CONSTRUCTION DRAWINGS

REVIEW SET

Treasure State Acres Storm Drainage Improvements

Prepared for:
Lewis & Clark County
Helena, Montana

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Date: May 2021
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SHEET INDEX

GENERAL

G-1	SHEET INDEX AND ABBREVIATIONS
G-2	LEGEND AND GENERAL NOTES
G-3	SURVEY CONTROL

STORM DRAINAGE

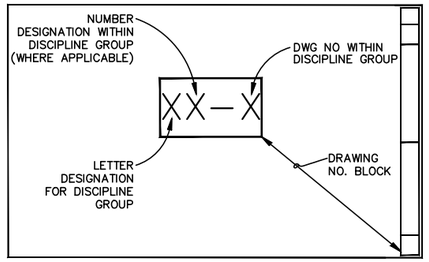
C1-0	STORM DRAINAGE OVERVIEW
C1-1	STORM DRAINAGE BIGHORN & RED FOX INTERSECTION
C1-2	STORM DRAINAGE BIGHORN & COUGAR INTERSECTION
C1-3	STORM DRAINAGE E OTTER & RED FOX INTERSECTION
C1-4	STORM DRAINAGE KODIAK & RED FOX INTERSECTION
C1-5	STORM DRAINAGE KODIAK & COUGAR INTERSECTION
C1-6	STORM DRAINAGE CAYUSE & RED FOX INTERSECTION
C1-7	STORM DRAINAGE MUSTANG & RED FOX INTERSECTION
C1-8	STORM DRAINAGE CAYUSE & WOLVERINE INTERSECTION
C1-9 - C1-10	TYPICAL DETAILS

LETTER	DISCIPLINE
C	CIVIL
E	ELECTRICAL
ES	EROSION AND SEDIMENT
G	GENERAL
M	MECHANICAL
S	STRUCTURAL
A	ARCHITECTURAL
PID	PROCESS AND INSTRUMENTATION DIAGRAM
HV	HVAC
L	LANDSCAPE
XS	CROSS SECTION

NOTES:

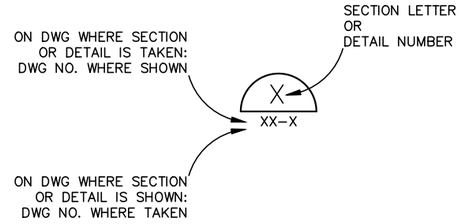
1. CONTACT THE ENGINEER FOR ABBREVIATIONS NOT LISTED.
2. THIS IS A STANDARD SHEET. THEREFORE, SOME ABBREVIATIONS MAY APPEAR ON THIS SHEET AND MAY NOT BE UTILIZED ON THIS PROJECT.

DRAWING IDENTIFICATION SYSTEM



STANDARD RPA FORMAT

DETAIL AND SECTION CALLOUT



ABBREVIATIONS

ø	DIAMETER
@	AT
AA	ALL AROUND
AB	ANCHOR BOLT, AGGREGATE BASE
AC	ASBESTOS CEMENT OR ACRE
AFF	ABOVE FINISHED FLOOR
ADA	AMERICANS WITH DISABILITIES ACT
AH	AHEAD
AL	ALUMINUM
ANC	ANCHOR
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATELY
ARV	AIR RELEASE VALVE
AVE	AVENUE
AWWA	AMERICAN WATER WORKS ASSOCIATION
BC	BUILDING CORNER
BF	BLIND FLANGE
BFF	BELOW FINISH FLOOR
BFV	BUTTERFLY VALVE
BGS	BELOW GROUND SURFACE
BK	BACK
BLDG	BUILDING
BLVD	BOULEVARD
BM	BENCH MARK
BOC	BACK OF CURB
BOD	BIOCHEMICAL OXYGEN DEMAND
BV	BALL VALVE
BVC	BEGIN VERTICAL CURVE
C	CHANNEL OR CENTER
CARV	COMBINATION AIR RELEASE VALVE
CATV	CABLE TELEVISION
CF	CUBIC FEET
CFS	CUBIC FEET PER SECOND
CI	CAST IRON OR CURB INLET
CIP	CAST IRON PIPE OR CAST–IN–PLACE
CIPP	CURED–IN–PLACE PIPE
CL	CENTERLINE
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
CONC	CONCRETE
COS	CERTIFICATE OF SURVEY
CP	CONTROL POINT
CPE	CORRUGATED POLYETHYLENE PIPE
CPLG	COUPLING
CPVC	CHLORINATED POLYVINYL CHLORIDE
CSP	CORRUGATED STEEL PIPE
CV	CHECK VALVE
CY	CUBIC YARDS
DEMO	DEMOLITION
DEPT	DEPARTMENT
DH	DRILL HOLE (SOIL BORING)
DI	DUCTILE IRON OR DRAIN INLET
DIA	DIAMETER
DIMJ	DUCTILE IRON MECHANICAL JOINT
DIP	DUCTILE IRON PIPE
DR	DRAIN OR DIMENSION RATIO
DWG	DRAWING
EA	EACH
EFF	EFFLUENT
ELEV	ELEVATION
EOC	EDGE OF CONCRETE
EOP	EDGE OF PAVEMENT
EOS	EDGE OF SIDEWALK
EPDM	ETHYLENE PROPYLENE DIENE M–CLASS RUBBER
EVC	END VERTICAL CURVE
EW	EACH WAY
EXT	EXTERIOR
EXIST	EXISTING
FAB	FABRICATION
FC	FLEXIBLE COUPLING
FCA	FLANGED COUPLING ADAPTER
FDN	FOUNDATION
FETS	FLARED END TERMINAL SECTION
FF	FINISHED FLOOR
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOOR, FLANGE OR FLOW LINE
FM	FORCE MAIN
FO	FIBER OPTIC
FOC	FACE OF CURB OR FACE OF CONCRETE
FPT	FEMALE PIPE THREAD
FS	FINISHED SURFACE
FTG	FOOTING
FT	FOOT OR FEET
G	GAS
GA	GAUGE
GALV	GALVANIZED
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GPS	GLOBAL POSITIONING SYSTEM OR GALLONS PER SECOND
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
HD	HEAVY DUTY OR HOT–DIPPED
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HDR	HEADER
HGT	HEIGHT
HP	HIGH POINT OR HORSEPOWER
HT	HEIGHT
HWY	HIGHWAY
HYD	FIRE HYDRANT
I&C	INSTRUMENTATION AND CONTROL
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
IN	INCH
INFL	INFLUENT
INFO	INFORMATION
INT	INTERIOR, INTERSECTION
INV	INVERT
JT	JOINT
K	KILOMETER
KW	KILOWATT
L	ANGLE OR LONG
LB(S)	POUND(S)
LD	LOCAL DISCONNECT
LEB	LARGE END BELL
LF	LINEAL FOOT OR LINEAR FEET
LP	LOW POINT
LT	LEFT
MAX	MAXIMUM
MC	MECHANICAL COUPLING
MCC	MOTOR CONTROL CENTER
MDT	MONTANA DEPARTMENT OF TRANSPORTATION
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM OR MINUTE
MJ	MECHANICAL JOINT
MPT	MALE PIPE THREAD
MPWSS	MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS
MTL	MATERIAL
MWS	MAXIMUM WATER SURFACE
N	NORTH
NEC	NATIONAL ELECTRIC CODE
N.I.C.	NOT IN CONTRACT
NO.	NUMBER
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
OAL	OVERALL LENGTH
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE, OVERFLOW
OH	OVERHEAD POWER
OPC	ORANGE PLASTIC CAP
PC	POINT OF CURVATURE
PE	PLAIN END
PH	PHONE
PL	PROPERTY LINE OR PLATE
PLCS	PLACES
PI	POINT OF INTERSECTION
PROP	PROPERTY OR PROPOSED
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE PLASTIC
PVI	POINT OF VERTICAL INTERSECTION
R	RADIUS
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
RCPA	REINFORCED CONCRETE PIPE ARCHED
RDCR	REDUCER
RFC	ROTATED FOR CLARITY
ROW	RIGHT–OF–WAY
RPA	ROBERT PECCIA & ASSOCIATES
RPC	RED PLASTIC CAP
RPP	REINFORCED POLYPROPYLENE
RR	RAILROAD
RT	RIGHT
RW	RIGHT–OF–WAY OR RACEWAY
R/W	RIGHT–OF–WAY
RWL	RAIN WATER LEADER
S	SLOPE
S/C	SERVICE CONNECT
SCH	SCHEDULE
SD	STORM DRAIN
SDI	STORM DRAIN INLET
SDR	STANDARD DIMENSION RATIO
SEB	SMALL END BELL
SECT	SECTION
SF	SQUARE FOOT OR FEET
SIM	SIMILAR
SQFT	SQUARE FOOT OR FEET
SS	SANITARY SEWER OR STAINLESS STEEL
SSMH	SANITARY SEWER MANHOLE
SSP	SPIRAL STEEL PIPE
ST	STREET
STA	STATION
STD	STANDARD
STL	STEEL OR STEEL PIPE
SV	SANITARY SEWER VALVE
SY	SQUARE YARDS
T	TELEPHONE
TBC	TOP OF BACK CURB
TBLAY	TOP BACK OF LAYDOWN CURB
TBM	TEMPORARY BENCH MARK
TEMP	TEMPERATURE OR TEMPORARY
THD	THREAD
TOA	TOP OF ASPHALT
TOC	TOP OF CONCRETE
TOG	TOP OF GRATE
TOS	TOP OF SIDEWALK
TOW	TOP OF WALL
TP	TEST PIT
TS	TECHNICAL SPECIFICATIONS
TV	CABLE TELEVISION
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UG	UNDERGROUND
UGP	UNDERGROUND POWER
UPC	UNIFORM PLUMBING CODE
V	VENT, VOLT OR VALVE
VERT	VERTICAL
VLV	VALVE
VPC	VERTICAL POINT OF CURVATURE
VPT	VERTICAL POINT OF TANGENCY
W	WATER OR WEST
W/	WITH
W/O	WITHOUT
WS	WATER SURFACE OR WATER STOP
WSO	WATER SERVICE OUTLET
WSP	WELDED STEEL PIPE
WV	WATER VALVE
WWF	WELDED WIRE FABRIC
X	USED AS A VARIABLE
XING	CROSSING
YD	YARD
YPC	YELLOW PLASTIC CAP

RPA

SYM	REVISION	BY	APPR	DATE
	PRELIMINARY NOT FOR CONSTRUCTION			

January 2019 DATE
18502.000 PROJECT NO.
General_TSAP1 FILE
B.THEIS DESIGNED BY
M.ROGERS DRAWN BY
T.CAVANAUGH CHECKED BY

PROJECT TITLE
TREASURE STATE ACRES STORM DRAINAGE IMPROVEMENTS
Helena, Montana

SHEET TITLE
SHEET INDEX AND ABBREVIATIONS

SHEET
G-1

LEGEND

DESCRIPTION	EXISTING SYMBOL	PROPOSED SYMBOL
ASPHALT PAVEMENT		
CONCRETE		
GRAVEL		
RIGHT-OF-WAY, PROPERTY LINE		
CONSTRUCTION LIMITS		
SURVEY CONTROL POINT	00	
CONTOUR MAJOR / MINOR	3050.00 / 3050.50	
POWER TRANSFORMER, PEDESTAL		
UNDERGROUND POWER	PWR	
UNDERGROUND TELEPHONE, PEDESTAL	PH, PEDESTAL	
UNDERGROUND CABLE TELEVISION	TV	
UNDERGROUND GAS	GAS	
SANITARY SEWER LINE AND MANHOLE	MANHOLE, SS	
WATER LINE	W	
CURB STOP		
WATER VALVE		
FIRE HYDRANT		
STORM DRAIN INLET	CURB INLET, AREA DRAIN	CURB INLET, AREA DRAIN
STORM DRAIN LINE (N-12, ADS)		PERFORATED
SIGN		
FENCE	CHAIN LINK, WOOD	
TREES & SHRUBS		
MAIL BOX		

GENERAL NOTES

GENERAL NOTES AND LEGEND FOR SHEETS INVOLVING CIVIL WORK ARE SHOWN ON THIS SHEET. UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS, ALL WORK WILL CONFORM TO MPWSS, LATEST EDITION, AND THE LEWIS AND CLARK PUBLIC WORKS MANUAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS REQUIRED FOR CONSTRUCTION ACTIVITIES. FIRE DEPARTMENT, RESIDENTS AND BUSINESSES MUST BE PROVIDED ACCESS TO ALL BUILDINGS DURING CONSTRUCTION.

MATCH LINES:

a) WHERE NEW PAVEMENT OR CURB AND GUTTER MEET EXISTING, SAW THE MATCH LINE TO A NEAT LINE AND DEPTH AS REQUIRED TO PROVIDE A SMOOTH AND NEAT FACE. NO SEPARATE PAYMENT WILL BE MADE FOR SAWCUTS.

b) PROVIDE EXPANSION JOINTS AT THE INTERFACE BETWEEN NEW AND EXISTING CURB AND GUTTER.

c) ALL CONCRETE CURB & GUTTER AND SIDEWALK COLD JOINTS SHALL HAVE TWO 12" SMOOTH DOWELS (½" DIAMETER).

MISCELLANEOUS:

a) SUBGRADE COMPACTION COSTS SHALL BE INCLUDED IN UNIT PRICE BID FOR ROADWAY SECTION REMOVAL & REPLACEMENT.

b) THE CONTRACTOR IS ENCOURAGED TO INVESTIGATE THE SITE PRIOR TO SUBMITTING A BID. INVESTIGATIONS THAT INCLUDE EXCAVATION ACTIVITIES MUST BE COORDINATED WITH THE ENGINEER AND APPROVED BY THE COUNTY. ALL INVESTIGATIONS MUST BE PERFORMED WITHIN THE TWO WEEK PERIOD PRIOR TO THE BID OPENING. TRAFFIC AND PEDESTRIAN CONTROL ASSOCIATED WITH THESE INVESTIGATIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE APPROVED BY THE COUNTY.

EXISTING UTILITIES:

a) EXISTING UNDERGROUND INSTALLATIONS AND PRIVATE UTILITIES SHOWN ARE FROM THE BEST INFORMATION AVAILABLE AT THE TIME OF DESIGN. ACCURACY OF SUCH INFORMATION IS NOT GUARANTEED AND SHALL BE VERIFIED BY THE CONTRACTOR. SERVICE LINES (i.e., WATER, POWER, SEWER, GAS, COMMUNICATIONS, DATA, IRRIGATION) MAY NOT BE BURIED AT EVEN DEPTHS OR AS INDICATED ON THE PLANS. THE CONTRACTOR SHALL NOTIFY EACH UTILITY COMPANY PRIOR TO EXCAVATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL UTILITY LOCATES.

b) ALL POWER, TELEPHONE, CABLE AND GAS WHICH INTERFERES WITH THE CONSTRUCTION SHALL BE REMOVED OR RELOCATED BY THE UTILITY COMPANY AT THE OWNER'S EXPENSE, UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL COORDINATE ALL NECESSARY UTILITY RELOCATION WORK WITH THE APPROPRIATE UTILITY COMPANY AT NO ADDITIONAL COST TO THE OWNER.

c) THE CONTRACTOR SHALL FIELD VERIFY LINE AND GRADE OF EXISTING CONNECTIONS WELL IN ADVANCE OF MAKING THE CONNECTION.

NEW UTILITIES:

a) THE CONTRACTOR SHALL SUPPLY ALL NECESSARY FITTINGS, COUPLINGS, AND SPOOL PIECES FOR CONNECTING NEW UTILITIES TO EXISTING UTILITIES. THESE PLANS MAY NOT SHOW ALL REQUIRED COMPONENTS FOR MAKING THE CONNECTIONS.

b) STORM DRAINAGE LINES SHALL BE SLOPED AT A UNIFORM GRADE BETWEEN ELEVATIONS SHOWN.

DESIGN ASSUMPTIONS TO BE FIELD VERIFIED

1. ALL EXISTING STORM STRUCTURES ARE 48" DIAMETER.
2. ALL EXISTING STORM STRUCTURES ARE AT LEAST 4' DEEP.
3. ALL SANITARY SEWER MAINS ARE AT LEAST 60" DEEP AND WILL NOT CONFLICT WITH NEW STORM.
4. ALL WATER MAINS ARE AT LEAST 60" DEEP AND WILL NOT CONFLICT WITH NEW STORM.

RPA

SYM	REVISION	BY	APPR.	DATE
	PRELIMINARY NOT FOR CONSTRUCTION			

January 2019 DATE
18502.000 PROJECT NO.
General_TSAP1 FILE
B.THEIS DESIGNED BY
M.ROGERS DRAWN BY
T.CAVANAUGH CHECKED BY

PROJECT TITLE
TREASURE STATE ACRES STORM DRAINAGE IMPROVEMENTS
Helena, Montana

SHEET TITLE
LEGEND AND GENERAL NOTES

SHEET
G-2

RPA

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January 2019 — DATE
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T.CAVANAUGH — CHECKED BY
General_TSAP1 — FILE

PROJECT TITLE
TREASURE STATE ACRES STORM DRAINAGE IMPROVEMENTS
Helena, Montana

SHEET TITLE
SURVEY CONTROL

SHEET
G-3

TREASURE STATE CONTROL POINT TABLE (MARCH 2016)

GRID NORTH, GRID DISTANCE FEET, ELEVATIONS ARE NAVD 88

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	878151.80	1335646.35	3784.11	RPA RPC stamped "RPA CONTROL" on 5/8" x 24" rebar in vacant lot S of Treasure State subdivision, 101' E of the Centerline of N. Montana Ave.
2	878716.67	1337575.09	3763.11	MAG NAIL set in the pavement at the intersection of Bighorn Rd and Red Fox Dr, 6' N of the S TBC of Bighorn Rd, 13' SW of the center of a SS MH lid.
3	878711.69	1337864.13	3761.45	MAG NAIL set in the pavement at the intersection of Bighorn Rd and Cougar Dr, 8' N of the S TBC of Bighorn Rd, 10' SE of the center of a SS MH lid.
4	879013.14	1337599.29	3763.18	MAG NAIL set in the pavement at the intersection of Otter Rd and Red Fox Dr, 7.5' W of the E TBC of Red Fox Dr, 11' NE of the center of a SS MH lid.
5	879304.41	1337612.17	3761.56	MAG NAIL set in the pavement at the intersection of Kodiak Rd and Red Fox Dr, 38.5' SE of the street sign, 22' NE of the center of a SS MH lid.
6	879280.33	1337887.41	3758.83	MAG NAIL set in the pavement at the intersection of Kodiak Rd and Cougar Dr, 5.5' W of the E TBC of Cougar Dr, 12' E of the center of a SS MH lid.
7	880120.33	1337629.88	3756.93	MAG NAIL set in the pavement at the intersection of Mustang Rd and Red Fox Dr, 7' W of the E TBC of Red Fox Dr, 13' SE of the center of a SS MH lid.
8	879908.41	1337623.24	3758.09	MAG NAIL set in the pavement at the intersection of Cayuse Rd and Red Fox Dr, 7' W of the E TBC of Red Fox Dr, 16' SE of the center of a SS MH lid.
9	879900.39	1336579.33	3765.17	MAG NAIL set in the pavement at the intersection of Cayuse Rd and Wolverine Dr,17' NW of the street sign, 26' SE of the center of a SS MH lid.

Metadata

Survey Performed by Robert Peccia and Associates - March 2016 Trimble R8-4 GPS/Trimble S6 and Geodimeter 610
Control established with GPS double tie methods:
Montana State Plane Coordinates (2500) NAD83(2011) Epoch 2010.000 International Foot Definition based on Helena CORS (MTDT)
NAVD 88 Elevations were computed using Geoid12A
TBC - Top back of Curb
RPA RPC: RED PLASTIC CAP MARKED "RPA CONTROL" SET ON 5/8" X 24" REBAR

N

200 0 200 400
(SCALE IN FEET)

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CAUTION

EXISTING GAS MAIN AND OTHER UNDERGROUND UTILITIES LOCATIONS TO BE VERIFIED BY CONTRACTOR.

200 0 200 400
(SCALE IN FEET)

SHEET
C1-0

SHEET TITLE
STORM DRAINAGE OVERVIEW

PROJECT TITLE
TREASURE STATE ACRES STORM DRAINAGE IMPROVEMENTS
Helena, Montana

B.THEIS — DESIGNED BY	January 2019 — DATE
M.ROGERS — DRAWN BY	18502.000 — PROJECT NO.
T.CAVANAUGH — CHECKED BY	Storm_TSAP1 — FILE

SYM	REVISION	BY	APPR.	DATE
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RPA

NOTES:

1. CONTRACTOR SHALL INSTALL FLEXSTORM PURE INLET FILTER, OR APPROVED EQUAL, IN ALL EXISTING AND NEW STORM INLETS THAT ARE BEING UPDATED WITH DRAIN PIPE.
2. ALL NEW STORM DRAINAGE PIPES SHALL SLOPE AWAY FROM EXISTING STORM STRUCTURES AT 1.00% SLOPE (UNLESS OTHERWISE SHOWN).
3. USE "ADS" FITTINGS, OR APPROVED EQUAL. FOLLOW MANUFACTURER'S INSTALLATION REQUIREMENTS.
4. DEPTH OF GAS MAIN IS UNKNOWN. PRIOR TO ROTOHAMMERING EXISTING STORM DRAIN INLET, CONTRACTOR SHALL EXPOSE EXISTING GAS AND VERIFY THAT THERE IS NO CONFLICT WITH THE NEW STORM PIPE.
5. ALL DISTURBED AREAS WITHIN CONSTRUCTION LIMITS SHALL BE RESTORED TO ORIGINAL GRADES AND CONDITIONS.

PROTECT AND MAINTAIN EXIST TREES
PROTECT AND MAINTAIN EXIST FENCE
PROTECT AND MAINTAIN EXIST SIGN
EXIST PROPERTY LINE (TYP)
1 C1-9 INFILTRATION BEDDING & BACKFILL
EXIST CONCRETE DRIVEWAY
EXIST CURB
RED FOX DR
BIGHORN RD
PROTECT AND MAINTAIN EXIST GAS MAIN 4
PROTECT AND MAINTAIN EXIST SANITARY SEWER MAIN
PROTECT AND MAINTAIN EXIST WALL
PROTECT AND MAINTAIN EXIST WATER MAIN
EXIST STORM DRAIN INLET GRATE ELEV=3762.40
EXIST STORM DRAIN INLET GRATE ELEV=3762.96
EXIST UG NATURAL GAS
EXIST SEWER MANHOLE
EXIST WATER LINE (TYP)
EXIST SEWER LINE (TYP)
2 C1-9 PAVEMENT SECTION (TYP)
6.0' (TYP)
EXIST FENCE
EXIST CONCRETE DRIVEWAY

LEGEND

- EXIST ASPHALT (REMOVAL AND REPLACEMENT)
- CONSTRUCTION LIMITS 5
- DRAIN ROCK (BURIED)
- 4" N-12 (ADS) PIPE (PERFORATED)

CAUTION
EXISTING GAS MAIN AND OTHER UNDERGROUND UTILITIES. LOCATIONS TO BE VERIFIED BY CONTRACTOR.

10 0 10 20
(SCALE IN FEET)

STORM DRAINAGE COORDINATE TABLE

POINT NO.	INV ELEV	NORTHING	EASTING	DESCRIPTION
1	3757.60	878742.94	1337522.87	CAP PERFORATED PIPE.
2	3757.80	878742.51	1337542.87	ANGLE BREAK (OR BEND PER MANUFACTURE'S RECOMMENDATIONS).
3	3057.90	878743.60	1337552.81	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
4	3058.00	878744.69	1337556.60	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
5	3758.40	878762.80	1337594.37	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.

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SHEET TITLE
STORM DRAINAGE BIGHORN & RED FOX INTERSECTION

SHEET
C1-1

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RPA

NOTES:

1. CONTRACTOR SHALL INSTALL FLEXSTORM PURE INLET FILTER, OR APPROVED EQUAL, IN ALL EXISTING AND NEW STORM INLETS THAT ARE BEING UPDATED WITH DRAIN PIPE.
2. ALL NEW STORM DRAINAGE PIPES SHALL SLOPE AWAY FROM EXISTING STORM STRUCTURES AT 1.00% SLOPE (UNLESS OTHERWISE SHOWN).
3. USE "ADS" FITTINGS, OR APPROVED EQUAL. FOLLOW MANUFACTURER'S INSTALLATION REQUIREMENTS.
4. DEPTH OF GAS MAIN IS UNKNOWN. PRIOR TO ROTOHAMMERING EXISTING STORM DRAIN INLET, CONTRACTOR SHALL EXPOSE EXISTING GAS AND VERIFY THAT THERE IS NO CONFLICT WITH THE NEW STORM PIPE.
5. ALL DISTURBED AREAS WITHIN CONSTRUCTION LIMITS SHALL BE RESTORED TO ORIGINAL GRADES AND CONDITIONS.
6. CAUTION: HOMES HAVE GAS SERVICES THAT ARE NOT SHOWN IN SURVEY

EXIST FENCE
EXIST CONCRETE DRIVEWAY
PROTECT AND MAINTAIN EXIST TREES
1 C1-9 INFILTRATION BEDDING & BACKFILL
EXIST PROPERTY LINE (TYP)
1 C1-10 CONCRETE CURB (TYP)
EXIST CONCRETE DRIVEWAY
EXIST CURB
EXIST MAILBOX
6.0' (TYP)
PAVEMENT SECTION (TYP) 2 C1-9
8
9
3 6
3 7
1 EXIST STORM DRAIN INLET GRATE ELEV=3761.18
BIGHORN RD
EXIST SEWER MANHOLE
EXIST SEWER LINE (TYP)
EXIST WATER LINE (TYP)
4 PROTECT AND MAINTAIN EXISTING GAS MAIN
3
10
COUGAR DR
EXIST MAILBOX
EXIST CONCRETE SIDEWALK
PROTECT AND MAINTAIN EXISTING SANITARY SEWER MAIN
EXIST CONCRETE DRIVEWAY
1 EXIST STORM DRAIN INLET GRATE ELEV=3761.21
PROTECT AND MAINTAIN EXIST FENCE
PROTECT AND MAINTAIN EXIST WATER MAIN
EXIST CONCRETE DRIVEWAY
EXIST CONCRETE SIDEWALK
EXIST CONCRETE DRIVEWAY
EXIST MAILBOX
PROTECT AND MAINTAIN EXISTING WATER MAIN
6

LEGEND

- EXIST ASPHALT (REMOVAL AND REPLACEMENT)
- EXIST CURB (REMOVAL AND REPLACEMENT)
- CONSTRUCTION LIMITS 5
- DRAIN ROCK (BURIED)
- 4" N–12 (ADS) PIPE (PERFORATED)

CAUTION
EXISTING GAS MAIN AND OTHER UNDERGROUND UTILITIES. LOCATIONS TO BE VERIFIED BY CONTRACTOR.

N

10 0 10 20
(SCALE IN FEET)

STORM DRAINAGE COORDINATE TABLE

POINT NO.	INV ELEV	NORTHING	EASTING	DESCRIPTION
6	3756.32	878736.08	1337796.68	CAP PERFORATED PIPE.
7	3756.52	878735.63	1337816.68	ANGLE BREAK (OR BEND PER MANUFACTURE'S RECOMMENDATIONS).
8	3756.62	878737.50	1337826.50	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
9	3756.72	878737.10	1337830.31	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
10	3757.21	878717.35	1337877.40	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.

SYM	REVISION	BY	APPR.	DATE
	PRELIMINARY NOT FOR CONSTRUCTION			

B.THEIS DESIGNED BY
M.ROGERS DRAWN BY
T.CAVANAUGH CHECKED BY
January 2019 DATE
18502.000 PROJECT NO.
Storm_TSAP1 FILE

PROJECT TITLE
TREASURE STATE ACRES STORM DRAINAGE IMPROVEMENTS
Helena, Montana

SHEET TITLE
STORM DRAINAGE BIGHORN & COUGAR INTERSECTION

SHEET
C1-2

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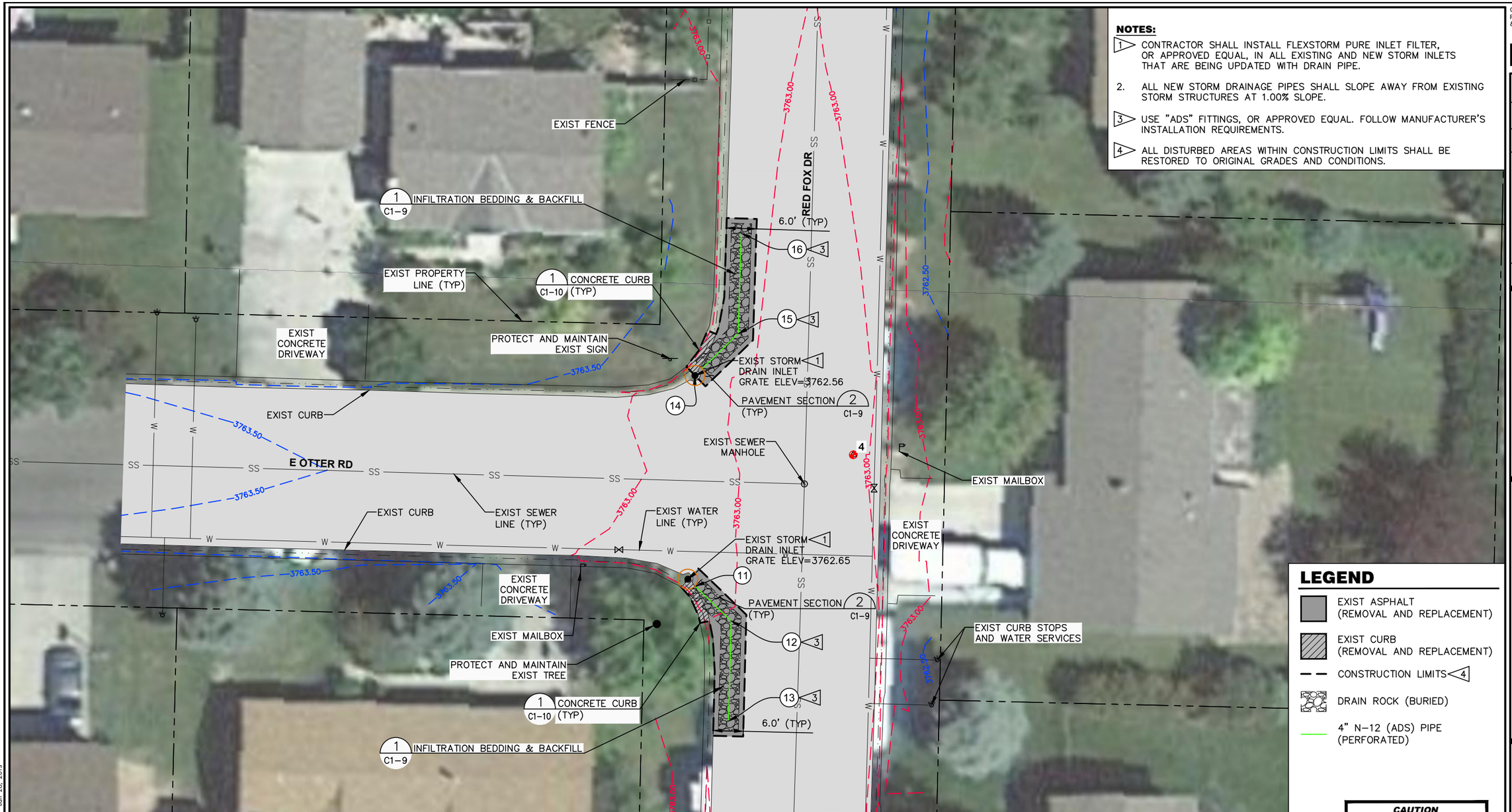

NOTES:

1. CONTRACTOR SHALL INSTALL FLEXSTORM PURE INLET FILTER, OR APPROVED EQUAL, IN ALL EXISTING AND NEW STORM INLETS THAT ARE BEING UPDATED WITH DRAIN PIPE.
2. ALL NEW STORM DRAINAGE PIPES SHALL SLOPE AWAY FROM EXISTING STORM STRUCTURES AT 1.00% SLOPE.
3. USE "ADS" FITTINGS, OR APPROVED EQUAL. FOLLOW MANUFACTURER'S INSTALLATION REQUIREMENTS.
4. ALL DISTURBED AREAS WITHIN CONSTRUCTION LIMITS SHALL BE RESTORED TO ORIGINAL GRADES AND CONDITIONS.

LEGEND

- EXIST ASPHALT (REMOVAL AND REPLACEMENT)
- EXIST CURB (REMOVAL AND REPLACEMENT)
- CONSTRUCTION LIMITS 4
- DRAIN ROCK (BURIED)
- 4" N-12 (ADS) PIPE (PERFORATED)

CAUTION
EXISTING GAS MAIN AND OTHER UNDERGROUND UTILITIES. LOCATIONS TO BE VERIFIED BY CONTRACTOR.

10 0 10 20
(SCALE IN FEET)

STORM DRAINAGE COORDINATE TABLE

POINT NO.	INV ELEV	NORTHING	EASTING	DESCRIPTION
11	3758.65	878986.91	1337567.71	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
12	3758.55	878979.97	1337574.91	ANGLE BREAK (OR BEND PER MANUFACTURE'S RECOMMENDATIONS).
13	3758.35	878959.97	1337574.38	CAP PERFORATED PIPE.

STORM DRAINAGE COORDINATE TABLE

POINT NO.	INV ELEV	NORTHING	EASTING	DESCRIPTION
14	3758.56	879028.96	1337567.70	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
15	3758.46	879037.31	1337576.31	ANGLE BREAK (OR BEND PER MANUFACTURE'S RECOMMENDATIONS).
16	3758.26	879057.30	1337576.93	CAP PERFORATED PIPE.

RPA

SYM	REVISION	BY	APPR	DATE
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M.ROGERS DRAWN BY
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T.CAVANAUGH CHECKED BY
Storm_TSAP1 FILE

PROJECT TITLE
TREASURE STATE ACRES STORM DRAINAGE IMPROVEMENTS
Helena, Montana

SHEET TITLE
STORM DRAINAGE E OTTER & RED FOX INTERSECTION

SHEET
C1-3

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RPA

NOTES:

1. CONTRACTOR SHALL INSTALL FLEXSTORM PURE INLET FILTER, OR APPROVED EQUAL, IN ALL EXISTING AND NEW STORM INLETS THAT ARE BEING UPDATED WITH DRAIN PIPE.
2. ALL NEW STORM DRAINAGE PIPES SHALL SLOPE AWAY FROM EXISTING STORM STRUCTURES AT 1.00% SLOPE.
3. USE "ADS" FITTINGS, OR APPROVED EQUAL. FOLLOW MANUFACTURER'S INSTALLATION REQUIREMENTS.
4. ALL DISTURBED AREAS WITHIN CONSTRUCTION LIMITS SHALL BE RESTORED TO ORIGINAL GRADES AND CONDITIONS.

RED FOX DR

KODIAK RD

1 C1-9 INFILTRATION BEDDING & BACKFILL

1 C1-10 CONCRETE CURB (TYP)

EXIST PROPERTY LINE (TYP)

EXIST CONCRETE DRIVEWAY

EXIST CURB

PROTECT AND MAINTAIN EXIST SIGN

6.0' (TYP)

PAVEMENT SECTION (TYP) 2 C1-9

EXIST STORM DRAIN INLET GRATE ELEV=3761.03

EXIST STORM DRAIN INLET GRATE ELEV=3761.13

EXIST SEWER LINE (TYP)

EXIST WATER LINE (TYP)

EXIST SEWER MANHOLE

EXIST FENCE

EXIST CONCRETE SIDEWALK

EXIST CONCRETE DRIVEWAY

EXIST CURB

EXIST MAILBOX

EXIST CURB STOPS AND WATER SERVICES

EXIST CONCRETE DRIVEWAY

1 C1-10 CONCRETE CURB (TYP)

1 C1-9 INFILTRATION BEDDING & BACKFILL

PAVEMENT SECTION (TYP) 2 C1-9

6.0' (TYP)

EXIST MAILBOX

EXIST FENCE

EXIST TREES

STORM DRAINAGE COORDINATE TABLE

POINT NO.	INV ELEV	NORTHING	EASTING	DESCRIPTION
17	3757.13	879266.40	1337575.31	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
18	3757.03	879259.10	1337582.14	ANGLE BREAK.
19	3756.83	879239.11	1337581.48	CAP PERFORATED PIPE.

STORM DRAINAGE COORDINATE TABLE

POINT NO.	INV ELEV	NORTHING	EASTING	DESCRIPTION
20	3757.03	879310.04	1337576.72	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
21	3756.93	879317.29	1337583.61	ANGLE BREAK.
22	3756.73	879337.28	1337584.29	CAP PERFORATED PIPE.

LEGEND

- EXIST ASPHALT (REMOVAL AND REPLACEMENT)
- EXIST CURB (REMOVAL AND REPLACEMENT)
- CONSTRUCTION LIMITS 4
- DRAIN ROCK (BURIED)
- 4" N-12 (ADS) PIPE (PERFORATED)

CAUTION
EXISTING GAS MAIN AND OTHER UNDERGROUND UTILITIES. LOCATIONS TO BE VERIFIED BY CONTRACTOR.

N

10 0 10 20
(SCALE IN FEET)

SYM	REVISION	BY	APPR.	DATE
	PRELIMINARY NOT FOR CONSTRUCTION			

January 2019 DATE
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Storm_TSAP1 FILE
B.THEIS DESIGNED BY
M.ROGERS DRAWN BY
T.CAVANAUGH CHECKED BY

PROJECT TITLE
TREASURE STATE ACRES STORM DRAINAGE IMPROVEMENTS
Helena, Montana

SHEET TITLE
STORM DRAINAGE KODIAK & RED FOX INTERSECTION

SHEET
C1-4

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RPA

NOTES:

1. CONTRACTOR SHALL INSTALL FLEXSTORM PURE INLET FILTER, OR APPROVED EQUAL, IN ALL EXISTING AND NEW STORM INLETS THAT ARE BEING UPDATED WITH DRAIN PIPE.
2. ALL NEW STORM DRAINAGE PIPES SHALL SLOPE AWAY FROM EXISTING STORM STRUCTURES AT 1.00% SLOPE.
3. USE "ADS" FITTINGS, OR APPROVED EQUAL. FOLLOW MANUFACTURER'S INSTALLATION REQUIREMENTS.
4. ALL DISTURBED AREAS WITHIN CONSTRUCTION LIMITS SHALL BE RESTORED TO ORIGINAL GRADES AND CONDITIONS.
5. NEW CURB SHALL BE STRAIGHT GRADED.
6. MATCH NEW PAVEMENT TO NEW CURB GRADES
7. MATCH NEW TOP BACK OF CURB GRADES TO THE EXISTING SIDEWALK.

EXIST MAILBOX
PROTECT AND MAINTAIN EXISTING SIDEWALK
EXIST CONCRETE DRIVEWAY
EXIST PROPERTY LINE (TYP)
7 6 5 1 C1-10 CONCRETE CURB (TYP)
EXIST CONCRETE SIDEWALK
EXIST CONCRETE DRIVEWAY
EXIST CONCRETE DRIVEWAY
EXIST CURB
1 C1-9 INFILTRATION BEDDING & BACKFILL
6.0' (TYP)
PAVEMENT SECTION (TYP) 2 C1-9
EXIST SEWER MANHOUSE
PROTECT AND MAINTAIN EXIST WATER MAIN
EXIST STORM DRAIN INLET 1
GRATE ELEV=3758.60
PROTECT AND MAINTAIN EXIST SIGN
EXIST GRAVEL DRIVEWAY
EXIST CONCRETE DRIVEWAY
EXIST CONCRETE SIDEWALK
EXIST MAILBOX
EXIST CURB STOP AND WATER SERVICE
PROTECT AND MAINTAIN EXIST WATER VALVE
EXIST TREE
EXIST SEWER LINE (TYP)
EXIST CONCRETE DRIVEWAY
SLOPE=0.80%
EXIST MAILBOX
EXIST WATER LINE (TYP)
EXIST CURB STOPS AND WATER SERVICES
EXIST MAILBOX
EXIST CONCRETE DRIVEWAY
KODIAK RD
COUGAR DR
3760.00
3761.00
3759.50
3758.50
3759.00
3758.00
3760.50

LEGEND

- EXIST ASPHALT (REMOVAL AND REPLACEMENT)
- EXIST CURB (REMOVAL AND REPLACEMENT)
- CONSTRUCTION LIMITS 4
- DRAIN ROCK (BURIED)
- 4" N-12 (ADS) PIPE (PERFORATED)

CAUTION
EXISTING GAS MAIN AND OTHER UNDERGROUND UTILITIES. LOCATIONS TO BE VERIFIED BY CONTRACTOR.

N

10 0 10 20
(SCALE IN FEET)

STORM DRAINAGE COORDINATE TABLE

POINT NO.	INV ELEV	NORTHING	EASTING	DESCRIPTION
23	3754.60	879267.25	1337840.66	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
24	3754.30	879295.24	1337841.52	CAP PERFORATED PIPE.

STORM DRAINAGE COORDINATE TABLE

POINT NO.	CURB FLOWLINE ELEV	NORTHING	EASTING	DESCRIPTION
25	3758.72	879298.33	1337836.45	NEW CURB FLOW LINE ELEVATION. MATCH EXISTING FLOWLINE GRADE.
26	3758.46	879313.98	1337859.17	NEW CURB FLOW LINE ELEVATION. MATCH EXISTING FLOWLINE GRADE.

SYM	REVISION	BY	APPR.	DATE
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January 2019 DATE
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T.CAVANAUGH CHECKED BY
18502.000 PROJECT NO.
Storm_TSAP1 FILE

PROJECT TITLE
TREASURE STATE ACRES STORM DRAINAGE IMPROVEMENTS
Helena, Montana

SHEET TITLE
STORM DRAINAGE KODIAK & COUGAR INTERSECTION

SHEET
C1-5

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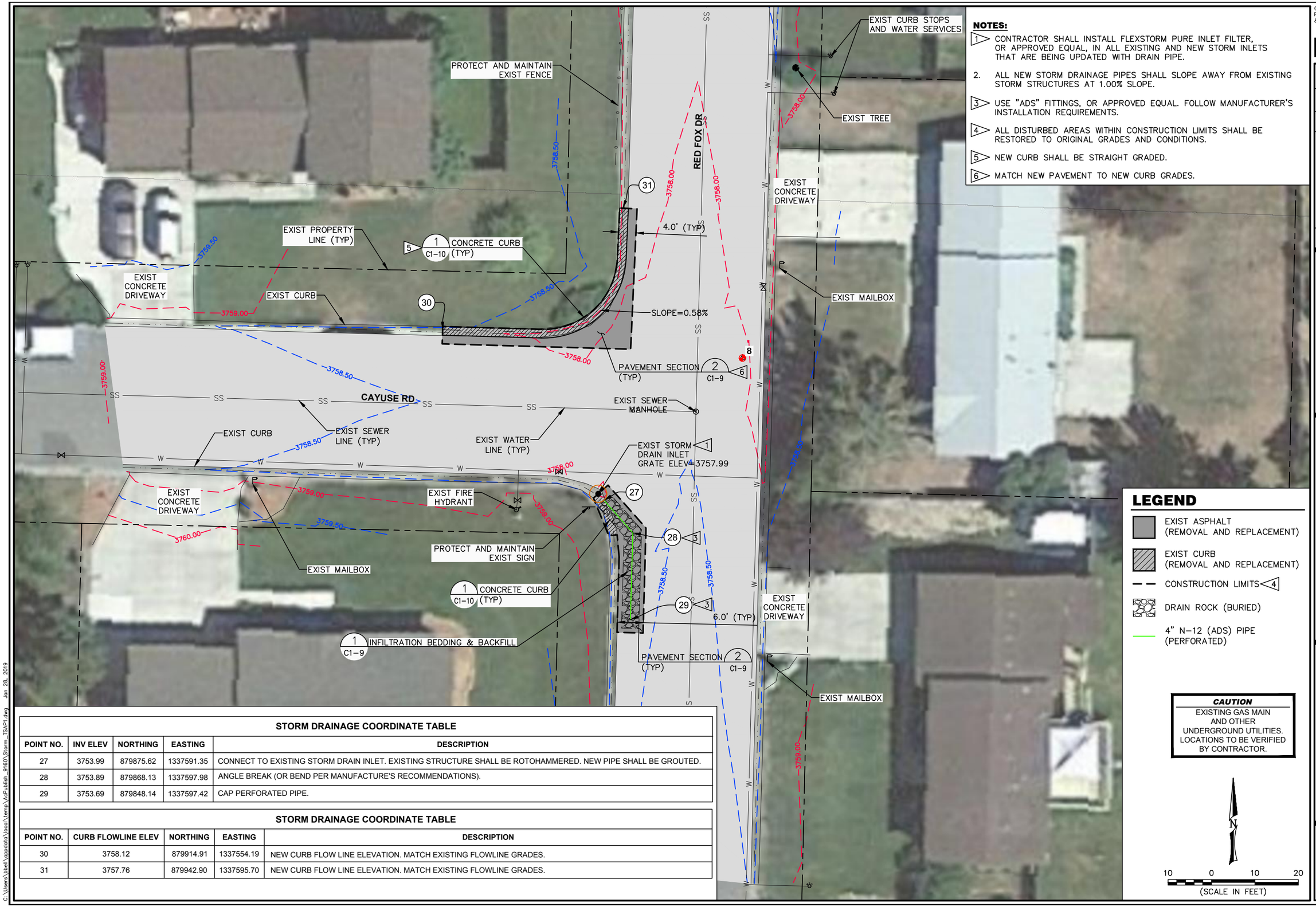

NOTES:

1. CONTRACTOR SHALL INSTALL FLEXSTORM PURE INLET FILTER, OR APPROVED EQUAL, IN ALL EXISTING AND NEW STORM INLETS THAT ARE BEING UPDATED WITH DRAIN PIPE.
2. ALL NEW STORM DRAINAGE PIPES SHALL SLOPE AWAY FROM EXISTING STORM STRUCTURES AT 1.00% SLOPE.
3. USE "ADS" FITTINGS, OR APPROVED EQUAL. FOLLOW MANUFACTURER'S INSTALLATION REQUIREMENTS.
4. ALL DISTURBED AREAS WITHIN CONSTRUCTION LIMITS SHALL BE RESTORED TO ORIGINAL GRADES AND CONDITIONS.
5. NEW CURB SHALL BE STRAIGHT GRADED.
6. MATCH NEW PAVEMENT TO NEW CURB GRADES.

STORM DRAINAGE COORDINATE TABLE

POINT NO.	INV ELEV	NORTHING	EASTING	DESCRIPTION
27	3753.99	879875.62	1337591.35	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
28	3753.89	879868.13	1337597.98	ANGLE BREAK (OR BEND PER MANUFACTURE'S RECOMMENDATIONS).
29	3753.69	879848.14	1337597.42	CAP PERFORATED PIPE.

STORM DRAINAGE COORDINATE TABLE

POINT NO.	CURB FLOWLINE ELEV	NORTHING	EASTING	DESCRIPTION
30	3758.12	879914.91	1337554.19	NEW CURB FLOW LINE ELEVATION. MATCH EXISTING FLOWLINE GRADES.
31	3757.76	879942.90	1337595.70	NEW CURB FLOW LINE ELEVATION. MATCH EXISTING FLOWLINE GRADES.

LEGEND

- EXIST ASPHALT (REMOVAL AND REPLACEMENT)
- EXIST CURB (REMOVAL AND REPLACEMENT)
- CONSTRUCTION LIMITS 4
- DRAIN ROCK (BURIED)
- 4" N-12 (ADS) PIPE (PERFORATED)

CAUTION
EXISTING GAS MAIN AND OTHER UNDERGROUND UTILITIES. LOCATIONS TO BE VERIFIED BY CONTRACTOR.

N

10 0 10 20
(SCALE IN FEET)

RPA

SYM	REVISION	BY	APPR	DATE
	PRELIMINARY NOT FOR CONSTRUCTION			

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M.ROGERS DRAWN BY
T.CAVANAUGH CHECKED BY
January 2019 DATE
18502.000 PROJECT NO.
Storm_TSAP1 FILE

PROJECT TITLE
TREASURE STATE ACRES
STORM DRAINAGE
IMPROVEMENTS
Helena, Montana

SHEET TITLE
STORM DRAINAGE
CAYUSE & RED FOX
INTERSECTION

SHEET
C1-6

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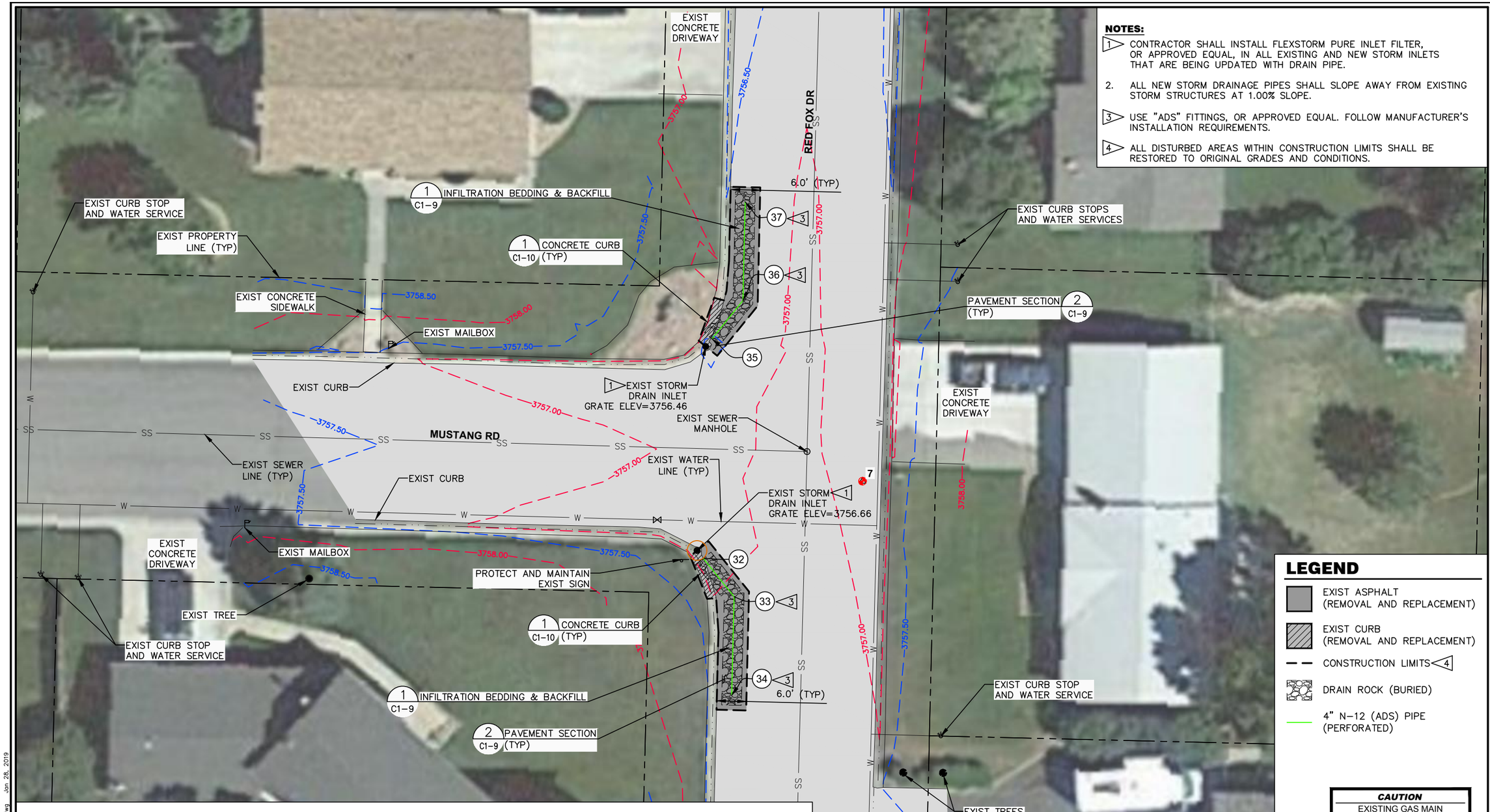

NOTES:

1. CONTRACTOR SHALL INSTALL FLEXSTORM PURE INLET FILTER, OR APPROVED EQUAL, IN ALL EXISTING AND NEW STORM INLETS THAT ARE BEING UPDATED WITH DRAIN PIPE.
2. ALL NEW STORM DRAINAGE PIPES SHALL SLOPE AWAY FROM EXISTING STORM STRUCTURES AT 1.00% SLOPE.
3. USE "ADS" FITTINGS, OR APPROVED EQUAL. FOLLOW MANUFACTURER'S INSTALLATION REQUIREMENTS.
4. ALL DISTURBED AREAS WITHIN CONSTRUCTION LIMITS SHALL BE RESTORED TO ORIGINAL GRADES AND CONDITIONS.

LEGEND

- EXIST ASPHALT (REMOVAL AND REPLACEMENT)
- EXIST CURB (REMOVAL AND REPLACEMENT)
- CONSTRUCTION LIMITS 4
- DRAIN ROCK (BURIED)
- 4" N-12 (ADS) PIPE (PERFORATED)

CAUTION
EXISTING GAS MAIN AND OTHER UNDERGROUND UTILITIES. LOCATIONS TO BE VERIFIED BY CONTRACTOR.

10 0 10 20
(SCALE IN FEET)

STORM DRAINAGE COORDINATE TABLE

POINT NO.	INV ELEV	NORTHING	EASTING	DESCRIPTION
32	3752.66	880104.71	1337597.58	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
33	3752.56	880096.91	1337603.84	ANGLE BREAK (OR BEND PER MANUFACTURE'S RECOMMENDATIONS).
34	3752.36	880076.91	1337603.35	CAP PERFORATED PIPE.

STORM DRAINAGE COORDINATE TABLE

POINT NO.	INV ELEV	NORTHING	EASTING	DESCRIPTION
35	3752.46	880149.21	1337599.35	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
36	3752.36	880156.99	1337605.63	ANGLE BREAK (OR BEND PER MANUFACTURE'S RECOMMENDATIONS).
37	3752.16	880176.98	1337606.08	CAP PERFORATED PIPE.

RPA

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January 2019 DATE
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18502.000 PROJECT NO.
T.CAVANAUGH CHECKED BY
Storm_TSAP1 FILE

PROJECT TITLE
TREASURE STATE ACRES STORM DRAINAGE IMPROVEMENTS
Helena, Montana

SHEET TITLE
STORM DRAINAGE MUSTANG & RED FOX INTERSECTION

SHEET
C1-7

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RPA

NOTES:

1. CONTRACTOR SHALL INSTALL FLEXSTORM PURE INLET FILTER, OR APPROVED EQUAL, IN ALL EXISTING AND NEW STORM INLETS THAT ARE BEING UPDATED WITH DRAIN PIPE.
2. ALL NEW STORM DRAINAGE PIPES SHALL SLOPE AWAY FROM EXISTING STORM STRUCTURES AT 1.00% SLOPE (UNLESS OTHERWISE SHOWN).
3. USE "ADS" FITTINGS, OR APPROVED EQUAL. FOLLOW MANUFACTURER'S INSTALLATION REQUIREMENTS..
4. ALL DISTURBED AREAS WITHIN CONSTRUCTION LIMITS SHALL BE RESTORED TO ORIGINAL GRADES AND CONDITIONS.
5. REPLACE DRAIN INLET ASPHALT APRON TO MATCH ORIGINAL SIZE AND GRADE.

WOLVERINE DR
CAYUSE RD
EXIST FENCE
EXIST UG POWER
EXIST PHONE PEDESTAL
EXIST MAILBOX
EXIST CONCRETE SIDEWALK
4 PROTECT AND MAINTAIN EXIST UG POWER
PROTECT AND MAINTAIN EXIST POWER PEDESTAL
1 C1-10 CONCRETE CURB (TYP)
1 C1-9 INFILTRATION BEDDING & BACKFILL
EXIST PROPERTY LINE (TYP)
EXIST CONCRETE DRIVEWAY
EXIST SEWER MANHOLE
EXIST UG PHONE AND CABLE
PAVEMENT SECTION 2 C1-9
EXIST STORM DRAIN INLET GRATE ELEV=3765.07
EXIST SEWER LINE (TYP)
6.0' (TYP)
EXIST WATER LINE (TYP)
EXIST STORM DRAIN INLET GRATE ELEV=3765.50
EXIST SIGN
EXIST FIRE HYDRANT
EXIST CURB
EXIST UG PHONE
EXIST UG NATURAL GAS
EXIST CURB STOP AND WATER SERVICE
EXIST TREE
EXIST MAILBOX
EXIST FENCE

LEGEND

- EXIST ASPHALT (REMOVAL AND REPLACEMENT)
- EXIST CURB (REMOVAL AND REPLACEMENT)
- CONSTRUCTION LIMITS 4
- DRAIN ROCK (BURIED)
- 4" N–12 (ADS) PIPE (PERFORATED)

CAUTION
EXISTING GAS MAIN AND OTHER UNDERGROUND UTILITIES. LOCATIONS TO BE VERIFIED BY CONTRACTOR.

N

10 0 10 20
(SCALE IN FEET)

STORM DRAINAGE COORDINATE TABLE

POINT NO.	INV ELEV	NORTHING	EASTING	DESCRIPTION
38	3761.30	879882.26	1336529.78	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
39	3761.07	879907.70	1336509.09	CONNECT TO EXISTING STORM DRAIN INLET. EXISTING STRUCTURE SHALL BE ROTOHAMMERED. NEW PIPE SHALL BE GROUTED.
40	3761.02	879904.15	1336511.98	ANGLE BREAK (TEE).
41	3760.72	879890.05	1336485.50	CAP PERFORATED PIPE.

SYM	REVISION	BY	APPR.	DATE
	PRELIMINARY NOT FOR CONSTRUCTION			

January 2019 DATE
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Storm_TSAP1 FILE
B.THEIS DESIGNED BY
M.ROGERS DRAWN BY
T.CAVANAUGH CHECKED BY

PROJECT TITLE
TREASURE STATE ACRES STORM DRAINAGE IMPROVEMENTS
Helena, Montana

SHEET TITLE
STORM DRAINAGE CAYUSE & WOLVERINE INTERSECTION

SHEET
C1-8

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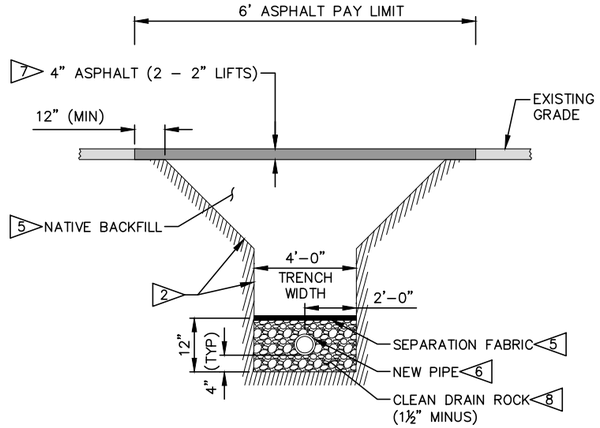
NOTES:

1. VERIFY THAT COMPACTION METHODS ARE COMPARABLE WITH PIPE MANUFACTURER'S RECOMMENDATIONS. ANY DAMAGE TO THE PIPE WILL BE THE CONTRACTOR'S RESPONSIBILITY.
2. TRENCH SHALL BE CONSTRUCTED TO OSHA SPECIFICATIONS FOR EXCAVATION. DRAWINGS DO NOT SHOW TRENCH DIMENSIONS OR BACKSLOPES THAT MAY BE REQUIRED. CONTRACTOR REQUIRED TO DETERMINE WHICH OSHA SPECIFICATIONS ARE APPLICABLE. CONTRACTOR SHALL BE RESPONSIBLE FOR TRENCH EXCAVATION AND SAFETY PER OSHA SPECIFICATIONS.
3. ALL EXCESS SPOILS SHALL BE REMOVED AND DISPOSED OF AT AN APPROVED LOCATION.
4. ALL ROCKS GREATER THAN 12" IN ANY DIMENSION SHALL BE HAULED OFF SITE AND DISPOSED OF PROPERLY.
5. GEOTEX 401 NONWOVEN GEOTEXTILE, MIRAFI S600 NONWOVEN GEOTEXTILE, OR APPROVED EQUAL.
6. 4" N-12 PIPE, OR APPROVED EQUAL. CONTRACTOR SHALL USE PERFORATED PIPE IN BURIED DRAIN ROCK AREAS SHOWN ON PLANS.
7. FINISHED GRADE MUST MATCH THE ORIGINAL EXISTING SURFACING AND GRADE WHERE PIPE IS INSTALLED UNLESS OTHERWISE NOTED.
8. NO FINES OR SANDS ALLOWED IN CLEAN DRAIN ROCK.



INFILTRATION BEDDING & BACKFILL (1)

SCALE: NONE

C1-1 – C1-8

NOTES:

1. PER TABLE 4.9 OF LEWIS AND CLARK COUNTY PUBLIC WORKS MANUAL.
2. PER TABLE 4.8 OF LEWIS AND CLARK COUNTY PUBLIC WORKS MANUAL.
3. COMPACT TO 93% RICE DENSITY PER LEWIS AND CLARK COUNTY PUBLIC WORKS MANUAL.
4. COMPACT TO 95% PER ASTM D-960.

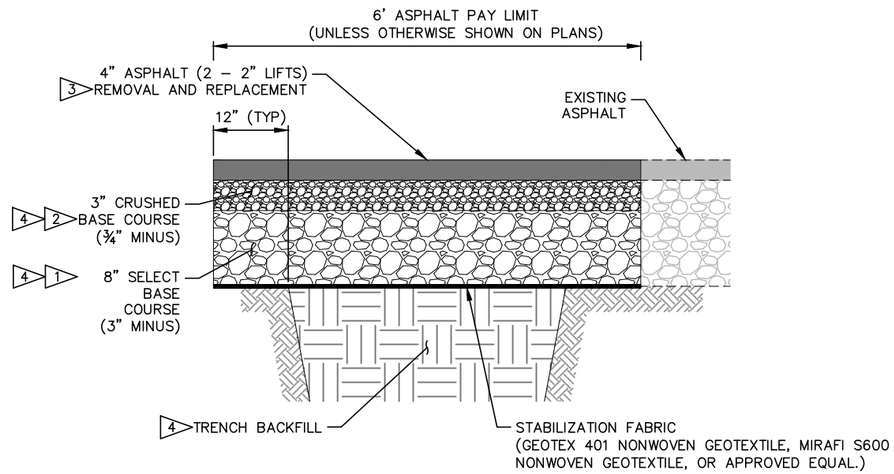
TABLE 4.8 - SPECIFICATION FOR CRUSHED BASE COURSE

(UNDER PAVED ROADS)

TABLE OF GRADATIONS	
PERCENTAGES BY WEIGHT PASSING SQUARE MESH SIEVE	
PASSING	**3/4" MINUS**
2" SIEVE	----
1-1/2" SIEVE	----
1" SIEVE	----
3/4" SIEVE	100%
1/2" SIEVE	----
NO. 4 SIEVE	40-70%
NO. 10 SIEVE	25-55%
NO. 200 SIEVE (NOT MORE THAN)	2-10%

TABLE 4.9 - SPECIFICATION FOR SELECT BASE COURSE MATERIAL

TABLE OF GRADATIONS	
PERCENTAGES BY WEIGHT PASSING SQUARE MESH SIEVE	
PASSING	**3" MINUS**
4" SIEVE	----
3" SIEVE	100%
2-1/2" SIEVE	----
2" SIEVE	----
1-1/2" SIEVE	----
NO. 4 SIEVE	25-60%
NO. 200 SIEVE (NOT MORE THAN)	2-12%



PAVEMENT SECTION (2)

SCALE: NONE

C1-1 – C1-8

RPA

SYM	REVISION	BY	APPR.	DATE
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January 2019 DATE
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M.ROGERS DRAWN BY
T.CAVANAUGH CHECKED BY
18502.000 PROJECT NO.
Storm_TSAP1 FILE

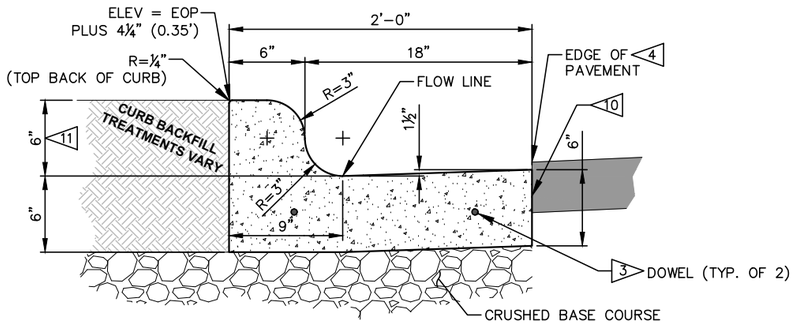
PROJECT TITLE
TREASURE STATE ACRES STORM DRAINAGE IMPROVEMENTS
Helena, Montana

SHEET TITLE
TYPICAL DETAILS

SHEET
C1-9

NOTES:

1. EXPANSION AND CONTRACTION JOINTS SHALL BE PLACED IN ACCORDANCE WITH MPWSS 02528. PLACE ADDITIONAL EXPANSION JOINTS AT INTERFACES BETWEEN NEW AND EXISTING CURB.
2. UNLESS OTHERWISE SPECIFIED IN THESE PLANS, CONSTRUCTION MATERIALS AND PROCEDURES SHALL CONFORM TO MPWSS CURRENT EDITION.
3. WHERE NEW CONCRETE CURB MEETS EXISTING CONCRETE CURB, MATCHLINE SHALL RECEIVE 12" SMOOTH DOWELS (½" DIAMETER) @ 2'–0" OC.
4. FINISHED PAVEMENT SURFACE SHALL BE ⅛" TO ¼" ABOVE EDGE OF CURB ON STANDARD "CATCH" TYPE CURBS AND FLUSH WITH EDGE OF CURB ON STANDARD "SPILL" TYPE CURBS.
5. CONTRACTION JOINT SHALL BE PLACED AT EVERY 15' OF CURB LENGTH AND SHALL HAVE A MINIMUM DEPTH OF ¾" AND MINIMUM WIDTH OF ⅛". CONTRACTION JOINTS SHALL BE CONSTRUCTED BY SCORING. A TOOL SHALL BE USED WHICH WILL LEAVE CORNERS ROUNDED AND DESTROY AGGREGATE INTERLOCK FOR THE SPECIFIED MINIMUM DEPTH.
6. GRADE, ALIGNMENT AND FORMS SHALL BE INSPECTED BY THE ENGINEER PRIOR TO POURING.
7. CONCRETE SHALL BE M–4000 WITH ¾" MAXIMUM AGGREGATE AND A 28–DAY STRENGTH OF 4000 PSI, 5% TO 8% AIR CONTENT WITH A MAXIMUM SLUMP OF 4".
8. INDIVIDUAL CONTRACTOR'S FORMS MAY VARY SLIGHTLY FROM THIS PATTERN. PATTERNS WHICH ACHIEVE ESSENTIALLY THE SAME RESULT AS THE ABOVE PATTERN MAY BE APPROVED BY THE CITY.
9. VISIBLE EDGES SHALL BE FINISHED TO A RADIUS OF ¼", UNLESS OTHERWISE NOTED.
10. CONTRACTOR SHALL TACK ALL VERTICAL SURFACES (MATCH LINES) PRIOR TO PAVING.
11. MAY VARY TO MATCH EXISTING SIDEWALKS WHEN PRESENT.



STANDARD FULL HEIGHT "CATCH" TYPE CURB

CONCRETE CURB 1
SCALE: NONE
C1–2 – C1–8

RPA

SYM	REVISION	BY	APPR.	DATE
	PRELIMINARY NOT FOR CONSTRUCTION			

B.THEIS DESIGNED BY
M.ROGERS DRAWN BY
T.CAVANAUGH CHECKED BY
January 2019 DATE
18502.000 PROJECT NO.
Storm_TSAP1 FILE

PROJECT TITLE
TREASURE STATE ACRES STORM DRAINAGE IMPROVEMENTS
Helena, Montana

SHEET TITLE
TYPICAL DETAILS

SHEET
C1-10