suite 100
Las Vegas, Nevada 89118
(702) 365-9312

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: COSTCO EXPANSION Date: 10/24/19

Location of Development: a) Descriptive (Cross Streets) North/South: PAVILION CENTER DR.

East/West: PARK RUN DR.

b) Section: 35 Township: 20 S Range: 59 E

c) APN : 137-35-714-001

Name of Owner: COSTCO WHOLESALE CORPORATION - Renee Krause

Telephone No.: (949) 705-0775 Fax No.: _____ E-Mail Address: _____

Address: 3333 Michelson Dr., Suite 100 Irvine, CA 92612

Contact Person-Name: MARK HEDGE, P.E. Telephone No.: 702-365-9312

* E-Mail Address: MARK@LOCHSA.COM Fax No.: 702-365-9317

Firm: LOCHSA ENGINEERING

Address: 6345 S JONES BLVD STE 100 LAS VEGAS NV 89118

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: 16.93 ACRES Being Developed/Disturbed: 0.62+/- ACRES

2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ Yes** ☒ No

3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☒ Yes** ☐ No

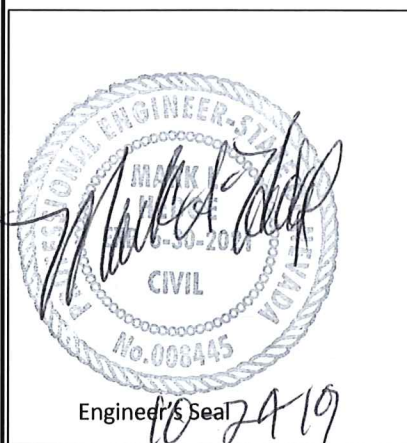
4. Proposed type of development (Residential, Commercial, Etc.): COMMERCIAL

5. Approximate upstream land area which drains to the subject site: 14+/- ACRES

6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: DS #2805 - TDS FOR COSTCO WHOLESALE AT CANYON POINTE

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: STORM DRAIN SYSTEM ONSITE AS PART OF CANYON POINTE ROADWAY IMPROVEMENTS

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



CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

The following checklist is intended as a supplemental guide for the engineer preparing a Technical Drainage Study submittal to the City of Las Vegas. This supplement focuses on requirements specific to the City of Las Vegas. The requirements presented are in addition to the Clark County Regional Flood Control District (CCRFCD) Manual Standard Form 2. The listed items are the minimum information required prior to the City performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the CCRFCD Hydrologic Criteria and Drainage Design Manual (Design Manual).

An appointment must be made to preview this checklist in conjunction with CCRFCD Standard Form 2 prior to the City accepting a new drainage study for review. The engineer must contact the Flood Control Section at (702) 229-6541 to schedule a submittal appointment.

If items are not applicable for the subject site, provide N/A.

I. GENERAL REQUIREMENT		
Yes	No	
	N/A	A notarized letter from the adjacent property owner(s) allowing off-site grading. (A copy of the letter must be received prior to final acceptance of the drainage study.)
	N/A	Copies of all conditions of approval for development related to this property. (e.g. zoning, use permit, tentative map, etc.) Verify compliance with conditions.
✓		An electronic copy of the complete submittal is required to be submitted with one original hard copy of the study. Electronic documents should be on a universal computer-readable digital output device replicating your submittal. An Indexed Portable Document Format (PDF) or Print Ready CAD file formats with a minimum of 300dpi are the desired formats. If figures are in color, they must be scanned in color and saved as a separate file. <i>MLN</i> by initial here, the engineer on record acknowledges that the electronic copy is an identical replicate of the original hard copy submitted to the City of Las Vegas.

Approved through Summerlin

II. GRADING PLAN INFORMATION		
Yes	No	
✓		(1) 24" X 36" copy of the Grading Plan, (including all Detail Sheets) sealed by the engineer.
✓		Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street. Note: Proposed top of curb elevations must be provided for both sides of roadways even if only half street construction is required.
✓		Label existing topography at a minimum 5 foot elevation interval including adjacent developments, finished floor elevations of existing buildings and top of existing curbs extending 100 feet around the perimeter of the site. (*Measured from the centerline of the adjacent roadway.)

CITY OF LAS VEGAS MINIMUM DRAINAGE STUDY CRITERIA CHECKLIST

II. GRADING PLAN INFORMATION		
Yes	No	
	N/A	Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), design hydraulic grade line, (HGL) and 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying off-site flows. An overflow path must be provided over all storm drains.
✓		All existing and "to be constructed" walls with cross-sections showing wall type, (e.g. block wall, retaining wall, flood wall, etc.), with limits clearly defined, adjacent ground elevations. Wall heights must meet current ordinances and in no case exceed 14 feet above the adjacent property.
✓		Street slopes for both interior and perimeter streets. Note: The minimum slope for a roadway is 0.4 percent, a minimum 18-inch storm drain must be provided where minimum slopes cannot be met.
✓		Back of lot elevations and lot drainage pattern for all lots including common lots.
	N/A	Sites with a grade difference two feet above or below existing ground are required to have approval from City of Las Vegas Current Planning. Current Planning approval is required prior to final approval of the drainage study.
✓		On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners. (The project must pass flows through the site every 600 feet where the project is blocking flow paths.)
	N/A	This project uses a solid grouted stem wall (or approved alternate) at the back of sidewalk to provide erosion protection for landscaped areas where the depth of flow in the roadway exceeds the back of walk elevation. A corresponding cross-section detail is included.
✓		Commercial and Common Lot Landscape areas are not allowed to drain over the sidewalk. The grading plans show flow lines with grades and sidewalk under drains for all landscape areas draining to the public ROW.

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
	N/A	Concrete valley gutters are required in parking lots with slopes less than 1 percent. Slopes through cul-de-sac must be at a 1 percent minimum where flow is drained through the cul-de-sac.
	N/A	Ten-foot wide public drainage easements to be privately maintained are allowed for flow less than 20 cfs. The depth of flow entering the easement must be checked using the submerged weir calculation.
	N/A	The limits of the flood zones and the base flood elevations (BFE) must be shown on all grading plans for all developments within a Special Flood Hazard Zone A, AO, AE, etc.
✓		Minimum finish floor elevation is 6 inches above highest adjacent top of curb. Finish floor calculations must include allowances for super elevations on curves and velocity head for tee intersections.
	N/A	Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir of submerged weir elevation, whichever is greater.

CITY OF LAS VEGAS MINIMUM DRAINAGE STUDY CRITERIA CHECKLIST

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
	N/A	Lots with "B and C Type Drainage" that drain from one lot to another through a drainage easement shall be required to install an underground nuisance drainage system or a 2-foot valley gutter. 16" x 24" minimum block wall openings are required for both options.
	N/A	Bubblers are required across 80 foot and greater ROW streets. When flows exceed 10 cfs, bubblers larger than 18 inches will be required up to a maximum of 36". Inlets must be sized to match the pipe size provided.

- Contact the Flood Control Section regarding the drainage study review fee. These fees are payable at the time of submittal.
- The Drainage Study must be conditionally approved prior to submitting improvement plans to the Civil and Planning Development of the Department of Building and Safety for review.

This document is intended as an aid in preparing Technical Drainage Studies for the City of Las Vegas. Each study submitted is reviewed for compliance with local and regional criteria. This form is not intended to be all-inclusive and does not limit the extent of the information, calculations or exhibits which may be necessary to properly evaluate the intended land use.

October 24, 2019

Mr. Albert Sung, P.E.
City of Las Vegas Public Works
Flood Control Division
333 North Rancho Drive
Las Vegas, NV 89106

Subject: **Costco Expansion**
Update #2 to the "Technical Drainage Study for Costco Wholesale at Canyon
Pointe (DS #2805)
Lochsa Job #191022

Dear Mr. Sung,

This letter is intended as an Update #2 to the "*Technical Drainage Study for Costco Wholesale at Canyon Pointe*" (DS #2805) prepared by WRG Design Inc., which was approved by the City of Las Vegas on December 4, 2000. A previously approved Update #1 was submitted for a building expansion of a Costco cooler, which was approved by the City of Las Vegas on November 19, 2009. The proposed improvements to the site being addressed in the subject update will consist of onsite parking improvements for additional ADA spaces, a small building expansion (1,400 square feet) for additional kitchen area and improve an existing walkway from the north side of Costco to help accommodate ADA better. Please refer to the attached revised grading plan set for the location of the proposed improvements.

The Costco Wholesale site is located at the northwest corner of the intersection of Park Run Drive and Pavilion Center Drive. The entire site is more specifically located within a portion of the northern half of the southeast quarter (SE 1/4) of Section 35, Township 20 South, Range 59 East of the M.D.M., in the City of Las Vegas, Nevada.

The proposed improvements do not alter the overall drainage patterns and the discharge locations remain consistent with the Original drainage study.

The parking lot revision is graded to follow the existing drainage pattern of the site.

The additional building expansion (1,400 sq. feet) has a FF set to the existing building FF of 3041.50ft. A roof drain for this small expansion has been provided that is connected to the onsite storm drain system. From the Original Study, the storm drain has adequate size for the additional flow from our building expansion. This area of the roof (0.32acres) is small and nearly negligible (1cfs extra) and will not negatively impact the existing onsite storm drain system.

The walkway east of the existing Costco Wholesale building has been revised to better accommodate ADA.

The hydrology and drainage pattern remains the same as the approved plans. Therefore, no hydrologic analysis has been provided to address the proposed improvements. We have included the relevant referenced excerpts in Appendix B. The drainage from the parking areas and drive aisles will continue to be collected by the existing private storm drain and discharged in the drainage pattern that was approved by the Original Study.

The site as previously designed is in accordance with the City of Las Vegas Department of Public Works and the CCRFCD drainage design criteria, and is also based on generally accepted engineering principles and practices. The proposed improvement additions will not cause any adverse impact on the adjacent and/or downstream properties.

Please refer to the attached grading plans and details for further clarification of the proposed improvements.

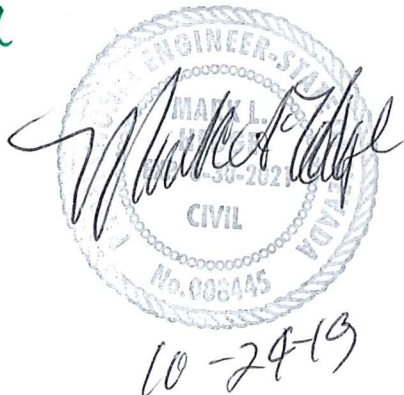
If you have any questions or comments, please do not hesitate to contact our office at your earliest convenience.

Sincerely,

LOCHSA ENGINEERING

Chris Blake

Chris Blake, E.I.
Hydrologist



APPENDIX A

(FIGURES)

ASSESSOR'S PARCELS - CLARK COUNTY, NV.

Briana Johnson - Assessor

T20S R59E

35

N 2 SE 4

137-35-7



PARCEL BOUNDARY	CONDOMINIUM UNIT
SUB BOUNDARY	AIR SPACE PCL
PAVED BOUNDARY	RIGHT OF WAY PCL
ROAD EASEMENT	SUB-SURFACE PCL
MATCH / LEADER LINE	
HISTORIC LOT LINE	
HISTORIC SUB BOUNDARY	
HISTORIC PMID BOUNDARY	
SECTION LINE	

MAP LEGEND

This map is for assessment use only and does NOT represent a survey. No liability is assumed for the accuracy of the data delineated herein. Information on roads and other non-assessed parcels may be obtained from the Road Document Listing in the Assessor's Office.

This map is compiled from official records, including surveys and deeds, but only contains the information required for assessment. See the recorded documents for more detailed legal information.

USE THIS SCALE(FEET) WHEN MAP REDUCED FROM 11X17 ORIGINAL

0 100 200 300 400 500 600 700 800

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

ASSESSOR'S PARCELS - CLARK COUNTY, NV.
 Briana Johnson - Assessor

137-36-4

S2 SW 4

36

T20S R59E

Rev: 1/8/2019

Scale: 1" = 200'

CLARK COUNTY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36

127 126 125 12

136 137 138 13

165 164 163 16

174 175 176 17

127 126 125 12

136 137 138 13

165 164 163 16

174 175 176 17

PARCEL BOUNDARY

SUB BOUNDARY

PAVED BOUNDARY

ROAD EASEMENT

MATCH / LEADER LINE

HISTORIC LOT LINE

HISTORIC SUB BOUNDARY

HISTORIC PBLD BOUNDARY

SECTION LINE

CONDOMINIUM UNIT

AIR SPACE PCL

RIGHT OF WAY PCL

SUB-SURFACE PCL

202 PARCEL SUB/SEQ NUMBER

PB 24-45 PLAT RECORDING NUMBER

5 BLOCK NUMBER

GLS GOZ LOT NUMBER

MAP LEGEND

0 100 200 400 600 800

USE THIS SCALE (FEET) WHEN MAP REDUCED FROM 11X17 ORIGINAL

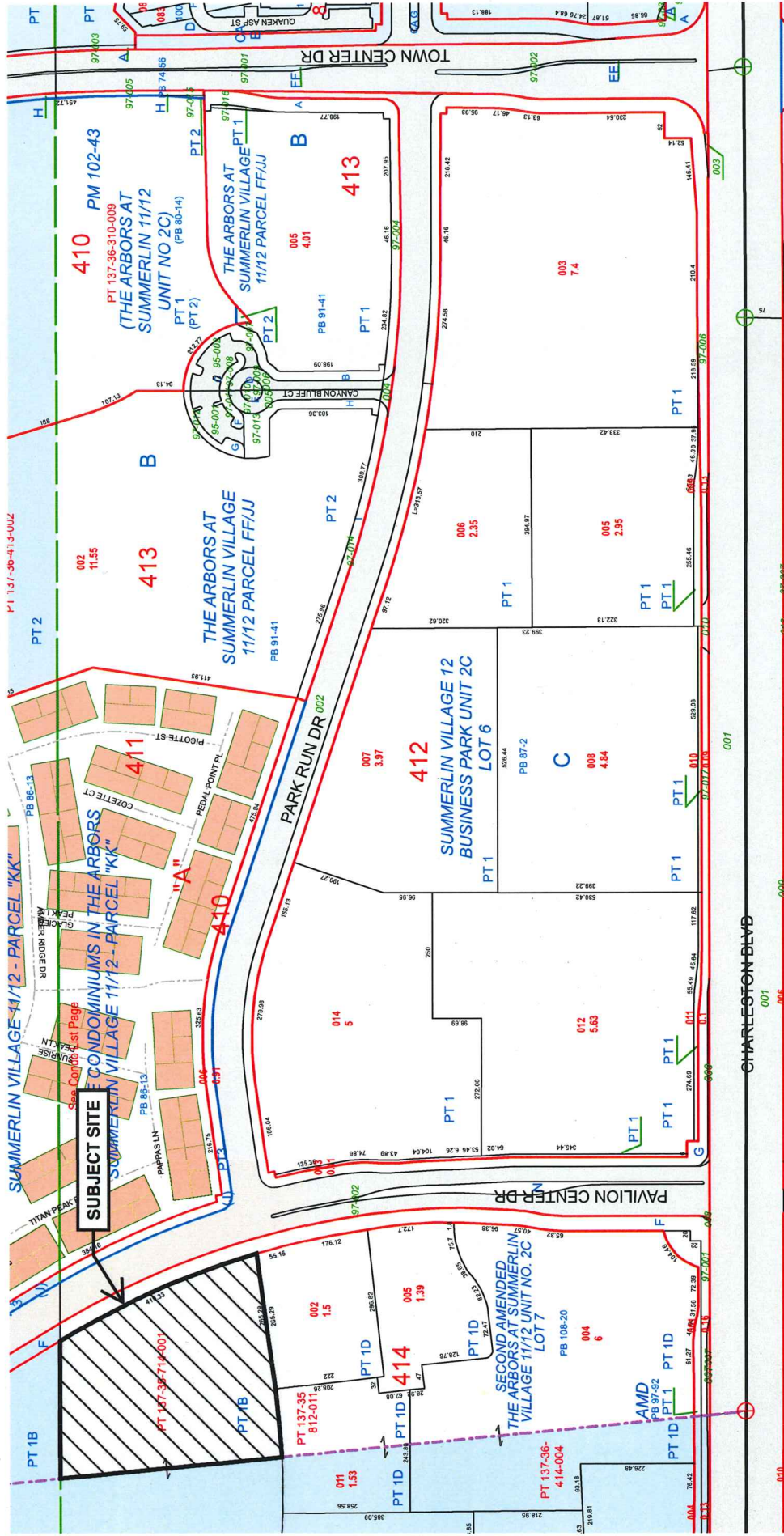
NOTES

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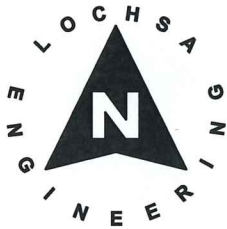
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TAX DIST 200



VICINITY MAP

NOT TO SCALE

DRAWN BY: JMD SCALE: N.T.S.

CHECKED BY: CB DATE: 10/24/19



6345 South Jones Blvd. Suite 100
Las Vegas, NV 89118
Phone (702) 365-9312 - Fax (702) 365-9317

VICINITY MAP (FIGURE 1)

COSTCO EXPANSION

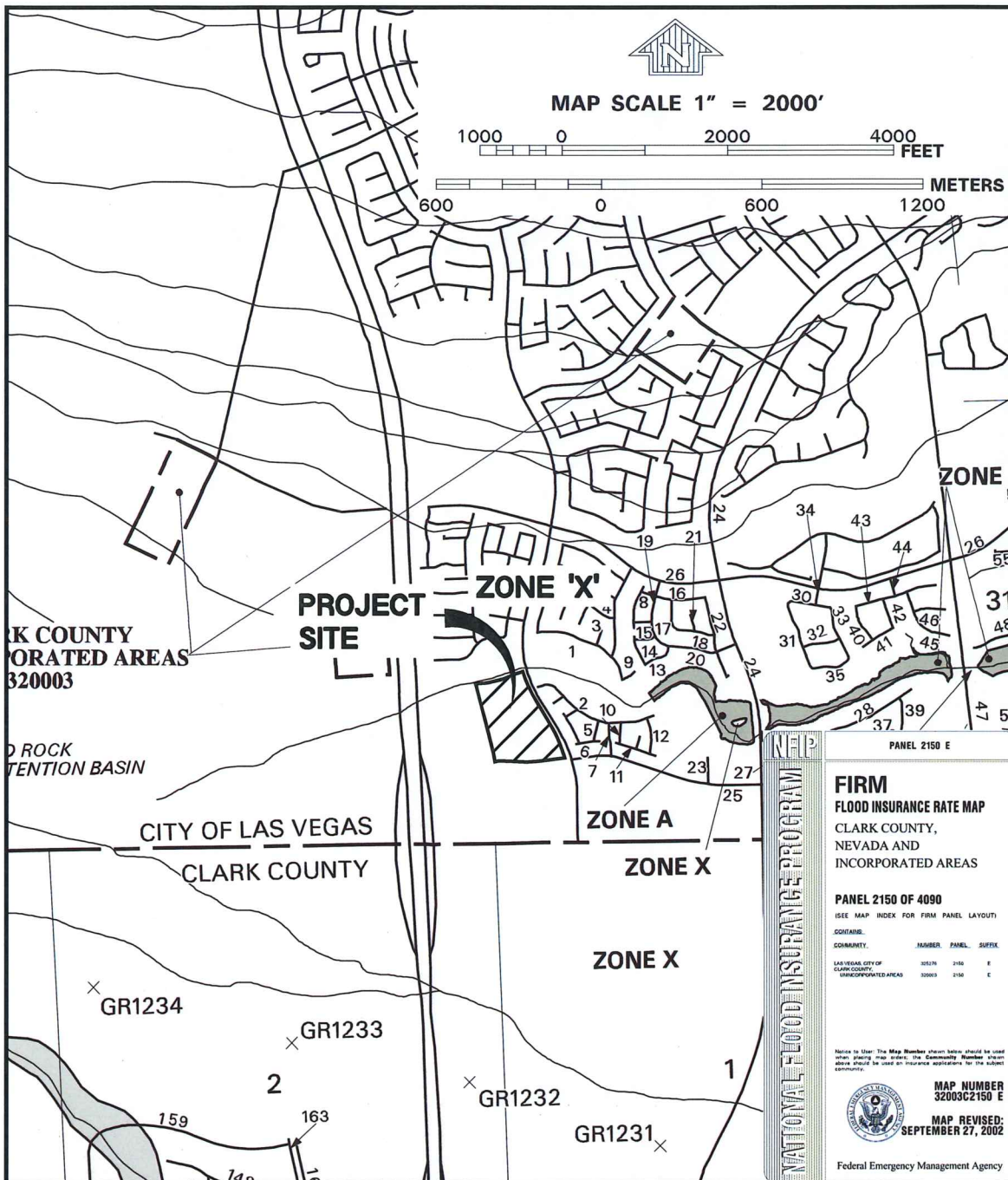
PROJECT No.:

191022

SHEET No.

1

SHEET 1 OF 1



DRAWN BY: JMD SCALE: 1"=2000'

CHECKED BY: CB DATE: 10/24/19

Lochsa
engineering

6345 South Jones Blvd. Suite 100
Las Vegas, NV 89118
Phone (702) 365-9312 - Fax (702) 365-9317

**FLOOD INSURANCE
RATE MAP
(FIGURE 2)**

**COSTCO
EXPANSION**

PROJECT No.:

191022

SHEET No.

2

SHEET 1 OF 1



2018
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

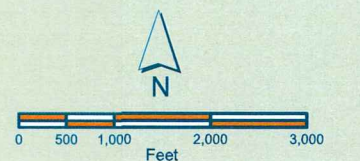
FIGURE F-27
FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Detention Basin
- Culvert or Bridge Crossing
- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

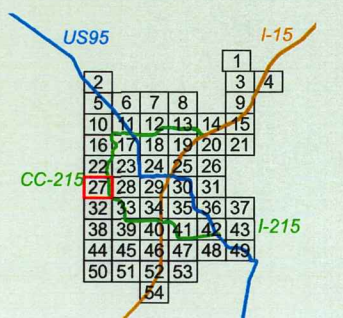
Remove & Replace/Parallel Facilities

- | Category A | Category B |
|------------|------------|
| Channel | Channel |
| Stormdrain | Stormdrain |
| Crossing | Crossing |



Scale: 1 inch = 2,000 feet

AerialSource:Esri World Imagery 2017

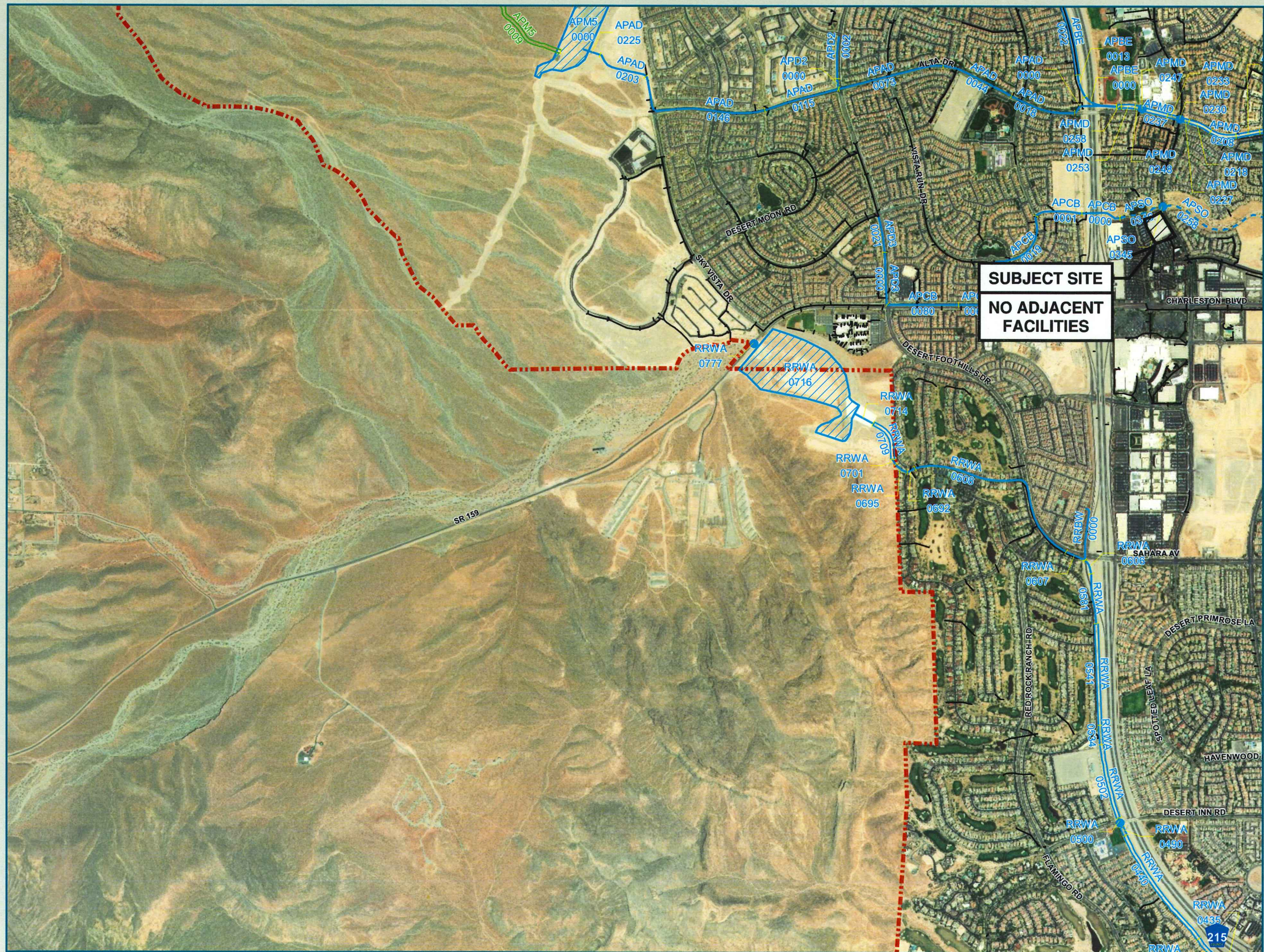


ATKINS

Member of the SNC-Lavalin Group

Louis Berger

SUBJECT SITE
NO ADJACENT
FACILITIES



ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
APAD		ANGEL PARK - ALTA DRIVE BRANCH						
0000	E	2-12' X 8' RCB	945	2801	CSWAA-3	GOW4A	8.22	6.00
0018	E	10' X 8' RCB	1392	2801	CSWAA-3	GOW4A	8.22	4.53
0044	E	11' X 8' RCAP	1565	2801	CSWAA-3	GOW4A	8.22	4.24
0073	E	11' X 8' RCAP	2232	2629	CSWAA-2	GOW3A	7.63	3.50
0115	E	10' X 8' RCB	1600	2629	CSWAA-2	GOW3A	7.63	2.20
0146	E	10' X 8' RCB	3057	2200	CSWAA-1	GOW3A	6.95	4.40
0203	E	2-7' X 5.5' RCB	1104	2200	CSWAA-1	GOW3A	6.95	5.28
0225	E	2-7' X 5.5' RCB OUTLET	360	2137	SUM5DB	GOW3A	6.73	3.40
APBE		ANGEL PARK - BELTWAY BRANCH						
0000	E	3-12' X 8' RCB	712	3366	CCSWFH15	GOW3A	3.39	0.82
0013	E	3-12' X 8' RCB	489	3366	CCSWFH15	GOW3A	3.39	6.50
0022	E	CONC CHNL 20'W 7'D 2:1 SS	1556	3366	CCSWFH15	GOW3A	3.39	1.81
APCB		ANGEL PARK - CHARLESTON BLVD BRANCH						
0000	E	2-10' X 6' RCB	833	1364	CSW18	GOW3A	1.37	1.54
0001	E	12' X 6' RCB	1000	1364	CSW18	GOW3A	1.37	3.13
0019	E	11' X 6' RCB	1616	999	CSW17	GOW3A	0.96	1.39
0050	E	8' X 7' RCB	757	999	CSW17	GOW3A	0.96	1.00
0064	E	8' X 7' RCB	849	999	CSW17	GOW3A	0.96	2.08
0080	E	7' X 7' RCB	1489	623	SW11	GOW3A	0.61	1.67
APD2		ANGEL PARK - DESERT FOOTHILLS 2 BRANCH						
0000	E	7' X 7' RCB	207	674	SWAA-2	GOW3A	0.68	2.29
0002	E	7' X 6' RCB	883	674	SWAA-2	GOW3A	0.68	1.08
APD3		ANGEL PARK - DESERT FOOTHILLS 3 BRANCH						
0000	E	7' X 7' RCB	1090	623	SW11	GOW3A	0.61	1.67
0021	E	7' X 7' RCB	750	623	SW11	GOW3A	0.61	2.75
APM5		DETENTION BASIN #5						
0000	E	384 AC-FT DETENTION BASIN #5		6856	SUM5IN	GOW3A	6.73	
0001	E	12,153 CFS PMF SPILLWAY		12153	SUM5IN	GOW3A	6.73	
0009	P0	CONC CHNL 50'W 4'D 2:1 SS	4180	3495	CDB55-7	GOW3A	2.60	5.80
APMD		ANGEL PARK - MIDDLE BRANCH						
0195	E	TRANSITION STRUCTURE	145	5058	C11A-1*	GOW4A	11.81	3.59
0198	E	CONC CHNL 62'-68'W 5.5'-7.5'D 2:1 SS	500	5058	C11A-1*	GOW4A	11.81	3.59
0208	E	CONC CHNL 62'-68'W 6.5'-7.5'D 2:1 SS	550	5058	C11A-1*	GOW4A	11.81	2.81
0218	E	CONC CHNL 66'-69'W 6.5'-7.0'D 2:1 SS	500	5058	C11A-1*	GOW4A	11.81	2.00
0227	E	TRANSITION STRUCTURE	134	5058	C11A-1*	GOW4A	11.81	2.00
0230	E	3-12' X 8' RCBC @ PAVILION CENTER DR	133	5058	C11A-1	GOW4A	11.81	2.00
0233	E	TRANSITION STRUCTURE	207	5058	C11A-1	GOW4A	11.81	4.00
0237	E	CONC CHNL 76' W 6.5'-9.0'D 2:1 SS	516	5058	C11A-1	GOW4A	11.81	4.00
0247	E	3-12' X 8' RCBC @ ACCESS RD	52	5058	C11A-1	GOW4A	11.81	4.00
0248	E	TRANSITION STRUCTURE	128	5058	C11A-1	GOW4A	11.81	4.00
0253	E	CONC CHNL 76'W 6.5'D 2:1 SS	283	5058	C11A-1	GOW4A	11.81	4.00
0258	E	TRANSITION STRUCTURE	100	4929	CCSWAA-3	GOW4A	11.60	0.82
APSO		ANGEL PARK - SOUTH BRANCH						
0258	E	NATURAL WASH	3235	1736	C12A	GOW3A	1.76	1.36
0345	E	2-8' X 8' RCBC @ PAVILION CENTER	120	1364	CSW18	GOW3A	1.37	2.00
0346	E	NATURAL WASH	880	1364	CSW18	GOW3A	1.37	1.40
RRBW		RED ROCK CHANNEL - BELTWAY LATERAL						
0000	E	6' X 6' RCB	1300	500	USACE	USACE	0.51	0.67
RRWA		RED ROCK CHANNEL						
0436	E	CONC CHNL 14'W 8'D 0:1 SS	800	2300	USACE	USACE	2.19	3.15
0440	E	CONC CHNL 10'W 7.5'D 2:1 SS	2660	2300	USACE	USACE	2.19	2.14
0490	E	CONC CHNL 13'W 10'D 0:1 SS	200	2300	USACE	USACE	2.19	1.00
0500	E	13' X 10' RCBC @ DESERT INN	190	1900	USACE	USACE	2.19	1.00
0502	E	CONC CHNL 10'W 7'D 2:1 SS	1580	1900	USACE	USACE	1.73	2.60
0534	E	CONC CHNL 16'W 7'D 0:1 SS	400	1500	USACE	USACE	1.73	1.24
0541	E	CONC CHNL 10'W 7'D 2:1 SS	2120	1500	USACE	USACE	1.04	0.80
0581	E	13' X 9' RCB	1040	1000	USACE	USACE	0.70	0.60
0606	E	10' X 9' RCB	320	750	USACE	USACE	0.70	0.60
0607	E	10' X 9' RCB	450	750	USACE	USACE	0.70	0.60
0608	E	96" RCP	4110	460	USACE	USACE	0.70	0.55
0692	E	96" CIPCP	170	180	USACE	USACE	0.19	1.40

ID / Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
RRWA		RED ROCK CHANNEL						
0695	E	96" RCP	300	180	USACE	USACE	0.19	0.50
0701	E	72" RCP	125	180	USACE	USACE	0.19	0.50
0709	E	RIPRAP CHNL 10'W 6'D 2:1 SS	930	180	USACE	USACE	0.19	0.80
0714	E	2.25' X 2.25' RCBC OUTLET	445	180	USACE	USACE	54.73	
0715	E	110,000 CFS PMF SPILLWAY		110000	USACE	USACE	54.73	
0716	E	2,007 AC-FT RED ROCK DETENTION BASIN		12800	USACE	USACE	54.73	
0777	E	2 SPAN BRIDGE 200'W 17'D @ SR 159	50	1922	CRD3	FLAM3A	1.23	2.50

NO ADJACENT FACILITIES

*The HEC-1 node shown identifies the controlling concentration point for the associated facility and is located upstream of this facility due to decreasing peak flow with increasing tributary area caused by storm distribution transitions, depth area reduction factors, or attenuation of flow from routing.

**As-built or design slopes were used when available. All other slopes are based on existing topography. The user should verify the facility slope listed prior to performing any facility specific analysis.

^ For parallel facilities, the existing facility flow equals its normal depth capacity, and the proposed parallel facility flow equals the remaining flow (i.e. HEC-1 Node flow = existing facility normal depth capacity + proposed parallel facility flow).

USACE - Refer to "Las Vegas Wash & Tributaries (Tropicana and Flamingo Washes) Hydrologic Basis for Design" prepared by U.S. Army Corps of Engineers, Los Angeles District, June 1993. See Figure W-6 for USACE Boundary.



2018 LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FACILITY INVENTORY
FIGURE F-27

L E G E N D	ID (Facility Identifier)	AABB
	Parent Stream Name	
	Stream Name	
	Mile	0000
	Distance Above Confluence with Parent Stream (Miles)	
	Miles in Hundredths	

Existing Facility..... E
Proposed or Modified Facility..... P
Contingency Level
Category A..... P
Category B..... P0

Bottom Width..... W

Depth..... D

Side Slope, H:V..... SS

Cast in Place Concrete Pipe..... CIPCP
Corrugated Metal Arch Pipe Culvert..... CMAP
Corrugated Metal Pipe Culvert..... CMPC
High Density Polyethylene..... HDPE
Horizontal Elliptical Reinforced Concrete Pipe..... HERCP
Reinforced Concrete Arch Pipe..... RCAP

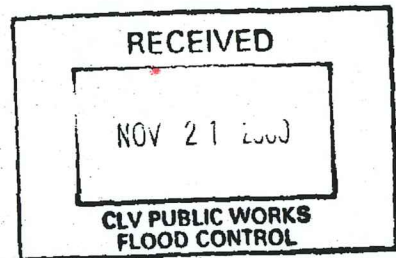
Construction Features

Reinforced Concrete Arch Culvert..... RCAC
Reinforced Concrete Box..... RCB
Reinforced Concrete Box Culvert..... RCBC
Reinforced Concrete Pipe..... RCP
Reinforced Concrete Pipe Culvert..... RCP
Storm Sewer Pipe..... SSP



APPENDIX B
(REFERENCE MATERIAL)

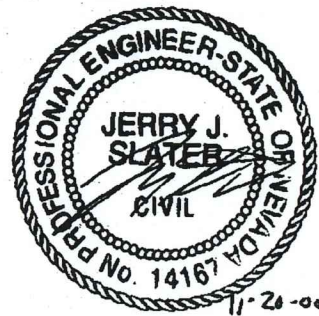
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TECHNICAL DRAINAGE STUDY 2805
FOR K 35
COSTCO WHOLESALE AT CANYON POINTE \$250
CCRFCD

W.R.G. Project No. MUL014

CITY OF LAS VEGAS, NEVADA
A portion of the Section 35 and 36,
Township 20 South, Range 59 East, M.D.M.,
Clark County, Nevada



Prepared for:

Costco Wholesale
C/o Mulvanny Architects
11820 Northup Way, #E300
Bellevue, WA 98005

File.

CITY OF LAS VEGAS		DATE:	
INTER-OFFICE MEMORANDUM		January 26, 2001	
TO: Land Development Services Department of Public Works		FROM: Randy Fultz, P.E. <i>RF</i> Flood Control Project Manager Department of Public Works	
SUBJECT: Drainage Study for: Costco Wholesale at Canyon Pointe		COPIES TO: Howard Hughes Properties	
Cross Streets:	Northwest corner of Pavilion Center Drive and Park Run Drive		WRG Design, Inc.
FILE NO.	F:\DEPOT\DSMEMOS\DS2805C.DOC		Cheri Edelman, DEVCO
Parcel Number:	137-35-811-001		CCRFGD
Zoning Action:			
FEMA Flood Zone	YES	No	X
Proposed Storm Drain	YES	Onsite	No
			X

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES
1 st Submittal	11/21/2000	11/29/2000	Not Accepted	\$250.00
2 nd Submittal	12/11/2000	12/11/2000	Conditionally Accepted	\$250.00
3 rd Submittal	01/25/2001	01/25/2001	See Comments Below	NC
TOTAL FEES (LDDRS):				\$500.00

REMARKS:

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

X	is acceptable in concept subject to conformance to all City standards and the following conditions.
	must be resubmitted or supplemented including the following:
	Must have Clark County Regional Flood Control District concurrence

1. Per previous comment #4: Sites with a grade difference 2 feet above or below existing are required to have approval from City of Las Vegas Current Planning. Current planning approval is required prior to final acceptance of the improvement plans.
2. It is noted that the private street and storm drain by G. C. Wallace shown as future on the grading plan must be constructed prior to occupancy of the Costco.
3. Provide detail design at the outlet of the temporary ditch at the future west property line. As storm water overflows the edge of the channel velocities may become excessive. Riprap may be warranted at this location. Review and revise the grading plan as necessary.
4. It is noted that the design of the temporary ditch to the west of the property was designed to convey interim flows. Developed conditions may require future improvements to this channel.
5. Label the size of the onsite drop inlets in the grading plan.

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 Amendment 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.

PLANS SENT TO LAND DEVELOPMENT NO (initial)

END OF REMARKS
Wld/jwb

T/R/S: T20S/R59E/35&36
AREA K-35

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT



RECEIVED

JAN 25 2001

CLV PUBLIC WORKS
FLOOD CONTROL

Gale Wm. Fraser, II, P.E.
General Manager/Chief
Engineer

BOARD OF DIRECTORS

Larry Brown
Chairman
City of Las Vegas

Crescent Hardy
Vice-Chairman
City of Mesquite

Mayor James Gibson
City of Henderson

Michael Mack
City of Las Vegas

Chip Maxfield
Clark County

Bryan A. Nix
City of Boulder City

John K. Rhodes
City of North Las Vegas

Bruce L. Woodbury
Clark County

January 23, 2001

Mr. Randy Fultz, P.E.
City of Las Vegas Public Works
731 4th Street
Las Vegas, NV 89101

DISTRICT CONCURRENCE: **COSTCO WHOLESALE AT CANYON POINTE
(DS2805)**

Dear Mr. Fultz:

The District has reviewed the Technical Drainage Study dated November 20, 2000, and Addendum No. 1 dated December 7, 2000, for the above-captioned project as submitted by WRG Design, Inc. In addition, the District is in receipt of the Conditional Letter of Acceptance from the City of Las Vegas Public Works dated December 12, 2000.

The District concurs with the acceptance of this Technical Drainage Study by the City of Las Vegas Public Works.

The District's review of this project was limited to issues of Regional Flood Control Significance as defined in the Uniform Regulations for the Control of Drainage.

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, the information submitted by WRG Design, Inc. may be superseded. Compliance with the regulatory elements and design standards specified in the Uniform Regulations for the Control of Drainage does not imply a guarantee that properties will be free from flooding or flood damage. The District, its officials, or employees assume no liability for the information, data, or conclusions presented by the consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review.

GALE WM. FRASER II, P.E.
General Manager/Chief Engineer

BY:

Jon H. Hayslip, P.E.
Senior Engineer

cc: WRG Design, Inc.

JHH:jms

File: 20-59-35.wrg

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: **COSTCO WHOLESALE AT CANYON POINTE**

Date: **11/10/00**

Location of Development: a) Descriptive: **NW Corner of intersection of Pavilion Center Drive & Park Run Drive**
b) Sect: **35/36** Twn: **20 South** Rng: **59 East**

Name of Owner: **Howard Hughes Properties, Inc.**

Assessors Parcel No: **137-35-811-001**

Contact Person - Name: **Jerry Slater**

Telephone No: **(702) 990-9300**

Firm: **W.R.G. Design, Inc.**

WILLDAN
SERVING PUBLIC AGENCIES

Address: **2260 Corporate Circle Drive, Suite 430**
Henderson, NV 89014

RECEIVED
NOV 29 2000
LAS VEGAS

Type of Land Development/Land Disturbance Process:

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

1. Total Owned Land Area: At Site: **16.9 +/- ac.**

Being Developed/Disturbed: **16.9 +/- 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.)? **Commercial**

5. Approximate upstream land area which drains to the subject site? **14 +/- ac.**

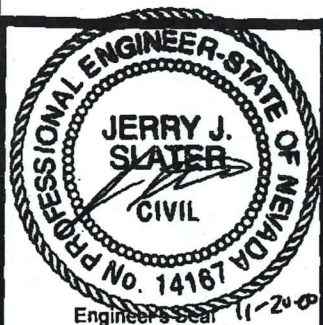
6. Has the site drainage been evaluated in the past? **YES** NO. If yes, please identify documentation:

Master Drainage Study for Canyon Pointe & Interior Roadways, August, 2000.

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

Storm drain system installed as part of Canyon Pointe Roadway Improvements.

8. Briefly describe your proposed schedule for the subject project: **A.S.A.P.**



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 the Conceptual Drainage Study.

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

Revision	Date

II. DRAINAGE BASIN DESCRIPTION

A. Offsite Drainage Description

Approximately 14 acres located directly west of the site sheet flows through the property to Pavilion Center Drive. At ultimate development, the parking lot and associate building of the off-site flows will enter the storm drain system now being constructed and convey runoff to the Park Run/Pavilion Center intersection as outlined in the previously approved Canyon Point & Interior Roadways Master Drainage Study (Reference #4)

B. Onsite Drainage Description

The existing onsite runoff currently sheetflows east into the Pavilion Center right-of-way.

C. Flood Control Master Plan Information

The 1997 *Clark County Regional Flood Control District Flood Control Master Plan Update* illustrates the existing and proposed Clark County Regional Flood Control District (CCRFCDD) facilities in the area as shown on Figure 2. To the north of the site is a proposed 4.5' deep by 12' wide concrete lined channel with 2:1 side slopes, identified as ASPO 0258. Since the open space tract to the north has been developed as a park along the existing wash, no future drainage improvements are necessary.

D. FEMA Floodplain Information

The Costco site lies within FEMA Zone "X" on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM). Figure 4 is reproduced from a portion of Community Panel Number 320003 C2150D, effective date August 16, 1995. FEMA defines Zone "X" as an area outside the 500-year flood plain.

5. Flow Split Analysis

No flow splits were calculated in this study.

D. Facility Design Calculations

All drainage facilities within this project have been designed in accordance with the CCRFCD *Hydrologic Criteria and Drainage Design Manual* (Reference 1).

The private storm drains that run around the Costco building have been sized to convey runoff during the 100 year storm event in accordance with the overall Master Drainage Study.

The storm drain system approved in the Master Drainage Study for the private drive in Canyon Pointe will require one adjustment to meet the site specific flows from Costco. Due to the grading and site constraints specific to Costco, an increased amount of runoff will be required to enter the storm drain system in the interior roads of Canyon Pointe. A 24" pipe stubbed into the Costco site will require upsizing to a 30" pipe for the increase in flow at this point. A new HGL was computed on the profile shown in Exhibit D included in this study. The overall site adds approximately 10 cfs in excess of the flow in the Canyon Point Interior Roads study to the storm drain system in Pavilion Center. This is approximately a 5% increase in the total flow. At the maximum hydraulic jump point (SDMH#1), the rise in the HGL is approximately 0.25' above the analysis in Reference #4. The analysis in this study concludes that this additional flow does not adversely impact the system.

V. CONCLUSIONS

1. The overland flow to Pavilion Center is 10 cfs, 8 cfs below the maximum of 18 cfs set forth in Reference #4.

2. The additional flow to the Canyon Pointe Interior Roadway storm drain does not adversely impact the design of the system.
3. The finish floor of Costco is at least twice the depth of flow that may pond at each of the catch basins located in front of the building.
4. The site is not located within a FEMA designated flood zone.
5. Off-site flows will be diverted around the site until adjacent properties develop.
6. Methods used to calculate stormwater runoff and size drainage facilities are in compliance with the Manual (Reference #1).

VII. REFERENCES

1. Clark County Regional Flood Control District, *Hydrologic Criteria and Drainage Design Manual*, August, 1999.
2. Clark County Regional Flood Control District, *Flood Control Master Plan Update of the Las Vegas Valley*, prepared by Post, Buckley, Schuh and Jernigan, Inc./V.T.N. Nevada, February 1997.
3. Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map, Clark County, Nevada (Panel No. 32003C 2150D), August 16, 1995.
4. G. C. Wallace, Inc., *Master Drainage Study for Canyon Pointe & Interior Roadways*, August, 2000.



HEC-1

PROPOSED CONDITION

DEVELOPED BASIN HEC-1 MODEL

HEC1 S/N: 1343001909 HMVersion: 6.33 Data File: d:\TEMP\~vbh0138.TMP

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* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* MAY 1991 *
* VERSION 4.0.1E *
* RUN DATE 11/16/2000 TIME 14:48:18 *
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* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET *
* DAVIS, CALIFORNIA 95616 *
* (916) 756-1104 *
*****
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X   X XXXXXXX XXXX   X
X   X X       X   X   XX
X   X X       X       X
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X   X X       X   X   X
X   X XXXXXXX XXXX   XXX

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: : by : :
: : Haestad Methods, Inc. : :
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE. THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION. NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE, SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY, DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL, LOSS RATE:GREEN AND AMPT INFILTRATION. KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM.

PAGE 1

LINE	ID	1	2	3	4	5	6	7	8	9	10
1	ID										
2	IT	5			300						
3	IO	5	0								
4	JR	PREC	.57	1.0							
5	IN	5	0	0							
6	RK	ON-2									
7	KM	ON-SITE BASIN 2									
8	KO					22					
9	BA	.00095									
10	PB	3.15									
11	PC	0	.02	.057	.07	.087	.108	.124	.13	.13	.13
12	PC	.13	.13	.13	.133	.14	.142	.148	.158	.172	.181
13	PC	.19	.197	.199	.20	.201	.204	.214	.229	.241	.249
14	PC	.251	.256	.27	.278	.281	.283	.295	.322	.352	.409
15	PC	.499	.590	.71	.744	.781	.812	.819	.835	.851	.856
16	PC	.86	.868	.876	.888	.91	.926	.937	.95	.97	.976
17	PC	.982	.985	.987	.989	.99	.993	.993	.994	.995	.998
18	PC	.998	.999	1.00							
19	LS	0	95								
20	UD	.066									
21	RK	ON-4									
22	KM	ON-SITE BASIN 4									
23	KO					22					
24	BA	.00108									
25	PB	3.15									
26	PC	0	.02	.057	.07	.087	.108	.124	.13	.13	.13
27	PC	.13	.13	.13	.133	.14	.142	.148	.158	.172	.181
28	PC	.19	.197	.199	.20	.201	.204	.214	.229	.241	.249
29	PC	.251	.256	.27	.278	.281	.283	.295	.322	.352	.409
30	PC	.499	.590	.71	.744	.781	.812	.819	.835	.851	.856
31	PC	.86	.868	.876	.888	.91	.926	.937	.95	.97	.976
32	PC	.982	.985	.987	.989	.99	.993	.993	.994	.995	.998
33	PC	.998	.999	1.00							
34	LS	0	95								
35	UD	.052									
36	RK	ON-3									
37	KM	ON-SITE BASIN 3									
38	KO					22					
39	BA	.00342									
40	PB	3.15									
41	PC	0	.02	.057	.07	.087	.108	.124	.13	.13	.13
42	PC	.13	.13	.13	.133	.14	.142	.148	.158	.172	.181
43	PC	.19	.197	.199	.20	.201	.204	.214	.229	.241	.249
44	PC	.251	.256	.27	.278	.281	.283	.295	.322	.352	.409
45	PC										

[illegible]

LINE	ITEM	UNIT	QTY	PRICE	AMOUNT	TAX	TOTAL	DISC	NET	GRAND
148	UD		.066							
149	KK	MH#2								
150	KM	MANHOLE #2								
151	KO									
152	HC	3								
153	KK	ON-13								
154	KM	ON-SITE BASIN 13								
155	KO									
156	BA	.00184								
157	PB	3.15								
158	PC	0	.02	.057	.07	.087	.108	.124	.13	.13
159	PC	.13	.13	.13	.133	.14	.142	.148	.158	.172
160	PC	.19	.197	.199	.20	.201	.204	.214	.229	.241
161	PC	.251	.256	.27	.278	.281	.283	.295	.322	.352
162	PC	.499	.590	.71	.744	.781	.812	.819	.835	.851
163	PC	.86	.868	.876	.888	.91	.926	.937	.95	.97
164	PC	.982	.985	.987	.989	.99	.993	.993	.994	.995
165	PC	.998	.999	1.00						
166	LS	0	95							
167	UD	.061								
168	KK	MH#1								
169	KM	MANHOLE #1								
170	KO									
171	HC	2								
172	KK	ON-11								
173	KM	ON-SITE BASIN 11								
174	KO									
175	BA	.00619								
176	PB	3.15								
177	PC	0	.02	.057	.07	.087	.108	.124	.13	.13
178	PC	.13	.13	.13	.133	.14	.142	.148	.158	.172
179	PC	.19	.197	.199	.20	.201	.204	.214	.229	.241
180	PC	.251	.256	.27	.278	.281	.283	.295	.322	.352
181	PC	.499	.590	.71	.744	.781	.812	.819	.835	.851
182	PC	.86	.868	.876	.888	.91	.926	.937	.95	.97
183	PC	.982	.985	.987	.989	.99	.993	.993	.994	.995
184	PC	.998	.999	1.00						
185	LS	0	95							
186	UD	.078								
187	KK	CP1								
188	KM	CONNECTION TO EXIST. 30" LINE								
189	KO									
190	HC	2								
191	KK	ON-1								
192	KM	ON-SITE BASIN 1								
193	KO									
194	BA	.00172								
195	PB	3.15								
196	PC	0	.02	.057	.07	.087	.108	.124	.13	.13
197	PC	.13	.13	.13	.133	.14	.142	.148	.158	.172
198	PC	.19	.197	.199	.20	.201	.204	.214	.229	.241
199	PC	.251	.256	.27	.278	.281	.283	.295	.322	.352
200	PC	.499	.590	.71	.744	.781	.812	.819	.835	.851
201	PC	.86	.868	.876	.888	.91	.926	.937	.95	.97
202	PC	.982	.985	.987	.989	.99	.993	.993	.994	.995
203	PC	.998	.999	1.00						

221	KK	ON-15											
222	KM	ON-SITE BASIN 15											
223	KO					22							
224	BA	.00155											
225	PB	3.15											
226	PC	0	.02	.057	.07	.087	.108	.124	.13	.13	.13	.13	.13
227	PC	.13	.13	.13	.133	.14	.142	.148	.158	.172	.181	.181	.181
228	PC	.19	.197	.199	.20	.201	.204	.214	.229	.241	.249	.249	.249
229	PC	.251	.256	.27	.278	.281	.283	.295	.322	.352	.409	.409	.409
230	PC	.499	.590	.71	.744	.781	.812	.819	.835	.851	.856	.856	.856
231	PC	.86	.868	.876	.888	.91	.926	.937	.95	.97	.976	.976	.976
232	PC	.982	.985	.987	.989	.99	.993	.993	.994	.995	.998	.998	.998
233	PC	.998	.999	1.00									
234	LS	0	95										
235	UD	.05											
236	KK	CP2											
237	KM	FLOW TO PAVILION CENTER/PARK RUN (OVERLAND, PARKING)											
238	KO					22							
239	HC	3											
240	KK	ON-12											
241	KM	ON-SITE BASIN 12 (TO EXIST. D.I. FROM CB)											
242	KO					22							
243	BA	.00228											
244	PB	3.15											
245	PC	0	.02	.057	.07	.087	.108	.124	.13	.13	.13	.13	.13
246	PC	.13	.13	.13	.133	.14	.142	.148	.158	.172	.181	.181	.181
247	PC	.19	.197	.199	.20	.201	.204	.214	.229	.241	.249	.249	.249
248	PC	.251	.256	.27	.278	.281	.283	.295	.322	.352	.409	.409	.409
249	PC	.499	.590	.71	.744	.781	.812	.819	.835	.851	.856	.856	.856
250	PC	.86	.868	.876	.888	.91	.926	.937	.95	.97	.976	.976	.976
251	PC	.982	.985	.987	.989	.99	.993	.993	.994	.995	.998	.998	.998
252	PC	.998	.999	1.00									
253	LS	0	95										
254	UD	.07											
255	KK	OFF-1											
256	KM	OFF-SITE BASIN 1 (NORTHERN 1/2 OF WESTERN PARCEL)											
257	KO					22							
258	BA	.01061											
259	PB	3.15											
260	PC	0	.02	.057	.07	.087	.108	.124	.13	.13	.13	.13	.13
261	PC	.13	.13	.13	.133	.14	.142	.148	.158	.172	.181	.181	.181
262	PC	.19	.197	.199	.20	.201	.204	.214	.229	.241	.249	.249	.249
263	PC	.251	.256	.27	.278	.281	.283	.295	.322	.352	.409	.409	.409
264	PC	.499	.590	.71	.744	.781	.812	.819	.835	.851	.856	.856	.856
265	PC	.86	.868	.876	.888	.91	.926	.937	.95	.97	.976	.976	.976

HEC1 S/N: 1343001909 HMVersion: 6.33 Data File: d:\TEMP\vbh0138.TMP

* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* MAY 1991 *
* VERSION 4.0.1E *
* RUN DATE 11/16/2000 TIME 14:48:18 *

* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET *
* DAVIS, CALIFORNIA 95616 *
* (916) 756-1104 *

3 IO OUTPUT CONTROL VARIABLES
IPRNT 5 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA
NMIN 5 MINUTES IN COMPUTATION INTERVAL
IDATE 1 0 STARTING DATE
ITIME 0000 STARTING TIME
NQ 300 NUMBER OF HYDROGRAPH ORDINATES
NDDATE 2 0 ENDING DATE
NDTIME 0055 ENDING TIME
ICENT 19 CENTURY MARK

COMPUTATION INTERVAL 0.08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS
DRAINAGE AREA SQUARE MILES
PRECIPITATION DEPTH INCHES
LENGTH, ELEVATION FEET
FLOW CUBIC FEET PER SECOND
STORAGE VOLUME ACRE-Feet
SURFACE AREA ACRES
TEMPERATURE DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
0.57 1.00

* ON-2 *

8 KO OUTPUT CONTROL VARIABLES
IPRNT 5 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE
IPNCH 0 PUNCH COMPUTED HYDROGRAPH
IOUT 22 SAVE HYDROGRAPH ON THIS UNIT
ISAV1 1 FIRST ORDINATE PUNCHED OR SAVED
ISAV2 300 LAST ORDINATE PUNCHED OR SAVED
TIMINT 0.083 TIME INTERVAL IN HOURS

* *

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
 FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
 TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION	
				RATIO 1 0.57	RATIO 2 1.00
HYDROGRAPH AT	ON-2	0.00	1 FLOW TIME	1. 3.50	2. 3.50
HYDROGRAPH AT	ON-4	0.00	1 FLOW TIME	1. 3.50	3. 3.50
HYDROGRAPH AT	ON-3	0.00	1 FLOW TIME	4. 3.50	8. 3.50
3 COMBINED AT	MH#4	0.01	1 FLOW TIME	7. 3.50	13. 3.50
HYDROGRAPH AT	ON-7	0.00	1 FLOW TIME	1. 3.50	1. 3.50
HYDROGRAPH AT	ON-8	0.00	1 FLOW TIME	0. 3.50	1. 3.50
HYDROGRAPH AT	ON-6	0.00	1 FLOW TIME	1. 3.50	2. 3.50
HYDROGRAPH AT	ON-5	0.00	1 FLOW TIME	1. 3.50	2. 3.50
5 COMBINED AT	MH#3	0.01	1 FLOW TIME	10. 3.50	19. 3.50
HYDROGRAPH AT	ON-9	0.00	1 FLOW TIME	2. 3.50	4. 3.50
HYDROGRAPH AT	ON-10	0.00	1 FLOW TIME	1. 3.50	2. 3.50
3 COMBINED AT	MH#2	0.01	1 FLOW TIME	13. 3.50	25. 3.50
HYDROGRAPH AT	ON-13	0.00	1 FLOW TIME	2. 3.50	5. 3.50
2 COMBINED AT	MH#1	0.01	1 FLOW TIME	16. 3.50	30. 3.50
HYDROGRAPH AT	ON-11	0.01	1 FLOW TIME	7. 3.50	14. 3.50
2 COMBINED AT	CP1	0.02	1 FLOW TIME	23. 3.50	44. 3.50
HYDROGRAPH AT	ON-1	0.00	1 FLOW TIME	2. 3.50	4. 3.50
HYDROGRAPH AT	ON-14	0.00	1 FLOW	1.	2.

TIME 3.50 3.50

HYDROGRAPH AT

ON-15 0.00 1 FLOW 2. 4.
TIME 3.50 3.50

3 COMBINED AT

CP2 0.00 1 FLOW 5. 10.
TIME 3.50 3.50

HYDROGRAPH AT

ON-12 0.00 1 FLOW 3. 5.
TIME 3.50 3.50

HYDROGRAPH AT

OFF-1 0.01 1 FLOW 8. 18.
TIME 3.58 3.50

HYDROGRAPH AT

OFF-2 0.01 1 FLOW 7. 15.
TIME 3.58 3.50

5 COMBINED AT

NULL 0.04 1 FLOW 45. 92.
TIME 3.50 3.50

*** NORMAL END OF HEC-1 ***

APPENDIX 3
HYDRAULIC COMPUTATIONS

**NO CHANGE
TO ONSITE EXIST. SD**

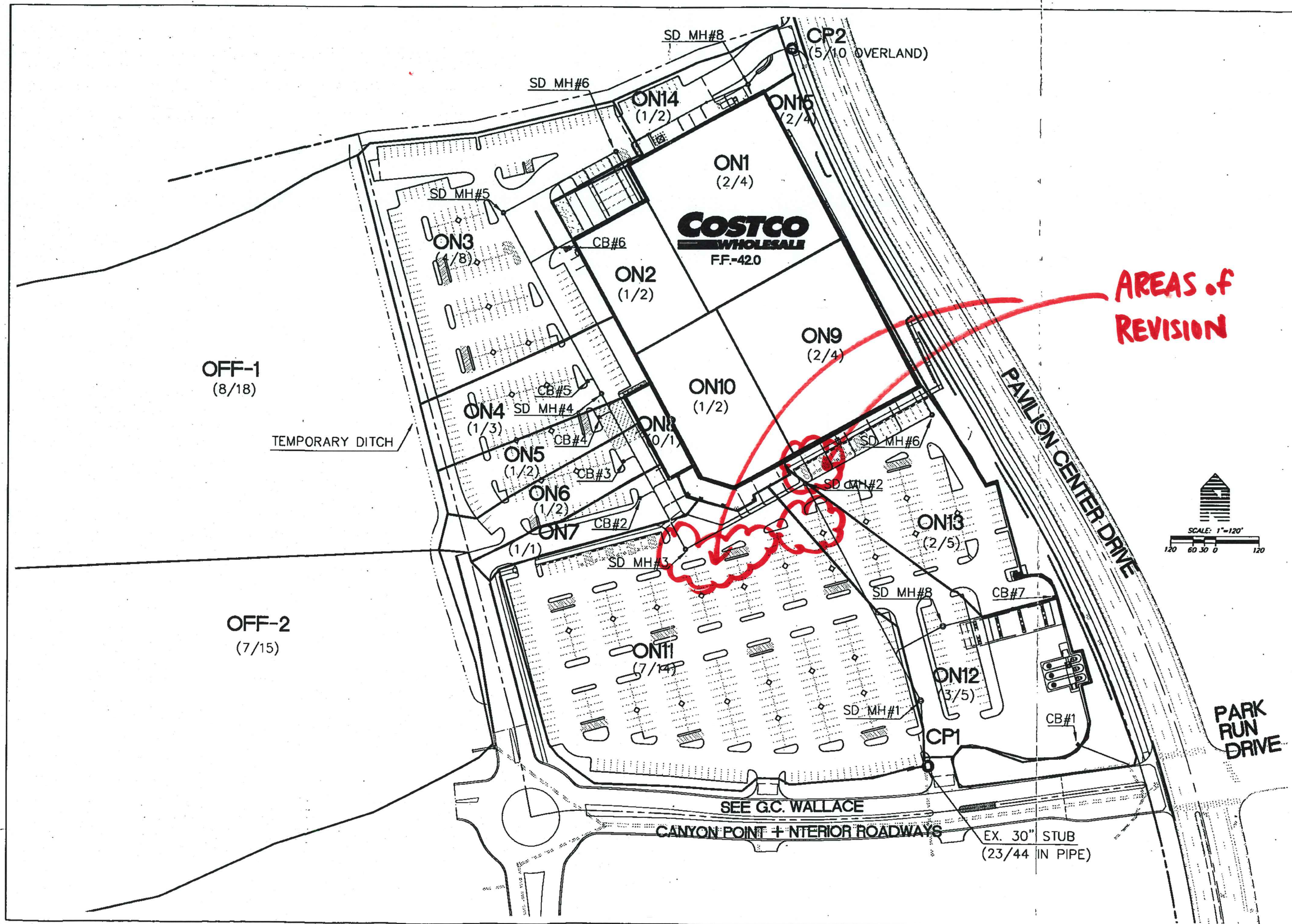
COSTCO WHOLESALE @ CANYON POINTE
100-Year Pipe Sizing for Private On-Site Conveyance System

11/20/00

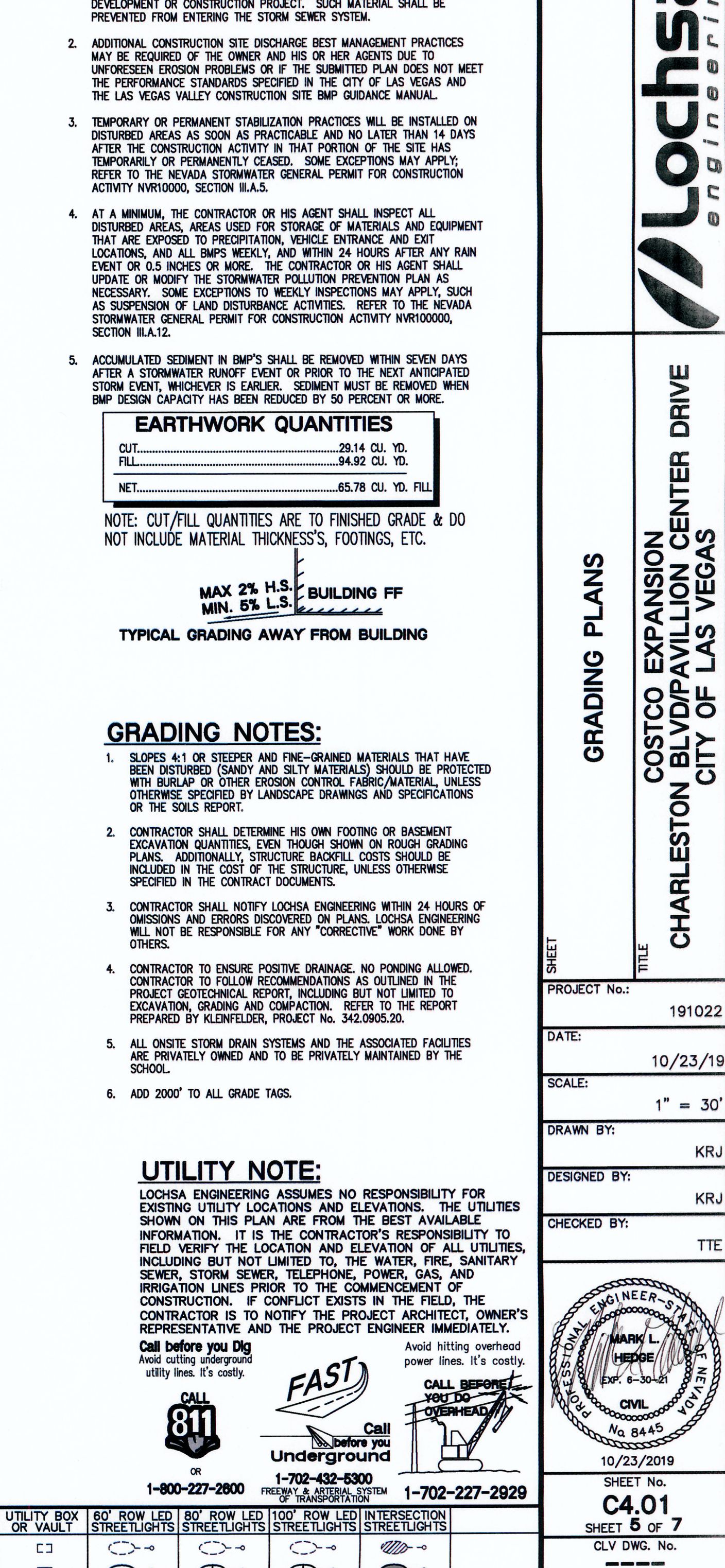
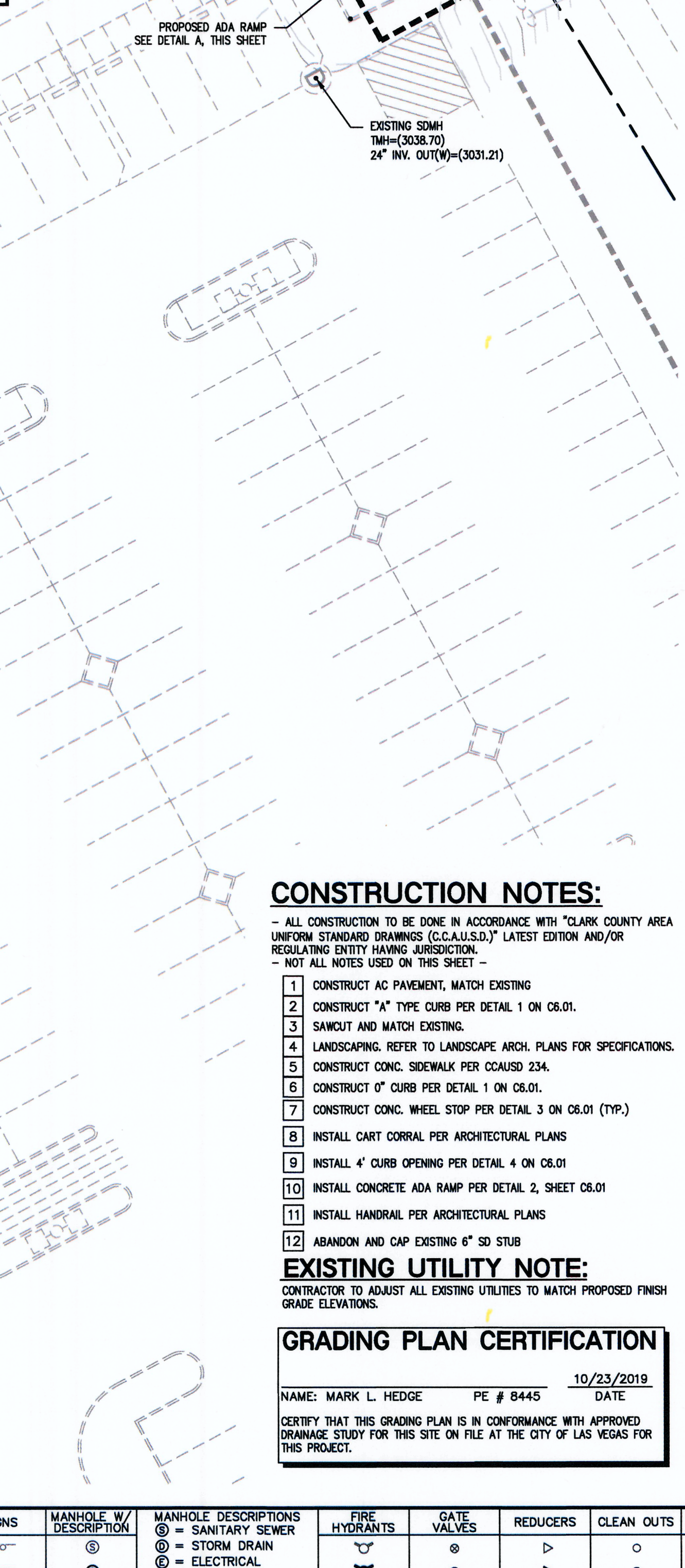
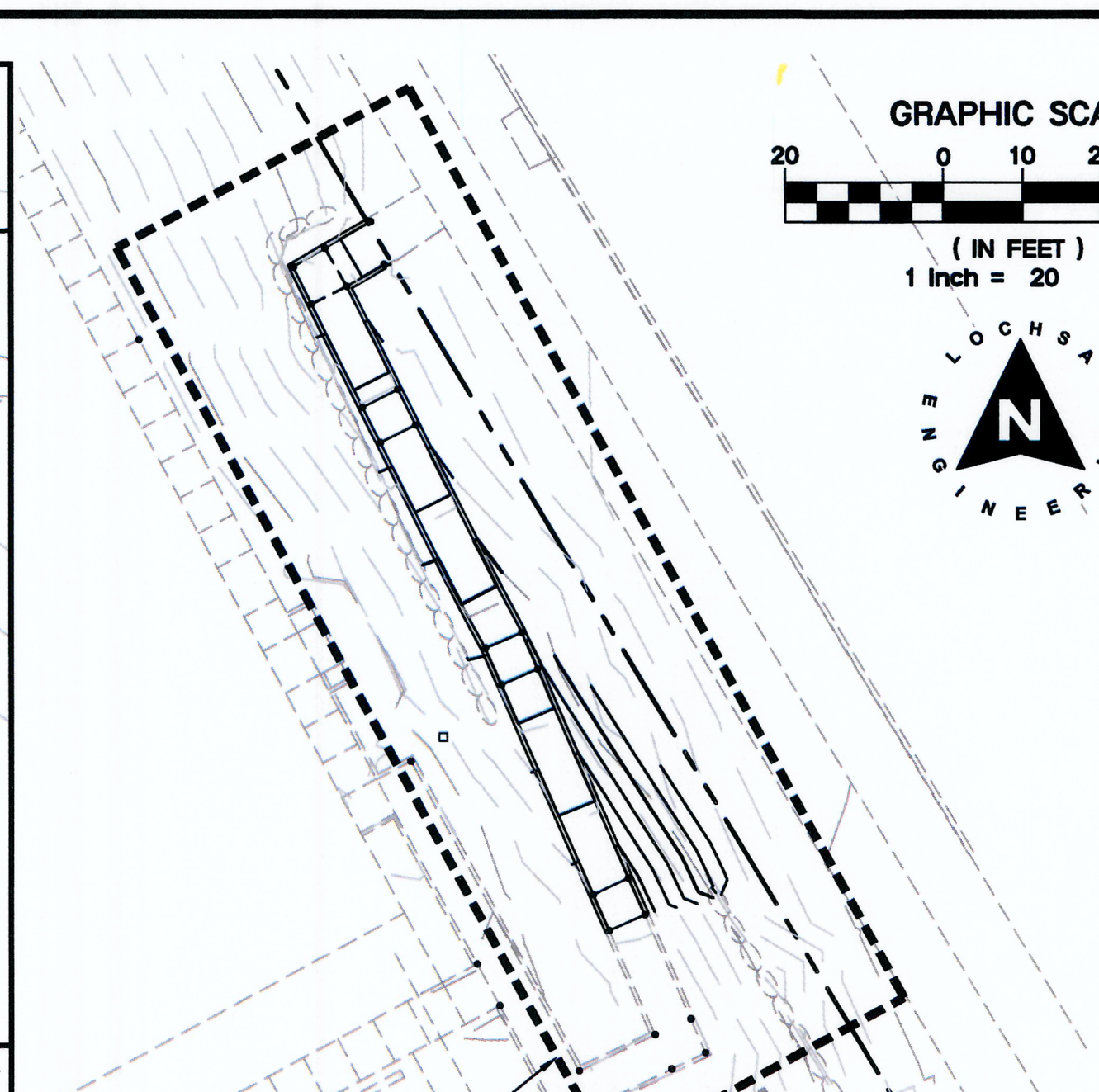
DESIGN SECTION					DESIGN				
MH TO MH OR ST TO ST	Additional Drainage Basins	Area (acres)	Inc. Runoff (cfs)	Total Runoff (cfs)	Pipe Slope %	Dia. (in)	Capacity (cfs)	Full Vel. (fps)	% Full
MH#6 TO MH#5	ON2	0.61	2.00	2.00	0.50	12	2.69	3.22	74%
MH#5 TO MH#4	ON3, ON4	2.88	11.00	13.00	0.50	24	17.05	5.11	76%
MH#4 TO MH#3	ON5, ON6, ON7, ON8	1.34	✓ 6.00	19.00	0.70	24	20.18	6.04	94%
MH#3 TO MH#2	ON10	0.65	2.00	21.00	0.70	24	20.18	6.04	104%
MH#7 TO MH#2	ON9	1.02	✓ 4.00	4.00	1.00	12	3.80	4.55	105%
CB#2 TO MH#7	ON13	1.18	(5.00)	5.00	0.50	15	4.87	3.73	103%
MH#7 TO TEE			4.00	5.00	0.50	15	4.87	3.73	103%
MH#2 TO MH#1				30.00	0.50	30	30.92	5.92	97%
MH#1 TO EXIST.	ON11	3.96	✓ 14.00	44.00	1.00	30	43.73	8.38	101%
TO MH#8	ON1	1.10	4.00	4.00	1.00	12	3.80	4.55	105%
CB#1 TO EXIST.	ON12	1.46	(5.00)	5.00	17.50	10	9.77	16.85	51%

Assumptions:

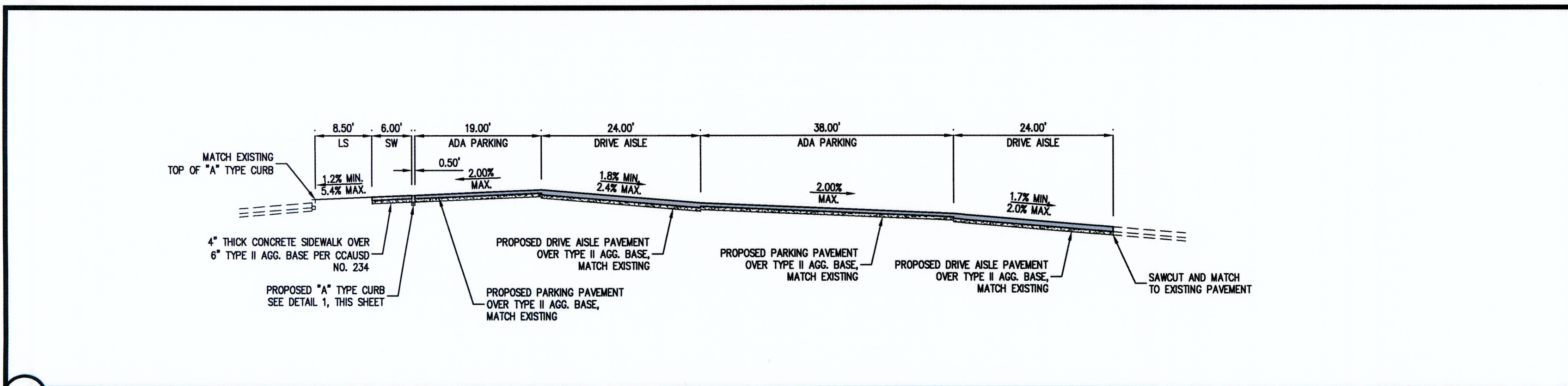
1. Mannings "n" = 0.013
2. Flows are from 100 year storm event.



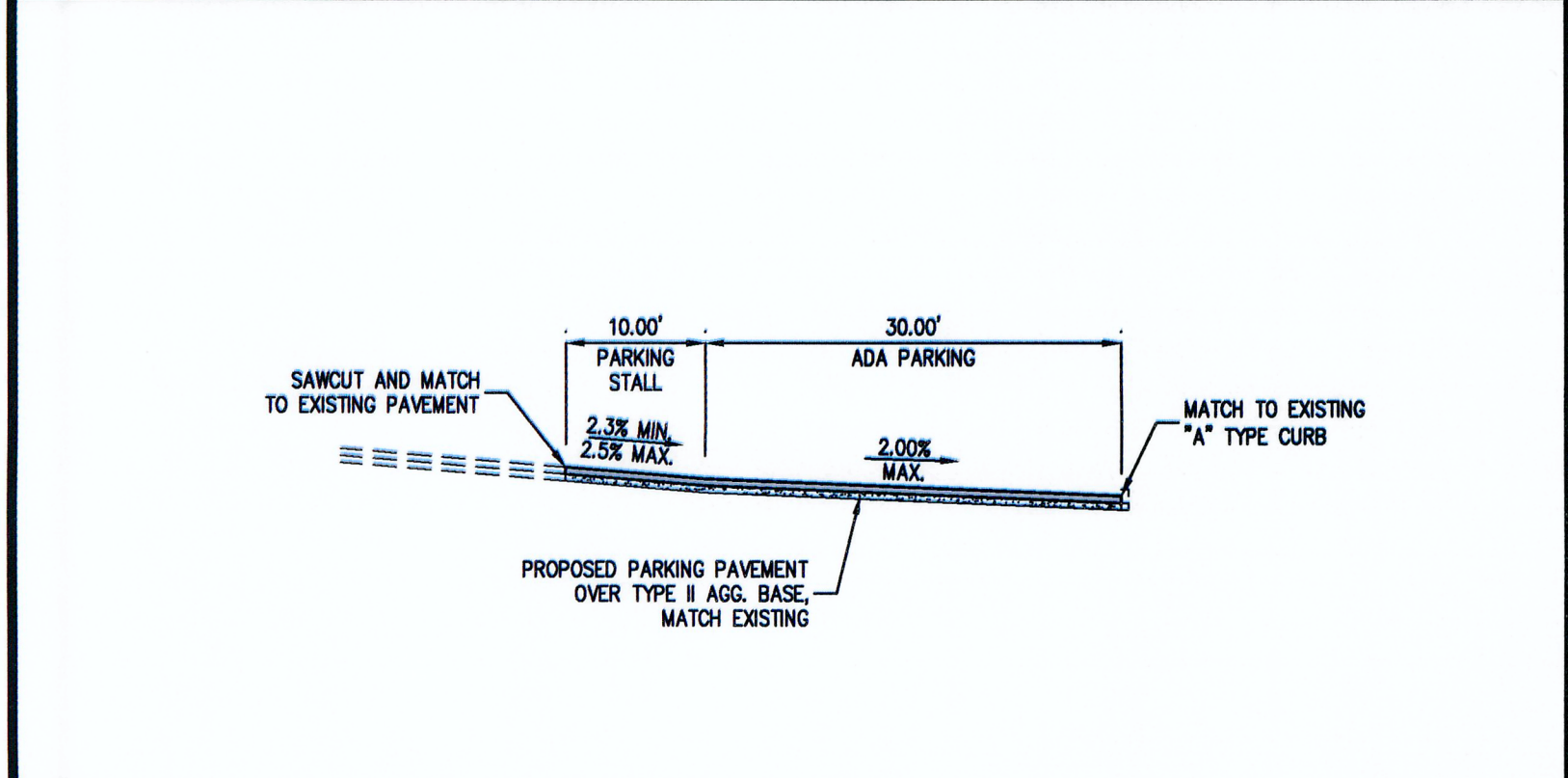
COSTCO WHOLESALE 999 Lake Drive Issaquah, Washington 98027 (206) 313-6652		DESIGNING W R G		REV. DATE BY _____
DEVELOPED BASIN EXHIBIT COSTCO WHOLESALE • SUMMERLIN CITY OF LAS VEGAS PORTION OF SECTION 35 AND 36, TOWNSHIP 20 SOUTH, RANGE 59 EAST MDM, CLARK COUNTY, NEVADA				
DATE: 11/10/00 DESIGNED: J. SLATER ENGINEER: J. SLATER CHECKED: _____ SCALE: _____	WRG PROJECT NO: MUL014			
SHEET TITLE: DEVELOPED BASIN SHEET NUMBER: EX-B CLV DRAWING NO.				



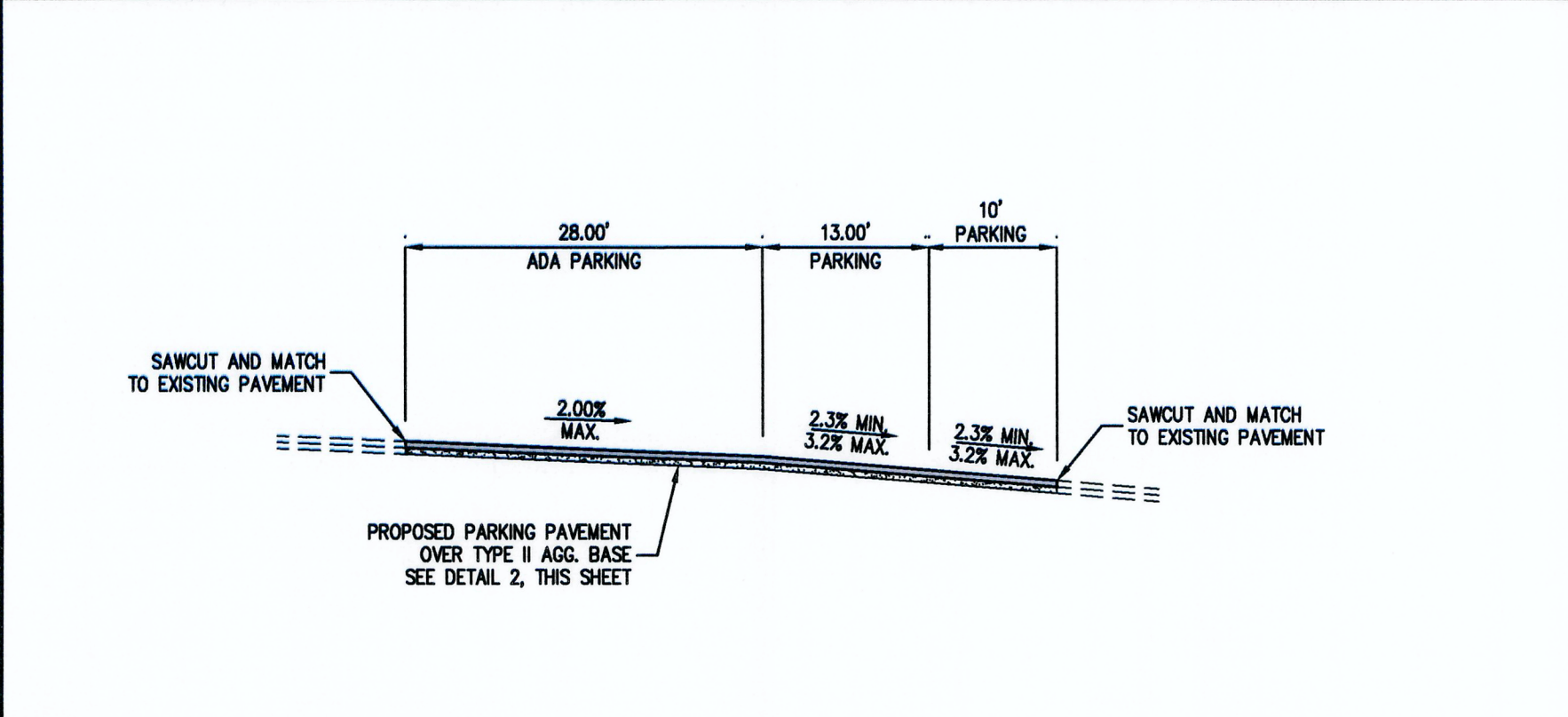
CL OR SURVEY LINE		EASEMENT LINE	DESCRIPTION:	BUILDING OUTLINE	EDGE OF PAVEMENT	"A" TYPE CURBS	"L" TYPE CURBS	WALLS	CONTOUR LINES	AC PAVEMENT	CONCRETE	SPOT ELEVATIONS	SIGNS	MANHOLE W/ DESCRIPTION	MANHOLE DESCRIPTIONS ① = SANITARY SEWER ② = STORM DRAIN ③ = ELECTRICAL	FIRE HYDRANTS	GATE VALVES	REDUCERS	CLEAN OUTS	UTILITY BOX OR VAULT	60' ROW LED STREETLIGHTS	80' ROW LED STREETLIGHTS	100' ROW LED STREETLIGHTS	INTERSECTION STREETLIGHTS	C4.01 SHEET DWG. No. 5 of 7 CLV DWG. No. -----
PROPERTY LINE		SAWCUT LINE	EXISTING: ROADWAY						(2210) 			(12.34) 34 		⑤ 			⑥ 		⑦ 						
ROW LINE		SCARP LINE	ROADWAY																						



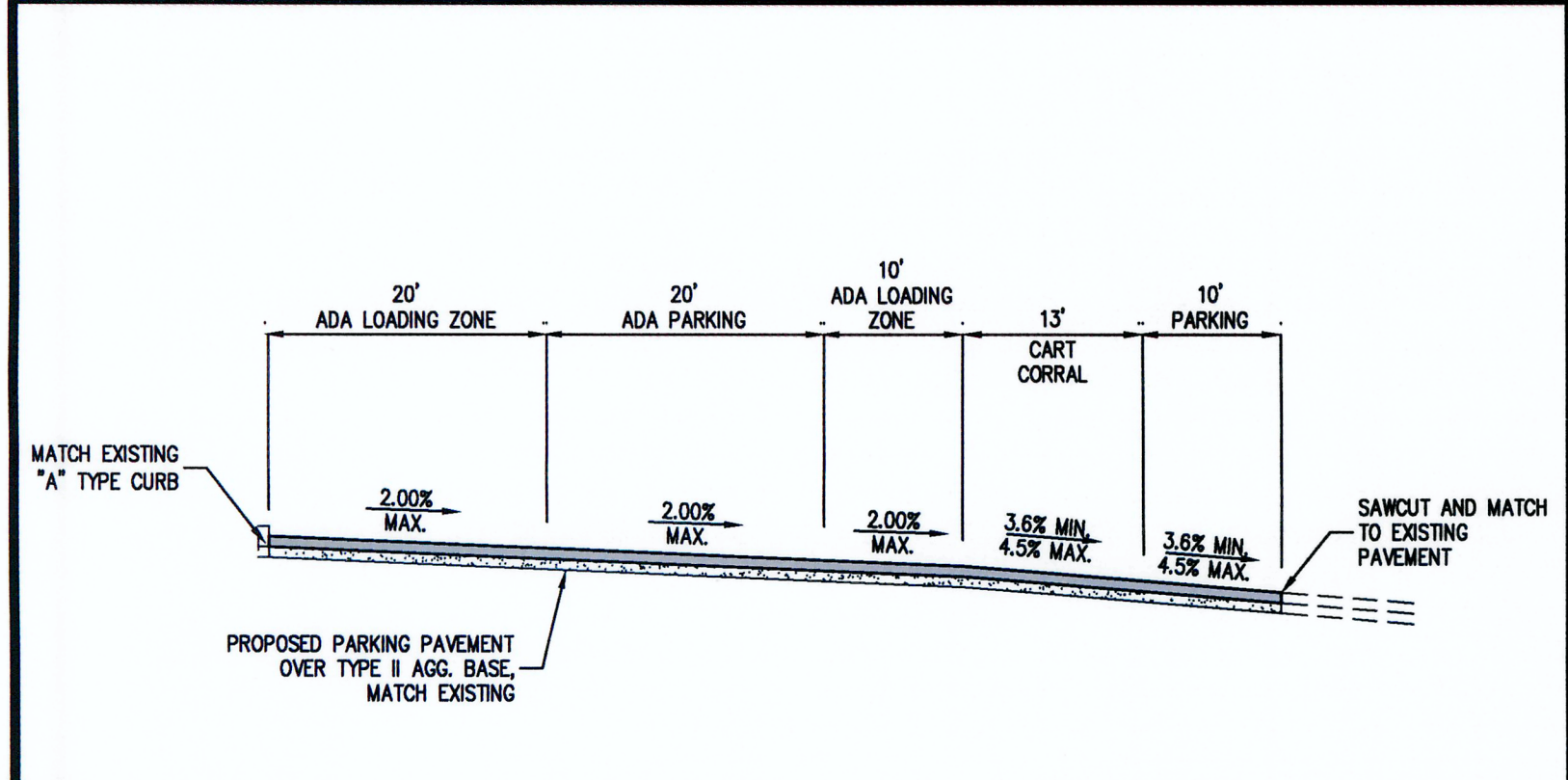
13 PARKING LOT SECTION NOT TO SCALE



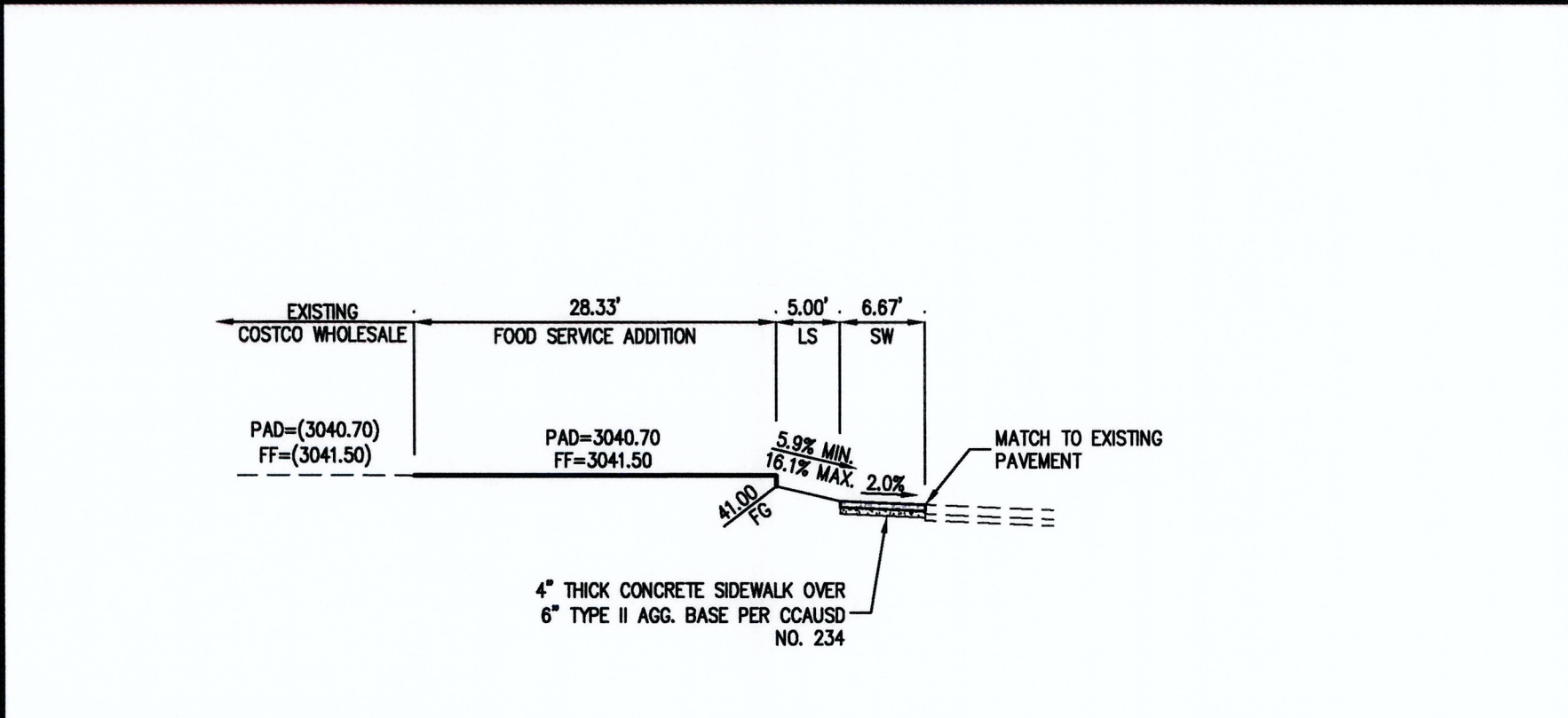
12 PARKING LOT SECTION NOT TO SCALE



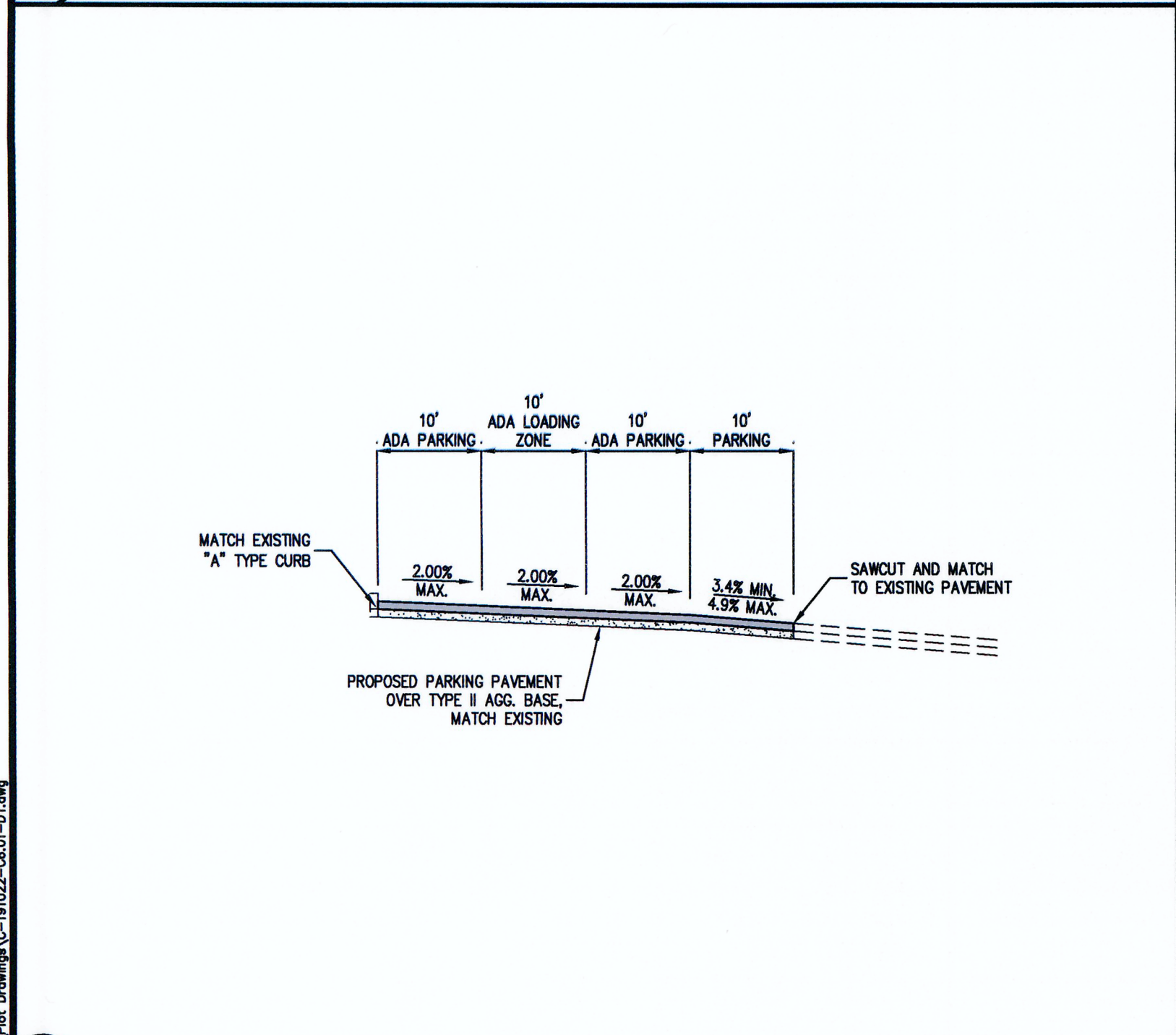
11 PARKING LOT SECTION NOT TO SCALE



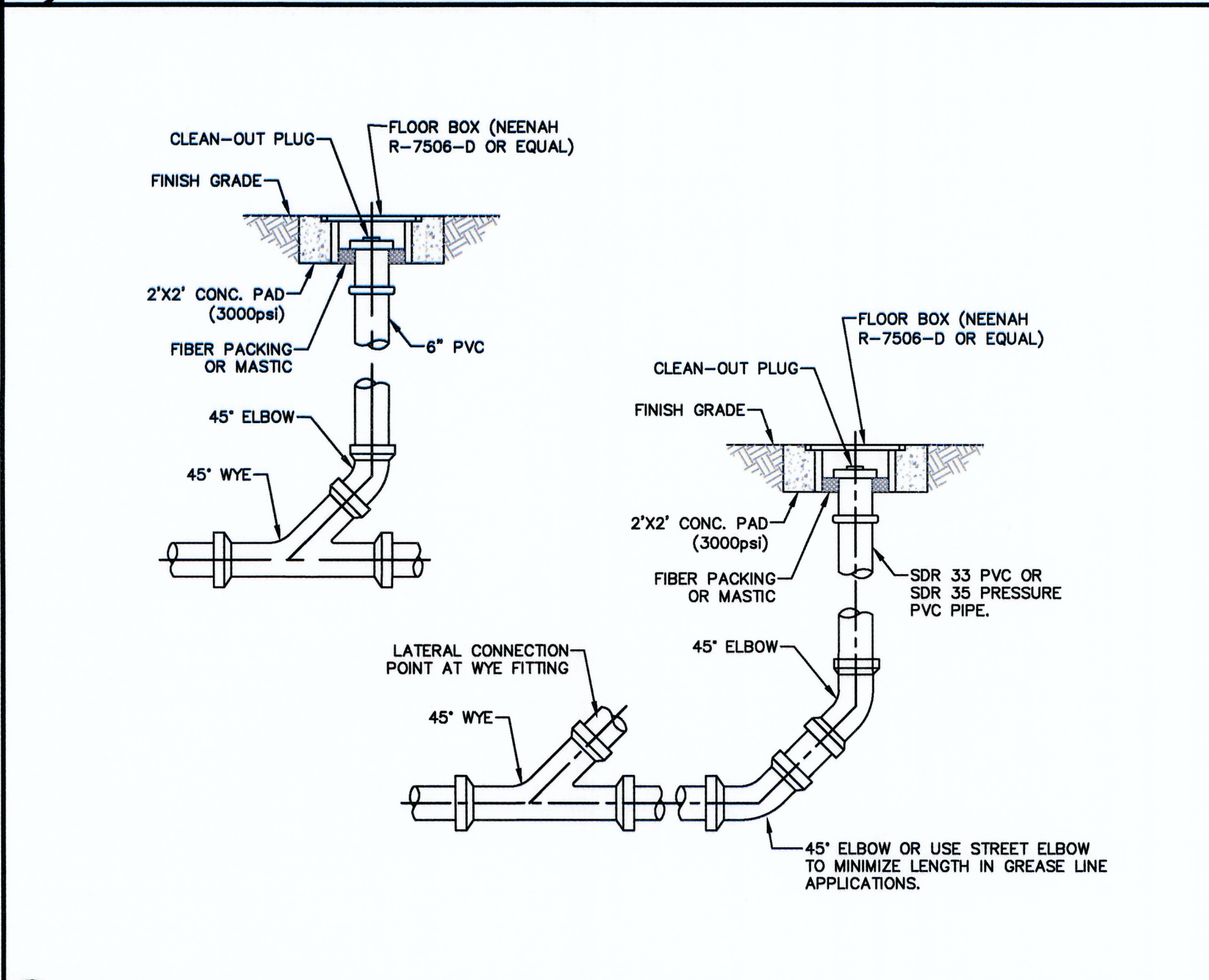
10 PARKING LOT SECTION NOT TO SCALE



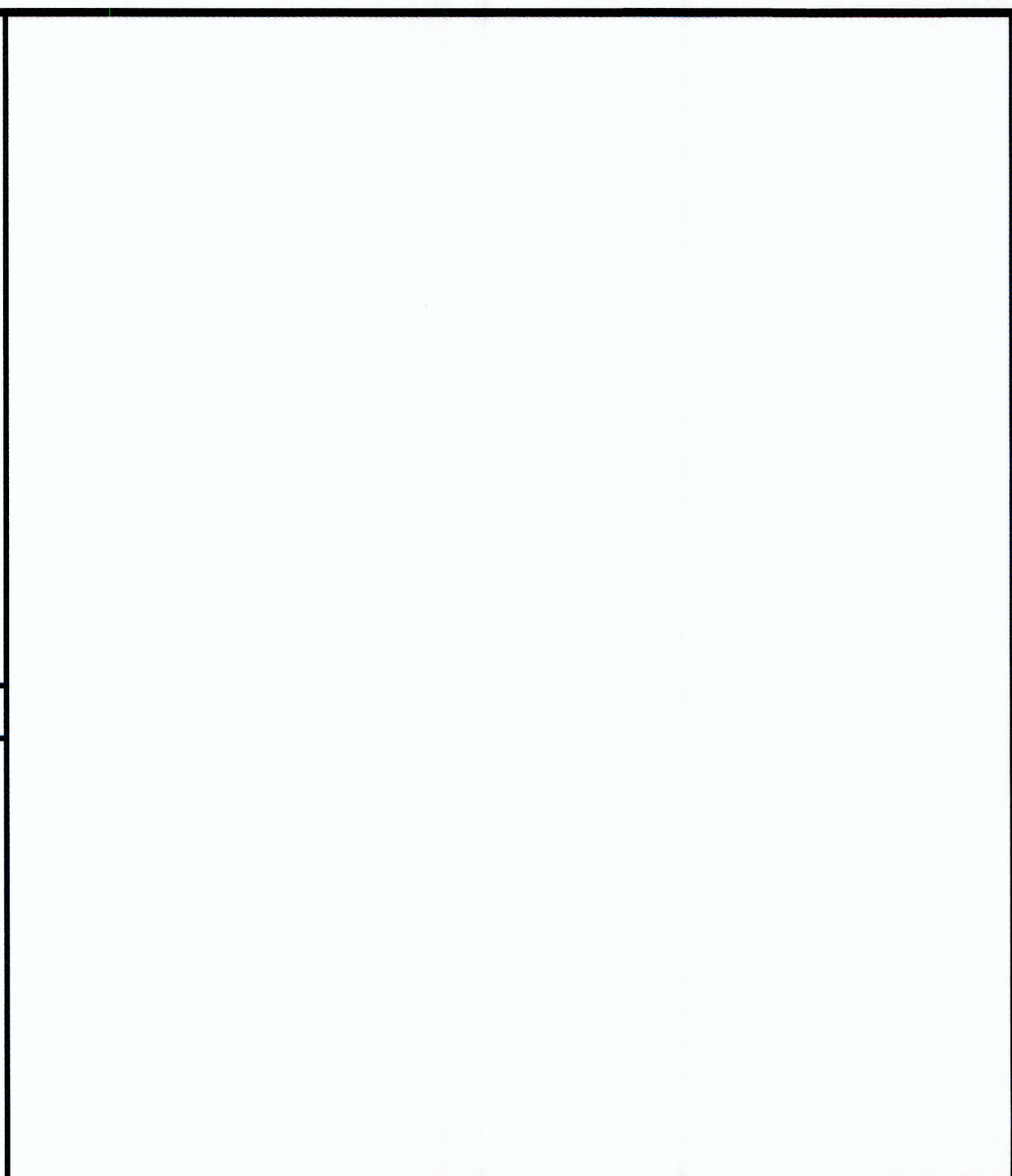
9 BUILDING ADDITION SECTION NOT TO SCALE



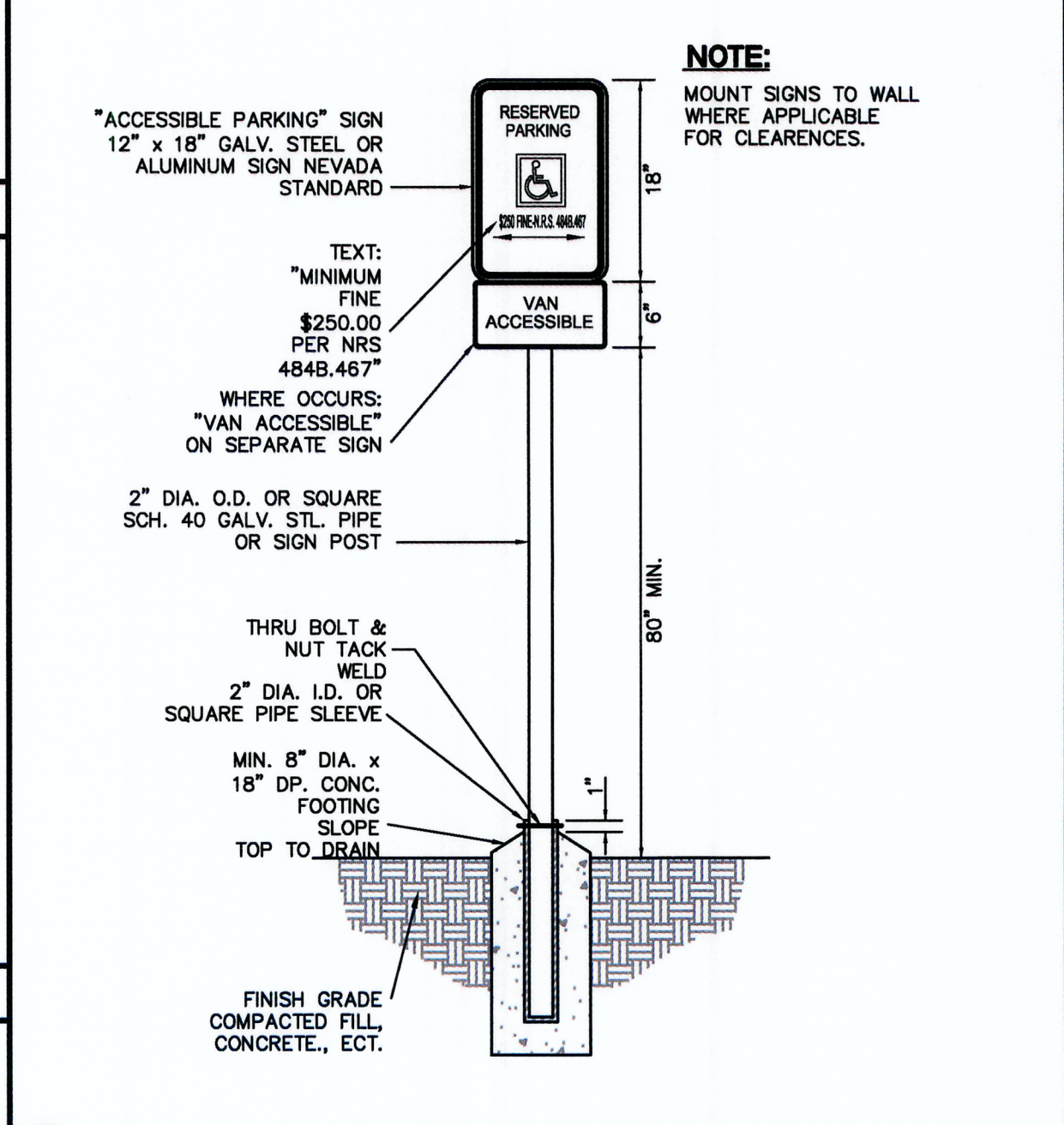
8 PARKING LOT SECTION NOT TO SCALE



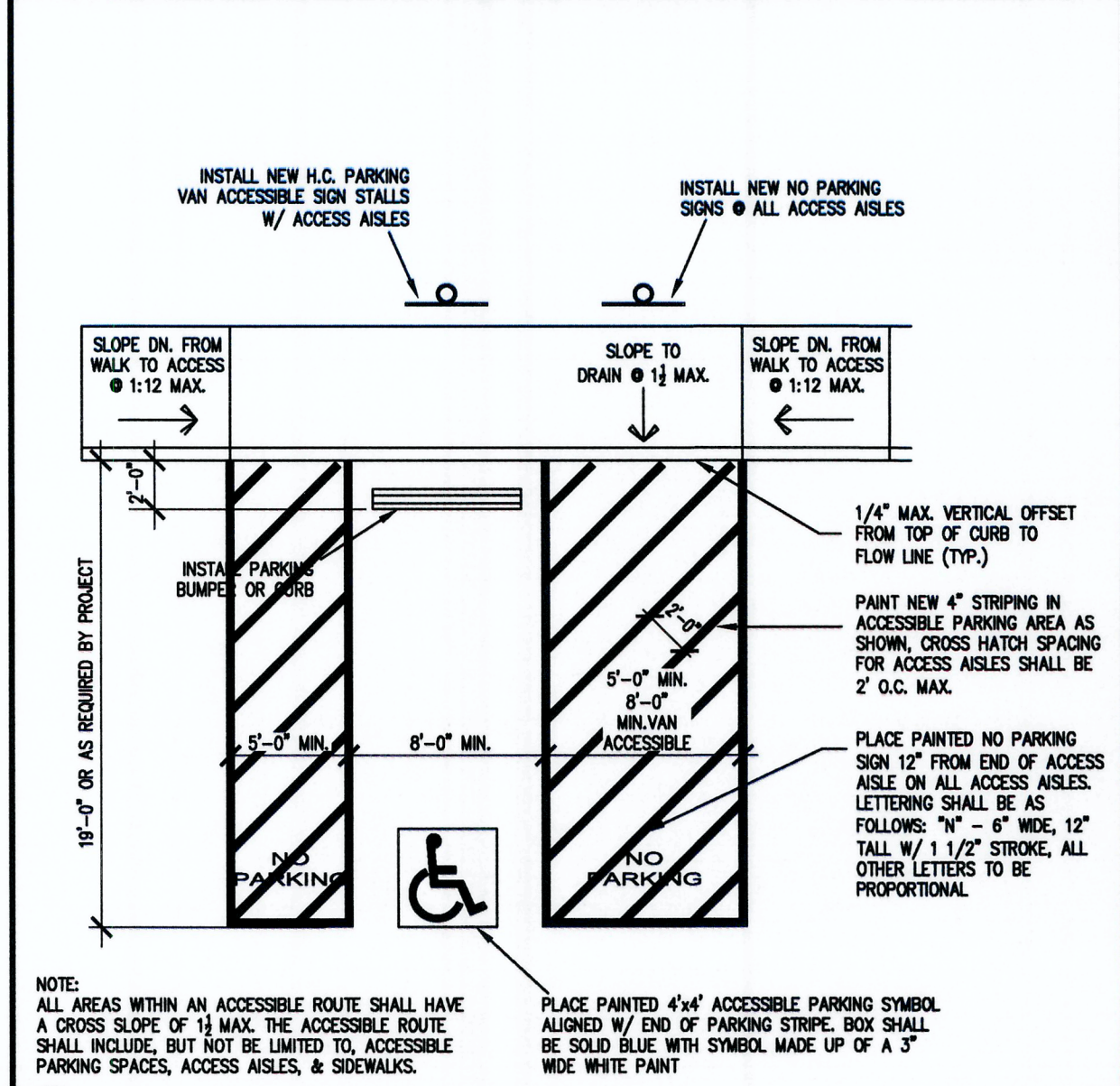
7 SEWER CLEAN OUT NOT TO SCALE



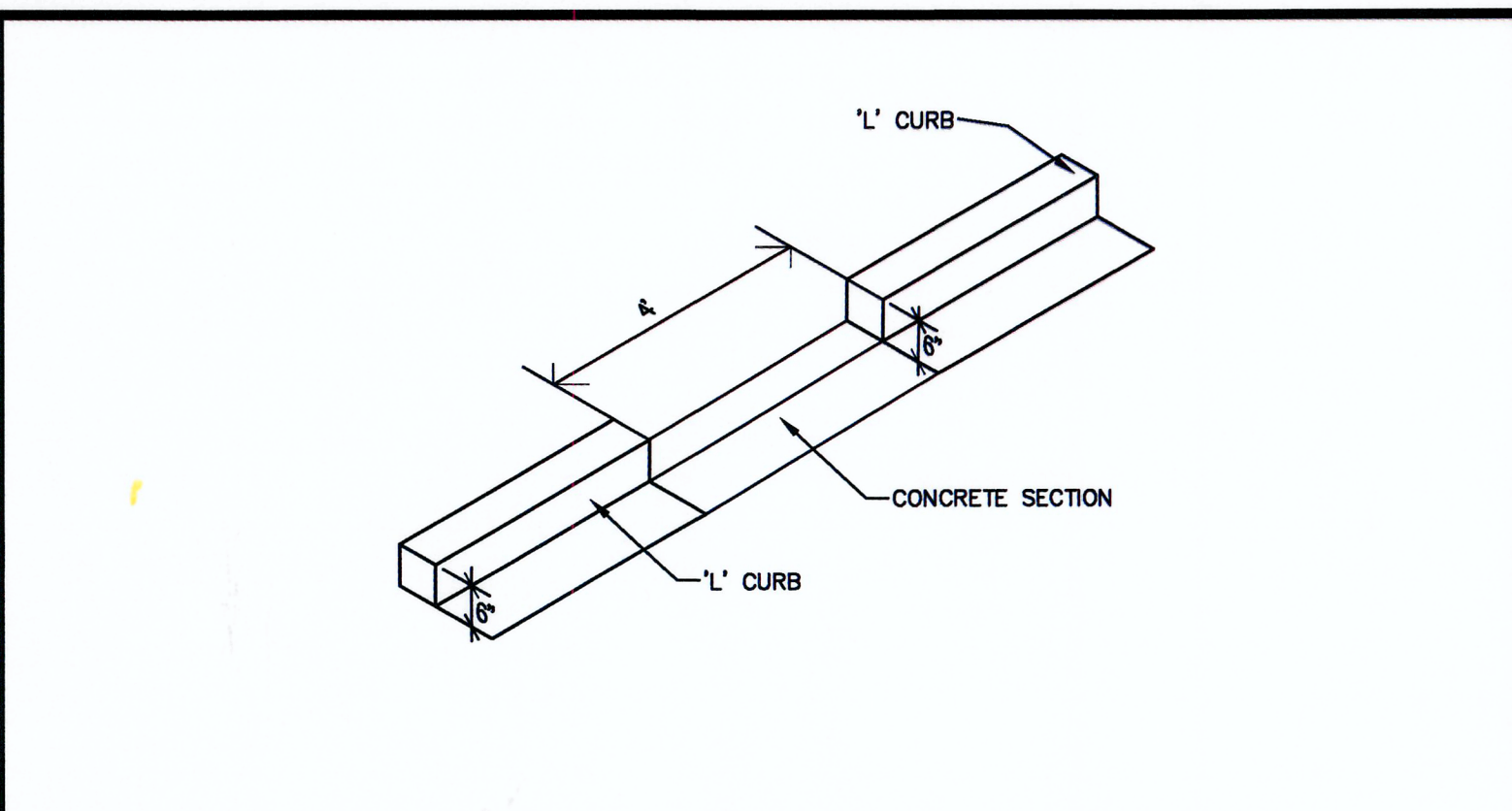
4' CURB OPENING NOT TO SCALE



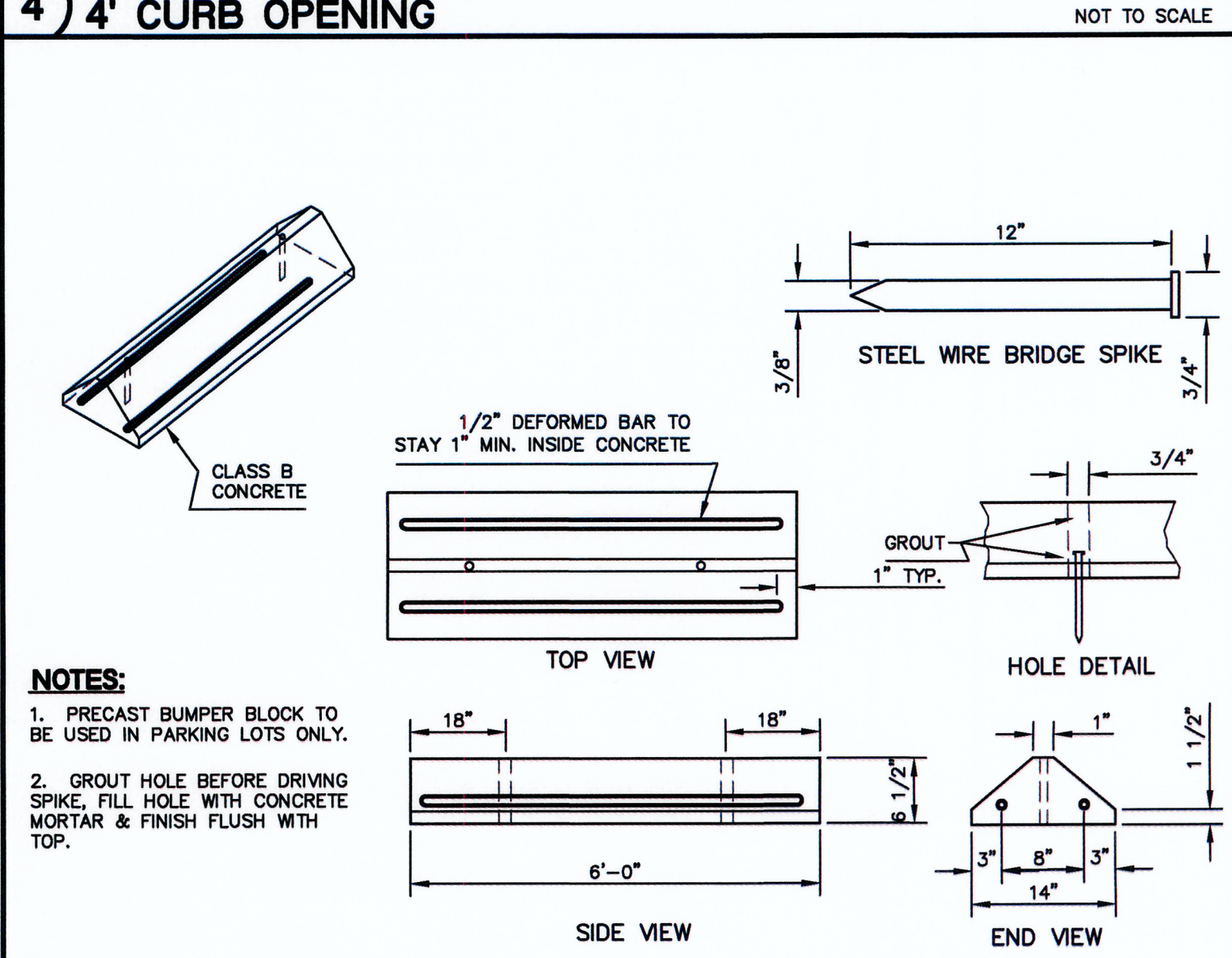
ACCESSIBLE PARKING SIGN NOT TO SCALE



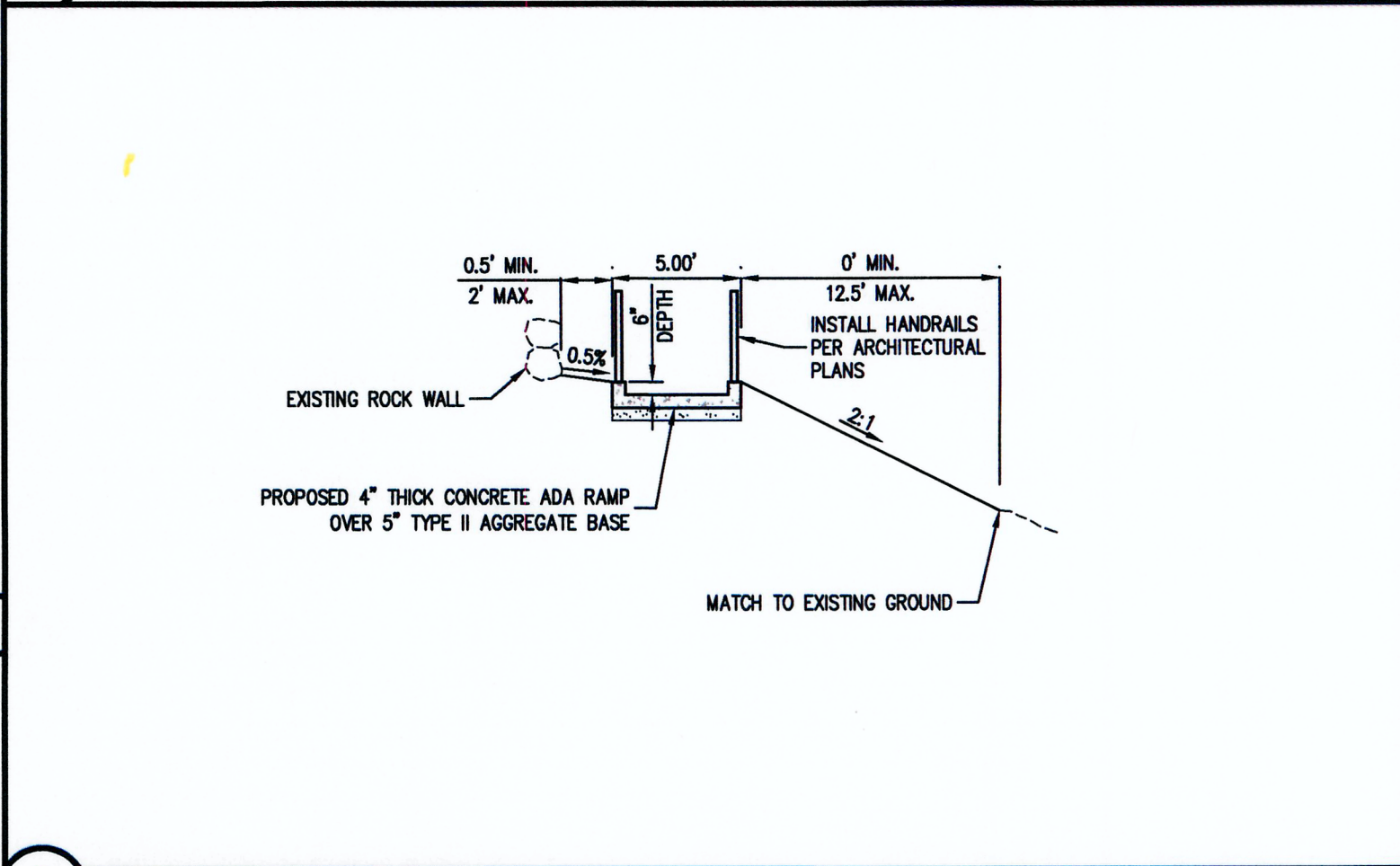
ACCESSIBLE PARKING DETAIL NOT TO SCALE



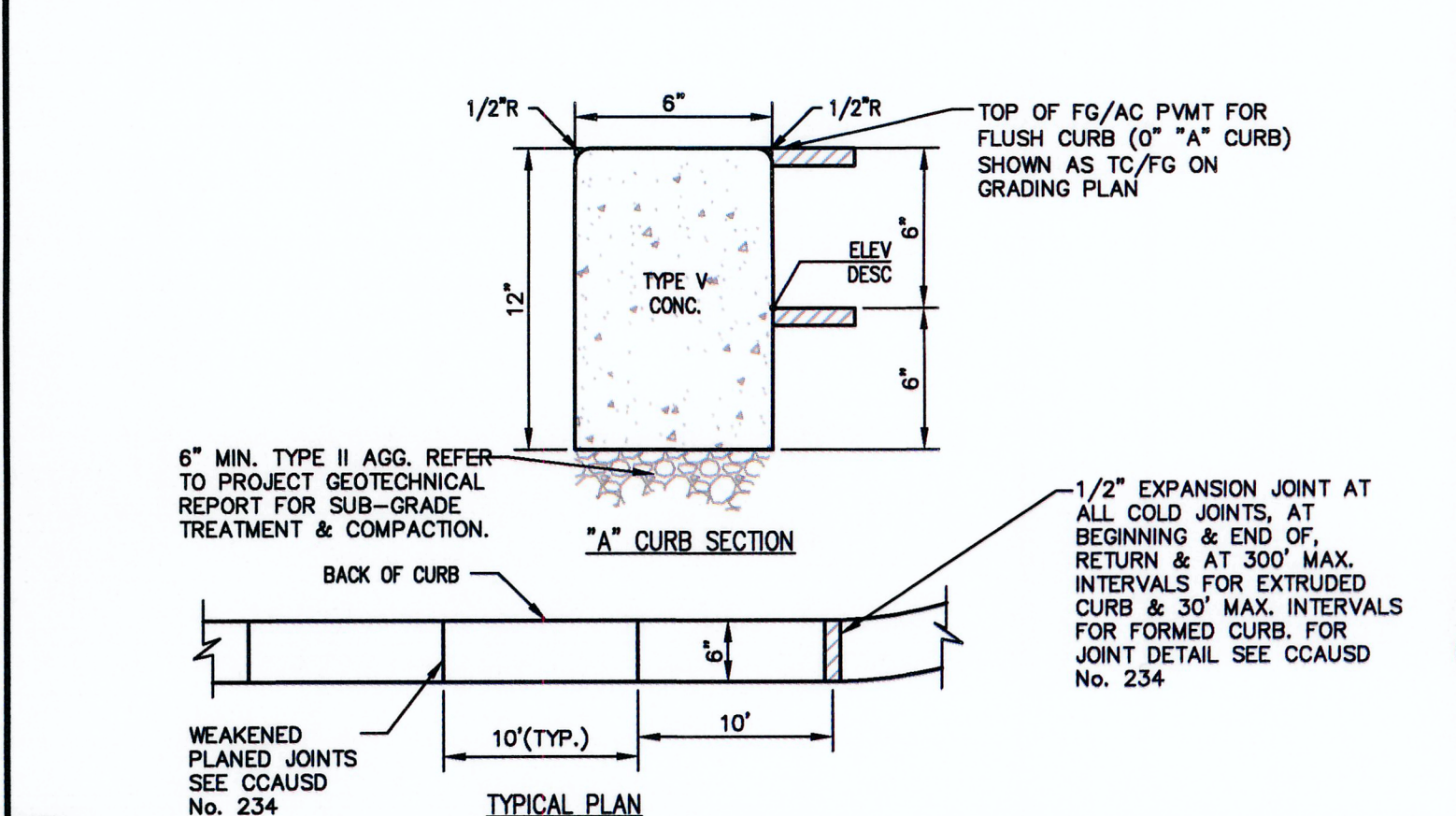
ON-SITE "A" TYPE CURB NOT TO SCALE



BUMPER BLOCK DETAIL NOT TO SCALE



ADA RAMP SECTION NOT TO SCALE



ON-SITE "A" TYPE CURB NOT TO SCALE

CL OR SURVEY LINE	EASEMENT LINE	DESCRIPTION:	BUILDING OUTLINE	EDGE OF PAVEMENT	"A" TYPE CURBS	"L" TYPE CURBS	WALLS	CONTOUR LINES	AC PAVEMENT	CONCRETE	SPT ELEVATIONS	SIGNS	MANHOLE W/ DESCRIPTION	MANHOLE DESCRIPTIONS	FIRE HYDRANTS	GATE VALVES	REDUCERS	CLEAN OUTS	UTILITY BOX OR VAULT	60' ROW LED STREETLIGHTS	80' ROW LED STREETLIGHTS	100' ROW LED STREETLIGHTS	INTERSECTION
---	---	EXISTING:	---	---	---	---	---	---	---	---	(12.34) BC	---	---	---	---	---	---	---	---	---	---	---	---
---	---	PROPOSED:	---	---	---	---	---	---	---	---	(12.34) BC	---	---	---	---	---	---	---	---	---	---	---	---

Lochsa
engineering

8345 South Jones Blvd.
Suite 100
Las Vegas, NV 89119
Tel: (702) 385-8317
Fax: (702) 385-8317
www.lochsa.com

DETAIL SHEET

COSTCO EXPANSION
BLVD/PAVILLION CENTER DRIVE
CITY OF LAS VEGAS

PROJECT No.: 191022

DATE: 10/23/19

SCALE: N/A

DRAWN BY: KRJ

DESIGNED BY: KRJ

CHECKED BY: TTE

10/23/2019

SHEET No. C6.01

SHEET 7 OF 7

CLY DWG No. ---