

DS #: 05202

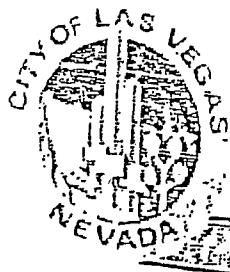
APN: 126-25-201-010

PROJECT: Centennial Heights Townhomes

SUBMITTAL: 4th

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		June 29, 2020
TO: Land Development Services Department of Building & Safety		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for:	COPIES TO:
Centennial Heights Townhomes		Horrocks Engineers
Cross Streets:	SWQ of Centennial Pkwy & Shaumber Road	Harmony Homes, LLC
File Number:	F:\Depot\DSMemos\DS5232D.doc	Bart Anderson, P.E., DevCo
Parcel Number:	126-25-201-010	CCRFCD
Zoning Action:	TMP-77575; VAC-77574; VAR-77573 & ZON-77572	
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES X	NO

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	12/30/2019	1/31/2019	Not Approved	\$400.00	3688174: \$400
2 nd Submittal	3/12/2020	4/12/2020	Not Approved	\$400.00	3776765: \$400
3 rd Submittal	5/1/2020	5/25/2020	Not Approved	\$400.00	3831188: \$400
4 th Submittal	6/12/2020	6/29/2020	See Comments Below	\$400.00	3881168: \$400
TOTAL FEES (LDDRS):				\$1,600.00	----

REMARKS:

***** The Conditional Approval of this Drainage Study is to allow the engineer/developer to submit the Improvement Plans to City Land Development Only**

***** Do not submit the Drainage Study to Clark County Regional Flood Control District (CCRFCD) prior to the Structural Design and Calculations being approved by the City Building & Safety Department**

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

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

- This drainage study is acceptable in concept;** however, *City of Las Vegas* will not formally accept the study until the *Clark County Regional Flood Control District (CCRFCD)* has issued a letter of concurrence. The engineer should contact the CCRFCD to confirm that they have begun their review.

Please note that effective April 6, 2020, only electronic submittals to the CCRFCD will be accepted for regional concurrence. Contact cwang@regionalflood.org for direction.

2. The project proposes to build two (2) temporary drainage facilities (graded channels with ripraps), one along the west boundary of the subject site and one further west along the future **Sheep Mountain Parkway** alignment. Prior to final plan approval the developer must complete a maintenance and liability agreement for the interim drainage improvements (off-site 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.

3. Structural plans for special design storm drain facilities (such as but not limited to SDMH#1, SDMH#4 & SDMH#5) must be submitted for review. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the *City of Las Vegas Building Department* for processing. The engineer must provide a copy of *Building Department* approval of the structures to *Flood Control* prior to final approval of the drainage study.

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
HDR/AYS

T/R/S: T19S/R59E/25
AREA F-25

**To: City of Las Vegas
Development Review
333 N Rancho Dr.
Las Vegas, NV 89106**

From: David Clark

Date: June 11, 2020

Transmittal

**Subject: Technical Drainage Study for Centennial Heights Townhomes Park,
(APN 126-25-201-010), DS 5232**

The following items are: ☐ Requested

☒ Enclosed

☐ Sent Separately

via Courier

No. of Copies	Description
1	Subject Addendum #3
1	CD
1	Phase 1 Grading Plans (Folded), Sheet C.6.0
1	Phase 2 Grading Plans (Folded), Sheet C.6.0

These data are submitted:

☒ For your review and Approval

Signature

ADDENDUM #3

TO THE

TECHNICAL DRAINAGE STUDY

FOR

CENTENNIAL HEIGHTS TOWNHOMES

IN

CITY OF LAS VEGAS, NEVADA

PREPARED FOR

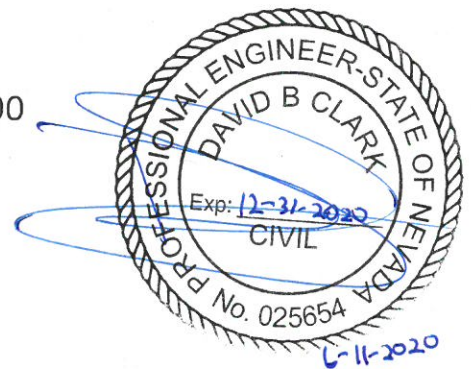
HARMONY HOMES, LLC

8912 Spanish Ridge Ave. Ste. 200

Las Vegas, NV, 89148

Ph. (702) 570-7240

JUNE 2020



HORROCKS ENGINEERS PROJECT NV-1949-1909

Horrocks Engineers

1401 N Green Valley Pkwy, Suite 160

Henderson, NV 89074

702.966.4063

HORROCKS

ENGINEERS

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: CENTENNIAL HEIGHTS TOWNHOMES, DS 5232 Date: 06-11-2020
Location of Development: a) Descriptive (Cross Streets) North/South: Shaumber Rd
East/West: Centennial Pkwy
b) Section: 25 Township: 19S Range: 59E
c) APN: 126-25-201-010

Name of Owner: HARMONY HOMES, LLC
Telephone No.: (702) 570-7240 Fax No.: _____ E-Mail Address: mrosenberg@harmonyhomes.com
Address: 8912 Spanish Ridge Ave. Ste. 200, Las Vegas, NV, 89148

Contact Person-Name: David B. Clark Telephone No.: 702.966.4063
* E-Mail Address: dclark@horrocks.com Fax No.: _____
Firm: Horrocks Engineers
Address: 1401 N Green Valley Pkwy, Suite 160 Henderson, NV 89014

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	OFFSITE ROADWAY/IMPROVEMENTS

1. Total Owned Land Area: At Site: 30+/- acres Being Developed/Disturbed: 30+/- 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.): Residential - Townhomes
5. Approximate upstream land area which drains to the subject site: 155 acres
6. Has the site drainage been evaluated in the past? ☐ YES ☒ NO If yes, please identify documentation: _____
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site:
The site discharges at 3 locations along eastern boundary of the northern half of the project site, and into the Tropical ROW at the southeast corner of the site
8. Briefly describe your proposed schedule for the subject project: ASAP



Engineer's Seal

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

***New Required Field**

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

Local Entity File No.	Revision	Date

REFERENCE:

STANDARD FORM 1

June 11, 2020

Albert Sung, P.E.
Department of Public Works
City of Las Vegas
333 N. Rancho Drive
Las Vegas, NV, 89106

**RE: Addendum #3 to Technical Drainage Study for Centennial Heights Townhomes
DS 5232**

Dear Mr. Sung,

Horrocks Engineers hereby submits Addendum #3 to the Technical Drainage Study for Centennial Heights Townhomes DS 5232, which responds to the City's comments dated May 25, 2020. The comments are listed below together with the associated responses.

CNLV COMMENTS AND RESPONSES

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

Please note that effective March 15, 2019, the CCRFCD adopted new requirements for drainage study concurrence submittal. Follow the link below for specific guidance.

<http://qustfront.ccrfcd.org/LandDev/LandDev.aspx>

RESPONSE: Noted. The Study and all Addenda will be submitted to CCRFCD upon conditional approval from CLV. The changes to CCRFCD requirements are noted.

2. The project proposes to build two (2) temporary drainage facilities (graded channels with ripraps), one along the west boundary of the subject site and one further west along the future *Sheep Mountain Parkway* alignment. Prior to final plan approval the developer must complete a maintenance and liability agreement for the interim drainage improvements (off-site 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.

RESPONSE: Noted. The Engineers estimates of quantities' was previously included with the submittal for Addendum #2. The design of the offsite berms and channels has not been revised for this submittal. The City's Land Development Section will be contacted upon conditional approval. It is understood that an update or letter will be required to justify that the berms and/or channels are not longer necessary and can be removed.

3. Previous Comment #38 *requesting about how in the future when "GOAN 0000" is extended to the west from the west end of the site to the existing Ann Road Detention Basin Outfall Pipe GOAN 0044 but the response was not to the point.*

On Sheet C.5.12, from SDMH #2, rotate the upstream pipe to align with the downstream pipes. SDMH #1 will be in the street centerline of Tropical Parkway as like the other manholes. Provide a 78"-stub at SDMH #1 to the west for future connection. Revise all pertinent plans such as Sheet C.5.12 and Sheet C.2.0 accordingly.

The comment to require the storm drain in alignment with downstream pipes will save the reopening of street pavement at SDMH #1 going east when the connection of *Ann Road Detention Basin Outfall Pipe* is constructed. Review and revise accordingly.

RESPONSE: The storm drain near the Puli alignment and Tropical Parkway has not been relocated per the comment. After a virtual meeting with CLV on June 3, 2020, the comment and the surrounding area was discussed including the issues regarding the proposed facilities by the westerly site (by Olympia and Westwood), the existing ROW alignment and possible future ROW alignment and widths. The proposed location of the SDMH#1 avoids various issues that arise from relocating the alignment. Per the meeting, Horrocks to submit justifications for the storm drain alignment. Justification for the location of SDMH#1 and the alignment of the adjoining storm drain include:

1. Tropical Parkway was realigned at Puli to avoid the NV Energy Transmission Pole at the request of CLV Public Works during the tentative map approval. The storm drain alignment accounts for this realignment.
2. The current location of the manholes/storm drain accommodates the re-aligned 80 ft roadway width and maintains SDMH#1 within the pavement (avoiding curb, gutter and sidewalk.) as requested during a discussion with Westwood.
3. The current location will accommodate a future transition to a 60' street for the Olympia development to the west. The reduction in ROW width is not finalized, but our ongoing coordination with Olympia and Westwood indicates to us that it is a possibility. The ROW width along Centennial Heights Townhomes project frontage is not proposed to be reduced to 60 ft.
4. The proposed storm drain/manhole location is within the current ROW. Revising the facility location to outside the ROW would trigger additional coordination and agreements with the landowner to the south (BLM) including a permissions to grade agreements.
5. The current location will avoid a relatively deep excavation within the existing NV Energy easement and existing 20'x40' NV Energy maintenance pad area which could jeopardize the corner anchor transmission pole stability.
6. The current design accommodates the submitted Westwood storm drain design as submitted with their TDS (DS). The pertinent grading plan sheets from the Westwood Study can be found in the Appendix.

4. **Structural plans for special design storm drain facilities (such as but not limited to SDMH#1, SDMH#4 & SDMH#5) must be submitted for review. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the *City of Las Vegas Building Department* for processing. The engineer must provide a copy of *Building Department* approval of the structures to *Flood Control* prior to final approval of the drainage study.**

RESPONSE: The soils report, structural calculations, and specifications, and structural sets for the special design storm drain facilities will be submitted to the *CLV Building Department* for processing upon receipt of conditional approval of the TDS. It is noted that final drainage study approval is dependent on the *Building Department* approval of the structures. Upon receipt of *Building Department* approval, a copy will be forwarded to *Flood Control*.

5. **Revise all callout for solid grouted wall to be 8"-thickness CMU or equivalent in all pertinent detail sections.**

RESPONSE: The callouts for the solid grouted walls have been revised to be, "8" thickness CMU or equivalent" on all pertinent detail sections. See the details sheets submitted with this addendum.

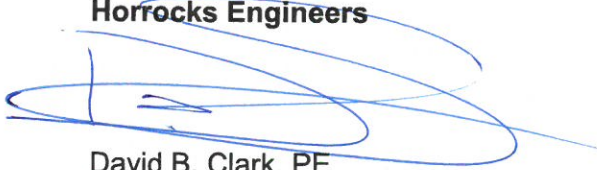
6. **In *Phase 2 Improvement Plans, Detail Section G3/C.6.0*, show a proposed storm drain / bubbler in the detail.**

RESPONSE: The bubbler is proposed with the Phase 1 improvements. The phase 2 detail Section G3/C.6.0 now labels the proposed storm drain/bubbler as "ex drop inlet/bubbler per Phase 1 plans." the detail Section G3/C.6.0 now labels the proposed storm drain/bubbler in the detail appropriately.

It is anticipated that the responses above and the attached Addendum #3 fully address the City comments. We respectfully request City approval of the Technical Study. Please don't hesitate to contact us with any questions.

Sincerely,

Horrocks Engineers



David B. Clark, PE

Engineer

Appendix A – Revised and Additional Calculations

CLV Comment Letter

Tropical Parkway ROW alignments Exhibits

BLM 270 Infrastructure Centennial parkway TDS Figures

CITY OF LAS VEGAS		DATE:
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Parcel Number:	126-25-201-010	CCRFCFCD
Zoning Action:	TMP-77575; VAC-77574; VAR-77573 & ZON-77572	
FEMA Flood Zone	YES NO X	
Proposed Storm Drain	YES X NO	

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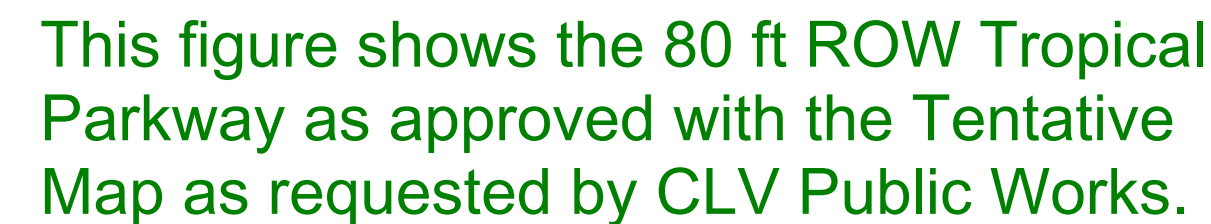
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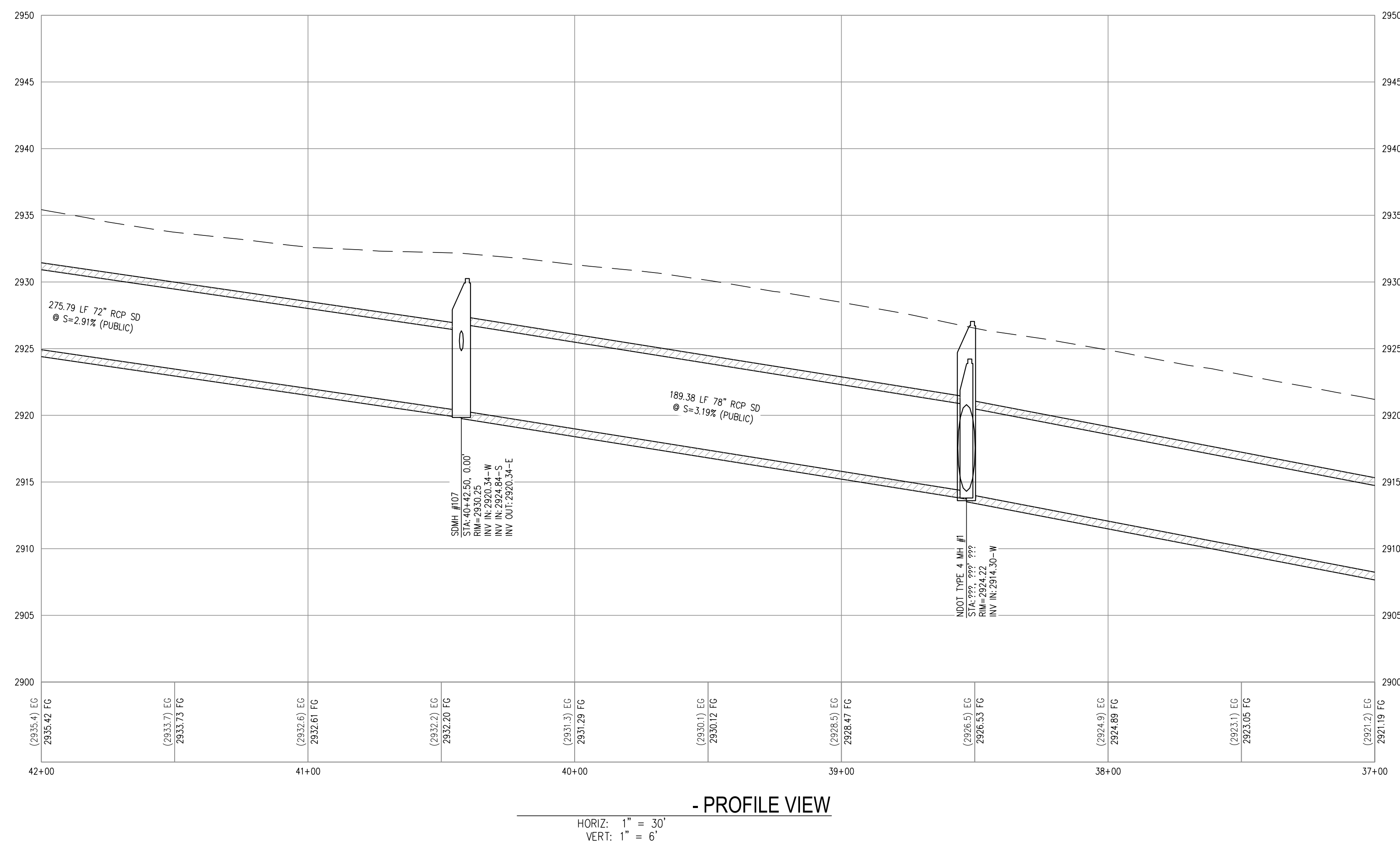
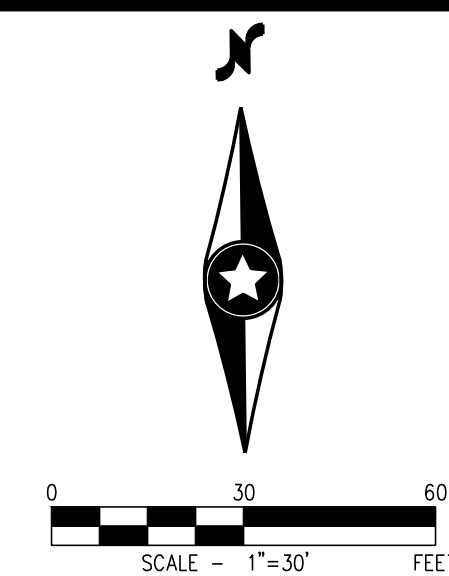
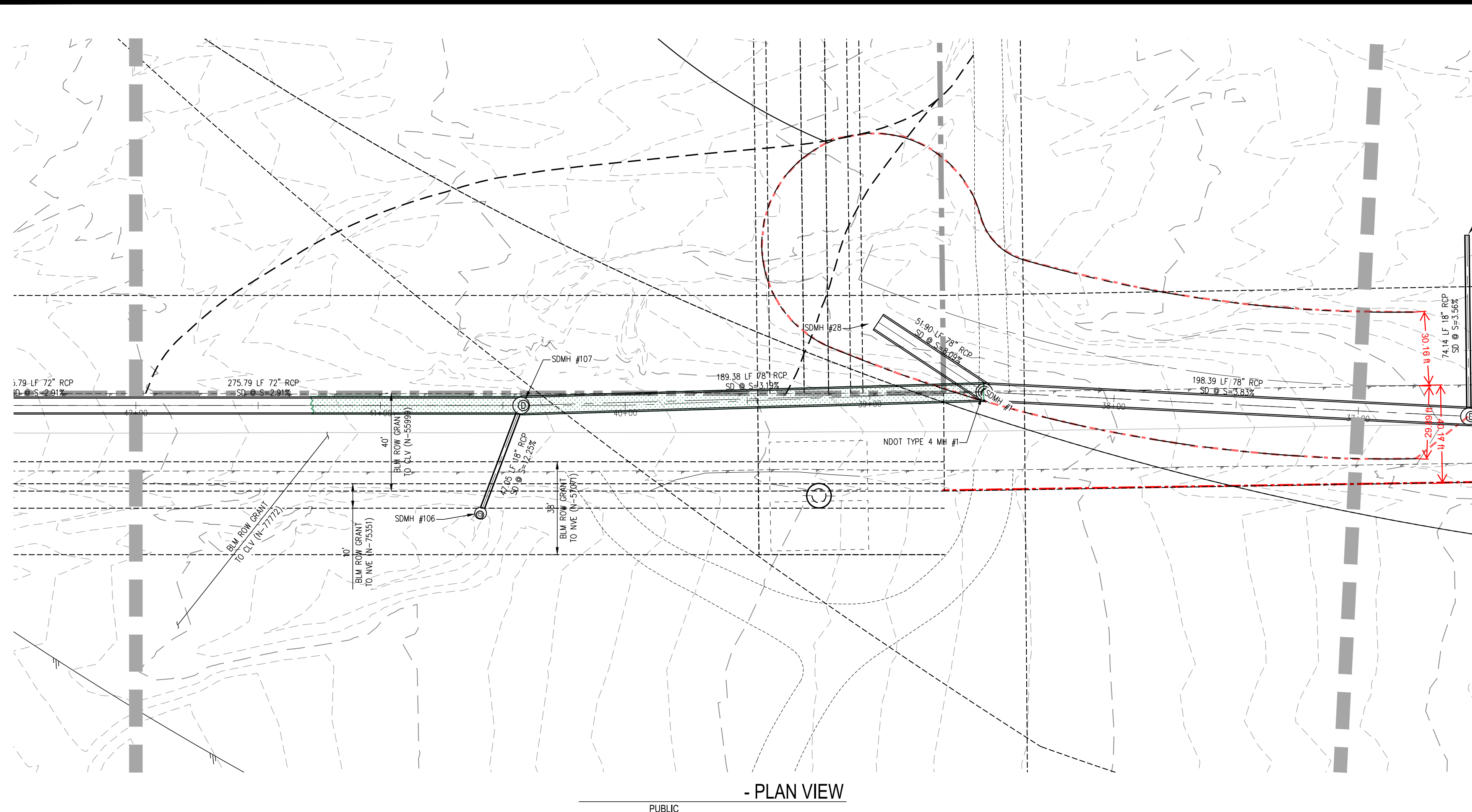
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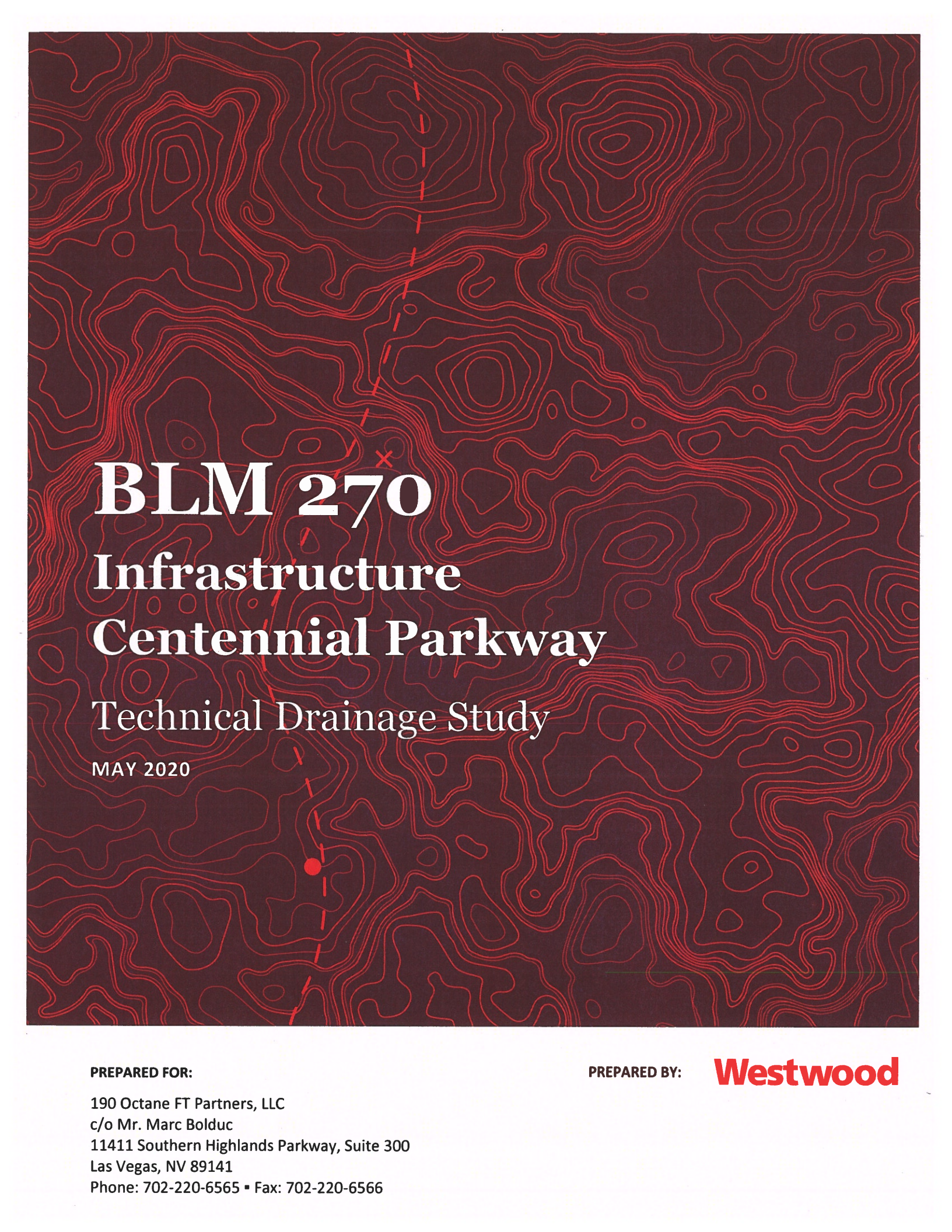
END OF REMARKS
HDR/AYS

T/R/S: T19S/R59E/25
AREA F-25



PAGE 34





BLM 270

Infrastructure

Centennial Parkway

Technical Drainage Study

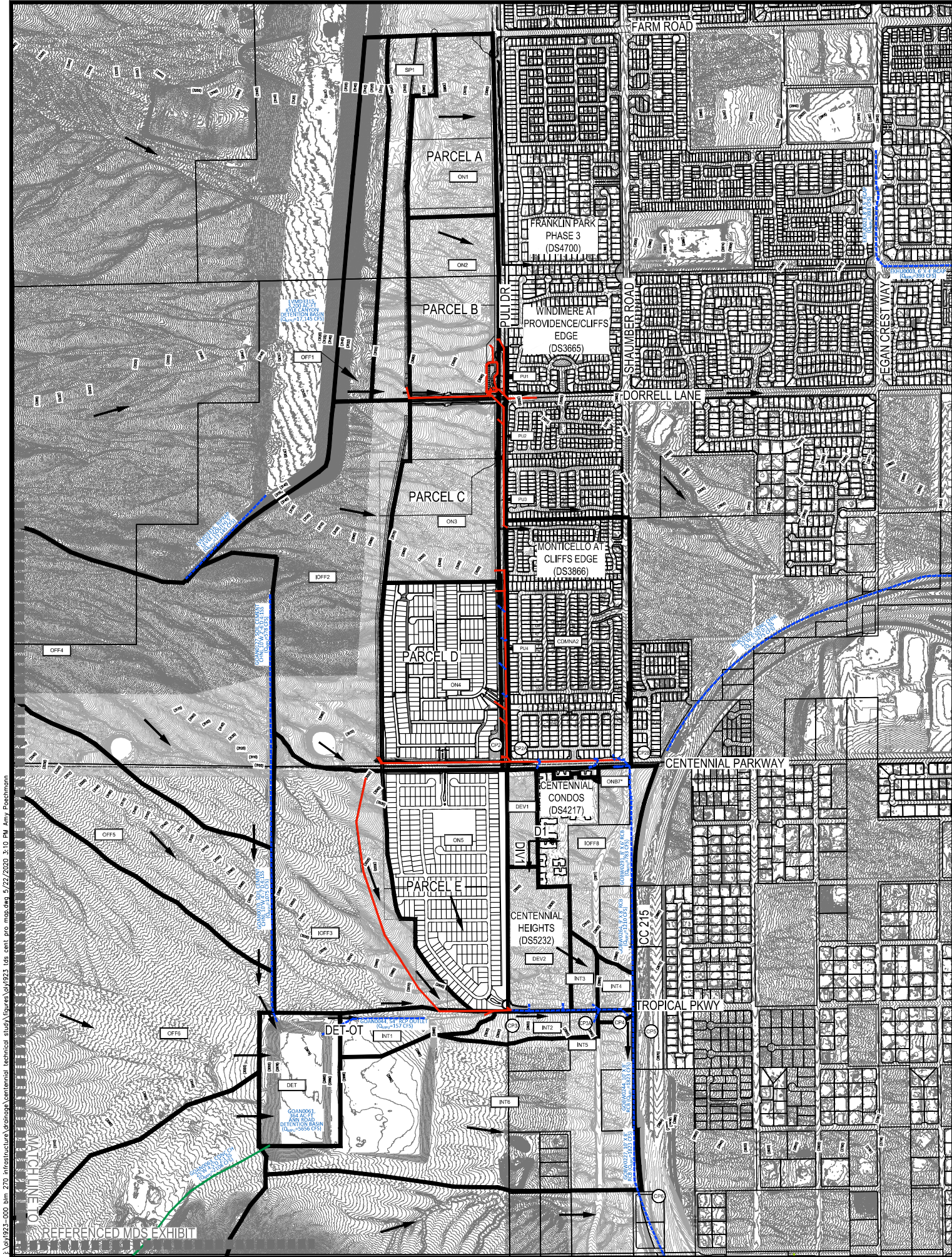
MAY 2020

PREPARED FOR:

190 Octane FT Partners, LLC
c/o Mr. Marc Bolduc
11411 Southern Highlands Parkway, Suite 300
Las Vegas, NV 89141
Phone: 702-220-6565 ▪ Fax: 702-220-6566

PREPARED BY:

Westwood



LEGEND

- BASIN BOUNDARY
- EXISTING DRAINAGE FACILITY
- PROPOSED DRAINAGE FACILITY
- FUTURE DRAINAGE FACILITY
- BASIN ID
- CONCENTRATION POINT ID
- FLOW DIRECTION
- FLOWMASTER SECTION
- FACILITY ID

Proposed Condition Flow Rate Summary			
Basin/Concentration Point ID	Area (mi ²)	Q ₁₀₀ (cfs)	Q ₁₀ (cfs)
ON1	0.06	53	13
ON2	0.07	121	50
ON3	0.08	155	75
ON4	0.09	167	92
ON5	0.11	193	88
SP1	0.05	87	36
OFF1	0.06	75	27
IOFF2	0.17	202	80
IOFF3	0.14	216	83
OFF4	0.34	508	200
OFF5	0.32	392	157
OFF6	1.81	2311	987
OFF7	1.25	1429	610
IOFF8	0.07	122	49
PUL1	0.00	4	2
PUL2	0.00	5	2
PUL3	0.00	9	4
PUL4	0.01	12	6
DET	0.05	80	33
DEV1	0.01	29	14
DEV2	0.04	61	25
INT1	0.02	27	8
INT2	0.02	25	10
INT3	0.01	3	<1
INT4	0.01	3	<1
INT5	0.00	2	1
INT6	0.19	299	115
ONB7*	0.00	3	2
CDMNA2**	0.13	221	102
CP1 Q = ON2 + SP1 + OFF1	0.18	279	113
CP2 Q = ON3 + ON4	0.18	343	167
CP2A Q = CP2 + IOFF2	0.34	503	226
CP2B Q = CP2A + PUL3 + PUL4 + CDMNA2** + ONB7*	0.48	745	339
DET-OT Discharge from Detention Basin	3.76	137	95
CPSLAT Q = DET-OT + INT1	3.78	138	95
CP3 Q = CPSLAT + ON5 + OFF3	4.03	468	240
DIV1*** Flow from DEV1 south thru DEV2	0.01	18	8
D1*** Flow from DEV1 east thru IOFF8	0.01	11	6
CP3A Q = CP3 + DIV1** + DEV2 + INT2 + INT3	4.09	556	279
CP4 Q = CP3A + INT4 + INT5	4.09	560	280
CP5 Q = CP2B + CP4 + D1*** + IOFF8	4.65	1334	675
CP6 Q = CP5 + INT6	4.89	1594	750

*Referenced from Condos Study (DS 4217)
**Referenced from Beltway Study (L-1803)
***Division referenced from Townhomes Study (DS 5232)

OLYMPIA

BLM 270 CENTENNIAL INFRASTRUCTURE

PROPOSED CONDITION DRAINAGE MAP

DATE: MAY 2020

DRAFTER: CLAYER

CHECKED: LL/ARP

PROJECT NO. OLY1923.000

EXHIBIT E

SHEET 1 OF 1

Westwood

5740 S. Arville Street
Suite 216
Las Vegas, NV 89118
Phone (702) 284-5300
Fax (702) 284-5399
westwood.com

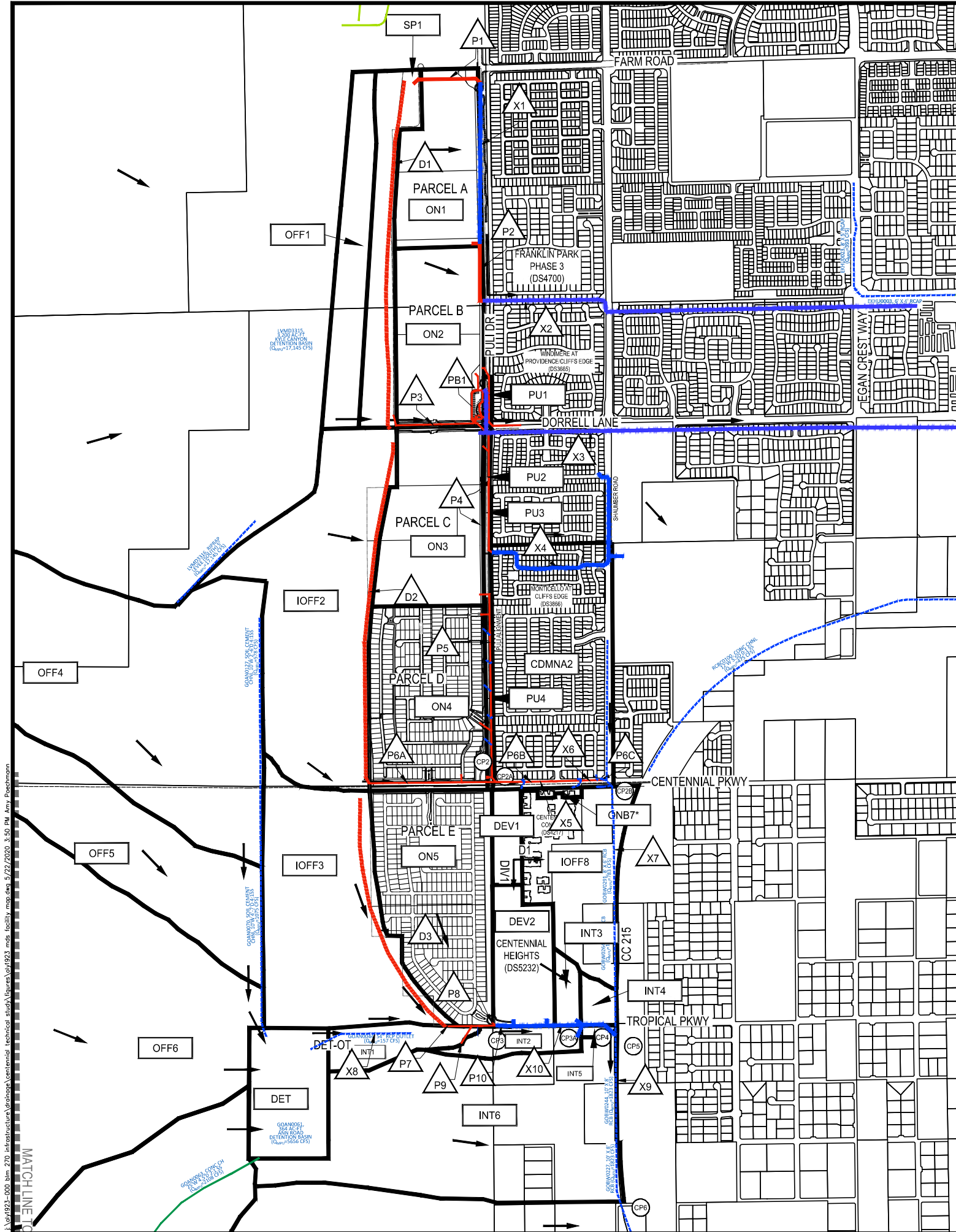
APP. DATE

DATE

BY

DESCRIPTION

NO.



LEGEND

- BASIN BOUNDARY
- BASIN ID
- CONCENTRATION POINT ID
- FLOW DIRECTION
- FLOWMASTER SECTION
- FACILITY ID
- EXISTING DRAINAGE FACILITY
- PROPOSED DRAINAGE FACILITY
- PROPOSED DITCH
- FUTURE DRAINAGE FACILITY

Proposed Facility Hydraulic Summary Table					
Facility ID	Facility Description	Length (FT)	Slope %	Flow Q ₁₀₀ (cfs)	Notes
P1	Proposed 18" RCP	780	3.0	9	
P2	Proposed 54" RCP	759	3.0	53	
P3	Proposed 66" RCP	907	4.2	202	
P4	Proposed 60" RCP	1900	2.0	130	
P5	Proposed 54" RCP	2125	2.1	155	
P6A	Proposed 48" RCP	1550	4.5	202	IOFF2
P6B	Proposed 60" RCP	1100	4.5	503	CP2A
P6C	Proposed 5x5' RCB	250	4.5	745	CP2B
P7	Proposed 60" RCP	700	3.4	216	IOFF3
P8	Proposed 66" RCP	100	3.4	155	ON5
P9	Proposed 60" RCP	50	3.0	138	CPSLAT
P10	Proposed 60" RCP	200	4.0	468	CP3 = CP3LAT + ON5 + IOFF3
D1	Trapezoidal Ditch	3068	0.5	202	Bottom Width 35-ft w/ 3:1 SS
D2	Trapezoidal Ditch	3909	0.5	202	Bottom Width 35-ft w/ 3:1 SS
D3	Trapezoidal Ditch	2800	0.5	216	Bottom Width 35-ft w/ 3:1 SS

Existing Facility Hydraulic Summary Table				
Facility ID	Facility Description	Design Flowrate (cfs)	Proposed Flowrate (cfs)	Notes
X1	Existing 18" RCP	4	9	
X2	Existing 42" RCP	62	62	
X3	Existing 24" RCP	30	33	
X4	Existing 48" RCP	85	130	
X5	Existing 36" RCP	63	-	Replace with P6B
X6	Existing 54" RCP	501	-	CORFCD Facility; Replace with P6B
X7	Existing 8x6' RCB	783	745	CORFCD Facility
X8	Existing 54" RCP	157	157	CORFCD Facility
X9	Existing 10x8' RCB	1823	1334	CORFCD Facility
X10	Existing Storm Drain	439	439	Built with Centennial Townhomes

Peaking Basin Hydraulic Summary Table			
Facility ID	Inflow	Outflow	Notes
PB1	303	150	300' x 100' Peaking Basin w/ 3 ac-ft max storage

Proposed Condition Flow Rate Summary				
Basin/Concentration Point ID	Area (mi²)	Q ₁₀₀ (cfs)	Q ₁₀ (cfs)	
ON1	0.06	53	13	
ON2	0.07	121	50	
ON3	0.08	155	75	
ON4	0.09	187	92	
ON5	0.11	193	88	
SP1	0.05	87	36	
OFF1	0.06	75	27	
IOFF2	0.17	202	80	
IOFF3	0.14	216	83	
OFF4	0.34	508	200	
OFF5	0.32	392	157	
OFF6	1.81	2311	987	
OFF7	1.25	1429	610	
IOFF8	0.07	122	49	
PUL1	0.00	4	2	
PUL2	0.00	5	2	
PUL3	0.00	9	4	
PUL4	0.01	12	6	
DET	0.05	80	33	
DEV1	0.01	29	14	
DEV2	0.04	61	25	
INT1	0.02	27	8	
INT2	0.02	25	10	
INT3	0.01	3	<1	
INT4	0.01	3	<1	
INT5	0.00	2	1	
INT6	0.19	299	115	
ONB7*	0.00	3	2	
CDMNA2**	0.13	221	102	
CP1	Q = ON2 + SP1 + OFF1	0.18	279	113
CP2	Q = ON3 + ON4	0.18	343	167
CP2A	Q = CP2 + IOFF2	0.34	503	226
CP2B	Q = CP2A + PUL3 + PUL4 + CDMNA2** + ONB7*	0.48	745	339
DET-OT	Discharge from Detention Basin	3.76	137	95
CP3LAT	Q = DET-OT + INT1	3.78	138	95
CP3	Q = CP3LAT + ON5 + IOFF3	4.03	468	240
DIV1***	Flow from DEV1 south thru DEV2	0.01	18	8
D1***	Flow from DEV1 east thru IOFF8	0.01	11	6
CP3A	Q = CP3 + DIV1** + DEV2 + INT2 + INT3	4.09	556	279
CP4	Q = CP3A + INT4 + INT5	4.09	560	280
CP5	Q = CP2B + CP4 + DIV1*** + IOFF8	4.65	1334	675
CP6	Q = CP5 + INT6	4.89	1594	790

- NOTES:
- REFER TO EXHIBIT E FOR THE FULL EXTENTS OF THE PROPOSED CONDITION DRAINAGE BASINS.
 - PROPOSED CONDITION CONTROLS DESIGN; ULTIMATE CONDITION FLOWS REDUCED BY FUTURE SHEEP MOUNTAIN PARKWAY IMPROVEMENTS

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www.westwoodinc.com

APP. DATE: _____

BY: _____

DATE: _____

DESCRIPTION: _____

NO. _____

OLYMPIA

BLM 270 CENTENNIAL INFRASTRUCTURE

REVISED BLM 270 MDS FACILITY MAP

DATE: MAY 2020

DRAFTER: ARP

DESIGNER: ARP

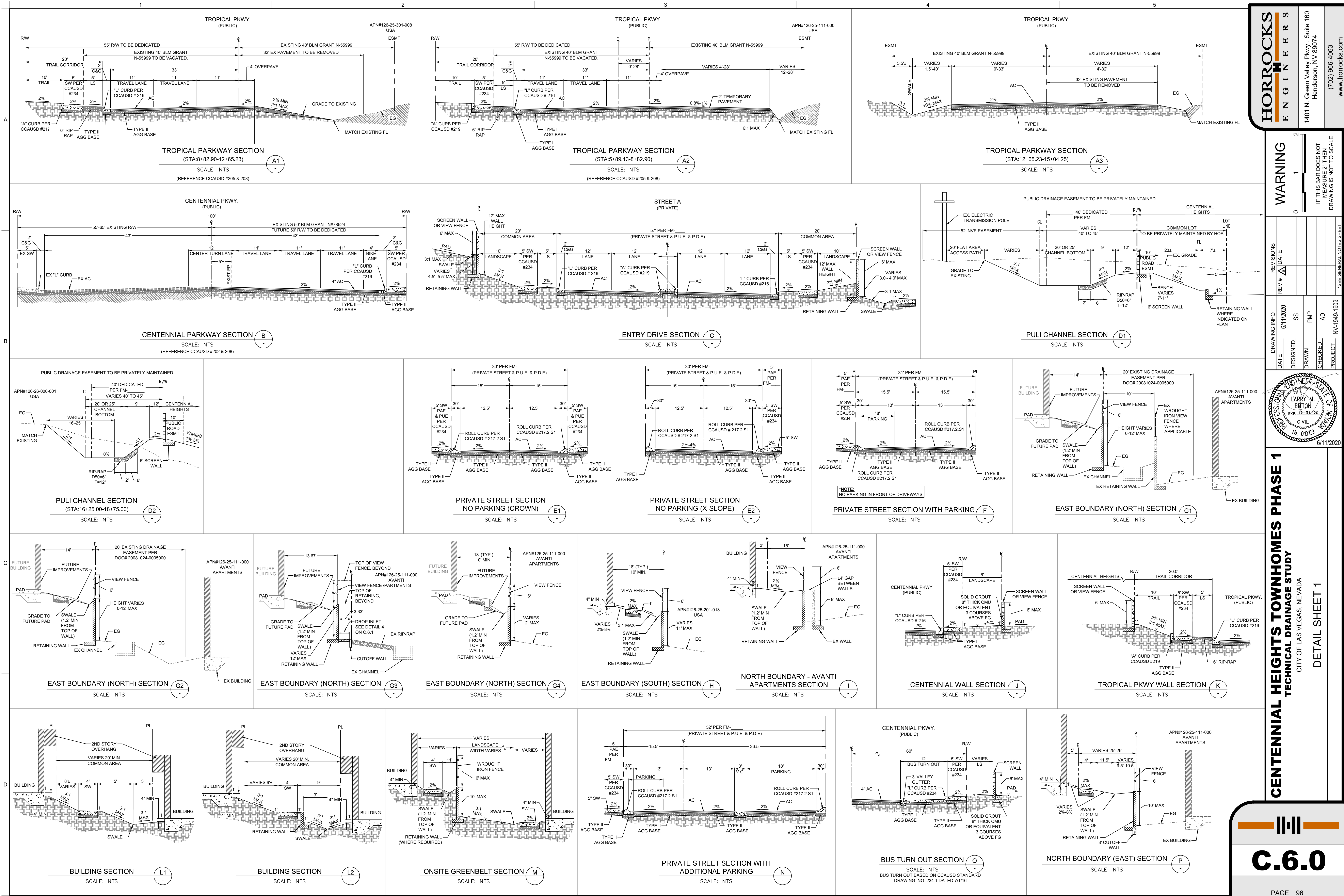
CHECKED: LL/ARP

PROJECT NO. OLY1923.000

EXHIBIT G

SHEET 1 OF 1

Grading Plans



WARNING
IF THIS BAR DOES NOT MEASURE 2" THEN DRAWING IS NOT TO SCALE

REVISIONS	DATE	REV #	DESCRIPTION
SS	6/11/2020	1	DESIGNED
PMP			DRAWN
AD			CHECKED
PROJECT			PROJECT NV-1949-1909

