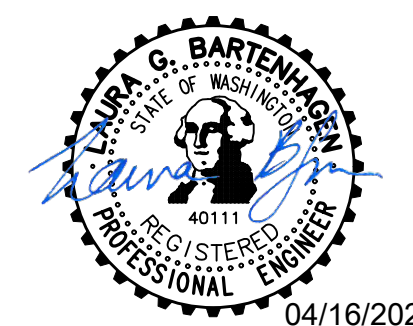




SUNCADIA
RESORT • COMMUNITY • LEGACY

ROADWAY AND UTILITY CONSTRUCTION PLANS
FOR
NELSON RIDGE (PHASE 2 DIVISION 6)

APRIL 16, 2021



33400 8th Ave S, Suite 205
Federal Way, WA 98003
Phone: (253) 838-6113
ESM JOB NO.: 998-812-020

APPROVED FOR CONSTRUCTION

_____	_____
KITTITAS COUNTY ENGINEER	DATE

PROJECT DIRECTORY

DEVELOPER

NEW SUNCADIA, LLC
770 SUNCADIA TRAIL
CLE ELUM, WA 98922
PHONE (509) 649-3000
FAX (509) 649-3059

CIVIL ENGINEER / SURVEYOR

ESM CONSULTING ENGINEERS, LLC
33400 8TH AVE. S., STE. #205
FEDERAL WAY, WA 98003
PHONE (253) 838-6113
FAX (253) 838-7104
LAURA G BARTENHAGEN, PE, LEED AP
KEITH COMBS

GEOTECHNICAL ENGINEER

ICICLE CREEK ENGINEERS
29335 NE 20TH STREET
CARNATION, WA 98014
PHONE (425) 333-0093
FAX (425) 996-4036
BRIAN BEAMAN, PE, LEG, LHG

AGENCIES

KITTITAS COUNTY DEPARTMENT
OF PUBLIC WORKS
411 N. RUBY
ELLENSBURG, WA 98926

SURVEY DATA

HORIZONTAL DATUM

THE HORIZONTAL DATUM FOR ALL PROJECT MAPPING IS NORTH AMERICAN DATUM OF 1983/1991 (NAD 83/91) (WASHINGTON SOUTH ZONE). THE MAPPING WAS MOVED FROM STATE PLANE COORDINATES TO PROJECT DATUM BASED ON A COMBINED SCALE FACTOR OF 0.999870387.

VERTICAL DATUM

THE VERTICAL DATUM FOR ALL PROJECT MAPPING IS NGVD 1929, AS PROVIDED BY AMERICAN ENGINEERING CORPORATION.

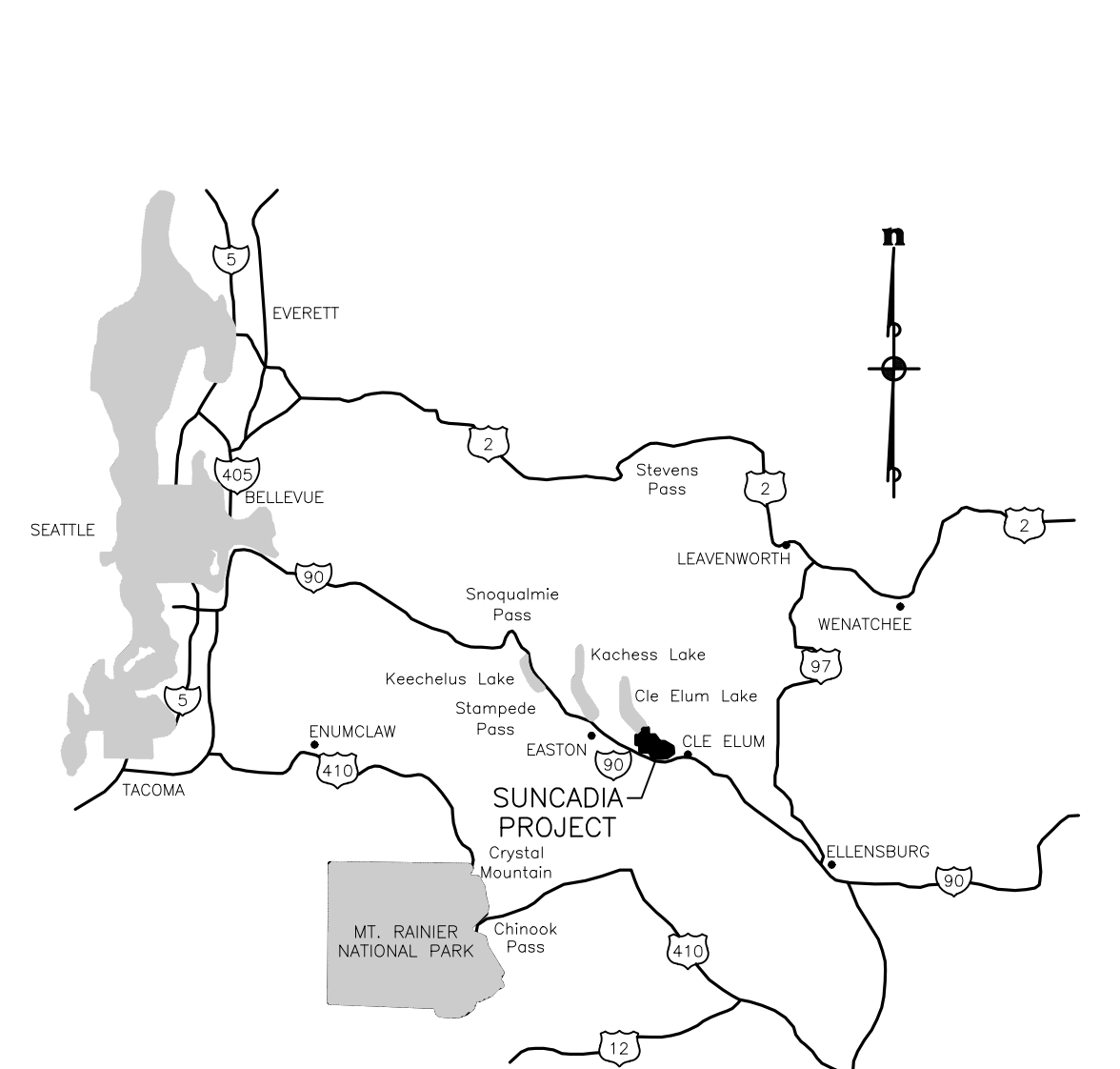
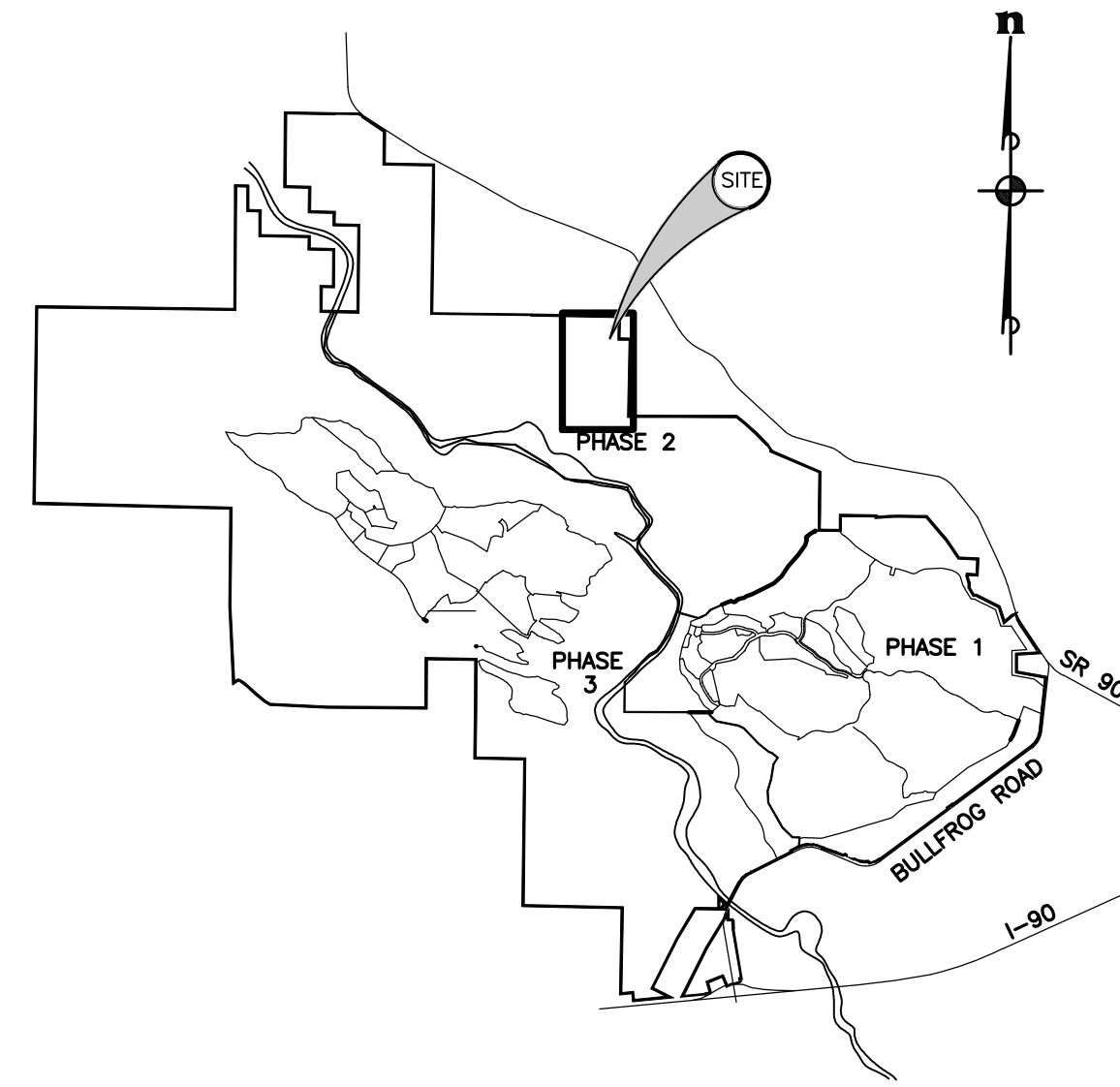
PROJECT BENCHMARK

BENCH MARK DISK L 525 1982, LOGO MARK - NGS
NGVD 29 ELEVATION 2026.05
LOCATION: SET IN TOP NORTH END OF WEST CURB
OF THE INTERSTATE 90 HIGHWAY OVERPASS ALONG
STATE HIGHWAY 903.

EARTHWORK QUANTITIES

12" STRIPPING ASSUMED 5,400 CY
CUT 2,200 CY
FILL 4,200 CY
NET FILL 2,000 CY

NOTE: EARTHWORK QUANTITIES ARE "NEAT LINE" ONLY AND DO NOT ACCOUNT FOR SHRINK OR SWELL FACTORS. FURTHERMORE, EXISTING TOPOGRAPHY IS A COMBINATION OF FIELD AND AERIAL INFORMATION. AERIAL TOPOGRAPHY MAY VARY FROM FIELD CONDITIONS. CONTRACTOR SHALL CALCULATE EARTHWORK VOLUMES FOR BID PURPOSES AND VERIFY EXISTING GRADES PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.



LOCATION MAP
NOT TO SCALE

VICINITY MAP
NOT TO SCALE

LEGEND

	EXISTING	PROPOSED
ROADWAY CENTERLINE	---	---
PROPERTY / LOT LINE	---	---
RIGHT-OF-WAY	---	---
BOUNDARY LINE	---	---
EASEMENT LINE	---	---
AERIAL CONTOUR	-2.0	-2.0
CONTOUR	-812	-812
WETLAND WITH BUFFER	[Symbol]	[Symbol]
STREAM WITH BUFFER	[Symbol]	[Symbol]
TOP OF SLOPE	---	---
CATCH BASIN TYPE 1/1L W/GRATE	[Symbol]	[Symbol]
CATCH BASIN TYPE 1 W/SOLID LID	[Symbol]	[Symbol]
CATCH BASIN TYPE 2 W/GRATE	[Symbol]	[Symbol]
CATCH BASIN TYPE 2 W/SOLID LID	[Symbol]	[Symbol]
ROOF LEVEL SPREADER	[Symbol]	[Symbol]
STORM DRAIN PIPE	[Symbol]	[Symbol]
SANITARY SEWER MANHOLE	[Symbol]	[Symbol]
SANITARY SEWER CLEANOUT	[Symbol]	[Symbol]
SANITARY SEWER CAP	[Symbol]	[Symbol]
SANITARY SEWER PIPE	[Symbol]	[Symbol]
SANITARY SEWER FORCE MAIN	[Symbol]	[Symbol]
6" DIA SINGLE SANITARY SIDE SEWER	[Symbol]	[Symbol]
FIRE HYDRANT (3 PORT)	[Symbol]	[Symbol]
GATE VALVE	[Symbol]	[Symbol]
BUTTERFLY VALVE	[Symbol]	[Symbol]
CONCRETE BLOCKING	[Symbol]	[Symbol]
WATER CAP	[Symbol]	[Symbol]
DOMESTIC / IRRIGATION METER	[Symbol]	[Symbol]
BLOWOFF ASSEMBLY	[Symbol]	[Symbol]
AIR-VAC ASSEMBLY	[Symbol]	[Symbol]
CROSS	[Symbol]	[Symbol]
TEE	[Symbol]	[Symbol]
90° BEND	[Symbol]	[Symbol]
WATER PIPE	[Symbol]	[Symbol]
GUARD POST (BOLLARD)	[Symbol]	[Symbol]

	EXISTING	PROPOSED
ANCHOR	[Symbol]	[Symbol]
POWER POLE	[Symbol]	[Symbol]
STREET LIGHT	[Symbol]	[Symbol]
POWER VAULT	[Symbol]	[Symbol]
TELE. VAULT	[Symbol]	[Symbol]
FENCE	[Symbol]	[Symbol]
SIGN	[Symbol]	[Symbol]
MAILBOX	[Symbol]	[Symbol]
BARRICADE	[Symbol]	[Symbol]
TELE. MANHOLE	[Symbol]	[Symbol]
GAS VALVE	[Symbol]	[Symbol]
GAS METER	[Symbol]	[Symbol]
JOINT UTILITY TRENCH	[Symbol]	[Symbol]

SURVEY

[Symbol]	SET HUB AND TACK	[Symbol]	ALDER
[Symbol]	FOUND HUB AND TACK	[Symbol]	CEDAR
[Symbol]	SET REBAR AND CAP	[Symbol]	COTTONWOOD
[Symbol]	FOUND REBAR AND CAP	[Symbol]	POPLAR
[Symbol]	SET PK-DRILL HOLE	[Symbol]	APPLE
[Symbol]	FOUND PK-DRILL HOLE	[Symbol]	FIR
[Symbol]	CALC CLOSING CORNER	[Symbol]	WILLOW
[Symbol]	FOUND CLOSING CORNER	[Symbol]	SPRUCE
[Symbol]	FOUND MEANDER CORNER	[Symbol]	MADRONA
[Symbol]	CALC MEANDER CORNER	[Symbol]	OAK
[Symbol]	PROPOSED MONUMENT IN CASE	[Symbol]	HEMLOCK
[Symbol]	FOUND MONUMENT IN CASE	[Symbol]	MAPLE
[Symbol]	PROPOSED MONUMENT IN CASE	[Symbol]	PINE
[Symbol]	FOUND SURFACE MONUMENT	[Symbol]	
[Symbol]	PROPOSED SURFACE MONUMENT	[Symbol]	
[Symbol]	CALC SECTION CORNER	[Symbol]	L ARC LENGTH
[Symbol]	FOUND SECTION CORNER	[Symbol]	Δ DELTA
[Symbol]	FOUND QUARTER CORNER	[Symbol]	(R) RADIAL BEARING < >
[Symbol]	CALC QUARTER CORNER	[Symbol]	(NR) NON-RADIAL BEARING
[Symbol]	CENTER SECTION	[Symbol]	S.S.E. SANITARY SEWER EASEMENT
[Symbol]	TAX LOT	[Symbol]	P.S.D.E. PRIVATE STORM DRAINAGE EASEMENT
[Symbol]	FOUND WITNESS CORNER	[Symbol]	FF ELEVATION OF MINIMUM BASEMENT FINISH FLOOR
[Symbol]	CALC WITNESS CORNER	[Symbol]	S.D.E. STORM DRAINAGE EASEMENT

SHEET INDEX

SHEET	PAGE	DESCRIPTION
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DT-01	2	INFORMATION SHEET
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RD-KEY	6	ROAD/STORM KEY MAP
RD-01 - RD-07	7-13	ROAD/STORM PLAN & PROFILE
WS-KEY	14	WATER/SEWER KEY MAP
WS-01 - WS-08	15-22	WATER/SEWER PLAN & PROFILE
DT-05 - DT-08	23-26	WATER/SEWER DETAILS & NOTES
ER-01	27	CLEARING & T.E.S.C. PLAN
ER-02	28	CLEARING & T.E.S.C. DETAILS & NOTES
UT-01	29	COMPOSITE UTILITY PLAN

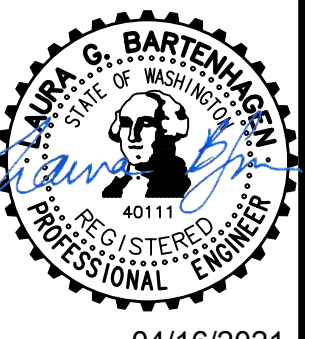
SOIL CONDITION AND GRADING NOTES

- FILL SHALL BE BENCHED ONTO SLOPES THAT EXCEED 4H:1V.
- IF CHANGED CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PROMPTLY OF (1) EXISTING SUBSURFACE CONDITIONS DIFFERING FROM THOSE INDICATED IN THE PLANS, OR (2) EXISTING UNKNOWN SUBSURFACE CONDITIONS, OF AN UNUSUAL NATURE, DIFFERING MATERIALLY FROM THOSE ORDINARILY ENCOUNTERED DURING CONSTRUCTION. THE CONTRACTOR SHALL MAKE NO CLAIMS TO THE OWNER/ENGINEER FOR EXTRA WORK RESULTING FROM CHANGED CONDITIONS UNLESS THE ENGINEER OR OWNER HAS APPROVED THE WORK IN WRITING AS PER SECTION 1-04.7 OF THE WSDOT/APWA STANDARD SPECIFICATIONS.
- ALL UTILITY TRENCHES AND BORROW PITS SHALL BE BACKFILLED AND COMPACTED TO A MINIMUM 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY THE ASTM D-1557 TEST METHOD.
- GROUNDWATER CONDITIONS VARY SEASONALLY. THE CONTRACTOR IS REQUIRED TO REVIEW THE PROJECT GEOTECHNICAL ENGINEERING REPORT, PERFORM A SITE VISIT, AND OTHERWISE COMMUNICATE WITH THE GEOTECHNICAL ENGINEER TO FAMILIARIZE HIMSELF WITH GROUNDWATER CONDITIONS ON-SITE. DEWATERING OF UTILITY TRENCHES SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AND INCORPORATED INTO THE VARIOUS BID ITEMS. CONTRACTOR SHALL DEVELOP A DEWATERING PLAN AS NECESSARY AND COORDINATE THE DISCHARGE LOCATION WITH THE SOILS ENGINEER. DEWATERING MAY BE ACCOMPLISHED BY PUMPING FROM A SUMP IN THE UTILITY TRENCH OR BY WELL POINTS.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL PROVISIONS OF THE SOILS REPORT FOR THE SITE BE OBSERVED AND COMPLIED WITH DURING ALL PHASES OF THE SITE PREPARATION, GRADING, TRENCHING, AND BACKFILL OPERATIONS, AND PAVING CONSTRUCTION, AS APPLICABLE FOR THE PROJECT.
- ANY PROVISIONS OF THE SOILS REPORT WHICH CONFLICT WITH INFORMATION SHOWN ELSEWHERE ON THESE DRAWINGS, OR WHICH REQUIRE FURTHER CLARIFICATION, SHALL BE BROUGHT TO THE ATTENTION OF THE SOILS ENGINEER.
- SOILS ENGINEER SHALL CONTRACT DIRECTLY WITH OWNER AND COORDINATE WITH CONTRACTOR. CONTRACTOR TO ENSURE A REPRESENTATIVE FOR THE SOILS ENGINEER IS AVAILABLE AND ON-SITE TO OBSERVE AND APPROVE THE EARTHWORK OPERATIONS AND TO VERIFY FIELD CONDITIONS AS WORK PROCEEDS. THE SOILS ENGINEER SHALL SUBMIT FIELD REPORTS CERTIFYING THAT THE METHODS AND MATERIALS OF THE EARTHWORK OPERATIONS WERE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE SOILS INVESTIGATION AND THAT THE WORK WAS PERFORMED TO THE SATISFACTION OF THE SOILS ENGINEER. ANY DISCREPANCIES ARE TO BE BROUGHT TO OWNER'S ATTENTION IN WRITING.

APPROVED FOR CONSTRUCTION

KITTITAS COUNTY ENGINEER _____ DATE _____

REVISIONS		
NO.	DESCRIPTION/DATE	BY



04/16/2021

ESM CONSULTING ENGINEERS, LLC
33400 8TH AVE. S., STE. #205
FEDERAL WAY, WA 98003
www.esmcivil.com

REGISTERED PROFESSIONAL ENGINEER
NO. 40111
STATE OF WASHINGTON

Land Planning
Project Management
Landscape Architecture
Civil Engineering
Public Works

NEW SUNCADIA, LLC

NELSON RIDGE

INFORMATION SHEET

WASHINGTON

KITTITAS COUNTY

JOB NO.:	998-812-020
DWG. NAME:	DT-01
DESIGNED BY:	LGB
DRAWN BY:	JJH
CHECKED BY:	
DATE:	04/16/2021
DATE OF PRINT:	
DT-01	
2 OF 29 SHEETS	

File: \\server\ENR\ESM-JOB\998\812\020\plans\DT-01.dwg
Plotted: 4/13/2021 9:15 AM
Plotted By: Greg Feltore

ENGINEER'S CONSTRUCTION NOTES

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) AND THE WASHINGTON STATE CHAPTER OF THE AMERICAN PUBLIC WORKS ASSOCIATION (APWA) STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION (LATEST EDITION), KITTITAS COUNTY, SUNCADIA WATER COMPANY (SWC), SUNCADIA ENVIRONMENTAL COMPANY (SEC) AND NEW SUNCADIA, LLC STANDARDS AND SPECIFICATIONS. SWC AND SEC RESERVE THE RIGHT TO ADJUST WATER AND SEWER REQUIREMENTS BASED ON CONDITIONS IN THE FIELD, PRODUCT AVAILABILITY, AND UPDATES TO OPERATIONS AND MAINTENANCE PRACTICES. THE STATE STANDARD SPECIFICATIONS AND PLANS SHALL BE MAINTAINED BY THE CONTRACTOR ON SITE DURING THE ENTIRE PERIOD OF THE CONSTRUCTION. DEFINITIONS NOTED AS "STATE" AND "CONTRACTING AGENCY" SHALL BE AMENDED TO READ "OWNER".
- ROAD STANDARDS SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN EXHIBIT "J" TO THE AMENDED AND RESTATED DEVELOPMENT AGREEMENT FOR THE SUNCADIA MASTER PLANNED RESORT DATED DECEMBER 2, 2008. THE MOST STRINGENT SPECIFICATION, INSTRUCTION, RULE AND/OR PLAN SHALL GOVERN THE SELECTION OF CONFLICTING AND/OR OVERLAPPING SPECIFICATIONS AND/OR PLANS.
- BEFORE ANY CONSTRUCTION OR DEVELOPMENT ACTIVITY, A PRECONSTRUCTION MEETING MUST BE HELD BETWEEN THE CONSTRUCTION REPRESENTATIVE AND THE OWNER.
- UTILITIES AND GRADES SHALL BE CONSTRUCTED PER THE APPROVED PLANS. A COPY OF THE APPROVED PLANS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
- CONSTRUCTION WORK HOURS FOR THE MASTER PLANNED RESORT (MPR) SHALL BE FROM 7:00 A.M. UNTIL 7:00 P.M. MONDAY THROUGH SATURDAY. WORK ON SUNDAYS WILL BE ON AN EMERGENCY BASIS ONLY. EQUIPMENT SERVICING AND MAINTENANCE TIMES WILL BE UNRESTRICTED.
- EXCEPT FOR EMERGENCY WORK, CONSTRUCTION CONTRACTOR SHALL NOT, ON OR WITHIN FIVE HUNDRED (500) FEET OF ANY NOISE SENSITIVE PROPERTY, OPERATE OR CAUSE TO BE OPERATED ANY EQUIPMENT USED IN CONSTRUCTION, REPAIR, ALTERATION, EXCAVATION, GRADING OR DEMOLITION WORK ON BUILDINGS, STRUCTURES, STREETS, ALLEYS, OR APPURTENANCES THERETO:
 - WITH SOUND-CONTROL DEVICES LESS EFFECTIVE THAN THOSE PROVIDED ON THE ORIGINAL EQUIPMENT; AND
 - WITH NOISE LEVELS EXCEEDING:
 - 80 DB DURING ANY CALENDAR DAY FOR MORE THAN THREE (3) CONSECUTIVE OR NON-CONSECUTIVE CALENDAR DAYS IN A THREE HUNDRED SIXTY-FIVE (365) DAY PERIOD. NOISE DETERMINATION TESTS SHALL BE FOR AT LEAST TEN (10) MINUTES, WITH ANY FOUR (4) TESTS IN CONSECUTIVE OR NON-CONSECUTIVE CLOCK HOURS ABOVE THE 80 DB LEVEL CONSTITUTING AN EXCEEDANCE FOR THAT DAY; OR
 - 90 DB DURING ANY CLOCK HOUR FOR MORE THAN FOUR (4) CONSECUTIVE OR NON-CONSECUTIVE CLOCK HOURS. TESTS SHALL BE FOR AT LEAST TEN (10) MINUTES, WITH ANY SINGLE TEST ABOVE THE 90 DB LEVEL CONSTITUTING AN EXCEEDANCE FOR THAT HOUR; OR
 - A NOISE SENSITIVE PROPERTY SHALL MEAN ANY NON-OWNER PROPERTY OUTSIDE THE MPR. THE LOCATION OF SOUND LEVEL MEASUREMENTS SHALL BE ON ANY RECEIVING NOISE-SENSITIVE PROPERTY OUTSIDE THE MPR, PROVIDED THAT EACH TEST IS TAKEN FROM THE SAME PROPERTY, AND THE PROVISIONS IN THIS SECTION SHALL APPLY TO THAT SPECIFIC TEST LOCATION.
- IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN ALL CONSTRUCTION EASEMENTS AND RIGHT-OF-WAY PERMITS NECESSARY BEFORE INITIATING OFF-SITE WORK WITHIN THE ROAD RIGHT-OF-WAY.
- FRANCHISED UTILITIES OR OTHER INSTALLATIONS THAT ARE NOT SHOWN ON THESE APPROVED PLANS SHALL NOT BE CONSTRUCTED UNLESS A SEPARATE SET OF PLANS HAS BEEN APPROVED BY THE REVIEWING AUTHORITY.
- OPEN CUTTING OF EXISTING ROADWAYS IS NOT ALLOWED UNLESS SPECIFICALLY APPROVED BY KITTITAS COUNTY, OR OWNER (AS APPROPRIATE) AND NOTED ON THESE APPROVED PLANS. APPROVED CUTS OF EXISTING ROADS SHALL BE PERFORMED WITH A NEAT SAW CUT AND RESTORED PER THE APPROPRIATE JURISDICTIONAL STANDARDS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SAFEGUARDS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND ANY OTHER NEEDED ACTIONS TO PROTECT THE LIFE, HEALTH, AND SAFETY OF WORKERS AND THE PUBLIC, AND TO PROTECT PROPERTY AND WORK PERFORMED BY THE CONTRACTOR. ANY WORK WITHIN THE TRAVELED RIGHT-OF-WAY THAT INTERRUPTS NORMAL TRAFFIC FLOW REQUIRES AT LEAST ONE FLAGGER FOR EACH LANE OF TRAFFIC AFFECTED. ALL SECTIONS OF THE WSDOT/APWA STANDARD SPECIFICATIONS 1-07.23, PUBLIC CONVENIENCE AND SAFETY, SHALL APPLY.
- CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, HE IS REQUIRED TO ASSUME SOLE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION. THIS INCLUDES SAFETY OF ALL PERSONS AND PROPERTY. THIS RESPONSIBILITY SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR IS TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL.
- EXISTING UTILITIES AND UNDERGROUND STRUCTURES SHOWN ON THE PLAN ARE BASED UPON THE BEST AVAILABLE PUBLIC AND PRIVATE RECORDS, SURFACE UTILITY FEATURES OBTAINED BY SURVEY, AND VERBAL INFORMATION OBTAINED FROM REPRESENTATIVES OF FRANCHISED UTILITIES. NEITHER THE OWNER NOR THE ENGINEER GUARANTEES THE ACCURACY OR COMPLETENESS OF HIS INFORMATION AND ASSUME NO RESPONSIBILITY FOR IMPROPER LOCATIONS OR FAILURE TO SHOW UTILITY LOCATIONS ON THE CONSTRUCTION PLANS.
- THE CONTRACTOR SHALL CALL THE UTILITIES UNDERGROUND LOCATION CENTER (811) FOR FIELD LOCATION OF ALL UTILITIES AND SHALL NOT BEGIN EXCAVATION UNTIL ALL KNOWN UNDERGROUND UTILITIES IN THE VICINITY OF THE PROPOSED WORK HAVE BEEN LOCATED AND MARKED. FOR UTILITIES NOT SUBSCRIBING TO THE UNDERGROUND LOCATION CENTER, THE CONTRACTOR SHALL GIVE INDIVIDUAL NOTICE TO THE UTILITY AS PER SECTION 1-07.17 OF THE WSDOT/APWA STANDARD SPECIFICATIONS.
- PRIOR TO COMMENCING SANITARY SEWER, STORM DRAIN, WATER MAIN AND OTHER UTILITY SERVICES, THE CONTRACTOR SHALL VERIFY THE VERTICAL AND HORIZONTAL LOCATION OF THE PROPOSED TIE-IN LOCATIONS. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY DISCREPANCIES OR ALTERED LOCATION OF PROPOSED TIE-INS TO THE ENGINEER AND PUBLIC AGENCY(S).
- IF EXISTING UTILITIES ARE DAMAGED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER AND THE ENGINEER. THE CONTRACTOR SHALL RESTORE THE UTILITY TO ITS EXISTING CONDITION AS PER SECTION 1-07.17 OF THE WSDOT/APWA STANDARD SPECIFICATIONS.
- TRACER WIRE SHALL BE INSTALLED ON ALL PVC AND HDPE PIPES.
- DETECTABLE UNDERGROUND WARNING TAPE SHALL CONSIST OF INERT POLYETHYLENE PLASTIC THAT IS IMPERVIOUS TO ALL KNOWN ALKALIS, ACIDS, CHEMICAL REAGENTS, AND SOLVENTS LIKELY TO BE ENCOUNTERED IN THE SOIL, WITH A METALLIC OIL CORE TO PROVIDE FOR THE MOST POSITIVE DETECTION AND PIPELINE LOCATION. THE TAPE SHALL BE COLOR CODED AND SHALL BE IMPRINTED CONTINUOUSLY OVER ITS ENTIRE LENGTH IN PERMANENT BLACK INK INDICATING THE TYPE OF LINE BURIED BELOW AND SHALL ALSO HAVE THE WORD "CAUTION" PROMINENTLY SHOWN. COLOR CODING OF THE TAPE SHALL BE AS FOLLOWS:

UTILITY	TAPE COLOR
WATER	BLUE
SEWER	GREEN
ELECTRICAL	RED
GAS/OIL	YELLOW
TELEPHONE/CATV/ORANGE	
NON-POTABLE WATER	PURPLE
- AIR AND WATER POLLUTION LAWS - THE ATTENTION OF THE CONTRACTOR IS CALLED TO THE STATUTES OF THE STATE OF WASHINGTON RELATING TO THE POLLUTION OF WATER AND AIR. THE CONTRACTOR SHALL CARRY OUT HIS OPERATIONS AND CONFORM WITH THE APPLICABLE SECTIONS OF THE STATE AND FEDERAL STATUTES AND ALL REGULATIONS ADOPTED PURSUANT THERETO.
- INSPECTION - THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE AGENCIES AND DEPARTMENTS FOR ALL REQUIRED INSPECTIONS PRIOR TO PLACING ANY UTILITIES INTO SERVICE.
- THE CONTRACTOR SHALL MAINTAIN AT THE JOB SITE ONE FULL SIZE, REPRODUCIBLE SET OF THE APPROVED DRAWINGS AND ANY SUPPLEMENTAL DRAWINGS FOR RECORD KEEPING. ALL CHANGES MADE DURING THE COURSE OF CONSTRUCTION INCLUDING INVERT, DEPTHS AND LOCATION OF ALL UTILITIES ENCOUNTERED, ETC., SHALL BE NEATLY MARKED ON THE REPRODUCIBLES. SEWER STUB LOCATIONS SHALL BE MARKED WITH LENGTH OF PIPE FROM SEWER MAIN, DISTANCE FROM NEAREST LOT LINE, AND STUB DEPTH. THE MARKED UP REPRODUCIBLES SHALL BE DELIVERED TO THE ENGINEER UPON COMPLETION OF THE WORK.
- CONTRACTOR SHALL COORDINATE FINAL WALKTHROUGH INSPECTIONS WITH APPROPRIATE AGENCIES AND DEPARTMENTS AND PROVIDE OWNER NOTICE OF DATE AND TIME OF INSPECTIONS WITH A WRITTEN INSPECTIONS COMPLETION LOG. CONTRACTOR TO INCLUDE ANY AGENCY REVISIONS ON PUNCH LIST AND PROVIDE ENGINEER AND OWNER WITH REVISED WRITTEN PUNCH LIST AND COMPLETE PUNCH LIST ITEMS IN A TIMELY MANNER AND COORDINATE RE-INSPECTION.
- UNAUTHORIZED CHANGES AND USES - CAUTION: THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL REQUESTS FOR CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.
- PRIOR TO TRANSPORTING ANY OVERSIZED OR OVERWEIGHT HAULS ON WSDOT-MAINTAINED RIGHTS-OF-WAY, THE CONTRACTOR SHALL OBTAIN THE APPROPRIATE PERMIT FROM RELEVANT JURISDICTIONS SUCH AS WSDOT, KITTITAS COUNTY, CITY OF CLE ELUM, AND CITY OF ROSLYN.

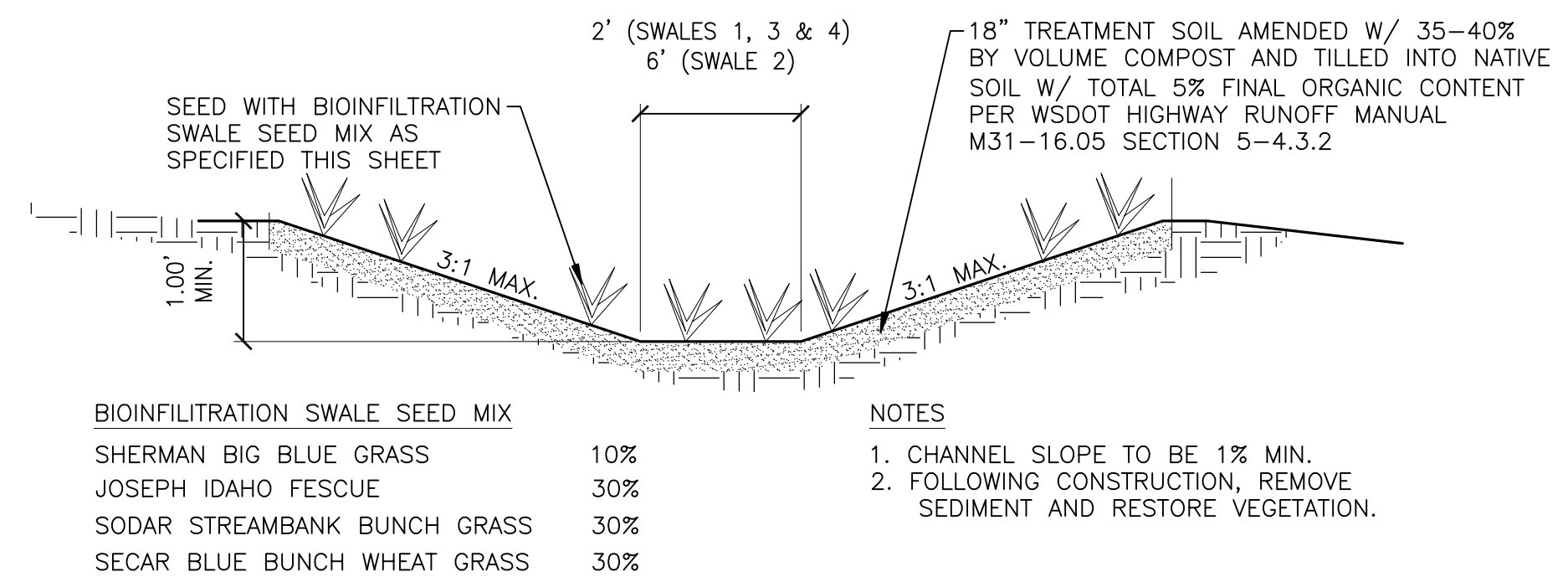
DRAINAGE SPECIFICATIONS

- STORMWATER STRUCTURES, CULVERTS AND CONDUITS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION AND THE WASHINGTON STATE CHAPTER OF THE AMERICAN PUBLIC WORKS ASSOCIATION, LATEST EDITION (ENGLISH UNITS) EXCEPT AS OTHERWISE SPECIFIED. CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SECTIONS OF SUCH STANDARDS SPECIFICATIONS:
 - 7-02 CULVERTS
 - 7-04 STORM SEWERS
 - 7-05 MANHOLES, INLETS, CATCH BASINS, AND DRY WELLS
 - 7-08 GENERAL PIPE INSTALLATION
 - 9-05 DRAINAGE STRUCTURES, CULVERTS AND CONDUITS
- CONSTRUCTION OF STORM DRAINAGE FACILITIES SHALL BE DONE IN ACCORDANCE WITH THESE PLANS AS APPROVED BY THE COUNTY ENGINEER.
- BACKFILL MATERIAL SHALL BE BANK RUN GRAVEL FOR TRENCH BACKFILL PER SECTIONS 9-03.19 OF THE WSDOT/APWA STANDARD SPECIFICATIONS, OR, WITH THE APPROVAL OF THE PROJECT GEOTECHNICAL ENGINEER, NATIVE MATERIAL OF SIMILAR CHARACTERISTICS TO BANK RUN GRAVEL FOR TRENCH BACKFILL.
- ALL UTILITY TRENCHES SHALL BE BACKFILLED AND COMPACTED TO A MINIMUM 95 PERCENT OF MAXIMUM DRY DENSITY AS DETERMINED BY THE ASTM D-1557 TEST METHOD.
- ALL DRAINAGE STRUCTURES, SUCH AS CATCH BASINS AND MANHOLES, NOT LOCATED WITHIN A TRAVELED ROADWAY SHALL HAVE SOLID LOCKING LIDS.
- ALL CONCRETE STORM DRAINAGE CATCH BASINS SHALL BE WSDOT/APWA TYPE 1 MEETING THE REQUIREMENTS OF ASTM C-478 (WSDOT STANDARD PLAN B-1) UNLESS OTHERWISE NOTED AS TYPE 1L. TYPE 1L CATCH BASINS SHALL CONFORM WITH WSDOT STANDARD PLAN B-1g EXCEPT THE MAXIMUM DEPTH SHALL BE 6 FEET. ALL CATCH BASIN COVERS SHALL BE PER ASTM A-536 AND WSDOT/APWA STANDARDS. CATCH BASINS DEEPER THAN 6 FEET (RIM TO INVERT) SHALL BE PRECAST TYPE 2 (WSDOT STANDARD PLAN B-1E) MEETING THE REQUIREMENTS OF ASTM C-478 AND JOINTS MEETING THE REQUIREMENTS OF ASTM C-443. TYPE 2 CATCH BASINS SHALL BE EQUIPPED WITH SAFETY STEPS PER WSDOT/APWA STANDARD PLANS. SAFETY STEPS SHALL BE ORIENTED IN THE CATCH BASIN SUCH THAT IMPEDIMENTS TO ENTRY ARE A MINIMUM OF 24-INCHES FROM THE STEPS.
- ALL STORM DRAIN AND CULVERT PIPE (SD) SHALL BE CONSTRUCTED OF ONE OF THE FOLLOWING MATERIALS UNLESS OTHERWISE SPECIFIED IN THE PLANS.
 - DUCTILE IRON (DI) - 24-INCH DIAMETER AND SMALLER SHALL BE CLASS 50 CONFORMING TO AWWA C-151 (WHEN SHOWN ON THE PLANS.)
 - CONCRETE (CONC) - 4-INCH THROUGH 12-INCH DIAMETER PIPE SHALL BE NON-REINFORCED, BELL AND SPIGOT WITH RUBBER GASKET JOINTS, CONFORMING TO ASTM C-14 (CLASS 3), OR ASTM C-76 (CLASS 3) FOR 12-INCH TO 36-INCH DIAMETER PIPE.
 - PVC - 4-INCH THROUGH 15-INCH DIAMETER PIPE, SHALL BE IN ACCORDANCE WITH ASTM D-3034 SDR 35 AND ASTM F-679 FOR 18-INCH TO 24-INCH PIPE. ALL JOINTS SHALL BE PUSH-ON RUBBER GASKET CONFORMING TO ASTM F-477.
 - CORRUGATED HIGH DENSITY POLYETHYLENE PIPE WITH SMOOTH INTERIOR, CONFORMING TO AASHTO DESIGNATION M-294S.
 - HIGH DENSITY POLYETHYLENE PIPE (HDPP): HDPP SHALL COMPLY WITH THE REQUIREMENTS OF AWWA C906 FOR PIPE MATERIALS AND PRESSURE RATING AS FOLLOWS:

STANDARD PE CODE DESIGNATION	- PE 3408
STANDARD DIMENSION RATIO	- MAXIMUM 32.5
PRESSURE CLASS	- MINIMUM 50 PSYG
- ALL PIPE COUPLINGS SHALL BE WATERTIGHT TO 2 PSI (MINIMUM). MINIMUM COVER AT ALL TIMES SHALL BE 1.5 FEET OR 1 FOOT FOR DUCTILE IRON. ADAPTERS AT MANHOLES AND CATCH BASINS SHALL BE WATERTIGHT TO 6.5 PSI (MINIMUM).
- ALL LOT DRAINAGE IS THE RESPONSIBILITY OF INDIVIDUAL PROPERTY OWNERS PER NEW SUNCADIA DESIGN STANDARDS.

ROADWAY SPECIFICATIONS

- ROADWAY CONSTRUCTION SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR ROAD BRIDGE AND MUNICIPAL CONSTRUCTION, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION AND THE WASHINGTON STATE CHAPTER OF THE AMERICAN PUBLIC WORKS ASSOCIATION, LATEST EDITION (ENGLISH UNITS). EXCEPT AS OTHERWISE SPECIFIED, CONSTRUCTION SHALL CONFORM TO THE FOLLOWING SECTIONS OF SUCH STANDARDS SPECIFICATIONS:
 - 2-03 ROADWAY EXCAVATION AND EMBANKMENTS
 - 2-06 SUBGRADE PREPARATION
 - 2-07 WATERING
 - 2-09 STRUCTURE EXCAVATION
 - 2-11 TRIMMING AND CLEANUP
 - 4-02 GRAVEL BASE
 - 4-04 BALLAST AND CRUSHED SURFACING
 - 5-04 HOT MIX ASPHALT
 - 9-02 BITUMINOUS MATERIAL
 - 9-03 AGGREGATES
- PAVEMENT SECTIONS SHALL BE CONSTRUCTED AS SHOWN ON THESE PLANS.
- ALL ROADWAY SUBGRADE SHALL BE COMPACTED TO 95 PERCENT OF MAXIMUM DRY DENSITY AS DETERMINED BY THE ASTM D-1557 TEST METHOD.
- OVER EXCAVATE TO REMOVE UNSUITABLE MATERIAL BELOW SUBGRADE AS DIRECTED BY THE GEOTECHNICAL ENGINEER. BACKFILL OVER EXCAVATED MATERIAL WITH GRAVEL BASE.
- ASPHALT CONCRETE SHALL BE HMA CI. 1/2" PG64-28.



BIOINFILTRATION SWALE SEED MIX	
SHERMAN BIG BLUE GRASS	10%
JOSEPH IDAHO FESCUE	30%
SODAR STREAMBANK BUNCH GRASS	30%
SECAR BLUE BUNCH WHEAT GRASS	30%

NOTES

- CHANNEL SLOPE TO BE 1% MIN.
 - FOLLOWING CONSTRUCTION, REMOVE SEDIMENT AND RESTORE VEGETATION.
- THE BIOINFILTRATION SWALE SHOULD NOT BE PUT INTO OPERATION UNTIL AREAS OF EXPOSED SOIL IN THE CONTRIBUTING DRAINAGE CATCHMENT HAVE BEEN SUFFICIENTLY STABILIZED.
 - EFFECTIVE EROSION AND SEDIMENT CONTROL MEASURES SHOULD REMAIN IN PLACE UNTIL THE SWALE VEGETATION IS ESTABLISHED.
 - AVOID COMPACTION DURING CONSTRUCTION. GRADE BIOINFILTRATION SWALES TO ATTAIN UNIFORM LONGITUDINAL AND LATERAL SLOPES.
 - THE SWALE BOTTOM SHOULD BE FLAT WITH A LONGITUDINAL SLOPE LESS THAN 1%.
 - INFILTRATION RATE TO BE FIELD VERIFIED BY GEOTECHNICAL ENGINEER.

BIO-INFILTRATION	SWALE #1	SWALE #2	SWALE #3	SWALE #4
SWALE SHAPE	TRAPEZOIDAL	TRAPEZOIDAL	TRAPEZOIDAL	TRAPEZOIDAL
BOTTOM WIDTH (FT)	2	6	2	2
TOTAL DEPTH (FT)	2.0	3.0	2.0	2.0

A BIOINFILTRATION SWALE DETAIL

NOT TO SCALE

APPROVED FOR CONSTRUCTION

KITTITAS COUNTY ENGINEER

DATE

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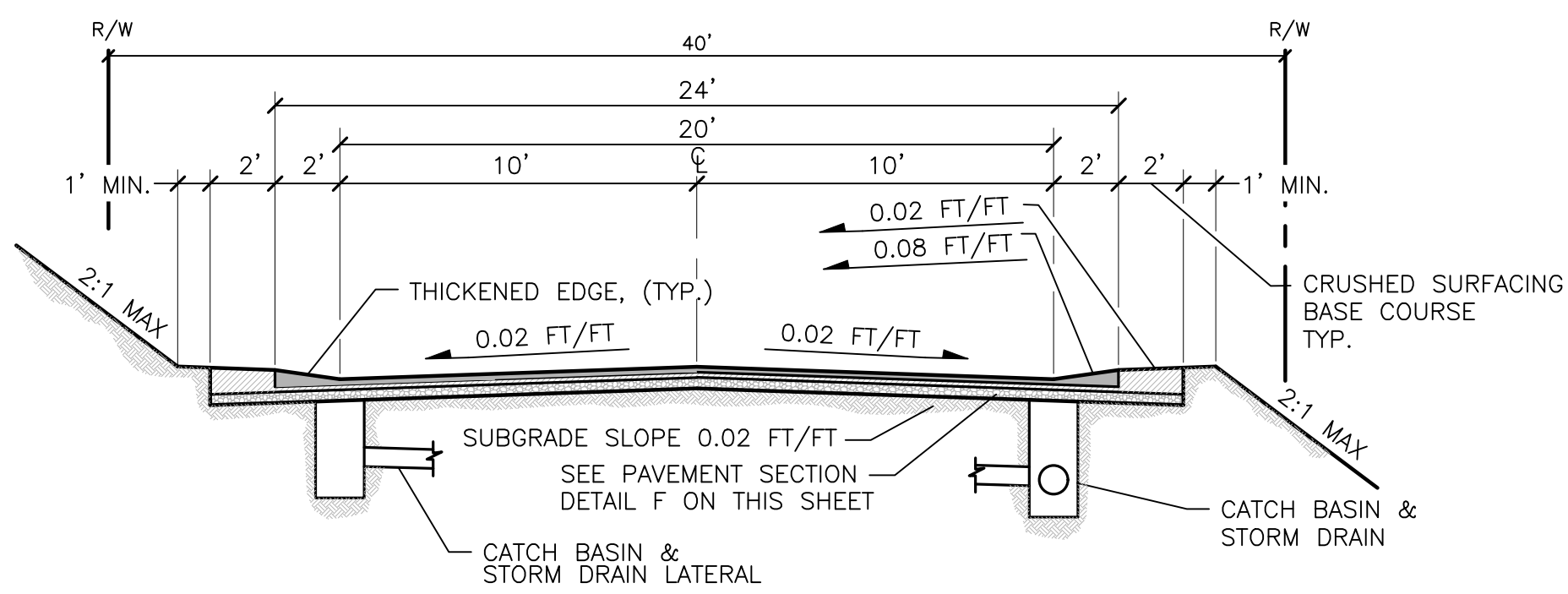
ESM CONSULTING ENGINEERS, LLC
 35400 8th Ave S, Suite 205
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 FEDERAL WAY (253) 838-6113
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NEW SUNCADIA, LLC
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 WASHINGTON

JOB NO.:	998-812-020
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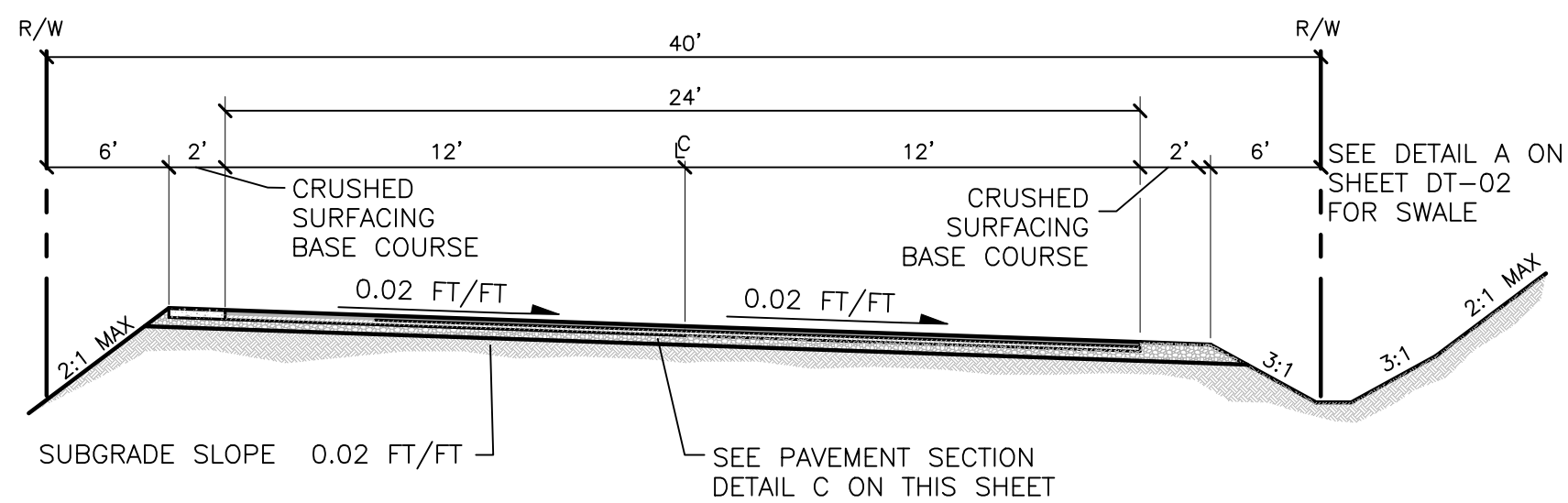
DT-02

3 OF 29 SHEETS



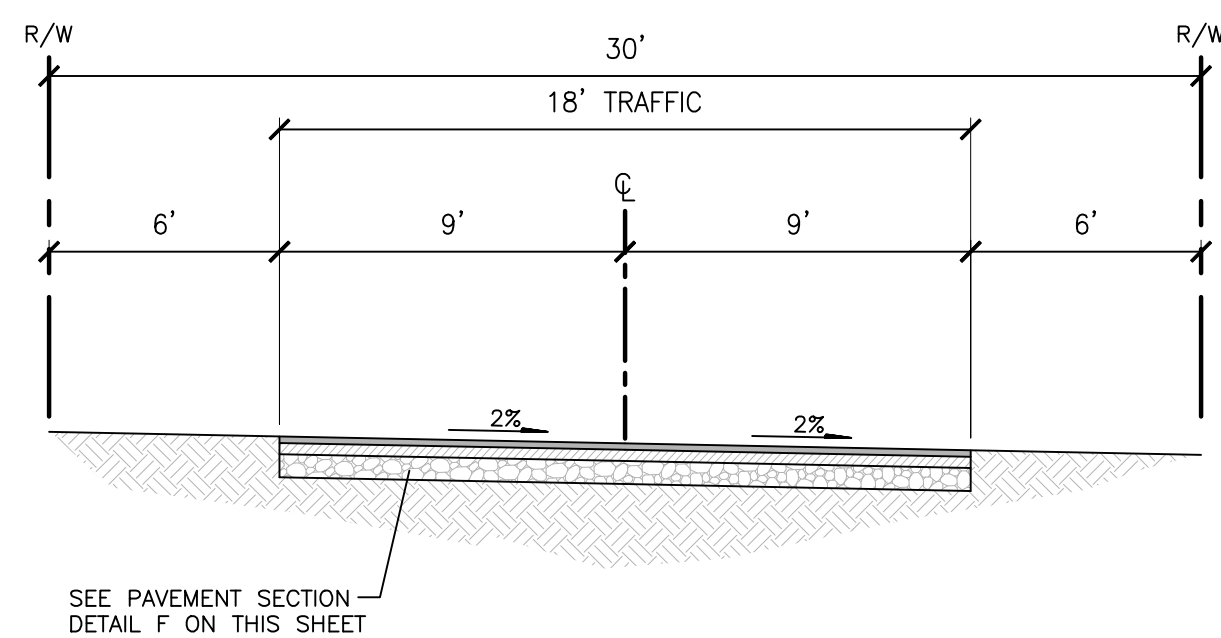
OLD GROVE TRAIL STA. 10+00.00 - 20+64.11 & 22+98.72 - 24+76.37
 RED SKY WAY STA. 28+00.00 - 35+22.52 & 39+25.67 - 39+82.43

A TYPE R-II
 MINOR RESIDENTIAL ROADWAY
 NOT TO SCALE

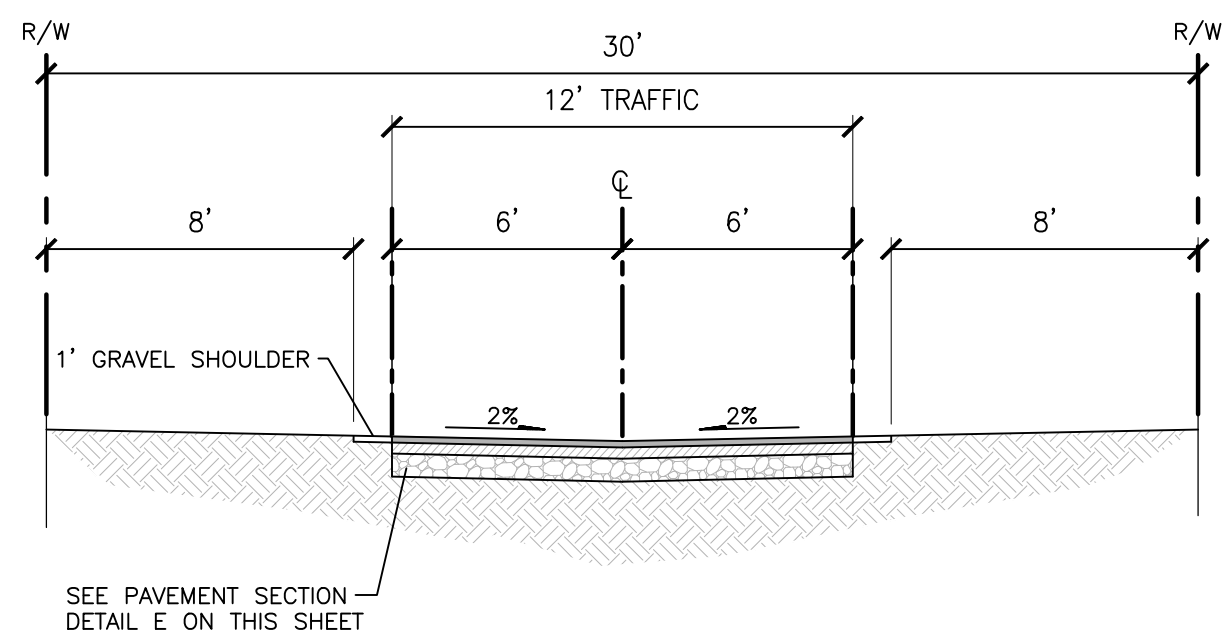


OLD GROVE TRAIL STA. 20+64.11 - 22+98.72
 RED SKY WAY STA. 35+22.52 - 39+25.67

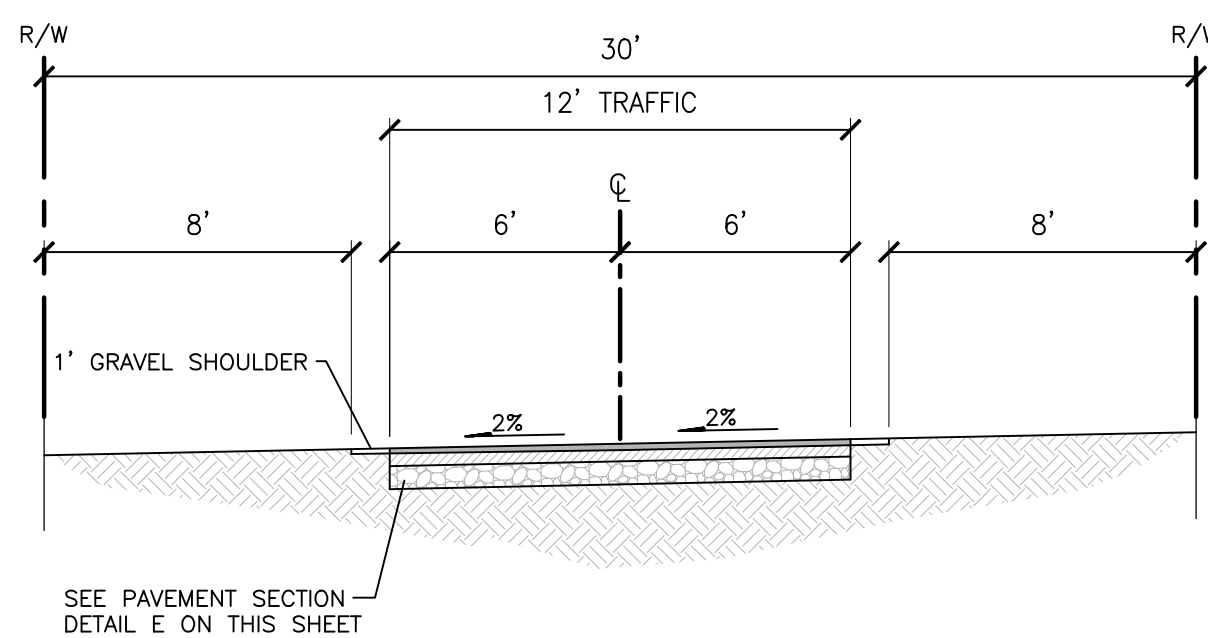
B TYPE R-II
 MINOR RESIDENTIAL ALT #2 ROADWAY
 NOT TO SCALE



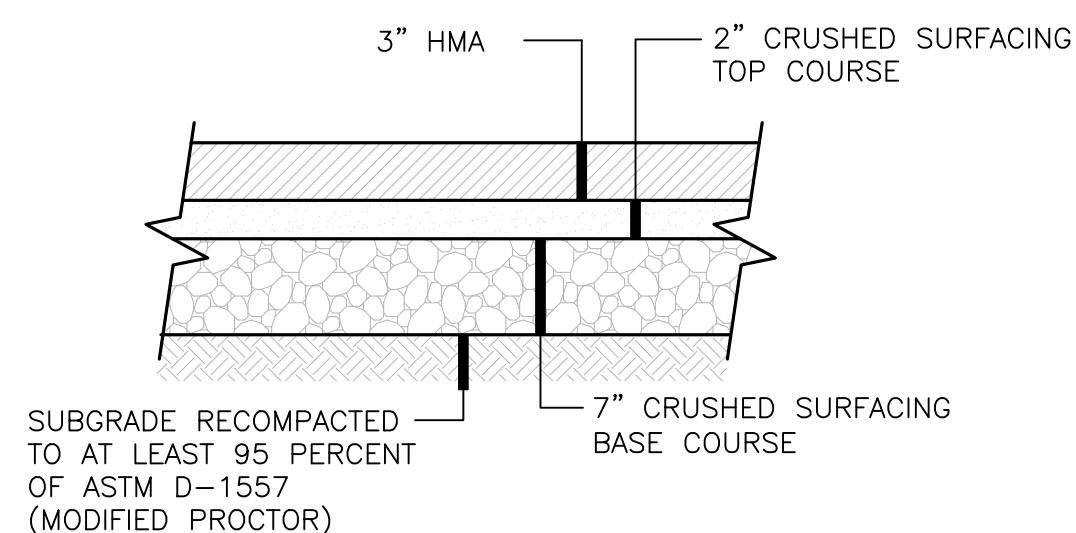
TRACT AC-1
C SECONDARY DRIVE
 NOT TO SCALE



TRACT AC-2
 TRACT AC-3
D SECONDARY DRIVE
 NOT TO SCALE

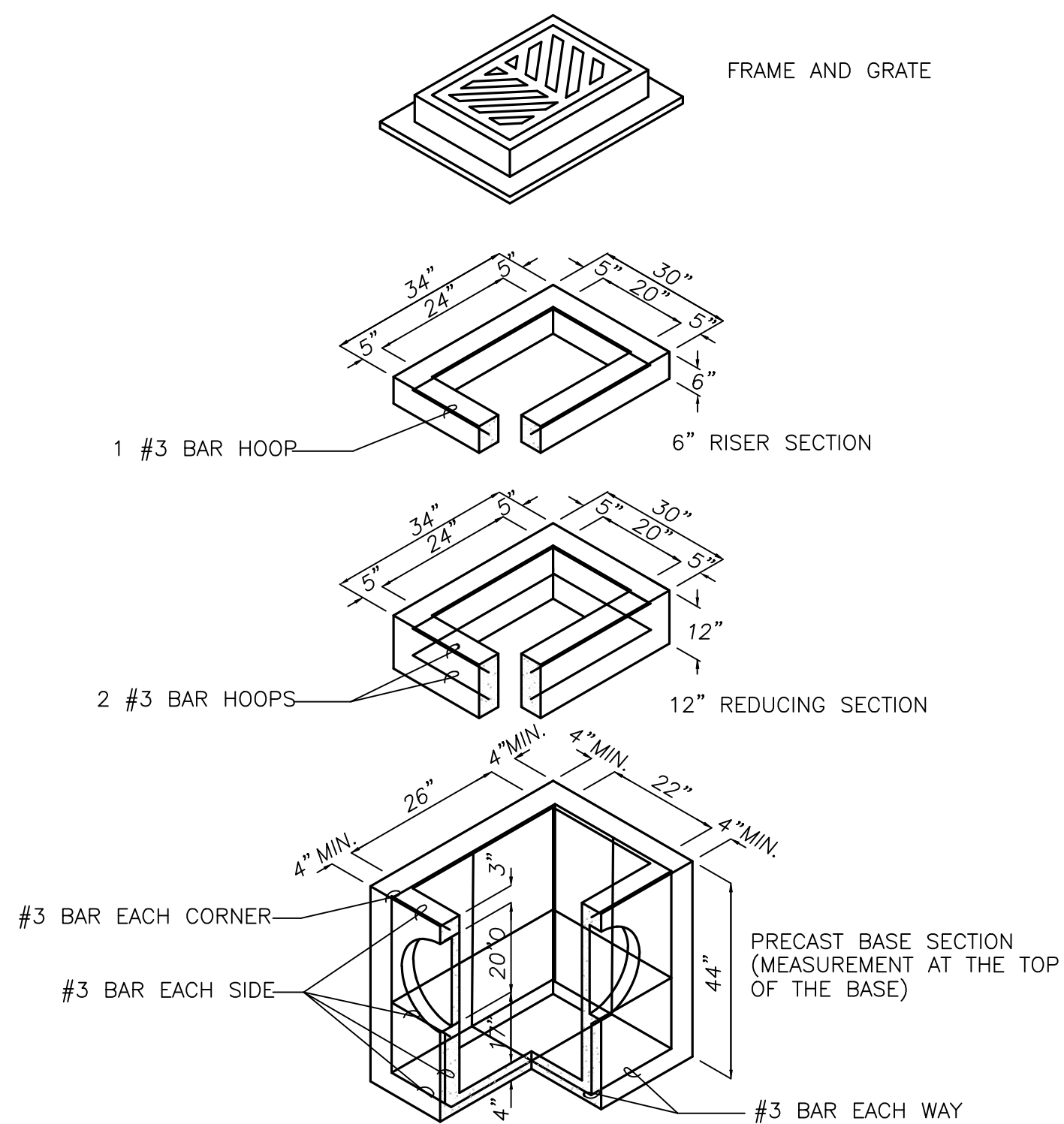


TRACT AC-4
E SECONDARY DRIVE
 NOT TO SCALE

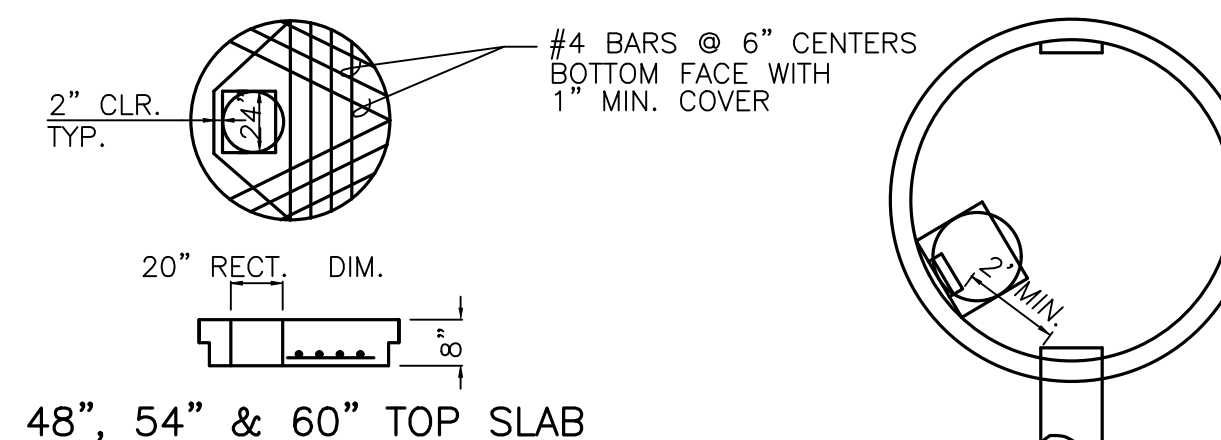


RESIDENTIAL ROADWAYS,
 AND JOINT UTILITY DRIVEWAY

F PAVEMENT SECTION DETAIL
 NOT TO SCALE



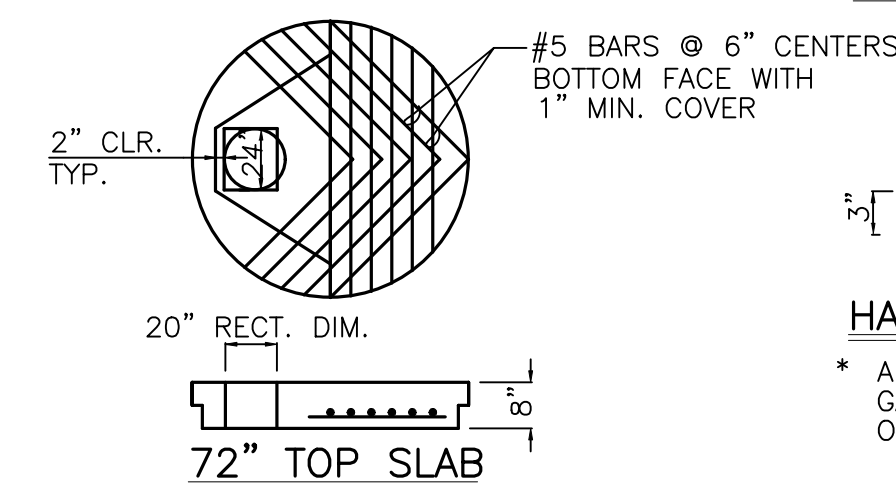
H TYPE 1 CATCH BASIN
 NOT TO SCALE



48", 54" & 60" TOP SLAB

TYPICAL ORIENTATION
 FOR ACCESS AND STEPS

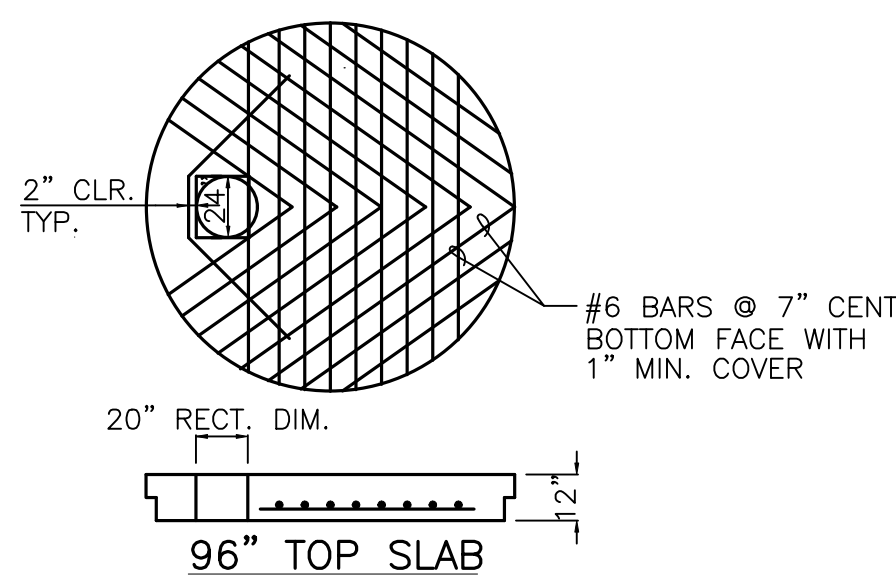
NOTE:
 AS AN ACCEPTABLE ALTERNATE TO REBAR,
 WIRE MESH HAVING A MINIMUM AREA OF 0.12
 SQUARE INCHES PER FOOT MAY BE USED FOR
 ADJUSTMENT SECTIONS.



72" TOP SLAB

HANDHOLD CATCH BASIN STEP

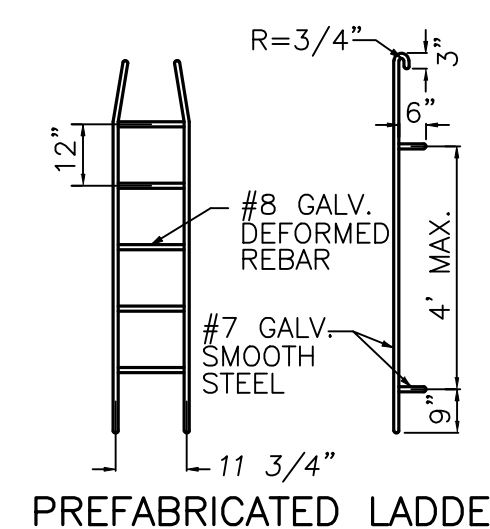
* ALL STEPS & RUNGS #8
 GALV. DEFORMED REBAR
 OR COPOLYMER PROPYLENE.



96" TOP SLAB

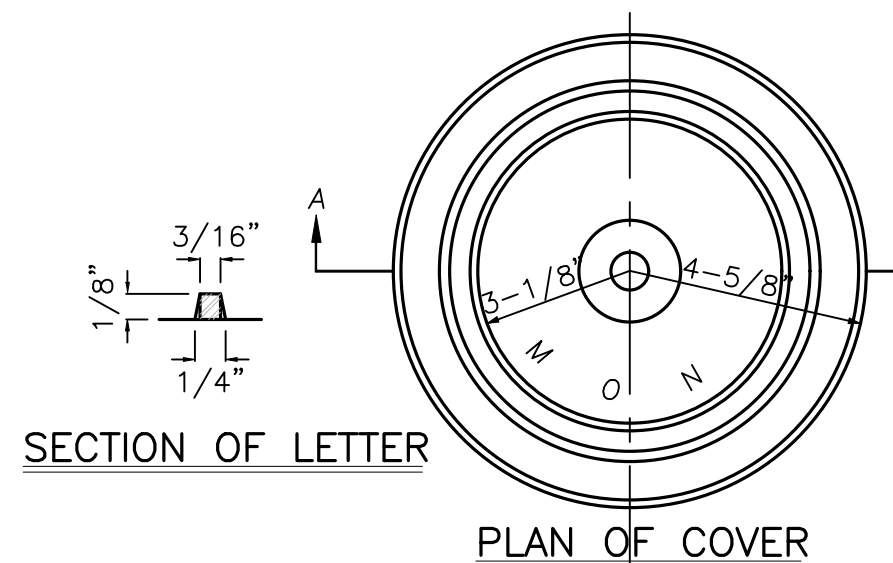
DROP RUNG
 CATCH BASIN STEP

GRADE RING



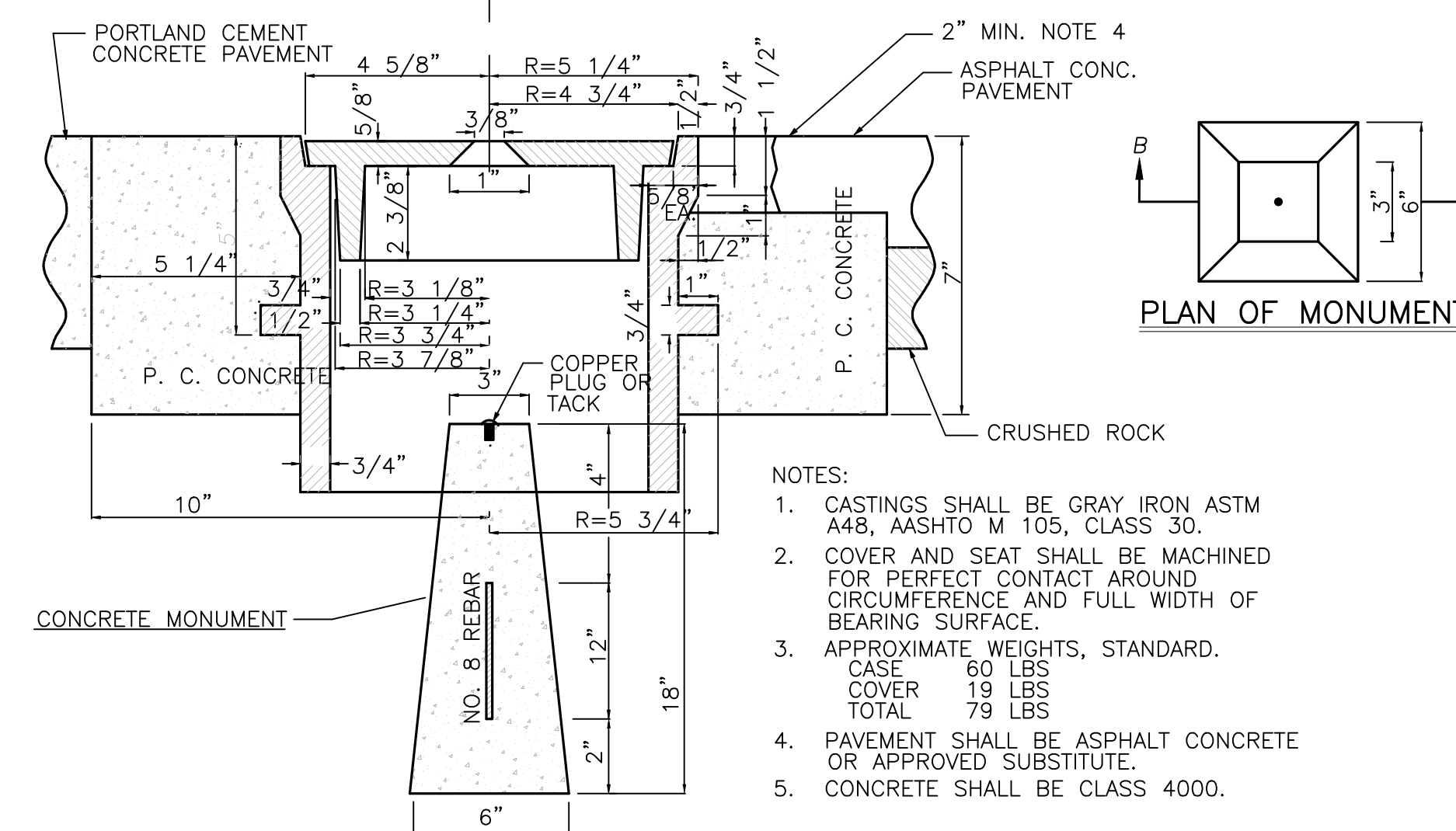
PREFABRICATED LADDER

G MISCELLANEOUS DETAILS
 NOT TO SCALE



SECTION OF LETTER

PLAN OF COVER



- NOTES:**
1. CASTINGS SHALL BE GRAY IRON ASTM A48, AASHTO M 105, CLASS 30.
 2. COVER AND SEAT SHALL BE MACHINED FOR PERFECT CONTACT AROUND CIRCUMFERENCE AND FULL WIDTH OF BEARING SURFACE.
 3. APPROXIMATE WEIGHTS, STANDARD.
 CASE 60 LBS
 COVER 19 LBS
 TOTAL 79 LBS
 4. PAVEMENT SHALL BE ASPHALT CONCRETE OR APPROVED SUBSTITUTE.
 5. CONCRETE SHALL BE CLASS 4000.

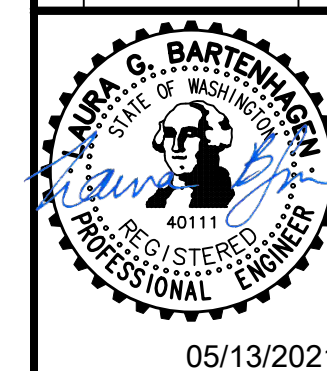
I ROADWAY SURVEY
 MONUMENT WITH CASE AND COVER
 NOT TO SCALE

APPROVED FOR CONSTRUCTION

KITTITAS COUNTY ENGINEER

DATE

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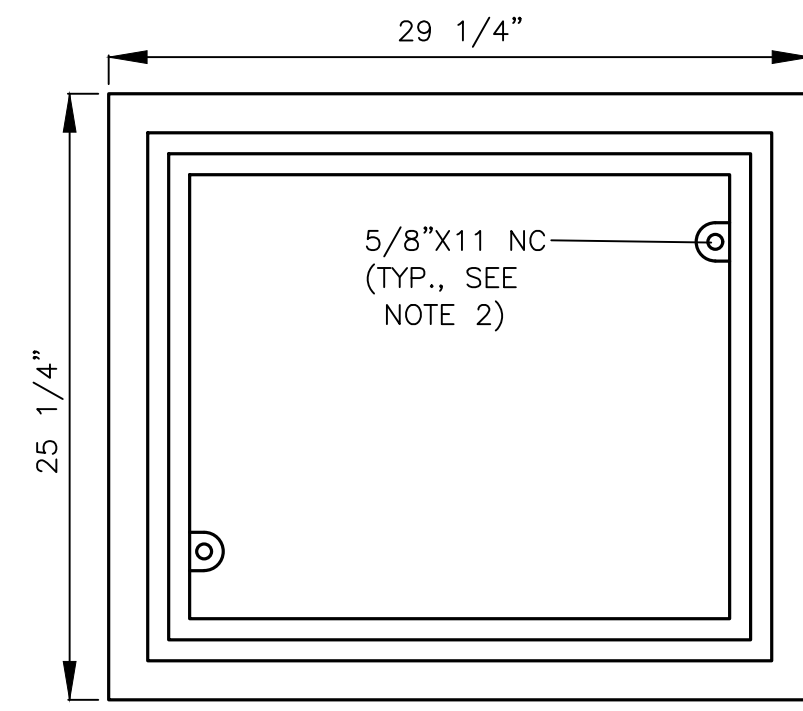
WASHINGTON

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 NELSON RIDGE
 ROAD/STORM DETAILS & NOTES

KITTITAS COUNTY

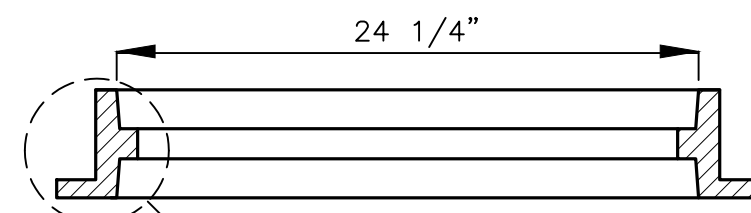
JOB NO.:	998-812-020
DWG. NAME:	DT-03
DESIGNED BY:	LGB
DRAWN BY:	JJH
CHECKED BY:	
DATE:	05/05/2021
DATE OF PRINT:	

DT-03



NOTES:

1. THIS FRAME IS DESIGNED TO ACCOMMODATE 20"x24" GRATES OR COVERS.
2. WHEN BOLT DOWN GRATES OR COVERS ARE SPECIFIED, PROVIDE TWO HOLES IN THE FRAME THAT ARE VERTICALLY ALIGNED WITH THE GRATE OR COVER SLOTS. TAP EACH HOLE TO ACCEPT A 5/8"x11 NC X 2" ALLEN HEAD CAP SCREW. LOCATION OF BOLT HOLES VARIES AMONG DIFFERENT MANUFACTURERS.



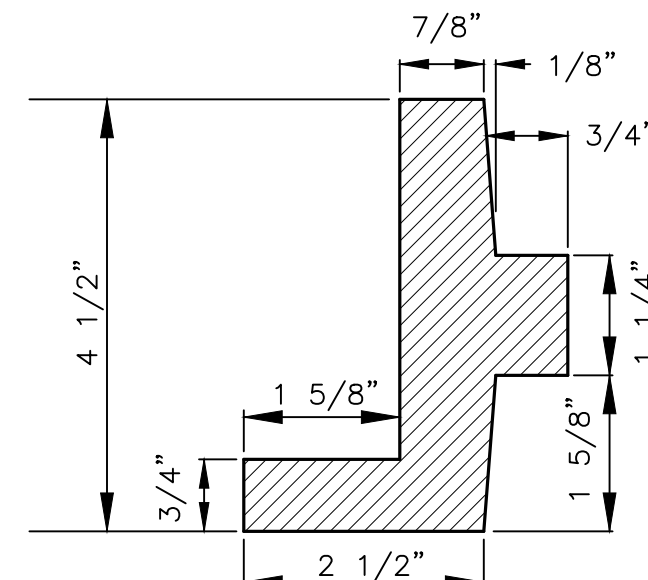
RECESSED ALLEN HEAD CAP SCREW (SEE NOTE 2)

GRATE OR SOLID COVER

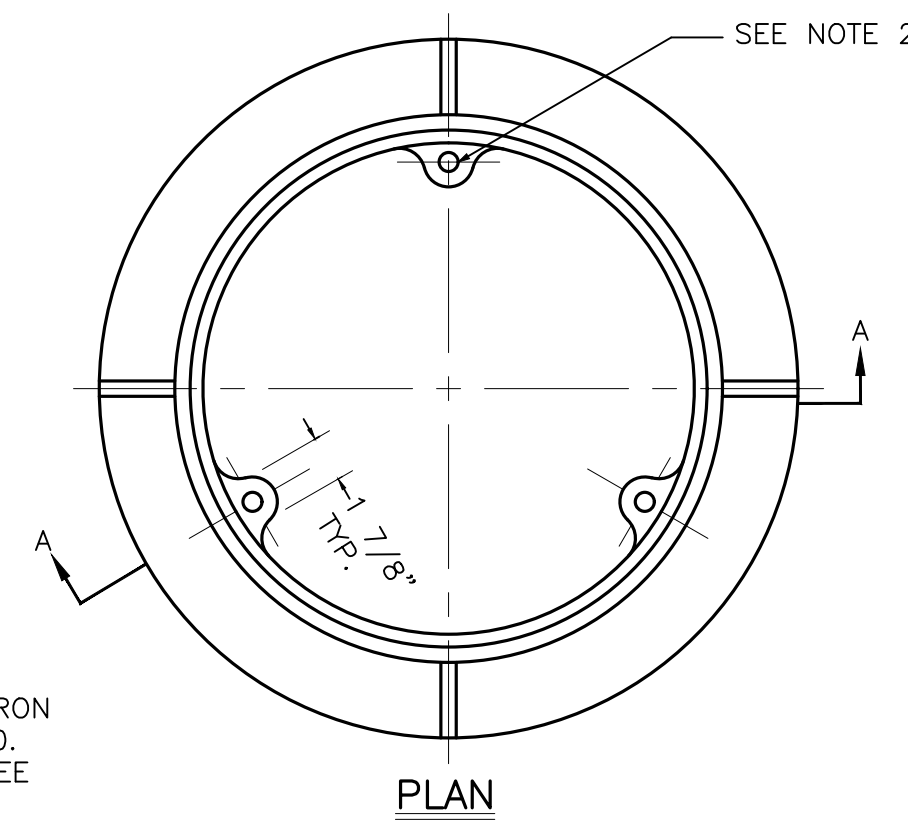
FRAME

BOLT DOWN DETAIL

A LOCKING FRAME
NOT TO SCALE



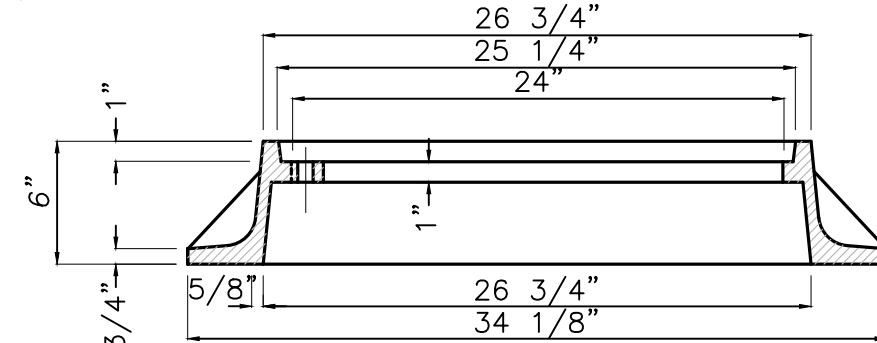
DETAIL "A"



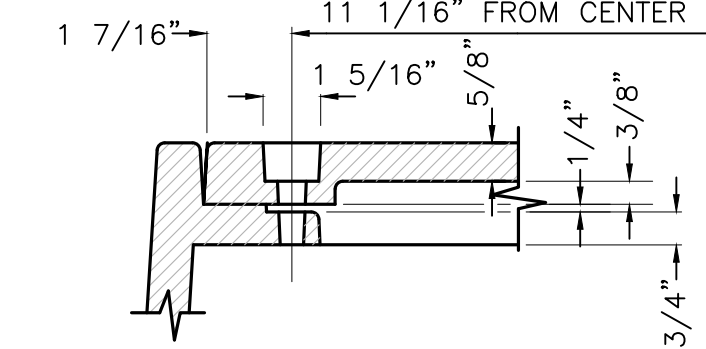
PLAN

NOTES:

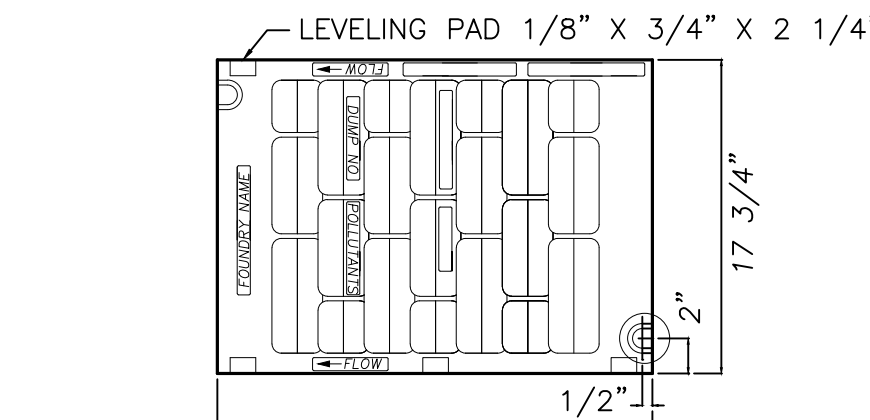
1. MATERIAL IS CAST IRON ASTM A48 CLASS 30.
2. DRILL AND TAP THREE 5/8"-11 NC HOLES THROUGH FRAME AT 120° AND 11 1/16" RADIUS.



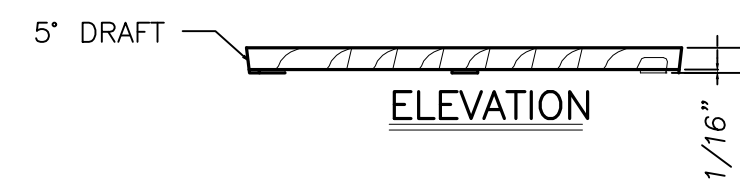
SECTION A-A



B LOCKING MANHOLE FRAME
NOT TO SCALE



PLAN

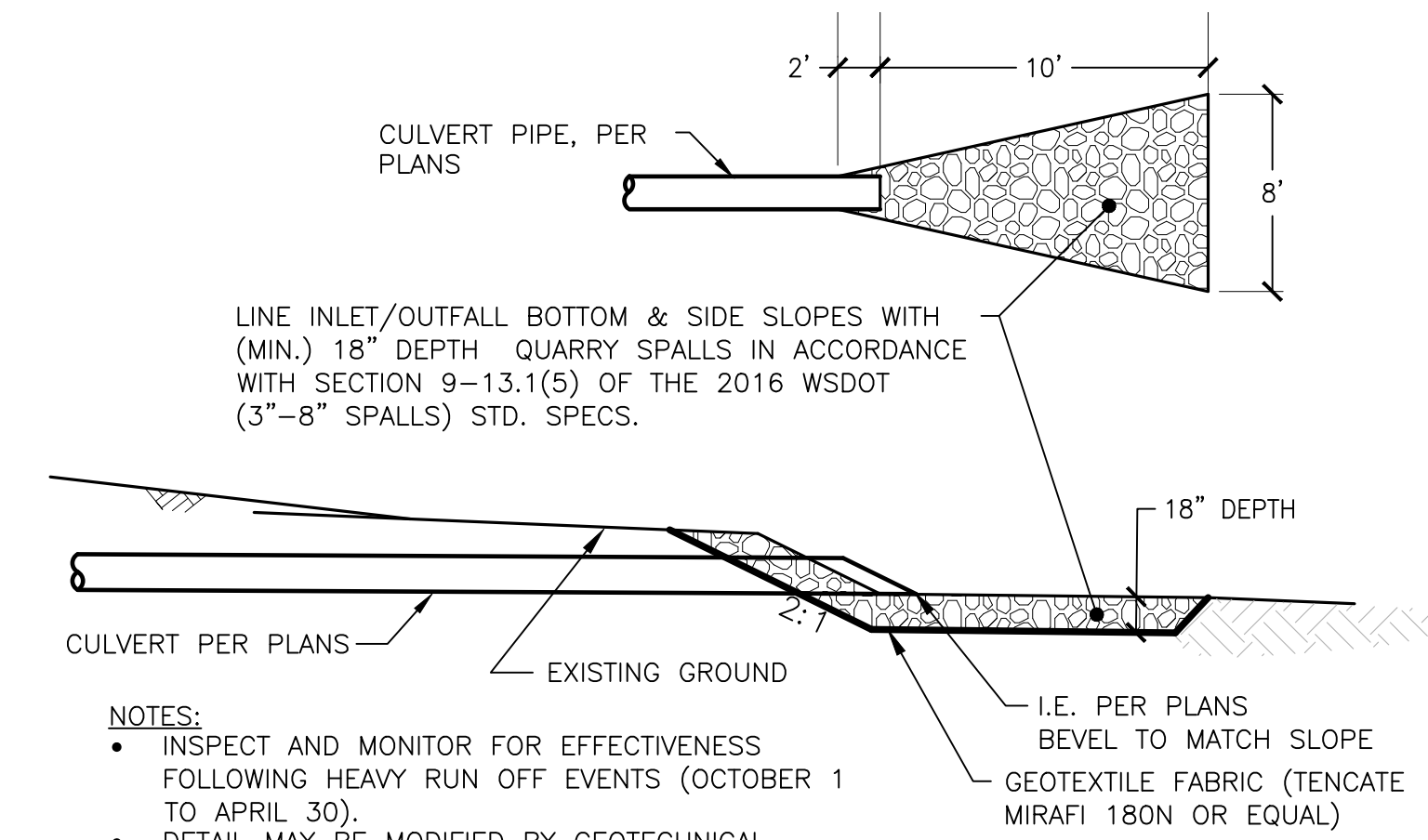


ELEVATION

NOTES:

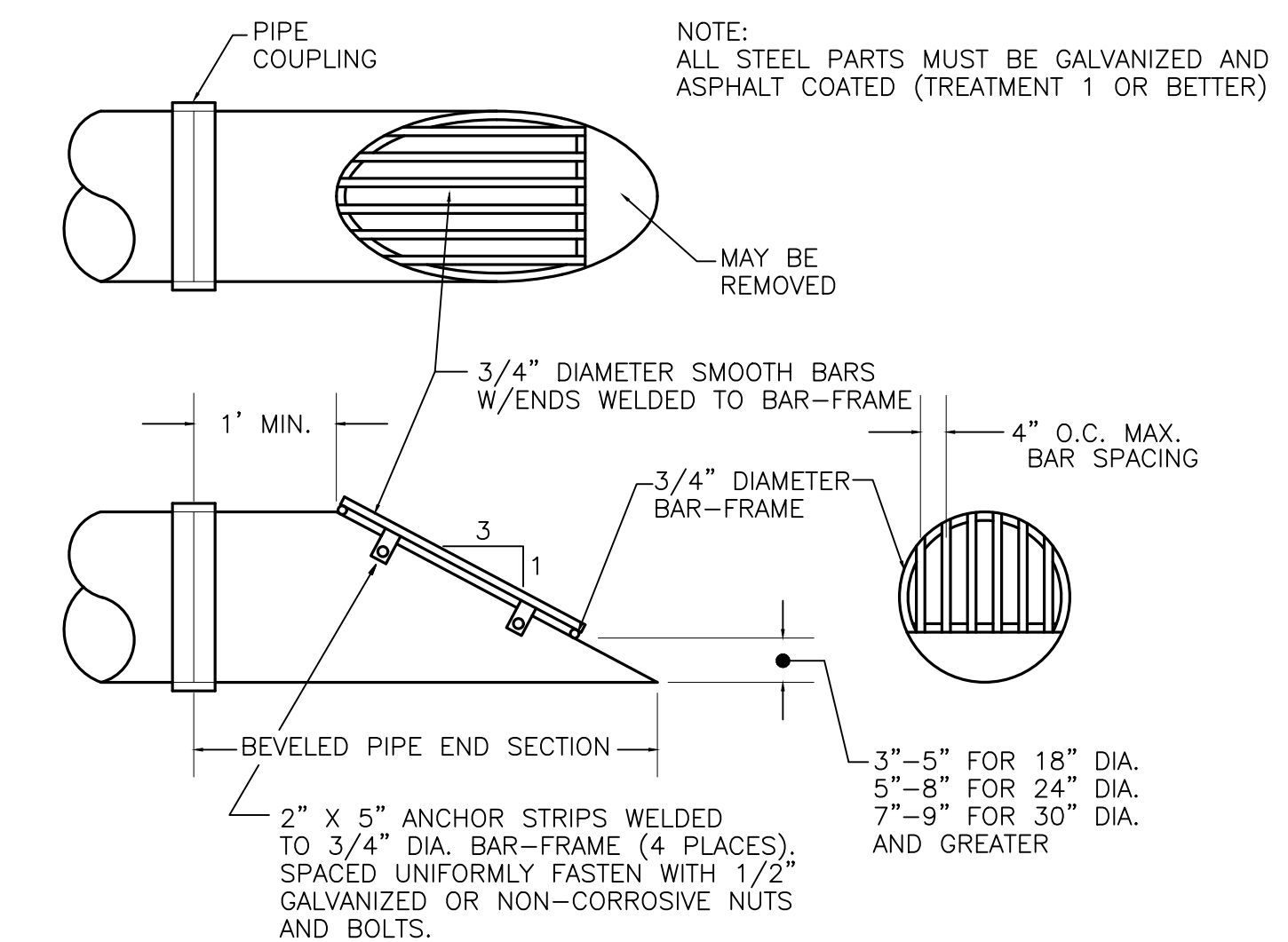
1. SELF-LOCK VANED GRATE MANUFACTURER SUBJECT TO APPROVAL BY ENGINEER.
2. USE WITH TWO LOCKING BOLTS 5/8"-11 NC STAINLESS TYPE 304 STEEL SOCKET HEAD (ALLEN HEAD) CAP SCREWS 2" LONG. NOTE SLOT DETAIL.
3. MATERIAL IS DUCTILE IRON ASTM A536 GRADE 80-55-06.
4. "DUMP NO POLLUTANTS" MAY BE LOCATED ON BORDER AREA.

C LOCKING GRATE
NOT TO SCALE

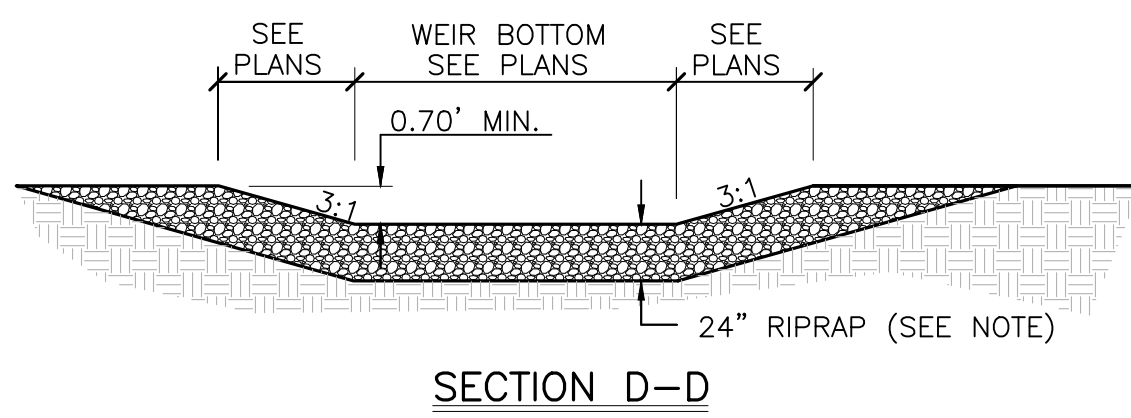


- NOTES:**
- INSPECT AND MONITOR FOR EFFECTIVENESS FOLLOWING HEAVY RUN OFF EVENTS (OCTOBER 1 TO APRIL 30).
 - DETAIL MAY BE MODIFIED BY GEOTECHNICAL ENGINEER ON A CASE BY CASE BASIS.

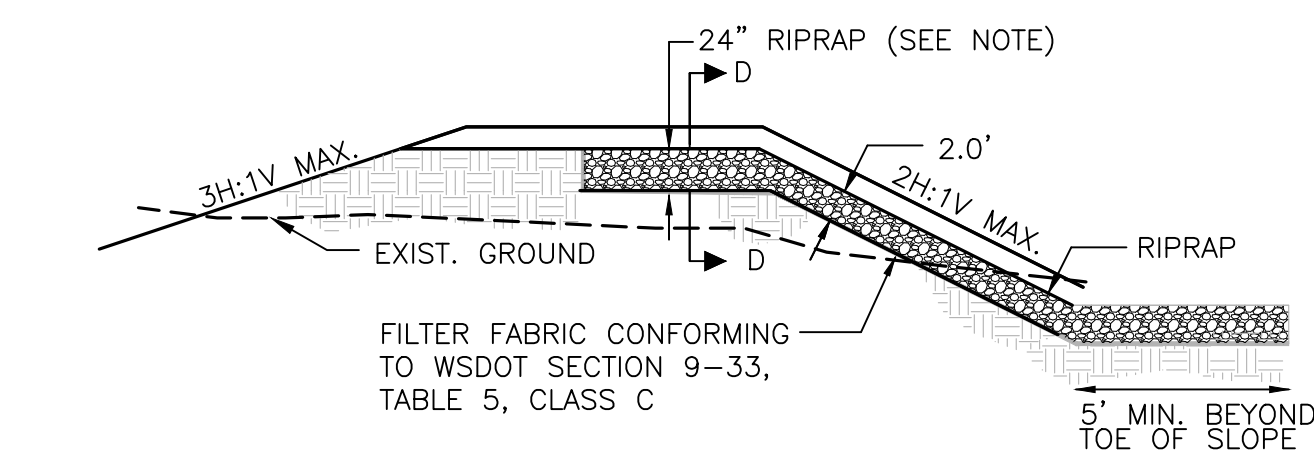
D CULVERT OUTFALL DETAIL
NOT TO SCALE



E DEBRIS BARRIER
NOT TO SCALE

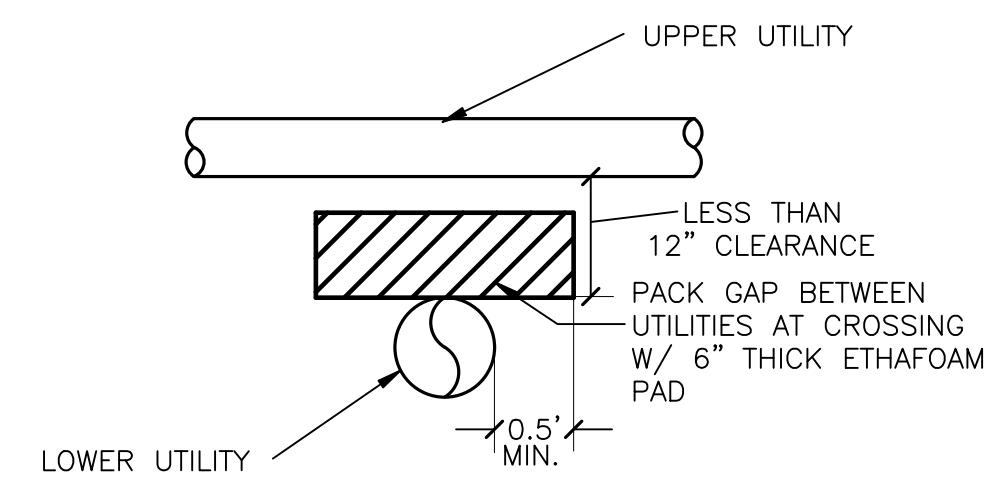


SECTION D-D

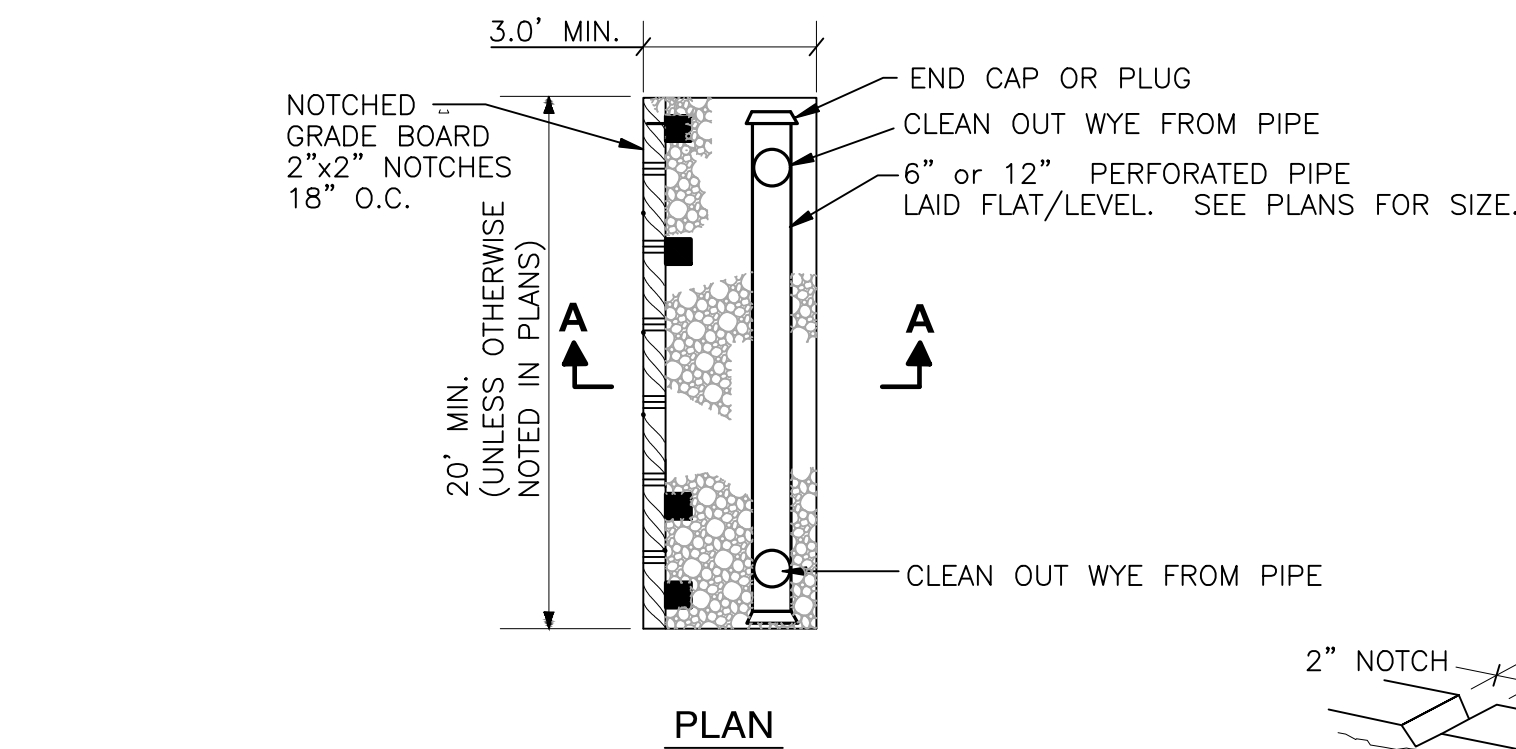


RIPRAP SHALL BE IN ACCORDANCE WITH SECTION 9.13.1(5) OF THE WSDOT/APWA STANDARD SPECIFICATIONS. RIPRAP TO BE REASONABLY WELL GRADED WITH ROCK GRADATION AS FOLLOWS:
 PASSING 8" SQUARE SIEVE 100% OR MAX STONE SIZE 12"
 PASSING 6" SQUARE SIEVE 40-60% OR MED STONE SIZE 6"
 PASSING 2" SQUARE SIEVE 0-10% OR MIN STONE SIZE 2"

F OVERFLOW AND SPILLWAY
NOT TO SCALE



G ETHAFOAM INSTALLATION DETAIL
NOT TO SCALE



PLAN

SECTION A-A

H DISPERSION TRENCH
NOT TO SCALE

NOTES:

1. WHEN TWO CB'S ARE SHOWN IN THE SAME DISPERSION TRENCH, THEY SHALL BE CONNECTED BY A 12" PERFORATED PIPE.
2. THIS TRENCH SHALL BE CONSTRUCTED SO AS TO PREVENT POINT DISCHARGE AND/OR EROSION.
3. TRENCHES MAY BE PLACED NO CLOSER THAN 50 FEET TO ONE ANOTHER. (100 FEET ALONG FLOWLINE)
4. TRENCH AND GRADE BOARD MUST BE LEVEL. ALIGN TO FOLLOW CONTOURS OF SITE.
5. SUPPORT POST SPACING AS REQUIRED BY SOIL CONDITIONS TO ENSURE GRADE BOARD REMAINS LEVEL.

APPROVED FOR CONSTRUCTION

KITTITAS COUNTY ENGINEER _____ DATE _____

REVISIONS		
NO.	DESCRIPTION/DATE	BY

LAUR G. BARTENKEL
 CIVIL ENGINEER
 40111 REGISTERED PROFESSIONAL ENGINEER
 04/16/2021

CONSULTING ENGINEERS LLC
 505 FEDERAL WAY, WA 98003
 (253) 838-6113
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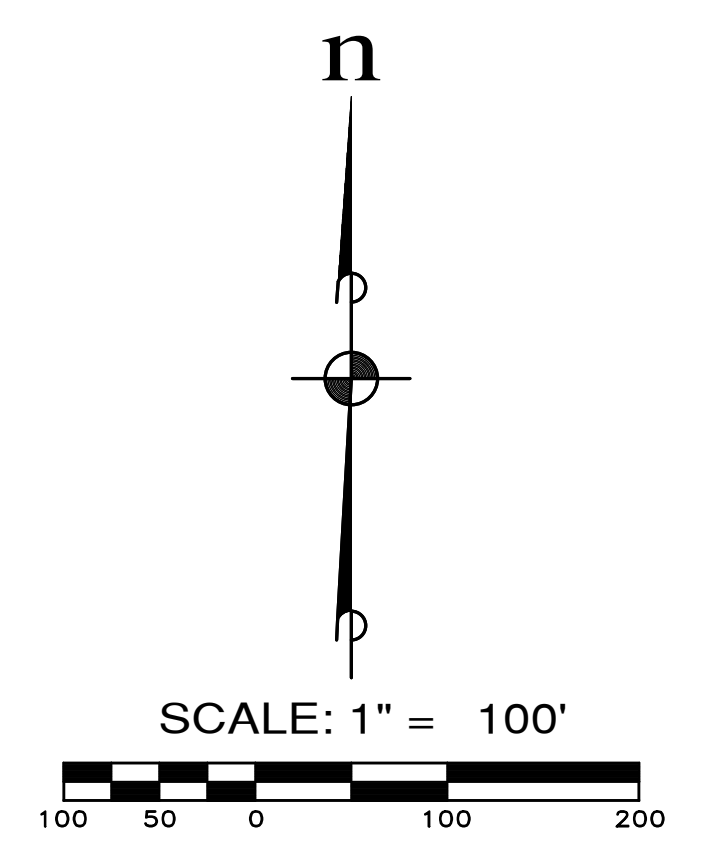
Civil Engineering
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NEW SUNCADIA, LLC
 NELSON RIDGE
 ROAD/STORM DETAILS & NOTES
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 KITTITAS COUNTY

JOB NO.: 998-812-020
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 DESIGNED BY: LGB
 DRAWN BY: JHJ
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 DATE OF PRINT:

DT-04
 5 OF 29 SHEETS

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NELSON RIDGE

ROAD/STORM KEY MAP

WASHINGTON

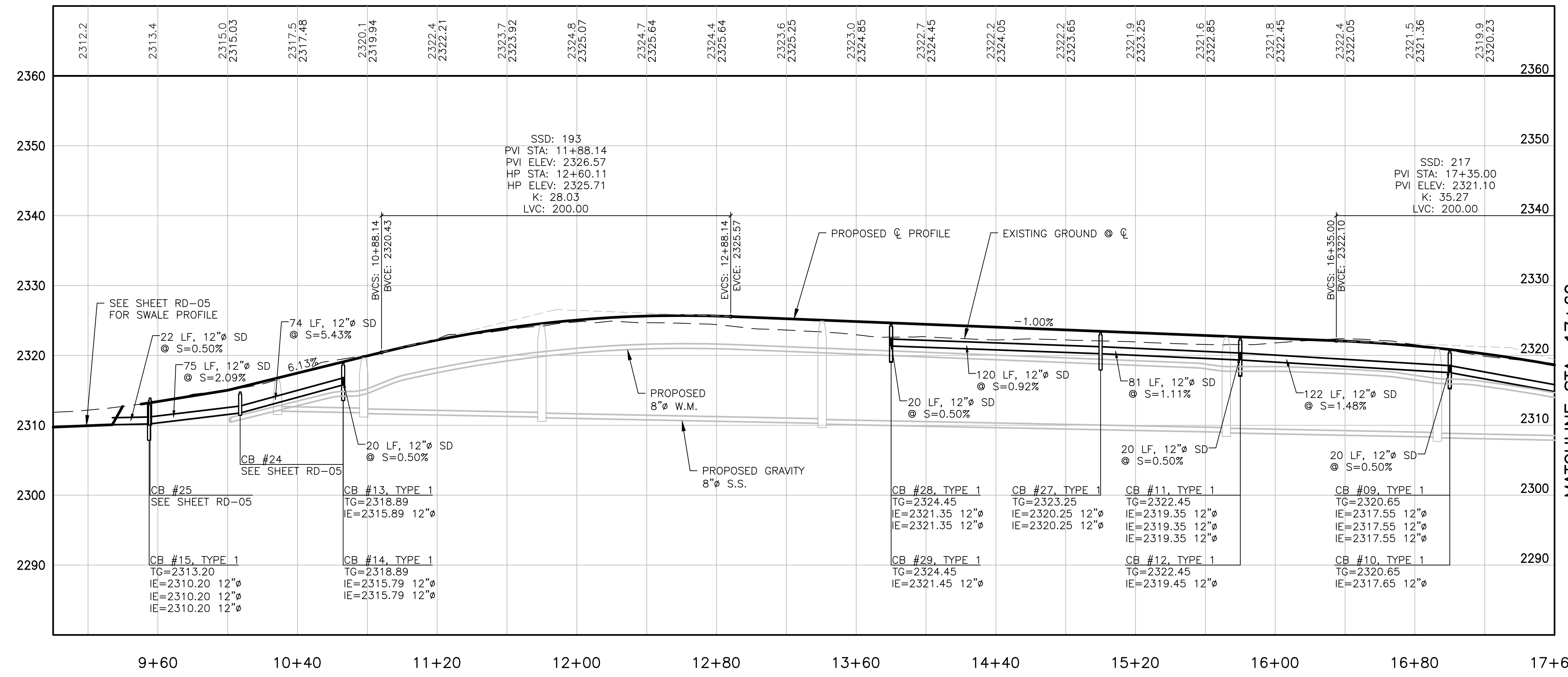
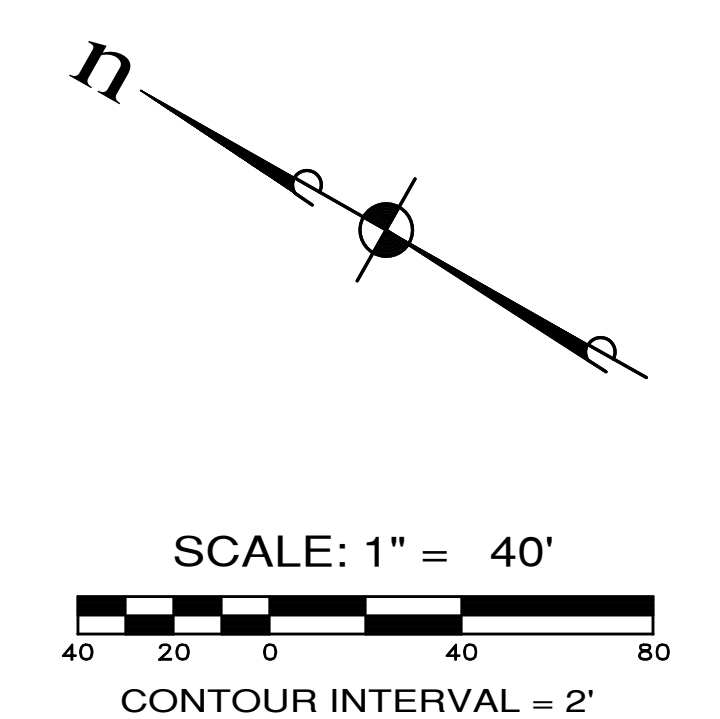
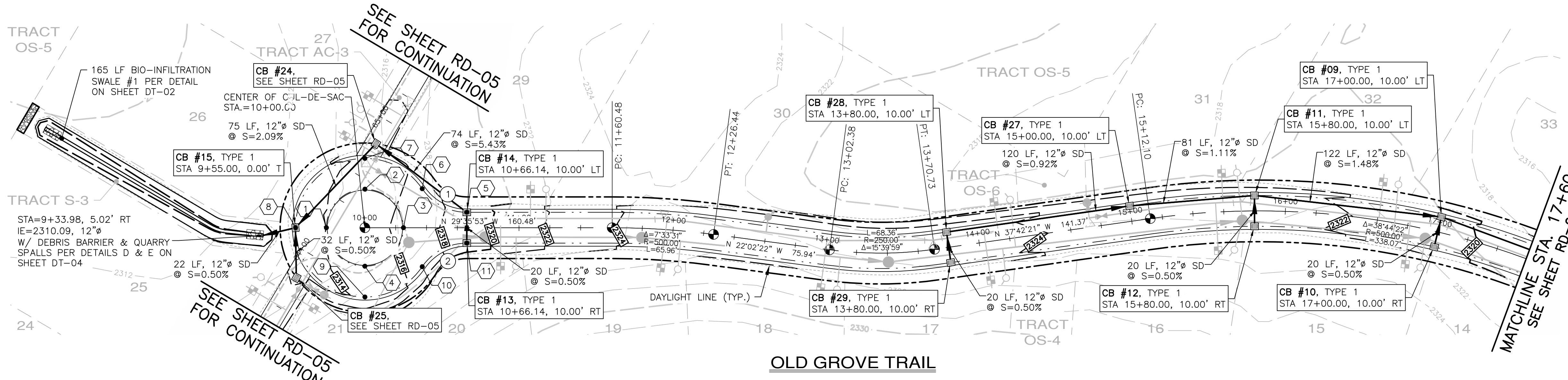
KITTITAS COUNTY

JOB NO.:	998-812-020
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RD-KEY

6 OF 29 SHEETS

A PORTION OF SECTION 13, T. 20 N., R. 14 E., AND SECTION 18, T. 20 N., R. 15 E., W.M., KITTITAS COUNTY, WASHINGTON



KEY MAP

CUL-DE-SAC TABLE

1	N:693150.45 E:1509109.31 EL.=2314.19	7	N:693150.43 E:1509150.90 EL.=2314.13
2	N:693140.55 E:1509133.51 EL.=2314.53	8	N:693167.33 E:1509089.55 EL.=2313.20
3	N:693106.46 E:1509124.12 EL.=2316.56	9	N:693105.97 E:1509072.65 EL.=2314.13
4	N:693115.85 E:1509090.04 EL.=2314.53	10	N:693083.35 E:1509108.14 EL.=2316.80
5	N:693075.63 E:1509153.14 EL.=2318.89	11	N:693065.75 E:1509135.75 EL.=2318.89
6	N:693108.35 E:1509152.16 EL.=2316.80		

CURB TABLE

STATION	OFFSET	ELEV.
10+37.21	25.31' LT	2316.80
1/4 Δ	-----	2317.33
1/2 Δ	-----	2317.85
3/4 Δ	-----	2318.37
ECR	10+66.14 10.00' LT	2318.89
Δ=55°46'16" R=35.00' L=34.07'		

STATION	OFFSET	ELEV.
10+37.21	25.31' RT	2316.80
1/4 Δ	-----	2317.33
1/2 Δ	-----	2317.85
3/4 Δ	-----	2318.37
ECR	10+66.14 10.00' RT	2318.89
Δ=55°46'16" R=35.00' L=34.07'		

SCALE: 1"=40' HORIZ.
1"=10' VERT.



APPROVED FOR CONSTRUCTION

KITTITAS COUNTY ENGINEER _____ DATE _____

REVISIONS		
NO.	DESCRIPTION/DATE	BY

05/13/2021

ESM CONSULTING ENGINEERS, LLC
 5000 Federal Way, WA 98003
 (206) 838-6113
 (206) 297-9900
 www.esmcivil.com

REGISTERED PROFESSIONAL ENGINEER
 LAND PLANNING ARCHITECTURE
 LAND SURVEYING
 PROJECT MANAGEMENT
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 PUBLIC WORKS

NEW SUNCADIA, LLC
NELSON RIDGE
 ROAD/STORM PLAN & PROFILE

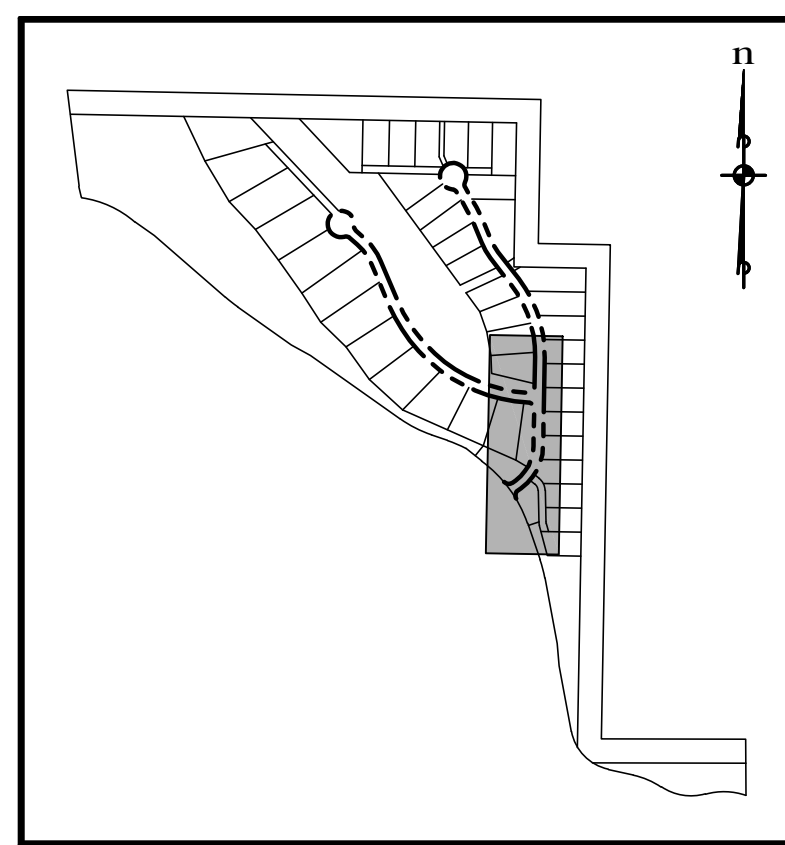
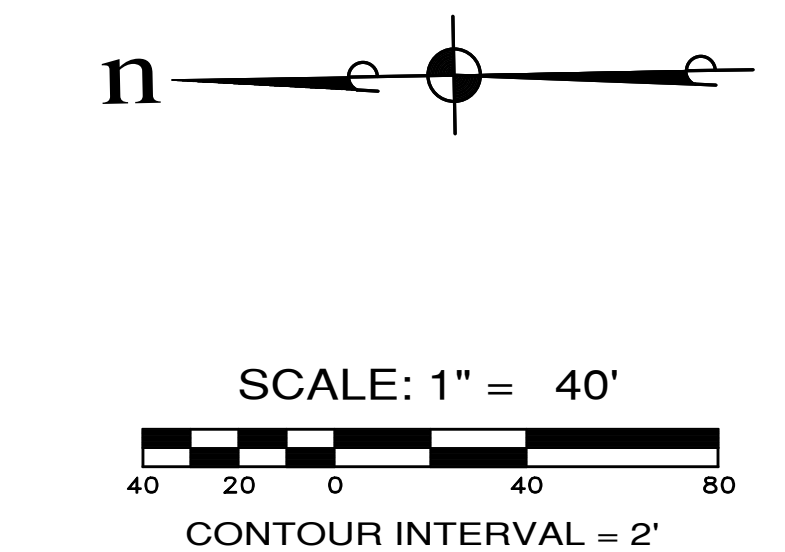
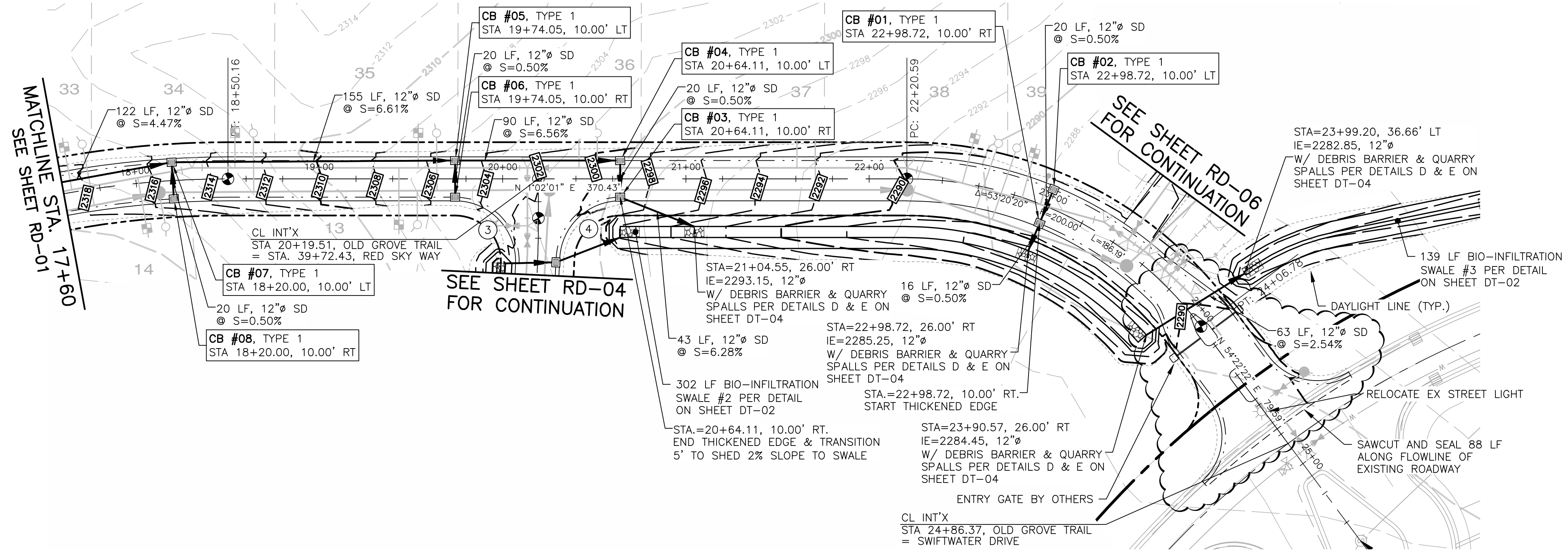
WASHINGTON
 KITTITAS COUNTY

JOB NO.: 998-812-020
 DWG. NAME: RD-01
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 DRAWN BY: JH
 CHECKED BY:
 DATE: 05/05/2021
 DATE OF PRINT:
RD-01

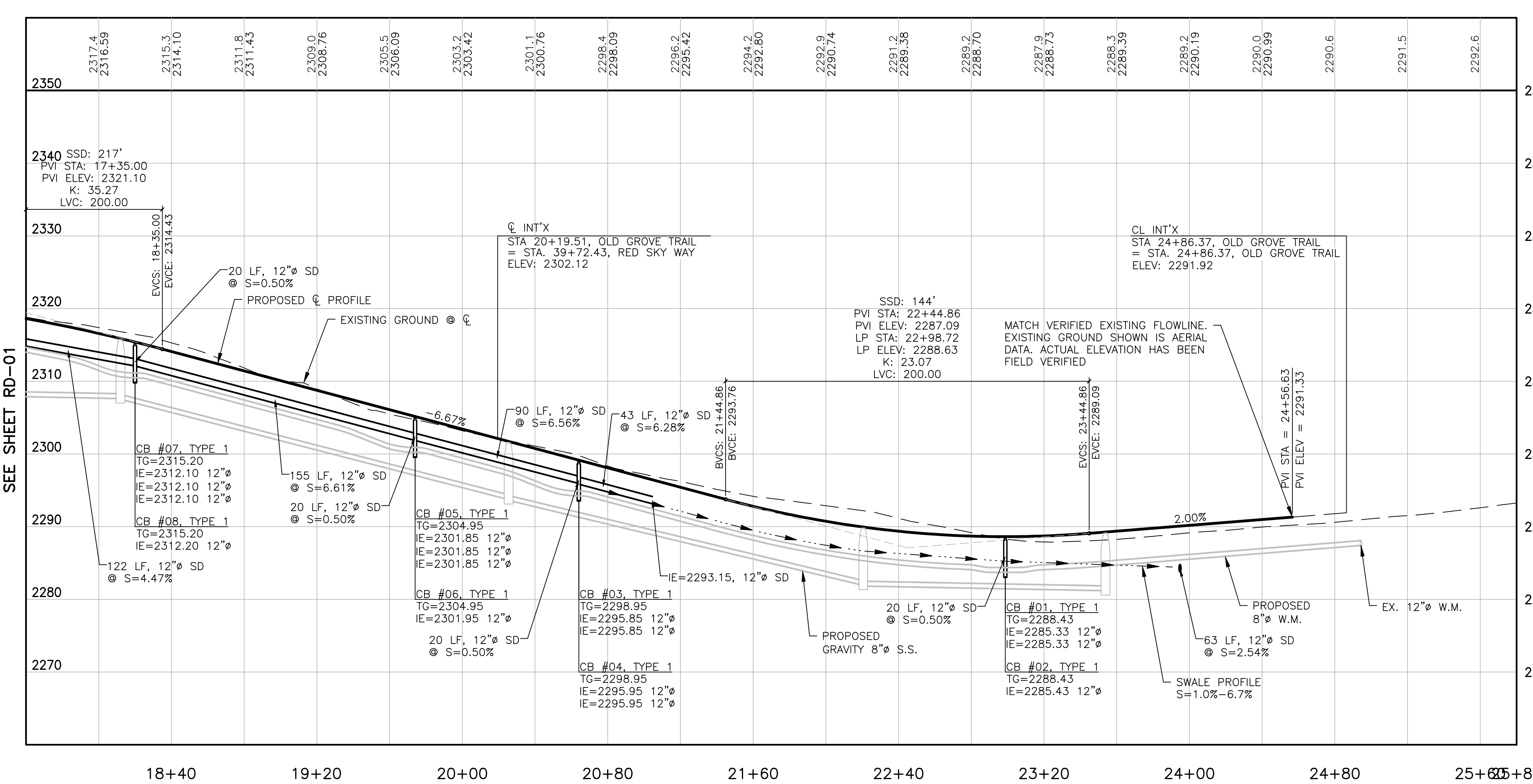
7 OF 29 SHEETS

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OLD GROVE TRAIL



KEY MAP

3 CURB F TABLE

STATION	OFFSET	ELEV.	
19+74.05	12.00' RT	2305.11	
1/4 Δ	-----	2304.18	
1/2 Δ	-----	2303.25	
3/4 Δ	-----	2302.32	
ECR	39+25.67	12.00' LT	2301.19
Δ=92°13'56" R=33.00' L=53.12'			

4 CURB F TABLE

STATION	OFFSET	ELEV.	
38+28.95	12.00' RT	2301.25	
1/4 Δ	-----	2300.72	
1/2 Δ	-----	2300.18	
3/4 Δ	-----	2299.64	
ECR	20+64.11	12.00' RT	2298.91
Δ=88°03'25" R=33.00' L=50.72'			

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REVISIONS

NO.	DESCRIPTION/DATE	BY

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LAUR G. BARTENBERG
 REGISTERED PROFESSIONAL ENGINEER
 No. 40111
 State of Washington

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 Public Works

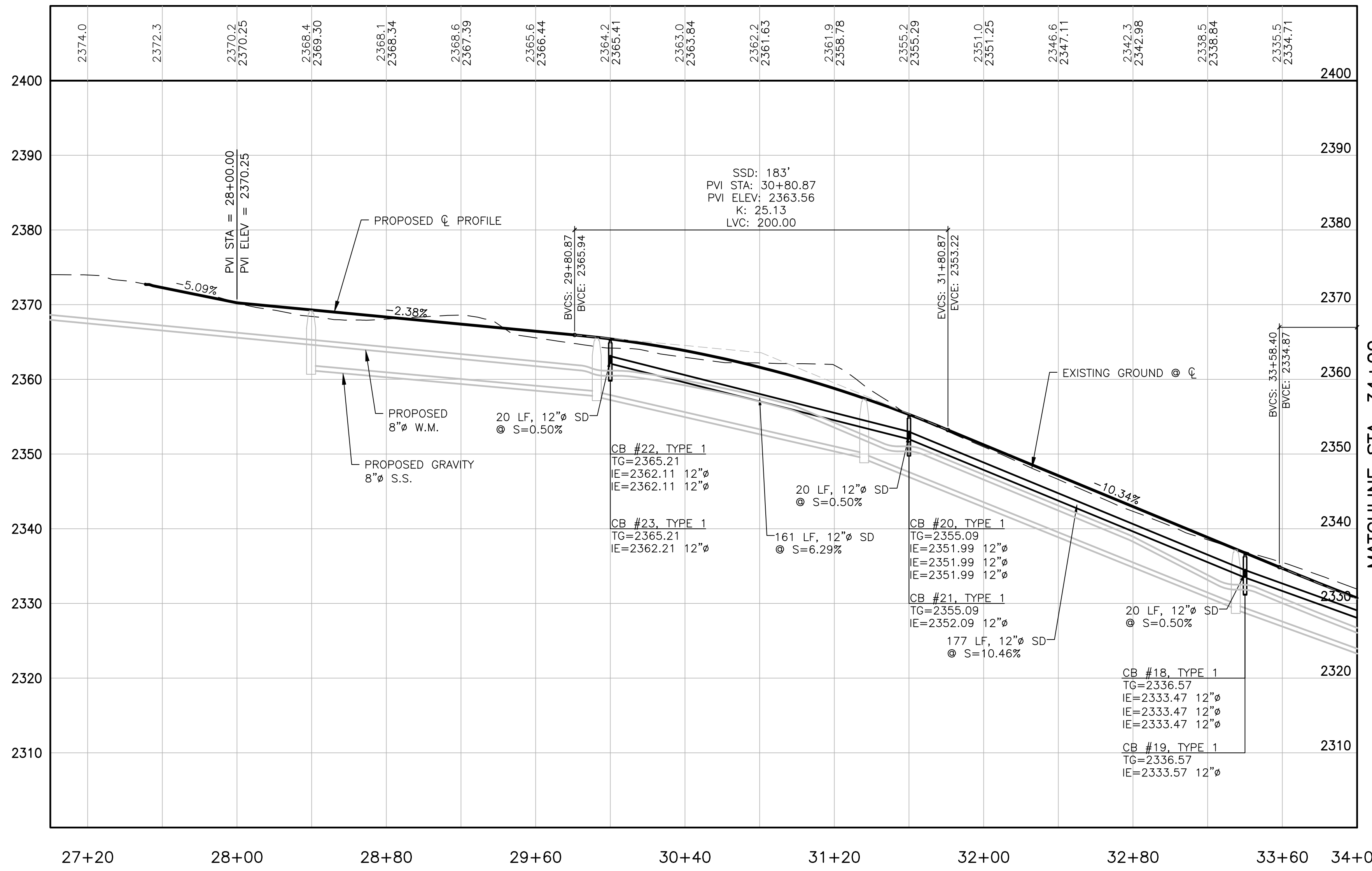
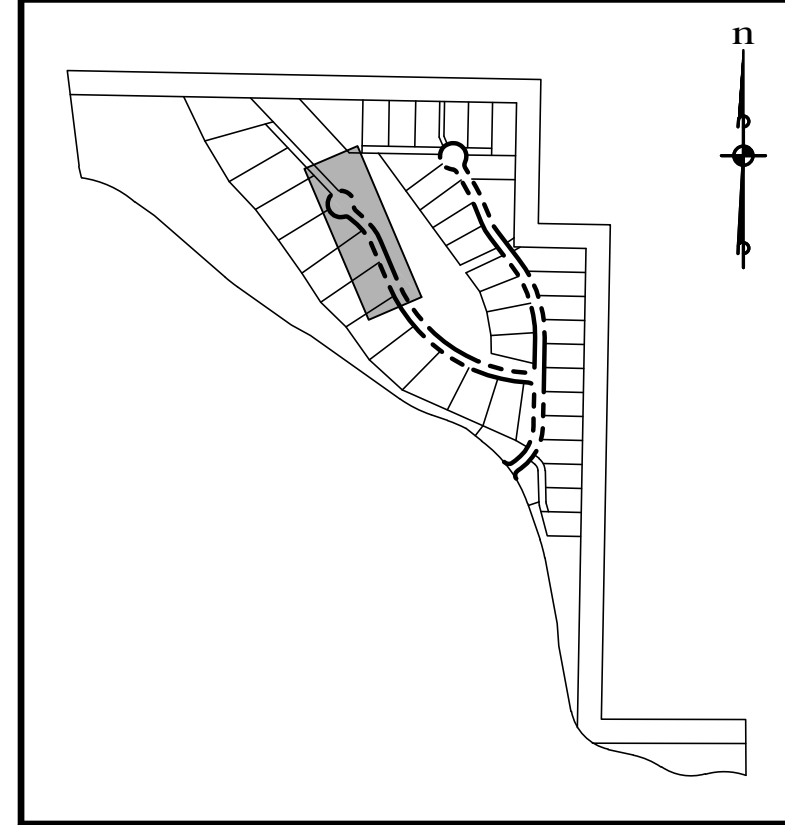
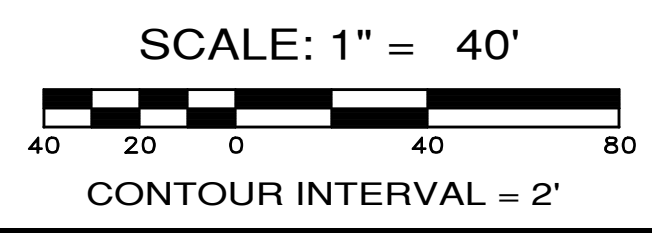
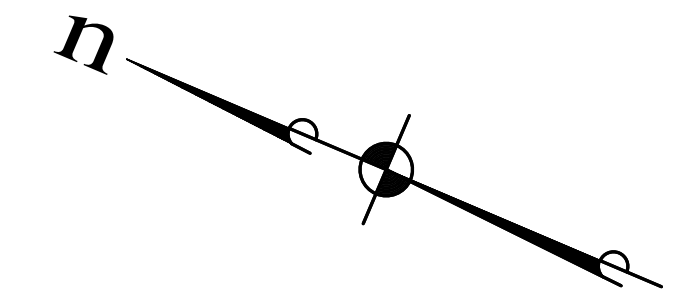
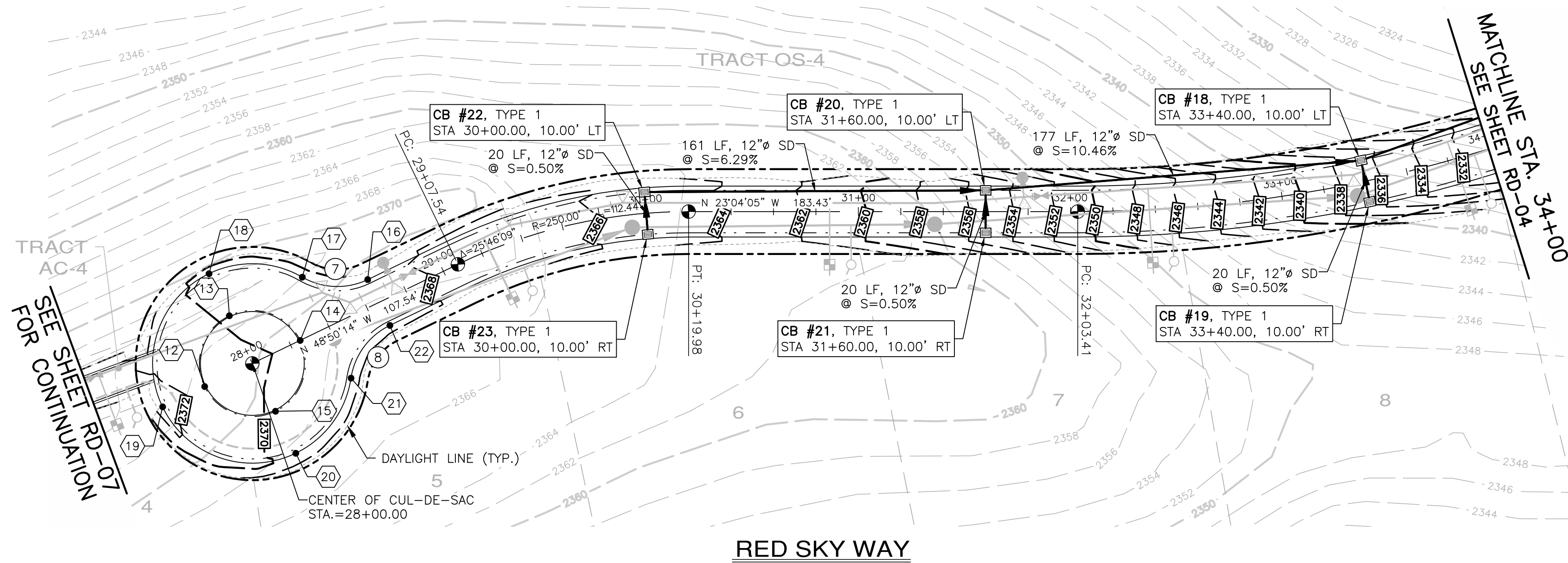
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KITTITAS COUNTY

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A PORTION OF SECTION 13, T. 20 N., R. 14 E., AND SECTION 18, T. 20 N., R. 15 E., W.M., KITTITAS COUNTY, WASHINGTON



MATCHLINE STA. 34+00
SEE SHEET RD-04

KEY MAP

CUL-DE-SAC TABLE

12	N:692945.71 E:1508625.08 EL.=2371.52	18	N:692964.64 E:1508674.83 EL.=2369.51
13	N:692948.08 E:1508660.35 EL.=2369.75	19	N:692960.19 E:1508608.51 EL.=2372.70
14	N:692912.80 E:1508662.72 EL.=2369.65	20	N:692893.87 E:1508612.96 EL.=2369.51
15	N:692910.44 E:1508627.44 EL.=2369.75	21	N:692883.78 E:1508655.75 EL.=2369.02
16	N:692893.25 E:1508700.28 EL.=2368.47	22	N:692876.69 E:1508685.79 EL.=2368.63
17	N:692923.82 E:1508688.57 EL.=2368.86		

7 CURB TABLE

STATION	OFFSET	ELEV.
BCR 28+38.86	26.44' LT	2369.02
1/4 Δ	-----	2368.92
1/2 Δ	-----	2368.83
3/4 Δ	-----	2368.73
ECR 28+66.14	12.00' LT	2368.63
Δ=55°46'18" R=33.00' L=32.12'		

8 CURB TABLE

STATION	OFFSET	ELEV.
BCR 28+38.86	26.44' RT	2369.02
1/4 Δ	-----	2368.92
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ECR 28+66.14	12.00' RT	2368.63
Δ=55°46'18" R=33.00' L=32.12'		

SCALE: 1"=40' HORIZ.
1"=10' VERT.



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 Land Surveying, Project Management
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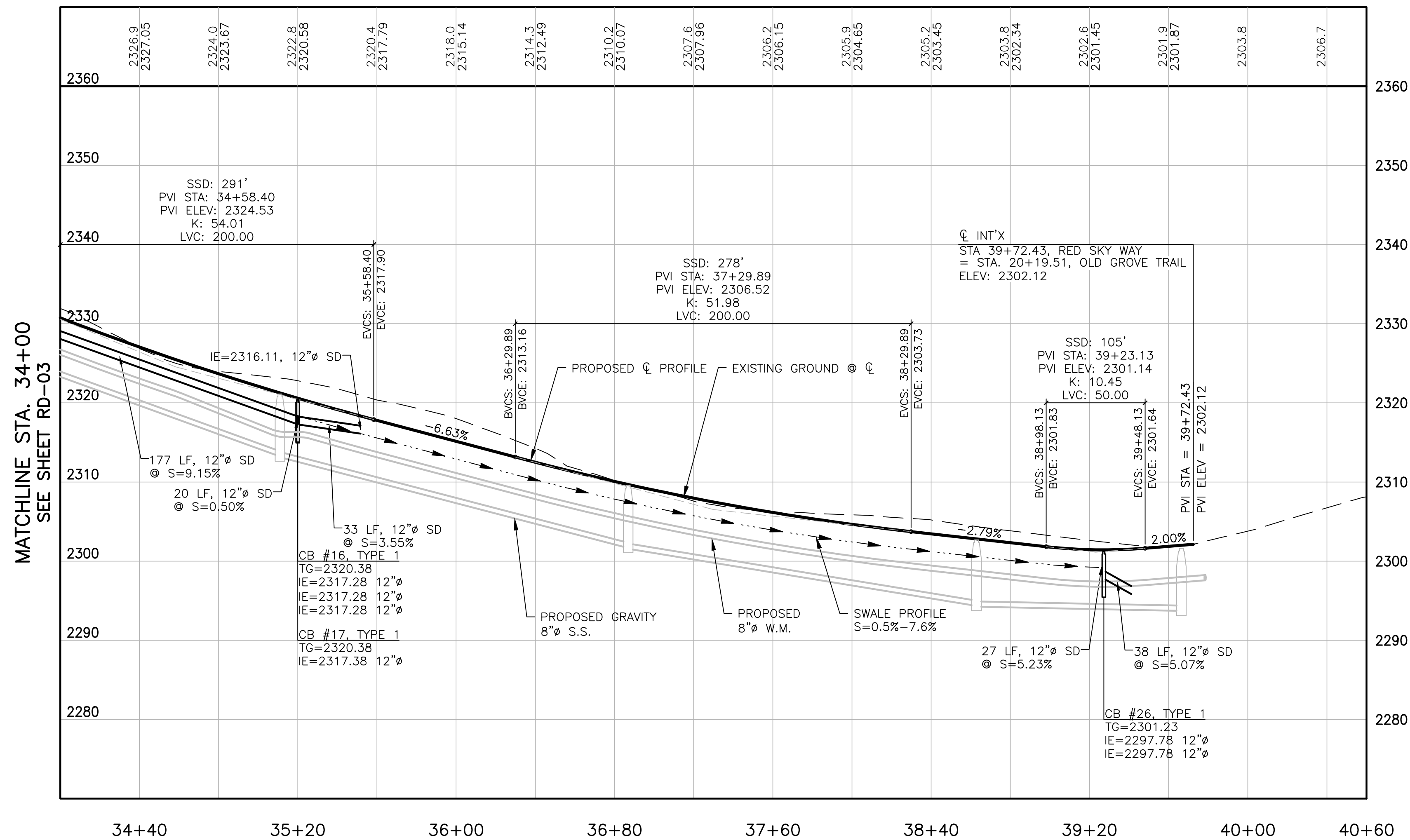
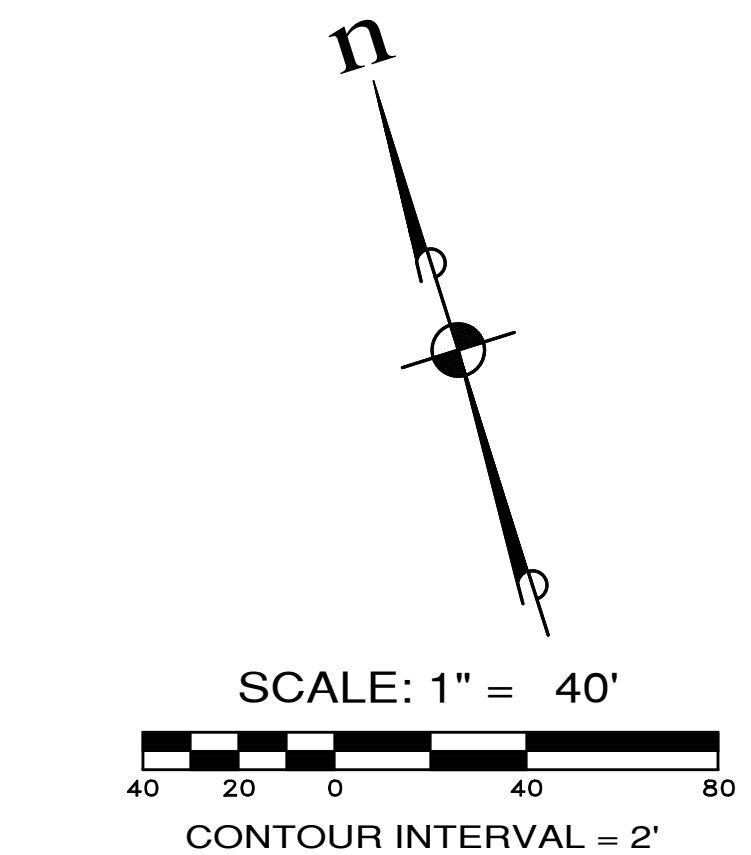
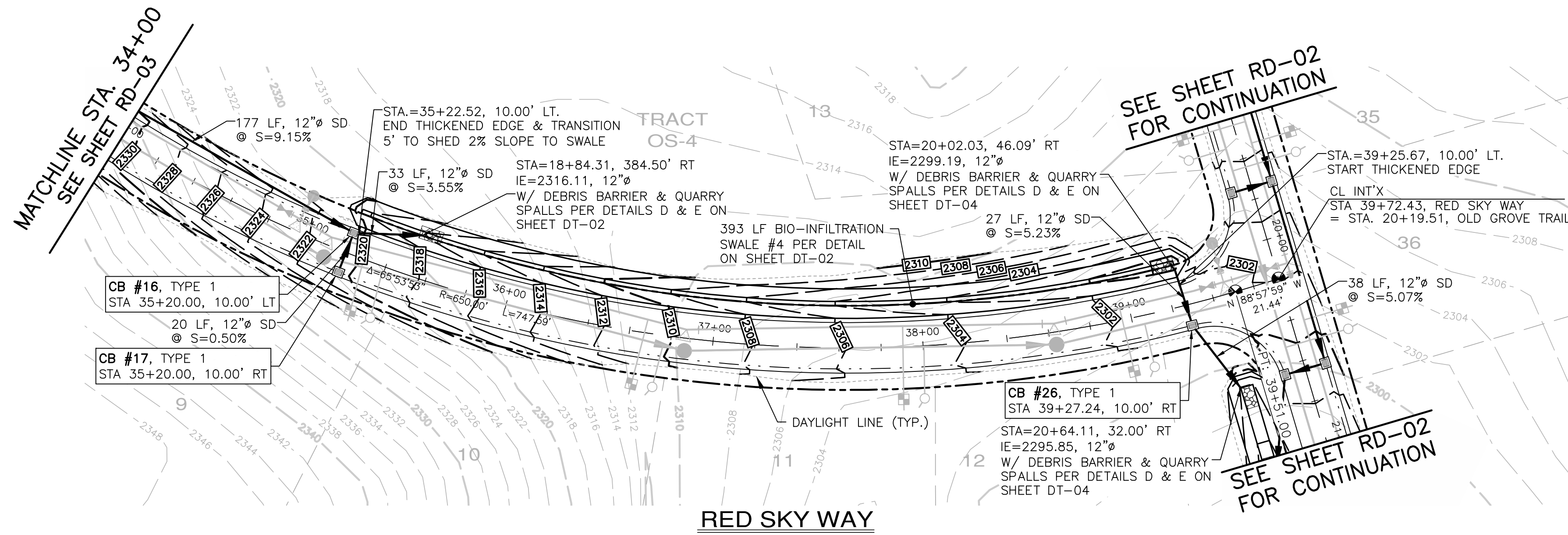
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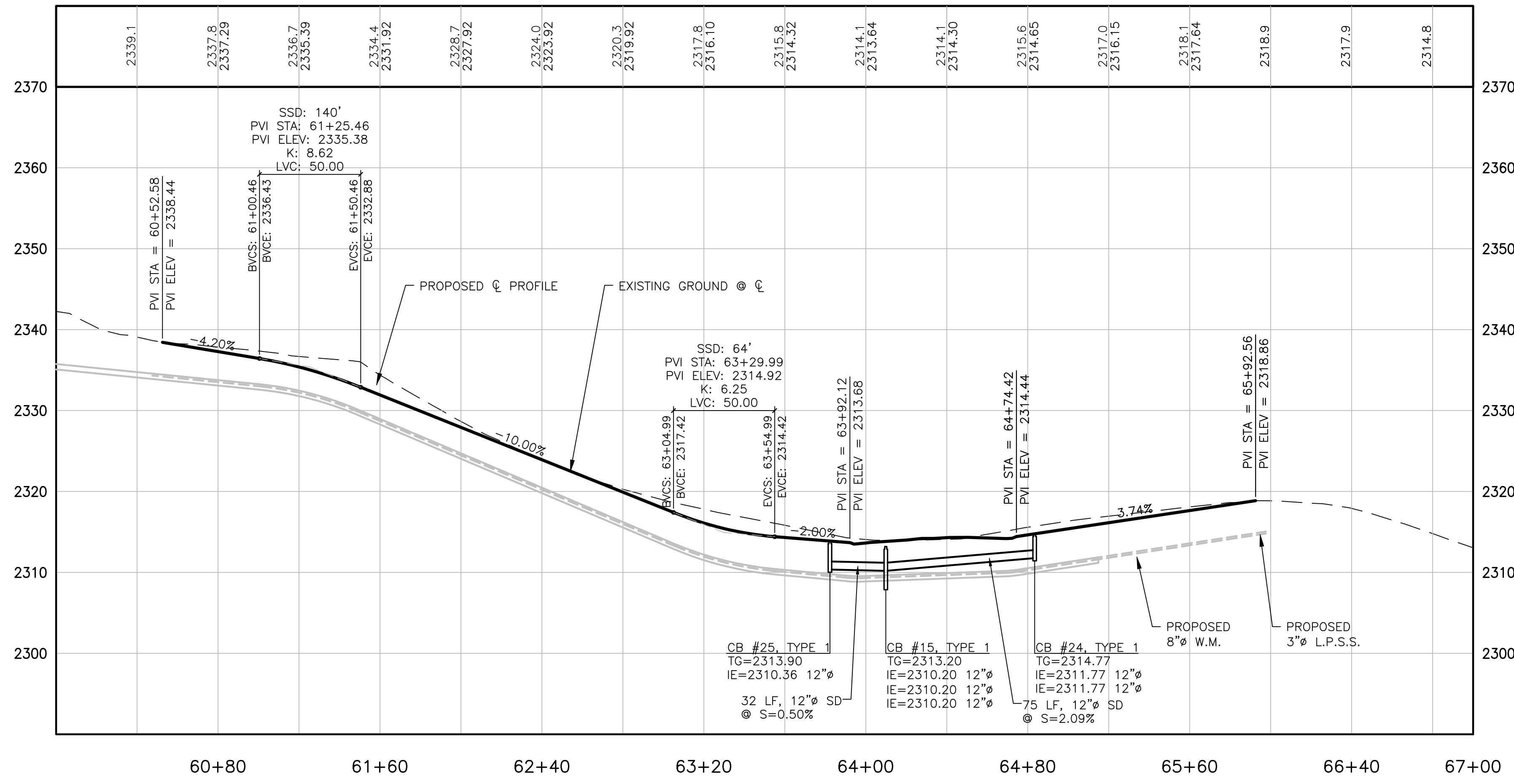
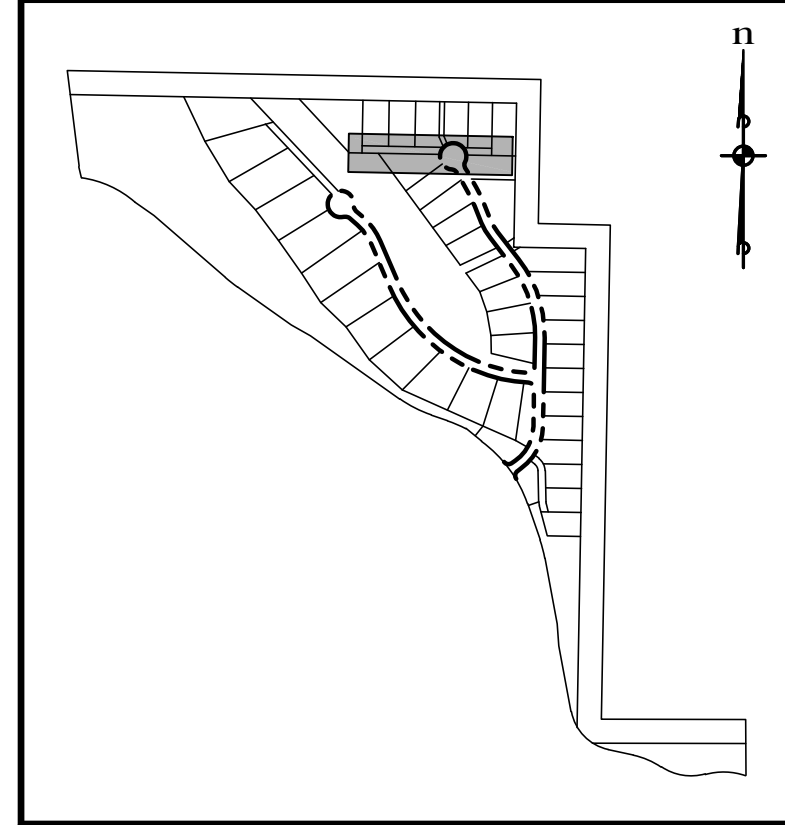
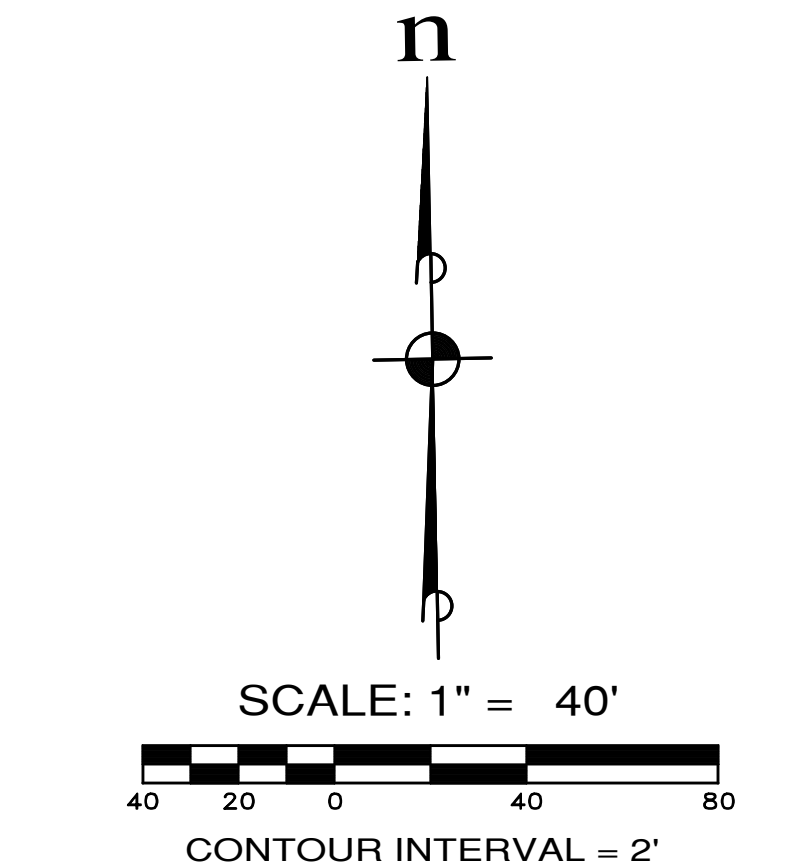
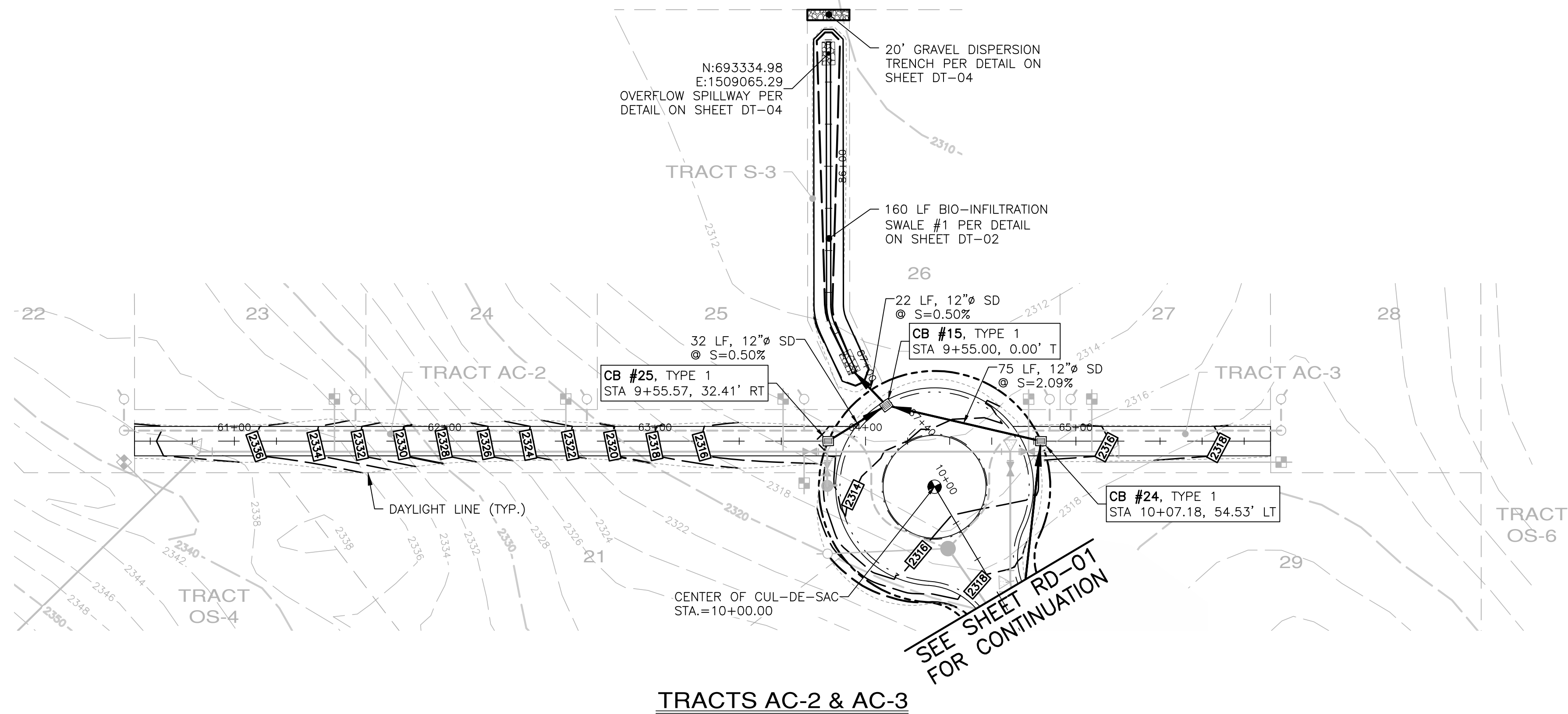
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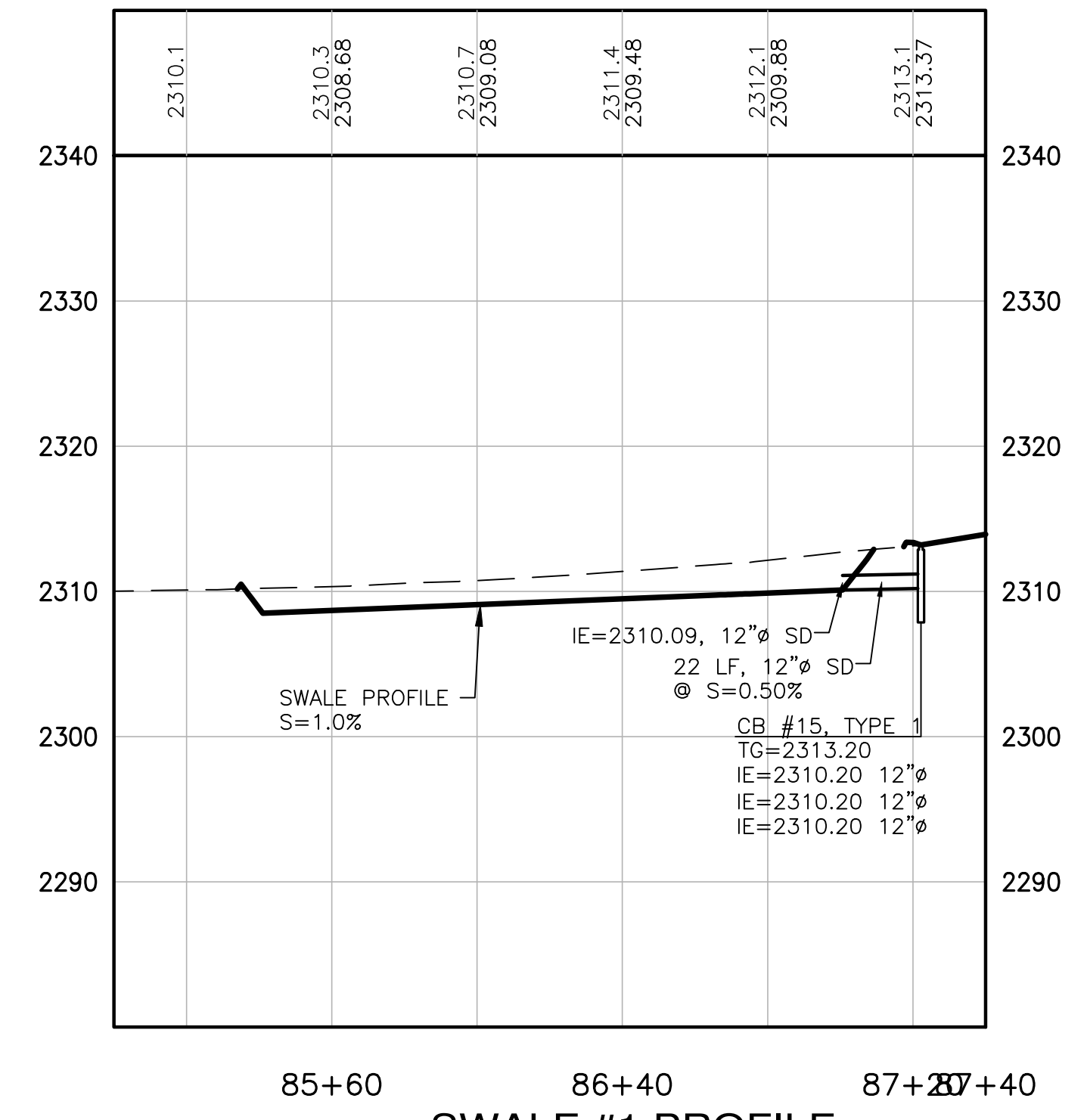
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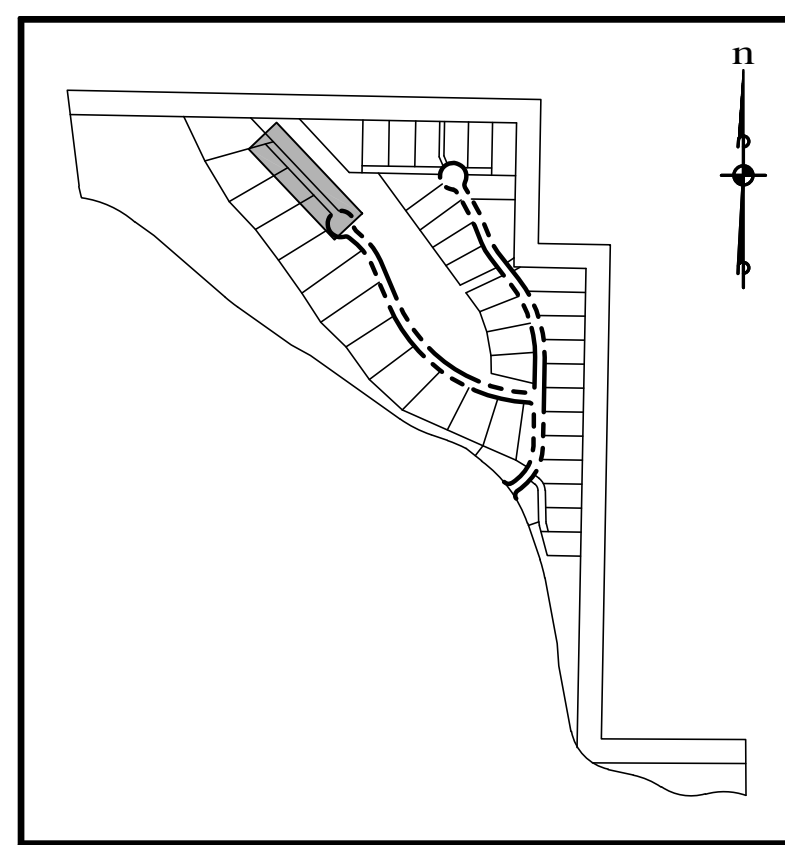
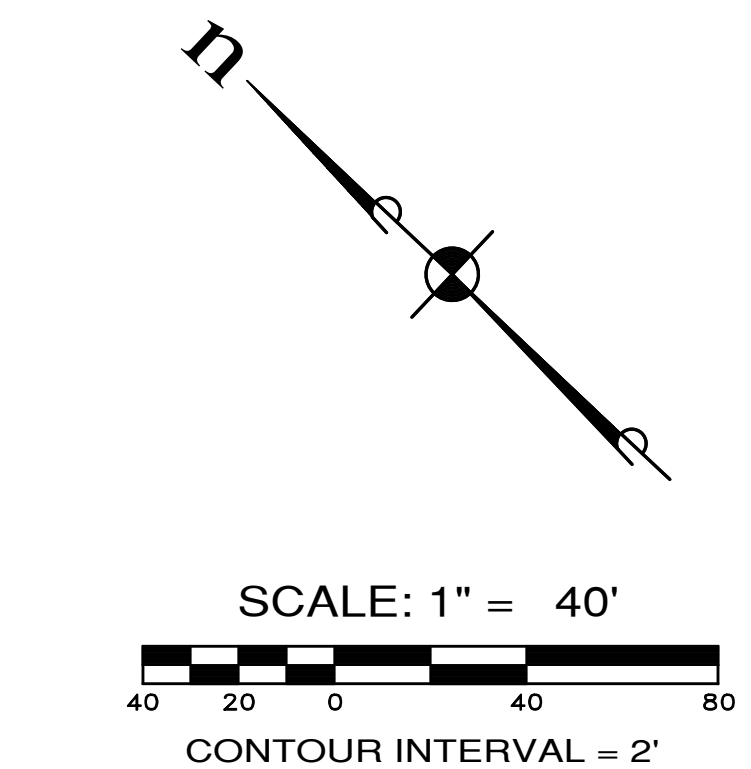
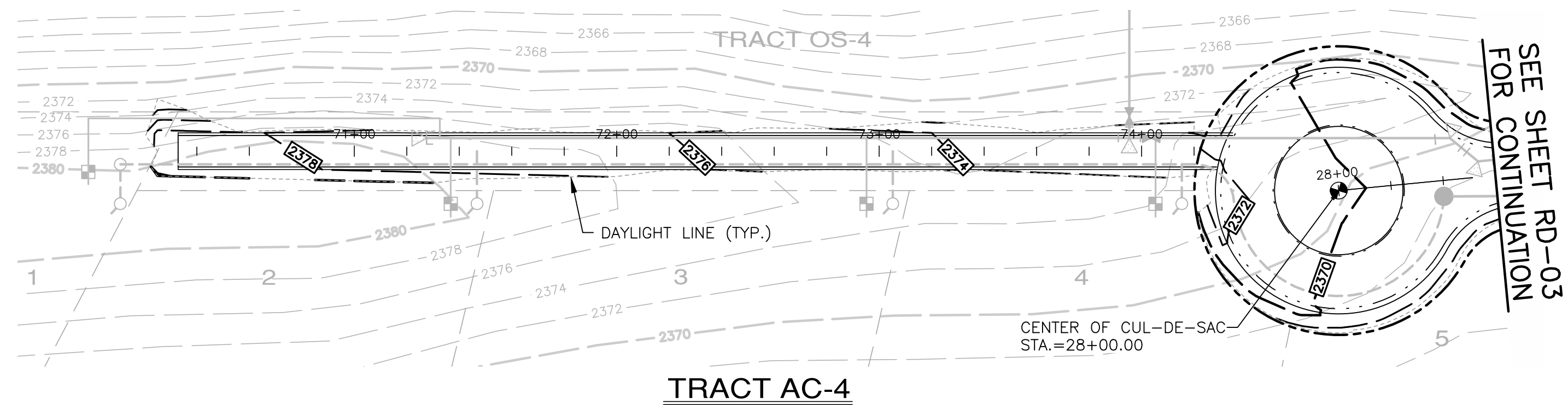
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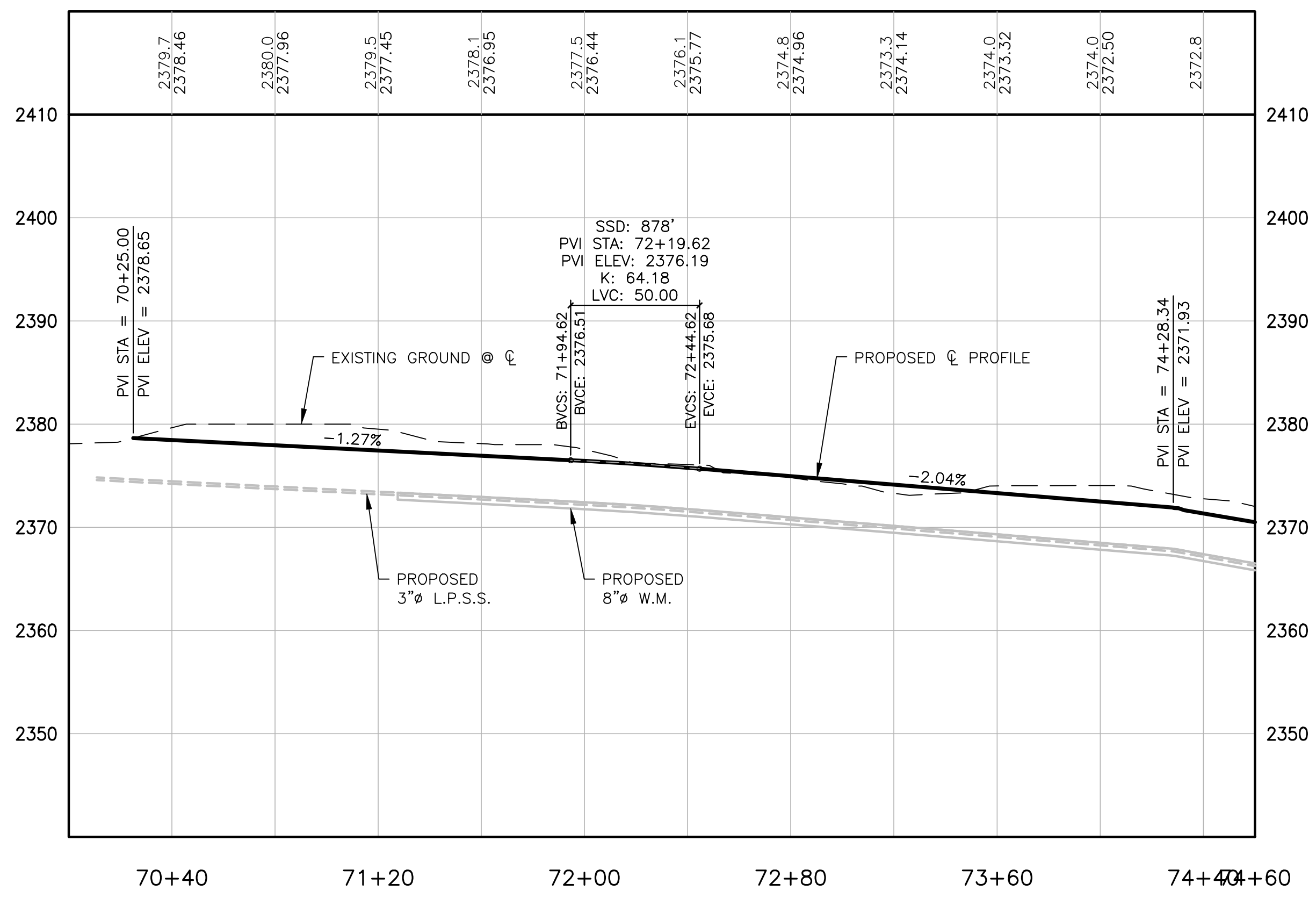
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KEY MAP



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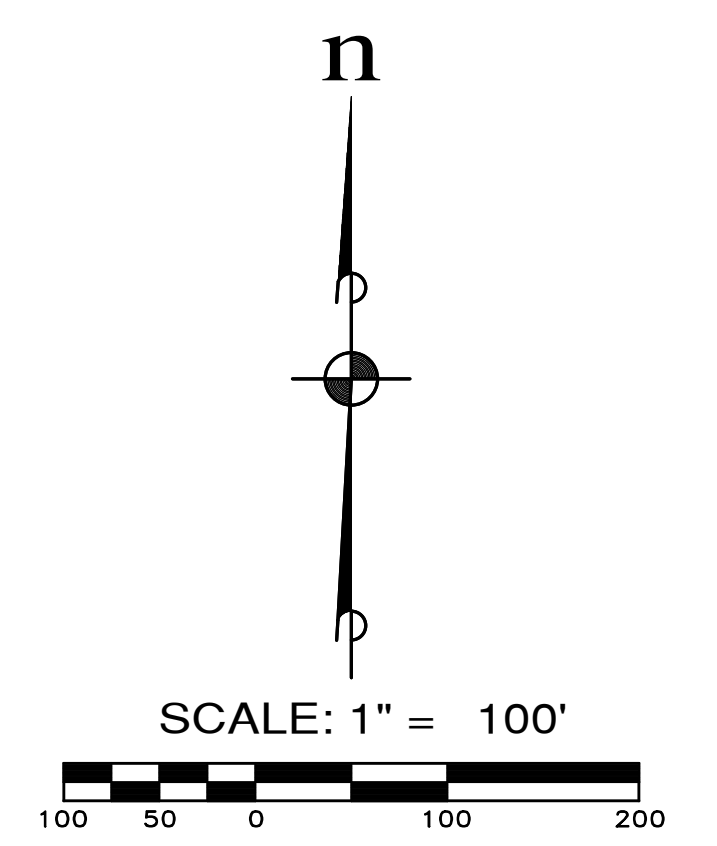
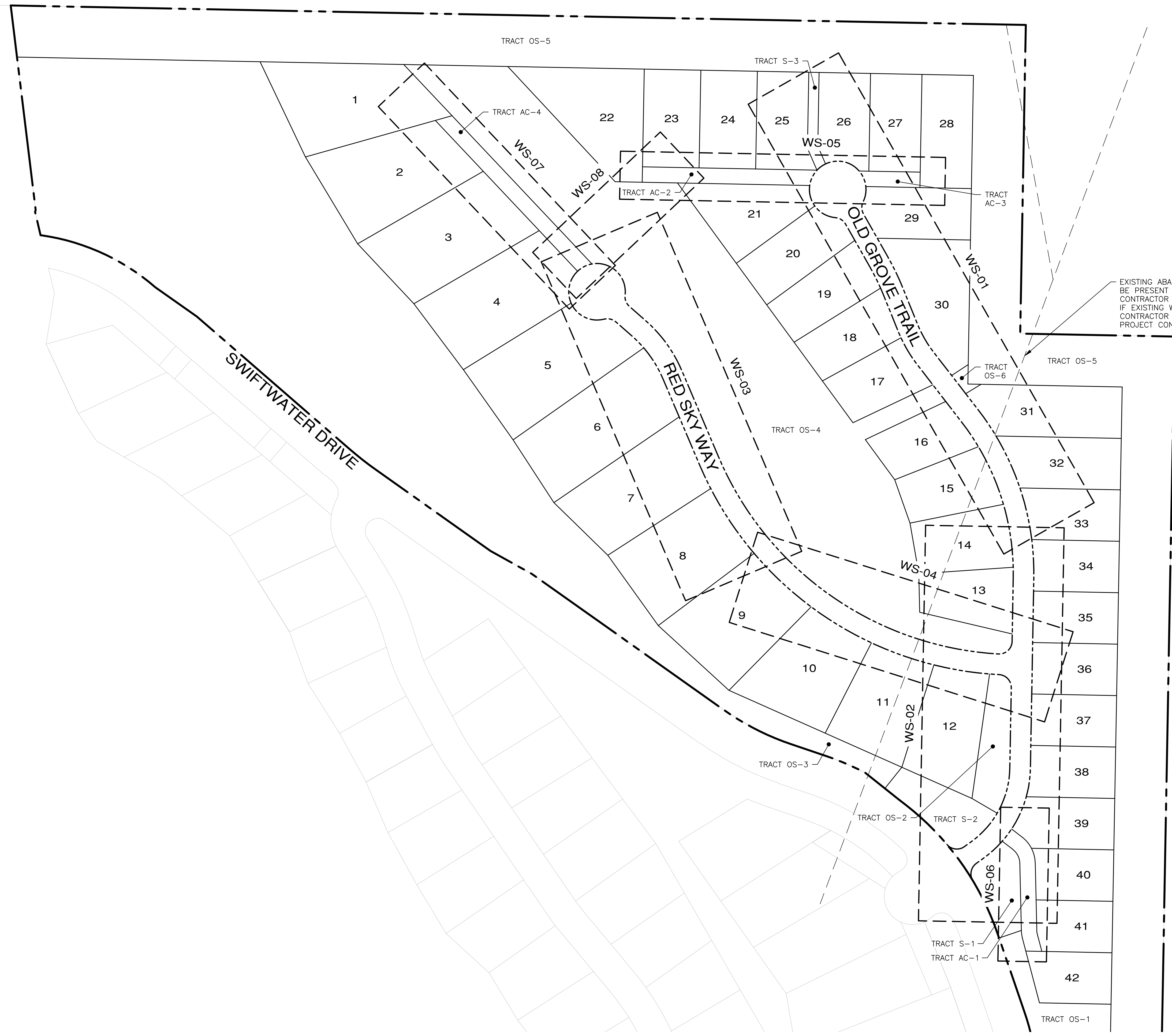
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WATER/SEWER KEY MAP

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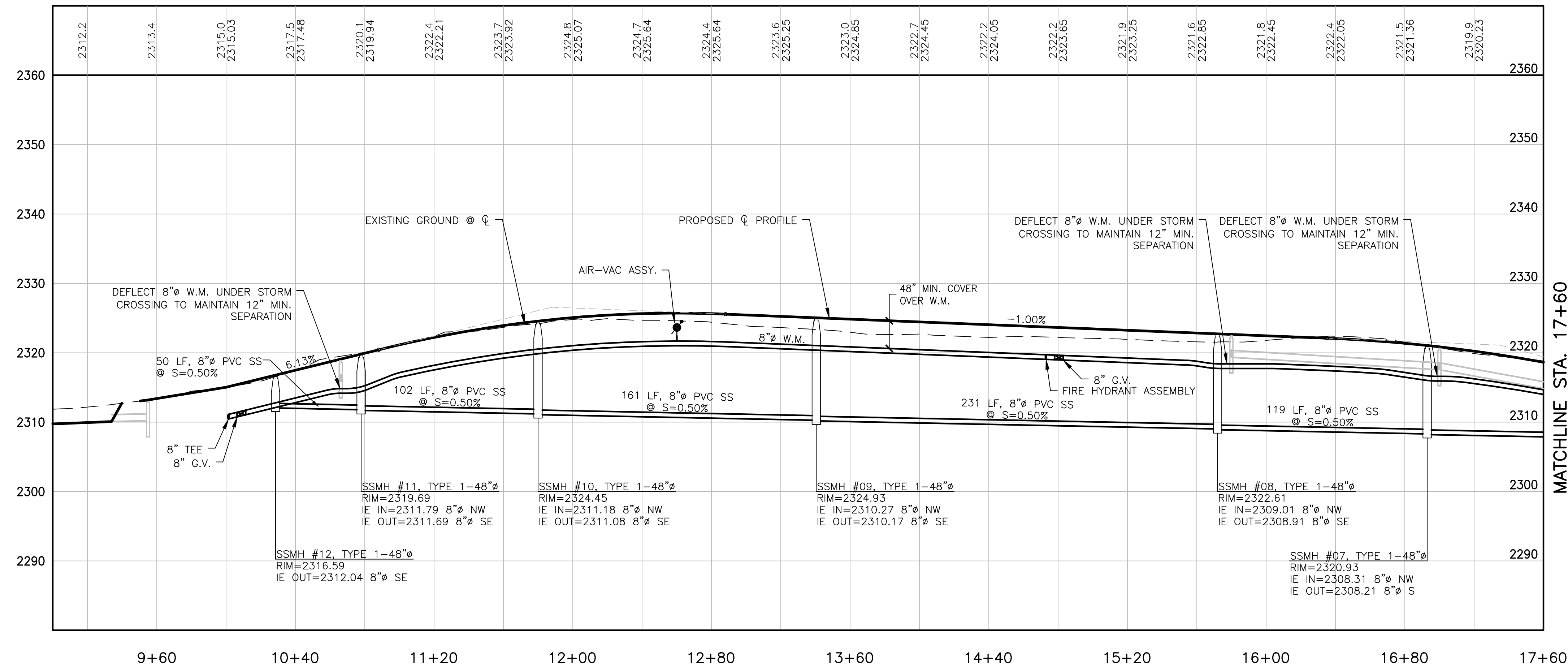
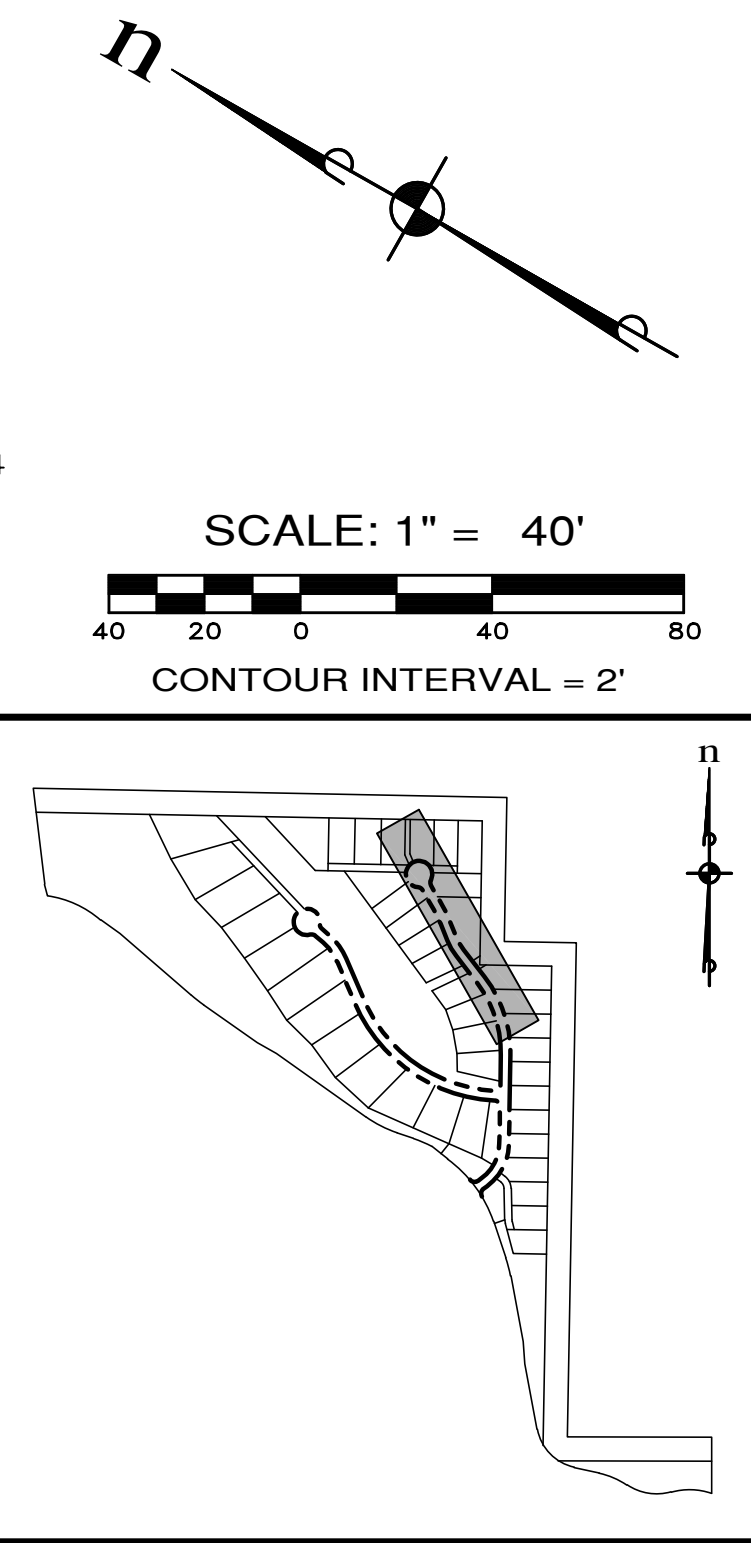
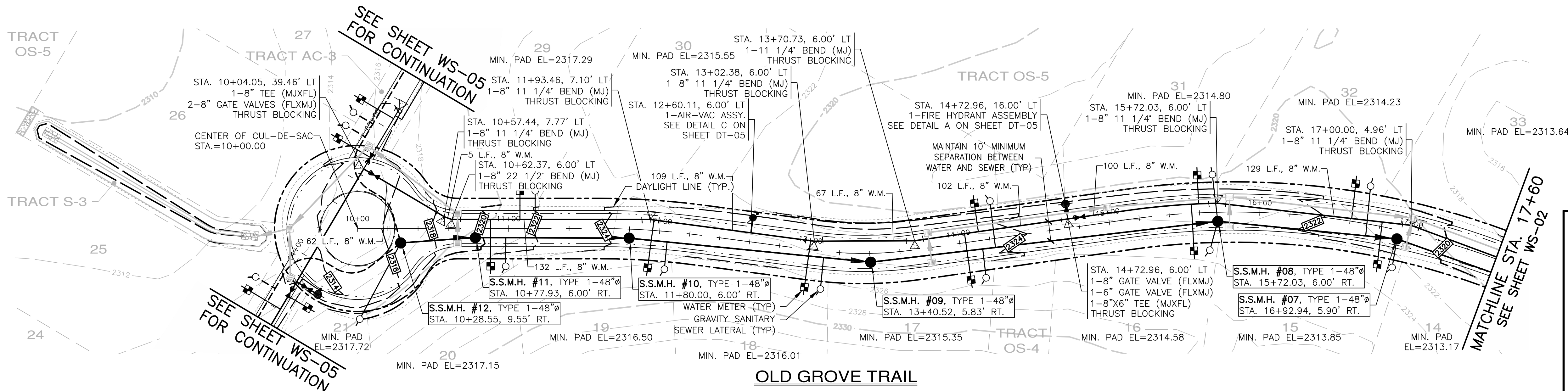
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14 OF 29 SHEETS

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- NOTES:**
1. CONTRACTOR TO VERIFY LOCATION, ELEVATION, SIZE AND TYPE PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES. CONTRACTOR TO PROVIDE UTILITY LOCATES TO CONFIRM EXISTING WATER INFRASTRUCTURE SUCH AS GATE VALVES AND BLOW-OFFS.
 2. MAINTAIN A MINIMUM OF 1' SEPARATION BETWEEN CB STRUCTURES AND 8" WATER MAIN.
 3. PRESERVE AND PROTECT EXISTING GRAVITY 8" SEWER & FORCE MAIN. CONTRACTOR TO ADJUST SSMH RIM TO PROPOSED FINISHED GRADE.

SCALE: 1"=40' HORIZ.
1"=10' VERT.



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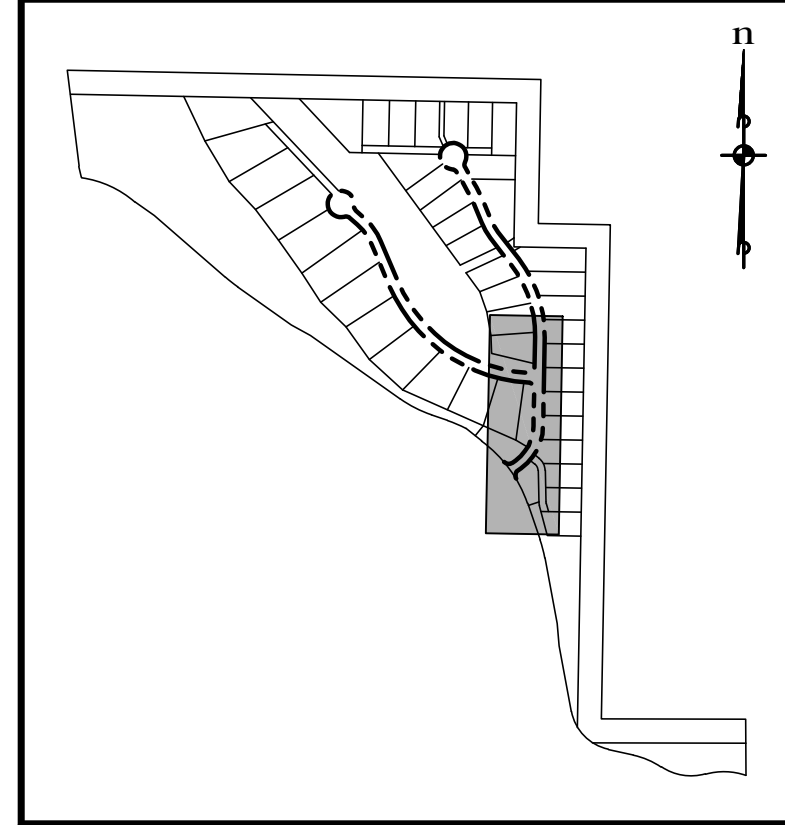
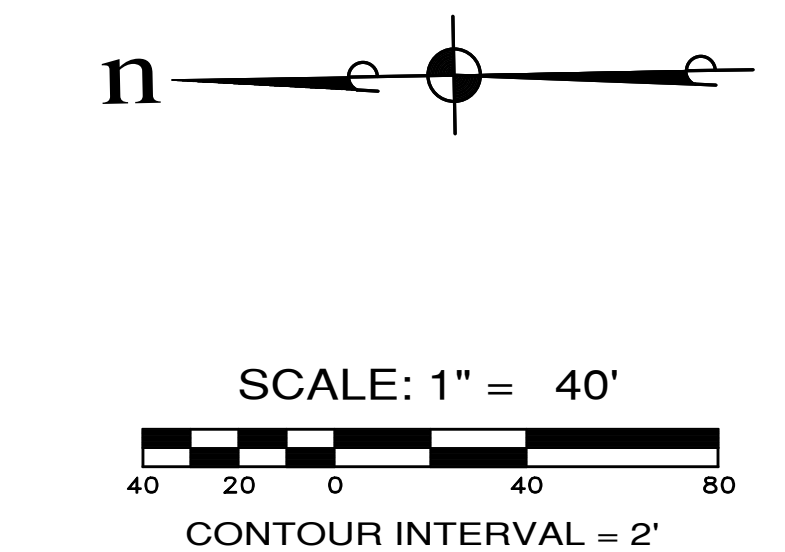
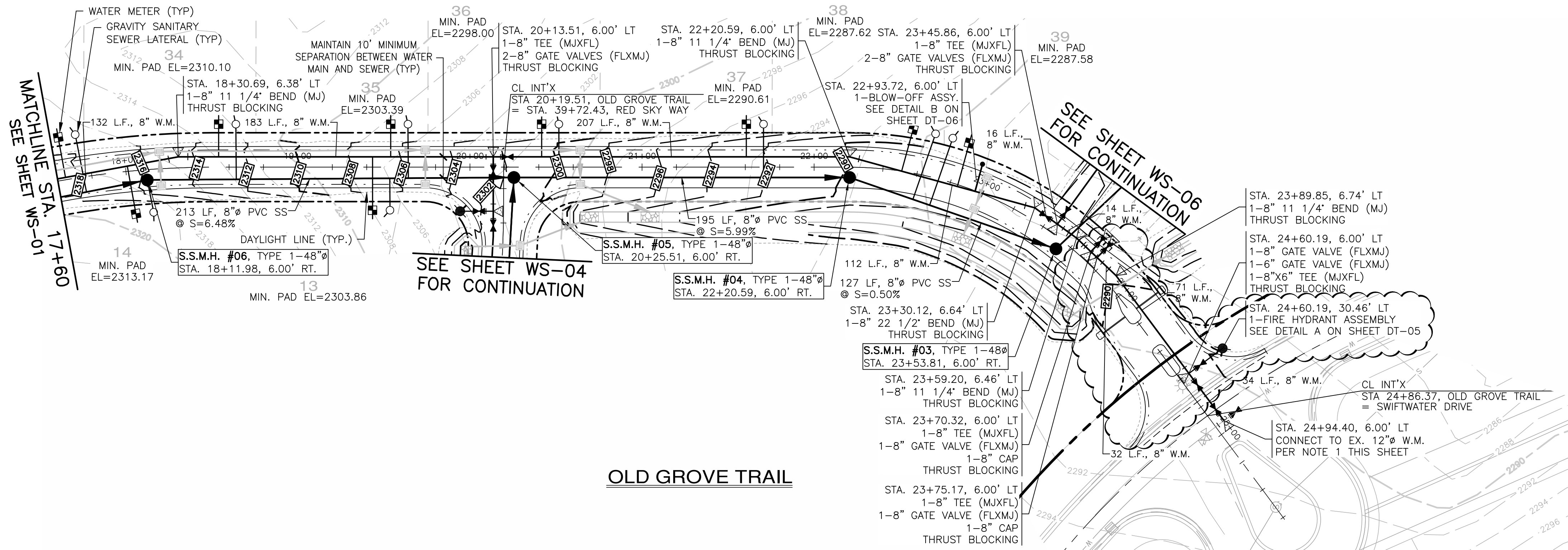
NEW SUNCADIA, LLC
NELSON RIDGE
 WATER/SEWER PLAN & PROFILE

KITTITAS COUNTY WASHINGTON

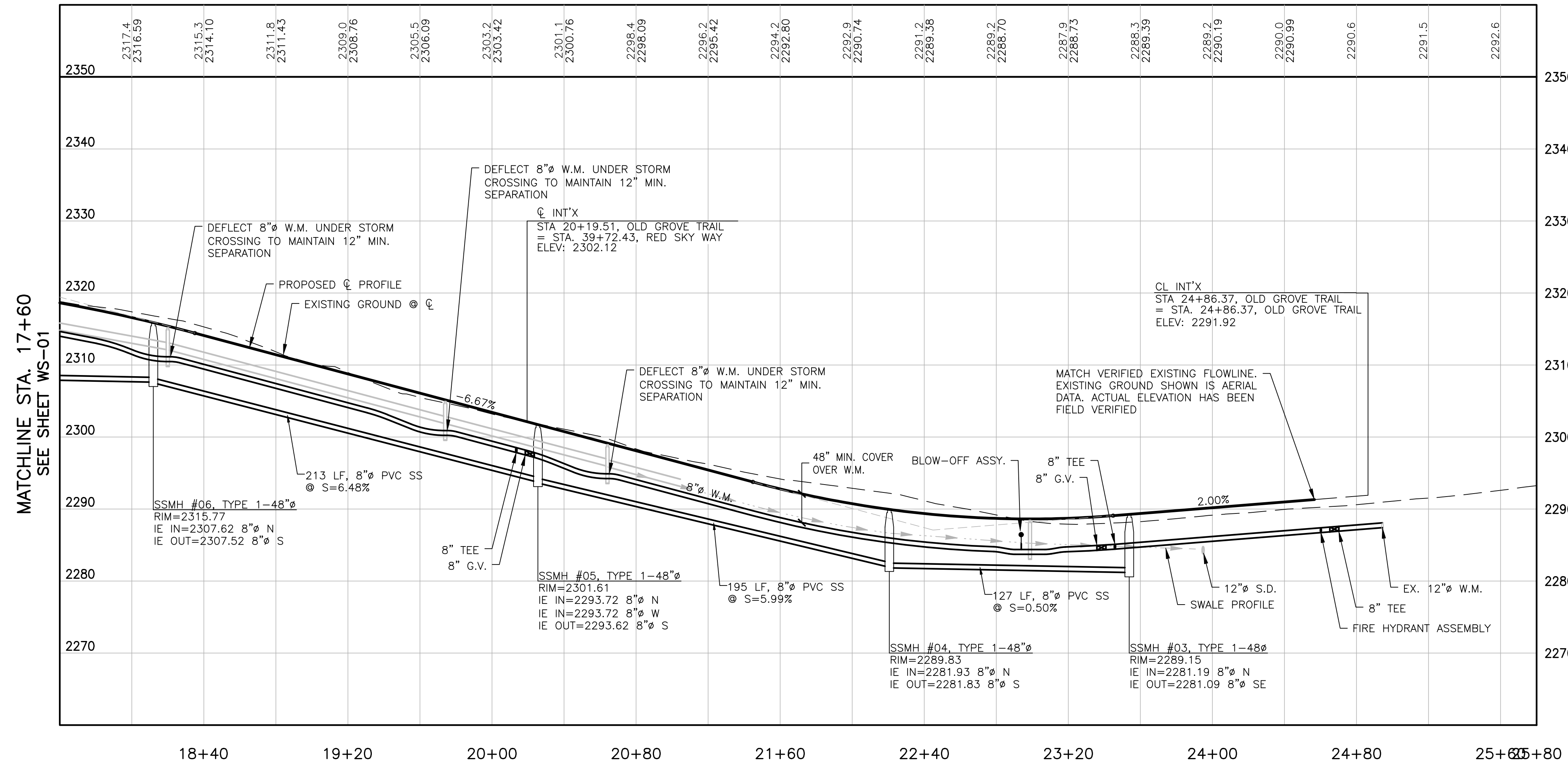
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OLD GROVE TRAIL



- NOTES:**
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SCALE: 1"=40' HORIZ.
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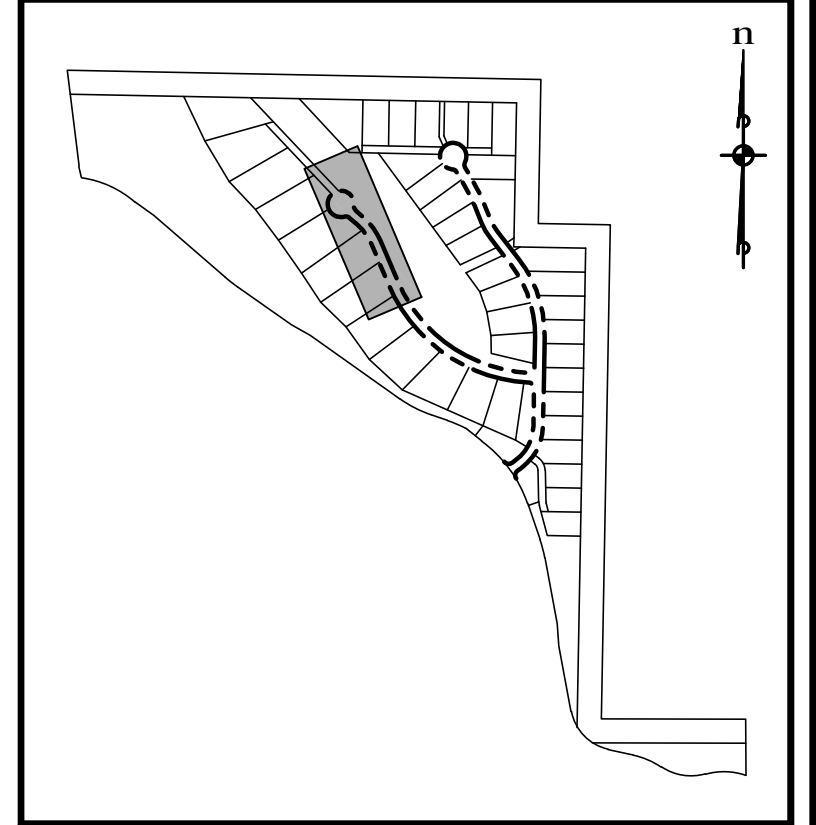
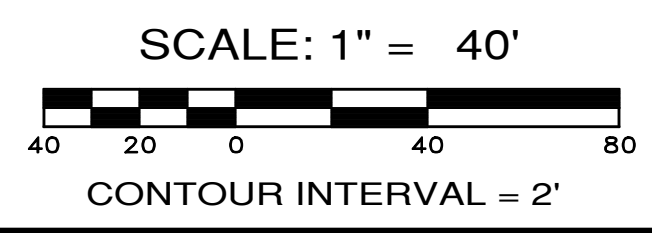
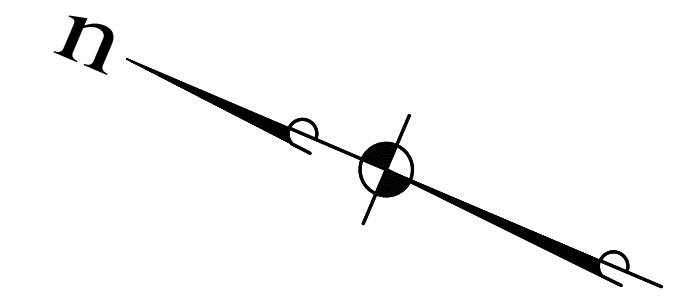
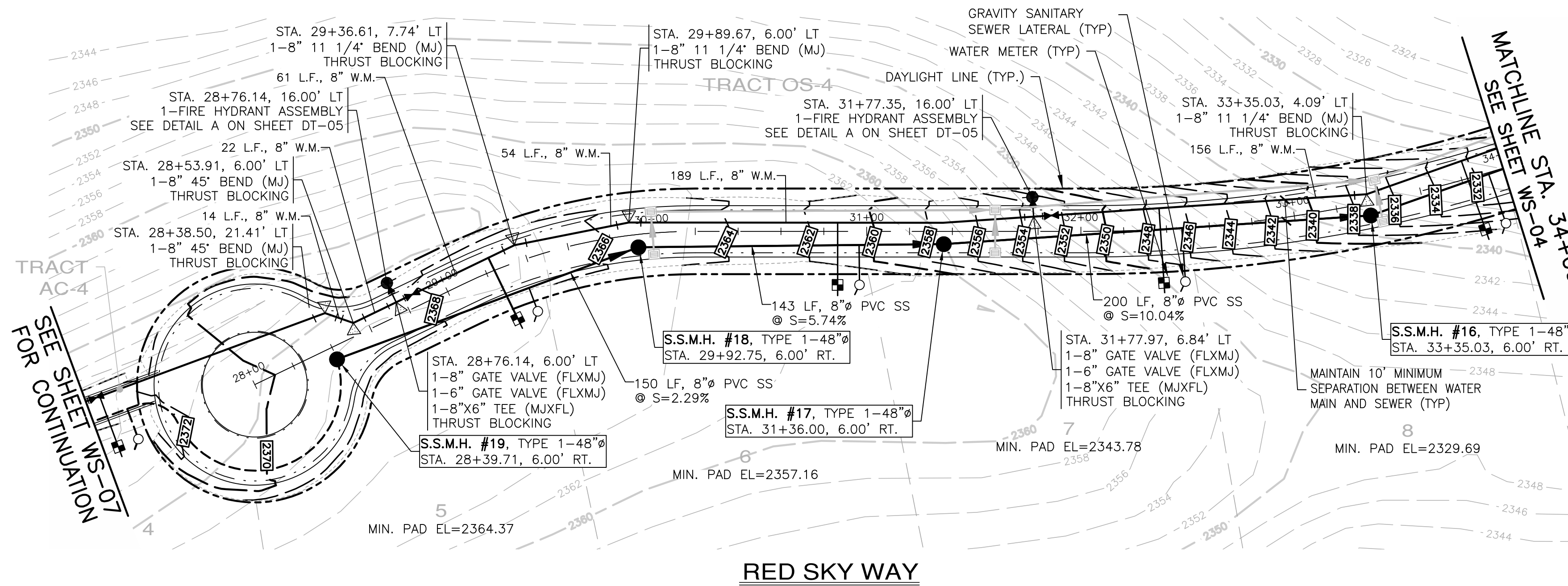
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DATE: 05/13/2021
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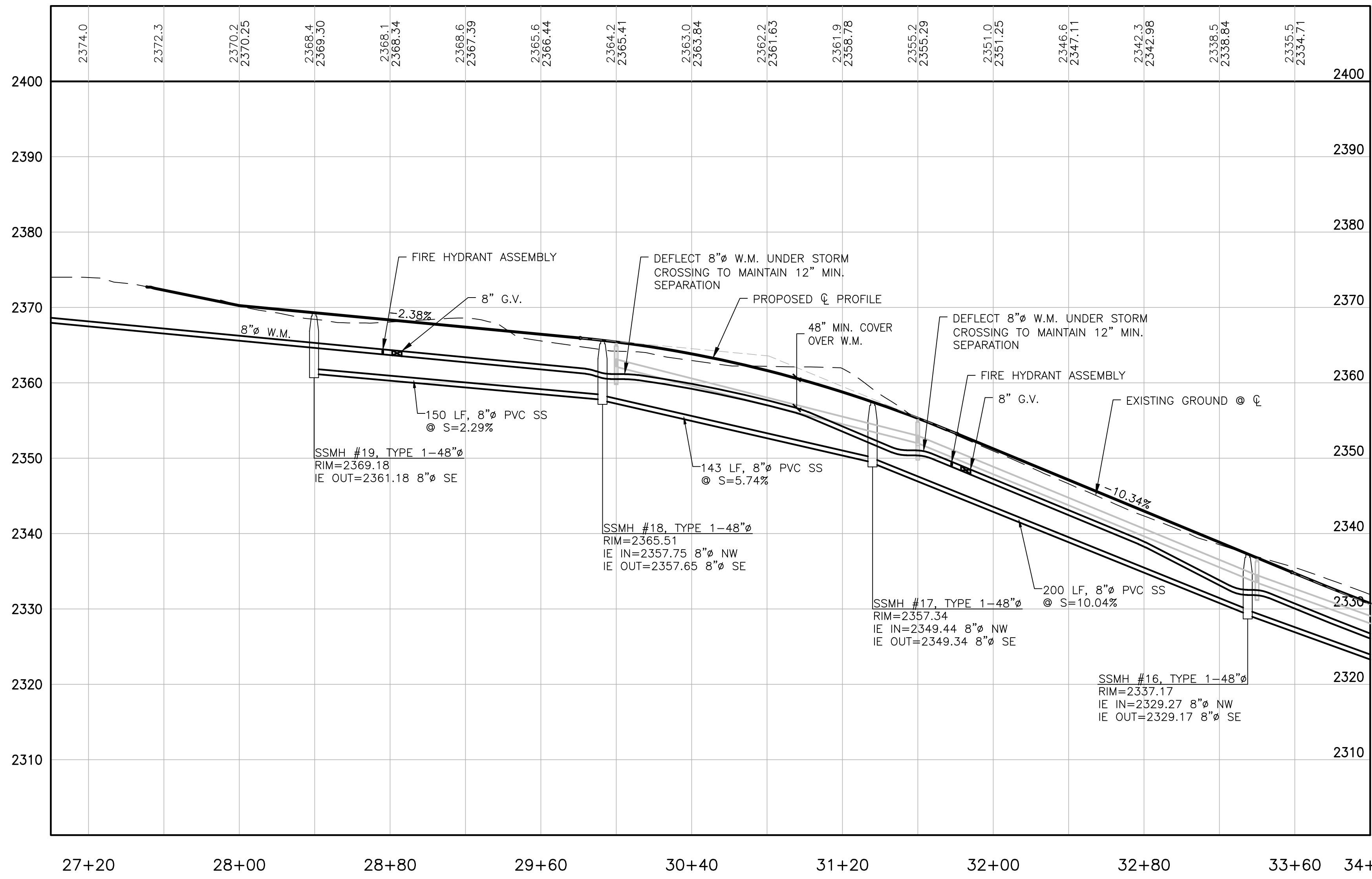
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KEY MAP



MATCHLINE STA. 34+00
SEE SHEET WS-04

SCALE: 1"=40' HORIZ.
1"=10' VERT.

- NOTES:**
- CONTRACTOR TO VERIFY LOCATION, ELEVATION, SIZE AND TYPE PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES. CONTRACTOR TO PROVIDE UTILITY LOCATES TO CONFIRM EXISTING WATER INFRASTRUCTURE SUCH AS GATE VALVES AND BLOW-OFFS.
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 - PRESERVE AND PROTECT EXISTING GRAVITY 8" SEWER & FORCE MAIN. CONTRACTOR TO ADJUST SSMH RIM TO PROPOSED FINISHED GRADE.



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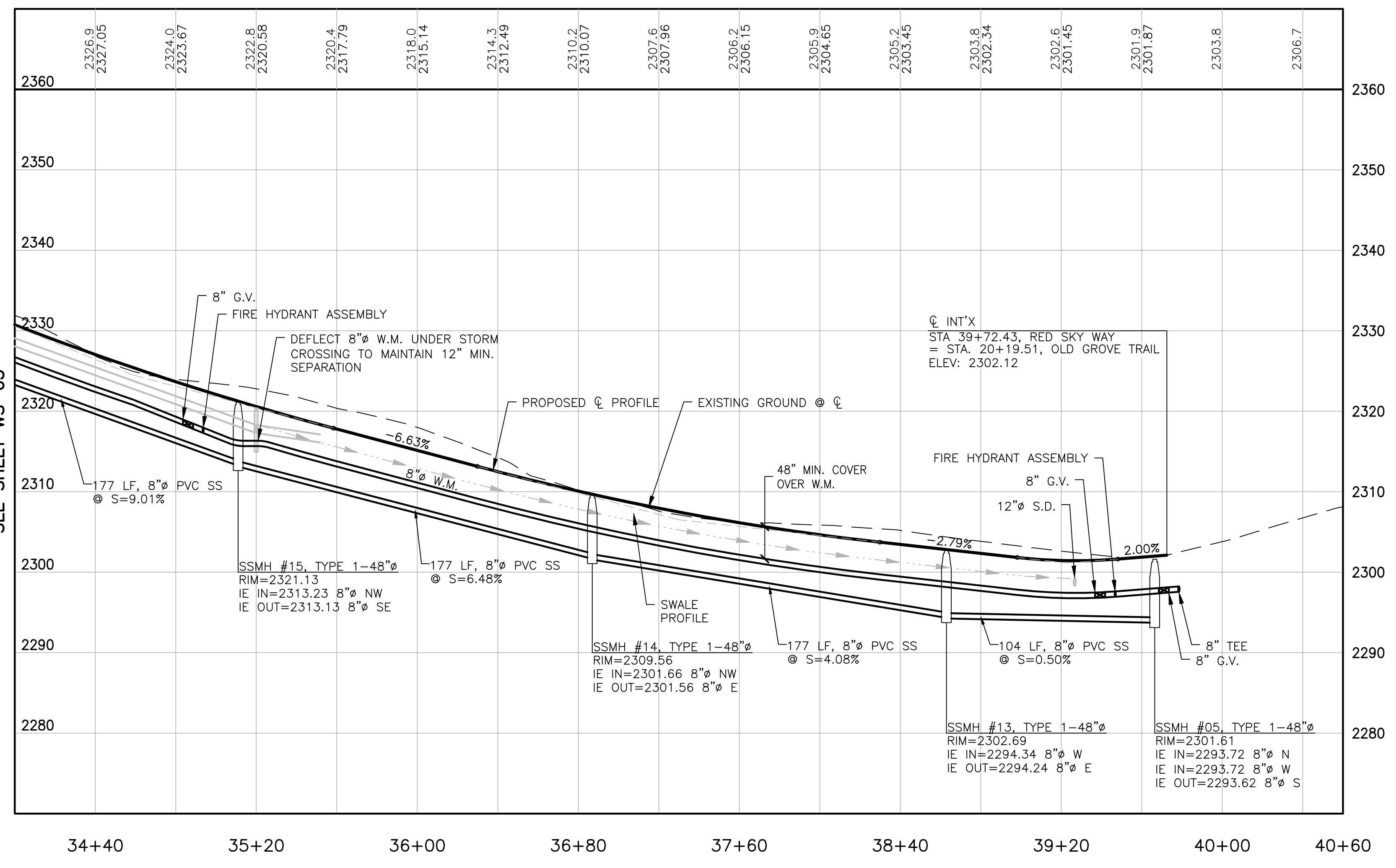
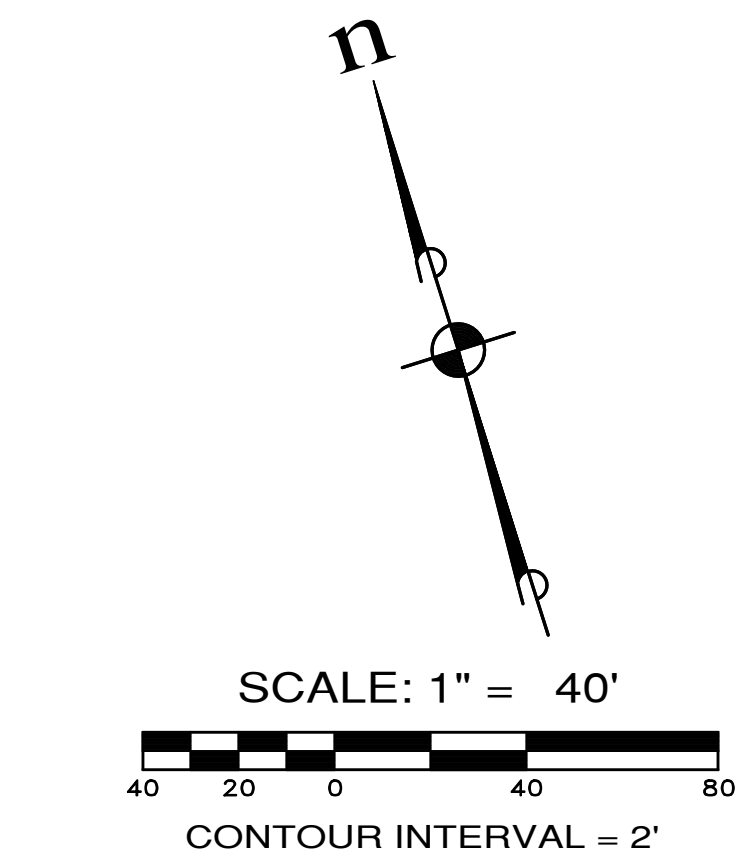
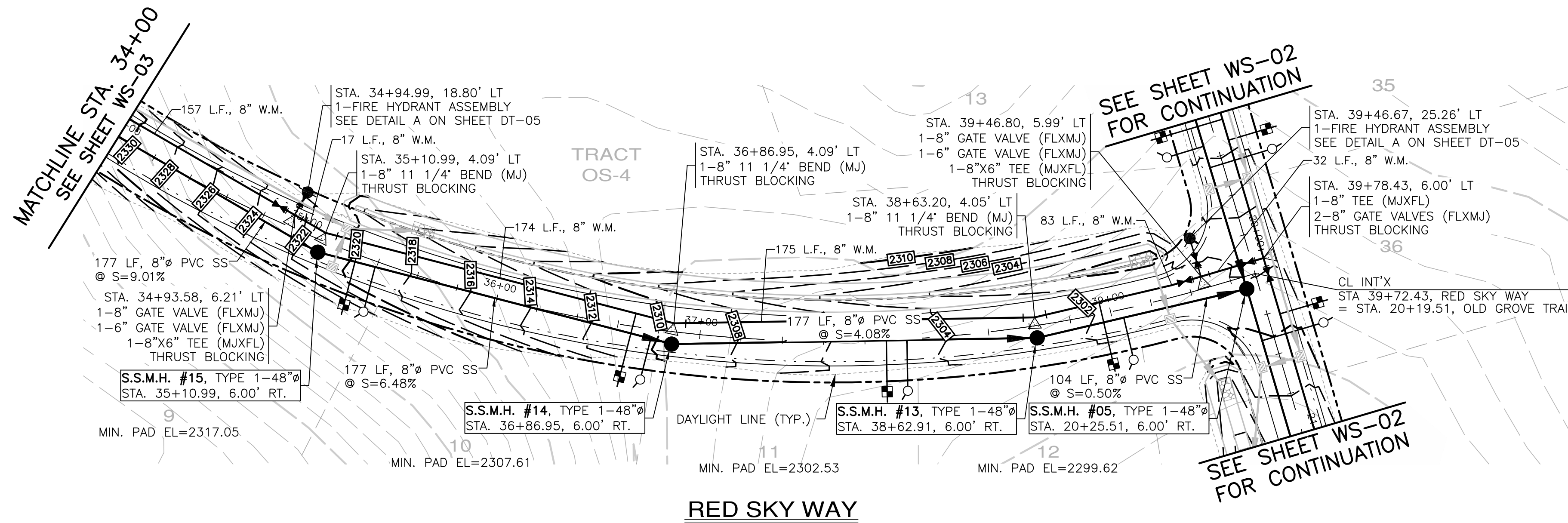
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SCALE: 1"=40' HORIZ.
1"=10' VERT.



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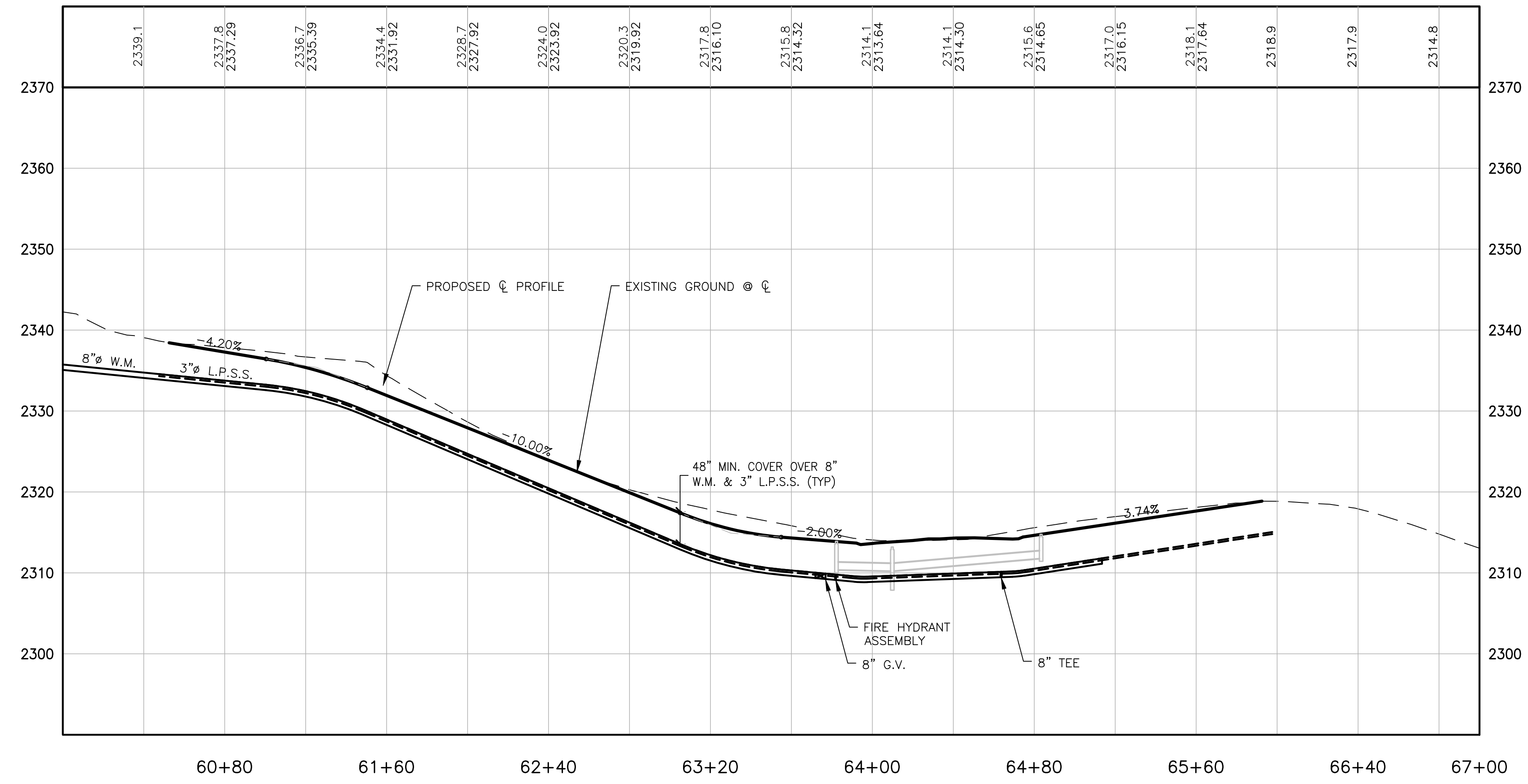
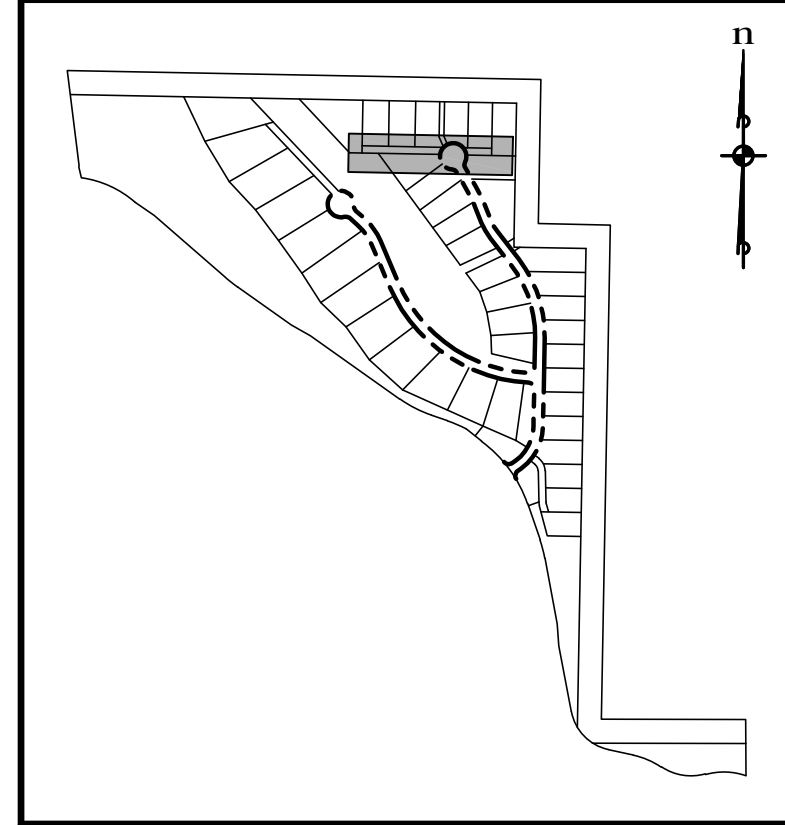
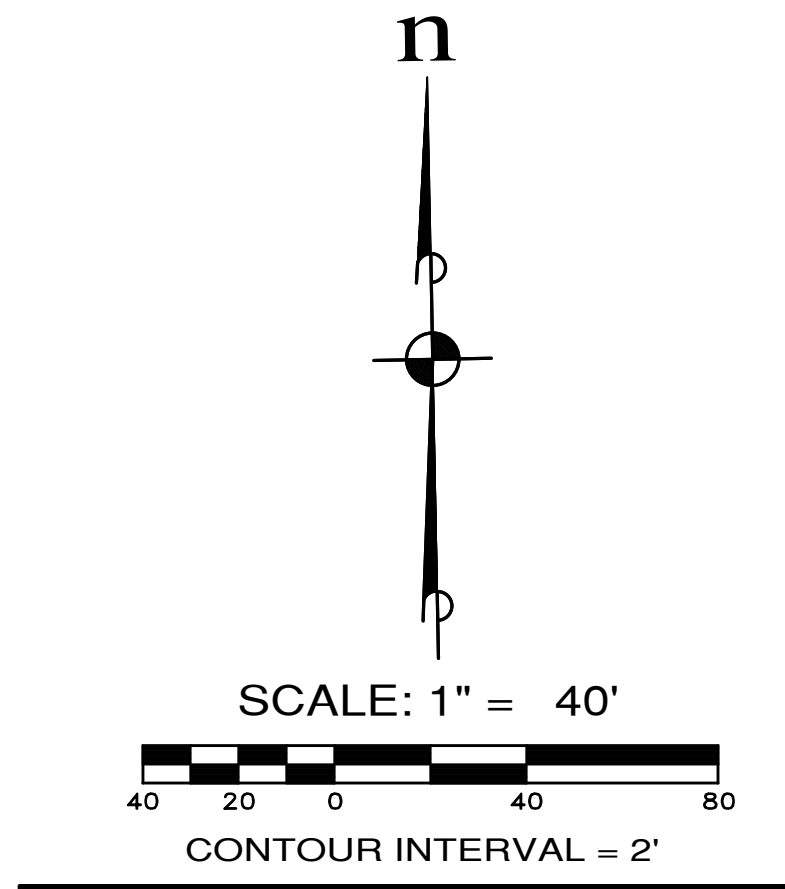
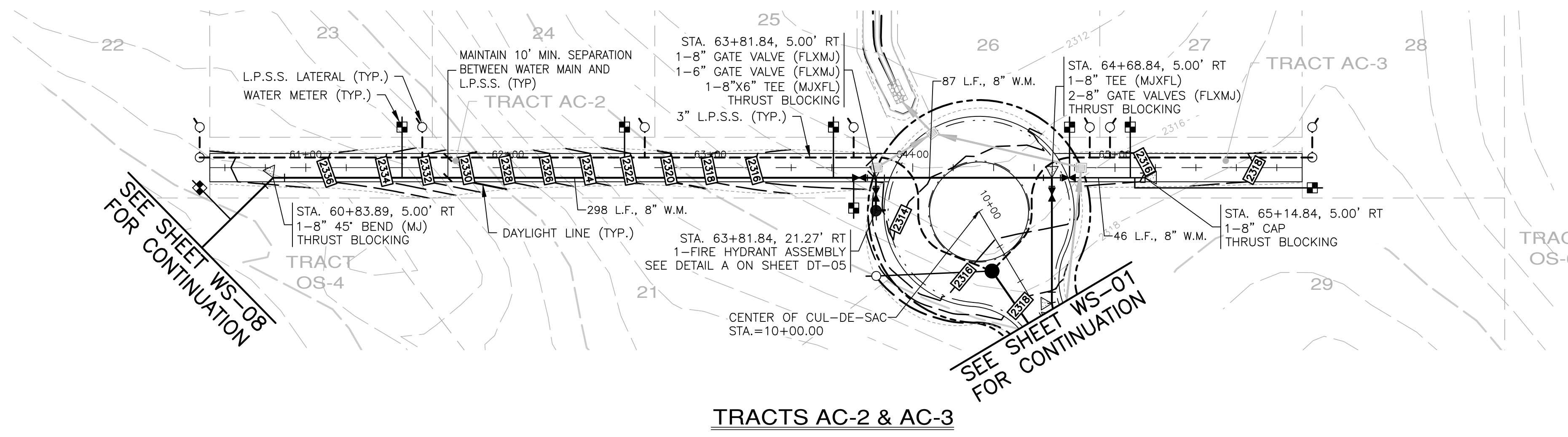
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WATER/SEWER PLAN & PROFILE

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SCALE: 1"=40' HORIZ.
1"=10' VERT.

- KEY MAP**
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WASHINGTON

KITTITAS COUNTY

NEW SUNCADIA, LLC

NELSON RIDGE

WATER/SEWER PLAN & PROFILE

JOB NO.: 998-812-020

DWG. NAME: WS-05

DESIGNED BY: LGB

DRAWN BY: JH

CHECKED BY:

DATE: 04/16/2021

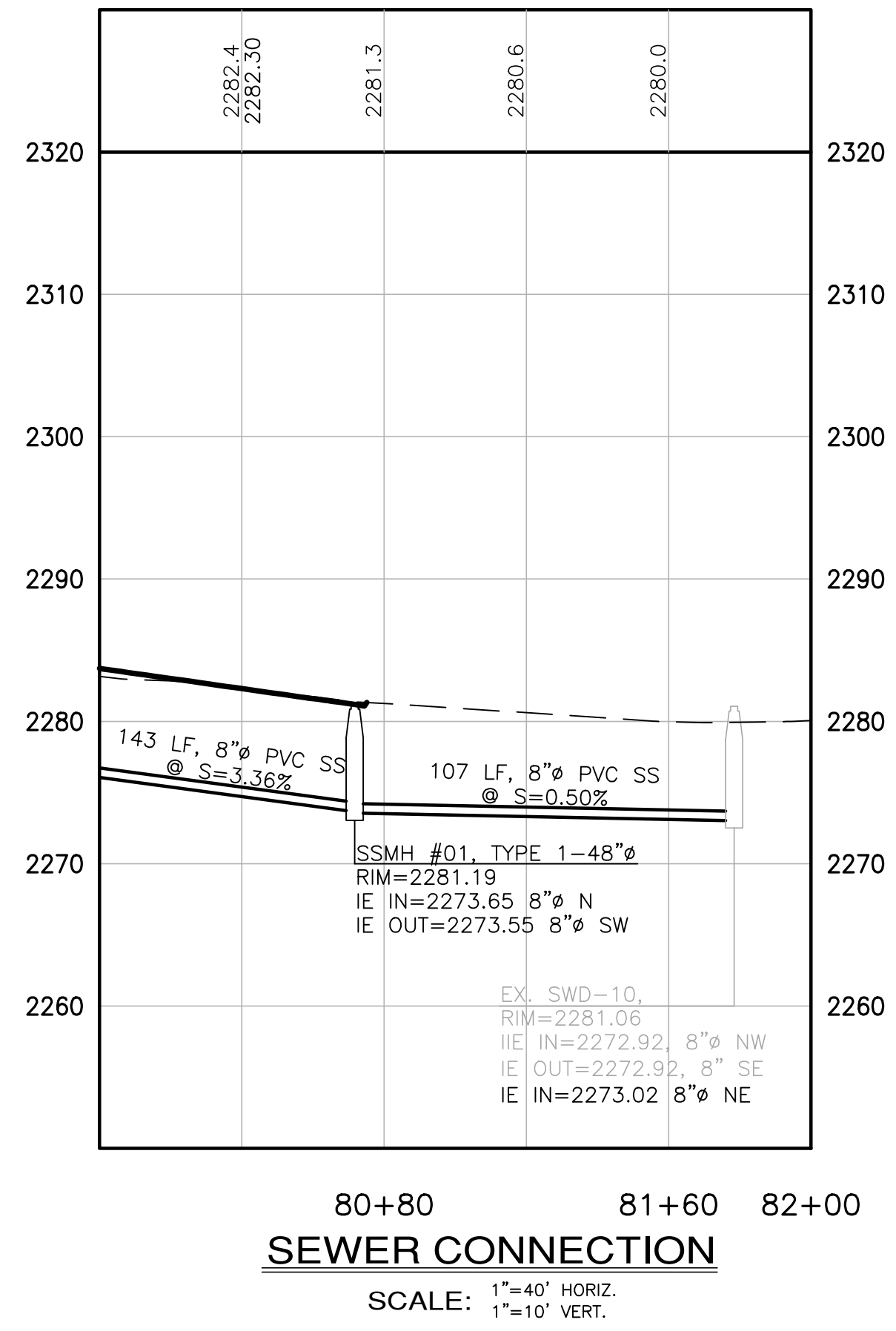
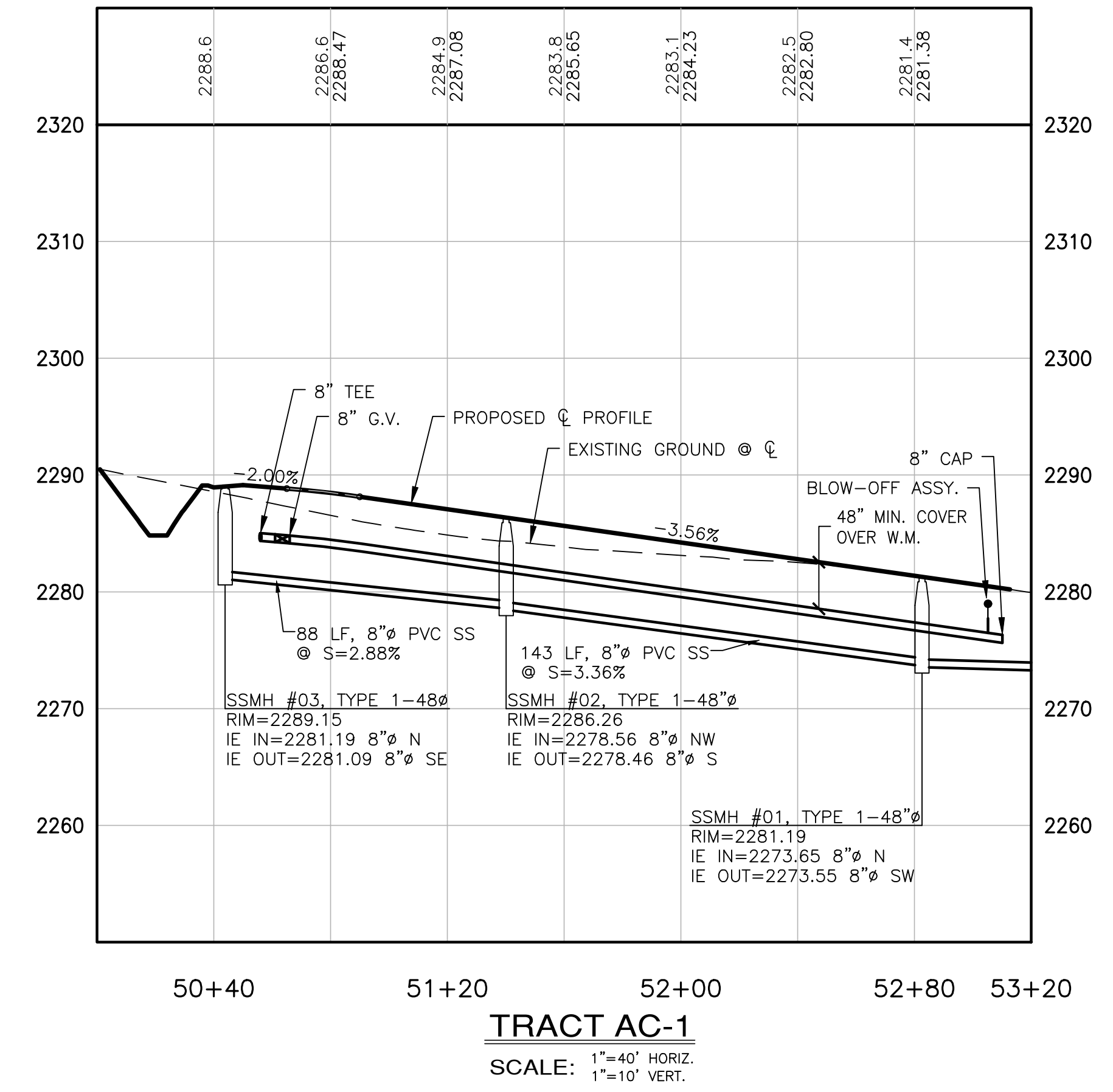
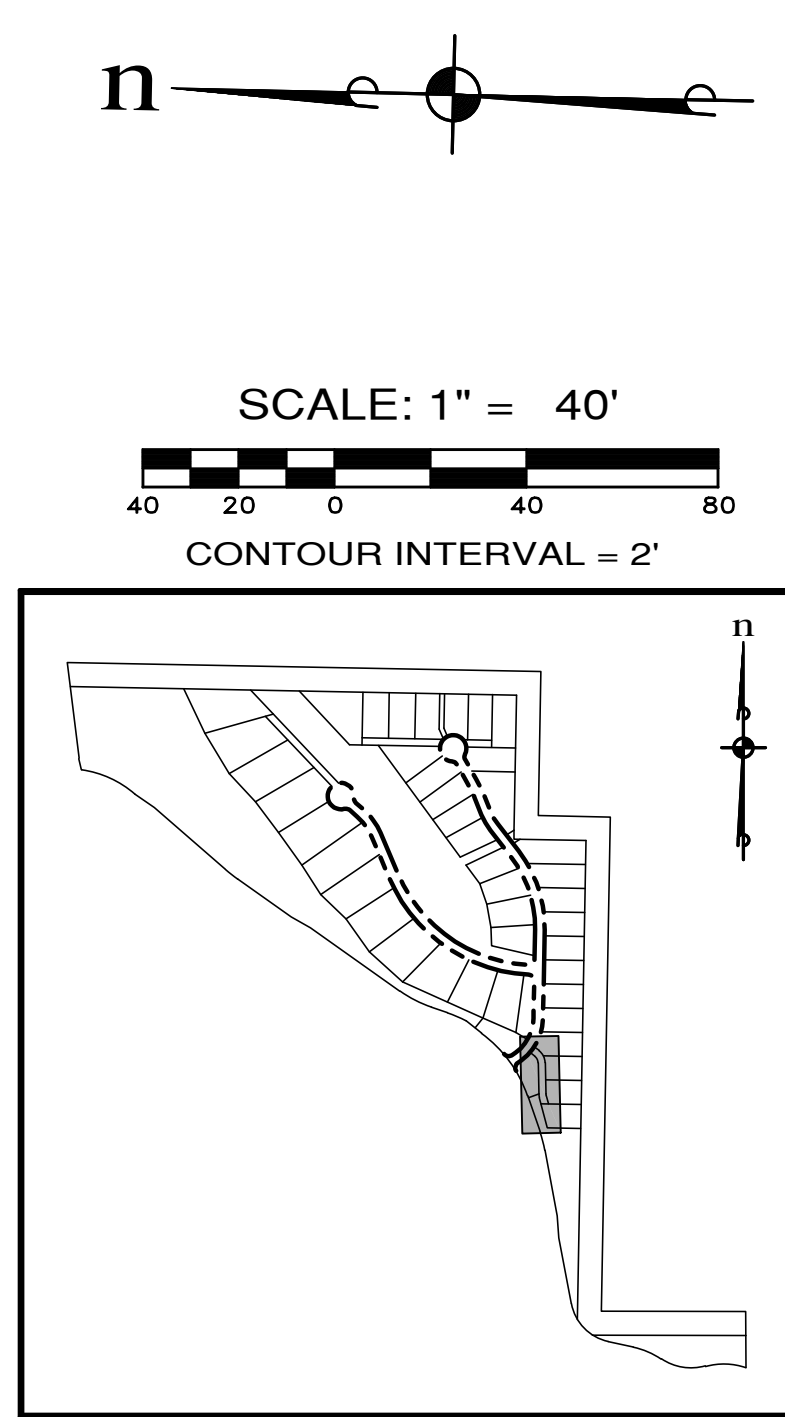
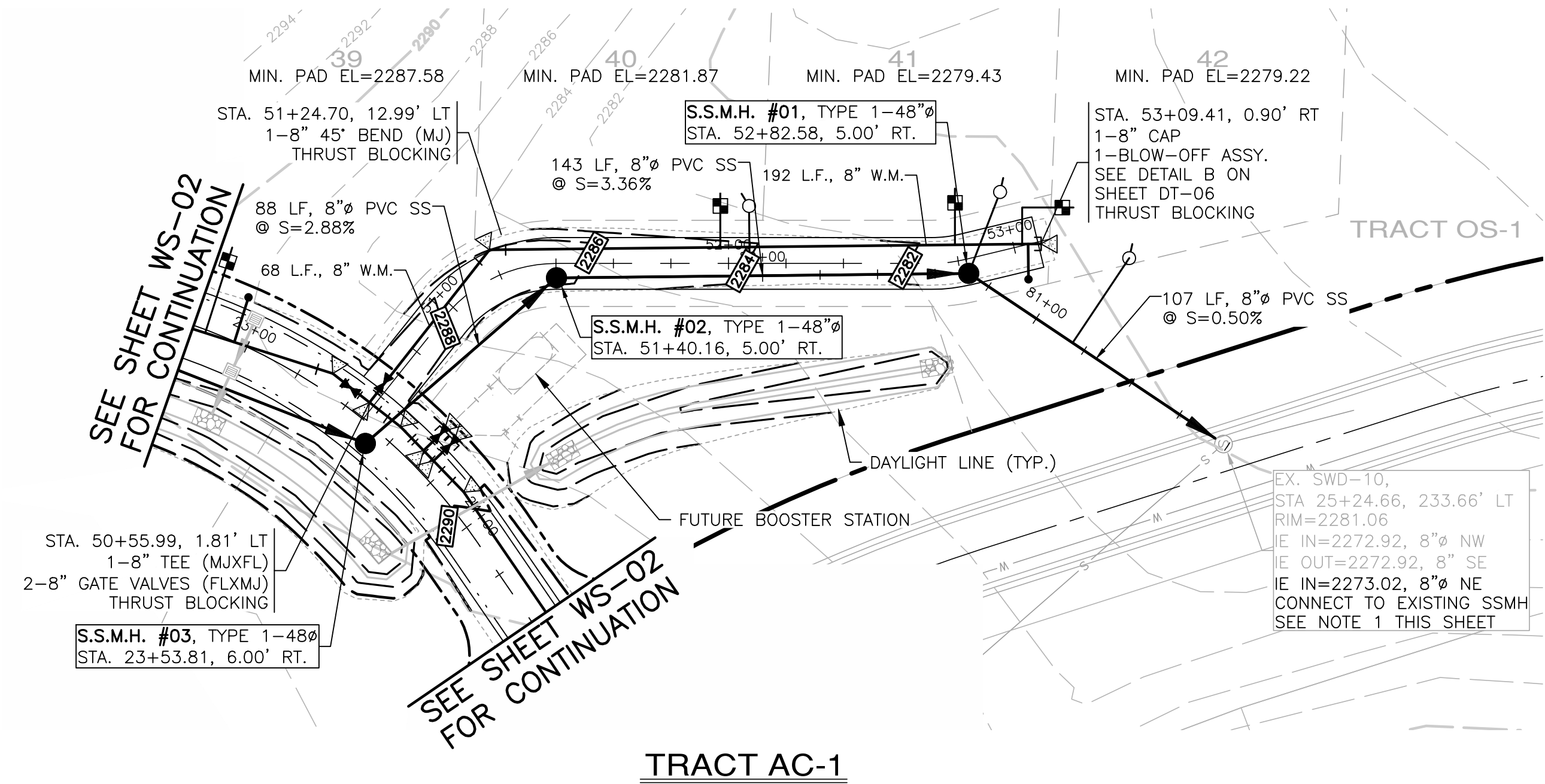
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WS-05

19 OF 29 SHEETS

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A PORTION OF SECTION 13, T. 20 N., R. 14 E., AND SECTION 18, T. 20 N., R. 15 E., W.M., KITTITAS COUNTY, WASHINGTON



- NOTES:**
1. CONTRACTOR TO VERIFY LOCATION, ELEVATION, SIZE AND TYPE PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES. CONTRACTOR TO PROVIDE UTILITY LOCATES TO CONFIRM EXISTING WATER INFRASTRUCTURE SUCH AS GATE VALVES AND BLOW-OFFS.
 2. MAINTAIN A MINIMUM OF 1' SEPARATION BETWEEN CB STRUCTURES AND 8" WATER MAIN.
 3. PRESERVE AND PROTECT EXISTING GRAVITY 8" SEWER & FORCE MAIN. CONTRACTOR TO ADJUST SSMH RIM TO PROPOSED FINISHED GRADE.



APPROVED FOR CONSTRUCTION

KITTITAS COUNTY ENGINEER _____ DATE _____

REVISIONS		
NO.	DESCRIPTION/DATE	BY



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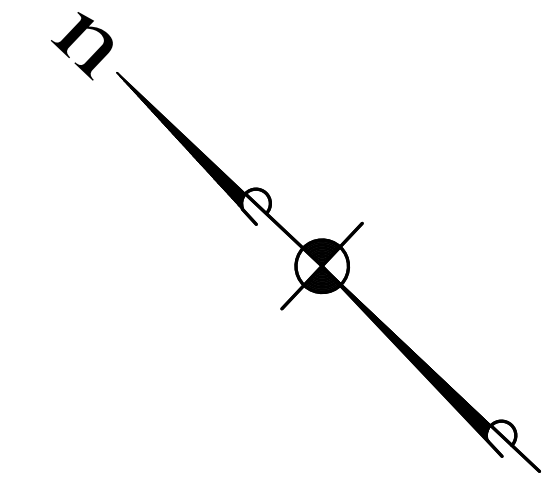
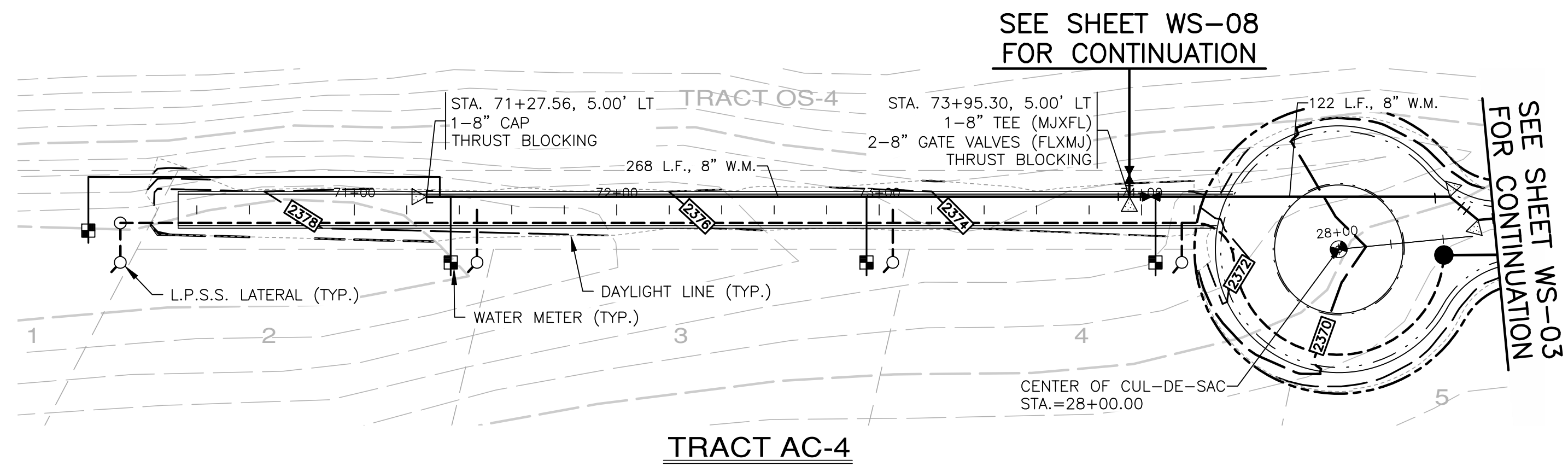
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NEW SUNCADIA, LLC
NELSON RIDGE
 WATER/SEWER PLAN & PROFILE

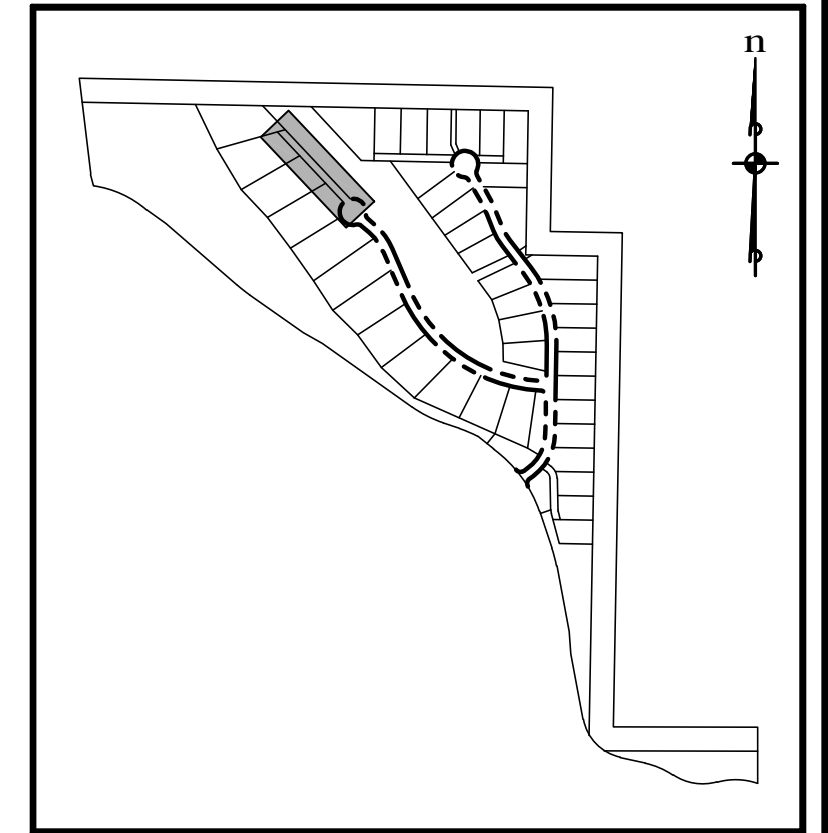
KITTITAS COUNTY WASHINGTON

JOB NO.: 998-812-020
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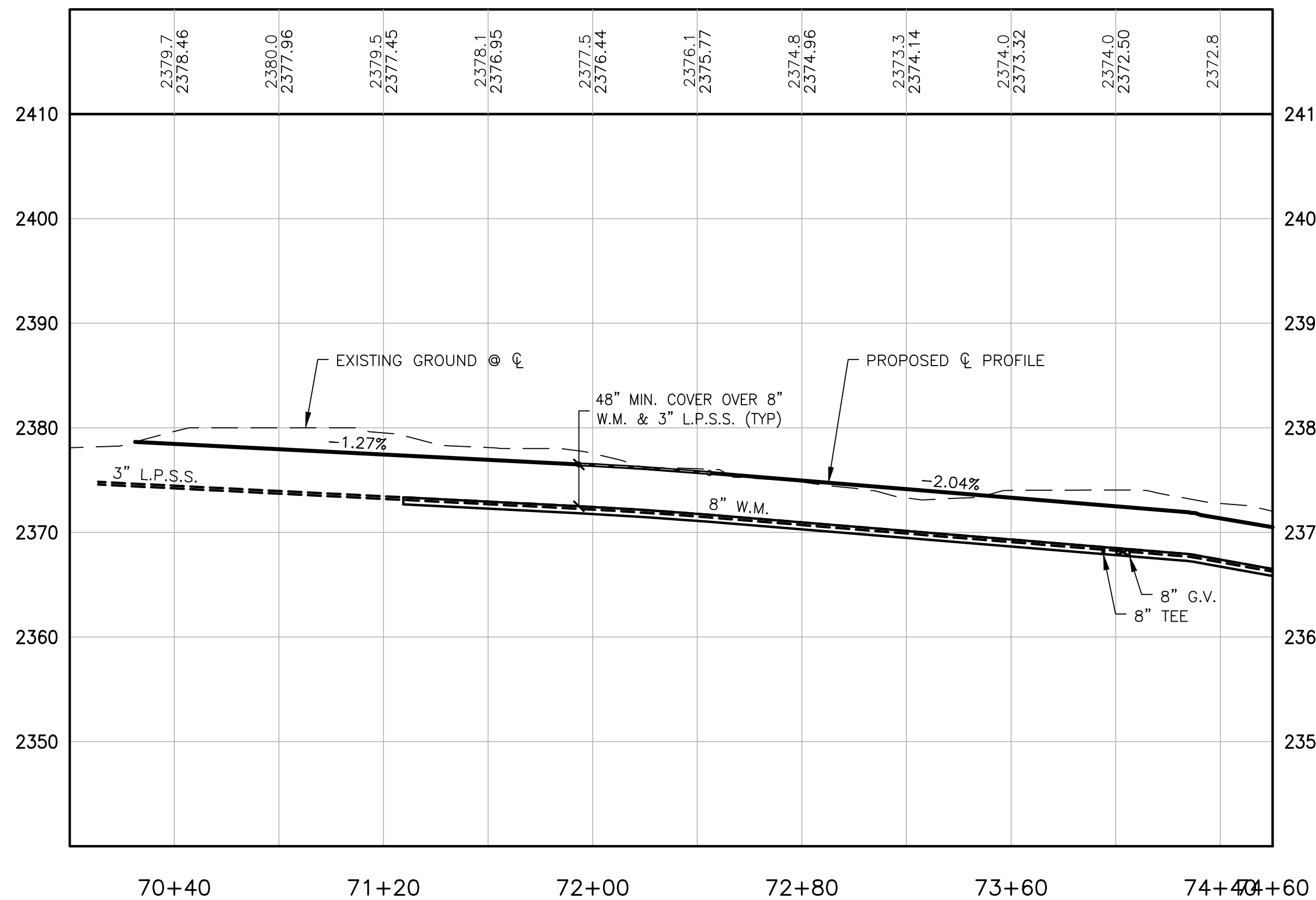
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SCALE: 1" = 40'
 CONTOUR INTERVAL = 2'



KEY MAP



SCALE: 1"=40' HORIZ.
 1"=10' VERT.

- NOTES:
- CONTRACTOR TO VERIFY LOCATION, ELEVATION, SIZE AND TYPE PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES. CONTRACTOR TO PROVIDE UTILITY LOCATES TO CONFIRM EXISTING WATER INFRASTRUCTURE SUCH AS GATE VALVES AND BLOW-OFFS.
 - MAINTAIN A MINIMUM OF 1' SEPARATION BETWEEN CB STRUCTURES AND 8" WATER MAIN.
 - PRESERVE AND PROTECT EXISTING GRAVITY 8" SEWER & FORCE MAIN. CONTRACTOR TO ADJUST SSMH RIM TO PROPOSED FINISHED GRADE.

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NELSON RIDGE
 WATER/SEWER PLAN & PROFILE

KITTITAS COUNTY

JOB NO.: 998-812-020
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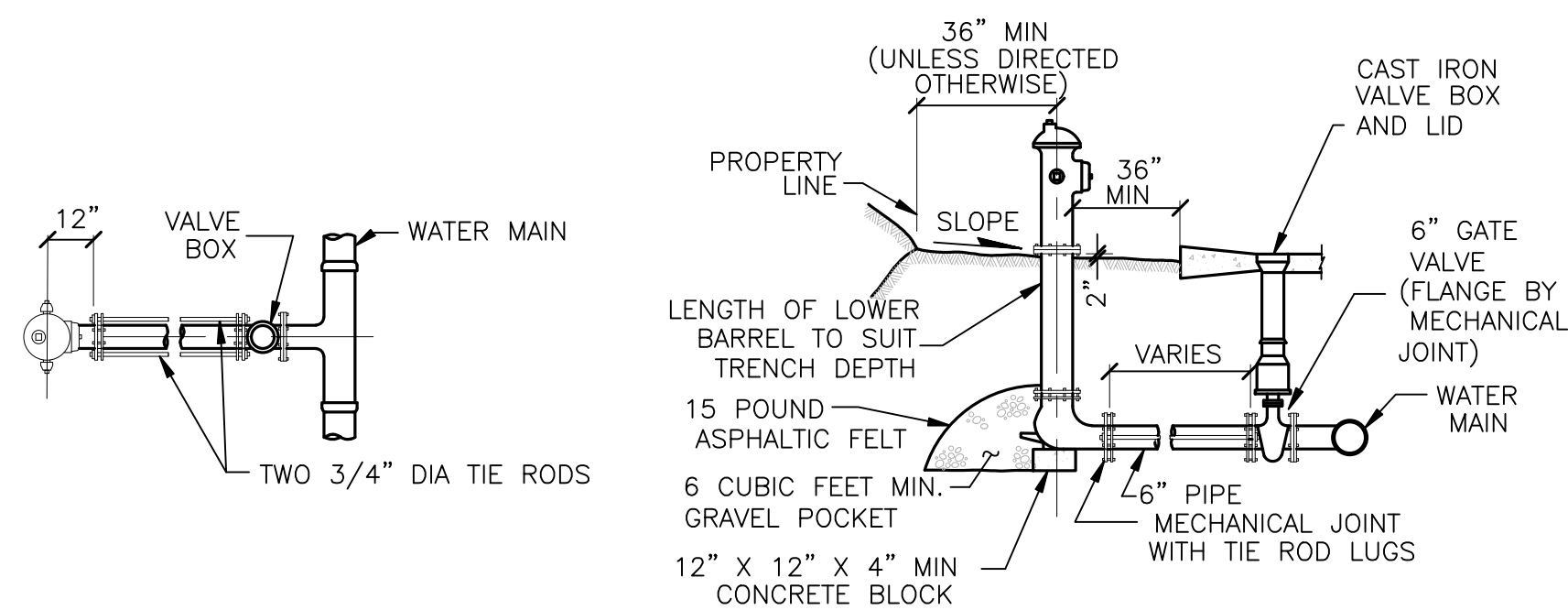
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 Call before you dig.

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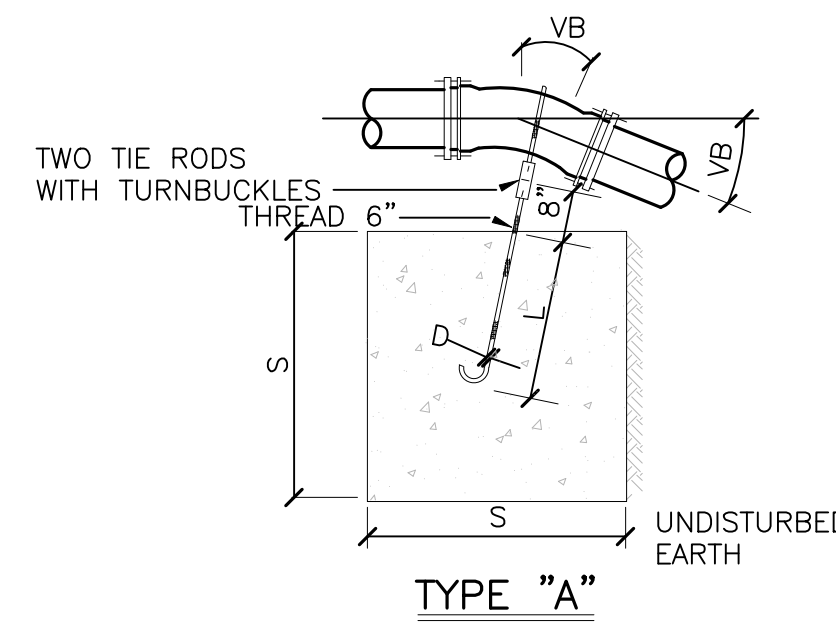
PLAN

ELEVATION

NOTES:

1. HYDRANT SHALL KENNEDY MODEL K81D AND PAINTED YELLOW.
2. STEEL TIE RODS TO BE HEAVILY COATED WITH ASPHALT AFTER INSTALLATION.
3. RESTRAINED JOINTS MAY BE SUBSTITUTED FOR THE RODS.
4. SURFACE OF GROUND WITHIN 36" OF HYDRANT TIE SHALL BE SMOOTH AND CLEAR OF ALL OBSTRUCTIONS.

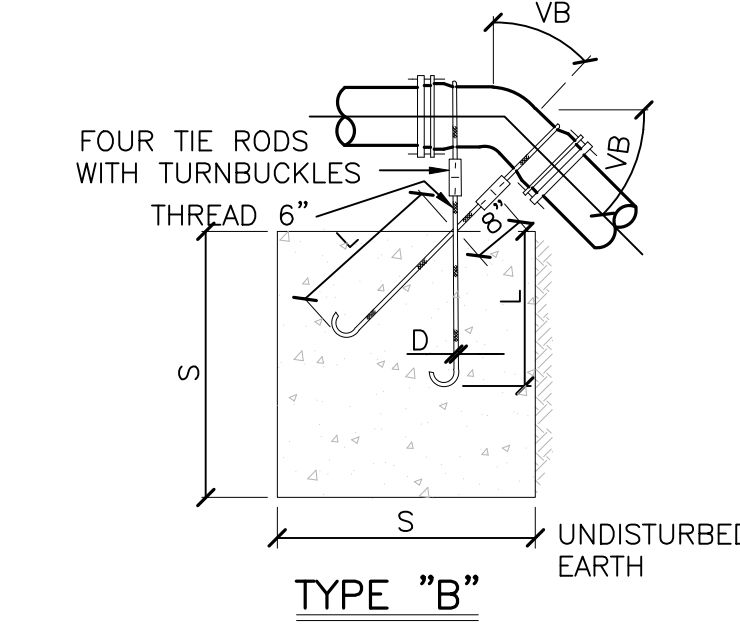
(A) HYDRANT SETTING
NOT TO SCALE



TYPE "A"

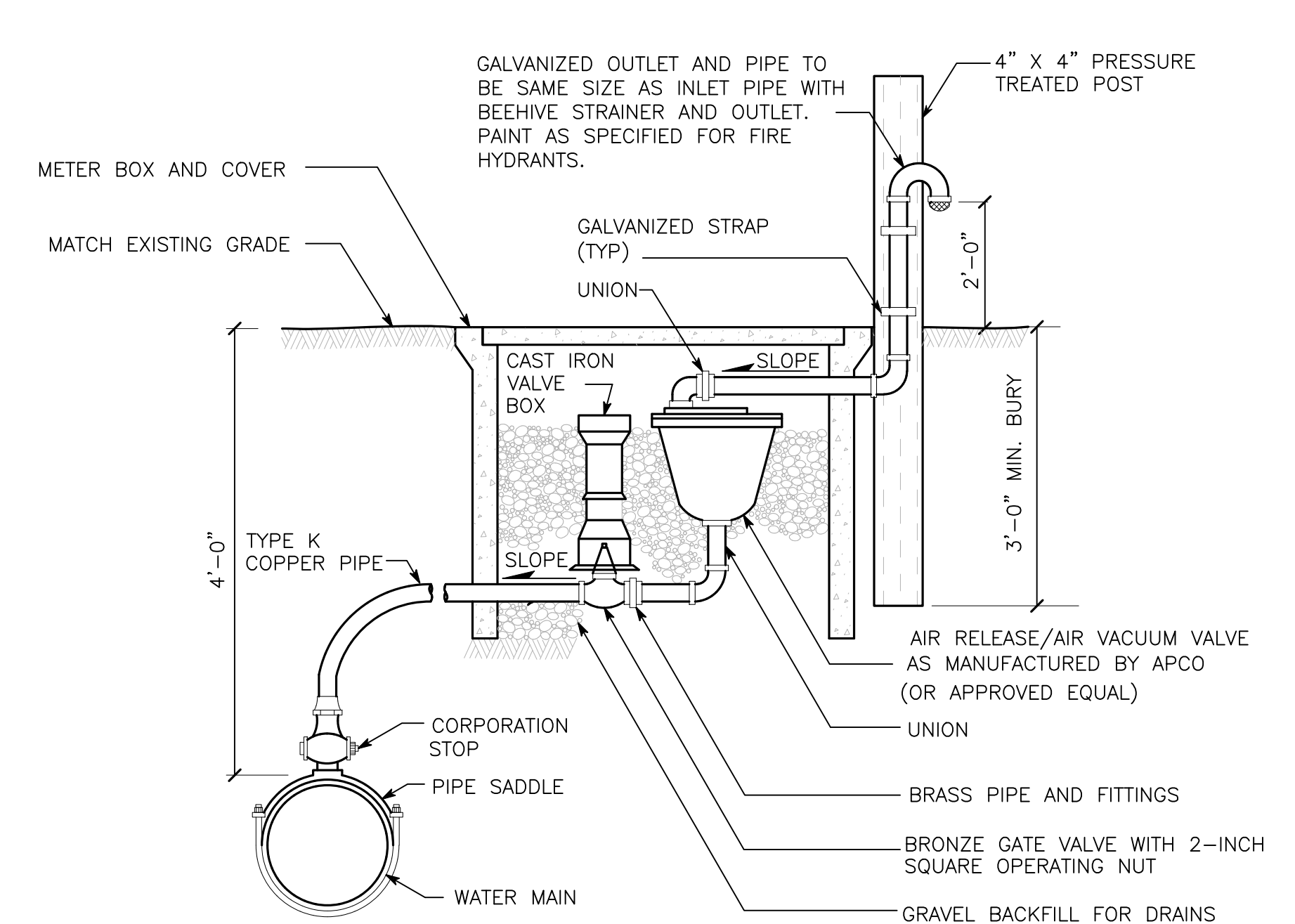
TYPE "A" BLOCKING FOR 11 1/4"-22" VERTICAL BENDS						
PIPE SIZE NOMINAL DIAMETER - INCHES	TEST PRESSURE PSI	VERTICAL BEND DEGREES	NO. OF CU. FT. OF CONC. BLOCKING	SIDE OF CUBE LIN. FT.	DIAM. OF TIE RODS INCHES	DEPTH OF RODS IN CONCRETE INCHES
4	250	11 1/4	6	1.8	5/8	17
		22 1/2	12	2.3		
6	250	11 1/4	14	2.4	5/8	17
		22 1/2	27	3.0		
8	250	11 1/4	25	2.9	5/8	17
		22 1/2	48	3.6		
10	250	11 1/4	38	3.4	5/8	17
		22 1/2	75	4.2		
12	250	11 1/4	55	3.8	5/8	17
		22 1/2	108	4.8		
14	250	11 1/4	75	4.2	5/8	17
		22 1/2	147	5.3		
16	250	11 1/4	98	4.6	5/8	17
		22 1/2	192	5.8		

(B) BLOCKING FOR CONVEX VERTICAL BEND
NOT TO SCALE



TYPE "B"

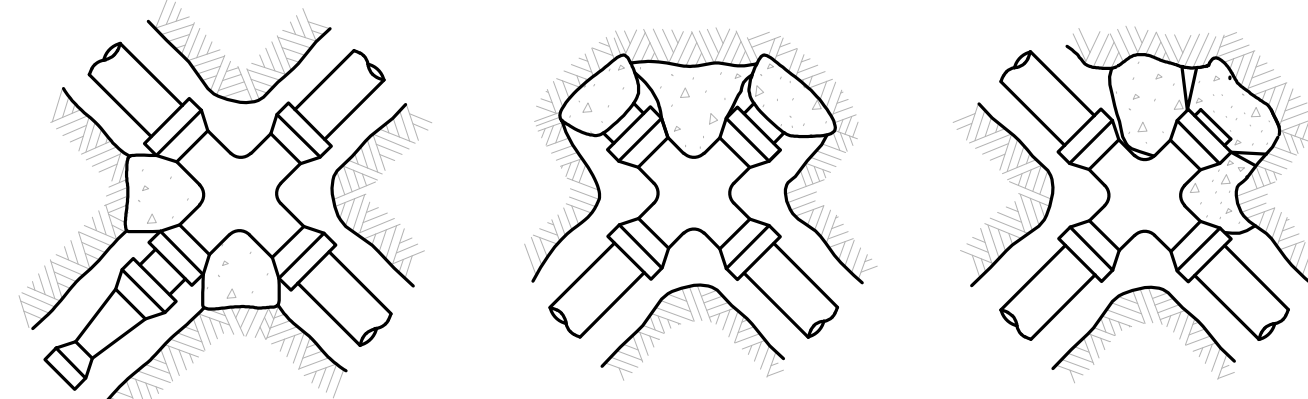
TYPE "B" BLOCKING FOR - 45° VERTICAL BENDS					
PIPE SIZE	TEST PRESSURE	VB	S	D	L
4	250	45	22	2.8	5/8 17
6	250	45	50	3.7	5/8 17
8	250	45	89	4.5	5/8 17
10	250	45	139	5.2	3/4 20
12	250	45	200	5.8	7/8 24
14	250	45	272	6.5	1 27
16	250	45	355	7.1	1 1/8 30



NOTES:

1. SIZE OF COMBINATION AIR RELEASE/AIR VACUUM VALVE SHALL BE SPECIFIED ON THE PLANS. PIPING AND VALVES SHALL BE THE SAME SIZE AS THE COMBINATION AIR RELEASE/AIR VACUUM VALVE.
2. LOCATE CORPORATION STOP AT THE HIGH POINT OF THE MAIN, TAP TOP OF MAIN.
3. LOCATE METER BOX AS INDICATED ON THE PLANS.

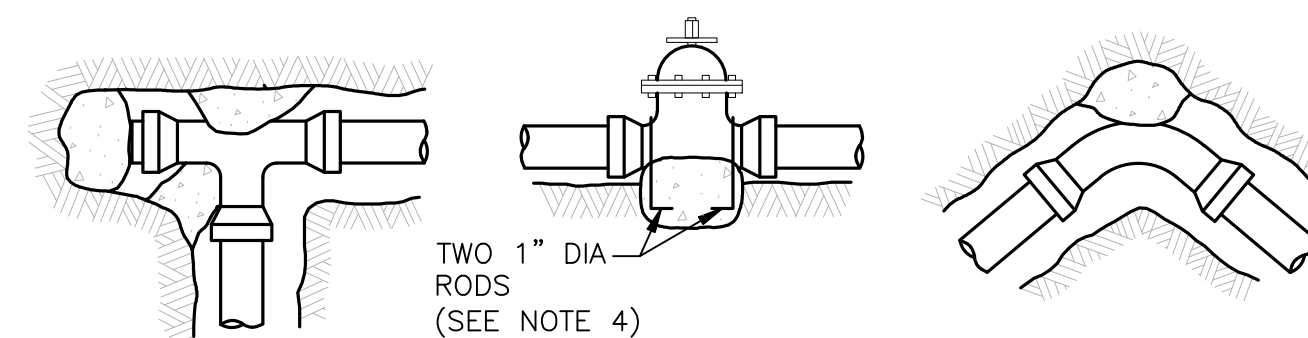
(C) COMBINATION AIR RELEASE/ AIR VACUUM VALVE ASSEMBLY
NOT TO SCALE



UNBALANCED CROSS (USE COLUMN "A")

PLUGGED CROSS (USE COLUMN "B")

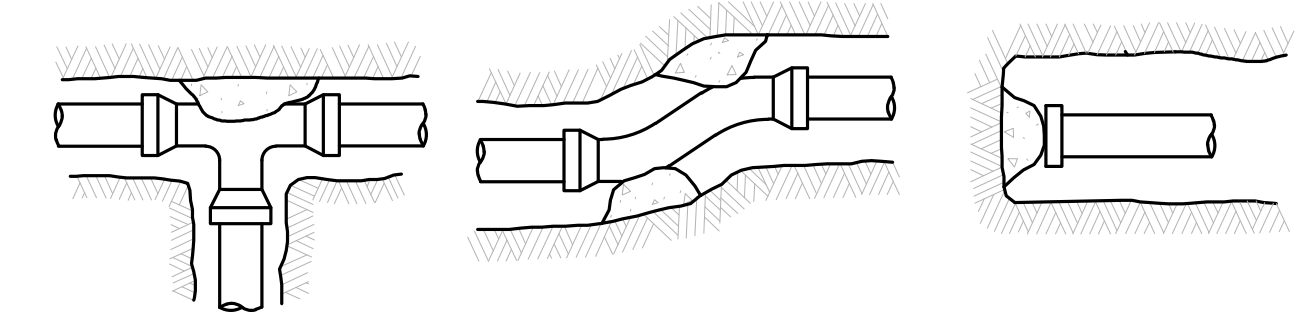
PLUGGED CROSS (USE COLUMN "A")



PLUGGED TEE (USE COLUMN "B")

VALVE (USE COLUMN "A")

BEND



TEE

OFFSET (USE COLUMNS "B" - "E")

DEAD END

NOTES:

1. CONTRACTOR TO PROVIDE BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE.
2. DIVIDE THRUST BY SAFE BEARING LOAD TO DETERMINE REQUIRED AREA (IN SQUARE FEET) OF CONCRETE TO DISTRIBUTE LOAD.
3. AREAS TO BE ADJUSTED FOR OTHER PRESSURE CONDITIONS.
4. PROVIDE TWO 1" MINIMUM DIAMETER RODS ON VALVES UP THROUGH 10" DIAMETER. VALVES LARGER THAN 10" REQUIRE SPECIAL TIE ROD DESIGN.

SIZE	TEST PRESSURE PSI	THRUST AT FITTINGS IN POUNDS				
		A TEE AND DEAD ENDS	B 90° BEND	C 45° BEND	D 22.5° BEND	E 11.25° BEND
4"	250	3,140	4,440	2,405	1,225	615
6"	250	7,070	9,995	5,410	2,760	1,385
8"	250	12,565	17,770	9,620	4,905	2,465
10"	250	19,635	27,770	15,030	7,660	3,850
12"	250	28,275	39,985	21,640	11,030	5,545
14"	250	38,485	54,425	29,455	15,015	7,545
16"	250	50,265	71,085	38,470	19,615	9,855

SOIL TYPE	SAFE BEARING LOAD PSF
MUCK, PEAT, ETC.	0
SOFT CLAY	1,000
SAND	2,000
SAND AND GRAVEL	3,000
SAND AND GRAVEL CEMENTED WITH CLAY	4,000
HARD SHALE	10,000

(D) CONCRETE THRUST BLOCK
NOT TO SCALE

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 NELSON RIDGE
 WATER/SEWER DETAILS & NOTES
 WASHINGTON
 KITITAS COUNTY
 JOB NO.: 998-812-020
 DWG. NAME: DT-05
 DESIGNED BY: LGB
 DRAWN BY: JHJ
 CHECKED BY:
 DATE: 04/16/2021
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 23 OF 29 SHEETS

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WATER MAIN CONSTRUCTION SPECIFICATIONS

1. WATER MAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT), WASHINGTON STATE CHAPTER OF THE AMERICAS PUBLIC WORKS ASSOCIATION (APWA), CURRENT EDITION (ENGLISH UNITS.) AND SUNCADIA WATER COMPANY (SWC). MATERIALS SHALL CONFORM TO APWA/WSDOT STANDARD SPECIFICATIONS, SECTION 9-30 WATER DISTRIBUTION MATERIALS, EXCEPT AS MODIFIED HEREIN. CONSTRUCTION SHALL CONFORM WITH THE FOLLOWING SECTIONS OF STANDARD SPECIFICATIONS:
 7-8 GENERAL PIPE INSTALLATION REQUIREMENTS
 7-9 WATER MAINS
 7-12 VALVES FOR WATER MAINS
 7-13 HYDRANTS
 7-14 SERVICE CONNECTIONS
2. WATER MAIN, HYDRANT, AND SERVICE CONNECTION CONSTRUCTION SHALL BE IN ACCORDANCE WITH WATER MAIN PIPE 4-INCH THROUGH 12-INCH DIAMETER SHALL BE CLASS 150 (DR18), POLYVINYL CHLORIDE (PVC) MEETING THE REQUIREMENTS OF ANSI/AWWA C900. WATER MAIN PIPE LARGER THAN 12-INCH DIAMETER SHALL BE CLASS 165 (DR25), POLYVINYL CHLORIDE (PVC) MEETING THE REQUIREMENTS OF ANSI/AWWA C905. PVC PIPE SHALL HAVE THE SAME OUTSIDE DIMENSIONS AS DUCTILE IRON PIPE. JOINTS SHALL MEET THE REQUIREMENTS OF ASTM D-3139 USING A RESTRAINED RUBBER GASKET CONFORMING TO ASTM F-477. THE MINIMUM DEPTH OF COVER SHALL BE 4- FEET.
3. PVC WATER PIPE UNDER 4-INCH DIAMETER SHALL MEET THE REQUIREMENTS OF ASTM D-2241. PIPE MATERIAL SHALL BE PVC 1120, PVC 1220 OR PVC 2120 AND SHALL HAVE A MINIMUM WALL THICKNESS EQUAL TO OR GREATER THAN A STANDARD DIMENSION RATIO (SDR) OF 21. JOINTS FOR PVC PIPE UNDER 4-INCH DIAMETER SHALL MEET THE REQUIREMENTS OF ASTM D-3139 USING A RESTRAINED RUBBER GASKET MEETING THE REQUIREMENTS OF ASTM F-477.
4. PVC WATER MAINS SHALL HAVE TRACER WIRE INSTALLED DIRECTLY TO THE TOP OF THE WATER MAIN. TRACER WIRE SHALL BE INSTALLED ON THE OUTSIDE OF VALVE BOX UNTIL 6" FROM THE TOP AND THEN ENTER INSIDE.
5. FITTINGS FOR PVC PIPE SHALL BE NEW DUCTILE IRON CONFORMING TO AWWA C-110 OR C-153 AND SHALL BE CEMENT MORTAR LINED CONFORMING TO AWWA C-104. JOINTS SHALL CONFORM TO AWWA C-111.
6. WHERE SPECIFIED ON THE PLANS, JOINT RESTRAINT SHALL BE PROVIDED. JOINT RESTRAINT SHALL BE SERIES 1500 FOR C-900 OR SERIES 2800 DUCTILE IRON RETAINERS FOR C-905 PVC PIPE AS MANUFACTURED BY EBAA IRON OR APPROVED EQUAL. RESTRAINT FOR FITTINGS SHALL BE SERIES 2000 PV DUCTILE IRON MECHANICAL JOINT RESTRAINT GLANDS FOR C-900 OR C-905 PVC PIPE AS MANUFACTURED BY EBAA IRON OR APPROVED EQUAL.
7. THE WATER SERVICE CONNECTION BETWEEN THE METER AND BUILDINGS SHALL BE AWWA C-901, ASTM D-2239 POLYETHYLENE PIPE WITH A 200 PSI RATING, OR COPPER TUBING MEETING THE REQUIREMENTS OF ASTM B88M, TYPE K. FITTINGS FOR COPPER PIPE SHALL BE FLARE TYPE COMPRESSION FITTINGS CONFORMING TO THE REQUIREMENTS OF AWWA C-800.
8. WATER METERS SHALL BE INSTALLED IN THE LOCATIONS SPECIFIED ON THE PLANS PER SWC.
9. METER BOXES SHALL BE LOCATED AS INDICATED ON THE PLANS. METER BOXES SHALL BE FORD OR MUELLER 18"x60" COIL PIT TYPE WITH A CAST IRON LID, OR AS OTHERWISE APPROVED BY SWC. A CUTOUT FOR AN AUTOMATIC METER READING SHALL BE PROVIDED UNLESS THE METER BOX IS LOCATED IN TRAFFIC AREAS, WHICH SHALL BE DESIGNED FOR H-20 LOADING.
10. FIRE HYDRANTS SHALL CONFORM TO AWWA C-502 AND HAVE 5-1/4 - INCH MINIMUM VALVE OPENING, AND PUMPER PORTS AS SPECIFIED BY KITTITAS COUNTY FIRE DISTRICT #7. FIRE HYDRANT SPOOLS SHALL BE DUCTILE IRON CLASS 52 CONFORMING TO AWWA C-151 WITH CEMENT MORTAR LINING CONFORMING TO AWWA C-104. FIRE HYDRANTS SHALL STAND PLUMB AND SET TO THE PROPOSED GRADE. THE LOWEST OUTLET OF THE HYDRANT SHALL BE NO LESS THAN 18-INCHES ABOVE GRADE. HYDRANTS SHALL BE PAINTED YELLOW.
11. ALL GATE VALVES SMALLER THAN 12-INCH DIAMETER SHALL BE RESILIENT WEDGE CONFORMING TO AWWA C-509 OR AWWA C-515. VALVES 12-INCH DIAMETER AND LARGER SHALL BE BUTTERFLY -TYPE CONFORMING TO AWWA C-504, CLASS 150B, SUITABLE FOR DIRECT BURIAL.
12. COMBINATION AIR VALVES SHALL BE SERIES 140 C AS MANUFACTURED BY THE APCO CORPORATION MEETING THE REQUIREMENTS OF AWWA C-512. COMBINATION VALVE SHALL BE LOCATED IN A METER BOX. A BRONZE GATE VALVE SHALL ISOLATE THE COMBINATION AIR VALVE FROM THE WATER MAIN. A 2-INCH DIAMETER GALVANIZED IRON PIPE SHALL DAYLIGHT WITH A 180-DEGREE BEND AND BEEHIVE STRAINER.
13. PRESSURE REDUCING STATIONS SHALL BE AS FABRICATED AND ASSEMBLED BY CIMCO-GC SYSTEMS, INC., OR APPROVED EQUAL.
14. VALVE BOXES SHALL BE INSTALLED ON ALL BURIED VALVES. THE BOX SHALL BE CAST IRON, TWO-PIECE SLIP DESIGN WITH A BASE CORRESPONDING TO THE SIZE OF THE VALVE. THE COVER SHALL HAVE THE WORD "WATER" CAST IN IT AND THE LID "EARS" SHALL BE INSTALLED PARALLEL TO THE MAIN. VALVE BOX SHALL BE OLYMPIC FOUNDRY PART NO. VB1 OR APPROVED EQUAL. VALVE BOX TABS SHALL POINT IN THE DIRECTION OF THE PIPE. VALVE BOX SHALL BE ENCASED WITH 6" CONCRETE COLLAR POURED AT SUBGRADE.
15. CONCRETE THRUST BLOCKING SHALL BE PER WSDOT/APWA AND SHALL UTILIZE 3000 PSI CONCRETE.
16. THE LOCATION OF WATER STUBS AT THE PROPERTY LINE SHALL BE MARKED BY THE CONTRACTOR WITH A 2 BY 4-INCH PRESSURE TREATED WOODEN STAKE 4 FEET LONG BURIED IN THE GROUND A DEPTH OF 3 FEET. THE LOW END SHALL HAVE A 2 BY 4-INCH CLEAT NAILED TO IT TO PREVENT WITHDRAWAL OF THE STAKE. THE EXPOSED END SHALL BE PAINTED BLUE AND THE DEPTH TO THE WATER STUB SHALL BE INDICATED IN BLACK PAINT ON THE 2 BY 4. IN ADDITION, A LENGTH OF 12-GAGE GALVANIZED WIRE SHALL BE PROVIDED TO EXTEND FROM THE PLUGGED END OF THE WATER STUB. THE UPPER END SHALL EMERGE AT THE 4-FOOT STAKE, BUT SHALL NOT BE FASTENED TO IT.
17. PRIOR TO CONNECTION WITH EXISTING MAINS, ALL NEW WATER MAINS AND HYDRANTS SHALL BE PRESSURE TESTED AND DISINFECTED IN ACCORDANCE WITH SECTION 7-09.3(24). PRESSURE TESTING AND DISINFECTION SHALL BE PERFORMED IN THE PRESENCE OF SWC OR SEC INSPECTOR. THE CONTRACTOR SHALL PROVIDE PLUGS, PORTABLE PUMP, BLOW OFF ASSEMBLIES, TEMPORARY BLOCKING, AND OTHER EQUIPMENT AND MATERIALS NECESSARY FOR PRESSURE TESTING AND DISINFECTION.
18. BLOW OFF ASSEMBLIES SHALL BE A MINIMUM OF 2.5- FEET DEEP TO BE ADEQUATELY INSULATED WITH A VALVE BOX.
19. BLOW OFF AND FLUSHING STATIONS SHALL NOT BE PVC AND SHALL TERMINATE WITH 2.5-INCH MALE FIRE HOSE NST AND CAP.
20. THE NEW CONNECTION TO THE EXISTING MAIN SHALL BE PERFORMED IN THE PRESENCE OF A SWC OR SEC INSPECTOR.
21. MINIMUM TEST PRESSURE IS 225 PSI.

GRAVITY SANITARY SEWER CONSTRUCTION SPECIFICATIONS

1. GRAVITY SANITARY SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) AND WASHINGTON STATE CHAPTER OF THE AMERICAN PUBLIC WORKS ASSOCIATION (APWA), CURRENT EDITION, (ENGLISH UNITS), AND SUNCADIA ENVIRONMENTAL COMPANY (SEC). CONSTRUCTION SHALL CONFORM WITH THE FOLLOWING SECTIONS OF THE STANDARD SPECIFICATIONS.
 7-05 MANHOLES, INLETS, CATCH BASINS AND DRY WELLS.
 7-08 GENERAL PIPE INSTALLATION REQUIREMENTS
 7-17 SANITARY SEWERS
 7-18 SIDE SEWERS
 7-19 SEWER CLEANOUTS
2. ALL SEWER PIPE SHALL BE PVC CONFORMING TO ASTM D-3034, SDR 35 FOR PIPE SIZES 4" TO 15". PVC PIPE SIZED 18" TO 27" SHALL MEET THE REQUIREMENTS OF ASTM F-679. PIPE JOINTS SHALL CONFORM TO ASTM D-3212 AND SHALL HAVE FACTORY INSTALLED RUBBER GASKETS MEETING REQUIREMENTS OF ASTM F-477. PVC PIPE FITTINGS SHALL MEET REQUIREMENTS OF ASTM D-3034 AND ASTM D-3212.
3. BEDDING FOR PVC PIPE SHALL CONFORM TO BEDDING MATERIAL PER SECTION 9-03.12(3).
4. SEWER STUBS SHALL HAVE TRACER WIRE INSTALLED. THE TRACER WIRE SHALL EXIT THE GROUND AT THE BASE OF THE 4X4 PRESSURE TREATED MARKER WITH AN EXTRA 3 FEET WRAPPED AROUND THE BASE OF THE MARKER.
5. BACKFILL MATERIAL SHALL BE BANK RUN GRAVEL FOR TRENCH BACKFILL PER SECTION 9-03.19OF THE WSDOT/APWA OR WITH THE APPROVAL OF THE PROJECT GEOTECHNICAL ENGINEER, NATIVE MATERIAL OF SIMILAR CHARACTERISTICS TO BANK RUN GRAVEL FOR TRENCH BACKFILL.
6. PRECAST CONCRETE MANHOLES SHALL MEET THE REQUIREMENTS OF AASHTO M-199.
7. CASTINGS FOR MANHOLE RINGS SHALL BE GRAY IRON CONFORMING TO THE REQUIREMENTS OF AASHTO M-105, GRADE 30B. CONTRACTOR SHALL PROVIDE PRO-STIK BUTYL SEALANT OR APPROVED EQUAL BETWEEN ALL MANHOLE RISER RINGS. COVERS SHALL BE CENTERED TO THE STRUCTURE AND SHALL BE DUCTILE IRON CONFORMING TO ASTM A-536, GRADE 80-55-06. MANHOLE RISER SHALL BE ENCASED WITH 6" CONCRETE COLLAR POURED AT SUBGRADE.
8. MANHOLE STEPS SHALL BE CONSTRUCTED TO MEET REQUIREMENTS OF ASTM C-478, BE RATED FOR A MINIMUM OF 300-FOOT-POUND CONCENTRATED LOAD AND MEET THE LATEST OSHA REQUIREMENTS. ACCESS STEPS SHALL BE 12-INCHES APART MAXIMUM AND THE LAST STEP SHALL BE 12-INCHES FROM THE CHANNEL. A CO-POLYMER POLYPROPYLENE STEEL REINFORCED STEP WITH A MINIMUM HALF INCH DIAMETER BAR FULLY ENCLOSED ON THE CO-POLYMER SHALL BE USED.
9. FLOW CHANNELS IN MANHOLES SHALL BE SHAPED AND SLOPED TO PROVIDE A SMOOTH TRANSITION BETWEEN THE INLET AND OUTLET SEWER LINES AND MINIMIZE TURBULENCE.
10. RIGID PIPE CONNECTIONS TO CONCRETE MANHOLES SHALL BE MADE WITH A FLEXIBLE JOINT, KOR-N-SEAL OR APPROVED EQUAL, AT A DISTANCE FROM THE FACE OF THE MANHOLE NOT MORE THAN 1.5 TIMES THE NOMINAL PIPE DIAMETER OR 18 INCHES, WHICHEVER IS GREATER.
11. PVC MANHOLE ADAPTERS SHALL BE MANUFACTURED BY GPK PRODUCTS, INC. (OR EQUIVALENT) WITH ABRASIVE SILICA EXTERIOR LAYER. THE MANHOLE ADAPTER WILL BE GROUTED WITH QUIKRETE MORTAR MIX OR EQUIVALENT. MANHOLE ADAPTERS SHALL BE WATERTIGHT TO 6.5 PSI (MINIMUM).
12. THE LOCATION OF SIDE SEWERS AT THE PROPERTY LINE SHALL BE MARKED BY THE CONTRACTOR WITH A 4 BY 4-INCH PRESSURE TREATED WOODEN STAKE THAT EXTENDS DOWN TO THE CAPPED END OF THE PIPE WITH 4 FEET EXPOSED. THE LOW END SHALL HAVE A 2 BY 4-INCH CLEAT NAILED TO IT TO PREVENT WITHDRAWAL OF THE STAKE. THE EXPOSED END SHALL BE PAINTED GREEN AND THE DEPTH TO THE SIDE SEWER OR TEE SHALL BE INDICATED IN BLACK PAINT ON THE 4 BY 4.
13. NEW CONNECTIONS TO EXISTING FACILITIES SHALL BE SEALED OFF UNTIL UPSTREAM CONSTRUCTION IS FINISHED, CLEANED, AND ACCEPTED. ALL CONSTRUCTION DEBRIS AND WATER SHALL BE REMOVED PRIOR TO OPENING THE SEAL. THE NEW CONNECTION TO THE EXISTING MAIN SHALL BE PERFORMED IN THE PRESENCE OF A SWC OR SEC INSPECTOR.
14. PRIOR TO FINAL ACCEPTANCE, THE CONTRACTOR SHALL FLUSH THE SYSTEM AT A SUFFICIENT VELOCITY TO REMOVE ANY DEBRIS FROM THE PIPE.
15. PRESSURE TESTING AND TV INSPECTION OF GRAVITY SEWER PIPES SHALL BE PERFORMED BY THE CONTRACTOR AS PER WSDOT/APWA SPECIFICATIONS. TESTING AND INSPECTION SHALL BE PERFORMED IN THE PRESENCE OF SEC INSPECTOR.
16. UTILITY CONTRACTOR TO INSTALL SANITARY SEWER SIDE SEWER LINES A MINIMUM OF 5 FEET BEYOND ROAD RIGHT-OF-WAY INTO PRIVATE PROPERTY.

LOW PRESSURE SANITARY SEWER CONSTRUCTION SPECIFICATIONS

1. PRESSURE SEWER LINES SHALL BE CONSTRUCTED OF HIGH-DENSITY POLYETHYLENE PIPE CONFORMING WITH ASTM-D-2737, SDR 11 WITH A WORKING PRESSURE OF 150 PSI.
2. CONTRACTOR SHALL STUB-OUT PRESSURE SEWER LATERALS FIVE FEET FROM ROAD RIGHT-OF-WAY. LATERAL ASSEMBLY SHALL CONSIST OF A 1.25-INCH CURB STOP, PACK JOINTS AND ADAPTERS, CHECK VALVE AND COUPLINGS. THE LATERAL ASSEMBLY SHALL BE MARKED ON THE SURFACE WITH A 2-INCH X 4-INCH STUD.
3. LOW PRESSURE SEWER PIPES UNDER 4-INCHES SHALL BE HDPE WITH WELDED JOINTS OR APPROVED EQUAL.
4. LOW PRESSURE SIDE SEWER PIPES SHALL BE 2-INCH HDPE WELDED WITH BRASS OR STAINLESS ¼ TURN VALVE OR APPROVED EQUAL.
5. LOW-PRESSURE SEWER CHECK-VALVES SHALL BE SELECTED FROM SEWER MANUFACTURERS.
6. LOW PRESSURE SEWER VALVES LOCATED IN DRIVEWAYS SHALL HAVE A VALVE BOX DESIGNED FOR H-20 LOADING.
7. PRESSURE SEWER AND MAINS SHALL HAVE TRACER WIRE INSTALLED DIRECTLY TO THE TOP OF THE PRESSURE SEWER PIPE.
8. BEDDING AND BACKFILL FOR PRESSURE SEWER SHALL BE AS SPECIFIED FOR GRAVITY SEWERS.

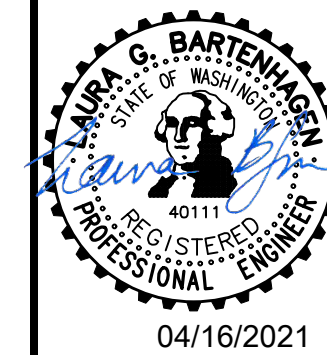
SANITARY SEWER FORCE MAIN CONSTRUCTION SPECIFICATIONS

1. SANITARY SEWER FORCE MAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH WATER MAIN CONSTRUCTION SPECIFICATIONS, EXCEPT THAT DISINFECTION REQUIREMENTS DO NOT APPLY.
2. FORCE MAINS SHALL BE PVC PRESSURE PIPE CONFORMING WITH AWWA C-900 AS SPECIFIED IN SECTION 9-30.1(5)A OF THE STANDARD SPECIFICATIONS.
3. PRESSURE SEWER AND MAINS SHALL HAVE TRACER WIRE INSTALLED NEAR THE SURFACE DIRECTLY ABOVE THE PRESSURE SEWER PIPE.

APPROVED FOR CONSTRUCTION

KITTITAS COUNTY ENGINEER _____	DATE _____
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REVISIONS		
NO.	DESCRIPTION/DATE	BY



04/16/2021

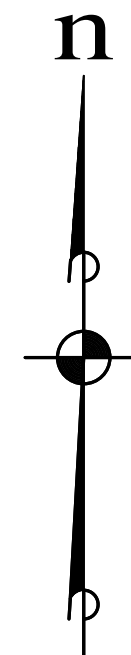
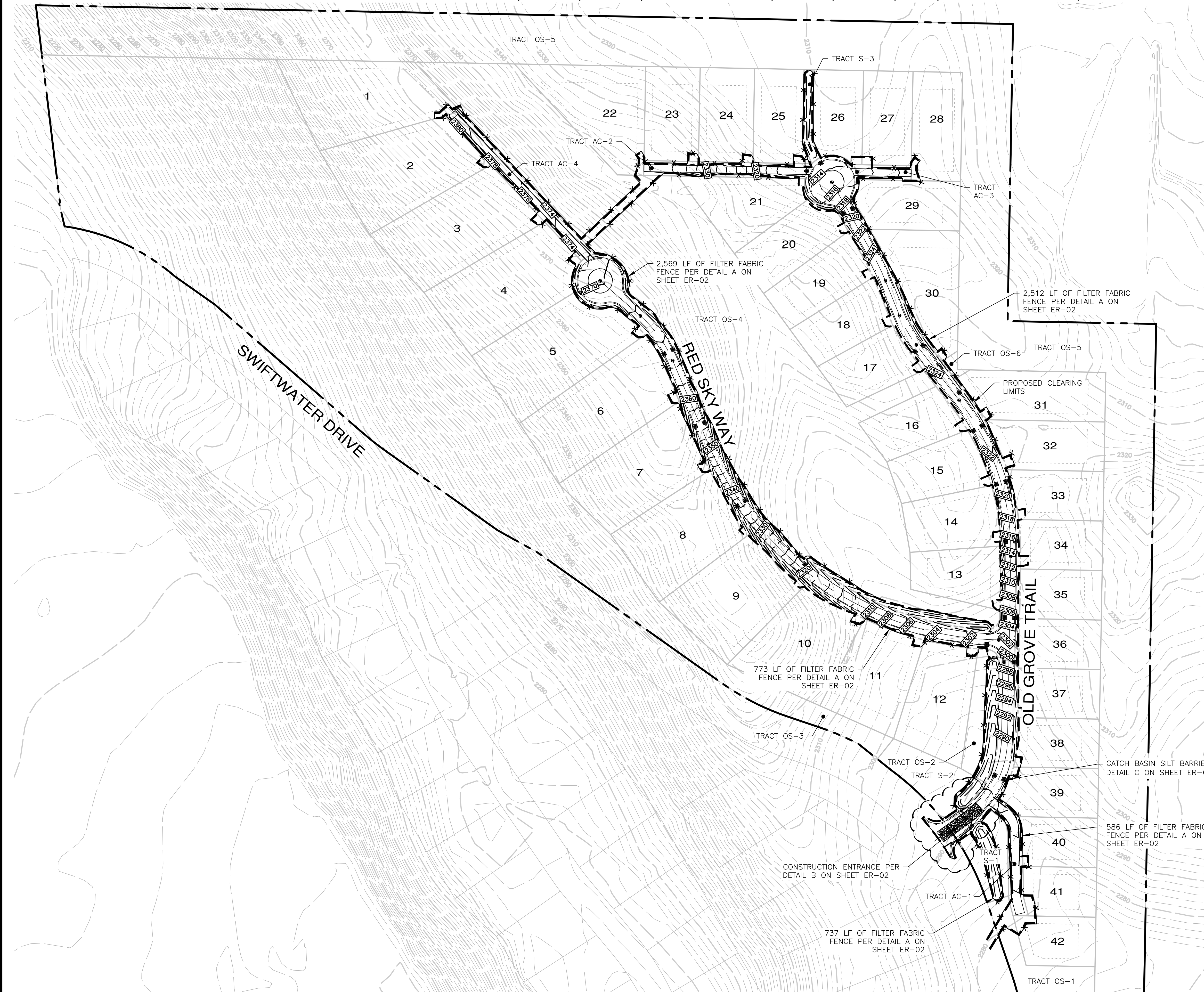
ESM CONSULTING ENGINEERS
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NEW SUNCADIA, LLC
NELSON RIDGE
 WATER/SEWER DETAILS & NOTES
 KITTITAS COUNTY WASHINGTON

JOB NO.:	998-812-020
DWG. NAME:	DT-07
DESIGNED BY:	LGB
DRAWN BY:	JJH
CHECKED BY:	
DATE:	04/16/2021
DATE OF PRINT:	

File: \\server\ENGR\ESM-JOB\998\812\020\plans\DT-07.dwg
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 Plotted By: Greg Fabore

A PORTION OF SECTION 13, T. 20 N., R. 14 E., AND SECTION 18, T. 20 N., R. 15 E., W.M., KITTITAS COUNTY, WASHINGTON



SCALE: 1" = 100'
 100 50 0 100 200
 CONTOUR INTERVAL = 2'

NOTES:
 DIVISION 6 CLEARING LIMIT AREA = 4.13 AC

LEGEND

- DAYLIGHT LINE
- PROP. CLEARING LIMITS
- 2262 --- EXISTING CONTOUR
- 2262 --- PROPOSED CONTOUR
- CATCH BASIN SILT BARRIER
- x-x-x- FILTER FABRIC FENCE

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NO.	DESCRIPTION/DATE	BY

05/13/2021

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NEW SUNCADIA, LLC
NELSON RIDGE
 CLEARING & T.E.S.C. PLAN

WASHINGTON
 KITTITAS COUNTY

JOB NO.: 998-812-020
 DWG. NAME: ER-01
 DESIGNED BY: LGB
 DRAWN BY: JH
 CHECKED BY:
 DATE: 05/13/2021
 DATE OF PRINT:

APPROVED FOR CONSTRUCTION

KITTITAS COUNTY ENGINEER _____ DATE _____

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ENGINEER'S STANDARD NOTES

CONSTRUCTION SEQUENCE

1. CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL AN ACCIDENTAL SPILL CONTROL AND CLEANUP PLAN.
2. CONTACT THE KITTITAS COUNTY DEPARTMENT OF PUBLIC WORKS AND SCHEDULE A PRECONSTRUCTION MEETING.
3. INSTALL FILTER FABRIC FENCE, CHECK DAMS, INTERCEPTOR SWALES, STRAW BALE BARRIERS, SEDIMENT TRAPS AND OTHER TESC MEASURES AS SPECIFIED IN THE DETAILS OR AS FIELD CONDITIONS DICTATE.
4. INSTALL TEMPORARY CONSTRUCTION ENTRANCE(S). (IF NECESSARY)
5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INCORPORATE THE NECESSARY EROSION CONTROL MEASURES SHOWN ON THESE PLANS FOR THE SPECIFIC SITE AREA CONDITIONS.
6. CONTROL DUST BY USE OF WATER TRUCKS ON ROADS AND EXPOSED AREAS AS NECESSARY. IF WATER FOR CONSTRUCTION PURPOSED IS OBTAINED FROM A HYDRANT, CONTRACTOR TO INSTALL A TEMPORARY METER W/ BACKFLOW PREVENTER. IF FLOCCULANT AGENTS ARE USED (PAM), FOLLOW THE MANUFACTURER'S GUIDELINES FOR APPLICATION RATES.
7. PARTICULAR ATTENTION SHALL BE PAID TO THE LOESS MATERIALS PRESENT ON THE SITE.
8. CONTRACTOR SHALL HAVE STREET SWEEPING EQUIPMENT AVAILABLE AND SHALL USE AS CONDITIONS DICTATE.
9. DURING THE CONSTRUCTION PERIOD, ANY AND ALL POLLUTANTS INCLUDING SEDIMENTS SHALL BE HANDLED AND DISPOSED OF IN A MANNER WHICH DOES NOT CAUSE CONTAMINATION OF STORMWATER.
10. LANDSCAPE OR SEED ALL EXPOSED AREAS AFTER CONSTRUCTION.
11. DURING THE CLEARING OPERATIONS IMPLEMENTATION OF THE EROSION CONTROL MEASURES DETAILED IN THESE PLANS IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE BASED ON AREA CLEARED AND WEATHER CONDITIONS.
12. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THEY ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON-SITE. DISTURBED AREAS RESULTING FROM SEDIMENT REMOVAL SHALL BE PERMANENTLY STABILIZED.
13. COLLECTED AND TREATED RUNOFF SHALL BE EITHER INFILTRATED OR, WHERE FEASIBLE, DISCHARGED IN A DISPERSED MANNER SUCH THAT SOIL EROSION DOES NOT OCCUR.
14. DEVELOP TESC INSPECTION CHECKLIST FOR USE IN WEEKLY INSPECTIONS. PROVIDE MONTHLY REPORT TO OWNER ON INSPECTIONS AND MAINTENANCE/UPGRADE ACTIVITIES.

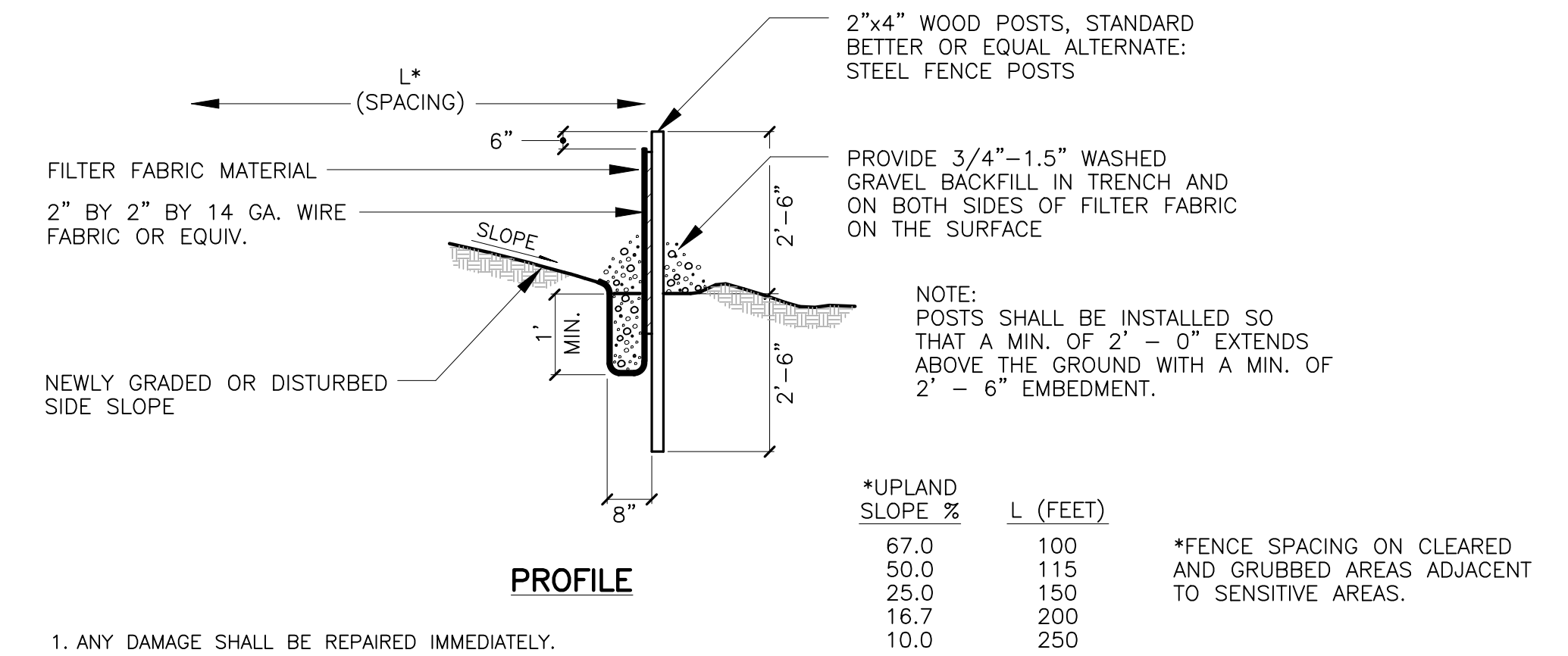
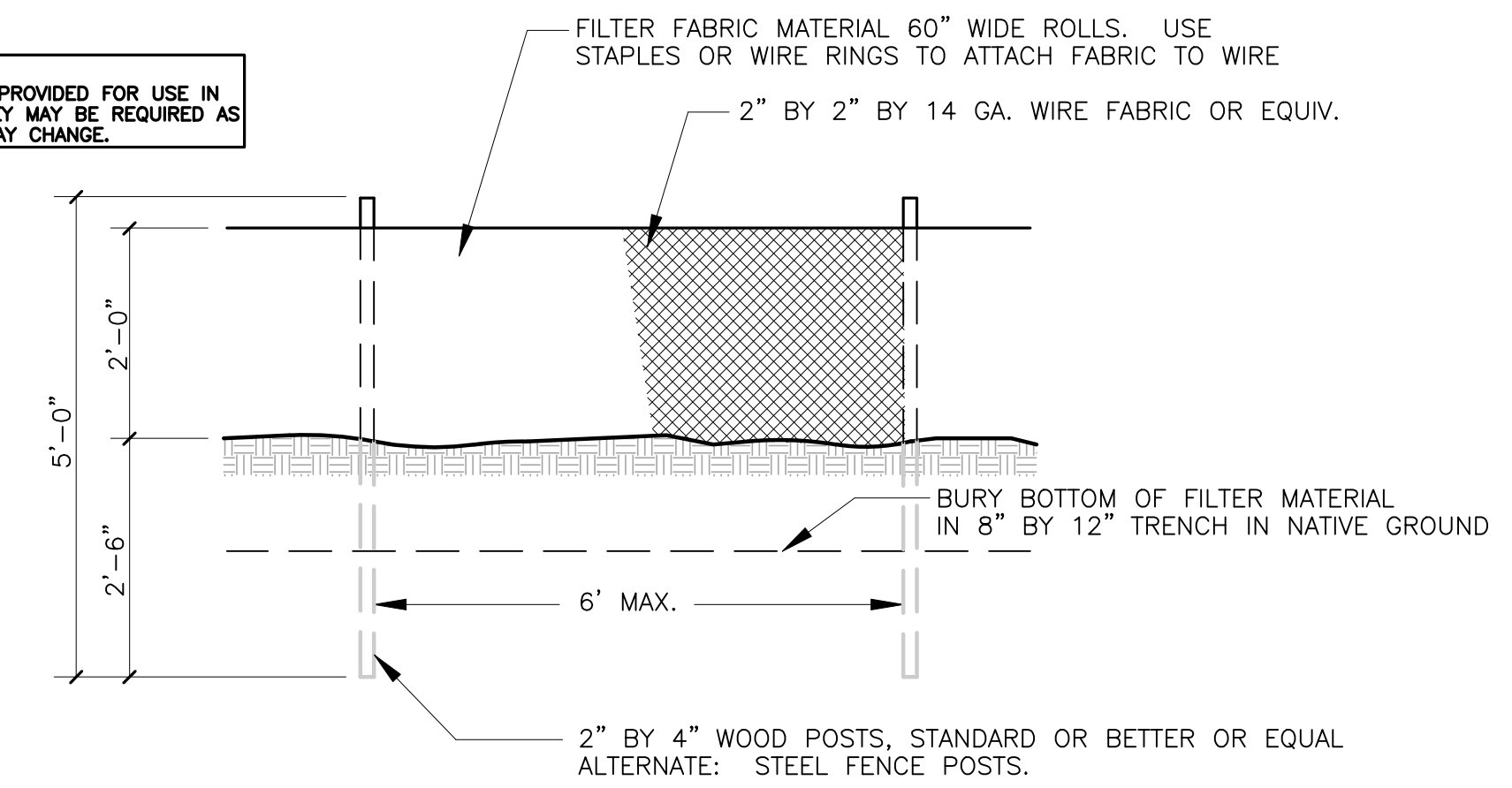
EROSION/SEDIMENTATION CONTROL SPECIFICATIONS

1. AGENCY APPROVAL OF THIS TEMPORARY EROSION AND SEDIMENTATION CONTROL (TESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. UTILITIES, ETC.) SEPARATE PERMITS ARE REQUIRED FOR BUILDING AND UTILITIES CONSTRUCTION.
2. THE TESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. IMPLEMENTATION OF THESE TESC PLANS AND CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE TESC FACILITIES AS NECESSARY TO PREVENT SEDIMENTATION OR SILTATION OF ON-SITE AND OFF-SITE DRAINAGE FEATURES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS APPROVED. THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR ASSISTANCE SHOULD THE NEED ARISE.
3. THE BOUNDARIES OF THE CLEARING LIMITS, BOTH INTERIOR AND EXTERIOR, SHALL BE CLEARLY FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION. THE CONTRACTOR SHALL LIMIT CLEARING TO THOSE AREAS NECESSARY FOR THE CURRENT OPERATION.
4. AS CONSTRUCTION PROGRESSES THE CONTRACTOR SHALL PHASE IMPLEMENTATION OF THE TESC MEASURES SHOWN ON THESE PLANS AS CLEARING AND GRADING ACTIVITIES ALLOW. PHASING OF TESC MEASURES SHALL BE PERFORMED IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT VIOLATE STATE WATER QUALITY STANDARDS. THE CONSTRUCTION SEQUENCE PROVIDED ON THESE PLANS SHALL SERVE AS GENERAL GUIDANCE IN THE DEVELOPMENT OF THE OPERATIONAL PHASING PLAN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DEVELOP THE OPERATIONAL PHASING PLAN AND TO ENSURE THAT SEDIMENTATION AND SILTATION OF ON-SITE AND OFF-SITE DRAINAGE FEATURES DOES NOT OCCUR.
5. THE TESC FACILITIES SHALL BE INSPECTED WEEKLY BY THE CONTRACTOR AND MAINTAINED/UPGRADED AS NECESSARY.
6. ANY AREA STRIPPED OF VEGETATION, INCLUDING ROADWAY EMBANKMENTS, WHERE NO FURTHER WORK IS ANTICIPATED FOR AN EXTENDED PERIOD OF TIME, SHALL BE STABILIZED WITH AN APPROVED TESC METHOD (E.G. SEEDING, MULCHING, NETTING, EROSION BLANKETS, ETC.) SEEDING SHALL BE PERFORMED IN A MANNER TIMELY TO GERMINATION OF SEED BY SITE RAINFALL.
7. ANY AREA NEEDING TESC MEASURES, NOT REQUIRING IMMEDIATE ATTENTION, SHALL BE ADDRESSED PRIOR TO RAINFALL EVENTS. THERE MAY BE AREAS NOT SHOWN ON TH EPLANS THAT WILL REQUIRE TESC MEASURES PRIOR TO A A RAINFALL EVENT, SUCH AS ADDITIONAL CLEARING, CUTS AND FILLS, ETC. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER FOR IMPLEMENTAION OF THE ADDITIONAL TESC MEASURES.
8. THE TESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 48 HOURS FOLLOWING A STORM EVENT.
9. STABILIZED CONSTRUCTION ENTRANCES AND WASH PADS SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT. (RCW 46.61.655).
10. DURING THE TIME PERIOD OF NOVEMBER 1 THROUGH FEBRUARY 28, NO CLEARING OR GRADING SHALL OCCUR IN AREAS OF HIGH EROSION POTENTIAL AS DEFINED IN THE PROJECT EIS.
11. CLEAN WATER ENTERING CONSTRUCTION AREA SHALL NOT BE ALLOWED TO MIX WITH CONSTRUCTION AREA RUNOFF.
12. TEMPORARY AND PERMANENT COVER OF EXPOSED SOILS AND MAJOR STOCKPILES OF ERODIBLE SOIL IS REQUIRED.
13. CONTRACTOR SHALL ESTABLISH SILT FENCES ALONG BOUNDARIES OF SENSITIVE AREAS AS REQUIRED FOR THEIR PROTECTION. SENSITIVE AREAS SHALL BE AS DEFINED IN THE PROJECT EIS.
14. WHERE SEEDING FOR TEMPORARY EROSION CONTROL IS REQUIRED, FAST GERMINATING GRASSES SHALL BE APPLIED AT A RATE OF 20 LB/ACRE ACCORDING TO THE FOLLOWING SEED MIXTURE:

NAME	PROPORTION PERCENT BY WEIGHT	PERCENT PURITY	PERCENT GERMINATION
BASIC SEED MIX @ 20 LB/ACRE			
CREeping RED FESCUE	23	98	90
SHEEP FESCUE	23	98	90
CANADA BLUEGRASS	24	98	90
RED TOP	10	98	90
SHERMAN BIG BLUE	20	98	90

15. THE CONTRACTOR SHALL ADJUST HIS EROSION CONTROL OPERATIONS ACCORDING TO THE FIELD CONDITIONS TO ENSURE ANY SEDIMENT LADEN WATER DOES NOT ENTER OFFSITE OR SURFACE WATER SYSTEMS.

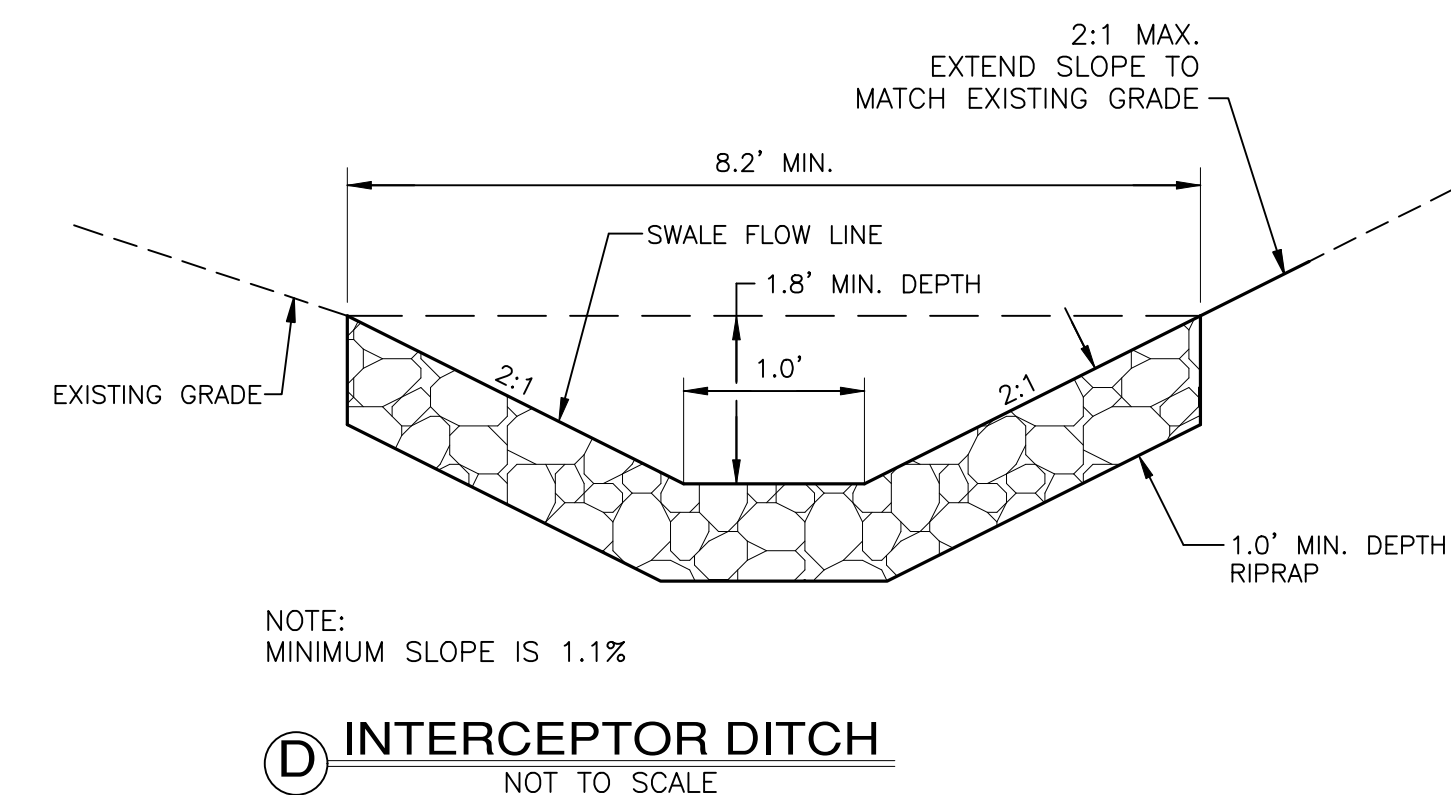
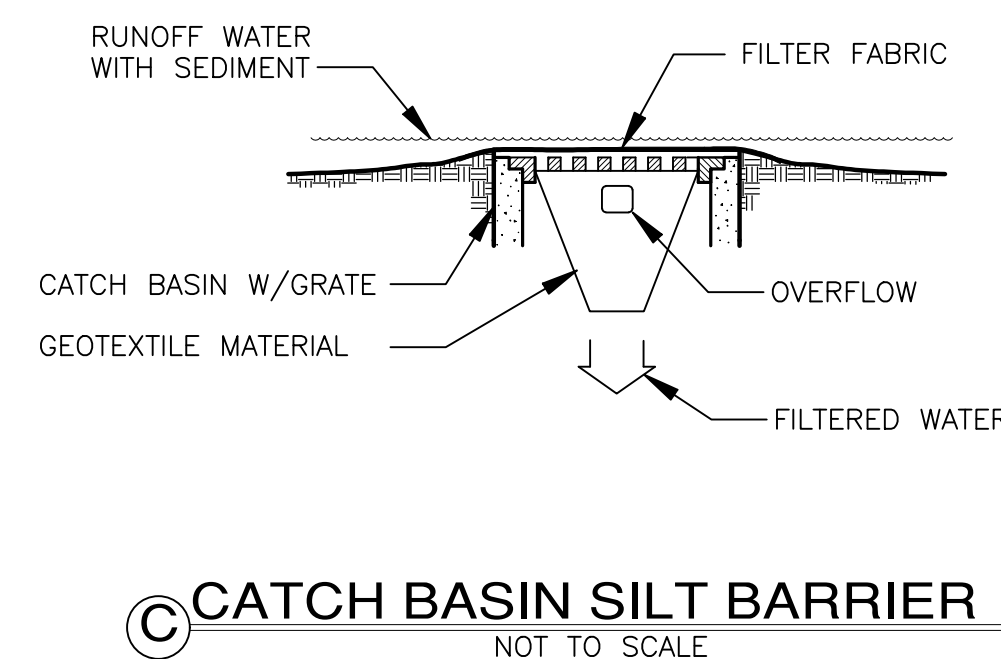
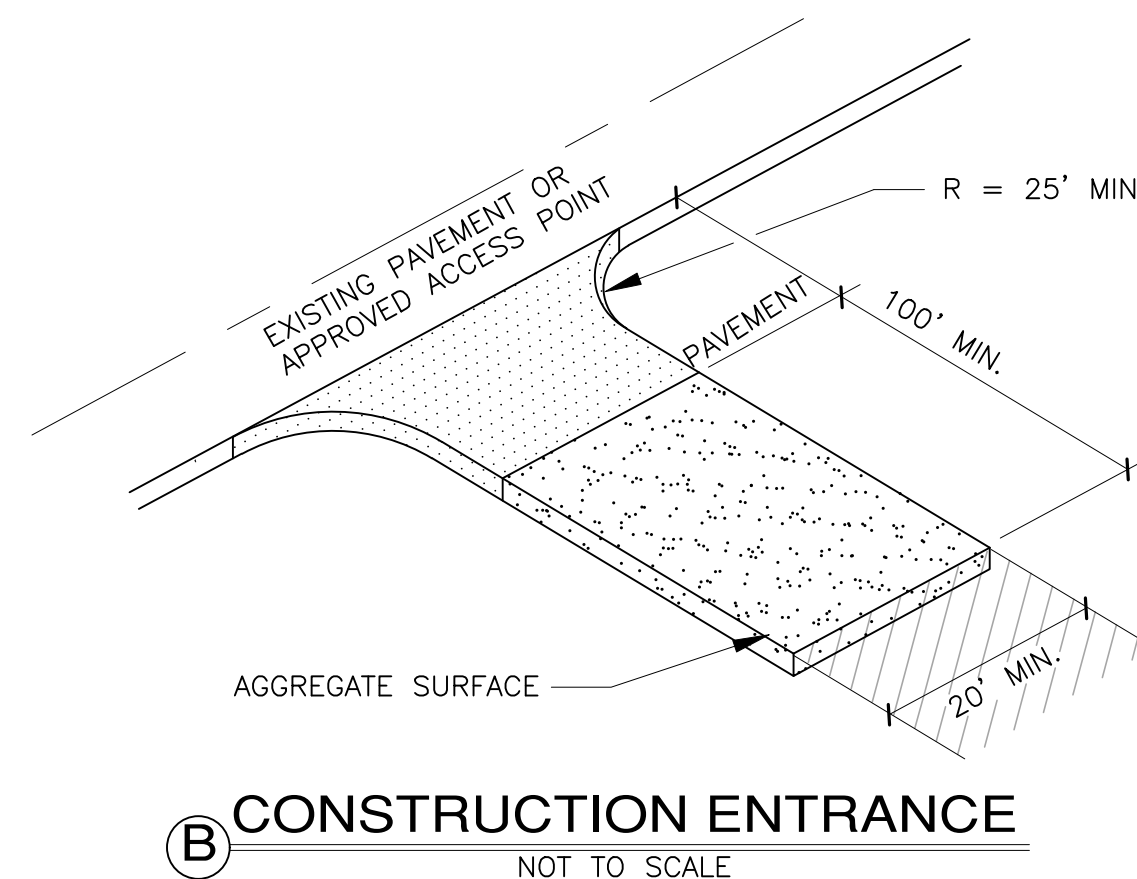
NOTE: THESE DETAILS ARE PROVIDED FOR USE IN THE EVENT THAT THEY MAY BE REQUIRED AS FIELD CONDITIONS MAY CHANGE.



1. ANY DAMAGE SHALL BE REPAIRED IMMEDIATELY.
2. IF CONCENTRATED FLOWS ARE EVIDENT UPHILL OF THE FENCE, THEY MUST BE INTERCEPTED AND CONVEYED TO A SEDIMENT TRAP OR POND.
3. IT IS IMPORTANT TO CHECK THE UPHILL SIDE OF THE FENCE FOR SIGNS OF THE FENCE CLOGGING AND ACTING AS A BARRIER TO FLOW AND THEN CAUSING CHANNELIZATION OF FLOWS PARALLEL TO THE FENCE. IF THIS OCCURS, REPLACE THE FENCE AND/OR REMOVE THE TRAPPED SEDIMENT.
4. SEDIMENT MUST BE REMOVED WHEN THE SEDIMENT IS 6" HIGH.
5. IF THE FILTER FABRIC HAS DETERIORATED DUE TO ULTRAVIOLET BREAKDOWN, IT SHALL BE REPLACED.

A TYPICAL FILTER FENCE DETAIL NOT TO SCALE

CONDITIONS FOR USE:
TO PREVENT OFF-SITE SEDIMENT TRANSPORT TO SENSITIVE AREAS FROM CLEARED AND GRUBBED AREAS.



APPROVED FOR CONSTRUCTION

KITTITAS COUNTY ENGINEER _____ DATE _____

REVISIONS		
NO.	DESCRIPTION/DATE	BY



04/16/2021

ESM CONSULTING ENGINEERS, LLC
 505 S. WASHINGTON ST. SUITE 205
 FEDERAL WAY, WA 98003
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 Land Surveying
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WASHINGTON

NEW SUNCADIA, LLC
NELSON RIDGE
 KITTITAS COUNTY CLEARING & T.E.S.C. DETAILS & NOTES

JOB NO.: 998-812-020
 DWG. NAME: ER-02
 DESIGNED BY: LGB
 DRAWN BY: JHJ
 CHECKED BY:
 DATE: 04/16/2021
 DATE OF PRINT:

ER-02

28 OF 29 SHEETS



May 14, 2021

Job No. 998-813-020

Mr. Cameron C. Curtis, EIT
Kittitas County, Dept. of Public Works
411 N Ruby St, Suite #1
Ellensburg, WA 98926

**Re: Suncadia Phase 2 Division 6 - Nelson Ridge
Engineering Plan Submittal**

Dear Mr. Curtis:

On behalf of New Suncadia, ESM Consulting Engineers, LLC is submitting this letter in response to your review letter we received on April 28, 2021 together with the revised construction plans. In an effort to provide concise and direct responses, we have copied the review comments below in *italics* and our responses are in **bold**.

ENGINEERING:

1. *Within the plan set a number of pipes aren't labeled. Please be sure to label all pipes on sheets RD-01, RD-02, RD-05, and WS-02.*

The pipes have been labeled as requested.

2. *The drainage report shows that Swale 1 seems to be under sized. For the design storm shown, the swale operates with 0 free board and still overflows into a dispersion device. The report claims that the existing Basin D discharges at a flow rate of 0.543 CFS, but existing conditions do not contain any conveyance systems so existing conditions aren't discharged through a single point. The plans do show a gravel dispersion trench and an overflow spillway, was there any analysis done to verify this solution.*

The existing basin flows are calculated for reference, to compare overall storm drainage flows and ensure that these are not exceeded for developed conditions. None of the existing basins have point discharges. For Basin D, the overall 100-year storm event flow rate is 0.543 cfs and the developed 100-year flow is 0.273 cfs (as generated by 0.36 acres of impervious area and 0.36 acres of landscaped area for a total of 0.72 acres).

The available infiltration rate for the location of Swale 1 is 1.08 inches per hour, which allows for the majority of the flows to be infiltrated in the bio-retention swale (0.273 - 0.105 = 0.168 infiltrated at peak flow). The remaining 0.105 cfs is discharged to a 20 feet wide dispersion trench which then has a 100 feet flow path. Dispersion

trenches typically allow for 0.10 cfs per 10 feet of dispersion trench width up to 0.5 cfs, so we believe the proposed design meets requirements with a factor of safety that would allow up to 0.2 cfs to be dispersed in the proposed dispersion trench.

The table in Section 3.1 has been corrected to reflect the calculated 0.27 cfs 100-year flow for Swale 1.

3. *In addition to the letter from the Suncadia Water Company, please provide an inventory of equivalent residential units, or the accounting method utilized in the general sewer plan, affirming sufficient capacity serving the plat.*

Following is the information provided by the Suncadia Water Company regarding the requested inventory, including the proposed Division 6:

- A) For water, there are currently 1,041 physical water connections. There are also water connections for Ready-to-Serve lots (573), the Winemaker's Cabins (26), Division 1 (36), and Division 6 (42) bringing the total to 1,718 possible connections.

The Washington Department of Health (DOH) originally approved 1,501 water connections in 2016. A connection is defined as an equivalent residential unit (ERU). For residential, water demand is considered a single ERU. For hotel, resort, commercial, and other non-residential users, average water demand is forecasted based on usage and then converted to ERUs. The Suncadia water system calculates ERUs based on the following assumptions:

- Average Daily Demand = 153 gal/day per person
- 3.75 people per residence
- Total Average Daily Demand/ERU = 574 gpd

Suncadia Water Company tracks the number of connections/ERUs added since 2016, by adding the total number of new physical single-family connections to the number of ERUs from other users (average daily use / 574 gal/ERU).

The Suncadia ERUs are calculated by taking total amount of potable water purchased from the City per year and applying this equation:

Total gallons purchased, divided by 574 gal/ERU, divided by 365 days.		
Consumption 2018	121,838,090	582 ERUs
Consumption 2019	121,740,052	581 ERUs
Consumption 2020	138,506,720	661 ERUs

This calculation provides an ERU count based on the actual amount of potable water purchased from the City and it is a much smaller number than what we are showing for physical connections.

In summary, the allowed DOH number of ERUs are 1,501 and while a total of possible connections is 1,718, the actual existing ERUs counted based on water purchase are 661. Therefore, adequate water capacity is provided.

B) For sewer, a Residential Customer Equivalent (RCE) report is provided to the City of Cle Elum annually. A residential lot is considered a single connection. As of October 31, 2020, the RCE count was residential (888) and commercial (30), for a total of 918. With the recent plants of Winemaker's Cabins (26), Division 1 (36), and Division 6 (42), the RCE report single connections adds up to 1,022. The total available sewer connections are 3,787 and adequate sewer capacity is provided.

4. *Please provide a cross section of the proposed roadway system.*

The cross-section has been added to sheet DT-03.

5. *The drainage report explains that SSC-6 will be met through amended soils. As in the previous submittal, please specify the approved soil on the plan set.*

Sheet DT-02 has been updated to reflect the engineered soil mix following the requirements of the SSC-6 in the Stormwater Manual. The engineered soil mix is proposed to contain compost and organic content as recommended in the WSDOT Highway Runoff Manual M31-16.05 Section 5-4.3.2 Soil Amendments.

6. *Please work with Public Works to schedule an inspection of the completed work or submit a bond for construction.*

A bond will be provided for construction.

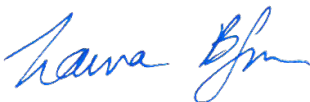
7. *Pursuant to the Suncadia letter dated October 9, 2019 responding to Public Works comments for Phase 3 Division 15 & 16, Suncadia requested a meeting to discuss the type and timing of needed traffic monitoring going forward. Traffic monitoring information is required and determination on type of monitoring and location is necessary. Please reach out to Public Works to schedule a time to meet.*

The meeting will be scheduled as requested.

If there are any questions or a need for further clarification, please feel free to contact me at (253) 838-6113 and I would be happy to discuss them with you.

Sincerely,

ESM CONSULTING ENGINEERS, LLC.



LAURA BARTENHAGEN, P.E., LEED AP
Principal

In summary, stormwater runoff from the Nelson Ridge plat will follow the existing downstream flow paths to maintain the natural discharge locations throughout the site, and be dispersed, treated for water quality and infiltrated, as applicable.

3.1 Bio-infiltration Swales:

The proposed bio-infiltration swale will serve for water quality treatment, flow control, and conveyance in the event of an overflow. Based on the geotechnical report and the soils, long-term design infiltration rates of 2.00, 1.30, and 1.08 inches per hour were used for Swale #4, Swale #2, and Swale #1 respectively.

For more information, see table below, MSRTS calculations attached in Appendix A, and the construction plan set.

Bio-infiltration		Swale #1	Swale #2	Swale #4
Swale Shape		Trapezoidal	Trapezoidal	Trapezoidal
Channel Slope	(%)	1.0	1.0-6.7	0.5-7.6
Side Slope		3:1	3:1	3:1
Bottom Width	(ft)	2	6	2
Basin Size	(ac)	0.72	2.62	1.12
Water Quality Flow	(cfs)	0.23	0.97	0.38
Maximum Depth of Water Quality Flow	(ft)	0.10	0.13	0.14
Maximum Peak Flow 100-year, 24-hour	(cfs)	1.01	3.86	1.60
Maximum Depth of Peak Flow 100-year, 24-hour	(ft)	0.27	0.29	0.30
Infiltration Depth	(ft)	2.0	2.4	1.4
Total Depth	(ft)	2.0	3.0	2.0
Freeboard	(ft)	0.0*	0.6	0.6
Length	(ft)	160	302	393
Volume Required	(cf)	2764	9515	3072
Volume Provided	(cf)	2680*	14076	6408
Infiltration Rate	(in/hr)	1.08	1.30	2.00

* This swale discharges the overflow into a dispersion device at a rate of 0.105 cfs and will continue downstream using a 100-foot flow path into existing native vegetation in the open space tract.

**Construction Cost Opinion
Nelson Creek (Phase 2 Division 6)
Suncadia MPR**

ESM Consulting Engineers, LLC
May 3, 2021

SCHEDULE "A" PREPARATION

ITEM	DESCRIPTION	TOTAL QUANT.	UNIT	UNIT PRICE	PRICE EXTENSION
A 1	Clearing & Grubbing	4.13	AC	\$ 6,784.90	\$ 28,021.64
A 2	Saw-cut Existing Pavement	90.00	LF	\$ 23.04	\$ 2,073.60
A 3	Remove Existing Asphalt Pavement	19.00	SY	\$ 15.00	\$ 285.00
A 4	Rock Truck Entrance (Quarry Spalls)	1	EA	\$ 3,500.00	\$ 3,500.00
A 5	Mobilization - 5% of total	1	LS	\$ 35,000.00	\$ 35,000.00
SCHEDULE "A" TOTAL					\$ 68,880.24

SCHEDULE "B" GRADING

B 1	Permanent Signage	1	LS	\$ 5,000.00	\$ 5,000.00
B 2	Fine Grading (Road)	10,245	SY	\$ 0.65	\$ 6,659.25
SCHEDULE "B" TOTAL					\$ 11,659.25

SCHEDULE "C" ROADWAY

ITEM	DESCRIPTION	TOTAL QUANT.	UNIT	UNIT PRICE	PRICE EXTENSION
C 1	7" Crushed Surfacing Base Course	2,000	CY	\$ 62.62	\$ 125,240.00
C 2	2" Crushed Surfacing Top Course	600	CY	\$ 18.00	\$ 10,800.00
C 3	3" HMA Cl. 1/2" PG 64-28 Roadway w/Thickened Edge	1,840	TON	\$ 132.47	\$ 243,744.80
C 4	2.5" HMA Cl. 1/2" PG 64-28 Trail	0	TON	\$ 87.00	\$ -
C 5	Roadway Monumentation	15	EA	\$ 548.28	\$ 8,224.20
C 6	Removable & Stationary Bollards	0	EA	\$ 250.00	\$ -
C 7	Entrance Gate	0	EA	\$ 12,000.00	\$ -
SCHEDULE "C" TOTAL					\$ 388,009.00

SCHEDULE "D" ROADWAY STORM DRAINAGE

D 1	Storm Drain ADS N12, 12"	1,535	LF	\$ 20.00	\$ 30,700.00
D 2	Type I Catch Basin	28	EA	\$ 1,875.03	\$ 52,500.84
D 3	Type I-L Catch Basin	0	EA	\$ 900.00	\$ -
D 4	Type II Catch Basin, 48" Dia., w/ Cover	0	EA	\$ 2,400.00	\$ -
D 5	Drainage Dispersion Trench	0	LF	\$ 50.00	\$ -
D 6	Drainage Ditch w/Riprap Bottom (1'-4' wide bot. x 2' deep min.)	0	LF	\$ 15.00	\$ -
D 7	Bio-Infiltration Swale	856	LF	\$ 15.00	\$ 12,840.00
D 8	Silt Fence	7,180	LF	\$ 5.43	\$ 38,987.40
D 9	Hydroseeding	2.00	AC	\$ 1,100.00	\$ 2,200.00
D 10	Rip Rap - Pipe Inlet/Outfall	504	CY	\$ 62.40	\$ 31,449.60
D 11	Infiltration Facility Excavation and Haul Off	0	CY	\$ 3.50	\$ -
D 12	Infiltration Facility Fine Grading	0	SY	\$ 0.65	\$ -
D 13	3/4" - 1 1/2" Washed Rock	0	CY	\$ 15.00	\$ -
D 14	Amended Soil	246	CY	\$ 30.00	\$ 7,380.00
D 15	Mirafi 180 Geotextile	0	SY	\$ 2.50	\$ -
SCHEDULE "D" TOTAL					\$ 176,057.84

Construction Cost Opinion

SCHEDULE "E" WATER

ITEM	DESCRIPTION	TOTAL QUANT.	UNIT	UNIT PRICE	PRICE EXTENSION
E 1	Water Main , 8" C900	3,982	LF	\$ 79.00	\$ 314,578.00
E 2	2" Blow-Off	0	EA	\$ 1,500.00	\$ -
E 3	Combination Air Valve Assembly	0	EA	\$ 2,200.00	\$ -
E 4	Fire Hydrant Assembly (includes Tee and 6" GV)	7	EA	\$ 4,948.80	\$ 34,641.60
E 5	Gate Valve, 8"	16	EA	\$ 2,166.67	\$ 34,666.72
E 6	Single Water Service (1-1/2"), 1" meter and box	42	EA	\$ 1,500.00	\$ 63,000.00
E 7	Connect to Existing	1	EA	\$ 2,000.00	\$ 2,000.00
SCHEDULE "E" TOTAL					\$ 448,886.32

SCHEDULE "F" SANITARY SEWER

F 1	8" PVC to 12 ft. Deep	2,659	LF	\$ 39.24	\$ 104,339.16
F 2	Extra Depth Trenching & Manholes	0	LF	\$ 4.00	\$ -
F 3	48" Manhole	20	EA	\$ 2,800.00	\$ 56,000.00
F 4	Side Sewer, 6"	31	EA	\$ 600.00	\$ 18,600.00
F 5	Low Pressure Lateral	11	EA	\$ 900.00	\$ 9,900.00
F 6	Cleanout	46	EA	\$ 1,000.00	\$ 46,000.00
F 7	4" HDPE Pressure Sewer Main		LF	\$ 15.00	\$ -
F 8	3" HDPE Low Pressure Sewer	1,113	LF	\$ 9.00	\$ 10,017.00
F 9	Sewer Single Flushing Station	1	EA	\$ 1,600.00	\$ 1,600.00
F 10	Sewer Double Flushing Station	0	EA	\$ 2,000.00	\$ -
F 11	Sewer Air Release Assembly	0	EA	\$ 2,200.00	\$ -
F 12	Connect to Existing	1	EA	\$ 3,000.00	\$ 3,000.00
SCHEDULE "F" TOTAL					\$ 249,456.16

SCHEDULE "G" EARTHWORK

G 1	Stripping (12")	5,400	CY	\$ 5.00	\$ 27,000.00
G 2	Cut	3,200	CY	\$ 6.00	\$ 19,200.00
G 3	Fill	2,800	CY	\$ 8.00	\$ 22,400.00
G 4	Unsuitable Excavation & Dispose On-Site	0	CY	\$ 4.00	\$ -
SCHEDULE "G" TOTAL					\$ 68,600.00

Construction Cost Opinion

SCHEDULE "H" DRY UTILITIES

ITEM	DESCRIPTION	TOTAL QUANT.	UNIT	UNIT PRICE	PRICE EXTENSION
H 1	60" x 60" Trench with (2) 6", (3) 4", (1) 3" and (3) 2" Conduit (includes Excavation for Electric Vaults, and 1' deep sand bedding and cover)	0	LF	\$ 39.00	\$ -
H 2	42" x 48" Trench with (1) 6", (2) 4", (1) 3" and (2) 2" Conduit (includes Excavation for Electric Vaults, and 1' deep sand bedding and cover)	3,920	LF	\$ 40.00	\$ 156,800.00
H 3	42" x 48" Trench with (2) 2" Conduit (includes 1' deep sand bedding and cover)	0	LF	\$ 12.00	\$ -
H 4	<i>Neighborhood Ped. Street Lights</i>	6	EA	\$ 5,000.00	\$ 30,000.00
H 5	Crossings with (1) 6", (2) 4", 1 (3") and (2) 2" Conduit (includes 1' deep sand bedding and cover, and select backfill)	0	LF	\$ 35.00	\$ -
H 6	Excavation and 1' Sand Bedding for Vaults (includes Power, Telephone and Cable Vaults)	6	EA	\$ 350.00	\$ 2,100.00
H 7	Lumination	0	LS	\$ 1.00	\$ -
SCHEDULE "H" TOTAL					\$ 188,900.00

TOTAL	\$ 1,600,448.81
Sales tax - 8%	\$ 128,035.90
SUB-TOTAL INCLUDING TAX	\$ 1,728,484.71
Contingency - 10%	\$ 172,848.47
Testing, Surveying, Inspection & Admin. - 15%	\$ 259,272.71
TOTAL BONDING ESTIMATE	\$ 2,160,700.00

NOTE: Since the design professional has no control over the cost of labor, materials, or equipment, or over the contractor's method of determining prices, or over competitive bidding or market conditions, our opinions of probable construction cost provided for herein are made on the basis of experience and qualifications. These opinions represent our best judgment as a design professional familiar with the construction industry. However, we cannot and do not guarantee that proposals, bids, or the construction cost will not vary from opinions of probable cost prepared by this firm. If the owner wishes greater assurance as to the construction cost, an independent cost estimator should be employed.