



Planning & Zoning Department

City of Kuna
P.O. Box 13
Kuna, Idaho 83634
Phone: (208) 922-5274
Fax: (208) 922-5989
www.kunacity.id.gov

Agency Notification

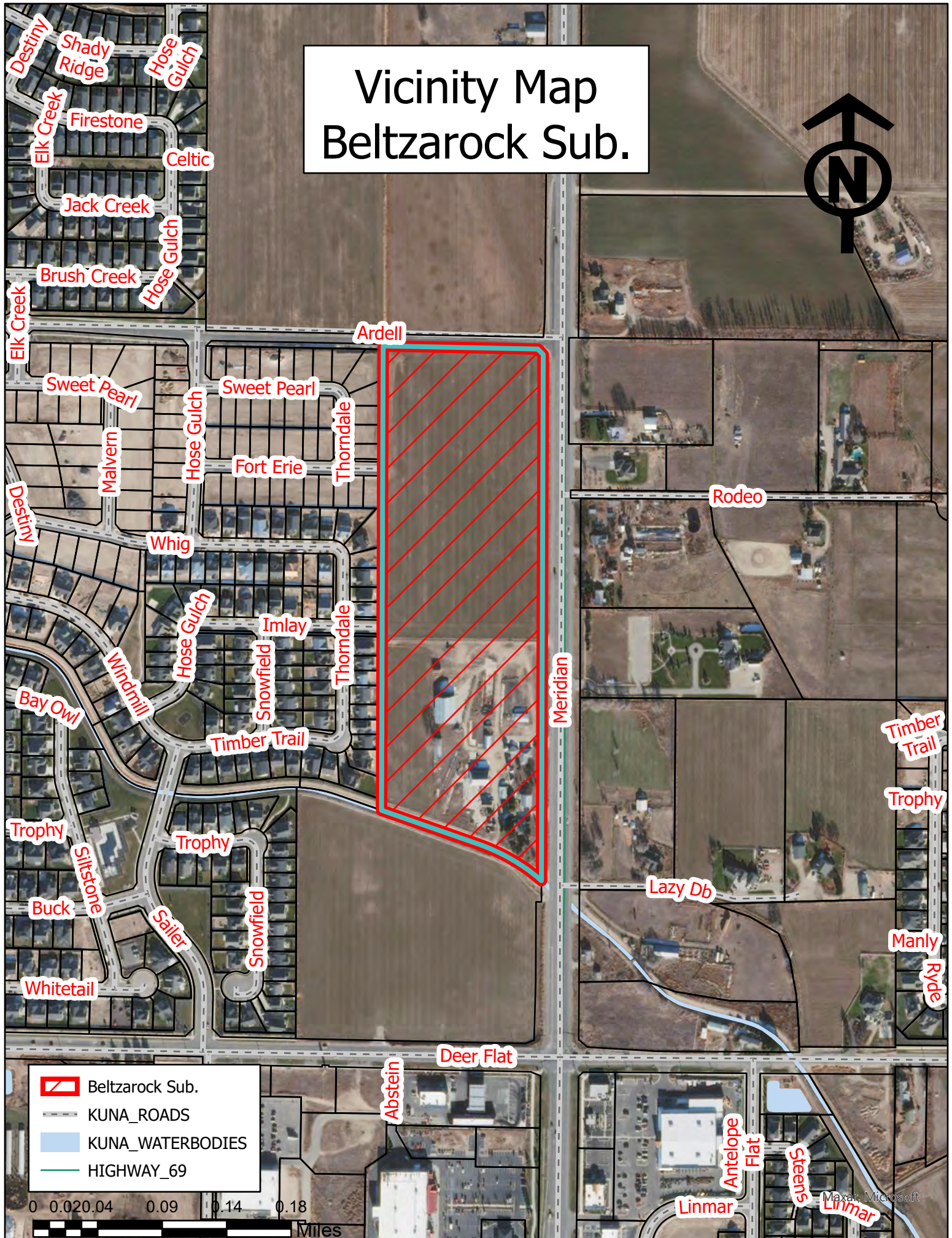
July 11, 2022

Notice is hereby given by the City of Kuna that the following action(s) are under consideration:

File Numbers & Case Name:	22-06-S (Pre Plat) & 22-26-DR (Design Review) Beltzarock Subdivision.
Project Description	Applicant requests preliminary plat approval in order to subdivide the approx. 24.56 acres into 74 total lots; including 53 Residential Lots, 10 Commercial Lots and 11 Common lots. The site was previously annexed and zoned as C-2 Area Commercial (approx. 19 acres) and as R-20 High Density Residential (approx. 5 acres).
Site Location	The SWC of Meridian and Ardell Roads, 1925 N Meridian Road, Kuna, Idaho 83634.
Applicant	SH69 North, LLC 1400 E Kokanee Ln, Kuna, ID 83634 208.861.6665 gronbeck@kkgdev.com
Representative	Civil Innovations, PLLC 1043 E Park Blvd. Ste. 101 Boise, ID 83712 208.884.8181 ben@civil-innovations.com
Tentative Public Hearing Date	PnZ Commission: On Tuesday, September 13, 2022 (<i>Tentative</i>) At 6:00 PM Council Chambers at Kuna City Hall, 751 W. 4 th Street, Kuna, ID 83634
Staff Contact	Troy Behunin, Planner III Kuna Planning and Zoning Department 208.922.5274 TBehunin@kunaid.gov

Enclosed is information to assist you with your consideration and response. All comments as to how this action may affect the service(s) your agency provides, is greatly appreciated. Please contact staff with any questions. **If your agency needs different or additional information to review and provide comment's please notify our office and they will be sent to you.** If your agency needs additional time for review, please let our office know as soon as possible. *No response within 15 business days will indicate you have no objection or comments for this project.*

Vicinity Map Beltzarock Sub.

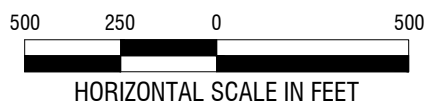
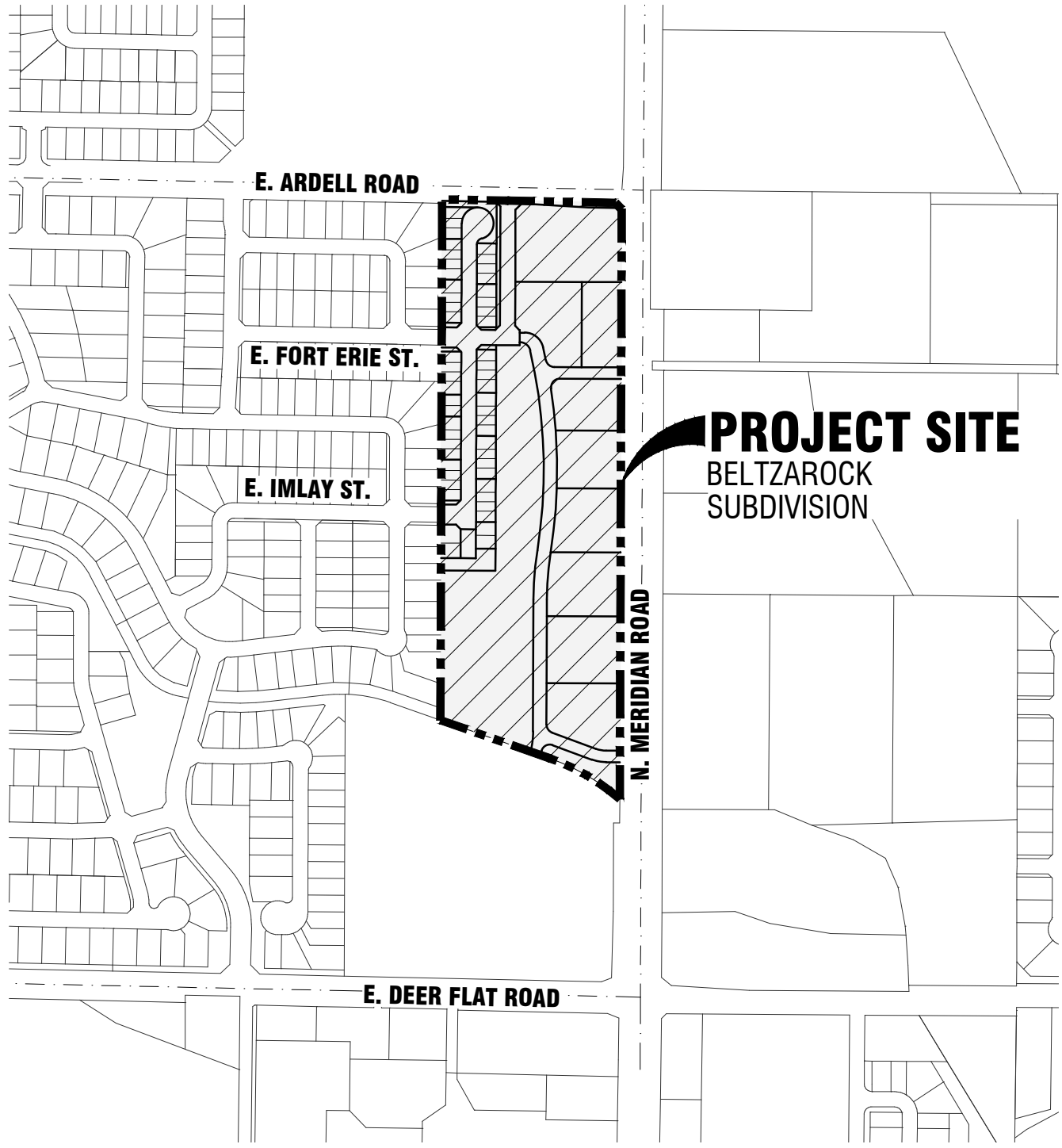


- Beltzarock Sub.
- KUNA_ROADS
- KUNA_WATERBODIES
- HIGHWAY_69

0 0.020.04 0.09 0.14 0.18
Miles

BELTZAROCK SUBDIVISION

KUNA, IDAHO - 2022



PROJECT NO.	21-0309-BR
DWG FILE	VICINITY MAP
DESIGNED BY	BT
DRAWN BY	BT
CHECKED BY	BT
ISSUE DATE	03/10/2022
SCALE	AS SHOWN
SHEET	1 OF 1

BELTZAROCK SUBDIVISION

KUNA, IDAHO

VICINITY MAP

CIVIL INNOVATIONS, PLLC

1043 E. PARK BLVD STE 101
BOISE, ID 83712
PHONE: (208) 884-8181
www.civil-innovations.com

Beltzarock Subdivision – Preliminary Plat Application Narrative

SH69 North, LLC submits its subdivision application in conformity with the previously submitted and approved annexation and rezone request. The parcel was annexed in conformity with the Kuna Comprehensive plan for a mixed-use zone. Approximately 5 acres of the 24-acre site were zoned R-20. The remaining 19 acres were zoned C2.

SH69 North intends to develop a 53-unit townhome project on the R-20 site. While this use is approximately 50% of the allowed density in an R-20 zone, after consulting with the neighbors and the planning staff we have determined that such density is a good compromise as a buffer between the adjacent residential uses and the commercial uses planned on the C-2 site.

SH69 North intends to develop the 19-acre commercial site with 10 commercial pads fronting Meridian Rd. These pads will be home to uses ranging from medical and dental services and financial service firms to multi-tenant retail buildings having food, retail, and service tenants. While we cannot announce tenants until this subdivision has been heard by council and approved, interest has been strong, and a quick lease up is expected. The remainder of the site will be used for transportation and a self-storage center.

The combined site will make use of and expand the existing greenbelt along the Kuna Canal which will make the existing and future residential units more walkable and enable safe transit into the commercial areas. The subdivision will be landscaped consistent with its name that means “Black Rock” in Basque. Landscape islands will use black rocks and boulders that are attractive and locally sourced.

Adequate services are nearby or adjacent to the site such that sewer and water can be supplied to the development. Due to the elevation in adjacent property, SH69 will provide a lift station for sewer.



Planning & Zoning Application Coversheet

PO Box 13 | 751 W 4th Street | Kuna, ID 83634
(208) 922-5274 | www.KunaCity.ID.gov



****Office Use Only****

File No.(s): 22-06-S & 22-26-DR

Project Name: Beltzarock Sub

Date Received: 03.16.2022

Date Accepted as Complete: 05.18.2022

Type of review requested (check all that apply):

<input type="checkbox"/>	Annexation	<input type="checkbox"/>	Appeal
<input type="checkbox"/>	Comp. Plan Map Amendment	<input type="checkbox"/>	Combination Pre & Final Plat
<input type="checkbox"/>	Design Review	<input type="checkbox"/>	Development Agreement
<input type="checkbox"/>	Final Planned Unit Development	<input type="checkbox"/>	Final Plat
<input type="checkbox"/>	Lot Line Adjustment	<input type="checkbox"/>	Lot Split
<input type="checkbox"/>	Ordinance Amendment	<input type="checkbox"/>	Planned Unit Development
<input checked="" type="checkbox"/>	Preliminary Plat	<input type="checkbox"/>	Rezone
<input type="checkbox"/>	Special Use Permit	<input type="checkbox"/>	Temporary Business
<input type="checkbox"/>	Vacation	<input type="checkbox"/>	Variance

Owner of Record

Name: SH69 North, LLC

Address: 1400 E. Kokanee Ln., Kuna, ID 83634

Phone: (208) 861-6665 Email: gronbeck@kggdev.com

Applicant (Developer) Information

Name: SH69 North, LLC

Address: 1400 E. Kokanee Ln., Kuna, ID 83634

Phone: (208) 861-6665 Email: gronbeck@kggdev.com

Engineer/Representative Information

Name: Civil Innovations, PLLC

Address: 1043 E. Park Blvd. Ste. 101, Boise, ID, 83712

Phone: (208) 884-8181 Email: ben@civil-innovations.com

Subject Property Information

Site Address: 1925 N. Meridian Road

Nearest Major Cross Streets: Deer Flat Road

Parcel No.(s): S1313449905

Section, Township, Range: Sec. 13, T.2N, R.1W

Property Size: 24.56 Acres

Current Land Use: Vacant Proposed Land Use: Residential & Commercial

Current Zoning: R-20, C-2 Proposed Zoning: _____

Project Description

Project Name: Beltzarock Subdivision

General Description of Project: 53 single family residential lots and 10 commercial lots on approximately 24.56 acres at the NW corner of Meridian and Deer Flat Roads.

62 Total Residential Lots (53 build-able, 9 Common), & 12 Commercial Lots (10 Build-able, 2 Common)

Type of proposed use (check all that apply and provide specific density/zoning):

Residential: (R-2) R-4 R-6 R-8 R-12 R-20 Commercial: C-1 (C-2) C-3 CBD
 Office Industrial: M-1 M-2 Other: _____

Type(s) of amenities provided with development: _____

Residential Project Summary (If Applicable)

Are there existing buildings? (YES) NO

If YES, please describe: Existing home and outbuildings

Will any existing buildings remain? YES (NO)

No. of Residential Units: 53 No. of Building Lots: 53

No. of Common Lots: 7 No. of Other Lots: 1

Type of dwelling(s) proposed (check all that apply):

Single-Family Townhomes Duplexes Multi-Family
 Other: _____

Minimum square footage of structure(s): 1,200 SF

Gross Density (Dwelling Units ÷ Total Acreage): 10.6

Net Density (Dwelling Units ÷ Total Acreage not including Roads): 18.6

Percentage of Open Space provided: 9.0 Acreage of Open Space: 0.45

Type of Open Space provided (i.e. public, common, landscaping): _____

Landscaped common areas

Non-Residential Project Summary (If Applicable)

Number of building lots: 10 Other lots: 3

Gross floor area square footage: _____ Existing (if applicable): _____

Building height: _____ Hours of Operation: _____

Total No. of Employees: _____ Max No. of Employees at one time: _____

No. of and ages of students: _____ Seating capacity: _____

Proposed Parking

ADA accessible spaces: _____ Dimensions: _____

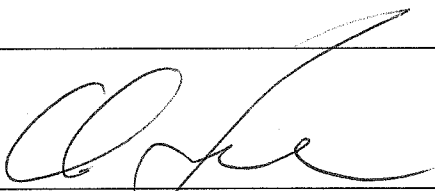
Regular parking spaces: _____ Dimensions: _____

Width of driveway aisle: _____

Proposed lighting: _____

Is lighting "Dark Sky" compliant? YES NO

Proposed landscaping (i.e. berms, buffers, entrances, parking areas, etc.):

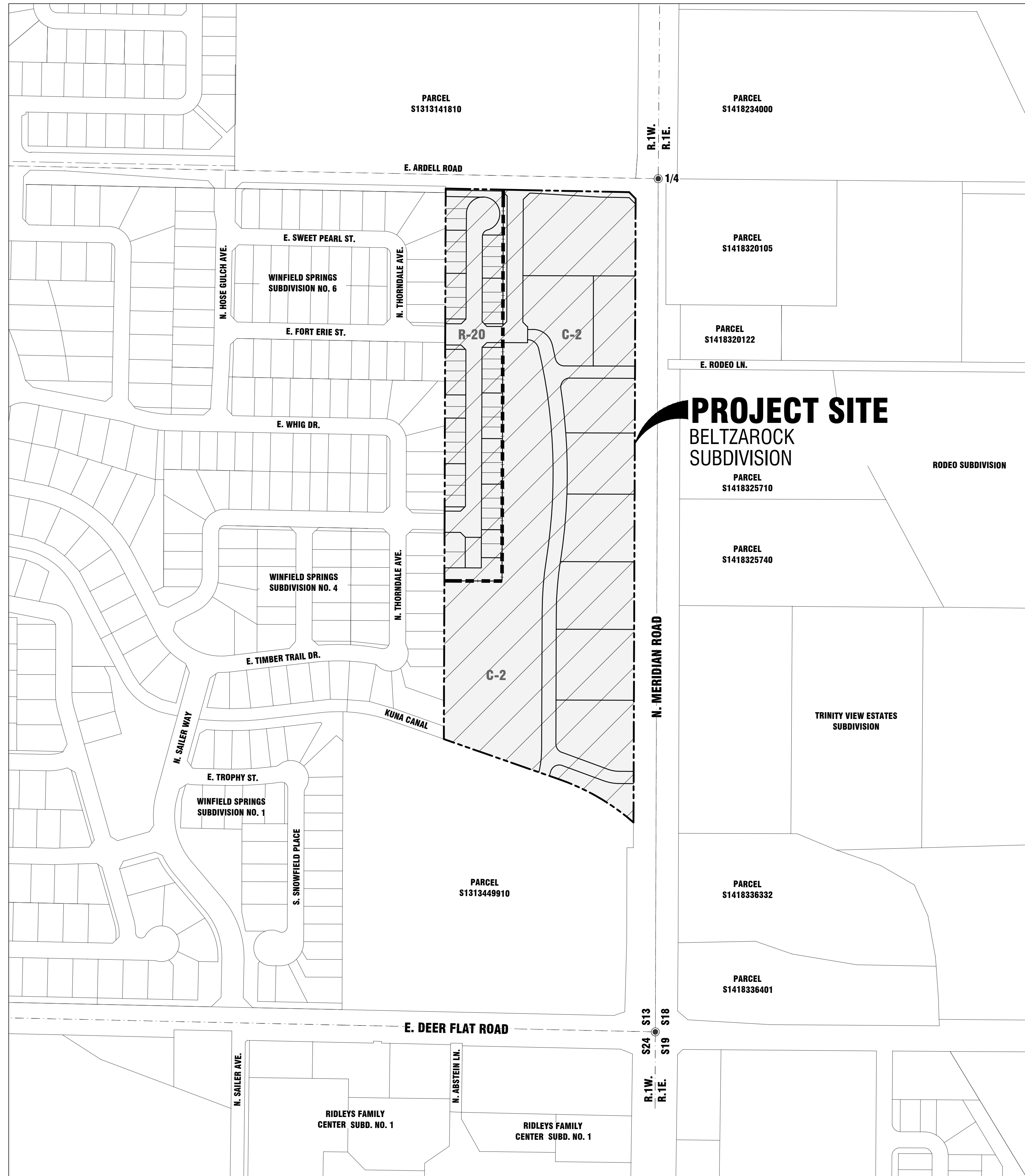
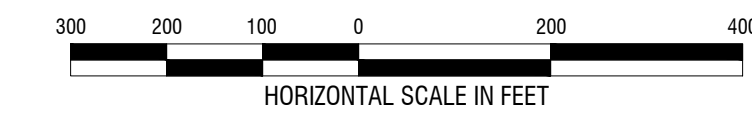
Applicant Signature:  Date: 3-10-22

By signing, you are confirming you have provided all required items listed on this application.

Upon completion of this form, please email to pzapplications@kunaaid.gov. A link will be provided for application attachments to be uploaded to the cloud.

BELTZAROCK SUBDIVISION - PRELIMINARY PLAT

KUNA, IDAHO - 2022



PROPOSED LEGEND

- BOUNDARY LINE
- RIGHT-OF-WAY LINE
- CENTERLINE
- PROPERTY LOT LINE
- ZERO PROPERTY LOT LINE
- ZONE BOUNDARY
- ZONE DESIGNATION
- PROPOSED VERTICAL CURB
- PROPOSED ROLLED CURB
- PROPOSED VERTICAL TO ROLLED CURB TRANSITION SECTION
- PROPOSED STREET LIGHT
- DIRECTION OF SURFACE FLOW
- PROPOSED SEEPAGE BED WITH MONITORING WELLS
- PROPOSED DROP INLET
- PROPOSED STORM DRAIN LINE AND MANHOLE
- PROPOSED GRAVITY IRRIGATION LINE AND BOX
- PROPOSED PRESSURE IRRIGATION LINE AND VALVE
- PROPOSED WATER LINE AND VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED SANITARY SEWER LINE AND MANHOLE

EXISTING LEGEND

- EXISTING PROPERTY LOT LINE
- EXISTING EDGE OF GRAVEL
- EXISTING TOP OF BANK
- EXISTING TOE OF BANK
- EXISTING DITCH FLOW LINE
- EXISTING OVERHEAD POWER W/ POLE
- EXISTING UNDERGROUND GAS
- EXISTING UNDERGROUND TELEPHONE
- EXISTING FENCE
- EXISTING VERTICAL CURB
- EXISTING ROLLED CURB
- EXISTING 9' CONTOUR
- EXISTING 1' CONTOUR
- EXISTING DROP INLET
- EXISTING STORM DRAIN LINE AND MANHOLE
- EXISTING GRAVITY IRRIGATION LINE
- EXISTING PRESSURE IRRIGATION LINE AND VALVE
- EXISTING WATER LINE AND VALVE
- EXISTING FIRE HYDRANT
- EXISTING SEWER LINE AND MANHOLE
- EXISTING STREET LIGHT
- EXISTING ROAD SIGN
- EXISTING SPRINKLER BOX
- EXISTING POWER JUNCTION BOX
- EXISTING TELEPHONE RISER
- EXISTING DECIDUOUS TREE
- EXISTING EVERGREEN TREE
- EXISTING GAS MARKER
- EXISTING GAS VALVE

1 VICINITY MAP

SCALE: 1" = 200'

2 SHEET INDEX

1 OF 6	C.100	TITLE SHEET
2 OF 6	C.200	PRELIMINARY PLAT
3 OF 6	C.201	PRELIMINARY PLAT
4 OF 6	C.300	PRELIMINARY SITE PLAN
5 OF 6	C.301	PRELIMINARY SITE PLAN
6 OF 6	C.400	PRELIMINARY STREET SECTIONS

3 SITE DATA

TOTAL ACRES	24.56 AC		
R-20 AREA	5.00 AC	C-2 AREA	19.56 AC
BUILDABLE LOTS	53	BUILDABLE LOTS	10
COMMON LOTS	7	COMMON LOTS	2
PRIVATE ROAD LOT	1	PRIVATE ROAD LOTS	1
TOTAL LOTS	61	TOTAL LOTS	13
LOT AREA	2.84 AC	LOT AREA	16.53 AC
COMMON AREA	0.45 AC	COMMON AREA	0.48 AC
RIGHT-OF-WAY AREA	1.60 AC	RIGHT-OF-WAY AREA	0.70 AC
PRIVATE ROAD LOT AREA	0.11 AC	PRIVATE ROAD LOT AREA	1.85 AC
GROSS DENSITY	10.60	GROSS DENSITY	0.51

4 CONSTRUCTION CONTACT INFORMATION

ENGINEER	DEVELOPER	SURVEYOR
CIVIL INNOVATIONS, PLLC CONTACT: BEN THOMAS 1043 E. PARK BLVD., STE 101 BOISE, IDAHO 83712 PHONE: (208) 884-8181	SH69 NORTH, LLC CONTACT: DAVID GRONBECK 1400 E. KOKAHEE LN. KUNA, ID 83834 PHONE: (208) 861-6665	IDAHO SURVEY GROUP CONTACT: GREG CARTER, PLS 955 W. EMERALD ST. BOISE, ID 83704 PHONE: (208) 846-8570

5 BENCH MARK AND DATUM DATA

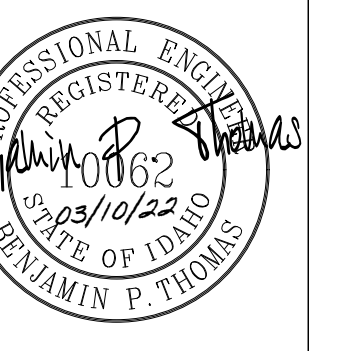
DATUM DATA
HORIZONTAL: NAD 83 (ADJUSTED TO THE ADA COUNTY H.A.R.N SURVEY)
VERTICAL: NAVD 88

6 PRELIMINARY PLAT NOTES

- MINIMUM BUILDING SETBACK LINES SHALL CONFORM TO THE APPLICABLE ZONING REGULATIONS OF THE CITY OF KUNA AT THE TIME OF ISSUANCE OF A BUILDING PERMIT.
- ANY RE-SUBDIVISION OF THIS PLAT SHALL COMPLY WITH THE APPLICABLE ZONING REGULATIONS OF THE CITY OF KUNA IN EFFECT AT THE TIME OF RE-SUBDIVISION.
- IRRIGATION WATER WILL BE PROVIDED BY THE CITY OF KUNA IN COMPLIANCE WITH IDAHO CODE SECTION 31-2805(1)(B). ALL LOTS WITHIN THIS SUBDIVISION WILL BE ENTITLED TO IRRIGATION RIGHTS AND WILL BE OBLIGATED FOR ASSESSMENTS FROM CITY OF KUNA.
- MAINTENANCE OF ANY IRRIGATION, DRAINAGE PIPE OR DITCHES CROSSING A LOT IS THE RESPONSIBILITY OF THE LOT OWNER UNLESS SUCH RESPONSIBILITY IS ASSUMED BY AN IRRIGATION/DRAINAGE ENTITY. SUCH LOTS MUST REMAIN FREE OF ENCROACHMENTS AND OBSTRUCTIONS TO SAID IRRIGATION/DRAINAGE FACILITIES.
- THIS DEVELOPMENT RECOGNIZES SECTION 22-4503 OF THE IDAHO CODE, RIGHT TO FARM ACT, WHICH STATES: "NO AGRICULTURAL OPERATION, AGRICULTURAL FACILITY OR EXPANSION THEREOF SHALL BE OR BECOME A NUISANCE, PRIVATE OR PUBLIC, BY ANY CHANGED CONDITIONS IN OR ABOUT THE SURROUNDING NONAGRICULTURAL ACTIVITIES AFTER IT HAS BEEN IN OPERATION FOR MORE THAN ONE (1) YEAR, WHEN THE OPERATION, FACILITY OR EXPANSION WAS NOT A NUISANCE AT THE TIME IT BEGAN OR WAS CONSTRUCTED. THE PROVISIONS OF THIS SECTION SHALL NOT APPLY WHEN A NUISANCE RESULTS FROM THE IMPROPER OR NEGLIGENT OPERATION OF AN AGRICULTURAL OPERATION, AGRICULTURAL FACILITY OR EXPANSION THEREOF."
- LOTS 1, 13 AND 22, BLOCK 1, LOTS 1 AND 16, BLOCK 2, LOTS 1, 4, AND 23, BLOCK 3, ARE COMMON LOTS AND SHALL BE OWNED AND MAINTAINED BY THE BELTZAROCK VILLAGE HOMEOWNERS ASSOCIATION, OR ASSIGNS. THESE COMMON LOTS ARE SUBJECT TO BLANKET EASEMENTS FOR PUBLIC UTILITIES AND CITY OF KUNA IRRIGATION.
- LOT 23, BLOCK 1 AND LOT 35, BLOCK 3 ARE COMMON LOTS AND SHALL BE OWNED AND MAINTAINED BY THE BELTZAROCK BUSINESS ASSOCIATION, OR ASSIGNS. THESE COMMON LOTS ARE SUBJECT TO BLANKET EASEMENTS FOR PUBLIC UTILITIES AND CITY OF KUNA IRRIGATION.
- ALL LOT LINES COMMON TO THE PUBLIC RIGHTS-OF-WAY CONTAIN A 14.00 FOOT WIDE EASEMENT, UNLESS OTHERWISE DIMENSIONED, FOR PUBLIC UTILITIES, CITY OF KUNA IRRIGATION AND LOT DRAINAGE. THIS EASEMENT SHALL NOT PRECLUDE THE CONSTRUCTION OF HARD-SURFACED DRIVEWAYS AND WALKWAYS TO EACH LOT.
- UNLESS OTHERWISE DIMENSIONED, ALL RESIDENTIAL INTERIOR LOT LINES CONTAIN A 5.00 FOOT EASEMENT, EACH SIDE, FOR PUBLIC UTILITIES, CITY OF KUNA IRRIGATION AND LOT DRAINAGE EXCEPT WHERE ZERO LOT LINES ARE SHOWN.
- UNLESS OTHERWISE DIMENSIONED, ALL LOT LINES COMMON TO THE SUBDIVISION BOUNDARY AND ALL REAR LOT LINES CONTAIN A 10.00 FOOT WIDE EASEMENT FOR PUBLIC UTILITIES, CITY OF KUNA IRRIGATION AND LOT DRAINAGE.
- LOTS SHALL NOT BE REDUCED IN SIZE WITHOUT PRIOR APPROVAL FROM THE HEALTH AUTHORITY AND THE CITY OF KUNA.
- THIS SUBDIVISION WILL BE SUBJECT TO THE COVENANTS, CONDITIONS AND RESTRICTIONS THAT ARE TO BE FILED FOR RECORD AT THE ADA COUNTY RECORDER'S OFFICE.
- A PORTION OF LOTS 24, 25, 35, 36, 42 AND 43, BLOCK 3 AS SHOWN HEREON ARE SUBJECT TO AN EXISTING BOISE PROJECT BOARD OF CONTROL EASEMENT FOR OPERATION AND MAINTENANCE OF THE KUNA CANAL.
- THE HOMEOWNERS ASSOCIATION (HOA), ITS OWNERSHIP AND MAINTENANCE COMMITMENTS CANNOT BE DISSOLVED WITHOUT THE EXPRESS WRITTEN CONSENT OF THE CITY OF KUNA, IDAHO. ALL IMPROVED INDIVIDUAL LOTS ARE SUBJECT TO A FRACTIONAL SHARE OF THE IRRIGATION ASSESSMENT FOR EACH HOA COMMON LOT(S) THAT RECEIVE(S) MUNICIPAL IRRIGATION. IF THE ASSESSMENT IS NOT PAID BY THE HOA, THE INDIVIDUAL IMPROVED LOTS ARE SUBJECT TO A LIEN FOR NON-PAYMENT.
- NO LOTS WITHIN THIS SUBDIVISION SHALL BE ALLOWED TO TAKE DIRECT ACCESS FROM N. MERIDIAN ROAD OR E. ARDELL ROAD.

GENERAL INFORMATION
IRRIGATION DISTRICT: BOISE KUNA IRRIGATION DISTRICT, NEW YORK IRRIGATION DISTRICT
SCHOOL DISTRICT: KUNA
FIRE DISTRICT: KUNA
SEWER PROVIDER: CITY OF KUNA
WATER PROVIDER: CITY OF KUNA

CIVIL INNOVATIONS, PLLC
1043 E. PARK BLVD., STE 101
BOISE, ID 83712
PHONE: (208) 884-8181
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REVISIONS	NO.	DESCRIPTION	BY	DATE

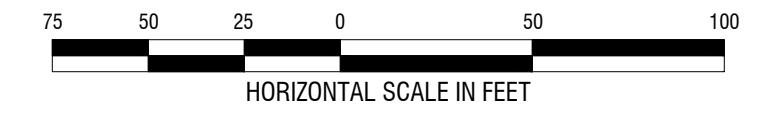
BELTZAROCK SUBDIVISION
KUNA, IDAHO

PROJECT NO.	21-0309-BR
DWG FILE	C.100
DESIGNED BY	BT
DRAWN BY	JTA
CHECKED BY	BT
ISSUE DATE	03/10/22
HORIZ. SCALE	AS SHOWN
VERT. SCALE	AS SHOWN

C.100
SHEET 1 OF 6

BELTZAROCK SUBDIVISION - PRELIMINARY PLAT

KUNA, IDAHO - 2022



R.1E. 1/4 S18
R.1W. S13

N. MERIDIAN RD.
S0°11'35"W 2650.38'

S44°20'11"E 28.54'

S0°11'35"W 1937.55'

S88°51'56"E 2631.65'

E. ARDELL RD.

S88°51'56"E 570.07'

52.50'

25.00'

48.00'

216.00'

117.27'

20.00'

4.49'

48.00'

117.27'

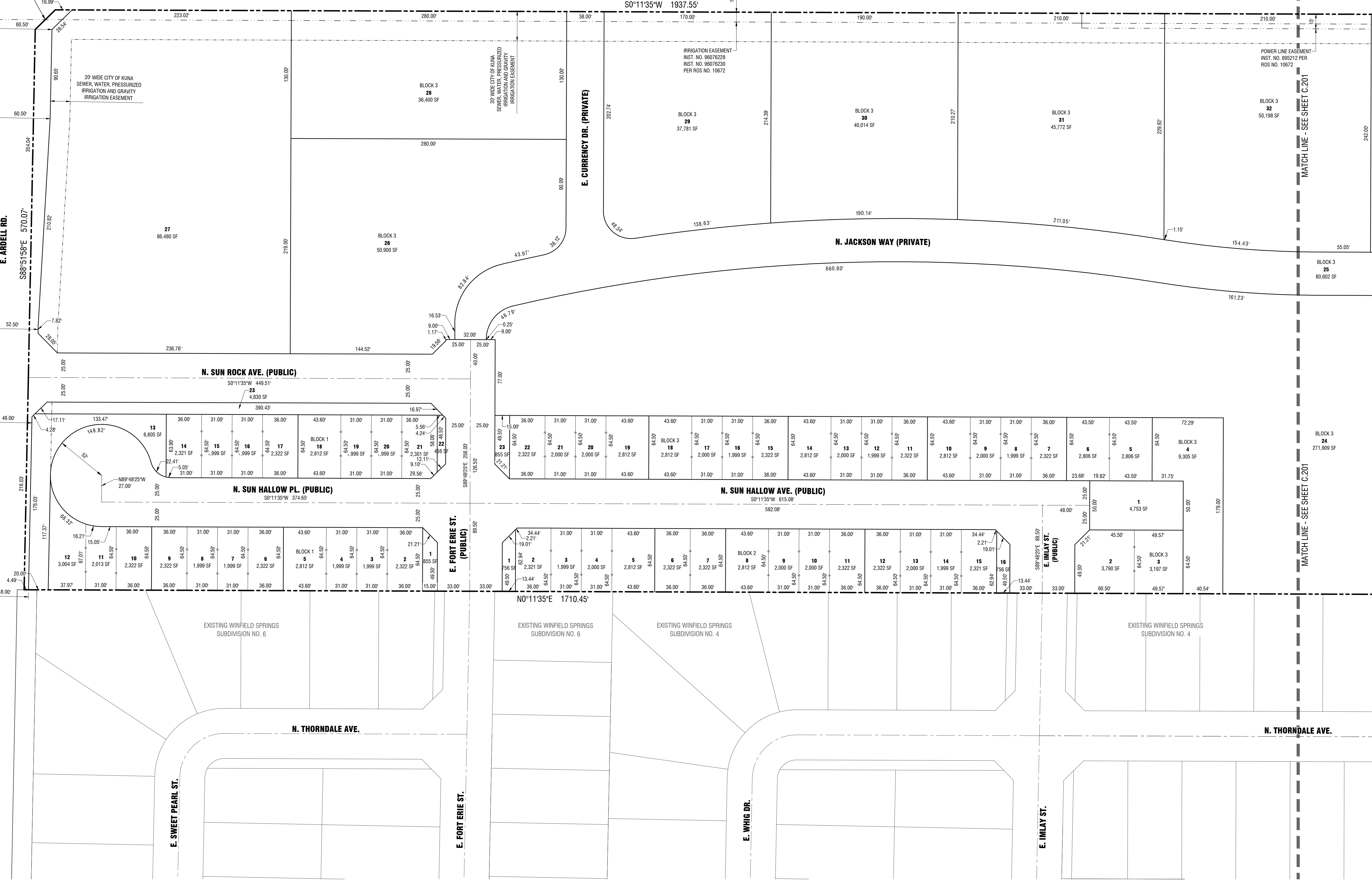
20.00'

4.49'

48.00'

216.00'

117.27'



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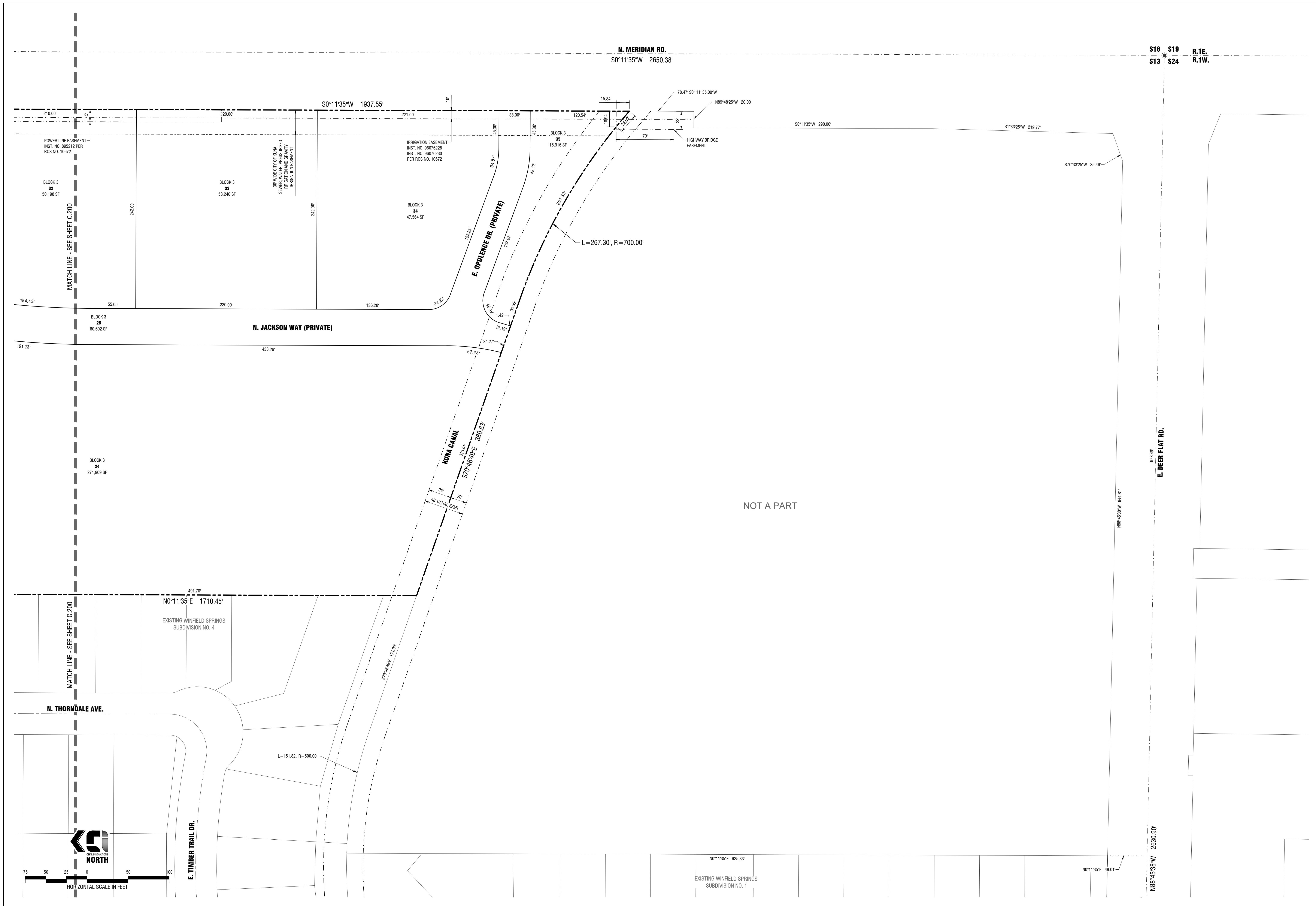
THESE DRAWINGS OR ANY PORTION OR EXTENSION THEREOF, SHALL NOT BE USED OR REPRODUCED ON ANY PROJECT WITHOUT WRITTEN CONSENT FROM CIVIL INNOVATIONS, PLLC

NO.	DESCRIPTION	BY	DATE

BELTZAROCK SUBDIVISION
KUNA, IDAHO
PRELIMINARY PLAT

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C.200
SHEET 2 OF 6



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BELTZAROCK SUBDIVISION
 KUNA, IDAHO
 PRELIMINARY PLAT

C.201
 SHEET 3 OF 6

PROFESSIONAL ENGINEER
 REGISTERED
 10062
 03/10/22
 STATE OF IDAHO
 BENJAMIN P. THOMAS

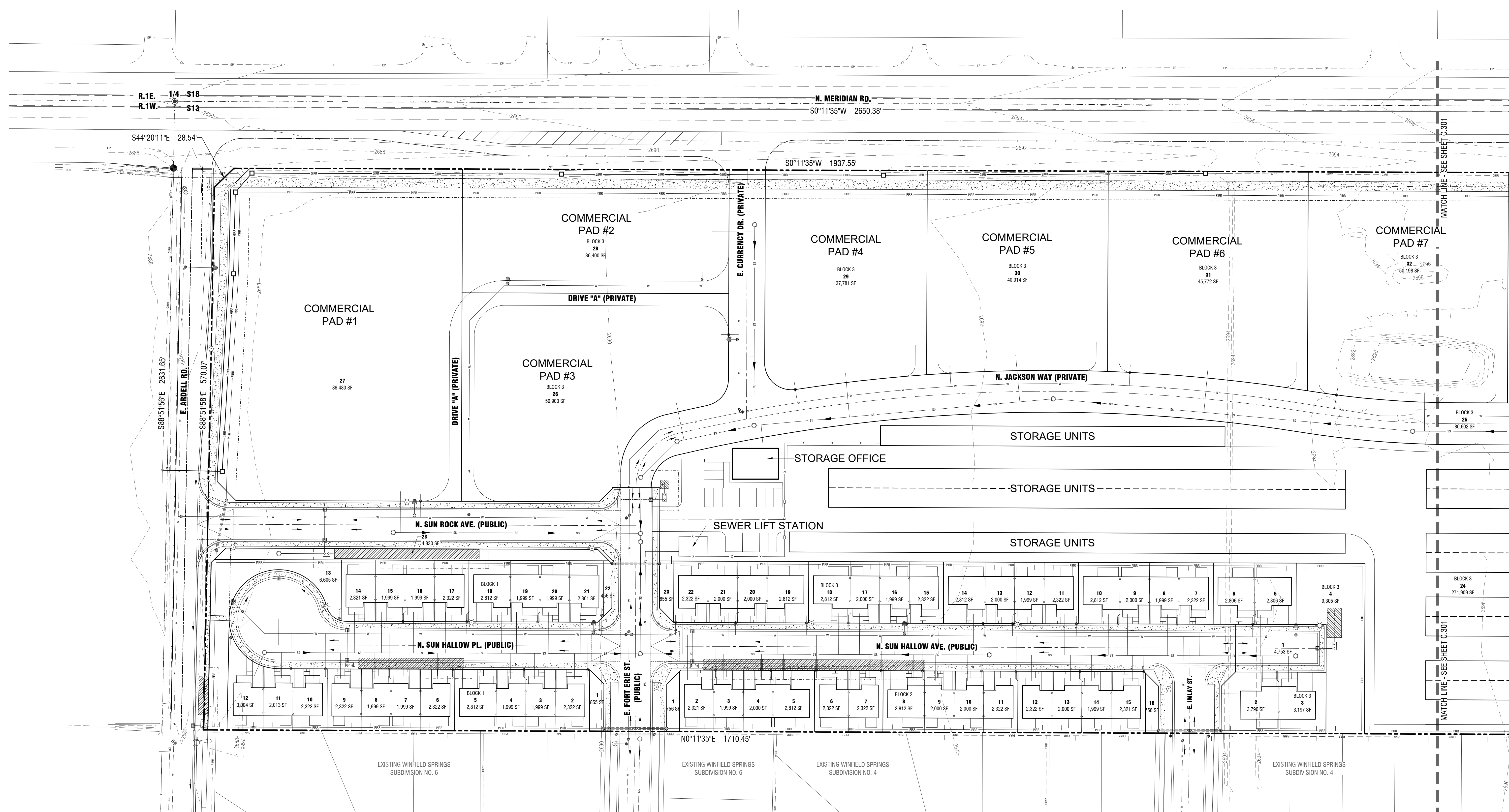
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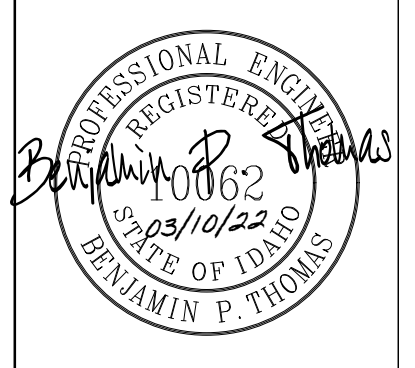
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BELTAZROCK SUBDIVISION - PRELIMINARY PLAT

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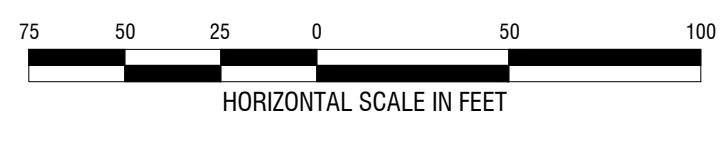
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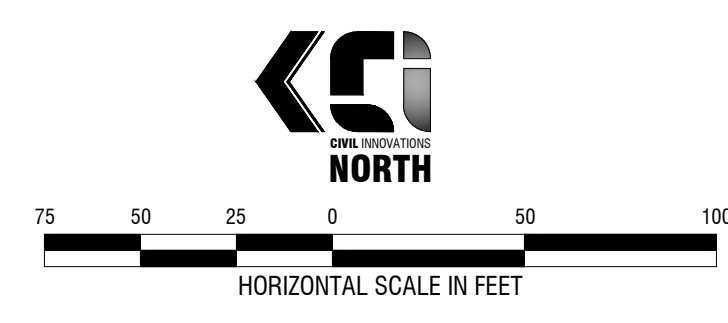
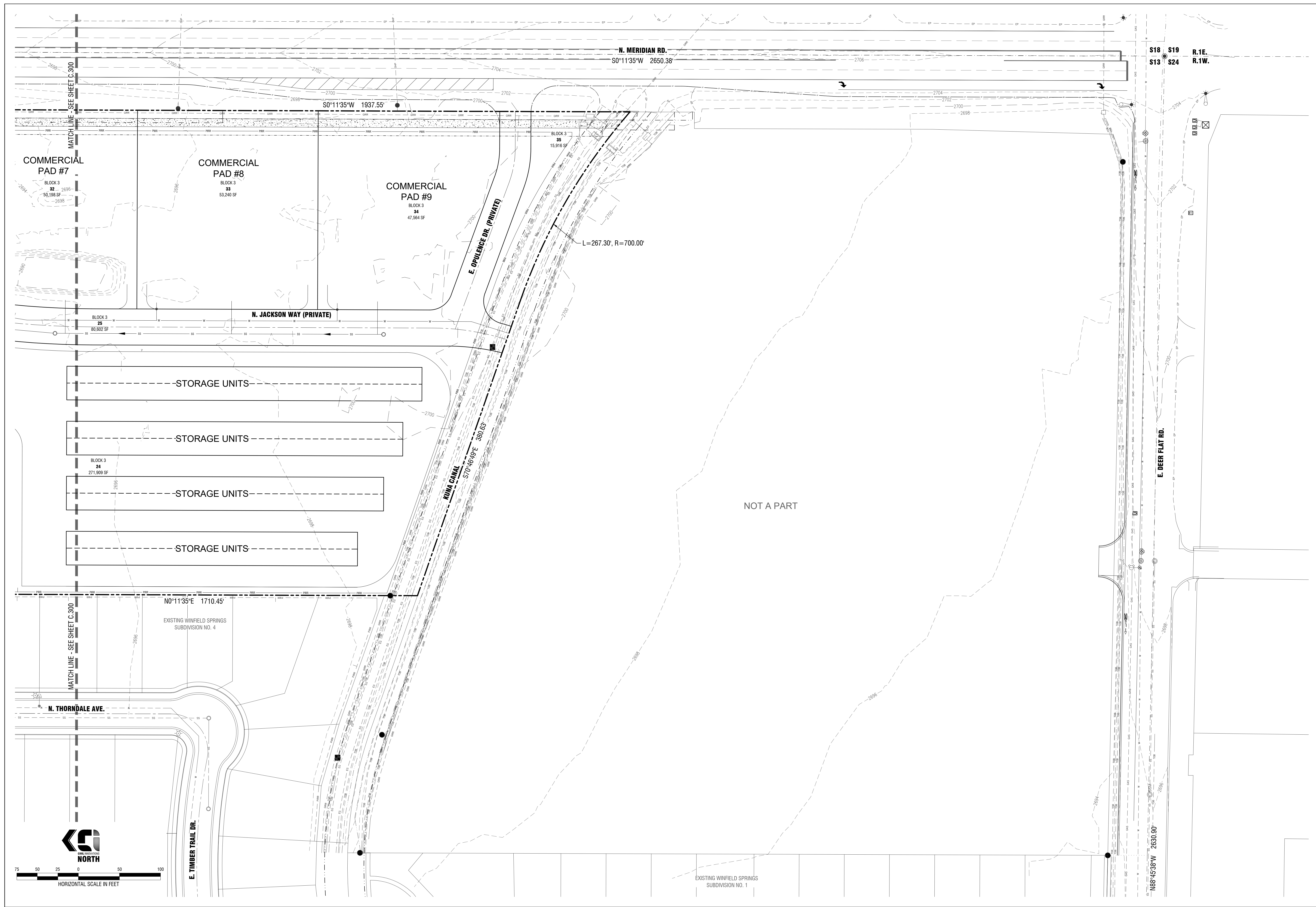
NO.	DESCRIPTION	BY	DATE

BELTAZROCK SUBDIVISION
 KUNA, IDAHO
 PRELIMINARY SITE PLAN

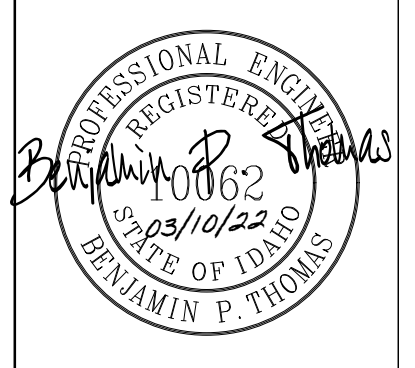
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DWG FILE	C.300
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HORIZ. SCALE	AS SHOWN
VERT. SCALE	AS SHOWN

C.300
 SHEET 4 OF 6





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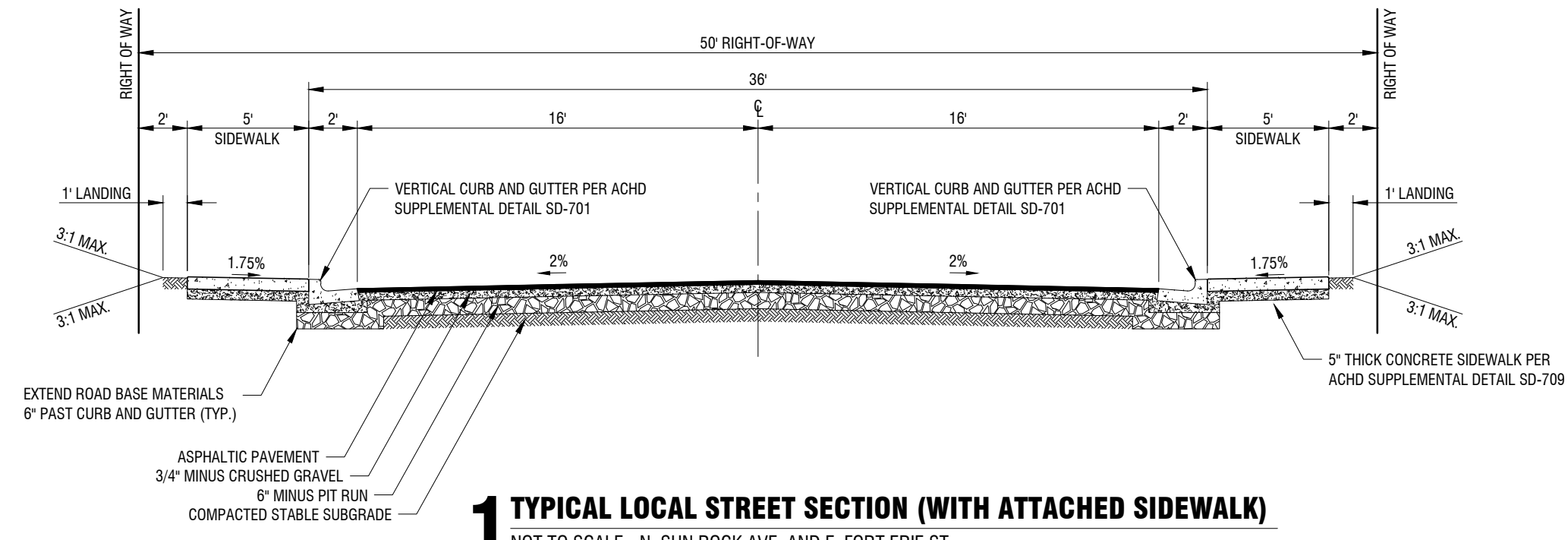
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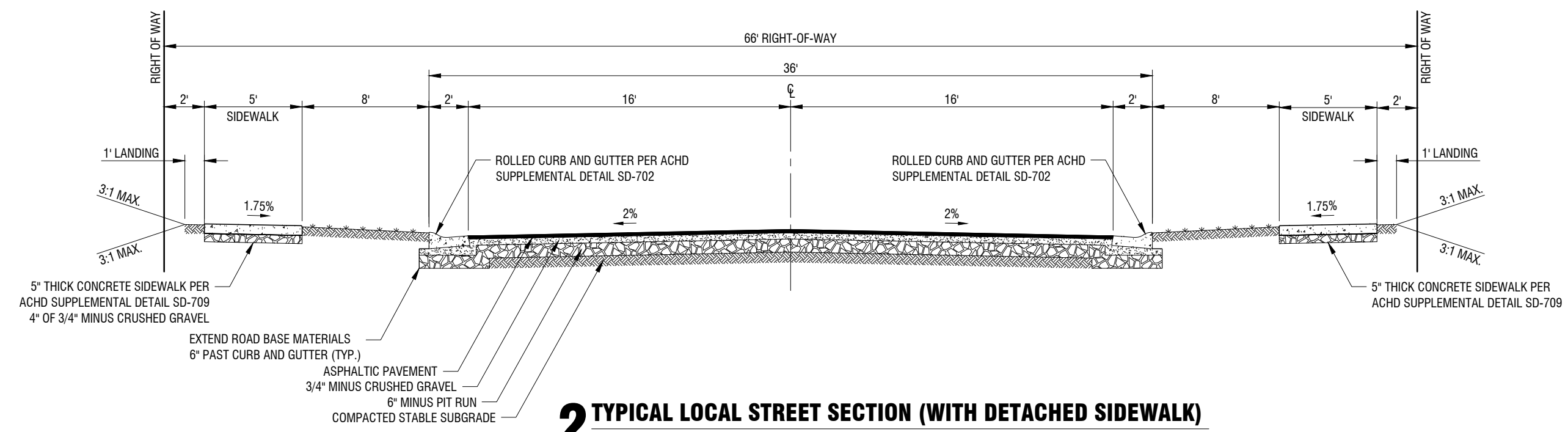
BELTZAROCK SUBDIVISION
 KUNA, IDAHO
 PRELIMINARY SITE PLAN

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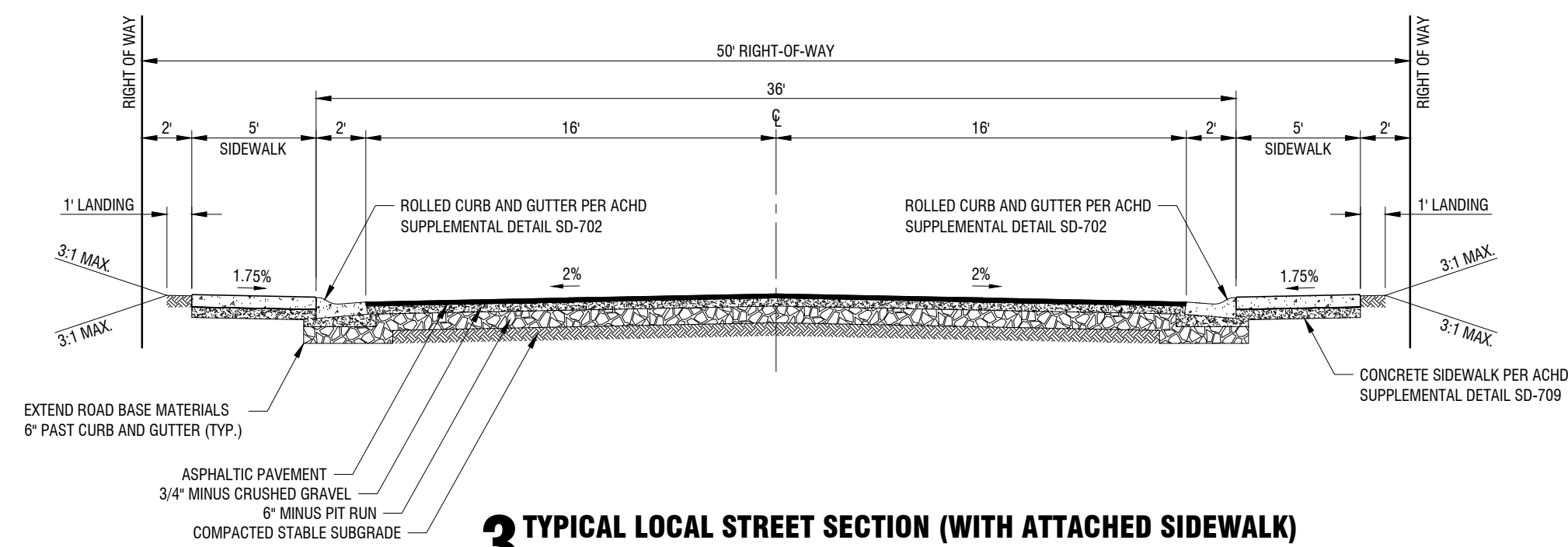
C.301
 SHEET 5 OF 6



1 TYPICAL LOCAL STREET SECTION (WITH ATTACHED SIDEWALK)
NOT TO SCALE - N. SUN ROCK AVE. AND E. FORT ERIE ST.



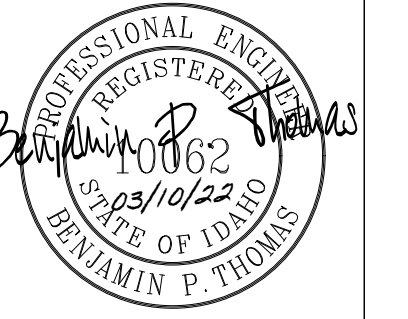
2 TYPICAL LOCAL STREET SECTION (WITH DETACHED SIDEWALK)
NOT TO SCALE - E. FORT ERIE ST. AND E. IMLAY ST.



3 TYPICAL LOCAL STREET SECTION (WITH ATTACHED SIDEWALK)
NOT TO SCALE - N. SUN HALLOW PL. AND N. SUN HALLOW AVE.

CIVIL INNOVATIONS, PLLC

1048 E. PARK BLVD. STE 101
BOISE, ID 83712
PHONE: (208) 884-8181
www.civil-innovations.com



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NO.	DESCRIPTION	BY	DATE

BELTZAROCK SUBDIVISION

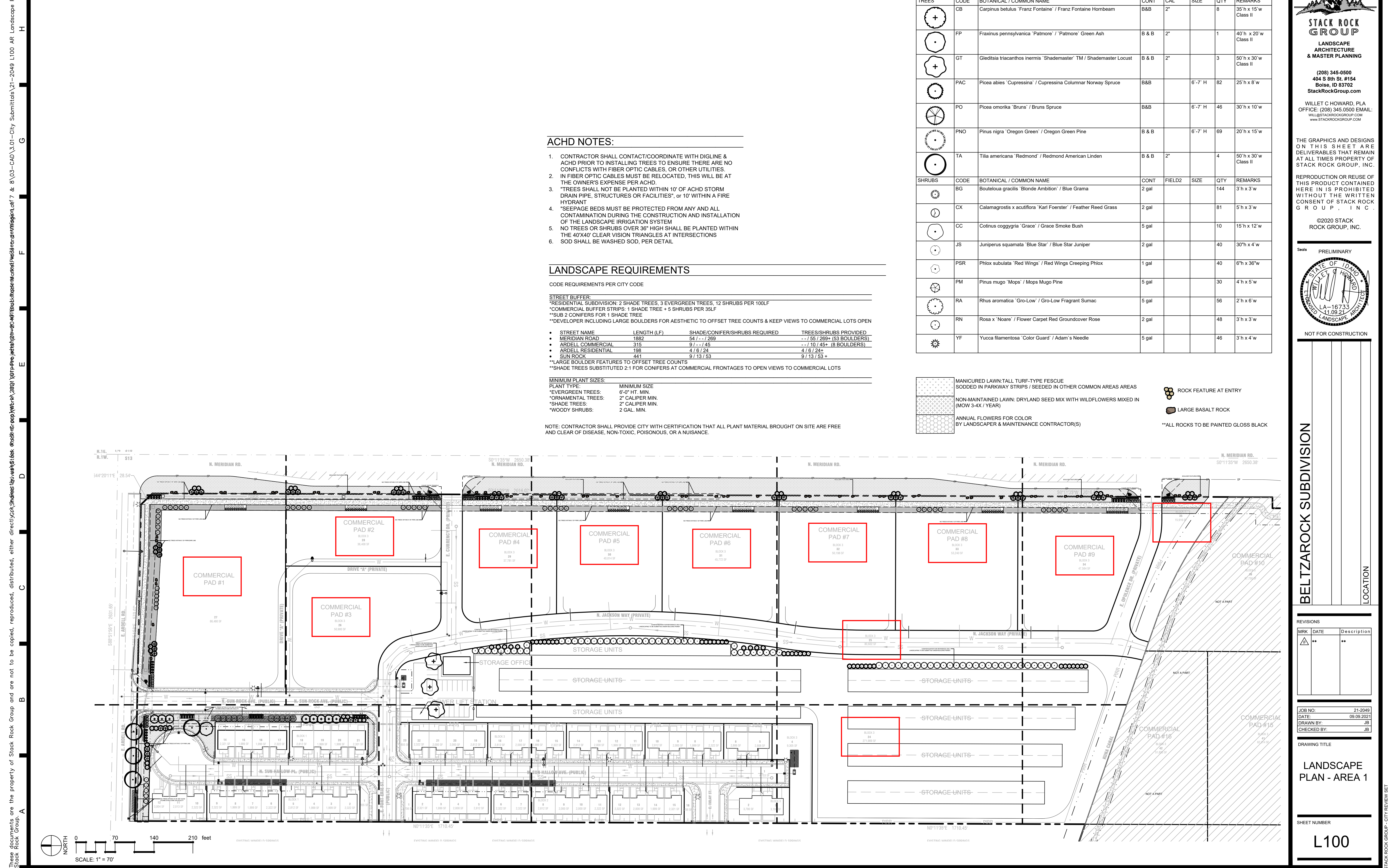
KUNA, IDAHO

PRELIMINARY STREET SECTIONS

PROJECT NO.	21-0309-BR
DWG FILE	C-400
DESIGNED BY	BT
DRAWN BY	JTA
CHECKED BY	BT
ISSUE DATE	03/10/22
HORIZ. SCALE	AS SHOWN
VERT. SCALE	AS SHOWN

C.400

SHEET 6 OF 6



ACHD NOTES:

- CONTRACTOR SHALL CONTACT/COORDINATE WITH DIGLINE & ACHD PRIOR TO INSTALLING TREES TO ENSURE THERE ARE NO CONFLICTS WITH FIBER OPTIC CABLES, OR OTHER UTILITIES.
- IN FIBER OPTIC CABLES MUST BE RELOCATED, THIS WILL BE AT THE OWNER'S EXPENSE PER ACHD.
- "TREES SHALL NOT BE PLANTED WITHIN 10' OF ACHD STORM DRAIN PIPE, STRUCTURES OR FACILITIES", or 10' WITHIN A FIRE HYDRANT
- "SLEEPAGE BEDS MUST BE PROTECTED FROM ANY AND ALL CONTAMINATION DURING THE CONSTRUCTION AND INSTALLATION OF THE LANDSCAPE IRRIGATION SYSTEM
- NO TREES OR SHRUBS OVER 36" HIGH SHALL BE PLANTED WITHIN THE 40'X40' CLEAR VISION TRIANGLES AT INTERSECTIONS
- SOD SHALL BE WASHED SOD, PER DETAIL

LANDSCAPE REQUIREMENTS

CODE REQUIREMENTS PER CITY CODE

- STREET BUFFER:**
 *RESIDENTIAL SUBDIVISION: 2 SHADE TREES, 3 EVERGREEN TREES, 12 SHRUBS PER 100LF
 *COMMERCIAL BUFFER STRIPS: 1 SHADE TREE + 5 SHRUBS PER 35LF
 **SUB 2 CONIFERS FOR 1 SHADE TREE
 **DEVELOPER INCLUDING LARGE BOULDERS FOR AESTHETIC TO OFFSET TREE COUNTS & KEEP VIEWS TO COMMERCIAL LOTS OPEN
- | STREET NAME | LENGTH (LF) | SHADE/CONIFERS/SHRUBS REQUIRED | TREES/SHRUBS PROVIDED |
|--------------------|-------------|--------------------------------|------------------------------|
| MERIDIAN ROAD | 1882 | 54 / - / 269 | -- / 55 / 269+ (53 BOULDERS) |
| ARDELL COMMERCIAL | 315 | 9 / - / 45 | -- / 10 / 45+ (8 BOULDERS) |
| ARDELL RESIDENTIAL | 198 | 4 / 6 / 24 | 4 / 6 / 24+ |
| SUN ROCK | 441 | 9 / 13 / 53 | 9 / 13 / 53 + |
- **LARGE BOULDER FEATURES TO OFFSET TREE COUNTS
 **SHADE TREES SUBSTITUTED 2:1 FOR CONIFERS AT COMMERCIAL FRONTAGES TO OPEN VIEWS TO COMMERCIAL LOTS

MINIMUM PLANT SIZES:

- | PLANT TYPE: | MINIMUM SIZE |
|--------------------|-----------------|
| *EVERGREEN TREES: | 6'-0" HT. MIN. |
| *ORNAMENTAL TREES: | 2" CALIPER MIN. |
| *SHADE TREES: | 2" CALIPER MIN. |
| *WOODY SHRUBS: | 2 GAL. MIN. |

NOTE: CONTRACTOR SHALL PROVIDE CITY WITH CERTIFICATION THAT ALL PLANT MATERIAL BROUGHT ON SITE ARE FREE AND CLEAR OF DISEASE, NON-TOXIC, POISONOUS, OR A NUISANCE.

PLANT SCHEDULE

TREES	CODE	BOTANICAL / COMMON NAME	CONT	CAL	SIZE	QTY	REMARKS
	CB	Carpinus betulus 'Franz Fontaine' / Franz Fontaine Hornbeam	B&B	2"		8	35' h x 15' w Class II
	FP	Fraxinus pennsylvanica 'Patmore' / Patmore Green Ash	B & B	2"		1	40' h x 20' w Class II
	GT	Gleditsia triacanthos inermis 'Shademaster' TM / Shademaster Locust	B & B	2"		3	50' h x 30' w Class II
	PAC	Picea abies 'Cupressina' / Cupressina Columnar Norway Spruce	B&B		6'-7' H	82	25' h x 8' w
	PO	Picea omorika 'Bruns' / Bruns Spruce	B&B		6'-7' H	46	30' h x 10' w
	PNO	Pinus nigra 'Oregon Green' / Oregon Green Pine	B & B		6'-7' H	69	20' h x 15' w
	TA	Tilia americana 'Redmond' / Redmond American Linden	B & B	2"		4	50' h x 30' w Class II
SHRUBS	CODE	BOTANICAL / COMMON NAME	CONT	FIELD2	SIZE	QTY	REMARKS
	BG	Bouteloua gracilis 'Blonde Ambition' / Blue Grama	2 gal			144	3' h x 3' w
	CX	Calamagrostis x acutiflora 'Karl Foerster' / Feather Reed Grass	2 gal			81	5' h x 3' w
	CC	Cotinus coggygria 'Grace' / Grace Smoke Bush	5 gal			10	15' h x 12' w
	JS	Juniperus squamata 'Blue Star' / Blue Star Juniper	2 gal			40	30' h x 4' w
	PSR	Phlox subulata 'Red Wings' / Red Wings Creeping Phlox	1 gal			40	6' h x 36' w
	PM	Pinus mugo 'Mops' / Mops Mugo Pine	5 gal			30	4' h x 5' w
	RA	Rhus aromatica 'Gro-Low' / Gro-Low Fragrant Sumac	5 gal			56	2' h x 6' w
	RN	Rosa x 'Noare' / Flower Carpet Red Groundcover Rose	2 gal			48	3' h x 3' w
	YF	Yucca filamentosa 'Color Guard' / Adam's Needle	5 gal			46	3' h x 4' w

	MANICURED LAWN:TALL TURF-TYPE FESCUE SODDED IN PARKWAY STRIPS / SEEDDED IN OTHER COMMON AREAS		ROCK FEATURE AT ENTRY
	NON-MAINTAINED LAWN: DRYLAND SEED MIX WITH WILDFLOWERS MIXED IN (MOW 3-4X / YEAR)		LARGE BASALT ROCK
	ANNUAL FLOWERS FOR COLOR BY LANDSCAPER & MAINTENANCE CONTRACTOR(S)		**ALL ROCKS TO BE PAINTED GLOSS BLACK

STACK ROCK GROUP
 LANDSCAPE ARCHITECTURE & MASTER PLANNING
 (208) 345-0500
 404 S 8th St. #154
 Boise, ID 83702
 StackRockGroup.com

WILLET C HOWARD, PLA OFFICE: (208) 345.0500 EMAIL: WILLET@STACKROCKGROUP.COM
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BELTZAROCK SUBDIVISION LOCATION

REVISIONS

MRK	DATE	Description
△	**	**

JOB NO: 21-2049
 DATE: 09.09.2021
 DRAWN BY: JB
 CHECKED BY: JB

DRAWING TITLE
LANDSCAPE PLAN - AREA 1

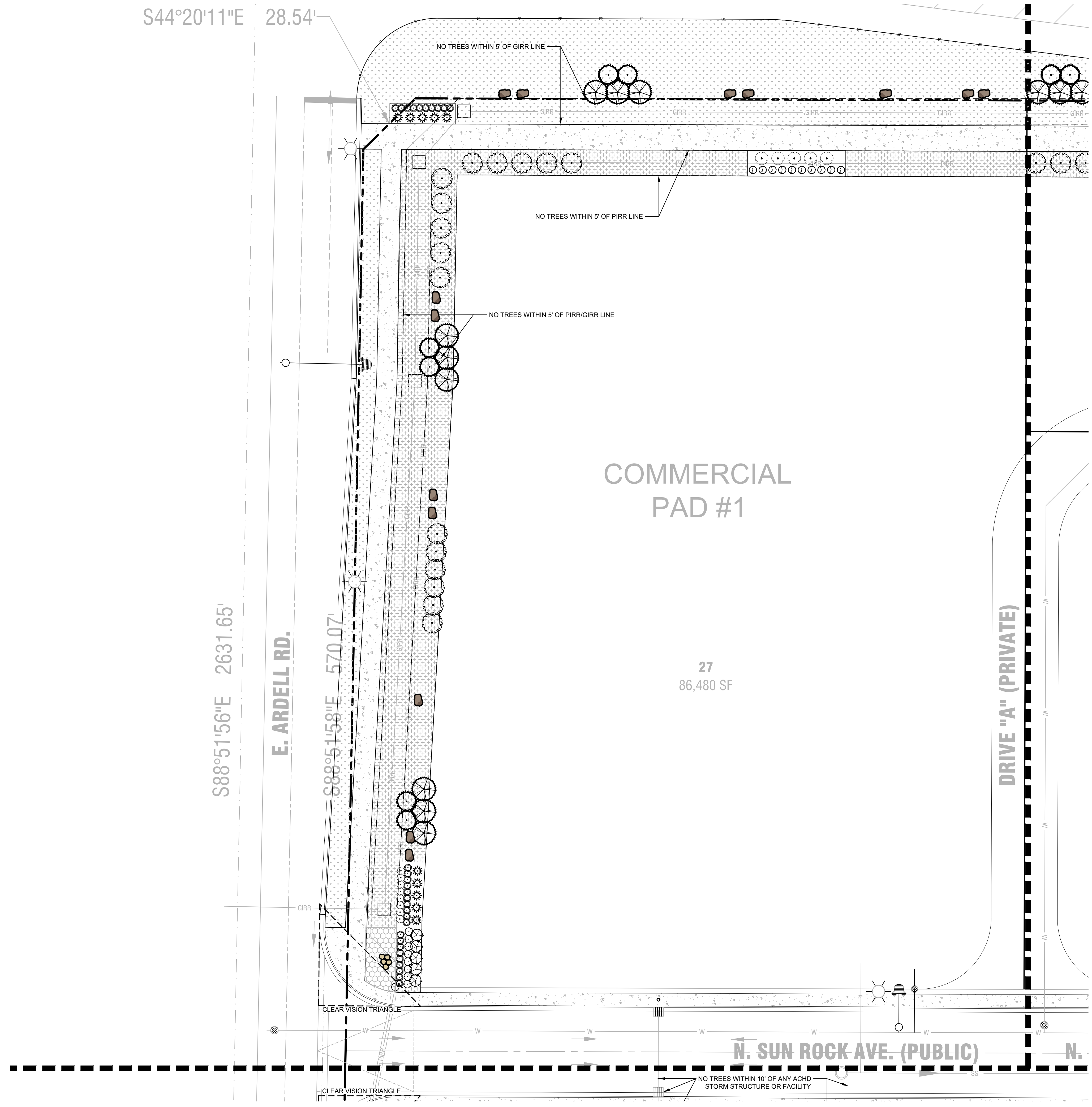
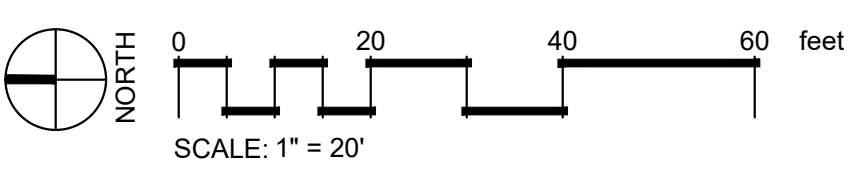
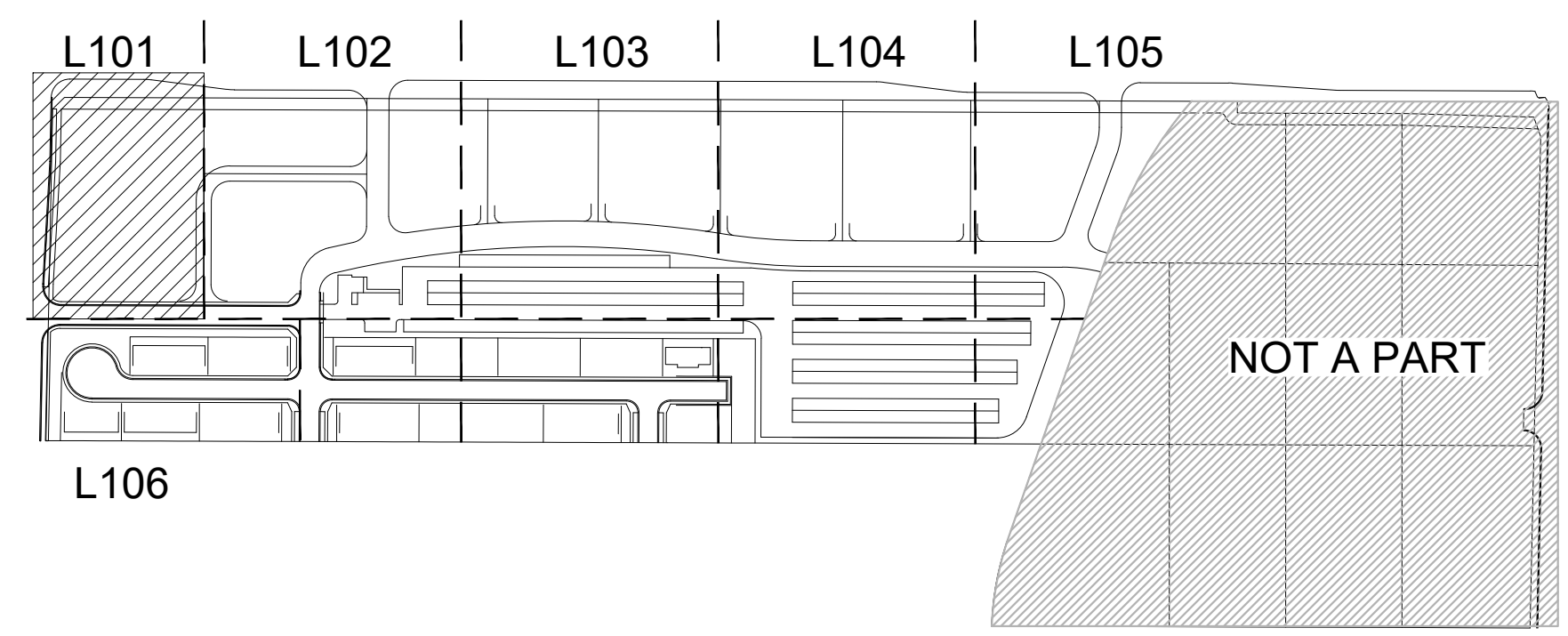
SHEET NUMBER
L100

PLANT SCHEDULE							
TREES	CODE	BOTANICAL / COMMON NAME	CONT	CAL	SIZE	QTY	REMARKS
	CB	Carpinus betulus 'Franz Fontaine' / Franz Fontaine Hornbeam	B&B	2"		8	35'h x 15'w Class II
	FP	Fraxinus pennsylvanica 'Patmore' / 'Patmore' Green Ash	B & B	2"		1	40'h x 20'w Class II
	GT	Gleditsia triacanthos inermis 'Shademaster' TM / Shademaster Locust	B & B	2"		3	50'h x 30'w Class II
	PAC	Picea abies 'Cupressina' / Cupressina Columnar Norway Spruce	B&B		6'-7' H	82	25'h x 8'w
	PO	Picea omorika 'Bruns' / Bruns Spruce	B&B		6'-7' H	46	30'h x 10'w
	PNO	Pinus nigra 'Oregon Green' / Oregon Green Pine	B & B		6'-7' H	69	20'h x 15'w
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	BG	Bouteloua gracilis 'Blonde Ambition' / Blue Grama	2 gal			144	3'h x 3'w
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	CC	Cotinus coggygria 'Grace' / Grace Smoke Bush	5 gal			10	15'h x 12'w
	JS	Juniperus squamata 'Blue Star' / Blue Star Juniper	2 gal			40	30'h x 4'w
	PSR	Phlox subulata 'Red Wings' / Red Wings Creeping Phlox	1 gal			40	6'h x 36'w
	PM	Pinus mugo 'Mops' / Mops Mugo Pine	5 gal			30	4'h x 5'w
	RA	Rhus aromatica 'Gro-Low' / Gro-Low Fragrant Sumac	5 gal			56	2'h x 6'w
	RN	Rosa x 'Noare' / Flower Carpet Red Groundcover Rose	2 gal			48	3'h x 3'w
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- MANICURED LAWN: TALL TURF-TYPE FESCUE
SODDED IN PARKWAY STRIPS / SEEDED IN OTHER COMMON AREAS
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(MOW 3-4X / YEAR)
- ANNUAL FLOWERS FOR COLOR
BY LANDSCAPER & MAINTENANCE CONTRACTOR(S)
- ROCK FEATURE AT ENTRY
- LARGE BASALT ROCK
- **ALL ROCKS TO BE PAINTED GLOSS BLACK

LANDSCAPE REQUIREMENTS

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| SUN ROCK | 441 | 9 / 13 / 53 | 9 / 13 / 53 |
- **LARGE BOULDER FEATURES TO OFFSET TREE COUNTS
 ***SHADE TREES SUBSTITUTED 2:1 FOR CONIFERS AT COMMERCIAL FRONTAGES TO OPEN VIEWS TO COMMERCIAL LOTS
- MINIMUM PLANT SIZES:**
- | PLANT TYPE | MINIMUM SIZE |
|-------------------|-----------------|
| EVERGREEN TREES: | 6'-0" HT. MIN. |
| ORNAMENTAL TREES: | 2" CALIPER MIN. |
| SHADE TREES: | 2" CALIPER MIN. |
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BELTZAROCK SUBDIVISION

LOCATION

REVISIONS

MRK	DATE	Description
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JOB NO: 21-2049
 DATE: 09.09.2021
 DRAWN BY: JB
 CHECKED BY: JB

DRAWING TITLE

LANDSCAPE PLAN - AREA 1

SHEET NUMBER

L101

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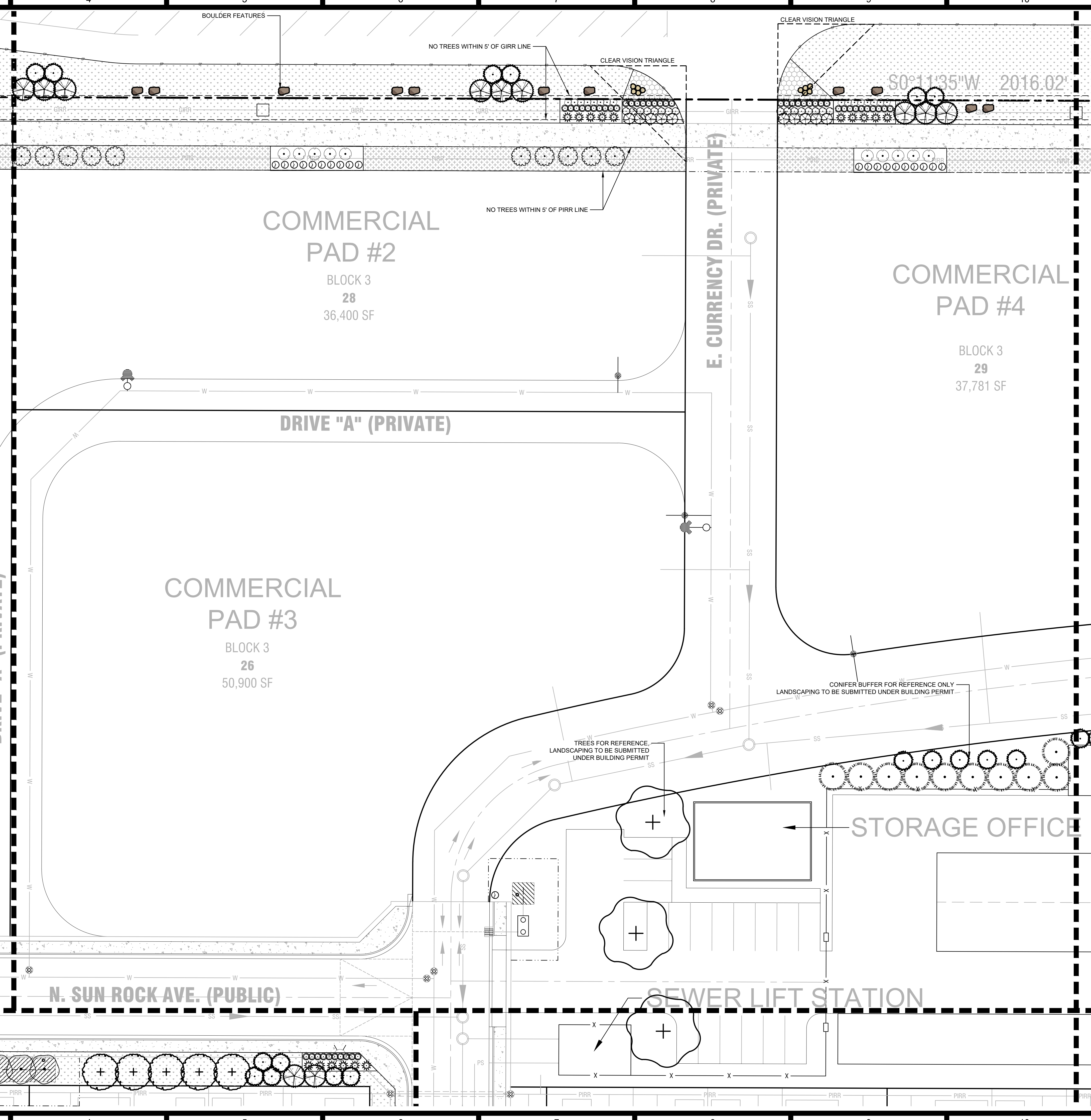
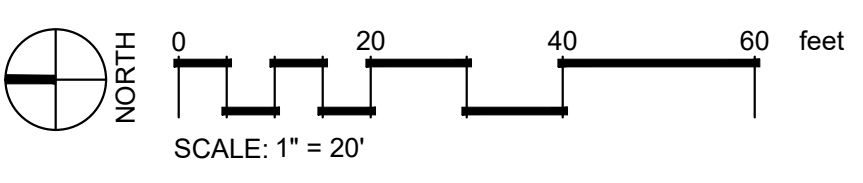
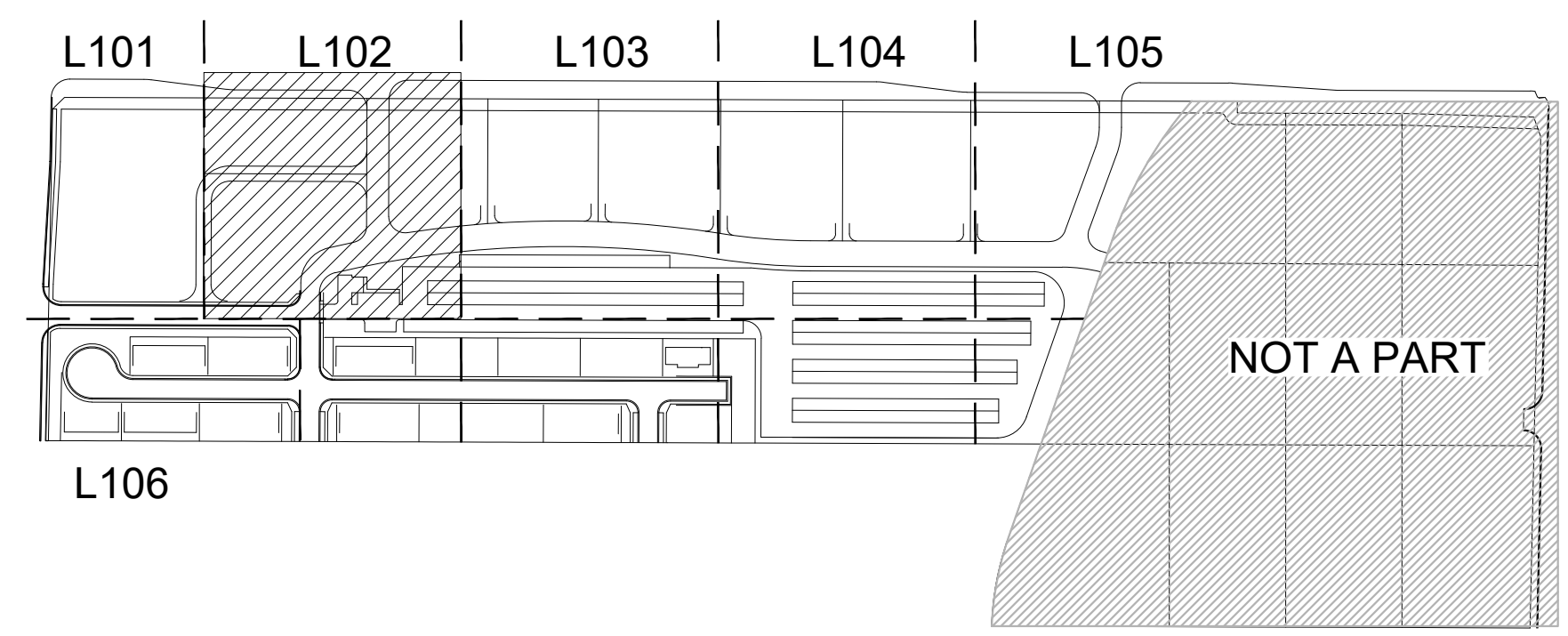
STACK ROCK GROUP - CITY REVIEW SET

PLANT SCHEDULE							
TREES	CODE	BOTANICAL / COMMON NAME	CONT	CAL	SIZE	QTY	REMARKS
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	PO	Picea omorika 'Brun's' / Brun's Spruce	B&B		6'-7' H	46	30'h x 10'w
	PNO	Pinus nigra 'Oregon Green' / Oregon Green Pine	B & B		6'-7' H	69	20'h x 15'w
	TA	Tilia americana 'Redmond' / Redmond American Linden	B & B	2"		4	50'h x 30'w Class II
SHRUBS	CODE	BOTANICAL / COMMON NAME	CONT	FIELD2	SIZE	QTY	REMARKS
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- ANNUAL FLOWERS FOR COLOR BY LANDSCAPER & MAINTENANCE CONTRACTOR(S)
- ROCK FEATURE AT ENTRY
- LARGE BASALT ROCK
- **ALL ROCKS TO BE PAINTED GLOSS BLACK

LANDSCAPE REQUIREMENTS

- CODE REQUIREMENTS PER CITY CODE
- STREET BUFFER:**
 *RESIDENTIAL SUBDIVISION: 2 SHADE TREES, 3 EVERGREEN TREES, 12 SHRUBS PER 100LF
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 **SUB 2 CONIFERS FOR 1 SHADE TREE
 ***DEVELOPER INCLUDING LARGE BOULDERS FOR AESTHETIC TO OFFSET TREE COUNTS & KEEP VIEWS TO COMMERCIAL LOTS OPEN
- | STREET NAME | LENGTH (LF) | SHADE/CONIFER/SHRUBS REQUIRED | TREES/SHRUBS PROVIDED |
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- **LARGE BOULDER FEATURES TO OFFSET TREE COUNTS
 **SHADE TREES SUBSTITUTED 2:1 FOR CONIFERS AT COMMERCIAL FRONTAGES TO OPEN VIEWS TO COMMERCIAL LOTS
- MINIMUM PLANT SIZES:**
 PLANT TYPE: MINIMUM SIZE
 *EVERGREEN TREES: 6'-0" HT. MIN.
 *ORNAMENTAL TREES: 2" CALIPER MIN.
 *SHADE TREES: 2" CALIPER MIN.
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BELTZAROCK SUBDIVISION
 LOCATION

REVISIONS

MRK	DATE	Description
△	**	**

JOB NO: 21-2049
 DATE: 09.09.2021
 DRAWN BY: JB
 CHECKED BY: JB

DRAWING TITLE

LANDSCAPE PLAN - AREA 2

SHEET NUMBER
L102

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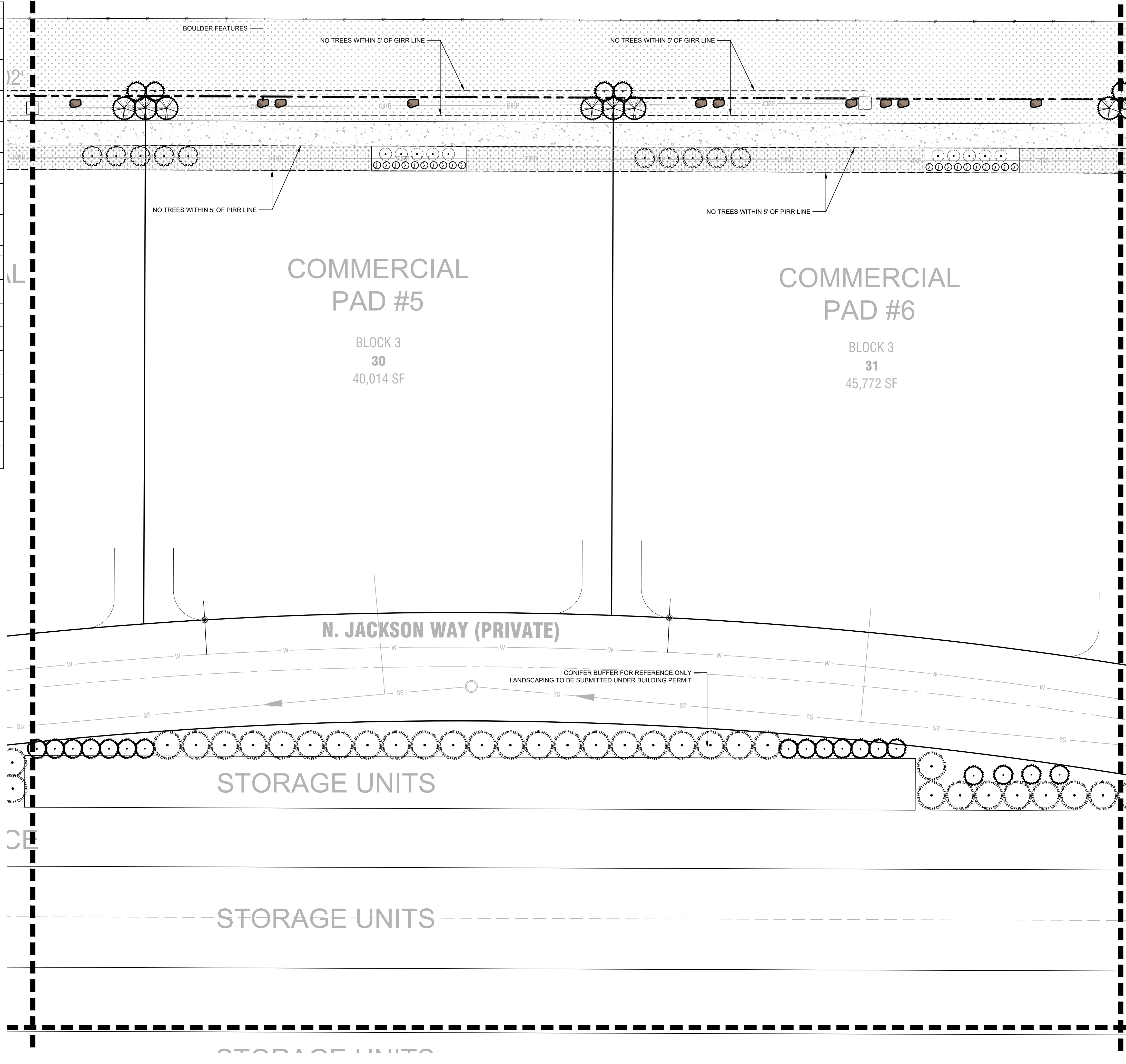
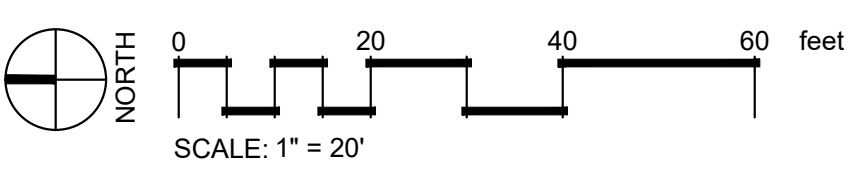
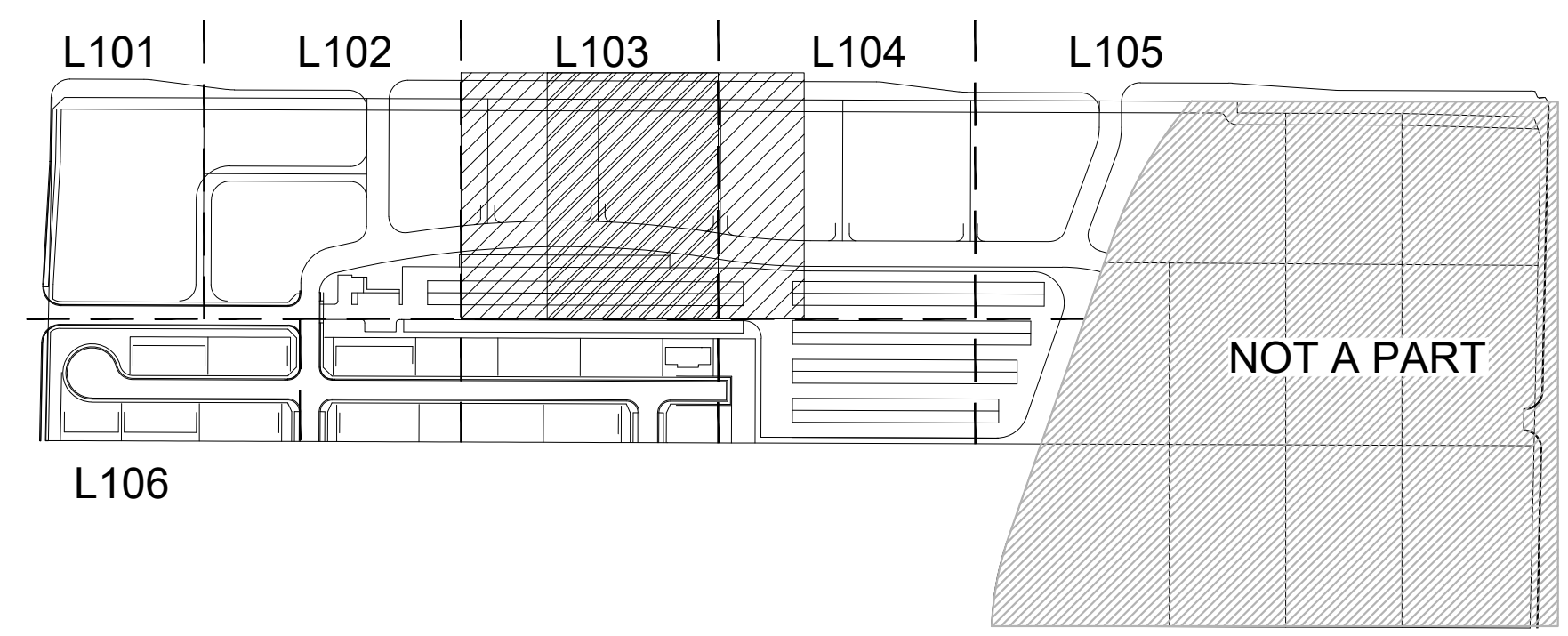
STACK ROCK GROUP - CITY REVIEW SET

PLANT SCHEDULE							
TREES	CODE	BOTANICAL / COMMON NAME	CONT	CAL	SIZE	QTY	REMARKS
	CB	Carpinus betulus 'Franz Fontaine' / Franz Fontaine Hornbeam	B&B	2"		8	35'h x 15'w Class II
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	RA	Rhus aromatica 'Gro-Low' / Gro-Low Fragrant Sumac	5 gal			56	2'h x 6'w
	RN	Rosa x 'Noare' / Flower Carpet Red Groundcover Rose	2 gal			48	3'h x 3'w
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LANDSCAPE REQUIREMENTS

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 *RESIDENTIAL SUBDIVISION: 2 SHADE TREES, 3 EVERGREEN TREES, 12 SHRUBS PER 100LF
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BELTZAROCK SUBDIVISION

LOCATION

REVISIONS

MRK	DATE	Description
△	**	**

JOB NO: 21-2049
 DATE: 09.09.2021
 DRAWN BY: JB
 CHECKED BY: JB

DRAWING TITLE

LANDSCAPE PLAN - AREA 3

SHEET NUMBER
L103

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STACK ROCK GROUP - CITY REVIEW SET

PLANT SCHEDULE							
TREES	CODE	BOTANICAL / COMMON NAME	CONT	CAL	SIZE	QTY	REMARKS
	CB	Carpinus betulus 'Franz Fontaine' / Franz Fontaine Hornbeam	B&B	2"		8	35'h x 15'w Class II
	FP	Fraxinus pennsylvanica 'Patmore' / 'Patmore' Green Ash	B & B	2"		1	40'h x 20'w Class II
	GT	Gleditsia triacanthos inermis 'Shademaster' TM / Shademaster Locust	B & B	2"		3	50'h x 30'w Class II
	PAC	Picea abies 'Cupressina' / Cupressina Columnar Norway Spruce	B&B		6'-7' H	82	25'h x 8'w
	PO	Picea omorika 'Bruns' / Bruns Spruce	B&B		6'-7' H	46	30'h x 10'w
	PNO	Pinus nigra 'Oregon Green' / Oregon Green Pine	B & B		6'-7' H	69	20'h x 15'w
	TA	Tilia americana 'Redmond' / Redmond American Linden	B & B	2"		4	50'h x 30'w Class II
SHRUBS	CODE	BOTANICAL / COMMON NAME	CONT	FIELD2	SIZE	QTY	REMARKS
	BG	Bouteloua gracilis 'Blonde Ambition' / Blue Grama	2 gal			144	3'h x 3'w
	CX	Calamagrostis x acutiflora 'Karl Foerster' / Feather Reed Grass	2 gal			81	5'h x 3'w
	CC	Cotinus coggygria 'Grace' / Grace Smoke Bush	5 gal			10	15'h x 12'w
	JS	Juniperus squamata 'Blue Star' / Blue Star Juniper	2 gal			40	30'h x 4'w
	PSR	Phlox subulata 'Red Wings' / Red Wings Creeping Phlox	1 gal			40	6'h x 36" w
	PM	Pinus mugo 'Mops' / Mops Mugo Pine	5 gal			30	4'h x 5'w
	RA	Rhus aromatica 'Gro-Low' / Gro-Low Fragrant Sumac	5 gal			56	2'h x 6'w
	RN	Rosa x 'Noare' / Flower Carpet Red Groundcover Rose	2 gal			48	3'h x 3'w
	YF	Yucca filamentosa 'Color Guard' / Adam's Needle	5 gal			46	3'h x 4'w

- MANICURED LAWN: TALL TURF-TYPE FESCUE SODDED IN PARKWAY STRIPS / SEEDED IN OTHER COMMON AREAS AREAS
- NON-MAINTAINED LAWN: DRYLAND SEED MIX WITH WILDFLOWERS MIXED IN (MOW 3-4X / YEAR)
- ANNUAL FLOWERS FOR COLOR BY LANDSCAPER & MAINTENANCE CONTRACTOR(S)
- ROCK FEATURE AT ENTRY
- LARGE BASALT ROCK
- **ALL ROCKS TO BE PAINTED GLOSS BLACK

LANDSCAPE REQUIREMENTS

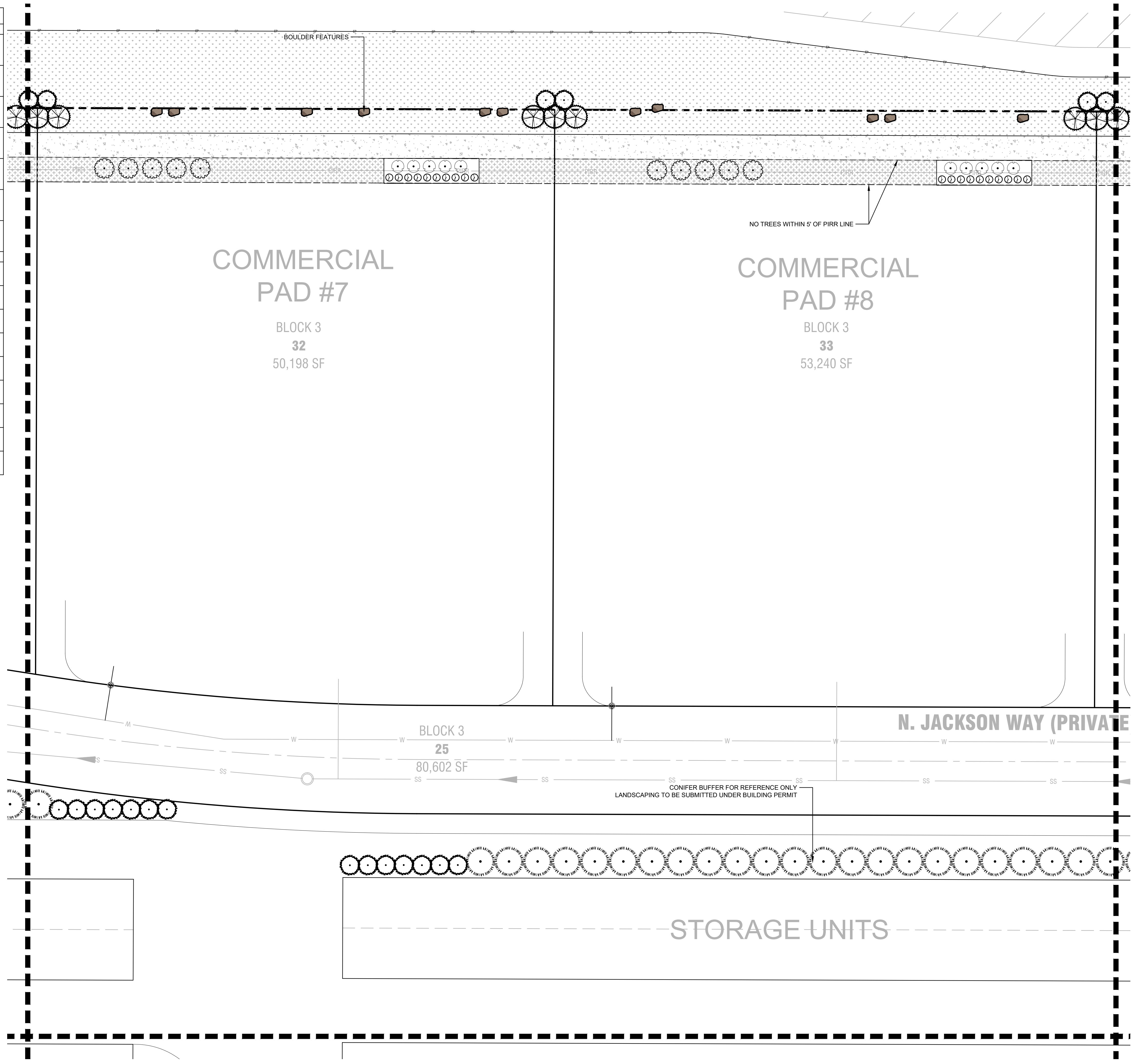
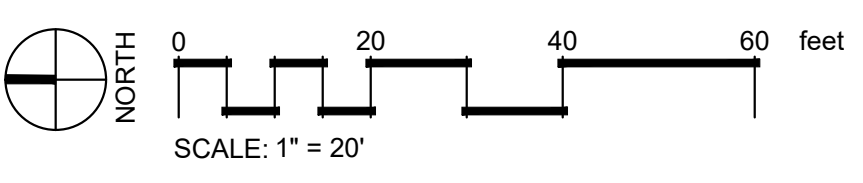
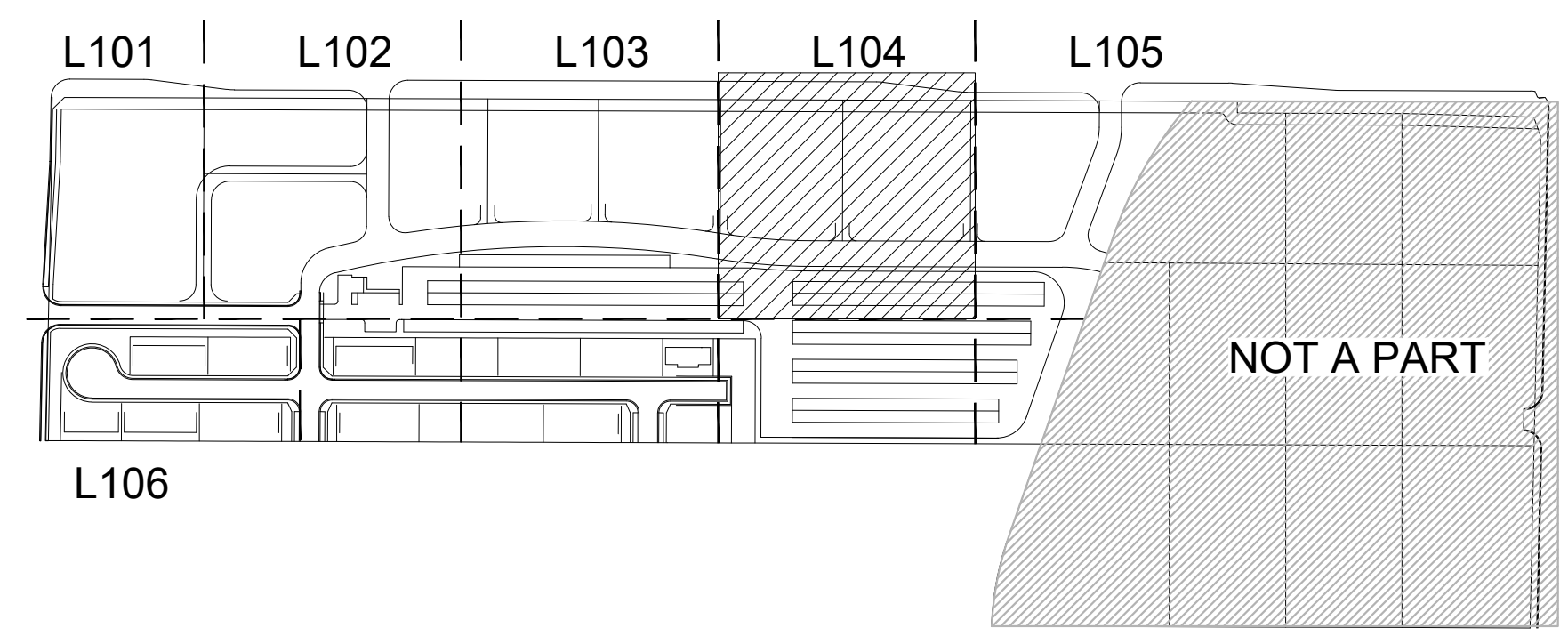
CODE REQUIREMENTS PER CITY CODE

STREET BUFFER:
 *RESIDENTIAL SUBDIVISION: 2 SHADE TREES, 3 EVERGREEN TREES, 12 SHRUBS PER 100LF
 *COMMERCIAL BUFFER STRIPS: 1 SHADE TREE + 5 SHRUBS PER 35LF
 **SUB 2 CONIFERS FOR 1 SHADE TREE
 ***DEVELOPER INCLUDING LARGE BOULDERS FOR AESTHETIC TO OFFSET TREE COUNTS & KEEP VIEWS TO COMMERCIAL LOTS OPEN

STREET NAME	LENGTH (LF)	SHADE/CONIFER/SHRUBS REQUIRED	TREES/SHRUBS PROVIDED
MERIDIAN ROAD	1882	54 / - / 269	- / 55 / 269* (63 BOULDERS)
ARDELL COMMERCIAL	315	9 / - / 45	- / 10 / 45* (8 BOULDERS)
ARDELL RESIDENTIAL	199	4 / 6 / 24*	4 / 6 / 24*
SUN ROCK	441	9 / 13 / 53	9 / 13 / 53*

**LARGE BOULDER FEATURES TO OFFSET TREE COUNTS
 ***SHADE TREES SUBSTITUTED 2:1 FOR CONIFERS AT COMMERCIAL FRONTAGES TO OPEN VIEWS TO COMMERCIAL LOTS

MINIMUM PLANT SIZES:
 PLANT TYPE: MINIMUM SIZE
 *EVERGREEN TREES: 6'-0" HT. MIN.
 *ORNAMENTAL TREES: 2" CALIPER MIN.
 *SHADE TREES: 2" CALIPER MIN.
 *WOODY SHRUBS: 2 GAL. MIN.



STACK ROCK GROUP
 LANDSCAPE ARCHITECTURE & MASTER PLANNING

(208) 345-0500
 404 S 8th St. #154
 Boise, ID 83702
 StackRockGroup.com

WILLET C HOWARD, PLA
 OFFICE: (208) 345.0500 EMAIL:
 WILLET@STACKROCKGROUP.COM
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BOLTZAROCK SUBDIVISION

LOCATION

REVISIONS

MRK	DATE	Description
△	**	**

JOB NO: 21-2049
 DATE: 09.09.2021
 DRAWN BY: JB
 CHECKED BY: JB

DRAWING TITLE

LANDSCAPE PLAN - AREA 4

SHEET NUMBER

L104

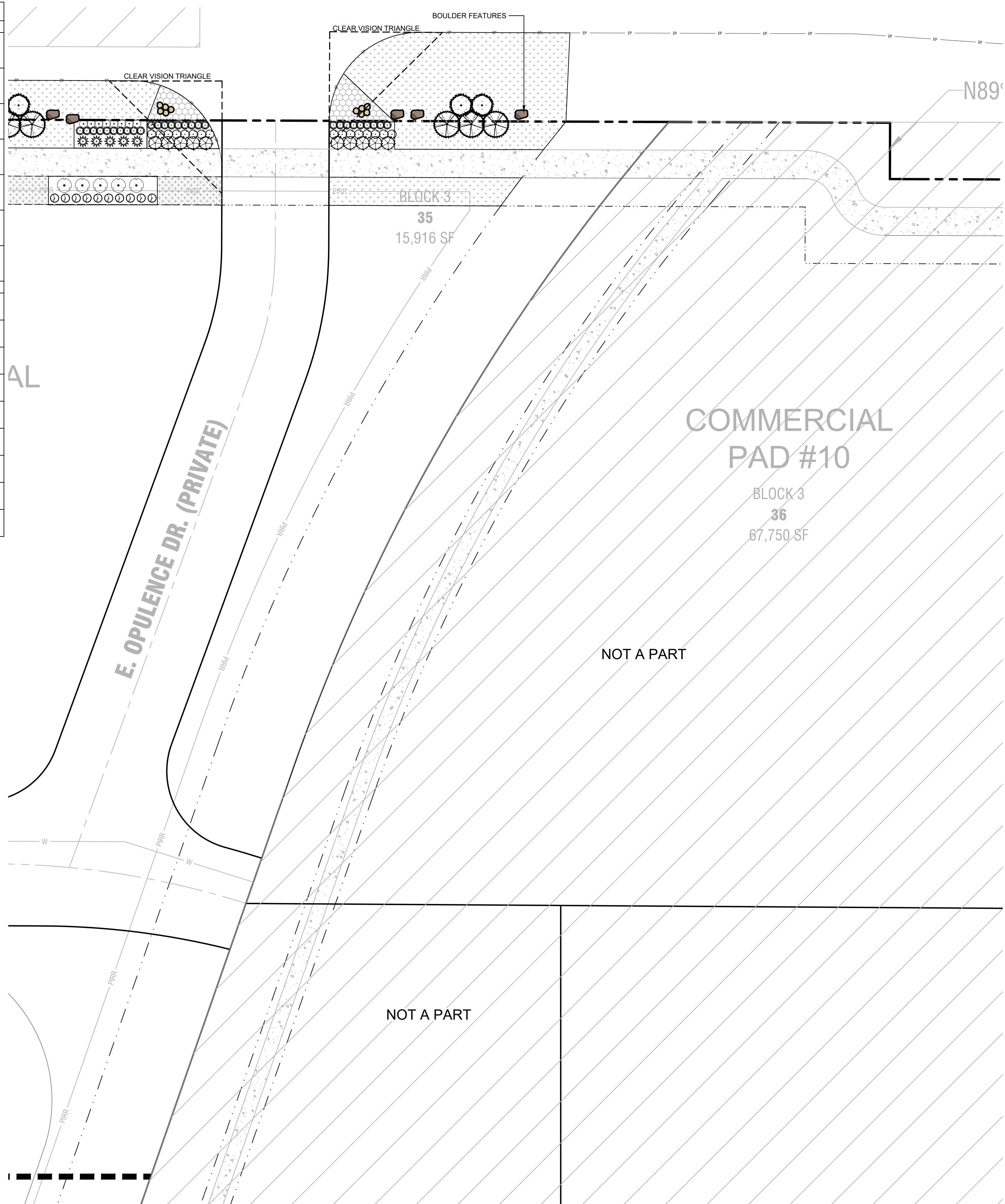
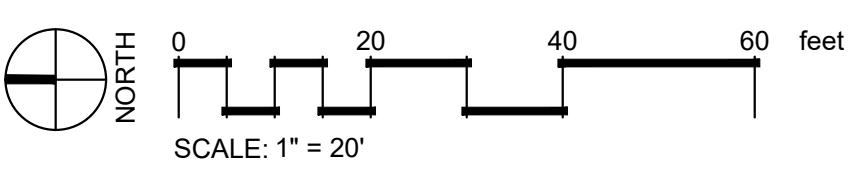
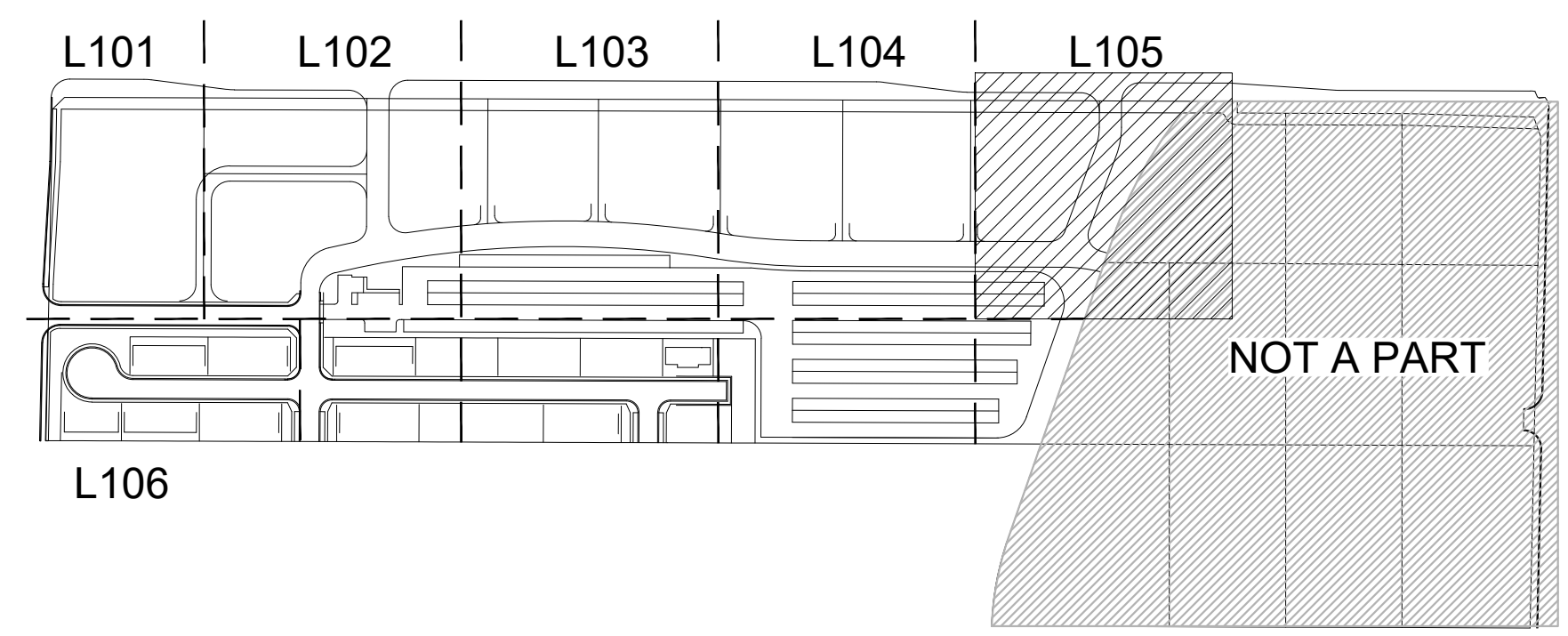
STACK ROCK GROUP - CITY REVIEW SET

PLANT SCHEDULE							
TREES	CODE	BOTANICAL / COMMON NAME	CONT	CAL	SIZE	QTY	REMARKS
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LANDSCAPE REQUIREMENTS

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BELTZAROCK SUBDIVISION

LOCATION

REVISIONS

MRK	DATE	Description
△	**	**

JOB NO: 21-2049
 DATE: 09.09.2021
 DRAWN BY: JB
 CHECKED BY: JB

DRAWING TITLE

LANDSCAPE PLAN - AREA 5

SHEET NUMBER
L105

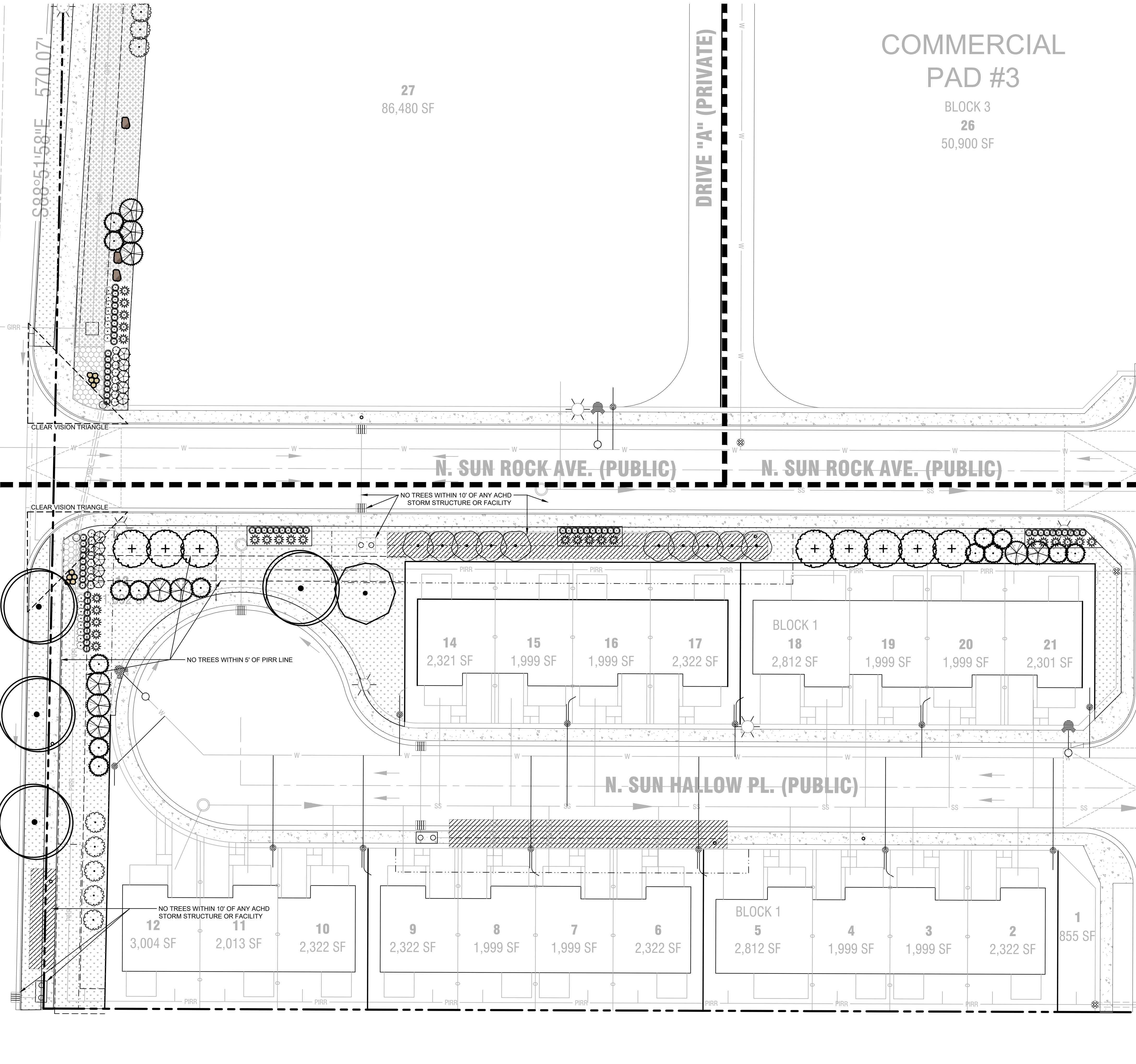
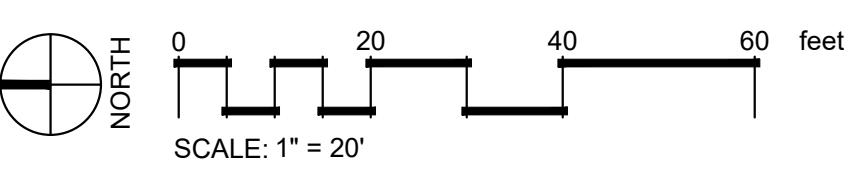
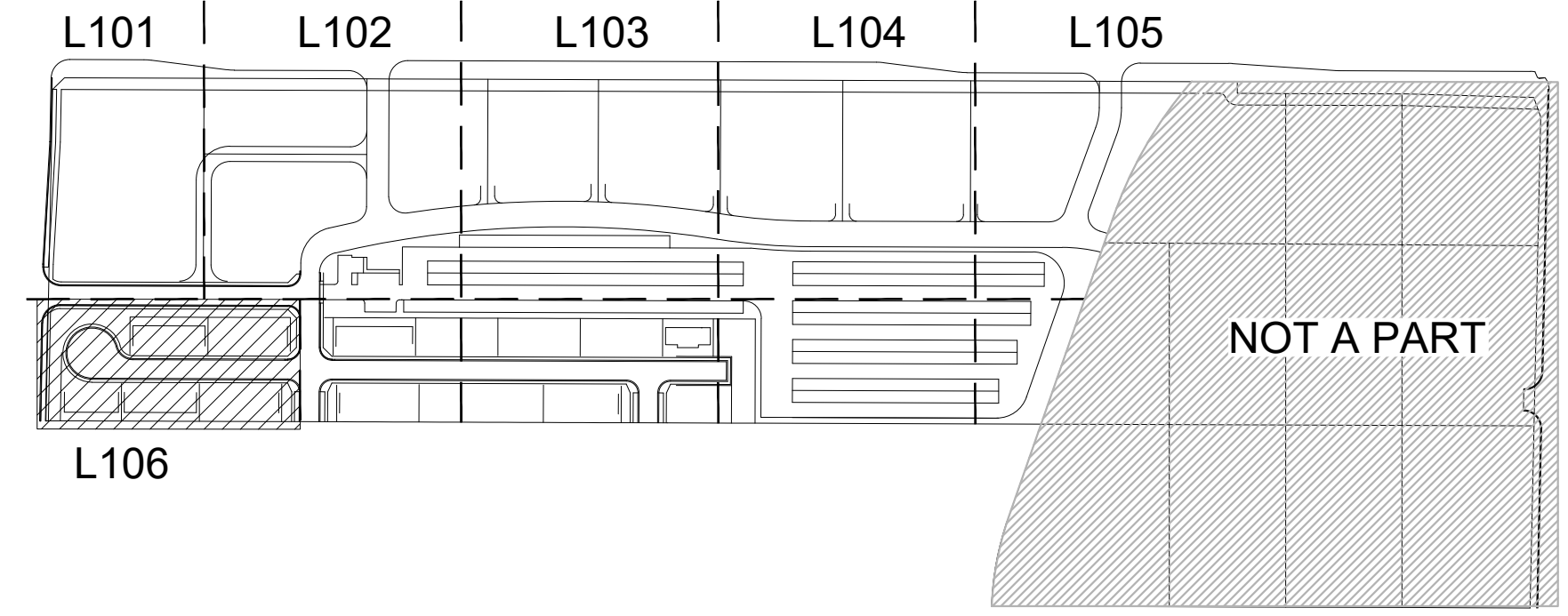
PLANT SCHEDULE

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COMMERCIAL PAD #3

BLOCK 3
26
50,900 SF

27
86,480 SF

DRIVE "A" (PRIVATE)

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BELTZAROCK SUBDIVISION

LOCATION

REVISIONS

MRK	DATE	Description
△	**	**

DRAWING TITLE

LANDSCAPE PLAN - AREA 6

SHEET NUMBER
L106

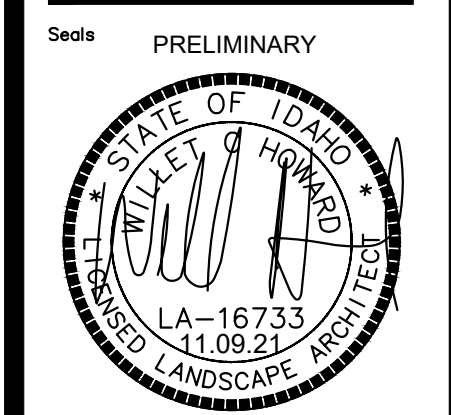
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STACK ROCK GROUP - CITY REVIEW SET

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BELTZAROCK SUBDIVISION

LOCATION

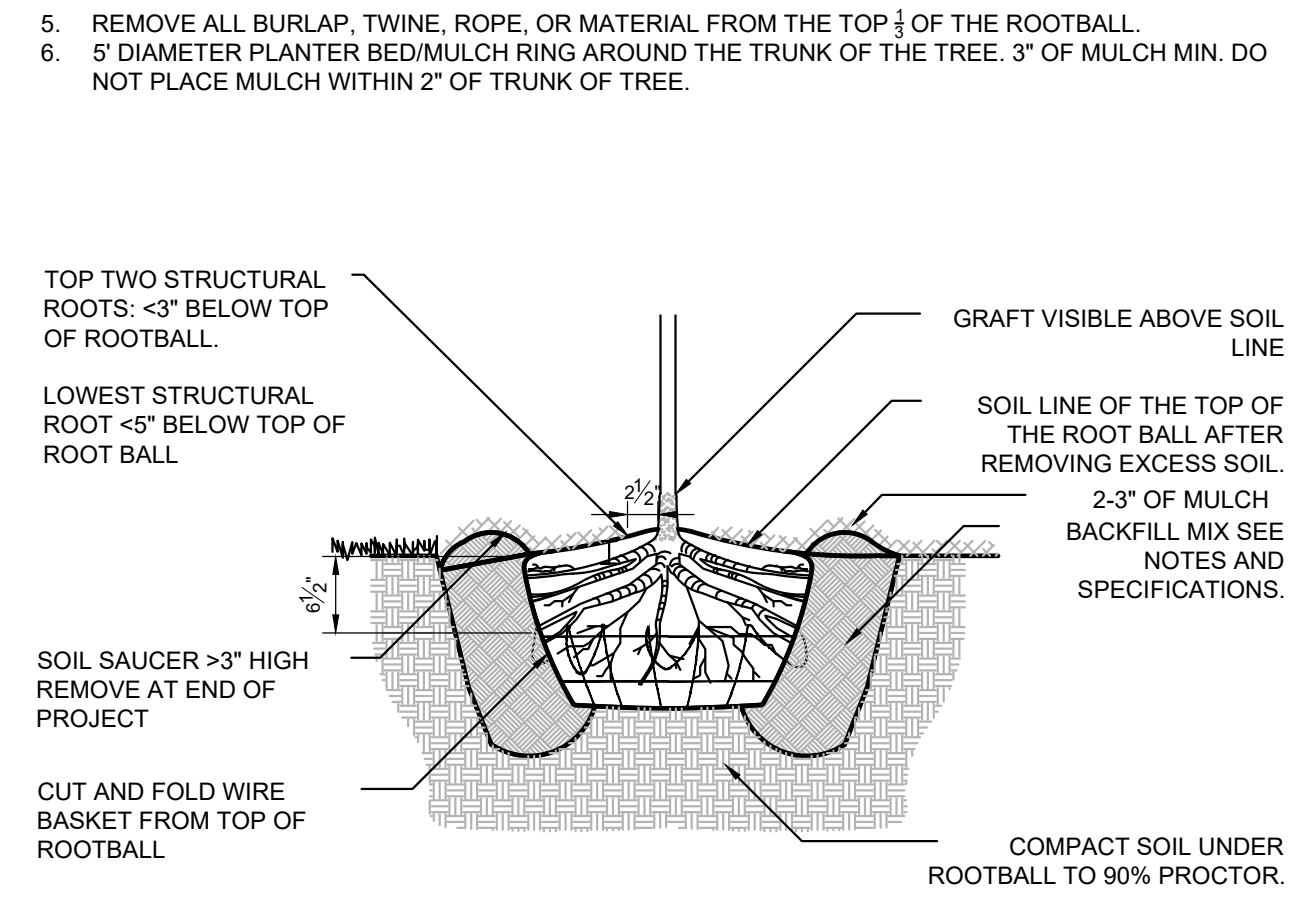
LANDSCAPE NOTES:

1. REGULATIONS & STANDARDS
 - 1.1. All contractor work shall be conducted in accordance with ISPWC (Idaho Standard Public Works Construction), 2021 (or most recent published); and City of KUNA, ID codes, standards and state and local regulations.
2. EXISTING CONDITIONS
 - 2.1. All utilities shall be located prior to construction and protected. Any damage to structures, utilities or concrete will be replaced at contractor's expense.
 - 2.2. The site has many existing improvements such as underground utilities, curb and gutter, light poles and sidewalks.
 - 2.3. See Engineer's plans for information about existing features.
 - 2.3.1. Refer to civil plans for all existing and/or proposed drainage pipes & locations, utilities. Protect all drainage at all times, protect all utilities at all times.
3. GRADING & SITE PREPARATION
 - 3.1. Prepare finish grades for planting by grubbing and removing weeds. If necessary apply Round-Up (or equivalent herbicide), using a certified applicator. Remove rocks and other materials over 2".
 - 3.2. All gravel overlap to be removed and disposed of off site.
 - 3.3. Finish grade to be smooth transition to allow for entire site to be a natural flowing space.
 - 3.4. Fine grade lawn areas to elevations set by Engineer's plans with positive drainage away from structures.
 - 3.5. Refer to Engineer's plans for grading information & for all drainage pipes and locations. Protect and retain drainage at all times.
 - 3.6. No pooling or standing water will be accepted per industry standards.
4. SOILS
 - 4.1. Lawn areas shall receive 12" min depth of screened topsoil.
 - 4.2. All planter beds shall receive 18" min depth of screened topsoil.
 - 4.3. Reuse of existing topsoil that has been stockpiled on site is permitted if:
 - 4.3.1. Topsoil is tested and analyzed to ensure a proper growing medium. Provide additional amendments as determined by soil tests.
 - 4.3.2. Topsoil is to be loose, friable sandy loam that is clean and free of toxic materials, noxious weeds, weed seeds, rocks, grass or other foreign materials.
 - 4.3.3. Topsoil shall have a pH of 6.5 to 8.0.
 - 4.3.4. If on site topsoil does not meet these minimum standards contractor is responsible for providing approved imported topsoil or improving onsite topsoil per the approval of the project manager.
 - 4.4. If imported topsoil is used it must be from a local source and be screened free of any debris or foreign matter. Topsoil must not contain rocks, sticks, lumps, or toxic matter and has a pH of 6.5-8.0.
5. LAWN AREAS
 - 5.1. Sodded lawn to be tall turf-type fescue, or approved other.
 - 5.2. Sodded lawn to be regionally/locally harvested, lay sod within 24 hours of harvesting.
 - 5.3. Lay sod to form a solid mass with offset, tightly fitted joints on even grades.
 - 5.4. Any existing lawn that is damaged shall be replaced with sodded lawn of the same type of existing lawn.
 - 5.5. All lawn areas adjacent to planter beds, gravel areas, or aggregate pathways shall have 4" black steel edging installed per manufacturer recommendations. Other applications to be approved by owner and landscape architect.
 - 5.6. Lawn adjacent to buildings, structures shall be a minimum of 18" away from foundations. Lawn adjacent to fences or other screening elements shall be a minimum of 9" away.
 - 5.6.1. Install 3/8" chips or other approved gravel mulch type in mow strip at a depth of 3" over commercial grade weed barrier fabric installed per manufacturer recommendations.
6. PLANTER BED MULCH
 - 6.1. All planter beds to receive 3" depth of black & tan mini rock mulch or approved equal, submit for approval prior to placement. Install over commercial grade weed barrier fabric per manufacturer recommendations.
7. PLANTS
 - 7.1. All plant material shall be installed per industry standards. All plant material shall meet or exceed the minimum federal standards as regulated by ANSI Z60.1, American Standard for Nursery Stock. Plants not meeting these standards for quality, or plants determined to be unhealthy by Owner's representative, will be rejected.
 - 7.2. All Ball and Burlap trees to be installed per Balled and Burlapped planting detail. All shrubs to be installed per detail.
 - 7.3. Trees and shrubs over 30" shall not be planted within clear vision triangles.
 - 7.4. Fertilize all trees and shrubs with 'Agriform' planting tablets or approved equal. Apply per manufacturers recommendations.
8. IRRIGATION
 - 8.1. Irrigation system shall be built to the following specifications:
 - 8.2. Adhere to city codes when connecting to city water.
 - 8.3. All irrigation material to be new with manufacturers' warranty fully intact.
 - 8.4. Install outdoor rated controller in specified location on plan, in a lock box with 2 keys. Coordinate with project manager and general contractor on exact location.
 - 8.4.1. Controller to have On/Off rain switch or rain shut off device that does not alter program.
- 8.5. All remote control valves (including master control valve) to have flow control device.
- 8.6. Irrigation system piping to be minimum class 200 PVC or approved equal, sleeves to be double the size of pipes located within, all wires to be contained in separate sleeves 1-1/2" dia min.
 - 8.7. All pipe above 3" caliber to be gasketed, with approved joint restraints at all 45, TEE, ELL, 22, 11.
 - 8.8. Use common trenching where possible.
 - 8.9. All PVC located under hardscapes to be schedule 40 PVC with same req's as above.
 - 8.10. All wires to be Paige wire 7350 or 7351 direct bury wire at a minimum of 12" below finished grade.
 - 8.11. Connect mainline to point of connection in approximate location shown on plan.
 - 8.12. Contractor is responsible complying with all codes and paying all permits necessary.
 - 8.13. Sprinkler heads shall have matched precipitation within each control circuit. Velocities shall not exceed 5 feet per second.
 - 8.14. All drip irrigation to be buried 2" below finished grade.
 - 8.15. Water schedule to be provided at a min of 80% evapotranspiration as determined by the local ET.
 - 8.16. Install all irrigation per irrigation drawings, utilize material specified or approved equal.
 - 8.17. Contractor shall confirm the static water pressure at least five days before construction begins and to contact the landscape architect in writing if the pressure is below 80 psi.
 - 8.18. If any discrepancies are found, then local codes shall prevail.
9. CONTRACTOR RESPONSIBILITIES
 - 9.1. Estimated quantities are shown for general reference only. Contractor shall be responsible for all quantity estimates.
 - 9.2. All plant material and workmanship shall be guaranteed for a period of one year beginning at the date of Acceptance by Owner. Replace all dead or unhealthy plant material immediately with same type and size at no cost to Owner.
 - 9.3. Landscape contractor to turn in as built drawings at the end of project. Substantial completion will not be granted until 2 copies @ 1"=20' scale are turned in and approved by owner's representative.
 - 9.4. In the event of a discrepancy, notify the Landscape Architect immediately.

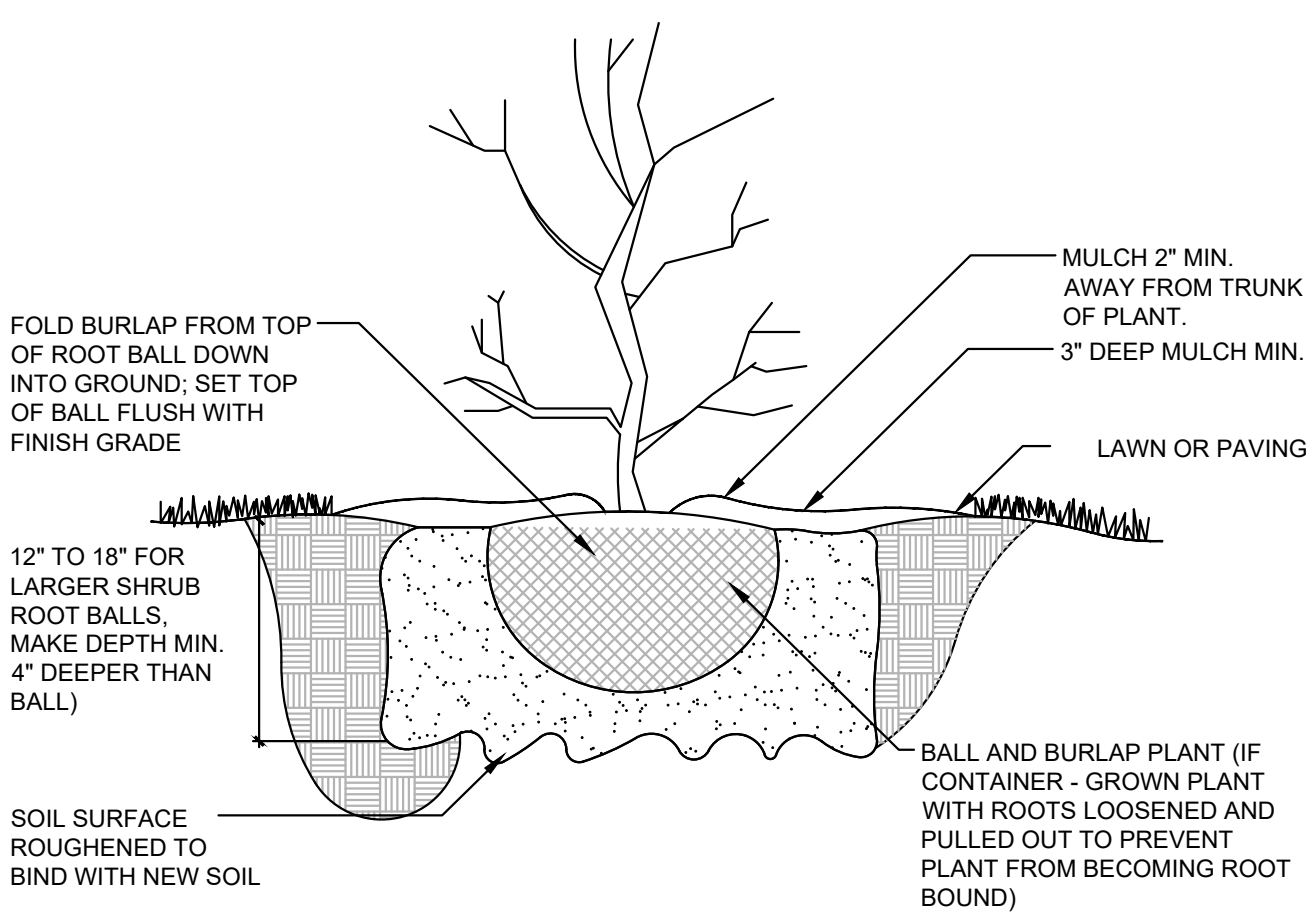
- NOTES:**
1. DO NOT DAMAGE OR CUT LEADER
 2. DO NOT DISTURB ROOT OR DAMAGE ROOT BALL WHEN INSTALLING TREE OR TREE STAKES.
 3. TREE STAKING SHALL BE AT THE DISCRETION OF CONTRACTOR. HOWEVER ANY TREES DISTURBED FROM PLUMB DURING THE PLANT WARRANTY PERIOD WILL BE REPAIRED OR REPLACED AT CONTRACTOR'S EXPENSE.
 4. WATER PLANTS THOROUGHLY IMMEDIATELY AFTER INSTALLATION.
 5. REMOVE ALL BURLAP, TWINE, ROPE, OR MATERIAL FROM THE TOP 1/4 OF THE ROOTBALL.
 6. 5" DIAMETER PLANTER BED/MULCH RING AROUND THE TRUNK OF THE TREE. 3" OF MULCH MIN. DO NOT PLACE MULCH WITHIN 2" OF TRUNK OF TREE.

NOTE:
 REMOVE ALL TAGS, TWINE OR OTHER NON BIODEGRADABLE MATERIALS ATTACHED TO PLANT OR ROOT MASS.

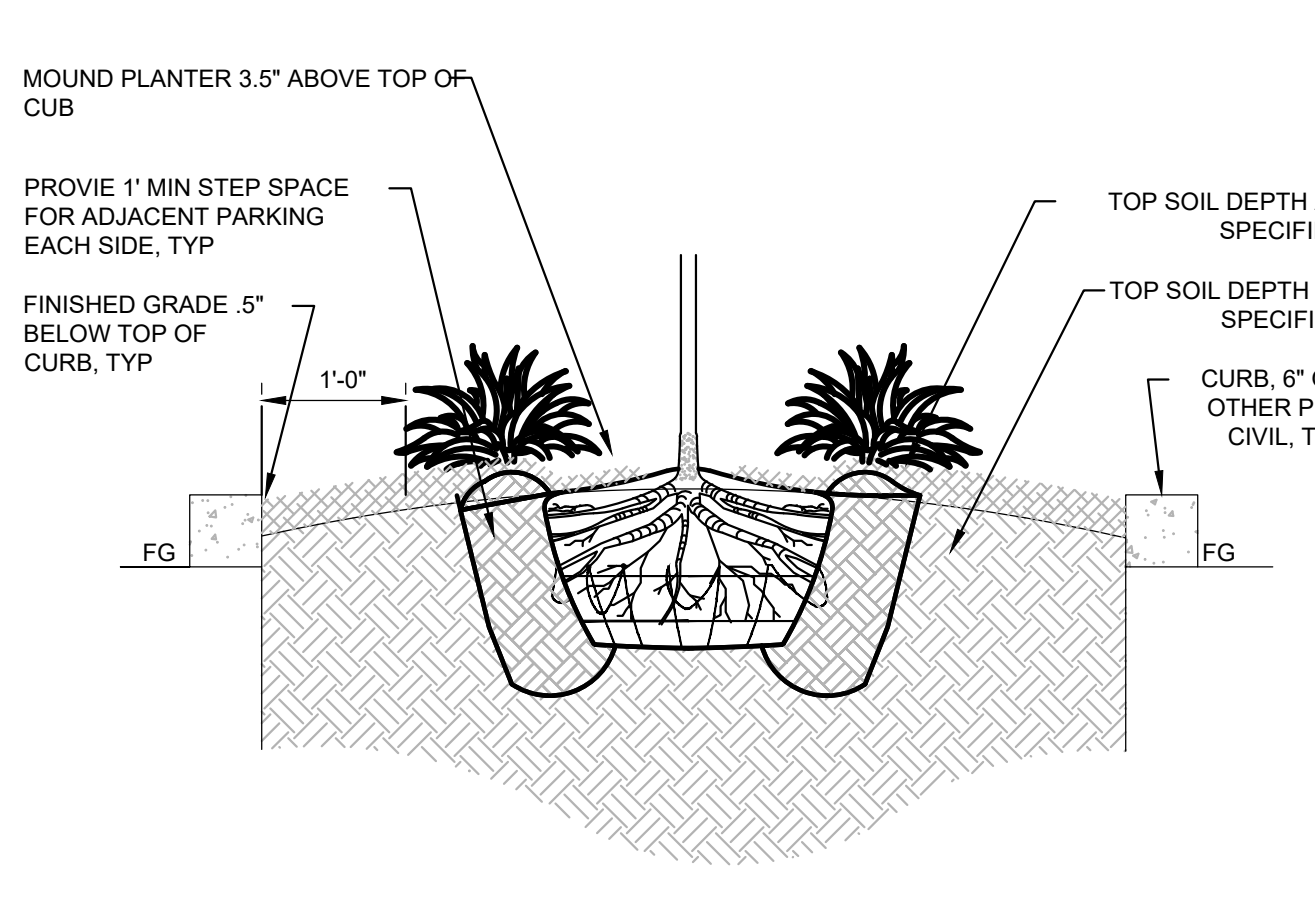
NOTE:
 *CURB & ADJACENT PAVEMENT PER CIVIL OR HARDSCAPE PLANS
 *TREE & SHRUB TO BE INSTALLED PER RESPECTIVE DETAILS
 *PLANTS & MULCH PER PLAN



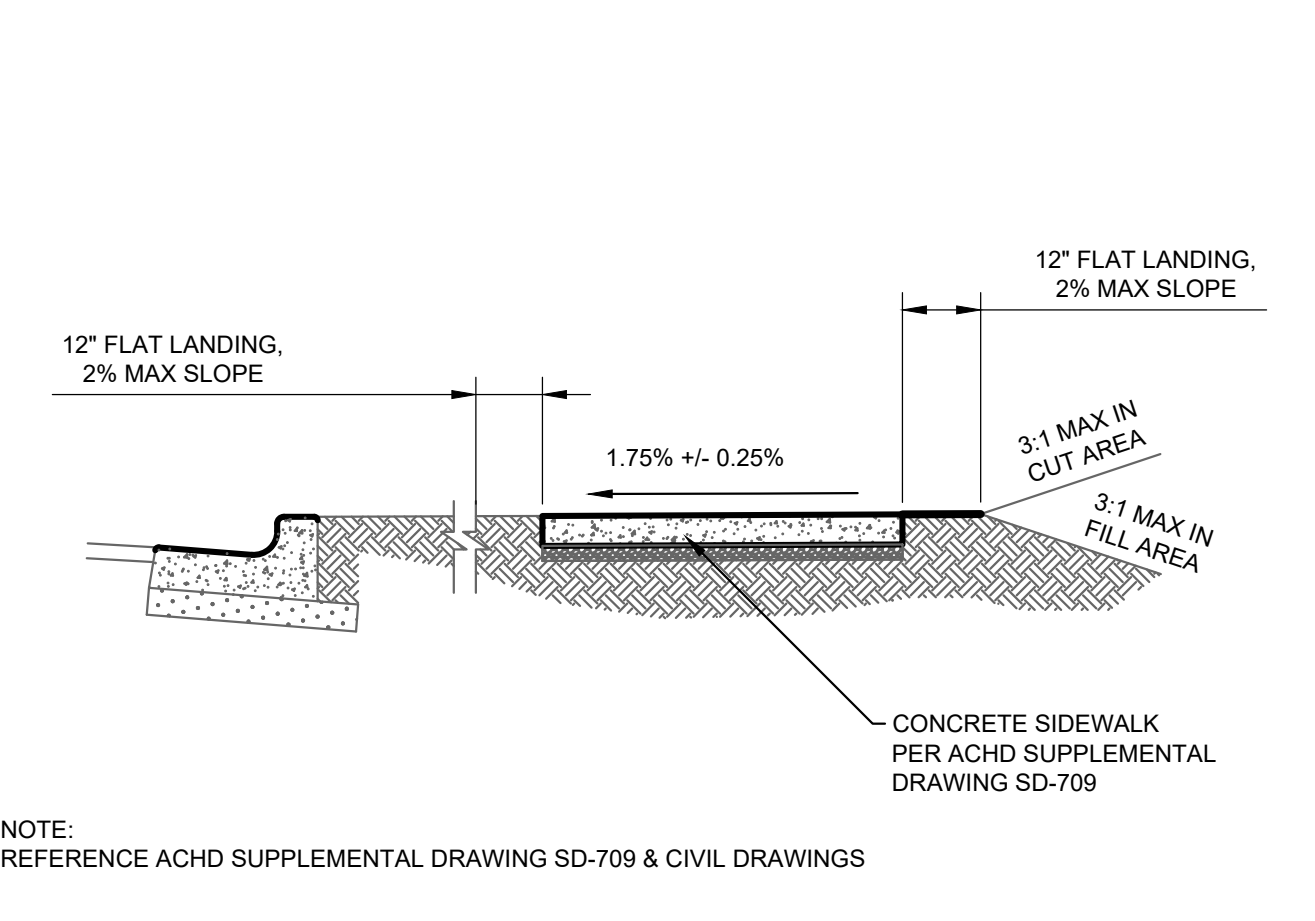
1 BALL & BURLAP TREE PLANTING
 3/4" = 1'-0" 3293-01



2 SHRUB PLANTING
 1" = 1'-0" 329333-03



3 PLANTER ISLAND DETAIL
 3/4" = 1'-0" P-CO-01



4 CONCRETE SIDEWALKS ADJ LANDING-12"
 3/8" = 1'-0" 329320-05

REVISIONS

MRK	DATE	Description
△	**	**

JOB NO: 21-2049
 DATE: 09.09.2021
 DRAWN BY: JB
 CHECKED BY: JB

DRAWING TITLE
LANDSCAPE NOTES & DETAILS

SHEET NUMBER
L150

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STACK ROCK GROUP - CITY REVIEW SET

**DESCRIPTION FOR
NORTH PARCEL
BLACKROCK MARKET PLACE**

A parcel of land located in the E 1/2 of the SE 1/4 of Section 13, Township 2 North, Range 1 West, Boise Meridian, Ada County, Idaho being more particularly described as follows:

Commencing at the SE corner of said Section 13 from which the S 1/4 corner of said Section 13 bears North 88°45'38" West, 2,630.90 feet;

thence along the South boundary line of said Section 13 North 88°45'38" West, 973.49 feet;

thence leaving said South boundary line North 00°11'35" East, 48.01 feet to a point on the North right-of-way line of E. Deer Flat Road;

thence continuing North 00°11'35" East, 925.33 feet to a point on the centerline of the Kuna Canal;

thence along the centerline of the Kuna Canal the following 2 courses and distances:

thence 151.82 feet along the arc of a non-tangent curve to the right, said curve having a radius of 500.00 feet, a central angle of 17°23'51" and a long chord which bears South 79°28'45" East, 151.24 feet;

thence South 70°46'49" East, 174.05 feet to the **REAL POINT OF BEGINNING**;

thence North 00°11'35" East, 1710.45 feet to a point on the South right-of-way line of E. Ardell Road;

thence along said South right-of-way line the following 2 courses and distances:

thence South 88°51'58" East, 570.07 feet;

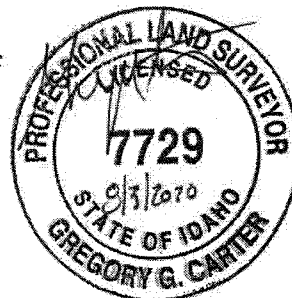
thence South 44°20'11" East, 28.54 feet to a point on the East right-of-way line of N. Meridian Road (SH 69);

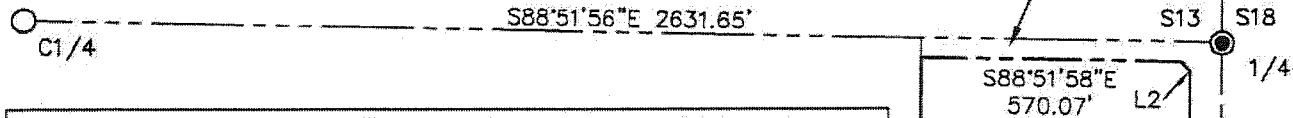
thence along said East right-of-way line South 00°11'35" West, 1937.55 feet to a point on the centerline of the Kuna Canal;

thence along the centerline of the Kuna Canal the following 2 courses and distances:

thence 267.30 feet along the arc of a non-tangent curve to the right, said curve having a radius of 700.00 feet, a central angle of 21°52'45" and a long chord which bears North 59°50'27" West, 265.68 feet;

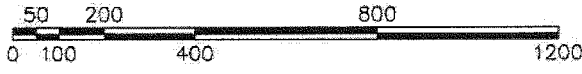
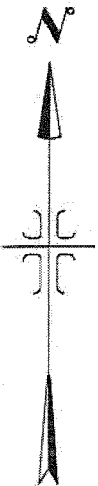
thence North 70°46'49" West, 380.63 feet to the **REAL POINT OF BEGINNING**. Containing 24.67 acres, more or less.





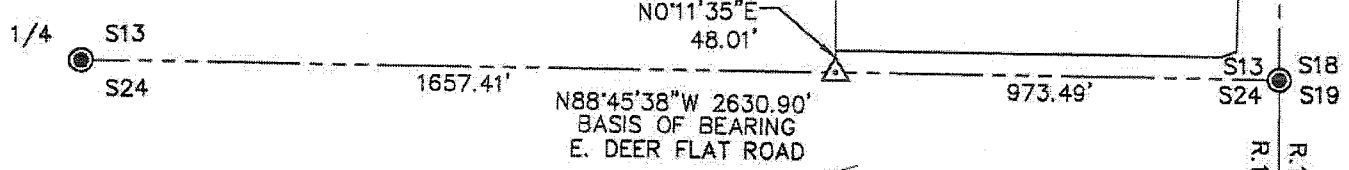
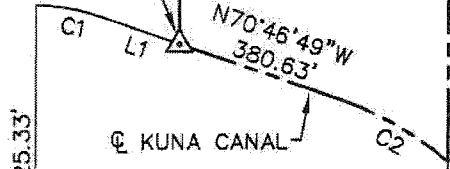
CURVE TABLE					
CURVE	RADIUS	LENGTH	CHORD DIST.	CHORD BRG.	DELTA
C1	500.00	151.82	151.24	S79°28'45\"/>	
C2	700.00	267.30	265.68	N59°50'27\"/>	

LINE TABLE		
LINE	LENGTH	BEARING
L1	174.05	S70°46'49\"/>
L2	28.54	S44°20'11\"/>



SCALE: 1" = 400'

REAL POINT OF BEGINNING



C:\Kuna\Marketsplace\Topo 18-129.dwg\North Parcel.dwg exhibit.dwg 8/3/2020 2:38:53 PM

IDAHO SURVEY GROUP, LLC
 9955 W. EMERALD ST.
 BOISE, IDAHO 83704
 (208) 948-9570

EXHIBIT DRAWING FOR
NORTH PARCEL
BLACKROCK MARKET PLACE
 LOCATED IN THE E 1/2 OF THE SE 1/4 OF SECTION 13
 T.2N., R.1W., B.M., ADA COUNTY, IDAHO

JOB NO. 18-129
SHEET NO. 1
DWG. DATE 8/3/2020

Ben Thomas

From: Sub Name Mail <subnamemail@adacounty.id.gov> on behalf of Sub Name Mail
Sent: Thursday, May 27, 2021 6:55 AM
To: Ben Thomas
Cc: Gregory Carter (gcarter@idahosurvey.com)
Subject: RE: Beltzarock Subdivision Name Reservation

May 27, 2021

Greg Carter, Idaho Survey Group
Ben Thomas, Civil-Innovations

RE: Subdivision Name Reservation: **BELTZAROCK SUBDIVISION**

At your request, I will reserve the name **Beltzarock Subdivision** for your project. I can honor this reservation only as long as your project is in the approval process. Final approval can only take place when the final plat is recorded.

This reservation is available for the project as long as it is in the approval process unless the project is terminated by the client, the jurisdiction or the conditions of approval have not been met, in which case the name can be re-used by someone else.

Sincerely,



Glen Smallwood
Surveying Technician
Ada County Development Services
200 W. Front St., Boise, ID 83702
(208) 287-7926 *office*
(208) 287-7909 *fax*

From: Ben Thomas <ben@civil-innovations.com>
Sent: Wednesday, May 26, 2021 9:19 AM
To: Sub Name Mail <subnamemail@adacounty.id.gov>
Subject: RE: [EXTERNAL] Subdivision Name Request

Glen,

Please find requested information below.

Owner/Developer:
SH69 Holdings, LLC
199 N. Capitol Blvd. Ste. 200
Boise, ID 83702
T.J. Angstman
208-384-8588
tj@angstman.com

TRANSPORTATION IMPACT STUDY

Blackrock Marketplace and Village

February 2022

PREPARED FOR
SH69 North, LLC
199 N. Capitol Boulevard, Suite 200
Boise, ID 83702

PREPARED BY
KITTELSON & ASSOCIATES, INC.
101 S Capitol Boulevard, Suite 600
Boise, ID 83702
208.338.2683

Transportation Impact Study

Blackrock Marketplace and Village

Kuna, Idaho

Prepared For:
SH69 North, LLC
199 N. Capitol Boulevard, Suite 200
Boise, ID 83702

Prepared By:
Kittelson & Associates, Inc.
101 South Capitol Boulevard, Suite 600
Boise, Idaho 83702
(208) 338-2683

Project Manager: John F. Ringert, PE
Project Analyst: Alec Kauffman

Project No. 25746

February 2022



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Section 1
Executive Summary

EXECUTIVE SUMMARY

Kittelson & Associates, Inc. (Kittelson) has prepared a Transportation Impact Study (TIS) for the proposed Blackrock Marketplace and Village, located on the west side of Meridian Road (SH 69) north of Deer Flat Road, in Kuna, Idaho. The proposed development site is bounded on the west by existing development (the Winfield Springs Subdivision), on the north by Ardell Road, on the south by Deer Flat Road, and on the east by Meridian Road. Figure 1 shows the site vicinity.

The purpose of this study is to evaluate the impact of the proposed development on the transportation system. Kittelson prepared this TIS based on conversations with SH69 North, LLC (property developer), Ada County Highway District (ACHD), Idaho Transportation Department (ITD) and Ada County Highway District (ACHD), Community Planning Association of Southwest Idaho (COMPASS), City of Kuna, and our familiarity with the area and with ACHD, City and ITD policies. *Appendix A includes the scope of work and coordination emails with ACHD, ITD and COMPASS and the COMPASS area of influence model run.*

The information presented in this report was developed based on conversations with the developer, a due diligence investigation, and coordination with the Idaho Transportation Department (ITD) and Ada County Highway District (ACHD).

FINDINGS

Existing Conditions

The existing conditions analysis findings are summarized below:

- The study evaluated four existing intersections during the AM and PM peak hours of a typical weekday.
- All study intersections were found to operate at acceptable operating standards during the existing weekday AM and PM peak hours with the exception of:
 - **Deer Flat Road / Meridian Road:** The eastbound left-turn movement was found to be over capacity during both the AM and PM peak hours:
 - Mitigation to acceptable operating standards requires adding a second eastbound left-turn lane creating dual eastbound left-turn lanes.
 - Field observations during the weekday AM peak hour revealed that there is a significant peak in eastbound traffic between approximately 7:20 and 7:40 AM that causes significant eastbound queuing on Deer Flat Road that appears to be partially due to traffic from the nearby high school to the west on Deer Flat Road.
 - This intersection is identified in the ACHD CIP for expansion and reconstruction in the 2031-2035 timeframe.

- The two existing unsignalized intersections that will be across from two of the proposed site driveways have movements that operate at LOS D which ACHD policy requires evaluation of signal warrants. These include:
 - **Site Access B (Future)/ Rodeo Lane / Meridian Road:** The westbound movement operates at LOS D with a V/C ratio of 0.03 during the weekday PM peak hour. The westbound volume was only 1 vehicle in the peak hour and therefore would not meet signal warrants. This intersection is also not planned for a signal by ITD in the draft concepts for the ITD SH-69 corridor plan.
 - **Site Access D (Future) / Ridleys Access / Deer Flat Road:** The northbound movement operates at LOS D with a V/C ratio of 0.68 during the weekday PM peak hour. Based on discussions with ACHD this intersection is planned to be converted to right-in, right-out (RIRO) and will not be considered for signalization. Therefore, traffic signal warrants were not evaluated. It should be noted that existing queues from Meridian Road current extend to this intersection for brief periods under existing conditions are not accounted for in the LOS procedures. Therefore, actual operations will be worse than reported during those periods.
- Intersection crash rates at the Ardell Road / Meridian Road intersection and Deer Flat Road / Meridian Road intersection did not indicate an abnormally high number of crashes. More detailed review of the crash characteristics identified the following:
 - **Deer Flat Road / Meridian Road:** A review of the crash data revealed a high percentage of the crashes were between eastbound left-turning traffic and westbound through traffic. This could indicate left-turn drivers may not be yielding to through traffic to the extent they should during the permissive left-turn signal phases.
- All ACHD study roadway segments are projected to operate at acceptable levels of service.

2030 Evaluation Findings

The evaluation included 2030 background and 2030 total traffic conditions. The 2030 findings are summarized below:

2030 Background Conditions

- Year 2030 background traffic volumes were forecasted using a 3.0 percent annual compounded growth rate to the existing traffic volumes for all roadways in the study area, except Ardell Road which a 2.0 percent annual compounded growth rate was applied to existing traffic volumes to account for regional growth in the site vicinity. Additionally, forecasted trips from the Lee Hubble Development were added on Ardell Road based on the TIS for that development.

- The 2030 analysis evaluated two roadway network scenarios for Ardell Road:
 - **Scenario 1:** Ardell Road remains as in the existing conditions and does not extend across the canal to the west.
 - **Scenario 2:** Ardell Road is connected over the canal to the west by 2030 and provides access to Linder Road.
- The 2030 background traffic analysis (without inclusion of site-generated traffic) found that all study intersections are expected to operate at acceptable operating standards during the weekday AM and PM peak hours, with the exception of the following intersections:
 - **Ardell Road / Meridian Road:** Under Scenario 2 in the PM peak hour, the eastbound approach is over-capacity.
 - ITD has an ongoing corridor study looking at long-term improvements that proposes a Reduced Conflict U-Turn (RCUT) intersection at the Ardell Road / Meridian Road intersection. An RCUT or right-in/right-out/left-in (RIROLI) mitigate this intersection under 2030 background conditions.
 - Improvement of this intersection is projected to be needed in approximately 2025, when approximately 122 additional eastbound PM peak hour trips are added to Ardell Road.
 - **Deer Flat Road / Meridian Road:** In the AM peak hour, the overall intersection V/C exceeds 1.00. The eastbound left turn also exceeds 1.00 in the AM and PM peak hour and the northbound and westbound through movements exceed the ITD V/C ratio threshold of ≤ 0.90 during the AM peak hour.
 - Similar to existing conditions, mitigation requires adding a second eastbound left-turn lane. But without signal timing changes the eastbound left-turn and westbound through movements have V/C ratios that exceed the ITD threshold of ≤ 0.90 . To mitigate to the ITD V/C threshold requires the following additional improvement:
 - A third eastbound left-turn lane.
 - **Site Access D / Ridley's Access / Deer Flat Road:** The northbound movement exceeds capacity in the PM peak hour.
 - Mitigation requires restricting the intersection to RIROLI.
 - This mitigation is projected to be needed in approximately 2029 with approximately 384 additional PM peak hour trips added to the intersection above existing traffic volume levels.
 - Discussion with ACHD have indicated that in the long term restriction of this intersection to RIRO is planned.

- All ACHD study roadway segments are projected to operate at acceptable levels of service with the exception of the following:
 - **Deer Flat Road (Site Frontage):** During the weekday AM peak hour, the single eastbound lane exceeds the ACHD segment threshold volume.
 - Mitigation requires adding a second eastbound through lane on Deer Flat Road.
 - This widening is projected to be needed in approximately 2024/2025 with approximately 70 additional eastbound trips on Deer Flat Road.
 - The ACHD CIP identifies widening of this section of Deer Flat Road in the 2031-2035 timeframe.

Trip Generation and Distribution

- The development is estimated to generate a total of approximately 18,158 daily trips, 778 weekday AM peak hour net new trips (440 inbound / 338 outbound) and 999 weekday PM peak hour net new trips (500 inbound / 499 outbound).
- The distribution pattern for site-generated trips was developed by reviewing the site plan and roadway system and evaluating a select zone analysis created by the COMPASS regional travel demand model.

2030 Total Traffic Conditions

- Year 2030 total traffic conditions found the same intersections not meeting ACHD and ITD requirements as under existing and 2030 background conditions which include the following:
 - **Ardell Road / Meridian Road:** Similar to 2030 background traffic conditions, the eastbound approach exceeds capacity during the weekday PM peak hour. With the site traffic, the intersection also exceeds capacity during the weekday AM peak hour under both Ardell Road scenarios.
 - Mitigation requires one of the following options:
 - **Option 1:** Signalized RCUT intersection
 - **Option 2:** Signalized RIROLI (similar to an RCUT operationally)
 - **Option 3:** Signalized full access with an eastbound left turn lane.
 - Options 1 and 2 operate at acceptable levels of service and under capacity, but the V/C ratios for the eastbound right-turn and the southbound through movements exceed the ITD policy of ≤ 0.90 during the weekday PM peak hour.

- Option 3 (full access signalized intersection) is the only option that meets ITD District 3 operational policy for LOS D and movement V/C ratios < 0.90.
 - The eastbound movement at the intersection is also projected to exceed capacity during the shoulder peak hour.
 - With development of the site mitigation, mitigation is projected to be needed in approximately 2023-2025 at which time approximately 27 percent (55,900 SF) and 21 percent (43,400 SF) of the development is estimated to be completed for Scenarios 1 and 2, respectively.
 - Approximately 122 additional eastbound PM peak hour trips, above existing conditions, can be added to the intersection prior to reaching capacity.
 - Site traffic accounts for approximately 18.8 and 19.8 percent of the total entering traffic during the AM and PM peak hours, respectively for Scenario 1 and 17.4 and 18.3 percent during the AM and PM peak hours, respectively for Scenario 2.
- **Deer Flat Road / Meridian Road:** Similar to 2030 background traffic conditions, the eastbound left turn and southbound right turn movements exceed capacity during the weekday AM and PM peak hours.
- Mitigation requires adding a second eastbound left-turn lane (same as existing and background conditions) to meet ACHD policy of LOS E and V/C ratios for movements of ≤ 1.00 .
 - Further mitigation would be needed to meet ITD policy of LOS D and V/C ratios for movements of ≤ 0.90 . Mitigation to ITD policy would require the following:
 - A third eastbound left-turn lane.
 - A third northbound and southbound through lane.
 - The median U-turn (MUT) intersection configuration identified in the draft SH-69 corridor plan was found to result operations that are under capacity, but some movements are projected to exceed the ITD V/C policy of ≤ 0.90 .
 - The eastbound left-turning movement is also projected to exceed capacity in the shoulder peak hours.
 - Site traffic accounts for approximately 13.5 percent of the total entering traffic during both the weekday AM and PM peak hours.
- **Site Access D / Ridley's Access / Deer Flat Road:** The northbound and southbound approaches at the intersection are projected exceed capacity during both the weekday AM and PM peak hours. Additionally, projected eastbound queues from the signal at Meridian Road were estimated to impact the ability to have a westbound

left-turn lane into the Ridley's Access. The intersection could be mitigated with the following options:

- **Option 1 - Site Access D RIROLI (Ridley's RIRO):** This option operates acceptably but requires southbound left-turning traffic from the site to turn right and make a U-turn at a location to the west, such as Sailer Way, to go east on Deer Flat Road.
- **Option 2 - Site Access D RIRO (Ridley's RIRO):** This option operates acceptably but requires the same re-routing as Option 1, but also requires eastbound left-turns at Site Access D to make turns or left-turns at the Deer Flat Road / Meridian Road intersection to access the site. This option results in the most impact to operations at the Deer Flat Road / Meridian Road intersection. This option may require minor widening and signal modifications at the Deer Flat Road / Meridian Road intersection to accommodate eastbound U-turns.
- With development of the site, mitigation is projected to be needed in approximately 2022/2023 at when approximately 7 percent (14,500 SF) of the development is completed.
- Approximately 75 additional trips can be added to the intersection prior to reaching capacity with the north leg added to the intersection.
- Site traffic accounts for approximately 33.9 percent and 26.8 percent of the total entering traffic during the weekday AM and PM peak hours, respectively.
- All ACHD study roadway segments are projected to operate at acceptable levels of service with the exception of:
 - **Deer Flat Road (Site Frontage):** During the weekday AM peak hour, the single eastbound lane exceeds the ACHD segment threshold volume.
 - The segment meets the ACHD segment thresholds in the shoulder peak hour. Two potential alternative mitigations could include:
 - **Deer Flat Road Sidewalk or Pathway:** A sidewalk or pathway connection along the site frontage to connect to the signal at Meridian Road and the stubbed sidewalk on the west end of the site. This is anticipated to be required by the City but would improve connectivity to the signalized pedestrian crossing on Meridian Road.
 - **Kuna Canal Shared-Use Pathway:** A shared use pathway along the Kuna Canal would provide a convenient connection to the adjacent neighborhood and potentially serve longer trips once other sections are completed by residential subdivisions to the east.
 - Mitigation requires adding a second eastbound through lane on Deer Flat Road.

- The ACHD CIP has widening of this section of Deer Flat Road identified for the 2031-2035 timeframe.
- This widening is projected to be needed in approximately 2024 with approximately 70 additional eastbound trips on Deer Flat Road.
- With development of the site mitigation is projected to be needed in approximately 2024/2025 when approximately 28 percent (55,200 SF) of the development is completed.
- Site traffic accounts for approximately 6.6 percent of the eastbound segment volume during the critical weekday AM peak hour.

Site Access Evaluation

- The turn lane analysis using ACHD and ITD procedures resulted in turn lane warrants at the following external site access streets:
 - Site Access B / Meridian Road:
 - Southbound right-turn lane
 - Northbound left-turn lane (existing center-turn lane)
 - Site Access C / Meridian Road:
 - Southbound right-turn lane
 - Northbound left-turn lane (existing center-turn lane)
 - Site Access D / Ridley's Access / Deer Flat Road:
 - Westbound right-turn lane (RIRO or RIROLI)
 - Eastbound left-turn lane (if RIROLI)
- Impacts to the adjacent local streets where the two street stubs are proposed to be extended into the northern portion of the development are projected to be low and not result in significant cut-through traffic for the following reasons:
 - The two connections to the west at Fort Erie Street and Imlay Street are at the northern portion of the site and therefore are not convenient for a majority of site traffic that is associated with the commercial uses on the south portion of the site.
 - The northern portion of the site has less commercial development than the southern portion of the development.
 - Use of the neighborhood streets would result in significantly longer travel distances to get to both Ardell Road and Deer Flat Road than using the internal site roadways.

- Most of the traffic (approximately 80 percent) is projected to have origins and destinations to the north, south, and east and only approximately 20 percent of the site trips will have destinations to the west on Deer Flat Road and Ardell Road.
- The intersection sight distance review identified that intersection sight distance can be achieved at the site access intersections.
- Daily traffic volumes at the site access locations are projected to remain under 5,000 with the exception of the following:
 - **Site Access A:** Site access A is projected to have a daily volume of 5,010.
 - **Site Access D – RIRO or RIROLI:** Site access D is projected to have a daily volume of 6,680 as a RIROLI and 6,130 as a RIRO.
 - Due to the volumes on these driveways being relatively close to the ACHD 5,000 daily trip threshold, additional driveways were not determined to be needed.
- A review of the site access locations and spacings identified the following:
 - **Site Access A:** The location will meet ACHD access spacing for Ardell Road.
 - **Site Access B:** This driveway will be in place of deeded accesses for the site and will only allow RIROLI movements. This driveway will be approximately opposite Rodeo Lane. The spacing to the north and south exceed the ITD minimum spacing between driveways but is only 550 feet south of Ardell Road which is below the 660 feet required by ITD upstream of the public road intersection.
 - Moving the access south approximately 30 feet may be necessary to accommodate the minimum standard ITD right-turn lane design for 55 mph. Moving the driveway to be offset with Rodeo Lane should not be a significant issue due to the low traffic volumes on Rodeo Lane.

There are minor driveways on the east side of Meridian Road that will be in the influence area of the RIROLI channelization for this driveway that may be restricted to RIRO depending on the design of the access.

- **Site Access C:** This driveway will be in place of deeded accesses for the site and will only allow RIROLI movements. The spacing to the north and south exceed the ITD minimum spacing between driveways and spacing to Ardell Road and Deer Flat Road on the west side of Meridian Road. There are minor driveways on the east side of Meridian Road that will be in the influence area of the RIROLI channelization for this driveway that may be restricted to RIRO depending on the design of the access.
- **Site Access D:** If designed as a RIRO driveway, this access will be aligned with the existing Ridley's driveway and not impact the access spacing of Deer Flat Road. If designed as a RIROLI driveway, this access may need to be shifted west to provide for the taper/gap for the dual left-turn lanes at the Deer Flat Road / Meridian Road.

If such offset is required, it will not create conflicts due to the restricted left-turn movements at both driveways. Additionally, the ACHD access spacing minimums will be met to Meridian Road (assuming the right-in, right out classification is applied for the distance from Meridian Road) to the east and Sailer Way to the west.

RECOMMENDATIONS

Based on the analyses and findings summarized in this report, following are the recommendations for the development.

Existing Traffic Condition Mitigations (Without the Proposed Development)

The following mitigations are recommended to accommodate the existing traffic volume and meet ACHD and ITD policies.

- **Deer Flat Road / Meridian Road:** Add a second eastbound left-turn lane to create dual eastbound left-turn lanes. In order to accommodate future traffic growth and the proposed development, a left-turn storage distance of 475 feet is recommended.

Year 2030 Background Traffic Conditions Mitigations (Without the Proposed Development)

The following mitigations are recommended to accommodate the year 2030 background traffic volume and meet ACHD and ITD policies.

2030 Background Traffic – Intersection Improvements

- **Ardell Road / Meridian Road:** Once Ardell Road is connected over the canal to the west (Scenario 2), one of the following mitigations are recommended:
 - **Option 1:** Install an RCUT intersection per the ITD draft corridor plan.
 - **Option 2:** Restrict to RIROLI by closing the eastbound left-turn movement.
 - Signalization could also be considered but is not consistent with the ITD draft corridor plan (see 2030 Total Traffic conditions)
 - Mitigation is estimated to be needed in approximately 2025 once approximately 122 additional eastbound trips are added in the weekday PM peak hour.
- **Deer Flat Road / Meridian Road:** Same improvement identified under existing conditions. It should be noted that two movements will exceed the ITD V/C threshold of 0.90 even with this mitigation and signal timing changes are required for those movements to meet ITD policy.

- **Site Access D / Ridleys Access / Deer Flat Road:** Restrict the existing access to RIRO. RIROLI could be considered if the length of the eastbound left-turn storage at the Deer Flat Road / Meridian Road intersection is not extended as recommended in the existing conditions recommendations and the left-turn lanes can be accommodated back-to-back.
 - This mitigation is projected to be needed in approximately 2029 with approximately 384 additional PM peak hour trips added to the intersection.
 - It should be noted that existing queues from Meridian Road currently extend to this intersection for brief periods under existing conditions which is not accounted for in the LOS procedures. Therefore, actual operations will be worse during those periods.

2030 Background Traffic - Roadway Segment Improvements

- **Deer Flat Road (Site Frontage):** Add an additional eastbound through lane to create two eastbound through lanes.
 - This widening is projected to be needed in approximately 2024 with approximately 70 additional eastbound trips on Deer Flat Road.

Year 2030 Total Traffic Conditions Mitigations (With the Proposed Development)

The following mitigations are recommended to accommodate the year 2030 total traffic volumes and meet ACHD and ITD policies:

2030 Total Traffic - Intersection Improvements

- **Ardell Road / Meridian Road:** Three mitigation options were identified.
 - **Option 1:** Signalized RCUT intersection
 - **Option 2:** Signalized RIROLI (similar to an RCUT operationally)
 - **Option 3:** Signalized full access with an eastbound left turn lane.
 - Improvement of this intersection is projected to be needed in approximately 2023-2025 at which time approximately 27 percent (55,900 SF) and 21 percent (43,400 SF) of the development is estimated to be completed for Scenarios 1 and 2, respectively.
 - Site traffic accounts for approximately 18.8 and 19.8 percent of the total entering traffic during the AM and PM peak hours, respectively for Scenario 1 and 17.4 and 18.3 percent during the AM and PM peak hours, respectively for Scenario 2.
- **Deer Flat Road / Meridian Road:** Same improvement identified under existing and background 2030 conditions. Queue storage of approximately 475 ft is recommended for the eastbound dual left-turn lanes.

- Site traffic accounts for approximately 13.5 percent of the total entering traffic during both the weekday AM and PM peak hours.
- **Site Access D / Ridley's Access / Deer Flat Road:** Two improvement options were identified, of which Option 1 provides the best operations with respect to the Deer Flat Road / Meridian Road intersection:
 - **Option 1 – Site Access D RIROLI (Ridley's RIRO):** Design the access at RIROLI for the north leg of the intersection a RIRO for the Ridley's Access in order to accommodate the eastbound left-turn queuing from the Deer Flat Road / Meridian Road intersection.
 - Install a westbound right-turn lane
 - Install an eastbound left-turn lane
 - Minor movement of Site Access D west may be needed depending on the design of the eastbound dual left-turn lanes.
 - **Option 2 – Site Access D RIRO (Ridley's RIRO):** Design the intersection as a RIRO for both the north and south legs of the intersection. This option results in the most impact to operations at the Deer Flat Road / Meridian Road intersection.
 - Install a westbound right turn lane.
 - Review the northwest corner of the Deer Flat Road / Meridian Road intersection to determine if eastbound U-turns can be accommodated and modify the corner design if necessary.
 - Improvement of this intersection is projected to be needed in approximately 2022/2023 when approximately 7 percent (14,500 SF) of the development is completed.
 - Site traffic accounts for approximately 33.9 percent and 26.8 percent of the total entering traffic during the weekday AM and PM peak hours, respectively.

2030 Total Traffic - Roadway Improvements

- **Deer Flat Road (Site Frontage):** Same as background 2030 (add an additional eastbound lane to accommodate AM traffic volumes).
 - With development of the site, mitigation is projected to be needed in approximately 2024/2025 at which time approximately 28 percent (55,200 SF) of the development is completed.
 - Site traffic accounts for approximately 6.6 percent of the eastbound segment volume during the critical weekday AM peak hour.
 - The segment meets the ACHD segment thresholds in the shoulder peak hour. Two potential alternative mitigations could include:

- **Deer Flat Road Sidewalk or Pathway:** A sidewalk or pathway connection along the site frontage to connect to the signal at Meridian Road and the stubbed sidewalk on the west end of the site. This is anticipated to be required by the City but would improve connectivity to the signalized pedestrian crossing on Meridian Road.
- **Kuna Canal Shared Use Pathway:** A shared use pathway along the Kuna Canal would provide a convenient connection to the adjacent neighborhood and potentially serve longer trips once other sections are completed by residential subdivisions to the west.

Site Driveways

- Install the site access driveways with the following configurations:
 - **Site Access A:** Single lane northbound and southbound.
 - **Site Access B:** Channelized RIROLI that may require relocation approximately 30 feet (or more) south to accommodate the ITD right-turn lane design. The following turn lanes are recommended:
 - Northbound left-turn lane with 100 feet of vehicle storage (existing two-way-left-turn (TWLTL) can be used).
 - Southbound right-turn lane per ITD design requirements.
 - Minor movement of the site driveway south may be needed to accommodate the southbound right-turn lane design.
 - **Site Access C:** Channelized RIROLI. The following turn lanes are recommended:
 - Northbound left-turn lane with 100 feet of vehicle storage (existing two-way-left-turn (TWLTL) can be used).
 - Southbound right turn lane per ITD design requirements.
 - **Site Access D:** Channelized RIROLI or RIRO. The following turn lanes are recommended:
 - RIROLI (provides best operations at Deer Flat Road / Meridian Road):
 - Eastbound left-turn lane with 100 feet of vehicle storage (existing two-way-left-turn (TWLTL) can be used).
 - Westbound right turn lane with 100 feet of vehicle storage per ACHD requirements.
 - Movement of Site Access D slightly west may be required based on the design of the eastbound dual-left-turn lanes taper/gap for the Deer Flat Road / Meridian Road intersection.

- RIRO:
 - Westbound right turn lane with 100 feet of vehicle storage.

The following recommendations have been identified to ensure adequate safety and sight distance is provided at the site access points, internal intersections, and roadways:

- Verify adequate intersection sight distance is available during the final design of the access driveways and internal intersections.
- Review placement of fences, walls, monument signs, street trees, and other features that may impact intersection sight distance.
- Site accesses should match the existing grade of the roadways.
- Shrubbery, weeds, and landscaping near the internal intersections and site access points should be maintained or modified to ensure adequate sight distance.
- If future widening occurs along adjacent roadways, care should be taken to ensure adequate intersection sight distance is maintained.

Section 2
Introduction

INTRODUCTION

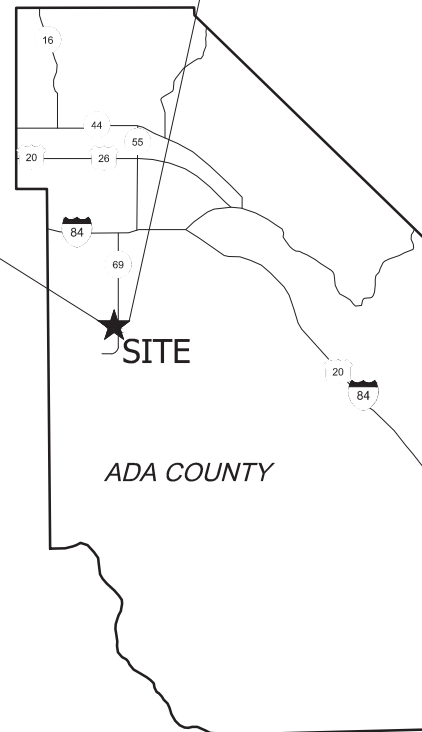
Kittelson & Associates, Inc. (Kittelson) has conducted a Transportation Impact Study (TIS) for the proposed Blackrock Marketplace and Village in Kuna, Idaho. The study was prepared in accordance with requirements of the Idaho Transportation Department (ITD) *Rules Governing Highway Right-of-Way Encroachment Rights-of-Way* (Reference 1) and Ada County Highway District's (ACHD) *Policy Manual Section 7106* (Reference 2). The TIS examines the current transportation network and addresses the transportation impacts associated with background growth and the proposed development.

PROJECT DESCRIPTION

The proposed Blackrock Marketplace and Village is situated on approximately 41 acres of land in Kuna, Idaho. The proposed development site is bounded on the west by existing residential development (the Winfield Springs Subdivision), north by Ardell Road, south by Deer Flat Road, and east by Meridian Road. Figure 1 shows the site vicinity. The development plan consists of the following land uses:

- Approximately 53 town homes
- Approximately 18,500 square feet of office space
- 189,500 square-feet of commercial/retail space, and
- 600 storage units

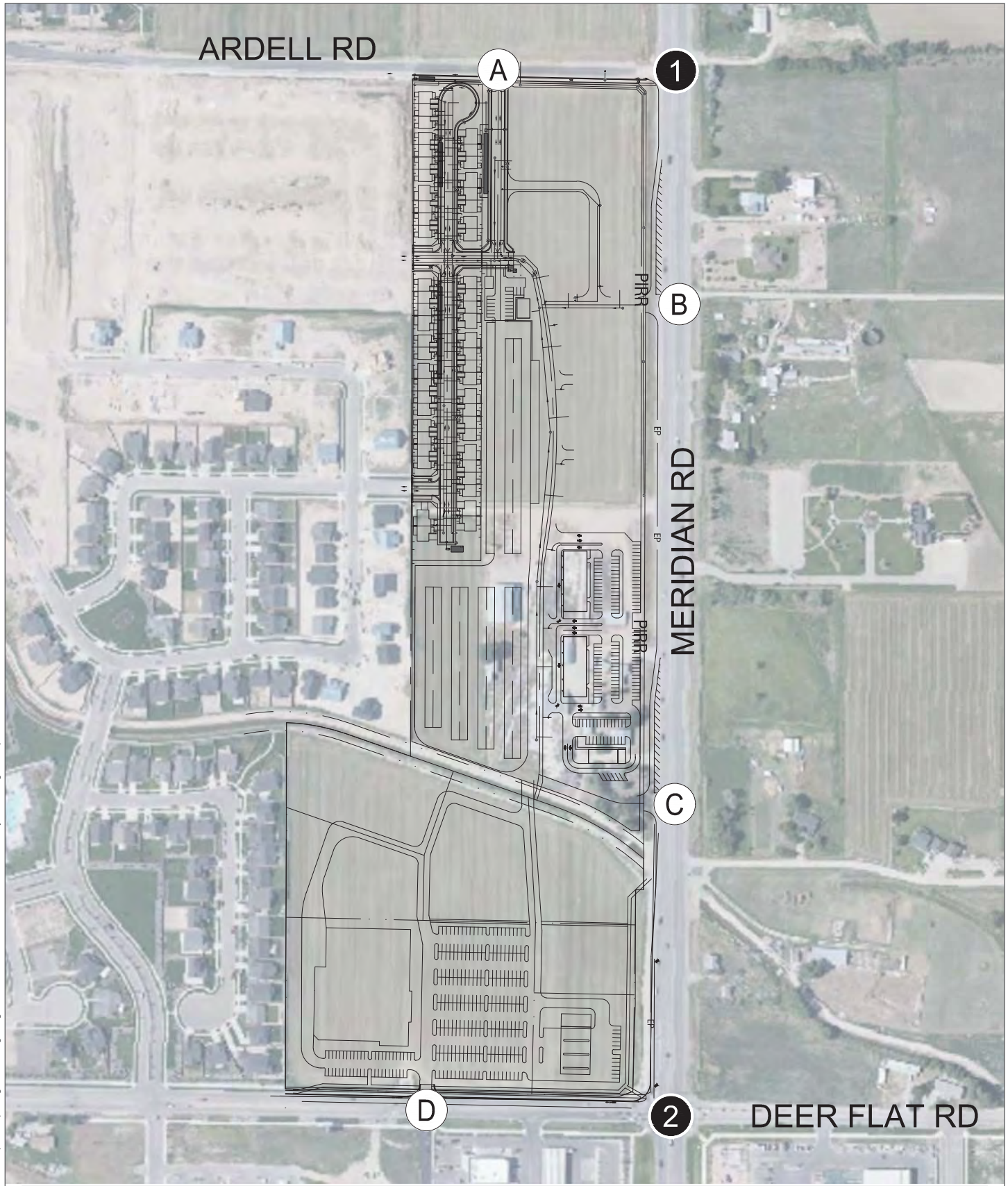
The proposed site plan for the development is shown in Figure 2. Access to the development is proposed via two right-in, right-out, left-in (RIROLI) accesses on Meridian Road, an access on Ardell Road, an access on Deer Flat Road, and connections to residential stub streets at Fort Erie Street and Imlay Street. It should be noted that the development has existing deeded accesses on Meridian Road which, based on discussions with ITD, will be replaced with the two RIROLI accesses.



- - Study Intersections
- - Future Intersections

Site Vicinity
Kuna, ID

Figure
1



- ⊞ - Study Intersections
- ⊗ - Future Intersections

Proposed Site Plan
Kuna, ID

Figure
2

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SCOPE OF THE REPORT

The scope, methodology, and key assumptions within the TIS were reviewed and agreed upon by ITD and ACHD in December 2021. *Appendix A includes the Proposed Scope of Work for the Transportation Impact Analysis memorandum and response emails from ITD and ACHD.*

This report evaluates the following transportation issues:

- Existing land-use, and transportation system conditions, including intersection and roadways within the site vicinity for a typical weekday AM and PM peak hour.
- Planned developments and transportation improvements for the area surrounding the Blackrock Marketplace and Village development.
- Future conditions were estimated using a 3.0 percent annual compounded growth rate to the existing traffic volumes for all roadways in the study area, except Ardell Road which a 2.0 percent annual compounded growth rate was applied to existing traffic volumes to account for regional growth in the site vicinity.
- Intersection and segment analysis of year 2030 background traffic conditions and 2030 total conditions during the weekday AM and PM peak hours.
- Trip generation, distribution, and trip assignment estimates for the proposed Blackrock Marketplace and Village development.
- Identification of transportation improvement mitigations at the study intersections impacted by site-generated trips.
- Evaluation of development and traffic thresholds for improvement mitigations.
- Evaluation of site access intersections and internal collector/arterial intersections.
- Summary of findings and recommendations.

STUDY AREA

The following study intersections and roadways were identified and included in this analysis:

Intersections:

- Meridian Road / Ardell Road
- Meridian Road / Deer Flat Road
- All site accesses

Roadway Segments:

- Ardell Road (west of Meridian Road)

- Deer Flat Road (Site Frontage – between Sailer Way and Meridian Road)

INTERSECTION PERFORMANCE MEASURES

Intersection performance measures reported in this study include level of service (LOS), volume-to-capacity ratio (V/C), delay, and 95th percentile queues.

The performance measures are used to gauge the performance of the transportation system and overall quality of the travel experience through an intersection or roadway segment as it is perceived by the traveler:

- *Level-of-service (LOS)* is currently the most commonly used performance measure. LOS uses an “A” to “F” ranking based on the average control delay experienced by motorists. LOS “A” conditions have very low vehicles delay times (10 seconds or less), while LOS “F” conditions have high delay times (over 80 seconds on average per vehicle at the signalized intersection) that are considered unacceptable to most drivers.
- *Volume-to-capacity (V/C)* compares the volume of traffic to the theoretical capacity of the facility to accommodate traffic. A V/C ratio of 1.0 indicates an intersection is operating at capacity. A V/C ratio over 1.0 indicates the intersection’s capacity is exceeded.
- *95th percentile queue* is the queue length that has only a 5 percent probability of being exceeded during the analysis time period. It is used to help determine turn lane storage, but not what the typical driver would experience. This performance measure is helpful in assessing access spacing from adjacent unsignalized and signalized intersections.

The performance measures are based on the peak 15-minutes of the peak hour and therefore, conditions may be better during other times of the day.

Overall intersection performance is calculated for signalized intersections and all-way stop-controlled intersections. For two-way stop-controlled intersection, performance measures are reported for only the stop-controlled movements.

TRAFFIC ANALYSIS METHODOLOGY

The intersection operational analysis was performed using the *Highway Capacity Manual (HCM) 6th Edition* analysis procedures (Reference 3). To ensure that this analysis is based on a reasonable worst-case scenario, the peak 15-minute flow rate during all peak hours was used in the evaluation of all intersection LOS and V/C ratios. This analysis reflects conditions that are only likely to occur for 15-minutes out of each average peak hour. The transportation system will likely operate better than the conditions described in this report during all other time periods. The intersection operations analyses conducted for the TIS were prepared using Synchro 10.

The roadway segment analysis was performed using the ACHD Street Capacity Guidelines Table in ACHD's Capital Improvement Plan (Reference 4) for all ACHD roadways.

The *HCM 2000* (Reference 5) was utilized due to the ability to report overall intersection V/C ratios for a signalized intersection as required by ACHD policy, since the HCM 6th Edition does not report overall intersection V/C ratio.

Additionally, the guidance in the *Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition* (Reference 6) was used for signal warrant analyses when determining the appropriate mitigation for an impacted study intersection.

Signal Timing and Other Parameters

ACHD provided current signal timing for the signalized intersections via signal timing sheets for all signalized study intersections. *Appendix B contains the intersection signal timing sheets.* ACHD required values were used for the ideal saturation flow rate (1800 vehicles per hour per lane), while other inputs were gathered from field data including truck percentages, peak hour factors, posted speeds, and storage lengths.

PERFORMANCE MEASURES

The operating standards of ITD and ACHD were used to assess the traffic operations of the study intersections and roadways. Table 1 summarizes the LOS standards for the study area intersections (signalized and unsignalized).

Table 1 Study Intersections and Corresponding Operational Standards

ID	Study Intersection	Agency	Traffic Control	ITD Operating Standard ¹	ACHD Operating Standard ²
1	SH-69 / Ardell Road	ITD/ACH D	Two Way Stop Controlled	<ul style="list-style-type: none"> LOS D or better Lane Group V/C Ratio \leq 0.90 	<ul style="list-style-type: none"> LOS E or better Critical movement V/C Ratio \leq 1.00 Evaluate signal warrants if \leq LOS D
2	SH-69 / Deer Flat Road	ITD/ACH D	Signalized	<ul style="list-style-type: none"> LOS D or better Lane Group V/C Ratio \leq 0.90 	<ul style="list-style-type: none"> LOS E or better Critical movement V/C Ratio \leq 1.00 Evaluate signal warrants if \leq LOS D
Existing Intersections That will Be Opposite Proposed Site Driveways					
B	Site Access B / Rodeo Ln / Meridian Rd	ITD/ACH D	Two Way Stop Controlled	<ul style="list-style-type: none"> LOS D or better Lane Group V/C Ratio \leq 0.90 	<ul style="list-style-type: none"> LOS E or better Critical movement V/C Ratio \leq 1.00 Evaluate signal warrants if \leq LOS D
C	Site Access D / Ridley's Access / Meridian Rd	ACHD	Two Way Stop Controlled	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> LOS E or better Critical movement V/C Ratio \leq 1.00 Evaluate signal warrants if \leq LOS D

ACHD Intersection and Roadway Standards

The analysis was performed in accordance with the methodologies stated in Section 7106.6 of the *ACHD Policy Manual*. Intersection and segment LOS are reported per ACHD thresholds.

ACHD requires that signalized intersections operate at a minimum of LOS E for Principal Arterials and Minor Arterials and LOS D for Collectors. The acceptable V/C ratio for signalized intersection is 0.90 for the overall intersection and 1.0 for each lane group. The acceptable V/C ratio is 1.0 for the critical lane group at unsignalized intersections. All unsignalized intersections that have a projected LOS D or worse are required to be evaluated to determine if a signal or roundabout is warranted. Additionally, Section 5108.6.4 identifies a maximum volume-to-capacity ratio at a roundabout to be 0.85, which is also reviewed for mitigations involving roundabouts.

ITD Intersection Standards

ITD's threshold are LOS D or better for all intersections and a V/C ratio of 0.90 or better for the overall intersections as well as each lane group.

Section 3
Existing Conditions

EXISTING CONDITIONS

The existing conditions analysis identifies the current site conditions, including operational and geometric characteristics of the roadways within the study area. These conditions will be compared with future conditions later in this report. Kittelson staff visited and inventoried the study area in July and September 2021. At that time, Kittelson collected information regarding site conditions, adjacent land uses, existing traffic operations, and transportation facilities in the study area.

SITE CONDITIONS AND ADJACENT LAND USES

The proposed Blackrock Marketplace and Village is situated on approximately 41 acres of land in Kuna, Idaho. The proposed development site is bounded on the west by existing development (the Winfield Springs Subdivision), north by Ardell Road, south by Deer Flat Road, and east by Meridian Road.

Transportation Facilities

The transportation system inventory identifies the current characteristics of roadways within the study area. Major roadways within the study area were identified and catalogued, including transit facilities and pedestrian and bicycle infrastructure.

Roadway Facilities

Table 2 provides a summary of the existing roadway facilities included in this study within the site vicinity.

Table 2. Existing Transportation Facilities

Roadway	Functional Classification ^{1,2}	Number of Travel Lanes	Speed Limit (mph ³)	Sidewalks	Bicycle Lanes	On-Street Parking
Meridian Road	Principal Arterial ¹	5	55	Partial	Yes	No
Deer Flat Road	Minor Arterial ¹	4	45	Partial	Yes	No
Ardell Road	Planned Residential Collector ²	2	25	No	No	No

¹COMPASS 2040 Functional Classification Map for Ada County and Canyon County (Reference 8).

²ACHD Master Street Map (Reference 9).

³MPH=Miles Per Hour.

Transit Facilities

Valley Regional Transit (VRT) is a public transportation service provider that provides fixed route buses and paratransit services within Ada and Canyon County. VRT's central bus station is located downtown Boise and provides county and intercounty connections within the Treasure Valley. There are no bus routes servicing the immediate vicinity of the site. Route 40 (Nampa/Meridian Express) and Route 29 (Overland) have stops near the Meridian Road/Overland Road intersection approximately 6 miles to the north of the site. There are future plans to provide bus services along Meridian Road but those are not funded at this time.

Pedestrian and Bicycle Facilities

Within the site's vicinity Deer Flat Road has bicycle lanes and sidewalks along the developed portions. Ardell has sidewalks along the developed portions. No sidewalks or bicycle lanes are provided along the site frontage on Meridian Road, but there are sections of sidewalks south of Deer Flat Road that have been constructed as part of more recent developments.

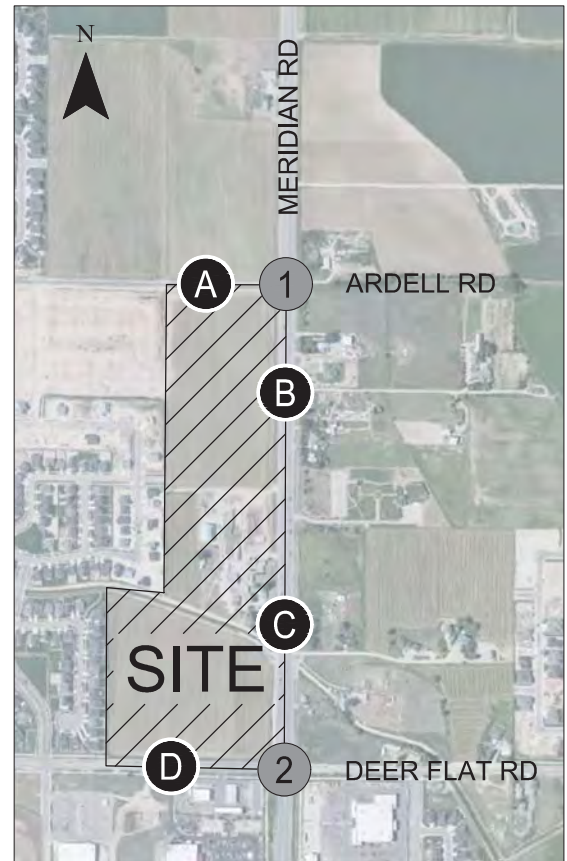
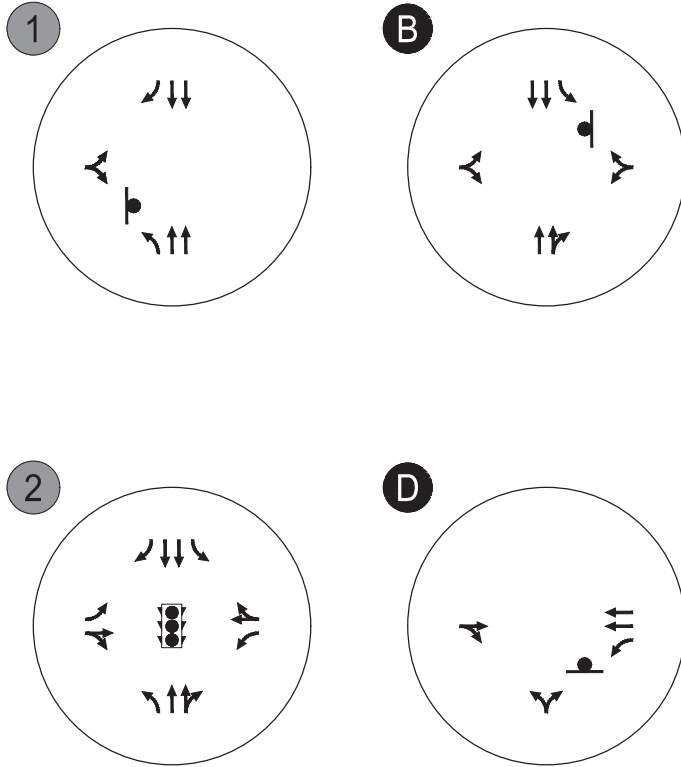
EXISTING TRAFFIC CONDITIONS

Data collected at the study intersections includes turning movement counts which are usually collected during a typical midweek (Tuesday through Thursday) AM peak period (7:00 AM – 9:00 AM) and PM peak period (4:00 PM – 6:00 PM). Traffic counts were collected during the weekday AM peak hour and weekday PM peak hour on September 14, 2021, at all existing study intersections. *Appendix C contains the traffic count data collected at the existing study intersections.*

Weekday AM and PM Peak Hour Intersection Operations

Existing peak hour traffic operations were analyzed for a typical mid-weekday AM peak hour and PM peak hour. The individual peak hours for each intersection were used to provide a conservative analysis. Figure 3 presents the existing lane configurations and traffic control devices. Figure 4 shows the weekday AM and PM peak hour traffic volumes at each of the study intersections.

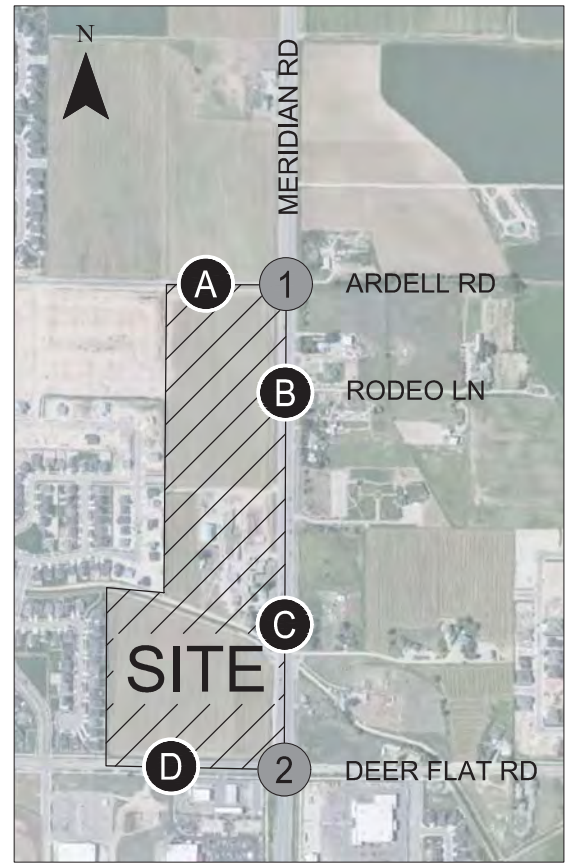
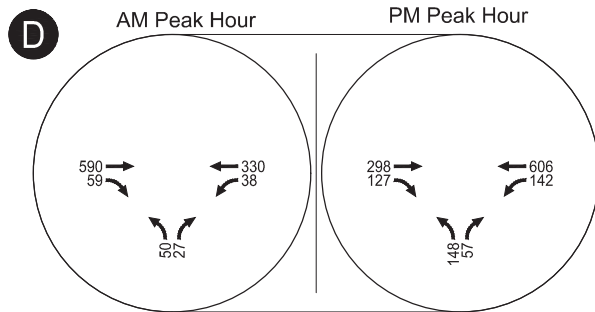
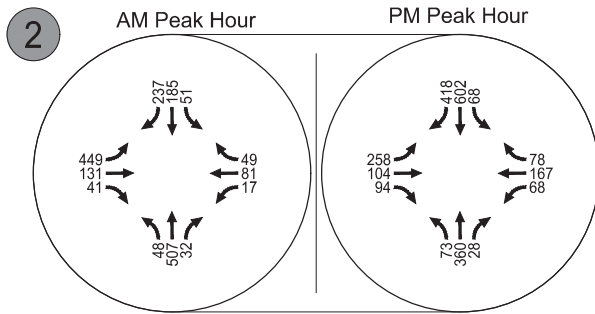
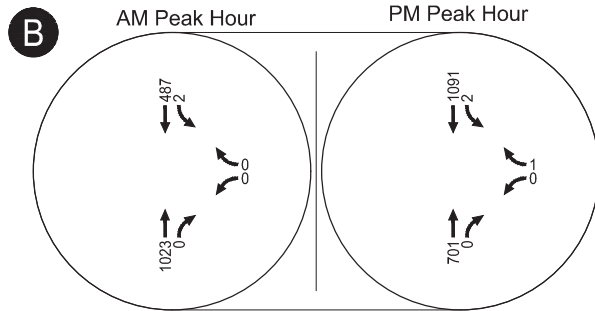
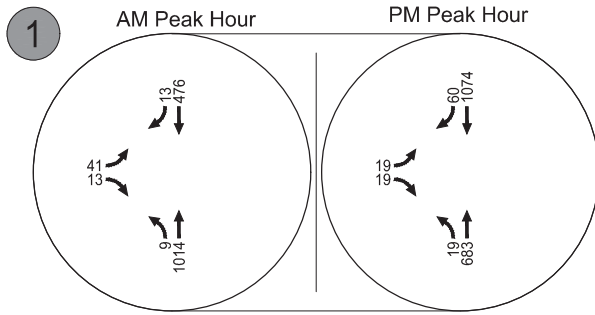
Table 3 presents the traffic operations results for each intersection and its corresponding lane groups during existing weekday AM and PM peak hours, while *Appendix D includes the existing conditions Synchro worksheets.*



-  - STOP SIGN
-  - TRAFFIC SIGNAL

Existing Lane Configurations
and Traffic Control Devices
Kuna, ID

Figure
3



Existing Traffic Volumes
AM and PM Peak Hour
Kuna, ID

Figure
4

Table 3. Existing Traffic Conditions, Weekday AM and PM Peak Hours

No.	Intersection	Intersection Control	Intersection AM/PM			Lane Group	AM Peak Hour			PM Peak Hour		
			V/C	LOS	Delay		V/C	LOS	Delay	V/C	LOS	Delay
1	Ardell Road / Meridian Rd	TWSC ¹	-	-	-	NBL	0.01	A	8.7	0.03	B	11.2
						EBLTR	0.19	C	16.8	0.15	C	19.6
2	Deer Flat Road / Meridian Rd	Traffic Signal ⁴	0.78/ 0.69	F/E	102.6/ 66.9	EBL	1.41	F	246.5	1.31	F	216.1
						EBTR	0.42	D	43.7	0.57	D	54.2
						WBL	0.11	D	53.1	0.29	D	48.9
						WBTR	0.84	E	71.1	0.89	E	75.9
						NBL	0.16	D	36.7	0.31	C	29.6
						NBT	0.67	D	54.4	0.35	D	35.5
						NBR	0.67	D	54.3	0.35	D	35.5
						SBL	0.32	D	38.2	0.19	C	28.5
						SBT	0.26	D	41.4	0.51	D	38.5
					SBR	0.22	D	41.5	0.37	D	36.8	
A	Site Access A / Ardell Rd	Future Intersection										
B	Site Access B / Rodeo Ln / Meridian Rd	TWSC ¹	-	-	-	WBLTR	0.00	A	0.0	0.03	D	33.1
						SBL	0.01	B	10.8	0.06	D	32.3
C	Site Access C / Meridian Rd	Future Intersection										
D	Site Access D / Ridley's Access / Meridian Rd	TWSC ¹	-	-	-	NBLTR	0.26	C	18.4	0.68	D	34.3
						WBL	0.07	A	9.6	0.15	A	8.9

V/C ratio is defined as vehicle-to-capacity ratio, which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour. LOS stand for Level of Service. Delay is reported in seconds per vehicle. Cells in the table above that are **bolded**, *italicized*, and **highlighted** indicate an intersection and/or lane group operating below the jurisdictional standards.

¹TWSC = Two-Way Stop-Controlled Intersection

²RIRO = Right-in Right-out

³AWSC = All-Way Stop-Controlled Intersection

⁴U-turns modeled as left-turns because U-turns are not supported under the HCM methodology.

As shown in Table 3, the study intersections are currently operating at acceptable operations during the weekday AM and PM peak hours, with the exception of the following intersections:

- **Deer Flat Road / Meridian Road:** The eastbound left at the intersection of Deer Flat Road / Meridian Road during the AM and PM peak hour.

Additionally, ACHD policy requires the evaluation of signal warrants at unsignalized intersections that operation at LOS D or worse. These include the following additional intersection:

- **Site Access B / Rodeo Lane / Meridian Road:** The westbound movement from Rodeo Lane operates at LOS D during the weekday PM peak hour.
- **Site Access D (Future) / Ridleys Access / Deer Flat Road:** The northbound movement from the Ridley's Access operates at LOS D during the weekday PM peak hour.

Existing Conditions Roadway Segment Analysis

Kittelson performed an operational analysis at the roadway segments during the weekday AM and PM peak hours. The peak hour, peak direction roadway segment volumes, and resultant LOS per ACHD Policy Manual 7106.4.1 for the existing study roadway segments summarized in Table 4. Additionally, daily traffic volumes were obtained for each study roadway segment, which are also shown.

Table 4. Year 2021 Existing Roadway Segment Operations – Weekday AM and PM Peak Hour

Roadway Segment	Classification ¹	Travel Lanes ²	Daily Trip (Two-Way)	ACHD Peak Hour Std. Volume (One-Way)	Weekday AM Peak Hour		Weekday PM Peak Hour	
					One-Way Volume/ Direction	Meets Std.	One-Way Volume/ Direction	Meets Std.
Ardell Road	Collector	2	1,311 (9/14/21)	D/425	54/EB	Yes	79/WB	Yes
Deer Flat Road	Minor Arterial ¹	4 ³	12,012 (6/17/2021)	E/720 (EB), 1,540 (WB)	649/EB	Yes	754/WB	Yes

¹Per COMPASS 2040 Functional Street Classification Map (Reference 8)

²Travel lanes include the total number of lanes across the roadway's respective cross section

³Cross section includes continuous left-turn lane

⁴Cross section includes two lanes in the eastbound direction, one lane in westbound direction, and turn lanes (via raised median and continuous left-turn lane)

⁵This value was recorded on the 24-hour tube count and is greater than the peak hour segment using existing traffic volumes from the intersection turning movement counts

As shown in Table 4, the existing roadway segments currently meets ACHD roadway segment LOS threshold under year 2021 existing conditions weekday AM and PM peak hours.

EXISTING CONDITIONS – INTERSECTION MITIGATIONS

This section outlines mitigations for intersections falling below ACHD's and ITD's traffic operation standards under existing conditions. *Appendix E contains the mitigated existing conditions Synchro worksheets.*

Deer Flat Road / Meridian Road Intersection Mitigation

The eastbound left-turn movement at the Deer Flat Road / Meridian Road intersection exceeds ITD's V/C ratio threshold of 0.90 for all movements as well as ACHD's V/C ratio threshold of 1.00 during the weekday AM and PM peak hours.

Site observations indicated that there is about a 20-minute morning peak in traffic between approximately 7:20 AM and 7:40 AM in which the eastbound left-turn movement has significant queues that extend past the Ridley's Access and are not fully served by the signal. This appears to coincide with the morning activity at the nearby high school. The morning the peak queuing by approximately 7:50 AM and appears to be operating under capacity. During the weekday PM peak hour, the eastbound left-turn was also observed to experience some relatively long queues, but not as pronounced as in the morning peak hour.

Due to the low overall intersection V/C ratio there are likely signal timing options that could provide greater green time and improve the eastbound left-turn movement during the peaks but based on the site observations, the left-turn demand is too high for a single left-turn lane. To mitigate the intersection operations back to standards a second eastbound left-turn lane is recommended. Table 5 shows the anticipated intersection operations with the planned improvement.

Table 5. Deer Flat Road / Meridian Road – Existing Conditions Mitigation

No.	Intersection & Mitigation	Intersection Control	Intersection AM/PM			Lane Group	AM Peak Hour			PM Peak Hour		
			V/C	LOS	Delay		V/C	LOS	Delay	V/C	LOS	Delay
2	Deer Flat Rd / Meridian Rd Mitigation: Dual Eastbound Left-turn Lanes	Traffic Signal	0.51/ 0.50	D/D	53.5/ 48.2	EBL	0.90	E	67.1	0.85	E	69.3
						EBTR	0.43	D	45.7	0.50	D	53.7
						WBL	0.10	E	56.1	0.26	D	50.0
						WBTR	0.81	E	73.1	0.88	E	72.3
						NBL	0.15	C	34.8	0.30	C	32.1
						NBT	0.63	D	50.6	0.33	D	37.6
						NBR	0.63	D	50.5	0.33	D	37.6
						SBL	0.28	D	36.5	0.19	C	31.2
SBT	0.22	D	39.4	0.53	D	41.5						
SBR	0.24	D	40.4	0.39	D	40.0						

V/C ratio is defined as vehicle-to-capacity ratio, which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour. LOS stand for Level of Service. Delay is reported in seconds per vehicle. Cells in the table above that are **bolded**, *italicized*, and highlighted indicate an intersection and/or lane group operating below the jurisdictional standards.

As shown in Table 5, the Deer Flat Road / Meridian Road intersection is anticipated to operate acceptably with the addition of a second eastbound left-turn lane.

This intersection is identified in the ACHD for reconstruction in the 2031-2035 timeframe.

Site Access B / Rodeo Lane / Meridian Road Intersection Signal Warrants

The westbound movement from Rodeo Lane operates at LOS D during the weekday PM peak hour. ACHD policy requires evaluation of signal warrants at unsignalized intersections that operate at LOS D or worse. A review of the traffic data identified that only one westbound vehicle was counted during the weekday PM peak hour, and it was a right-turning movement. One vehicle per hour is significantly below the signal warrant thresholds and therefore a detailed signal warrant analysis was not conducted. Additionally, ITD indicated a traffic signal at this location will not be allowed on Meridian Road.

Site Access D (Future) / Ridleys Access / Deer Flat Road Signal Warrants

The northbound movement operates at LOS D with a V/C ratio of 0.68 during the weekday PM peak hour. Based on discussions with ACHD, this intersection is planned to be converted to RIRO and will not be considered for signalization. Therefore, traffic signal warrants were not evaluated.

It should be noted that existing queues from the Meridian Road intersection currently extend to this intersection for brief periods under existing conditions. The impact of those queues on turning traffic from the Ridleys Access is not accounted for in the LOS procedures. Therefore, actual operations will be worse than shown during those periods.

CRASH HISTORY

Crash data for the study intersections and roadways was provided by the Idaho Transportation Department for the previous five years (2016-2020). This data was used to evaluate and document any

potential crash trends occurring at study intersections and along study roadways. *Appendix F contains the crash data reports provided by ITD.*

Table 6 presents the numbers of crashes, by crash type and severity, at each study intersection.

Table 6. Study Intersection Crash Type and Severity Summary, 2016-2020

Intersection	Crash Type						Total	Severity			Crash Rate (Crashes/M EV)
	Rear-End	Turning	Head-On	Side Swipe	Angle	Other		PDO ¹	Injury	Fatality	
Ardell Road / Meridian Road (ID-69)	0	0	0	0	0	1 ²	1	1	0	0	0.03
Deer Flat Road / Meridian Road (ID-69)	8	19	0	3	2	0	32	14	18	0	0.76

¹PDO = Property Damage Only.

²Other for Ardell Road / Meridian Road (ID-69) consists of the following: 1 fixed object (fence) crash.

As shown in Table 6, both study intersections have crash rates below 1.0 per million entering vehicles (MEV).

While the overall number of crashes is not considered high, the percentage of turning crashes at the Deer Flat Road / Meridian Road intersection is relatively high. Further review identified that the turning crashes are distributed between the east-west movements and north-south movements. But most of the east-west crashes are between eastbound left-turns and westbound through traffic. That is likely due to the eastbound left-turn volume being higher than the opposing through volume and the use of protected/permitted left-turn phasing which requires the eastbound left-turning traffic to yield to the lower-volume westbound through traffic during the permissive signal phase. The mitigation identified under existing conditions to add a second eastbound left turn lane will also require the phasing to be protected which would eliminate the permissive left-turn phasing and may decrease the eastbound turning crashes.

Section 4
Transportation Impact Study

TRAFFIC IMPACT STUDY

This section identifies how the study area's transportation system will operate under year 2030 traffic conditions, with and without the proposed development. Year 2030 represents the anticipated build-out year. The impact of site-generated trips by the proposed development during the weekday AM and PM peak hours was examined for each of the study years as follows:

- Future traffic volumes were estimated using annual compounded growth rates in addition to inclusion of estimated traffic from background developments that may not be accounted for in the growth rates.
- Background traffic conditions (build-out year of the proposed development but without the development site-generated traffic) were analyzed at the study intersections during the weekday AM and weekday PM peak hours.
- Trip generation, trip distribution, and trip assignment were estimated.
- Site-generated trips were added to the year 2030 background traffic volumes.
- Total traffic conditions (build-out year of the proposed development with the site-generated traffic included) were analyzed at the study intersections and site accesses during the weekday AM and weekday PM peak hours.
- Estimated timing and development thresholds for mitigations were evaluated.
- The need for turn lanes at site access intersections was analyzed.
- Site access locations were reviewed with respect to traffic operations, ACHD and ITD access policy, and daily traffic thresholds.

YEAR 2030 BACKGROUND TRAFFIC CONDITIONS

The year 2030 background traffic conditions analysis identifies how the study area's transportation system will operate in the future without the development in place. This analysis includes traffic attributed to general background growth and in-process developments but does not include traffic from the proposed development.

Planned Intersection and Roadway Improvements

Based on a review of the ACHD's Capital Improvement Plan (CIP) (Reference 4), ACHD's Integrated Five Year Work Plan (Reference 10), and ITD's Statewide Transportation Improvement Program (STIP, Reference 11), the following improvements are planned in the study area and included in funding programs:

- **Deer Flat Road (Linder Road to Meridian Road):** Widen to 5 lanes intersection (2031 – 2035) (RD2020-300)

- **Deer Flat Road / Meridian Road Intersection:** Replace signal and reconstruct/modify approaches (2031-2035) (IN2020-340).

ITD does not have any near-term projects on the ITIP except for a pavement sealcoat. There is an ongoing corridor study looking at long-term improvements that proposes a restricted crossing U-turn (RCUT) at the Ardell Road / Meridian Road intersection and a median U-turn (MUT) at the Deer Flat Road / Meridian Road intersection. Because these improvements on Meridian Road are not planned within the 2030 study horizon year, the improvements will only be considered when evaluating future mitigations.

Background Growth

The year 2030 background traffic volumes reflect existing traffic counts plus nine years of annual background growth. COMPASS provided growth rates for the base year to year 2030 in the study area based on the travel demand model traffic forecasts. From review of the model growth rates and historical traffic volumes in the area, Kittelson applied a 3.0 percent annual compounded growth rate to the existing traffic volumes for all roadways in the study area, except Ardell Road in which a 2.0 percent annual compounded growth rate was applied. The growth rate on Ardell Road is lower due to adding an in-process development with access on Ardell Road in addition to the growth rate. Kittelson confirmed the growth rate with ACHD and ITD during the scoping of the TIS.

In-Process Developments

Based on discussions with ACHD and ITD, most of the in-process developments surrounding the site are nearly built-out or already accounted for in the travel demand model land-use projections and will be captured in the growth rates discussed in the previous section. But one major development, the Lee Hubble Development (Reference 12), is going through the approval process ahead of this proposed development that will impact traffic on Ardell Road. Therefore, the following in-process development will be assumed:

- **Lee Hubble Development (Based on TIS Provided)** – The Lee Hubble Subdivision is a mixed-use development that consists of 136 single-family homes, 216 multifamily dwelling units, 100,000 square-feet of office space, and 260,000 square-feet of commercial space. The anticipated build-out year for the proposed development is 2030.

Ardell Connection

Ardell Road continues west to Linder Road; however, Ardell Road is not connected from Meridian Road to Linder Road due to lack of a canal crossing. Ardell Road may be extended over the canal by 2030 and therefore provide a continuous connection of Ardell Road between Meridian Road and Linder Road. Therefore, for the future year 2030 analysis two scenarios will be considered:

- **Scenario 1:** Ardell Road remains as in the existing conditions and does not extend across the canal.

- Scenario 2:** Ardell Road is connected over the canal by 2030. Based on modeling data provided by COMPASS, connection of Ardell Road over the canal increases traffic on Ardell Road and reduces some of the traffic volumes that may currently utilize Hubbard Road to go to and from the north.

Year 2030 Background Traffic Volumes

Year 2030 background traffic volumes, shown in Figure 5, were estimated by applying annual compounded growth rates to the existing year 2021 traffic volumes and adding relevant in-process developments. Year 2030 background traffic conditions were analyzed at the study intersection for the weekday AM and PM peak hours. Per the ACHD Policy Manual, intersections with an existing peak hour factor of less than 0.90 were adjusted to 0.90 in the future year analysis to account for the likely increase in traffic throughout the entire peak hour in the future.

Table 7 summarizes the traffic operations for the year 2030 background conditions. *Appendix G includes year 2030 background traffic conditions Synchro worksheets.*

Table 7. Year 2030 Background Traffic Conditions, Weekday AM and PM Peak Hours

No.	Intersection	Intersection Control	Intersection AM/PM			Lane Group	AM Peak Hour			PM Peak Hour		
			V/C	LOS	Delay		V/C	LOS	Delay	V/C	LOS	Delay
1	Ardell Rd / Meridian Rd	TWSC ¹ Scenario 1 No Ardell Connection	-	-	-	NBL	0.02	A	9.3	0.07	B	14.2
						EBLR	0.34	C	23.5	0.54	E	47.6
		TWSC ¹ Scenario 2 With Ardell Connection	-	-	-	NBL	0.05	A	9.7	0.15	C	15.9
						EBLTR	0.70	E	43.3	1.14	F	170.8
2	Deer Flat Rd / Meridian Rd	Traffic Signal ⁴	1.03/ 0.90	F/E	154.5/ 74.4	EBL	1.80	F	416.0	1.47	F	281.0
						EBTR	0.52	D	45.0	0.59	D	52.4
						WBL	0.11	D	52.6	0.33	D	44.6
						WBTR	0.84	E	70.8	0.91	E	79.4
						NBL	0.23	D	36.4	0.47	C	32.1
						NBT	0.93	E	78.8	0.45	D	38.2
						NBR	0.93	E	78.3	0.45	D	38.2
						SBL	0.53	D	41.1	0.28	C	28.8
						SBT	0.35	D	43.2	0.69	D	43.5
					SBR	0.32	D	43.9	0.45	D	38.8	
A	Site Access A / Ardell Rd	Future Intersection										
B	Site Access B / Rodeo Ln / Meridian Rd	TWSC ¹	-	-	-	WBLTR	0.00	A	0.0	0.01	B	12.3
						SBL	0.01	B	13.2	0.01	B	10.5
C	Site Access C / Meridian Rd	Future Intersection										
D	Site Access D / Ridley's Access / Meridian Rd	TWSC ¹	-	-	-	NBLTR	0.37	C	23.6	1.03	F	101.5
						WBL	0.08	B	10.4	0.20	A	9.6

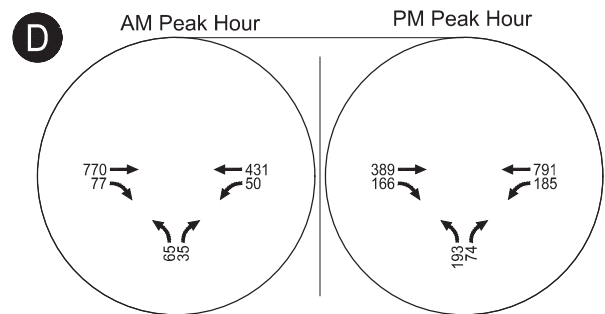
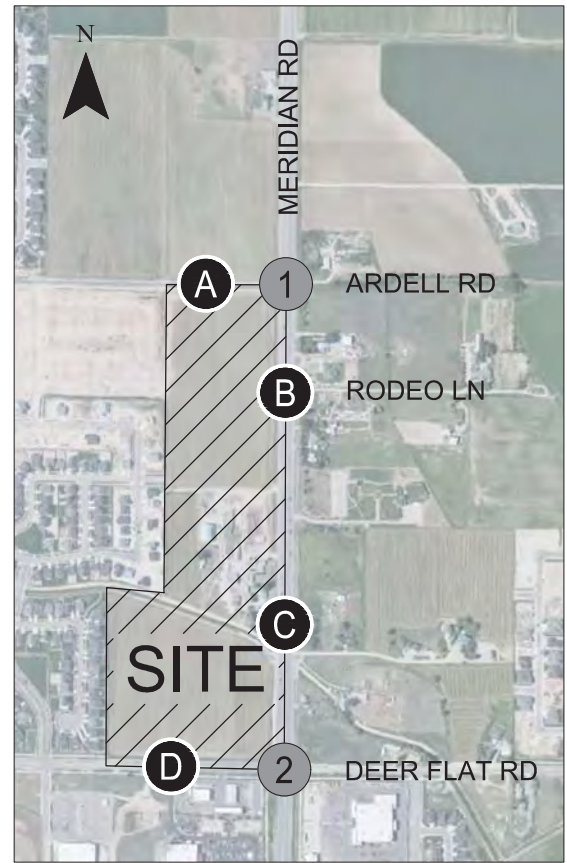
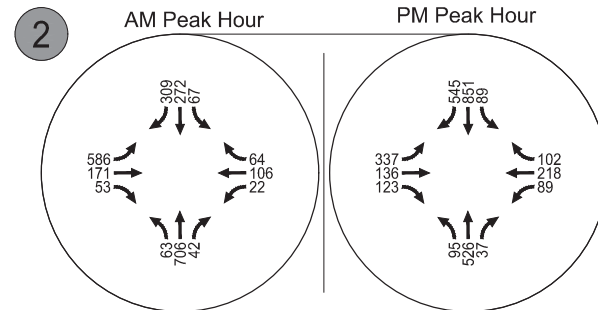
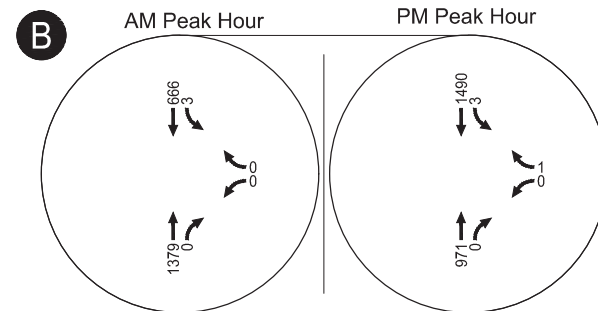
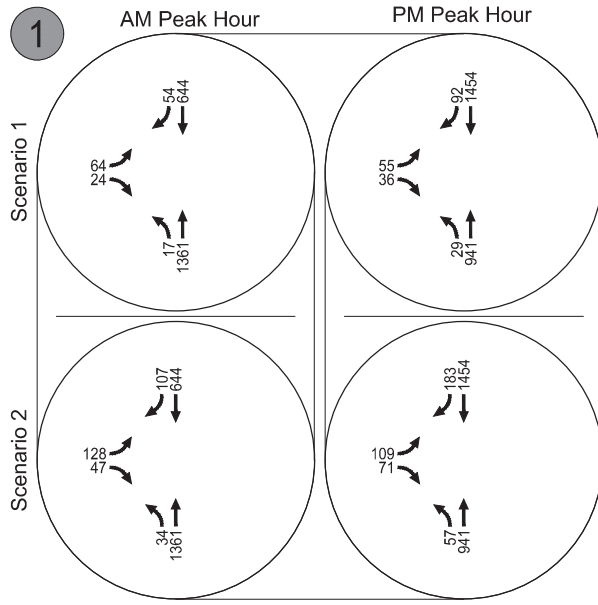
V/C ratio is defined as vehicle-to-capacity ratio, which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour. LOS stand for Level of Service. Delay is reported in seconds per vehicle. Cells in the table above that are **bolded**, *italicized*, and **highlighted** indicate an intersection and/or lane group operating below the jurisdictional standards.

¹TWSC = Two-Way Stop-Controlled Intersection

²RIRO = Right-in Right-out

³AWSC = All-Way Stop-Controlled Intersection

⁴U-turns modeled as left-turns because U-turns are not supported under the HCM methodology.



Year 2030 Background Traffic Volumes
AM and PM Peak Hour
Kuna, ID

Figure
5

As shown in Table 7, the following study intersections are not anticipated to meet ACHD or ITD operating policy standards:

- **Ardell Road / Meridian Road:** Under Scenario 2 in the PM peak hour, the eastbound approach is over-capacity.
- **Deer Flat Road / Meridian Road:** In the AM peak hour, the overall intersection V/C exceeds 1.00. The eastbound left turn also exceeds 1.00 in the AM and PM peak hour. Additionally, the northbound and westbound through movements exceed the ITD V/C threshold of ≤ 0.90 .
- **Site Access D / Ridley's Access / Deer Flat Road:** The northbound movement from the Ridley's access operates at LOS F during the weekday PM peak hour.

Additionally, ACHD policy requires the evaluation of signal warrants at unsignalized intersections that operation at LOS D or worse. This includes the following additional intersection:

- **Site Access B / Rodeo Lane / Meridian Road:** The westbound movement from Rodeo Lane operates at LOS D during the weekday PM peak hour. As described in the existing conditions section, traffic counts indicated that traffic volumes were very low and below what would be considered for a signal warrant analysis. Additionally, the SH-69 corridor plan indicates a median in this area of Meridian Road.

Year 2030 Background Roadway Segment Analysis

Table 8 shows the peak hour, peak direction roadway segment volumes, and whether the segment volumes meet the LOS policy standard volume threshold per ACHD District Policy 7106.3.3 for the ACHD roadway facilities.

Table 8. Year 2030 Background Segment Operations – Weekday AM and PM Peak Hour

Roadway Segment	Classification ¹	Travel Lanes ²	Estimated Daily Trips (Two Way)	ACHD Peak Hour Std. Volume (One-Way)	Weekday AM Peak Hour		Weekday PM Peak Hour	
					One-Way Volume/ Direction	Meets Std.	One-Way Volume/ Direction	Meets Std.
Ardell Rd	Collector	2	Scenario 1					
			1,573	D/425	88 / EB	Yes	121 WB	Yes
			Scenario 2					
			3,146	D/425	175 / EB	Yes	241 WB	Yes
Deer Flat Rd	Minor Arterial ¹	4 ³	Scenarios 1 & 2					
			15,616	E/720 (EB), 1,540 (WB)	847/EB	No (EB)	984/WB	Yes
		5	Mitigation: Add Eastbound (EB) Through Travel Lane					
			15,616	E/1,540	847/EB	Yes	984/WB	Yes

¹Per COMPASS 2040 Functional Street Classification Map (Reference 8)

²Travel lanes include the total number of lanes across the roadway's respective cross section

³Cross section includes continuous left-turn lane

⁴Cross section includes two lanes in the eastbound direction, one lane in westbound direction, and turn lanes (via raised median and continuous left-turn lane).

As shown in Table 8, the roadway segments are anticipated to meet ACHD roadway segment LOS threshold under year 2030 background conditions weekday AM and PM peak hours with the exception of the following:

- **Deer Flat Road (West of Meridian Road):** The eastbound direction on Deer Flat Road only has a single travel lane. Under 2030 Background conditions, an additional eastbound through lane is needed.

YEAR 2030 BACKGROUND CONDITIONS MITIGATIONS

This section describes the mitigations needed to address each of the intersections and roadway segments exceeding desired operational thresholds under year 2030 background conditions. *Appendix H contains year 2030 background mitigated traffic operation worksheets for the intersections outlined below.*

Ardell Road / Meridian Road Intersection – Background 2030 Mitigation

The eastbound movement is projected to exceed both the ITD and ACHD V/C thresholds during both peak hours and under both scenarios for Ardell Road connecting over the canal. ITD has an ongoing corridor study looking at long-term improvements that proposes a RCUT intersection at the Ardell Road / Meridian Road intersection. An RCUT provides Right-in/Right-out/Left-in (RIROLI) intersection movements with a U-turn movement to accommodate side-street left-turn movements. An RCUT may operate unsignalized or be signalized if sufficient gaps in traffic on Meridian Road are not available. Exhibit 1 shows a figure provided by ITD (Reference 13)

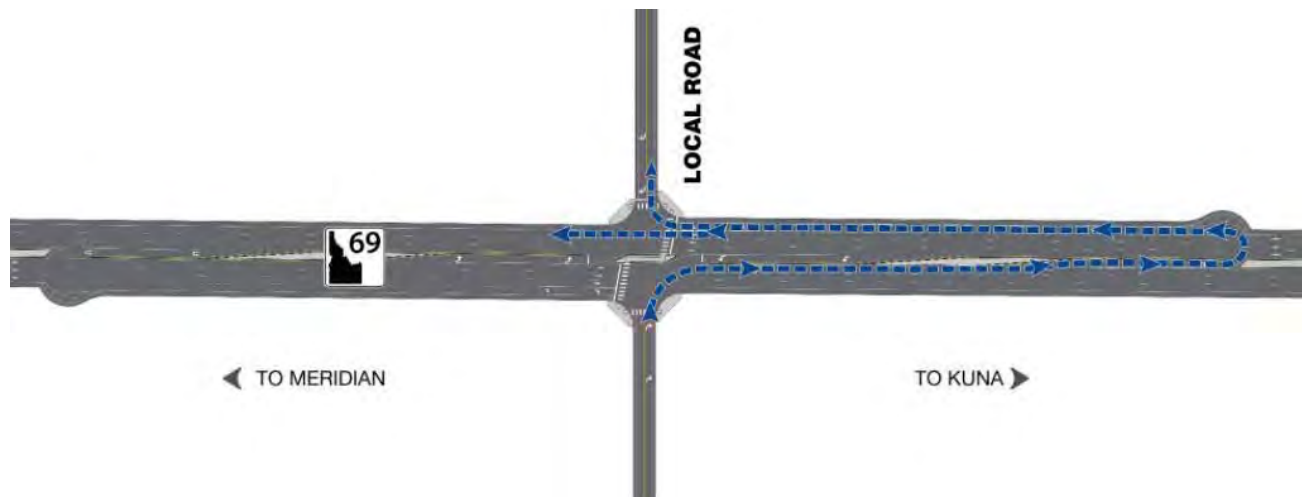


Exhibit 1. RCUT Intersection and Left-Turn Routing (Reference 13)

An RCUT and RIROLI intersection are similar functionally at this intersection, with the exception of a designated U-turn location with a wider turn area for the RCUT configuration. U-turns can still be done with a RIROLI, but the location would vary. Therefore, the RCUT and RIROLI are both listed as the same mitigation since they have identical operations for the movements at the intersection. The operations results are shown in Table 9.

Additionally, the Scenario 2 volumes are higher than the Scenario 1 volumes and therefore Scenario 2 volumes were used to evaluate mitigations due to the likelihood that Ardel Road will be extended over the canal at some time in the future, even if it is beyond 2030.

Table 9. Ardel Road / Meridian Road – 2030 Background Mitigation

No.	Intersection	Intersection Control	Intersection AM/PM			Lane Group	AM Peak Hour			PM Peak Hour		
			V/C	LOS	Delay		V/C	LOS	Delay	V/C	LOS	Delay
<i>Access Scenario 2 (Highest Volume Scenario)</i>												
1	Ardell Rd / Meridian Rd	RIROLI or RCUT ¹	-	-	-	NBL	0.05	A	9.7	0.15	C	15.9
		(With Ardel Connection)	-	-	-	EBR	0.30	B	13.0	0.21	C	17.9

V/C ratio is defined as vehicle-to-capacity ratio, which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour. LOS stand for Level of Service. Delay is reported in seconds per vehicle. Cells in the table above that are **bolded**, *italicized*, and **highlighted** indicate an intersection and/or lane group operating below the jurisdictional standards.

¹RCUT = Reduced Conflict U-Turn

As shown in Table 9, the Ardel Road / Meridian Road intersection is anticipated to operate acceptably with the addition of a RCUT or RIROLI.

Deer Flat Road / Meridian Road Intersection – Background 2030 Mitigation

Under existing conditions, an additional eastbound left turn lane was shown to mitigate the intersection to acceptable operating standards. Table 10 shows the mitigated operations under 2030 background conditions at the Deer Flat Road / Meridian Road intersection.

As shown in Table 10, the eastbound left-turn movement at the Deer Flat Road / Meridian Road intersection is still anticipated to operate acceptably with respect to ACHD policy with the addition of a second eastbound left-turn lane but will require a third eastbound left-turn lane to meet ITD policy.

Table 10. Deer Flat Road / Meridian Road – 2030 Background Mitigation

No.	Intersection	Intersection Control	Intersection AM/PM			Lane Group	AM Peak Hour			PM Peak Hour		
			V/C	LOS	Delay		V/C	LOS	Delay	V/C	LOS	Delay
Mitigated to Meet ACHD Policy												
2	Deer Flat Rd / Meridian Rd <u>Existing Cond Mitigation:</u> Dual Eastbound Left-turn Lanes	Traffic Signal ⁴	0.72/ 0.74	E/D	59.4/ 53.4	EBL	0.95	E	74.0	0.93	F	84.9
						EBTR	0.43	D	38.1	0.45	D	41.5
						WBL	0.11	D	52.6	0.26	D	45.3
						WBTR	0.85	E	70.9	0.91	E	76.9
						NBL	0.22	C	34.6	0.50	C	34.9
						NBT	0.85	E	64.3	0.47	D	40.6
						NBR	0.85	E	63.9	0.47	D	40.6
						SBL	0.51	D	39.5	0.30	C	31.7
						SBT	0.32	D	40.7	0.74	D	47.9
SBR	0.26	D	40.5	0.44	D	41.1						
Mitigated to Meet ITD & ACHD Policy												
2	Deer Flat Rd / Meridian Rd <u>Existing Cond Mitigation:</u> Dual Eastbound Left-turn Lanes <u>Additional Mitigation:</u> Third Eastbound Left-turn Lane	Traffic Signal ⁴	0.62/ 0.65	E/E	57.2/ 57.9	EBL	0.88	E	62.1	0.82	E	68.8
						EBTR	0.86	E	66.2	0.57	D	50.4
						WBL	0.10	D	55.0	0.35	D	45.9
						WBTR	0.84	E	70.9	0.90	E	70.4
						NBL	0.22	C	34.6	0.64	D	47.7
						NBT	0.85	E	64.3	0.58	D	50.7
						NBR	0.85	E	63.9	0.58	D	50.6
						SBL	0.51	D	39.5	0.37	D	37.3
						SBT	0.32	D	40.7	0.89	E	62.7
SBR	0.26	A	7.8	0.53	D	49.6						

V/C ratio is defined as vehicle-to-capacity ratio, which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour. LOS stand for Level of Service. Delay is reported in seconds per vehicle. Cells in the table above that are **bolded**, *italicized*, and **highlighted** indicate an intersection and/or lane group operating below the jurisdictional standards.

¹TWSC = Two-Way Stop-Controlled Intersection

²RIRO = Right-in Right-out

³AWSC = All-Way Stop-Controlled Intersection

⁴U-turns modeled as left-turns because U-turns are not supported under the HCM methodology.

Site Access D / Ridley's Access / Deer Flat Road Intersection Mitigation

The northbound movement at the intersection of the Site Access D / Ridelys Access / Deer Flat Road intersection operates at LOS F and exceeds ACHD's V/C ratio threshold of ≤ 1.00 . To mitigate the intersection operations back to standards, the intersection was limited to RIROLI. Under this option it is assumed that most northbound left-turns would be re-routed to the shared access with the Bi-Mart development opposite Sailer Way approximately 700 feet to the west or other access driveways. Table 11 shows the anticipated intersection operations of both intersections with the planned improvement as the U-turns will impact the intersection of Meridian Road/Deer Flat Road.

Table 11. Site Access D / Ridley’s Access / Deer Flat Road – 2030 Background Mitigation RIROLI

No.	Intersection & Mitigation	Intersection Control	Intersection AM/PM			Lane Group	AM Peak Hour			PM Peak Hour		
			V/C	LOS	Delay		V/C	LOS	Delay	V/C	LOS	Delay
D	Site Access D / Ridley’s Access / Deer Flat Road Mitigation: RIROLI	TWSC	-	-	-	NBR	0.12	C	17.5	0.14	B	12.4
						WBL	0.08	B	10.4	0.20	A	9.6

V/C ratio is defined as vehicle-to-capacity ratio, which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour. LOS stand for Level of Service. Delay is reported in seconds per vehicle. Cells in the table above that are **bolded**, *italicized*, and **highlighted** indicate an intersection and/or lane group operating below the jurisdictional standards.

As shown in Table 11, the Site Access D / Ridley’s Access / Deer Flat Road intersection is anticipated to operate acceptably if it is restricted to RIROLI.

While ACHD policy requires evaluation of signal warrants at unsignalized intersections that operate at LOS D or worse, based on discussions with ACHD, a traffic signal will not be allowed or considered at the existing Ridley’s access and the ultimate configuration of this intersection is planned for RIRO only. Therefore, a signal warrant analysis was not conducted and a signal as a mitigation option was not evaluated.

Deer Flat Road (West of Meridian Road):

The eastbound direction on Deer Flat Road only has a single travel lane. Under 2030 Background conditions, an additional eastbound through lane is needed. This segment is identified in the ACHD for widening to five lanes in the 2031-2035 timeframe.

TRIP GENERATION

The projected weekday daily, AM, and PM peak hour vehicle trips for the development were estimated based on the *Trip Generation Manual, 10th Edition* (Reference 14) and *Trip Generation Handbook, 3rd Edition* (Reference 15). Table 12 summarizes the estimated trip generation for the development.

As shown in Table 12, the development is estimated to generate a total of approximately 18,158 daily net new trips, 778 weekday AM peak hour net new trips (440 inbound / 338 outbound) and 999 weekday PM peak hour net new trips (500 inbound / 499 outbound).

TRIP DISTRIBUTION AND TRIP ASSIGNMENT

The distribution of site generated trips onto the roadway system was based on the site’s connections to nearby collector and arterial streets, an area of impact model run by COMPASS, review of the roadway system, and knowledge of travel patterns the area. The proposed distribution is shown in Exhibit 2.

Table 12. Blackrock Marketplace and Village Development Trip Generation

Land Use	ITE Code	Size	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Residential Uses									
Townhouses/Apartment (Multi-Family Low-Rise)	220	53	360	26	6	20	34	21	12
<i>Residential Internal Trips</i>				(4)	-	(4)	(18)	(13)	(5)
Residential External & Net New Trips				22	6	16	16	8	7
Office Uses									
Office	710	14,000	158	40	34	6	18	3	15
Medical-Dental Office	720	4,500	85	14	11	3	17	5	12
<i>Office Sub-Total</i>				54	45	9	35	8	27
<i>Office Internal Trips</i>				(16)	(8)	(8)	(9)	(5)	(4)
Office External & Net New Trips				38	37	1	26	3	23
Retail Uses									
Shopping Center	820	156,800	8,163	230	143	87	758	364	394
<i>Shopping Center Internal Trips</i>				(18)	(6)	(12)	(75)	(37)	(38)
Shopping Center External Trips				212	137	75	683	327	356
<i>Pass-By Trips (0% AM, 34% PM, 26% SAT)</i>				-	-	-	(232)	(116)	(116)
Super Convenience Market/Gas Station (two)	960	28	6,455	786	393	393	643	322	321
<i>Conv. Market Internal Trips</i>				(70)	(17)	(52)	(64)	(33)	(31)
Conv. Market External Trips				717	376	341	579	289	290
<i>Pass-By Trips (76% AM and PM)</i>				(544)	(272)	(272)	(440)	(220)	(220)
Drive-In Bank	911	1,500	150	14	8	6	31	15	15
<i>Bank Internal Trips</i>				(1)	(0)	(1)	(3)	(2)	(1)
Bank External Trips				13	8	5	28	14	14
<i>Pass-By Trips (29% and 35% PM)</i>				(4)	(2)	(1)	(10)	(5)	(5)
Quick Lube	941	800	56	5	3	2	7	3	4
<i>Quick Lube Internal Trips</i>				(0)	(0)	(0)	(0)	(0)	(0)
Quick Lube External Trips				4	3	1	7	3	4
Retail Sub-Total			14,823	1,035	548	487	1,439	705	734
<i>Retail Sub-Total Internal Trips</i>				(89)	(24)	(65)	(143)	(72)	(71)
Retail External Trips				946	524	422	1,296	633	663
<i>Retail Pass-By Trips</i>				(548)	(274)	(274)	(682)	(341)	(341)
Retail Net New External Trips				398	250	148	614	292	322
Restaurant Uses									
High Turn-Over Sit Down Restaurant (two)	932	10,500	1,178	104	57	47	103	64	39
Fast Casual Restaurant (three)	930	5,700	1,796	12	8	4	81	45	36
Fast Food Restaurant with Drive Through (two)	934	5,500	2,590	221	113	108	180	94	86
Restaurant Sub-Total				337	178	159	364	202	162
<i>Restaurant Internal Trips</i>				(101)	(73)	(28)	(133)	(62)	(71)
Restaurant External Trips				236	105	131	231	140	91
<i>Pass-By Trips Sit Down Rest (43% PM)</i>							(32)	(16)	(16)
<i>Pass-By Trips FF Rest (49% AM, 50% PM/SAT)</i>				(76)	(38)	(38)	(58)	(29)	(29)
Restaurant Net New Trips				312	143	169	141	95	46
Other Uses									
Storage	151	600	108	8	4	4	11	6	5
Development Total									
Total Trips			21,458	1,460	781	679	1,883	942	941
<i>Internal Trips</i>			3,300 Est	(210)	(105)	(105)	(304)	(152)	(152)
Total External Trips (Driveway Trips)			18,158	1,250	676	574	1,579	790	789
<i>Total Pass-By Trips</i>				(472)	(236)	(236)	(772)	(386)	(386)
<i>Estimate Maximum Pass-By Base on SH-69 & Deer Flat Volumes</i>				(480)	(240)	(240)	(580)	(290)	(290)
BUILDOUT NET NEW TRIPS				778	440	338	999	500	499

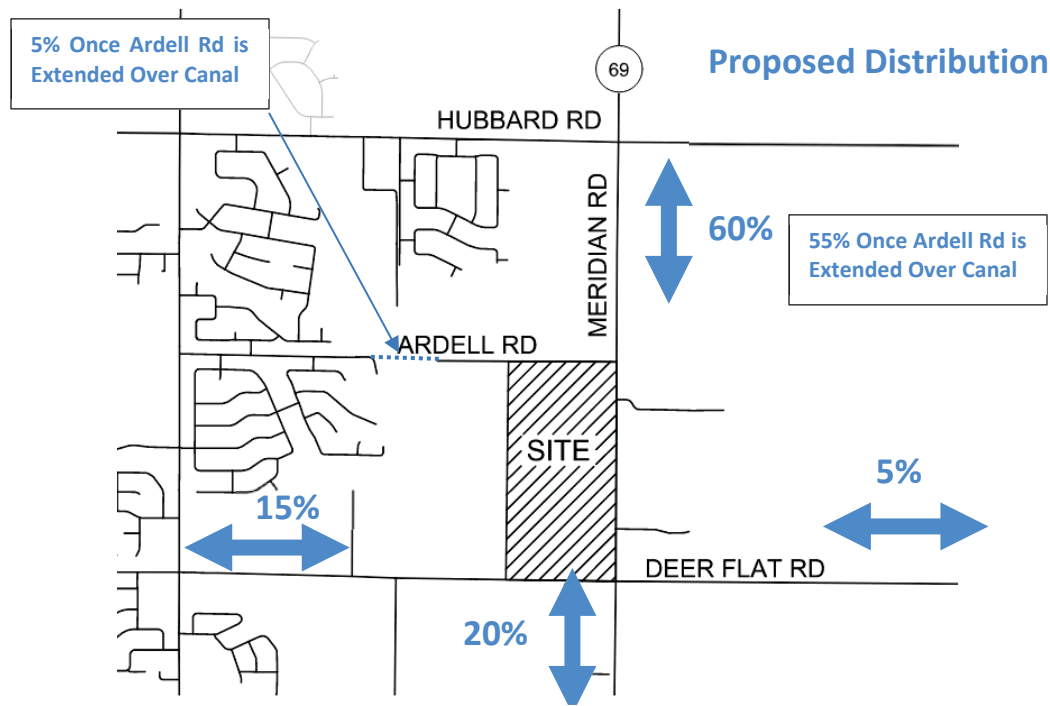


Exhibit 2. Proposed Trip Distribution

The distribution of site-generation trips estimates approximately 20 percent of trips will be to/from the south via Meridian Road, 15 percent of trips to/from the west via Deer Flat Road, 5 percent to/from the east via Deer Flat Road, and 60 percent of trips to/from the north via Meridian Road. With Ardeell Road extending over the Canal, based on the COMPASS modeling, approximately 5 percent of the trips are estimated to utilize Ardeell Road to the west. *Appendix A includes the scoping memo with the select zone analysis provided by COMPASS.*

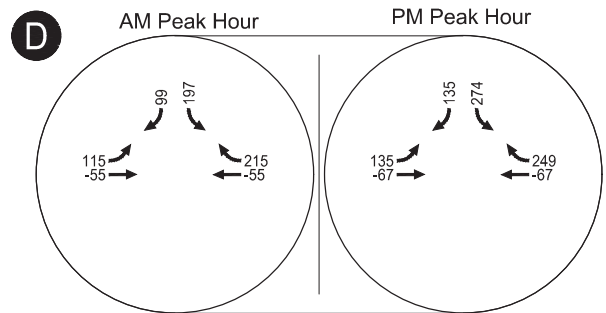
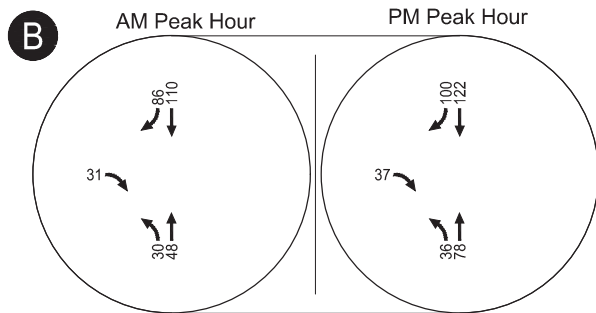
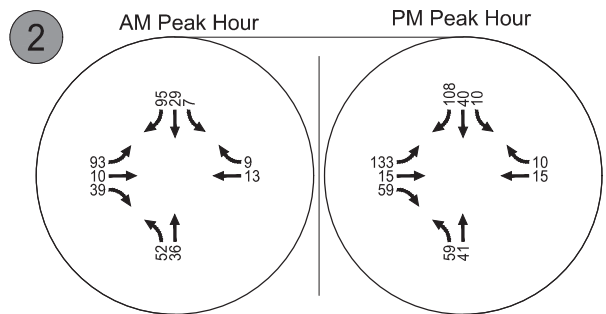
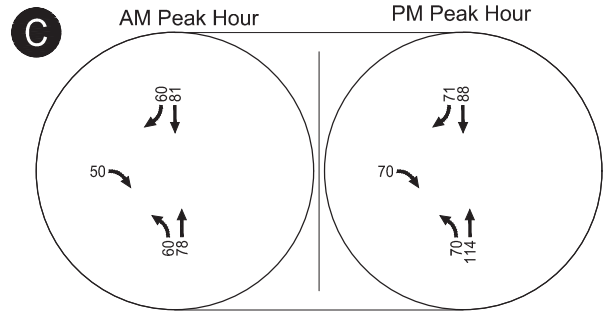
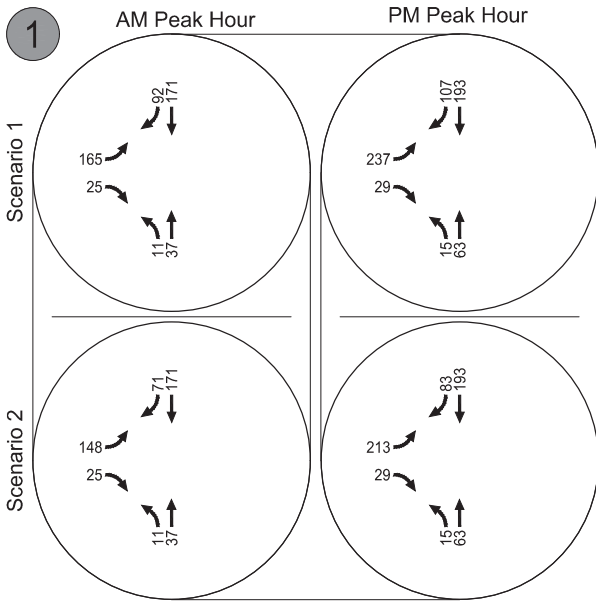
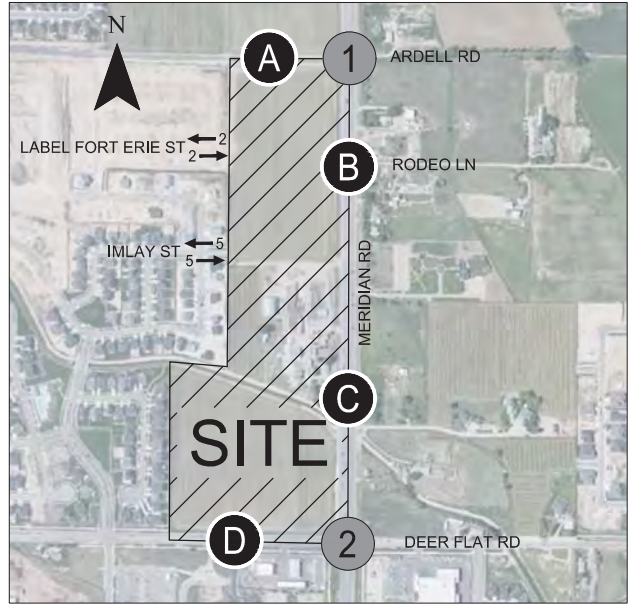
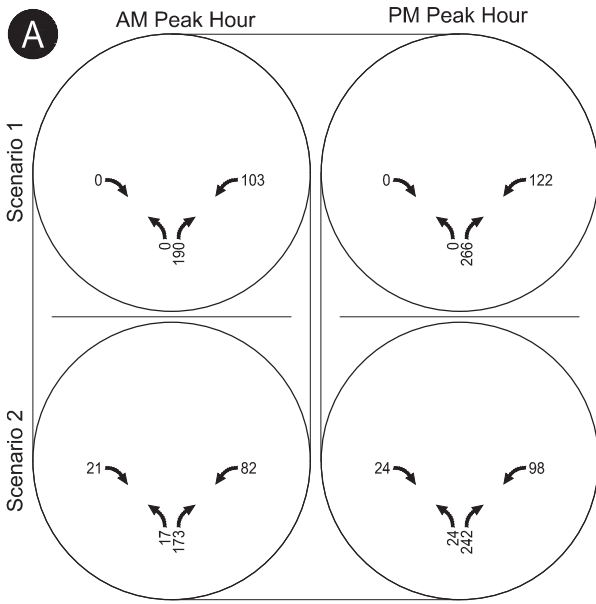
YEAR 2030 TOTAL TRAFFIC CONDITIONS

The year 2030 total traffic conditions analyze how the study area's transportation system will operate with the site-generated trips from the build-out of the proposed development. Site-generated trips were added to the year 2030 background weekday AM and PM peak hour traffic volumes to arrive at year 2030 total traffic volumes.

Year 2030 Total Traffic Conditions Intersection Operations

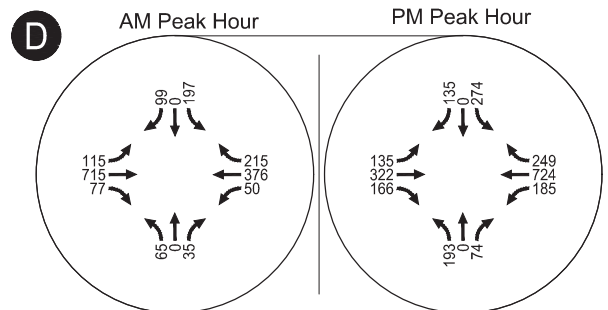
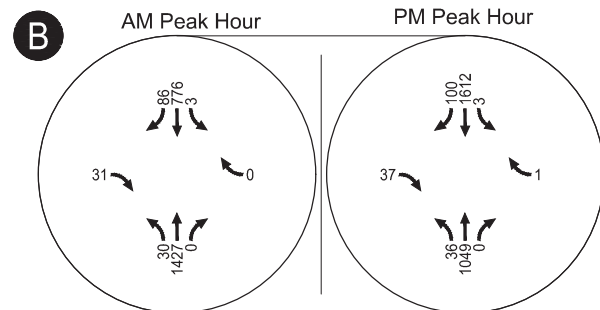
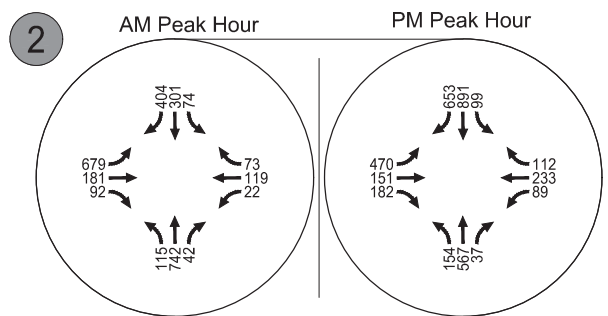
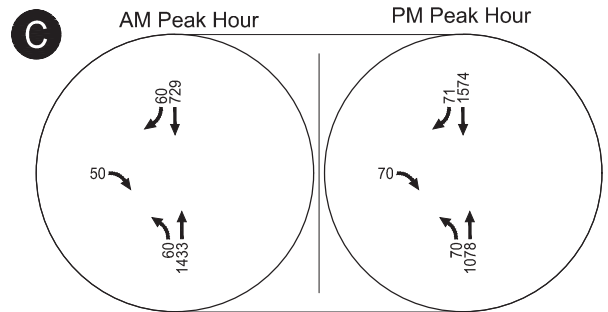
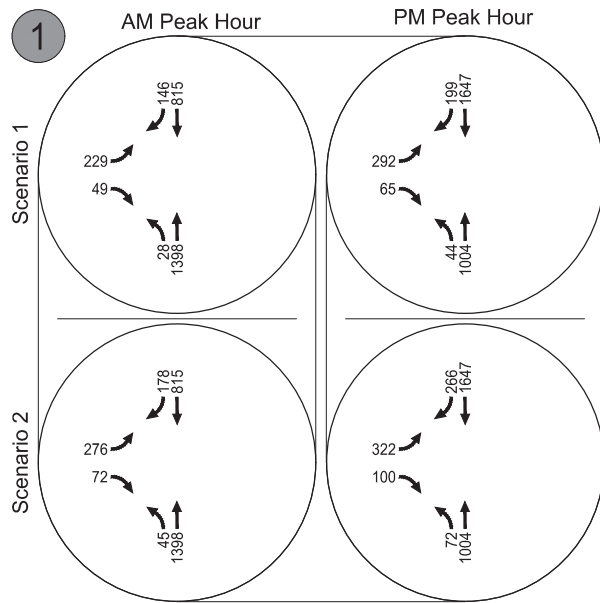
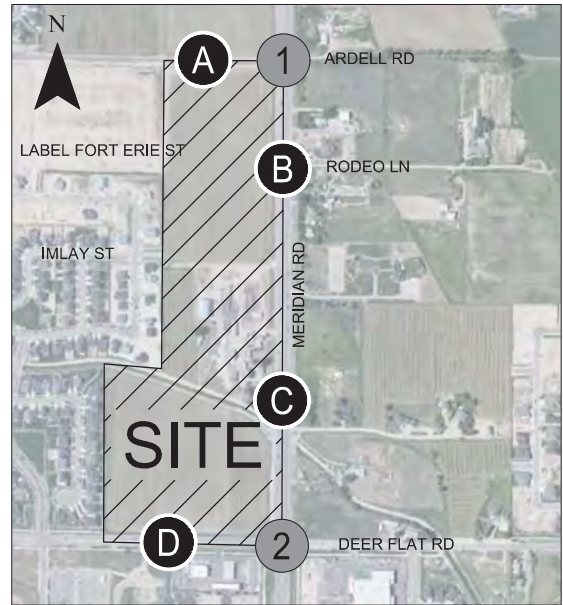
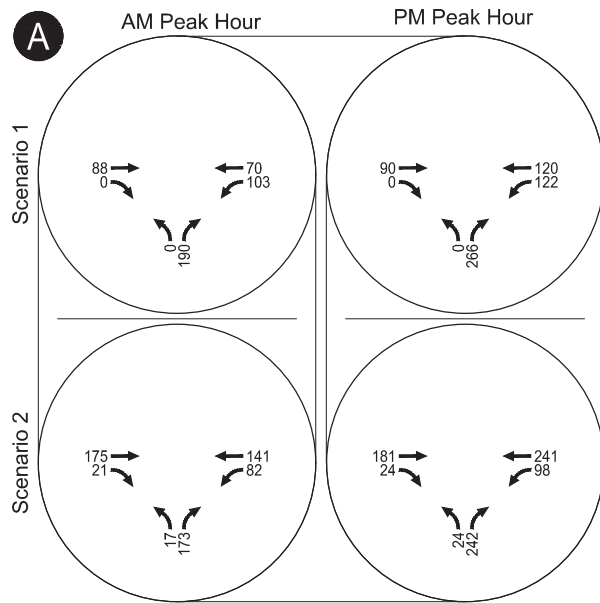
Figure 6 illustrates the estimated site generated traffic distributed through the study intersections and Figure 7 illustrates the year 2030 total traffic volumes at the study intersection during the weekday AM and PM peak hours.

Table 13 summarizes the results of the year 2030 total traffic conditions at the study intersections. *Appendix I includes year 2030 total traffic conditions Synchro worksheets.*



Site Generated Traffic
AM and PM Peak Hour
Kuna, ID

Figure
6



Year 2030 Total Traffic Volumes
AM and PM Peak Hour
Kuna, ID

Figure
7

Table 13. Year 2030 Total Traffic Conditions, Weekday AM and PM Peak Hours

No.	Intersection	Intersection Control	Intersection AM/PM			Lane Group	AM Peak Hour			PM Peak Hour			
			V/C	LOS	Delay		V/C	LOS	Delay	V/C	LOS	Delay	
1	Ardell Rd / Meridian Rd	TWSC ¹ Scenario 1 No Ardell Connection	-	-	-	NBL	0.05	B	10.7	0.14	C	18.0	
						EBLTR	1.39	F	243.1	3.31	F	1122.9	
			<i>Shoulder Peak Hour</i>										
			-	-	-	NBL	0.03	A	9.5	0.12	C	17.8	
		EBLTR				1.10	F	116.9	3.29	F	1108.4		
		TWSC ¹ Scenario 2 With Ardell Connection	-	-	-	NBL	0.08	B	11.1	0.24	C	20.6	
						EBLTR	1.77	F	404.1	4.22	F	1534.9	
			<i>Shoulder Peak Hour</i>										
-	-		-	NBL	0.05	A	9.7	0.22	C	20.1			
		EBLTR		1.39	F	227.5	4.13	F	1489.9				
2	Deer Flat Rd / Meridian Rd	Traffic Signal ⁴	1.19/ 1.21	F/F	186.7/ 117.5	EBL	2.08	F	539.6	2.06	F	538.5	
						EBTR	0.60	D	45.1	0.72	E	56.6	
						WBL	0.10	D	50.8	0.39	D	43.9	
						WBTR	0.86	E	69.5	0.92	F	81.0	
						NBL	0.39	D	35.2	0.69	D	35.6	
						NBT	0.90	E	72.0	0.46	D	36.6	
						NBR	0.90	E	71.4	0.46	D	36.5	
						SBL	0.53	D	40.5	0.30	C	28.4	
			SBT	0.39	D	44.2	0.72	D	44.6				
			SBR	0.38	D	45.6	0.69	D	47.3				
			<i>Shoulder Peak Hour</i>										
			0.80/ 1.14	F/F	115.7/ 99.0	EBL	1.52	F	298.1	1.85	F	442.8	
						EBTR	0.50	D	46.6	0.64	D	53.0	
						WBL	0.09	E	56.1	0.35	D	43.6	
						WBTR	0.81	E	72.9	0.92	F	80.8	
						NBL	0.27	D	35.7	0.72	D	38.1	
NBT	0.67	D				52.8	0.45	D	36.7				
NBR	0.67	D				52.7	0.45	D	36.7				
SBL	0.31	D				38.1	0.31	C	28.3				
SBT	0.30	D	42.7	0.77	D	46.6							
SBR	0.33	D	44.5	0.77	D	52.3							
A	Ardell Rd / Site Access A	TWSC ¹ Scenario 1 No Ardell Connection	-	-	-	NBLR	0.22	A	9.8	0.31	B	10.4	
						WBL	0.08	A	7.6	0.09	A	7.6	
		TWSC ¹ Scenario 2 With Ardell Connection	-	-	-	NBLR	0.27	B	11.3	0.40	B	13.0	
						WBL	0.07	A	7.8	0.08	A	7.9	
B	Site Access B / Meridian Rd	RIROLI ⁵	-	-	-	NBL	0.05	B	10.2	0.13	C	18.0	
						EBR	0.06	B	12.1	0.16	C	21.1	
						WBR	0.00	A	0.0	0.01	B	12.8	
						SBL	0.01	B	13.6	0.01	B	11.0	
C	Site Access C / Meridian Rd	RIROLI ⁵	-	-	-	NBL	0.09	B	10.1	0.23	C	18.8	
						EBR	0.10	B	12.0	0.28	C	22.8	
D	Site Access D / Ridleys Access / Deer Flat Rd	TWSC ¹	-	-	-	NBLTR	1.07	F	184.9	4.76	F	1826.6	
						EBL	0.14	A	9.4	0.22	B	11.9	
						WBL	0.07	B	10.1	0.19	A	9.2	
						SBLTR	5.06	F	1953.9	14.34	F	6246.8	

V/C ratio is defined as vehicle-to-capacity ratio, which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour. LOS stand for Level of Service. Delay is reported in seconds per vehicle. Cells in the table above that are **bolded**, *italicized*, and **highlighted** indicate an intersection and/or lane group operating below the jurisdictional standards.

¹TWSC = Two-Way Stop-Controlled Intersection

²RIRO = Right-in Right-out

³AWSC = All-Way Stop-Controlled Intersection

⁴U-turns modeled as left-turns because U-turns are not supported under the HCM methodology.

As shown in Table 13, the study intersections operate acceptably under 2030 total traffic conditions during the weekday AM and PM peak hours, except:

- **Ardell Road / Meridian Road:** Similar to 2030 background traffic conditions, the eastbound approach exceeds capacity during the weekday AM and PM peak hour under both scenarios. Operations improve during the shoulder peak hour, but the eastbound approach is still projected to be over capacity.
- **Deer Flat Road / Meridian Road:** Similar to 2030 background traffic conditions, the eastbound left-turn exceeds capacity during the weekday AM and PM peak hour. The northbound and westbound through movements also exceed the ITD V/C threshold of ≤ 0.90 . Operations improve during the shoulder peak hour, but the eastbound left-turn movement is still projected to be over capacity.
- **Site Access D / Ridley's Access / Deer Flat Road:** The northbound and southbound approaches are over capacity during both the weekday AM and PM peak hours.

2030 Total Traffic Roadway Segment Analysis

Table 14 shows the peak hour, peak direction roadway segment volumes, and whether the segment volumes meet the LOS policy standard volume threshold per ACHD District Policy 7106.3.3 for the ACHD roadway facilities.

Table 14. Year 2030 Total Segment Operations – Weekday AM and PM Peak Hour

Roadway Segment	Classification ¹	Travel Lanes ²	Estimated Daily Trips (Two Way)	ACHD Peak Hour Std. Volume (One-Way)	Weekday AM Peak Hour		Weekday PM Peak Hour	
					One-Way Volume/ Direction	Meets Std.	One-Way Volume/ Direction	Meets Std.
Ardell Rd	Collector	2	Scenario 1					
			6,586	D/425	278 / EB	Yes	356 EB	Yes
			Scenario 2					
			7,252	D/425	348 / EB	Yes	423 EB	Yes
Deer Flat Rd	Minor Arterial ¹	4 ³	Scenarios 1 & 2					
			22,226	E/720 (EB), 1,540 (WB)	952/EB	No (EB)	1158/WB	Yes
		5	Scenarios 1 & 2 Shoulder Peak Hour					
			22,226	E/720 (EB), 1,540 (WB)	694/EB (8-9 AM)	Yes	Not Applicable	
			Mitigation: Add Eastbound (EB) Through Travel Lane					
22,226	1,540	952/EB	Yes	1158/WB	Yes			

¹Per COMPASS 2040 Functional Street Classification Map (Reference 8)

²Travel lanes include the total number of lanes across the roadway's respective cross section

³Cross section includes continuous left-turn lane

⁴Cross section includes two lanes in the eastbound direction, one lane in westbound direction, and turn lanes (via raised median and continuous left-turn lane).

As shown in Table 14, the roadway segments are anticipated to meet ACHD roadway segment LOS threshold under year 2030 total conditions weekday AM and PM peak hours with the exception of the following:

- **Deer Flat Road (West of Meridian Road):** Similar to 2030 background conditions, the eastbound direction on Deer Flat Road only has a single travel lane and exceeds the ACHD segment volume threshold. Under 2030 Background conditions, an additional eastbound through lane is needed. But the segment was found to operate acceptably in the shoulder peak hour.

YEAR 2030 TOTAL TRAFFIC MITIGATION

This section highlights the mitigations required at each intersection and roadway segment projected to exceed ACHD and ITD operational thresholds under 2030 total traffic conditions. *Appendix J contains year 2030 total mitigated traffic operation worksheets for the intersections outlined below.*

Ardell Road / Meridian Road Intersection – 2030 Total Mitigation

The eastbound movement from Ardell Road is projected to continue to exceed both the ITD and ACHD V/C thresholds during all time periods and under both scenarios for Ardell Road connecting over the canal. ITD has an ongoing corridor study that has recommended an RCUT intersection at Ardell Road / Meridian Road intersection. As described in the background conditions section, an RCUT operates similarly to RIROLI intersection with exception of formalized U-turn intersection further to the south on Meridian Road. An RCUT and RIROLI may operate unsignalized or be signalized if sufficient gaps in traffic on Meridian Road are not available.

Three mitigation options were evaluated for the Ardell Road / Meridian Road intersection, which include:

- Unsignalized RCUT (or RIROLI)
- Signalized RCUT (or RIROLI)
- Traditional signalized full-access intersection

Table 16 shows the operational results for the mitigation options.

As shown in Table 16, the Ardell Road / Meridian Road intersection is anticipated to not operate acceptably as an unsignalized RCUT. This is because there are not sufficient gaps in southbound traffic on Meridian Road during the weekday PM peak hour for the volume of eastbound right turning traffic once the left-turning traffic is required to turn right and then make a U-turn to the south. But the intersection operates acceptably with the addition of a signalized RCUT or RIROLI with the exception of not meeting the ITD V/C ratio of 0.90 for the eastbound right-turning movement and southbound through movement.

Table 15. Year 2030 Total Ardell Road / Meridian Road – 2030 Total Mitigation

No.	Intersection	Intersection Control	Intersection AM/PM			Lane Group	AM Peak Hour			PM Peak Hour		
			V/C	LOS	Delay		V/C	LOS	Delay	V/C	LOS	Delay
1	Ardell Road / Meridian Road	Unsignalized										
		RIROLI or RCUT ¹ (Without Ardell Connection)	-	-	-	NBL	0.05	B	10.7	0.14	C	18.0
						EBR	0.55	C	19.1	1.21	F	156.2
		RIROLI or RCUT ¹ (With Ardell Connection)	-	-	-	NBL	0.08	B	11.1	0.24	C	20.6
						EBR	0.69	C	24.6	1.43	F	242.5
		Signalized										
		Signalized RIROLI/RCUT with EB RT Overlap (With Ardell Connection)	0.57/ 0.93	B/C	14.0/ 24.7	EBR	0.59	C	31.1	0.96	E	63.6
						NBL	0.06	A	2.9	0.26	D	35.9
						NBTR	0.51	A	0.6	0.43	A	6.4
						SBT	0.57	C	28.3	0.92	C	27.4
		Full Access Signalized with EBL Turn Lane (With Ardell Connection)	0.76/ 0.85	B/C	15.5/ 20.6	EBL	0.87	D	46.1	0.90	E	57.4
						EBR	0.25	C	30.2	0.33	C	30.6
						NBL	0.10	B	16.0	0.32	D	37.8
						NBTR	0.66	A	9.4	0.44	A	6.9
SBT	0.54					B	16.9	0.88	C	23.3		
				SBR	0.28	A	3.0	0.31	A	1.8		

V/C ratio is defined as vehicle-to-capacity ratio, which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour. LOS stand for Level of Service. Delay is reported in seconds per vehicle. Cells in the table above that are **bolded**, *italicized*, and **highlighted** indicate an intersection and/or lane group operating below the jurisdictional standards.

¹RCUT = Reduced Conflict U-Turn

Additionally, the intersection was evaluated with a traditional traffic signal which was also found to operate acceptably and meet the ITD V/C ratio of 0.90 for all the movements. A traditional signal performs better in this case because the eastbound left-turn and right-turn movements can be served at the same time from separate lanes which requires less green time for the Ardell Road signal phase and allows more green time for Meridian Road.

Traffic signal warrants were evaluated which identified that the intersection is projected to meet traffic signal warrants.

Deer Flat Road / Meridian Road Intersection – 2030 Total Mitigation

Under existing conditions an additional eastbound left turn lane was shown to mitigate the intersection to acceptable operating standards.

Table 17 shows the mitigated operations under 2030 total conditions at Deer Flat Road / Meridian Road with the dual eastbound left-turn lanes as well as additional lanes that would be required to meet the ITD V/C policy threshold of ≤0.90 for the intersection and all the movements. Additionally, the intersection was evaluated with a median U-turn (MUT) configuration which is recommended as part of the ITD corridor plan.

Table 16. Deer Flat Road / Meridian Road – 2030 Total Mitigation

No.	Intersection	Intersection Control	Intersection AM/PM			Lane Group	AM Peak Hour			PM Peak Hour		
			V/C	LOS	Delay		V/C	LOS	Delay	V/C	LOS	Delay
Mitigation to Remain Under Capacity												
2	Deer Flat Road / Meridian Road Mitigation: Dual Eastbound Left-turn Lanes	Traffic Signal ⁴	0.78/ 0.81	E/E	67.6/ 57.2	EBL	0.95	<i>E</i>	71.9	0.91	<i>E</i>	76.3
						EBTR	0.47	D	35.9	0.56	D	42.1
						WBL	0.10	D	50.7	0.29	D	43.6
						WBTR	0.86	E	69.7	0.93	<i>F</i>	83.1
						NBL	0.42	D	37.8	0.81	E	59.4
						NBT	0.99	<i>F</i>	92.4	0.54	D	45.0
						NBR	0.99	<i>F</i>	91.7	0.54	D	45.0
						SBL	0.61	D	46.4	0.36	C	33.7
SBT	0.41	D	45.8	0.85	E	56.3						
SBR	0.29	D	45.0	0.66	D	51.5						
Mitigation Required to Meet ITD & ACHD Policy												
2	Deer Flat Road / Meridian Road Mitigation: Triple Eastbound Left-turn Lanes and a Westbound Right-turn Lane	Traffic Signal ⁴	0.64/ 0.69	D/E	54.2/ 60.0	EBL	0.90	E	64.9	0.88	E	78.6
						EBTR	0.68	D	49.9	0.84	E	61.3
						WBL	0.13	E	55.8	0.52	D	53.0
						WBT	0.80	E	71.6	0.86	E	70.5
						WBR	0.45	E	62.6	0.43	E	58.8
						NBL	0.36	C	32.7	0.79	E	55.3
						NBT	0.80	E	56.2	0.55	D	45.3
						NBR	0.80	E	55.9	0.55	D	45.2
SBL	0.47	D	36.2	0.37	D	35.9						
SBT	0.33	D	38.6	0.90	E	62.9						
SBR	0.24	D	37.8	0.69	E	55.3						
Estimated ITD Corridor Study MUT Configuration												
2	Deer Flat Road / Meridian Road Mitigation: MUT Intersection	Traffic Signal ⁴	0.79/ 0.80	E/D	62.6/ 47.7	EBL	1.02	<i>F</i>	87.0	0.90	E	69.1
						EBTR	0.51	C	34.3	0.57	D	37.7
						WBL	0.10	D	45.5	0.28	D	38.5
						WBTR	0.85	E	62.8	0.91	<i>E</i>	70.3
						NBT	0.95	<i>E</i>	69.9	0.67	D	39.9
						NBR	0.95	<i>E</i>	69.8	0.67	D	39.9
						SBT	0.38	C	33.9	0.78	D	41.1
						SBR	0.43	D	36.3	0.77	D	46.3

V/C ratio is defined as vehicle-to-capacity ratio, which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour. LOS stand for Level of Service. Delay is reported in seconds per vehicle. Cells in the table above that are **bolded**, *italicized*, and **highlighted** indicate an intersection and/or lane group operating below the jurisdictional standards.

¹TWSC = Two-Way Stop-Controlled Intersection

²RIRO = Right-in Right-out

³AWSC = All-Way Stop-Controlled Intersection

⁴U-turns modeled as left-turns because U-turns are not supported under the HCM methodology.

Exhibit 3 illustrates the MUT intersection configuration proposed in the ITD corridor plan

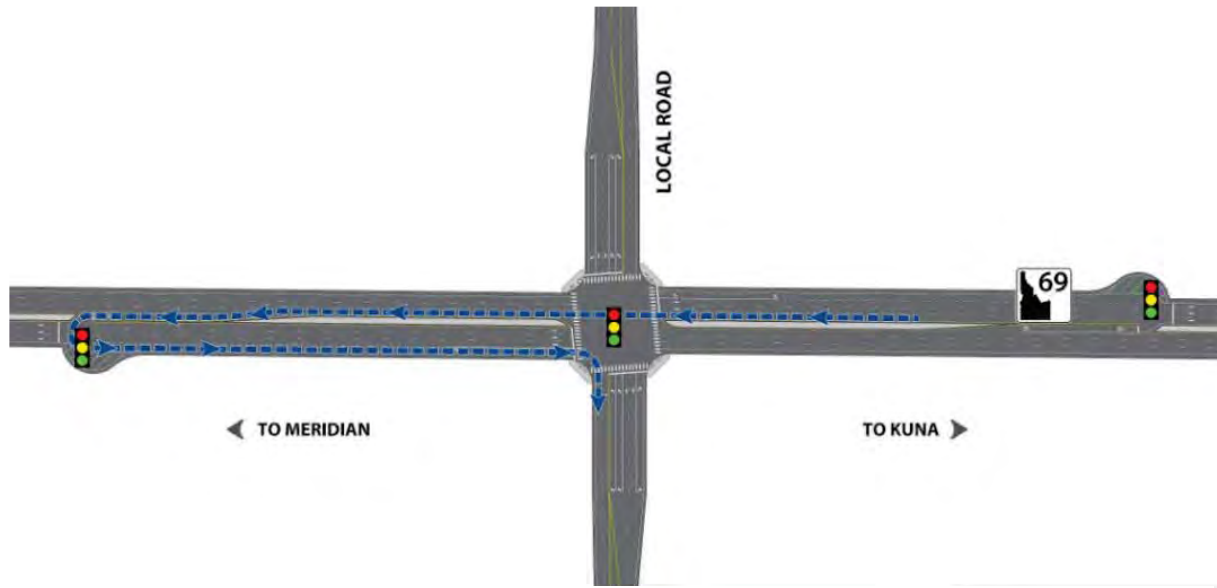


Exhibit 3. ITD Proposed MUT Intersection (Reference 13)

With the existing and background mitigation of dual eastbound left-turn lanes, the Deer Flat Road / Meridian Road intersection is anticipated to operate within ACHD policy of LOS E and V/C ratio for movements of ≤ 1.00 with the second eastbound left-turn lane.

Further mitigation would be needed to meet ITD policy of LOS D and V/C ratios for the overall intersection and movements of ≤ 0.90 . Mitigation to ITD policy would require the following:

- A third eastbound left-turn lane.
- A westbound right-turn lane.

The third option of a MUT intersection (per the ITD draft corridor plan) operates under capacity but still was found to result in the eastbound left-turn movement reaching capacity during the weekday AM peak hour. Additionally, the northbound and westbound through movements were found to operate above the ITD V/C threshold of ≤ 0.90 with the MUT configuration during the weekday AM and PM peak hours, respectively.

Site Access D / Ridley's Access / Deer Flat Road Intersection – Total 2030 Mitigation

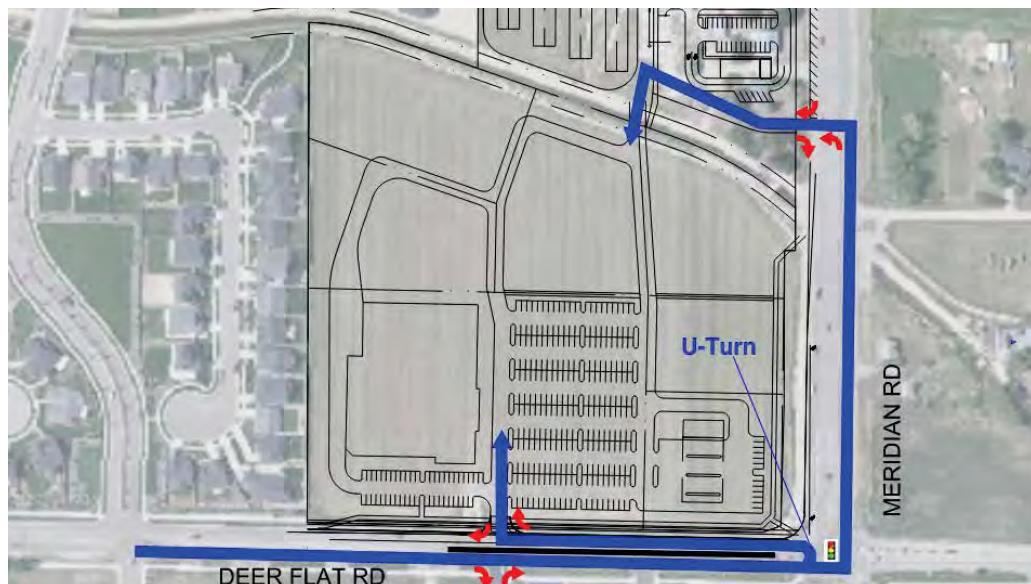
Based on discussions with ACHD, the intent of ACHD is to restrict this access to RIRO and ACHD has indicated that the Ridley's development understands that their driveway will also be limited to RIRO in the future. ACHD agreed to an evaluation of RIROLI for Site Access D, for informational purposes.

Based on the intersection queuing analysis, there is not enough distance between the Site Access D / Ridley's Access to accommodate the queuing projections for the eastbound dual left-turn movement at Meridian Road and the westbound left-turn movement into the Ridleys Access. Therefore, the Ridley's access is assumed to be restricted to RIRO for the 2030 mitigated options.

With either RIRO or RIROLI for Site Access D, it is anticipated that U-turns will occur at other interactions on Deer Flat Road. Exhibit 5 shows optional routes for the southbound left-turns that are projected to occur with RIRO operation and RIROLI operation at Site Access D and the eastbound left-turns at Site Access D under RIRO operation.



Southbound Left-Turn U-Routing with RIROLI & RIRO



Eastbound Left-Turn Routing with RIRO

Exhibit 4. Optional Site Traffic Routes for Resulting from RIROLI and RIRO at Site Access D

For both RIRO and RIROLI alternatives the southbound left-turning traffic from the site onto Deer Flat Road will be forced to use one of the following options to get to Meridian Road northbound, Meridian Road southbound, and Deer Flat Road eastbound:

Reroute to Site Access C: This option has the southbound left-turns from Site Access D re-route to be eastbound right-turns at Site Access C and then use the Deer Flat Road / Meridian Road intersection to either go south on Meridian Road (straight through), north on Meridian Road (U-turn), or east on Deer Flat Road (left-turn).

Turn Right onto Deer Flat: This option has the southbound left-turns from Site Access D become southbound right turns at Site Access D and then find a location to the make a U-turn on Deer Flat Road. Most likely the U-turns will occur at the Deer Flat Road / Sailer Way intersection or turn left at Sailer Way and loop through the Bi-Mart and Ridley's parking lots to go east on Deer Flat Road.

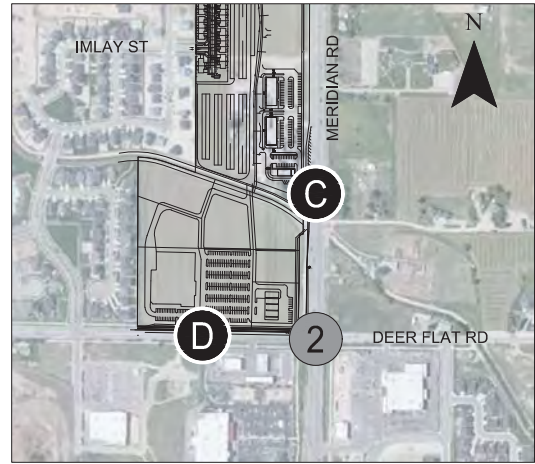
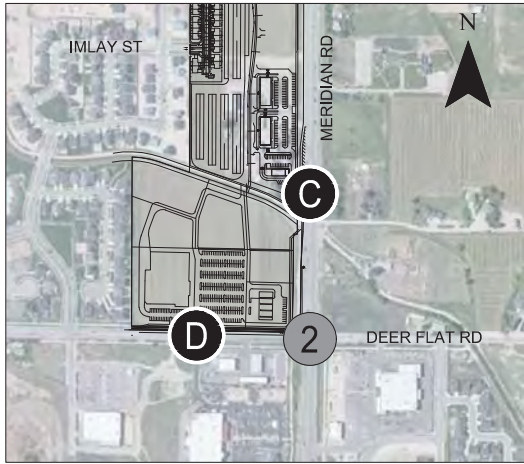
If this intersection is further restricted to RIRO, the eastbound left-in movement would shift to eastbound U-turns or left-turning movements at the Deer Flat Road / Meridian Road intersection. Removing the eastbound left turn will increase the eastbound left turn volume at the Deer Flat Road / Meridian Road intersection because some of this volume will perform a U-turn in order to enter the site at Site Access D as a westbound right-turning movement and other drivers will likely perform a left turn and enter at Site Access C as a northbound left-turning movement.

Figure 8 shows the traffic volumes at the three study intersections impacted by the access configuration options for Site Access D.

Table 17 shows how the intersection would operate under 2030 total traffic conditions with a RIRO and RIROLI restriction as well as the anticipated impacts to Site Access C / Meridian Road and Deer Flat Road / Meridian Road intersections.

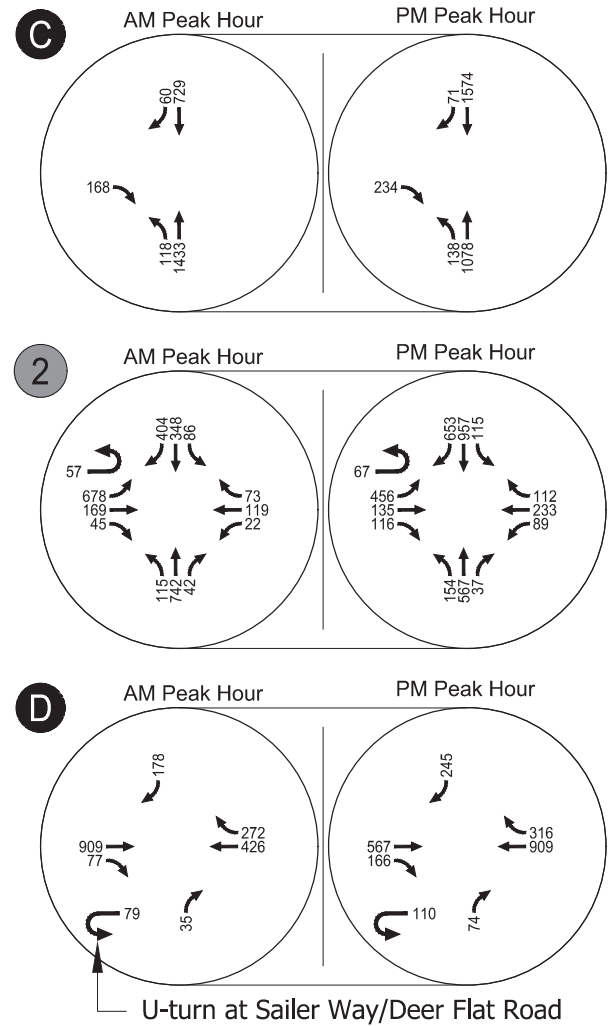
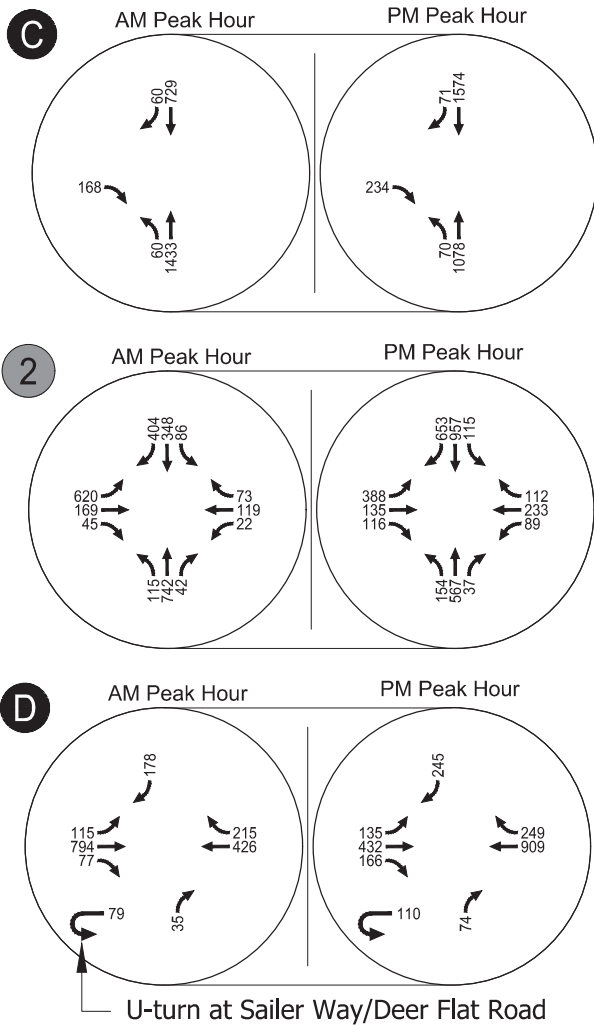
As shown in Table 17, the Site Access D / Ridley's Access / Deer Flat Road intersection is anticipated to operate acceptably with a RIROLI for Site Access D and RIRO access assumed for the Ridley's Access. The intersections of Deer Flat Road / Meridian Road and Site Access C / Meridian Road are anticipated to operate under capacity but not meet ITD V/C policy of ≤ 0.90 for intersection movements under both options.

Comparing the two options, the RIROLI option for Site Access D provides better operations at the Deer Flat Road / Meridian Road intersection. The worse operations with the RIRO option are due to increases in eastbound left-turning and U-turn movements at the Deer Flat Road / Meridian Road intersection.



Right-in Right-out Left-in
(RIROLI, Assumes South
Access is RIRO)

Right-in Right-out
(RIRO)



Rerouted Year 2030 Total Traffic Volumes
AM and PM Peak Hour
Kuna, ID

Figure
8

Table 17. Site Access D / Ridley's Access / Deer Flat Road

No.	Intersection	Intersection Control	Intersection AM/PM			Lane Group	AM Peak Hour			PM Peak Hour		
			V/C	LOS	Delay		V/C	LOS	Delay	V/C	LOS	Delay
Site Access D RIROLI (with RIRO on Ridley's South Leg)												
2	Deer Flat Rd / Meridian Rd Mitigation: Dual Eastbound Left-turn Lanes	Traffic Signal ⁴	0.76/ 0.82	E/E	67.7/ 59.2	EBL	0.93	<i>E</i>	69.3	0.89	<i>E</i>	72.5
						EBTR	0.39	D	36.1	0.45	D	42.5
						WBL	0.10	D	50.7	0.26	D	43.5
						WBTR	0.86	E	69.7	0.93	<i>F</i>	83.1
						NBL	0.45	D	38.1	0.87	E	72.4
						NBT	0.99	<i>F</i>	93.0	0.55	D	46.1
						NBR	0.99	<i>F</i>	92.3	0.56	D	46.0
						SBL	0.71	D	54.9	0.40	C	33.7
SBT	0.47	D	47.1	0.91	<i>E</i>	62.3						
SBR	0.30	D	45.2	0.68	D	52.6						
C	Site Access C / Meridian Rd	RIROLI ⁵	-	-	-	NBL	0.09	B	10.1	0.23	C	18.8
						EBR	0.33	B	14.3	0.93	<i>F</i>	77.7
D	Site Access D / Ridleys Access / Deer Flat Rd Mitigation: RIROLI	TWSC ¹	-	-	-	NBR	0.12	C	18.0	0.15	B	13.0
						EBL	0.14	A	9.7	0.26	B	13.7
						SBR	0.31	B	13.0	0.62	D	26.2
Site Access D RIRO												
2	Deer Flat Rd / Meridian Rd Mitigation: Dual Eastbound Left-turn Lanes	Traffic Signal ⁴	0.82/ 0.87	E/E	66.7/ 60.2	EBL	0.95	<i>E</i>	69.8	0.92	<i>E</i>	75.3
						EBTR	0.34	C	32.0	0.38	D	37.3
						WBL	0.10	D	50.8	0.25	D	43.6
						WBTR	0.86	E	69.9	0.94	<i>F</i>	86.8
						NBL	0.46	D	41.3	0.90	E	78.0
						NBT	0.98	<i>F</i>	91.4	0.56	D	46.4
						NBR	0.98	<i>F</i>	90.7	0.56	D	46.4
						SBL	0.77	E	64.2	0.41	C	33.6
SBT	0.46	D	40.6	0.91	<i>E</i>	61.6						
SBR	0.25	D	38.4	0.59	D	48.8						
C	Site Access C / Meridian Rd	RIROLI ⁵	-	-	-	NBL	0.17	B	10.6	0.45	C	24.1
						EBR	0.33	C	14.3	0.93	<i>F</i>	77.7
D	Site Access D / Ridleys Access / Deer Flat Rd Mitigation: RIROLI	TWSC ¹	-	-	-	NBR	0.15	C	20.8	0.18	C	15.0
						SBR	0.32	B	13.6	0.65	D	29.1

V/C ratio is defined as vehicle-to-capacity ratio, which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour. LOS stand for Level of Service. Delay is reported in seconds per vehicle. Cells in the table above that are **bolded**, *italicized*, and **highlighted** indicate an intersection and/or lane group operating below the jurisdictional standards.

¹TWSC = Two-Way Stop-Controlled Intersection

²RIRO = Right-in Right-out

³AWSC = All-Way Stop-Controlled Intersection

⁴U-turns modeled as left-turns because U-turns are not supported under the HCM methodology.

A review the northwest corner of the Deer Flat Road / Meridian Road intersection identified that modifications of the corner design and signal may be necessary to accommodate eastbound U-Turns. Based on the analysis results above and the queuing results, maintaining the eastbound left-turn at Site Access D benefits the Deer Flat Road / Meridian Road intersection and should be considered.

Due to queuing for the eastbound left-turn movement from Deer Flat Road / Meridian Road intersection requiring approximately 475 feet (see queuing evaluation section) of the estimated 550 feet of usable left-turn distance between Meridian Road and Site Access D, there could be a need to shift Site Access D a small distance west to accommodate the tapers and other design elements. Exhibit 4 shows a concept layout for Site Access D that illustrates providing the recommended eastbound left-turn storage at the Deer Flat Road / Meridian Road intersection with RIROLI at Site Access D.

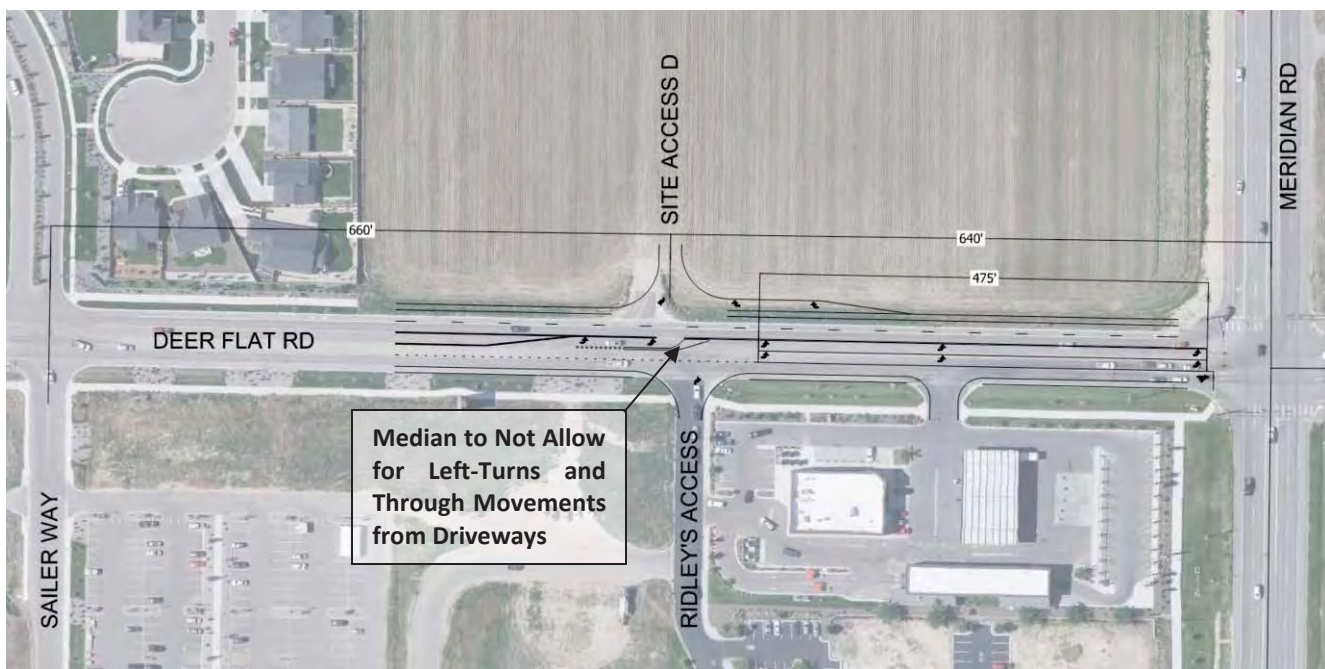


Exhibit 5. Conceptual RIROLI Layout for Site Access D

Deer Flat Road (West of Meridian Road):

Similar to 2030 background traffic conditions, an additional eastbound through lane is needed. But the segment was found to operate acceptably in the shoulder peak hour indicating that the peaking in traffic discussed in the existing conditions section subsides in by the 8:00-9:00 AM shoulder peak hour. Additionally, due to such as large percentage of the eastbound traffic on Deer Flat Road turns to go north on Meridian Road, the additional lane could drop into the second eastbound left-turn lane as shown in Exhibit 5.

- Given the segment meets the ACHD segment thresholds in the shoulder peak hour, ACHD policy allows for possible alternative mitigation, including bicycle and pedestrian improvements. Two potential alternative mitigations could include:

- **Deer Flat Road Sidewalk or Pathway:** A sidewalk or pathway connection along the site frontage to connect to the signal at Meridian Road and the stubbed sidewalk on the west end of the site. This is anticipated to be required by the City but would improve connectivity to the signalized pedestrian crossing on Meridian Road.
- **Kuna Canal Shared-Use Pathway:** A shared use pathway along the Kuna Canal would provide a convenient connection to the adjacent neighborhood and potentially serve longer trips once other sections are completed by residential subdivisions to the west.
- This roadway segment is identified in the ACHD for widening in the 2031-2035 timeframe.

2030 QUEUING ANALYSIS

Kittelson performed an analysis of the 95th percentile queuing at the study intersections and site accesses. Table 18 shows the projected queue under existing, year 2030 background, and year 2030 total traffic conditions.

As shown in Table 18, all queues are anticipated to have acceptable storage with the exception of the eastbound left at Deer Flat Road / Meridian Road intersection.

- **Deer Flat Road / Meridian Road:** The eastbound storage for the Deer Flat Road / Meridian Road intersection is shown to need approximately 475 feet of storage per the queuing results with dual eastbound left-turn lanes. The total estimated left-turn lane distance between Meridian Road and Site Access D is approximately 550 feet. Therefore, 475 feet extends the left-turn lanes to within 75 feet of Site Access D. This has the following implications:
 - Maintaining a westbound left-turn for the Ridley's Access is not possible.
 - Site Access D may need to be relocated a small distance west depending on the final design of the eastbound left-turn lanes at the Deer Flat Road / Meridian Road intersection if the taper/gap for the dual left-turn lanes is longer than 100 feet.

This is also discussed in 2030 total traffic mitigations section and is illustrated in Exhibit 5.

Table 18. 95th Percentile Queuing Analysis

No.	Intersection	Intersection Control	Lane Group	95 th Queue (ft) AM/PM Existing	95 th Queue (ft) AM/PM 2030 Background	95 th Queue (ft) AM/PM 2030 Total	95 th Queue (ft) AM/PM 2030 Total Mitigated	Storage Available (ft) (Proposed)	Fits within Storage (Mitigated Condition)
1	Ardell Rd / Meridian Rd	TWSC ¹ Scenario 1 No Ardell Connection	NBL	25/25	25/25	25/25	-	(100)	Yes
			EBLTR	50/50	150/250	875/1150		Continuous	Yes
		TWSC ¹ Scenario 2 With Ardell Connection	NBL	-	25/25	25/25	0/0	(100)	Yes
			EBLTR	-	425/525	1125/1375	250/600 Signalized RCUT	Continuous	Yes
			SBT	-	-	-	225/200 Signalized RCUT	Continuous	Yes
			SBR	-	-	-	50/25 Signalized RCUT	375	Yes
2	Deer Flat Road / Meridian Road	Traffic Signal ⁴	EBL	625/375	950/575	1150/875	475/300	125	No (No)
			EBTR	200/250	275/300	325/400	275/325	Continuous	Yes
			WBL	25/100	50/100	50/100	50/100	150	Yes
			WBTR	175/325	225/400	250/450	250/475	Continuous	Yes
			NBL	50/75	75/100	125/125	125/200	150 + TWLTL	Yes (No)
			NBTR	275/200	425/275	450/300	575/350	Continuous	Yes
			SBL	50/75	75/100	75/100	100/125	175	Yes
			SBT	100/300	150/450	175/500	200/550	Continuous	Yes
			SBR	50/75	75/100	100/350	100/325	350	Yes
A	Ardell Road / Site Access A	TWSC ¹ Scenario 1 No Ardell Connection	NBLR	-	-	25/50	-	Continuous	Yes
			WBL	-	-	25/25	-	Continuous	Yes
		TWSC ¹ Scenario 2 With Ardell Connection	NBLR	-	-	50/50	-	Continuous	Yes
			WBL	-	-	25/25	-	Continuous	Yes
B	Site Access B / Meridian Road	RIROLI ⁵	NBL	-	-	25/25	-	100 (Proposed)	Yes
			EBR	-	-	25/25	-	Continuous	Yes
			WBR	0/25	0/0	0/0	-	Continuous	Yes
			SBL	0/25	0/0	0/0	-	100 (Proposed)	Yes
C	Site Access C / Meridian Road (ID-69)	RIROLI ⁵	NBL	-	-	25/25	25/25	100 (Proposed)	Yes
			EBR	-	-	25/50	50/225	Continuous	Yes
D	Deer Flat Road / Site Access D	TWSC ¹	NBLTR	25/125	50/275	175/800	25/25 (RIRO)	Continuous (NBRT)	Yes
			EBL	-	-	25/25	25/50	100 (Proposed)	Yes
			WBL	25/25	25/25	25/25	-	Not Applicable	Not Applicable
			SBLTR	-	-	925/1375	50/100	Continuous (SBRT)	Yes

TURN LANE WARRANT ANALYSIS

Kittelson evaluated left and right turn lane warrants at Site Access A, B, C, and D for the relevant approaches under year 2030 total traffic conditions. Deer Flat Road has an existing two-way, left-turn lane, so no additional left-turn lane warrant analysis is needed at Site Access D. Table 18 shows the results of the turn lane evaluation. *Appendix K contains the turn lane analysis worksheets.*

Table 19. Turn Lane Analysis Results at the Site Accesses

<i>Intersection</i>	<i>Turn Lane</i>	<i>Year 2030 Turning Volume (AM/PM)</i>	<i>Warranted in 2030?</i>
Site Access A/Ardell Road	EB Right-Turn Lane WB Left-Turn Lane	147/81	No No
Meridian Road/Site Access B	SB Right-Turn Lane NB Left-Turn Lane	16/29	Yes Yes (Ex TWLTL)
Meridian Road/Site Access C	SB Right-Turn Lane NB Left-Turn Lane	16/29	Yes Yes (Ex TWLTL)
Site Access D/Deer Flat Road	WB Right-Turn Lane EB Left-Turn Lane if not RIRO	147/81	Yes Yes (Ex TWLTL)

As shown in Table 19, site access A does not meet any turn lane warrants. Site access B, C and D warrant left and right turn lanes at each access under 2030 total traffic conditions.

IMPROVEMENT THRESHOLD ANALYSIS

In order to assess the approximate timing for future transportation improvements, an evaluation of when roadway and intersection improvements may be needed and the approximate square footage of the development that could be completed was conducted. It should be noted that development size thresholds were estimated based on the square footage of the commercial portion of the development and not the residential or storage uses. The residential and storage uses have very low trip generation as compared to the commercial uses. *Appendix K includes a summary of the improvement threshold calculations.*

Table 20 shows the roadway segments and intersections requiring improvements to accommodate 2030 background traffic conditions. Also shown in the table are the approximate timeframes.

2030 Background Threshold Summary

Table 20. 2030 Background Mitigation Threshold Evaluation

Roadway or Intersection	Existing Need?	ACHD CIP Year or ITD Const Year	2030 Background Mitigation			Notes
			Mitigation	Mitigation Approx. Year	Additional Peak Hour Trips over Existing (Peak Dir or TEV)	
Roadways						
Deer Flat Rd (Site Frontage)	No	2031-2035 5 Lanes	2 Lanes EB	2024/2025	71	
Intersections						
Deer Flat Road / Meridian Rd	Yes	2031-2035 Reconstruct Signal	Dual EB LT Lanes	Existing Need	Not Applicable	
Site Access D / Ridley's Access / Deer Flat Road	Yes	None	RIROLI or RIRO	2029	384	
Ardell Rd / Meridian Rd	No	None	RCUT or RIROLI	2029	122 EB PM Peak Hour Trips	Scenario 2 (Ardell Rd over Canal) only

2030 Total Threshold Summary

Table 21 shows the off-site study intersections and segments requiring improvements to accommodate 2030 total traffic conditions for the off-site improvements with additional estimates of the approximate percentage and square footage of development and the percentage of the total traffic that is generated by the proposed development. In the case of this development, all the mitigation locations also require mitigation in the 2030 background traffic conditions.

Table 21. 2030 Total Traffic Mitigation Threshold Evaluation

Intersection or Roadway	2025 Existing or Bkgd Need?	ACHD CIP Year or ITD Const Year	2030 Total Traffic Mitigation				Site Traffic % AM (PM)
			Mitigation	Additional Peak Hour Trips over Existing (Peak Dir or TEV)	Mitigation Approx. Year (Crit Time)	% pf Development (SF)	
Roadways							
Deer Flat Rd (Site Frontage)	Yes	2031-2035 5 Lanes	2 Lanes EB (AM Only)	71	2024	28% (55,200)	6.6%
Off-Site Intersections							
Deer Flat Road / Meridian Rd	Yes	2031-2035 Reconstruct Signal	Dual EB LT Lanes	Existing Need	Not Applicable	Not Applicable (Exiting Need)	13.5% (13.5%)
Site Access D / Ridley's Access / Deer Flat Road	Yes	None	RIROLI or RIRO	75 (With North Approach)	2022/2023	7% (14,500)	33.9% (26.8%)
Ardell Rd / Meridian Rd	No	None	RCUT or RIROLI	122 EB PM Peak Hour Trips	2023/2024	27% (55,900) S1 21% (43,400) S2	18.8% (19.8%) S1 17.4% (18.3%) S2

REVIEW OF THE PROPOSED ACCESS FOR THE DEVELOPMENT

Kittelson reviewed the estimate daily traffic at the site access locations and local streets that provide access, evaluated access spacing based on ACHD and ITD policies, and reviewed intersection sight distance for site access intersections.

Site Access Roadway Daily Traffic Volume Threshold Evaluation

Table 22 shows the estimated average daily traffic (ADT) on the site access roadways as compared with the ACHD Policy Manual for maximum traffic on a local or collector street and traffic volume on a site driveway.

Table 22. 2030 Daily Traffic Estimates on Site Access Roadways & Driveways

Street	Existing Daily Traffic	Estimated 2030 Site Generated Daily Trips	ACHD ADT Classification / Planning ADT Threshold	Meets ACHD Criteria?
Ardell Rd (Site Frontage)			See Table 13	
Deer Flat Rd (Site Frontage)			See Table 13	
Site Access A	0	5,010	Driveway / 5,000	No
Site Access B	0	1,810	Driveway / 5,000	Yes
Site Access C	0	2,410 Full Access D	Driveway / 5,000	Yes
		4,330 RIROLI Access D		Yes
		4,880 RIRO Access D		Yes
Site Access D	0	8,610 Full Access D	Driveway / 5,000	No
		6,680 RIROLI Access D		No
		6,130 RIRO Access D		No
Local Stub Street Access Connections				
Fort Erie St (Stub)	0	45	Local Street / 2,000	Yes
Imlay St (Stub)	0	115	Local Street / 2,000	Yes
Potential for Cut Through Route to Deer Flat				
Sailer Way (North of Deer Flat)	1,694	150	Local Street / 2,000	Not evaluated due ongoing construction activity and will depend on when Kay Ave is completed to Deer Flat

As shown in Table 22, daily traffic at the site access locations is projected to remain under 5,000 with the exceptions of the following:

- **Site Access A:** Site access A is projected to have a daily volume of approximately 5,010.
- **Site Access D – RIRO or RIROLI:** Site access D is projected to have a daily volume of approximately 6,680 as a RIROLI and approximately 6,130 as a RIRO.

Due to the volumes on these driveways being relatively close to the ACHD 5,000 daily trip threshold, additional driveways were not determined to be needed.

Local Street Impacts

One issue that comes up when a development provides stub street connections to future development is the unknown amount of traffic that might come from the future development and therefore increase volumes on the local streets within the development. Therefore, ACHD has a general threshold of 2,000 ADT for local streets and a lower threshold of 1,000 ADT for local streets that connect to stub streets.

The site plan proposes two connections to local stub streets at Fort Erie Street and Imlay Street. Both of these stub street connections will provide access to the local neighborhood which will reduce the need for local residents to go north to Ardell Road or south to Deer Flat Road to access the development. Due to the locations of these stub street connections and the estimated distribution of site trips neither of these stub street connections is projected to service cut through traffic. Exhibit 4 shows a comparison of traffic routes using the local street stub connections to the routes using the internal roadway and site driveway connections.

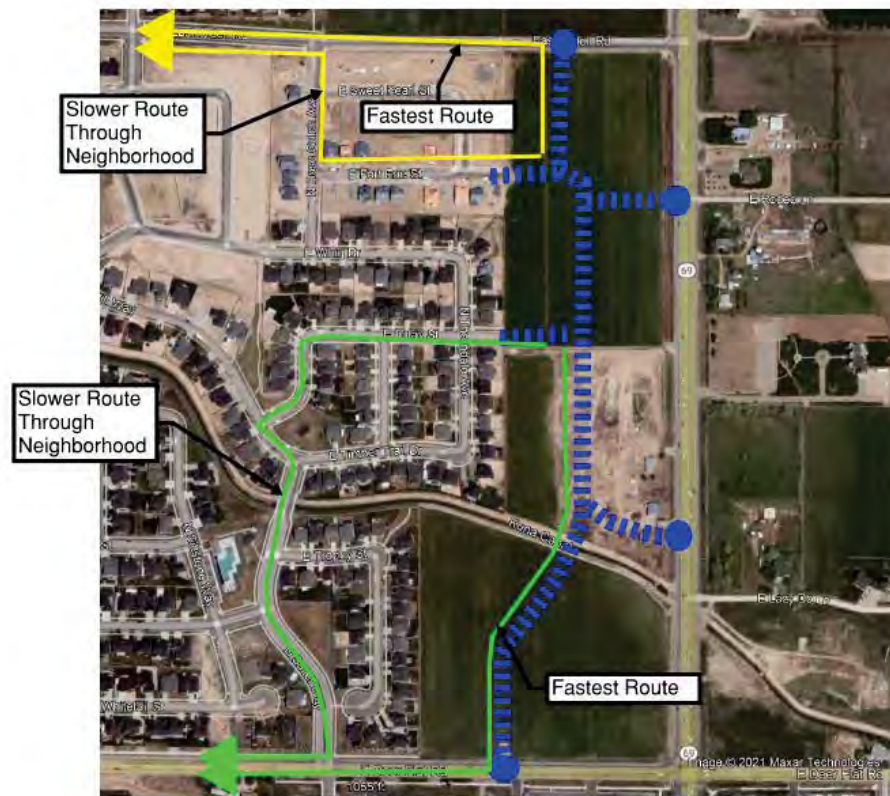


Exhibit 6. Local Neighborhood Cut-Through Route Comparison

As shown in Exhibit 4, using the local street connection to go to the west results in a longer and less efficient route for site traffic that could be considered “cut through” and is not coming from the homes in the neighborhood.

As shown in Table 22, the trips using the stub street connections are estimated to be approximately 45 daily trips for Fort Erie Street and 115 daily trips using Imlay Street. This is well below the 2,000 ACHD policy daily trip threshold for local streets.

Therefore, impacts to the adjacent local streets where the two street stubs are proposed to be extended are projected to be low and not result in significant cut-through traffic for the following reasons:

- The two connections to the west at Fort Erie Street and Imlay Street are at the northern portion of the site and therefore are not convenient for a majority of site traffic that is associated with the commercial uses on the south portion of the site.
- Use of the neighborhood streets would result in significantly longer travel distances to get to both Ardell Road and Deer Flat Road than using the internal site roadways.
- Most of the traffic (approximately 80 percent) is projected to have origins and destinations to the north, south, and east and therefore will not be coming from the west.

Assuming the trips to the stub streets cut-through to utilize Sailer Way to get to Deer Flat Road, the impact on Sailer Way is estimated to be approximately 150 daily trips which is approximately 9 percent of the existing traffic volume counted on Sailer Way north of Deer Flat Road. Ultimately Kay Avenue will extend to Deer Flat Road per the ACHD Master Street Map (Reference 9) which may reduce traffic on Sailer Way.

Access Evaluation

The proposed access driveways were reviewed related to ACHD and ITD access justification and spacing requirements.

ITD access locations are governed by Idaho Administrative Code (IDAPA) section 39.03.42 which identifies the following spacing requirements for the Regional Route classification of Meridian Road:

- Half-mile spacing for traffic signals.
- Minimum spacing of 660 feet for a driveway upstream from a public road intersection (such as Deer Flat Road or Ardell Road).
- Minimum distance between driveways of 360 feet between driveways and 500 feet from signalized driveways.

ACHD policy for access to Deer Flat Road is based on classification. Direct parcel access to a minor arterial is typically prohibited. If access is allowed, driveway spacing shall meet the following spacing requirements for 45 mph:

- Minimum of 330' between driveways.
- Minimum of 330' away from a signalized intersection for a right-in, right-out driveway.

- Minimum of 710 feet way from a signalized intersection with dual left-turn lanes for a full access driveway.

The district has criteria for approving a driveway on an arterial when one or more of the following criteria are met:

- The daily volume using one driveway exceeds 5,000 vehicles (total volume for entering and exiting traffic).
- Traffic using one driveway exceeds the volume to capacity ratio (v/c) equal to or greater than 1 at a STOP controlled intersection during either the peak hour of the street or the peak hour of the site traffic generation.
- A District approved traffic impact study and analysis determines that conditions warrant additional driveways.

ACHD Policy only provides access spacing criteria for access driveways on collector roadways, such as Ardell Road. Based on the posted speed of 25 mph on Ardell Road, the following minimum criteria are provided in ACHD policy:

- Minimum spacing between high-volume driveways is 245 feet
- Outside the influence of the nearest stop-controlled intersection or signal or
 - Adjacent signalized intersection: 220 feet for a right-in/right-out driveway and 440 feet for a full movement driveway:
 - Adjacent unsignalized stop-controlled intersection: 150 feet.

Exhibit 7 shows the proposed accesses locations and spacings.



Exhibit 7. On-Site Access Driveway Spacing

Site Access A / Ardell Road

This proposed driveway is located approximately 450 feet from Meridian Road. Therefore, the spacing meets ACHD access spacing policy distances with the exception of possibly being within the influence area of the Ardell Road / Meridian Road intersection which should not be a problem assuming a RCUT configuration which would not have a separate eastbound left-turn lane that would need to be developed

through striping and channelization. Therefore, it is important to mitigate the operations of that intersection as described in previous sections.

One potential issue with the location of Site Access A is that a review of the draft TIS site plan for the proposed Lee-Hubble development on the north side of Ardell Road indicates and “Access E” located approximately 260 feet west of the proposed site driveway. An overlay is shown in Exhibit 8. Assuming the estimate of that driveway location is accurate and doesn’t change from the site plan in their TIS, this offset should still meet ACHD spacing of 245’ but coordination may be necessary to ensure the driveway offsets meet ACHD policy.



Exhibit 8. Overlay of Lee-Hubble Development Site Plan

Site Access B / Meridian Road

This proposed secondary access is located approximately 550 feet south of Ardell Road and 1,200 feet north of Site Access C. This distance is under the 660 feet required upstream of a public road intersection for Ardell Road but exceeds the minimum spacing between driveways. It should be noted that this access will be limited to RIROLI. A review of the typical design dimensions for a RCUT, the U-Turn is typically located approximately 425 feet from the intersection. Therefore, this access location should be acceptable for the northbound left-turn into the site since that would be located about 600 feet from the intersection. But the location would not provide sufficient distance for southbound left-turn into Rodeo Lane.

Due to Rodeo Lane having very low volumes of less than five trips in the peak hours, requiring RIRO only for Rodeo Lane once an RCUT is constructed by ITD would only require a small number of out-of-direction travel for left-turns into Rodeo Lane.

One potential issue with the spacing of this access being 550 feet from Ardell Road is that the available distance to install a southbound right-turn lane was estimated to be between 490 and 500 feet. That is lower than the distance of approximately 520 feet needed to accommodate the typical ITD turn lane design. Therefore, moving the access south approximately 30 feet may be necessary which would no longer line up with Rodeo lane. Moving the access south approximately 30 feet may be necessary to accommodate the minimum standard ITD right-turn lane design for 55 mph. Moving the driveway to be offset with Rodeo Lane should not be a significant issue due to the low traffic volumes on Rodeo Lane.

It should be noted that positive channelization using either a median curb or tubular markers are recommended for restricting the driveway to RIROLI. There are minor driveways on the east side of Meridian Road that will be in the influence area of the RIROLI channelization for this driveway that may be restricted to RIRO depending on the design of the access.

Site Access C / Meridian Road

This proposed secondary access is located approximately 1,200 feet south of Site Access A and 730 feet north of Deer Flat Road. This distance exceeds the minimum spacing between driveways and the minimum distance from a signalized intersection.

It should be noted that positive channelization using either a median curb or tubular markers are recommended for restricting the driveway to RIROLI. There are minor driveways on the east side of Meridian Road that will be in the influence area of the RIROLI channelization for this driveway that may be restricted to RIRO depending on the design of the access.

Site Access D / Ridley's Access / Deer Flat Road

This driveway is located approximately 620 feet west of Deer Flat Road and approximately 680 feet east of Sailer Way and does not change the access spacing in Deer Flat Road since it will align with the exiting Ridley's driveway. While RIROLI movements operate acceptably for both Site Access D and the Ridleys Access, the eastbound queues from the Deer Flat Road / Meridian Road signal are projected to extend far enough west to not provide sufficient room for a westbound left-turn into the Ridley's driveway.

If the eastbound turn lane storage is extended per the queuing analysis in this study the access would need to be moved approximately 20-30 feet west to accommodate RIROLI movements. This would result in the driveway being located approximately 640 feet west of Deer Flat Road and 660 feet east of Sailer Way.

This driveway should be one of the following configurations:

- Configuration 1: (provides better operations at Deer Flat Road / Meridian Road)
 - Site Access D: RIROLI
 - Ridley's Access: RIRO
- Configuration 2:
 - Site Access D: RIRO
 - Ridley's Access: RIRO

As described in previous sections, allowing a left-in movement at Site Access D is beneficial to the Deer Flat Road / Meridian Road intersection. Therefore, Site Access D with Configuration 1 is recommended for the following reasons:

- Access spacing is not impacted on Deer Flat Road due to aligning with the Ridley's Access and if it is moved west a small distance to accommodate RIROLI access, the movements at the driveways

will not conflict due to median that will separate the driveway and restrict the left-turn and through movements associated with the driveways.

- The site access operates acceptably with RIROLI movements.
- Without this access all site trips from Deer Flat Road would have to turn left on Meridian Road and then turn left again at Site Access C which would significantly worsen the operations of the Deer Flat Road / Meridian Road intersection.

It should be noted that positive channelization using either a median curb or tubular markers are recommended for restricting the driveway to RIROLI or RIRO.

INTERSECTION SIGHT DISTANCE

Site Access A and Site Access C will be new intersections constructed for the proposed development. Site Access B and D will add a fourth leg to an existing three leg intersection. As a result, the sight distance for each site access will be discussed in this section.

Site Access A / Ardell Road

Looking to the east on Ardell Road there is adequate sight distance (beyond the AASHTO policy (Reference 7) distance of 280 feet at 25 mph) of approximately 450 feet to Meridian Road, allowing the driver to see the intersection of Meridian Road and Ardell Road. Looking to the west on Ardell Road there is also adequate sight distance exceeding 500 feet, allowing the driver to see the intersection of Hose Gulch Avenue.

Exhibits 9 and 10 provide the views looking east and west on Ardell Road from the approximate location of Site Access A. To ensure adequate sight distance, it is recommended that roadside landscaping and shrubbery be trimmed prior to changes to the intersection.

Looking east along Ardell Road



Exhibit 9. Sight Distance at Site Access A

Looking west along Ardell Road



Exhibit 10. Sight Distance at Site Access A

Site Access B / Meridian Road

From the west leg, looking to the north on Meridian Road there is adequate sight distance (beyond the AASHTO policy distance of 610 feet at 55 mph) of over 1,000 feet north past Ardell Road and south to Access C.

Exhibits 11 and 12 provide the views looking north and south on Meridian Road from the approximate location of Site Access B. To ensure adequate sight distance, it is recommended that roadside landscaping and shrubbery be trimmed prior to changes to the intersection.

Looking north along Meridian Road



Exhibit 11. Sight Distance at Site Access B

Looking south along Meridian Road



Exhibit 12. Sight Distance at Site Access B

Site Access C / Meridian Road

To the north there is adequate site distance of over 1,000 feet to Site Access B. To the south there is a canal crossing of Meridian Road approximately 100 feet south toward Deer Flat Road that creates a slight change in the profile of Meridian Road but does not impact intersection sight distance. Sight distance is available through the Deer Flat Road intersection approximately 750 feet south.

Exhibits 13 and 14 provide the views looking north and south on Meridian Road from the approximate location of Site Access C. To ensure adequate sight distance, it is recommended that roadside landscaping and shrubbery be trimmed prior to changes to the intersection.

Looking north along Meridian Road



Exhibit 13. Sight Distance at Site Access C

Looking south along Meridian Road

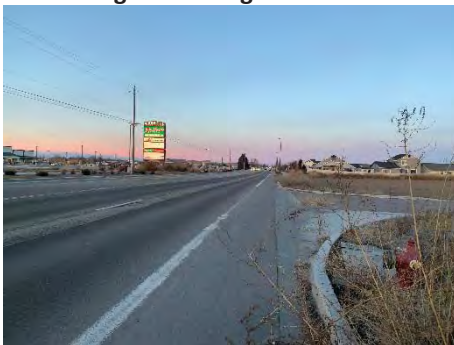


Exhibit 14. Sight Distance at Site Access C

Site Access D / Ridley's Access / Deer Flat Road

From the north leg, looking to the west on Deer Flat Road there is adequate sight distance (beyond the AASHTO recommended 500 feet at 45 mph). The sight distance looking east is in excess of 620' to the Deer Flat Road / Meridian Road intersection and over 1,000 feet to the west. Southbound left turns will likely be restricted at this intersection, requiring less sight distance for right-turn and left-in movements. Exhibit 11 shows photos at the approximate location of Site Access D.

Looking west along Deer Flat Road



Looking east along Deer Flat Road

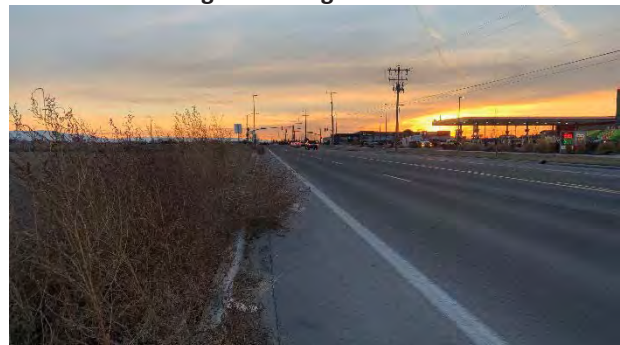


Exhibit 15. Sight Distance at Records Avenue/Site Access D

The following recommendations have been identified to ensure adequate safety and operations at the site access points, internal intersections, and roadways:

- Verify adequate intersection sight distance is available during the final design of the access driveways and internal intersections.
- Review placement of fences, walls, monument signs, street trees, and other features that may impact intersection sight distance.

- Site accesses should match the existing grade of the roadways.
- Shrubbery, weeds, and landscaping near the internal intersections and site access points should be maintained to ensure adequate sight distance.
- If future widening occurs along adjacent roadways, care should be taken to ensure adequate intersection sight distance is maintained.

Section 5
Findings and Recommendations

FINDINGS & RECOMMENDATIONS

The results of the traffic impact analysis indicate that the development can be constructed while maintaining acceptable levels of service and safety on the surrounding transportation system as long as the appropriate mitigations are in place. The findings of this analysis and recommendations are discussed below.

FINDINGS

Existing Conditions

The existing conditions analysis findings are summarized below:

- The study evaluated four existing intersections during the AM and PM peak hours of a typical weekday.
- All study intersections were found to operate at acceptable operating standards during the existing weekday AM and PM peak hours with the exception of:
 - **Deer Flat Road / Meridian Road:** The eastbound left-turn movement was found to be over capacity during both the AM and PM peak hours:
 - Mitigation to acceptable operating standards requires adding a second eastbound left-turn lane creating dual eastbound left-turn lanes.
 - Field observations during the weekday AM peak hour revealed that there is a significant peak in eastbound traffic between approximately 7:20 and 7:40 AM that causes significant eastbound queuing on Deer Flat Road that appears to be partially due to traffic from the nearby high school to the west on Deer Flat Road.
 - This intersection is identified in the ACHD CIP for expansion and reconstruction in the 2031-2035 timeframe.
- The two existing unsignalized intersections that will be across from two of the proposed site driveways have movements that operate at LOS D which ACHD policy requires evaluation of signal warrants. These include:
 - **Site Access B (Future)/ Rodeo Lane / Meridian Road:** The westbound movement operates at LOS D with a V/C ratio of 0.03 during the weekday PM peak hour. The westbound volume was only 1 vehicle in the peak hour and therefore would not meet signal warrants. This intersection is also not planned for a signal by ITD in the draft concepts for the ITD SH-69 corridor plan.
 - **Site Access D (Future) / Ridleys Access / Deer Flat Road:** The northbound movement operates at LOS D with a V/C ratio of 0.68 during the weekday PM peak hour. Based on discussions with ACHD this intersection is planned to be converted

to right-in, right-out (RIRO) and will not be considered for signalization. Therefore, traffic signal warrants were not evaluated. It should be noted that existing queues from Meridian Road current extend to this intersection for brief periods under existing conditions are not accounted for in the LOS procedures. Therefore, actual operations will be worse than reported during those periods.

- Intersection crash rates at the Ardell Road / Meridian Road intersection and Deer Flat Road / Meridian Road intersection did not indicate an abnormally high number of crashes. More detailed review of the crash characteristics identified the following:
 - **Deer Flat Road / Meridian Road:** A review of the crash data revealed a high percentage of the crashes were between eastbound left-turning traffic and westbound through traffic. This could indicate left-turn drivers may not be yielding to through traffic to the extent they should during the permissive left-turn signal phases.
- All ACHD study roadway segments are projected to operate at acceptable levels of service.

2030 Evaluation Findings

The evaluation included 2030 background and 2030 total traffic conditions. The 2030 findings are summarized below:

2030 Background Conditions

- Year 2030 background traffic volumes were forecasted using a 3.0 percent annual compounded growth rate to the existing traffic volumes for all roadways in the study area, except Ardell Road which a 2.0 percent annual compounded growth rate was applied to existing traffic volumes to account for regional growth in the site vicinity. Additionally, forecasted trips from the Lee Hubble Development were added on Ardell Road based on the TIS for that development.
- The 2030 analysis evaluated two roadway network scenarios for Ardell Road:
 - **Scenario 1:** Ardell Road remains as in the existing conditions and does not extend across the canal to the west.
 - **Scenario 2:** Ardell Road is connected over the canal to the west by 2030 and provides access to Linder Road.
- The 2030 background traffic analysis (without inclusion of site-generated traffic) found that all study intersections are expected to operate at acceptable operating standards during the weekday AM and PM peak hours, with the exception of the following intersections:

- **Ardell Road / Meridian Road:** Under Scenario 2 in the PM peak hour, the eastbound approach is over-capacity.
 - ITD has an ongoing corridor study looking at long-term improvements that proposes a Reduced Conflict U-Turn (RCUT) intersection at the Ardell Road / Meridian Road intersection. An RCUT or right-in/right-out/left-in (RIROLI) mitigate this intersection under 2030 background conditions.
 - Improvement of this intersection is projected to be needed in approximately 2025, when approximately 122 additional eastbound PM peak hour trips are added to Ardell Road.
- **Deer Flat Road / Meridian Road:** In the AM peak hour, the overall intersection V/C exceeds 1.00. The eastbound left turn also exceeds 1.00 in the AM and PM peak hour and the northbound and westbound through movements exceed the ITD V/C ratio threshold of ≤ 0.90 during the AM peak hour.
 - Similar to existing conditions, mitigation requires adding a second eastbound left-turn lane. But without signal timing changes the eastbound left-turn and westbound through movements have V/C ratios that exceed the ITD threshold of ≤ 0.90 . To mitigate to the ITD V/C threshold requires the following additional improvement:
 - A third eastbound left-turn lane.
- **Site Access D / Ridley's Access / Deer Flat Road:** The northbound movement exceeds capacity in the PM peak hour.
 - Mitigation requires restricting the intersection to RIROLI.
 - This mitigation is projected to be needed in approximately 2029 with approximately 384 additional PM peak hour trips added to the intersection above existing traffic volume levels.
 - Discussion with ACHD have indicated that in the long term restriction of this intersection to RIRO is planned.
- All ACHD study roadway segments are projected to operate at acceptable levels of service with the exception of the following:
 - **Deer Flat Road (Site Frontage):** During the weekday AM peak hour, the single eastbound lane exceeds the ACHD segment threshold volume.
 - Mitigation requires adding a second eastbound through lane on Deer Flat Road.
 - This widening is projected to be needed in approximately 2024/2025 with approximately 70 additional eastbound trips on Deer Flat Road.
 - The ACHD CIP identifies widening of this section of Deer Flat Road in the 2031-2035 timeframe.

Trip Generation and Distribution

- The development is estimated to generate a total of approximately 18,158 daily trips, 778 weekday AM peak hour net new trips (440 inbound / 338 outbound) and 999 weekday PM peak hour net new trips (500 inbound / 499 outbound).
- The distribution pattern for site-generated trips was developed by reviewing the site plan and roadway system and evaluating a select zone analysis created by the COMPASS regional travel demand model.

2030 Total Traffic Conditions

- Year 2030 total traffic conditions found the same intersections not meeting ACHD and ITD requirements as under existing and 2030 background conditions which include the following:
 - **Ardell Road / Meridian Road:** Similar to 2030 background traffic conditions, the eastbound approach exceeds capacity during the weekday PM peak hour. With the site traffic, the intersection also exceeds capacity during the weekday AM peak hour under both Ardell Road scenarios.
 - Mitigation requires one of the following options:
 - **Option 1:** Signalized RCUT intersection
 - **Option 2:** Signalized RIROLI (similar to an RCUT operationally)
 - **Option 3:** Signalized full access with an eastbound left turn lane.
 - Options 1 and 2 operate at acceptable levels of service and under capacity, but the V/C ratios for the eastbound right-turn and the southbound through movements exceed the ITD policy of ≤ 0.90 during the weekday PM peak hour.
 - Option 3 (full access signalized intersection) is the only option that meets ITD District 3 operational policy for LOS D and movement V/C ratios < 0.90 .
 - The eastbound movement at the intersection is also projected to exceed capacity during the shoulder peak hour.
 - With development of the site mitigation, mitigation is projected to be needed in approximately 2023-2025 at which time approximately 27 percent (55,900 SF) and 21 percent (43,400 SF) of the development is estimated to be completed for Scenarios 1 and 2, respectively.
 - Approximately 122 additional eastbound PM peak hour trips, above existing conditions, can be added to the intersection prior to reaching capacity.
 - Site traffic accounts for approximately 18.8 and 19.8 percent of the total entering traffic during the AM and PM peak hours, respectively for Scenario

- 1 and 17.4 and 18.3 percent during the AM and PM peak hours, respectively for Scenario 2.
- **Deer Flat Road / Meridian Road:** Similar to 2030 background traffic conditions, the eastbound left turn and southbound right turn movements exceed capacity during the weekday AM and PM peak hours.
 - Mitigation requires adding a second eastbound left-turn lane (same as existing and background conditions) to meet ACHD policy of LOS E and V/C ratios for movements of ≤ 1.00 .
 - Further mitigation would be needed to meet ITD policy of LOS D and V/C ratios for movements of ≤ 0.90 . Mitigation to ITD policy would require the following:
 - A third eastbound left-turn lane.
 - A third northbound and southbound through lane.
 - The median U-turn (MUT) intersection configuration identified in the draft SH-69 corridor plan was found to result operations that are under capacity, but some movements are projected to exceed the ITD V/C policy of ≤ 0.90 .
 - The eastbound left-turning movement is also projected to exceed capacity in the shoulder peak hours.
 - Site traffic accounts for approximately 13.5 percent of the total entering traffic during both the weekday AM and PM peak hours.
 - **Site Access D / Ridley's Access / Deer Flat Road:** The northbound and southbound approaches at the intersection are projected exceed capacity during both the weekday AM and PM peak hours. Additionally, projected eastbound queues from the signal at Meridian Road were estimated to impact the ability to have a westbound left-turn lane into the Ridley's Access. The intersection could be mitigated with the following options:
 - **Option 1 - Site Access D RIROLI (Ridley's RIRO):** This option operates acceptably but requires southbound left-turning traffic from the site to turn right and make a U-turn at a location to the west, such as Sailer Way, to go east on Deer Flat Road.
 - **Option 2 - Site Access D RIRO (Ridley's RIRO):** This option operates acceptably but requires the same re-routing as Option 1, but also requires eastbound left-turns at Site Access D to make turns or left-turns at the Deer Flat Road / Meridian Road intersection to access the site. This option results in the most impact to operations at the Deer Flat Road / Meridian Road intersection. This option may require minor widening and signal modifications at the Deer Flat Road / Meridian Road intersection to accommodate eastbound U-turns.

- With development of the site, mitigation is projected to be needed in approximately 2022/2023 at when approximately 7 percent (14,500 SF) of the development is completed.
- Approximately 75 additional trips can be added to the intersection prior to reaching capacity with the north leg added to the intersection.
- Site traffic accounts for approximately 33.9 percent and 26.8 percent of the total entering traffic during the weekday AM and PM peak hours, respectively.
- All ACHD study roadway segments are projected to operate at acceptable levels of service with the exception of:
 - **Deer Flat Road (Site Frontage):** During the weekday AM peak hour, the single eastbound lane exceeds the ACHD segment threshold volume.
 - The segment meets the ACHD segment thresholds in the shoulder peak hour. Two potential alternative mitigations could include:
 - **Deer Flat Road Sidewalk or Pathway:** A sidewalk or pathway connection along the site frontage to connect to the signal at Meridian Road and the stubbed sidewalk on the west end of the site. This is anticipated to be required by the City but would improve connectivity to the signalized pedestrian crossing on Meridian Road.
 - **Kuna Canal Shared-Use Pathway:** A shared use pathway along the Kuna Canal would provide a convenient connection to the adjacent neighborhood and potentially serve longer trips once other sections are completed by residential subdivisions to the east.
 - Mitigation requires adding a second eastbound through lane on Deer Flat Road.
 - The ACHD CIP has widening of this section of Deer Flat Road identified for the 2031-2035 timeframe.
 - This widening is projected to be needed in approximately 2024 with approximately 70 additional eastbound trips on Deer Flat Road.
 - With development of the site mitigation is projected to be needed in approximately 2024/2025 when approximately 28 percent (55,200 SF) of the development is completed.
 - Site traffic accounts for approximately 6.6 percent of the eastbound segment volume during the critical weekday AM peak hour.

Site Access Evaluation

- The turn lane analysis using ACHD and ITD procedures resulted in turn lane warrants at the following external site access streets:

- Site Access B / Meridian Road:
 - Southbound right-turn lane
 - Northbound left-turn lane (existing center-turn lane)
- Site Access C / Meridian Road:
 - Southbound right-turn lane
 - Northbound left-turn lane (existing center-turn lane)
- Site Access D / Ridley's Access / Deer Flat Road:
 - Westbound right-turn lane (RIRO or RIROLI)
 - Eastbound left-turn lane (if RIROLI)
- Impacts to the adjacent local streets where the two street stubs are proposed to be extended into the northern portion of the development are projected to be low and not result in significant cut-through traffic for the following reasons:
 - The two connections to the west at Fort Erie Street and Imlay Street are at the northern portion of the site and therefore are not convenient for a majority of site traffic that is associated with the commercial uses on the south portion of the site.
 - The northern portion of the site has less commercial development than the southern portion of the development.
 - Use of the neighborhood streets would result in significantly longer travel distances to get to both Ardell Road and Deer Flat Road than using the internal site roadways.
 - Most of the traffic (approximately 80 percent) is projected to have origins and destinations to the north, south, and east and only approximately 20 percent of the site trips will have destinations to the west on Deer Flat Road and Ardell Road.
- The intersection sight distance review identified that intersection sight distance can be achieved at the site access intersections.
- Daily traffic volumes at the site access locations are projected to remain under 5,000 with the exception of the following:
 - **Site Access A:** Site access A is projected to have a daily volume of 5,010.
 - **Site Access D – RIRO or RIROLI:** Site access D is projected to have a daily volume of 6,680 as a RIROLI and 6,130 as a RIRO.
 - Due to the volumes on these driveways being relatively close to the ACHD 5,000 daily trip threshold, additional driveways were not determined to be needed.
- A review of the site access locations and spacings identified the following:
 - **Site Access A:** The location will meet ACHD access spacing for Ardell Road.

- **Site Access B:** This driveway will be in place of deeded accesses for the site and will only allow RIROLI movements. This driveway will be approximately opposite Rodeo Lane. The spacing to the north and south exceed the ITD minimum spacing between driveways but is only 550 feet south of Ardell Road which is below the 660 feet required by ITD upstream of the public road intersection.
 - Moving the access south approximately 30 feet may be necessary to accommodate the minimum standard ITD right-turn lane design for 55 mph. Moving the driveway to be offset with Rodeo Lane should not be a significant issue due to the low traffic volumes on Rodeo Lane.

There are minor driveways on the east side of Meridian Road that will be in the influence area of the RIROLI channelization for this driveway that may be restricted to RIRO depending on the design of the access.

- **Site Access C:** This driveway will be in place of deeded accesses for the site and will only allow RIROLI movements. The spacing to the north and south exceed the ITD minimum spacing between driveways and spacing to Ardell Road and Deer Flat Road on the west side of Meridian Road. There are minor driveways on the east side of Meridian Road that will be in the influence area of the RIROLI channelization for this driveway that may be restricted to RIRO depending on the design of the access.
- **Site Access D:** If designed as a RIRO driveway, this access will be aligned with the existing Ridley's driveway and not impact the access spacing of Deer Flat Road. If designed as a RIROLI driveway, this access may need to be shifted west to provide for the taper/gap for the dual left-turn lanes at the Deer Flat Road / Meridian Road. If such offset is required, it will not create conflicts due to the restricted left-turn movements at both driveways. Additionally, the ACHD access spacing minimums will be met to Meridian Road (assuming the right-in, right out classification is applied for the distance from Meridian Road) to the east and Sailer Way to the west.

RECOMMENDATIONS

Based on the analyses and findings summarized in this report, following are the recommendations for the development.

Existing Traffic Condition Mitigations (Without the Proposed Development)

The following mitigations are recommended to accommodate the existing traffic volume and meet ACHD and ITD policies.

- **Deer Flat Road / Meridian Road:** Add a second eastbound left-turn lane to create dual eastbound left-turn lanes. In order to accommodate future traffic growth and the proposed development, a left-turn storage distance of 475 feet is recommended.

Year 2030 Background Traffic Conditions Mitigations (Without the Proposed Development)

The following mitigations are recommended to accommodate the year 2030 background traffic volume and meet ACHD and ITD policies.

2030 Background Traffic – Intersection Improvements

- **Ardell Road / Meridian Road:** Once Ardell Road is connected over the canal to the west (Scenario 2), one of the following mitigations are recommended:
 - **Option 1:** Install an RCUT intersection per the ITD draft corridor plan.
 - **Option 2:** Restrict to RIROLI by closing the eastbound left-turn movement.
 - Signalization could also be considered but is not consistent with the ITD draft corridor plan (see 2030 Total Traffic conditions)
 - Mitigation is estimated to be needed in approximately 2025 once approximately 122 additional eastbound trips are added in the weekday PM peak hour.
- **Deer Flat Road / Meridian Road:** Same improvement identified under existing conditions. It should be noted that two movements will exceed the ITD V/C threshold of 0.90 even with this mitigation and signal timing changes are required for those movements to meet ITD policy.
- **Site Access D / Ridley's Access / Deer Flat Road:** Restrict the existing access to RIRO. RIROLI could be considered if the length of the eastbound left-turn storage at the Deer Flat Road / Meridian Road intersection is not extended as recommended in the existing conditions recommendations and the left-turn lanes can be accommodated back-to-back.
 - This mitigation is projected to be needed in approximately 2029 with approximately 384 additional PM peak hour trips added to the intersection.
 - It should be noted that existing queues from Meridian Road currently extend to this intersection for brief periods under existing conditions which is not accounted for in the LOS procedures. Therefore, actual operations will be worse during those periods.

2030 Background Traffic - Roadway Segment Improvements

- **Deer Flat Road (Site Frontage):** Add an additional eastbound through lane to create two eastbound through lanes.

- This widening is projected to be needed in approximately 2024 with approximately 70 additional eastbound trips on Deer Flat Road.

Year 2030 Total Traffic Conditions Mitigations (With the Proposed Development)

The following mitigations are recommended to accommodate the year 2030 total traffic volumes and meet ACHD and ITD policies:

2030 Total Traffic - Intersection Improvements

- **Ardell Road / Meridian Road:** Three mitigation options were identified.
 - **Option 1:** Signalized RCUT intersection
 - **Option 2:** Signalized RIROLI (similar to an RCUT operationally)
 - **Option 3:** Signalized full access with an eastbound left turn lane.
 - Improvement of this intersection is projected to be needed in approximately 2023-2025 at which time approximately 27 percent (55,900 SF) and 21 percent (43,400 SF) of the development is estimated to be completed for Scenarios 1 and 2, respectively.
 - Site traffic accounts for approximately 18.8 and 19.8 percent of the total entering traffic during the AM and PM peak hours, respectively for Scenario 1 and 17.4 and 18.3 percent during the AM and PM peak hours, respectively for Scenario 2.
- **Deer Flat Road / Meridian Road:** Same improvement identified under existing and background 2030 conditions. Queue storage of approximately 475 ft is recommended for the eastbound dual left-turn lanes.
 - Site traffic accounts for approximately 13.5 percent of the total entering traffic during both the weekday AM and PM peak hours.
- **Site Access D / Ridley's Access / Deer Flat Road:** Two improvement options were identified, of which Option 1 provides the best operations with respect to the Deer Flat Road / Meridian Road intersection:
 - **Option 1 – Site Access D RIROLI (Ridley's RIRO):** Design the access at RIROLI for the north leg of the intersection a RIRO for the Ridley's Access in order to accommodate the eastbound left-turn queuing from the Deer Flat Road / Meridian Road intersection.
 - Install a westbound right-turn lane
 - Install an eastbound left-turn lane
 - Minor movement of Site Access D west may be needed depending on the design of the eastbound dual left-turn lanes.

- **Option 2 – Site Access D RIRO (Ridley’s RIRO):** Design the intersection as a RIRO for both the north and south legs of the intersection. This option results in the most impact to operations at the Deer Flat Road / Meridian Road intersection.
 - Install a westbound right turn lane.
 - Review the northwest corner of the Deer Flat Road / Meridian Road intersection to determine if eastbound U-turns can be accommodated and modify the corner design if necessary.
- Improvement of this intersection is projected to be needed in approximately 2022/2023 when approximately 7 percent (14,500 SF) of the development is completed.
- Site traffic accounts for approximately 33.9 percent and 26.8 percent of the total entering traffic during the weekday AM and PM peak hours, respectively.

2030 Total Traffic - Roadway Improvements

- **Deer Flat Road (Site Frontage):** Same as background 2030 (add an additional eastbound lane to accommodate AM traffic volumes).
 - With development of the site, mitigation is projected to be needed in approximately 2024/2025 at which time approximately 28 percent (55,200 SF) of the development is completed.
 - Site traffic accounts for approximately 6.6 percent of the eastbound segment volume during the critical weekday AM peak hour.
 - The segment meets the ACHD segment thresholds in the shoulder peak hour. Two potential alternative mitigations could include:
 - **Deer Flat Road Sidewalk or Pathway:** A sidewalk or pathway connection along the site frontage to connect to the signal at Meridian Road and the stubbed sidewalk on the west end of the site. This is anticipated to be required by the City but would improve connectivity to the signalized pedestrian crossing on Meridian Road.
 - **Kuna Canal Shared Use Pathway:** A shared use pathway along the Kuna Canal would provide a convenient connection to the adjacent neighborhood and potentially serve longer trips once other sections are completed by residential subdivisions to the west.

Site Driveways

- Install the site access driveways with the following configurations:
 - **Site Access A:** Single lane northbound and southbound.
 - **Site Access B:** Channelized RIROLI that may require relocation approximately 30 feet (or more) south to accommodate the ITD right-turn lane design. The following turn lanes are recommended:
 - Northbound left-turn lane with 100 feet of vehicle storage (existing two-way-left-turn (TWLTL) can be used).
 - Southbound right-turn lane per ITD design requirements.
 - Minor movement of the site driveway south may be needed to accommodate the southbound right-turn lane design.
 - **Site Access C:** Channelized RIROLI. The following turn lanes are recommended:
 - Northbound left-turn lane with 100 feet of vehicle storage (existing two-way-left-turn (TWLTL) can be used).
 - Southbound right turn lane per ITD design requirements.
 - **Site Access D:** Channelized RIROLI or RIRO. The following turn lanes are recommended:
 - RIROLI (provides best operations at Deer Flat Road / Meridian Road):
 - Eastbound left-turn lane with 100 feet of vehicle storage (existing two-way-left-turn (TWLTL) can be used).
 - Westbound right turn lane with 100 feet of vehicle storage per ACHD requirements.
 - Movement of Site Access D slightly west may be required based on the design of the eastbound dual-left-turn lanes taper/gap for the Deer Flat Road / Meridian Road intersection.
 - RIRO:
 - Westbound right turn lane with 100 feet of vehicle storage.

The following recommendations have been identified to ensure adequate safety and sight distance is provided at the site access points, internal intersections, and roadways:

- Verify adequate intersection sight distance is available during the final design of the access driveways and internal intersections.
- Review placement of fences, walls, monument signs, street trees, and other features that may impact intersection sight distance.

- Site accesses should match the existing grade of the roadways.
- Shrubbery, weeds, and landscaping near the internal intersections and site access points should be maintained or modified to ensure adequate sight distance.
- If future widening occurs along adjacent roadways, care should be taken to ensure adequate intersection sight distance is maintained.

Section 6
References

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Appendix A
Proposed Scope of Work Memorandum

MEMORANDUM

Date: November 30, 2021

Project #: 25746

To: Paige Bankhead (ACHD), Regan Hansen, (ITD) & Sarah Arjona (ITD)

From: Mark Heisinger and John Ringert, PE

Project: Blackrock Marketplace and Village

Subject: Transportation Impact Study Scope of Work and Assumptions (Revised)

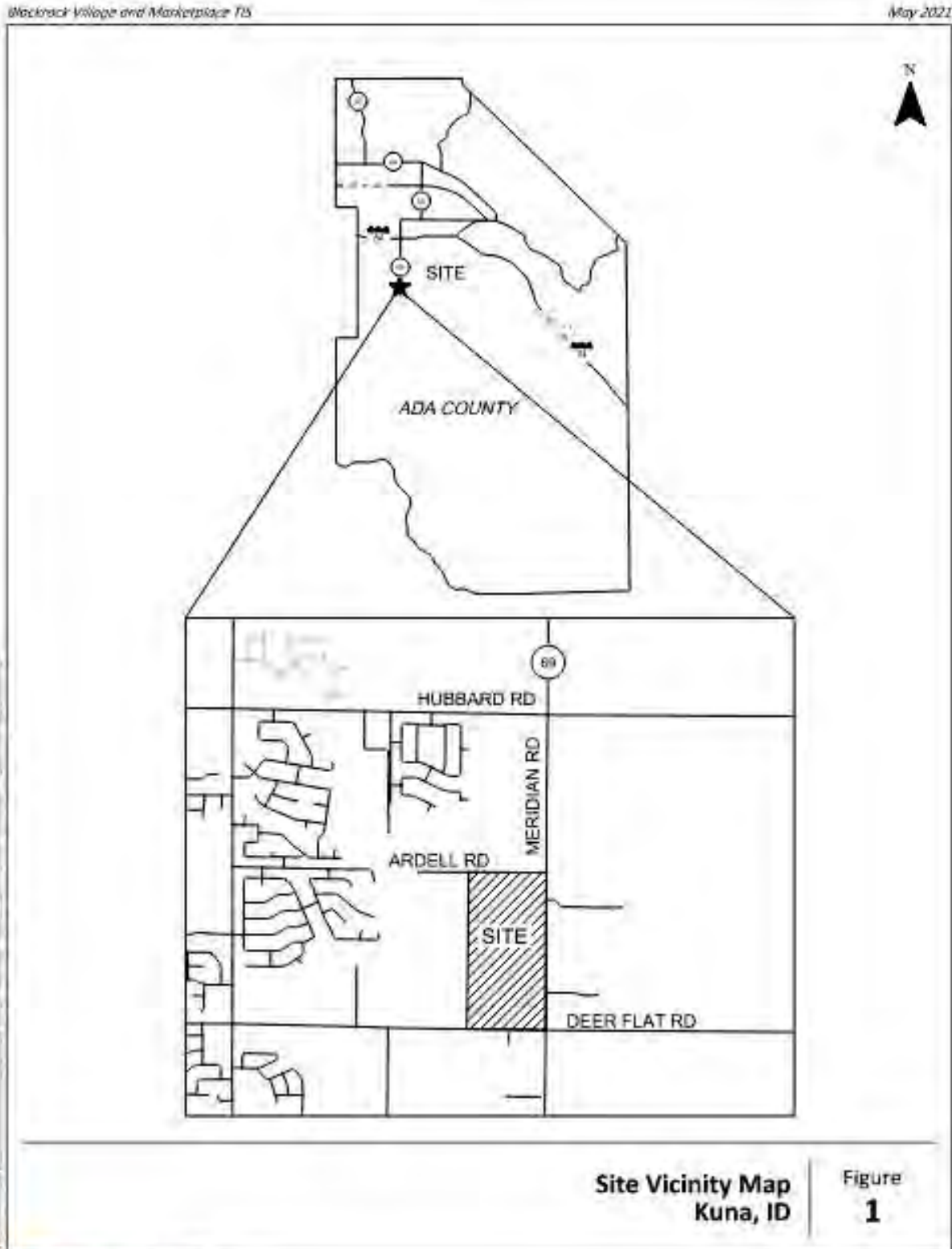
This memorandum documents the scope of work and summarizes the assumptions for the transportation impact study (TIS) for the proposed Blackrock Marketplace and Village, located on the west side of Meridian Road (SH 69) north of Deer Flat Road, in Kuna, Idaho. The proposed development site is bounded on the west by existing development (the Winfield Springs Subdivision), north by Ardell Road, south by Deer Flat Road, and east by Meridian Road. Figure 1 shows the site vicinity.

The information presented in this memorandum was developed based on conversations with the developer, a due diligence investigation, and coordination with the Idaho Transportation Department (ITD) and Ada County Highway District (ACHD).

This memorandum addressed the following items:

- Project Description
- Analysis Scenarios and Study Assumptions
- Analysis Tools
- Background Roadway Projects

Figure 1: Site Vicinity Map



PROJECT DESCRIPTION

The proposed Blackrock Marketplace and Village is situated on approximately 41 acres of land in Kuna, Idaho. The development plan consists of the following land uses:

- Approximately 53 town homes
- Approximately 18,500 square feet of office spacing
- 189,500 square-feet of commercial/retail space, and
- 600 storage units

The proposed site plan for the development is shown in Figure 2. All internal streets are proposed to be local streets. Access to the development is proposed via two accesses on Meridian Road, an access on Ardell Road, an access on Deer Flat Road, and connections to residential stub streets at Fort Erie Street and Imlay Street.

ESTIMATED TRIP GENERATION AND DISTRIBUTION

The projected weekday daily, a.m. and p.m. peak hour vehicle trips for the proposed development were estimated based on the *Trip Generation Manual, 10th Edition* (Reference 1). Figure 3 shows the estimated land-uses by parcel used to develop the trip generation.

Table 1 summarizes the estimated trip generation for full buildout the proposed Blackrock Marketplace

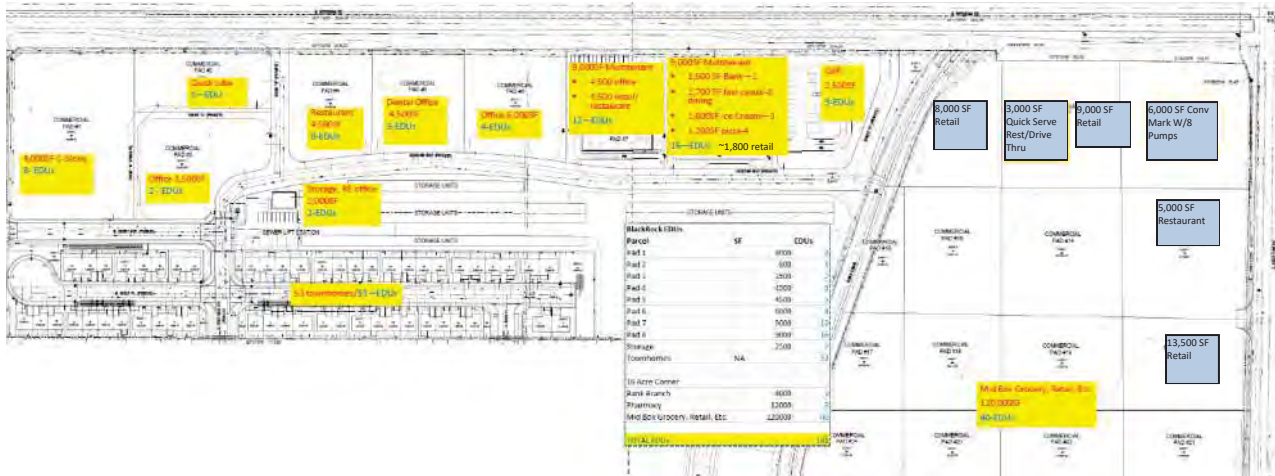


Figure 3. Site Plan Land-Uses

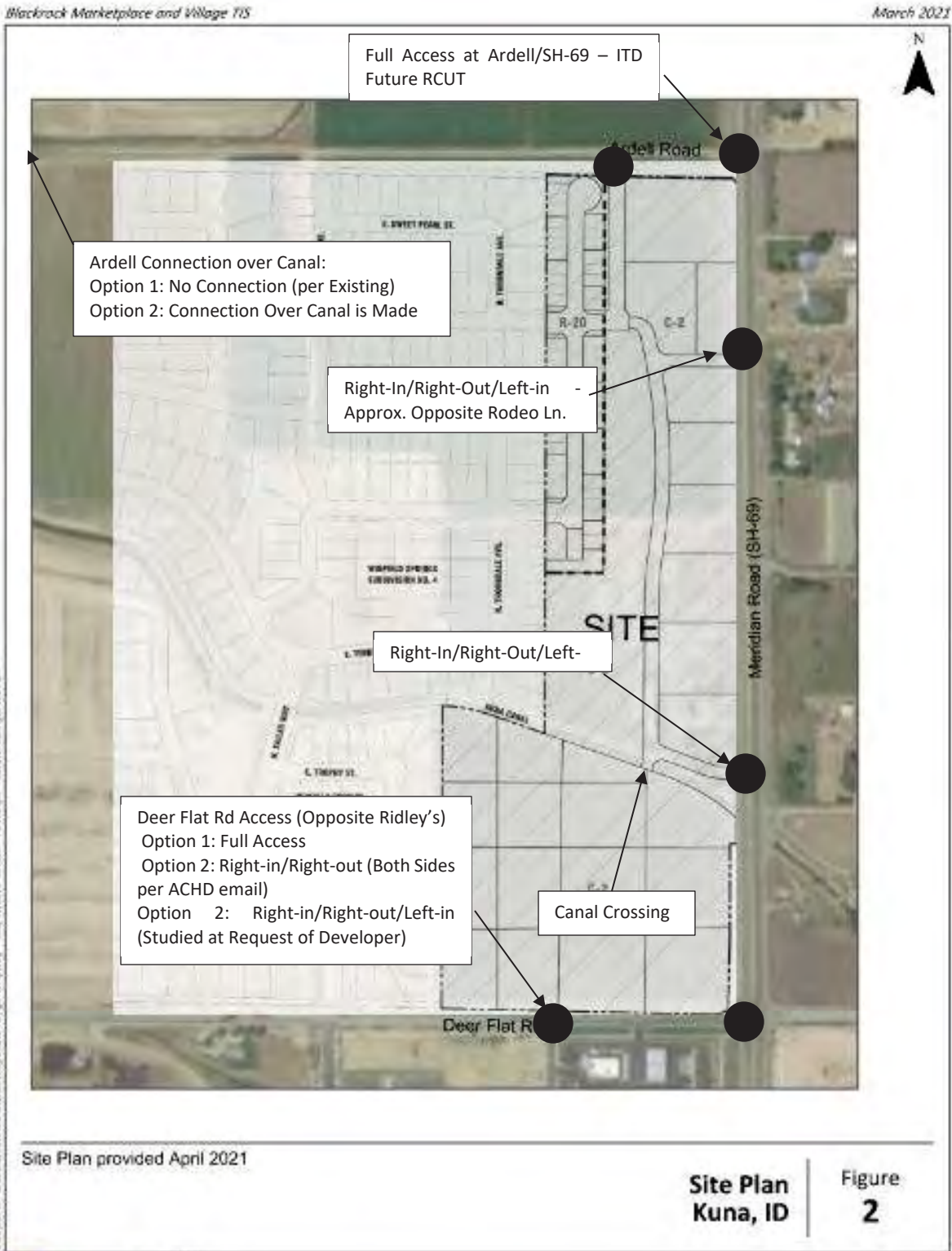


Table 1 Proposed Blackrock Marketplace and Village Development Trip Generation

Land Use	ITE Code	Size	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Residential Uses									
Townhouses/Apmts (Multi-Family Low-Rise)	220	53	360	26	6	20	34	21	12
<i>Residential Internal Trips</i>				(4)	-	(4)	(18)	(13)	(5)
Residential External & Net New Trips				22	6	16	16	8	7
Office Uses									
Office	710	14,000	158	40	34	6	18	3	15
Medical-Dental Office	720	4,500	85	14	11	3	17	5	12
<i>Office Sub-Total</i>				54	45	9	35	8	27
<i>Office Internal Trips</i>				(16)	(8)	(8)	(9)	(5)	(4)
Office External & Net New Trips				38	37	1	26	3	23
Retail Uses									
Shopping Center	820	156,800	8,163	230	143	87	758	364	394
<i>Shopping Center Internal Trips</i>				(18)	(6)	(12)	(75)	(37)	(38)
Shopping Center External Trips				212	137	75	683	327	356
<i>Pass-By Trips (0% AM, 34% PM, 26% SAT)</i>				-	-	-	(232)	(116)	(116)
Super Convenience Market/Gas Station (two)	960	28	6,455	786	393	393	643	322	321
<i>Conv. Market Internal Trips</i>				(70)	(17)	(52)	(64)	(33)	(31)
Conv. Market External Trips				717	376	341	579	289	290
<i>Pass-By Trips (76% AM and PM)</i>				(544)	(272)	(272)	(440)	(220)	(220)
Drive-In Bank	911	1,500	150	14	8	6	31	15	15
<i>Bank Internal Trips</i>				(1)	(0)	(1)	(3)	(2)	(1)
Bank External Trips				13	8	5	28	14	14
<i>Pass-By Trips (29% and 35% PM)</i>				(4)	(2)	(1)	(10)	(5)	(5)
Quick Lube	941	800	56	5	3	2	7	3	4
<i>Quick Lube Internal Trips</i>				(0)	(0)	(0)	(0)	(0)	(0)
Quick Lube External Trips				4	3	1	7	3	4
Retail Sub-Total			14,823	1,035	548	487	1,439	705	734
<i>Retail Sub-Total Internal Trips</i>				(89)	(24)	(65)	(143)	(72)	(71)
Retail External Trips				946	524	422	1,296	633	663
<i>Retail Pass-By Trips</i>				(548)	(274)	(274)	(682)	(341)	(341)
Retail Net New External Trips				398	250	148	614	292	322
Restaurant Uses									
High Turn-Over Sit Down Restaurant (two)	932	10,500	1,178	104	57	47	103	64	39
Fast Casual Restaurant (three)	930	5,700	1,796	12	8	4	81	45	36
Fast Food Restaurant with Drive Through (two)	934	5,500	2,590	221	113	108	180	94	86
Restaurant Sub-Total				337	178	159	364	202	162
<i>Restaurant Internal Trips</i>				(101)	(73)	(28)	(133)	(62)	(71)
Restaurant External Trips				236	105	131	231	140	91
<i>Pass-By Trips Sit Down Rest (43% PM)</i>							(32)	(16)	(16)
<i>Pass-By Trips FF Rest (49% AM, 50% PM/SAT)</i>				(76)	(38)	(38)	(58)	(29)	(29)
Restaurant Net New Trips				312	143	169	141	95	46
Other Uses									
Storage	151	600	108	8	4	4	11	6	5
Development Total									
Total Trips			21,458	1,460	781	679	1,883	942	941
<i>Internal Trips</i>			3,300 Est	(210)	(105)	(105)	(304)	(152)	(152)
Total External Trips (Driveway Trips)			18,158	1,250	676	574	1,579	790	789
<i>Total Pass-By Trips</i>				(472)	(236)	(236)	(772)	(386)	(386)
<i>Estimate Maximum Pass-By Base on SH-69 & Deer Flat Volumes</i>				(480)	(240)	(240)	(580)	(290)	(290)
BUILDOUT NET NEW TRIPS				778	440	338	999	500	499

As shown in Table 1, the development is expected to generate 18,158 daily trips with approximately 778 trips in the AM peak hour (440 inbound, 338 outbound) and 999 trips in the PM peak hour (500 inbound, 499 outbound).

Trip Distribution (Updated for Ardell Connection Over Canal)

The distribution of site generated trips onto the roadway system was based on the site's connections to nearby collector and arterial streets, an area of impact model run by COMPASS, review of the roadway system, and knowledge of travel patterns the area. The proposed distribution is shown in Figure 4. Overall, the trip distribution shows approximately 20% of trips to/from the south via Meridian Road, 15% of trips to/from the west via Deer Flat Road, 5% to/from the east via Deer Flat Road, and 60% of trips to/from the north via SH-16. With Ardell Road extending over the Canal, based on the COMPASS modeling, approximately 5% of the trips are estimated to utilize Ardell Road to the west. Attachment "A" includes the select zone analysis provided by COMPASS.

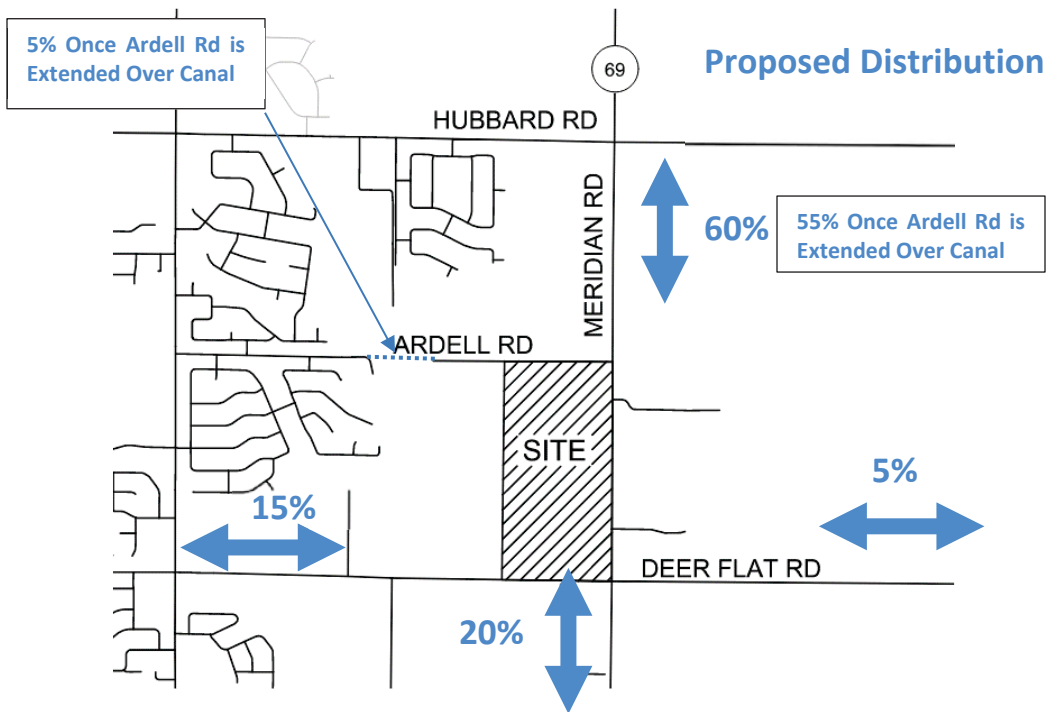


Figure 4. Proposed Trip Distribution

ANALYSIS SCENARIOS & STUDY ASSUMPTIONS

The proposed assumptions for the analysis include:

- **Study Years**
 - Existing Traffic Conditions (Year 2021)
 - Year 2030 background traffic conditions (includes regional growth and in-process developments but no site development traffic)
 - Year 2030 total traffic conditions (includes background traffic volumes plus site-generated trips)
- **Time Periods:**
 - Weekday AM Peak Hour (7:00 – 9:00 a.m.)
 - Weekday PM Peak Hour (4:00 – 6:00 p.m.)
- **Study intersections (Based on Area of Influence Analysis and ACHD/ITD Review)**
 - Meridian Road (SH-69) & Ardell Road
 - Meridian Road (SH-69) & Deer Flat Road
 - All site accesses
- **Access Scenarios (Updated)**
 - Deer Flat Access:
 - Option 1 (Base Scenario): Full Access
 - Option 2: Right-in/Right Rout (both sides per ACHD email)
 - Option 3: Right-in/Right-out/Left-in (Study for Client per 8/20 ACHD Email)
 - Ardell Road Canal Connection:
 - Option 1 (Base Scenario): Does not extend over Canal
 - Option 2: Ardell extends over canal to west
 - Ardell Road/SH-69:
 - Option 1 (Base Scenario): Unsignalized full access
 - Option 2: RCUT per ITD email correspondence (ITD indicated a signal will not be approved and restricting access was determined not to be feasible for commercial accesses)
- **Study Roadway Segments (Based on Area of Influence Analysis and ACHD/ITD Review):**
 - Ardell Road
 - Site frontage (no counts)
- **Data Collection:**
 - Turning movement counts will be collected during a typical midweek (Tuesday through Thursday) AM peak period (7:00 AM to 9:00 AM) and PM peak period (4:00 PM to 6:00 PM) at the study intersections listed above.
 - New 24-hour directional count will be done during a typical midweek (Tuesday through Thursday) at the study roadway segments identified above.
 - For crash data, Kittelson will obtain historical crash data from ITD for the last five years on record.

▪ **Background Growth Rate and In-Process Developments (Updated)**

- The following growth rates are proposed:
 - *Ardell Road*: A 2.0%/yr growth rate in addition to the in-process development per emails with ACHD and ITD.
 - *SH-69 & Deer Flat Road*: A 3.0%/yr growth rate. Based on a review of ATR data, traffic growth has generally been in the range of 3% and 4% per year for the peak hours over the past ten years for the weekday a.m. and p.m. peak hours, respectively. COMPASS model growth rates on SH-69 along the site frontage indicate 5.6%/yr between 2020 and 2025 and 1% between 2025 and 2030. COMPASS model growth rates on Deer Flat along the site frontage indicate 3.3%/yr between 2020 and 2025 and 1.7% between 2025 and 2030.
- In Process Developments:
 - Based on email discussions with ACHD and ITD, most of the in-process developments surrounding the site are either nearly built-out or in the travel demand model and will be captured in the growth rate. See Figures 5 and 6. But one major development, the Lee Hubble Development, is going through the approval process ahead of this proposed development that will impact traffic on Ardell Road. Therefore, the following in-process development will be assumed:
 - Lee Hubble Development (Based on TIS Provided)

▪ **Access Spacing and Needs:**

- Access locations will be evaluated with respect to ACHD & ITD policy and spacing requirements.
 - The need for traffic control and turn lanes will also be evaluated at each site access.



Figure 5. New Aerial Showing Other Surrounding Developments (Looking South Toward Deer Flat Rd)



Figure 6. 2018 Aerial Showing Site with Other Developments Starting

- **Stub Street Connections to Adjacent Neighborhoods**
 - Daily and peak hour traffic at the proposed connections from the multi-family area of the development to the two local stub streets will be evaluated with respect to ACHD policy.

- **Planned Transportation Improvements:**
 - Based on our review of ACHD’s Capital Improvement Plan, the following projects are planned by ACHD in the study area:
 - Deer Flat Road (Linder Road to Meridian Road): Widen to 5 lanes intersection (2036 – 2040) (RD2020-300)
 - Deer Flat Road/Meridian Road Intersection: Replace signal and reconstruct/modify approaches (2031-2035) (IN2020-340).
 - ITD does not have any near term projects on the ITIP except for a pavement sealcoat. There is an ongoing corridor study looking at long-term improvements that proposes a RCUT intersection at SH-69/Ardell Road an MUT intersection at SH-69/Deer Flat Road.
 - Because none of these improvements is planned within the 2030 study horizon year, the improvements will only be considered when evaluating future mitigations.

ANALYSIS TOOLS AND OPERATING STANDARDS

The intersection operational analysis will be performed using the *Highway Capacity Manual 6th Edition* analysis procedures (Reference 2). To ensure that this analysis is based on a reasonable worst-case scenario, the peak 15-minute flow rate during the weekday a.m. and p.m. peak hours will be used in the evaluation of all intersection level of service (LOS) and vehicle-to-capacity (V/C) ratios. The intersection peak hour factor (PHF) will be utilized in all operations analyses to comply with ACHD Policy and HCM methods. The signalized and stop-controlled intersection operations analyses presented in this report will be completed using Synchro 10 software, and if needed for supplemental analysis, HCS 7 software. For a signalized intersection’s overall V/C ratios, the HCM 2000 procedure will be utilized since the HCM 6th Edition procedure doesn’t produce an intersection V/C ratio.

The analysis will be performed in accordance with the methodologies stated in Section 7106.6 of the *ACHD Policy Manual* (Reference 3) and include consideration of separate left-and right-turn lanes as well as queuing impacts. Intersection and segment level of service will be reported per *ACHD Policy Manual* thresholds.

ACHD requires that signalized intersections operate at a minimum of LOS E for Principal Arterials and Minor Arterials and LOS D for Collectors. All unsignalized intersections that have a projected level of service D or worse shall be evaluated to determine if a signal or roundabout is warranted. The acceptable volume-to-capacity ratio for signalized intersections is 0.90 for the overall intersection and 1.0 for each lane group. The acceptable volume-to-capacity ratio is 1.0 for the critical lane group at unsignalized intersections.

Although not policy, ITD's desirable thresholds are LOS D and v/c ratio of 0.90 or better for all intersections and a v/c ratio of 0.90 or better for all intersection land groups.

NEXT STEPS

We request that ITD and ACHD review this scoping memorandum and provide a response on the assumptions so that we can move forward with this study. Please contact John Ringert (jringert@kittelsohn.com) or Mark Heisinger (mheisinger@kittelsohn.com) if you have any questions or comments on the information provided in this memorandum.

REFERENCES

1. Institute of Transportation Engineers. *Trip Generation Manual, 10th Edition*. September 2017.
2. Transportation Research Board. *Highway Capacity Manual 6th Edition*. Washington D.C. 2015.
3. Ada County Highway District. *Policy Manual*. 2020.

COMPASS Area of Influence Modeling Report and Agency Responses

Blackrock Proposed Development

The following summarizes the results of an area of influence model run for a proposed development located northwest of Deer Flat and State Highway 69. The proposed development will consist of 53 townhomes, 178,000 ft² of varied commercial uses, and 600 storage units with an anticipated build out by 2030. See Figure 1.

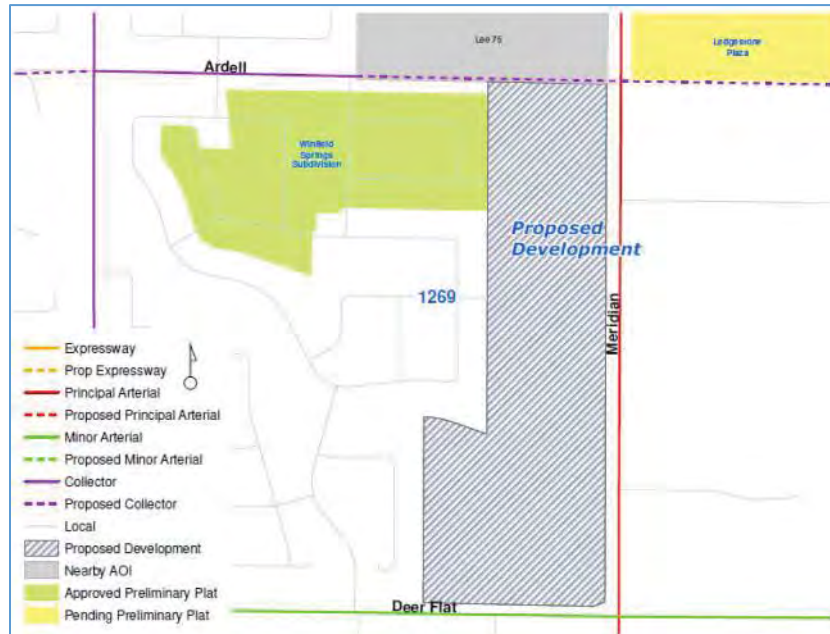


Figure 1

Table 1 provides the existing demographics for TAZ 1269 and the proposed development's demographics used for the area of influence model run. A temporary TAZ was used to isolate the impact of the proposed development. This analysis assumes completion of both collector roads in the area, Ardell Rd and Kay Ave, by 2030. A [cumulative analysis](#) was also conducted to account for proposed developments nearby with recent area of influence model runs and pending entitlements.

Table 1

	2020		2030 (Proposed)		2040	
	HH	Jobs	HH	Jobs	HH	Jobs
TAZ 1269	148	0	359	0*	440	401
<i>Temporary TAZ 1313</i>	<i>n/a</i>	<i>n/a</i>	53	348	<i>n/a</i>	<i>n/a</i>
<i>Surrounding TAZs</i>	432	416	750	636	1,008	781
Total	580	416	1,162	984	1,448	1,182

* official 2030 jobs in TAZ 1269 were reduced to zero for this analysis as this TAZ would be consumed by Blackrock and Winfield Springs proposals.

Figure 2: Area of Influence (Blackrock Only), Peak hour demand contribution to the total peak hour demand

Figure 3: Peak Hour Demand with Proposed Development (Blackrock Only)

Figure 4: Area of Influence (Cumulative), Peak hour demand contribution to the total peak hour demand

Figure 5: Peak Hour Demand with Proposed Development (Cumulative)

Figure 6: Peak Hour Demand without Proposed Development

Figure 7: Surrounding Area TAZs

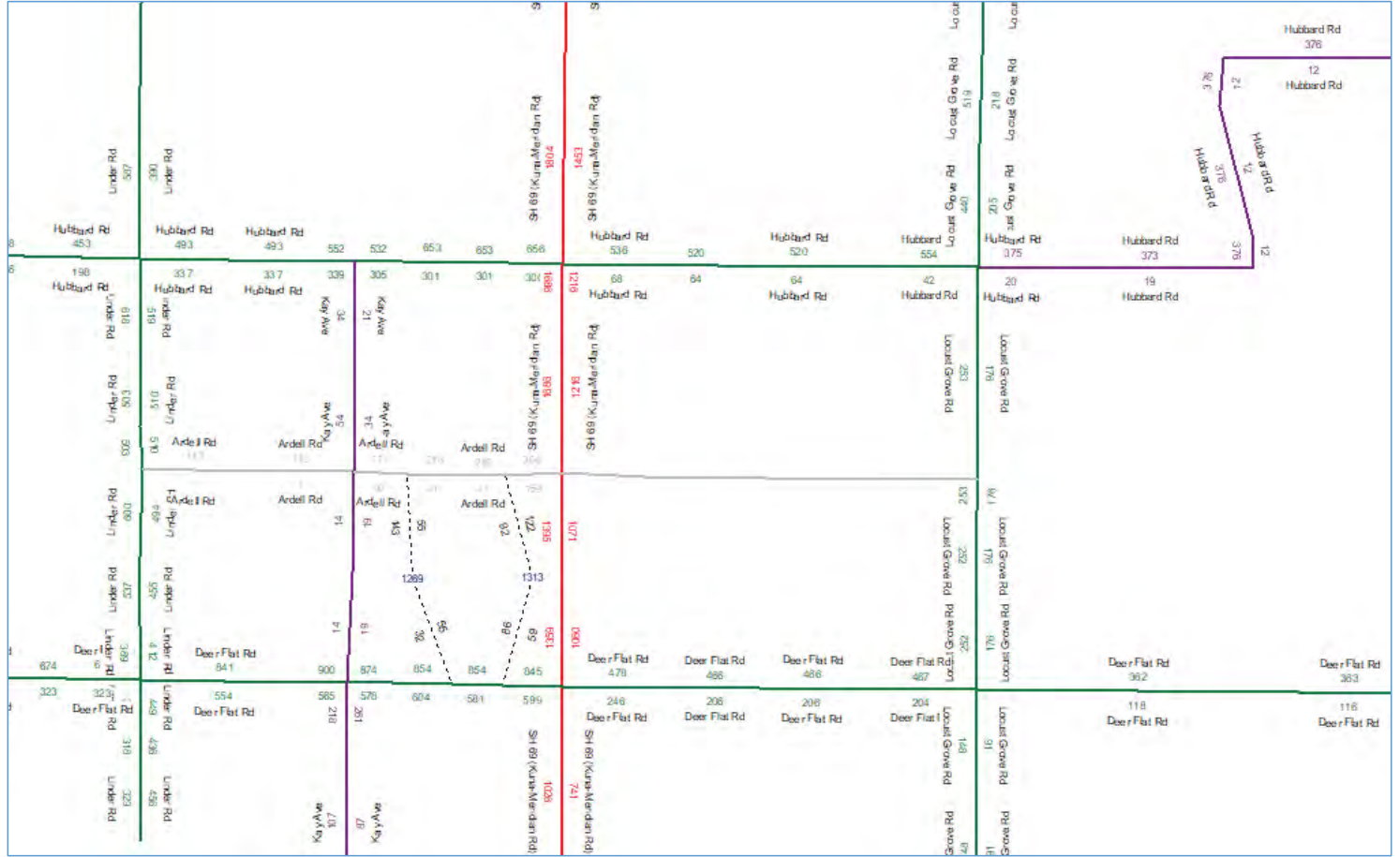
Figure 8: 2020 to 2025 Compounded Annual Growth Rate

Figure 9: 2025 to 2030 Compounded Annual Growth Rate
Figure 10: 2030 to 2040 Compounded Annual Growth Rate

Figure 2: Area of Influence (Blackrock Only), Peak hour demand contribution to the total peak hour demand



Figure 3: Peak Hour Demand with Proposed Development (Blackrock Only)



Cumulative Analysis

The following figures show the results of including the proposed Lee 75 development north of Ardell Rd and the Ledgestone development east of State Highway 69. Official demographic growth sufficiently covers proposed households in the second phase of Lugarno Terra to the east.

TAZs 1181 and 1183; Temp TAZ 1312	2020		2030 Cumulative	
	HH	Jobs	HH	Jobs
	11	0	1,388	535

Figure 4: Area of Influence (Cumulative), Peak hour demand contribution to the total peak hour demand



Figure 5: Peak Hour Demand with Proposed Development (Cumulative)

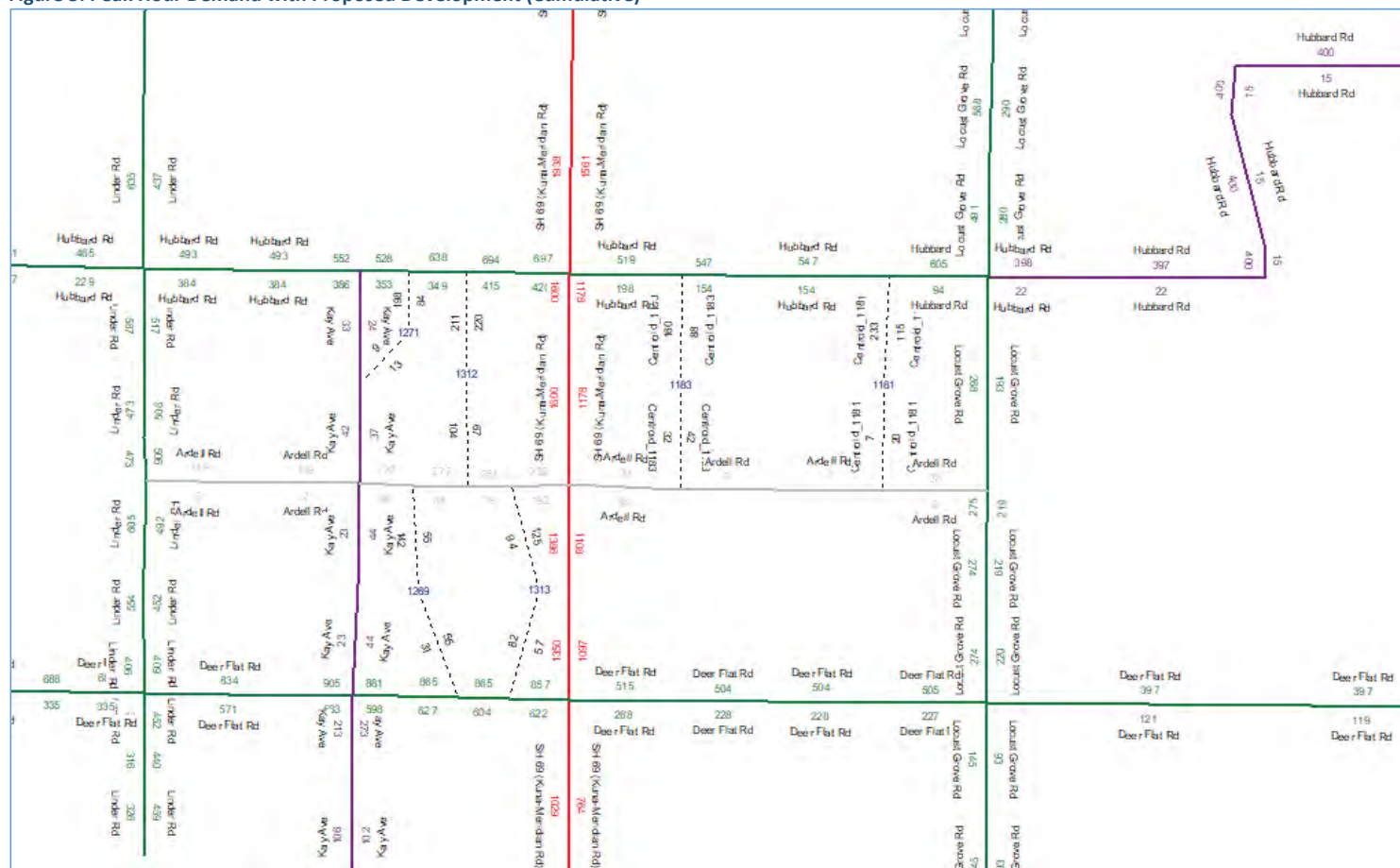


Figure 6: Peak Hour Demand without Proposed Development

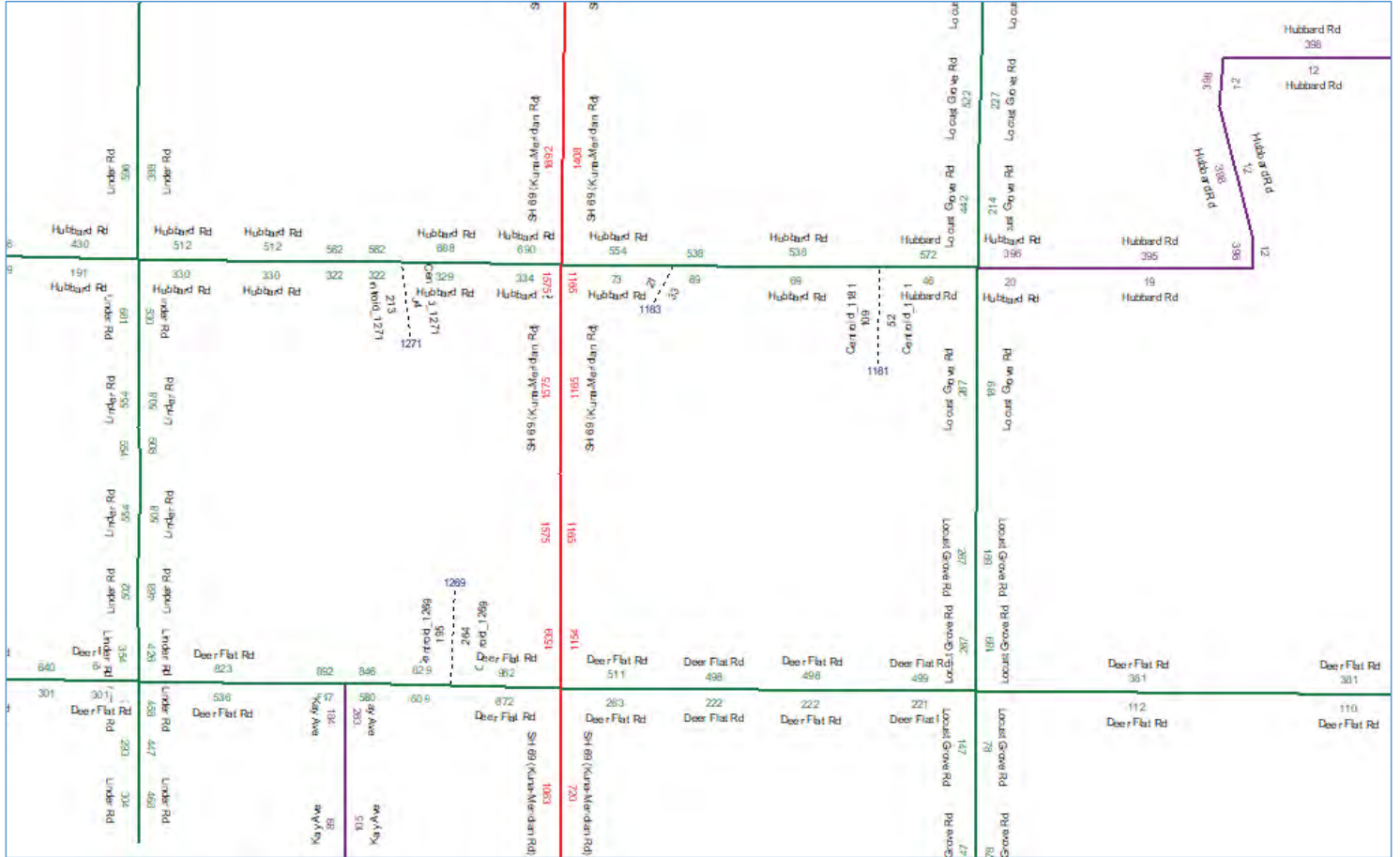


Figure 7: Surrounding Area TAZs

