FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN

SUNDARA RIDGE LOTS 1 THROUGH 91

A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRB&M TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA

2101153

GRADING PERMIT #2500131

AS-BUILT CERTIFICATION: (LANDSCAPE)

I HEREBY CERTIFY THAT THE PLANTING AND IRRIGATION HAS BEEN DESIGNED IN ACCORDANCE WITH THE LANDSCAPING AND PLANTING GUIDELINES FOR PUBLIC SEWERS PER PIMA COUNTY RWRD ENGINEERING DESIGN STANDARDS SUBSECTION 7.7

REGISTERED LAND SURVEYOR DATE

REGISTRATION NUMBER EXPIRES

AS-BUILT CERTIFICATION: (PAVING & GRADING)

I HEREBY CERTIFY THAT THE "RECORD DRAWING" LINE AND GRADE MEASUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED LAND SURVEYOR DATE

REGISTRATION NUMBER EXPIRES

AS-BUILT CERTIFICATION: (SEWER)

I HEREBY CERTIFY THAT THE AS-BUILT ANNOTATIONS PROVIDED ON THIS DRAWING WERE BASED ON AN AS-BUILT SURVEY CONDUCTED UNDER MY SUPERVISION AND ACCURATELY DEPICTS EXISTING FIELD CONDITIONS TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED LAND SURVEYOR DATE

REGISTRATION NUMBER EXPIRES

ENGINEER'S STANDARD DETAILS DISCLAIMER:

COMPLYING WITH THE ARIZONA STATE BOARD OF TECHNICAL REGISTRATION'S SUBSTANTIVE POLICY STATEMENT REGARDING SEALING OF STANDARD DETAILS, THE STANDARD DETAILS USED IN THE DESIGN OF THIS PROJECT HAVE BEEN FORMALLY ADOPTED BY THE AGENCIES THAT PREPARED THEM. IN VIEW OF THEIR LONG HISTORY OF USE, APPLICABILITY, AND/OR SOUNDNESS, THE ENGINEER ACCEPTS THEIR USE FOR THIS PROJECT AND FINDS NO NEED FOR ALTERATION. EXCEPT IN CASES WHERE ITS USE MUST BE MODIFIED BY THE ENGINEER IN ORDER TO WORK WITH PROPOSED DESIGN CONDITIONS. SUCH MODIFICATIONS SHALL BE NOTED ON PLAN AND SEALED BY THE REGISTRANT ACCORDINGLY.

LEGEND

- PROPERTY LINE
- SECTION LINE
- MATCH LINE PAVING
- PROPOSED GRADING LIMITS
- MATCH LINE
- PROPOSED CENTER LINE
- PROPOSED EASEMENT
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED SURVEY MARKER
- W — PROPOSED WATER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- PROPOSED WATER METER BOX
- S — PROPOSED SEWER LINE
- (S) PROPOSED SEWER MANHOLE
- PROPOSED WEDGE CURB
- PROPOSED VERTICAL CURB
- 1200 EXISTING CONTOUR ELEVATION
- 1200 PROPOSED CONTOUR ELEVATION
- EG=*(21.20) EXISTING AND PROPOSED GRADE
- GRADE BREAK
- PROPOSED SEWER CLEANOUT
- PROPOSED TRAIL
- CRITICAL RESOURCE AREA
- PROPOSED STABILIZED TREATMENT
- EXISTING CULVERT
- PROPOSED 100-YEAR FLOODPLAIN LINE
- FEMA FLOODPLAIN
- EROSION HAZARD SETBACK
- (D) DRAINAGE MANHOLE
- STORM DRAIN PIPE
- DRIVEWAY SIDE FOR SLOPED LOT/ROAD
- (Dx.x) CONCENTRATION POINT (Q100)
- (BW) BACK WATER VALVE
- S HIGHPOINT
- SINGLE STORY RETAINING WALL
- SIGHT VISIBILITY TRIANGLE
- FLOW ARROWS
- LOCAL COLLECTOR CHANNEL CROSS-SECTION
- HYDRO SEED

ABBREVIATIONS LIST

B/C	BACK OF CURB
BCHH	BRASS CAP IN HAND HOLE
BCR	BEGIN CURB RETURN
BLDG	BUILDING
C	CONCRETE
CB	CATCH BASIN
CI	CONTOUR INTERVAL
DE	DRAINAGE EASEMENT
ECR	END CURB RETURN
EL	ELEVATION
EHS	EROSION HAZARD SETBACK
EOP	EDGE OF PAVEMENT
ESMT	EASEMENT
EX	EXISTING
F	FIRE
FF	FINISHED FLOOR ELEVATION
FP	FINISHED PAD ELEVATION
FG	FINISHED GRADE
FGB	FINISHED GRADE BOTTOM
FGT	FINISHED GRADE TOP
GR	GRATE
G	GUTTER
NG	NATURAL GRADE
P	PAVEMENT
PC	PIMA COUNTY OR POINT OF CURVATURE
PRC	POINT OF REVERSE CURVATURE
PT	POINT OR POINT OF TANGENCY
PUE	PUBLIC UTILITY EASEMENT
R/W	RIGHT OF WAY
S	SEWER/SINGLE STORY LOT
SDMH	STORM DRAIN MANHOLE
SMH	SEWER MANHOLE
S/W	SIDEWALK
STW	STEMWALL
TC	TOP OF CURB
TBM	TEMPORARY BENCH MARK
TOBP	TOP OF BANK PROTECTION
TOV	TOWN OF ORO VALLEY
VG	VALLEY GUTTER
VNAE	VEHICLE NON ACCESS EASEMENT
W	WATER
WSEL	WATER SURFACE ELEVATION

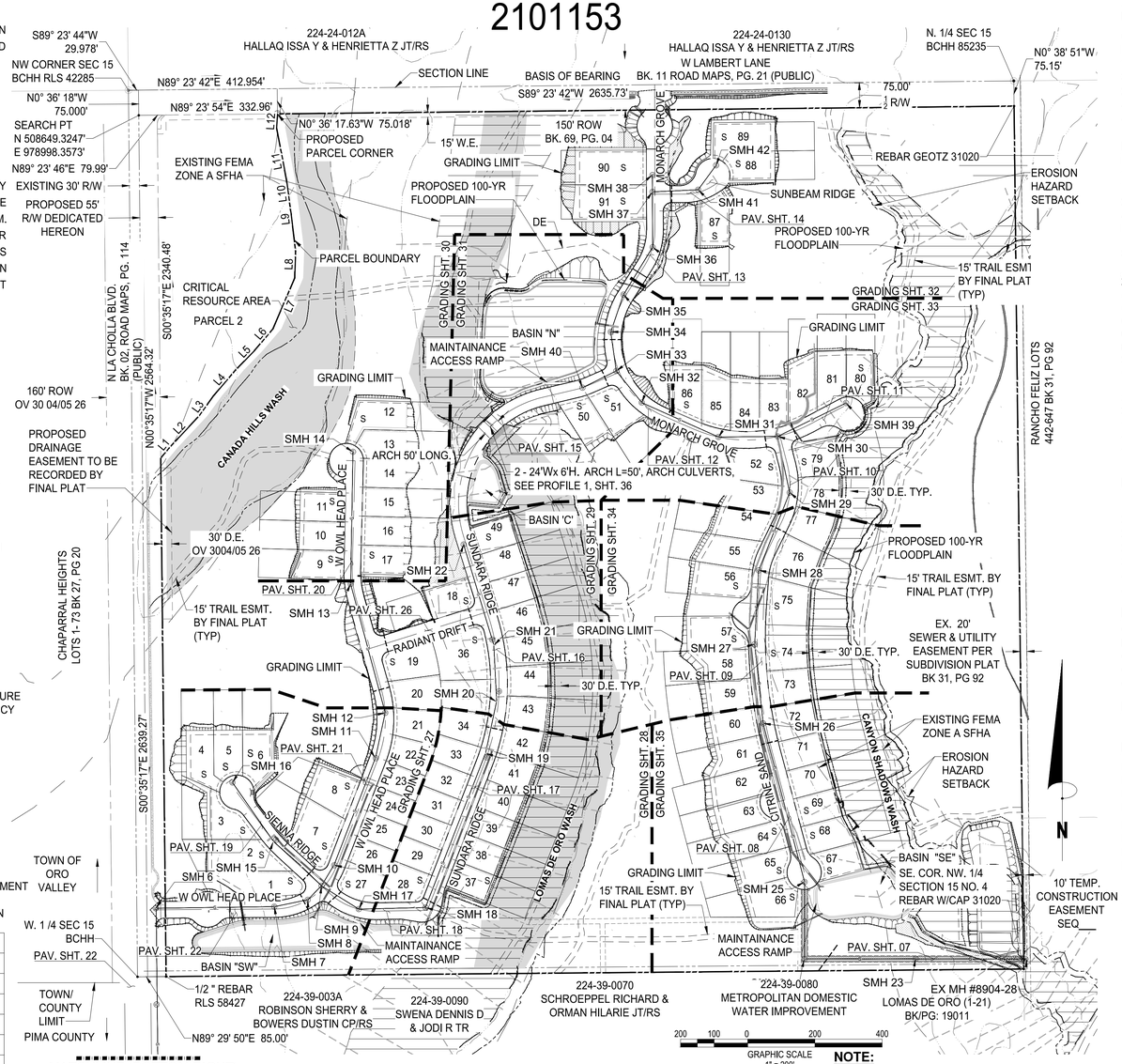
LINE TABLE

LINE	BEARING	DISTANCE
L1	S39°33'36"W	39.19'
L2	S43°09'17"W	128.34'
L3	S35°50'22"W	76.00'
L4	S40°33'22"W	101.11'
L5	S44°13'13"W	78.16'
L6	S40°32'21"W	86.34'
L7	S23°15'15"W	164.58'
L8	S02°01'08"W	80.84'
L9	S06°57'12"E	112.01'
L10	S07°39'12"E	98.87'
L11	S10°42'43"E	161.18'
L12	S03°46'59"W	41.04'

ESTIMATED EARTHWORK QUANTITIES

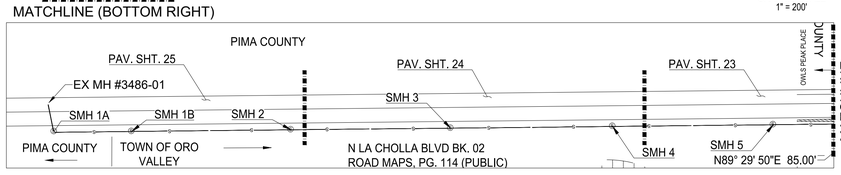
(NOT TO BE USED FOR BIDDING PURPOSE, CONTRACTOR IS RESPONSIBLE FOR HIS OWN CUT & FILL QUANTITIES)

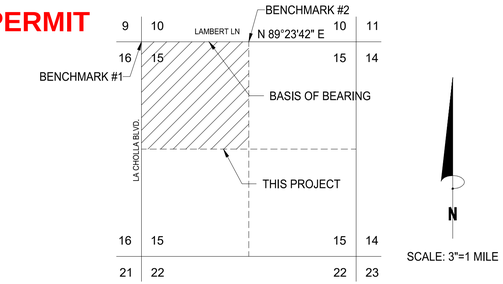
	FILL (C.Y.)	CUT (C.Y.)
RAW QUANTITIES	212,700	168,500
COMPACTION SHRINKAGE (20%)*	42,540	0
TOTAL:	255,240	168,500
NET:	86,740	0



NOTE:
ALL ONSITE STREETS ARE PRIVATE AND COMMON AREA "A" FUNCTIONAL OPEN SPACE, DRAINAGE, PUBLIC UTILITIES, ACCESS & MAINTENANACE & COMMON AREA "B" NATURAL OPEN SPACE

MATCHLINE (BOTTOM RIGHT)





LOCATION MAP

A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRB&M TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA

OWNER

FUTURE ARIZONA INC.
1555 N. ASTOR STREET, APT 28W
CHICAGO, IL 60610
(312) 961-2750
ATTN: ALEXIS FASSEAS
ALXS@ME.COM

DEVELOPER

FUTURE ARIZONA INC.
1555 N. ASTOR STREET, APT 28W
CHICAGO, IL 60610
(312) 961-2750
ATTN: ALEXIS FASSEAS
ALXS@ME.COM

ENGINEER

LJA ENGINEERING
1860 E RIVER RD, SUITE 325
TUCSON, AZ. 85718
(520) 257-3446
ATTN: ROB SCHLICHER, PE
RSCHLICHER@LJA.COM

LANDSCAPE ARCHITECT

WILDER LANDSCAPE ARCHITECTS
2738 E. ADAMS STREET
(520) 320-3936
ATTN: JENNIFER PATTON
JENNIFER@WILDERLA.COM

SHEET INDEX

WATER AND SEWER SERVICE PROVIDERS

WATER: METRO WATER
SEWER: PIMA COUNTY

PAG STANDARD DETAILS

103	SURVEY MONUMENT
200	CONCRETE SIDEWALK
205	SIDEWALK SCUPPER - TYPE 5
205.5	SIDEWALK SCUPPER - TYPE 3
207	CURB ACCESS RAMP
209	CONCRETE CURB TYPE 2 (WEDGE)
209	CONCRETE CURB TYPE 2 (SINGLE VERT)
210	CONCRETE CURB TRANSITION
211	CONCRETE CURB: NEW TO EXISTING
300	STORM MANHOLE BASE (48 DIA. AND SMALLER)
302	STORM DRAIN MANHOLE

PCRWRD STANDARD DETAILS

108	SEWER/WATER CROSSING DETAILS
205	4' DIAMETER MANHOLE
211	CONCRETE COLLAR FOR PAVED AREAS
214	24" WATERTIGHT FRAME AND COVER
301	CONNECTION TO EXISTING MANHOLE
401&404	HCS WITH CLEANOUT
402	HCS CONNECTION TO MANHOLE

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE ARIZONA STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NAD 83. THE BEARING EQUATION FOR THIS PROJECT IS THE NORTH LINE OF NORTHWEST QUARTER (NW 1/4) OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G.&S.R.M., PIMA COUNTY, ARIZONA HAVING A BEARING OF NORTH 89°23'42" EAST BETWEEN THE NORTHWEST CORNER OF SECTION 15 AND THE NORTH QUARTER CORNER OF SECTION 15.

BASIS OF ELEVATION

NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

BENCHMARK

BENCHMARK #1: DESCRIPTION
NORTHWEST CORNER OF SECTION 15
BRASS CAP IN HANDHOLE RLS 42285
ELEVATION = 2607.67 FEET

BENCHMARK #2: DESCRIPTION
NORTH QUARTER CORNER OF SECTION 15
BRASS CAP IN HANDHOLE RLS 85235
ELEVATION = 2600.64 FEET

BACK WATER VALVES - LOTS

3	7	8	9	10	11
15	16	17	19	20	22
24	25	26	28	29	30
31	32	37	38	39	40
41	42	46	54	55	57
59	60	62	63	64	65
67	68	69	70	71	73
76	77	79	83	84	85
86	87	89	90		

FIRE NOTES

1. IFC SECTION D107.1 ONE OR TWO FAMILY DWELLING RESIDENTIAL DEVELOPMENTS: THIS SUBDIVISION DOES NOT REQUIRE FIRE SPRINKLERS
2. BE ADVISED: IF ANY BUILDING IS OVER 4800 SF (UNDER ROOF) A FIRE SPRINKLER SYSTEM WILL BE REQUIRED IF FIRE FLOW (1750 GPM) IS NOT AVAILABLE

ACCEPTED

BY: Bayer Vella — Digitally signed by Bayer Vella DN: C=US, E=bvella@orovalleyaz.gov, O=Town of Oro Valley, OU=Planning Division, CN=Bayer Vella Reason: Emmasue Date: 2025.01.30 14:37:03-07'00'
PLANNING & ZONING ADMINISTRATOR DATE

BY: 2025.01.23 16:32:12-07'00'
TOWN OF ORO VALLEY, TOWN ENGINEER DATE

RELATED CASE #
OV914-009
2100731
OV114-018

Contact Arizona 811 at least two full working days before you begin excavation. ARIZONA811 Call 811 or click Arizona811.com

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

COVER
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil) CERTIFICATE NO. 54544 ROBERT W. SCHLICHER Date Signed 10/18/24 ARIZONA U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: 1"=200' C.I.=2'
V:
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131
P22WI00005
G-2022-007

DateTime: Mon, 16 Dec 2024 - 10:03am PathName: S:\ARIZ\Tucson\AZ4072\400\AND_LJA MOVING FORWARD\BASE FILES\Plyt01 COVER.DWG

GENERAL NOTES:

1. THE GROSS AREA OF THIS DEVELOPMENT IS 145.203 ACRES.
2. THE PROPOSED NUMBER OF RESIDENTIAL UNITS IS 91 (0.63 UNIT PER ACRE)
3. TOTAL LENGTH OF NEW PUBLIC STREET IS 0.0 MILES.
4. TOTAL LENGTH OF NEW PRIVATE STREET IS 1.48 MILES.
5. ASSURANCES FOR SITE IMPROVEMENTS, LANDSCAPING, AND REVEGETATION BONDS MUST BE POSTED PRIOR TO THE ISSUANCE OF GRADING PERMITS.
6. ALL NEW PRIVATE INGRESS/EGRESS WILL BE DEDICATED BY FINAL PLAT.
7. GROSS AREA OF IMPERVIOUS SURFACES IS 15.86 AC.
8. EXISTING ZONING IS R1-43 PER (O) 16-64.
9. THE MAXIMUM LOT SIZE IS 37,257 SF (LOT #7). THE MINIMUM LOT SIZE IS 10,000 SF (LOTS # 23,24,25,26,29,30,31).THE AVERAGE LOT SIZE IS 20,000 S.F.
10. NO CULTURAL RESOURCE AREA PROTECTIVE FENCING OR OTHER APPROVED PROTECTIVE MEASURES ARE NEEDED.
11. ASSURANCES FOR WATER SERVICE, SITE STABILIZATION AND LANDSCAPING MUST BE POSTED PRIOR TO THE ISSUANCE OF GRADING PERMITS.
12. THIS PROJECT IS SUBJECT TO THE REZONING CONDITIONS SET FORTH IN (O) 16-64.
13. THE TOTAL AREA OF LANDSCAPED AND/OR OPEN SPACE COMMON AREA PROVIDED IS 108.9 AC.

PLANNING GENERAL NOTES:

1. MAXIMUM BUILDING HEIGHT ALLOWED AND PROPOSED = 28' / 2-STORY, ONE STORY LOTS ARE: 1-9, 11, 12, 17-19, 27, 28, 36, 37, 49-52, 56, 57, 64-69, 74, 75, 79, 80, 86-91. 2-STORY LOTS ARE: 10, 13-16, 20-26, 29-35, 38-48, 53-55, 58-63, 70-73, 76-78, 81-85.
2. TOTAL AMOUNT OF RECREATION AREA REQUIRED =98.90± AC. INCLUDING TOT-LOTS AND PEDESTRIAN/EQUESTRIAN TRAILS.
3. SETBACKS REQUIRED/PROVIDED PER (O)16-04 REZONING CONDITIONS OF APPROVAL: FRONT = 10' AS LONG AS A 20' ON-LOT DRIVEWAY IS PROVIDED; SIDE = 7.5'; REAR = 20'.
4. COMMON AREAS (COMMON AREA "A": PRIVATE STREETS AND COMMON AREA "B": NATURAL OPEN SPACES) SHALL BE OWNED AND MAINTAINED BY THE H.O.A. TOTAL ACRES OF LANDSCAPED AREAS AND NATURAL OPEN SPACE IS 108.9 AC.
5. ALL SIGNAGE AND LIGHTING TO BE ADDRESSED AS PART OF SEPARATE REVIEW AND APPROVAL PROCESS.
6. A MINIMUM LOT SIZE REDUCTION TO 10,000 S.F. IN ACCORDANCE WITH THE CONSERVATION SUBDIVISION DESIGN LOT REDUCTION INCENTIVE. LOT SIZE RANGE SHOWN =10,000 S.F. TO 37,257 S.F.
7. BUFFERYARD TYPES: 40' NATURAL DESERT BUFFERYARD "B" ALONG LAMBERT LANE AND LA CHOLLA BLVD. 150' BUFFERYARD LONG EASTERN AND SOUTHERN SIDES.
8. THIS PROJECT HAS BEEN DESIGNED IN ACCORDANCE WITH THE ENVIRONMENTALLY SENSITIVE LANDS REGULATIONS OF THE ZONING CODE.
9. THE NATIVE PLANT SALVAGE AND MITIGATION REQUIREMENTS OF SECTION 27.6 ARE WAIVED FOR ALL DEVELOPMENT WITHIN DEVELOPMENT ENVELOPES, AS SHOWN HEREON.
10. E.S.L.O. FLEXIBLE DESIGN OPTIONS GRANTED TO THIS DEVELOPMENT INCLUDE: MINIMUM LOT SIZE, RECREATION AREA AND BUILDING HEIGHT FLEXIBLE DESIGN OPTIONS.
11. ALL DISTURBED AREAS WITHIN THE RESOURCE MANAGEMENT TIER 1 ENVELOPE SHALL BE REVEGETATED BACK TO NATURAL CONDITIONS USING PLANTS ON THE TOWN OF ORO VALLEY APPROVED NATIVE PLANT LIST.
12. EXISTING ZONING IS R1-43 SUBJECT TO CONDITION PER (O)16-04.
13. ALL SIGNAGE AND LIGHTING TO BE ADDRESSED AS PART OF A SEPARATE REVIEW AND APPROVAL PROCESS

ENGINEERING GENERAL NOTES:

1. MATERIALS WITHIN SIGHT VISIBILITY TRIANGLES MUST BE PLACED SO AS NOT TO INTERFERE WITH A VISIBILITY PLANE DESCRIBED BY TWO HORIZONTAL LINES LOCATED THIRTY (30) INCHES AND SEVENTY TWO INCHES ABOVE FINISHED GRADE OF ROADWAY SURFACE.
2. FINAL SITE PLANS AND IMPROVEMENT PLAN MUST BE APPROVED PRIOR TO THE ISSUANCE OF ANY PERMITS BY THE TOWN ENGINEER AND/OR BUILDING OFFICIAL.
3. ALL WEATHER ACCESS MUST BE PROVIDED TO ALL LOTS WITHIN THE SUBDIVISION.
4. THE DESIGN VEHICLE FOR THIS PROJECT IS A SU-30. THE DESIGN SPEED FOR PRIVATE ROADS IS 25 MPH. THE POSTED SPEED FOR LA CHOLLA ROAD/LAMBERT ROAD IS 45 MPH.
5. ALL NEW PUBLIC ROADS WITHIN AND ADJACENT TO THIS PROJECT WILL BE CONSTRUCTED IN ACCORDANCE WITH APPROVED PLANS. SEPARATE PUBLIC IMPROVEMENT AND CONSTRUCTION PLANS WILL BE SUBMITTED TO THE TOWN ENGINEER'S OFFICE FOR REVIEW AND APPROVAL.
6. ANY RELOCATION OR MODIFICATION OF EXISTING UTILITIES AND/OR PUBLIC IMPROVEMENTS NECESSITATED BY THE PROPOSED DEVELOPMENT WILL BE AT NO EXPENSE TO THE PUBLIC.

DRAINAGE GENERAL NOTES:

1. DEVELOPER WILL COVENANT TO HOLD THE TOWN OF ORO VALLEY, ITS SUCCESSORS AND ASSIGNS, HARMLESS IN THE EVENT OF FLOODING.
2. DRAINAGE WILL NOT BE ALTERED, DISTURBED, OR OBSTRUCTED WITHOUT THE APPROVAL OF THE ORO VALLEY TOWN COUNCIL.
3. DRAINAGE STRUCTURES MUST BE CONSTRUCTED AND INSTALLED ACCORDING TO TOWN STANDARDS AND PAID FOR BY THE DEVELOPER.
4. ALL DRAINAGE STRUCTURES MUST BE DESIGNED TO CONVEY A Q100 FLOW.
5. ALL DRAINAGE FACILITIES WILL BE CONSTRUCTED ACCORDING TO APPROVED PLANS PRIOR TO THE ISSUANCE OF ANY CERTIFICATES OF OCCUPANCY FROM THE BUILDING OFFICIAL FOR ALL AFFECTED BUILDINGS.
6. THE DEVELOPER WILL ACCEPT RESPONSIBILITY FOR MAINTENANCE, CONTROL, SAFETY AND LIABILITY OF PRIVATE DRAINAGEWAYS, DRAINAGE EASEMENTS, AND COMMON AREAS UNTIL OWNERSHIP IS TRANSFERRED TO THE HOA.
7. ALL DRAINAGE WAYS WILL BE CONSTRUCTED ACCORDING TO APPROVED PLANS PRIOR TO THE ISSUANCE OF ANY PERMITS FROM THE TOWN ENGINEER AND/OR BUILDING OFFICIAL FOR PARCELS AFFECTED. AFFECTED PARCELS MUST BE SPECIFICALLY IDENTIFIED EITHER BY NUMBER IN NOTE OR OUTLINE ON THE DEVELOPMENT PLAN.
8. DRAINAGE MUST BE COLLECTED AND RELEASED FROM A PROPOSED DEVELOPMENT AT THE LOCATIONS AND THE MANNER EXISTING PRIOR TO DEVELOPMENT.
9. DRAINAGE WAYS MUST BE PROVIDED WHERE NECESSARY TO CARRY DRAINAGE FLOWS THROUGH OR FROM THE DEVELOPMENT AND SUCH DRAINAGE WAYS MUST BE DEDICATED AND MAINTAINED BY THE PROPERTY OWNERS OR PROPERTY OWNERS ASSOCIATION.
10. DRAINAGE WAYS MUST BE DESIGNED TO NOT DISCHARGE ONTO PAVED STREETS, EASEMENTS OR PARKING AREAS.
11. PARKING AREAS MUST NOT BE USED AS DETENTION BASINS.
12. ALL DRAINAGE STRUCTURES SHALL BE INSPECTED AND A SUMMARY REPORT PREPARED A MINIMUM OF ONCE EACH YEAR IN ACCORDANCE WITH THE PROCEDURES IN THE APPROVED DRAINAGE REPORT. COPIES OF THE ANNUAL INSPECTION REPORTS SHALL BE MADE AVAILABLE TO THE TOWN UPON REQUEST.
13. ALL DRAINAGE STRUCTURES SHALL BE INSPECTED AND A SUMMARY REPORT PREPARED BY AN ARIZONA REGISTERED CIVIL ENGINEER A MINIMUM OF ONCE EACH FIVE YEARS IN ACCORDANCE WITH THE PROCEDURES IN THE APPROVED DRAINAGE REPORT. COPIES OF THE 5-YEAR ANNUAL INSPECTION REPORTS SHALL BE MADE AVAILABLE TO THE TOWN UPON REQUEST. THE REPORT SHALL IDENTIFY THE MAINTENANCE NEEDS FOR THE NEXT 5-YEAR PERIOD, INCLUDING ANTICIPATED ANNUAL COSTS OF MAINTENANCE AND REPAIR
14. ALL LOTS WITHIN THIS SUBDIVISION EXCEPT LOTS 1-10, 19-34, 50-51, 52-66, 80-86 AND 87-91 ARE WITHIN A FEMA (S) ZONE A SPECIAL FLOOD HAZARD AREA (SFHA) AS SHOWN ON FEMA FLOOD INSURANCE RATE MAP (FIRM) PANEL NUMBER 04019C1070L WITH EFFECTIVE DATE JUNE 16, 2011. A CONDITIONAL LETTER OF MAP REVISION (CLOMR) WILL BE SUBMITTED TO THE TOWN OF ORO VALLEY AND FEMA FOR APPROVAL WITH THE INTENT OF REMOVING THESE LOTS FROM THE FEMA FLOODPLAIN. THE CLOMR DOES NOT GUARANTEE THESE LOTS WILL BE REMOVED FROM THE FEMA SPECIAL FLOOD HAZARD AREA (SFHA), THEREFORE FLOODPLAIN USE PERMITS, AND CORRESPONDING ELEVATIONS CERTIFICATES FOR ALL STRUCTURES LOCATED WITHIN THE EFFECTIVE SFHA SHALL BE REQUIRED UNTIL THE EFFECTIVE FLOODPLAIN HAS BEEN REVISED AND APPROVED BY FEMA. FEDERAL LAW REQUIRES THAT A FLOOD INSURANCE POLICY BE OBTAINED AS A CONDITION OF A FEDERALLY-BACKED MORTGAGE OR LOAN THAT IS SECURED BY A BUILDING LOCATED WITHIN AN EFFECTIVE SFHA.
15. REVISING THE EFFECTIVE FIRM REQUIRES COMPLETION OF THE INFRASTRUCTURE SHOWN IN THE CLOMR ,PREPARATION OF AS-BUILT PLANS FOR THE INFRASTRUCTURE, TOWN OF ORO VALLEY AND FEMA REVIEW AND APPROVAL OF THE AS-BUILT PLANS, FEMA ISSUANCE OF A LETTER OF MAP REVISION (LOMR) AND COMPLETION OF A PUBLIC COMMENT PERIOD. UNLESS AND UNTIL THE EFFECTIVE FIRM HAS BEEN REVISED. THERE IS SOME RISK TO AN OWNER OF ANY LOTS WITHIN THE EFFECTIVE FEMA FLOODPLAIN THAT THE FLOODPLAIN WILL NOT BE REVISED
16. A TYPE 2 PERMIT FOR MASS GRADING SHALL ONLY BE ISSUED AFTER THE SITE DRAINAGE REPORT, BANK-PROTECTION IMPROVEMENT PLANS, AND CLOMR REPORT HAVE BEEN ACCEPTED BY THE TOWN, AND THE CLOMR REPORT HAS BEEN SUBMITTED TO FEMA.
17. A BUILDING PERMIT FOR VERTICAL CONSTRUCTION SHALL NOT BE ISSUED BY THE TOWN UNTIL AFTER THE AS-BUILT GRADING PLAN, AND/OR THE BUILDING PAD ELEVATION CERTIFICATE, HAS BEEN ACCEPTED BY THE TOWN; AND UNTIL AFTER THE APPLICANT ACKNOWLEDGES AND ACCEPTS THE RISK THAT THE DEVELOPMENT WILL REMAIN IN THE EFFECTIVE SPECIAL FLOOD HAZARD AREA, REQUIRING FLOOD INSURANCE FOR AN INDEFINITE PERIOD OF TIME UNTIL A LOMR IS GRANTED, IF EVER.
18. THE HOA IS RESPONSIBLE FOR ALL COMMON AREAS AND MAINTENANCE OF ALL DRAINAGE STRUCTURES WITHIN COMMON AREAS.
19. LOTS ARE TO BE GRADED TO DRAIN SO AS NOT TO ADEVERSLEY AFFECT ADJACENT PROPERTIES. ALL LOTS WITH CROSS DRAINAGE FACILITIES (37 TO 49, 67-79) . SHALL BE IN AN EASEMENT GRANTING ACCESS FOR INPECTION AND MAINTENANCE. THERE SHALL BE NO PERIMTER WALLS LOCATED WITHIN SAID EASEMENT. THESE IMPROVEMENTS SHALL BE INSPECTED ON AN ANUAL BASIS PER DRAINAGE IMPROVEMENTS MAINTENANCE NOTES ON THIS SHEET DRAINAGE MAINTENANCE NOTES..

GENERAL UTILITY NOTES:

1. SHOULD AN EASEMENT BE IN CONFLICT WITH ANY PROPOSED BUILDING LOCATION, VACATION OF THE EASEMENT IS TO OCCUR PRIOR TO ISSUANCE OF BUILDING PERMITS.

PARKS AND RECREATION GENERAL NOTES:

1. ALL TRAIL EASEMENTS INDICATED ARE FOR USE BY THE GENERAL PUBLIC AS PERMANENT, NON-MOTORIZED TRAIL EASEMENTS.
2. PUBLIC TRAIL EASEMENTS MUST BE DEDICATED TO THE TOWN AS PART OF THE FINAL PLAT.
3. ALL PUBLIC TRAIL AND SIGNAGE MUST BE CONSTRUCTED BY THE DEVELOPER TO PIMA REGIONAL TRAIL SYSTEM MASTER PLAN STANDARDS IN CONSULTATION WITH THE TOWN PARKS AND RECREATION DEPARTMENT. THE APPLICABLE LOCATIONS AND DESIGN CROSS-SECTIONS ARE INCLUDED WITHIN THESE PLANS.
4. TRAIL AND SIGN LOCATIONS, AS INDICATED ON THIS PLAN, MUST BE FIELD VERIFIED BY TOWN STAFF PRIOR TO CONSTRUCTION AND ARE SUBJECT TO ADJUSTMENT.
5. TRAILS MUST BE POSITIONED IN A MANNER TO AVOID VEGETATION AND MINIMIZE POTENTIAL FOR EROSION.

GOLDER RANCH FIRE GENERAL NOTES:

1. FIRE HYDRANTS CONNECTED TO AN APPROVED WATER SUPPLY OF 1000 GPM FOR FIRE PROTECTION MUST BE INSTALLED AND IN SERVICE PRIOR TO COMBUSTIBLE MATERIAL DELIVERY TO THE SITE. TEMPORARY CONSTRUCTION OFFICE TRAILERS ARE CONSIDERED COMBUSTIBLE MATERIAL.
2. APPROVED FIRE APPARATUS ACCESS ROADS MUST BE INSTALLED AND IN SERVICE PRIOR TO COMBUSTIBLE MATERIAL DELIVERY TO THE SITE.
3. SECTION 903.2.8 GROUP R: AN AUTOMATIC SPRINKLER SYSTEM INSTALLED IN ACCORDANCE WITH SECTION 903.3 SHALL BE PROVIDED THROUGHOUT ALL BUILDINGS WITH A GROUP R FIRE AREA INCLUDING ONE- AND TWO-FAMILY DWELLINGS AND TOWNHOUSES USED AS MODEL HOMES WITH SALES OR CONSTRUCTION OFFICES AND ONE- AND TWO-FAMILY DWELLINGS AND TOWNHOUSES.

EXCEPTION: GROUP R-3 OCCUPANCIES ARE NOT REQUIRED TO INSTALL AUTOMATIC SPRINKLER SYSTEMS WHEN ALL OF THE FOLLOWING EXIST:

1.GROUP R-3 OCCUPANCIES PROVIDING THE REQUIRED FIRE FLOW IN ACCORDANCE WITH SECTION B105 AND TABLES B105.1 (1) AND B105.1 (2).

2.GROUP R-3 OCCUPANCIES WITHIN 600 FEET (182.880M) OF FIRE HYDRANTS CAPABLE OF SUPPLYING THE REQUIRED FIRE FLOW.

3.GROUP R-3 OCCUPANCIES IN COMPLIANCE WITH SECTION D106 AND D107.

4. TEMPORARY STREET SIGNS MUST BE INSTALLED AT EACH STREET INTERSECTION WHEN CONSTRUCTION OF NEW ROADWAYS ALLOWS PASSAGE OF VEHICLES. ALL STRUCTURES UNDER CONSTRUCTION MUST BE CLEARLY IDENTIFIED WITH AN APPROVED ADDRESS.
5. THE INSTALLATION OF TRAFFIC CONTROL SIGNALING DEVICES AND/OR ELECTRICALLY OPERATED GATES ON FIRE APPARATUS ACCESS ROADS SHALL INCLUDE PREEMPTIVE CONTROL EQUIPMENT COMPATIBLE WITH THE FIRE DEPARTMENT'S EXISTING SYSTEM.

ORO VALLEY WASTEWATER GENERAL NOTES:

1. PROJECT IS IN CONFORMANCE WITH SECTION J, WASTEWATER, OF THE PIMA COUNTY DEVELOPMENT PLAN REQUIREMENTS AS REFERENCED IN 18.71.030.A.
2. ANY RELOCATION, MODIFICATION, ETC., OF THE EXISTING UTILITIES AND/OR PUBLIC IMPROVEMENTS REQUIRED BY THIS DEVELOPMENT WILL BE AT NO EXPENSE TO THE PUBLIC.
3. ANY WASTEWATER DISCHARGED INTO THE PUBLIC SANITARY SEWERAGE SYSTEM SHALL MEET THE REQUIREMENTS OF THE INDUSTRIAL WASTE ORDINANCE (PIMA COUNTY ORDINANCE NO.1991-140, AS AMENDED).
4. THE ON-SITE SANITARY SEWAGE COLLECTION LINES WILL BE PUBLIC AND DESIGNED AND CONSTRUCTED TO PIMA COUNTY REGIONAL WASTEWATER RECLAMATION DEPARTMENT STANDARDS. ALL BUILDING CONNECTION SEWERS WILL BE PRIVATELY MAINTAINED.
5. A PROJECT CONSTRUCTION PERMIT MUST BE SECURED FROM PIMA COUNTY REGIONAL WASTEWATER RECLAMATION DEPARTMENT BEFORE BEGINNING ANY WORK ON THIS PROJECT.
6. CONSTRUCTION AUTHORIZATION FROM THE PIMA COUNTY DEPARTMENT OF ENVIRONMENTAL QUALITY IS REQUIRED BEFORE BEGINNING ANY WORK ON THIS PROJECT. APPROVAL OF THIS DEVELOPMENT PLAN DOES NOT CONSTITUTE CONSTRUCTION AUTHORIZATION.

PERMITTING DIVISION-BUILDING NOTES:

THE FOLLOWING CODES AND STANDARDS SHALL BE APPLICABLE TO THIS DEVELOPMENT:

1. INTERNATIONAL FIRE CODE AS AMENDED
2. INTERNATIONAL BUILDING CODES WITH LOCAL AMENDMENTS
3. NATIONAL ELECTRIC CODE
4. ADA STANDARDS FOR ACCESSIBLE DESIGN
5. GOLDER RANCH FIRE DISTRICT STANDARDS AND FORMS
6. INTERNATIONAL SWIMMING POOL AND SPA CODE
7. PAG STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC IMPROVEMENTS
8. TOWN OF ORO VALLEY DRAINAGE CRITERIA MANUAL
9. TOWN OF ORO VALLEY SUBDIVISION STREET STANDARDS AND POLICIES MANUAL
10. TOWN OF ORO VALLEY ZONING CODE, CURRENT REVISED
11. ORO VALLEY TOWN CODE, CURRENT REVISED.

REZONING CONDITIONS OF APPROVAL (O)16-04

1. THE ROADWAY CROSSING OVER THE LOMAS DE ORO WASH SHALL BE DESIGNED TO BE A WILDLIFE PERMEABLE BRIDGE THAT DOES NOT IMPEDE WILDLIFE MOVEMENT WITHIN THE WASH.
2. THE FOLLOWING GENERAL NOTES LISTED ON THE TENTATIVE DEVELOPMENT PLAN ARE CONDITIONS OF APPROVAL:
   a. MAXIMUM NUMBER OF LOTS: 91
   b. MINIMUM LOT SIZE: 10,000 SQ. FT.
   c. MAXIMUM NUMBER OF 10,000 SQ. FT. MINIMUM LOT SIZE LOTS: 18
   d. MINIMUM NUMBER OF ½-ACRE MINIMUM LOT SIZE LOTS: 73
   e. INTERNAL BUILDING SETBACKS
      i. FRONT: 10 FEET (MINIMUM 20 FEET FOR VEHICLE PARKING)
      ii. SIDE: 7.5 FEET
      iii. REAR: 20 FEET
   f. MAXIMUM BUILDING HEIGHT
      i. 1-STORY: 20 FEET
      ii. 2-STORY: 28 FEET
   g. MINIMUM PERCENT OF OPEN SPACE/COMMON AREA: 75%
   h. MINIMUM PERCENT OF ENVIRONMENTALLY SENSITIVE OPEN SPACE: 71%
   i. CORNER LOTS RESTRICTED TO SINGLE-STORY
   j. NO MORE THAN TWO 2-STORY HOMES SHALL BE LOCATED SIDE-BY-SIDE ON THE SAME STREET
   k. ORO VALLEY TRAIL #161 WILL BE PROTECTED AS A NON-MOTORIZED PUBLIC ACCESS TRAIL EASEMENT
   l. NO ROADWAY CONNECTIONS WILL BE ALLOWED BETWEEN THIS DEVELOPMENT AND THE RANCHO FELIZ NEIGHBORHOOD TO THE EAST
3. ALL PROPOSED DRAINAGE BASINS TO BE LANDSCAPED TO REDUCE THE VISIBILITY OF THE DISTURBED AREAS.
4. THE OFF-LINE DRAINAGE BASIN ADJACENT TO THE CRITICAL RESOURCE AREA, MUST BE THOROUGHLY LANDSCAPED AROUND THE PERIMETER AND INTERNALLY, TO REDUCE THE VISIBILITY OF THE DISTURBED AREA.
5. LOTS RESTRICTED TO SINGLE-STORY ARE DEPICTED ON THE TENTATIVE DEVELOPMENT PLAN DATED 5.10.2016
6. IN ACCORDANCE WITH SECTION 11.3.11 OF THE TOWN OF ORO VALLEY DRAINAGE CRITERIA MANUAL, THE APPLICANT SHALL REDUCE THE POST-DEVELOPMENT OUTFLOW OF DRAINAGE FROM THE LOMAS DE ORO AND CANYON SHADOWS WASHES, OR PROVIDE OTHER MEANS AS APPROVED BY THE TOWN ENGINEER, TO IMPROVE THE EXISTING DRAINAGE WITHIN THE DOWNSTREAM AREA. THE REDUCTION SHALL BE TO AN AMOUNT THAT HAS THE EFFECT OF MAKING EXISTING RESIDENTIAL STRUCTURES LOCATED ON IMMEDIATELY ADJACENT DOWNSTREAM PROPERTIES, AS SHOWN ON THE TENTATIVE DEVELOPMENT PLAN, ELIGIBLE TO BE REMOVED FROM THE TOWN AND FEMA FLOODPLAIN.
   a. THE REGIONAL ON-SITE DETENTION DEPICTED ON THE TENTATIVE DEVELOPMENT PLAN AND DISCUSSED IN THE SITE ANALYSIS SHALL BE DESIGNED AND CONSTRUCTED SO THAT THE EXISTING 100-YEAR LOMAS DE ORO WASH PEAK FLOW IS REDUCED BY 10% WHERE IT EXITS THE PROJECT'S SOUTHERN BOUNDARY. FURTHERMORE, THE BASIN SHALL BE DEDICATED BY THE DEVELOPER TO THE TOWN OF ORO VALLEY UPON SUCCESSFUL INSPECTION AND ACCEPTANCE BY THE TOWN ENGINEER AND PRIOR TO THE RELEASE OF BUILDING PERMITS.
   b. IF THE APPLICANT IS UNABLE TO CONSTRUCT THE PROPOSED OFF-SITE IMPROVEMENTS DEPICTED ON THE TENTATIVE DEVELOPMENT PLAN AND DISCUSSED IN THE SITE ANALYSIS, AN ON-SITE SOLUTION MUST BE ESTABLISHED AND APPROVED BY THE TOWN ENGINEER.
7. ALL CRITICAL DRAINAGE ELEMENTS DESIGNED TO PROTECT DOWNSTREAM PROPERTY OWNERS MUST BE IN PLACE BY THE ONSET OF GRADING ACTIVITIES, AS APPROVED BY THE TOWN ENGINEER. THE BASINS ARE TO BE IN PLACE AND FUNCTIONAL AT THE BEGINNING OF PROJECT CONSTRUCTION TO CAPTURE RUNOFF AND IMPROVE DOWNSTREAM CONDITIONS.
8. THE APPLICANT SHALL DEDICATE 55' OF NEW RIGHT-OF-WAY ALONG THE PROPERTY'S LA CHOLLA BOULEVARD FRONTAGE.
9. THE APPLICANT SHALL PROVIDE A 30' EASEMENT ALONG A PORTION OF THE NEW LA CHOLLA BOULEVARD RIGHT-OF-WAY FOR DRAINAGE IMPROVEMENTS. EASEMENT SHALL BE DEDICATED BY FINAL PLAT.
10. THE APPLICANT SHALL CONSTRUCT A CONTROLLED ACCESS INTERSECTION (E.G. RIGHT-IN/OUT) OR MAKE OTHER NECESSARY IMPROVEMENTS FOR SAFE SIGHT VISIBILITY AT THE LA CHOLLA ACCESS DRIVE LOCATION AS APPROVED BY THE TOWN ENGINEER IF THIS PROJECT IS CONSTRUCTED PRIOR TO THE LA CHOLLA BOULEVARD WIDENING PROJECT.
11. THE APPLICANT SHALL CONSTRUCT A MULTI-USE PATH THE LENGTH OF THE PROPERTY'S FRONTAGE ALONG THE SOUTH SIDE OF LAMBERT LANE.

DRAINAGE IMPROVEMENTS MAINTENANCE PLAN

THE FOLLOWING MAINTENANCE ACTIVITIES SHOULD BE ADDRESSED AT LEAST ANNUALLY.

(1)DEBRIS REMOVAL – ALL CHANNELS, DROP SPILLWAY STRUCTURES, AND ENERGY DISSIPATORS SHALL BE KEPT CLEAR OF TREES, LOGS, DEBRIS, TRASH, AND OTHER OBSTACLES, WHICH COULD INTERFERE WITH THE PROPER FUNCTIONING OF THE STRUCTURES.

(2)CONCRETE – CONCRETE SHALL BE VISUALLY INSPECTED FOR SPALLS, CRACKS, MISALIGNMENT, OR STRUCTURAL BREAKAGE. SPALLS DEEPER THAN 1-INCH AND CRACKS LESS THAN 0.25 INCHES SHALL BE REPAIRED WITH CEMENT MORTAR AND SEALING COMPOUND RESPECTIVELY. CRACKS GREATER THAN 0.25 INCHES, MISALIGNMENTS OF MORE THAN 0.5 INCHES, AND ANY STRUCTURAL BREAKAGE SHALL BE MEASURED, MONITORED, AND REPAIRED IN ACCORDANCE WITH TOWN OF ORO VALLEY RECOMMENDATIONS. EXPOSED JOINTS SHALL BE VISUALLY INSPECTED. ANY JOINTS WHERE THE SEALING COMPOUND OR JOINT FILLER IS MISSING SHALL BE REPAIRED WITH MATERIALS SIMILAR TO THAT USED IN THE ORIGINAL CONSTRUCTION. ANY JOINTS FOUND TO HAVE OPENED MORE THAN 1- INCH SHALL BE MEASURED AND PROMPTLY REPAIRED.

(3)EARTH FILL AREAS AND SLOPES – ALL SOIL REMOVED FROM REGRADED AREAS AND UPPER CHANNEL SLOPES BY EROSION, VANDALISM, RODENTS, VEHICLES OR OTHER CAUSES SHALL BE REPLACED TO THE ORIGINAL SLOPES AND GRADES. ALL EARTH FILL SHALL BE AN APPROVED MATERIAL THAT IS COMPACTED AND GRADED TO PREVENT PONDING OR CONCENTRATED DRAINAGE.

(4)ROCK RIPRAP – REPLACE WEATHERED OR DISPLACED ROCK RIPRAP TO CONSTRUCTED GRADES.

(5)FENCES – INSPECT ALL BARRICADE RAILINGS, FENCES AND GATES AT LEAST ONCE EACH YEAR AND REPAIR OR REPLACE AS NEEDED. ALL METALWORK SHALL BE VISUALLY INSPECTED AND REPAIRED OR REPLACED IF IT IS DAMAGED OR IMPROPERLY FUNCTIONING. ALL PAINTED SURFACES SHALL BE CLEANED AND PAINTED WHEN RUST STARTS TO APPEAR, OR THE PAINT SYSTEM SHOWS SIGNS OF PEELING OR HEAVY OXIDATION.

(6)BASIN ACCESS ROAD – MAINTAIN THE ACCESS RAMP IN DRIVABLE CONDITION. REMOVE ANY OBSTRUCTIONS TO THE PASSAGE OF VEHICLES AND ADD FILL AS NEEDED TO PREVENT PONDING OF WATER AND MAINTAIN ADEQUATE DRAINAGE. EROSION WITHIN THE ROADWAY MORE THAN 6 INCHES WIDE AND 8 INCHES DEEP WILL BE REPAIRED.

(7)ENCROACHMENTS: EXCAVATIONS, STRUCTURES, OR OTHER OBSTRUCTIONS PRESENT WITHIN THE DRAINAGE EASEMENT AREA ARE PROHIBITED.

A SCHEDULE FOR CORRECTIVE ACTIONS SHALL BE DEVELOPED FOR COMPLETION OF IDENTIFIED MAINTENANCE WORK IN A TIMELY MANNER.

INSPECTIONS:
THE FOLLOWING INSPECTIONS ARE REQUIRED TO ENSURE THAT THE FLOOD CONTROL STRUCTURES FUNCTION AS DESIGNED.
(1)ANNUAL INSPECTIONS WILL BE ACCOMPLISHED BY QUALIFIED STAFF USING THE INSPECTION FORM BELOW. INSPECTIONS WILL IDENTIFY ITEMS SUCH AS:
•DEBRIS REMOVAL•CONCRETE REPAIR/REPLACEMENT

•METALWORK (TRASH RACKS, RAILINGS, DRAINAGE)

•EROSION REPAIRS

•FENCE/GATE REPAIRS AND/OR INSTALLATION•ADDING SLOPE PROTECTION

•VANDALISM RELATED REPAIRS: FENCES, GATES, SIGNS, TRASH, GRAFFITI, ABANDONED VEHICLES, ETC.

•MISCELLANEOUS MAINTENANCE ITEMS AS APPROPRIATE.

•SEDIMENT REMOVAL•UNFORESEEN AND LONG TERM MAINTENANCE NEEDS
(2)SPECIAL INSPECTIONS WILL BE CONDUCTED IMMEDIATELY FOLLOWING SEVERE STORMS, EARTHQUAKES, VANDALISM, AND OTHER SIGNIFICANT EVENTS. ALL INSPECTIONS SHALL BE DOCUMENTED USING THE STANDARD INSPECTION FORM BELOW..

RELATED CASE #
OV914-009
2100731
OV114-018

Contact Arizona 811 at least two full working days before you begin excavation
Call 811 or 1-800-782-5348
ARIZONA 811

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

FSP NOTES
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 10-9-24
ARIZONA, U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: C.I.=2'
V:
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007

GENERAL PAVING/GRADING NOTES:

1. ALL MATERIALS AND WORKMANSHIP ARE TO BE IN ACCORDANCE WITH PIMA ASSOCIATION OF GOVERNMENTS STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS (PAG SSPI), EDITION OF 2015, EXCEPT AS MODIFIED HEREBY.
2. ALL CONSTRUCTION AND TESTING METHODS SHALL BE IN CONFORMANCE WITH P.A.G. SSPI, EDITION OF 2015, EXCEPT AS MODIFIED HEREBY.
3. EXCAVATION AND BACKFILL FOR STRUCTURES SHALL CONFORM TO P.A.G. SSPI, SECTION 203-5.
4. EARTHWORK, EXCEPT AS MODIFIED BY THE SOILS REPORT OF RECORD, SHALL CONFORM TO P.A.G. SSPI SECTION 203.
5. AGGREGATE BASE COURSE SHALL CONFORM TO PAG SSPI, SECTION 303.
6. ASPHALTIC CONCRETE SHALL CONFORM TO PAG SSPI, SECTION 406, ASPHALTIC CONCRETE MIXTURE NO. 2 SPECIFICATIONS.
7. ALL CONCRETE SHALL CONFORM TO PAG SSPI, SECTION 1006, CLASS S, 3,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS, UNLESS OTHERWISE SPECIFIED.
8. A STAMPED SET OF APPROVED PLANS SHALL BE KEPT IN AN EASILY ACCESSIBLE LOCATION ON THE JOB SITE AT ALL TIMES OR DURING CONSTRUCTION.
9. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS.
10. CONTRACTOR SHALL CALL BLUE STAKE (ARIZONA 811) TO VERIFY LOCATION OF ALL UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION, A MINIMUM OF TWO (2) FULL WORKING DAYS PRIOR TO EXCAVATION.
11. CONTRACTOR SHALL OBTAIN ALL PERMITS REQUIRED BY GOVERNMENTAL AGENCIES.
12. CONTRACTOR SHALL INSTALL STREET SIGNS IN ACCORDANCE WITH THE TOWN OF ORO VALLEY SUBDIVISION STREET STANDARDS - SIGNAGE POLICY.
13. PAVING CONTRACTOR SHALL ADJUST BOTH EXISTING AND NEW WATER VALVES, BOX COVERS, WATER METER BOXES, SANITARY SEWER MANHOLES AND CLEANOUT RINGS AND COVERS, TELEPHONE AND ELECTRIC MANHOLE RING AND COVERS TO THE NEW FINISHED GRADE.
14. UPON COMMENCEMENT OF WORK, TRAFFIC CONTROL DEVICES SHALL BE POSTED AND MAINTAINED BY THE CONTRACTOR UNTIL SUCH TIME AS THE WORK IS COMPLETED. ALL WARNING SIGNS, BARRICADES, ETC., SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES ADOPTED BY THE STATE OF ARIZONA PURSUANT TO A.R.S. 28-650.
15. IF UNANTICIPATED CONDITIONS ARE ENCOUNTERED DURING THE COURSE OF CONSTRUCTION AND ARE BEYOND THE SCOPE OF THE DESIGN, THE ENGINEER SHALL SUBMIT THE NECESSARY REVISED OR SUPPLEMENTAL IMPROVEMENT PLANS FOR REVIEW AND APPROVAL BY THE TOWN OF ORO VALLEY PRIOR TO SUCH REVISIONS/CHANGES BEING MADE IN THE FIELD.
16. ALL STATIONING SHOWN ON PLAN AND PROFILE ARE ALONG CONSTRUCTION CENTERLINE UNLESS OTHERWISE NOTED.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CARE AND MAINTENANCE OF EXISTING IMPROVEMENTS AND VEGETATION IN THE WORK AREA. PAVEMENT, CURBS, CART PATHS AND ANY OTHER OBSTRUCTIONS DAMAGED DURING CONSTRUCTION ARE TO BE REPLACED BY THE CONTRACTOR. ANY UNDERGROUND PIPES, IRRIGATION LINES, IRRIGATION CONTROLS, DRAINS, STRUCTURES, OR OBSTRUCTIONS NOT SHOWN ON THESE PLANS SHALL BE MOVED, ALTERED, OR REPAIRED BY THE CONTRACTOR WHEN ENCOUNTERED, AS DIRECTED BY THE ENGINEER AND IS A DEFINITE PART OF THIS PROJECT.
18. ACCEPTANCE OF THESE PLANS DOES NOT CONSTITUTE OR IMPLY ACCEPTANCE OF ANY OF THE FOLLOWING:
A. WALLS(S), RETAINING OR OTHER TYPE(S).
B. ANY REINFORCED CONCRETE STRUCTURE(S).
C. ANY EMBANKMENT(S) WHOSE PRIMARY PURPOSE IS TO FUNCTION AS A RETENTION/DETENTION STRUCTURE.
THE ITEMS LISTED ABOVE ARE APPROVED FOR LOCATION ONLY. SEPARATE PLAN CHECKS AND PERMITS ARE REQUIRED, ALL IN ACCORDANCE WITH THE APPLICABLE CODES OF THE TOWN OF ORO VALLEY.
19. THE CONTRACTOR SHALL GIVE FORTY-EIGHT (48) HOURS NOTICE WHEN THEY SHALL REQUIRE THE SERVICES OF THE ENGINEER OR ANY OTHER PERSON PROPERLY AUTHORIZED FOR SUCH PURPOSE FOR LAYING OUT ANY PORTION OF THE WORK. THEY SHALL ALSO DIG ALL STAKE HOLES NECESSARY TO GIVE LINE AND LEVELS AND SHALL PROVIDE ASSISTANCE CALLED FOR BY THE ENGINEER OR HIS ASSISTANTS UPON ANY PART OF THE WORK WHENEVER SO REQUESTED, AND SHALL PRESERVE ALL STAKES SET FOR THE LINES, LEVELS OR MEASUREMENTS OF THE WORK IN THEIR PROPER PLACES UNTIL AUTHORIZED TO REMOVE THEM BY THE ENGINEERS. ANY EXPENSE INCURRED IN REPLACING ANY STAKES WHICH THE CONTRACTOR OR THEIR SUBORDINATES MAY HAVE FAILED TO PRESERVE SHALL BE CHARGED TO THE CONTRACTOR.
20. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FURNISH, HAUL AND APPLY ALL WATER REQUIRED FOR COMPACTION AND FOR THE CONTROL OF DUST FROM CONSTRUCTION ACTIVITY. THE COST THEREOF IS TO BE INCLUDED IN THE GRADING CONSTRUCTION PRICE.
21. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FULLY COMPLY WITH A.D.E.Q. STORMWATER POLLUTION PREVENTION PERMITS IN ACCORDANCE WITH THE REPORT AND POLLUTION PLANS PREPARED BY THE ENGINEER. THE COST THEREOF TO BE INCLUDED IN THE GRADING CONSTRUCTION PRICE.
22. BUILDING SITES SHALL BE CONSTRUCTED TO WITHIN 0.10 FOOT OF FINISH BUILDING PAD ELEVATIONS AS STAKED BY THE ENGINEER. STREETS AND PARKING AREAS SHALL BE CONSTRUCTED TO WITHIN +0.10 FEET OF FINISH SUBGRADE AS STAKED BY THE SURVEYOR.
23. A REPORT OF SOILS INVESTIGATION, INCLUDING RECOMMENDATIONS FOR GRADING PROCEDURE HAS BEEN PREPARED BY ALTA ARIZONA, PROJECT NO. 220076-G, APRIL 11, 2022 ALL EARTHWORK SHALL CONFORM TO THE RECOMMENDATIONS CONTAINED IN SAID REPORT AND ANY AMENDMENTS MADE THERETO.
24. THE SOILS ENGINEER SHALL OBSERVE, INSPECT AND TEST ALL CONSTRUCTION OPERATIONS, INCLUDING BUT NOT LIMITED TO: CLEARING, GRUBBING, SUBGRADE PREPARATION, STRUCTURAL, TRENCH EXCAVATION AND BACKFILL, MATERIAL TESTING, TOGETHER WITH PLACEMENT OF FILL. SAID ENGINEER SHALL CERTIFY IN WRITING, THAT ALL SOILS OPERATIONS AND MATERIALS USED FOR THIS DEVELOPMENT WERE PERFORMED IN ACCORDANCE WITH THE RECOMMENDATIONS AS SET FORTH IN THE GEOTECHNICAL INVESTIGATION OF RECORD AND ARE IN CONFORMANCE WITH THE ACCEPTED PLANS AND SPECIFICATIONS. CERTIFICATION, IN WRITING, IS TO BE RECEIVED BY THE TOWN OF ORO VALLEY PRIOR TO THE REQUEST FOR FINAL INSPECTION AND RELEASE OF ASSURANCES.
25. GRADING BOUNDARIES SHALL BE CLEARLY MARKED, AND ALL WORK WILL BE CONFINED TO APPROVED PROJECT LIMITS AS SHOWN ON THESE PLANS.

GENERAL PAVING/GRADING NOTES (CONT.)

26. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE SURVEYOR PROVIDING THE CONSTRUCTION LAYOUT TO VERIFY THE BENCHMARK AND COMPARE THE SITE CONDITIONS WITH THE PLANS AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES OBSERVED. SHOULD ANY BENCHMARK, GRADE OR DESIGN INDICATED ON THE PLANS BE SUSPECT, THE ENGINEER SHALL BE NOTIFIED OF SAID BENCHMARK, GRADE OR DESIGN PROBLEM AT LEAST TWENTY-FOUR HOURS BEFORE CONSTRUCTION IS SCHEDULED TO BEGIN ON THE AFFECTED AREA.
27. IT SHALL BE THE SOLE RESPONSIBILITY OF THE OWNER(S), THEIR SUCCESSORS OR ASSIGNS, (AND/OR THEIR CONTRACTOR, THEIR SUCCESSORS OR ASSIGNS AS APPLICABLE) TO PURSUE ANY NEGOTIATIONS, OBTAIN ANY AGREEMENTS AND/OR PERMITS, ETC., FROM ALL NECESSARY OWNERS, PRIVATE AND/OR GOVERNMENTAL AGENCIES IN CHARGE OF PROPERTIES AND/OR RIGHTS-OF-WAY ADJACENT TO (OR NEIGHBORING) THIS PROJECT, THAT MAY BE REQUIRED TO DO ANY WORK (CONSTRUCTION, ACCESS, MODIFICATIONS, GRADING, DRAINAGE, STRUCTURES, ROADS, ETC.) ENCROACHING OR AFFECTING - DIRECTLY OR INDIRECTLY - ON THESE ADJACENT PROPERTIES AND RIGHTS-OF-WAY IN ANY CONCEIVABLE MANNER, REGARDLESS OF WHETHER OR NOT THIS WORK IS SHOWN OR DESCRIBED ON THESE PLANS (OR) ON THIS PLAT.
28. THE PROFESSIONAL ENGINEER OF RECORD SHALL SUBMIT AS-BUILT RECORD DRAWINGS AND CERTIFY IN WRITING THAT ALL IMPROVEMENTS, WHETHER PRIVATE OR PUBLIC, HAVE BEEN CONSTRUCTED, PLACED, INSTALLED, ETC. IN SUBSTANTIAL CONFORMANCE WITH THE ACCEPTED PLANS FOR THIS DEVELOPMENT. CERTIFICATIONS IN WRITING AND THE AS-BUILT RECORD DRAWINGS ARE TO BE RECEIVED BY THE TOWN OF ORO VALLEY A MINIMUM OF TWO (2) WEEKS PRIOR TO THE REQUEST FOR CERTIFICATES OF OCCUPANCY AND/OR FINAL INSPECTION BY THE DEPARTMENT OF PUBLIC WORKS AND THE RELEASE OF ASSURANCES, EXCEPT FOR MODEL HOMES INTENDED TO BE USED FOR SALES PURPOSES. IF THE PROJECT IS PHASED THE ABOVE PERTAINS TO EACH PHASE
29. THE TOWN OF ORO VALLEY WILL, UPON RECEIPT OF ALL NECESSARY CERTIFICATIONS AS OUTLINED ON THE IMPROVEMENT PLANS AND FINAL PLAT, PERFORM A FIELD REVIEW OF THE DEVELOPMENT. FIELD CONDITIONS, DESIGN OVERSIGHTS, ETC., MAY REQUIRE ADDITIONAL WORK AND/OR IMPROVEMENTS AS A RESULT OF SAID REVIEW.
30. ALL EASEMENTS MUST BE ACQUIRED BY OWNER/BUILDER PRIOR TO CONSTRUCTION.
31. ANY PROPOSED REVISION OR MODIFICATION TO THIS APPROVED PLAN SHALL BE SUBMITTED TO THE TOWN ENGINEER'S OFFICE FOR REVIEW AND APPROVAL PRIOR TO SUCH CHANGES BEING MADE IN THE FIELD.
32. ALL TRAIL ALIGNMENTS MUST BE FIELD VERIFIED & DEDICATED BY FINAL PLAT.
33. LANDSCAPING SHALL BE LIMITED IN AREAS WHERE STORM DRAIN PIPES AND STRUCTURES ARE LOCATED.
34. ALL ARCHAEOLOGICAL MITIGATION SHALL BE APPROVED AND IMPLEMENTED TO THE SATISFACTION OF THE PLANNING AND ZONING ADMINISTRATION PRIOR TO ISSUANCE OF ANY GRADING PERMITS BY THE TOWN.
35. ALL WORK SHALL BE IN CONFORMANCE TO GRADING STANDARDS, CHAPTER 27-SECTION 27.9 OF THE ORO VALLEY ZONING CODE REVISED, YEAR 2005.
36. ALL EXPOSED CUT SLOPES SHALL BE TREATED WITH A RESTORATIVE AGENT AND REVEGETATED TO REFLECT EXISTING NATIVE VEGETATION AND DENSITIES IN ADJACENT NATURAL AREAS. ALL AREAS OF DISTURBANCE SHALL BE RECONTOURED TO MIMIC EXISTING GRADES, PER THE APPROVED GRADING EXCEPTION.
37. ALL WORK WITHIN THE PUBLIC RIGHT-OF-WAY SHALL REQUIRE SEPARATE PERMIT.
38. ALL BASIN AND OUTLET STRUCTURES, INCLUDING TEMPORARY SWALES MUST BE IN PLACE PRIOR TO COMMENCING GRADING ACTIVITIES BEYOND THESE NOTED IMPROVEMENTS.
39. ALL EXISTING DRAINAGE PATTERNS MUST BE MAINTAINED ALONG WITHOUT NEGATIVE IMPACTS TO DOWNSTREAM OFFSITE PROPERTIES.
40. BANK PROTECTION AND LOT TO LOT INFRASTRUCTURE TO BE BUILT AS PART OF THE SITES OVERALL, GRADING PLAN WITHIN AN EASEMENT FOR MAINTENANCE PURPOSES.
41. NO PERIMETER WALLS SHALL CROSS THE LOT TO LOT DRAINAGE FACILITIES.

OWNER

FUTURE ARIZONA INC.
1555 N. ASTOR STREET, APT 28W
CHICAGO, IL 60610

DEVELOPER

FUTURE ARIZONA INC.
1555 N. ASTOR STREET, APT 28W
CHICAGO, IL 60610

BASIS OF BEARING

GRID NORTH AS DEFINED BY THE ARIZONA STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, NAD 83. THE BEARING EQUATION FOR THIS PROJECT IS THE NORTH LINE OF NORTHWEST QUARTER (NW 1/4) OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G.&S.R.M., PIMA COUNTY, ARIZONA HAVING A BEARING OF NORTH 89°23'42" EAST BETWEEN THE NORTHWEST CORNER OF SECTION 15 AND THE NORTH QUARTER CORNER OF SECTION 15.

BASIS OF ELEVATION

NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

BENCHMARK

BENCHMARK #1:
NORTHWEST CORNER OF SECTION 15
BRASS CAP IN HANDHOLE RLS 42285
ELEVATION = 2607.67 FEET NAVD-1988

BENCHMARK #2:
NORTH QUARTER CORNER OF SECTION 15
BRASS CAP IN HANDHOLE RLS 85235
ELEVATION = 2600.64 FEET NAVD-1988

PUBLIC SEWER GENERAL NOTES:

1. ALL DESIGN STANDARDS, MATERIALS AND WORKMANSHIP FOR PUBLIC SANITARY SEWERS SHALL BE IN ACCORDANCE WITH THE PIMA COUNTY REGIONAL WASTEWATER RECLAMATION DEPARTMENT. (PCRWRD) ENGINEERING DESIGN STANDARDS (EDS 2016) AND THE STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION 2016 (SSDC 2016). SAID DOCUMENTS ARE AVAILABLE THROUGH THE PCRWRD WEBSITE (www.pima.gov/wastewaterreclamation).
2. ONLY APPROVED PLANS SHALL BE USED FOR THE CONSTRUCTION OF PUBLIC SANITARY SEWER FACILITIES. APPROVED PLANS REQUIRING DESIGN REVISIONS SHALL BE RESUBMITTED TO PIMA COUNTY FOR REVIEW AND RE-APPROVAL PRIOR TO THE START OF THE REVISED SEWER WORK.

PUBLIC SEWER GENERAL NOTES (CONT.):

5. SEWER CONSTRUCTION SHALL NOT COMMENCE UNTIL: (A) THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (ADEQ) OR ITS DELEGATED AUTHORITY HAS ISSUED A CONSTRUCTION AUTHORIZATION FOR THIS PROJECT; (B) THE CONTRACTOR HAS OBTAINED A PCRWRD PUBLIC SEWER CONSTRUCTION PERMIT (CONTACT THE PCRWRD PERMITS SECTION AT (520) 724-6649 FOR PERMIT APPLICATION REQUIREMENTS); (C) THE CONTRACTOR'S FLOW MANAGEMENT PLAN HAS BEEN SUBMITTED THIRTY (30) CALENDAR DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING AND APPROVED BY PCRWRD FIELD ENGINEERING; AND (D) A PRE-CONSTRUCTION MEETING WITH THE ASSIGNED PIMA COUNTY PROJECT FIELD INSPECTOR IS SCHEDULED AT LEAST THREE (3) FULL BUSINESS DAYS PRIOR TO COMMENCING WITH SEWER CONSTRUCTION.
6. IMMEDIATELY REPORT ANY OF THE FOLLOWING TO THE PCRWRD OPERATIONS CONTROL CENTER (OCC) AT (520) 724-6500: ANY RELEASE OF SEWAGE, ANY DAMAGE TO THE PUBLIC SANITARY SEWER SYSTEM, OR THE DROPPING OF DEBRIS INTO A PUBLIC SANITARY SEWER MANHOLE. A PCRWRD REPRESENTATIVE WILL BE DISPATCHED TO THE SITE. THE CONTRACTOR SHALL TAKE IMMEDIATE ACTION TO CONTAIN A SANITARY SEWAGE OVERFLOW (SSO). THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS TO REPAIR THE SYSTEM, MITIGATE THE RELEASE OF SEWAGE, DISINFECT THE RELEASE AREAS, AND ANY REGULATORY PENALTIES LEVIED ON PCRWRD FOR SEWAGE ENTERING A NATURAL DRAINAGE WAY OR STORM WATER DRAINAGE SYSTEM. THE CONTRACTOR SHALL REPAIR ALL DAMAGE AS DIRECTED AND APPROVED BY THE PCRWRD FIELD REPRESENTATIVE.
7. STORM WATER AND SEDIMENT CONTROL MEASURES SHALL BE PROPERLY INSTALLED TO PROTECT PCRWRD MANHOLES AT THE BEGINNING OF CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONSTANTLY MAINTAIN STORM WATER AND SEDIMENT CONTROL MEASURES THAT PROTECT PCRWRD FACILITIES UNDER ALL CONDITIONS FOR THE DURATION OF THE PROJECT. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR ALLOW STORM WATER, SEDIMENT, OR POTENTIAL POLLUTANTS FROM CONSTRUCTION SITE TO ENTER A PCRWRD MANHOLE. THE CONTRACTOR SHALL ENSURE THAT THEIR FLOW MANAGEMENT OPERATION INCLUDE CONTROLS TO PREVENT ANY INTRODUCTION OF STORM WATER, SEDIMENT, OR POLLUTANTS INTO THE PUBLIC SANITARY SEWER SYSTEM. FAILURE TO CONFORM TO THESE REQUIREMENTS SHALL RESULT IN CANCELLATION OF THE SEWER CONSTRUCTION PERMIT.
8. SPECIAL CARE SHALL BE TAKEN TO ENSURE DESIGN SLOPES ARE MAINTAINED. SEWERS CONSTRUCTED AT INSUFFICIENT SLOPES WILL NOT BE ACCEPTED BY PCRWRD FIELD ENGINEERING AND/OR ADEQ. CORRECTIVE ACTION, INCLUDING RE-CONSTRUCTION OF THE SEWER(S), WILL BE AT THE SOLE EXPENSE OF THE PROJECT OWNER/CONTRACTOR.
9. THE CONTRACTOR SHALL ADJUST OR RECONSTRUCT ALL SANITARY SEWER MANHOLES TO FINISHED ALL FRAMES AND COVER ADJUSTMENTS SHALL BE IN ACCORDANCE WITH PCRWRD SSDC 2016, DETAIL NOS. RWRD 211, 212, 304 OR 305 (AS APPLICABLE). THE CONTRACTOR SHALL PROTECT THE BENCH AND FLOW CHANNELS WITH A COVER PER PCRWRD SSDC 2016, DETAIL NO. RWRD 306. PRIOR TO COMMENCING ANY WORK TO THE MANHOLE AND REMOVE THE COVER AFTER ALL WORK IS COMPLETED. THE CONTRACTOR SHALL ENSURE THAT FRAMES AND COVERS ARE CLEAN AND FREE FROM ANY AND ALL ATTACHED MATERIALS (ASPHALT, CONCRETE, ETC.) AND THAT ALL VENT HOLES ARE OPEN AND CLEAR OF OBSTRUCTIONS, AS APPROVED BY THE PCRWRD FIELD ENGINEER. EXISTING FRAMES AND/OR COVERS THAT ARE DAMAGED OR CANNOT BE COMPLETELY CLEANED SHALL BE REPLACED WITH A NEW FRAME AND COVER IN ACCORDANCE WITH PCRWRD SSDC 2016, DETAIL NO. RWRD 213 - 218. COSTS ASSOCIATED WITH EXISTING FRAMES AND COVERS THAT ARE LOST OR DAMAGED DUE TO THE CONTRACTOR'S OPERATIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
10. SANITARY SEWER IS MEASURED FROM INSIDE FACE OF STRUCTURE TO INSIDE FACE OF STRUCTURE AND ALL INVERTS INDICATE INSIDE FACE OF STRUCTURE ELEVATION.

GENERAL SIGNING NOTES:

1. ALL SIGNS SHALL BE IN COMPLIANCE WITH THE 2009 EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, 2000 EDITION OF THE PIMA COUNTY AND CITY OF TUCSON TRAFFIC SIGNING DESIGN MANUAL (2002 REVISION), THE CURRENT SUPPLEMENTAL SPECIFICATIONS, THESE PLANS AND THE SPECIAL PROVISIONS.
2. SIGNS MAY BE MODIFIED AND LOCATIONS ADJUSTED TO FIT CONDITIONS AS DIRECTED BY THE ENGINEER.
3. POST LENGTHS INDICATED ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ACTUAL POST LENGTHS.
4. ALL NEW AND EXISTING SIGNS SHALL BE INSTALLED ON PERFORATED POST (SQUARE TUBE), AND SHALL BE INSTALLED IN A CONCRETE FOUNDATION, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
5. ALL SIGN STATION LOCATIONS ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ACTUAL SIGN LOCATIONS WITH THE ENGINEER PRIOR TO THE INSTALLATION OF ALL SIGNS.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL WORK WITH BLUE STAKE AND FOR INSTALLING ALL TRAFFIC SIGNS IN THE FIELD.
7. SPEED LIMIT SIGNS AND STOP SIGNS SHALL BE TYPE IX (DIAMOND GRADE) SHEETING. ALL OTHER WARNING AND REGULATORY SIGNS SHALL BE TYPE III (HIGH INTENSITY) SHEETING UNLESS OTHERWISE DETERMINED BY THE JURISDICTION ENGINEER. STREET NAME SIGNS (D3) SHALL BE FABRICATED USING TYPE III (HIGH INTENSITY) SHEETING AND ADVANCE STREET NAME SIGNS (TE9) SHALL BE FABRICATED USING TYPE III SHEETING. NO PARKING SIGNS SHALL BE TYPE II SHEETING. ALL SCHOOL ZONE SIGNS SHALL BE FLUORESCENT YELLOW-GREEN, DIAMOND GRADE SHEETING. ALL OVERHEAD SIGNS SHALL BE DIAMOND GRADE SHEETING.
8. ALL NEW SIGNS SHALL HAVE ALUMINUM BACKING, UNLESS OTHERWISE SPECIFIED.
9. ANY SALVAGED SIGN THAT IS TO BE REUSED SHALL BE TEMPORARILY STORED IN A SAFE LOCATION UNTIL REINSTALLATION.
10. THE DESIGN SPEED FOR THIS DEVELOPMENT IS: 25 M.P.H. AND THE DESIGN VEHICLE IS: SU-30. THE POSTED SPEED LIMIT FOR TANGERINE ROAD/FIRST AVENUE IS: 45 M.P.H.
11. FINAL INSPECTION/ACCEPTANCE OF SIGNING SHALL BE PERFORMED BY THE ENGINEER.

ESOS NOTE:

1. ALL ESOS AREAS ARE TO HAVE A ROPE OR FENCE BARRIER INDICATING LIMITS PRIOR TO COMMENCING GRADING ACTIVITIES

RELATED CASE #
OV914-009
2100731
OV114-018

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA 811
Call 811 or visit ArizonaBlueStake.com

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

IP NOTES
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA U.S.A.

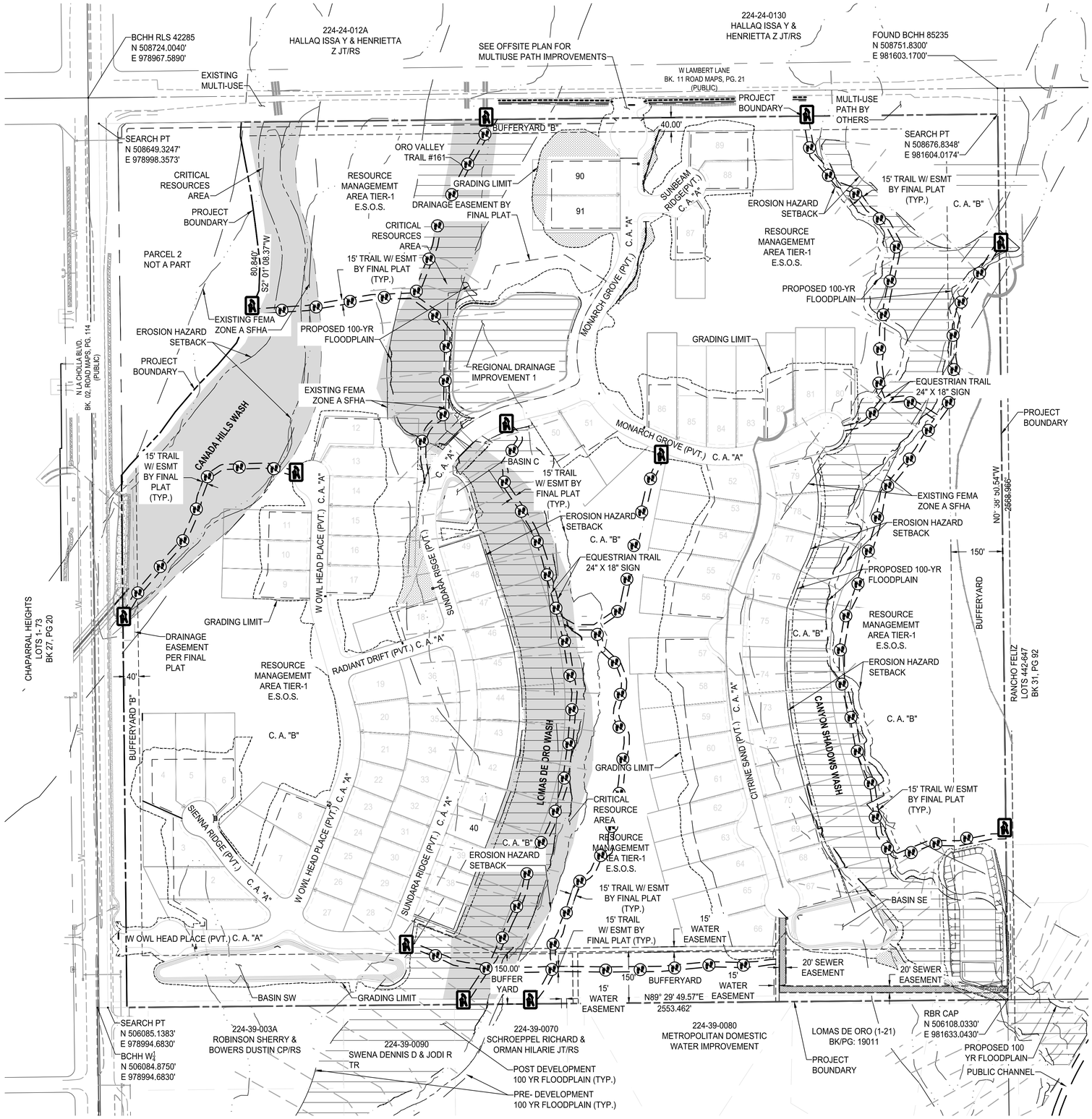
PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: C.I.=2'
V:
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007

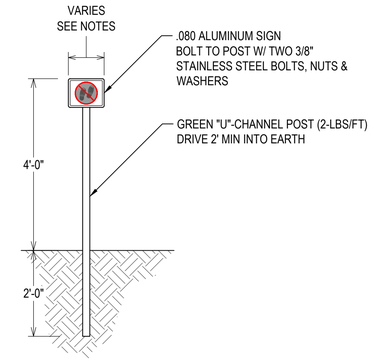


E.S.O.S. CATEGORY	TOTAL AREA EXISTING (AC)	REQUIRED AREA (AC)	PROVIDED ESOS (AC)
CRITICAL RESOURCE AREA	18.43±	17.51± (95.0%)	17.85± (96.9%)
RESOURCE MANAGEMENT AREA 1*	123.32±	81.39± (66.0%)	81.41± (66.0%)
TOTAL (ESOS)	141.75±	98.90± (69.8%)	104.30± (73.6%)

* REGIONAL DRAINAGE IMPROVEMENTS INCLUDED IN RESOURCE MANAGEMENT AREA 1 PER TOWN ZONING CODE SECTION 27.10.E.3.c and 27.10.F.2.2.f.vi.

LEGEND

TRAIL ROUTE SIGNAGE



NOTES:
1. Install sign 2 feet from edge of trail.
2. Install top of sign four feet above the ground.
3. Mount sign with 2 EA, ⅜" carriage bolts, flat washers, locking washers, nuts. Bend down excess bolt length to prevent theft.
4. Size of sign depends on amount of text. Use: 6" x 6", 8" x 8", 10" x 12" or 12" x 18".
5. Use white lettering on a brown background.
6. Incorporate Oro Valley jurisdictional logo on sign.
7. Treat sign with anti-grafitti clear coat.

3 ESOS / TRAIL ROUTE SIGNAGE

NTS

NOTE:
PER SECTION 26.5.D8 WHERE THE RECREATIONAL AREA ABUTS ENVIRONMENTALLY SENSITIVE LAND (ESL), A SIGN SHALL BE POSTED EVERY ONE HUNDRED (100) FEET AT THE BORDER OF THE ESL AREA.

N

150 75 0 150 300
GRAPHIC SCALE
1" = 150'

RELATED CASE #
OV914-009
2100731
OV114-018

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

ESOS MAP
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12
SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA, U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: 1"=150' C.I.=2'
V:
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007

Date/Time: Mon, 16 Dec 2024 - 10:06am Path/Name: S:\ARIZOTucson\AZ4072-4000LAND_LJA MOVING FORWARD\BASE FILES\PV04 ESOS MAP.dwg

RELATED CASE #
OV914-009
2100731
OV114-018

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA 811
Call 811 or click Arizona811.com

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

RHSP
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12
SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

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ROBERT W. SCHLICHER
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ARIZONA, U.S.A.

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LJA
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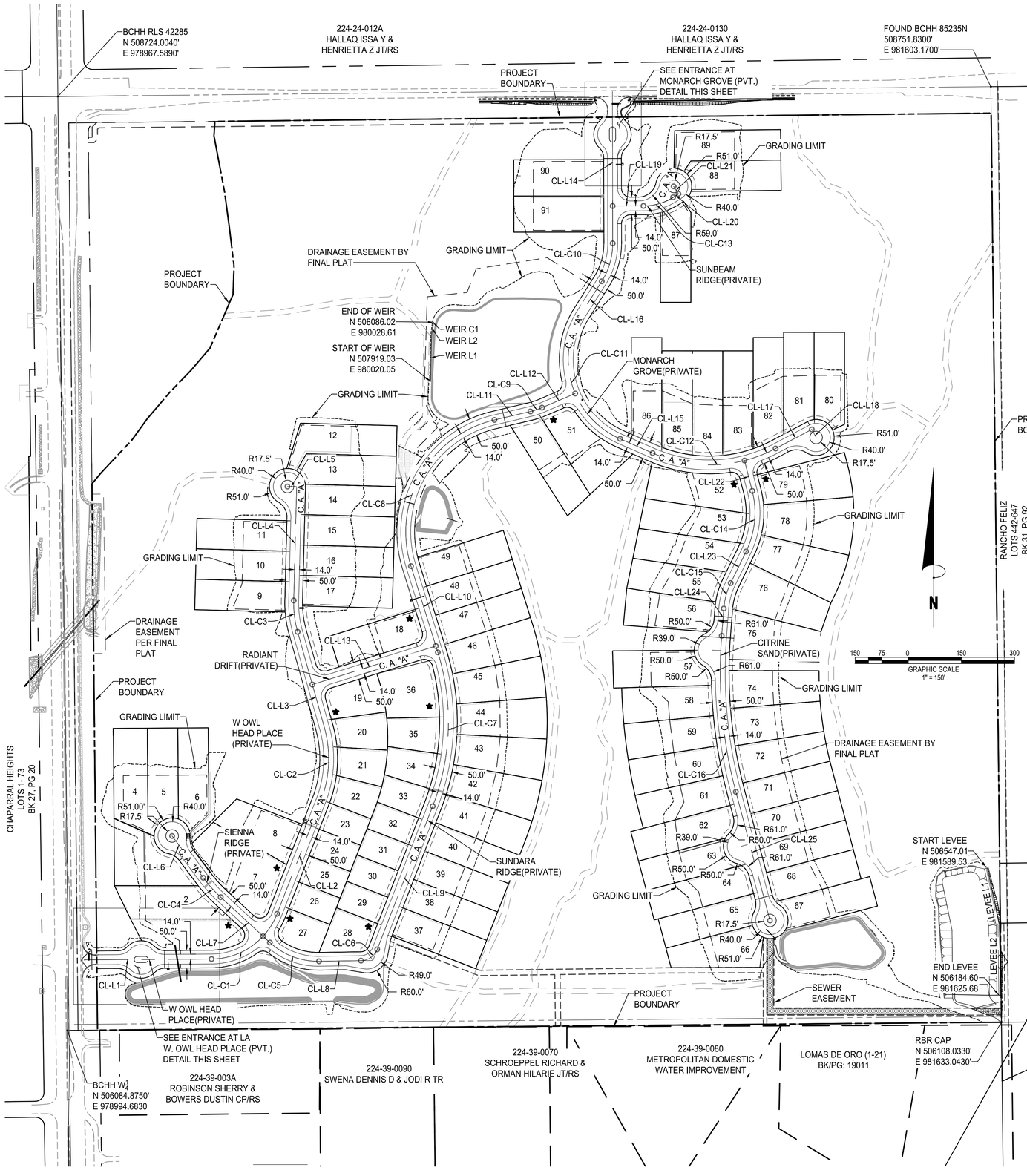
RWS
CHECKED BY

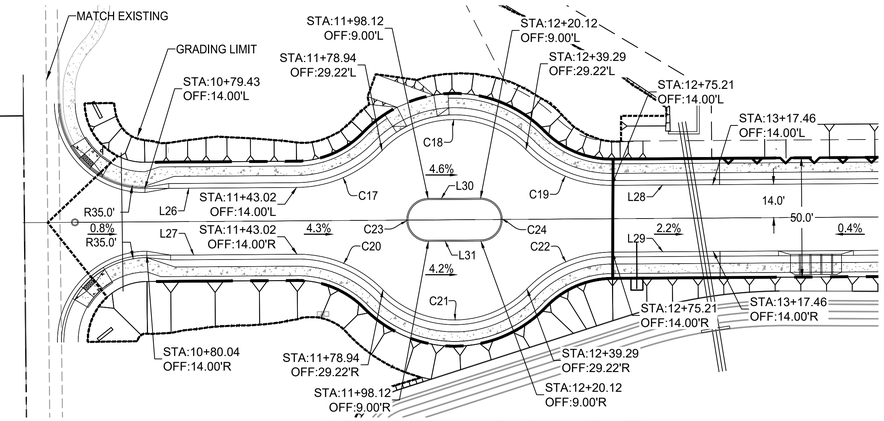
GRADING PERMIT #2500131

P22WI00005

G-2022-007

Date/Time: Mon, 16 Dec 2024 - 10:08am PathName: S:\ARIZ\Tucson\AZ4072-4000\AND_LJA MOVING FORWARD\BASE FILES\P\05 RHSP.dwg





ENTRANCE AT W. OWL HEAD PLACE (PRIVATE)

CURVE TABLE: ALIGNMENTS				
CURVE #	RADIUS	DELTA	LENGTH	CHORD
CL-C1	200.00'	68°26'34"	238.91'	224.96'
CL-C2	330.00'	36°47'43"	211.93'	208.30'
CL-C3	300.00'	17°06'34"	89.58'	89.25'
CL-C4	400.00'	10°33'52"	73.75'	73.65'
CL-C5	200.00'	43°35'24"	152.16'	148.51'
CL-C6	50.00'	67°57'27"	59.30'	55.89'
CL-C7	660.00'	38°29'20"	443.36'	435.07'
CL-C8	325.00'	94°03'49"	533.56'	475.63'
CL-C9	200.00'	9°52'41"	34.48'	34.44'
CL-C10	200.00'	32°25'37"	113.19'	111.69'
CL-C11	245.00'	98°41'14"	421.99'	371.73'
CL-C12	400.00'	51°29'51"	359.52'	347.54'
CL-C13	156.00'	32°25'31"	88.28'	87.11'
CL-C14	250.00'	40°18'38"	175.89'	172.28'
CL-C15	200.00'	21°30'56"	75.10'	74.66'
CL-C16	1320.00'	19°18'15"	444.73'	442.63'

LINE TABLE: LEVEE		
LINE #	LENGTH	DIRECTION
LEVEE L1	167.96'	N11° 38' 50.54"W
LEVEE L2	197.93'	N0° 38' 54.25"W

LINE TABLE: ALIGNMENTS		
LINE #	LENGTH	DIRECTION
CL-L1	357.96'	N89° 36' 46.39"E
CL-L2	341.70'	N21° 10' 12.78"E
CL-L3	280.45'	N15° 37' 29.88"W
CL-L4	321.33'	N1° 29' 03.84"E
CL-L5	26.00'	N88° 30' 56.16"W
CL-L6	147.14'	S36° 43' 04.16"E
CL-L7	163.02'	S47° 16' 56.15"E
CL-L8	118.69'	N89° 07' 39.97"E
CL-L9	433.67'	N21° 10' 12.78"E
CL-L10	255.12'	N17° 19' 06.86"W
CL-L11	104.54'	N76° 44' 42.35"E
CL-L12	101.84'	N66° 52' 01.49"E
CL-L13	365.48'	N72° 40' 53.14"E
CL-L14	356.52'	S0° 06' 17.63"E
CL-L15	100.18'	S66° 21' 54.96"E
CL-L16	106.21'	S32° 19' 19.01"W
CL-L17	115.70'	N62° 08' 14.10"E
CL-L18	26.00'	S27° 51' 45.90"E
CL-L19	87.11'	S89° 53' 42.37"W
CL-L20	17.89'	S57° 28' 11.73"W
CL-L21	25.00'	S32° 31' 48.27"E
CL-L22	88.50'	N14° 20' 10.32"W

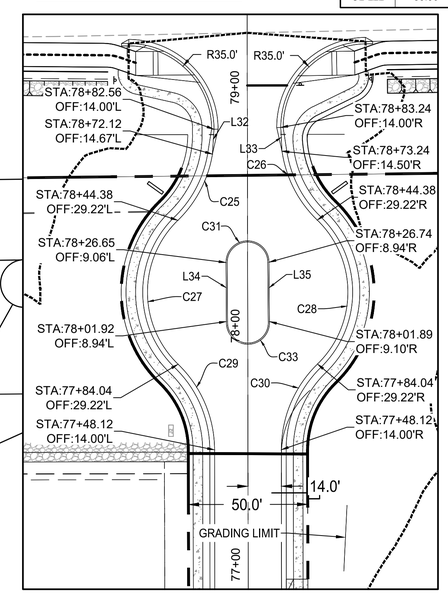
LINE TABLE: ALIGNMENTS		
LINE #	LENGTH	DIRECTION
CL-L23	98.93'	N25° 58' 27.89"E
CL-L24	77.38'	N4° 27' 31.83"E
CL-L25	376.07'	N14° 50' 42.93"W

CURVE TABLE				
CURVE #	RADIUS	DELTA	LENGTH	CHORD
C17	50.00'	45°55'15"	40.07'	39.01'
C18	42.00'	91°50'30"	67.32'	60.34'
C19	50.00'	45°55'15"	40.07'	39.01'
C20	50.00'	45°55'15"	40.07'	39.01'
C21	42.00'	91°50'30"	67.32'	60.34'
C22	50.00'	45°55'15"	40.07'	39.01'
C23	9.00'	180°00'00"	28.27'	18.00'
C24	9.00'	180°00'00"	28.27'	18.00'
C25	50.00'	36°30'01"	31.85'	31.32'
C26	50.00'	37°48'20"	32.99'	32.40'
C27	42.00'	91°50'30"	67.32'	60.34'
C28	42.00'	91°50'30"	67.32'	60.34'
C29	50.00'	45°55'15"	40.07'	39.01'
C30	50.00'	45°55'15"	40.07'	39.01'
C31	9.00'	179°48'35"	28.24'	18.00'
C33	9.04'	186°31'20"	29.41'	18.04'

LINE TABLE		
LINE #	LENGTH	DIRECTION
L26	63.59'	N89° 36' 46.39"E
L27	62.99'	N89° 36' 46.39"E
L28	42.25'	N89° 36' 46.39"E
L29	42.25'	N89° 36' 46.39"E
L30	22.00'	S89° 36' 46.39"W
L31	22.00'	N89° 36' 46.39"E
L32	10.46'	S3° 35' 30.03"W
L33	10.01'	S2° 58' 16.83"E
L34	24.73'	S0° 23' 13.61"E
L35	24.85'	N0° 28' 55.90"W

LINE TABLE: WEIR		
LINE #	LENGTH	DIRECTION
WEIR L1	132.88'	N1° 37' 38.36"E
WEIR L2	30.82'	N7° 46' 31.64"E

CURVE TABLE: WEIR				
CURVE #	RADIUS	DELTA	LENGTH	CHORD
WEIR C1	57.00'	3°41'23"	3.67'	3.67'



ENTRANCE AT MONARCH GROVE (PRIVATE)

RELATED CASE #
OV914-009
2100731
OV114-018

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

HORIZONTAL CONTROL
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12
SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA, U.S.A.

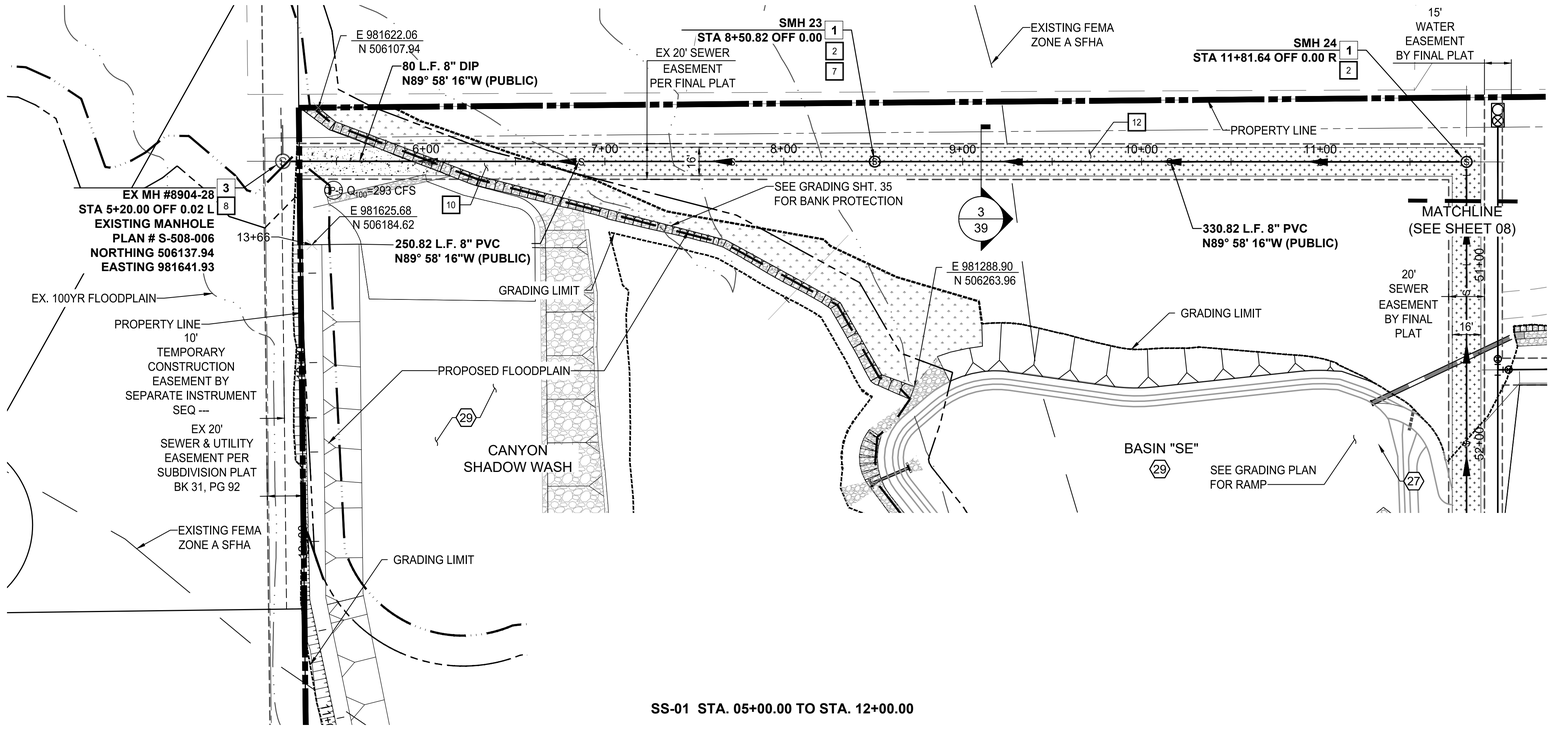
PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: 1"=150' V: C.I.=2'
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007



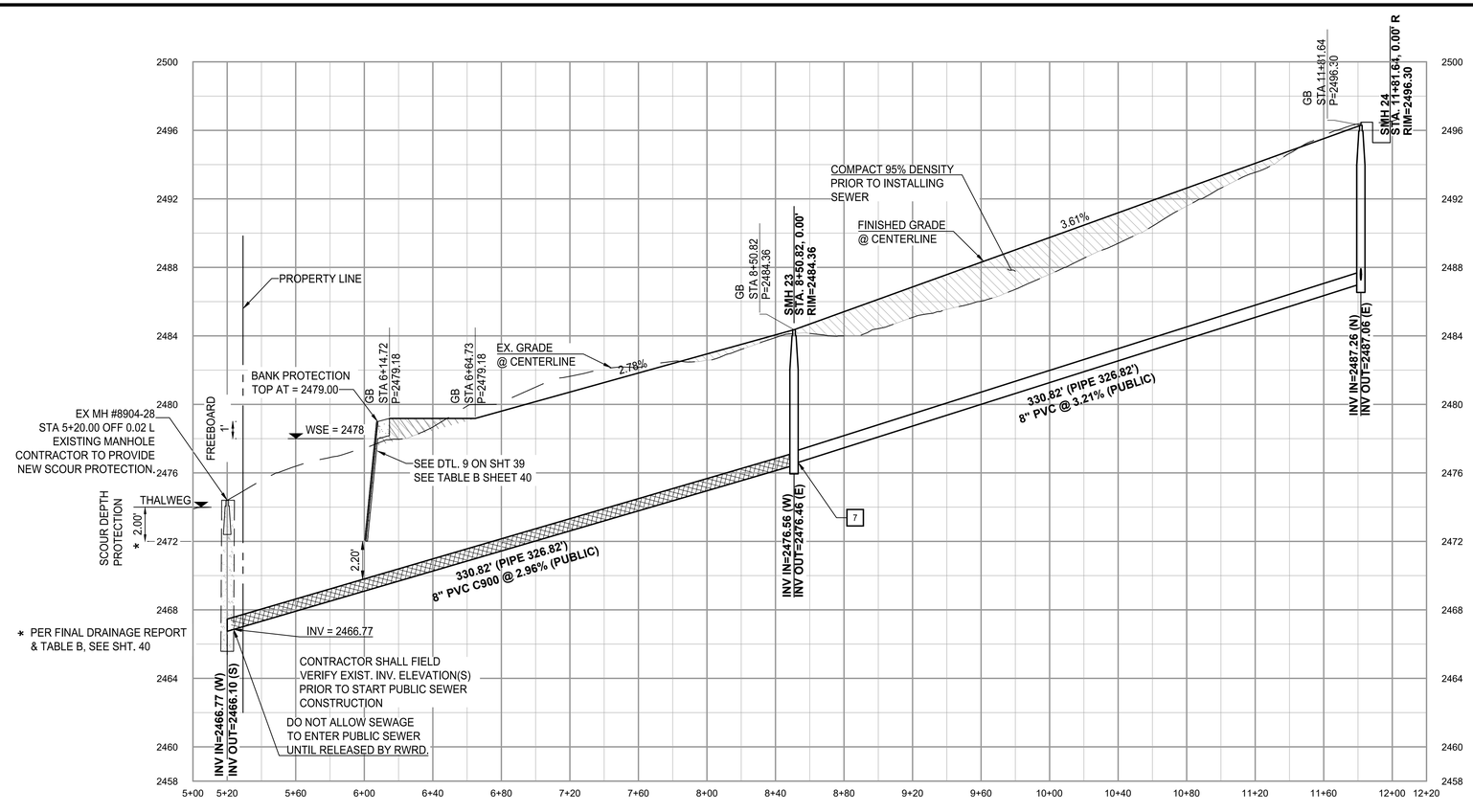
SS-01 STA. 05+00.00 TO STA. 12+00.00

NOTE:
1. STATIONING IS ALONG THE SEWER CENTERLINE.

N

GRAPHIC SCALE
1" = 40'

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



EASEMENT KEYNOTES

1. 10' PUBLIC UTILITY, ROADWAY MAINTENANCE, & SIGNAGE EASEMENT BY FINAL PLAT
2. BUILDING SETBACK LINE, SEE DTL. 6 SHT 38.
3. DRAINAGE EASEMENT PER FINAL FLAT.

SEWER KEYNOTES

1. CONSTRUCT 4' DIA. MANHOLE PER STD. DTL. RWRD 205 WITH CONCRETE COLLAR PER STD. DTL. RWRD 211
2. INSTALL 24" WATERTIGHT FRAME AND COVER PER STD. DTL. RWRD 214.
3. INSTALL CONNECTION TO EXISTING MANHOLE BASE STD. DTL. RWRD 301.
4. INSTALL HCS CONNECTION TO MANHOLE PER STD. DTL. RWRD 402.
5. SEWER/WATER CROSSING PER STD. DTL. RWRD 108. CONTRACTOR TO VERIFY EXISTING ELEVATION PRIOR TO CONSTRUCTION. SEWER CONTRACTOR RESPONSIBLE FOR ANY DAMAGE DURING CONSTRUCTION.
6. INSTALL HCS WITH CLEANOUT PER STD. DTL. RWRD 401 AND STD. DTL. RWRD 404.
7. INSTALL BLOCK OUT PER RWRD 203, SIZE AND INVERT PER PLAN. INSTALL AT MANHOLE CONNECTION TEMPORARY PLUG AND SECURE WITH A CHAIN OR CABLE TO A MANHOLE STEP. PLUG TO INCLUDE CONTRACTOR'S COMPANY NAME. THE PLUG IS TO BE REMOVED AFTER PDEQ/ADEQ's DISCHARGE AUTHORIZATION AND POST PAVING INSPECTION AS DIRECTED BY THE FIELD ENGINEERING INSPECTOR. PLUG TO BE PLACED DOWNSTREAM OF ALL PROPOSED SERVICE LATERALS.
8. CONTRACTOR TO PROVIDE NEW SCOUR PROTECTION PER PAG AND RWRD STANDARDS
9. SEWER/STORM CROSSING PER RWRD SECTION 5.1.10.B CONTRACTOR TO VERIFY EXISTING ELEVATION PRIOR TO CONSTRUCTION. SEWER CONTRACTOR RESPONSIBLE FOR CROSSING CONSTRUCTION.
10. INSTALL SCOUR PROTECTION FOR SEWER LINES PER RWRD 113
11. NOT USED.
12. STABILIZED SURFACE PER STD. DTL. RWRD 111.

CONSTRUCTION KEYNOTES

1. INSTALL SURVEY MONUMENT PER P.A.G. STD. DTL. 103.
2. CONSTRUCT 2' WEDGE CURB (H=6") PER P.A.G. STD. DTL. 209.
3. CONSTRUCT 6" REVEAL VERTICAL CURB PER P.A.G. STD. DTL. 209. (TYPE 2).
4. CONSTRUCT MODIFIED TRANSITION CURB FROM VERTICAL CURB TO WEDGE CURB PER P.A.G. STD. DTL. 210.
5. CONSTRUCT CONCRETE SIDEWALK PER P.A.G. STD. DTL. 200. STANDARD 4' WIDE SIDEWALK UNLESS OTHERWISE NOTED.
6. NEW CONCRETE CURB TO EXISTING CONNECTION PER P.A.G. STD. DTL. 211.
7. SAWCUT 2' OF EXISTING PAVEMENT, TACK, AND JOIN TO EXISTING.
8. CONSTRUCT CURB RAMPS PER P.A.G. STD. DTL. 207. SEE PLAN FOR TYPE OF RAMPS.
9. INSTALL 3" AC OVER 5" ABC SEE DTL. 10, SHT. 38.
10. SLOPE STABILIZATION, SEE DTL. 8, SHT. 38
11. SIGHT VISIBILITY TRIANGLE, SEE DTL. 4, SHT. 38.
12. INSTALL 30" X 30" R1-1 "STOP SIGN" AND STREET NAME SIGN.
13. CONSTRUCT TYPE 3 SIDEWALK SCUPPER PER P.A.G. STD. DTL. 205.5. NUMBER OF CELLS AS NOTED. SEE SHT. 37 FOR DETAILS, W/ GUARDRAIL PER PAG. 105
22. CONSTRUCT TYPE 2 SIDEWALK SCUPPER PER P.A.G. STD. DTL. 205 NUMBER OF CELLS AS NOTED.
23. CONSTRUCT 48" STORM DRAIN MANHOLE PER PAG STD. DTL. 300 & 302.
26. INSTALL CATCH BASIN PER DETAIL 1 SHT. 40 AND SEE STORM DRAIN PROFILES ON SHT. 36-37, 40-41
27. NEW IRRIGATION LINE SLEEVE, THE CURB SHALL BE MARKED/STAMPED WITH "IS" (IRRIGATION SYSTEM), SEE LANDSCAPE PLAN FOR LINE INFORMATION.
28. INSTALL TYPE 4 CATCH BASIN PER PAG STD. DTL. 309.
29. SEE GRADING PLAN FOR DETAILS.
30. 2 - 24'x 6' ARCH CULVERTS, SEE PROFILE 1, SHT. 36 AND SHT. 45-51 FOR DTLS.
31. INSTALL HANDRAIL PER PAG STD. DTL. 105.
32. CONSTRUCT DRIVEWAY APRON PER P.A.G. STD. DTL. 206.
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35. INSTALL RCP CLASS V STORM DRAIN PIPE. LENGTH, SLOPE, AND DIAMETER PER PLAN, SEE STORM DRAIN PROFILE ON SHT. 36-37, 40-41

RELATED CASE #
OV914-009
2100731
OV114-018

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA 811
Call 811 or click Arizona811.com

LJA Engineering, Inc.
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PAVING PLAN AND PROFILE
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: 1"=40' C.I.=2'
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AZ4072-1004
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DRAWN BY
LJA
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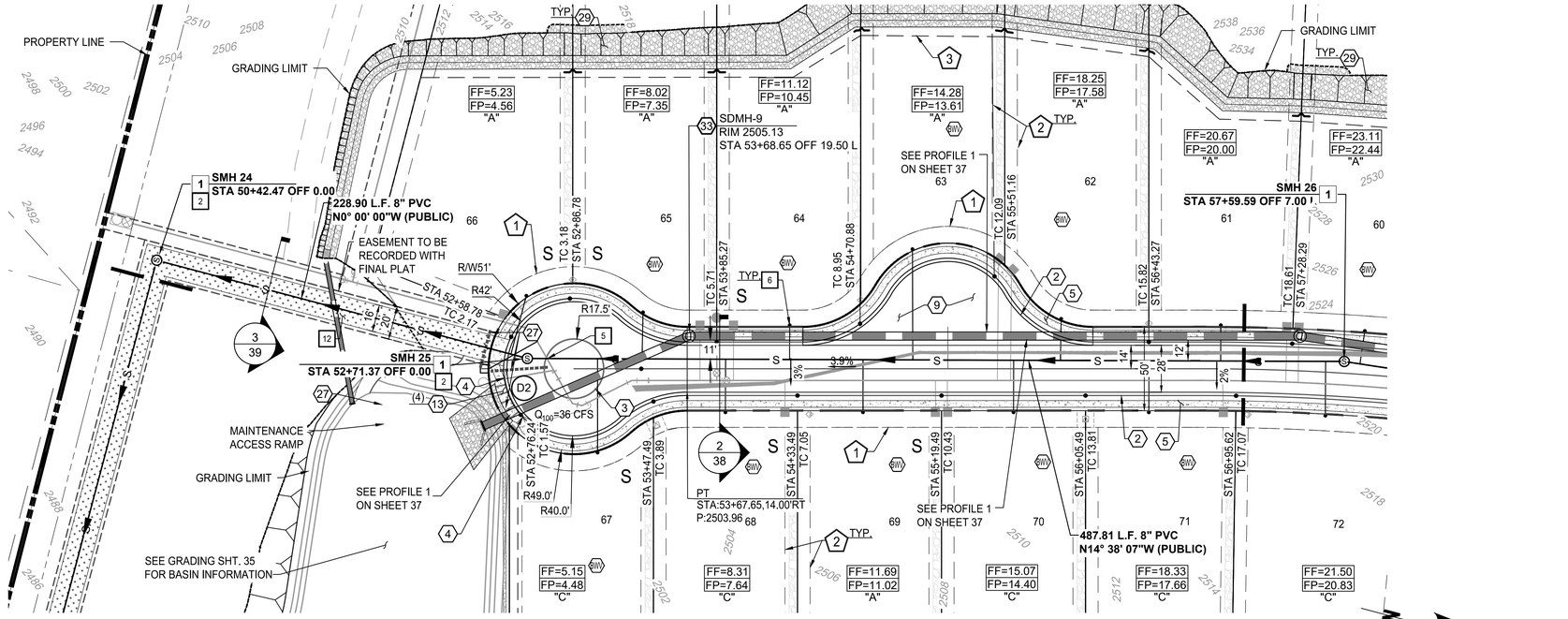
GRADING PERMIT #2500131

P22WI00005

G-2022-007



CITRINE SAND (PRIVATE) STA. 50+00.00 TO STA. 57+00.00

NOTE:
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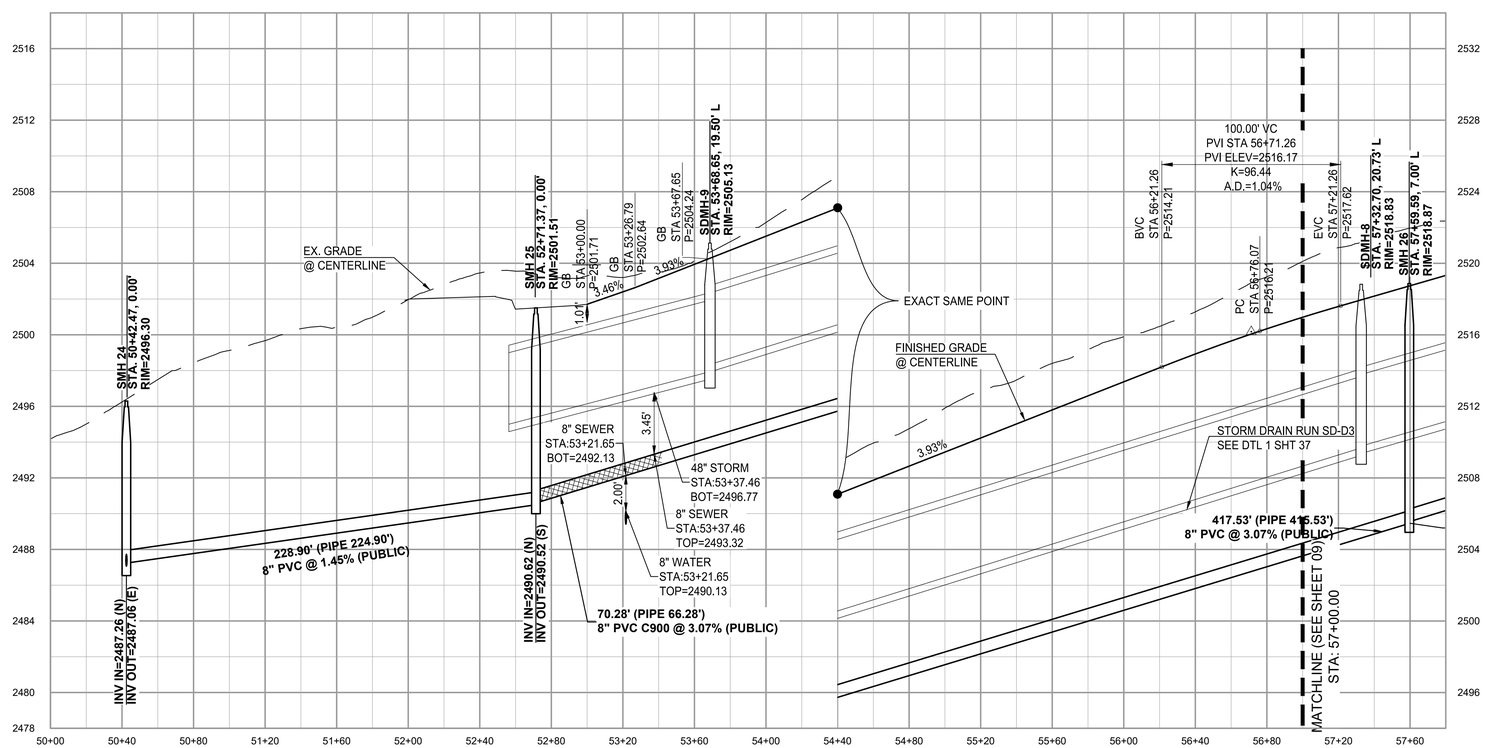

EASEMENT KEYNOTES

1. 10' PUBLIC UTILITY, ROADWAY MAINTENANCE, & SIGNAGE EASEMENT BY FINAL PLAT
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3. DRAINAGE EASEMENT PER FINAL FLAT.

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11. NOT USED.
12. STABILIZED SURFACE PER STD. DTL. RWRD 111.

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NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil) CERTIFICATE NO. 54544 ROBERT W. SCHICHER Date Signed 10/8/24 ARIZONA, U.S.A.

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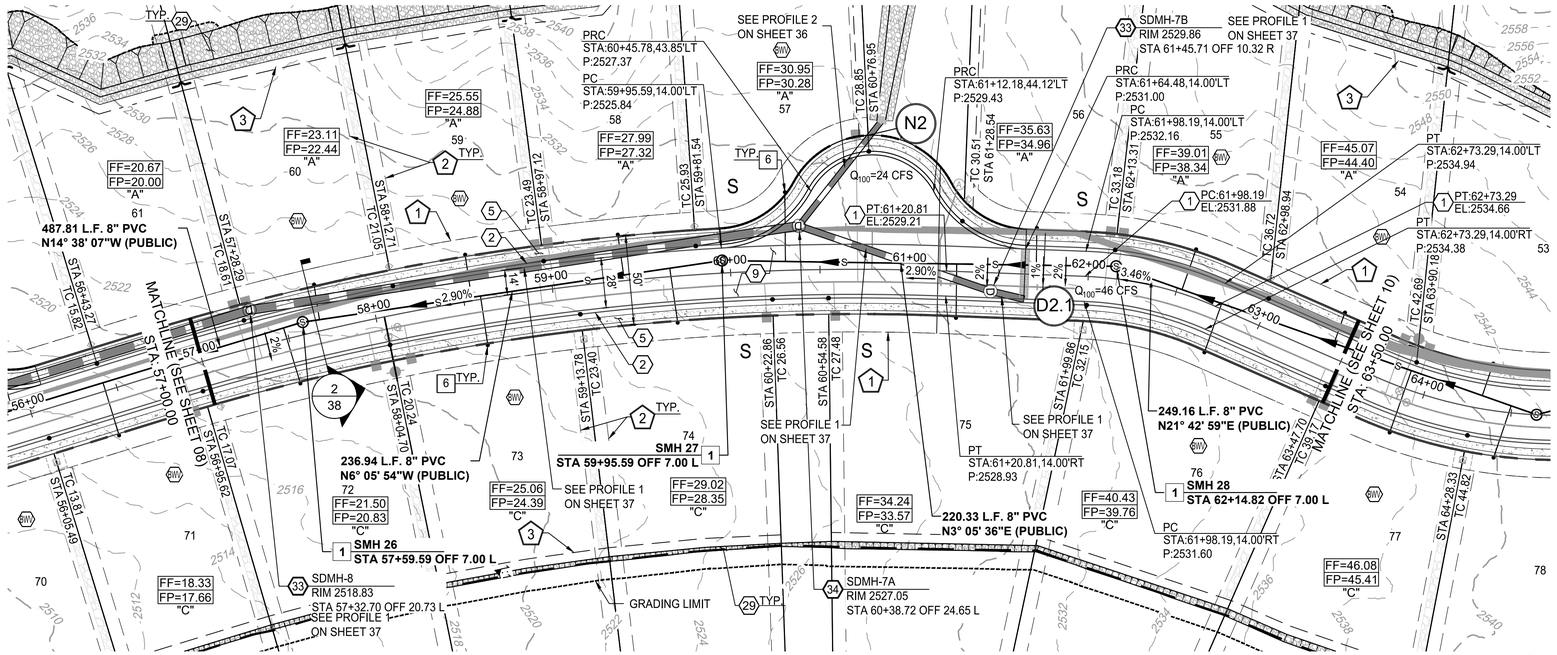
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007

DateTime: Tue, 10 Dec 2024 - 4:15pm PathName: S:\ARIZ\Tucson\AZ4072-400L\AND_LJA MOVING FORWARD\BASE FILES\PIV\08 PAVING PLAN AND PROFILE.dwg



CITRINE SAND (PRIVATE) STA. 57+00.00 TO 63+50.00

NOTE:
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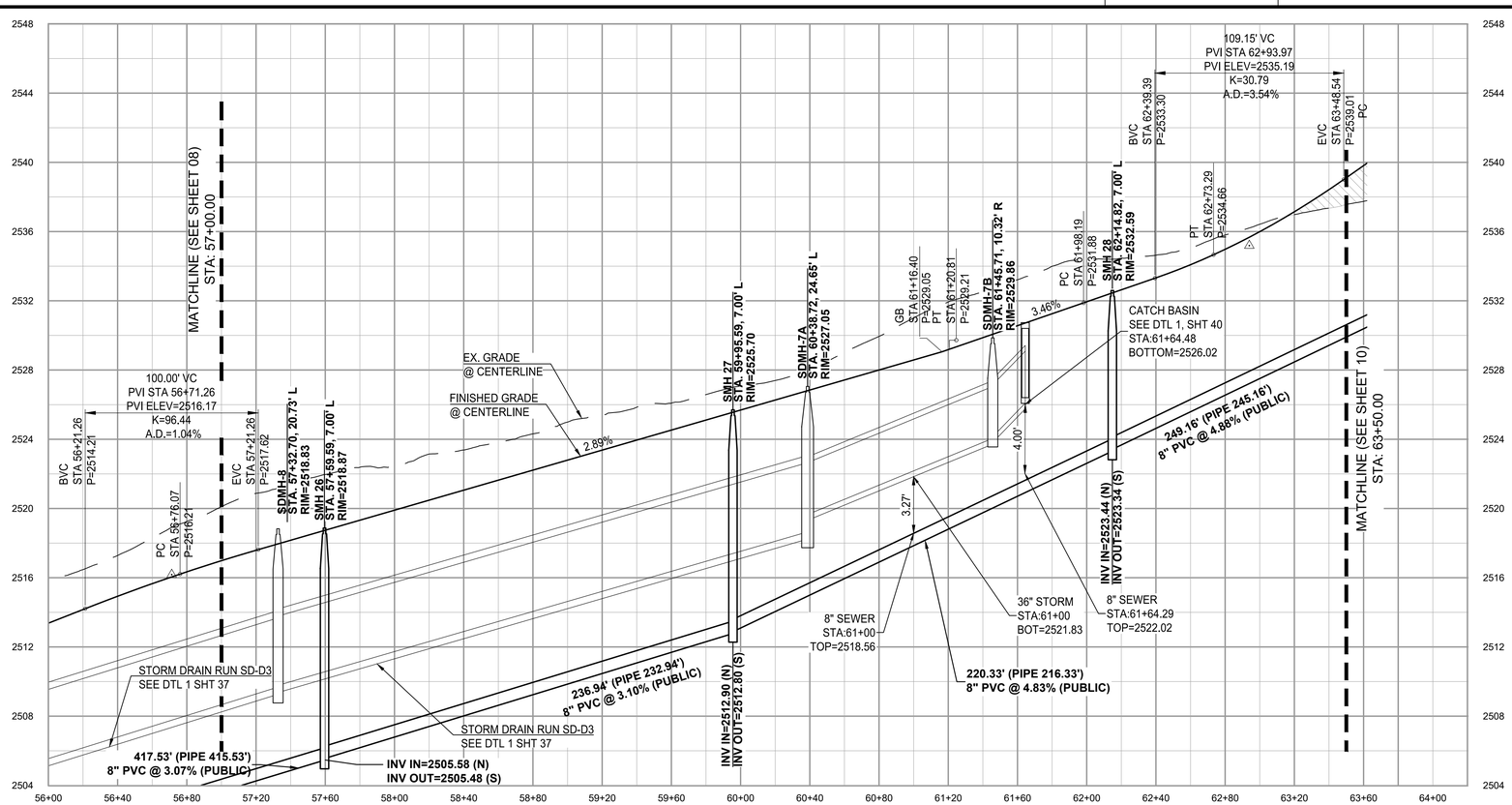

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RELATED CASE #
OV914-009
2100731
OV114-018

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

PAVING PLAN AND PROFILE
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FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil) CERTIFICATE NO. 54544 ROBERT W. SCHLICHER Date Signed 12-16-24 ARIZONA U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: 1"=40' C.I.=2'
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SCALE
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AZ4072-1004
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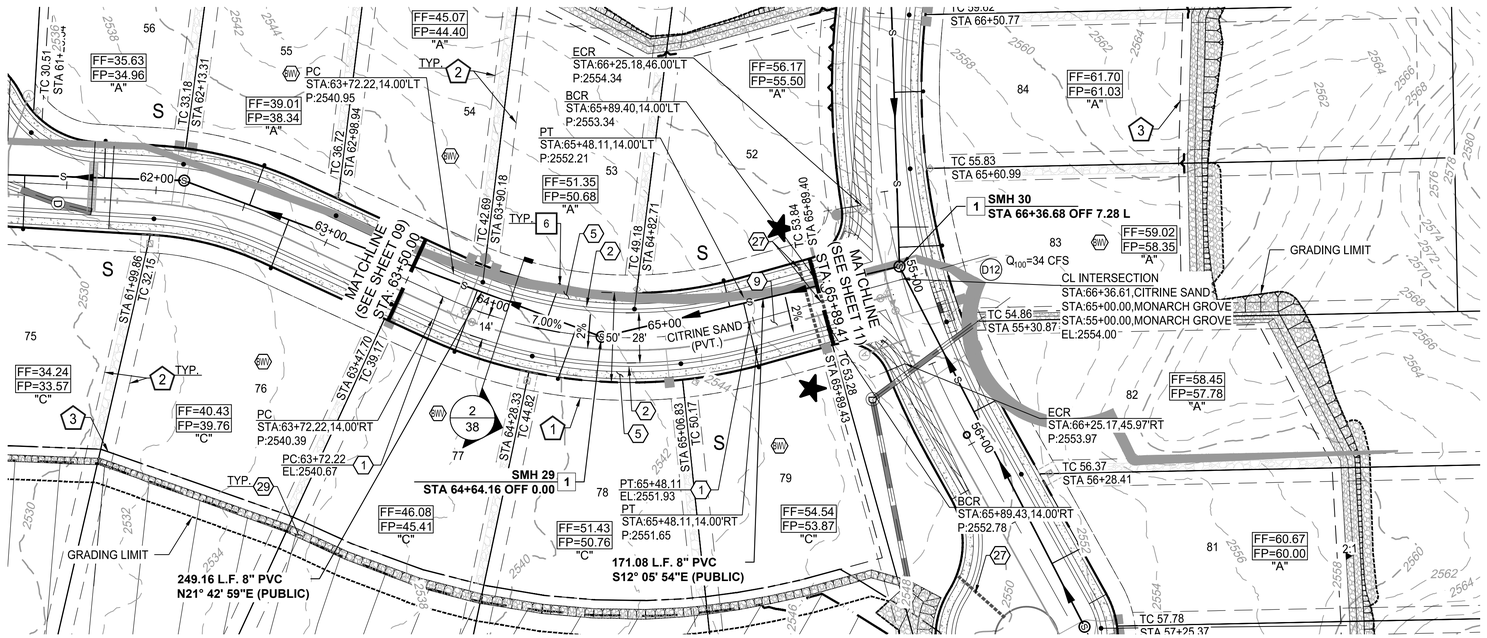
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007

Date/Time : Tue, 10 Dec 2024 - 4:19pm Path/Name : S:\ARIZ\Tucson\AZ4072\4004_AND_LJA MOVING FORWARD\BASE FILES\Pv\09 PAVING PLAN AND PROFILE.dwg



CITRINE SAND (PRIVATE) STA. 63+50.00 TO STA. 65+89.41

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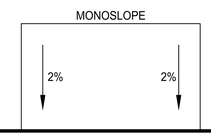

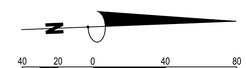

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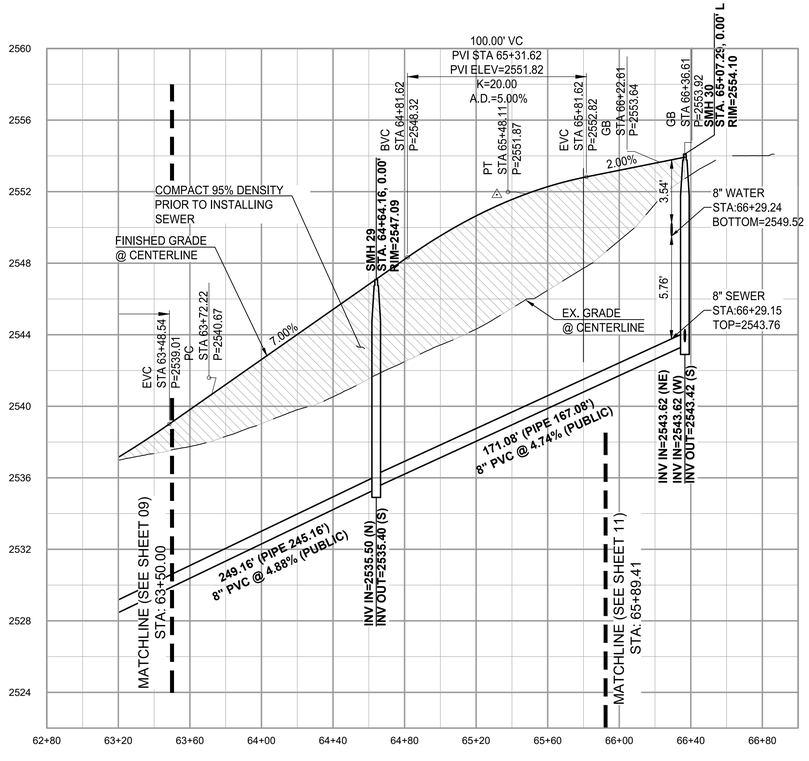

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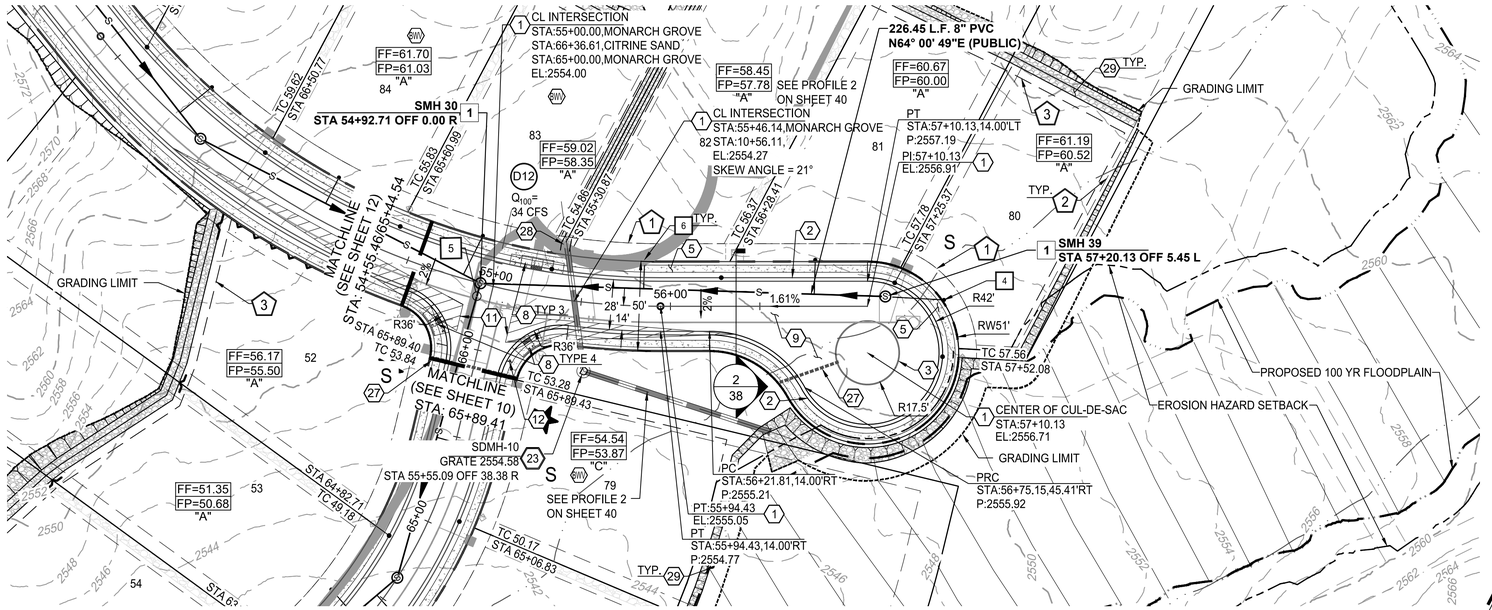

MONARCH GROVE (PRIVATE) STA. 54+55.46 TO STA. 66+89.41

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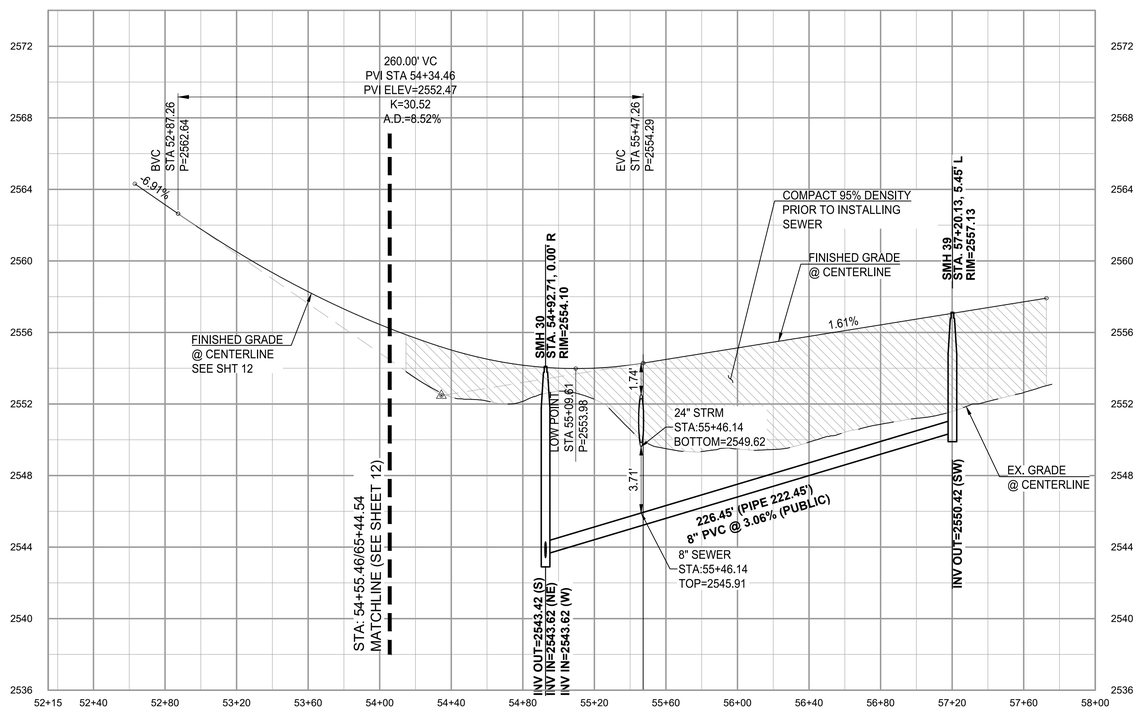

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SEWER KEYNOTES

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2. INSTALL 24" WATERTIGHT FRAME AND COVER PER STD. DTL. RWRD 214.
3. INSTALL CONNECTION TO EXISTING MANHOLE BASE STD. DTL. RWRD 301.
4. INSTALL HCS CONNECTION TO MANHOLE PER STD. DTL. RWRD 402.
5. SEWER/WATER CROSSING PER STD. DTL. RWRD 108. CONTRACTOR TO VERIFY EXISTING ELEVATION PRIOR TO CONSTRUCTION. SEWER CONTRACTOR RESPONSIBLE FOR ANY DAMAGE DURING CONSTRUCTION.
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7. INSTALL BLOCK OUT PER RWRD 203, SIZE AND INVERT PER PLAN. INSTALL AT MANHOLE CONNECTION TEMPORARY PLUG AND SECURE WITH A CHAIN OR CABLE TO A MANHOLE STEP. PLUG TO INCLUDE CONTRACTOR'S COMPANY NAME. THE PLUG IS TO BE REMOVED AFTER PDEQ/ADEQ's DISCHARGE AUTHORIZATION AND POST PAVING INSPECTION AS DIRECTED BY THE FIELD ENGINEERING INSPECTOR. PLUG TO BE PLACED DOWNSTREAM OF ALL PROPOSED SERVICE LATERALS.
8. CONTRACTOR TO PROVIDE NEW SCOUR PROTECTION PER PAG AND RWRD STANDARDS
9. SEWER/STORM CROSSING PER RWRD SECTION 5.1.10.B CONTRACTOR TO VERIFY EXISTING ELEVATION PRIOR TO CONSTRUCTION. SEWER CONTRACTOR RESPONSIBLE FOR CROSSING CONSTRUCTION.
10. INSTALL SCOUR PROTECTION FOR SEWER LINES PER RWRD 113
11. NOT USED.
12. STABILIZED SURFACE PER STD. DTL. RWRD 111.

CONSTRUCTION KEYNOTES

1. INSTALL SURVEY MONUMENT PER P.A.G. STD. DTL. 103.
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35. INSTALL RCP CLASS V STORM DRAIN PIPE. LENGTH, SLOPE, AND DIAMETER PER PLAN, SEE STORM DRAIN PROFILE ON SHT. 36-37, 40-41

RELATED CASE #
OV914-009
2100731
OV114-018

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Call 811 or click Arizona811.com

LJA Engineering, Inc.
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PAVING PLAN AND PROFILE
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil) CERTIFICATE NO. 54544 ROBERT W. SCHLICHER Date Signed 12/16/24 ARIZONA U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

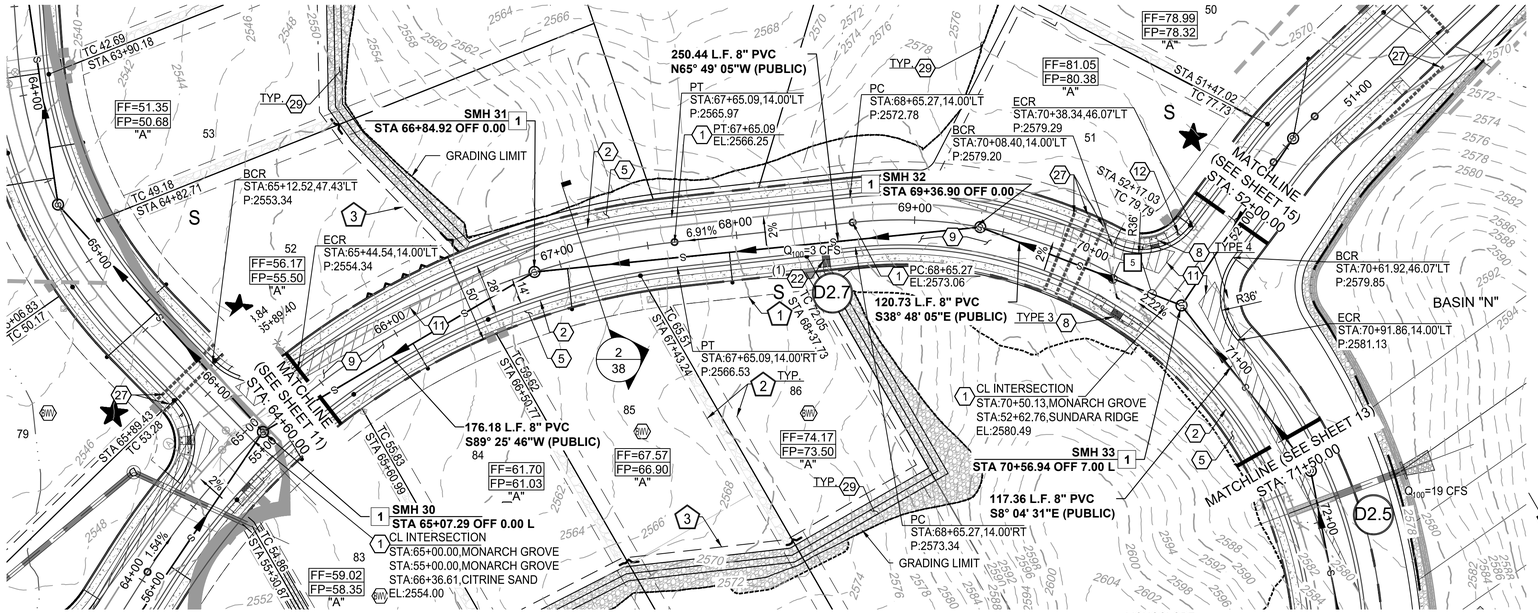
H: 1"=40' V: 1"=4' C.I.=2'
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007

DateTime: Tue, 10 Dec 2024 - 4:23pm PathName: S:\ARIZTucson\AZ4072-0400_AND_LJA MOVING FORWARD\BASE FILES\P\11 PAVING PLAN AND PROFILE.dwg



MONARCH GROVE (PRIVATE) STA. 64+60.00 TO STA. 71+50.00

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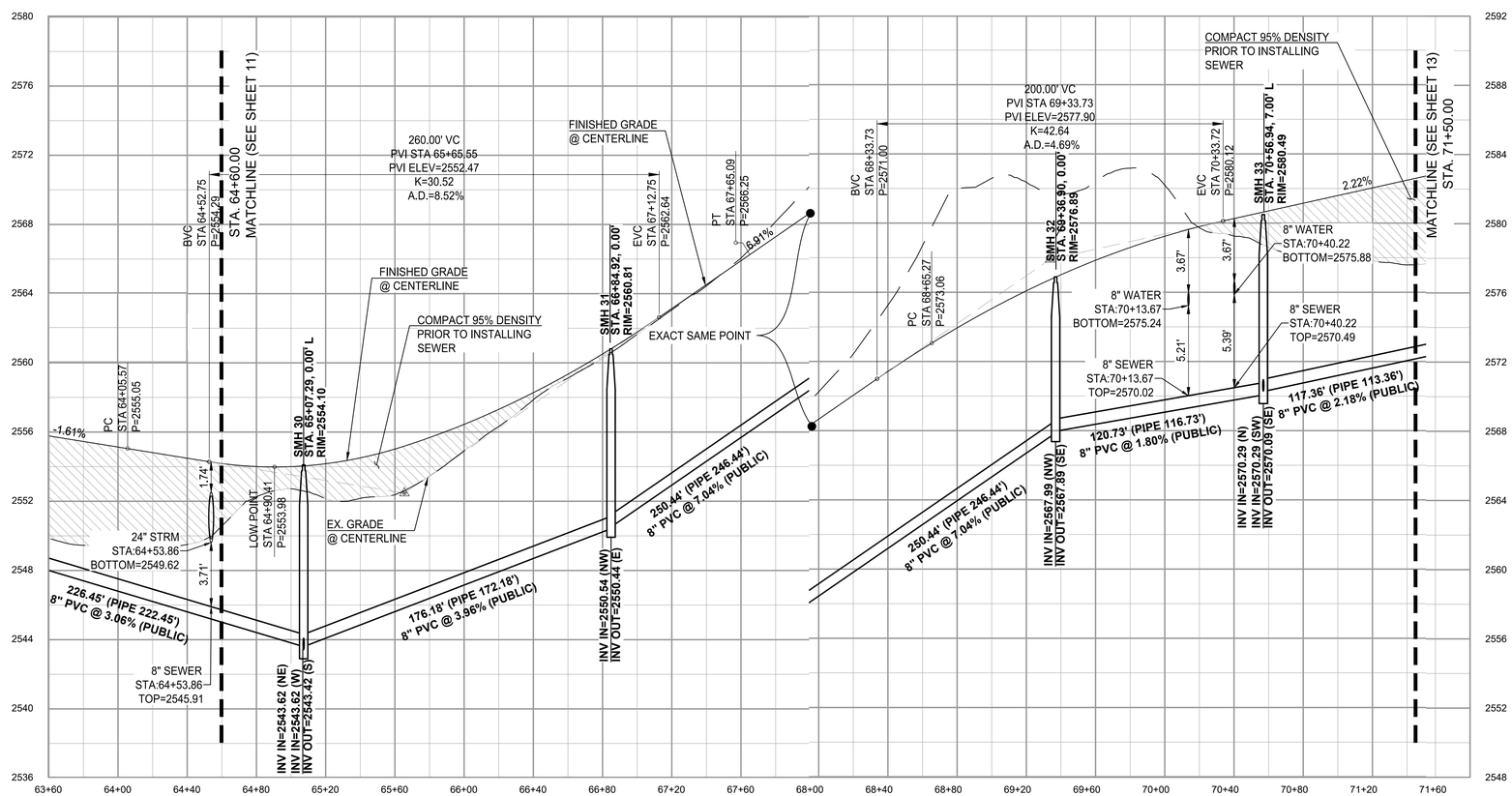

EASEMENT KEYNOTES

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LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
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2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 01/16/24
ARIZONA U.S.A.

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P22WI00005

G-2022-007

RELATED CASE #
OV914-009
2100731
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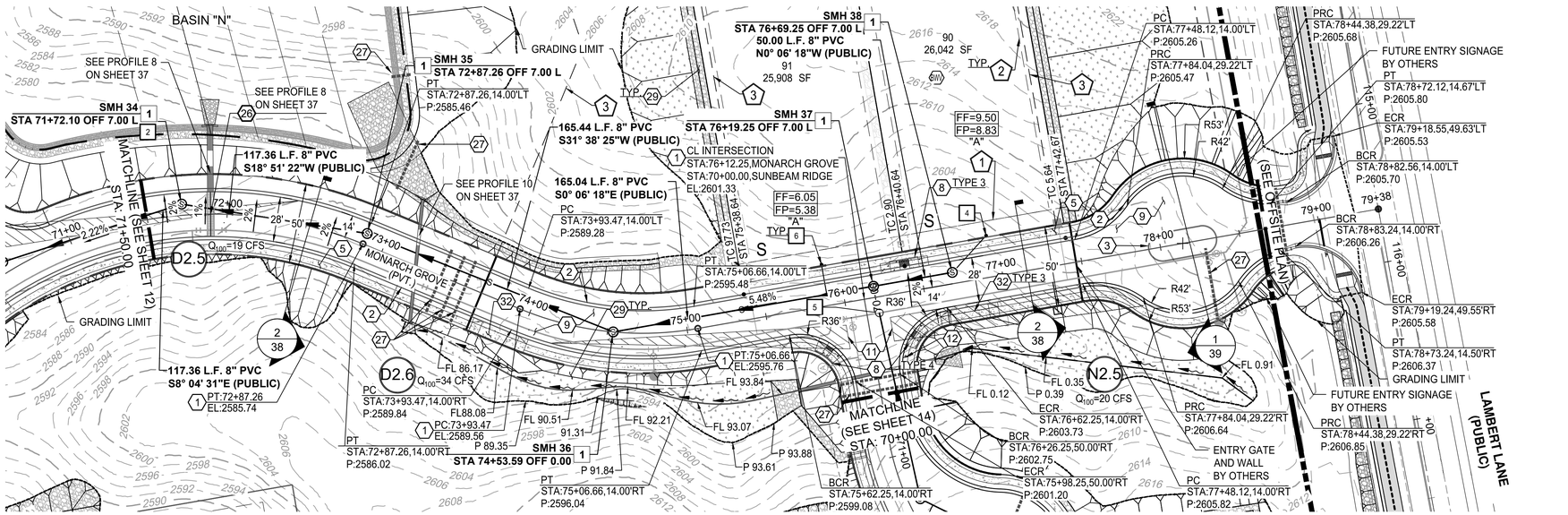
Call 811 or click Arizona811.com

Date/Time : Tue, 10 Dec 2024 - 4:28pm Path/Name : S:\ARIZ\Tucson\AZ4072\400_AND_LJA MOVING FORWARD\BASE FILES\Pv\12 PAVING PLAN AND PROFILE.dwg



MONARCH GROVE (PRIVATE) STA. 71+50.00 TO STA. 78+74.19

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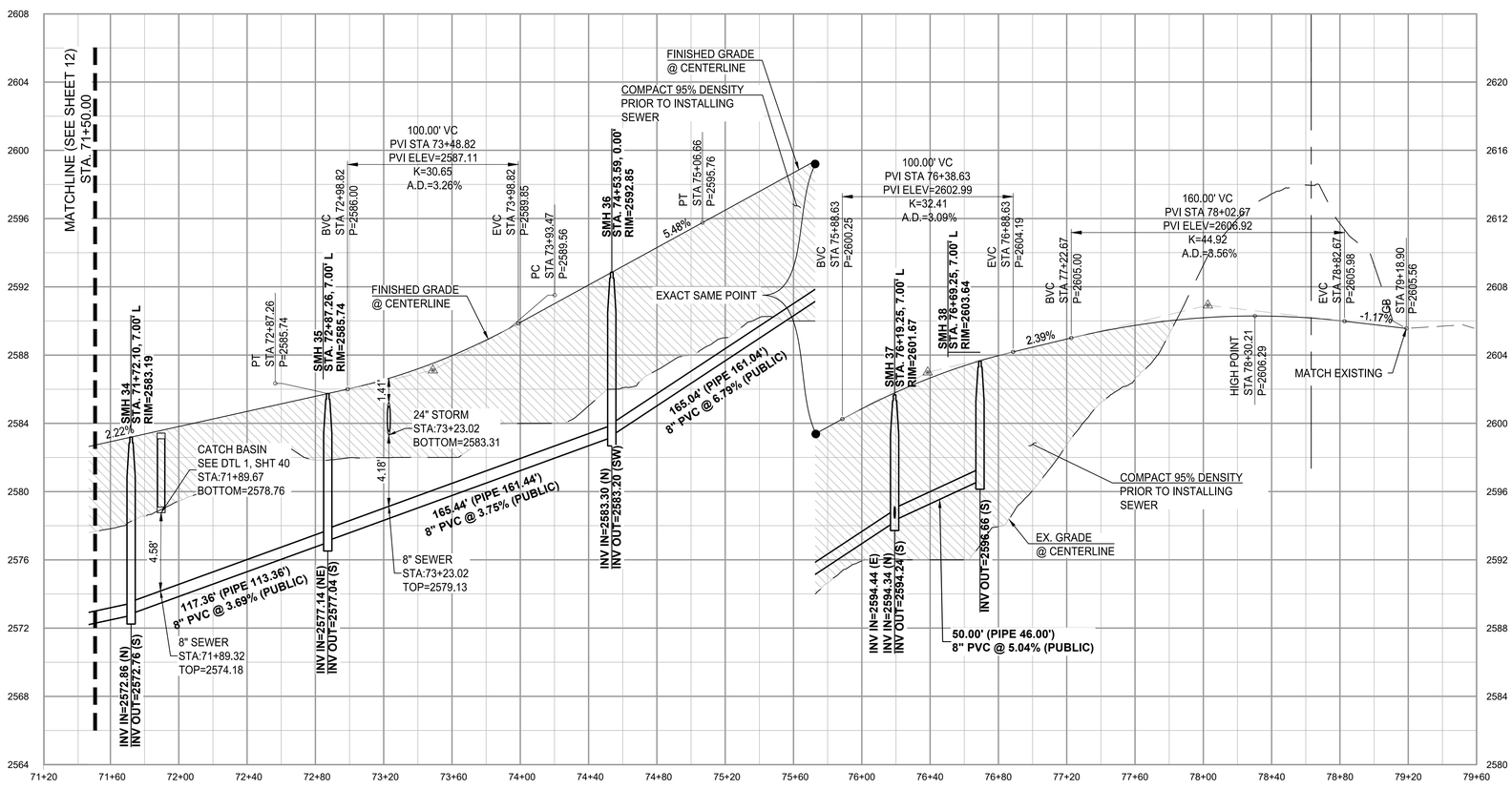

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2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil) CERTIFICATE NO. 54544 ROBERT W. SCHLICHER Date Signed 12/16/24 ARIZONA, U.S.A.

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12/16/24
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P22WI00005

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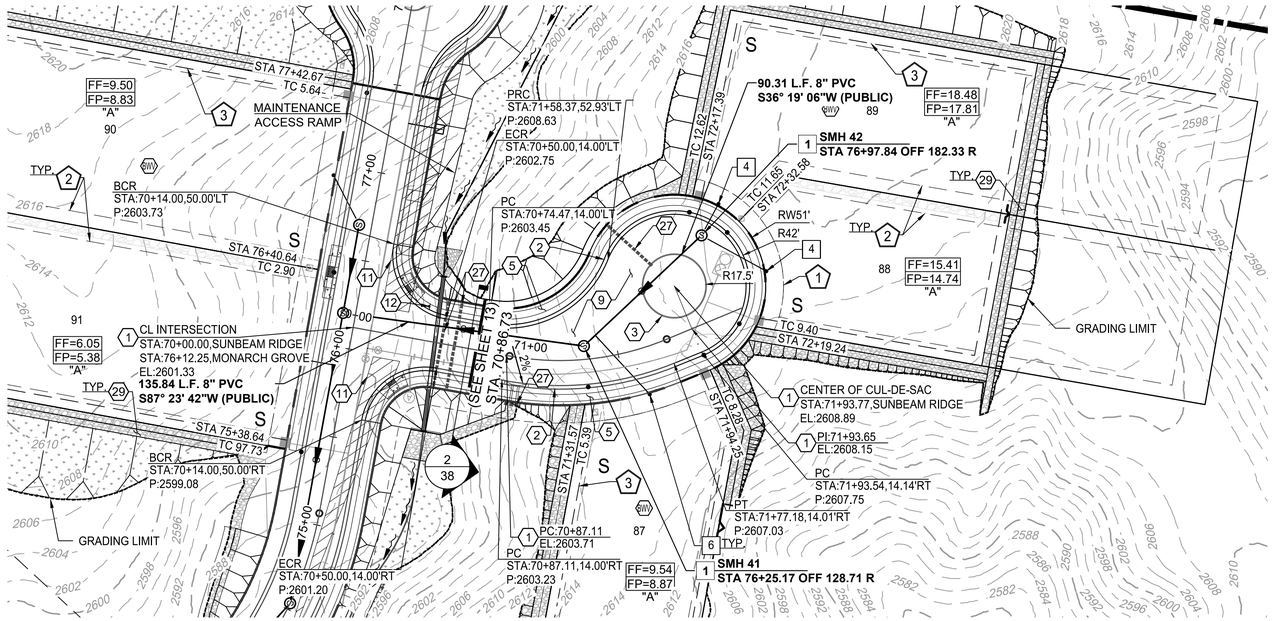
DateTime: Tue, 10 Dec 2024 - 4:32pm PathName: S:\ARIZ\Tucson\AZ4072\400LAND_LJA MOVING FORWARD\BASE FILES\PN113 PAVING PLAN AND PROFILE.dwg



SUNBEAM RIDGE (PRIVATE) STA. 70+50.00 TO STA. 72+24.38

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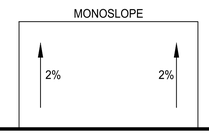

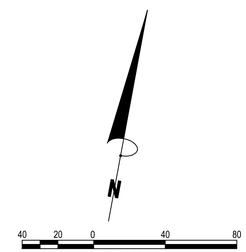

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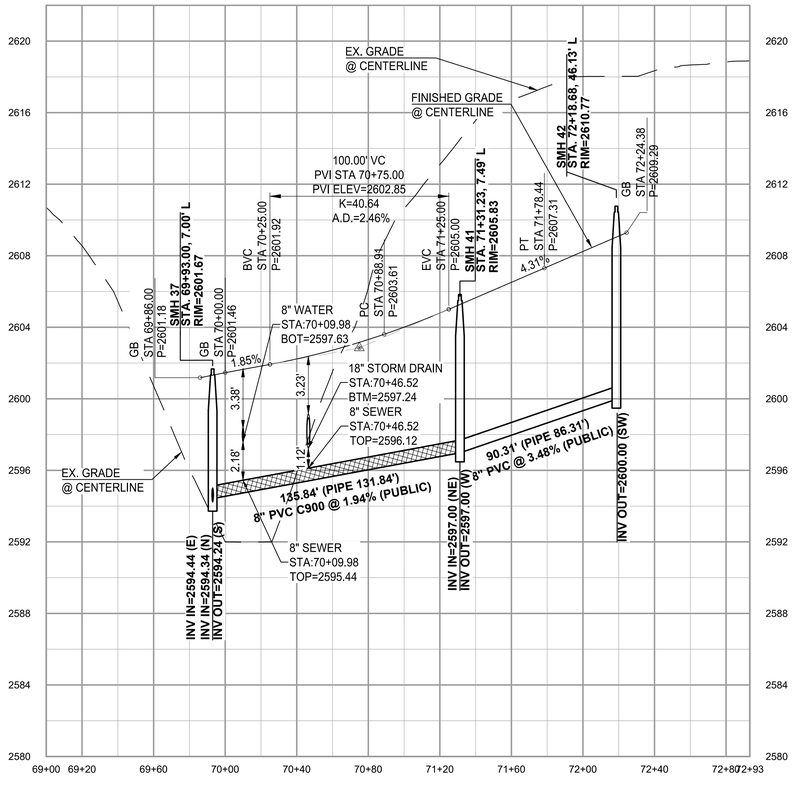

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27. NEW IRRIGATION LINE SLEEVE, THE CURB SHALL BE MARKED/STAMPED WITH "IS" (IRRIGATION SYSTEM), SEE LANDSCAPE PLAN FOR LINE INFORMATION.
28. INSTALL TYPE 4 CATCH BASIN PER PAG STD. DTL. 309.
29. SEE GRADING PLAN FOR DETAILS.
30. 2 - 24'x 6' ARCH CULVERTS, SEE PROFILE 1, SHT. 36 AND SHT. 45-51 FOR DTLS.
31. INSTALL HANDRAIL PER PAG STD. DTL. 105.
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RELATED CASE #
OV914-009
2100731
OV114-018

Contact Arizona 811 at least two full working days before you begin excavation
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Call 811 or click Arizona811.com

LJA Engineering, Inc.
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PAVING PLAN AND PROFILE
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

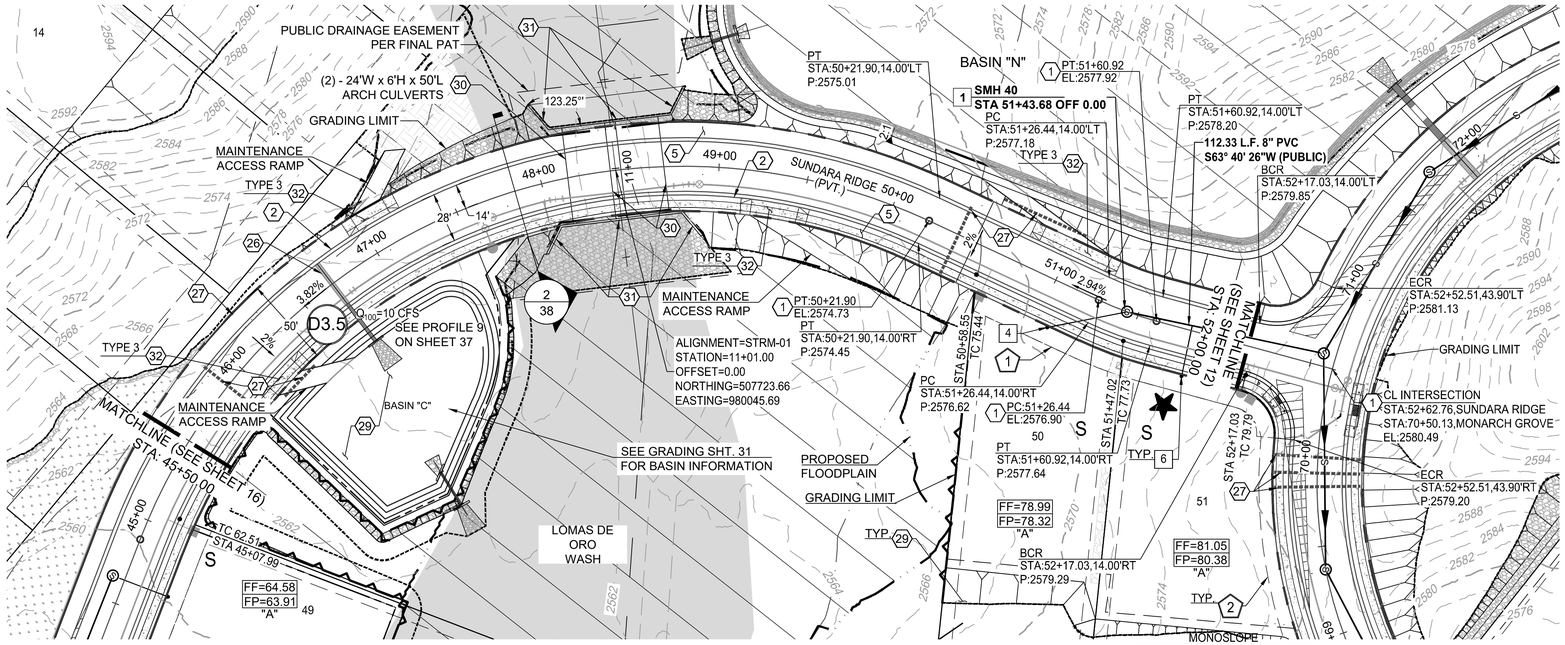
H: 1"=40' C.I.=2'
V: 1"=4'
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007

DateTime: Tue, 10 Dec 2024 - 4:34pm PathName: S:\ARIZTucson\AZ4072-0005_AND_LJA MOVING FORWARD\BASE FILES\P\14 PAVING PLAN AND PROFILE.dwg



SUNDARA RIDGE(PRIVATE) STA. 45+50.00 TO STA. 52+00.00

NOTE:
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PROFILE SCALE:
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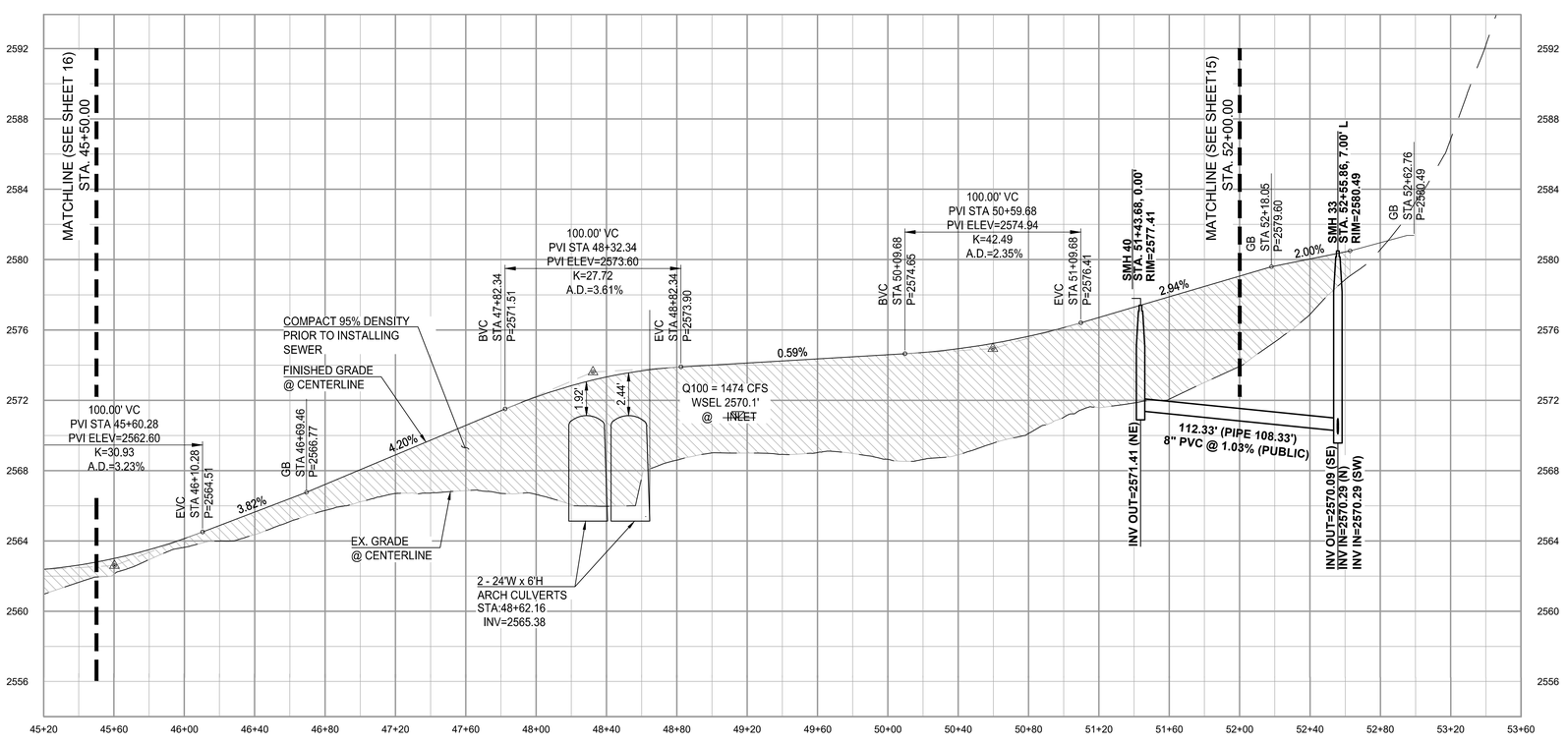
VERT: 1" = 4'



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3. DRAINAGE EASEMENT PER FINAL FLAT.

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5. SEWER/WATER CROSSING PER STD. DTL. RWRD 108. CONTRACTOR TO VERIFY EXISTING ELEVATION PRIOR TO CONSTRUCTION. SEWER CONTRACTOR RESPONSIBLE FOR ANY DAMAGE DURING CONSTRUCTION.
6. INSTALL HCS WITH CLEANOUT PER STD. DTL. RWRD 401 AND STD. DTL. RWRD 404.
7. INSTALL BLOCK OUT PER RWRD 203, SIZE AND INVERT PER PLAN. INSTALL AT MANHOLE CONNECTION TEMPORARY PLUG AND SECURE WITH A CHAIN OR CABLE TO A MANHOLE STEP. PLUG TO INCLUDE CONTRACTOR'S COMPANY NAME. THE PLUG IS TO BE REMOVED AFTER PDEQ/ADEQ's DISCHARGE AUTHORIZATION AND POST PAVING INSPECTION AS DIRECTED BY THE FIELD ENGINEERING INSPECTOR. PLUG TO BE PLACED DOWNSTREAM OF ALL PROPOSED SERVICE LATERALS.
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10. INSTALL SCOUR PROTECTION FOR SEWER LINES PER RWRD 113
11. NOT USED.
12. STABILIZED SURFACE PER STD. DTL. RWRD 111.

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NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil) CERTIFICATE NO. 54544 ROBERT W. SCHLICHER Date Signed 12/10/24 ARIZONA U.S.A.

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P22WI00005

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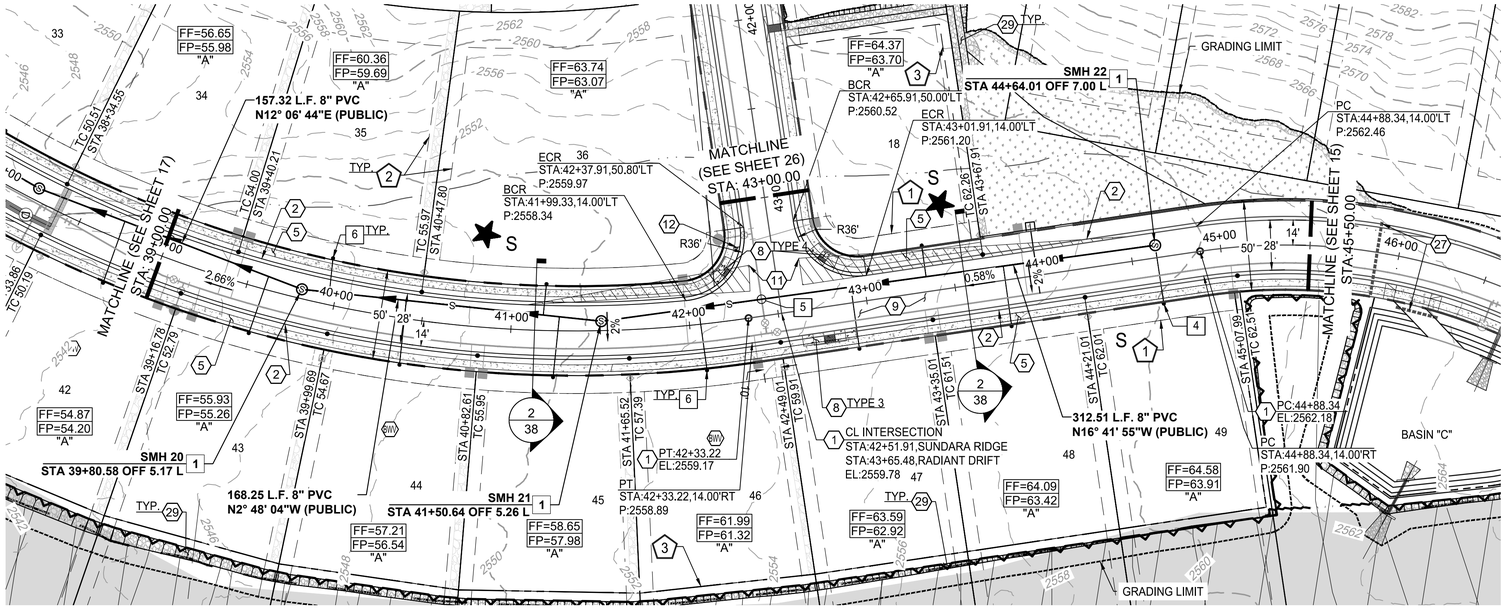

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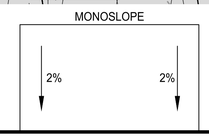

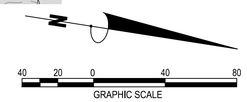

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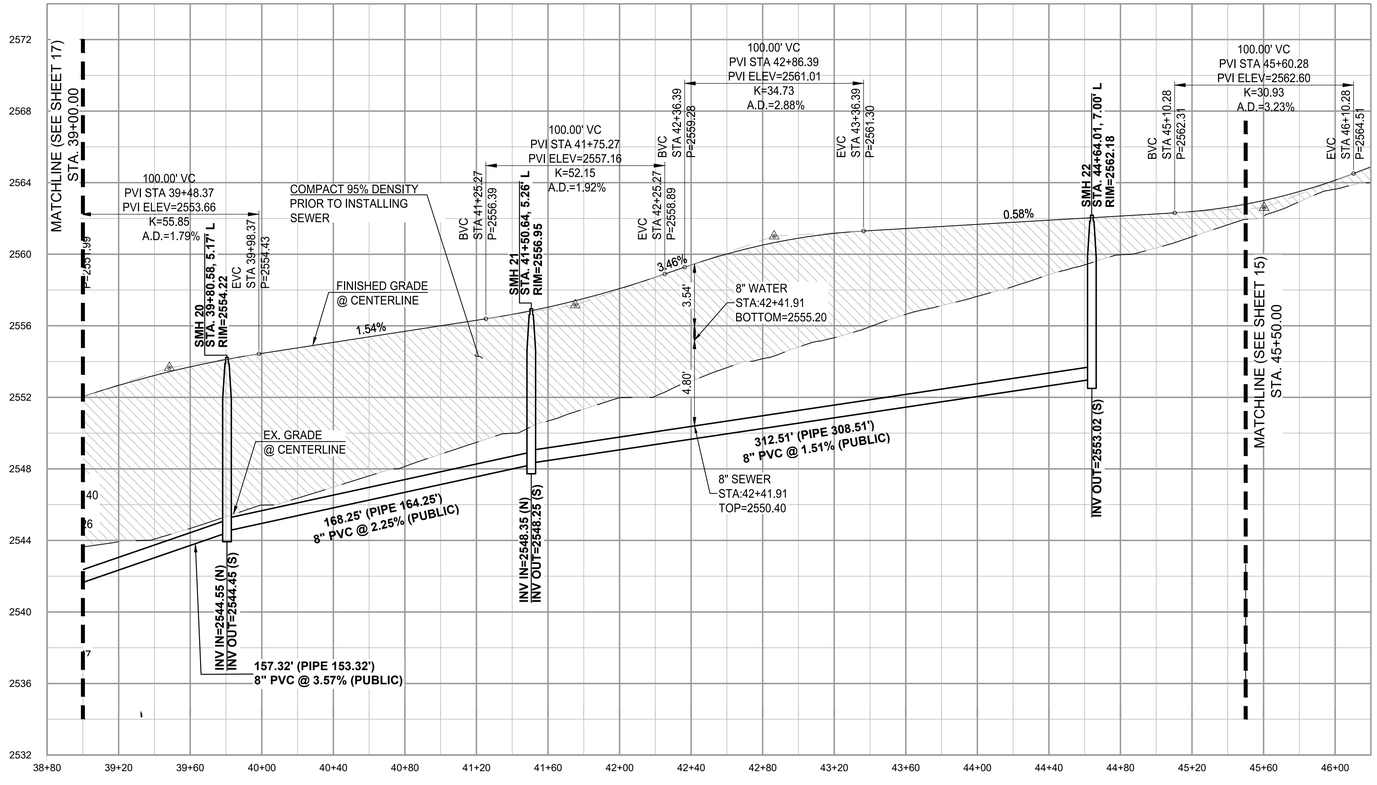

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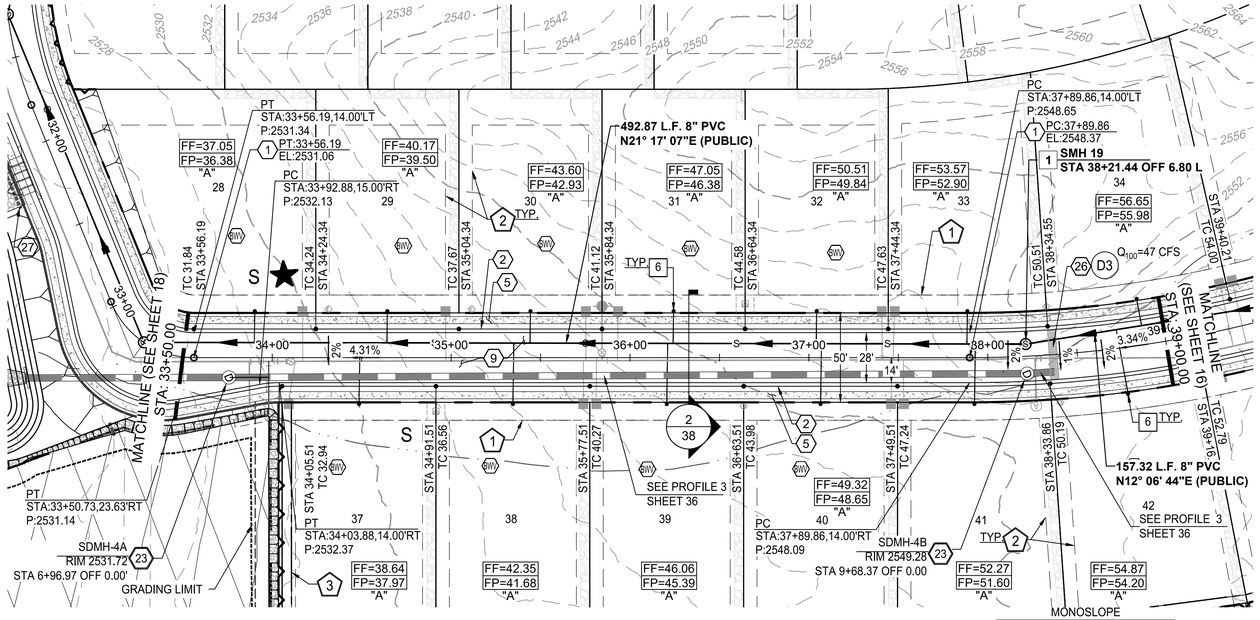

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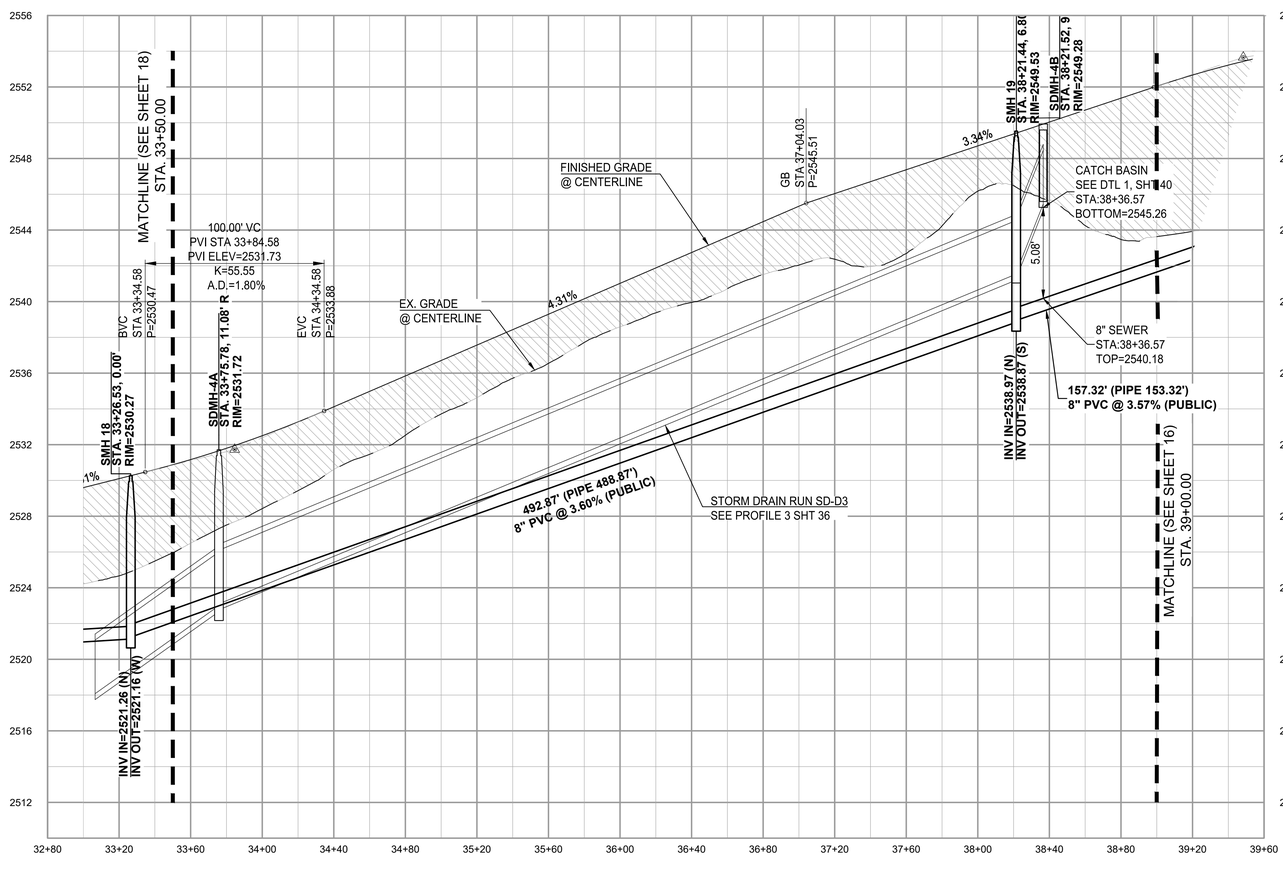

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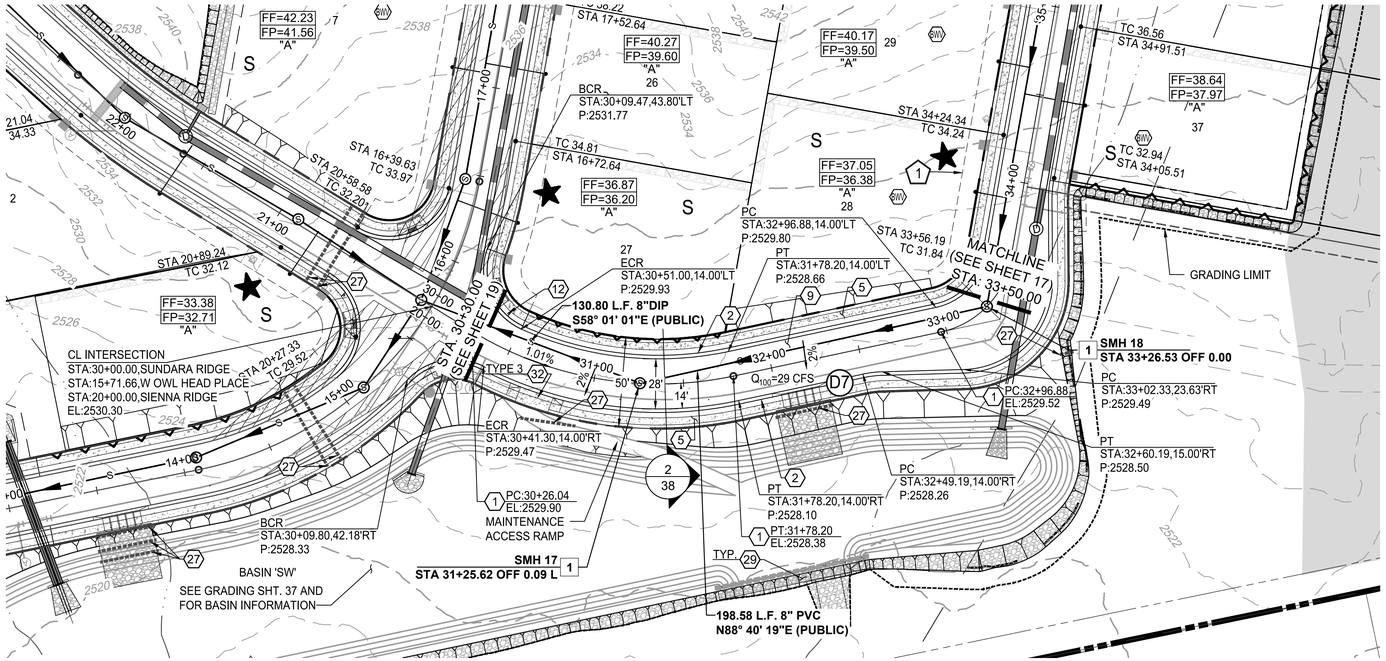

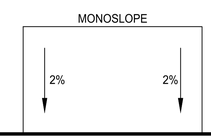

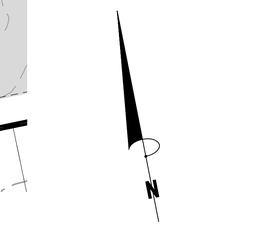

SUNDARA RIDGE (PRIVATE) STA. 30+30.00 TO STA. 33+50.00

NOTE:
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PROFILE SCALE:
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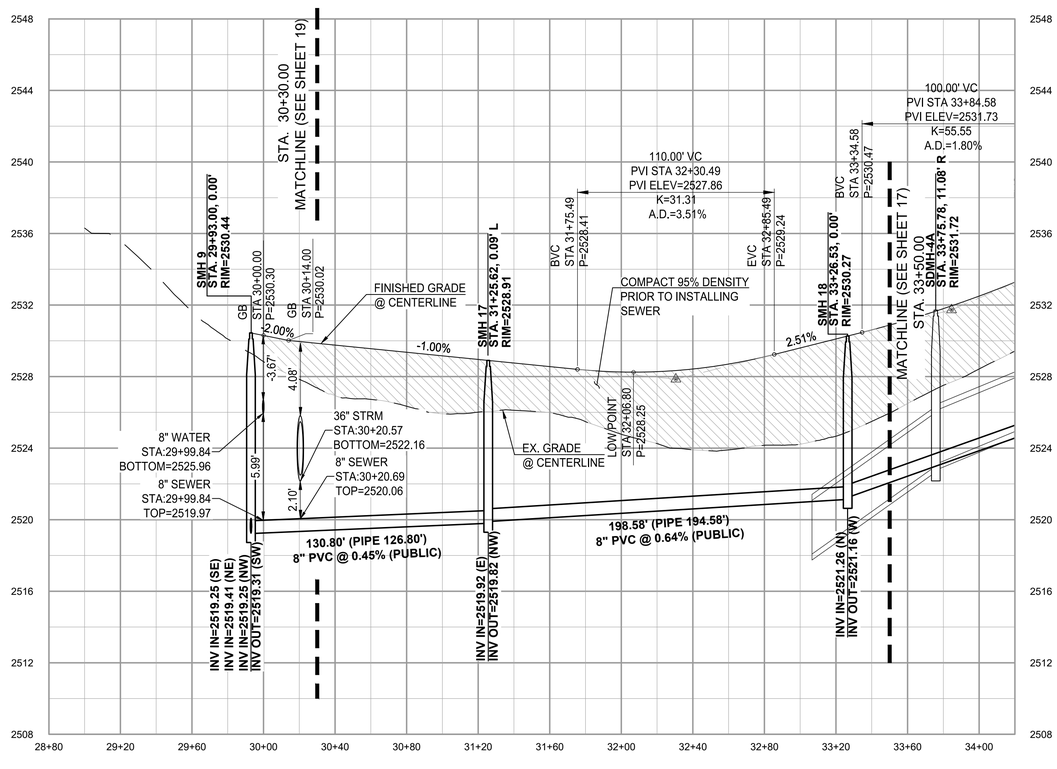

EASEMENT KEYNOTES

1. 10' PUBLIC UTILITY, ROADWAY MAINTENANCE, & SIGNAGE EASEMENT BY FINAL PLAT
2. BUILDING SETBACK LINE, SEE DTL. 6 SHT 38.
3. DRAINAGE EASEMENT PER FINAL FLAT.

SEWER KEYNOTES

1. CONSTRUCT 4' DIA. MANHOLE PER STD. DTL. RWRD 205 WITH CONCRETE COLLAR PER STD. DTL. RWRD 211
2. INSTALL 24" WATERTIGHT FRAME AND COVER PER STD. DTL. RWRD 214.
3. INSTALL CONNECTION TO EXISTING MANHOLE BASE STD. DTL. RWRD 301.
4. INSTALL HCS CONNECTION TO MANHOLE PER STD. DTL. RWRD 402.
5. SEWER/WATER CROSSING PER STD. DTL. RWRD 108. CONTRACTOR TO VERIFY EXISTING ELEVATION PRIOR TO CONSTRUCTION. SEWER CONTRACTOR RESPONSIBLE FOR ANY DAMAGE DURING CONSTRUCTION.
6. INSTALL HCS WITH CLEANOUT PER STD. DTL. RWRD 401 AND STD. DTL. RWRD 404.
7. INSTALL BLOCK OUT PER RWRD 203, SIZE AND INVERT PER PLAN. INSTALL AT MANHOLE CONNECTION TEMPORARY PLUG AND SECURE WITH A CHAIN OR CABLE TO A MANHOLE STEP. PLUG TO INCLUDE CONTRACTOR'S COMPANY NAME. THE PLUG IS TO BE REMOVED AFTER PDEQ/ADEQ's DISCHARGE AUTHORIZATION AND POST PAVING INSPECTION AS DIRECTED BY THE FIELD ENGINEERING INSPECTOR. PLUG TO BE PLACED DOWNSTREAM OF ALL PROPOSED SERVICE LATERALS.
8. CONTRACTOR TO PROVIDE NEW SCOUR PROTECTION PER PAG AND RWRD STANDARDS
9. SEWER/STORM CROSSING PER RWRD SECTION 5.1.10.B CONTRACTOR TO VERIFY EXISTING ELEVATION PRIOR TO CONSTRUCTION. SEWER CONTRACTOR RESPONSIBLE FOR CROSSING CONSTRUCTION.
10. INSTALL SCOUR PROTECTION FOR SEWER LINES PER RWRD 113
11. NOT USED.
12. STABILIZED SURFACE PER STD. DTL. RWRD 111.

CONSTRUCTION KEYNOTES

1. INSTALL SURVEY MONUMENT PER P.A.G. STD. DTL. 103.
2. CONSTRUCT 2' WEDGE CURB (H=6") PER P.A.G. STD. DTL. 209.
3. CONSTRUCT 6" REVEAL VERTICAL CURB PER P.A.G. STD. DTL. 209. (TYPE 2).
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5. CONSTRUCT CONCRETE SIDEWALK PER P.A.G. STD. DTL. 200. STANDARD 4' WIDE SIDEWALK UNLESS OTHERWISE NOTED.
6. NEW CONCRETE CURB TO EXISTING CONNECTION PER P.A.G. STD. DTL. 211.
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35. INSTALL RCP CLASS V STORM DRAIN PIPE. LENGTH, SLOPE, AND DIAMETER PER PLAN, SEE STORM DRAIN PROFILE ON SHT. 36-37, 40-41

RELATED CASE #
OV914-009
2100731
OV114-018

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA 811
Call 811 or click Arizona811.com

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

PAVING PLAN AND PROFILE
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: 1"=40' C.I.=2'
V: 1"=4'
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007

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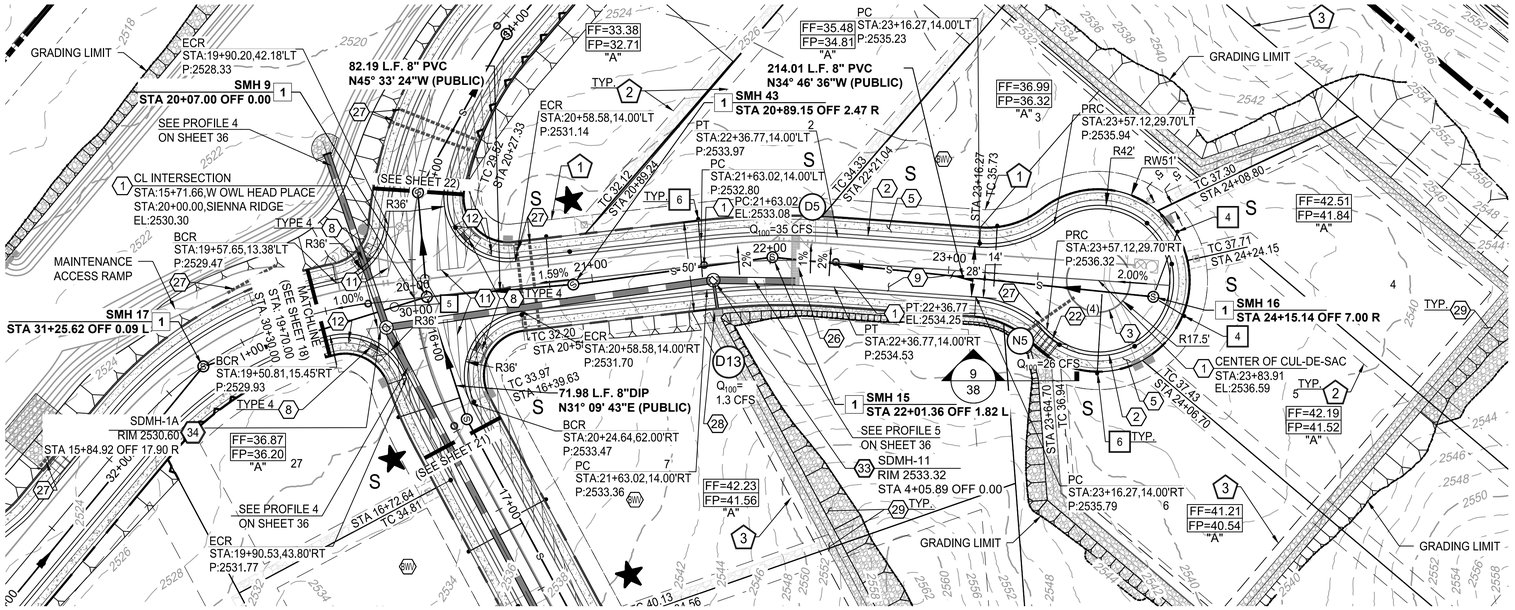

SIENNA RIDGE (PRIVATE) STA. 19+70.00 TO STA. 23+83.91

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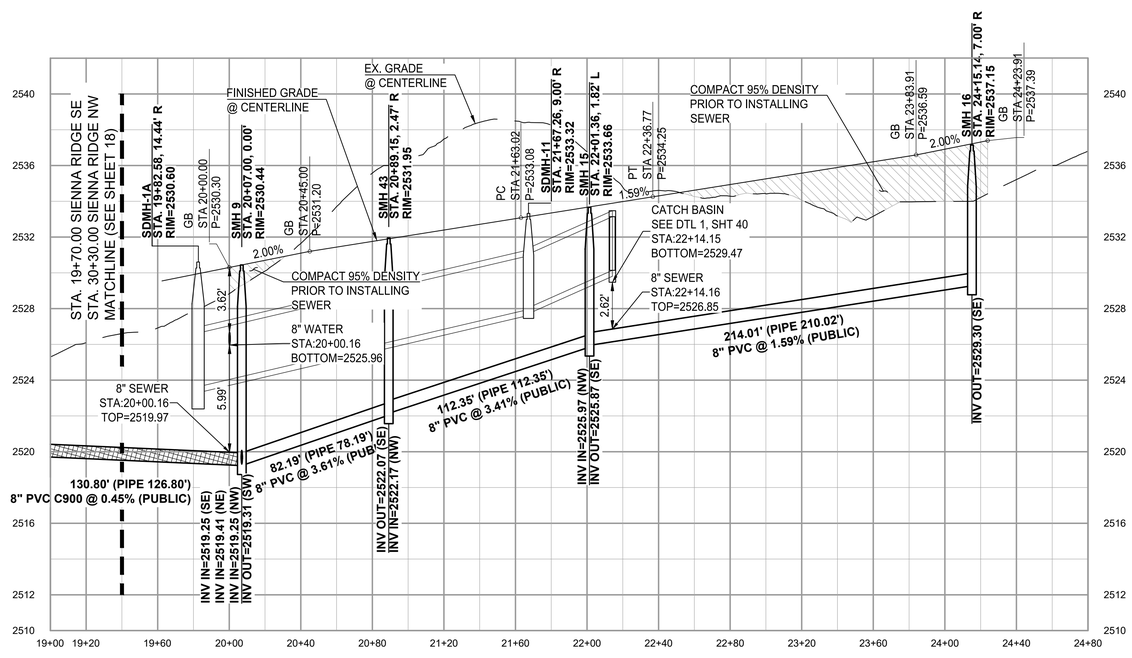

EASEMENT KEYNOTES

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2. BUILDING SETBACK LINE, SEE DTL. 6 SHT 38.
3. DRAINAGE EASEMENT PER FINAL FLAT.

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11. NOT USED.
12. STABILIZED SURFACE PER STD. DTL. RWRD 111.

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RELATED CASE #
OV914-009
2100731
OV114-018

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PAVING PLAN AND PROFILE
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: 1"=40' V: 1"=4' C.I.=2'
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007

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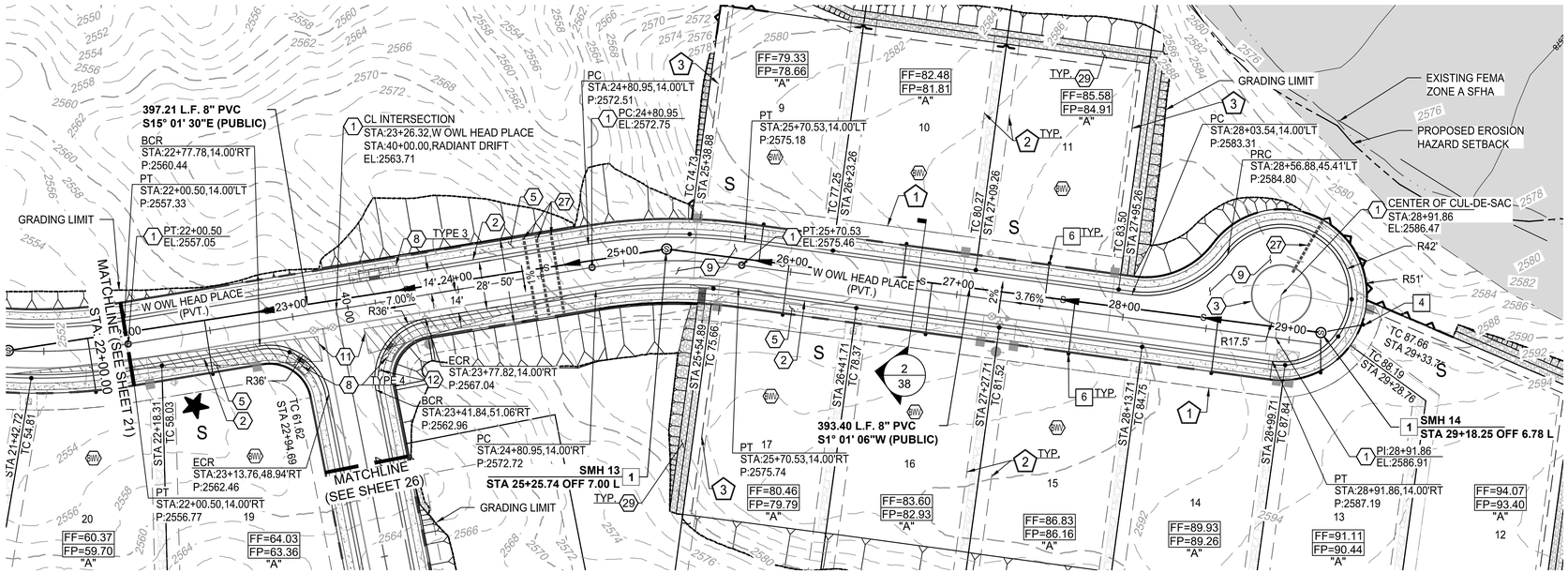

W OWL HEAD PLACE(PRIVATE) STA. 22+00.00 TO STA. 29+18.23

NOTE:
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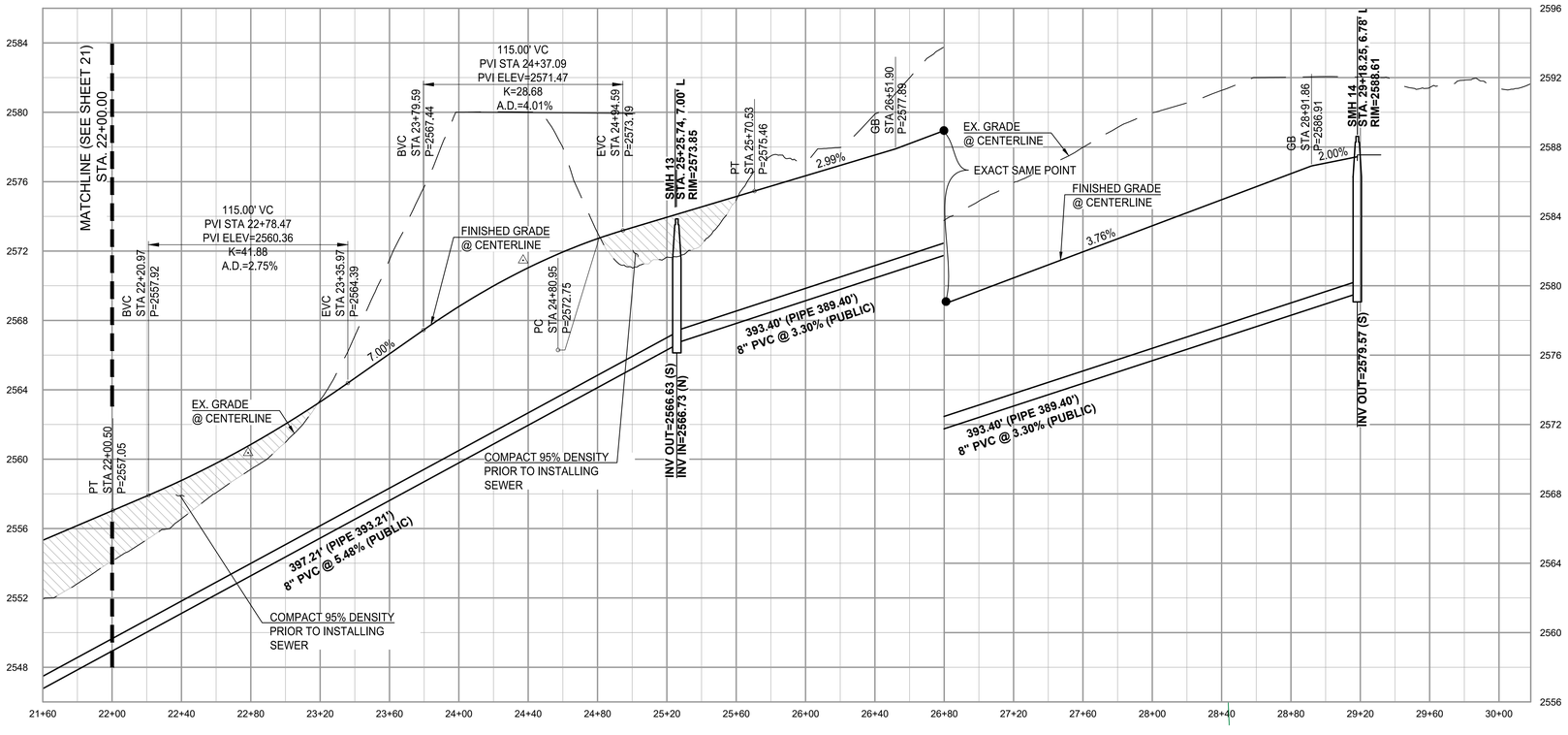

EASEMENT KEYNOTES

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11. NOT USED.
12. STABILIZED SURFACE PER STD. DTL. RWRD 111.

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RELATED CASE #
OV914-009
2100731
OV114-018

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SUNDARA RIDGE LOTS 1 THROUGH 91
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2101153

NO.	DATE	REVISION	APP.

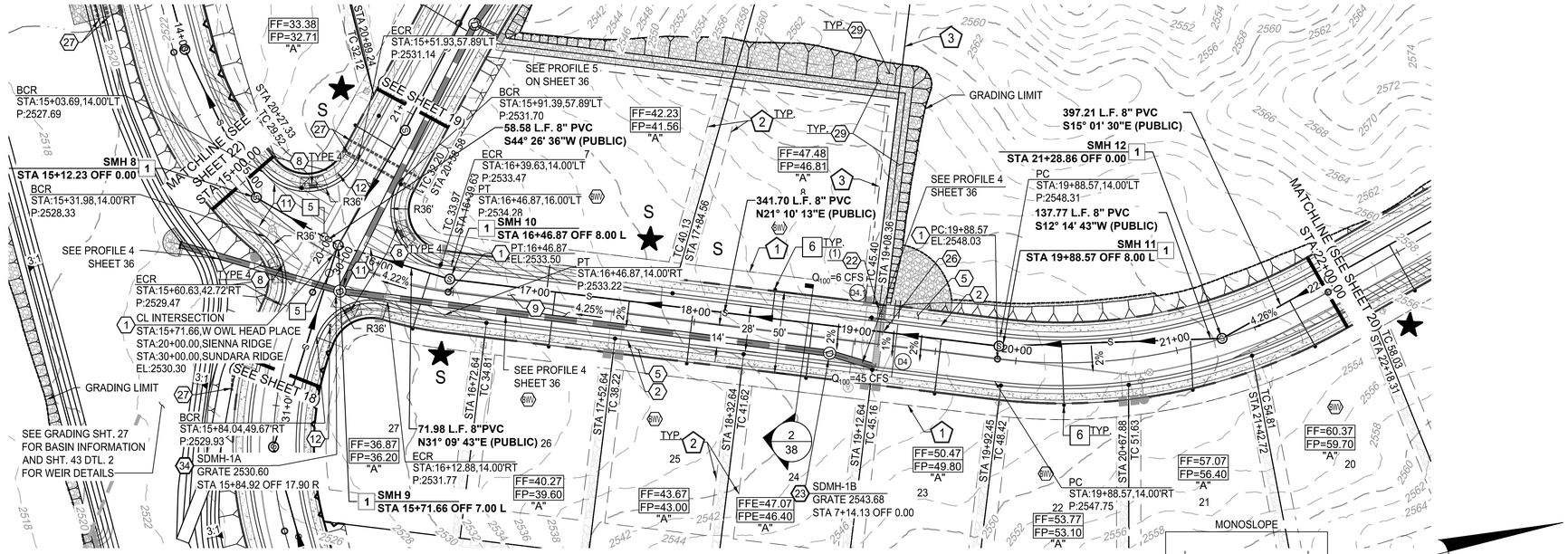
Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: 1"=40' C.I.=2'
V: 1"=4'
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131
P22WI00005
G-2022-007

DateTime: Tue, 10 Dec 2024 - 4:53pm PathName: S:\ARIZTucson\AZ4072-4000_AND_LJA MOVING FORWARD\BASE FILES\PV\20 PAVING PLAN AND PROFILE.dwg



W OWL HEAD PLACE (PRIVATE) STA. 15+00.00 TO STA. 22+00.00

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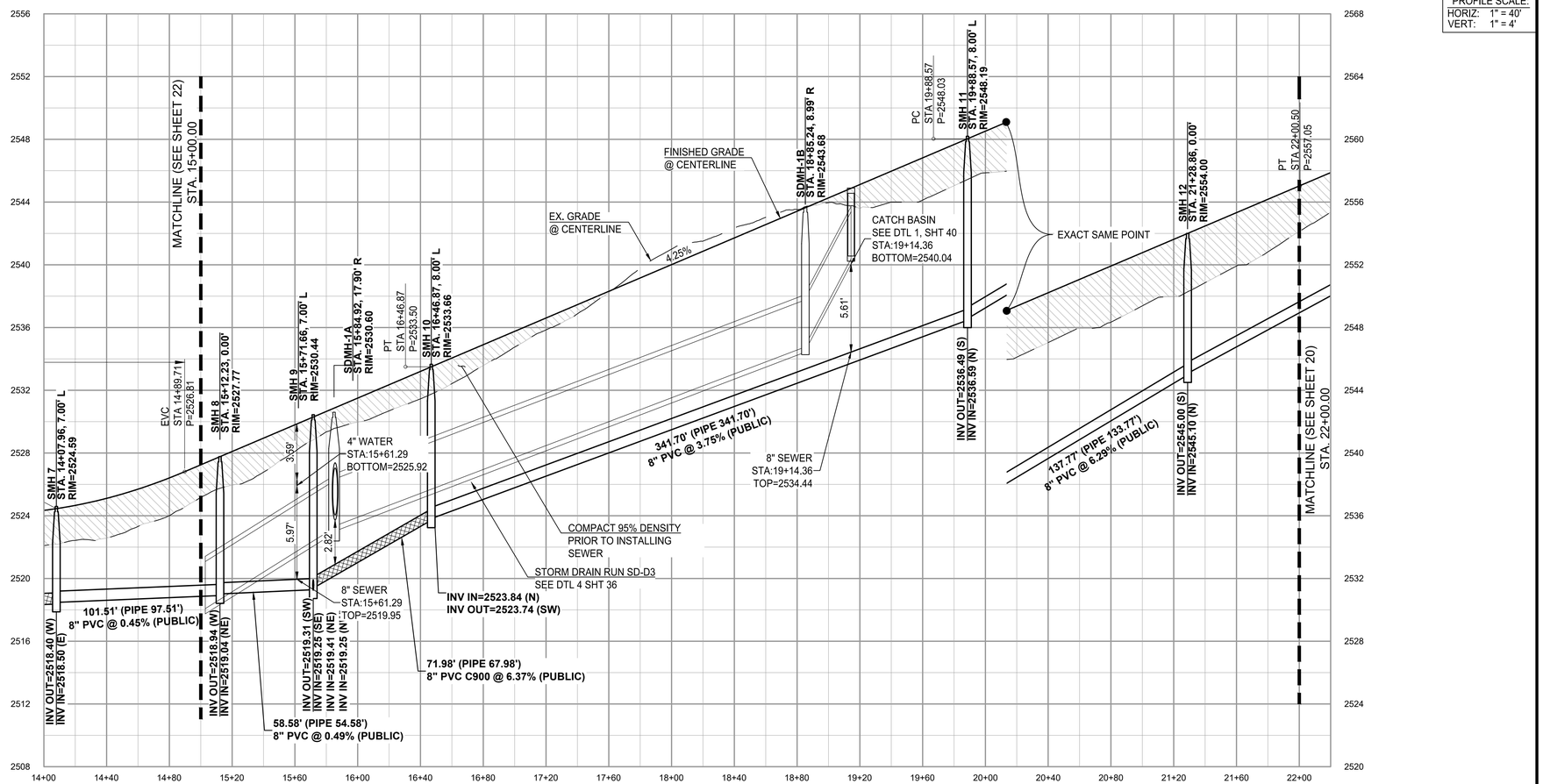

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2. CONSTRUCT 2' WEDGE CURB (H=6") PER P.A.G. STD. DTL. 209.
3. CONSTRUCT 6" REVEAL VERTICAL CURB PER P.A.G. STD. DTL. 209. (TYPE 2).
4. CONSTRUCT MODIFIED TRANSITION CURB FROM VERTICAL CURB TO WEDGE CURB PER P.A.G. STD. DTL. 210.
5. CONSTRUCT CONCRETE SIDEWALK PER P.A.G. STD. DTL. 200. STANDARD 4' WIDE SIDEWALK UNLESS OTHERWISE NOTED.
6. NEW CONCRETE CURB TO EXISTING CONNECTION PER P.A.G. STD. DTL. 211.
7. SAWCUT 2' OF EXISTING PAVEMENT, TACK, AND JOIN TO EXISTING.
8. CONSTRUCT CURB RAMPS PER P.A.G. STD. DTL. 207. SEE PLAN FOR TYPE OF RAMPS.
9. INSTALL 3" AC OVER 5" ABC SEE DTL. 10, SHT. 38.
10. SLOPE STABILIZATION, SEE DTL. 8, SHT. 38
11. SIGHT VISIBILITY TRIANGLE, SEE DTL. 4, SHT. 38.
12. INSTALL 30" X 30" R1-1 "STOP SIGN" AND STREET NAME SIGN.
13. CONSTRUCT TYPE 3 SIDEWALK SCUPPER PER P.A.G. STD. DTL. 205.5. NUMBER OF CELLS AS NOTED. SEE SHT. 37 FOR DETAILS, W/ GUARDRAIL PER PAG. 105
22. CONSTRUCT TYPE 2 SIDEWALK SCUPPER PER P.A.G. STD. DTL. 205 NUMBER OF CELLS AS NOTED.
23. CONSTRUCT 48" STORM DRAIN MANHOLE PER PAG STD. DTL. 300 & 302.
26. INSTALL CATCH BASIN PER DETAIL 1 SHT. 40 AND SEE STORM DRAIN PROFILES ON SHT. 36-37, 40-41
27. NEW IRRIGATION LINE SLEEVE, THE CURB SHALL BE MARKED/STAMPED WITH "IS" (IRRIGATION SYSTEM), SEE LANDSCAPE PLAN FOR LINE INFORMATION.
28. INSTALL TYPE 4 CATCH BASIN PER PAG STD. DTL. 309.
29. SEE GRADING PLAN FOR DETAILS.
30. 2 - 24'x 6' ARCH CULVERTS, SEE PROFILE 1, SHT. 36 AND SHT. 45-51 FOR DTLS.
31. INSTALL HANDRAIL PER PAG STD. DTL. 105.
32. CONSTRUCT DRIVEWAY APRON PER P.A.G. STD. DTL. 206.
33. CONSTRUCT 60" STORM DRAIN MANHOLE PER PAG STD. DTL. 301 & 302.
34. CONSTRUCT 72" STORM DRAIN MANHOLE PER PAG STD. DTL. 301 & 302.
35. INSTALL RCP CLASS V STORM DRAIN PIPE. LENGTH, SLOPE, AND DIAMETER PER PLAN, SEE STORM DRAIN PROFILE ON SHT. 36-37, 40-41

RELATED CASE #
OV914-009
2100731
OV114-018

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

PAVING PLAN AND PROFILE
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA, U.S.A.

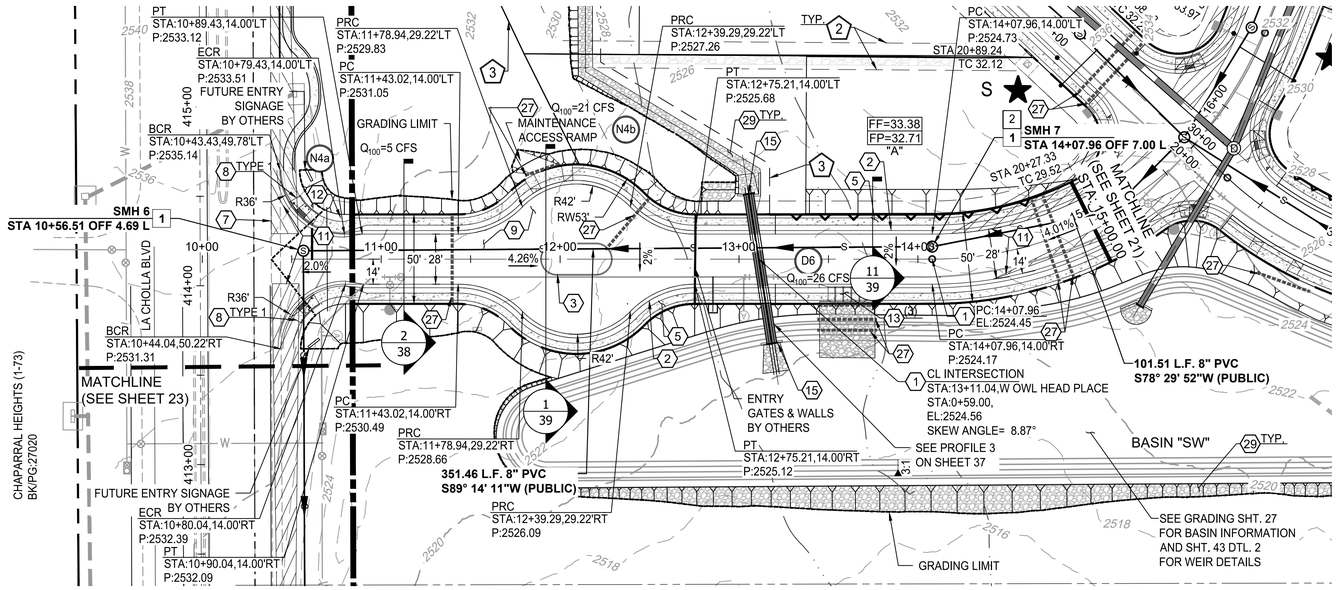
PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: 1"=40' C.I.=2'
V: 1"=4'
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007



W OWL HEAD PLACE (PRIVATE) STA. 9+50.00 TO STA. 15+00.00

NOTE:
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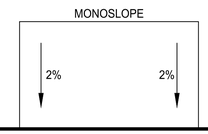
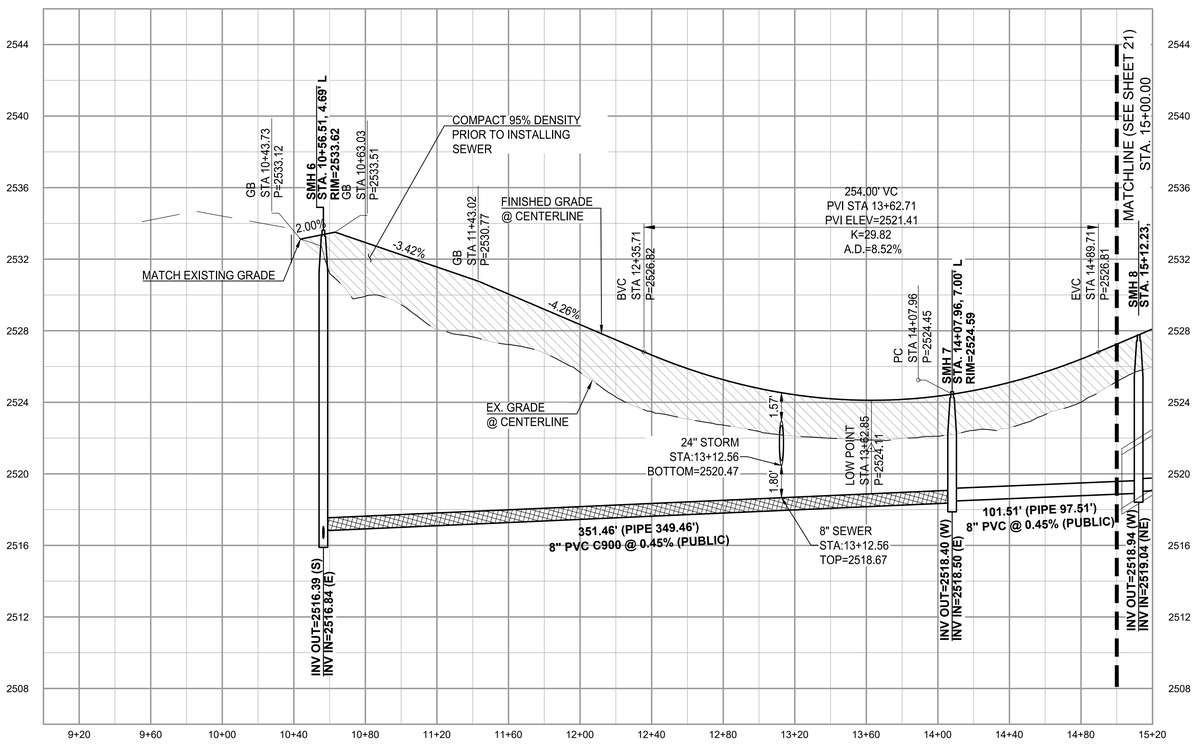
2. ALL SEWER H.C.S. ARE CENTERED BETWEEN LOT LINES UNLESS OTHERWISE NOTED.



GRAPHIC SCALE 1" = 40'

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



EASEMENT KEYNOTES

1. 10' PUBLIC UTILITY, ROADWAY MAINTENANCE, & SIGNAGE EASEMENT BY FINAL PLAT
2. BUILDING SETBACK LINE, SEE DTL. 6 SHT 38.
3. DRAINAGE EASEMENT PER FINAL FLAT.

SEWER KEYNOTES

1. CONSTRUCT 4' DIA. MANHOLE PER STD. DTL. RWRD 205 WITH CONCRETE COLLAR PER STD. DTL. RWRD 211
2. INSTALL 24" WATERTIGHT FRAME AND COVER PER STD. DTL. RWRD 214.
3. INSTALL CONNECTION TO EXISTING MANHOLE BASE STD. DTL. RWRD 301.
4. INSTALL HCS CONNECTION TO MANHOLE PER STD. DTL. RWRD 402.
5. SEWER/WATER CROSSING PER STD. DTL. RWRD 108. CONTRACTOR TO VERIFY EXISTING ELEVATION PRIOR TO CONSTRUCTION. SEWER CONTRACTOR RESPONSIBLE FOR ANY DAMAGE DURING CONSTRUCTION.
6. INSTALL HCS WITH CLEANOUT PER STD. DTL. RWRD 401 AND STD. DTL. RWRD 404.
7. INSTALL BLOCK OUT PER RWRD 203, SIZE AND INVERT PER PLAN. INSTALL AT MANHOLE CONNECTION TEMPORARY PLUG AND SECURE WITH A CHAIN OR CABLE TO A MANHOLE STEP. PLUG TO INCLUDE CONTRACTOR'S COMPANY NAME. THE PLUG IS TO BE REMOVED AFTER PDEQ/ADEQ's DISCHARGE AUTHORIZATION AND POST PAVING INSPECTION AS DIRECTED BY THE FIELD ENGINEERING INSPECTOR. PLUG TO BE PLACED DOWNSTREAM OF ALL PROPOSED SERVICE LATERALS.
8. CONTRACTOR TO PROVIDE NEW SCOUR PROTECTION PER PAG AND RWRD STANDARDS
9. SEWER/STORM CROSSING PER RWRD SECTION 5.1.10.B CONTRACTOR TO VERIFY EXISTING ELEVATION PRIOR TO CONSTRUCTION. SEWER CONTRACTOR RESPONSIBLE FOR CROSSING CONSTRUCTION.
10. INSTALL SCOUR PROTECTION FOR SEWER LINES PER RWRD 113
11. NOT USED.
12. STABILIZED SURFACE PER STD. DTL. RWRD 111.

CONSTRUCTION KEYNOTES

1. INSTALL SURVEY MONUMENT PER P.A.G. STD. DTL. 103.
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RELATED CASE #
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2100731
OV114-018

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SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil) CERTIFICATE NO. 54544 ROBERT W. SCHLICHER Date Signed 12/16/24 ARIZONA U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: 1"=40' V: 1"=4' C.I.=2'
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007

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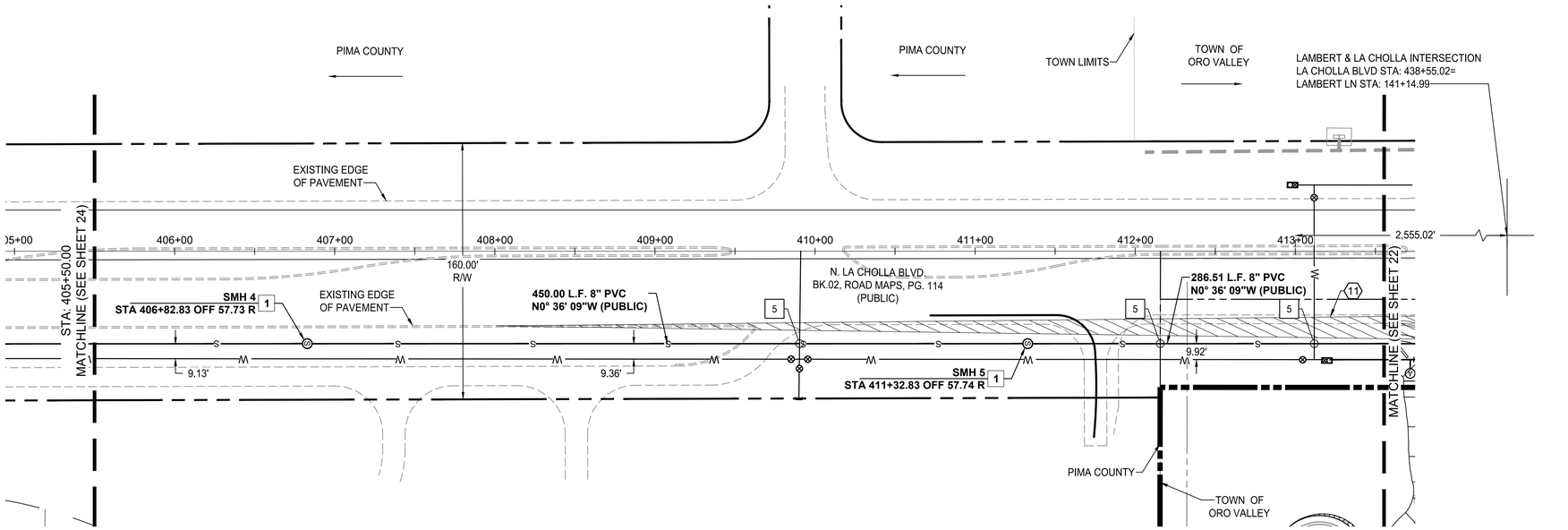
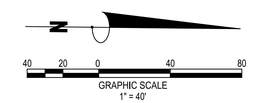
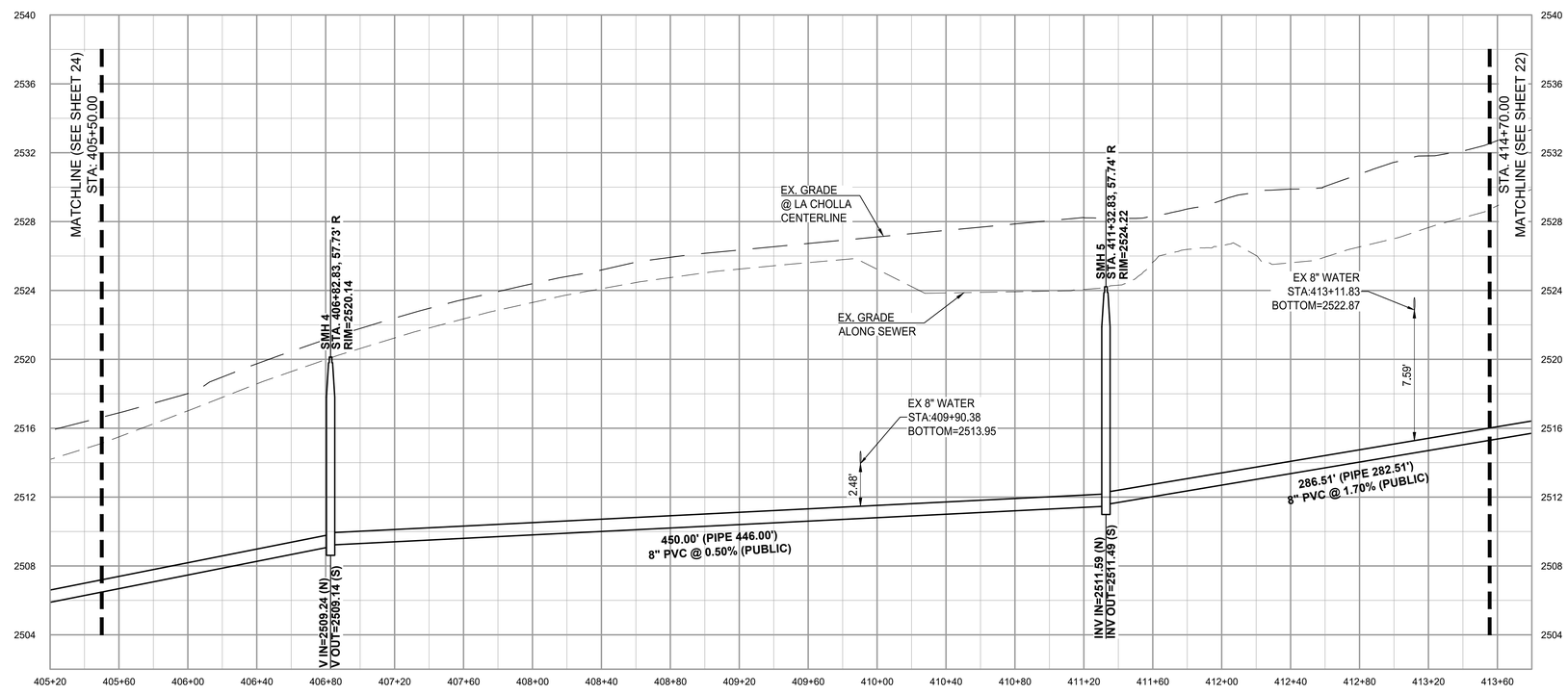


OSS-01 STA. 405+50.00 TO STA. 414+70.00
N. LA CHOLLA BLVD.



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



EASEMENT KEYNOTES

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3. DRAINAGE EASEMENT PER FINAL FLAT.

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10. INSTALL SCOUR PROTECTION FOR SEWER LINES PER RWRD 113
11. NOT USED.
12. STABILIZED SURFACE PER STD. DTL. RWRD 111.

RELATED CASE #
OV914-009
2100731
OV114-018

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SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA U.S.A.

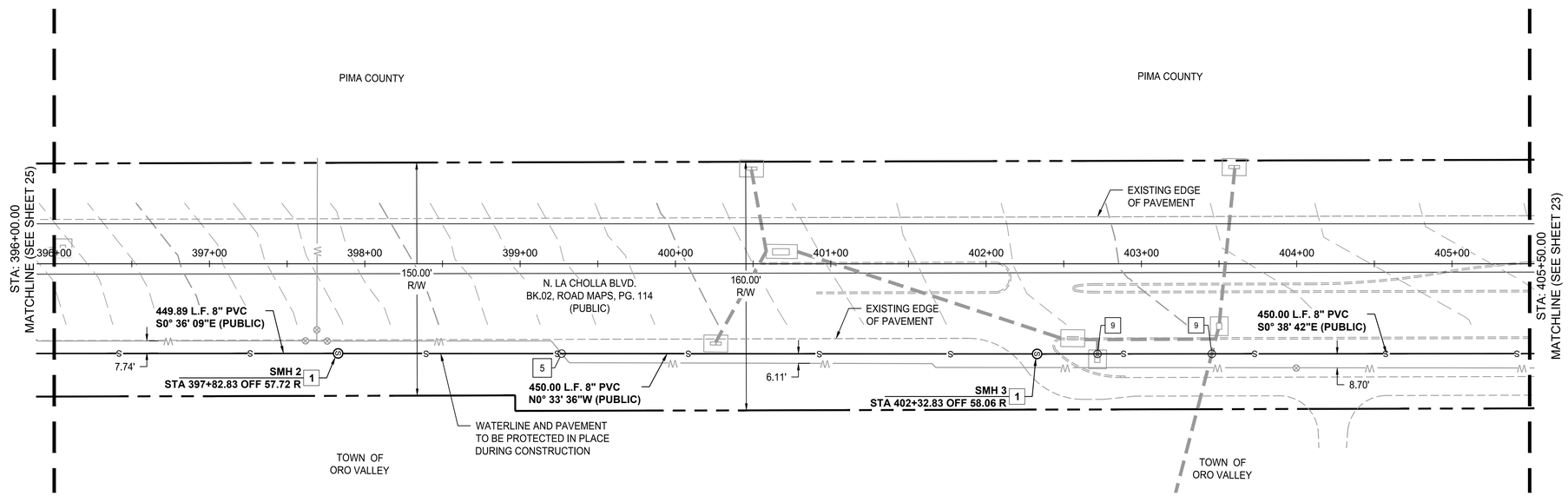
PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: 1"=40' C.I.=2'
V: 1"=4'
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI0005

G-2022-007



OSS-01 STA. 396+00.00 TO STA. 405+50.00
N. LA CHOLLA BLVD.

N

40 20 0 40 80
GRAPHIC SCALE
1" = 40'

PROFILE SCALE:
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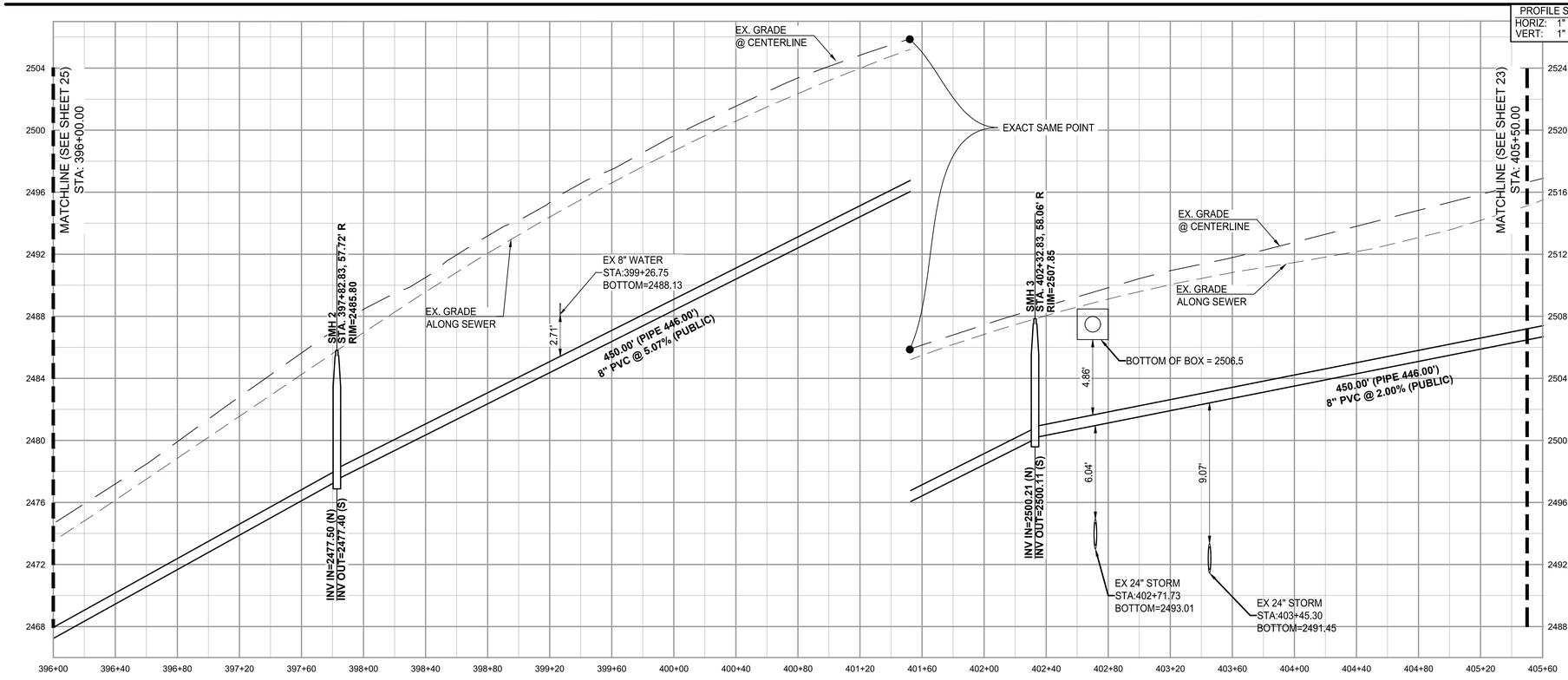

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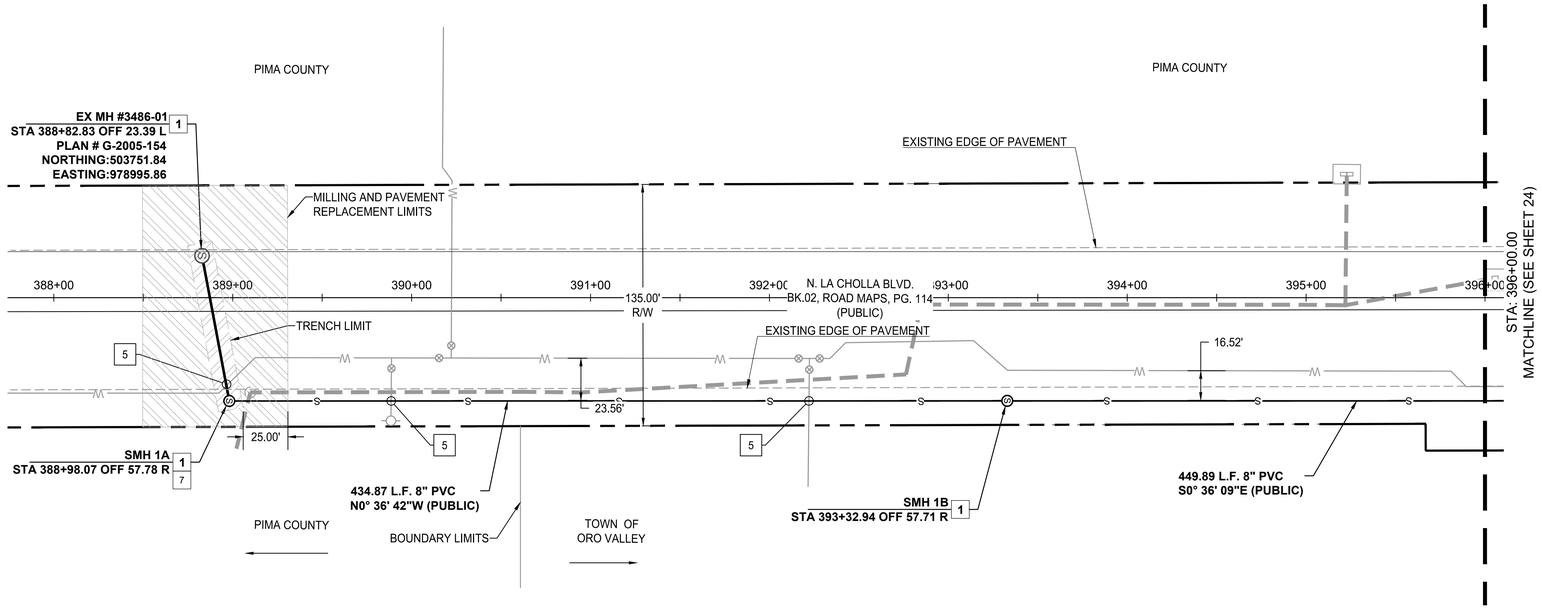
GRADING PERMIT #2500131
P22WI00005
G-2022-007

DateTime: Tue, 10 Dec 2024 - 5:04pm PathName: S:\ARIZRTucson\AZ4072\400LAND_LJA MOVING FORWARD\BASE FILES\PV24 PAVING PLAN AND PROFILE.dwg



OSS-01 STA. 388+00.00 TO STA. 396+00.00
N. LA CHOLLA BLVD.
(PUBLIC)

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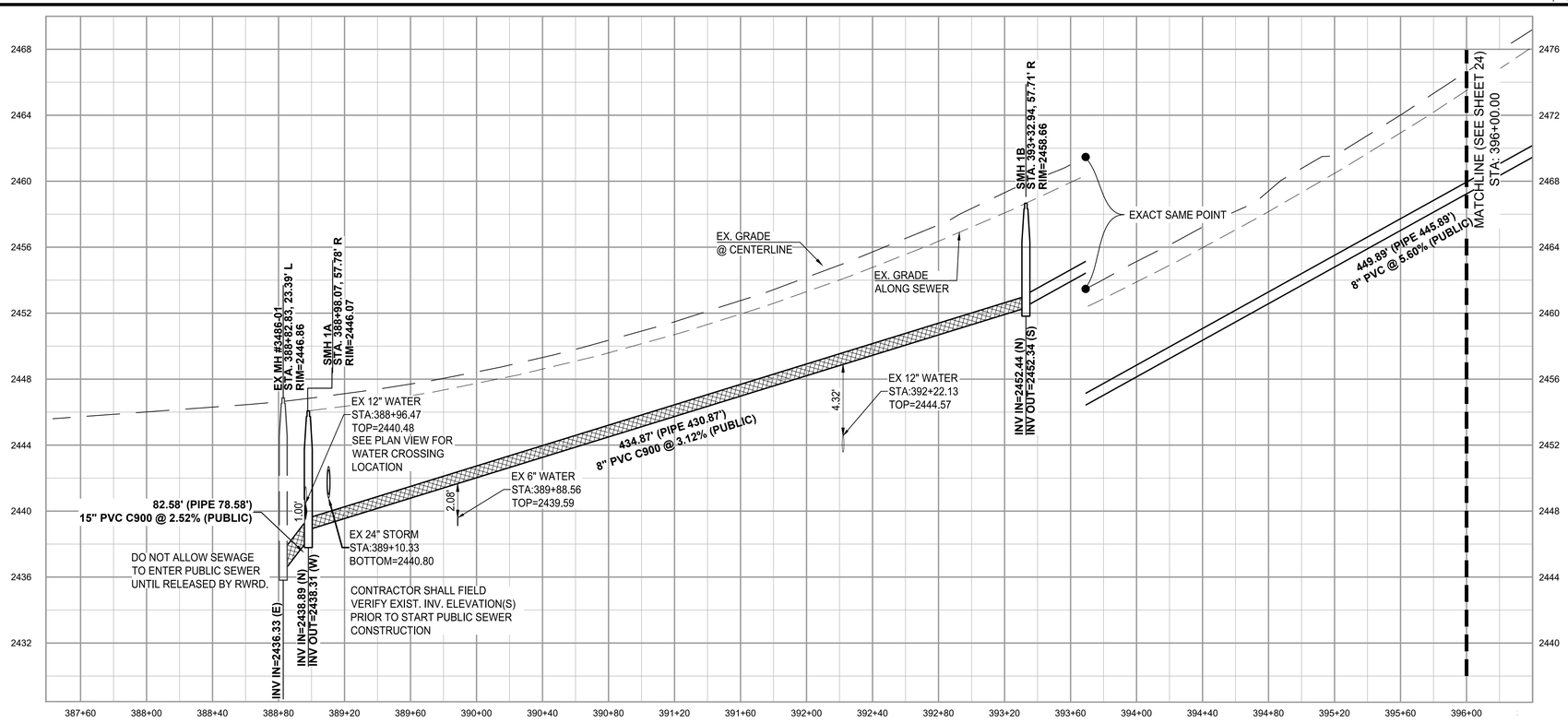

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P22WI00005
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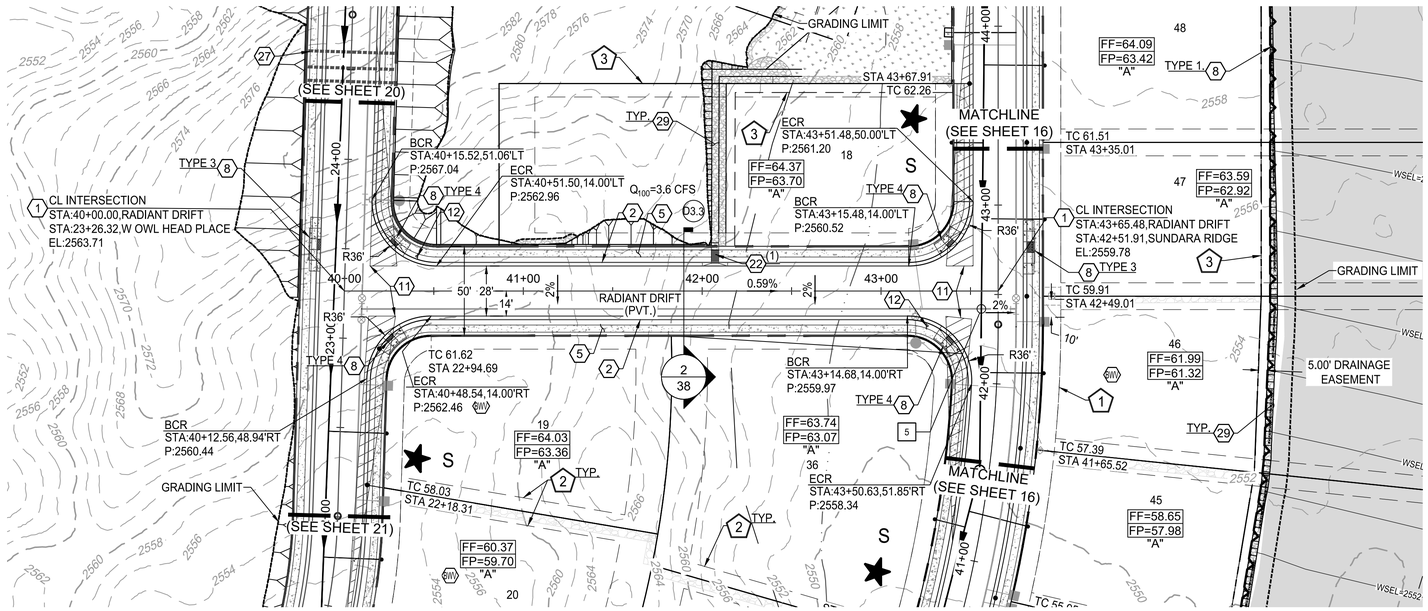
DateTime: Tue, 10 Dec 2024 - 5:05pm PathName: S:\ARIZT\tucson\AZ4072\400LAND_LJA MOVING FORWARD\BASE FILES\PV25 PAVING PLAN AND PROFILE.dwg



RADIANT DRIFT (PRIVATE) STA. 40+00.00 TO STA. 43+65.48

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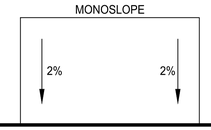
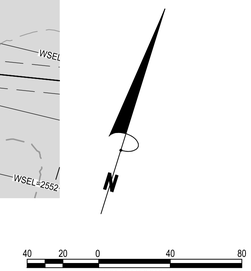
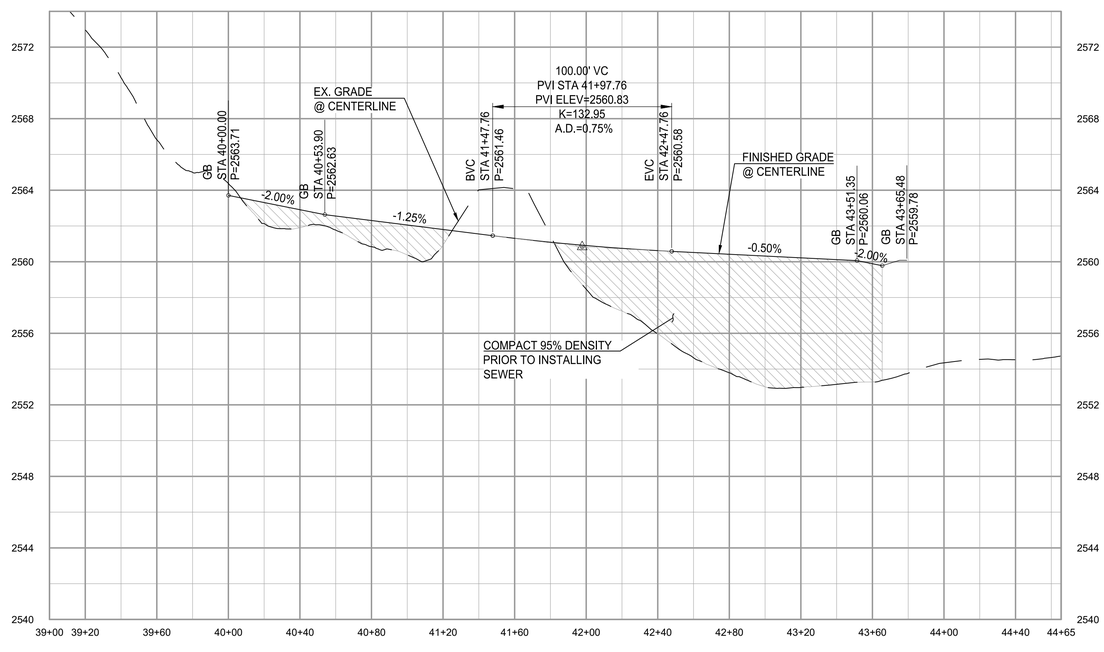
2. ALL SEWER H.C.S. ARE CENTERED BETWEEN LOT LINES UNLESS OTHERWISE NOTED.





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



EASEMENT KEYNOTES

1. 10' PUBLIC UTILITY, ROADWAY MAINTENANCE, & SIGNAGE EASEMENT BY FINAL PLAT
2. BUILDING SETBACK LINE, SEE DTL. 6 SHT 38.
3. DRAINAGE EASEMENT PER FINAL FLAT.

SEWER KEYNOTES

1. CONSTRUCT 4' DIA. MANHOLE PER STD. DTL. RWRD 205 WITH CONCRETE COLLAR PER STD. DTL. RWRD 211
2. INSTALL 24" WATERTIGHT FRAME AND COVER PER STD. DTL. RWRD 214.
3. INSTALL CONNECTION TO EXISTING MANHOLE BASE STD. DTL. RWRD 301.
4. INSTALL HCS CONNECTION TO MANHOLE PER STD. DTL. RWRD 402.
5. SEWER/WATER CROSSING PER STD. DTL. RWRD 108. CONTRACTOR TO VERIFY EXISTING ELEVATION PRIOR TO CONSTRUCTION. SEWER CONTRACTOR RESPONSIBLE FOR ANY DAMAGE DURING CONSTRUCTION.
6. INSTALL HCS WITH CLEANOUT PER STD. DTL. RWRD 401 AND STD. DTL. RWRD 404.
7. INSTALL BLOCK OUT PER RWRD 203, SIZE AND INVERT PER PLAN. INSTALL AT MANHOLE CONNECTION TEMPORARY PLUG AND SECURE WITH A CHAIN OR CABLE TO A MANHOLE STEP. PLUG TO INCLUDE CONTRACTOR'S COMPANY NAME. THE PLUG IS TO BE REMOVED AFTER PDEQ/ADEQ's DISCHARGE AUTHORIZATION AND POST PAVING INSPECTION AS DIRECTED BY THE FIELD ENGINEERING INSPECTOR. PLUG TO BE PLACED DOWNSTREAM OF ALL PROPOSED SERVICE LATERALS.
8. CONTRACTOR TO PROVIDE NEW SCOUR PROTECTION PER PAG AND RWRD STANDARDS
9. SEWER/STORM CROSSING PER RWRD SECTION 5.1.10.B CONTRACTOR TO VERIFY EXISTING ELEVATION PRIOR TO CONSTRUCTION. SEWER CONTRACTOR RESPONSIBLE FOR CROSSING CONSTRUCTION.
10. INSTALL SCOUR PROTECTION FOR SEWER LINES PER RWRD 113
11. NOT USED.
12. STABILIZED SURFACE PER STD. DTL. RWRD 111.

CONSTRUCTION KEYNOTES

1. INSTALL SURVEY MONUMENT PER P.A.G. STD. DTL. 103.
2. CONSTRUCT 2' WEDGE CURB (H=6") PER P.A.G. STD. DTL. 209.
3. CONSTRUCT 6" REVEAL VERTICAL CURB PER P.A.G. STD. DTL. 209. (TYPE 2).
4. CONSTRUCT MODIFIED TRANSITION CURB FROM VERTICAL CURB TO WEDGE CURB PER P.A.G. STD. DTL. 210.
5. CONSTRUCT CONCRETE SIDEWALK PER P.A.G. STD. DTL. 200. STANDARD 4' WIDE SIDEWALK UNLESS OTHERWISE NOTED.
6. NEW CONCRETE CURB TO EXISTING CONNECTION PER P.A.G. STD. DTL. 211.
7. SAWCUT 2' OF EXISTING PAVEMENT, TACK, AND JOIN TO EXISTING.
8. CONSTRUCT CURB RAMPS PER P.A.G. STD. DTL. 207. SEE PLAN FOR TYPE OF RAMPS.
9. INSTALL 3" AC OVER 5" ABC SEE DTL. 10, SHT. 38.
10. SLOPE STABILIZATION, SEE DTL. 8, SHT. 38
11. SIGHT VISIBILITY TRIANGLE, SEE DTL. 4, SHT. 38.
12. INSTALL 30" X 30" R1-1 "STOP SIGN" AND STREET NAME SIGN.
13. CONSTRUCT TYPE 3 SIDEWALK SCUPPER PER P.A.G. STD. DTL. 205.5. NUMBER OF CELLS AS NOTED. SEE SHT. 37 FOR DETAILS, W/ GUARDRAIL PER PAG. 105
22. CONSTRUCT TYPE 2 SIDEWALK SCUPPER PER P.A.G. STD. DTL. 205 NUMBER OF CELLS AS NOTED.
23. CONSTRUCT 48" STORM DRAIN MANHOLE PER PAG STD. DTL. 300 & 302.
26. INSTALL CATCH BASIN PER DETAIL 1 SHT. 40 AND SEE STORM DRAIN PROFILES ON SHT. 36-37, 40-41
27. NEW IRRIGATION LINE SLEEVE, THE CURB SHALL BE MARKED/STAMPED WITH "IS" (IRRIGATION SYSTEM), SEE LANDSCAPE PLAN FOR LINE INFORMATION.
28. INSTALL TYPE 4 CATCH BASIN PER PAG STD. DTL. 309.
29. SEE GRADING PLAN FOR DETAILS.
30. 2 - 24'x 6' ARCH CULVERTS, SEE PROFILE 1, SHT. 36 AND SHT. 45-51 FOR DTLS.
31. INSTALL HANDRAIL PER PAG STD. DTL. 105.
32. CONSTRUCT DRIVEWAY APRON PER P.A.G. STD. DTL. 206.
33. CONSTRUCT 60" STORM DRAIN MANHOLE PER PAG STD. DTL. 301 & 302.
34. CONSTRUCT 72" STORM DRAIN MANHOLE PER PAG STD. DTL. 301 & 302.
35. INSTALL RCP CLASS V STORM DRAIN PIPE. LENGTH, SLOPE, AND DIAMETER PER PLAN, SEE STORM DRAIN PROFILE ON SHT. 36-37, 40-41

RELATED CASE #
OV914-009
2100731
OV114-018

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PAVING PLAN AND PROFILE
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SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA U.S.A.

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FOR CONSTRUCTION ☐

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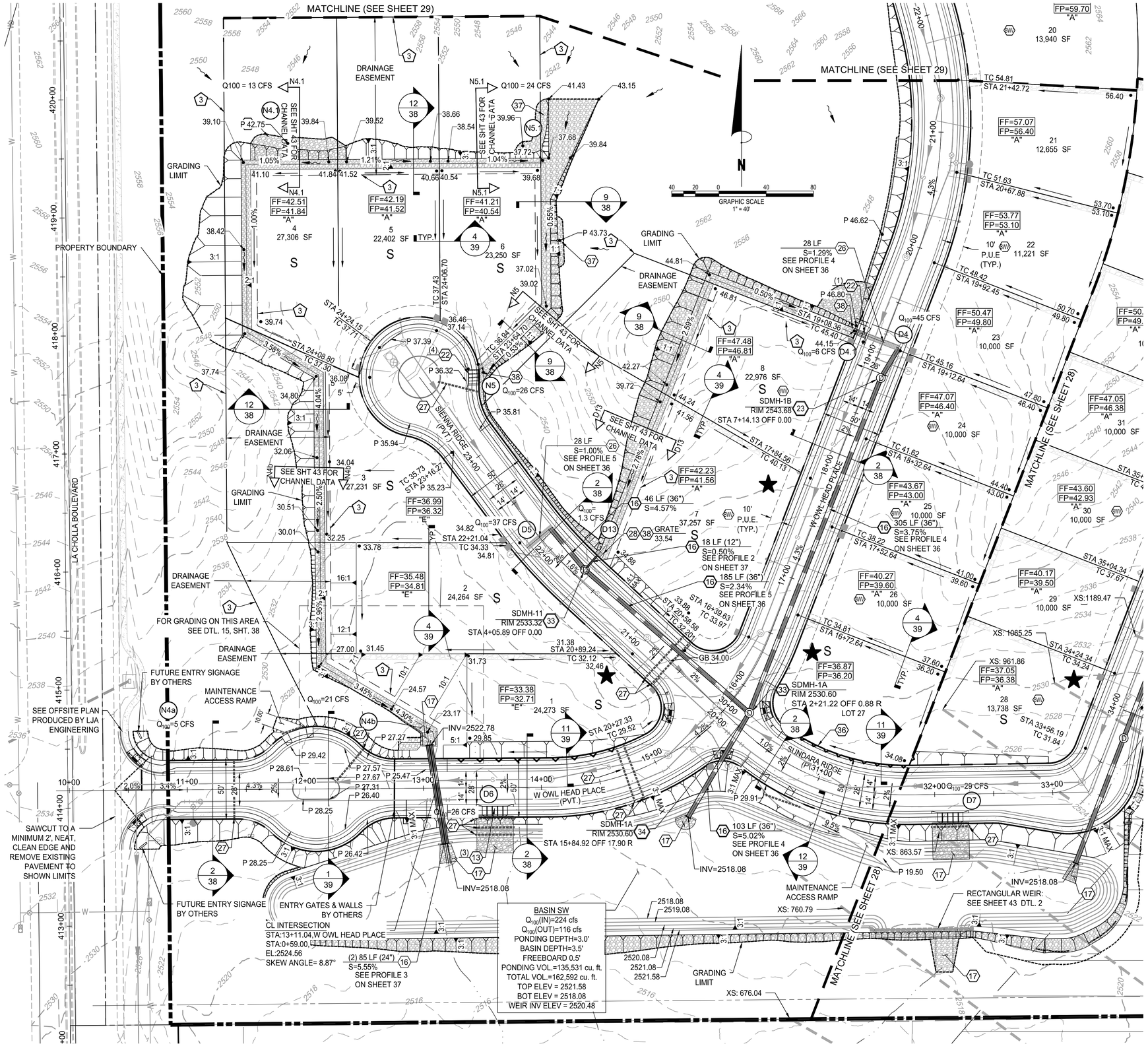

EASEMENT KEYNOTES

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2. BUILDING SETBACK LINE, SEE DTL. 6 SHT 38.
3. PRIVATE DRAINAGE EASEMENT PER FINAL PLAT.

CONSTRUCTION KEYNOTES

10. SLOPE STABILIZATION, SEE DTL. 8, SHT. 38
12. INSTALL 30" X 30" R1-1 "STOP SIGN" AND STREET NAME SIGN.
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14. INSTALL BANK PROTECTION PER DTL. 7 ON SHT. 38
15. INSTALL INLET AND OUTLET STRUCTURES PER ADOT (SD 6: DRAINAGE STRUCTURES-SD 6.30 SERIES) SEE STORM DRAIN PROFILE ON SHT.36-37,40-41
16. INSTALL SRP (16 GAUGE) STORM DRAIN PIPE. LENGTH, SLOPE, AND DIAMETER PER PLAN, SEE STORM DRAIN PROFILE ON SHT. 36-37, 40-41
17. TYPICAL ROCK RIP-RAP SPLASH PAD, SEE DTL. 3, SHT. 38 FOR CULVERTS, FOR SCUPPER SPILL WAYS AND CHANNELS.
18. RETAINING WALL BY OTHERS, REQUIRES SEPARATE PERMIT.
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23. CONSTRUCT 48" STORM DRAIN MANHOLE PER PAG STD. DTL. 300 & 302.
25. CONSTRUCT GROUTED RIP RAP BANK PROTECTION PER DTL. 9, SHT. 39
26. INSTALL CATCH BASIN PER DTL. 1 SHT. 40 AND SEE STORM DRAIN PROFILES ON SHT. 36-37, 40-41
27. NEW IRRIGATION LINE SLEEVE, THE CURB SHALL BE MARKED/STAMPED WITH "IS" (IRRIGATION SYSTEM), SEE LANDSCAPE PLAN FOR LINE INFORMATION.
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33. CONSTRUCT 60" STORM DRAIN MANHOLE PER PAG STD. DTL. 301 & 302.
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35. INSTALL RCP STORM DRAIN PIPE. LENGTH, SLOPE, AND DIAMETER PER PLAN, CLASS PER PROFILE, SEE STORM DRAIN PROFILE ON SHT. 36-37, 40-41
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40. INSTALL BANK PROTECTION PER DTL. 9 ON SHT. 39
41. INSTALL RIP-RAP PROTECTION PER DTL. 9 ON SHT. 41

LJA Engineering, Inc.
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GRADING
SUNDARA RIDGE

FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil) CERTIFICATE NO. 54544 ROBERT W. SCHLICHER Date Signed 12/16/24 ARIZONA U.S.A.

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G-2022-007

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ARIZONA811
Call 811 or visit Arizona811.com

Date/Time: Tue, 10 Dec 2024 - 5:08pm PathName: S:\ARIZ\Tucson\AZ4072-1004_LAND, LJA MOVING FORWARD\BASE FILES\FP-27 GRADING.dwg

LOMAS DE ORO WASH FLOODPLAIN			
LOT#	WATER SURFACE ELEVATION (WSE)	REGULATORY FLOOD ELEVATION (RFE)	FINISHED FLOOR ELEVATION (FFE)
49	2562.17	2563.17	2564.58
48	2559.67	2560.67	2564.09
47	2557.75	2558.75	2563.59
46	2555.71	2556.71	2561.99
45	2553.12	2554.12	2558.65
44	2550.31	2551.31	2557.21
43	2547.65	2548.65	2555.93
42	2544.81	2545.81	2554.87
41	2541.65	2542.65	2552.27
40	2538.95	2539.95	2549.32
39	2536.32	2537.32	2546.06
38	2533.93	2534.93	2542.35
37	2530.98	2531.98	2538.64

EASEMENT KEYNOTES

1. 10' PUBLIC UTILITY, ROADWAY MAINTENANCE, & SIGNAGE EASEMENT BY FINAL PLAT
2. BUILDING SETBACK LINE, SEE DTL. 6 SHT 38.
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CONSTRUCTION KEYNOTES

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Date/Time: Tue, 10 Dec 2024 - 5:09pm PathName: S:\AR\ZT\tucson\AZ4072-1004_LAND_LJA MOVING FORWARD\BASE FILES\IP\28 GRADING.dwg

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Date/Time : Tue, 10 Dec 2024 - 5:11pm Path/Name : S:\ARIZOTucson\AZ4072-4000LAND_LJA MOVING FORWARD\BASE FILES\Pr29 GRADING.dwg

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39. SAW CUT AND REMOVE EXISTING M.U.P. AT ENTRANCE MATCH GRADE AT RAMP REPLACE AS NEEDED PER DTL. 8 SHT. 39.
40. INSTALL BANK PROTECTION PER DTL. 9 ON SHT. 39
41. INSTALL RIP-RAP PROTECTION PER DTL. 9 ON SHT. 41

TABLE 'A' _ SCOUR DEPTH PROTECTION

LOMAS DE ORO WASH

LOT	WASH THALWEG ELEV.	MIN. TOE DOWN	TOE DOWN ELEV.
37	2528.00	4.1	2523.90
38	2531.47	4.1	2527.37
39	2533.99	4.1	2529.89
40	2536.00	4.1	2531.90
41	2538.00	4.1	2533.90
42	2541.71	4.1	2537.61
43	2544.71	4.1	2540.61
44	2547.20	4.1	2543.10
45	2551.96	4.1	2547.86
46	2552.62	4.1	2548.52
47	2555.67	4.1	2551.57
48	2557.09	4.1	2552.99
49	2559.65	4.6	2555.05
Basin "C"	2563.00	4.6	2558.40
Basin "N"	2573.00	4.2	2568.80
Basin "SW"	2522.00	4.2	2517.80

RELATED CASE #
OV914-009
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OV114-018

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GRADING
SUNDARA RIDGE

FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil) CERTIFICATE NO. 54544 ROBERT W. SCHLICHER Date Signed 12/16/24 ARIZONA U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

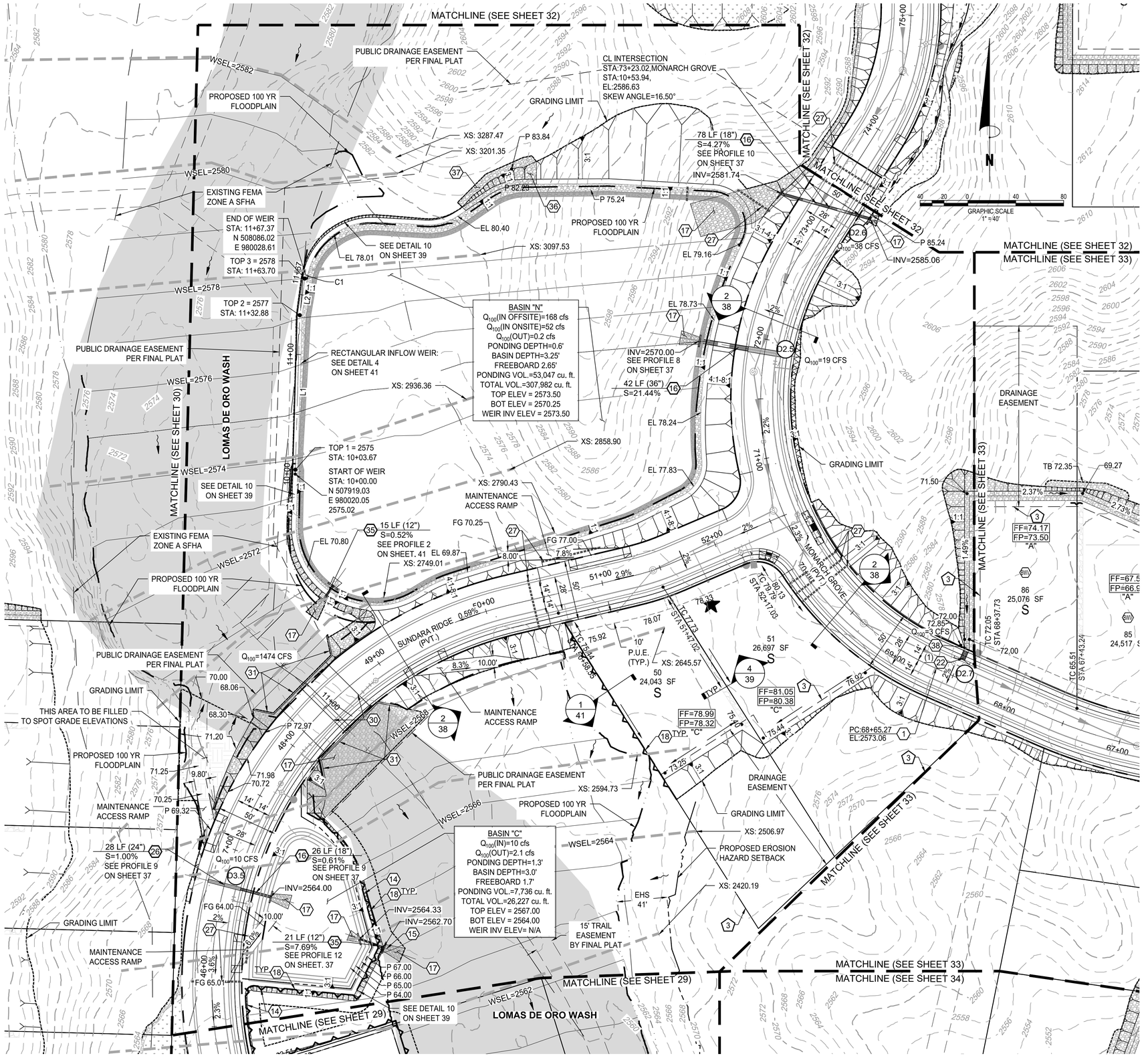
H: 1"=40' C.I.=2'
V:
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

G-2022-007

P22WI00005

GRADING PERMIT #25000131

Date/Time: Tue, 10 Dec 2024 - 5:12pm PathName: S:\ARIZT\tucson\AZ4072\4004_AND_LJA MOVING FORWARD\BASE FILES\Pr\30 GRADING.dwg



EASEMENT KEYNOTES

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CONSTRUCTION TABLE BASIN "N"

BASIN "N" - CURVE TABLE

Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C1	3.67	57.00	3.69	N9° 37' 13"E	3.67

BASIN "N" - LINE TABLE

Line #	Length	Direction
L1	132.88	N1° 37' 38.36"E
L2	30.82	N7° 46' 31.64"E

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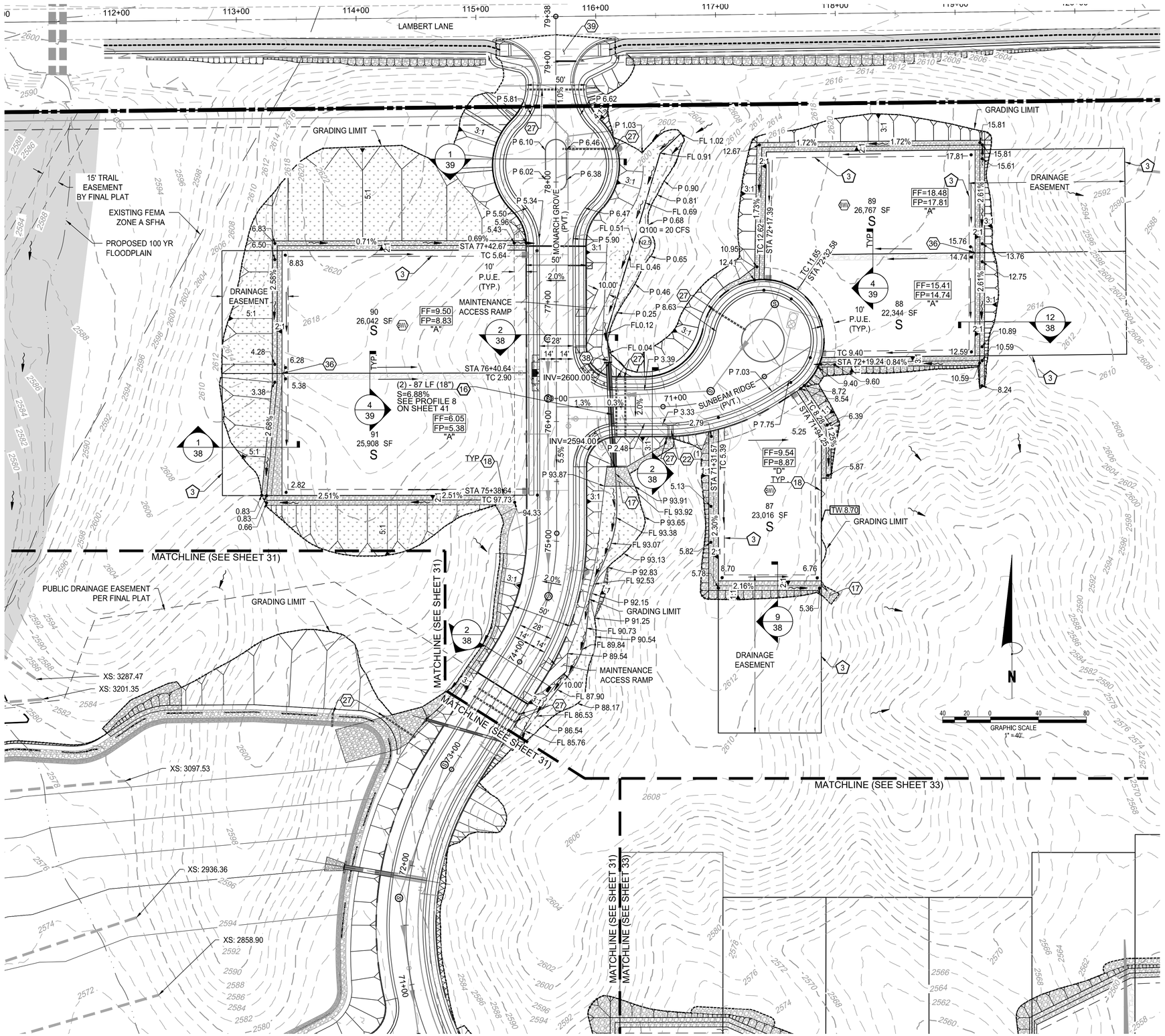
Date/Time : Tue, 10 Dec 2024 - 5:14pm Path/Name : S:\ARIZ\Tucson\AZ4072-400\LAND_LJA MOVING FORWARD\BASE FILES\P31-31 GRADING.dwg



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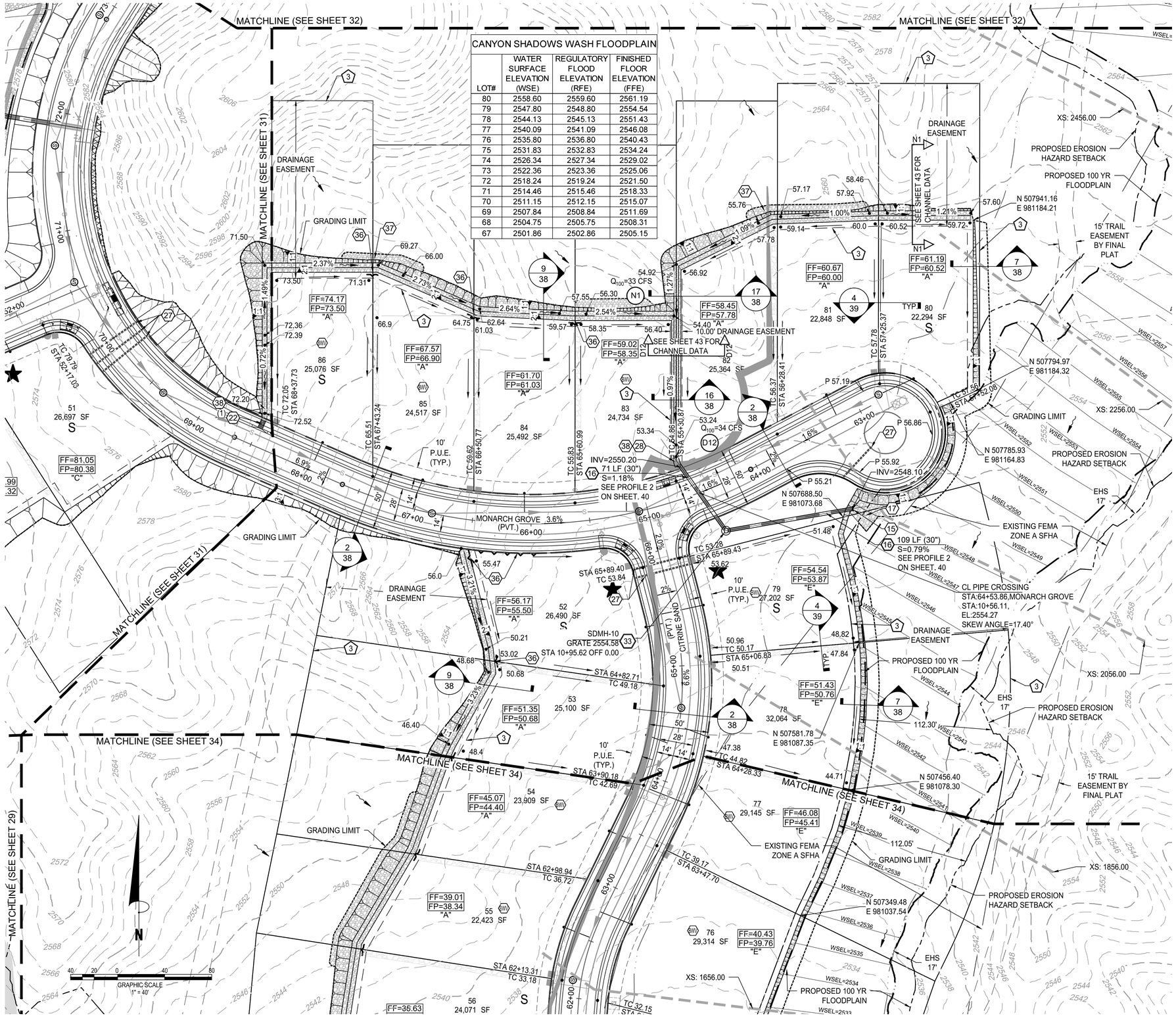
DateTime: Thu, 09 Jan 2025 - 10:51am PathName: S:\ARIZ\Tucson\AZ4072-4006_AND_LJA MOVING FORWARD\BASE FILES\PN\32-GRADING.dwg



CANYON SHADOWS WASH FLOODPLAIN

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76	2535.80	2536.80	2540.43
75	2531.83	2532.83	2534.24
74	2526.34	2527.34	2529.02
73	2522.36	2523.36	2525.06
72	2518.24	2519.24	2521.50
71	2514.46	2515.46	2518.33
70	2511.15	2512.15	2515.07
69	2507.84	2508.84	2511.69
68	2504.75	2505.75	2508.31
67	2501.86	2502.86	2505.15

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Staff 811 or submit Arizona811 Ticket

Date/Time: Tue, 10 Dec 2024 - 5:15pm Path/Name: S:\ARIZ\Tucson\AZ4072-4000_AND_LJA MOVING FORWARD\BASE FILES\Plan\33 GRADING.dwg

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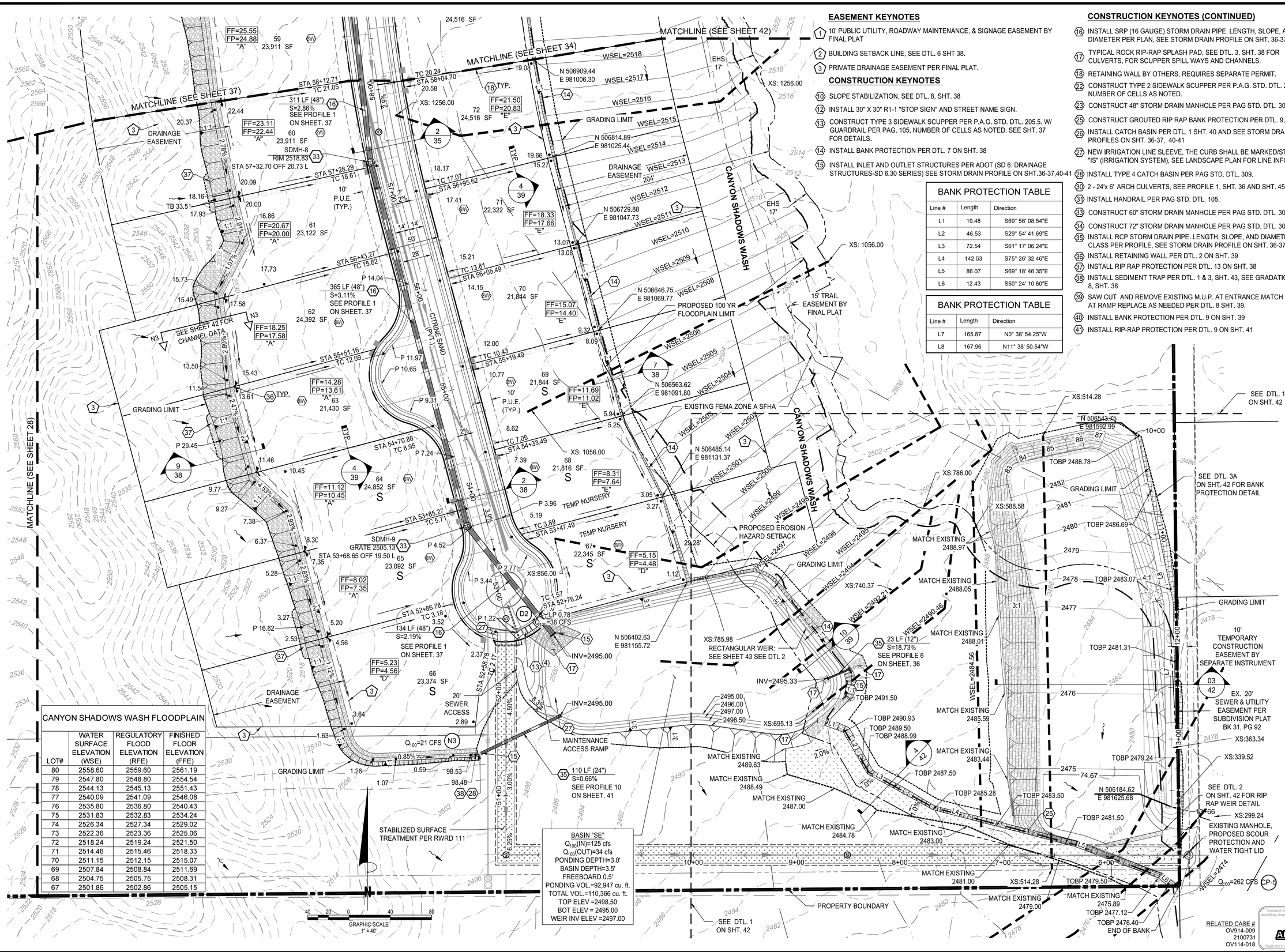

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13. CONSTRUCT TYPE 3 SIDEWALK SCUPPER PER P.A.G. STD. DTL. 205.5. W/ GUARDRAIL PER PAG. 105, NUMBER OF CELLS AS NOTED. SEE SHT. 37 FOR DETAILS.
14. INSTALL BANK PROTECTION PER DTL. 7 ON SHT. 38
15. INSTALL INLET AND OUTLET STRUCTURES PER ADOT (SD 6: DRAINAGE STRUCTURES-SD 6.30 SERIES) SEE STORM DRAIN PROFILE ON SHT.36-37,40-41

CONSTRUCTION KEYNOTES (CONTINUED)

16. INSTALL SRP (16 GAUGE) STORM DRAIN PIPE. LENGTH, SLOPE, AND DIAMETER PER PLAN, SEE STORM DRAIN PROFILE ON SHT. 36-37, 40-41
17. TYPICAL ROCK RIP-RAP SPLASH PAD, SEE DTL. 3, SHT. 38 FOR CULVERTS, FOR SCUPPER SPILL WAYS AND CHANNELS.
18. RETAINING WALL BY OTHERS, REQUIRES SEPARATE PERMIT.
22. CONSTRUCT TYPE 2 SIDEWALK SCUPPER PER P.A.G. STD. DTL. 205 NUMBER OF CELLS AS NOTED.
23. CONSTRUCT 48" STORM DRAIN MANHOLE PER PAG STD. DTL. 300 & 302.
25. CONSTRUCT GROUTED RIP RAP BANK PROTECTION PER DTL. 9, SHT. 39
26. INSTALL CATCH BASIN PER DTL. 1 SHT. 40 AND SEE STORM DRAIN PROFILES ON SHT. 36-37, 40-41
27. NEW IRRIGATION LINE SLEEVE, THE CURB SHALL BE MARKED/STAMPED WITH "IS" (IRRIGATION SYSTEM), SEE LANDSCAPE PLAN FOR LINE INFORMATION.
28. INSTALL TYPE 4 CATCH BASIN PER PAG STD. DTL. 309.
30. 2 - 24'x 6' ARCH CULVERTS, SEE PROFILE 1, SHT. 36 AND SHT. 45-51 FOR DTLS.
31. INSTALL HANDRAIL PER PAG STD. DTL. 105.
33. CONSTRUCT 60" STORM DRAIN MANHOLE PER PAG STD. DTL. 301 & 302.
34. CONSTRUCT 72" STORM DRAIN MANHOLE PER PAG STD. DTL. 301 & 302.
35. INSTALL RCP STORM DRAIN PIPE. LENGTH, SLOPE, AND DIAMETER PER PLAN, CLASS PER PROFILE, SEE STORM DRAIN PROFILE ON SHT. 36-37, 40-41
36. INSTALL RETAINING WALL PER DTL. 2 ON SHT. 39
37. INSTALL RIP RAP PROTECTION PER DTL. 13 ON SHT. 38
38. INSTALL SEDIMENT TRAP PER DTL. 1 & 3, SHT. 43, SEE GRADATION PER DTL. 8, SHT. 38
39. SAW CUT AND REMOVE EXISTING M.U.P. AT ENTRANCE MATCH GRADE AT RAMP REPLACE AS NEEDED PER DTL. 8 SHT. 39.
40. INSTALL BANK PROTECTION PER DTL. 9 ON SHT. 39
41. INSTALL RIP-RAP PROTECTION PER DTL. 9 ON SHT. 41

BANK PROTECTION TABLE

Line #	Length	Direction
L1	19.48	S69° 56' 08.54"E
L2	46.53	S29° 54' 41.69"E
L3	72.54	S61° 17' 06.24"E
L4	142.53	S75° 26' 32.46"E
L5	86.07	S69° 18' 46.35"E
L6	12.43	S50° 24' 10.60"E

BANK PROTECTION TABLE

Line #	Length	Direction
L7	165.87	N0° 38' 54.25"W
L8	167.96	N11° 38' 50.54"W

CANYON SHADOWS WASH FLOODPLAIN

LOT#	WATER SURFACE ELEVATION (WSE)	REGULATORY FLOOD ELEVATION (RFE)	FINISHED FLOOR ELEVATION (FFE)
80	2558.60	2559.60	2561.19
79	2547.80	2548.80	2554.54
78	2544.13	2545.13	2551.43
77	2540.09	2541.09	2546.08
76	2535.80	2536.80	2540.43
75	2531.83	2532.83	2534.24
74	2526.34	2527.34	2529.02
73	2522.36	2523.36	2525.06
72	2518.24	2519.24	2521.50
71	2514.46	2515.46	2518.33
70	2511.15	2512.15	2515.07
69	2507.84	2508.84	2511.69
68	2504.75	2505.75	2508.31
67	2501.86	2502.86	2505.15

BASIN "SE"
Q_{100}(IN)=125 cfs
Q_{100}(OUT)=34 cfs
PONDING DEPTH=3.0'
BASIN DEPTH=3.5'
FREEBOARD 0.5'
PONDING VOL.=92,947 cu. ft.
TOTAL VOL.=110,366 cu. ft.
TOP ELEV =2498.50
BOT ELEV = 2495.00
WEIR INV ELEV =2497.00

RELATED CASE #
OV914-009
2100731
OV114-018

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

GRADING
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12 SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/10/24
ARIZONA, U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

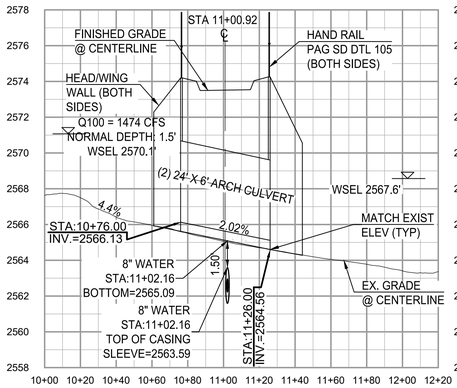
H: 1"=40' V: C.I.=2'
SCALE
12/10/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

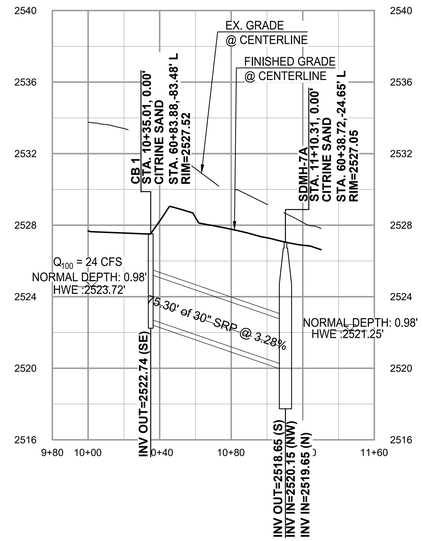
P22WI00005

G-2022-007

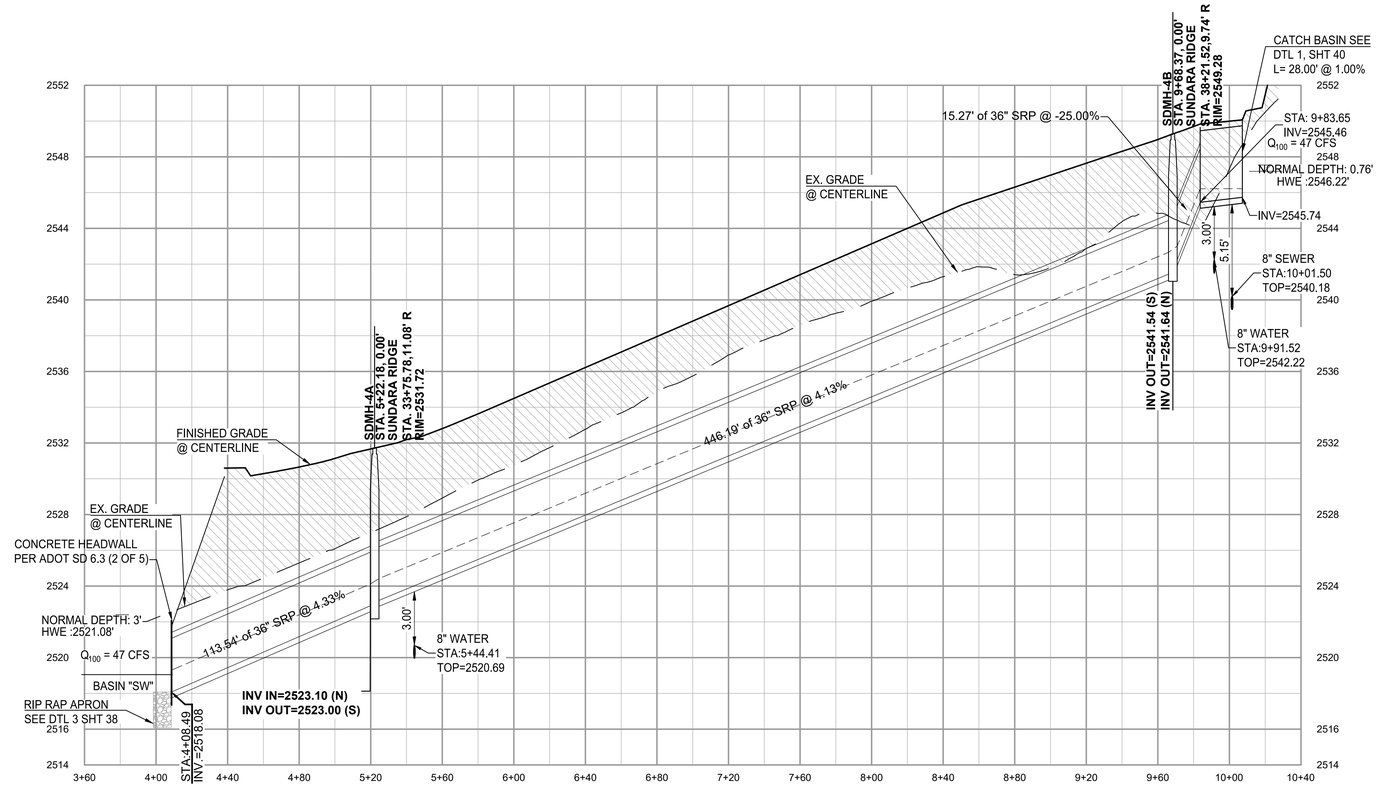
Date/Time: Wed, 08 Jan 2025 - 3:56pm Path/Name: S:\ARIZ\Tucson\AZ4072-400L-AND_LJA MOVING FORWARD\BASE FILES\P\35-GRADING.DWG



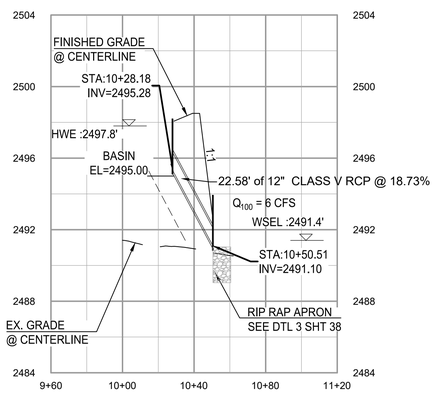
1 STORM DRAIN RUN LDO @ STREET SUNDARA RIDGE
SCALE: H:1"=40', V:1"=4'



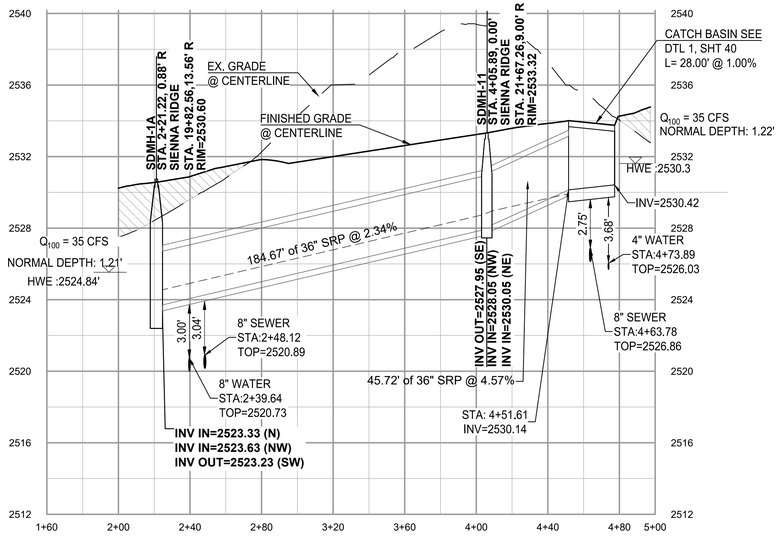
2 STORM DRAIN RUN N2 @ CITRINE SAND
SCALE: H:1"=40', V:1"=4'



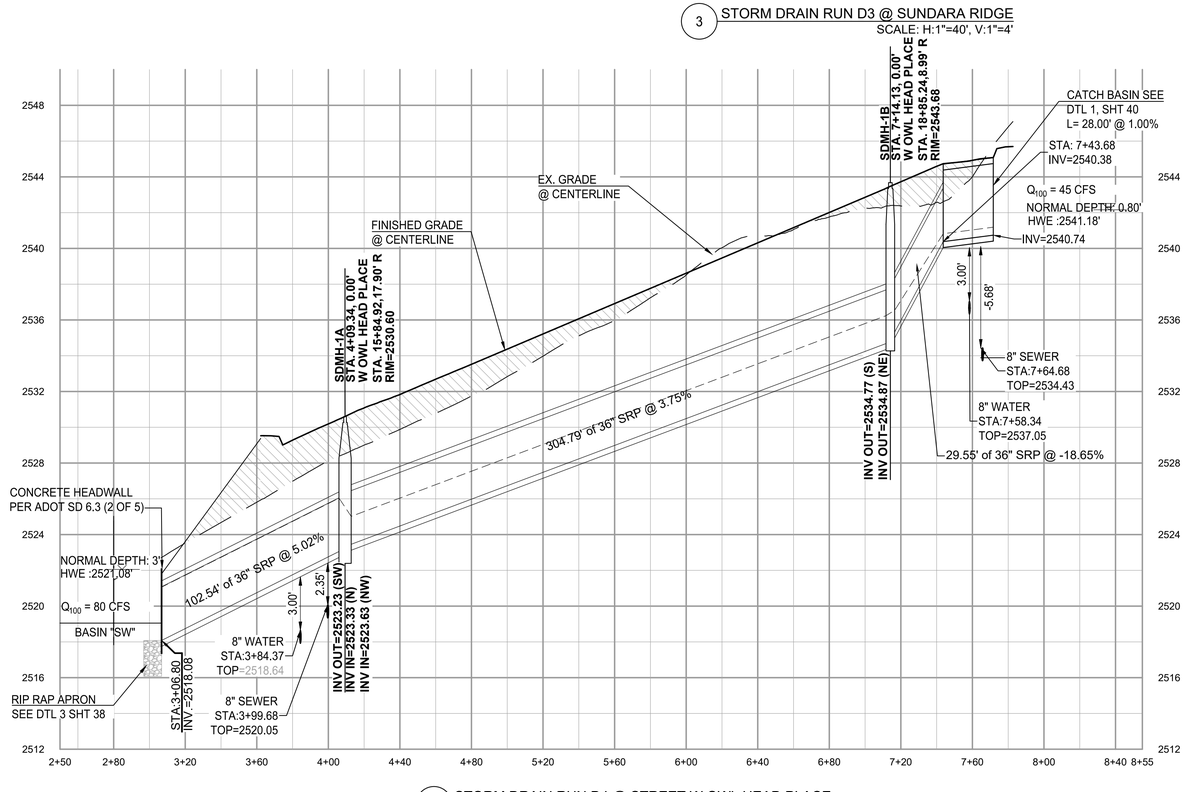
3 STORM DRAIN RUN D3 @ SUNDARA RIDGE
SCALE: H:1"=40', V:1"=4'



6 STORM DRAIN @ BASIN "SE"
SCALE: H:1"=40', V:1"=4'



5 STORM DRAIN RUN D5 @ STREET SIENNA RIDGE
SCALE: H:1"=40', V:1"=4'



4 STORM DRAIN RUN D4 @ STREET W OWL HEAD PLACE
SCALE: H:1"=40', V:1"=4'

RELATED CASE #
OV914-009
2100731
OV114-018

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ARIZONA 811

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STORM DRAIN PROFILES
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NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil) CERTIFICATE NO. 54544 ROBERT W. SCHLICHER Date Signed 12/16/24 ARIZONA U.S.A.

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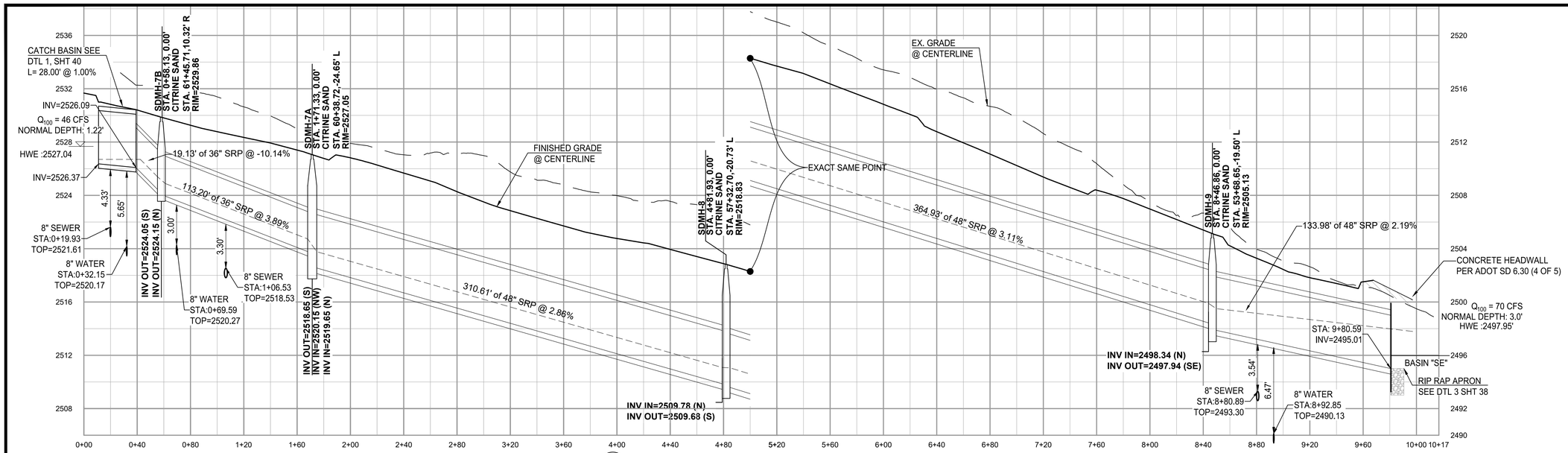
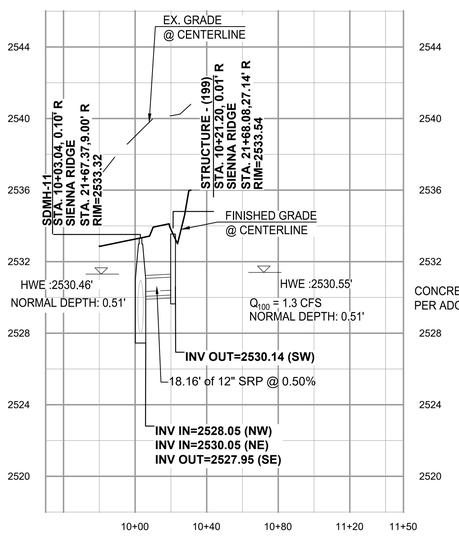
P22WI00005

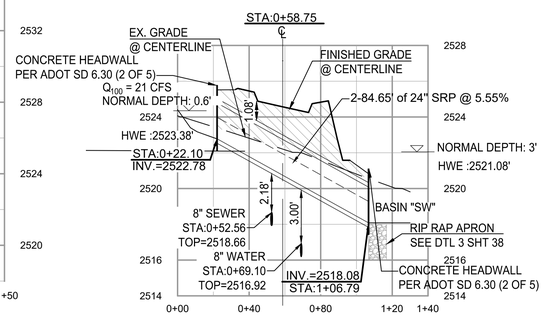
G-2022-007



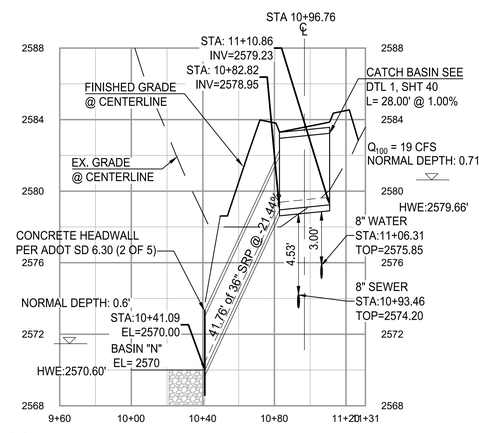
1 STORM DRAIN RUN SD-D2.1 (STREET CITRINE SAND)
SCALE: H:1"=40', V:1"=4'



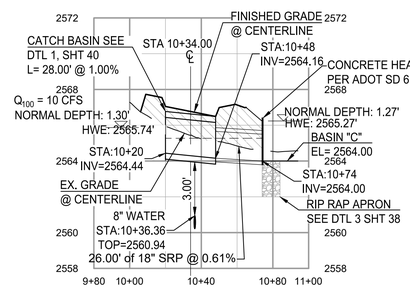
2 STORM DRAIN RUN SD-D13 @ SIENNA RIDGE
SCALE: H:1"=40', V:1"=4'



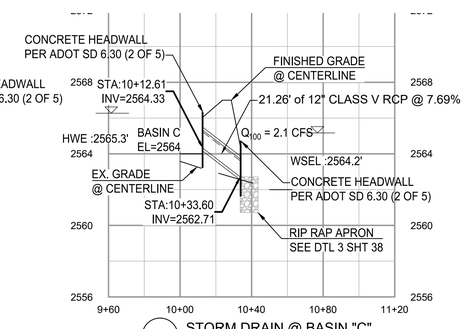
3 STORM DRAIN RUN SD-N4b @ STREET W OWL HEAD PLACE
SCALE: H:1"=40', V:1"=4'



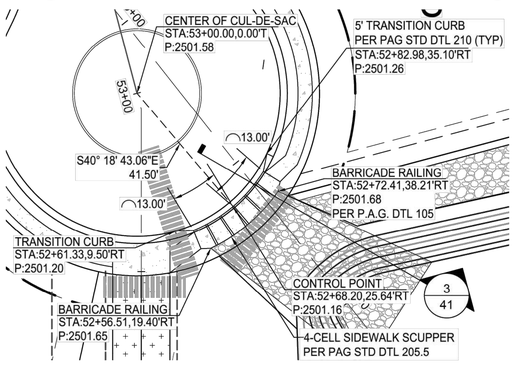
8 STORM DRAIN RUN SD-D2.5 @ STREET MONARCH GROVE
SCALE: H:1"=40', V:1"=4'



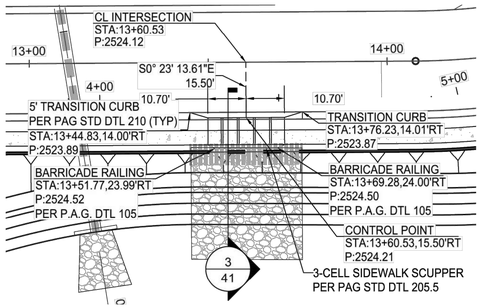
9 STORM DRAIN RUN SD-D3.5 @ STREET SUNDARA RIDGE
SCALE: H:1"=40', V:1"=4'



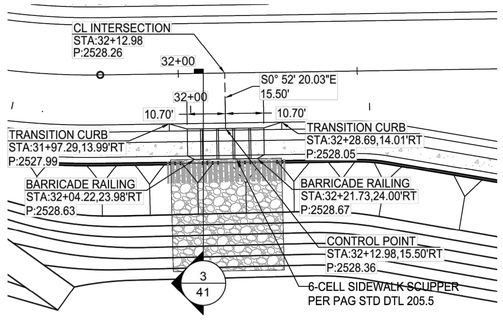
12 STORM DRAIN @ BASIN "C"
SCALE: H:1"=40', V:1"=4'



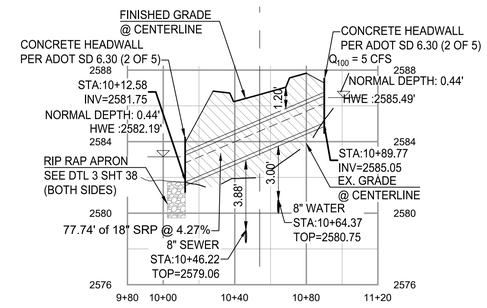
5 STORM DRAIN SCUPPER D2 @ STREET CITRINE SAND
SCALE: 1"=20'



6 STORM DRAIN SCUPPER D6 @ STREET W OWL HEAD PLACE
SCALE: 1"=20'



7 STORM DRAIN SCUPPER D7 @ STREET SUNDARA RIDGE
SCALE: 1"=20'



10 STORM DRAIN RUN SD-D2.6 @ STREET MONARCH GROVE
SCALE: H:1"=40', V:1"=4'

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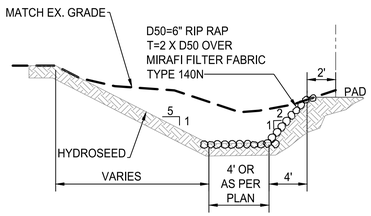
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

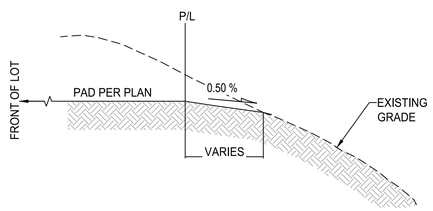
P22WI00005

G-2022-007

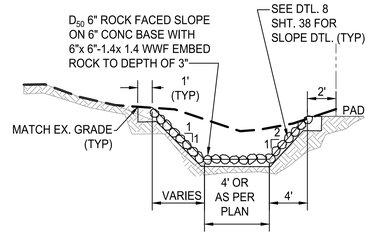
Date/Time: Tue, 10 Dec 2024 - 5:20pm Path/Name: S:\ARIZOTucson\AZ4072-4000\AND_LJA MOVING FORWARD\BASE FILES\PN\37 STORM DRAIN PROFILES.dwg



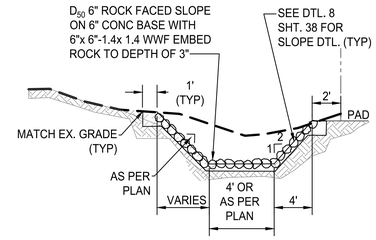
1 SECTION
N.T.S.



5 SECTION LOT 12 TO 17
N.T.S.



9 SECTION
N.T.S.



11 SECTION
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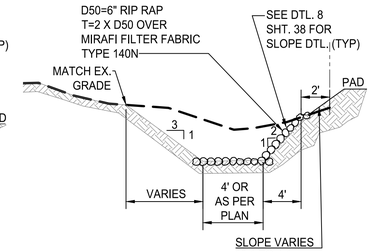

12 SECTION
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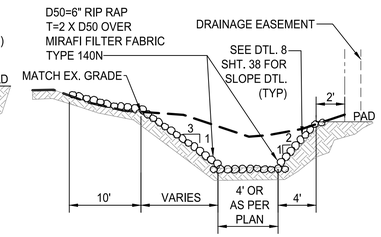

13 SECTION
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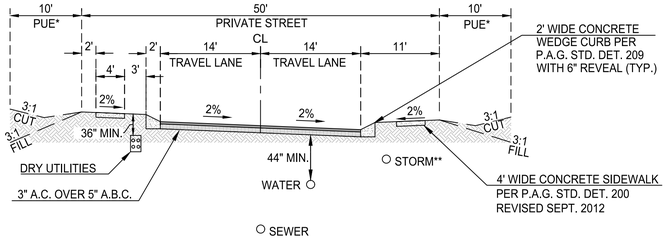
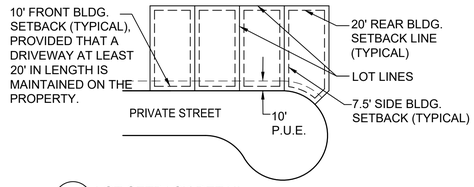
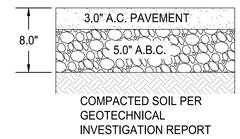


2 TYPICAL ROADWAY CROSS SECTION
N.T.S.

* PUE SECTION ONLY APPLIES TO SIDE(S) WITH ADJACENT LOT LINE THAT INCLUDE A PUE
** STORM LOCATION VARIES, SEE PLAN FOR LOCATION, SIZE, SLOPE, AND MATERIAL

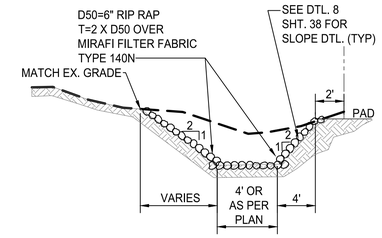


6 LOT SETBACK DETAIL
(FOR REFERENCE ONLY)
N.T.S.



*SEE GEOTECHNICAL INVESTIGATION REPORT

10 PAVEMENT STRUCTURE
N.T.S.



14 SECTION
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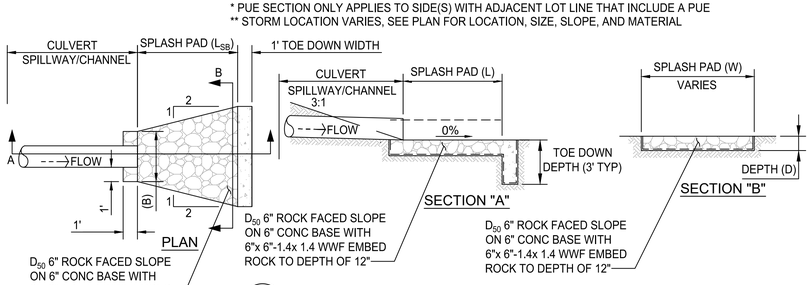
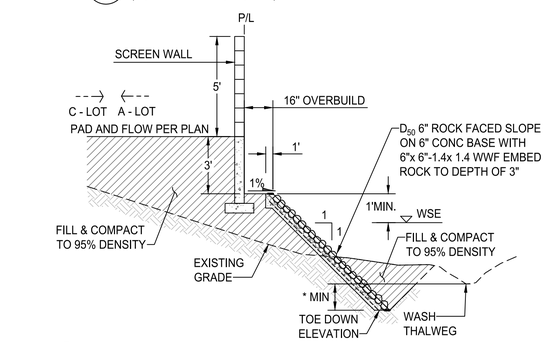
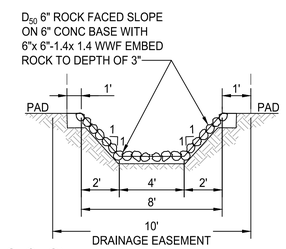


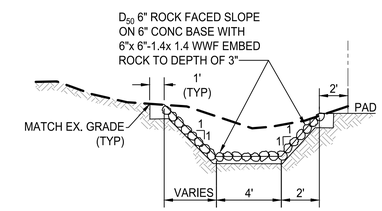
3 EROSION CONTROL APRON DETAIL @ STORM DRAIN OUTLETS
N.T.S.



7 BANK PROTECTION ADJACENT TO LOMAS DE ORO WASH
* = SEE SCOUR DEPTH PROTECTION
N.T.S.
PROFILES & TABLES A & B ON DTL. 06, SHT. 40 FOR MIN. TOE DOWN DEPTH.



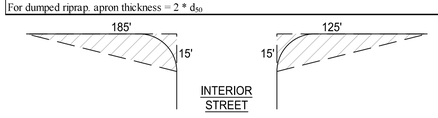
16 SECTION
N.T.S.



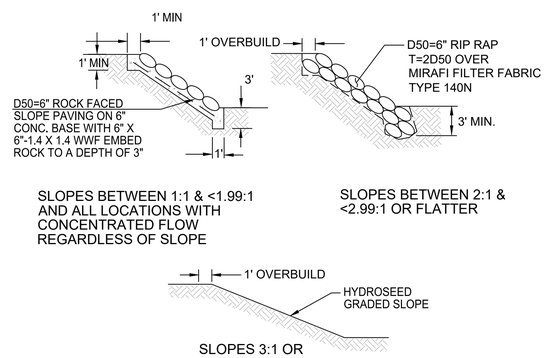
17 SECTION
N.T.S.

Design[1] for Erosion Control Aprons				
Location	Pipe size	Apron upstream width[B] (ft)	Length of Apron[A] (L_{SB}) (ft)	Riprap (d_{50})
LdO Wash	2 24'x6' ConSpan	48'+(2*4.5') = 57'	36	Grouted 6 inch
D12	1 30-inch	2.5'+(2*2.5') = 7.5'	20	Grouted 6 inch
N2.5	2 18-inch	3'+(2*1.5') = 6'	12	Grouted 6 inch
D2.65	3' scupper	3'+1.3' = 4.3'	5	Grouted 6 inch
Basin outlets				
Basin SW	1 12-inch	3	8	Grouted 6 inch
	80-ft weir, d= 0.6'	80'+(2*0.6') = 81.2'	5	Grouted 6 inch
Basin SE	1 12-inch	3	8	Grouted 6 inch
	19-ft weir, d= 1.0	19'+(2*1.0') = 21'	8	Grouted 6 inch
Basin N	1 12-inch	3	8	Grouted 6 inch
Basin C	1 12-inch	3	8	Grouted 6 inch
Basin inlets				
D2.1	1 48-inch	4'+(2*1.6') = 7.2'	32	Grouted 6 inch
D2	13' scupper	13'+1.3' = 14.3'	5	Grouted 6 inch
D2.5	1 36-inch	3'+(2*0.7') = 4.4'	24	Grouted 6 inch
D2.6	2 24-inch	4'+(2*2') = 8'	16	Grouted 6 inch
D3	1 36-inch	3'+(2*1.2') = 5.4'	24	Grouted 6 inch
D3.5	1 18-inch	1.5'+(2*1.5') = 4.5'	12	Grouted 6 inch
D4+5	1 36-inch	3'+(2*1.6') = 6.2'	24	Grouted 6 inch
D6	10' scupper	10'+1.3' = 11.3'	5	Grouted 6 inch
D7	11' scupper	11'+1.3' = 12.3'	5	Grouted 6 inch
N3	2 24-inch	4'+(2*2.0') = 8'	16	Grouted 6 inch
N4b	2 24-inch	4'+(2*2.0') = 8'	16	Grouted 6 inch

[1] **Concept design may vary on LJA Final Site Plan depending on site grading constraints**
[A] L_{SB} = (8 * pipe diameter or flow depth),
[B] apron upstream width = culvert spread + 1D or 1Dc on each side
For dumped riprap. apron thickness = 2 * d_{50}



4 SIGHT VISIBILITY TRIANGLE
N.T.S.



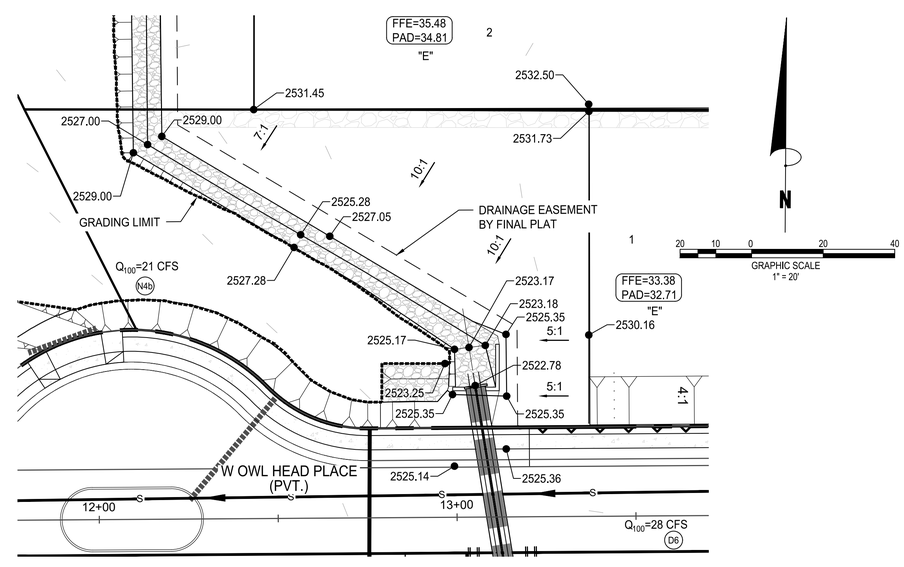
8 SLOPE STABILIZATION DETAILS
N.T.S.

NOTE: ALL RIP RAP TO BE EARTHEN COLORED (SHADES OF BROWN)
REFERENCE 2015 P.A.G. STANDARD SPECIFICATIONS SECTION 912 FOR MORE DETAIL.

RIP-RAP GRADATION TABLE

% GRADATION FINER THAN SIEVE OPENING	
100	2.0 D_{50}
85	1.65 D_{50}
50	1.0 D_{50}
15	0.5 D_{50}

RIP-RAP GRADATION TABLE PER P.A.G. STD. SPEC 912 FOR SLOPE PAVING & 913 FOR BANK PROTECTION TO BE USED ON ALL OF PROJECT UNLESS OTHERWISE NOTED. ALL RIP-RAP SHALL BE OF A NATURAL COLOR AND BLEND IN WITH THE ENVIRONMENT.



15 LOT 1 - GRADING DETAIL
1" = 20'

RELATED CASE #
OV914-009
2100731
OV114-018

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

DETAILS
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12
SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

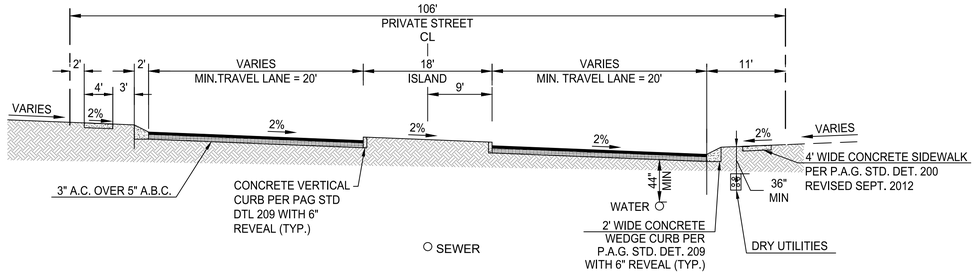
NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA, U.S.A.

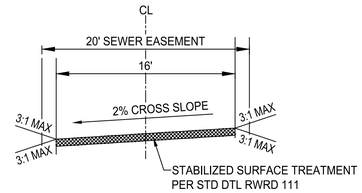
PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: N/A C.I.=2'
V:
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

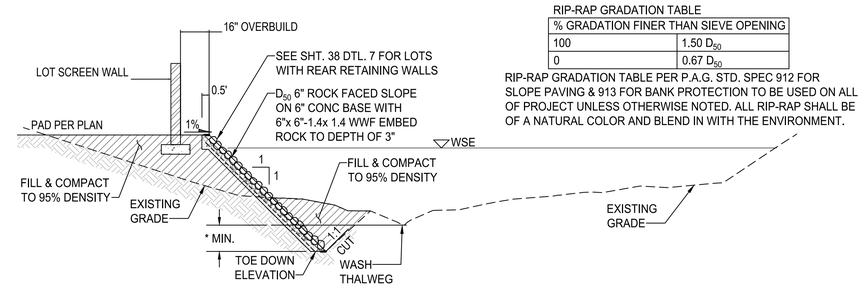
GRADING PERMIT #2500131
P22WI00005
G-2022-007



1 ROADWAY CROSS SECTION
NOTE:
LOCATION OF UTILITIES VARIES, SEE PLAN FOR LOCATION
N.T.S.



3 SEWER EASEMENT
N.T.S.

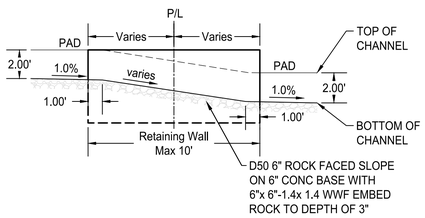


RIP-RAP GRADATION TABLE

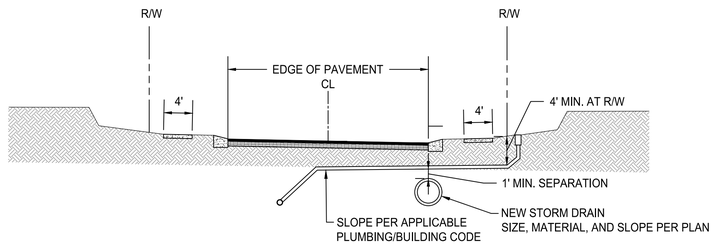
% GRADATION FINER THAN SIEVE OPENING	
100	1.50 D_{50}
0	0.67 D_{50}

RIP-RAP GRADATION TABLE PER P.A.G. STD. SPEC 912 FOR SLOPE PAVING & 913 FOR BANK PROTECTION TO BE USED ON ALL OF PROJECT UNLESS OTHERWISE NOTED. ALL RIP-RAP SHALL BE OF A NATURAL COLOR AND BLEND IN WITH THE ENVIRONMENT.

5 CANYON SHADOWS WASH CROSS SECTION
* = SEE SCOUR DEPTH PROTECTION PROFILES & TABLES A & B ON DTL. 06, SHT. 40 FOR MIN. TOE DOWN DEPTH.
N.T.S



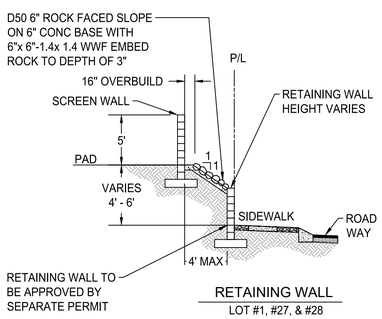
2 RETAINING WALL ON DROP SLOPE DETAIL
N.T.S



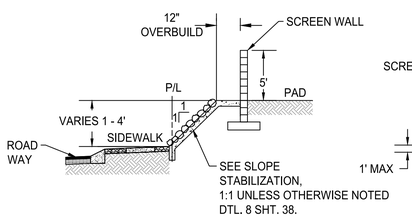
7 TYPICAL HCS CONNECTION TO SEWER LINE OVER STORM DRAIN
PIMA COUNTY - DETAIL RWRD 401
N.T.S.

X NOT USED
N.T.S.

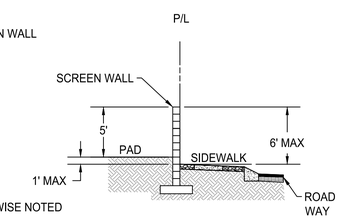
Onsite Hydraulic Structures – Grate Inlets				
Conc. Pt.	Q_{100} (cfs)	Grate width (lf)	Grate inlet (max slope [sL] for 100% intercention)	Bypass flow at curbs (cfs)
D2.1	46	28	7.4%	1.9
D2.5	19	28	6.3%	0.8
D3	47	28	6.6%	1.9
D3.5	10	28	8.8%	0.4
D4	45	28	6.6%	1.8
D5	35	28	7.7%	1.4



RETAINING WALL
LOT #1, #27, & #28

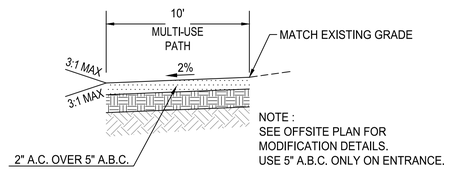


SIDEWALK TO PAD GRADING

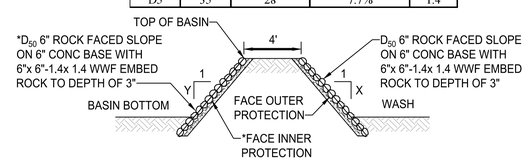


SINGLE WALL

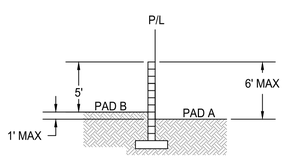
11 LOT TO SIDEWALK GRADING
N.T.S



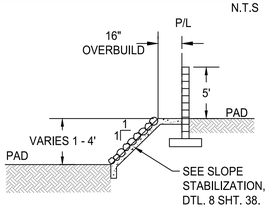
8 MULTI-USE PATH TYPICAL SECTION DETAIL
N.T.S.



10 BANK PROTECTION ON BASINS
*NO RIP RAP FOR 3:1 OR GREATER SLOPES WITHIN BASIN
N.T.S.



SINGLE WALL



PAD TO PAD GRADING

4 LOT TO LOT GRADING
N.T.S.

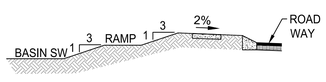
Rip Rap Protection				
Basin	Y	X	Face Inner	Face Outter
SE	3	1	No	Yes
SW	3	3	No	Yes
C	3	1	No	Yes
N	1	1	No	Yes

Onsite Hydraulic Structures – Storm Drains (1 of 3)							
Storm Drain Outfall at SW Basin = D4+D5							
RUN D4							
Station	Inv. Elev.	# pipes	Dia. (in)	Q (cfs)	Depth (ft)	V (ft/s)	s (%)
306.80	2518.08	1	36	80	3.00	0.0	
length	*102.5*						5.02%
409.34	2523.23	1	36	80	1.56	21.5	
Manhole and D5 lateral inflow							
409.34	2523.33	1	36	45	1.22	16.6	
length	*304.8*						3.75%
714.13	2534.77	1	36	45	1.22	16.6	
Manhole							
714.13	2534.87	1	36	45	0.80	29.7	
length	*29.6*						18.65%
743.68	2540.38	1	36	45	0.80	29.7	
Storm Drain Lateral from D5 to D4							
RUN D5							
Station	Inv. Elev.	# pipes	Dia. (in)	Q (cfs)	Depth (ft)	V (ft/s)	s (%)
221.22	2523.63	1	36	35	1.21	13.1	
length	*184.7*						2.34%
405.89	2527.95	1	36	35	1.21	13.1	
Manhole and D13 lateral inflow							
405.89	2528.05	1	36	35	1.22	12.9	
length	*45.7*						2.25%
451.64	2529.08	1	36	35	1.22	12.9	
Storm Drain Lateral from D13 to D5							
RUN SD-D13							
Station	Inv. Elev.	# pipes	Dia. (in)	Q (cfs)	Depth (ft)	V (ft/s)	s (%)
1003.04	2529.95	1	12	1.3	0.51	3.2	
length	18.2						0.50%
1021.20	2530.04	1	12	1.3	0.51	3.2	

Onsite Hydraulic Structures – Storm Drains (2 of 3)							
Storm Drain Outfall at SW Basin = D3							
RUN D3							
Station	Inv. Elev.	# pipes	Dia. (in)	Q (cfs)	Depth (ft)	V (ft/s)	s (%)
408.49	2518.08	1	36	47	3.00	0.0	
length	113.7						4.33%
522.18	2523.00	1	36	47	1.20	17.7	
Manhole							
522.18	2523.10	1	36	47	1.22	17.4	
length	446.2						4.13%
968.38	2541.54	1	36	47	1.22	17.4	
968.38	2541.54	1	36	47	1.22	17.4	
Manhole							
968.38	2541.64	1	36	47	0.76	33.3	
length	15.3						25.02%
983.65	2545.46	1	36	47	0.76	33.3	
Storm Drain Outfall at SE Basin = D2.1+N2							
RUN SD-D2.1							
Station	Inv. Elev.	# pipes	Dia. (in)	Q (cfs)	Depth (ft)	V (ft/s)	s (%)
997.10	2494.95	1	48	70	3.0	0.0	
length	-150.5						1.99%
846.61	2497.94	1	48	70	1.62	14.6	
Manhole							
846.86	2498.34	1	48	70	1.44	17.2	
length	-364.93						3.11%
481.93	2509.68	1	48	70	1.44	17.2	
Manhole							
481.93	2509.78	1	48	70	1.47	16.7	
length	-310.6						2.86%
171.33	2518.65	1	48	70	1.47	16.7	
Manhole and N2 lateral inflow							
171.33	2519.65	1	36	46	1.22	17.0	
length	-113.20						3.89%
58.13	2524.05	1	36	46	1.22	17.0	
Manhole							
58.13	2524.15	1	36	46	0.95	24.0	
length	-19.13						10.14%
39.00	2526.09	1	36	46	0.95	24.0	

Onsite Hydraulic Structures – Storm Drains (3 of 3)							
Storm Drain Lateral from N2 to D2.1							
RUN N2							
Station	Inv. Elev.	# pipes	Dia. (in)	Q (cfs)	Depth (ft)	V (ft/s)	s (%)
1110.31	2520.27	1	30	24	0.98	13.5	
length	-75.3						3.28%
1035.01	2522.74	1	30	24	0.98	13.5	
Storm Drain from D2.5 to Basin N							
RUN SD-D2.5							
Station	Inv. Elev.	# pipes	Dia. (in)	Q (cfs)	Depth (ft)	V (ft/s)	s (%)
1041.09	2570.00	1	36	38	0.60	0	
length	41.7						21.45%
1082.82	2578.95	1	36	38	0.71	29.7	
Storm Drain from D3.5 to Basin C							
RUN SD-D3.5							
Station	Inv. Elev.	# pipes	Dia. (in)	Q (cfs)	Depth (ft)	V (ft/s)	s (%)
1074.00	2564.00	1	18	10	1.30	0.0	
length	-54.0						-0.81%
1020.00	2564.44	1	18	10	1.33	6.0	
Storm Drain at D12							
RUN SD-D12							
Station	Inv. Elev.	# pipes	Dia. (in)	Q (cfs)	Depth (ft)	V (ft/s)	s (%)
1205.09	2548.10	1	30	34	1.91	8.4	
length	-109.5						0.79%
1095.62	2548.96	1	30	34	1.91	8.4	
Manhole							
1097.52	2549.36	1	30	34	1.64	10.0	
length	-71.5						1.18%
1026.04	2550.20	1	30	34	1.64	10.0	

Onsite Hydraulic Structures – Scuppers								
Scupper Conc. Pt.	Q_{100} (cfs)	Bypass flow from from upstream vane grate		Design Q_{100} (cfs)	Opening height (h) (ft)	Scupper thickness (t) (ft)	Yi (ft)	Minimum width (L) (ft)
		CP	Q (cfs)					
D2	36	D2.1+D2.5	2.7	38.7	0.67	0.33	1	13
D2.65	8	n/a		8	0.67	0.33	1	3
D6	26	D4+D5	3.2	29.2	0.67	0.33	1	10
D7	29	D3	1.9	30.9	0.67	0.33	1	11
N2.4	2	reverse scupper		2	0.67	0.33	1	1
N5	26	reverse scupper		26	0.67	0.33	1	9
D2.7	3	reverse scupper		3	0.67	0.33	1	1
D3.3	3.6	reverse scupper		3.6	0.67	0.33	1	1
D4.1	6	reverse scupper		6	0.67	0.33	1	2



12 RAMP SECTION DETAIL
N.T.S.

RELATED CASE #
OV914-009
2100731
OV114-018

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA 811
Call 811 or click Arizona811.com

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

DETAILS
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12
SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil) CERTIFICATE NO. 54544 ROBERT W. SCHLICHER Date Signed 12/16/24 ARIZONA, U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: N/A C.I.=2'
V:
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
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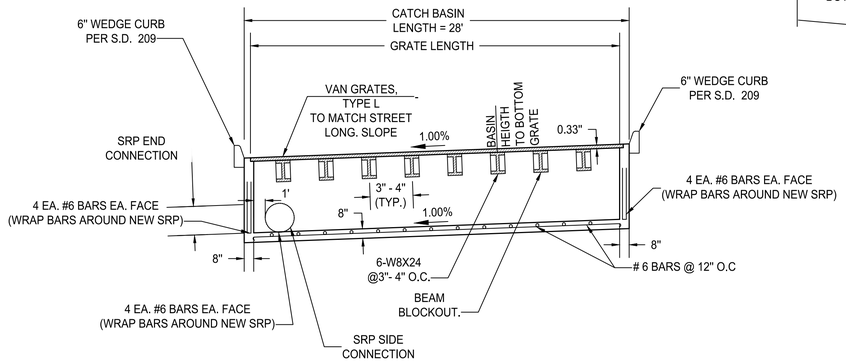
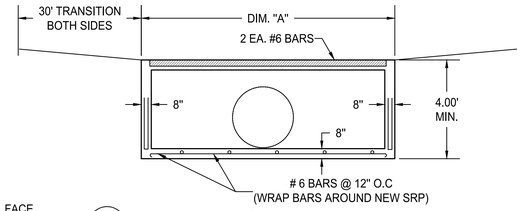
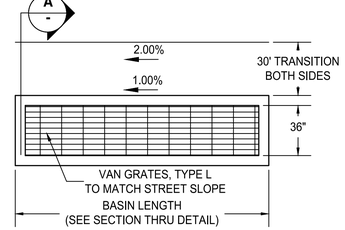
G-2022-007



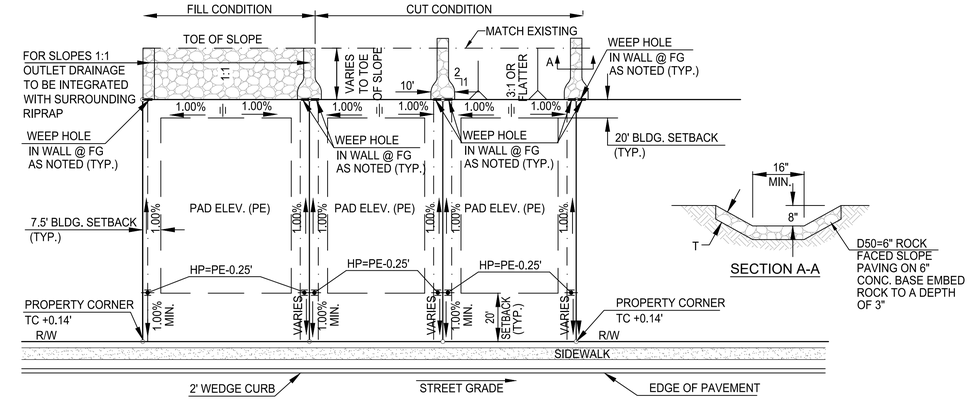
1 SECTION (CATCH BASIN DETAIL)
SEE RIGHT "A" AND "B" FOR X-SECTION AND PLAN VIEW
N.T.S.



A CATCH BASIN - X-SECTION



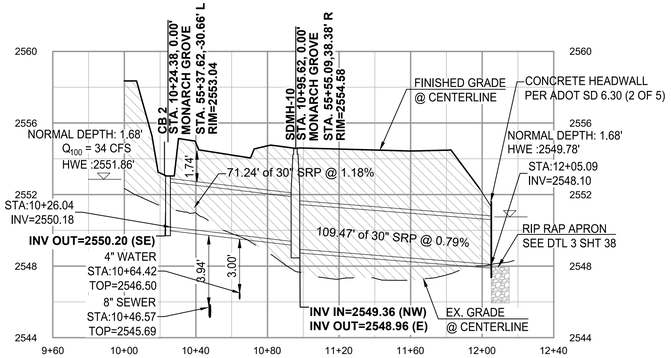
B CATCH BASIN GRATE - PLAN VIEW



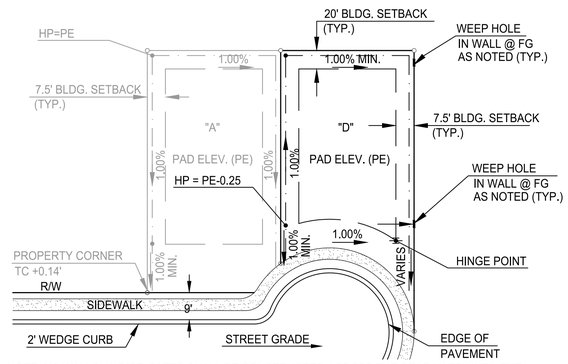
NOTE: NO WALLS AND/OR GATES SHALL BE CONSTRUCTED ACROSS THE REAR YARD UNTIL THE FINAL LOT GRADING HAS BEEN ESTABLISHED TO MEET THE 1% MIN. DRAINAGE REQUIREMENTS. OUTLET INVERTS SHALL BE DESIGNED TO MEET THE FINAL GRADES.
FINAL LOT GRADING SHALL NOT EXCEED 2.5% IN ANY DIRECTION.

4 TYPE "C" LOT GRADING
N.T.S.

SECTION A-A

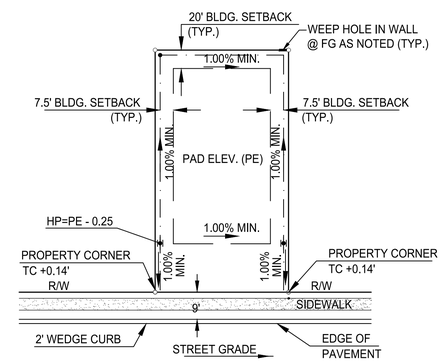


2 STORM DRAIN RUN SD-D12 @ CANYON SHADOWS WASH
SCALE: H:1"=40', V:1"=4'



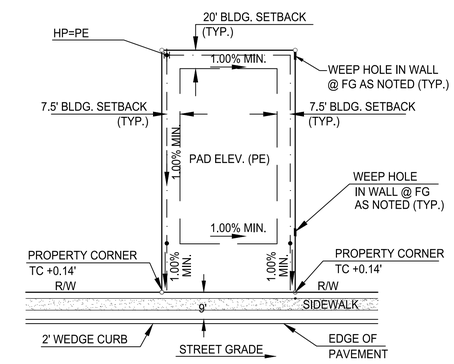
NOTE: NO WALLS AND/OR GATES SHALL BE CONSTRUCTED ACROSS THE REAR YARD UNTIL THE FINAL LOT GRADING HAS BEEN ESTABLISHED TO MEET THE 1% MIN. DRAINAGE REQUIREMENTS. OUTLET INVERTS SHALL BE DESIGNED TO MEET THE FINAL GRADES. FINAL LOT GRADING SHALL NOT EXCEED 2.5% IN ANY DIRECTION.

5 TYPE "D" LOT GRADING
N.T.S.



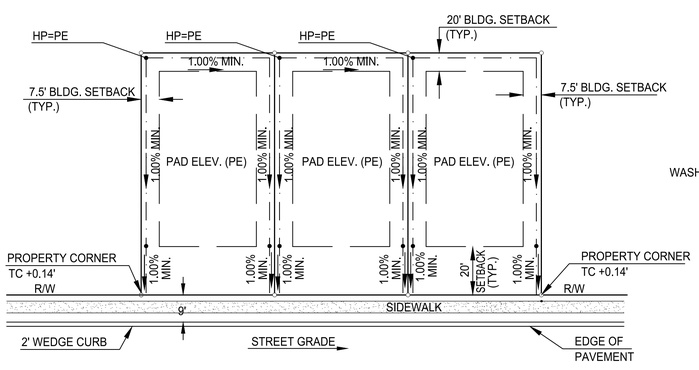
NOTE: NO WALLS AND/OR GATES SHALL BE CONSTRUCTED ACROSS THE REAR YARD UNTIL THE FINAL LOT GRADING HAS BEEN ESTABLISHED TO MEET THE 1% MIN. DRAINAGE REQUIREMENTS. OUTLET INVERTS SHALL BE DESIGNED TO MEET THE FINAL GRADES.
FINAL LOT GRADING SHALL NOT EXCEED 2.5% IN ANY DIRECTION.

7 TYPE "E" LOT GRADING
N.T.S.



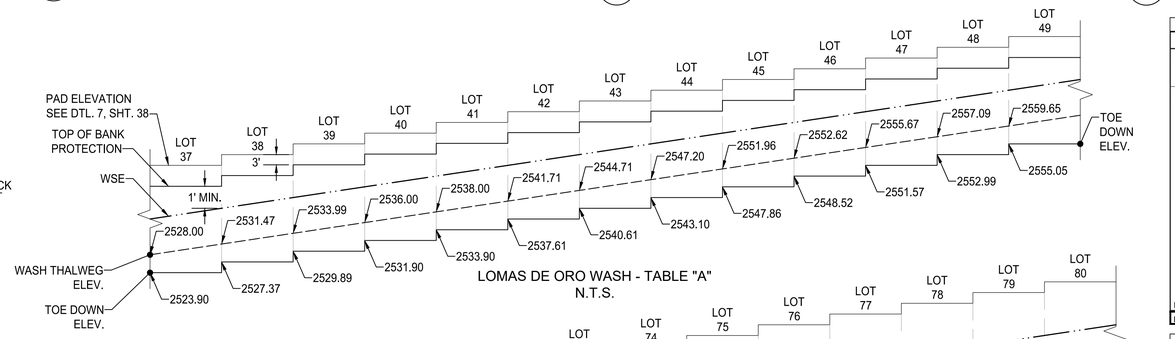
NOTE: NO WALLS AND/OR GATES SHALL BE CONSTRUCTED ACROSS THE REAR YARD UNTIL THE FINAL LOT GRADING HAS BEEN ESTABLISHED TO MEET THE 1% MIN. DRAINAGE REQUIREMENTS. OUTLET INVERTS SHALL BE DESIGNED TO MEET THE FINAL GRADES.
FINAL LOT GRADING SHALL NOT EXCEED 2.5% IN ANY DIRECTION.

8 TYPE "F" LOT GRADING
N.T.S.

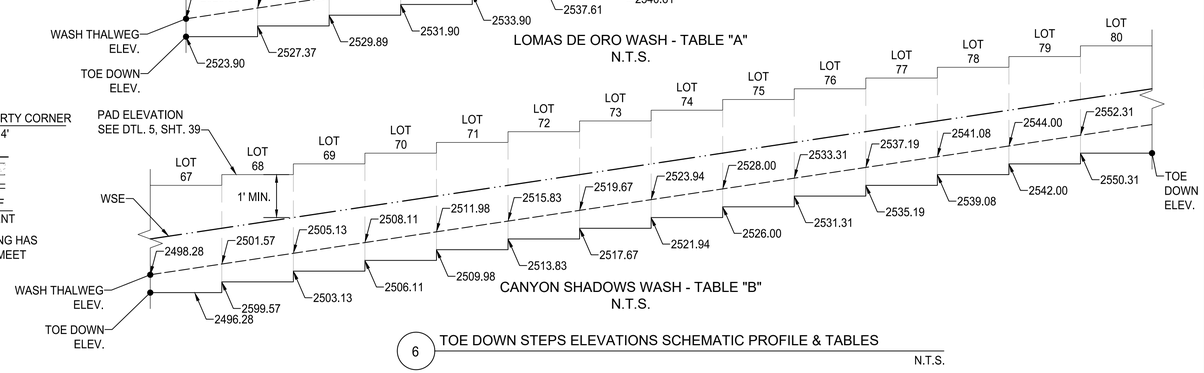


NOTE: NO WALLS AND/OR GATES SHALL BE CONSTRUCTED ACROSS THE REAR YARD UNTIL THE FINAL LOT GRADING HAS BEEN ESTABLISHED TO MEET THE 1% MIN. DRAINAGE REQUIREMENTS. OUTLET INVERTS SHALL BE DESIGNED TO MEET THE FINAL GRADES.
FINAL LOT GRADING SHALL NOT EXCEED 2.5% IN ANY DIRECTION.

3 TYPE "A" LOT GRADING
N.T.S.



LOMAS DE ORO WASH - TABLE "A"
N.T.S.



CANYON SHADOWS WASH - TABLE "B"
N.T.S.

6 TOE DOWN STEPS ELEVATIONS SCHEMATIC PROFILE & TABLES
N.T.S.

TABLE 'A' SCOUR DEPTH PROTECTION
LOMAS DE ORO WASH

LOT	WASH THALWEG ELEV.	MIN. TOE DOWN	TOE DOWN ELEV.
37	2528.00	4.1	2523.90
38	2531.47	4.1	2527.37
39	2533.99	4.1	2529.89
40	2536.00	4.1	2531.90
41	2538.00	4.1	2533.90
42	2541.71	4.1	2537.61
43	2544.71	4.1	2540.61
44	2547.20	4.1	2543.10
45	2551.96	4.1	2547.86
46	2552.62	4.1	2548.52
47	2555.67	4.1	2551.57
48	2557.09	4.1	2552.99
49	2559.65	4.6	2555.05
Basin "C"	2563.00	4.6	2558.40
Basin "N"	2573.00	4.2	2568.80
Basin "SW"	2522.00	4.2	2517.80

BASIN TOE DOWN DEPTH= TOE DOWN ELEVATION

TABLE 'B' SCOUR DEPTH PROTECTION
CANYON SHADOWS WASH

LOT	WASH THALWEG ELEV.	MIN. TOE DOWN	TOE DOWN ELEV.
67	2498.28	2	2496.28
68	2501.57	2	2499.57
69	2505.13	2	2503.13
70	2508.11	2	2506.11
71	2511.98	2	2509.98
72	2515.83	2	2513.83
73	2519.67	2	2517.67
74	2523.94	2	2521.94
75	2528.00	2	2526.00
76	2533.31	2	2531.31
77	2537.19	2	2535.19
78	2541.08	2	2539.08
79	2544.00	2	2542.00
80	2552.31	2	2550.31
Basin "SE"	2492.00	2	2490.00

BASIN TOE DOWN DEPTH= TOE DOWN ELEVATION

RELATED CASE #
OV914-009
2100731
OV114-018

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DETAILS
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12
SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA U.S.A.

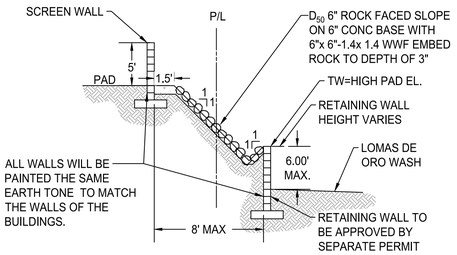
PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: N/A C.I.=2'
V:
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

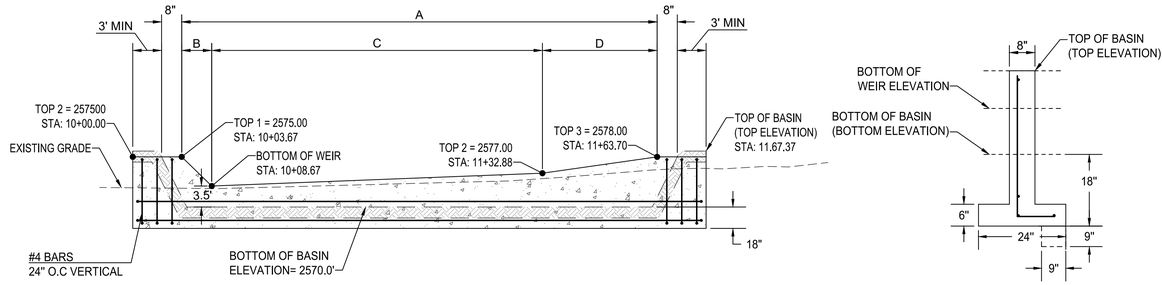
P22WI00005

G-2022-007



1 RETAINING WALL DETAIL

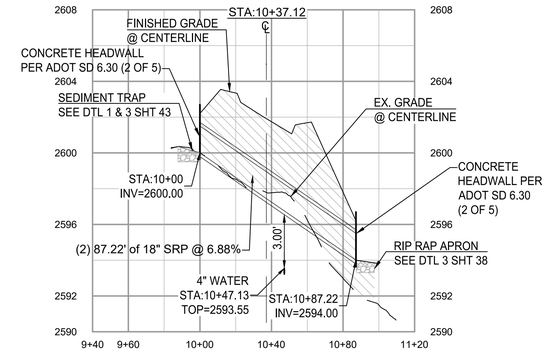
N.T.S.



WEIR DIMENSIONS								
BASIN	A (FT)	B (FT)	C (FT)	D (FT)	TOP 1 (FT)	TOP 2 (FT)	TOP 3 (FT)	BOTTOM OF WEIR
N	160.03'	5.00'	124.21'	30.82'	2575.00	2577.00	2578.00	2573.50

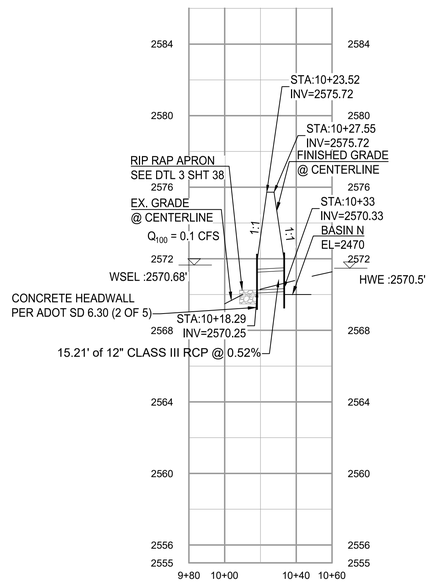
4 BASIN "N" WEIR DETAIL

N.T.S.



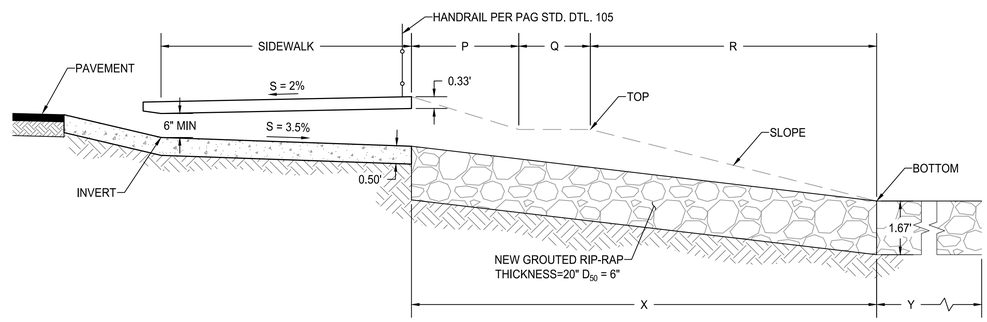
8 STORM DRAIN RUN @ STREET SUNBEAM RIDGE

N.T.S.



2 STORM DRAIN @ BASIN "N"

N.T.S.

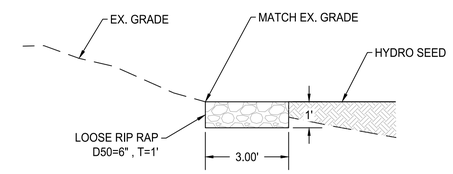


SIDEWALK SCUPPER (TYPE 3) PER PAG DETAIL 205.5

SIDEWALK SCUPPER (TYPE 3) DIMENSIONS									
SCUPPER	INVERT	P (FT)	Q (FT)	R (FT)	SLOPE	X (FT)	Y (FT)	TOP	BOTTOM
D6	2523.31'	6.9'	4.0'	10.5'	3:1	21.4'	9.7'	2521.58'	2518.08'
D7	2524.95'	-	-	21.2'	3:1	21.2'	9.0'	2521.58'	2518.08'
D2	2500.29'	-	-	31.1'	3:1	31.1'	16.0'	2495.00'	2498.50'

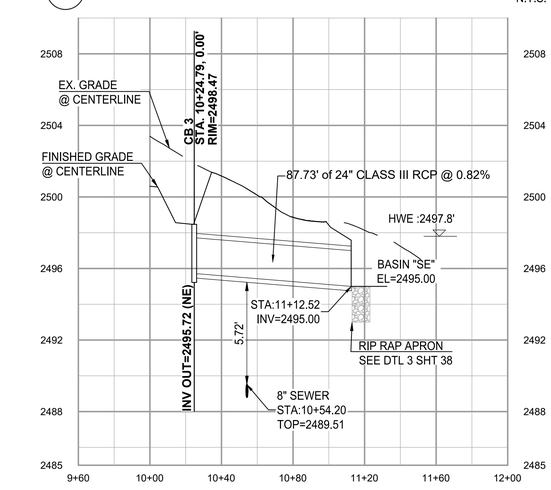
3 SCUPPER CROSS SECTION DETAIL

N.T.S.



9 RIP RAP PROTECTION

N.T.S.



10 STORM DRAIN @ BASIN "SE" (WEST SIDE)

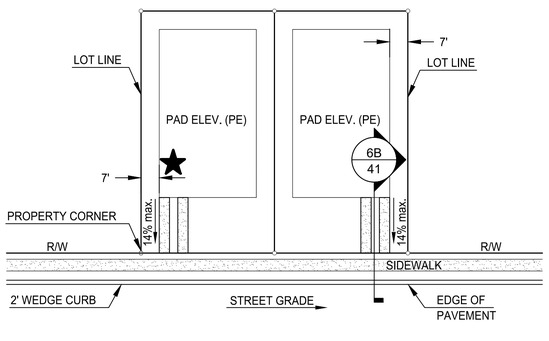
N.T.S.

LOT #	Driveway Length (ft)	Slope
1	16	3%
2	16	3%
3	16	3%
4	48	9%
5	37	10%
6	23	13%
7	16	9%
8	16	9%
9	16	9%
10	16	9%
11	16	9%
12	55	9%
13	16	14%
14	16	9%
15	16	9%
16	16	9%
17	16	9%
18	16	9%
19	16	11%
20	16	10%
21	16	10%
22	16	9%
23	16	8%
24	16	7%
25	16	8%
26	16	8%
27	16	8%
28	16	13%
29	16	11%
30	16	11%
31	16	11%
32	16	14%
33	17	14%
34	16	12%
35	16	11%
36	16	11%
37	16	9%
38	16	9%
39	16	9%
40	16	9%
41	16	9%
42	16	9%
43	16	3%
44	16	3%
45	16	3%
46	16	9%

LOT #	Driveway Length (ft)	Slope
47	16	9%
48	16	9%
49	16	8%
50	16	3%
51	19	14%
52	20	8%
53	16	9%
54	16	10%
55	16	10%
56	16	11%
57	16	9%
58	16	8%
59	16	8%
60	16	8%
61	16	8%
62	16	11%
63	16	9%
64	16	9%
65	16	10%
66	16	8%
67	16	3%
68	16	3%
69	16	3%
70	16	3%
71	16	3%
72	16	3%
73	16	6%
74	16	11%
75	16	9%
76	16	3%
77	16	3%
78	16	3%
79	16	3%
80	20	13%
81	16	14%
82	16	9%
83	18	14%
84	16	9%
85	16	8%
86	16	9%
87	16	3%
88	35	9%
89	40	13%
90	23	14%
91	23	11%

7 DRIVEWAY GRADE TABLE

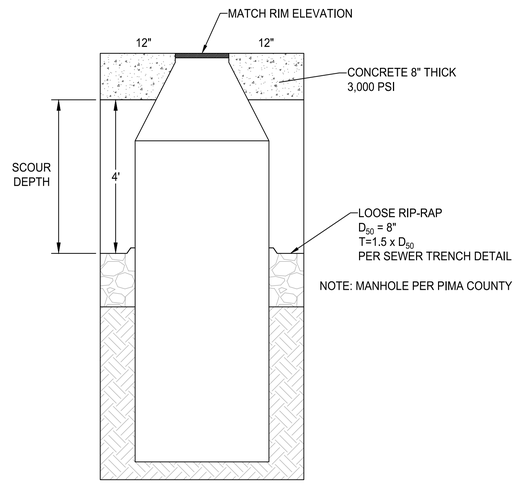
N.T.S.



6 DRIVEWAY LOCATION DETAIL

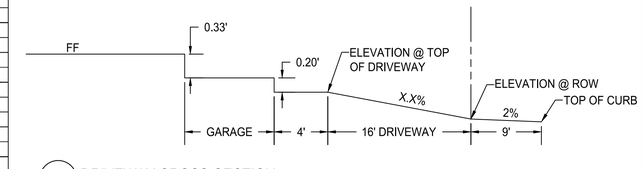
SEE DRIVEWAY GRADE TABLE

N.T.S.



11 MANHOLE SCOUR PROTECTION DETAIL

N.T.S.



6B DRIVEWAY CROSS-SECTION

SEE DRIVEWAY GRADE TABLE

N.T.S.

RELATED CASE #
OV914-009
2100731
OV114-018

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2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil) CERTIFICATE NO. 54544 ROBERT W. SCHLICHER Date Signed 10/18/24 ARIZONA, U.S.A.

PLAN STATUS:
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FOR CONSTRUCTION ☐

H: N/A C.I.=2'
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LJA
DESIGNED BY
RWS
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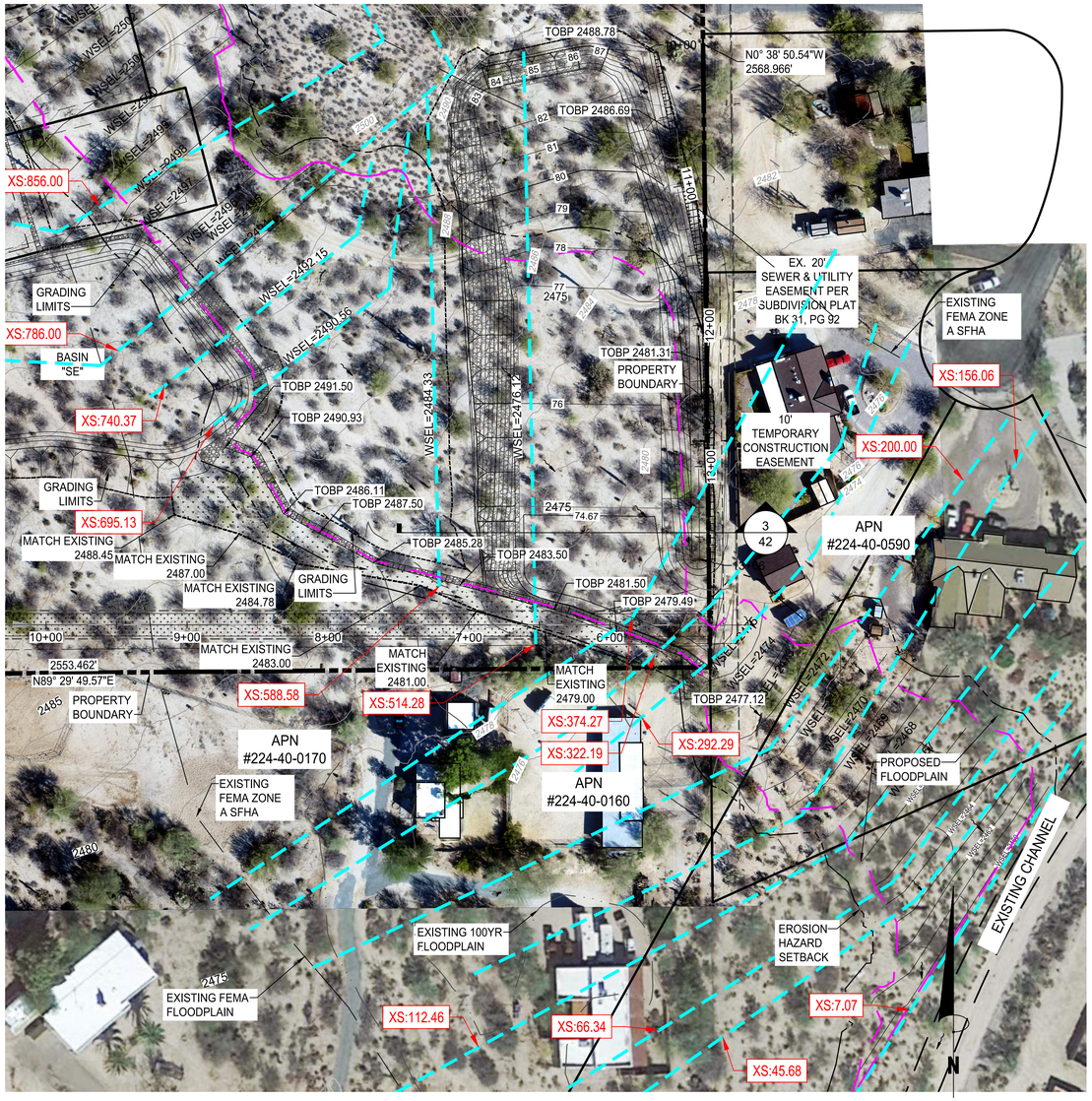
P22WI00005

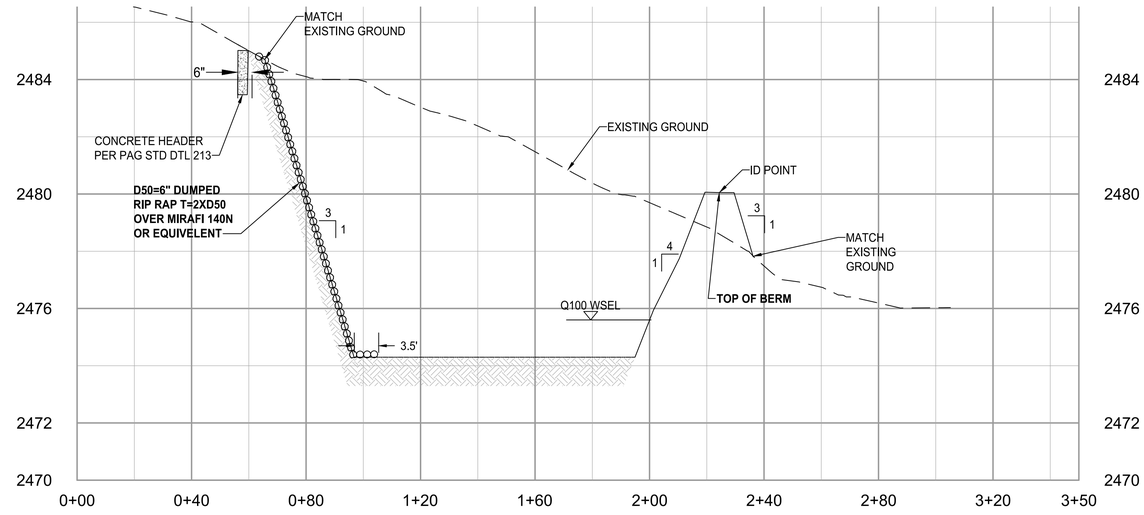
G-2022-007

Date/Time: Thu, 09 Jan 2025 - 11:20am Path/Name: S:\ARIZ\Tucson\AZ4072-4000\AND_LJA MOVING FORWARD\BASE FILES\PN\41 DETAILS.dwg



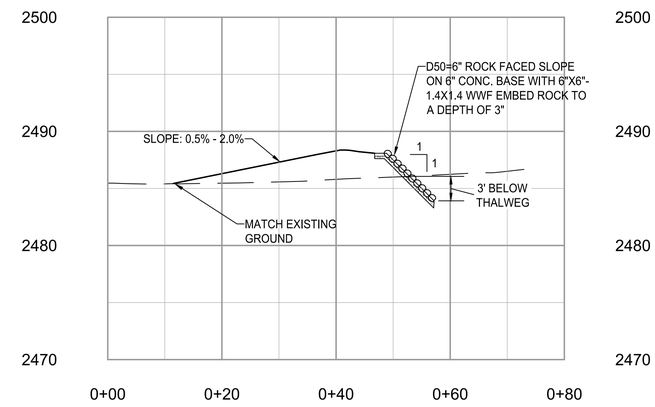
1 GRADING DETAIL - CORNER SE

N.T.S.



3 BERM @ SOUTHEAST CORNER

N.T.S.



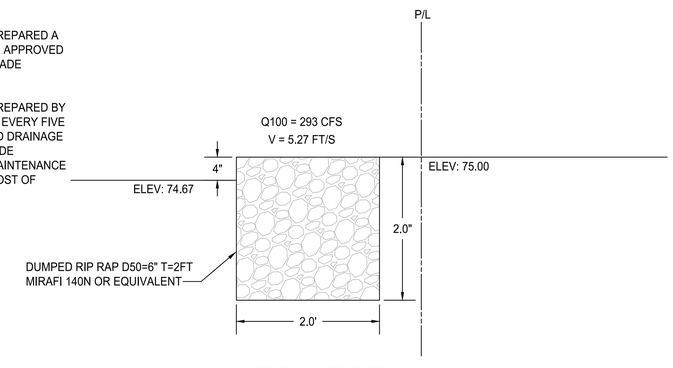
4 BACKFILL DETAIL

N.T.S.

NOTES:

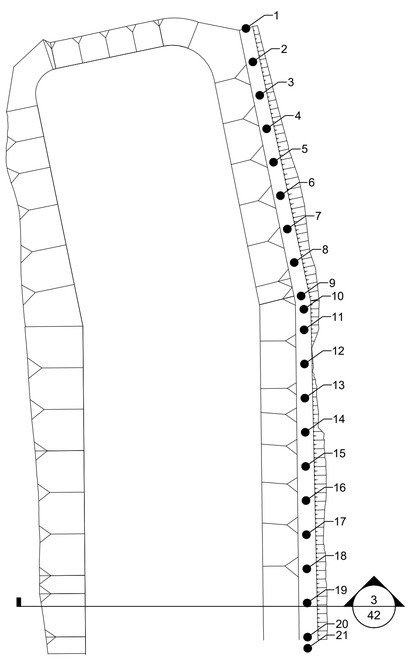
1. ALL DRAINAGE STRUCTURES SHALL BE INSPECTED AND A SUMMARY REPORT PREPARED A MINIMUM OF ONCE EACH YEAR IN ACCORDANCE WITH THE PROCEDURES IN THE APPROVED DRAINAGE REPORT. COPIES OF THE ANNUAL INSPECTION REPORTS SHALL BE MADE AVAILABLE TO THE TOWN UPON REQUEST.

2. ALL DRAINAGE STRUCTURES SHALL BE INSPECTED AND A SUMMARY REPORT PREPARED BY AN ARIZONA REGISTERED PROFESSIONAL CIVIL ENGINEER A MINIMUM OF ONCE EVERY FIVE YEARS IN ACCORDANCE WITH THE PROCEDURES PRESENTED IN THE APPROVED DRAINAGE REPORT. COPIES OF THE 5-YEAR-INTERVAL INSPECTION REPORTS SHALL BE MADE AVAILABLE TO THE TOWN UPON REQUEST. THE REPORT SHALL IDENTIFY THE MAINTENANCE NEEDS FOR THE NEXT 5-YEAR PERIOD, INCLUDING THE ANTICIPATED ANNUAL COST OF MAINTENANCE AND REPAIR.



2 RIP RAP WEIR DETAIL

N.T.S.



3A BASIN WITH POINT ID

N.T.S.

BERM PROTECTION TABLE							
POINT ID	NORTHING	EASTING	CANYON SHADOWS WASH BOTTOM	Q100 WSEL	TOP OF BERM	FREEBOARD	EXISTING GRADE ON PROTECTED SIDE
1	506547.01	981589.53	2486.59		2488.71		2488.02
2	506527.43	981593.57	2482.74		2488.19		2487.02
3	506507.84	981597.61	2481.90		2487.43		2486.01
4	506488.25	981601.65	2481.06		2486.67		2484.98
5	506468.66	981605.68	2480.23		2485.91		2483.95
6	506449.07	981609.72	2479.39		2485.16		2482.47
7	506429.49	981613.76	2478.55		2484.41		2481.97
8	506409.90	981617.80	2477.71		2483.65		2481.81
9	506390.31	981621.84	2476.87	2475.90	2482.90	7.00	2480.96
10	506382.51	981623.44	2476.77	2475.89	2482.60	6.71	2480.92
11	506370.47	981623.58	2476.23	2475.89	2482.33	6.44	2480.85
12	506350.47	981623.81	2475.78	2475.89	2481.88	5.99	2482
13	506330.48	981624.03	2475.33	2475.88	2481.44	5.56	2480.64
14	506310.48	981624.26	2474.88	2475.88	2480.99	5.11	2480.02
15	506290.48	981624.48	2474.43	2475.88	2480.54	4.66	2478.35
16	506270.48	981624.71	2474.00	2475.87	2480.09	4.22	2477.85
17	506250.48	981624.94	2474.00	2475.87	2479.65	3.78	2478.03
18	506230.48	981625.16	2474.00	2475.87	2479.20	3.33	2477.37
19	506210.48	981625.39	2474.00	2475.75	2478.75	3.00	2476.79
20	506190.48	981625.62	2474.00	2475.29	2478.31	3.02	2476.44
21	506183.95	981625.69	2474.00	2475.12	2478.13	3.01	2476.43

*REFER TO DETAIL 3 ON THIS PAGE, FOR GRAPHICAL REPRESENTATION.

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GRADING PERMIT #2500131

P22WI00005

G-2022-007

Date/Time: Mon, 16 Dec 2024 - 10:19am Path/Name: S:\ARIZ\Tucson\AZ4072\400LAND_LJA MOVING FORWARD\BASE FILES\IP\42 DETAILS.dwg

HCS DESIGN AND AS-BUILT INFORMATION								
LOT #	CLEANOUT LOCATION			DISTANCE TO DOWNSTREAM MH		AS-BUILT		
						STATE PLANE COORDINATES (ARIZONA CENTRAL) NAD 83 INTERNATIONAL FEET AT HCS CLEANOUT		DISTANCE TO DOWNSTREAM MANHOLE
	STATION	OFFSET	INVERT	MH#	DISTANCE	NORTHING	EASTING	DISTANCE
1	20+78.79	-26.00	2528.53	SMH 9	70.54			
2	21+62.73	-26.00	2529.85	SMH 9	154.40			
3	23+25.39	-26.60	2533.12	SMH 15	125.07			
4	24+26.17	-30.31	2534.55	SMH 16	0.00			
5	24+33.23	16.48	2534.67	SMH 16	0.00			
6	23+86.86	51.92	2534.07	SMH 15	185.93			
7	17+07.25	-26.00	2533.48	SMH 10	60.38			
8	18+47.16	-26.00	2540.88	SMH 10	200.29			
9	25+80.25	-26.00	2574.64	SMH 14	55.56			
10	26+66.26	-26.00	2577.21	SMH 14	141.57			
11	27+52.26	-26.00	2579.96	SMH 14	227.57			
12	29+66.95	-7.55	2585.97	SMH 14	0.00			
13	29+26.31	25.38	2584.87	SMH 14	401.20			
14	28+56.71	26.00	2582.94	SMH 14	331.59			
15	27+70.75	26.00	2580.19	SMH 14	245.64			
16	26+84.71	26.00	2577.78	SMH 14	159.60			
17	25+98.71	26.00	2574.54	SMH 14	73.60			
18	43+34.91	-26.00	2556.95	SMH 22	166.03			
19	22+47.42	26.00	2559.21	SMH 13	118.34			
20	21+78.60	26.00	2555.20	SMH 13	47.81			
21	21+04.08	26.00	2551.91	SMH 12	118.61			
22	20+29.67	26.00	2548.72	SMH 12	38.73			
23	19+52.64	26.00	2545.84	SMH 11	305.77			
24	18+72.64	26.00	2541.74	SMH 11	225.77			
25	17+98.47	26.00	2538.57	SMH 11	151.60			
26	17+12.61	26.00	2534.91	SMH 11	65.73			
27	16+30.04	26.00	2531.43	SMH 10	59.51			
28	33+90.26	-26.00	2525.67	SMH 19	61.71			
29	34+64.34	-26.00	2528.36	SMH 19	135.78			
30	35+44.34	-26.00	2532.09	SMH 19	215.77			
31	36+24.34	-26.00	2535.39	SMH 19	295.76			
32	37+04.34	-26.00	2538.62	SMH 19	375.74			
33	37+88.59	-26.00	2541.75	SMH 19	459.98			
34	38+87.34	-26.00	2545.40	SMH 20	77.01			
35	39+93.96	-26.00	2549.02	SMH 20	179.22			
36	41+19.27	-26.00	2553.57	SMH 21	107.26			
37	34+48.51	26.00	2526.82	SMH 19	120.84			
38	35+34.51	26.00	2530.32	SMH 19	206.82			
39	36+20.51	26.00	2533.83	SMH 19	292.81			
40	37+06.51	26.00	2537.33	SMH 19	378.80			
41	37+92.41	26.00	2540.63	SMH 19	464.79			
42	38+75.30	26.00	2542.39	SMH 20	62.64			
43	39+58.25	26.00	2543.88	SMH 20	148.80			
44	40+41.13	26.00	2545.36	SMH 21	26.22			
45	41+24.04	26.00	2546.93	SMH 21	112.22			
46	42+07.00	26.00	2549.03	SMH 22	37.65			
47	42+92.01	26.00	2551.29	SMH 22	123.69			
48	43+78.01	26.00	2553.95	SMH 22	209.68			
49	44+64.01	26.00	2556.61	SMH 22	0.00			
50	51+06.92	26.00	2572.79	SMH 40	0.00			
51	51+82.48	26.00	2574.28	SMH 40	75.11			
52	65+38.93	-26.00	2549.80	SMH 30	73.62			
53	64+35.68	-26.00	2543.64	SMH 29	216.85			
54	63+41.14	-26.00	2537.13	SMH 29	129.22			
55	62+53.30	-26.00	2531.90	SMH 29	38.99			
56	61+70.28	-26.00	2528.35	SMH 28	175.71			
57	60+31.65	-43.67	2525.27	SMH 28	34.59			
58	59+39.33	-26.00	2521.81	SMH 27	181.40			
59	58+54.92	-26.00	2519.54	SMH 27	95.36			
60	57+70.49	-26.00	2516.99	SMH 27	9.39			
61	56+86.08	-26.00	2514.32	SMH 26	414.04			
62	55+90.94	-29.82	2511.23	SMH 26	318.69			
63	55+02.16	-71.40	2508.70	SMH 26	229.75			
64	54+28.83	-26.00	2505.20	SMH 26	156.58			
65	53+41.28	-33.70	2501.32	SMH 26	69.01			
66	52+71.61	-43.57	2498.65	SMH 25	218.77			
67	53+14.09	50.05	2499.74	SMH 26	42.13			
68	53+90.45	26.00	2503.02	SMH 26	118.40			
69	54+72.56	25.99	2506.23	SMH 26	200.51			
70	55+62.49	26.00	2509.68	SMH 26	290.44			

MANHOLE AS-BUILT INFORMATION		
MH NO	STATE PLANE COORDINATES (ARIZONA CENTRAL) NAD 83 INTERNATIONAL FEET	
	NORTHING	EASTING
1		
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HCS DESIGN AND AS-BUILT INFORMATION								
LOT #	CLEANOUT LOCATION			DISTANCE TO DOWNSTREAM MH		AS-BUILT		
						STATE PLANE COORDINATES (ARIZONA CENTRAL) NAD 83 INTERNATIONAL FEET AT HCS CLEANOUT		DISTANCE TO DOWNSTREAM MANHOLE
	STATION	OFFSET	INVERT	MH#	DISTANCE	NORTHING	EASTING	DISTANCE
71	56+43.27	26.00	2512.22	SMH 26	371.22			
72	57+50.17	26.00	2515.93	SMH 26	476.63			
73	58+59.25	26.00	2519.13	SMH 27	100.50			
74	59+68.33	26.00	2522.25	SMH 27	207.36			
75	61+27.02	26.00	2526.72	SMH 28	131.22			
76	62+78.14	26.00	2533.26	SMH 29	62.53			
77	63+89.20	26.00	2539.34	SMH 29	175.08			
78	64+43.44	26.00	2543.97	SMH 29	234.53			
79	65+46.04	26.00	2549.36	SMH 30	81.59			
80	57+52.91	-3.57	2551.55	SMH 39	0.00			
81	56+80.94	-26.00	2550.77	SMH 39	186.60			
82	55+84.92	-26.00	2550.93	SMH 39	91.25			
83	65+13.04	26.00	2550.38	SMH 31	10.98			
84	66+06.10	26.00	2556.98	SMH 31	97.43			
85	66+99.50	26.00	2562.36	SMH 32	18.80			
86	67+94.82	26.00	2567.07	SMH 32	109.53			
87	71+60.81	25.20	2606.04	SMH 42	8.77			
88	72+43.51	-13.99	2608.70	SMH 42	0.00			
89	72+33.50	-58.02	2609.26	SMH 42	0.00			
90	76+94.02	-26.00	2598.89	SMH 38	0.00			
91	75+89.64	-26.00	2594.91	SMH 37	135.43			

Onsite Hydraulic Structures - Local Collector Channels

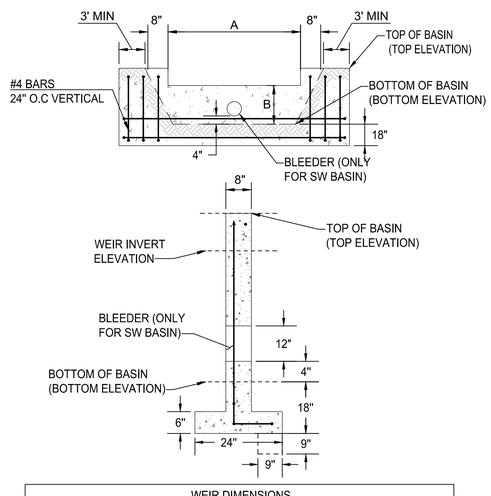
Location	Q100	Flow	Design	Bottom	Design	Left	Left	Right	Right	min slope
	(cfs)	Depth (ft)	Depth (ft)	width (ft)	Topwidth (ft)	sideslope (xH:1V)	lining	sideslope (xH:1V)	lining	%
N1	34	1.6	3.1	4	13	1	grouted riprap	2	grouted riprap	0.5
N2	24	1.3	2.6	4	12	2	grouted riprap	1	grouted riprap	0.5
N3	21	1.1	2.2	4	15	2	grouted riprap	1	grouted riprap	0.5
N4.1	13	0.9	1.8	4	13	2	dumped riprap	3	earthen	0.5
N4b	21	1.1	2.2	4	15	2	dumped riprap	3	earthen	0.51
N5	26	1.4	2.9	4	12	1	grouted riprap	2	grouted riprap	0.5
N5.1	24	1.2	2.4	4	16	3	earthen	2	dumped riprap	0.5
D3.3	3.6	0.4	0.9	4	8	2	dumped riprap	2	dumped riprap	0.54
D13	1.3	0.2	0.4	4	5	2	grouted riprap	1	grouted riprap	1.0

d_{50} = 6 inches

Onsite Hydraulic Structures - Local Channels

Location	Q100	Flow	Design	Bottom	Design	Left	Left	Right	Right	min slope
	(cfs)	Depth (ft)	Depth[a] (ft)	width (ft)	Topwidth (ft)	sideslope (xH:1V)	lining	sideslope (xH:1V)	lining	%
D12	34	1.4	1.7	4	7	1	grouted riprap	1	grouted riprap	0.97
N2	24	1.7	2	4	8	1	grouted riprap	1	grouted riprap	0.25
N3	21	1.1	1.3	4	7	1	grouted riprap	1	grouted riprap	0.85

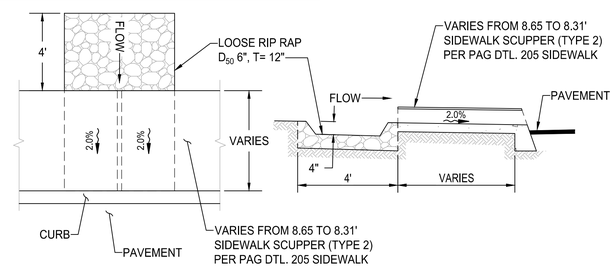
[a] = includes freeboard, d_{50} = 6 inches for grouted riprap



WEIR DIMENSIONS				
BASIN	A (FT)	B (FT)	WEIR ELEVATION	BLEEDER DIAM.
SW	80.0	2.4	2520.48	12"
SE	9.0	2.0	2407.00	NA

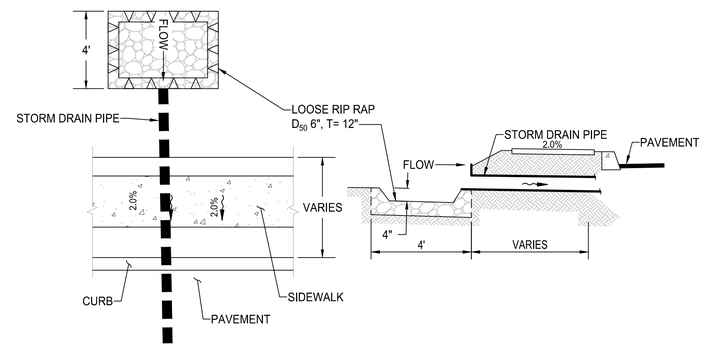
2 BASIN WEIR

N.T.S.



1 SEDIMENT TRAP DETAIL

N.T.S.



3 SEDIMENT TRAP DETAIL

N.T.S.

RELATED CASE #
OV914-009
2100731
OV114-018

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or 602.271.5485

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

HCS TABLE
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12
SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO.
54544
ROBERT W. SCHLICHER
Date Signed 12-10-24
ARIZONA U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

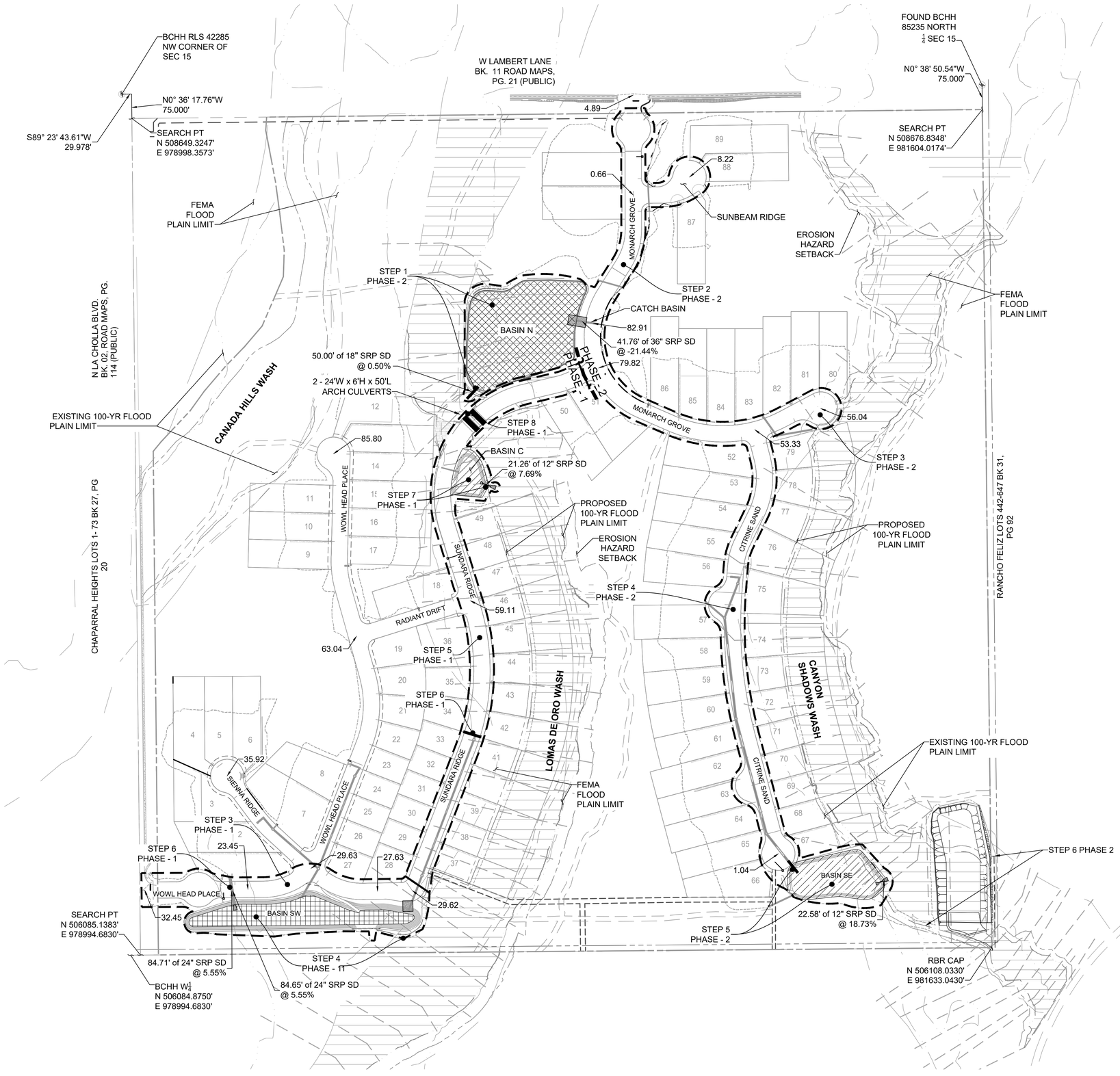
H: C.I.=2'
V:
SCALE
12/10/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007

Date/Time : Thu, 09 Jan 2025 - 11:15am Path/Name : S:\ARIZ\Tucson\AZ4072\400LAND_LJA MOVING FORWARD\BASE FILES\IPs\43 HCS TABLE.dwg



LEGEND

- BASIN C
- BASIN N
- BASIN SE
- BASIN SW
- CATCH BASIN
- TEMP RIP-RAP
- DRAINAGE MANHOLE
- STORM DRAIN PIPE

CRITICAL GRADING & STORM DRAINAGE SEQUENCE

PHASE 1:

STEP 1. STAKE CLEARING LIMITS

STEP 2. INSTALL BEST MANAGEMENT PRACTICES

STEP 3. GRADE "WOWL HEAD PLACE" (FROM "LA CHOLLA" TO "SUNDARA RIDGE")

STEP 4. BUILD BASIN "SW" AND INSTALL OUTLET STRUCTURE

STEP 5. GRAD "SUNDARA RIDGE"

STEP 6. INSTALL DRAINAGE TEMPORARY SWALES AT STRUCTURE LOCATIONS.

STEP 7. BUILD BASIN "C" AND INSTALL OUTLET STRUCTURE.

STEP 8. INSTALL ARCH CULVERTS

PHASE 2:

STEP 1. BUILD BASIN "N" AND INSTALL OUTLET STRUCTURE

STEP 2. GRADE "MONARCH GROVE" (FROM "LAMBERT" TO "CITRINE SAND"

STEP 3. GRADE "MONARCH GROVE"

STEP 4. GRADE "CITRINE SAND"

STEP 5. BUILD BASIN "SE" AND INSTALL OUTLET STRUCTURE

RELATED CASE #
OV914-009
2100731
OV114-018

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811
Call 811 or click Arizona811.com

LJA Engineering, Inc.
7458 N. La Cholla Boulevard,
Tucson, AZ 85741
Phone 520.257.3400

CDFMA
SUNDARA RIDGE
FINAL SITE PLAN, IMPROVEMENT PLAN AND PUBLIC SEWER PLAN
SUNDARA RIDGE LOTS 1 THROUGH 91
A PORTION OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 12
SOUTH, RANGE 13 EAST, G&SRM TOWN OF ORO VALLEY, PIMA COUNTY, ARIZONA
2101153

NO.	DATE	REVISION	APP.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 54544
ROBERT W. SCHLICHER
Date Signed 12/16/24
ARIZONA, U.S.A.

PLAN STATUS:
FOR REVIEW ☒
FOR CONSTRUCTION ☐

H: 1"=150' C.I.=2'
V:
SCALE
12/16/24
DATE
AZ4072-1004
JOB NUMBER
ML
DRAWN BY
LJA
DESIGNED BY
RWS
CHECKED BY

GRADING PERMIT #2500131

P22WI00005

G-2022-007

DateTime: Mon, 16 Dec 2024 - 10:21am PathName: S:\ARIZRTucson\AZ4072\400LAND_LJA MOVING FORWARD\BASE FILES\PN\44 CDFMA.dwg

CON/SPAN B-Series DYO
TWIN 24 x 6

NOTES

GENERAL NOTES:

1. THIS BRIDGE HAS BEEN DESIGNED FOR GENERAL SITE CONDITIONS. THE PROJECT ENGINEER SHALL BE RESPONSIBLE FOR THE STRUCTURE'S SUITABILITY TO THE EXISTING SITE CONDITIONS AND FOR THE HYDRAULIC EVALUATION -- INCLUDING SCOUR AND CONFIRMATION OF SOIL CONDITIONS.

2. PRIOR TO CONSTRUCTION, CONTRACTOR MUST VERIFY ALL ELEVATIONS SHOWN THROUGH THE ENGINEER.

3. ONLY CONTECH ENGINEERED SOLUTIONS LLC, THE CON/SPAN® APPROVED PRECASTER IN ARIZONA MAY PROVIDE THE STRUCTURE DESIGNED IN ACCORDANCE WITH THESE PLANS.

4. THE USE OF ANOTHER PRECAST STRUCTURE WITH THE DESIGN ASSUMPTIONS USED FOR THE CON/SPAN® STRUCTURE MAY LEAD TO SERIOUS DESIGN ERRORS. USE OF ANY OTHER PRECAST STRUCTURE WITH THIS DESIGN AND DRAWINGS VOIDS ANY CERTIFICATION OF THIS DESIGN AND WARRANTY. CONTECH ASSUMES NO LIABILITY FOR DESIGN OF ANY ALTERNATE OR SIMILAR TYPE STRUCTURES.

5. ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT DRAWINGS AND CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF ARIZONA, EMPLOYED BY THE PRECAST CONCRETE BRIDGE SUPPLIER, ARE SUBMITTED TO THE ENGINEER 2 WEEKS PRIOR TO THE BID DATE FOR REVIEW AND APPROVAL.

6. ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT THE ALTERNATE DESIGN DOES NOT REDUCE THE HYDRAULIC OPENING OF THE STRUCTURE AS SHOWN ON THE DRAWINGS. AT A MINIMUM THE ALTERNATE STRUCTURE MUST PROVIDE THE SAME OR LARGER SPAN AND RISE AS THE STRUCTURE SHOWN ON THE DRAWINGS.

7. THE PRECAST ARCH SUPPLIER MUST ATTEND THE PRE-BID MEETING, IF ONE IS HELD.

8. SUPPLIER OF PROPOSED ALTERNATES TO A CON/SPAN® BRIDGE SYSTEM MUST SUBMIT AT LEAST TWO (2) INDEPENDENTLY VERIFIED FULL SCALE LOAD TESTS THAT CONFIRM THE PROPOSED DESIGN METHODOLOGY OF THE THREE SIDED/ARCH STRUCTURE(S). THE PROPOSED ALTERNATE, UPON SATISFACTORY CONFIRMATION OF DESIGN METHODOLOGY, MAY BE CONSIDERED AN ACCEPTABLE ALTERNATE.

9. PROPOSED ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT THE PRECAST CONCRETE BRIDGE STRUCTURES ARE PROVIDED BY A SUPPLIER THAT HAS A MINIMUM OF TWO (2) REGISTERED PROFESSIONAL ENGINEERS ON STAFF THAT ARE DEDICATED TO THE DESIGN OF THESE TYPES OF STRUCTURES. SUPPLIER MUST PROVIDE THESE NAMES, P.E. LICENSE NUMBERS AND DATES OF HIRE AT TIME OF ALTERNATE SUBMITTAL.

DESIGN DATA

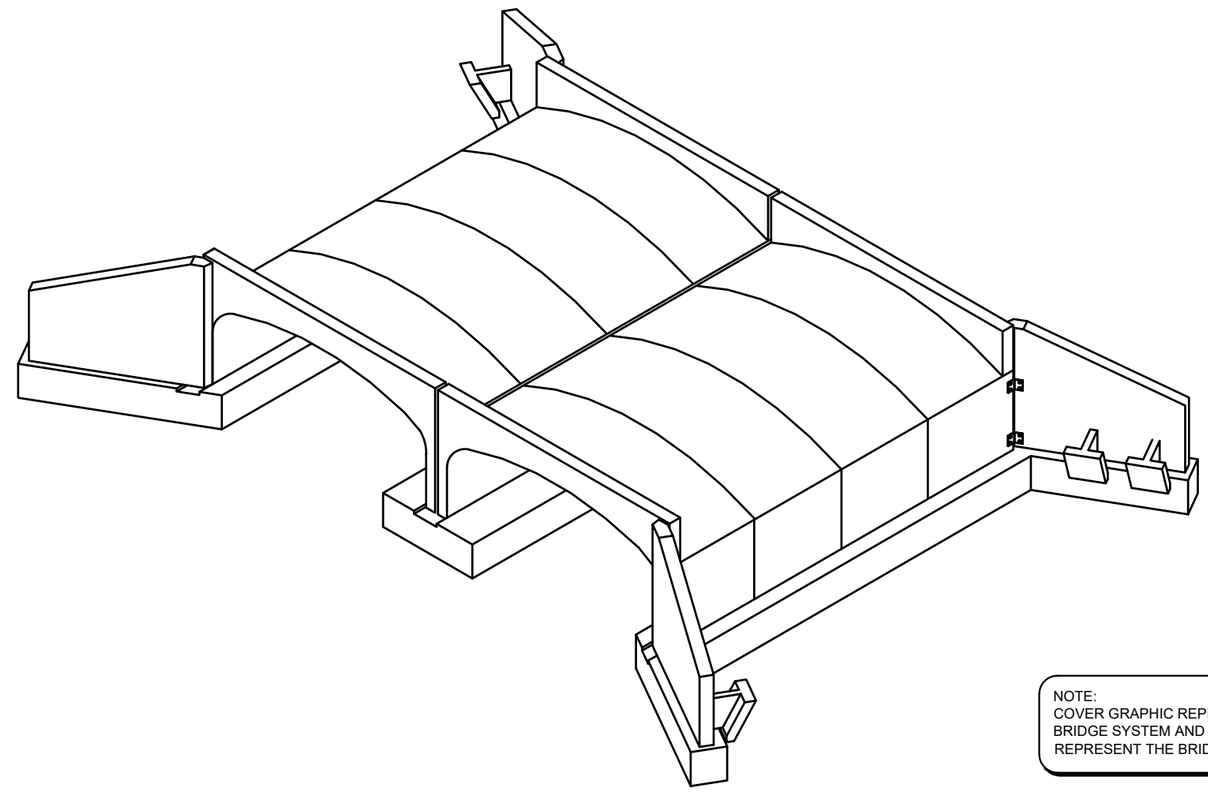
DESIGN LOADING:
- BRIDGE UNITS: HL93
- HEADWALLS: EARTH PRESSURE ONLY
- WINGWALLS: EARTH PRESSURE ONLY

DESIGN FILL HEIGHT: 2'-0" TO 3'-0"
FROM TOP OF CROWN TO TOP OF PAVEMENT.
DESIGN METHOD: LOAD RESISTANCE FACTOR DESIGN PER AASHTO LRFD SPECIFICATION

*AT THE TIME OF DESIGN, A GEOTECHNICAL REPORT FOR THE PROJECT SITE WAS NOT AVAILABLE. IT IS THE PROJECT ENGINEER'S, OWNER'S AND/OR THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THAT THE ACTUAL SITE CONDITIONS AT THE TIME OF CONSTRUCTION ARE CONSISTENT WITH THE FOUNDATION BEARING PRESSURES SHOWN WITH A GEOTECHNICAL INVESTIGATION FROM A QUALIFIED GEOTECHNICAL ENGINEER.

MATERIALS

PRECAST UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CON/SPAN® SPECIFICATIONS. CONCRETE FOR FOOTINGS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. REINFORCING STEEL FOR FOOTINGS SHALL CONFORM TO ASTM A615 OR A996-GRADE 60.



ISOMETRIC VIEW

NOTE:
COVER GRAPHIC REPRESENTS CON/SPAN® BRIDGE SYSTEM AND IS NOT INTENDED TO REPRESENT THE BRIDGE DESIGNED HEREIN.

REQUIRES SEPARATE PERMIT.
NOT FOR CONSTRUCTION

PRELIMINARY
NOT FOR CONSTRUCTION

GRADING PERMIT #2500131

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CON/SPAN BRIDGE SYSTEMS

DYOB DRAWING

SUNDARA RIDGE
TWIN 24 x 6
ORO VALLEY, AZ
B Series, 24' Span x 6' Rise

PROJECT No.: 16385	DYO No.: 24776	DATE: 4/12/23
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 45 OF 51		

NOTES

GENERAL NOTES:

1. THIS BRIDGE HAS BEEN DESIGNED FOR GENERAL SITE CONDITIONS. THE PROJECT ENGINEER SHALL BE RESPONSIBLE FOR THE STRUCTURE'S SUITABILITY TO THE EXISTING SITE CONDITIONS AND FOR THE HYDRAULIC EVALUATION -- INCLUDING SCOUR AND CONFIRMATION OF SOIL CONDITIONS.
2. PRIOR TO CONSTRUCTION, CONTRACTOR MUST VERIFY ALL ELEVATIONS SHOWN THROUGH THE ENGINEER.
3. ONLY CONTECH ENGINEERED SOLUTIONS LLC, THE CON/SPAN® APPROVED PRECASTER IN ARIZONA MAY PROVIDE THE STRUCTURE DESIGNED IN ACCORDANCE WITH THESE PLANS.
4. THE USE OF ANOTHER PRECAST STRUCTURE WITH THE DESIGN ASSUMPTIONS USED FOR THE CON/SPAN® STRUCTURE MAY LEAD TO SERIOUS DESIGN ERRORS. USE OF ANY OTHER PRECAST STRUCTURE WITH THIS DESIGN AND DRAWINGS VOIDS ANY CERTIFICATION OF THIS DESIGN AND WARRANTY. CONTECH ASSUMES NO LIABILITY FOR DESIGN OF ANY ALTERNATE OR SIMILAR TYPE STRUCTURES.
5. ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT DRAWINGS AND CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF ARIZONA, EMPLOYED BY THE PRECAST CONCRETE BRIDGE SUPPLIER, ARE SUBMITTED TO THE ENGINEER 2 WEEKS PRIOR TO THE BID DATE FOR REVIEW AND APPROVAL.
6. ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT THE ALTERNATE DESIGN DOES NOT REDUCE THE HYDRAULIC OPENING OF THE STRUCTURE AS SHOWN ON THE DRAWINGS. AT A MINIMUM THE ALTERNATE STRUCTURE MUST PROVIDE THE SAME OR LARGER SPAN AND RISE AS THE STRUCTURE SHOWN ON THE DRAWINGS.
7. THE PRECAST ARCH SUPPLIER MUST ATTEND THE PRE-BID MEETING, IF ONE IS HELD.
8. SUPPLIER OF PROPOSED ALTERNATES TO A CON/SPAN® BRIDGE SYSTEM MUST SUBMIT AT LEAST TWO (2) INDEPENDENTLY VERIFIED FULL SCALE LOAD TESTS THAT CONFIRM THE PROPOSED DESIGN METHODOLOGY OF THE THREE SIDED/ARCH STRUCTURE(S). THE PROPOSED ALTERNATE, UPON SATISFACTORY CONFIRMATION OF DESIGN METHODOLOGY, MAY BE CONSIDERED AN ACCEPTABLE ALTERNATE.
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DESIGN DATA

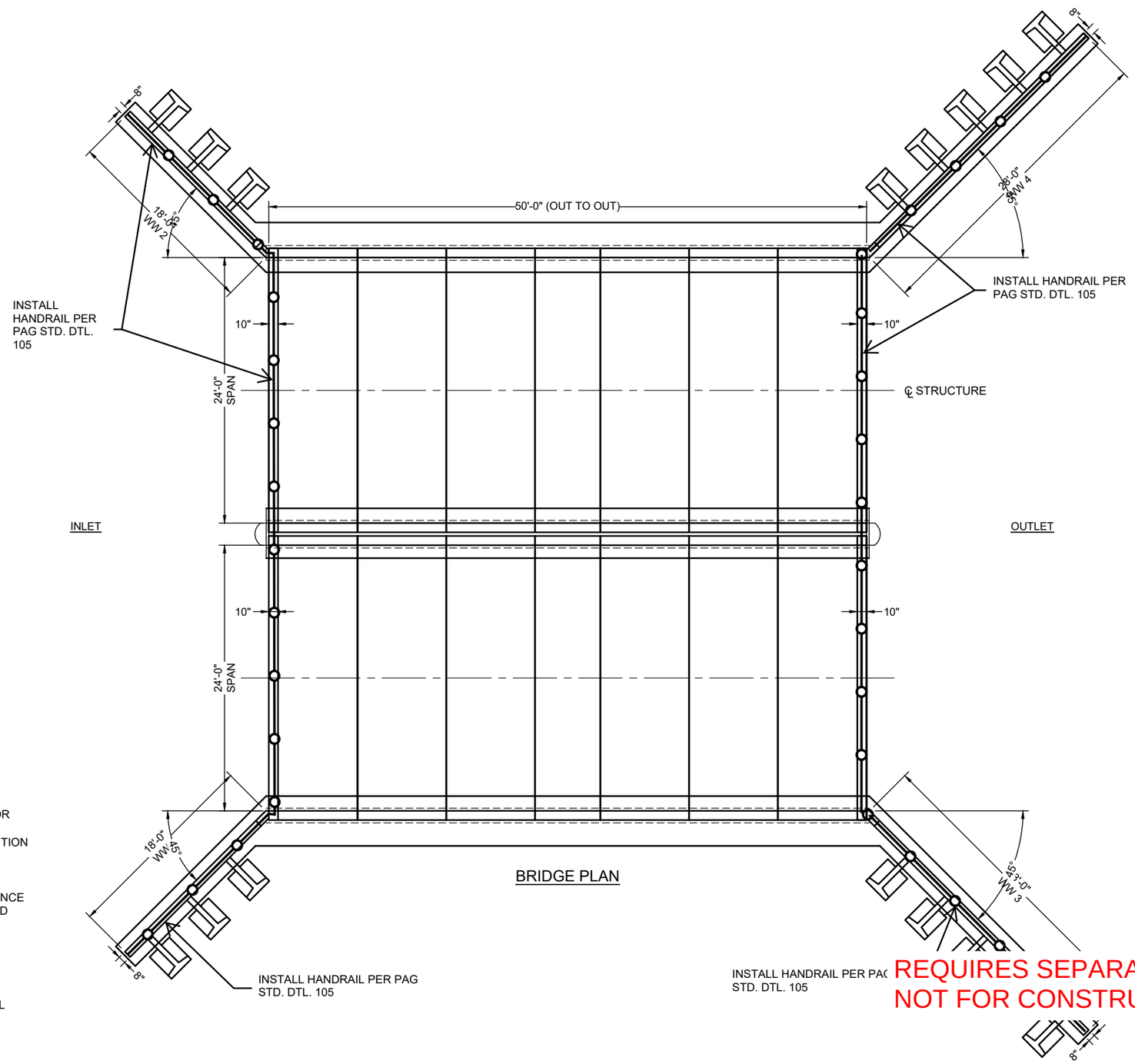
DESIGN LOADING:
- BRIDGE UNITS: HL93
- HEADWALLS: EARTH PRESSURE ONLY
- WINGWALLS: EARTH PRESSURE ONLY

DESIGN FILL HEIGHT: 2'-0" TO 4'-0"
FROM TOP OF CROWN TO TOP OF PAVEMENT.
DESIGN METHOD (ARCHES, HEADWALLS & WINGWALLS): LOAD RESISTANCE FACTOR DESIGN PER AASHTO LRFD SPECIFICATION
DESIGN METHOD (FOUNDATION): PER STANDARD AASHTO SPECIFICATION, 17th EDITION
NET ALLOWABLE SOIL BEARING PRESSURE: 3,000 PSF*
GROSS ALLOWABLE SOIL BEARING PRESSURE: 3,300 PSF*

*FOUNDATION EXCAVATION AND SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT FOR THIS PROJECT PREPARED BY SPEEDIE AND ASSOCIATES DATED MARCH 28, 2019.

MATERIALS

PRECAST UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CON/SPAN® SPECIFICATIONS. CONCRETE FOR FOOTINGS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. REINFORCING STEEL FOR FOOTINGS SHALL CONFORM TO ASTM A615 OR A996-GRADE 60.



BRIDGE PLAN

REQUIRES SEPARATE PERMIT.
NOT FOR CONSTRUCTION

PRELIMINARY
NOT FOR CONSTRUCTION

GRADING PERMIT #2500131

MARK	DATE	REVISION DESCRIPTION	BY

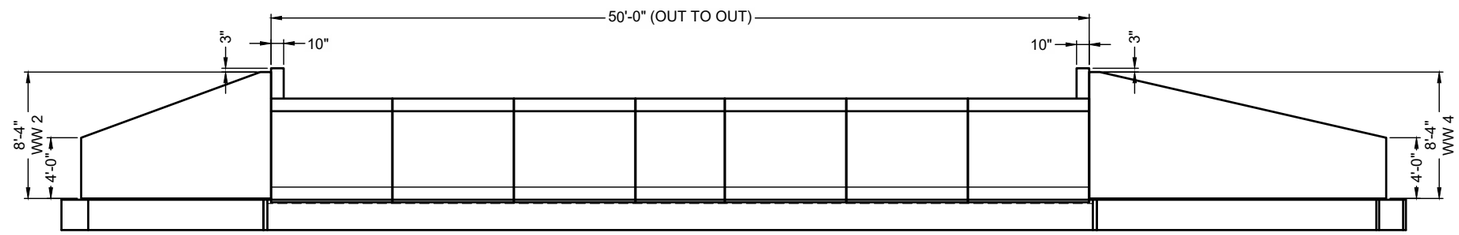
CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CON/SPAN BRIDGE SYSTEMS

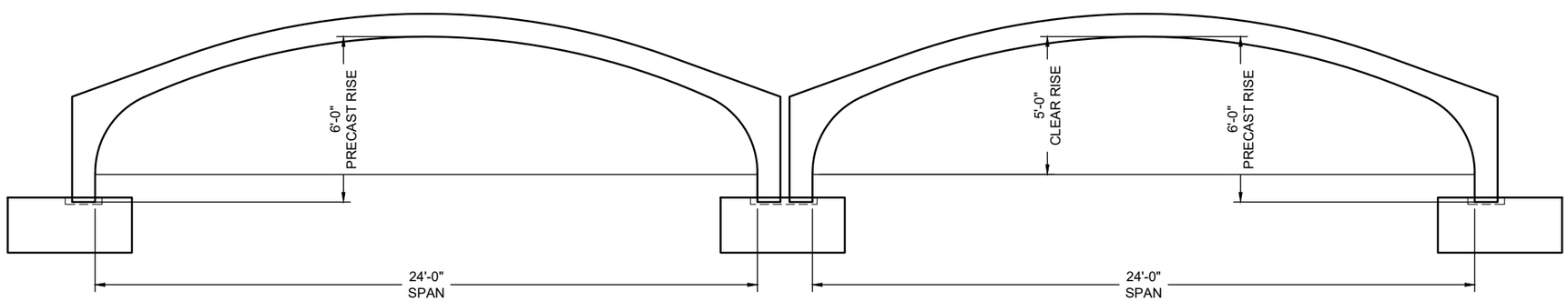
DYOB DRAWING

SUNDARA RIDGE
TWIN 24 x 6
ORO VALLEY, AZ
B Series, 24' Span x 6' Rise

PROJECT No.:	DYO No.:	DATE:
16385	24776	4/12/23
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 46	OF 51	



LONGITUDINAL SECTION



CROSS SECTION

REQUIRES SEPARATE PERMIT.
NOT FOR CONSTRUCTION

PRELIMINARY
NOT FOR CONSTRUCTION

GRADING PERMIT #2500131

MARK	DATE	REVISION DESCRIPTION	BY

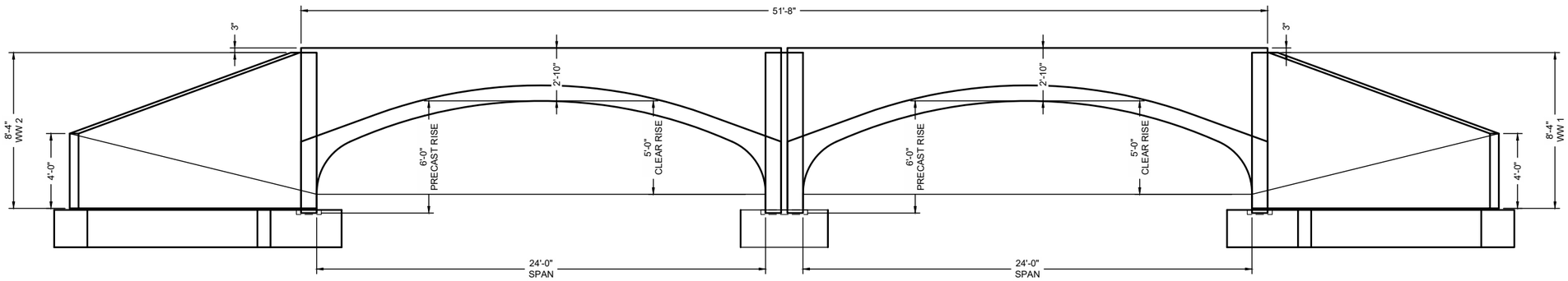
CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

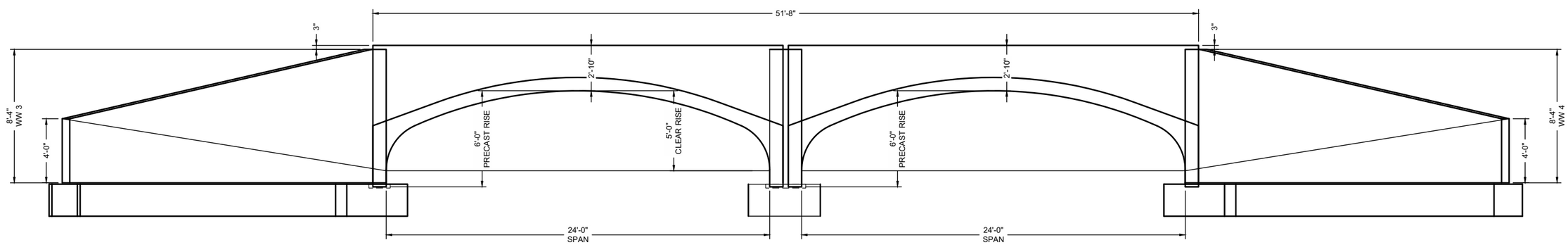
DYOB DRAWING

SUNDARA RIDGE
TWIN 24 x 6
ORO VALLEY, AZ
B Series, 24' Span x 6' Rise

PROJECT No.: 16385	DYO No.: 24776	DATE: 4/12/23
DESIGNED: DYO		DRAWN: DYO
CHECKED: DYO		APPROVED: DYO
SHEET NO.: 47 OF 51		



INLET END ELEVATION



OUTLET END ELEVATION

REQUIRES SEPARATE PERMIT.
NOT FOR CONSTRUCTION

PRELIMINARY
NOT FOR CONSTRUCTION

GRADING PERMIT #2500131

MARK	DATE	REVISION DESCRIPTION	BY

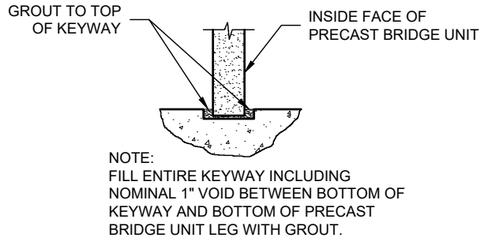
CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONSPAN BRIDGE SYSTEMS

DYOB DRAWING

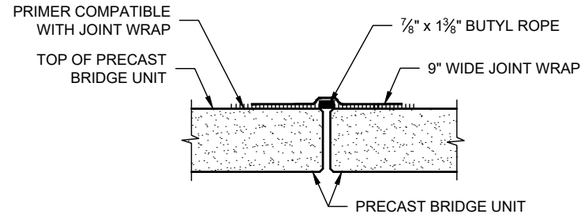
SUNDARA RIDGE
TWIN 24 x 6
ORO VALLEY, AZ
B Series, 24' Span x 6' Rise

PROJECT No.: 16385	DYO No.: 24776	DATE: 4/12/23
DESIGNED: DYO		DRAWN: DYO
CHECKED: DYO		APPROVED: DYO
SHEET NO.: 48 OF 51		



TYPICAL BRIDGE UNIT GROUT DETAIL

NOT TO SCALE



TYPICAL JOINT SEAL DETAIL

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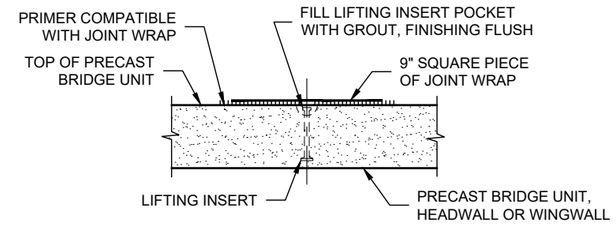
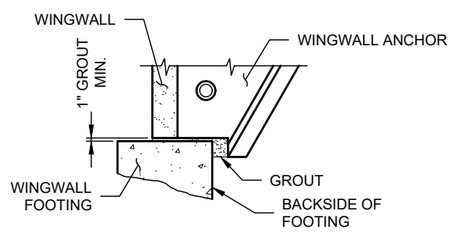


TYPICAL LIFT INSERT SEALING DETAIL

NOT TO SCALE

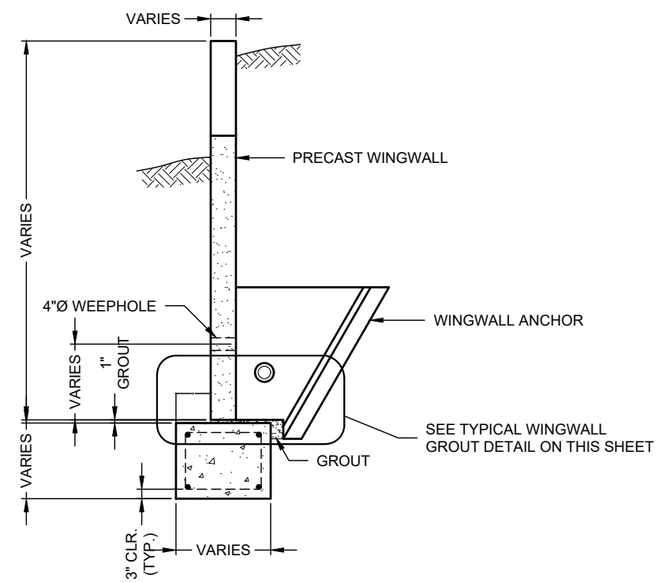


NOTES:

- MINIMUM 1" GROUT UNDER WINGWALL LEG & ANCHOR STEM.
- AREA BETWEEN WINGWALL FOOTING AND WINGWALL ANCHOR SHALL BE GROUTED SOLID BEFORE BACKFILL.
- FORM BACKSIDE OF FOOTING TO DIMENSIONS SHOWN ON FOUNDATION PLAN.

TYPICAL WINGWALL GROUT DETAIL

NOT TO SCALE



TYPICAL WINGWALL SECTION

NOT TO SCALE

REQUIRES SEPARATE PERMIT.
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PROJECT No.: 16385	DYO No.: 24776	DATE: 4/12/23
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SHEET NO.: 49 OF 51		

SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS

1. DESCRIPTION
   1.1. TYPE - THIS WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTING A CON/SPAN® BRIDGE SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN AND DIMENSIONS SHOWN ON THE PLANS OR AS ESTABLISHED BY THE ENGINEER. IN SITUATIONS WHERE TWO OR MORE SPECIFICATIONS APPLY TO THIS WORK, THE MOST STRINGENT REQUIREMENTS SHALL GOVERN.
   1.2. DESIGNATION - PRECAST REINFORCED CONCRETE CON/SPAN® BRIDGE UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY SPAN AND RISE. PRECAST REINFORCED CONCRETE WINGWALLS AND HEADWALLS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT, AND DEFLECTION ANGLE. PRECAST REINFORCED CONCRETE EXPRESS™ FOUNDATION UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT AND WIDTH.

2. DESIGN
   2.1. SPECIFICATIONS - THE PRECAST ELEMENTS ARE DESIGNED IN ACCORDANCE WITH THE "AASHTO LRFD BRIDGE SPECIFICATION" 6TH EDITION, ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2012. A MINIMUM OF ONE FOOT OF COVER ABOVE THE CROWN OF THE BRIDGE UNITS IS REQUIRED IN THE INSTALLED CONDITION. (UNLESS NOTED OTHERWISE ON THE SHOP DRAWINGS AND DESIGNED ACCORDINGLY.)

3. MATERIALS
   3.1. CONCRETE - THE CONCRETE FOR THE PRECAST ELEMENTS SHALL BE AIR-ENTRAINED WHEN INSTALLED IN AREAS SUBJECT TO FREEZE-THAW CONDITIONS, COMPOSED OF PORTLAND CEMENT, FINE AND COARSE AGGREGATES, ADMIXTURES AND WATER. AIR-ENTRAINED CONCRETE SHALL CONTAIN 6 ± 2 PERCENT AIR. THE AIR- ENTRAINING ADMIXTURE SHALL CONFORM TO AASHT0 M154. THE MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE AS SHOWN ON THE SHOP DRAWINGS.
      3.1.1. PORTLAND CEMENT - SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATIONS C150-TYPE I, TYPE II, OR TYPE III CEMENT.
      3.1.2. COARSE AGGREGATE - SHALL CONSIST OF STONE HAVING A MAXIMUM SIZE OF 1 INCH. AGGREGATE SHALL MEET REQUIREMENTS FOR ASTM C33.
      3.1.3. WATER REDUCING ADMIXTURE - THE MANUFACTURER MAY SUBMIT, FOR APPROVAL BY THE ENGINEER, A WATER-REDUCING ADMIXTURE FOR THE PURPOSE OF INCREASING WORKABILITY AND REDUCING THE WATER REQUIREMENT FOR THE CONCRETE.
      3.1.4. CALCIUM CHLORIDE - THE ADDITION TO THE MIX OF CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE WILL NOT BE PERMITTED.
      3.1.5. MIXTURE - THE AGGREGATES, CEMENT AND WATER SHALL BE PROPORTIONED AND MIXED IN A BATCH MIXER TO PRODUCE A HOMOGENEOUS CONCRETE MEETING THE STRENGTH REQUIREMENTS OF THIS SPECIFICATION. THE PROPORTION OF PORTLAND CEMENT IN THE MIXTURE SHALL NOT BE LESS THAN 564 POUNDS (6 SACKS) PER CUBIC YARD OF CONCRETE.
   3.2. STEEL REINFORCEMENT
      3.2.1. THE MINIMUM STEEL YIELD STRENGTH SHALL BE 60,000 PSI, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS.
      3.2.2. ALL REINFORCING STEEL FOR THE PRECAST ELEMENTS SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE DETAILED SHOP DRAWINGS SUBMITTED BY THE MANUFACTURER.
      3.2.3. REINFORCEMENT SHALL CONSIST OF WELDED WIRE FABRIC CONFORMING TO ASTM SPECIFICATION A 185 OR A 497, OR DEFORMED BILLET STEEL BARS CONFORMING TO ASTM SPECIFICATION A 615, GRADE 60. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY CONSIST OF WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS.
   3.3. STEEL HARDWARE
      3.3.1. BOLTS AND THREADED RODS FOR WINGWALL CONNECTIONS SHALL CONFORM TO ASTM A 307. NUTS SHALL CONFORM TO AASHTO M292 (ASTM A194) GRADE 2H. ALL BOLTS, THREADED RODS AND NUTS USED IN WINGWALL CONNECTIONS SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
      3.3.2. STRUCTURAL STEEL FOR WINGWALL CONNECTION PLATES AND PLATE WASHERS SHALL CONFORM TO AASHTO M 270 (ASTM A 709) GRADE 36 AND SHALL BE HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.3. INSERTS FOR WINGWALLS SHALL BE 1" DIAMETER TWO-BOLT PRESET WINGWALL ANCHORS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700 AND SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
      3.3.4. FERRULE LOOP INSERTS SHALL BE F-64 FERRULE LOOP INSERTS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700.
      3.3.5. HOOK BOLTS USED IN ATTACHED HEADWALL CONNECTIONS SHALL BE ASTM A307.
      3.3.6. INSERTS FOR DETACHED HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL, EXPANDED COIL INSERTS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700. COIL RODS AND NUTS USED IN HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL. WASHERS USED IN HEADWALL CONNECTIONS SHALL BE EITHER AISI TYPE 304 STAINLESS STEEL PLATE WASHERS OR AASHTO M270 (ASTM A709) GRADE 36 PLATE WASHERS HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.7. MECHANICAL SPLICES OF REINFORCING BARS SHALL BE MADE USING THE DOWEL BAR SPLICER SYSTEM AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700, AND SHALL CONSIST OF THE DOWEL BAR SPLICER (DB-SAE) AND DOWEL-IN (DI).

4. MANUFACTURE OF PRECAST ELEMENTS - SUBJECT TO THE PROVISIONS OF SECTION 5, BELOW, THE PRECAST ELEMENT DIMENSION AND REINFORCEMENT DETAILS SHALL BE AS PRESCRIBED IN THE PLAN AND SHOP DRAWINGS PROVIDED BY THE MANUFACTURER.
   4.1. FORMS - THE FORMS USED IN MANUFACTURE SHALL BE SUFFICIENTLY RIGID AND ACCURATE TO MAINTAIN THE REQUIRED PRECAST ELEMENT DIMENSIONS WITHIN THE PERMISSIBLE VARIATIONS GIVEN IN SECTION 5 OF THESE SPECIFICATIONS. ALL CASTING SURFACES SHALL BE OF A SMOOTH MATERIAL.
   4.2. PLACEMENT OF REINFORCEMENT
      4.2.1. PLACEMENT OF REINFORCEMENT IN PRECAST BRIDGE UNITS - THE COVER OF CONCRETE OVER THE OUTSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MINIMUM. THE COVER OF CONCRETE OVER THE INSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 1½" MINIMUM, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS. THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 2" FROM THE ENDS OF EACH SECTION. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING SINGLE OR MULTIPLE LAYERS OF WELDED WIRE FABRIC (NOT TO EXCEED 3 LAYERS), SUPPLEMENTED WITH A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS, WHEN NECESSARY. WELDED WIRE FABRIC SHALL BE COMPOSED OF CIRCUMFERENTIAL AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE BRIDGE UNIT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW. THE ENDS OF THE LONGITUDINAL DISTRIBUTION REINFORCEMENT SHALL BE NOT MORE THAN 3" AND NOT LESS THAN 1½" FROM THE ENDS OF THE BRIDGE UNIT.
      4.2.2. BENDING OF REINFORCEMENT FOR PRECAST BRIDGE UNITS - THE OUTSIDE AND INSIDE CIRCUMFERENTIAL REINFORCING STEEL FOR THE CORNERS OF THE BRIDGE SHALL BE BENT TO SUCH AN ANGLE THAT IS APPROXIMATELY EQUAL TO THE CONFIGURATION OF THE BRIDGE'S OUTSIDE CORNER.
      4.2.3. PLACEMENT OF REINFORCEMENT FOR PRECAST WINGWALLS AND HEADWALLS - THE COVER OF CONCRETE OVER THE LONGITUDINAL AND TRANSVERSE REINFORCEMENT SHALL BE 2" MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 1½" NOR MORE THAN 3". REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC, OR A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
      4.2.4. PLACEMENT OF REINFORCMENT FOR PRECAST FOUNDATION UNITS - THE COVER OF CONCRETE OVER THE BOTTOM REINFORCEMENT SHALL BE 3 INCHES MINIMUM. THE COVER OF CONCRETE FOR ALL OTHER REINFORCEMENT SHALL BE 2 INCHES MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 2 INCHES NOR MORE THAN 3 INCHES. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC OR A SINGLE LAYER OF DEFOREMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
   4.3. LAPS, WELDS, SPACING
      4.3.1. LAPS, WELDS, AND SPACING FOR PRECAST BRIDGE UNITS - TENSION SPLICES IN THE CIRCUMFERENTIAL REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.2 AND 5.11.6.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.1 AND 5.11.6.1. THE OVERLAP OF WELDED WIRE FABRIC SHALL BE MEASURED BETWEEN THE OUTER-MOST LONGITUDINAL WIRES OF EACH FABRIC SHEET. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.1 FOR SPLICES OTHER THAN TENSION SPLICES, THE OVERLAP SHALL BE A MINIMUM OF 1'-0" FOR WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS. THE SPACING CENTER TO CENTER OF THE CIRCUMFERENTIAL WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL DISTRIBUTION STEEL FOR EITHER LINE OF REINFORCING IN THE TOP SLAB SHALL BE NOT MORE THAN 1'-4".
      4.3.2. LAPS, WELDS, AND SPACING FOR PRECAST WINGWALLS, HEADWALLS AND FOUNDATIONS - SPLICES IN THE REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.2 AND 5.11.6.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.1 AND 5.11.6.1. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.1. THE SPACING CENTER-TO-CENTER OF THE WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 8".
   4.4. CURING - THE PRECAST CONCRETE ELEMENTS SHALL BE CURED FOR A SUFFICIENT LENGTH OF TIME SO THAT THE CONCRETE WILL DEVELOP THE SPECIFIED COMPRESSIVE STRENGTH IN 28 DAYS OR LESS. ANY ONE OF THE FOLLOWING METHODS OF CURING OR COMBINATIONS THERE OF SHALL BE USED:
      4.4.1. STEAM CURING - THE PRECAST ELEMENTS MAY BE LOW-PRESSURE STEAM CURED BY A SYSTEM THAT WILL MAINTAIN A MOIST ATMOSPHERE.
      4.4.2. WATER CURING - THE PRECAST ELEMENTS MAY BE WATER CURED BY ANY METHOD THAT WILL KEEP THE SECTIONS MOIST.
      4.4.3. MEMBRANE CURING - A SEALING MEMBRANE CONFORMING TO THE REQUIREMENTS OF ASTM SPECIFICATION C309 MAY BE APPLIED AND SHALL BE LEFT INTACT UNTIL THE REQUIRED CONCRETE COMPRESSIVE STRENGTH IS ATTAINED. THE CONCRETE TEMPERATURE AT THE TIME OF APPLICATION SHALL BE WITHIN +/- 10 DEGREES F OF THE ATMOSPHERIC TEMPERATURE. ALL SURFACES SHALL BE KEPT MOIST PRIOR TO THE APPLICATION OF THE COMPOUNDS AND SHALL BE DAMP WHEN THE COMPOUND IS APPLIED.
   4.5. STORAGE, HANDLING & DELIVERY
      4.5.1. STORAGE - PRECAST CONCRETE BRIDGE ELEMENTS SHALL BE LIFTED AND STORED IN "AS-CAST" POSITION. PRECAST CONCRETE HEADWALL AND WINGWALL UNITS ARE CAST, STORED AND SHIPPED IN A FLAT POSITION. THE PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER TO PREVENT CRACKING OR DAMAGE. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE. THE UNITS SHALL NOT BE MOVED UNTIL THE CONCRETE COMPRESSIVE STRENGTH HAS REACHED A MINIMUM OF 2500 PSI, AND THEY SHALL NOT BE STORED IN AN UPRIGHT POSITION.
      4.5.2. HANDLING - HANDLING DEVICES SHALL BE PERMITTED IN EACH PRECAST ELEMENT FOR THE PURPOSE OF HANDLING AND SETTING. SPREADER BEAMS MAY BE REQUIRED FOR THE LIFTING OF PRECAST CONCRETE BRIDGE ELEMENTS TO PRECLUDE DAMAGE FROM BENDING OR TORSION FORCES.
      4.5.3. DELIVERY - PRECAST CONCRETE ELEMENTS MUST NOT BE SHIPPED UNTIL THE CONCRETE HAS ATTAINED THE SPECIFIED DESIGN COMPRESSIVE STRENGTH, OR AS DIRECTED BY THE DESIGN ENGINEER. PRECAST CONCRETE ELEMENTS MAY BE UNLOADED AND PLACED ON THE GROUND AT THE SITE UNTIL INSTALLED. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE.
   4.6. QUALITY ASSURANCE - THE PRECASTER SHALL DEMONSTRATE ADHERENCE TO THE STANDARDS SET FORTH IN THE NPCA QUALITY CONTROL MANUAL. THE PRECASTER SHALL MEET EITHER SECTION 4.6.1 OR 4.6.2
      4.6.1. CERTIFICATION - THE PRECASTER SHALL BE CERTIFIED BY THE PRECAST/PRESTRESSED CONCRETE INSTITUTE PLANT CERTIFICATION PROGRAM OR THE NATIONAL PRECAST CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM PRIOR TO AND DURING PRODUCTION OF THE PRODUCTS COVERED BY THIS SPECIFICATION.
      4.6.2. QUALIFICATIONS, TESTING AND INSPECTION
         4.6.2.1. THE PRECASTER SHALL HAVE BEEN IN THE BUSINESS OF PRODUCING PRECAST CONCRETE PRODUCTS SIMILAR TO THOSE SPECIFIED FOR A MINIMUM OF THREE YEARS. HE SHALL MAINTAIN A PERMANENT QUALITY CONTROL DEPARTMENT OR RETAIN AN INDEPENDENT TESTING AGENCY ON A CONTINUING BASIS. THE AGENCY SHALL ISSUE A REPORT, CERTIFIED BY A LICENSED ENGINEER, DETAILING THE ABILITY OF THE PRECASTER TO PRODUCE QUALITY PRODUCTS CONSISTENT WITH INDUSTRY STANDARDS.
         4.6.2.2. THE PRECASTER SHALL SHOW THAT THE FOLLOWING TESTS ARE PERFORMED IN ACCORDANCE WITH THE ASTM STANDARDS INDICATED. TESTS SHALL BE PERFORMED AS INDICATED IN SECTION 6 OF THESE SPECIFICATIONS.
            4.6.2.2.1. AIR CONTENT: C231 OR C173
            4.6.2.2.2. COMPRESSIVE STRENGTH: C31,C39,C497
         4.6.2.3. THE PRECASTER SHALL PROVIDE DOCUMENTATION DEMONSTRATING COMPLIANCE WITH THIS SECTION TO CONTECH® ENGINEERED SOLUTIONS AT REGULAR INTERVALS OR UPON REQUEST.
         4.6.2.4. THE OWNER MAY PLACE AN INSPECTOR IN THE PLANT WHEN THE PRODUCTS COVERED BY THIS SPECIFICATION ARE BEING MANUFACTURED.
      4.6.3. DOCUMENTATION - THE PRECASTER SHALL SUBMIT PRECAST PRODUCTION REPORTS TO CONTECH® ENGINEERED SOLUTIONS AS REQUIRED.

5. PERMISSIBLE VARIATIONS
   5.1. BRIDGE UNITS
      5.1.1. INTERNAL DIMENSIONS - THE INTERNAL DIMENSION SHALL VARY NOT MORE THAN 1% FROM THE DESIGN DIMENSIONS NOR MORE THAN 1½" WHICHEVER IS LESS.
      5.1.2. SLAB AND WALL THICKNESS - THE SLAB AND WALL THICKNESS SHALL NOT BE LESS THAN THAT SHOWN IN THE DESIGN BY MORE THAN ¼". A THICKNESS MORE THAN THAT REQUIRED IN THE DESIGN SHALL NOT BE CAUSE FOR REJECTION.
      5.1.3. LENGTH OF OPPOSITE SURFACES - VARIATIONS IN LAYING LENGTHS OF TWO OPPOSITE SURFACES OF THE BRIDGE UNIT SHALL NOT BE MORE THAN ½" IN ANY SECTION, EXCEPT WHERE BEVELED ENDS FOR LAYING OF CURVES ARE SPECIFIED BY THE PURCHASER.
      5.1.4. LENGTH OF SECTION - THE UNDERRUN IN LENGTH OF A SECTION SHALL NOT BE MORE THAN ½" IN ANY BRIDGE UNIT.
      5.1.5. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN ½" FOR THE OUTSIDE CIRCUMFERENTIAL STEEL OR BE LESS THAN 1" FOR THE INSIDE CIRCUMFERENTIAL STEEL AS MEASURED TO THE EXTERNAL OR INTERNAL SURFACE OF THE BRIDGE. THESE TOLERANCES OR COVER REQUIREMENTS DO NOT APPLY TO MATING SURFACES OF THE JOINTS.
      5.1.6. AREA OF REINFORCEMENT - THE AREAS OF STEEL REINFORCEMENT SHALL BE THE DESIGN STEEL AREAS AS SHOWN IN THE MANUFACTURER'S SHOP DRAWINGS. STEEL AREAS GREATER THAN THOSE REQUIRED SHALL NOT BE CAUSE FOR REJECTION. THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCEMENT SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCEMENT.
   5.2. WINGWALLS & HEADWALLS
      5.2.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ¼".
      5.2.2. LENGTH/HEIGHT OF WALL SECTIONS - THE LENGTH AND HEIGHT OF THE WALL SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.2.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
      5.2.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.
   5.3. FOUNDATION UNITS
      5.3.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.3.2. LENGTH/ HEIGHT/WIDTH OF FOUNDATION SECTIONS - THE LENGTH, HEIGHT AND WIDTH OF THE FOUNDATION UNITS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.3.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
      5.3.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.

6. TESTING/ INSPECTION
   6.1. TESTING
      6.1.1. TYPE OF TEST SPECIMEN - CONCRETE COMPRESSIVE STRENGTH SHALL BE DETERMINED FROM COMPRESSION TESTS MADE ON CYLINDERS OR CORES. FOR CYLINDER TESTING, A MINIMUM OF 4 CYLINDERS SHALL BE TAKEN FOR EACH BRIDGE ELEMENT. EACH ELEMENT SHALL BE CONSIDERED SEPARATELY FOR THE PURPOSE OF TESTING AND ACCEPTANCE.
      6.1.2. COMPRESSION TESTING - CYLINDERS SHALL BE MADE AND TESTED AS PRESCRIBED BY THE ASTM C39 SPECIFICATION. CYLINDERS SHALL BE CURED IN THE SAME ENVIRONMENT AS THE BRIDGE ELEMENTS. CORES SHALL BE OBTAINED AND TESTED FOR COMPRESSIVE STRENGTH IN ACCORDANCE WITH THE PROVISIONS OF THE ASTM C42 SPECIFICATION.
      6.1.3. ACCEPTABILITY OF CYLINDER TESTS - WHEN THE AVERAGE COMPRESSIVE STRENGTH OF ALL CYLINDERS TESTED IS EQUAL TO OR GREATER THAN THE DESIGN COMPRESSIVE STRENGTH, AND NOT MORE THAN 10% OF THE CYLINDERS TESTED HAVE A COMPRESSIVE STRENGTH LESS THAN THE DESIGN CONCRETE STRENGTH, AND NO CYLINDER TESTED HAS A COMPRESSIVE STRENGTH LESS THAN 80% OF THE DESIGN COMPRESSIVE STRENGTH, THEN THE ELEMENT SHALL BE ACCEPTED. WHEN THE COMPRESSIVE STRENGTH OF THE CYLINDERS TESTED DOES NOT CONFORM TO THESE ACCEPTANCE CRITERIA, THE ACCEPTABILITY OF THE ELEMENT MAY BE DETERMINED AS DESCRIBED IN SECTION 6.1.4, BELOW.
      6.1.4. ACCEPTABILITY OF CORE TESTS - THE COMPRESSIVE STRENGTH OF THE CONCRETE IN A BRIDGE ELEMENT IS ACCEPTABLE WHEN THE AVERAGE CORE TEST STRENGTH IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH. WHEN THE COMPRESSIVE STRENGTH OF A CORE TESTED IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN MAY BE RE-CORED. WHEN THE COMPRESSIVE STRENGTH OF THE RE-CORE IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH, THE COMPRESSIVE STRENGTH OF THE CONCRETE IN THAT BRIDGE ELEMENT IS ACCEPTABLE.
         6.1.4.1. WHEN THE COMPRESSIVE STRENGTH OF ANY RECORE IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN SHALL BE REJECTED.
         6.1.4.2. PLUGGING CORE HOLES - THE CORE HOLES SHALL BE PLUGGED AND SEALED BY THE MANUFACTURER IN A MANNER SUCH THAT THE ELEMENTS WILL MEET ALL OF THE TEST REQUIREMENTS OF THIS SPECIFICATION. PRECAST ELEMENTS SO SEALED SHALL BE CONSIDERED SATISFACTORY FOR USE.
         6.1.4.3. TEST EQUIPMENT - EVERY MANUFACTURER FURNISHING PRECAST ELEMENTS UNDER THIS SPECIFICATION SHALL FURNISH ALL FACILITIES AND PERSONNEL NECESSARY TO CARRY OUT THE TEST REQUIRED.
   6.2. INSPECTION - THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST ELEMENTS SHALL BE SUBJECT TO INSPECTION BY THE PURCHASER.

7. JOINTS
   THE BRIDGE UNITS SHALL BE PRODUCED WITH FLAT BUTT ENDS. THE ENDS OF THE BRIDGE UNITS SHALL BE SUCH THAT WHEN THE SECTIONS ARE LAID TOGETHER THEY WILL MAKE A CONTINUOUS LINE WITH A SMOOTH INTERIOR FREE OF APPRECIABLE IRREGULARITIES, ALL COMPATIBLE WITH THE PERMISSIBLE VARIATIONS IN SECTION 5, ABOVE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

8. WORKMANSHIP/ FINISH
   THE BRIDGE UNITS, WINGWALLS, HEADWALLS AND FOUNDATION UNITS SHALL BE SUBSTANTIALLY FREE OF FRACTURES. THE ENDS OF THE BRIDGE UNITS SHALL BE NORMAL TO THE WALLS AND CENTERLINE OF THE BRIDGE SECTION, WITHIN THE LIMITS OF THE VARIATIONS GIVEN IN SECTION 5, ABOVE, EXCEPT WHERE BEVELED ENDS ARE SPECIFIED. THE FACES OF THE WINGWALLS AND HEADWALLS SHALL BE PARALLEL TO EACH OTHER, WITHIN THE LIMITS OF VARIATIONS GIVEN IN SECTION 5, ABOVE. THE SURFACE OF THE PRECAST ELEMENTS SHALL BE A SMOOTH STEEL FORM OR TROWELED SURFACE. TRAPPED AIR POCKETS CAUSING SURFACE DEFECTS SHALL BE CONSIDERED AS PART OF A SMOOTH, STEEL FORM FINISH.

9. REPAIRS
   PRECAST ELEMENTS MAY BE REPAIRED, IF NECESSARY, BECAUSE OF IMPERFECTIONS IN MANUFACTURE OR HANDLING DAMAGE AND WILL BE ACCEPTABLE IF, IN THE OPINION OF THE PURCHASER, THE REPAIRS ARE SOUND, PROPERLY FINISHED AND CURED, AND THE REPAIRED SECTION CONFORMS TO THE REQUIREMENTS OF THIS SPECIFICATION.

10. REJECTION
   THE PRECAST ELEMENTS SHALL BE SUBJECT TO REJECTION ON ACCOUNT OF ANY OF THE SPECIFICATION REQUIREMENTS. INDIVIDUAL PRECAST ELEMENTS MAY BE REJECTED BECAUSE OF ANY OF THE FOLLOWING:
   10.1. FRACTURES OR CRACKS PASSING THROUGH THE WALL, EXCEPT FOR A SINGLE END CRACK THAT DOES NOT EXCEED ONE HALF THE THICKNESS OF THE WALL.
   10.2. DEFECTS THAT INDICATE PROPORTIONING, MIXING, AND MOLDING NOT IN COMPLIANCE WITH SECTION 4 OF THESE SPECIFICATIONS.
   10.3. HONEYCOMBED OR OPEN TEXTURE.
   10.4. DAMAGED ENDS, WHERE SUCH DAMAGE WOULD PREVENT MAKING A SATISFACTORY JOINT.

REQUIRES SEPARATE PERMIT. NOT FOR CONSTRUCTION

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CON/SPAN BRIDGE SYSTEMS

DYOB DRAWING

SUNDARA RIDGE
TWIN 24 x 6
ORO VALLEY, AZ
B Series, 24' Span x 6' Rise

PROJECT No.: 16385	DYO No.: 24776	DATE: 4/12/23
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.: 50 OF 51		

SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS (CONT'D)

11. MARKING
EACH BRIDGE UNIT SHALL BE CLEARLY MARKED BY WATERPROOF PAINT. THE FOLLOWING SHALL BE SHOWN ON THE INSIDE OF THE VERTICAL LEG OF THE BRIDGE SECTION:
BRIDGE SPAN x BRIDGE RISE
DATE OF MANUFACTURE
NAME OR TRADEMARK OF THE MANUFACTURER

12. INSTALLATION PREPARATION
TO ENSURE CORRECT INSTALLATION OF THE PRECAST CONCRETE BRIDGE SYSTEM, CARE AND CAUTION MUST BE EXERCISED IN FORMING THE SUPPORT AREAS FOR BRIDGE UNITS, HEADWALL, AND WINGWALL ELEMENTS. EXERCISING SPECIAL CARE WILL FACILITATE THE RAPID INSTALLATION OF THE PRECAST COMPONENTS.

12.1. FOOTINGS
DO NOT OVER EXCAVATE FOUNDATIONS UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.

THE SITE SOILS ENGINEER SHALL CERTIFY THAT THE BEARING CAPACITY MEETS OR EXCEEDS THE FOOTING DESIGN REQUIREMENTS, PRIOR TO THE CONTRACTOR POURING OF THE FOOTINGS.

THE BRIDGE UNITS AND WINGWALLS SHALL BE INSTALLED ON EITHER PRECAST OR CAST-IN-PLACE CONCRETE FOOTINGS. THE SIZE AND ELEVATION OF THE FOOTINGS SHALL BE AS DESIGNED BY THE ENGINEER. A KEYWAY SHALL BE FORMED IN THE TOP SURFACE OF THE BRIDGE FOOTING AS SPECIFIED ON THE PLANS. NO KEYWAY IS REQUIRED IN THE WINGWALL FOOTINGS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

THE FOOTINGS SHALL BE GIVEN A SMOOTH FLOAT FINISH AND SHALL REACH A COMPRESSIVE STRENGTH OF 2,000 PSI BEFORE PLACEMENT OF THE BRIDGE AND WINGWALL ELEMENTS. BACKFILLING SHALL NOT BEGIN UNTIL THE FOOTING HAS REACHED THE FULL DESIGN COMPRESSIVE STRENGTH.

THE FOOTING SURFACE SHALL BE CONSTRUCTED IN ACCORDANCE WITH GRADES SHOWN ON THE PLANS. WHEN TESTED WITH A 10'-0" STRAIGHT EDGE, THE SURFACE SHALL NOT VARY MORE THAN ¼" IN 10'-0".

IF A PRECAST CONCRETE FOOTING IS USED, THE CONTRACTOR SHALL PREPARE A 4" THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOOTING PRIOR TO PLACING THE PRECAST FOOTING.

THE FOUNDATIONS FOR PRECAST CONCRETE BRIDGE ELEMENTS AND WINGWALLS MUST BE CONNECTED BY REINFORCEMENT TO FORM ONE MONOLITHIC BODY. EXPANSION JOINTS SHALL NOT BE USED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF THE FOUNDATIONS PER THE PLANS AND SPECIFICATIONS.

13. INSTALLATION
13.1. GENERAL - THE INSTALLATION OF THE PRECAST CONCRETE ELEMENTS SHALL BE AS EXPLAINED IN THE PUBLICATION CON/SPAN BRIDGE SYSTEMS INSTALLATION HANDBOOK.
13.1.1. LIFTING - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT A CRANE OF THE CORRECT LIFTING CAPACITY IS AVAILABLE TO HANDLE THE PRECAST CONCRETE UNITS. THIS CAN BE ACCOMPLISHED BY USING THE WEIGHTS GIVEN FOR THE PRECAST CONCRETE COMPONENTS AND BY DETERMINING THE LIFTING REACH FOR EACH CRANE UNIT. SITE CONDITIONS MUST BE CHECKED WELL IN ADVANCE OF SHIPPING TO ENSURE PROPER CRANE LOCATION AND TO AVOID ANY LIFTING RESTRICTIONS. THE LIFT ANCHORS OR HOLES PROVIDED IN EACH UNIT ARE THE ONLY MEANS TO BE USED TO LIFT THE ELEMENTS. THE PRECAST CONCRETE ELEMENTS MUST NOT BE SUPPORTED OR RAISED BY OTHER MEANS THAN THOSE GIVEN IN THE MANUALS AND DRAWINGS WITHOUT WRITTEN APPROVAL FROM CONTECH® ENGINEERED SOLUTIONS.
13.1.2. CONSTRUCTION EQUIPMENT WEIGHT RESTRICTIONS - IN NO CASE SHALL EQUIPMENT OPERATING IN EXCESS OF THE DESIGN LOAD (HL-93) BE PERMITTED OVER THE BRIDGE UNITS UNLESS APPROVED BY CONTECH® ENGINEERED SOLUTIONS.
13.1.2.1. IN THE IMMEDIATE AREA OF THE BRIDGE UNITS, THE FOLLOWING RESTRICTIONS FOR THE USE OF HEAVY CONSTRUCTION MACHINERY DURING BACKFILLING OPERATIONS APPLY:
- NO CONSTRUCTION EQUIPMENT SHALL CROSS THE BARE PRECAST CONCRETE BRIDGE UNIT.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 4" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 10 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 1'-0" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 30 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED THE DESIGN COVER, OR 2'-0" MINIMUM, OVER THE CROWN OF THE PRECAST CONCRETE BRIDGE, CONSTRUCTION EQUIPMENT WITHIN THE DESIGN LOAD LIMITS FOR THE ROAD MAY CROSS THE PRECAST CONCRETE BRIDGE.

13.2. LEVELING PAD/SHIMS - THE BRIDGE UNITS AND WINGWALLS SHALL BE SET ON HARDBOARD SHIMS CONFORMING TO ASTM D1037 OR PLASTIC SHIMS (DAYTON SUPERIOR P-80, P-81 OR APPROVED EQUAL) MEASURING 5" x 5", MINIMUM, UNLESS SHOWN OTHERWISE ON THE PLANS. A MINIMUM GAP OF ½" SHALL BE PROVIDED BETWEEN THE FOOTING AND THE BOTTOM OF THE BRIDGE'S VERTICAL LEGS OR THE BOTTOM OF THE WINGWALL. ALSO, A SUPPLY OF ¼", ½" AND ⅛" THICK HARDBOARD OR PLASTIC SHIMS FOR VARIOUS SHIMMING PURPOSES SHALL BE ON SITE.
13.3• PLACEMENT OF BRIDGE UNITS - THE BRIDGE UNITS SHALL BE PLACED AS SHOWN ON THE ENGINEER'S PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

13.4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE STRUCTURE SPAN DURING ALL PHASES OF INSTALLATION. DUE TO THE ARCH SHAPE, BRIDGE ELEMENTS WILL TEND TO SPREAD UNDER SELF-WEIGHT. IT IS IMPERATIVE THAT ANY LATERAL SPREADING OF THE BRIDGE ELEMENTS BE AVOIDED DURING AND AFTER THEIR PLACEMENT. GENERALLY, HORIZONTAL CABLE TIES OR TIE RODS ARE SHIPPED IN THE LARGER BRIDGE ELEMENTS TO ASSIST IN PREVENTING THIS SPREADING. CABLE TIES/TIE RODS SHALL NOT BE REMOVED UNTILL BRIDGE UNITS ARE GROUTED AND GROUT HAS CURED. IT IS RECOMMENDED THAT TEMPORARY HARDWOOD BLOCKS BE USED IN CONJUNCTION WITH THE CABLE TIES/TIE RODS TO MAINTAIN SPAN. IF, HOWEVER, DUE TO SITE RESTRICTIONS, THESE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO PLACEMENT OF THE BRIDGE ELEMANTS, THE CONTRACTOR MUST NOTIFY CONTECH (MANUFACTURER) AND REQUEST A SUGGESTED INSTALLATION PROCEDURE.

IN ADDITION, IF THE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO SETTING ARCH UNITS, THE FOLLOWING QUALITY CONTROL PROCEDURE MUST BE FOLLOWED:
1) FIND "MEASURED SPAN" UPON ARCH UNIT'S DELIVERY TO SITE, PRIOR TO LIFTING FROM TRUCK AND REMOVING CABLE TIES/TIE RODS. "MEASURED SPAN" SHALL BE THE AVERAGE OF (3) SPAN MEASUREMENTS ALONG THE LAY LENGTH OF THE ARCH UNIT.
2) AFTER SETTING OF BRIDGE UNIT ON THE FOUNDATION, VERIFY THE SPAN. THIS "INSTALLED SPAN MEASUREMENT" SHALL NOT EXCEED THE MAXIMUM OF:
A) THE NOMINAL SPAN +½" OR
B) THE "MEASURED SPAN"
IF THE "INSTALLED SPAN MEASUREMENT" EXCEEDS THIS AMOUNT, THE ARCH UNIT SHALL BE LIFTED AND RE-SET UNTIL THE "INSTALLED SPAN MEASUREMENT" MEETS THE LIMITS.

13.5. PLACEMENT OF WINGWALLS, HEADWALLS AND FOUNDATION UNITS - THE WINGWALLS, HEADWALLS AND FOUNDATIONS SHALL BE PLACED AS SHOWN ON THE PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE.
13.6. WATERPROOFING/JOINT PROTECTION AND SUBSURFACE DRAINAGE
13.6.1. EXTERNAL PROTECTION OF JOINTS - THE BUTT JOINT MADE BY TWO ADJOINING BRIDGE UNITS SHALL BE COVERED WITH A ⅞" x 1⅜" PREFORMED BITUMINOUS JOINT SEALANT AND A MINIMUM OF A 9" WIDE JOINT WRAP. THE SURFACE SHALL BE FREE OF DIRT BEFORE APPLYING THE JOINT MATERIAL. A PRIMER COMPATIBLE WITH THE JOINT WRAP TO BE USED SHALL BE APPLIED FOR A MINIMUM WIDTH OF 9" ON EACH SIDE OF THE JOINT. THE EXTERNAL WRAP SHALL BE CS212 BY CONCRETE SEALANTS INC., EZ-WRAP RUBBER BY PRESS-SEAL GASKET CORPORATION, SEAL WRAP BY MAR MAC MANUFACTURING CO. INC. OR APPROVED EQUAL. THE JOINT SHALL BE COVERED CONTINUOUSLY FROM THE BOTTOM OF ONE BRIDGE SECTION LEG, ACROSS THE TOP OF THE BRIDGE AND TO THE OPPOSITE BRIDGE SECTION LEG. ANY LAPS THAT RESULT IN THE JOINT WRAP SHALL BE A MINIMUM OF 6" LONG WITH THE OVERLAP RUNNING DOWNHILL.
13.6.2. IN ADDITION TO THE JOINTS BETWEEN BRIDGE UNITS, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE HEADWALL SHALL ALSO BE SEALED AS DESCRIBED ABOVE. IF PRECAST WINGWALLS ARE USED, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE WINGWALL SHALL BE SEALED WITH A 2'-0" STRIP OF FILTER FABRIC. ALSO, IF LIFT HOLES ARE FORMED IN THE BRIDGE UNITS, THEY SHALL BE PRIMED AND COVERED WITH A 9" x 9" SQUARE OF JOINT WRAP.
13.6.3. DURING THE BACKFILLING OPERATION, CARE SHALL BE TAKEN TO KEEP THE JOINT WRAP IN ITS PROPER LOCATION OVER THE JOINT.
13.6.4. SUBSOIL DRAINAGE SHALL BE AS DIRECTED BY THE ENGINEER.

13.7. GROUTING
13.7.1. GROUTING SHALL NOT BE PERFORMED WHEN TEMPERATURES ARE EXPECTED TO GO BELOW 35° FOR A PERIOD OF 72 HOURS. FILL THE BRIDGE-FOUNDATION KEYWAY WITH CEMENT GROUT (PORTLAND CEMENT AND WATER OR CEMENT MORTAR COMPOSED OF PORTLAND CEMENT, SAND AND WATER) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI. VIBRATE AS REQUIRED TO ENSURE THAT THE ENTIRE KEY AROUND THE BRIDGE ELEMENT IS COMPLETELY FILLED. IF BRIDGE ELEMENTS HAVE BEEN SET WITH TEMPORARY TIES (CABLES, BARS, ETC.) GROUT MUST ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI BEFORE TIES MAY BE REMOVED.
13.7.2. ALL GROUT SHALL HAVE A MAXIMUM AGGREGATE SIZE OF ¼".
13.7.3. LIFTING AND ERECTION ANCHOR RECESSES SHALL BE FILLED WITH GROUT.
13.7.4. AFTER GROUT HAS REACHED ITS DESIGN STRENGTH THE TEMPORARY HARDWOOD WEDGES SHALL BE REMOVED AND THEIR HOLES FILLED WITH GROUT.
13.8. BACKFILL
13.8.1. DO NOT PERFORM BACKFILLING DURING WET OR FREEZING WEATHER.
13.8.2. NO BACKFILL SHALL BE PLACED AGAINST ANY STRUCTURAL ELEMENTS UNTIL THEY HAVE BEEN APPROVED BY THE ENGINEER.
13.8.3. BACKFILL SHALL BE CONSIDERED AS ALL REPLACED EXCAVATION AND NEW EMBANKMENT ADJACENT TO THE PRECAST CONCRETE ELEMENTS. THE PROJECT CONSTRUCTION AND MATERIAL SPECIFICATIONS, WHICH INCLUDE THE SPECIFICATIONS FOR EXCAVATION FOR STRUCTURES AND ROADWAY EXCAVATION AND EMBANKMENT CONSTRUCTION, SHALL APPLY EXCEPT AS MODIFIED IN THIS SECTION.
13.8.4. BACKFILL ZONES:
- IN-SITU SOIL
- ZONE A: CONSTRUCTED EMBANKMENT OR OVERFILL.
- ZONE B: FILL THAT IS DIRECTLY ASSOCIATED WITH PRECAST CONCRETE BRIDGE INSTALLATION.
- ZONE C: ROAD STRUCTURE.

13.8.5. REQUIRED BACKFILL PROPERTIES
13.8.5.1. IN-SITU SOIL - NATURAL GROUND IS TO BE SUFFICIENTLY STABLE TO ALLOW EFFECTIVE SUPPORT TO THE PRECAST CONCRETE BRIDGE UNITS. AS A GUIDE, THE EXISTING NATURAL GROUND SHOULD BE OF SIMILAR QUALITY AND DENSITY TO ZONE B MATERIAL FOR MINIMUM LATERAL DIMENSION OF ONE BRIDGE SPAN OUTSIDE OF THE BRIDGE FOOTING.
13.8.5.2. ZONE A - ZONE A REQUIRES FILL MATERIAL WITH SPECIFICATIONS AND COMPACTING PROCEDURES EQUAL TO THAT FOR NORMAL ROAD EMBANKMENTS.
13.8.5.3. ZONE B - GENERALLY, SOILS SHALL BE REASONABLY FREE OF ORGANIC MATTER, AND, NEAR CONCRETE SURFACES, FREE OF STONES LARGER THAN 3" IN DIAMETER SEE CHARTS FOR DETAILED DESCRIPTIONS OF ACCEPTABLE SOILS.
13.8.5.4. ZONE C - ZONE C IS THE ROAD SECTION OF GRAVEL, ASPHALT OR CONCRETE BUILT IN COMPLIANCE WITH LOCAL ENGINEERING PRACTICES.
13.8.5.5. GEOTECHNICAL ENGINEER SHALL REVIEW GRADATIONS OF ALL INTERFACING MATERIALS AND, IF NECESSARY, RECOMMEND GEOTEXTILE FILTER FABRIC (PROVIDED BY CONTRACTOR)

13.8.6. PLACING AND COMPACTING BACKFILL
DUMPING FOR BACKFILLING IS NOT ALLOWED ANY NEARER THAN 3'-0" FROM THE BRIDGE LEG.

THE FILL MUST BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE MAXIMUM DIFFERENCE IN THE SURFACE LEVELS OF THE FILL ON OPPOSITE SIDES OF THE BRIDGE MUST NOT EXCEED 2'-0".

THE FILL BEHIND WINGWALLS MUST BE PLACED AT THE SAME TIME AS THAT OF THE BRIDGE FILL. IT MUST BE PLACED IN PROGRESSIVELY PLACED HORIZONTAL LAYERS NOT EXCEEDING 8" PER LAYER.

THE BACKFILL OF ZONE B SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% OF THE STANDARD PROCTOR, AS REQUIRED BY AASHTO T-99.

SOIL WITHIN 1'-0" OF CONCRETE SURFACES SHALL BE HAND-COMPACTED. ELSEWHERE, USE OF ROLLERS IS ACCEPTABLE. IF VIBRATING ROLLER-COMPACTORS ARE USED, THEY SHALL NOT BE STARTED OR STOPPED WITHIN ZONE B AND THE VIBRATION FREQUENCY SHOULD BE AT LEAST 30 REVOLUTIONS PER SECOND.

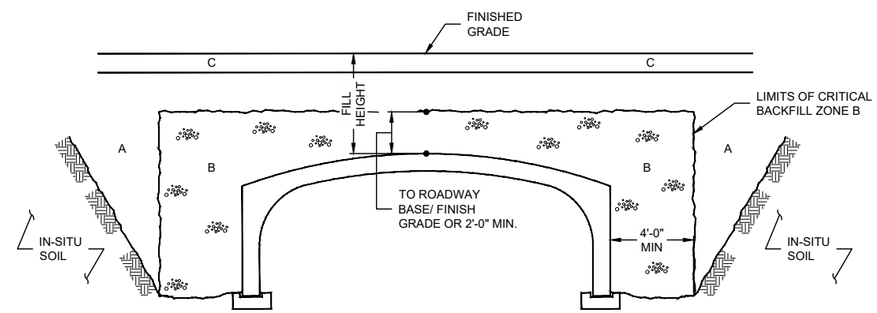
THE BACKFILL MATERIAL AND COMPACTING BEHIND WINGWALLS SHALL SATISFY THE CRITERIA FOR THE BRIDGE BACKFILL, ZONE B.

BACKFILL AGAINST A WATERPROOFED SURFACE SHALL BE PLACED CAREFULLY TO AVOID DAMAGE TO THE WATERPROOFING MATERIAL.
13.8.7. BRIDGE UNITS
FOR FILL HEIGHTS OVER 12 FEET (AS MEASURED FROM TOP CROWN OF BRIDGE TO FINISHED GRADE), NO BACKFILLING MAY BEGIN UNTIL A BACKFILL COMPACTION TESTING PLAN HAS BEEN COORDINATED WITH AND APPROVED BY CONTECH® ENGINEERED SOLUTIONS.
13.8.8. WINGWALLS
BACKFILL IN FRONT OF WINGWALLS SHALL BE CARRIED TO GROUND LINES SHOWN IN THE PLANS.
13.8.9. MONITORING
THE CONTRACTOR SHALL CHECK SETTLEMENTS AND HORIZONTAL DISPLACEMENT OF FOUNDATION TO ENSURE THAT THEY ARE WITHIN THE ALLOWABLE LIMIT PROVIDED BY THE ENGINEER. THESE MEASUREMENTS SHOULD GIVE AN INDICATION OF THE SETTLEMENTS AND DEFORMATIONS ALONG THE LENGTH OF THE FOUNDATIONS.

THE FIRST MEASUREMENT SHOULD TAKE PLACE AFTER THE ERECTION OF ALL PRECAST BRIDGE SYSTEM ELEMENTS, A SECOND AFTER COMPLETION OF BACKFILLING, AND A THIRD BEFORE OPENING OF THE BRIDGE TO TRAFFIC. FURTHER MEASUREMENTS MAY BE MADE ACCORDING TO LOCAL CONDITIONS.

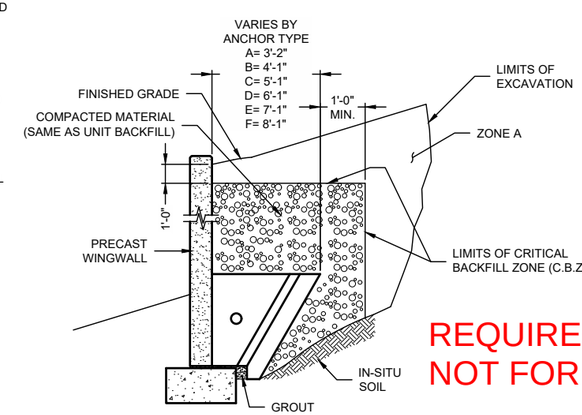
ACCEPTABLE SOILS FOR USE IN ZONE B BACKFILL

TYPICAL USCS MATERIALS	AASHTO GROUP	AASHTO SUBGROUP	PERCENT PASSING US SIEVE NO. #10	#40	#200	CHARACTER OF FRACTION PASSING NO. 40 SIEVE LIQUID LIMIT	PLASTICITY INDEX	SOIL DESRIPTION
GW, GP, SP	A1	A-1a	50 MAX	30 MAX	15 MAX		6 MAX	LARGELY GRAVEL BUT CAN INCLUDE SAND AND FINES
GM, SW, SP, SM		A-1b		50 MAX	25 MAX		6 MAX	GRAVELLY SAND OR GRADED SAND, MAY INCLUDE FINES
GM, SM, ML, SP, GP	A2	A-2-4			35 MAX	40 MAX	10 MAX	SANDS, GRAVELS WITH LOW-PLASTICITY SILT FINES
SC, GC, GM		A-2-5			35 MAX	41 MIN	10 MAX	SANDS, GRAVELS WITH PLASTIC SILT FINES
SP, SM, SW	A3			51 MIN	10 MAX		NON-PLASTIC	FINE SANDS
ML, SM, SC	A4				36 MIN	40 MAX	10 MAX	LOW-COMPRESSIBILTY SILTS

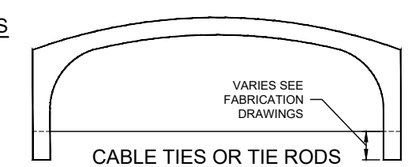


SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE ZONE B
≤ 24'-0"	≥ 12'-0"	A1, A3
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4
> 24'-0"	ALL	A1, A3

BACKFILL REQUIREMENTS



WALL BACKFILL REQUIREMENTS



CABLE TIES OR TIE RODS
(> 24'-0" SPAN)

REQUIRES SEPARATE PERMIT.
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GRADING PERMIT #2500131

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DYOB DRAWING

SUNDARA RIDGE
TWIN 24 x 6
ORO VALLEY, AZ
B Series, 24' Span x 6' Rise

PROJECT No.: 16385	DYO No.: 24776	DATE: 4/12/23
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