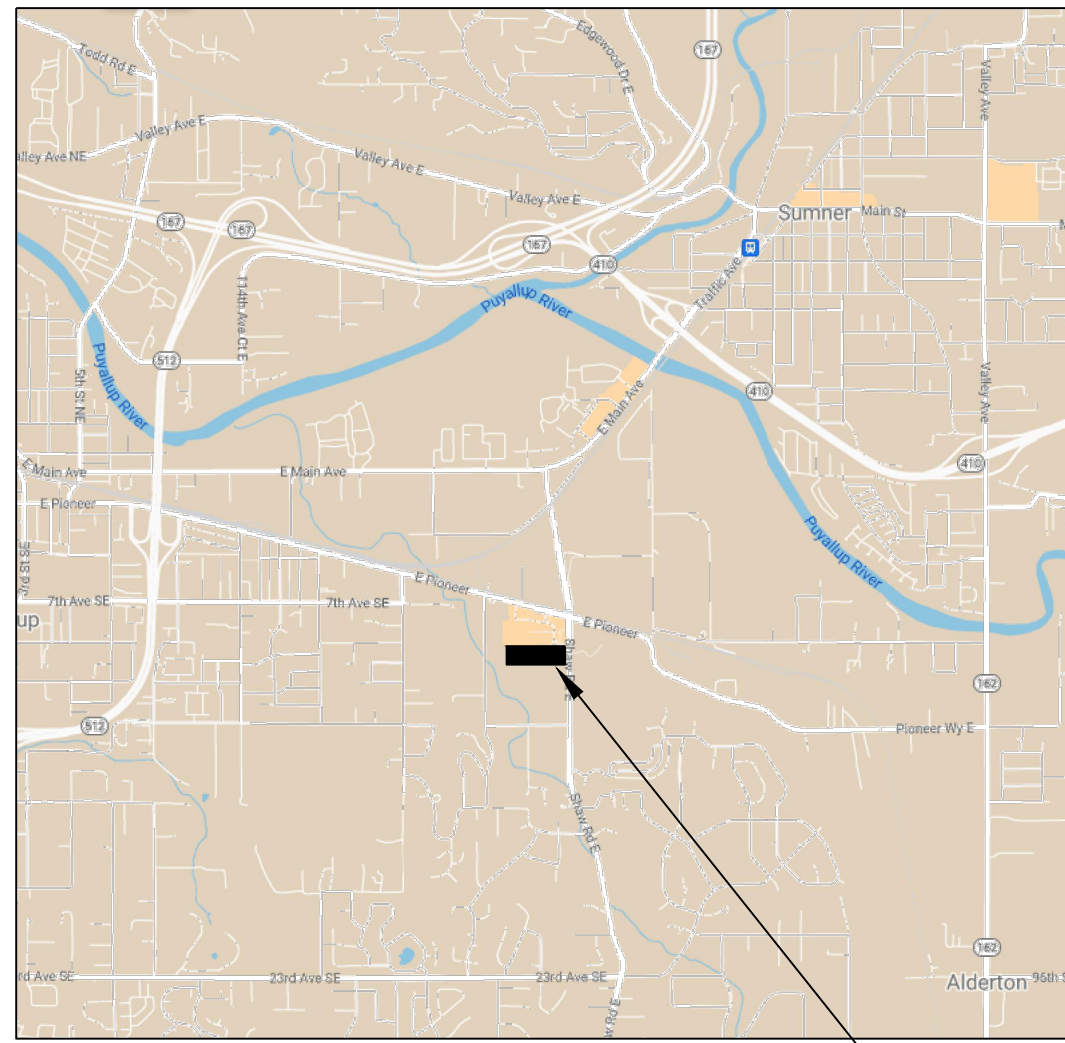


CASCADE SHAW

SECTION 35, TOWNSHIP 20 N, RANGE 4 E, W.M.

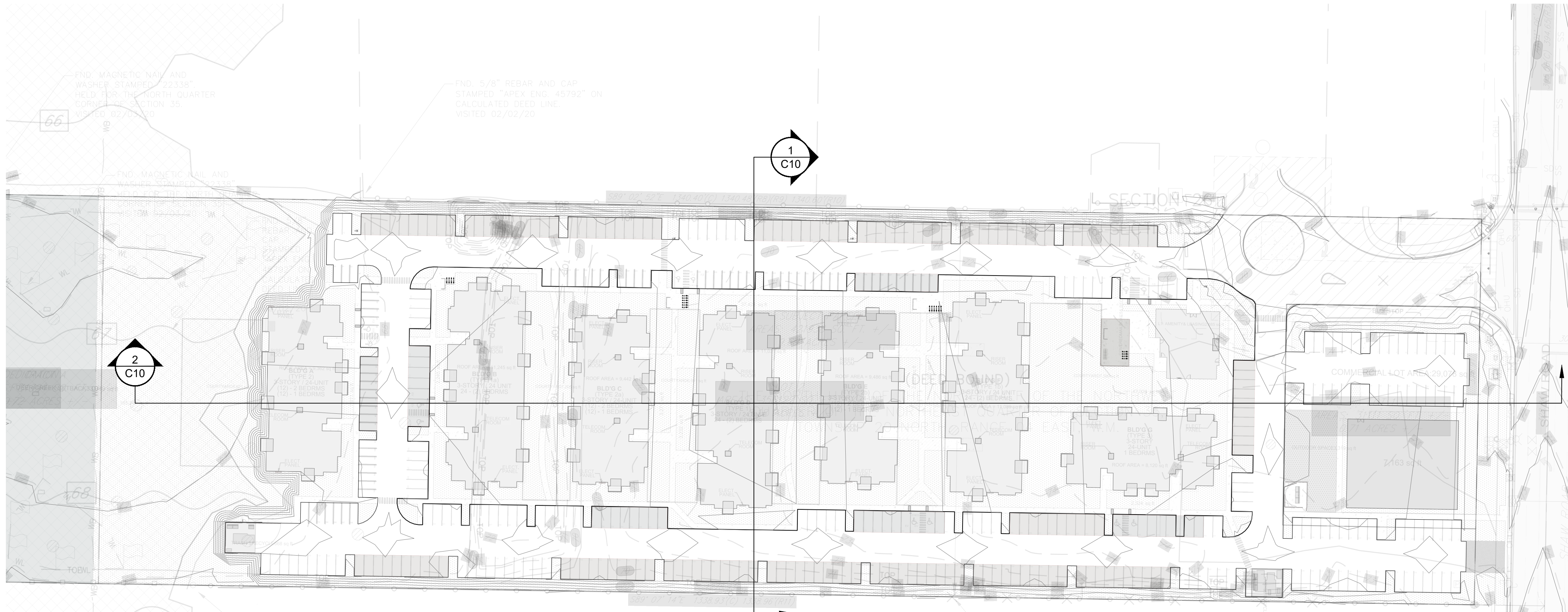
SHEET INDEX

SHEET NUMBER	SHEET NAME	DESCRIPTION
1	C-1	COVER SHEET
2	C-2	GRADING 1
3	C-3	GRADING 2
4	C-4	DRAINAGE 1
5	C-5	DRAINAGE 2
6	C-6	PROFILES
7	C-7	NOTES 1
8	C-8	NOTES 2
9	C-9	NOTES 3
10	C-10	NOTES 4



VICINITY MAP
SCALE: NTS

PROJECT SITE



TOPOGRAPHIC SURVEY MASTER LEGEND:

- EXISTING STORMDRAIN MANHOLE
- ⊠ EXISTING STORMDRAIN CATCHBASIN
- < EXISTING STORMDRAIN CULVERT END
- EXISTING SANITARY SEWER MANHOLE
- SS EXISTING SANITARY SEWER VAULT
- ↑ EXISTING SANITARY SEWER VENT STAND PIPE
- SS EXISTING SANITARY SEWER LINE VALVE
- ⊠ EXISTING WATER VAULT
- ⊠ EXISTING WATER METER
- ⊠ EXISTING WATER VALVE
- ⊠ EXISTING FIRE HYDRANT
- ⊠ EXISTING UTILITY JUNCTION BOX
- ⊠ EXISTING TRAFFIC SIGNAL CONTROL CABINET
- ⊠ EXISTING UTILITY POLE
- ⊠ EXISTING LUMINAIRE
- ⊠ EXISTING FENCE GATE POST
- ⊠ EXISTING BOLLARD
- ⊠ EXISTING SIGN
- ⊠ EXISTING MONITORING WELL
- ⊠ HABITAT TECHNOLOGIES DELINEATED
- ⊠ EXISTING SURFACE SPOT GRADE

- SECTIONAL SUBDIVISIONAL LINE
- RIGHT OF WAY CENTERLINE
- RIGHT OF WAY MARGIN
- SUBJECT PARCEL DEED LINE
- EASEMENT LINE
- EXISTING WOOD FENCE
- EXISTING CHAINLINK FENCE
- EXISTING 1 FOOT MAJOR CONTOUR INTERVAL
- EXISTING 1 FOOT MINOR CONTOUR INTERVAL
- SD EXISTING STORMDRAIN LINE
- SS EXISTING SANITARY SEWER LINE
- WL HABITAT TECHNOLOGIES DELINEATED
- WB WETLAND BOUNDARY LINE

- EXISTING CONCRETE SURFACE
- EXISTING POROUS CONCRETE SURFACE
- EXISTING ASPHALT SURFACE
- EXISTING RIP RAP SURFACE
- EXISTING DIRT ACCESS ROAD
- EXISTING WETLAND AREA
- "DEER CREEK" CITY OF PUYALLUP TYPE II STREAM BUFFER AREA

TOPOGRAPHIC NOTE

THE EXISTING CULTURAL AND TOPOGRAPHICAL DATA SHOWN ON THESE DRAWINGS HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, MCINNIS ENGINEERING CANNOT ENSURE ACCURACY AND THIS IS NOT RESPONSIBLE FOR THE ACCURACY OF THAT INFORMATION OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DRAWINGS AS A RESULT.

FILL SPECIFICATIONS

FILL MATERIAL SHALL NOT CONTAIN PETROLEUM PRODUCTS, OR SUBSTANCES WHICH ARE HAZARDOUS, DANGEROUS, TOXIC, OR WHICH OTHERWISE VIOLATE ANY STATE, FEDERAL OR LOCAL LAW, ORDINANCE, CODE, REGULATION, RULE, ORDER, OR STANDARD.

FIRE SPRINKLER NOTE

FIRE LINE SHALL BE SIZED BY A LICENSED FIRE PROTECTION ENGINEER. A SEPARATE, DETAILED PLAN SHALL BE APPROVED BY THE FIRE MARSHALL AND INSTALLED BY A WASHINGTON CERTIFIED LEVEL "U" CONTRACTOR IN ACCORDANCE WITH WAC 212-80-010. A POST INDICATOR VALVE SHALL BE INSTALLED ON THE SPRINKLER LINE TO ISOLATE THE FIRE SYSTEM FROM THE WATER SYSTEM WHEN REQUIRED.

TRENCH NOTES

IF WORKERS ENTER ANY TRENCH OR OTHER EXCAVATION FOUR OR MORE FEET IN DEPTH THAT DOES NOT MEET THE OPEN PIT REQUIREMENTS OF WSDOT SECTION 2-09.3(3)8, IT SHALL BE SHORED AND CRIBBED. THE CONTRACTOR IS ALONE RESPONSIBLE FOR WORKER SAFETY. ALL TRENCH SAFETY SYSTEMS SHALL MEET THE REQUIREMENTS OF THE WASHINGTON INDUSTRIAL SAFETY AND HEALTH ACT, CHAPTER 49.17 RCW.

VERIFICATION NOTE

ALL EXISTING UTILITIES IN THE CONSTRUCTION AREA SHALL BE IDENTIFIED AND VERIFIED FOR DEPTH AND LOCATION PRIOR TO ANY CONSTRUCTION ACTIVITIES SO TO IDENTIFY ANY POTENTIAL CONFLICTS WITH PROPOSED CONSTRUCTION. CONTACT PROJECT ENGINEER IMMEDIATELY IF ANY CONFLICTS ARE IDENTIFIED.

PRIOR TO ANY CONSTRUCTION ACTIVITIES, VERIFY EXISTING TOPOGRAPHY IS CONSISTENT WITH WHAT IS SHOWN ON PLANS AND IF THERE ARE ANY POTENTIAL CONFLICTS WITH PROPOSED CONSTRUCTION ACTIVITIES, CONTACT PROJECT ENGINEER IMMEDIATELY IF ANY CONFLICTS ARE IDENTIFIED.

CONSTRUCTION SEQUENCE

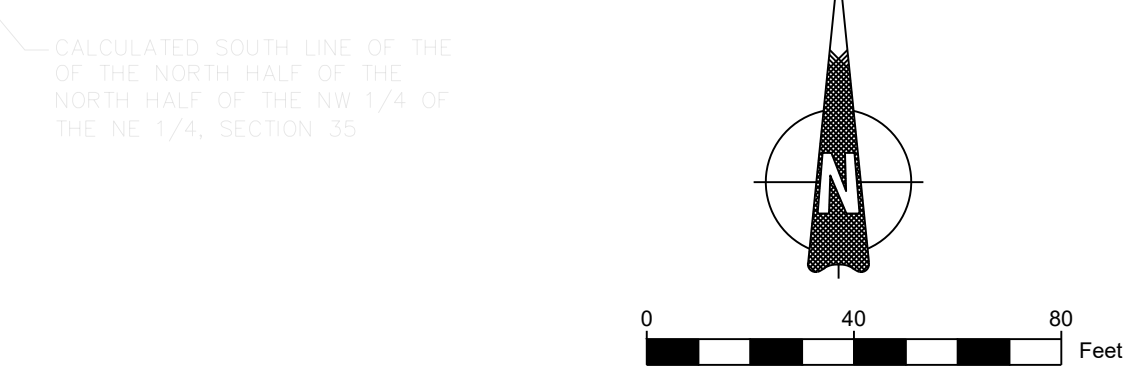
- OBTAIN REQUIRED PERMITS AND HOLD A PRE-CONSTRUCTION MEETING WITH THE COUNTY
- POTHOLE ANY EXISTING UTILITIES FOR VERIFICATION OF DEPTH AND LOCATION. SEE VERIFICATION NOTE
- GRADE SITE
- CONSTRUCT BUILDINGS
- CREATE BIoretention
- BUILD PARKING LOT
- ARRANGE FINAL INSPECTION WITH THE CITY

HORIZONTAL DATUM
NAD 83/91 STATE PLANE, SOUTH ZONE AS COMPUTED FROM DATA SHEETS AS HELD BY THE WASHINGTON STATE COUNCIL OF COUNTY SURVEYORS (W.C.C.S.). ALL DISTANCES SHOWN HEREON ARE GROUND. UNIT OF MEASUREMENT IS U.S. SURVEY FEET.

VERTICAL DATUM
NAVD 88 AS DEFINED BY THE NATIONAL GEODETIC SURVEY (NGS)
PROJECT BENCHMARK DESIGNATION: 21 010
PID: DL2774
PUBLISHED ELEVATION: 75.70 FEET (NAVD 88)
DESCRIPTION: ENCASED STEEL ROD LOCATED IN EASTERLY GRAVEL SHOULDER AT THE INTERSECTION OF PIONEER WAY AND 134TH AVE E

SURVEYOR'S NOTES

- THE PURPOSE OF THIS SURVEY IS FOR CONTEMPLATED FUTURE PLANNING AND DEVELOPMENT OF THE SUBJECT PARCEL.
- DATE OF SURVEY: JANUARY AND FEBRUARY OF 2015, JUNE OF 2016, MARCH AND JULY OF 2019, JANUARY AND FEBRUARY OF 2020.
- THIS SURVEY DOES NOT PURPORT TO SHOW ANY EASEMENTS OF RECORD. THERE MAY EXIST MATTERS OF TITLE OR EASEMENTS NOT SHOWN HEREON. FULL RELIANCE WAS PLACED UPON THE SUPPLIED TITLE REPORT STATED HEREIN.
- IN ACCORDANCE WITH REVISED CODE OF WASHINGTON (R.C.W.) 58.09 AND THE WASHINGTON ADMINISTRATIVE CODE (W.A.C.) 332-130, THIS SURVEY MAY DEPICT OCCUPATIONAL INDICATORS THAT DIFFER FROM THE DEEDED LOT LINES (SUCH AS FENCES, ETC.). THESE INDICATORS, IF AT ALL PRESENT, MAY REPRESENT A POTENTIAL FOR CLAIMS OF UNWRITTEN TITLE. THIS SURVEY DOES NOT PURPORT TO RESOLVE SUCH MATTERS.
- THE CONTOUR INTERVAL AS SHOWN HEREON IS 1 FOOT AND IS GENERATED FROM DIRECT FIELD OBSERVATIONS.
- THE UTILITIES SHOWN HEREON, IF ANY, ARE BASED UPON SURFACE EVIDENCE FIELD OBSERVATIONS. UTILITIES MAY EXIST THAT ARE NOT SHOWN HEREON.
- THE LIMITS OF TOPOGRAPHY AS AGREED UPON BETWEEN ABBEY ROAD GROUP AND THE CLIENT WERE LIMITED TO THE SUBJECT PARCEL AND FULL RIGHT OF WAY WIDTHS OF ADJUTING ROADS 50 FEET NORTHSOUTH +/- OF THE SUBJECT PARCEL.
- THIS SURVEY WAS PREPARED FOR THE EXCLUSIVE USE OF CASCADE SHAW DEVELOPMENT, LLC AND DOES NOT EXTEND TO ANY UNNAMED PERSON OR PERSONS WITHOUT EXPRESS CERTIFICATION BY SURVEYOR NAMING SAID PARTY.



SURVEYOR
ABBNEY ROAD GROUP
CONTACT: LARRY WALKER
P.O. BOX 1224
PUYALLUP, WA 98371
OFFICE: 253-435-3699

ARCHITECT
SYNTHESIS 9
CONTACT: BRETT LINDSAY
523 N. D ST.
TACOMA, WA 98403
OFFICE: 253-468-4117

CIVIL ENGINEER
MCINNIS ENGINEERING
535 DOCK ST. STE. 111
TACOMA, WA 98402
CONTACT: WILL MCINNIS
OFFICE: 253-414-1992

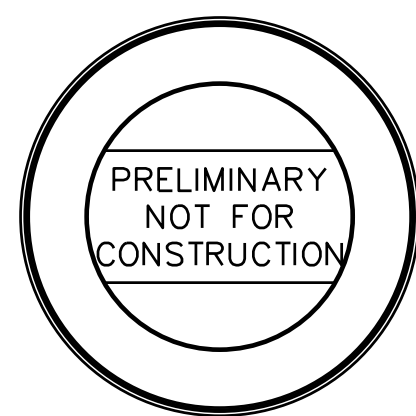
SITE INFORMATION
PARCEL: 0420351003
ADDRESS: 808 SHAW RD
ZONING: RM-20 - High Density
Multiple-Family Residential

LEGAL DESCRIPTION
PER FIRST AMERICAN TITLE INSURANCE COMPANY, SUBDIVISION GUARANTEE, GUARANTEE NO. 5003353-0003195E WITH A DATE OF GUARANTEE OF NOVEMBER 3, 2021.

THE NORTH HALF OF THE NORTH HALF OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M.

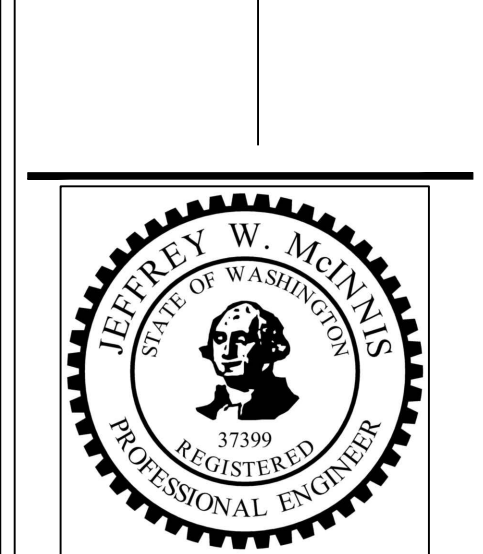
EXCEPT THE EAST 30 FEET FOR SHAW ROAD;
EXCEPT THAT PORTION CONVEYED TO THE CITY OF PUYALLUP BY DEED RECORDED UNDER RECORDING NUMBER 200702120863.

SITUATE IN THE CITY OF PUYALLUP, COUNTY OF PIERCE, STATE OF WASHINGTON.



McInnis ENGINEERING
253.414.1992
mcinnisengineering.com
535 Dock Street, Suite 111, Tacoma, WA 98402

CASCADE SHAW
SECTION 35, TOWNSHIP 20 N,
RANGE 4 E, W.M.



DESCRIPTION	DATE	NUM	SCALE
DESIGNED			1"=20'
J. MCINNIS			
DRAWN			CHECKED
W. MCINNIS			CHCK
DATE			APPROVED
2/22/23			APRD

SHEET
1 OF 10

CALL BEFORE YOU DIG
1-800-424-5555 OR 811

C-1

CASCADE SHAW

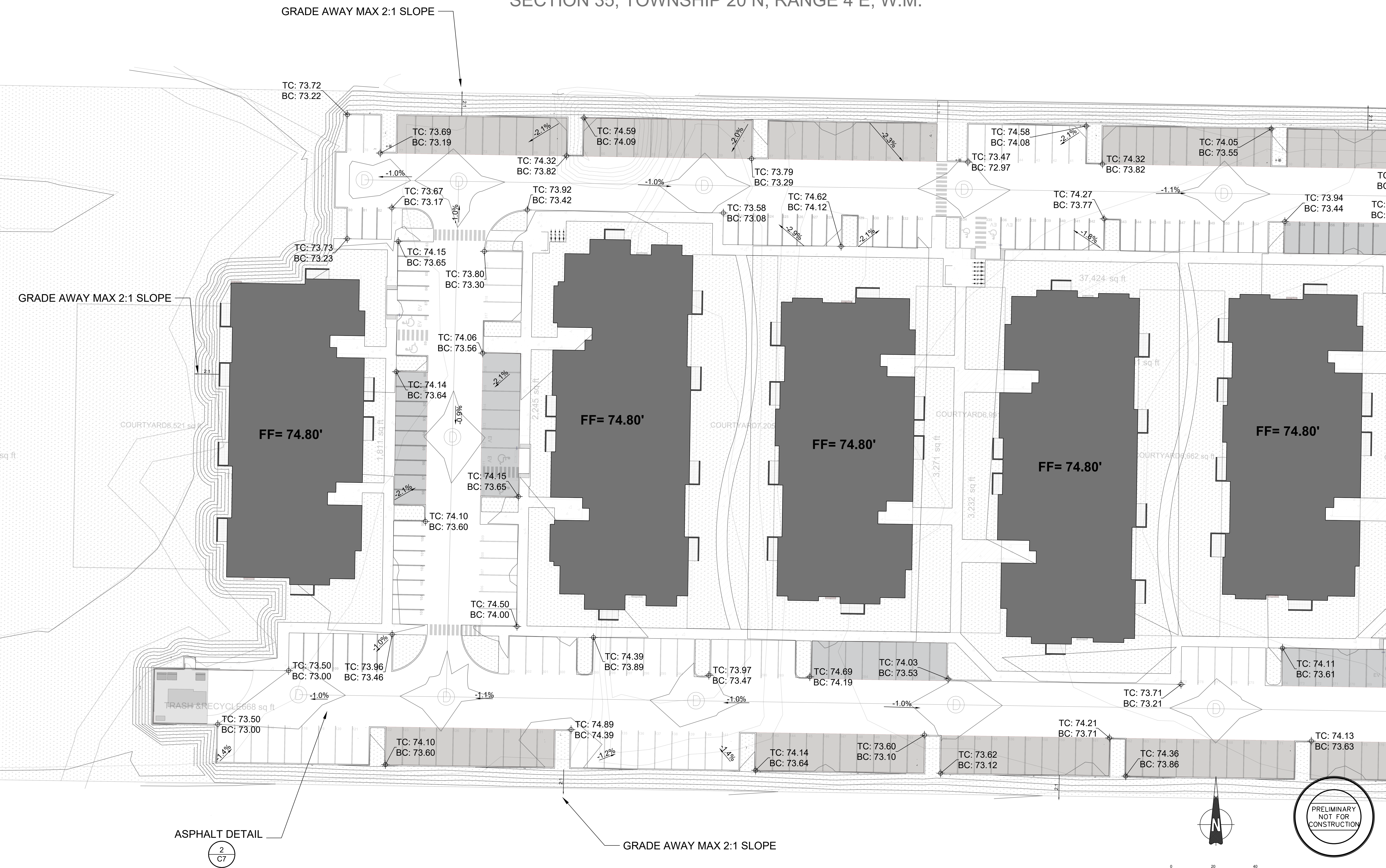
GRADING PLAN I

SECTION 35, TOWNSHIP 20 N, RANGE 4 E, W.M.

McInnis
ENGINEERING

253.414.1992
mcinisengineering.com

535 Dock Street, Suite 111, Tacoma, WA 98402



CASCADE SHAW

SECTION 35, TOWNSHIP 20 N,
RANGE 4 E, W.M.

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS	SCALE 1"=20'
DRAWN W. MCINNIS	CHECKED CHCK
DATE 2/22/23	APPROVED APRD

SHEET
2 OF 10

C-2

PRELIMINARY
NOT FOR
CONSTRUCTION

CALL BEFORE YOU DIG
1-800-424-5555 OR 811

CASCADE SHAW

GRADING PLAN II

SECTION 35, TOWNSHIP 20 N, RANGE 4 E, W.M.

GRADE AWAY MAX 2:1 SLOPE

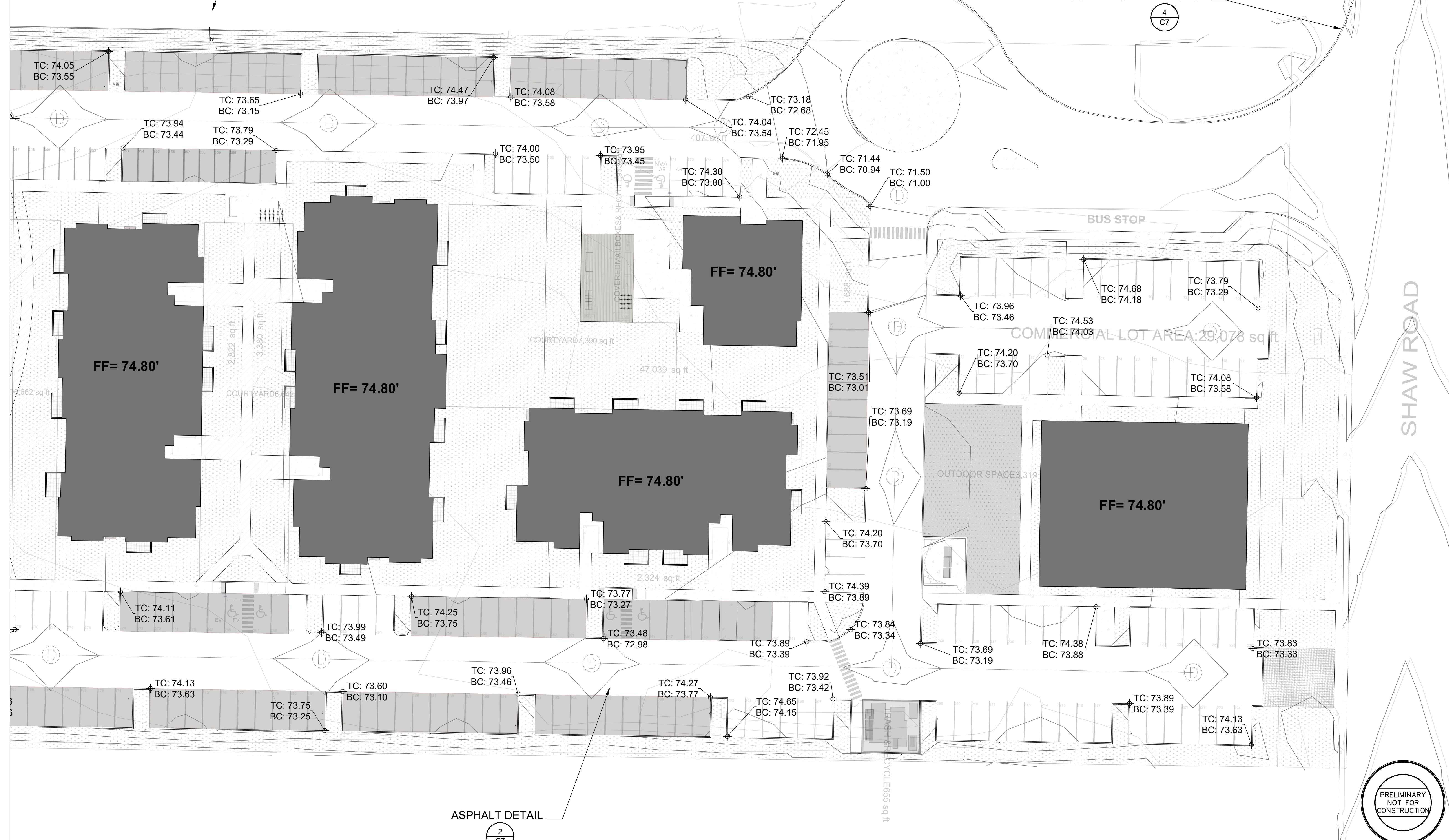
STD COMMERCIAL APPROACH

4
C7

CASCADE SHAW

SECTION 35, TOWNSHIP 20 N,
RANGE 4 E, W.M.

SHAW ROAD



ASPHALT DETAIL

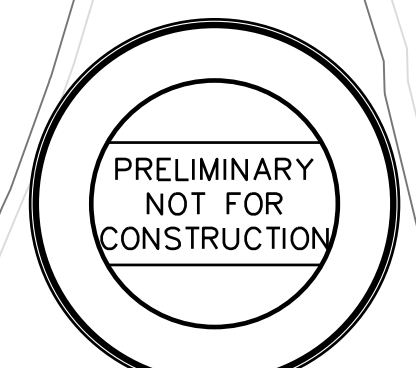
2
C7

BUS STOP

COMMERCIAL LOT AREA: 29,078 sq ft

OUTDOOR SPACE 3,319

FF= 74.80'



NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS	SCALE 1"=20'
DRAWN W. MCINNIS	CHECKED CHK
DATE 2/22/23	APPROVED APRD

SHEET
3 OF 10

C-3

CALL BEFORE YOU DIG
1-800-424-5555 OR 811

CASCADE SHAW

SECTION 35, TOWNSHIP 20 N, RANGE 4 E, W.M.

CASCADE SHAW

SECTION 35, TOWNSHIP 20 N,
RANGE 4 E, W.M.

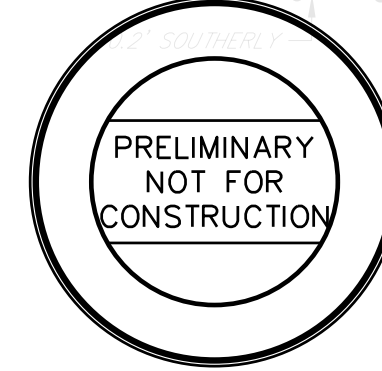
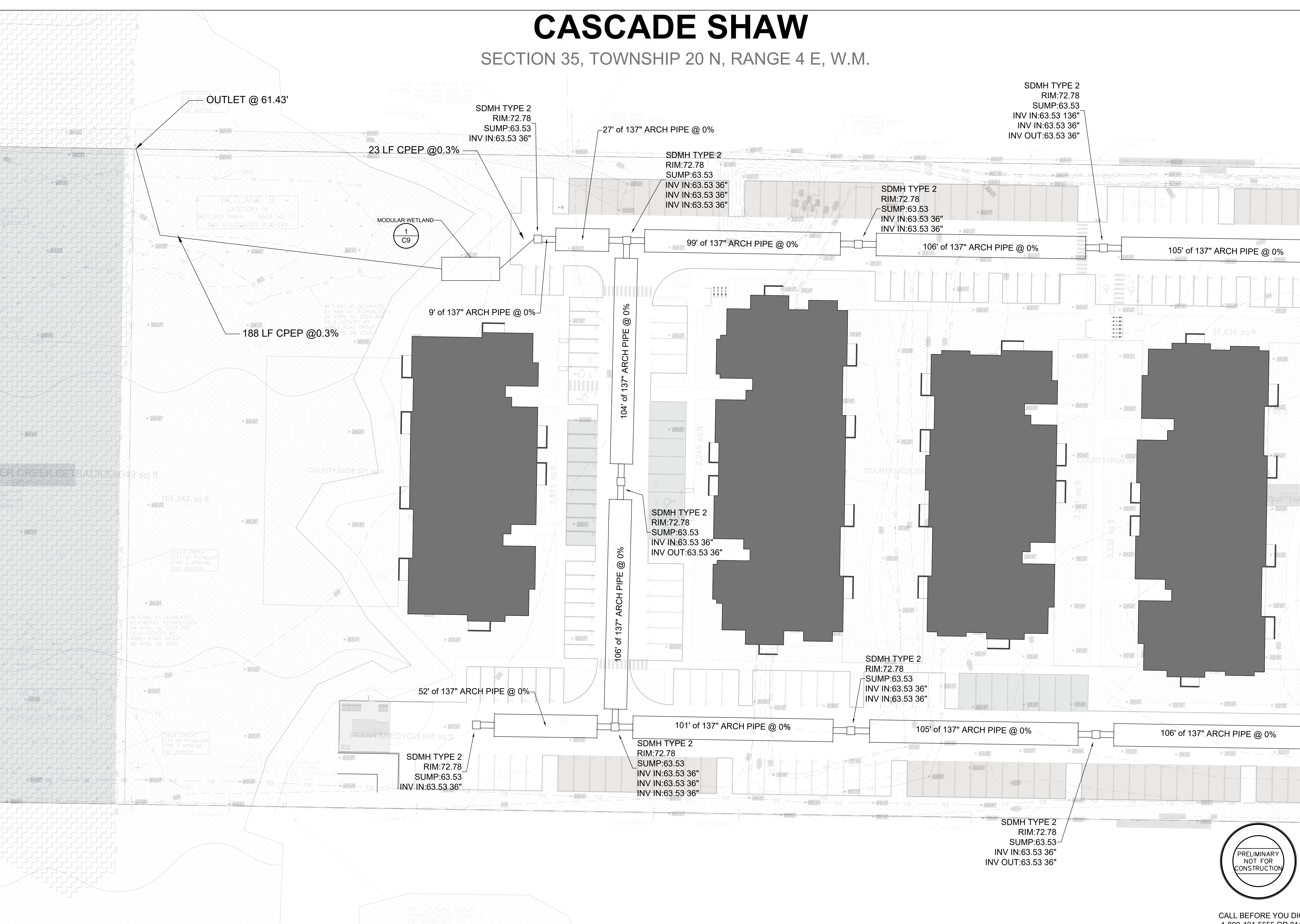


NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS	SCALE 1"=20'
DRAWN W. MCINNIS	CHECKED CHK
DATE 2/22/23	APPROVED APRD

SHEET
4 OF 10

C-4



CALL BEFORE YOU DIG
1-800-424-5555 OR 811

CASCADE SHAW

SECTION 35, TOWNSHIP 20 N, RANGE 4 E, W.M.

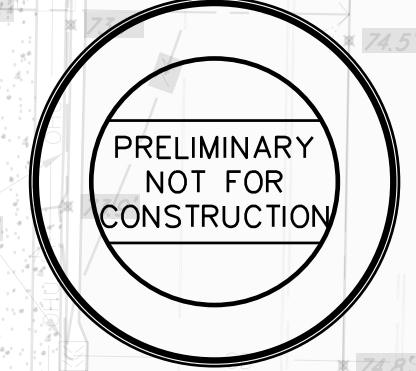
PROJECT ADDRESS
CASCADE SHAW



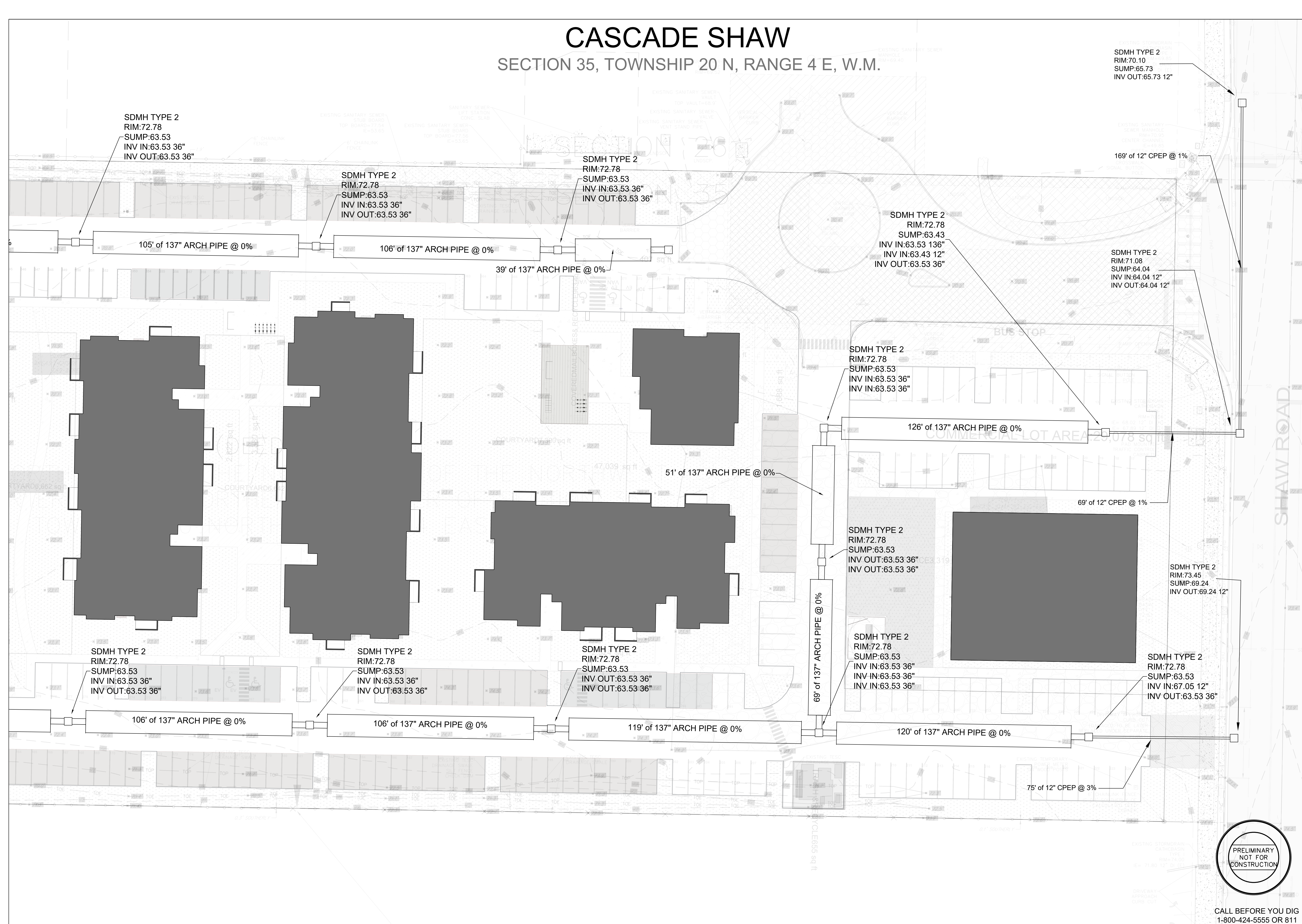
DESCRIPTION	DATE	NUM	DESIGNED	SCALE
			W. MCINNIS	1"=20'
			DRAWN	CHECKED
			W. MCINNIS	CHK
			DATE	APPROVED
			2/22/23	APRD

SHEET
5 OF 10

C-5



CALL BEFORE YOU DIG
1-800-424-5555 OR 811



SDMH TYPE 2
RIM:72.78
SUMP:63.53
INV IN:63.53 36"
INV OUT:63.53 36"

SDMH TYPE 2
RIM:72.78
SUMP:63.53
INV IN:63.53 36"
INV OUT:63.53 36"

SDMH TYPE 2
RIM:72.78
SUMP:63.53
INV IN:63.53 36"
INV OUT:63.53 36"

SDMH TYPE 2
RIM:72.78
SUMP:63.43
INV IN:63.53 136"
INV IN:63.43 12"
INV OUT:63.53 36"

SDMH TYPE 2
RIM:70.10
SUMP:65.73
INV OUT:65.73 12"

SDMH TYPE 2
RIM:71.08
SUMP:64.04
INV IN:64.04 12"
INV OUT:64.04 12"

SDMH TYPE 2
RIM:72.78
SUMP:63.53
INV IN:63.53 36"
INV IN:63.53 36"

SDMH TYPE 2
RIM:73.45
SUMP:69.24
INV OUT:69.24 12"

SDMH TYPE 2
RIM:72.78
SUMP:63.53
INV IN:63.53 36"
INV OUT:63.53 36"

SDMH TYPE 2
RIM:72.78
SUMP:63.53
INV IN:63.53 36"
INV OUT:63.53 36"

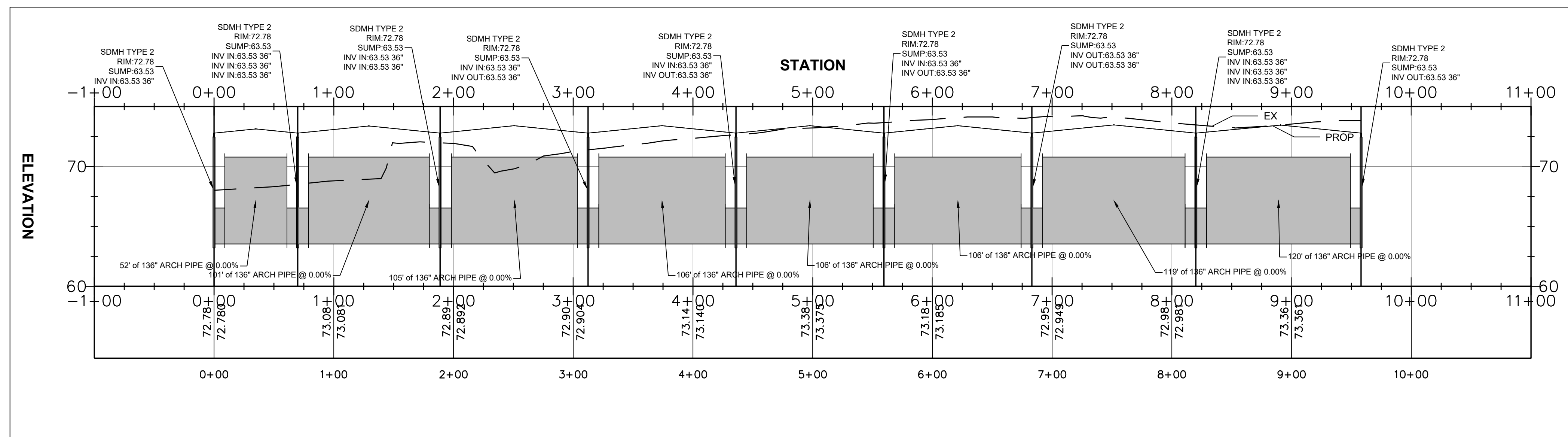
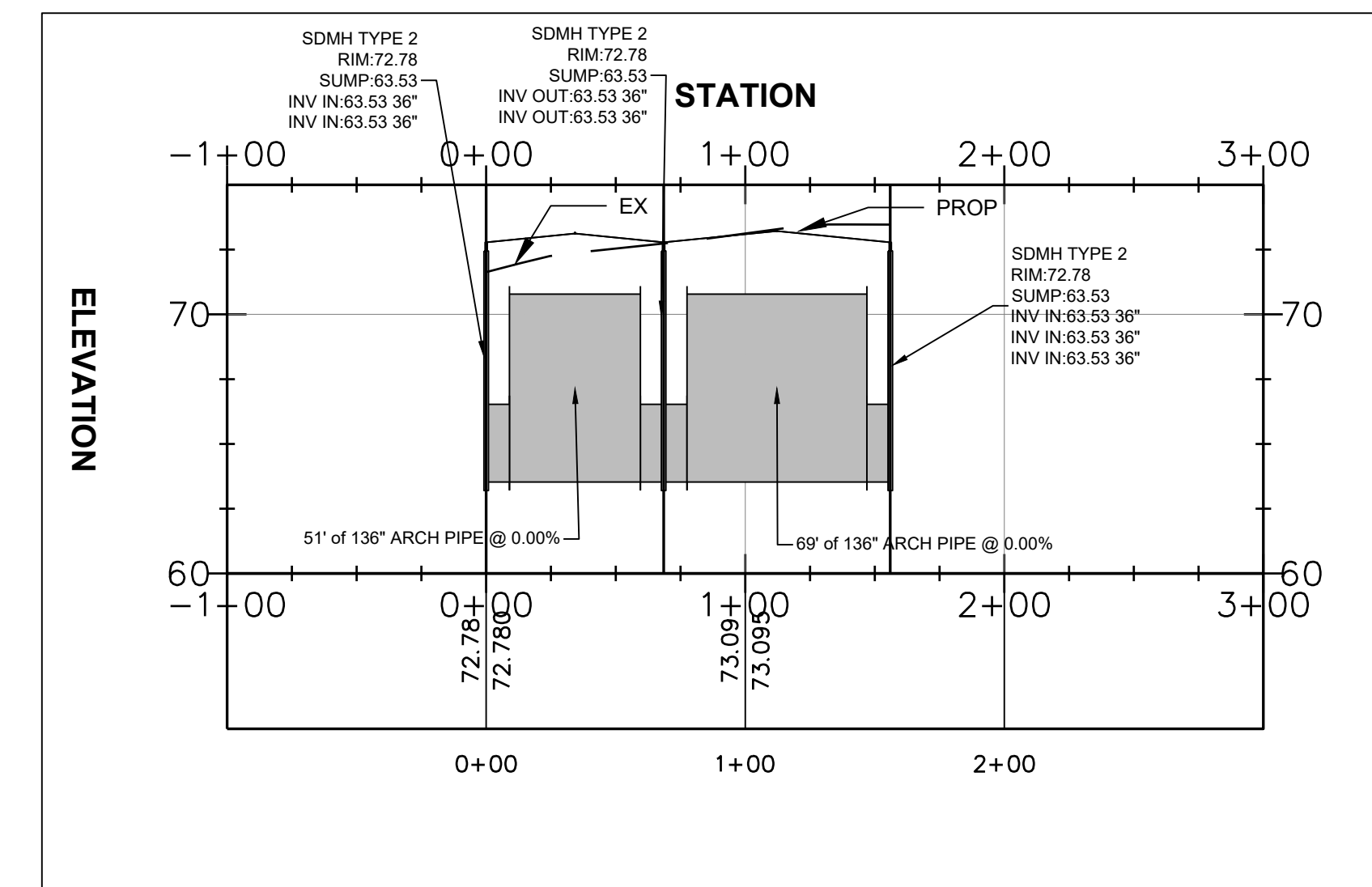
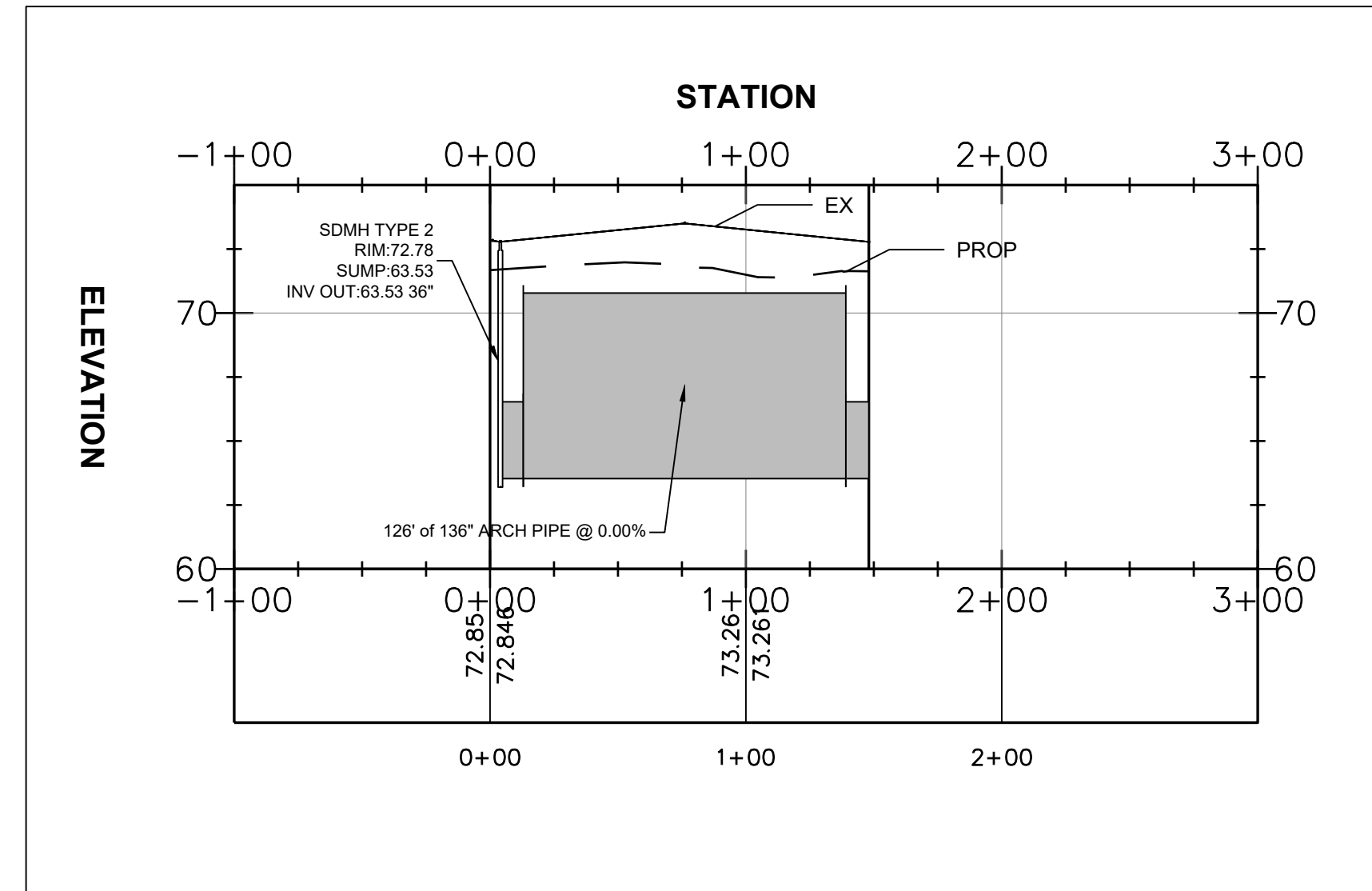
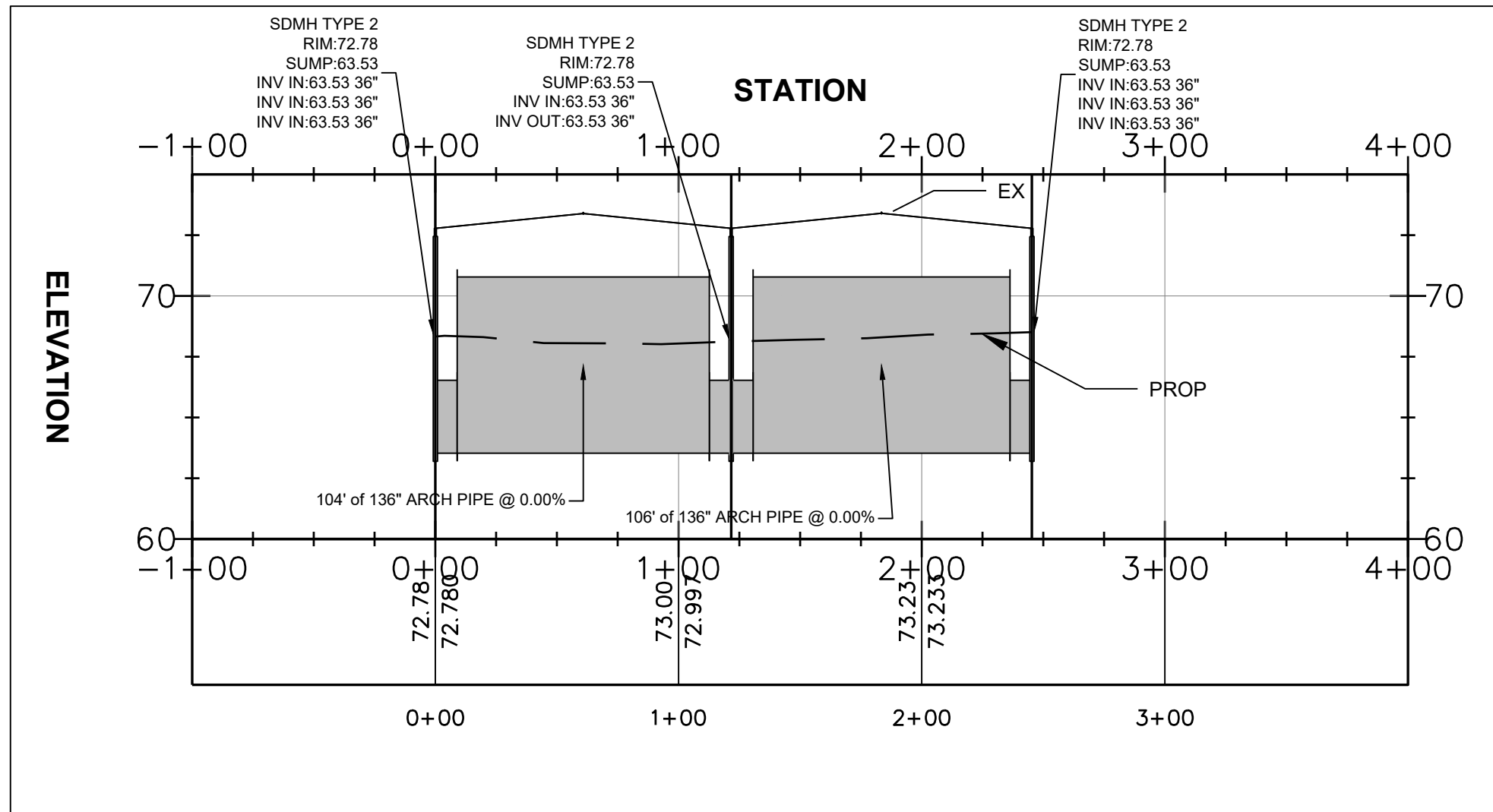
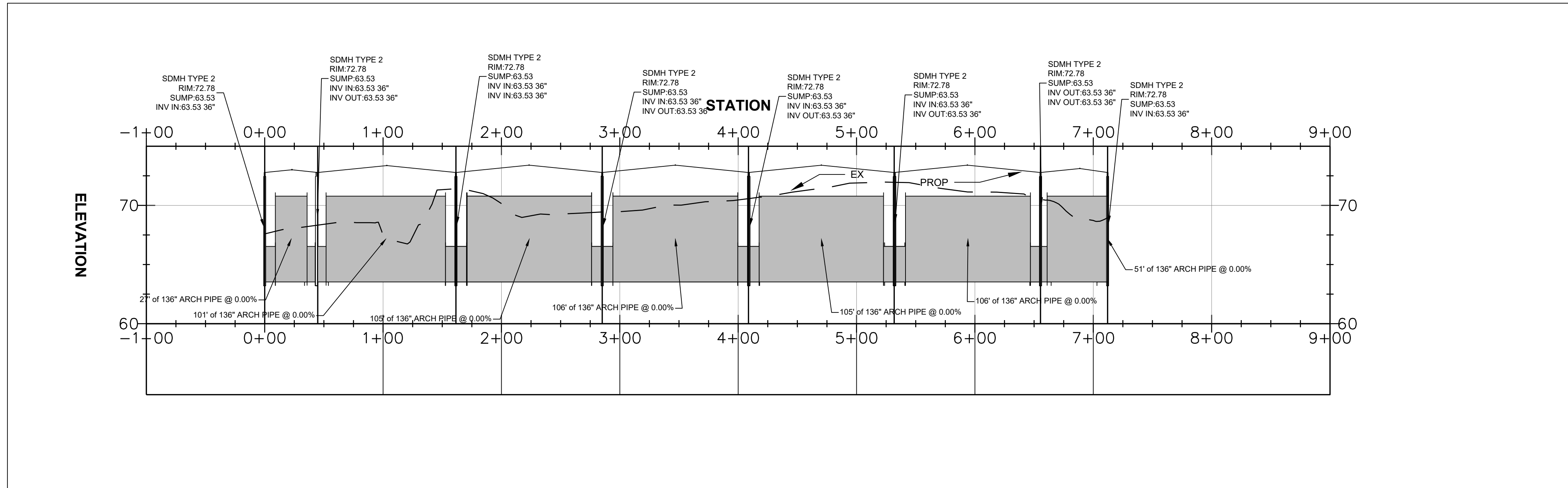
SDMH TYPE 2
RIM:72.78
SUMP:63.53
INV IN:63.53 36"
INV OUT:63.53 36"

SDMH TYPE 2
RIM:72.78
SUMP:63.53
INV IN:63.53 36"
INV IN:63.53 36"
INV IN:63.53 36"

SDMH TYPE 2
RIM:72.78
SUMP:63.53
INV IN:67.05 12"
INV OUT:63.53 36"

CASCADE SHAW

SECTION 35, TOWNSHIP 20 N, RANGE 4 E, W.M.



CASCADE SHAW

SECTION 35, TOWNSHIP 20 N,
RANGE 4 E, W.M.

DESCRIPTION

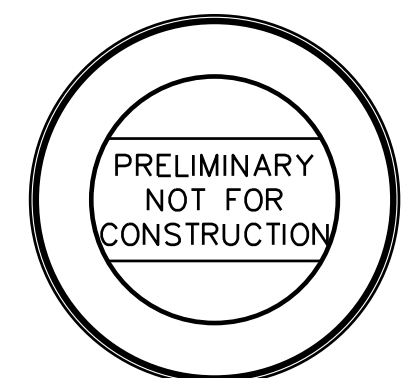
DATE

NUM

DESIGNED W. MCINNIS	SCALE 1"=20'
DRAWN W. MCINNIS	CHECKED CHK
DATE 2/22/23	APPROVED APRD

SHEET

6 OF 10

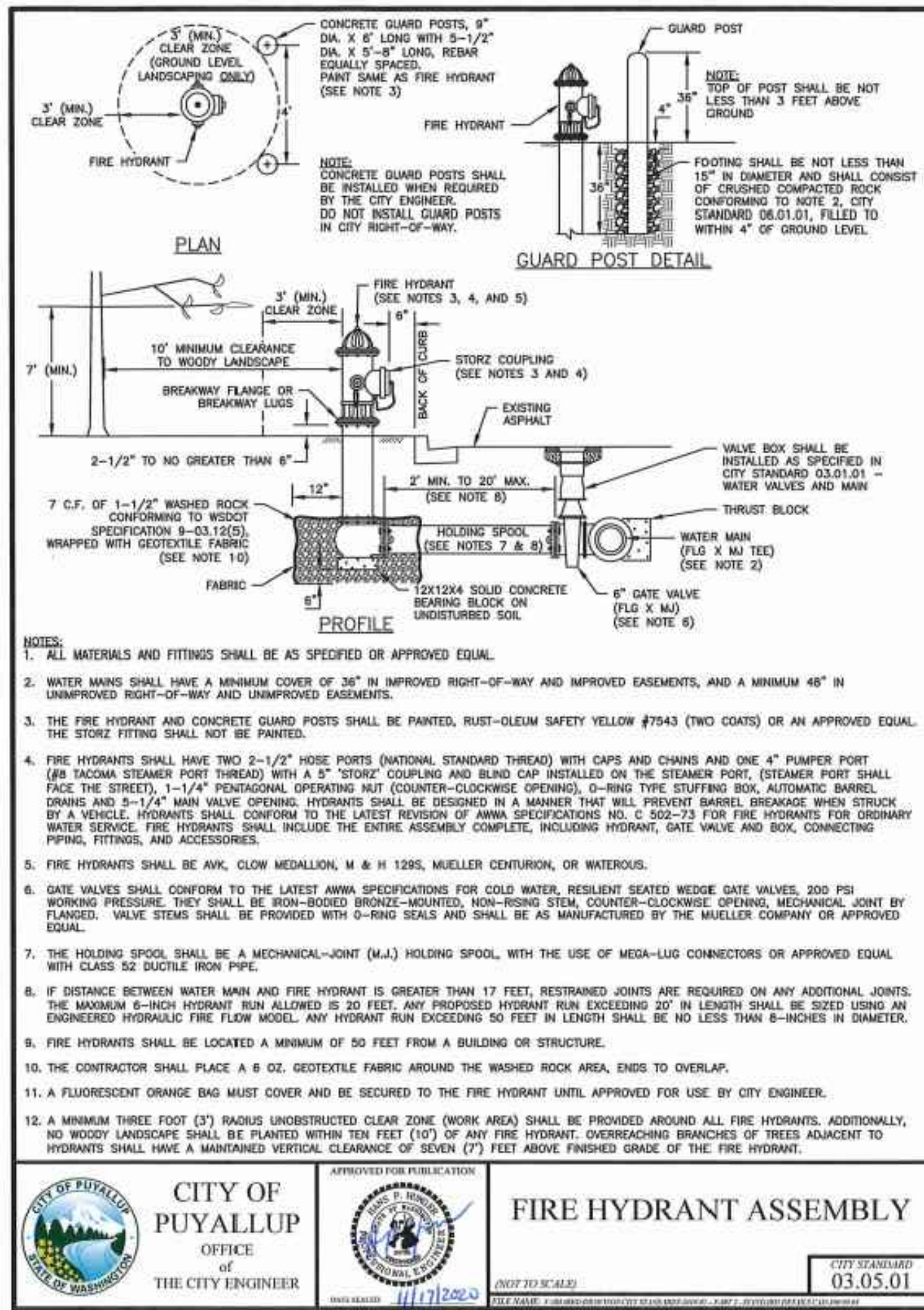


CALL BEFORE YOU DIG
1-800-424-5555 OR 811

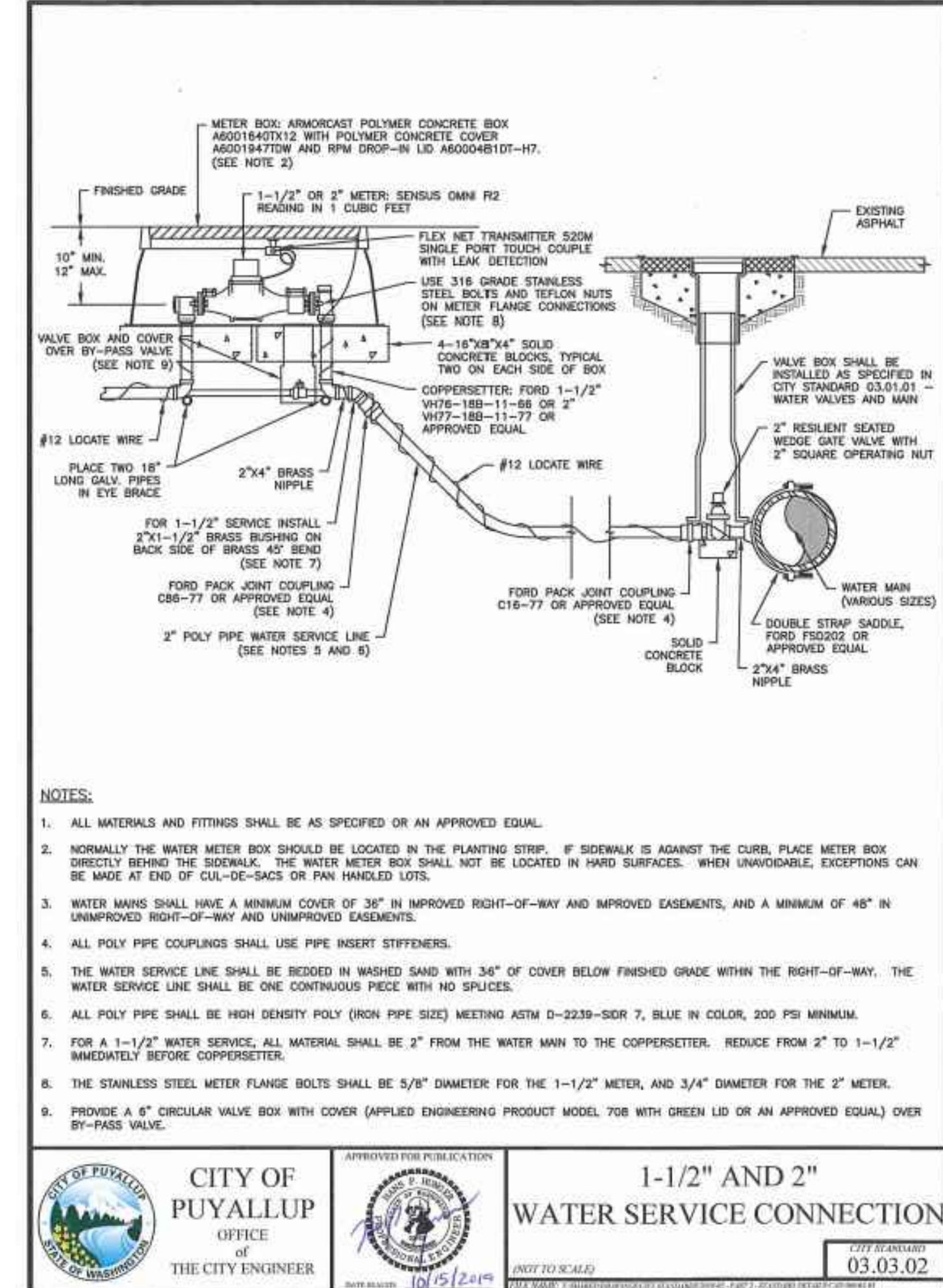
C-6

CASCADE SHAW

NOTES I

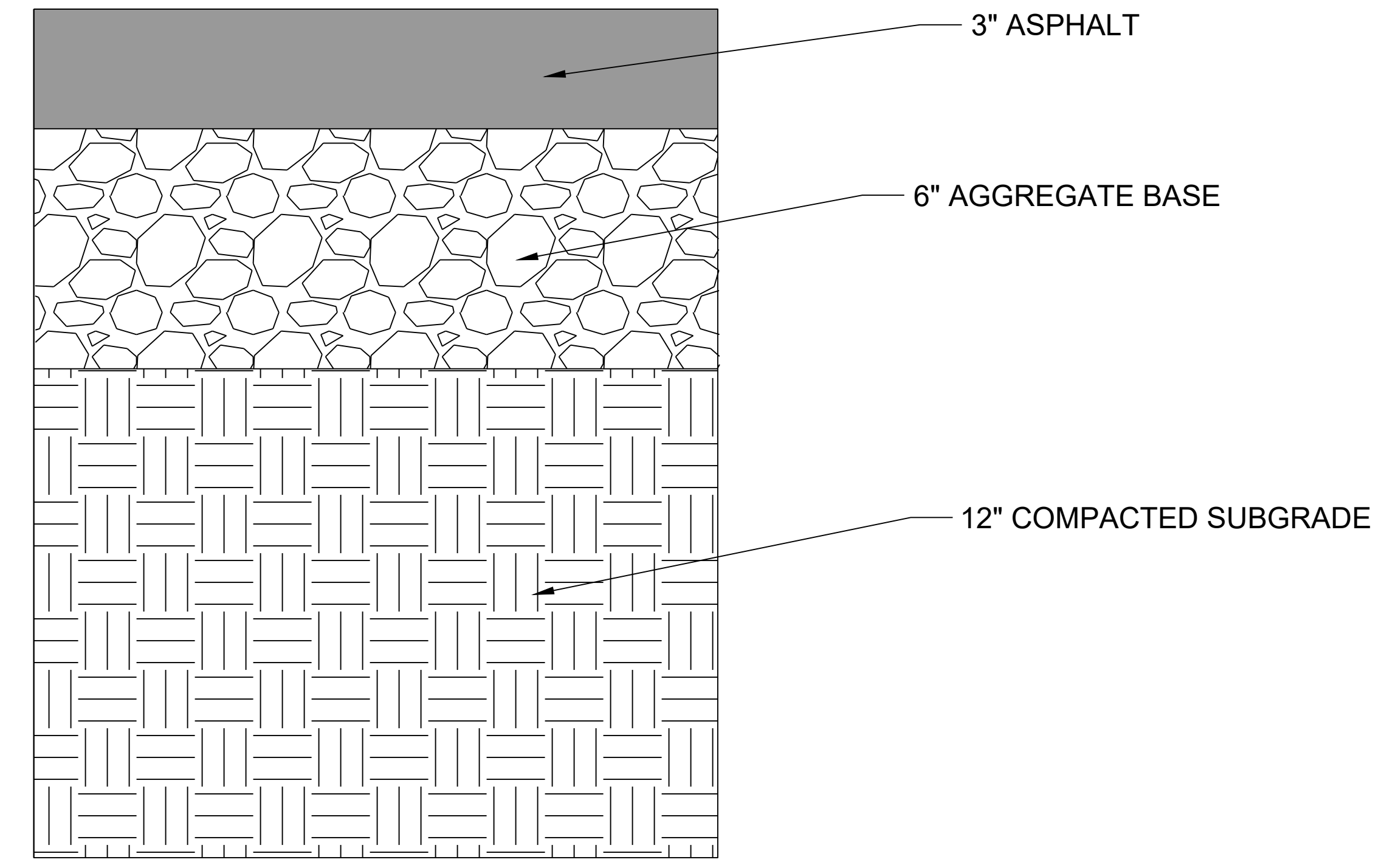


1 FIRE HYDRANT SCALENTS

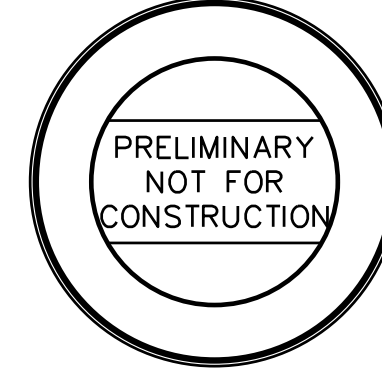
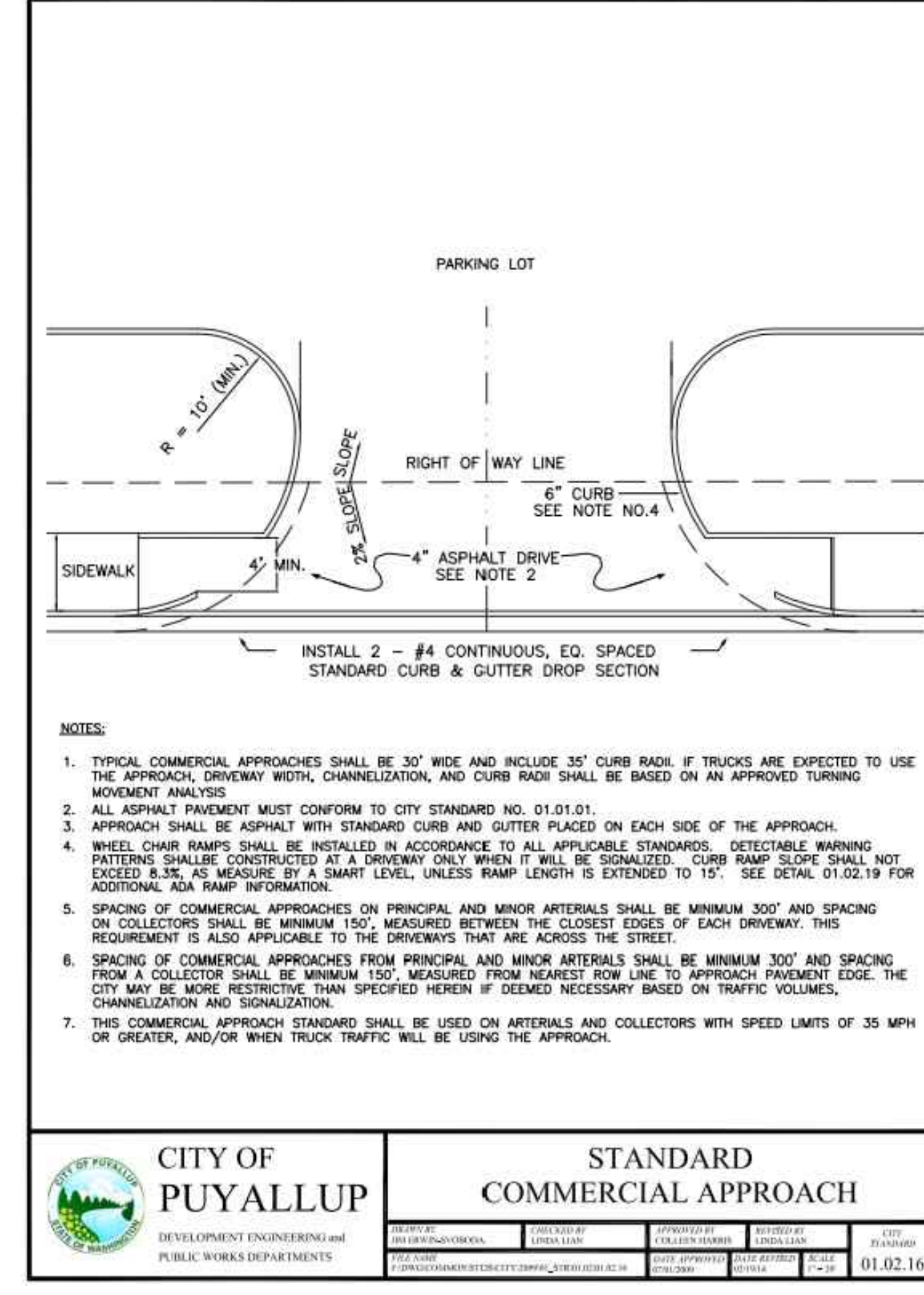


3 WATER SERVICE CONNECTION SCALENTS

2 ASPHALT PAVEMENT SCALENTS



4 STANDARD COMMERCIAL DRIVEWAY APPROACH SCALENTS



DESCRIPTION	DATE	NUM

DESIGNED	SCALE
J. MCINNIS	NTS
DRAWN	CHECKED
W. MCINNIS	CHCK
DATE	APPROVED
2/22/23	APRD

DETAILS AND NOTES I

SHEET 7 OF 10

CASCADE SHAW

NOTES II

CORRUGATED STEEL PIPE - ARCH

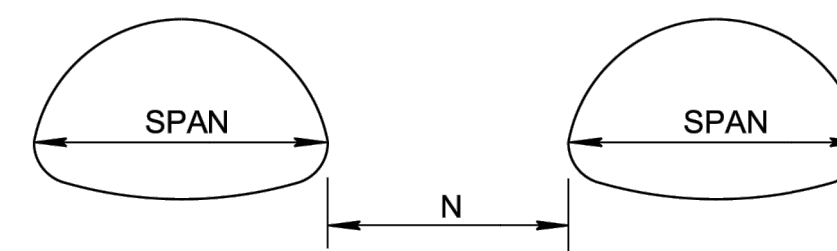
PIPE - ARCH DIMENSIONS			MINIMUM SHEET THICKNESS (INCHES)	FILL HEIGHT	
SPAN - RISE (INCHES)	EQUIVALENT PIPE DIAMETER (INCHES)	MINIMUM CORNER RADIUS (INCHES)		MINIMUM (INCHES)	MAXIMUM (FEET)
2 2/3" X 1 1/2" CORRUGATIONS					
17 X 13	15	3	0.079 - (14)	12	52
21 X 15	18	3	0.079 - (14)	12	42
24 X 18	21	3	0.079 - (14)	12	37
28 X 20	24	3	0.079 - (14)	12	32
35 X 24	30	3	0.079 - (14)	12	27
42 X 29	36	3.5	0.079 - (14)	12	22
49 X 33	42	4	0.109 - (12)	12	19
57 X 38	48	5	0.109 - (12)	12	18
64 X 43	54	6	0.109 - (12)	12	17
71 X 47	60	7	0.138 - (10)	12	16
77 X 52	66	8	0.168 - (8)	12	16
83 X 57	72	9	0.168 - (8)	12	15
3" X 1" AND 5" X 1" CORRUGATIONS					
40 X 31	36	5	0.079 - (14)	12	25
46 X 36	42	6	0.079 - (14)	12	23
53 X 41	48	7	0.079 - (14)	12	22
60 X 46	54	8	0.079 - (14)	12	20
66 X 51	60	9	0.079 - (14)	12	19
73 X 55	66	12	0.079 - (14)	12	20
81 X 59	72	14	0.079 - (14)	12	20
87 X 63	78	14	0.079 - (14)	12	18
95 X 67	84	16	0.079 - (14)	12	18
103 X 71	90	16	0.109 - (12)	12	17
112 X 75	96	18	0.109 - (12)	12	17
117 X 79	102	18	0.109 - (12)	12	16
128 X 83	108	18	0.138 - (10)	15	14
137 X 87	114	18	0.138 - (10)	18	13
142 X 91	120	18	0.168 - (8)	18	13

CORRUGATED ALUMINUM PIPE - ARCH

PIPE - ARCH DIMENSIONS			MINIMUM SHEET THICKNESS (INCHES)	FILL HEIGHT	
SPAN - RISE (INCHES)	EQUIVALENT PIPE DIAMETER (INCHES)	MINIMUM CORNER RADIUS (INCHES)		MINIMUM (INCHES)	MAXIMUM (FEET)
2 2/3" X 1 1/2" CORRUGATIONS					
17 X 13	15	3	0.075 - (14)	12	52
21 X 15	18	3	0.075 - (14)	12	42
24 X 18	21	3	0.075 - (14)	12	37
28 X 20	24	3	0.075 - (14)	12	32
35 X 24	30	3	0.075 - (14)	12	25
42 X 29	36	3.5	0.075 - (14)	12	22
49 X 33	42	4	0.105 - (12)	12	19
57 X 38	48	5	0.105 - (12)	12	18
64 X 43	54	6	0.135 - (10)	12	17
71 X 47	60	7	0.164 - (8)	12	16
3" X 1" CORRUGATIONS					
60 X 46	54	8	0.075 - (14)	12	20
66 X 51	60	9	0.075 - (14)	12	19
73 X 55	66	12	0.075 - (14)	12	20
81 X 59	72	14	0.105 - (12)	12	20
87 X 63	78	14	0.105 - (12)	12	18
95 X 67	84	16	0.105 - (12)	12	18
103 X 71	90	16	0.135 - (10)	12	17
112 X 75	96	18	0.164 - (8)	12	16

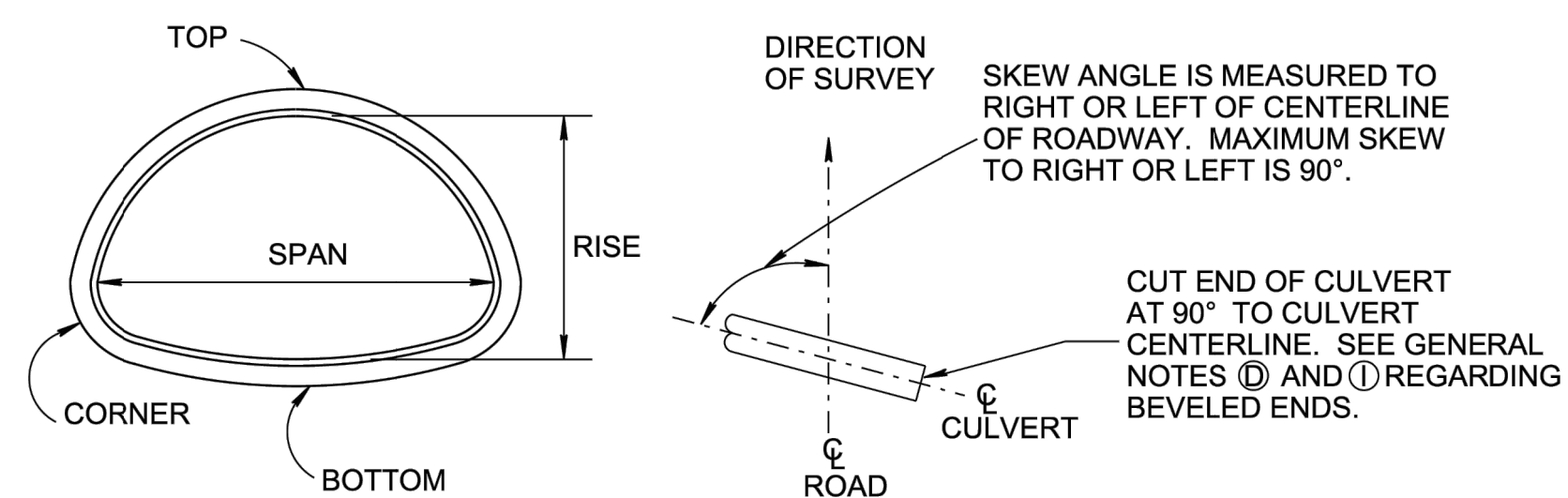
FOOTNOTES

- ① 3" X 1" CORRUGATION ONLY
- ② ALUMINUM BOLTS / STEEL BOLTS. WHERE A SINGLE NUMBER IS SHOWN IN THIS COLUMN, EITHER ALUMINUM OR STEEL BOLTS MAY BE USED.



SPAN	MINIMUM SPACE (N) BETWEEN PIPE - ARCHES WITH CLASS "B" OR "C" BEDDING
UP TO 35"	12"
42" TO 142"	1/3 SPAN OF PIPE - ARCH
145" TO 199"	48"

WHEN CLASS "A" BEDDING IS USED, A DETAIL SHALL BE SHOWN ON PLANS FOR MINIMUM SPACE BETWEEN PIPE - ARCHES.



PIPE - ARCH CULVERT DETAIL

SKIEW DETAIL FOR PIPE - ARCH CULVERTS

STRUCTURAL PLATE STEEL PIPE - ARCHES

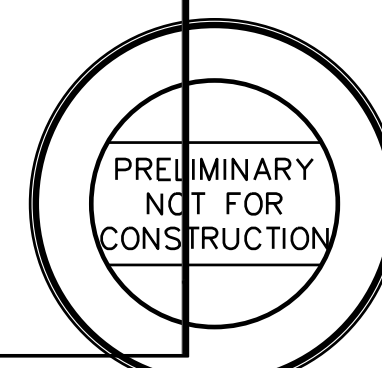
PIPE - ARCH DIMENSIONS			MINIMUM GAUGE REQUIRED	FILL HEIGHT	
SPAN	RISE	CORNER RADIUS (INCHES)		MINIMUM (INCHES)	MAXIMUM (FEET)
6" X 2" CORRUGATIONS					
6' - 1"	4' - 7"	18	12	12	26
6' - 4"	4' - 9"	18	12	12	25
6' - 9"	4' - 11"	18	12	12	23
7' - 0"	5' - 1"	18	12	12	22
7' - 3"	5' - 3"	18	12	12	21
7' - 8"	5' - 5"	18	12	12	20
7' - 11"	5' - 7"	18	12	12	20
8' - 2"	5' - 9"	18	12	12	19
8' - 7"	5' - 11"	18	12	12	18
8' - 10"	6' - 1"	18	12	12	17
9' - 4"	6' - 3"	18	12	12	16
9' - 6"	6' - 5"	18	12	12	16
9' - 9"	6' - 7"	18	12	12	16
10' - 3"	6' - 9"	18	12	15	15
10' - 8"	6' - 11"	18	12	15	14
10' - 11"	7' - 1"	18	12	15	14
11' - 5"	7' - 3"	18	12	18	13
11' - 7"	7' - 5"	18	12	18	13
11' - 10"	7' - 7"	18	12	18	13
12' - 4"	7' - 9"	18	12	18	12
12' - 6"	7' - 11"	18	12	18	12
12' - 8"	8' - 1"	18	12	18	12
12' - 10"	8' - 4"	18	12	18	12
13' - 5"	8' - 5"	18	12	21	11
13' - 11"	8' - 7"	18	12	21	11
13' - 3"	9' - 4"	31	12	12	17
13' - 6"	9' - 6"	31	12	12	17
14' - 0"	9' - 8"	31	12	12	16
14' - 2"	9' - 10"	31	12	12	16
14' - 5"	10' - 0"	31	12	15	15
14' - 11"	10' - 2"	31	12	15	15
15' - 4"	10' - 4"	31	12	15	15
15' - 7"	10' - 6"	31	12	15	14
15' - 10"	10' - 8"	31	12	15	14
16' - 3"	10' - 10"	31	10	15	14
16' - 6"	11' - 0"	31	10	18	13
17' - 0"	11' - 2"	31	10	18	13
17' - 2"	11' - 4"	31	10	18	13
17' - 5"	11' - 6"	31	10	18	13
17' - 11"	11' - 8"	31	10	18	12
18' - 1"	11' - 10"	31	8	18	12
18' - 7"	12' - 0"	31	8	18	12
18' - 9"	12' - 2"	31	8	21	12
19' - 3"	12' - 4"	31	8	21	11
19' - 6"	12' - 6"	31	8	21	11
19' - 8"	12' - 8"	31	8	21	11
19' - 11"	12' - 10"	31	8	21	11
20' - 5"	13' - 0"	31	7	21	11
20' - 7"	13' - 2"	31	7	21	11

STRUCTURAL PLATE ALUMINUM PIPE - ARCHES

PIPE - ARCH DIMENSIONS			MINIMUM GAUGE REQUIRED	FILL HEIGHT	
SPAN	RISE	CORNER RADIUS (INCHES)		MINIMUM (INCHES)	MAXIMUM (FEET)
9" X 2 1/2" CORRUGATIONS					
6' - 2"	5' - 0"	31.8	12	12	23 / 26
6' - 7"	4' - 11"	31.8	12	12	22 / 23
6' - 11"	5' - 9"	31.8	12	12	21 / 22
7' - 3"	5' - 11"	31.8	12	12	20 / 21
7' - 9"	6' - 0"	31.8	12	12	18 / 20
8' - 1"	6' - 1"	31.8	12	12	18 / 19
8' - 5"	6' - 3"	31.8	12	12	17 / 18
8' - 10"	6' - 4"	31.8	12	12	16 / 17
9' - 3"	6' - 5"	31.8	12	15	15 / 16
9' - 7"	6' - 6"	31.8	12	15	15 / 16
9' - 11"	6' - 8"	31.8	12	15	14 / 15
10' - 3"	6' - 9"	31.8	12	15	14 / 15
10' - 9"	6' - 10"	31.8	12	18	13 / 14
11' - 1"	7' - 0"	31.8	12	18	13 / 14
11' - 5"	7' - 1"	31.8	12	18	12 / 13
11' - 9"	7' - 2"	31.8	12	18	12 / 13
12' - 3"	7' - 3"	31.8	10	15	15 / 18
12' - 7"	7' - 5"	31.8	10	15	15 / 18
12' - 11"	7' - 6"	31.8	10	15	14 / 17
13' - 1"	8' - 2"	31.8	10	15	14 / 17
13' - 11"	8' - 5"	31.8	10	18	13 / 16
14' - 0"	8' - 7"	31.8	10	18	13 / 16
13' - 11"	9' - 5"	31.8	8	12	16
14' - 3"	9' - 7"	31.8	8	12	16
14' - 8"	9' - 8"	31.8	8	12	16
14' - 11"	9' - 10"	31.8	8	15	15
15' - 4"	10' - 0"	31.8	8	15	15
15' - 7"	10' - 2"	31.8	8	15	15
16' - 1"	10' - 4"	31.8	7	15	14
16' - 4"	10' - 6"	31.8	7	15	14
16' - 9"	10' - 8"	31.8	7	18	14
17' - 0"	10' - 10"	31.8	7	18	13
17' - 3"	11' - 0"	31.8	7	18	13
17' - 9"	11' - 2"	31.8	7	18	13
18' - 0"	11' - 4"	31.8	5	18	13
18' - 5"	11' - 6"	31.8	5	18	12
18' - 8"	11' - 8"	31.8	5	18	12
19' - 2"	11' - 9"	31.8	5	21	12
19' - 5"	11' - 11"	31.8	5	21	12
19' - 10"	12' - 1"	31.8	3	21	11
20' - 1"	12' - 3"	31.8	3	21	11
20' - 1"	12' - 6"	31.8	3	21	11
20' - 10"	12' - 7"	31.8	1	21	11
21' - 1"	12' - 9"	31.8	1	21	11
21' - 6"	12' - 11"	31.8	1	21	10

GENERAL NOTES

- (A) PIPE SHALL CONFORM TO SECTION 915 OF THE STANDARD SPECIFICATIONS.
- (B) ALL CORRUGATED METAL PIPE - ARCHES SHALL BE INSTALLED ACCORDING TO BEDDING STANDARD NO. D-PB-1. THE BEDDING MATERIAL UNDER ALL PIPE - ARCHES, SHALL BE LOOSE UNDER THE BOTTOM AND SHAPED TO FIT THE PIPE - ARCH.
- (C) THE HEIGHTS OF COVER SHOWN IN THE TABLES ARE FOR FINISHED CONSTRUCTION. A MINIMUM COVER OF FOUR (4) FEET SHALL BE PLACED OVER CULVERTS PRIOR TO DRIVING HEAVY CONSTRUCTION VEHICLES OVER THEM. THE WIDTH OF THIS EXTRA COVER SHALL BE WIDE ENOUGH TO FULLY ACCOMMODATE THE HEAVY CONSTRUCTION VEHICLES AND SHALL BE THE ONLY ACCESS ACROSS THESE CULVERTS DURING CONSTRUCTION.
- (D) LENGTH OF PIPE SHALL BE IN INCREMENTS OF EVEN TWO (2) FEET FOR THE PURPOSE OF ESTIMATING PLANS QUANTITIES. SEE STANDARD DRAWING NO. D-PE-8 FOR METHOD OF MEASUREMENT OF PAYMENT, DETAILS OF BEVELED ENDS AND RIP-RAP PROTECTION.
- (E) POLYMERIC COATED PIPE - ARCH, WHEN REQUIRED, SHALL CONFORM TO SECTION 915.03 OF THE STANDARD SPECIFICATIONS.
- (F) VARIATION OF MATERIALS OR CORRUGATION WILL NOT BE PERMITTED IN ANY LINE OF PIPE.
- (G) PLATES FOR STEEL STRUCTURAL PLATE STRUCTURES ARE STANDARD 6" X 2" CORRUGATION WITH FOUR (4) BOLTS PER FOOT IN EACH LONGITUDINAL SEAM (UNLESS OTHERWISE SHOWN).
- (H) PLATES FOR ALUMINUM STRUCTURAL PLATE STRUCTURES ARE STANDARD 9" X 2 1/2" CORRUGATION WITH FIVE AND ONE - THIRD (5 1/3) BOLTS PER FOOT IN EACH LONGITUDINAL SEAM (UNLESS OTHERWISE SHOWN).
- (I) PIPE - ARCH CULVERTS WITH SPAN LESS THAN 57" ARE NOT TO HAVE THEIR ENDS BEVELED. DO NOT BEVEL PIPE ON FLATTER SLOPE THAN 2 : 1.
- (J) ANY EVIDENCE OF WRINKLING OR BUCKLING IN THE CORRUGATED METAL PIPE - ARCHES SHALL BE CAUSE FOR REJECTION OF THE PIPE ESPECIALLY IF IT IS IN THE CORNER RADII.
- (K) TYPE I AND TYPE II PIPE WITH HELICAL CORRUGATIONS SHALL BE REROLLED TO FORM ANNULAR (CIRCUMFERENTIAL) ENDS WHERE THE CULVERT IS TO BE JOINED. SEE CURRENT AASHTO SPECIFICATIONS M36 AN M196, SECTIONS ON END FINISH AND COUPLING BANDS. ONLY COUPLING BANDS WITH ANNULAR CORRUGATIONS SHALL BE ALLOWED. WHEN EXTENDING AN EXISTING CULVERT, A CONCRETE COLLAR SHALL BE USED IF A COUPLING BAND WITH ANNULAR CORRUGATIONS WILL NOT FIT.



NOT TO SCALE

1 ARCH PIPE SCALE:NTS

CALL BEFORE YOU DIG
1-800-424-5555 OR 811

DESCRIPTION	DATE	NUM	SCALE
DESIGNED J. MCINNIS			1"=20'
DRAWN W. MCINNIS			CHECKED
DATE 2/22/23			APPROVED APRD

DETAILS AND NOTES II

SHEET 8 OF 10

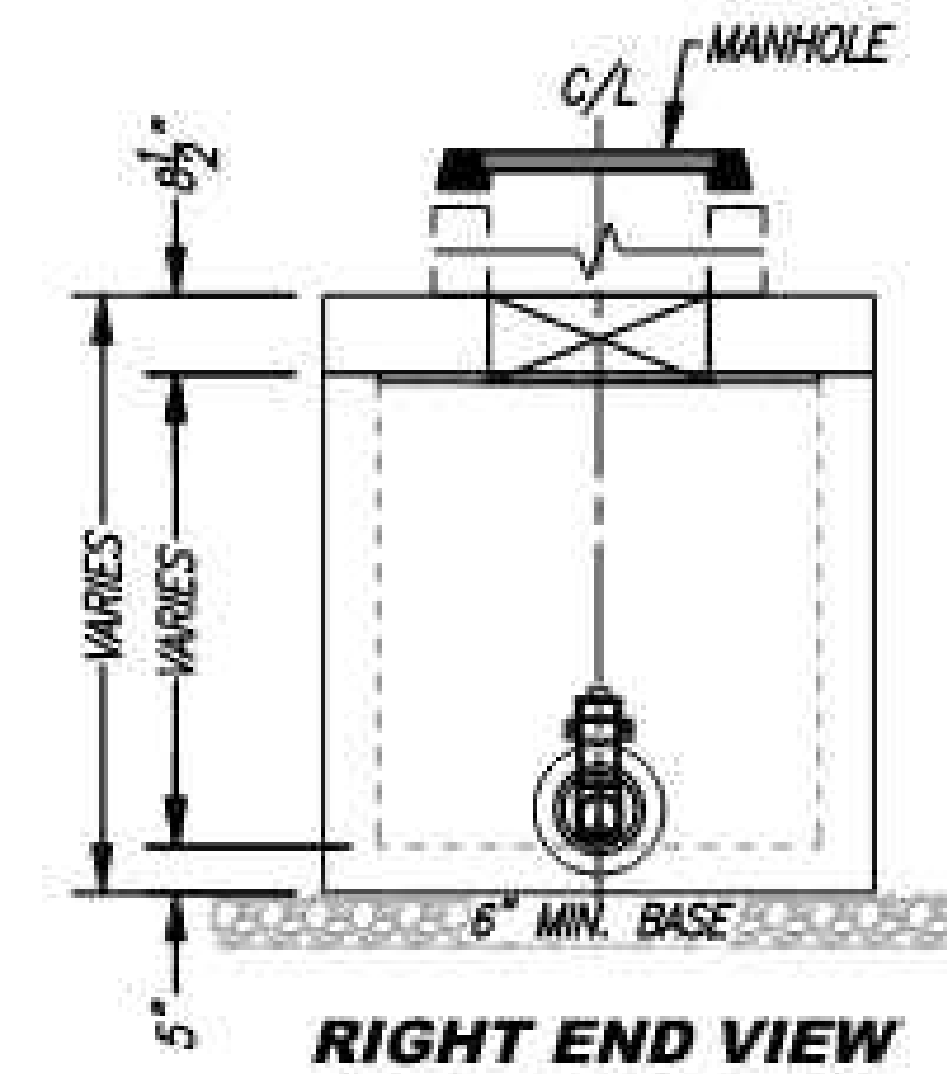
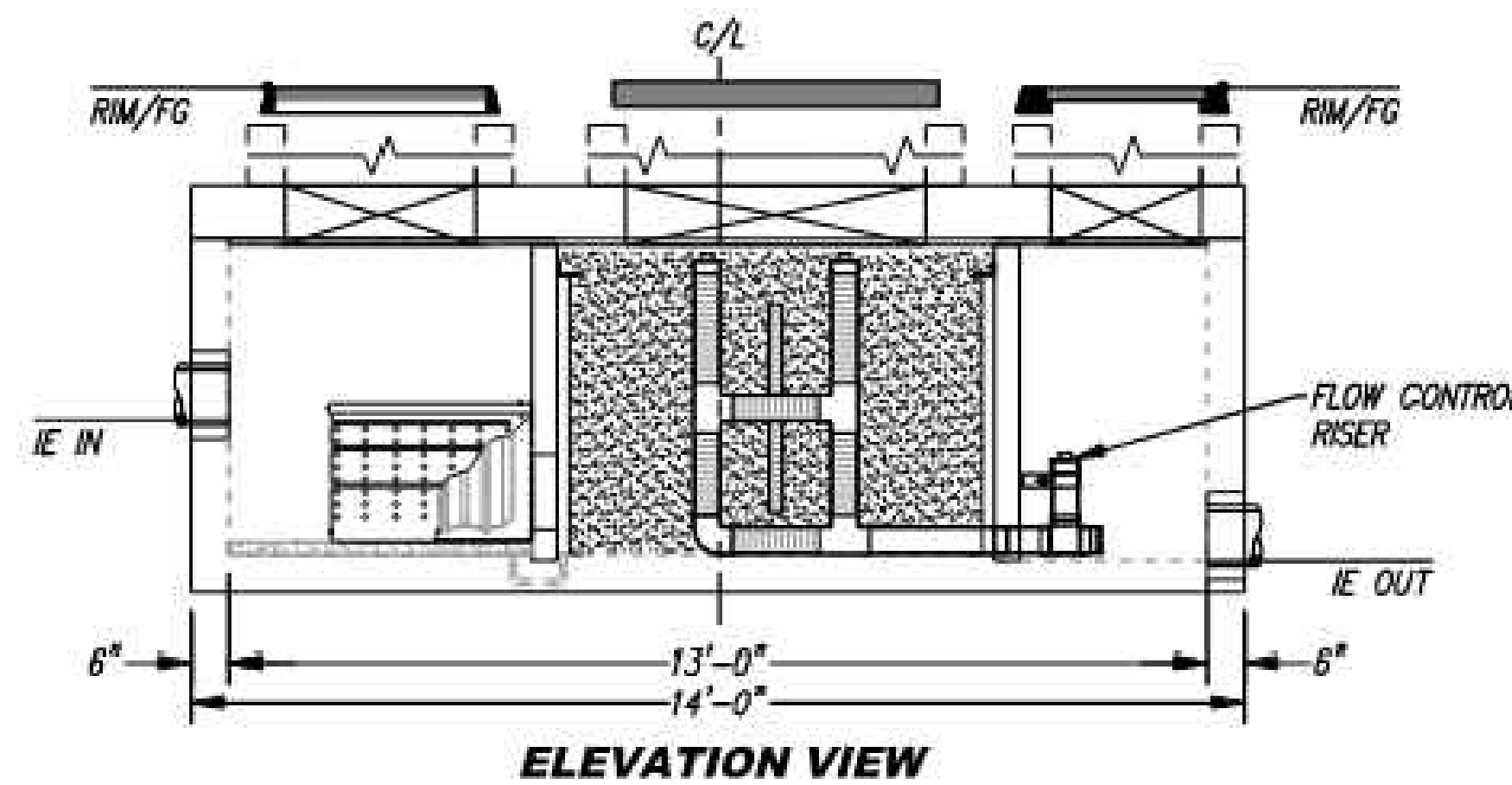
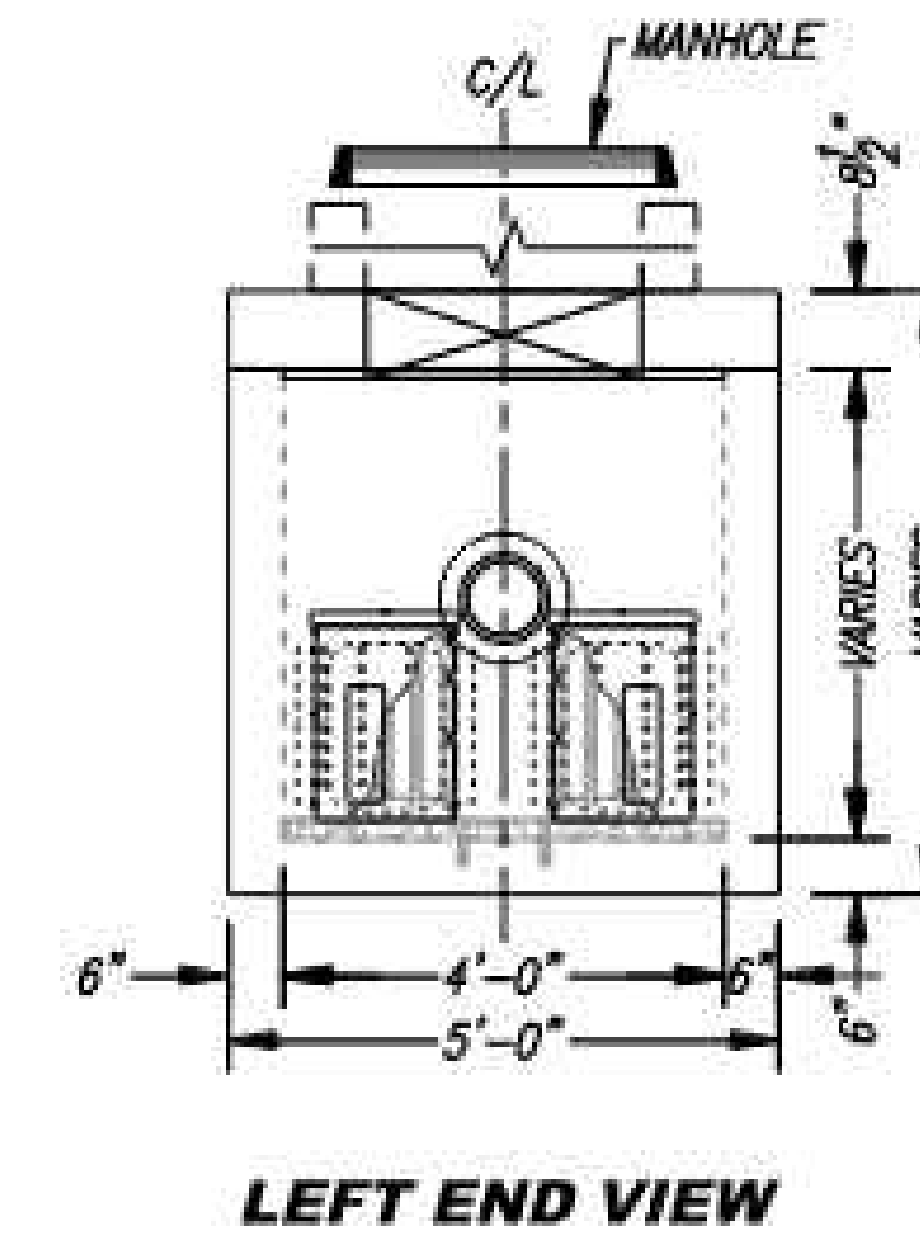
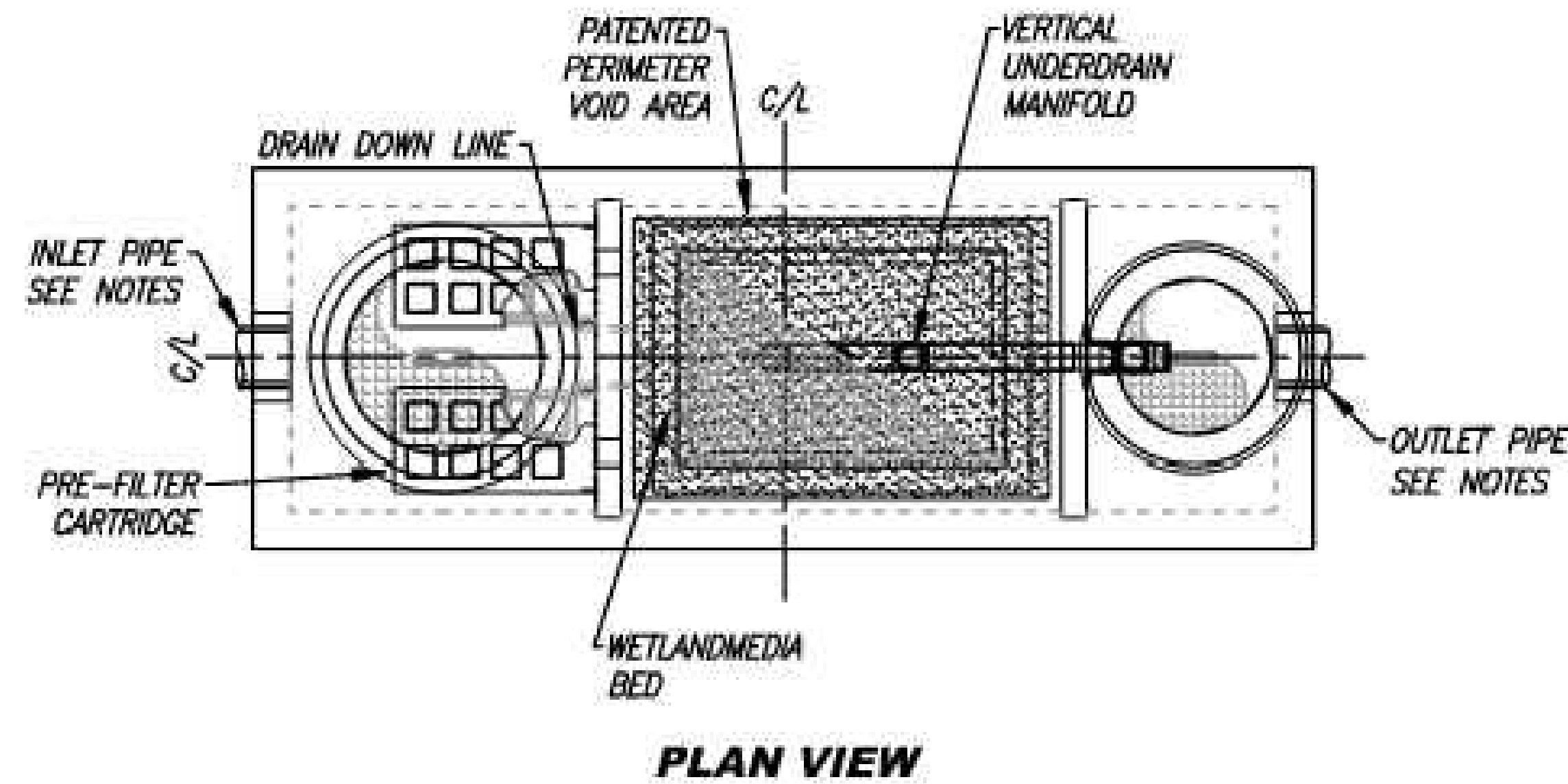
C-8

CASCADE SHAW

NOTES III

SITE SPECIFIC DATA			
PROJECT NUMBER			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
FLOW BASED (CFS)			
0.144			
PEAK BYPASS REQUIRED (CFS) - IF APPLICABLE			OFFLINE
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	DIRECT TRAFFIC		
NOTES:			

* PRELIMINARY NOT FOR CONSTRUCTION



INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO USE GROUT AND/OR BRICKS TO MATCH COVERS WITH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING CONTECH FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A CONTECH REPRESENTATIVE.

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT CONTECH.

TREATMENT FLOW (CFS)	0.144
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	1.3
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0



MWS-L-4-13-V-UG
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

PRELIMINARY
NOT FOR
CONSTRUCTION

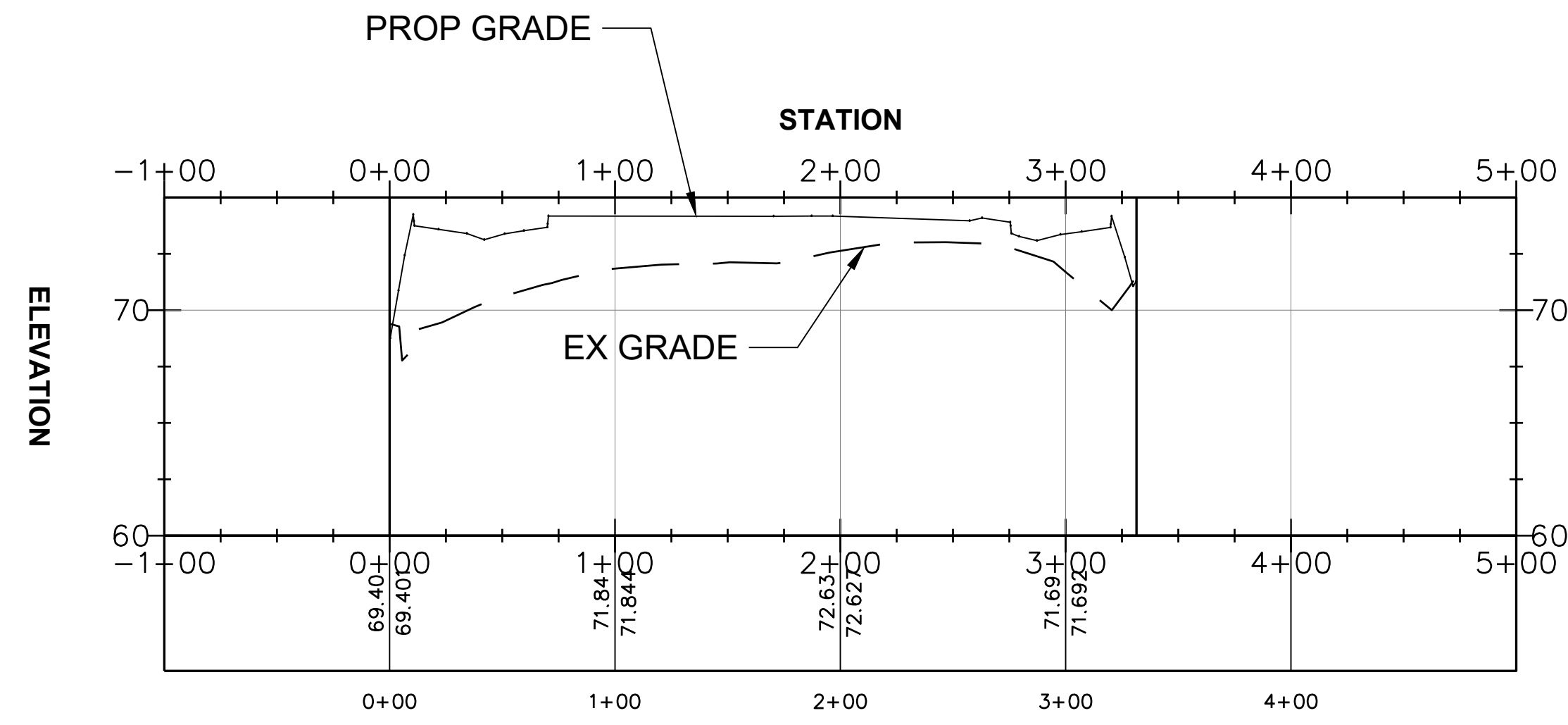
DESCRIPTION	DATE	NUM	DESIGNED	SCALE
			J. MCINNIS	1"=20'
			W. MCINNIS	CHECKED
				CHK
				APPROVED
				APRD

DETAILS AND NOTES III

SHEET 9 OF 10

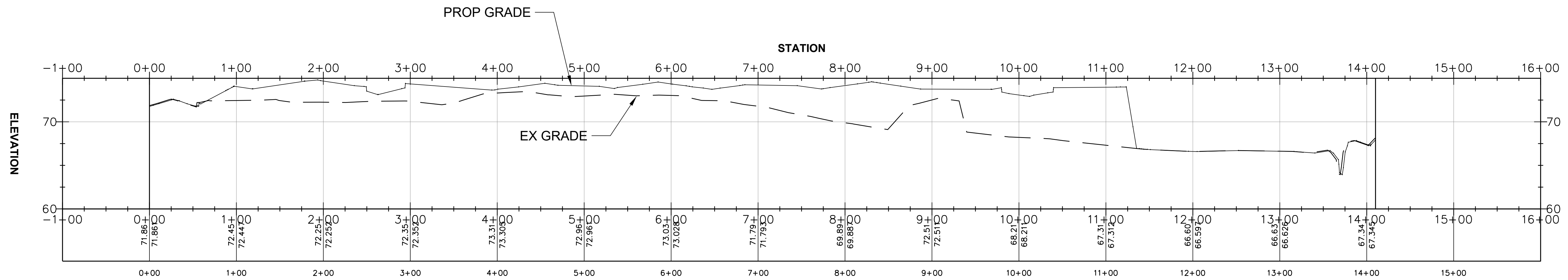
CASCADE SHAW

SECTION 35, TOWNSHIP 20 N, RANGE 4 E, W.M.



X-SECTION 1-1

NTS



X-SECTION 2-2

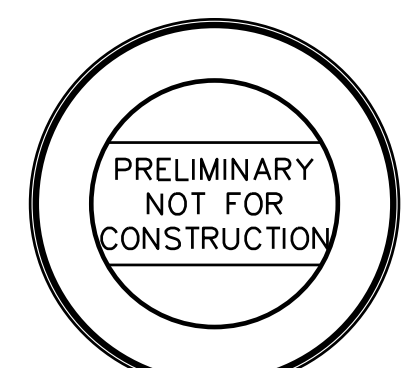
NTS

CASCADE SHAW

SECTION 35, TOWNSHIP 20 N,
RANGE 4 E, W.M.

DESCRIPTION	DATE	NUM

DESIGNED W. MCINNIS	SCALE 1"=20'
DRAWN W. MCINNIS	CHECKED CHCK
DATE 2/22/23	APPROVED APRD



SHEET
10 OF 10

C-10