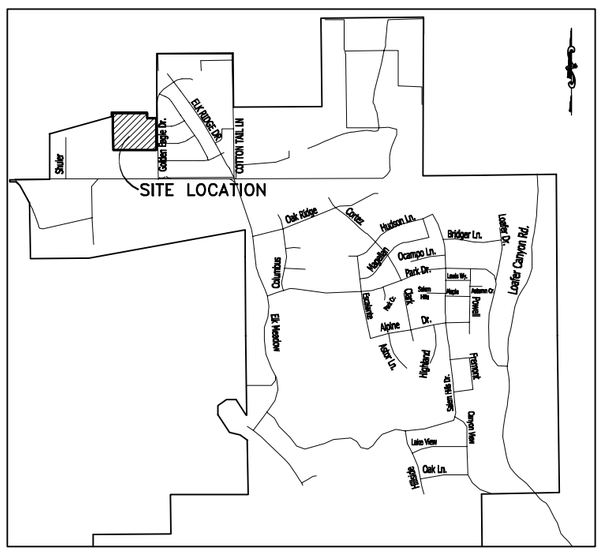
DRYLAND SUBDIVISION

A RESIDENTIAL SUBDIVISION
ELK RIDGE, UTAH
FINAL PLAN SET
JANUARY 2021

-SHEET INDEX-

NOTES:
CONTRACTOR RESPONSIBLE TO CONTACT BLUESTAKES PRIOR TO CONSTRUCTION. ANY DISCREPANCIES BETWEEN PLANS AND ACTUAL FIELD CONDITIONS TO BE REPORTED TO ENGINEER.



VICINITY MAP
-NTS-

OWNER/DEVELOPER
LEE HASKELL
901 GOOSENEST DR.
ELK RIDGE, UTAH
801-372-0139

DATA TABLE
ZONING=R-20
TOTAL ACREAGE=11.10
TOTAL # OF LOTS=15
TOTAL ACREAGE OF LOTS=9.31
TOTAL ACREAGE IN ROADS=1.79
TOTAL LOTS/ACRE=1.35

GENERAL NOTE:
1. THE SECTIONS OF THE STREET IN THE SUBDIVISION THAT ARE ON FILL WILL REQUIRE A VERY SPECIFIC CONSTRUCTION AND TESTING REGIMEN. THE FILL MATERIAL WILL NEED TO BE PLACED IN 6" LIFTS AND WILL NEED TO MEET 95% COMPACTION. THE CITY WILL WANT TO SEE COMPACTION TESTING EVERY 100 FEET, NEAR THE CENTER AND OUT NEAR BOTH SIDES OF THE FILL. THE TESTING SHALL OCCUR AFTER THE FIRST FOOT OF MATERIAL IS PLACED AND COMPACTED AND THEN AGAIN AFTER THE SECOND FOOT OF MATERIAL IS PLACED AND COMPACTED. IF THE METHOD IS SUCCESSFUL WITH CONSISTENTLY PASSINT TESTS THE TESTING RATE CAN BE RELAXED TO TWO FOOT INTERVALS IN THE SECTIONS THAT ARE SIX FEET OR DEEPER UP TO THE LAST TWO FEET OF DEPTH WHICH WILL REQUIRE TESTING EVERY FOOT OF DEPTH TO THE SURFACE. IF THE MATERIAL BEING USED CHANGES, NEW PROCTORS WILL BE REQUIRED AND THE TESTING FREQUENCY WILL NEED TO GO BACK TO ONE FOOT INTERVALS UNTIL CONSISTENT FAVORABLE COMPACTION TESTS ARE ACHEIVED. WHEN THIS PROJECT GOES INTO CONSTRUCTION, CONTRACTOR IS TO CONTACT ELK RIDGE CITY AND SPECIFICALLY DETERMINE WHERE THE DIFFERENT FREQUENCIES OF TESTING WILL OCCUR.
2. TO ENSURE THE MATERIAL IS PLACED IN 6" LIFTS ELK RIDGE CITY WILL REQUIRE THAT THE ELEVATION OF THE 6" LIFTS WILL BE MEASURED AND DOCUMENTED BY THE CONTRACTOR AT SIMILAR FREQUENCY (EVERY 100 FEET) AND PATTERN (CENTER AND BOTH SIDES) AS THE COMPACTION TESTING.

REGISTERED PROFESSIONAL ENGINEER
SCOTT D. PETERSON
No. 362274
1/15/21
STATE OF UTAH

LEGEND
(APPLIES TO ALL SHEETS)

- SECTION CORNER
- FOUND ALUMINUM CAP
- SET 5/8" IRON PIN
- CALCULATED POINT, NOT SET
- EXISTING POWER POLE
- PROPOSED STREET LIGHT
- PROPOSED FIRE HYDRANT
- PROPOSED SIGN
- PROPOSED STREET SIGN
- PROPERTY BOUNDARY
- CENTERLINE
- RIGHT-OF-WAY LINE
- LOT LINE
- SECTION LINE
- EASEMENT
- EXISTING DEED LINE
- EDGE OF PAVEMENT
- EXISTING OVER HEAD POWER
- EXISTING FENCE LINE
- EXISTING DITCH
- EXISTING SANITARY SEWER W/MANHOLE
- 18"ADS — PROPOSED STORM DRAIN W/MANHOLE
- 8"SS — PROPOSED PVC SDR-35 SEWER W/MH
- 8"CUL — PROPOSED CULINARY WATERLINE
- 6"PI — PROPOSED PRESSURIZED IRRIGATION

SHEET NO. 1

NO.	REVISIONS	BY	DATE
1			
2			
3			
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5			
6			

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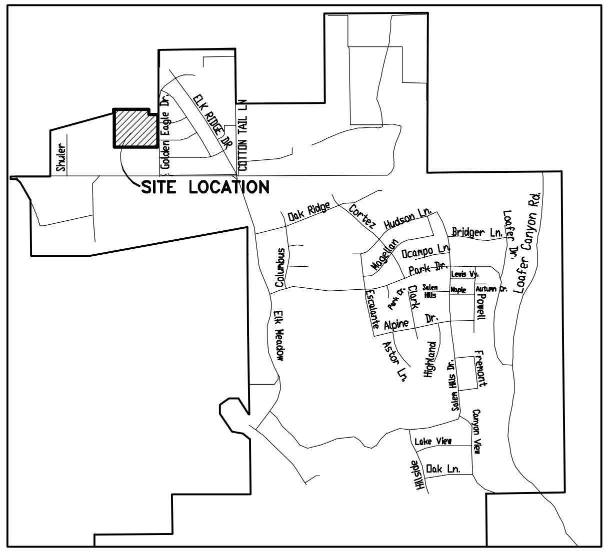
DRYLAND SUBDIVISION
COVER

ELK RIDGE, UTAH

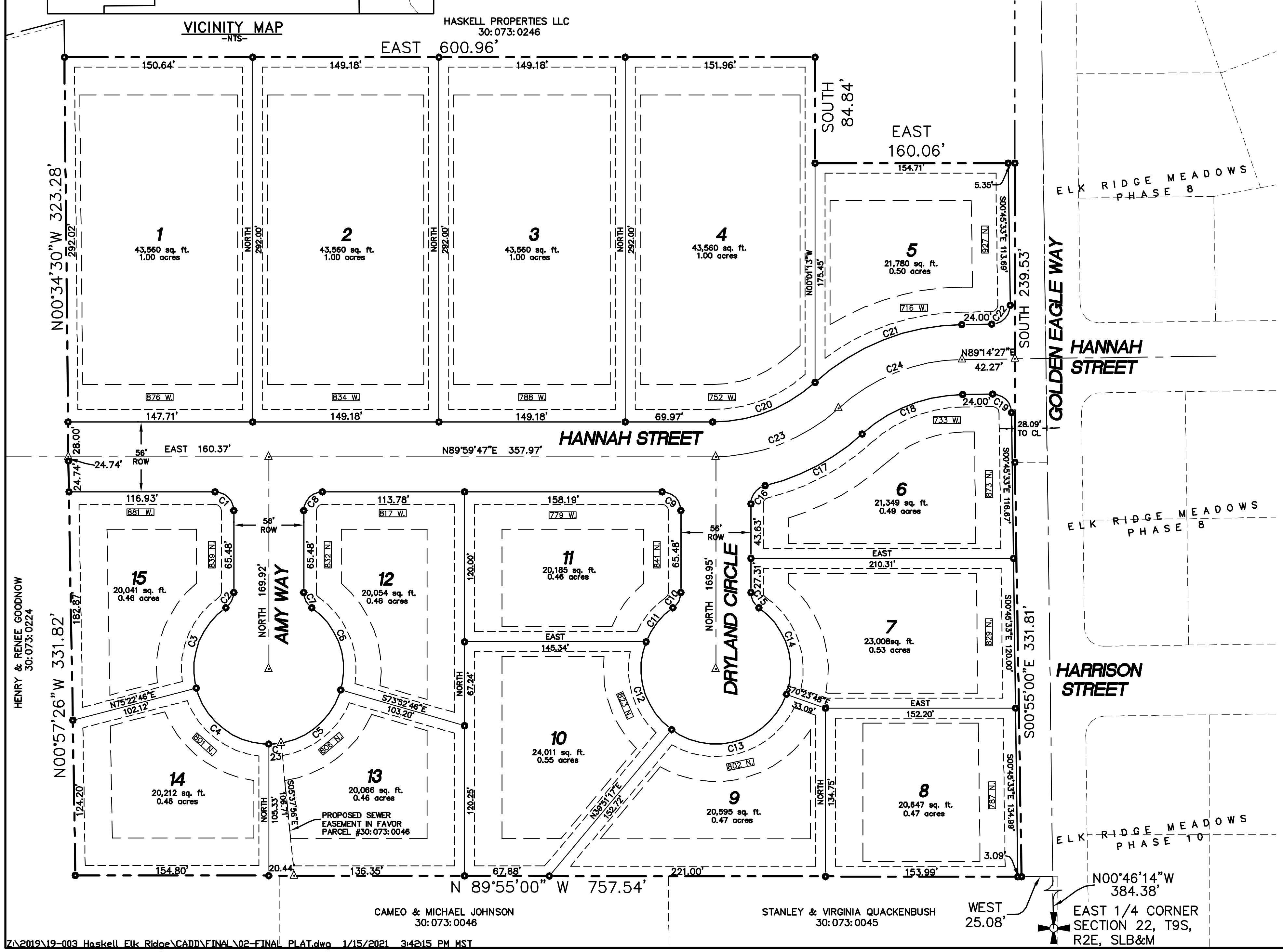
ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E 800 N SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)


SITE LOCATION
Golden Eagle Dr.
Elk Ridge Dr.
Cotton Tail Ln.
Shuler
Oak Ridge
Cortez
Hudson Ln.
Bridger Ln.
Loafer Dr.
Loafer Canyon Rd.
Ocampo Ln.
Park Dr.
Columbus
Alpine
Escalante
Astor Ln.
Highland
Powell
Fremont
Lake View
Canyon View
Oak Ln.
Hillside
Elk Meadow

VICINITY MAP
-NTS-

CURVE TABLE											
CURVE	RADIUS	LENGTH	CHORD DIST.	CHORD BRG.	DELTA	CURVE	RADIUS	LENGTH	CHORD DIST.	CHORD BRG.	DELTA
C1	15.00	23.56	21.21	N 45°00'00" W	90°00'00"	C12	60.00	78.79	73.25	S 16°11'05" E	75°14'05"
C2	15.00	14.40	13.86	N 27°30'31" E	55°01'01"	C13	60.00	111.63	96.21	N 72°54'02" E	106°35'41"
C3	60.00	72.92	68.52	S 20°11'53" W	69°38'16"	C14	60.00	74.50	69.80	N 19°26'53" W	71°08'16"
C4	60.00	78.94	73.37	S 52°18'37" E	75°22'46"	C15	15.00	14.40	13.86	S 27°30'31" E	55°01'01"
C5	60.00	67.36'	63.88'	N 48°16'53" E	64°19'17"	C16	15.00	19.99	18.54	S 38°10'09" W	76°20'19"
C6	60.00	74.50	69.80	N 19°26'53" W	71°08'16"	C17	178.00	88.86	87.94	N 62°02'13" E	28°36'12"
C7	15.00	14.40	13.86	S 27°30'31" E	55°01'01"	C18	122.00	88.38	86.46	S 68°29'17" W	41°30'20"
C8	15.00	23.56	21.21	S 45°00'00" W	90°00'00"	C19	15.00	23.56	21.21	N 45°45'33" W	90°00'00"
C9	15.00	23.56	21.21	N 45°00'00" W	90°00'00"	C20	122.00	89.99	87.97	N 68°52'03" E	42°15'53"
C10	15.00	14.40	13.86	N 27°30'31" E	55°01'01"	C21	178.00	128.95	126.14	S 68°29'17" W	41°30'20"
C11	60.00	35.17	34.67	S 38°13'29" W	33°35'04"	C22	15.00	23.56	21.21	N 44°14'27" E	90°00'00"
						C23	60.00	10.01	10.00	N 85°13'16" E	9°33'29"


HASKELL PROPERTIES LLC
30:073:0246
EAST 600.96'
SOUTH 84.84'
EAST 160.06'
N00°34'30"W 323.28'
N00°57'26"W 331.82'
HENRY & RENEE GOODNOW
30:073:0224
HANNAH STREET
AMY WAY
DRYLAND CIRCLE
GOLDEN EAGLE WAY
HANNAH STREET
HARRISON STREET
SOUTH 239.53'
S00°55'00"E 331.81'
N 89°55'00" W 757.54'
ELK RIDGE MEADOWS PHASE 8
ELK RIDGE MEADOWS PHASE 8
ELK RIDGE MEADOWS PHASE 10
1 43,560 sq. ft. 1.00 acres
2 43,560 sq. ft. 1.00 acres
3 43,560 sq. ft. 1.00 acres
4 43,560 sq. ft. 1.00 acres
5 21,780 sq. ft. 0.50 acres
6 21,349 sq. ft. 0.49 acres
7 23,008sq. ft. 0.53 acres
8 20,647 sq. ft. 0.47 acres
9 20,595 sq. ft. 0.47 acres
10 24,011 sq. ft. 0.55 acres
11 20,185 sq. ft. 0.46 acres
12 20,054 sq. ft. 0.46 acres
13 20,066 sq. ft. 0.46 acres
14 20,212 sq. ft. 0.46 acres
15 20,041 sq. ft. 0.46 acres
PROPOSED SEWER EASEMENT IN FAVOR PARCEL #30:073:0046
CAMEO & MICHAEL JOHNSON
30:073:0046
STANLEY & VIRGINIA QUACKENBUSH
30:073:0045
WEST 25.08'
N00°46'14"W 384.38'
EAST 1/4 CORNER SECTION 22, T9S, R2E, SLB&M

(24"x36")
SCALE 1" = 50'
(11"x17")
SCALE 1" = 100'

LEGEND

- FOUND BRASS CAP
- SET 5/8" IRON PIN
- CALCULATED POINT, NOT SET
- SET SURVEY MONUMENT
- PROPERTY BOUNDARY
- RIGHT-OF-WAY LINE
- LOT LINE
- SECTION LINE
- MUNICIPAL UTILITY EASEMENT
- SETBACK
- CENTERLINE
- XXX X — ADDRESSES

ENGINEER/SURVEYOR CONTACT INFO:
ATLAS ENGINEERING
PHONE: 801-655-0566
FAX: 801-655-0109
946 E 800 N SUITE A
SPANISH FORK, UT 84660

OWNER/DEVELOPER
LEE HASKELL
901 GOOSENEST DR.
ELK RIDGE, UTAH
801-372-0139

SURVEYOR'S CERTIFICATE

I, BARRY L. PRETTYMAN DO HEREBY CERTIFY THAT I AM A PROFESSIONAL LAND SURVEYOR, AND THAT I HOLD CERTIFICATE NO. 166406 AS PRESCRIBED UNDER THE LAWS OF THE STATE OF UTAH. I FURTHER CERTIFY BY AUTHORITY OF THE OWNERS, I HAVE MADE A SURVEY OF SAID TRACT OF LAND SHOWN ON THIS PLAT AND DESCRIBED BELOW, AND HAVE SUBDIVIDED SAID TRACT OF LAND INTO LOTS, STREETS, AND EASEMENTS AND THAT THE SAME HAS BEEN CORRECTLY SURVEYED AND STAKED ON THE GROUND AS SHOWN ON THIS PLAT AND THAT THIS IS TRUE AND CORRECT.

SURVEYOR ____ DATE ____

BOUNDARY DESCRIPTION

BEGINNING AT A POINT WHICH LIES N00°46'14"W 384.38 FEET AND WEST 25.08 FEET FROM THE EAST QUARTER CORNER OF SECTION 22, TOWNSHIP 9 SOUTH, RANGE 2 EAST, SALT LAKE BASE AND MERIDIAN;
AND RUNNING THENCE N89°55'00"W 757.54 FEET TO AN EXISTING FENCE; THENCE N00°57'26"W 331.82 FEET ALONG SAID FENCE; THENCE N00°34'30"W 323.28 FEET; THENCE EAST 600.96 FEET; THENCE SOUTH 84.84 FEET; THENCE EAST 160.06 FEET; THENCE SOUTH 239.53 FEET; THENCE S00°55'00"E 331.81 FEET TO THE POINT OF BEGINNING.
CONTAINING 11.10 ACRES.

OWNER'S DEDICATION

KNOW ALL MEN BY THESE PRESENTS THAT WE, ALL OF THE UNDERSIGNED OWNERS OF ALL THE PROPERTY DESCRIBED IN THE SURVEYOR'S CERTIFICATE HEREON AND SHOWN ON THIS MAP, HAVE CAUSED THE SAME TO BE SUBDIVIDED INTO LOTS, STREETS, AND EASEMENTS AND DO HEREBY DEDICATE THE STREETS, EASEMENTS AND OTHER PUBLIC AREAS AS INDICATED HEREON TO ELK RIDGE CITY FOR PERPETUAL USE OF THE PUBLIC.

IN WITNESS HEREOF WE HAVE HEREUNTO SET OUR HANDS THIS ____ DAY OF ____. A.D. 2020.

MEMBER: ____

MEMBER: ____

MEMBER: ____

MEMBER: ____

ACKNOWLEDGMENT

STATE OF UTAH
COUNTY OF UTAH } S.S.

ON THE ____ DAY OF ____, A.D. 2020 PERSONALLY APPEARED BEFORE ME ____, THE SIGNERS OF THE FOREGOING DEDICATION WHO DULY ACKNOWLEDGED TO ME THAT THEY DID EXECUTE THE SAME.

NOTARY PUBLIC IN THE STATE OF UTAH

COMMISSION NUMBER / EXPIRES — NOTARY PUBLIC PRINTED NAME

ACCEPTANCE BY LEGISLATIVE BODY

THE ____ OF ____ COUNTY OF UTAH, APPROVES THIS SUBDIVISION AND HEREBY ACCEPTS THE DEDICATION OF ALL STREETS, EASEMENTS, AND OTHER PARCELS OF LAND INTENDED FOR PUBLIC PURPOSES FOR THE PERPETUAL USE OF THE PUBLIC THIS ____ DAY OF ____ A.D. 2020.

APPROVED ____ MAYOR

ATTEST ____ CLERK-RECORDER

DRYLAND SUBDIVISION PLAT "A"

ELK RIDGE CITY, UTAH COUNTY, UTAH
CONTAINING 15 LOTS AND 11.10 ACRES
LOCATED IN THE NORTHEAST QUARTER OF SECTION 22, TOWNSHIP 9 SOUTH, RANGE 2 EAST, SALT LAKE BASE AND MERIDIAN, UTAH COUNTY, UTAH.

CLERK-RECORDER SEAL	SURVEYOR'S SEAL	NOTARY PUBLIC SEAL	UTAH COUNTY RECORDER

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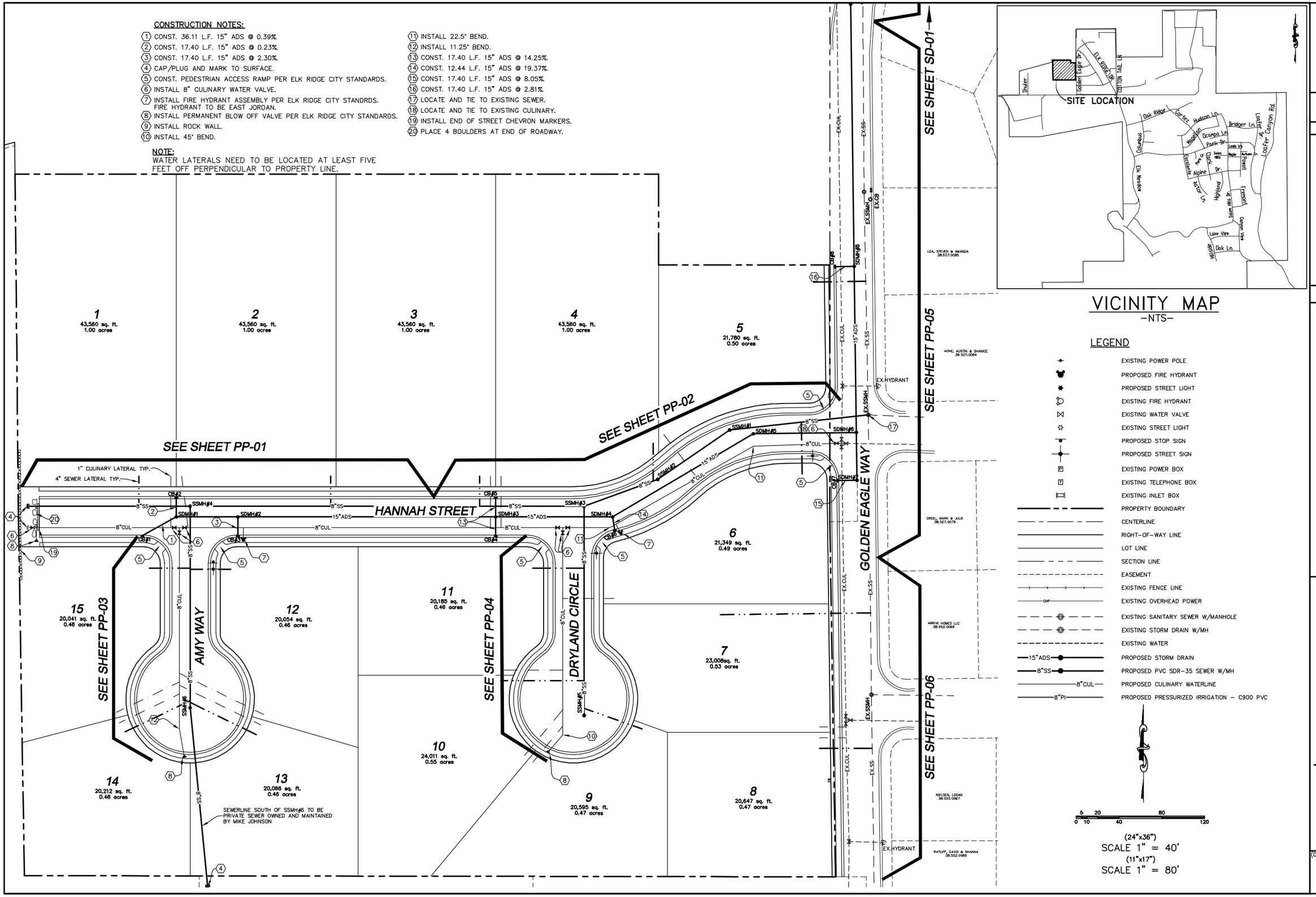
CONSTRUCTION NOTES:

1. CONST. 36.11 L.F. 15" ADS @ 0.39%.
2. CONST. 17.40 L.F. 15" ADS @ 0.23%.
3. CONST. 17.40 L.F. 15" ADS @ 2.30%.
4. CAP/PLUG AND MARK TO SURFACE.
5. CONST. PEDESTRIAN ACCESS RAMP PER ELK RIDGE CITY STANDARDS.
6. INSTALL 8" CULINARY WATER VALVE.
7. INSTALL FIRE HYDRANT ASSEMBLY PER ELK RIDGE CITY STANDRDS. FIRE HYDRANT TO BE EAST JORDAN.
8. INSTALL PERMANENT BLOW OFF VALVE PER ELK RIDGE CITY STANDARDS.
9. INSTALL ROCK WALL.
10. INSTALL 45° BEND.
11. INSTALL 22.5° BEND.
12. INSTALL 11.25° BEND.
13. CONST. 17.40 L.F. 15" ADS @ 14.25%.
14. CONST. 12.44 L.F. 15" ADS @ 19.37%.
15. CONST. 17.40 L.F. 15" ADS @ 8.05%.
16. CONST. 17.40 L.F. 15" ADS @ 2.81%.
17. LOCATE AND TIE TO EXISTING SEWER.
18. LOCATE AND TIE TO EXISTING CULINARY.
19. INSTALL END OF STREET CHEVRON MARKERS.
20. PLACE 4 BOULDERS AT END OF ROADWAY.

NOTE:
WATER LATERALS NEED TO BE LOCATED AT LEAST FIVE FEET OFF PERPENDICULAR TO PROPERTY LINE.



VICINITY MAP
-NTS-

LEGEND

- EXISTING POWER POLE
- PROPOSED FIRE HYDRANT
- PROPOSED STREET LIGHT
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING STREET LIGHT
- PROPOSED STOP SIGN
- PROPOSED STREET SIGN
- EXISTING POWER BOX
- EXISTING TELEPHONE BOX
- EXISTING INLET BOX
- PROPERTY BOUNDARY
- CENTERLINE
- RIGHT-OF-WAY LINE
- LOT LINE
- SECTION LINE
- EASEMENT
- EXISTING FENCE LINE
- OHP — EXISTING OVERHEAD POWER
- EXISTING SANITARY SEWER W/MANHOLE
- EXISTING STORM DRAIN W/MH
- EXISTING WATER
- 15"ADS — PROPOSED STORM DRAIN
- 8"SS — PROPOSED PVC SDR-35 SEWER W/MH
- 8"CUL — PROPOSED CULINARY WATERLINE
- 8"PI — PROPOSED PRESSURIZED IRRIGATION - C900 PVC

0 10 20 40 80 120

(24"x36")
SCALE 1" = 40'
(11"x17")
SCALE 1" = 80'

SHEET NO. 3

NO.	REVISIONS	BY	DATE
1			
2			
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UTILITY & INDEX

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

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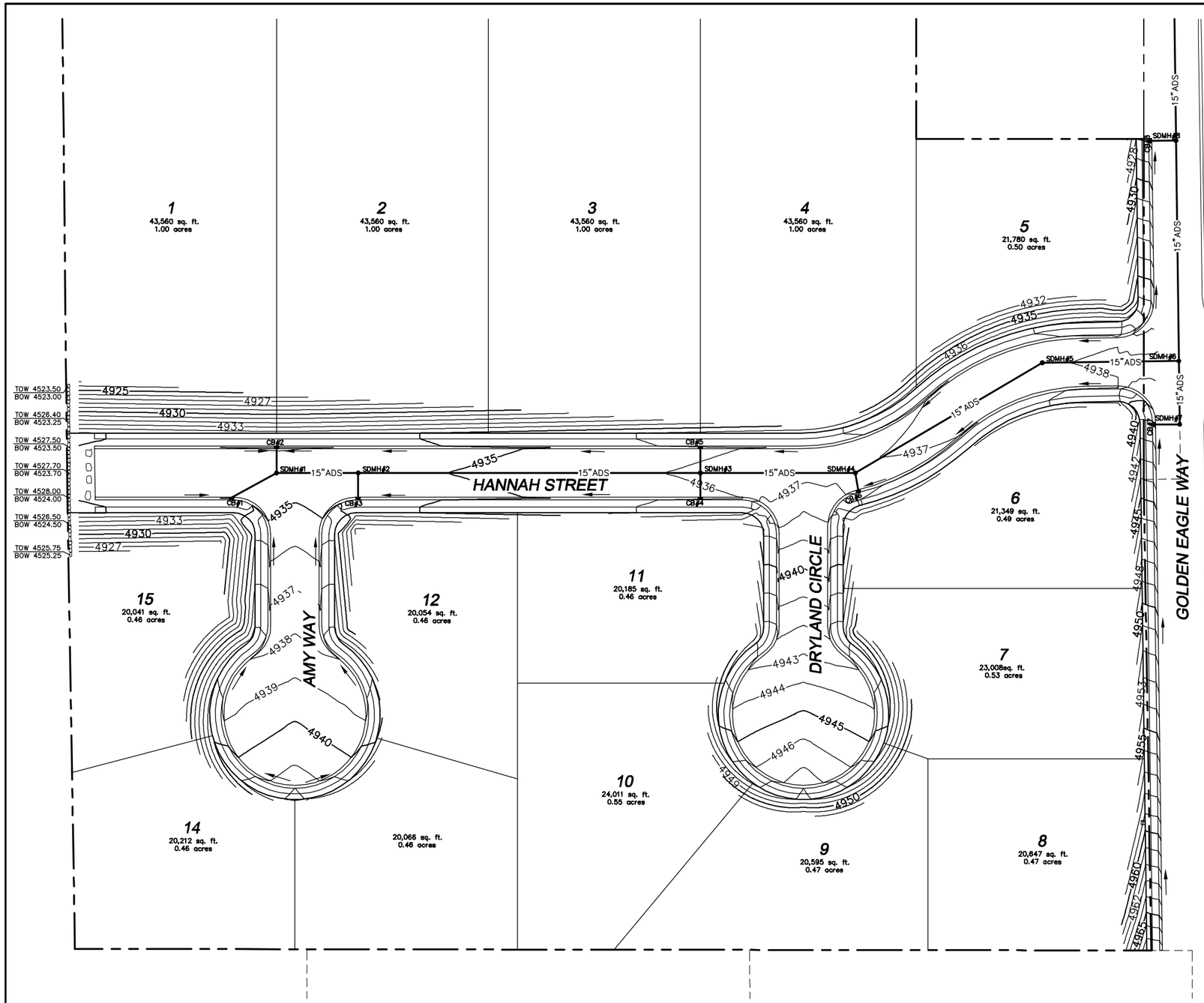
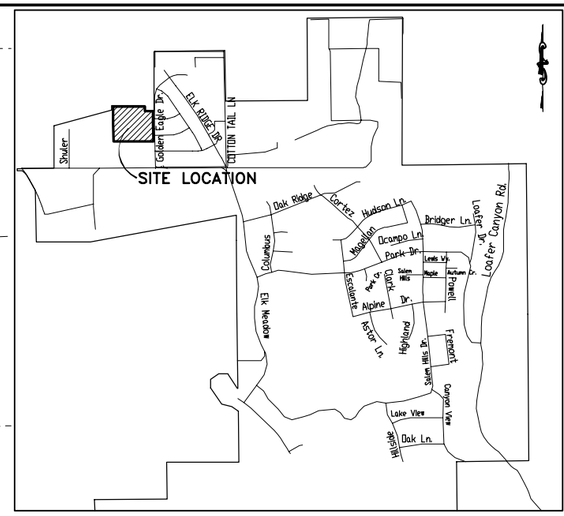
ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E 800 N SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)





VICINITY MAP
-NTS-

LEGEND

- EXISTING POWER POLE
- PROPOSED FIRE HYDRANT
- PROPOSED STREET LIGHT
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING STREET LIGHT
- PROPOSED STOP SIGN
- PROPOSED STREET SIGN
- EXISTING POWER BOX
- EXISTING TELEPHONE BOX
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- SECTION LINE
- EASEMENT
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- OHP — EXISTING OVERHEAD POWER
- EXISTING SANITARY SEWER W/MANHOLE
- EXISTING STORM DRAIN W/MH
- EXISTING WATER
- 15"ADS — PROPOSED STORM DRAIN
- 8"SS — PROPOSED PVC SDR-35 SEWER W/MH
- 8"CUL — PROPOSED CULINARY WATERLINE
- 8"PI — PROPOSED PRESSURIZED IRRIGATION - C900 PVC

0 10 40 120 (5 20 80)

(24"x36")
SCALE 1" = 40'
(11"x17")
SCALE 1" = 80'

SHEET NO. 4

NO.	REVISIONS	BY	DATE
1			
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6			

GRADING PLAN

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

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ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
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946 E 800 N SUITE A
SPANISH FORK, UT 84660

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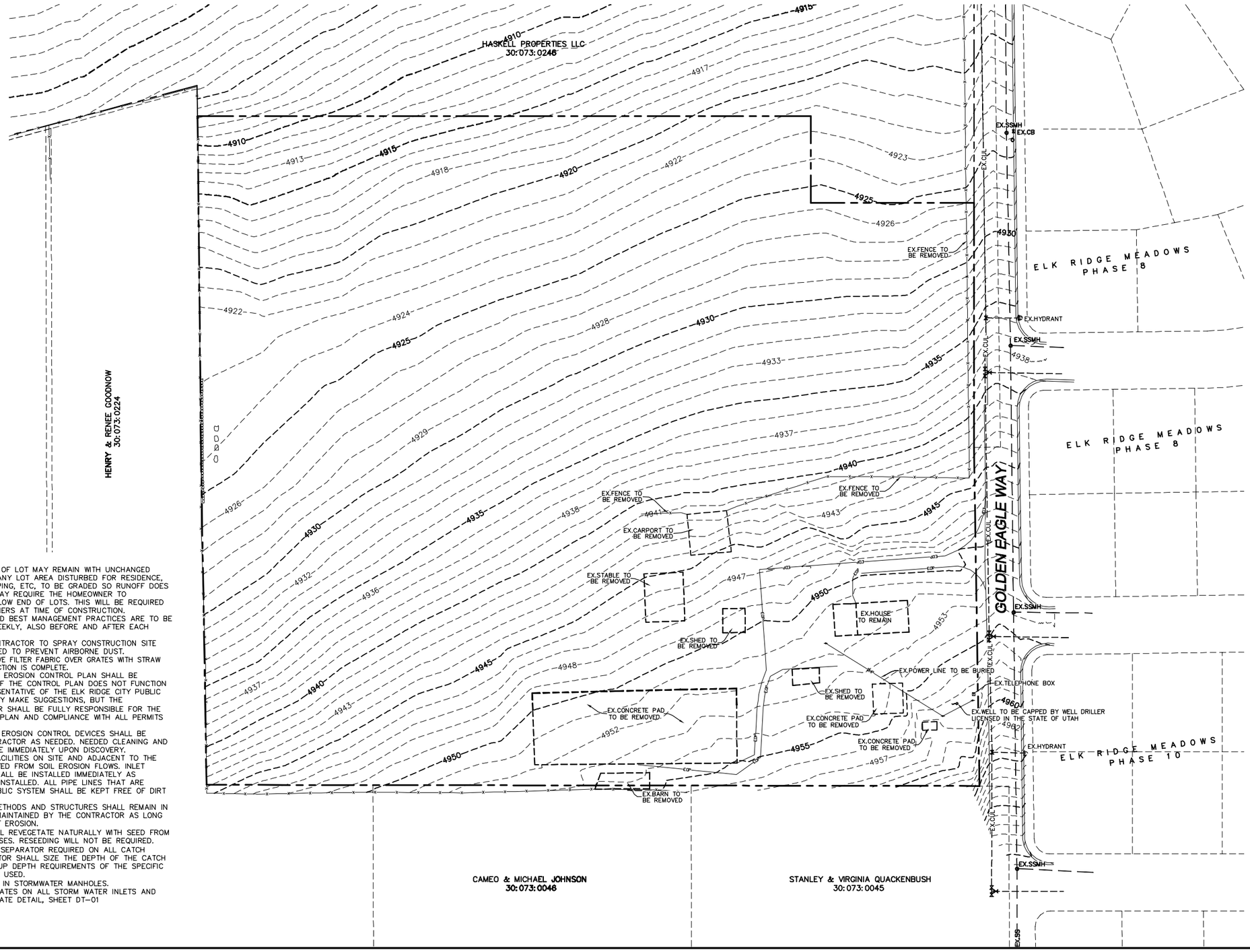

(24"x36")
SCALE 1" = 50'
(11"x17")
SCALE 1" = 100'

NOTES:
1. UNDISTURBED AREAS OF LOT MAY REMAIN WITH UNCHANGED HISTORICAL DRAINAGE. ANY LOT AREA DISTURBED FOR RESIDENCE, HARDSCAPES, LANDSCAPING, ETC, TO BE GRADED SO RUNOFF DOES NOT LEAVE LOT. THIS MAY REQUIRE THE HOMEOWNER TO CONSTRUCT BERMS AT LOW END OF LOTS. THIS WILL BE REQUIRED OF INDIVIDUAL HOMEOWNERS AT TIME OF CONSTRUCTION.
2. CONSTRUCTION PERIOD BEST MANAGEMENT PRACTICES ARE TO BE INSPECTED AT LEAST WEEKLY, ALSO BEFORE AND AFTER EACH STORM EVENT.
3. DUST CONTROL– CONTRACTOR TO SPRAY CONSTRUCTION SITE WITH WATER AS REQUIRED TO PREVENT AIRBORNE DUST.
4. CATCH BASINS TO HAVE FILTER FABRIC OVER GRATES WITH STRAW WATTLES UNTIL CONSTRUCTION IS COMPLETE.
5. THE DUST, MUD, AND EROSION CONTROL PLAN SHALL BE ADJUSTED AS NEEDED. IF THE CONTROL PLAN DOES NOT FUNCTION AS INTENDED, A REPRESENTATIVE OF THE ELK RIDGE CITY PUBLIC WORKS DEPARTMENT MAY MAKE SUGGESTIONS, BUT THE DEVELOPER/CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE EFFECTIVENESS OF THE PLAN AND COMPLIANCE WITH ALL PERMITS AND REGULATIONS.
6. ALL DUST, MUD AND EROSION CONTROL DEVICES SHALL BE CHECKED BY THE CONTRACTOR AS NEEDED. NEEDED CLEANING AND REPAIRS SHALL BE DONE IMMEDIATELY UPON DISCOVERY.
7. ALL STORM DRAIN FACILITIES ON SITE AND ADJACENT TO THE SITE SHALL BE PROTECTED FROM SOIL EROSION FLOWS. INLET PROTECTION DEVICES SHALL BE INSTALLED IMMEDIATELY AS INDIVIDUAL INLETS ARE INSTALLED. ALL PIPE LINES THAT ARE CONNECTED TO THE PUBLIC SYSTEM SHALL BE KEPT FREE OF DIRT AND DEBRIS.
8. EROSION CONTROL METHODS AND STRUCTURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED BY THE CONTRACTOR AS LONG AS NEEDED TO PREVENT EROSION.
9. CUT/FILL SLOPES WILL REVEGETATE NATURALLY WITH SEED FROM ADJACENT NATIVE GRASSES. RESEEDING WILL NOT BE REQUIRED.
10. SNOUTS OIL/WATER SEPARATOR REQUIRED ON ALL CATCH BASINS. THE CONTRACTOR SHALL SIZE THE DEPTH OF THE CATCH BASINS TO MEET THE SUP DEPTH REQUIREMENTS OF THE SPECIFIC MODEL OF SNOUT BEING USED.
11. PROVIDE 1/10 DROP IN STORMWATER MANHOLES.
12. PROVIDE SAFETY GRATES ON ALL STORM WATER INLETS AND OUTLETS. SEE GRID GRATE DETAIL, SHEET DT–01

OWNER/DEVELOPER
LEE HASKELL
901 GOOSENEST DR.
ELK RIDGE, UTAH
801–372–0139

DATA TABLE
ZONE CLASSIFICATION=R–1–20
TOTAL ACREAGE=11.10 ACRES
TOTAL # OF LOTS=15
UNITS/ACRE=1.35
ACREAGE IN ROADS=1.78 ACRES
ACREAGE IN LOTS=9.32 ACRES

SHEET NO. 5

NO.	REVISIONS	BY	DATE
1			
2			
3			
4			
5			
6			

EXISTING TOPOGRAPHY

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

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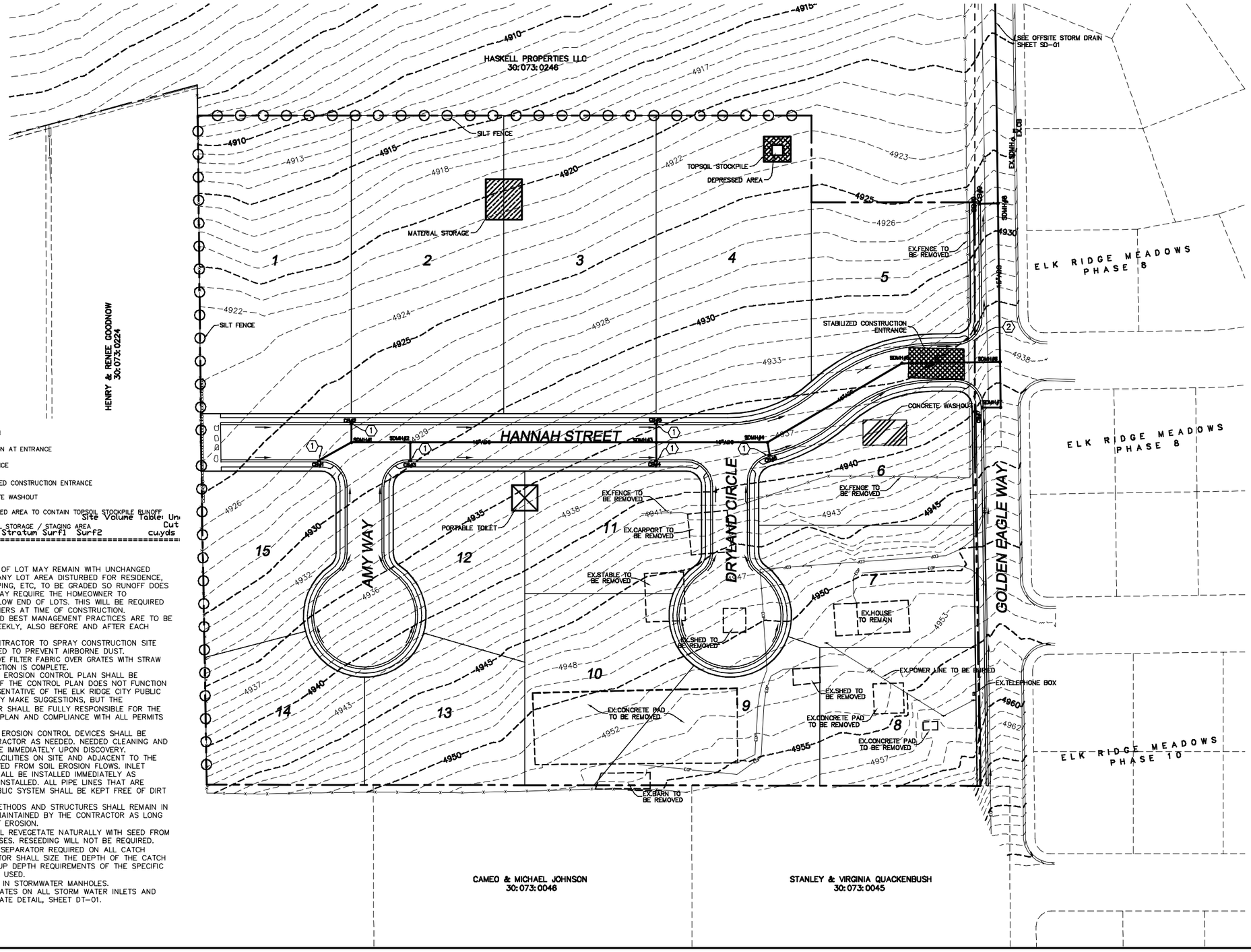
ATLAS ENGINEERING L.L.C.
PHONE: 801–655–0566
FAX: 801–655–0109
946 E 800 N SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)



(1) INLET PROTECTION
(2) PLACE SWPPP SIGN AT ENTRANCE
SILT FENCE
STABILIZED CONSTRUCTION ENTRANCE
CONCRETE WASHOUT
DEPRESSED AREA TO CONTAIN TOPSOIL STOCKPILE RUNOFF
MATERIAL STORAGE / STAGING AREA

Site Volume Table: Un
Site Stratum Surf1 Surf2 Cut cu.yds

NOTES:
1. UNDISTURBED AREAS OF LOT MAY REMAIN WITH UNCHANGED HISTORICAL DRAINAGE. ANY LOT AREA DISTURBED FOR RESIDENCE, HARDSCAPES, LANDSCAPING, ETC, TO BE GRADED SO RUNOFF DOES NOT LEAVE LOT. THIS MAY REQUIRE THE HOMEOWNER TO CONSTRUCT BERMS AT LOW END OF LOTS. THIS WILL BE REQUIRED OF INDIVIDUAL HOMEOWNERS AT TIME OF CONSTRUCTION.
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6. ALL DUST, MUD AND EROSION CONTROL DEVICES SHALL BE CHECKED BY THE CONTRACTOR AS NEEDED. NEEDED CLEANING AND REPAIRS SHALL BE DONE IMMEDIATELY UPON DISCOVERY.
7. ALL STORM DRAIN FACILITIES ON SITE AND ADJACENT TO THE SITE SHALL BE PROTECTED FROM SOIL EROSION FLOWS. INLET PROTECTION DEVICES SHALL BE INSTALLED IMMEDIATELY AS INDIVIDUAL INLETS ARE INSTALLED. ALL PIPE LINES THAT ARE CONNECTED TO THE PUBLIC SYSTEM SHALL BE KEPT FREE OF DIRT AND DEBRIS.
8. EROSION CONTROL METHODS AND STRUCTURES SHALL REMAIN IN PLACE AND SHALL BE MAINTAINED BY THE CONTRACTOR AS LONG AS NEEDED TO PREVENT EROSION.
9. CUT/FILL SLOPES WILL REVEGETATE NATURALLY WITH SEED FROM ADJACENT NATIVE GRASSES. RESEEDING WILL NOT BE REQUIRED.
10. SNOUTS OIL/WATER SEPARATOR REQUIRED ON ALL CATCH BASINS. THE CONTRACTOR SHALL SIZE THE DEPTH OF THE CATCH BASINS TO MEET THE SUP DEPTH REQUIREMENTS OF THE SPECIFIC MODEL OF SNOUT BEING USED.
11. PROVIDE 1/10 DROP IN STORMWATER MANHOLES.
12. PROVIDE SAFETY GRATES ON ALL STORM WATER INLETS AND OUTLETS. SEE GRID GRATE DETAIL, SHEET DT–01.

0 5 25 50 100 150

(24"x36")
SCALE 1" = 50'
(11"x17")
SCALE 1" = 100'

SHEET NO. 6

NO.	REVISIONS	BY	DATE
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EROSION CONTROL PLAN

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E 800 N SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)

HASKELL PROPERTIES LLC
30:073:0246

HENRY & RENEE GOODNOW
30:073:0224

CAMEO & MICHAEL JOHNSON
30:073:0046

STANLEY & VIRGINIA QUACKENBUSH
30:073:0045

SEE OFFSITE STORM DRAIN SHEET SD-01

HANNAH STREET

AMY WAY

DRYLAND CIRCLE

GOLDEN EAGLE WAY

ELK RIDGE MEADOWS PHASE 8

ELK RIDGE MEADOWS PHASE 10

1	29,041 BLD AREA	43,560 sq. ft. 1.00 acres
2	29,042 BLD AREA	43,560 sq. ft. 1.00 acres
3	29,042 BLD AREA	43,560 sq. ft. 1.00 acres
4	29,001 BLD AREA	43,560 sq. ft. 1.00 acres
5	8,904 BLD AREA	21,780 sq. ft. 0.50 acres
6	9,051 BLD AREA	20,641 sq. ft. 0.47 acres
7	12,372 BLD AREA	22,998 sq. ft. 0.53 acres
8	10,321 BLD AREA	20,647 sq. ft. 0.47 acres
9	7,999 BLD AREA	20,595 sq. ft. 0.47 acres
10	12,066 BLD AREA	24,011 sq. ft. 0.55 acres
11	8,310 BLD AREA	20,185 sq. ft. 0.46 acres
12	6,866 BLD AREA	20,054 sq. ft. 0.46 acres
13	8,401 BLD AREA	20,066 sq. ft. 0.46 acres
14	8,594 BLD AREA	20,212 sq. ft. 0.46 acres
15	6,958 BLD AREA	20,050 sq. ft. 0.46 acres

NOTES:
1. THERE ARE NO AREAS GREATER THAN 30% SLOPE.

DISTURBED AREA

0 5 25 50 100 150

(24"x36")
SCALE 1" = 50'
(11"x17")
SCALE 1" = 100'

SHEET NO. 7

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RE-VEGITATION/RETENTION PLAN

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

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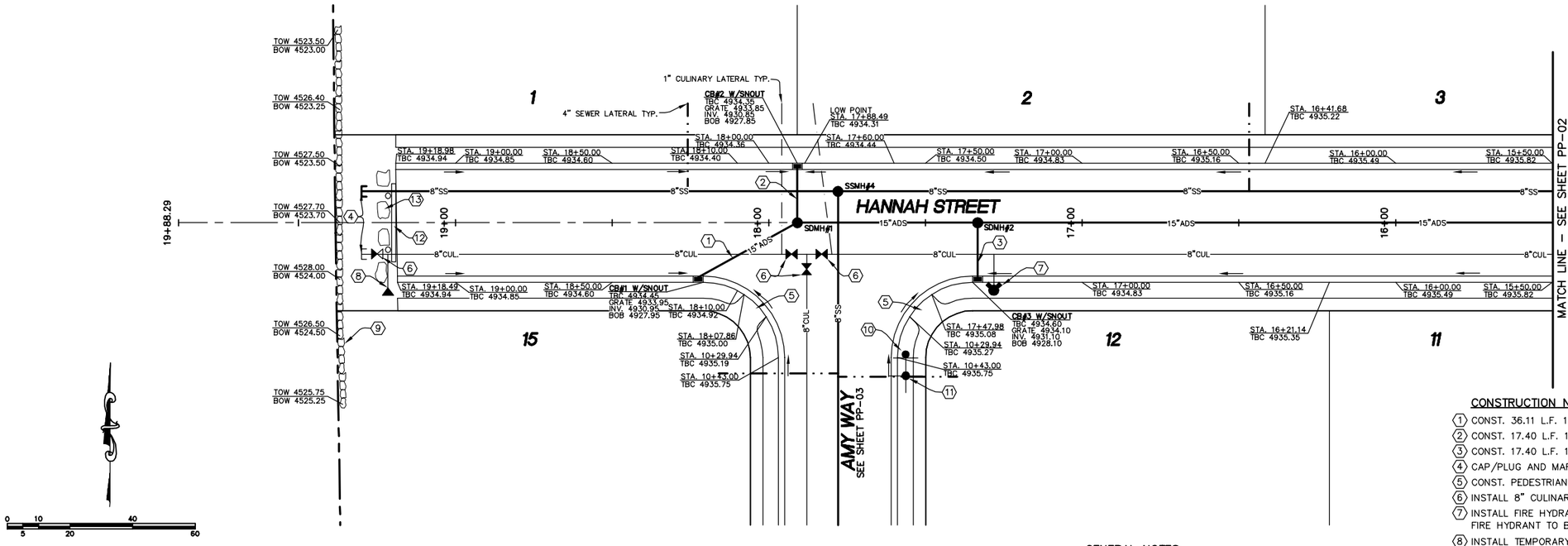
ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E 800 N SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)



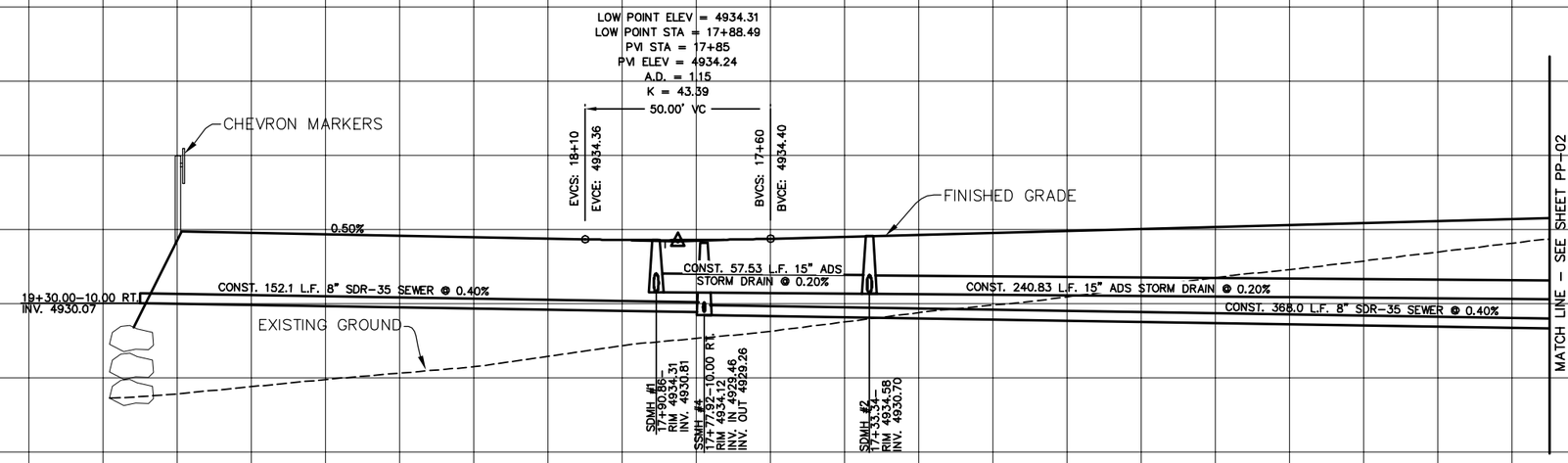
-24"x36"-
SCALE 1" = 20'
-11"x17"-
SCALE 1" = 40'

CONSTRUCTION NOTES:

1. CONST. 36.11 L.F. 15" ADS @ 0.39%.
2. CONST. 17.40 L.F. 15" ADS @ 0.23%.
3. CONST. 17.40 L.F. 15" ADS @ 2.30%.
4. CAP/PLUG AND MARK TO SURFACE.
5. CONST. PEDESTRIAN ACCESS RAMP PER ELK RIDGE CITY STANDARDS.
6. INSTALL 8" CULINARY WATER VALVE.
7. INSTALL FIRE HYDRANT ASSEMBLY PER ELK RIDGE CITY STANDRDS. FIRE HYDRANT TO BE EAST JORDAN.
8. INSTALL TEMPORARY BLOW OFF VALVE PER ELK RIDGE CITY STANDARDS.
9. INSTALL ROCK WALL.
10. INSTALL STOP SIGN PER ELK RIDGE CITY STANDARDS.
11. INSTALL STREET SIGN PER ELK RIDGE CITY STANDARDS.
12. INSTALL END OF STREET CHEVRON MARKERS.
13. PLACE 4 BOULDERS AT END OF ROADWAY.

GENERAL NOTES:

ALL CURB INTEL BOXES REQUIRE A SNOUT.
CONTRACTOR TO SIZE THE CURB INTEL BOX SUMP DEPTH PER SNOUT MANUFACTURES RECOMMENDATION.



HORIZONTAL SCALE
-24"x36"-
SCALE 1" = 20'
-11"x17"-
SCALE 1" = 40'

VERTICAL SCALE
-24"x36"-
SCALE 1" = 5'
-11"x17"-
SCALE 1" = 10'

SHEET NO. PP-01

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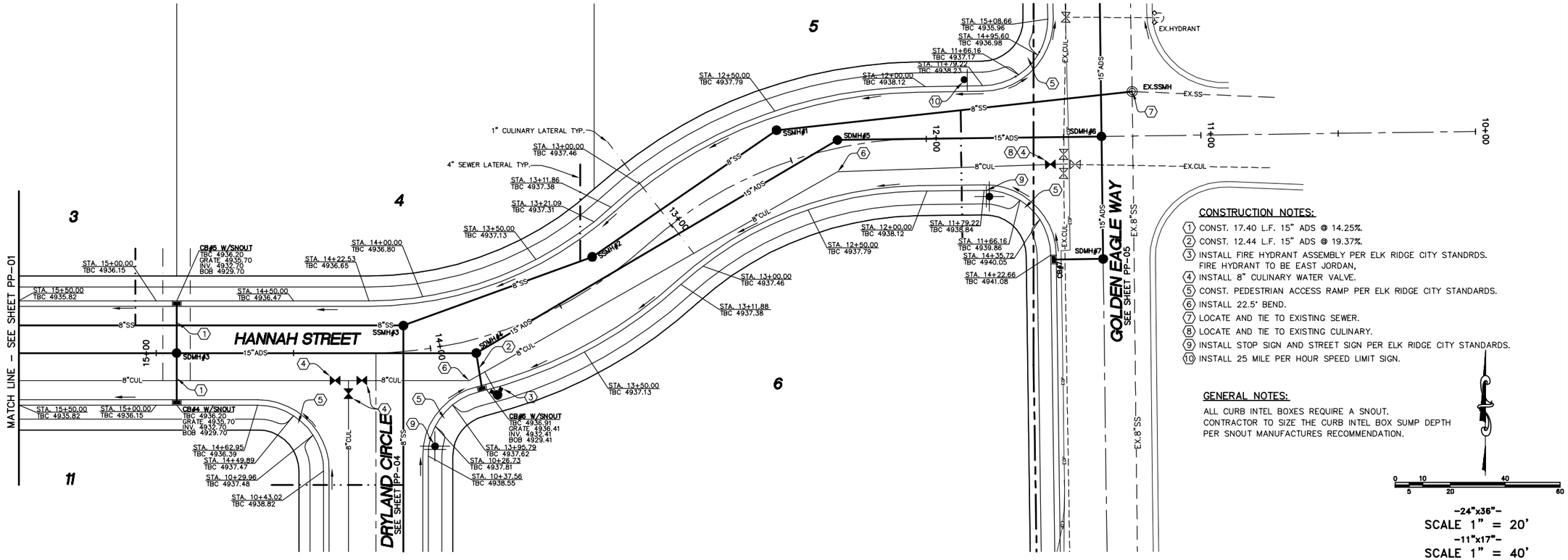
HANNAH STREET
STA. 15+50 TO STA. 19+88.29

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E. 800 N. SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)



CONSTRUCTION NOTES:

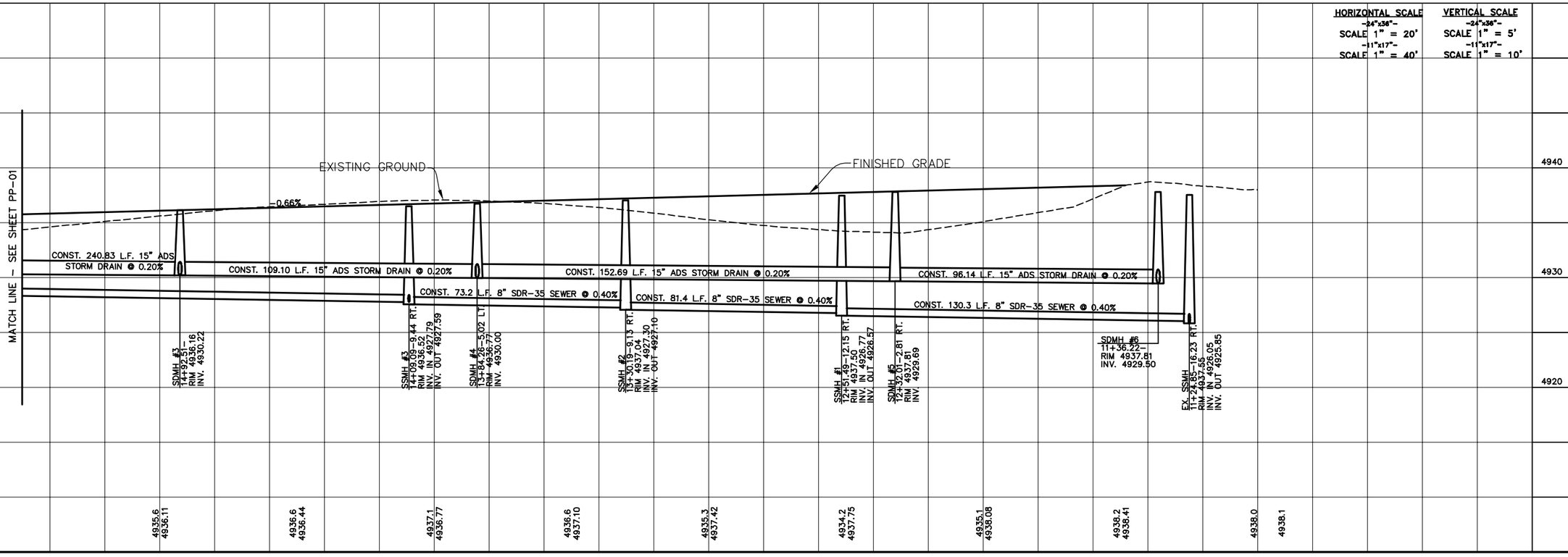
1. CONST. 17.40 L.F. 15" ADS @ 14.25%.
2. CONST. 12.44 L.F. 15" ADS @ 19.37%.
3. INSTALL FIRE HYDRANT ASSEMBLY PER ELK RIDGE CITY STANDRDS. FIRE HYDRANT TO BE EAST JORDAN,
4. INSTALL 8" CULINARY WATER VALVE.
5. CONST. PEDESTRIAN ACCESS RAMP PER ELK RIDGE CITY STANDARDS.
6. INSTALL 22.5° BEND.
7. LOCATE AND TIE TO EXISTING SEWER.
8. LOCATE AND TIE TO EXISTING CULINARY.
9. INSTALL STOP SIGN AND STREET SIGN PER ELK RIDGE CITY STANDARDS.
10. INSTALL 25 MILE PER HOUR SPEED LIMIT SIGN.

GENERAL NOTES:

ALL CURB INTEL BOXES REQUIRE A SNOUT.
CONTRACTOR TO SIZE THE CURB INTEL BOX SUMP DEPTH PER SNOUT MANUFACTURES RECOMMENDATION.

0 10 40
5 20 60

-24"x36"-
SCALE 1" = 20'
-11"x17"-
SCALE 1" = 40'



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SHEET NO. PP-02

HANNAH STREET
STA. 10+00 TO STA. 15+50

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E. 800 N. SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)

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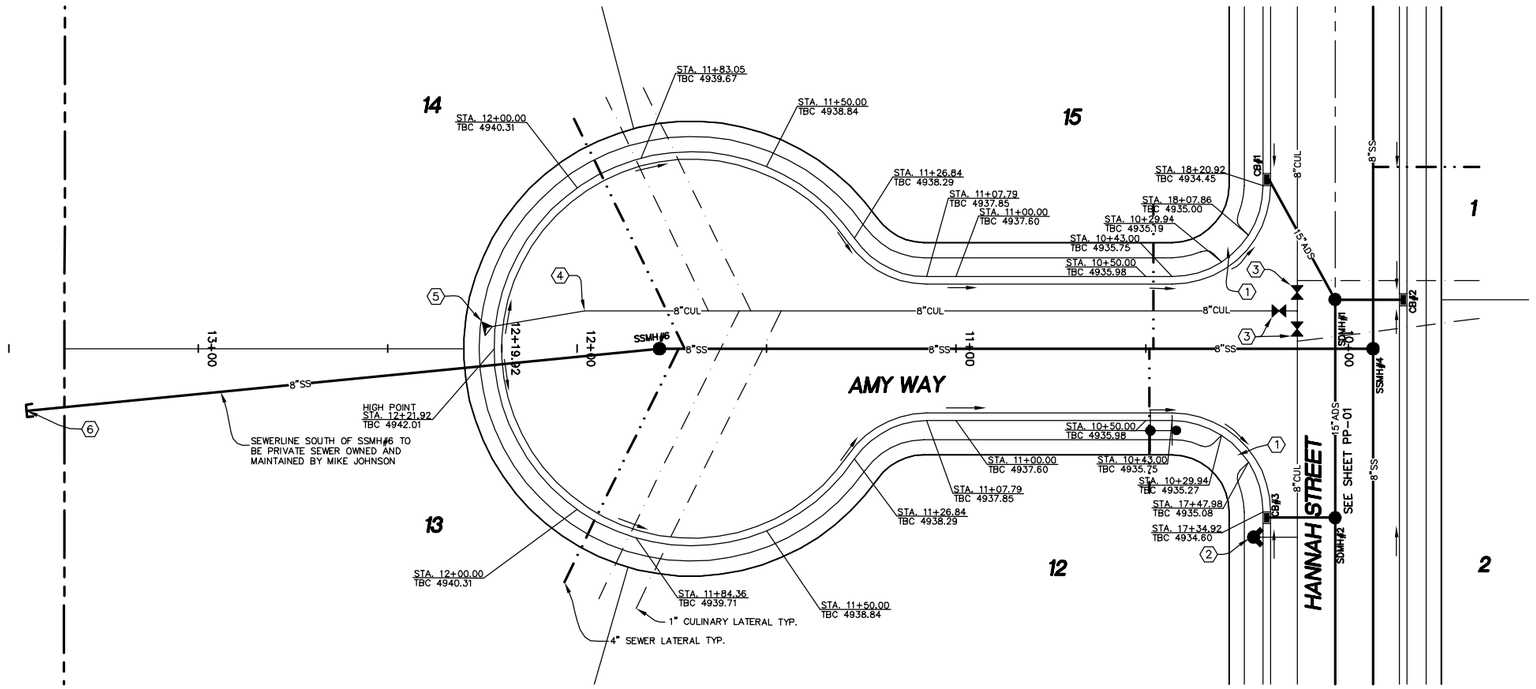
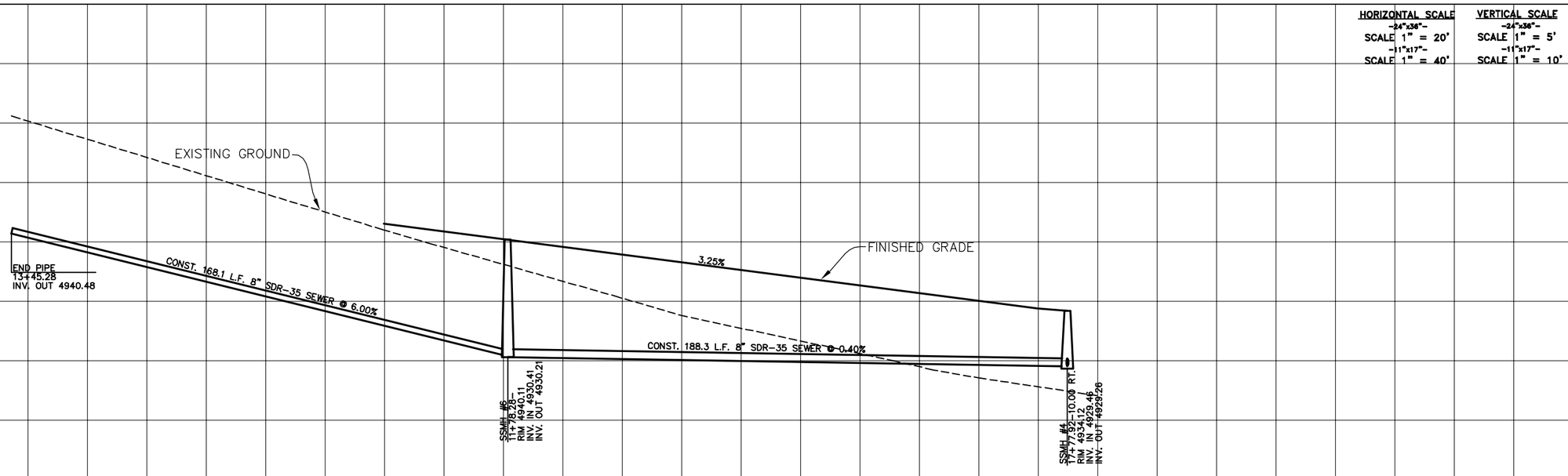


CONSTRUCTION NOTES:

1. CONST. PEDESTRIAN ACCESS RAMP PER ELK RIDGE CITY STANDARDS.
2. INSTALL FIRE HYDRANT ASSEMBLY PER ELK RIDGE CITY STANDRDS. FIRE HYDRANT TO BE EAST JORDAN.
3. INSTALL 8" CULINARY WATER VALVE.
4. INSTALL 11.25° BEND.
5. INSTALL BLOW OFF VALVE.
6. CAP/PLUG AND MARK TO SURFACE.

0 10 40
5 20 60

-24"x36"-
SCALE 1" = 20'
-11"x17"-
SCALE 1" = 40'



HORIZONTAL SCALE	VERTICAL SCALE
-24"x36"- SCALE 1" = 20'	-24"x36"- SCALE 1" = 5'
-11"x17"- SCALE 1" = 40'	-11"x17"- SCALE 1" = 10'

SHEET NO. PP-03

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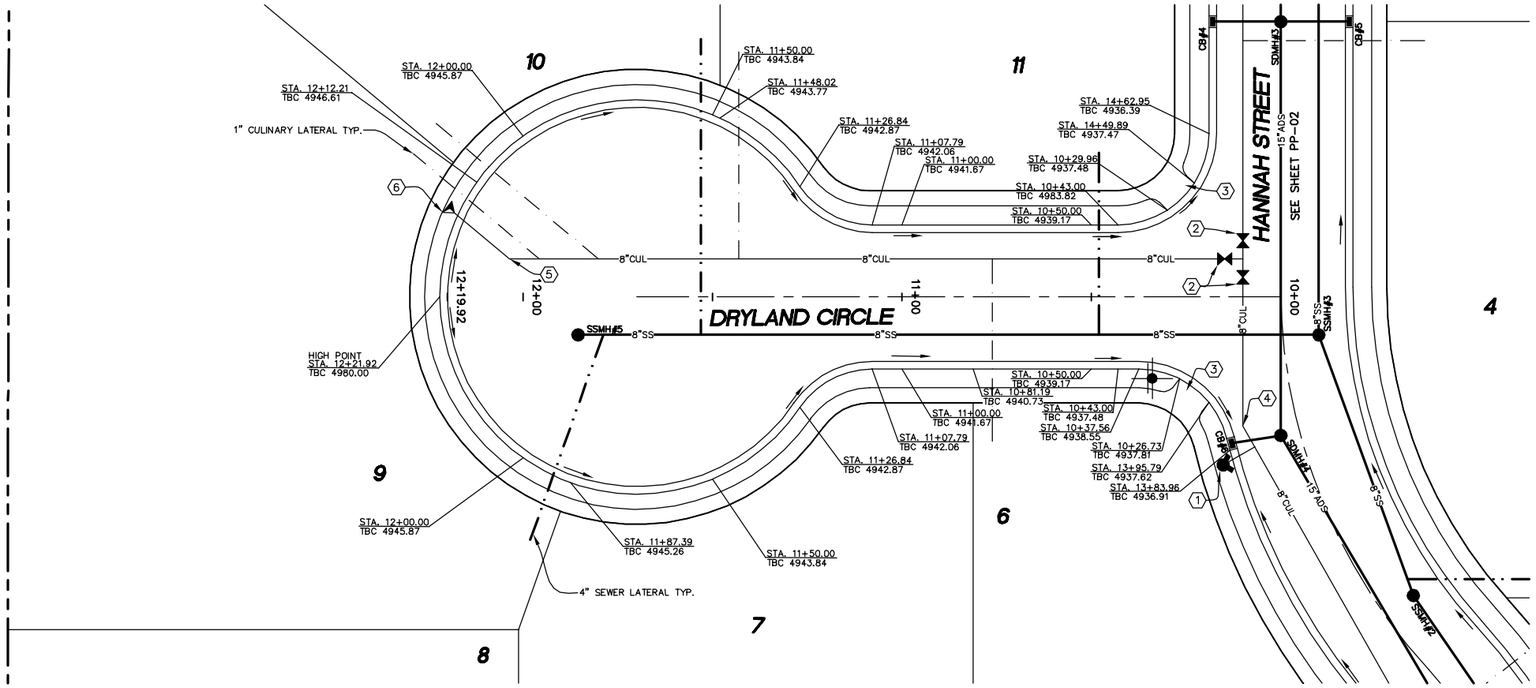
AMY WAY
STA. 10+00 TO STA. 13+50

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E. 800 N. SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)

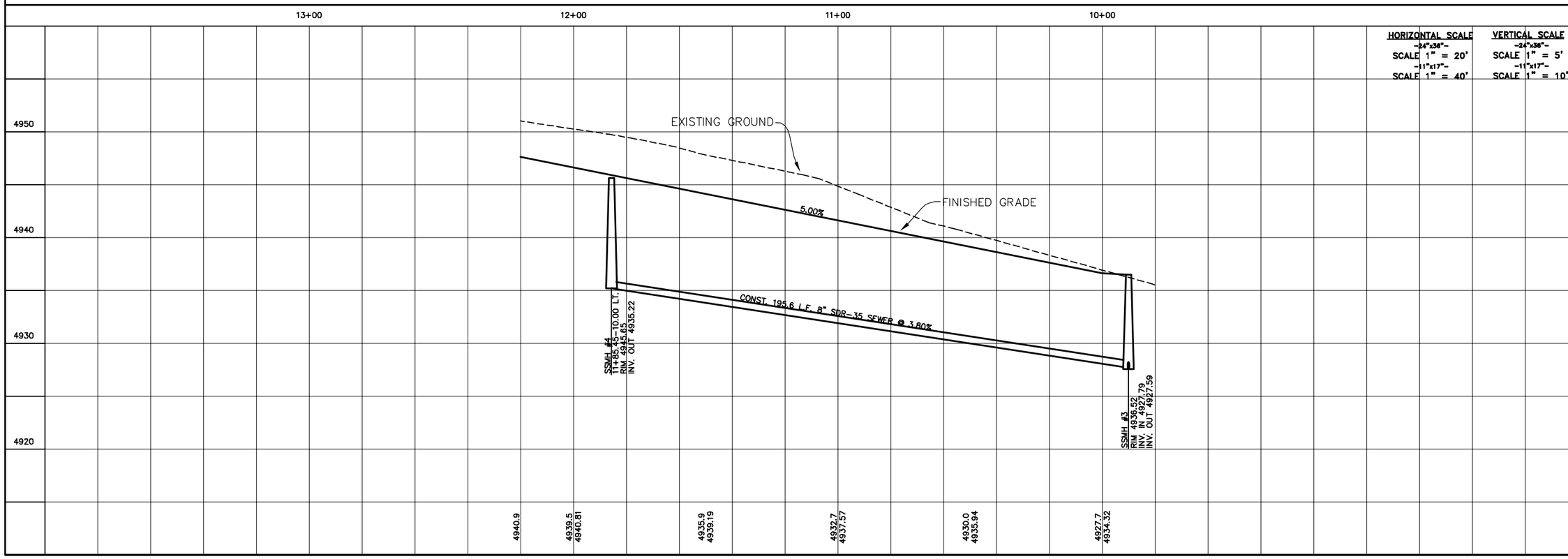


CONSTRUCTION NOTES:

1. INSTALL FIRE HYDRANT ASSEMBLY PER ELK RIDGE CITY STANDRDS. FIRE HYDRANT TO BE EAST JORDAN.
2. INSTALL 8" CULINARY WATER VALVE.
3. CONST. PEDESTRIAN ACCESS RAMP PER ELK RIDGE CITY STANDARDS.
4. INSTALL 22.5° BEND.
5. INSTALL 45° BEND.
6. INSTALL BLOW OFF VALVE.

0 10 40
5 20 60

-24"x36"-
SCALE 1" = 20'
-11"x17"-
SCALE 1" = 40'



HORIZONTAL SCALE
-24"x36"-
SCALE 1" = 20'
-11"x17"-
SCALE 1" = 40'

VERTICAL SCALE
-24"x36"-
SCALE 1" = 5'
-11"x17"-
SCALE 1" = 10'

SHEET NO.
PP-04

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LOIS LANE
STA. 10+00 TO STA. 12+19.92

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ELK RIDGE, UTAH

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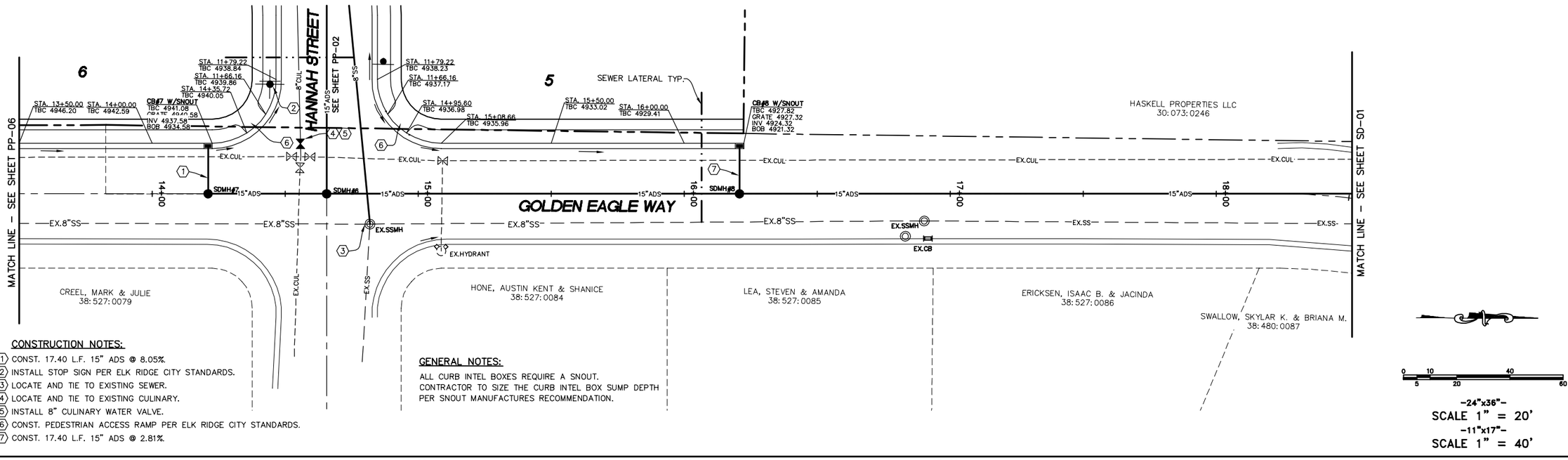
PHONE:801-655-0566
FAX:801-655-0109
946 E. 800 N. SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)



CONSTRUCTION NOTES:

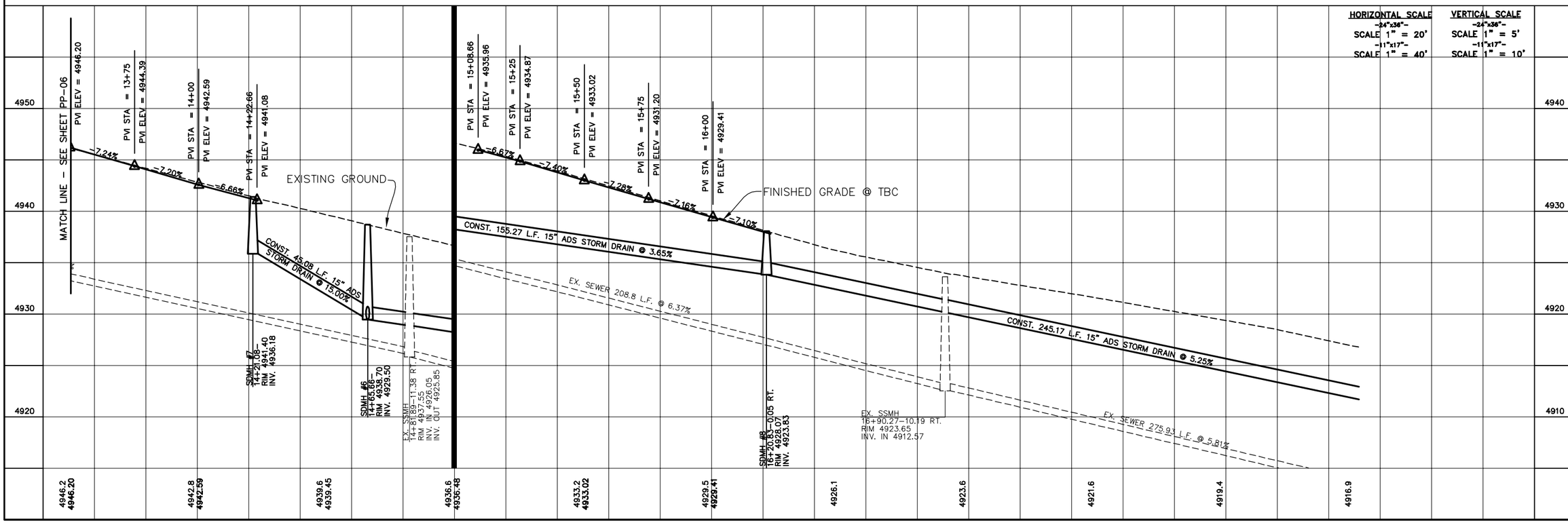
1. CONST. 17.40 L.F. 15" ADS @ 8.05%.
2. INSTALL STOP SIGN PER ELK RIDGE CITY STANDARDS.
3. LOCATE AND TIE TO EXISTING SEWER.
4. LOCATE AND TIE TO EXISTING CULINARY.
5. INSTALL 8" CULINARY WATER VALVE.
6. CONST. PEDESTRIAN ACCESS RAMP PER ELK RIDGE CITY STANDARDS.
7. CONST. 17.40 L.F. 15" ADS @ 2.81%.

GENERAL NOTES:

ALL CURB INTEL BOXES REQUIRE A SNOUT.
CONTRACTOR TO SIZE THE CURB INTEL BOX SUMP DEPTH PER SNOUT MANUFACTURES RECOMMENDATION.

0 10 40
5 20 60

-24"x36"-
SCALE 1" = 20'
-11"x17"-
SCALE 1" = 40'



HORIZONTAL SCALE
-24"x36"-
SCALE 1" = 20'
-11"x17"-
SCALE 1" = 40'

VERTICAL SCALE
-24"x36"-
SCALE 1" = 5'
-11"x17"-
SCALE 1" = 10'

SHEET NO.
PP-05

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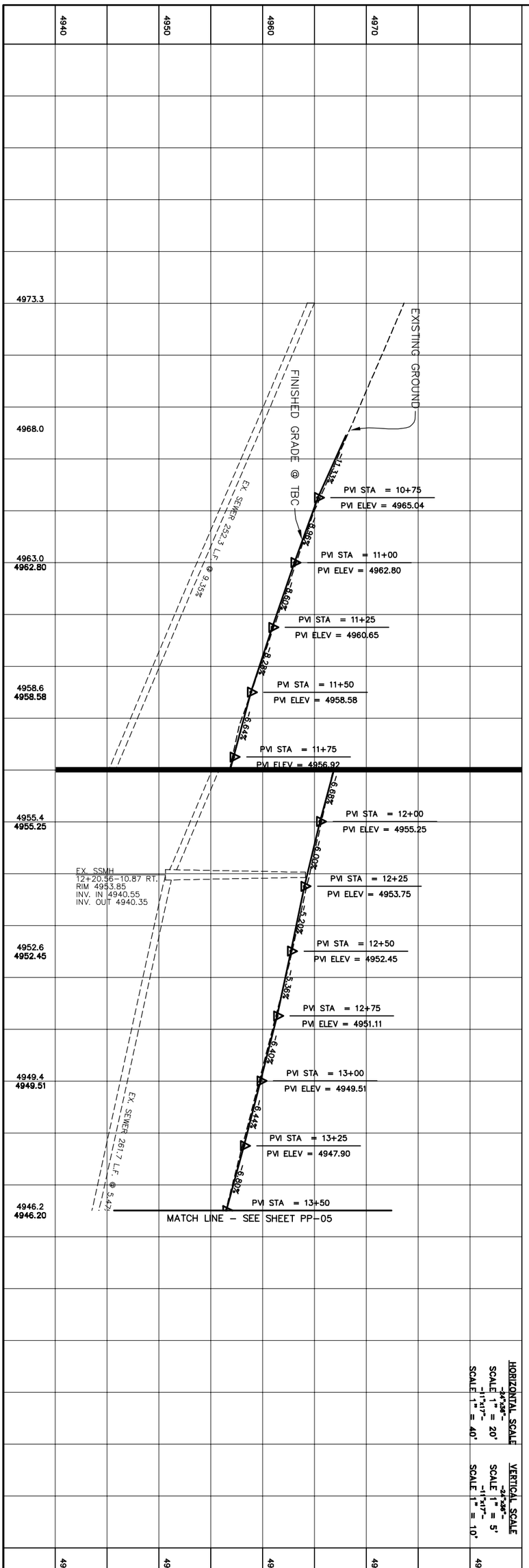
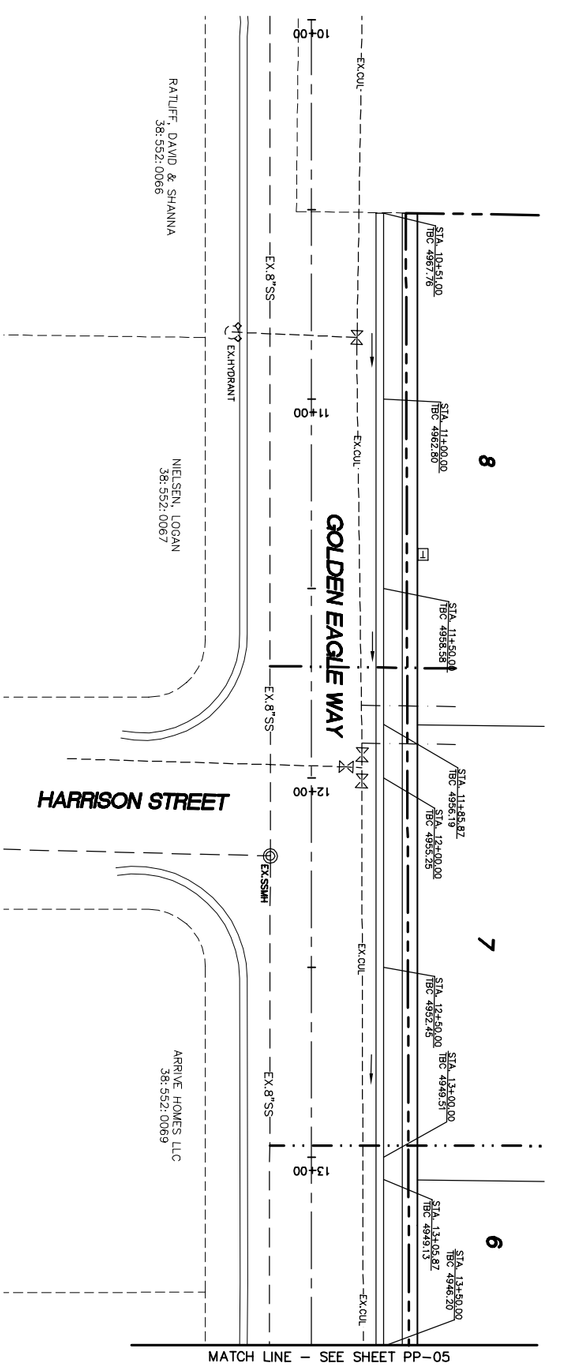
GOLDEN EAGLE WAY
STA. 13+50 TO STA. 18+50

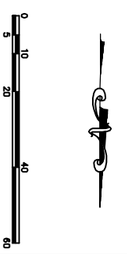
DRYLAND SUBDIVISION
ELK RIDGE, UTAH

ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E. 800 N. SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)







-24"x36"- SCALE 1" = 20'
-11"x17"- SCALE 1" = 40'

(DATE STAMP)

ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E. 800 N. SUITE A
SPANISH FORK, UT 84660

GOLDEN EAGLE WAY
STA. 10+00 TO STA. 13+50

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

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SHEET NO.

PP-06

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GENERAL NOTE:
1. POND LANDSCAPING TO MATCH EXISTING POND. ROCK, SOD, AND IRRIGATION SYSTEM WILL BE RESTORED AFTER POND IS ENLARGED.
2. ALL CURB INTEL BOXES REQUIRE A SNOUT.
3. CONTRACTOR TO SIZE THE CURB INTEL BOX SUMP DEPTH PER SNOUT MANUFACTURES RECOMMENDATION.

MATCH LINE - SEE SHEET PP-05

SDMH #8
10+00

EX.SSMH
11+00

15" ADS

SUMP #1

INSTALL W-BEAM GUARDRAIL

INSTALL W-BEAM GUARDRAIL

EX.SS

EX.CUL

EX.PI

EX.SSMH
12+00

INSTALL FLARED END SECTION WITH TRASH GRATE. SEE SHEET DT-05
12+43.54

GOLDEN EAGLE WAY

SWALLOW, SKYLAR K. & BRIANA M.
38:480:0087

POND 1
EX. CAPACITY: 11,000 CF
NEW CAPACITY: 21,450 CF
TOP: 4894.00
BOTTOM: 4892.50

EX.SSMH

EX.HYDRANT

SILVER WOLF ROAD

EX.SUMP

MCKLENBURG, CHRISTOPHER & ERIN
38:480:0027

4905 4900 4895 4890 4897 4893 4891 4894 4888 4890

0 10 40
5 20 60

-24"x36"-
SCALE 1" = 20'
-11"x17"-
SCALE 1" = 40'

10+00 11+00 12+00

MATCH LINE - SEE SHEET PP-05

SDMH #9
10+00
RIM 4916.03
INV. 4910.98

EXISTING GROUND

CONST. 177.90 L.F. 15" ADS STORM DRAIN @ 6.63%

CONST. 66.49 L.F. 15" ADS STORM DRAIN @ 10.06%

SUMP #1
11+77.63
RIM 4904.52
INV. IN 4899.19
BOTTOM 4893.52

EXISTING SEWER

END OF PIPE
12+43.54
INV. 4892.50

4916.0 4913.0 4909.6 4905.9 4902.9 4898.8

4920 4910 4900 4890 4880

HORIZONTAL SCALE	VERTICAL SCALE
-24"x36"- SCALE 1" = 20'	-24"x36"- SCALE 1" = 5'
-11"x17"- SCALE 1" = 40'	-11"x17"- SCALE 1" = 10'

SHEET NO. SD-01

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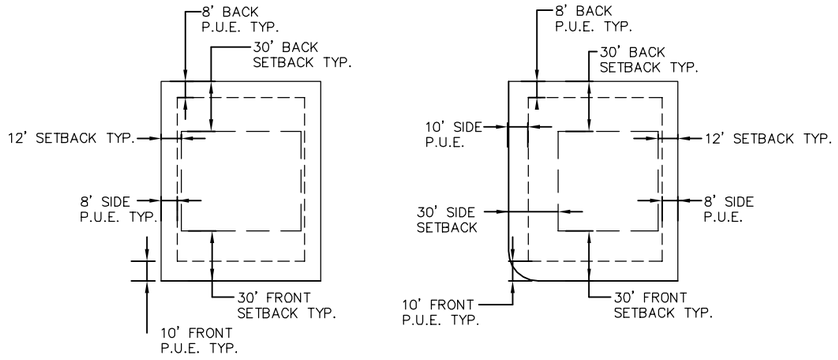
OFFSITE STORM DRAIN
STA. 10+00 TO STA. 12+43.54

HASKELL
ELK RIDGE, UTAH

ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E. 800 N. SUITE A
SPANISH FORK, UT 84660

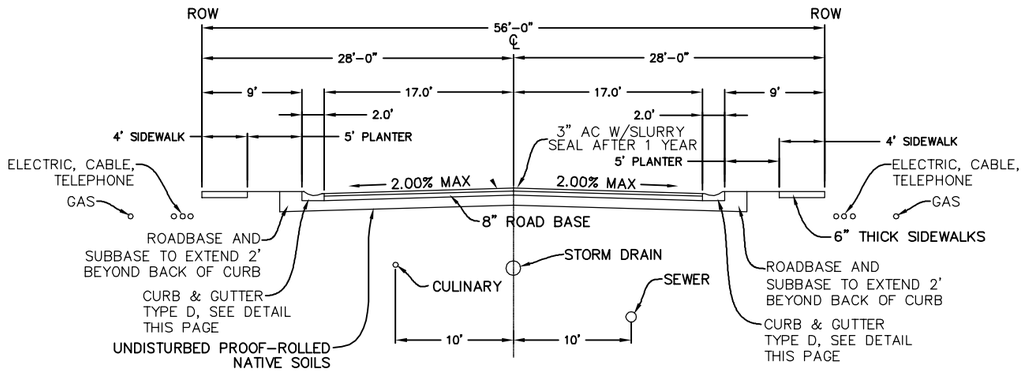
(DATE STAMP)



INTERIOR LOT CORNER LOT

DETAIL - TYPICAL BUILDING SETBACK AND EASEMENT

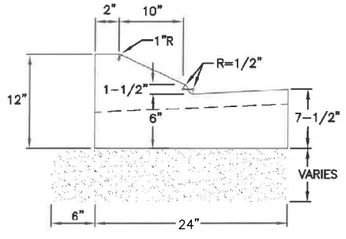
–NTS–



NOTES:
1. ALL PAVEMENT DESIGN TO FOLLOW RECOMMENDATIONS OF GEOTECHNICAL REPORT PROJECT NO. 03278–001 BY IGES.
2. BASED ON SECTION 6.2.4 OF GEOTECH REPORT PROJECT NO. 03278–001 BY IGES, ONCE TOPSOIL IS STRIPPED, MOST OF THE NATIVE SOILS ARE SUITABLE TO BE USED AS SUB–BASE WHEN PROPERLY SCARIFIED AND COMPACTED. THE SITE IS COVERED BY UP TO 12 TO 18 INCHES OF TOPSOIL COMPRISED OF LEAN CLAY. TOPSOIL MAY NOT BE USED AS STRUCTURAL FILL; THIS MATERIAL MUST BE KEPT SEGREGATED FROM OTHER SOILS INTENDED TO BE USED AS STRUCTURAL FILL.

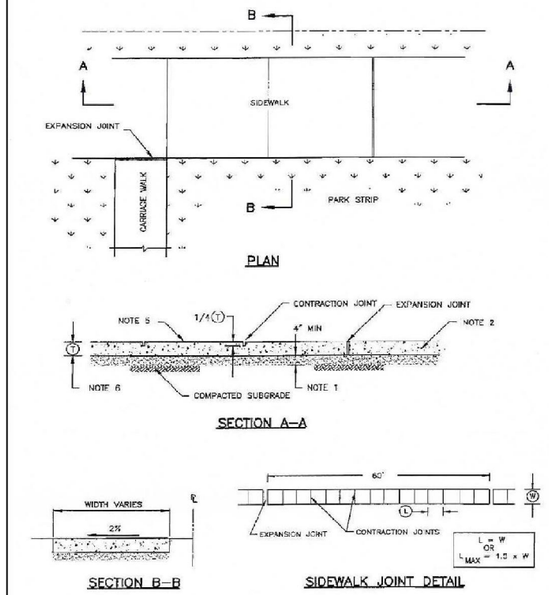
DETAIL - TYPICAL 56' RIGHT-OF-WAY STREET SECTION

–NTS–



TYPE D MODIFIED CURB

–NTS–

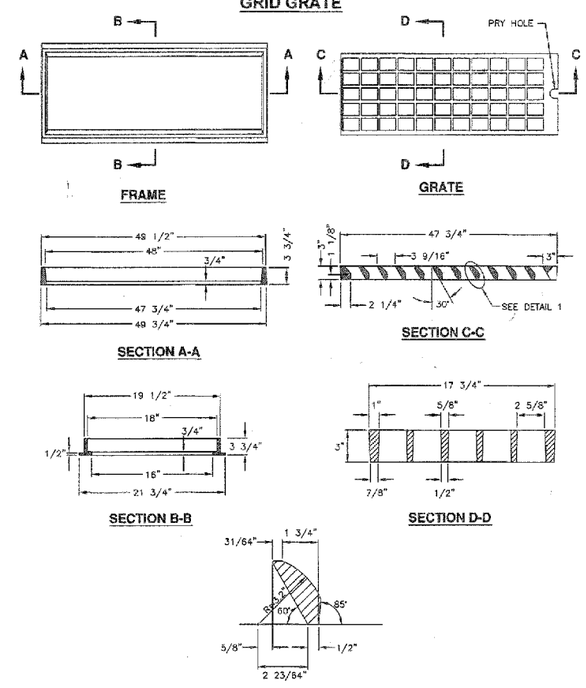


Concrete sidewalk

CONCRETE SIDEWALK STANDARD

1. UNTREATED BASE COURSE: Provide material specified in APW A Section 02060. Do not use gravel or sewer rock. Place per APWA Section 02322. Compact per APWA Section 02324 to a modified proctor density of 95-percent or greater. Maximum lift thickness is 8-inches before compaction.
2. CONCRETE: Class 4000 per APWA Section 03304. Place per APWA Section 02770. Cure per APWA Section 03390.
   A If necessary, provide concrete that achieves design strength in less than 7 days. Use caution, however, as spider cracks develop if air temperature exceeds 90 degrees F.
   B. Unless shown otherwise, provide 1/2-inch radius on concrete edges exposed to public view.
3. FINISH: Fine hair broom on longitudinal grades under 6% and rough hair broom on longitudinal grades over 6%.
4. DEPTH OF SIDEWALK (T):
   A. New construction: Nominal 6" in residential zones, 8" in non-residential zones.
   B. Removal and replacement construction: Match existing.

GRID GRATE



47 3/4" Grate and frame

Plan **309.2** June 2006

SHEET NO. DT-01

NO.	REVISIONS	BY	DATE
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DETAIL SHEET

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E. 800 N SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)

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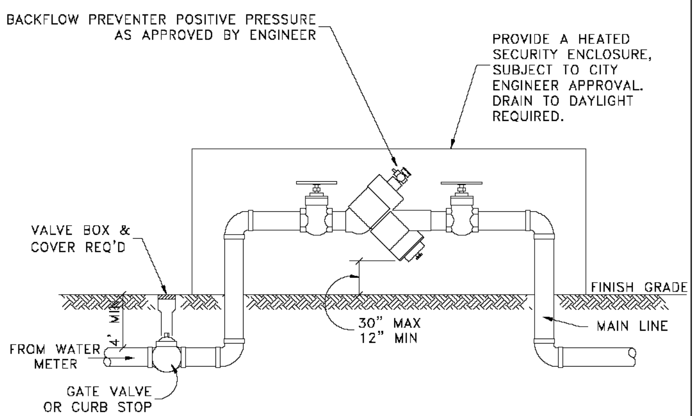
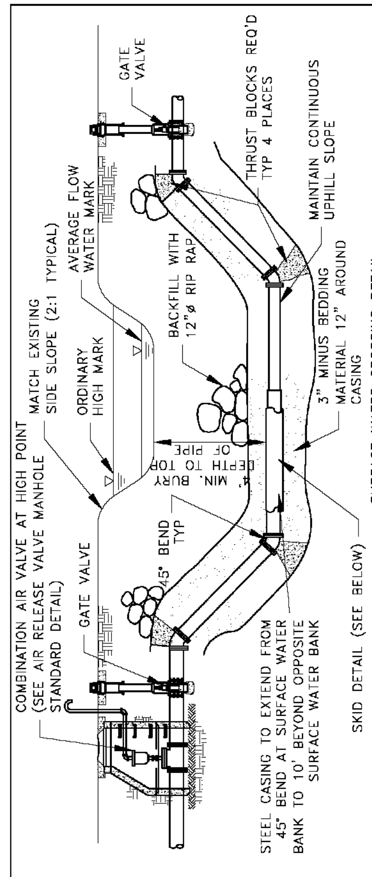
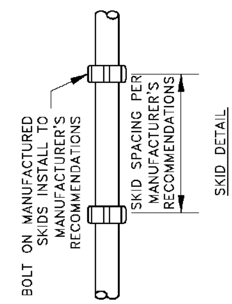


NOTES:

1. ALL PIPES, FITTING & APPURTENANCES SHALL BE NSF-61 CERTIFIED AND TO CONFORM TO AWWA STANDARDS C104-A21.4 THROUGH C550, LATEST EDITIONS AND C900 THROUGH C905, LATEST EDITIONS. [UAC R309-550-6 (3)]
2. ALL NEW OR REPLACED WATER LINES SHALL BE FLUSHED & DISINFECTED PER AWWA STANDARD C651 LATEST EDITION.

CITY OF ELK RIDGE
TYPICAL BACKFLOW PREVENTER INSTALLATION

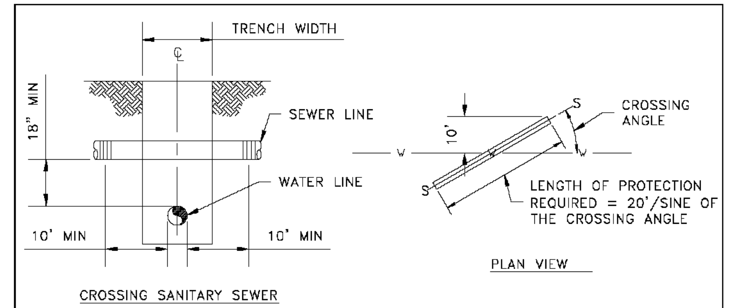




NOTES:

1. SURFACE WATER CROSSING MUST BE APPROVED BY ARMY CORP OF ENG. PRIOR TO CONSTRUCTION IS WORK IS COMPLETED WITHIN THE HIGH WATER MARK AND THE WATER WAY IS UNDER ARMY CORP JURISDICTION.
2. WHEN CROSSING WATER COURSES THAT ARE GREATER THAN 15 FEET IN WIDTH, THE FOLLOWING SHALL BE PROVIDED UAC R309-550-8(8)(b)(ii):
   A. CONSTRUCTION, HAVING RESTRAINED JOINTS FOR JOINTS WITHIN THE SURFACE WATER COURSE AND FLEXIBLE RESTRAINED JOINTS AT BOTH EDGES OF THE WATER COURSE.
   B. ISOLATING VALVES SHALL BE PROVIDED ON BOTH SIDES OF THE WATER CROSSING AT LOCATIONS NOT SUBJECT TO HIGH GROUND WATER OR FLOODING, SO THAT THE SECTION CAN BE ISOLATED FOR TESTING OR REPAIR.
   C. A MEANS SHALL BE PROVIDED, SUCH AS A SAMPLING TAP, NOT SUBJECT TO FLOODING, TO ALLOW FOR REPRESENTATIVE WATER QUALITY TESTING ON THE UPSTREAM AND DOWNSTREAM SIDE OF THE CROSSING.
   D. A MEANS SHALL BE PROVIDED TO PRESSURE TEST THE UNDERGROUND WATER CROSSING PIPE.

CITY OF ELK RIDGE
SURFACE WATER CROSSING FOR WATER & SEWER

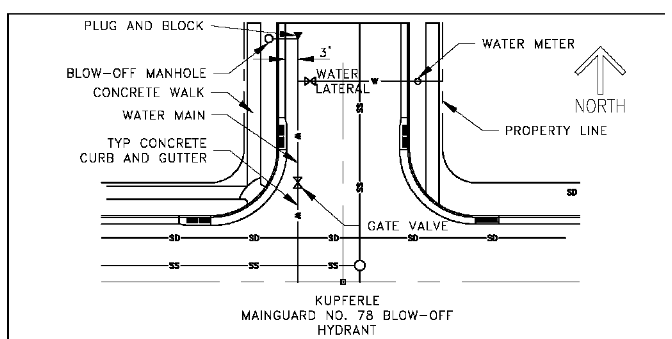


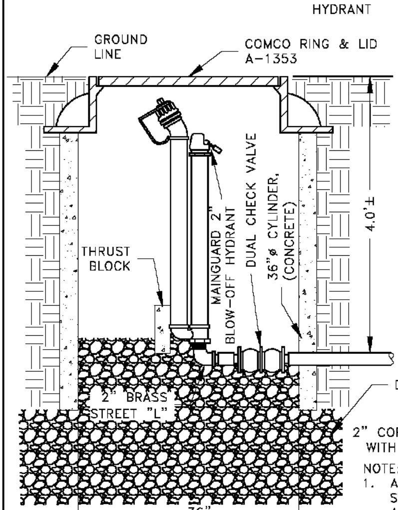
FOR NEW SANITARY SEWER LINE CONSTRUCTION
WHEN SANITARY SEWER LINE IS ABOVE THE WATER LINE, INSTALL SEWER LINE WITH ONE OF THE FOLLOWING; CAST IRON, DUCTILE IRON, GALVANIZED STEEL, OR PROTECTED STEEL PIPE WITH MECHANICAL JOINTS FOR THE MINIMUM DISTANCE OF 10 FEET ON EITHER SIDE OF WATER CROSSING. THE LINES SHALL BE PRESSURE TESTED TO ASSURE WATER TIGHTNESS BEFORE BACKFILLING. (SEE NOTE #1)

GENERAL NOTES:

1– WATER AND SANITARY SEWER SEPARATIONS SHALL COMPLY WITH UAC R309-550-7.
2– IN ALL CASES, PROVIDE 18" MIN. OF VERTICAL SEPARATION BETWEEN WATER, SANITARY SEWER LINES. WHEN SEPARATION CAN NOT BE OBTAINED, AN EXCEPTION CAN BE APPLIED FOR WITH ADDITIONAL MEASURES TO PROTECT PUBLIC HEALTH, IN ACCORDANCE WITH UAC R309-105-6(2)(B).
3– IF WATER LINE IS 18" OR GREATER ABOVE THE SEWER LINE OR STORM DRAIN LINE, NO SPECIAL CONSTRUCTION IS REQUIRED.
4– ALL PROVISIONS ABOVE SHALL APPLY FOR CROSSINGS OTHER THAN 90° TO THE POINT AT WHICH THE 10' SEPARATION BETWEEN THE WATER AND SANITARY SEWER LINE IS ACHIEVED (10'/SINE OF CROSSING ANGLE).
5– FOR PURPOSES OF SEPARATIONS AND PROTECTION OF THE WATER SUPPLY, A RECLAIMED WATER LINE SHALL BE CONSIDERED A SANITARY SEWER LINE.
6– WHEN A SANITARY SEWER FORCE MAIN CROSSES UNDER AN EXISTING WATER MAIN, ALL PORTIONS OF THE SEWER FORCE MAIN WITHIN 10 FEET (HORIZONTALLY) OF THE WATER MAIN SHALL BE ENCLOSED IN A CONTINUOUS SLEEVE.
7– WHEN A NEW WATER MAIN CROSSES OVER AN EXISTING SEWER FORCE MAIN, THE WATER MAIN SHALL BE CONSTRUCTED OF PIPE MATERIALS WITH A MINIMUM RATED WORKING PRESSURE OF 200 PSI OR EQUIVALENT PRESSURE RATING.

CITY OF ELK RIDGE
SANITARY SEWER CROSSINGS

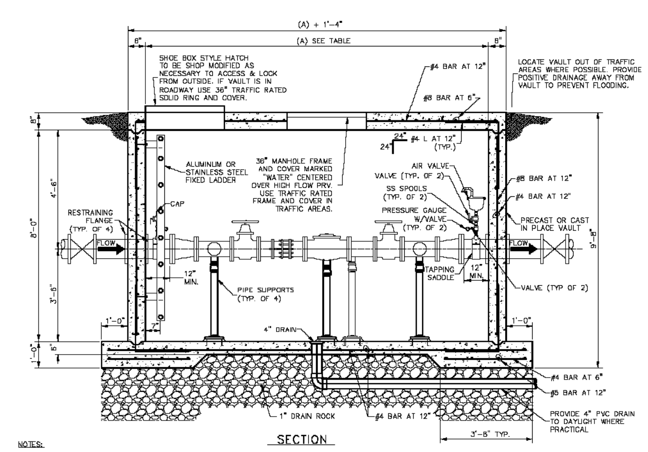




BLOW-OFF HYDRANTS SHALL BE NON-FREEZING, SELF DRAINING TYPE, WITH AN OVERALL LENGTH OF 6" SHORTER THAN NORMAL DEPTH OF BURY. SET UNDERGROUND IN A 36" CYLINDER, THESE HYDRANTS WILL BE FURNISHED WITH A 2" FIP INLET, A NON-TURNING OPERATING ROD, AND SHALL OPEN TO THE LEFT. ALL OF THE WORKING PARTS SHALL BE OF BRONZE-TO-BRONZE DESIGN, AND BE SERVICABLE FROM ABOVE GRADE WITH NO DIGGING. THE OUTLET SHALL ALSO BE BRONZE AND BE 2-1/2" NST. HYDRANTS SHALL BE LOCKABLE TO PREVENT UNAUTHORIZED USE AS MANUFACTURED BY KUPFERLE FOUNDRY CO., ST. LOUIS, MO, OR APPROVED EQUAL.

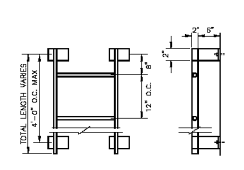
NOTE:
1. ALL NEW OR REPLACED WATER LINES SHALL BE FLUSHED & DISINFECTED PER AWWA STANDARD C651 LATEST EDITION

CITY OF ELK RIDGE
2" BLOW-OFF INSTALLATION



NOTES:

1. ALL BOLTS IN VAULT ARE TO BE STAINLESS STEEL OR TRIPAC.
2. THE LOW FLOW LINE VALVES MAY BE BALL VALVES TO 3" AND GATE VALVES FOR 4" OR GREATER.
3. PRECAST VAULTS MAY BE USED. VAULT REINFORCING IS FOR TRAFFIC LOADING. REINFORCEMENT AND VAULT DESIGN MAY BE ALTERED BY DESIGN ENGINEER FOR NON-TRAFFIC LOADING CONDITIONS.
4. PROVIDE INSULATING CONNECTORS BETWEEN DISSIMILAR METALS WHERE OPERATING PRESSURES ALLOW.
5. USE TAPPING SADDLES FOR ALL TAPS. NO DIRECT TAPS ALLOWED.
6. USE STAINLESS STEEL OR EPOXY COATED/LINED FOR LOW-FLOW PIPING. DUCTILE IRON MAY BE USED FOR 4" OR GREATER.
7. ALL MAINLINE PIPING BETWEEN EXTERIOR GATE VALVES TO BE DUCTILE IRON WITH RESTRAINED JOINTS.
8. LOW FLOW LINE SHALL BE PROVIDED WITH A UNION TO 3" AND RESTRAINED DISMANTLING JOINT FOR 4" AND LARGER.
9. DETAIL SHOWS AN INSTALLATION NOT SUBJECT TO FLOODING. IF THE INSTALLATION IS SUBJECT TO FLOODING, EITHER THE OPEN END OF THE AIR RELIEF VALVE SHALL BE PROVIDED WITH A #14 MESH, NON-CORRODIBLE SCREEN, DOWNWARD ELBOW, AND EXTEND AT LEAST 4 FEET ABOVE GROUND SURFACE PER THE AIR RELEASE VALVE MANHOLE DETAIL OR THE VAULT SHALL BE PROVIDED WITH A DRAIN MEETING UAC R309-550-6(7) REQUIREMENTS.



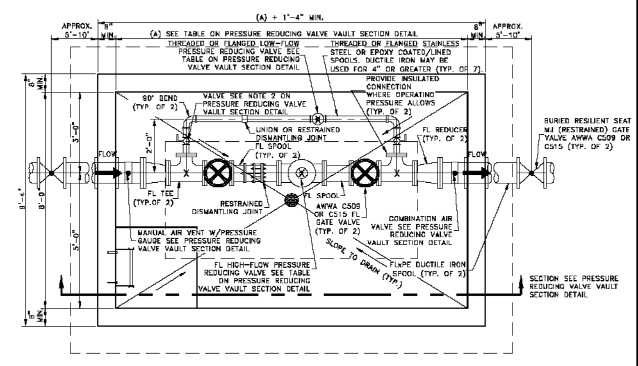
1. LADDER SHALL BE SHOP FABRICATED TO PROPER LENGTH & INSTALLED IN ONE PIECE.
2. SIDE RAILS AND MOUNTING BRACKETS TO BE 1/4"x2" GALVANIZED STEEL PLATE.
3. RUNGS TO BE 3/4"ø STEEL ROD.
4. ALL WELDS AND SPLICES SHALL BE BRUSHED WITH GALVANIZING AGENT IN SHOP.
5. USE 5/8"x4" BOLT CONNECTIONS.

LADDER DETAILS

PRESSURE REDUCTION VAULT TABLE

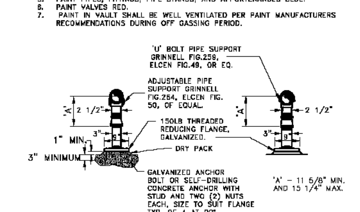
MAIN SIZE	PRV HIGH FLOW SIZE	PRV LOW FLOW SIZE	MANUAL AIR VENT	VAULT LENGTH (A)
8"	6"	3"	1"	14'-0"
10"	8"	4"	1 1/2"	14'-0"
12"	10"	6"	2"	16'-0"
14"	12"	8"	3"	16'-0"

CITY OF ELK RIDGE
PRESSURE REDUCING VALVE VAULT SECTION



PRV SPECIFICATIONS:

1. ALL PRV SHALL BE EQUIPPED WITH STAINLESS STEEL POSITION INDICATORS AND "NO YELLOW METAL OPTION".
2. SPECIFY LONGITUDINAL RESTRAINT REQUIREMENTS FOR THE OPERATING CONDITIONS AND RESTRAIN ALL JOINTS AS REQUIRED.
3. LABEL PROPOSED PRV SETTINGS ON PLANS.
4. PAINT INTERIOR WALLS, FLOOR, AND CEILING OF CONCRETE VAULT WHITE.
5. PAINT PIPES, FITTINGS, PIPE STANDS, AND APPURTENANCES BLUE.
6. PAINT VALVES RED.
7. PAINT IN VAULT SHALL BE WELL VENTILATED PER PAINT MANUFACTURERS RECOMMENDATIONS DURING OFF GASSING PERIOD.



ADJUSTABLE PIPE SUPPORT DETAIL

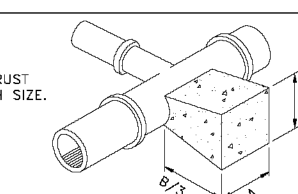
SCALE: NONE

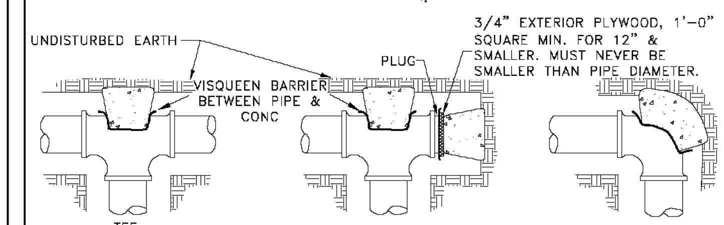
NOTES:

1. WHEN STATIC PRESSURE EXCEEDS 150 PSI IN NEW DISTRIBUTION WATER LINES, PRESSURE REDUCING DEVICES SHALL BE PROVIDED ON MAINS IN THE DISTRIBUTION SYSTEM WHERE SERVICE CONNECTIONS EXIST. [UAC R309-550-5(1)(B)]
2. ALL PIPES, FITTINGS & APPURTENANCES SHALL BE NSF-61 APPROVED AND CONFORM TO AWWA STANDARDS C104-A21.4 THOURGH C550, LATEST EDITIONS AND C900 THOUGH C905, LATEST EDITIONS. [UAC R309-550-6 (3)]
3. ALL NEW OR REPLACED WATER LINES SHALL BE FLUSHED & DISINFECTED PER AWWA STANDARD C651 LATEST EDITION.

CITY OF ELK RIDGE
PRESSURE REDUCING VALVE VAULT PLAN

NOTE:
FOR TEE, PROVIDE THRUST BLOCKING FOR BRANCH SIZE.





DIMENSIONS FOR THRUST BLOCKING

FITTING	TEES & PLUGS		90° BENDS		45° BENDS & "Y"S		22 1/2° BENDS	
SIZES	A	B	A	B	A	B	A	B
4"	1'-6"	1'-6"	1'-6"	1'-9"	1'-3"	0'-6"	1'-0"	0'-6"
6"	2'-0"	1'-0"	2'-0"	2'-0"	1'-3"	1'-6"	1'-0"	1'-5"
8"	2'-0"	1'-6"	2'-3"	2'-3"	1'-8"	1'-8"	1'-0"	1'-3"
10"	2'-6"	2'-3"	2'-9"	2'-10"	2'-3"	1'-10"	1'-3"	2'-0"
12"	3'-0"	2'-9"	3'-6"	3'-3"	2'-6"	2'-4"	2'-0"	1'-6"
14"	3'-5"	3'-0"	4'-0"	3'-8"	3'-6"	2'-4"	2'-0"	2'-3"
16"	4'-0'	3'-6"	5'-0"	4'-0"	3'-6"	3'-0"	2'-6"	2'-3"
18"	4'-0"	4'-3"	6'-0"	4'-0"	4'-0"	3'-3"	2'-9"	2'-6"
20"	5'-0"	4'-3"	6'-0"	5'-0"	4'-3"	4'-0"	3'-0"	2'-9"
24"	6'-0"	5'-3"	8'-0"	5'-6"	6'-0"	4'-0"	4'-0"	3'-0"

NOTES:

1. THIS TABLE IS BASED ON 200 P.S.I. MAIN PRESSURE AND 2000 P.S.F. SOIL BEARING PRESSURE. ADJUST BEARING AREAS IN ACCORDANCE WITH SOIL CONDITIONS AND PRESSURES ENCOUNTERED.
2. USE POLYETHYLENE ENCASEMENT BETWEEN CONCRETE AND PIPE.
3. REFER TO CONCRETE STANDARD SPECIFICATIONS.
4. THE "THRUST BLOCKING DETAILS" IN NO WAY LIMITS THE LOCATION OR SIZE OF ADDITIONAL BLOCKING WHEN SO WARRANTED OR REQUIRED BY THE ENGINEER.
5. THRUST BLOCKS NEED TO BE INSPECTED BY CITY PRIOR TO BACKFILL.

CITY OF ELK RIDGE
THRUST BLOCK DETAIL

SHEET NO.
DT-02

NO.	REVISIONS	BY	DATE
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5			
4			
3			
2			
1			

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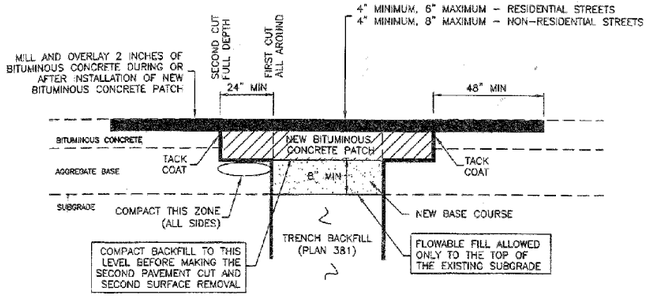
DETAIL SHEET

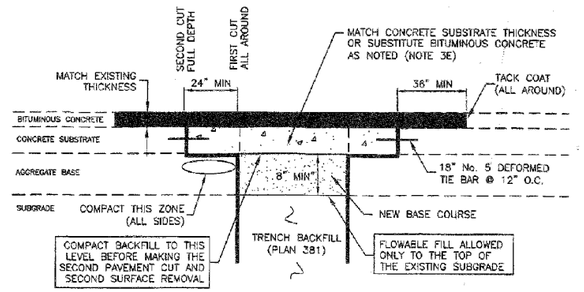
DRYLAND SUBDIVISION
ELK RIDGE, UTAH

ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E 800 N SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)



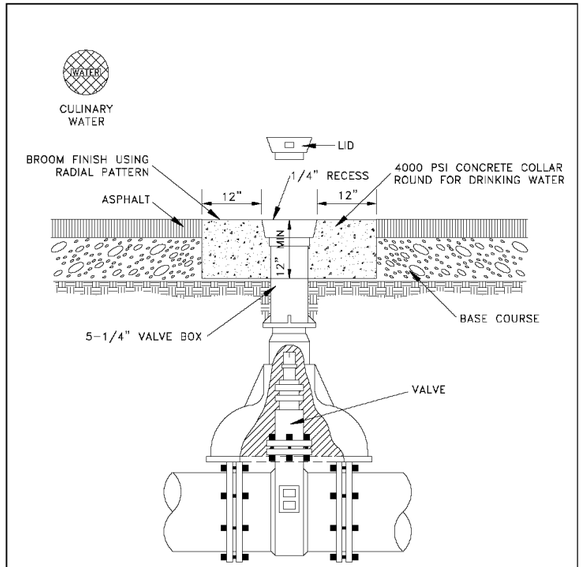
BITUMINOUS CONCRETE RESTORATION



COMPOSITE RESTORATION

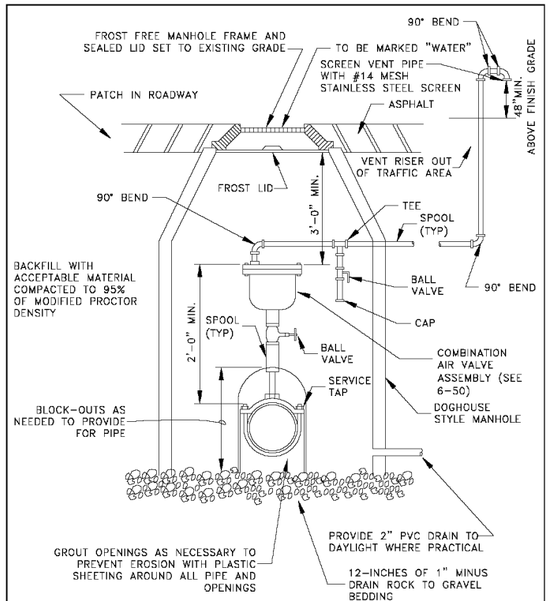
Bituminous pavement T-patch

1. **GENERAL**
   - A. Vertical cuts in bituminous pavement may be done by saw or pavement zipping. If cuts greater than 6 inches are necessary to prevent pavement "break off" consult ENGINEER for directions on handling addtional costs.
   - B. Repair a T-patch restoration if any of the following conditions occur prior to final payment or at the end of the one year correction period.
     1) Pavement surface distortion exceeds 1/4-inch deviation in 10 feet. Repair option - plane off surface distortions. coat planed surface with a cationic or anionic mulsion that complies with APWA Section 32 12 03..
     2) Separation appears at a connection to an existing pavement or any Street Fixture. Repair option - blow separation clean and apply joint sealant, Plan 265.
     3) Cracks at least 1-foot long and 1/4-inch wide occur more often than 1 in 10 square feet. Repair option - blow clean and apply crack seal, Plan 265.
     4) Pavement raveling is greater than 1 square foot per 100 square feet. Repair option - Mill and inlay, APWA Sections 32 01 16.71 and 32 12 05.
2. **PRODUCTS**
   - A. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.
   - B. Flowable Fill: Target is 60 psi in 28 days with 90 psi maximum in 28 days, APWA Section 31 05 15. It must flow easily requiring no vibration for consolidation.
   - C. Reinforcement. No. 5, galvanized or epoxy coated, deformed, 60 ksi yield grade steel, ASTM A615.
   - D. Concrete: Class 4000, APWA Section 03 30 04.
   - E. Tack Coat: APWA Section 32 12 13.13.
   - F. Bituminous Concrete. APWA Section 32 12 05.
     1) Warm Weather Patch: PG64-22-DM-1/2, unless indicated otherwise.
     2) Cold Weather Patch: Modified MC-250-FM-1 as indicated in APWA Section 33 05 25.
3. **EXECUTION**
   - A. Base Course Placement: APWA Section 32 05 10. Maximum lift thickness before compaction is 8-inches when using riding equipment or 6-inches when using hand held equipment. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26.
   - B. Flowable Fill: Cure to initial set before placing aggregate base or bituminous pavement. Use in excavations that are too narrow to receive compaction equipment.
   - C. Tack Coat. Clean all horizontal and vertical surfaces. Apply full coverage all surfaces.
   - D. Pavement Placement: Follow APWA Section 32 12 16.13. Unless indicated otherwise, lift thickness is 3-inches minimum after compaction. Compact to 94 percent of ASTM D2041 (Rice density) plus or minus 2 percent.
   - E. Bituminous Concrete Substitution: If bituminous concrete is substituted for Portland cement concrete substrate, omit rebar and provide 1.25 inches of bituminous concrete for each 1 inch of Portland cement concrete. Follow paragraph E requirements.
   - F. Reinforcement. Required if thickness of existing Portland-cement concrete substrate is 6-inches or greater. Not required if 1) less than 6-inches thick, 2) if existing concrete is deteriorating, 3) if excavation is less than 3 feet square, or 4) if bituminous pavement is substituted for Portland-cement concrete substrate.
   - G. Concrete Substrate. Cure to initial set before placing new bituminous concrete patch.



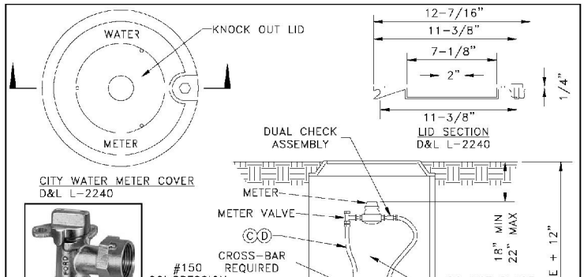
NOTES:
1. RAISE VALVE BOX AND PLACE CONCRETE COLLAR AFTER PAVING OPERATION IS COMPLETED.
2. ALL PIPES, FITTINGS & APPURTENANCES SHALL BE NSF-61 CERTIFIED AND CONFORM TO AWWA STANDARDS C104-A21.4 THROUGH C550, LATEST EDITIONS AND C900 THROUGH C905, LATEST EDITIONS. [UAC R309-550-6 (3)].
3. BURIED GATE VALVES SHALL BE USED FOR LINES 10-INCHES AND SMALLER. BURIED BUTTERFLY VALVES SHALL BE USED FOR LINES 12-INCHES AND LARGER.
4. ISOLATION VALVES SHALL BE PROVIDED AT NO MORE THAN 500-FOOT INTERVALS IN COMMERCIAL DISTRICTS AND AT NOT MORE THAN ONE BLOCK OR 800-FOOT INTERVALS IN OTHER DISTRICTS, [UAC 309-550-5(8)].

CITY OF ELK RIDGE
VALVE BOX COLLAR DETAIL



NOTE:
1- ALTERNATELY, THE OPEN END OF THE PIPE MAY BE EXTENDED TO AS LITTLE AS 1 FOOT ABOVE THE TOP OF THE PIPE IF THE VALVE CHAMBER IS NOT SUBJECT TO FLOODING, OR IF IT MEETS THE REQUIREMENTS OF UAC R309-550-6(7).

CITY OF ELK RIDGE
AIR RELEASE VALVE MANHOLE DETAIL

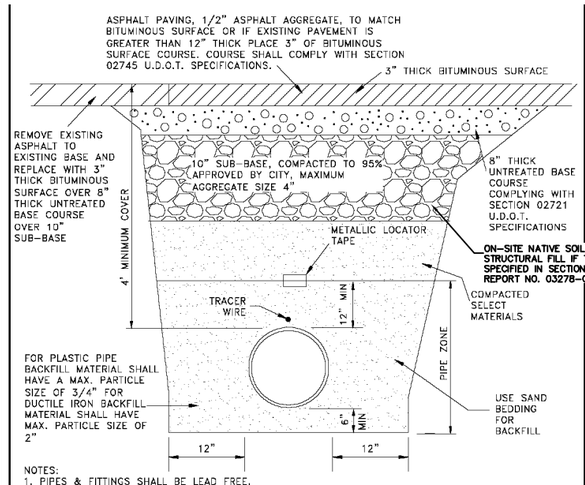


NOTES:
1- PIPES AND FITTINGS SHALL BE "LEAD FREE" AND NSF 61 CERTIFIED AND CONFORM TO AWWA STANDARDS C104-A21.4 THROUGH C550, LATEST EDITIONS AND C900 THROUGH C905, LATEST EDITIONS. [UAC R309-550-6 (3)].
2- INSTALL TRACER WIRE FROM MAIN CONNECTION THROUGH METER PIT WITH 30 FEET EXCESS TO EXTEND TO DWELLING.
3- SERVICE CONNECTIONS AND METER ASSEMBLIES LARGER THAN 1-INCH NEED TO COMPLY WITH THE LATEST APWA STANDARD DETAILS.
4- INSTALL SERVICE LATERALS AND METERS WITHIN 5 FEET OF LOT LINES ONE ON EACH SIDE OF COMMON LOT LINE (ALTERNATE WITH SECONDARY WATER). INSTALL METER BOX OUTSIDE OF DRIVEWAY.
5- STAMP GUTTER LIP AND TOP OF CURB WITH A "W" IN TWO PLACES, NEAR CURB LIP AND TOP OF CURB.

LEGEND

No	*	ITEM	DESCRIPTION
A		FRAME AND COVER	CAST IRON COVER (GRASS)
B		METER BOX (21" DIAMETER) (30" TO 36" DEEP)	WHITE CORRUGATED PE
C		1" METER YOKE	DUAL CHECK ASSEMBLY REQUIRED
D		1" METER YOKE	OPTIONAL BACKFLOW PROTECTION PER AGENCY REQUIREMENTS
E		1" SERVICE LINE	HDPE IPS SDR 9

CITY OF ELK RIDGE
SERVICE CONNECTION & METER ASSEMBLY



NOTES:
1. PIPES & FITTINGS SHALL BE LEAD FREE.
2. ASBESTOS CEMENT PIPE SHALL NOT BE ALLOWED.
3. WATER MAINS & SEWER LINES SHALL NOT BE INSTALLED IN THE SAME TRENCH.
4. ALL PIPES, FITTINGS & APPURTENANCES SHALL BE NSF-61 CERTIFIED AND CONFORM TO AWWA STANDARDS C104-A21.4 THROUGH C550, LATEST EDITIONS AND C900 THROUGH C905, LATEST EDITIONS. [UAC R309-550-6 (3)]
5. ALL NEW OR REPLACED WATER LINES SHALL BE FLUSHED & DISINFECTED PER AWWA STANDARD C651 LATEST EDITION.
6. MATERIAL THICKNESS MAY CHANGE AS DIRECTED BY THE CITY ENGINEER BASED UPON FINDINGS AND RECOMMENDATIONS IN GEOTECHNICAL REPORT.
7. FOR WATER METERS NOT CONNECTED TO FIRE HYDRANTS, THE MINIMUM LINE SIZE SHALL BE 4" IN DIAMETER, UNLESS THEY SERVE PICNIC SITES, PARKS, SEMI-DEVELOPED CAMPS, PRIMITIVE CAMPS, OR ROADWAY REST-STOPS. MINIMUM WATER MAIN SIZE SERVICING A FIRE HYDRANT LATERAL SHALL BE 8 INCHES IN DIAMETER UNLESS A HYDRAULIC ANALYSIS INDICATES THAT REQUIRED FLOW AND PRESSURES CAN BE MAINTAINED BY 6" LINES. [UAC R309-550-5(4)].
8. ALL TYPES OF INSTALLED PIPE SHALL BE PRESSURE TESTED AND LEAKAGE TESTED IN ACCORDANCE WITH AWWA C600 (LATEST EDITION).
9. UNDER NO CIRCUMSTANCES SHALL THE PIPE OR ACCESSORIES BE DROPPED INTO THE TRENCH.
10. CONSIDERATION SHALL BE GIVEN TO THE MATERIALS TO BE USED WHEN CORROSIVE SOILS OR WATERS WILL BE ENCOUNTERED. [UAC R309-550-5 (9)]

LOCATED IN SURFACED ROAD

CITY OF ELK RIDGE
UTILITY TRENCH FOR WATER MAIN

SHEET NO. DT-03

DETAIL SHEET

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

NO.	REVISIONS	BY	DATE
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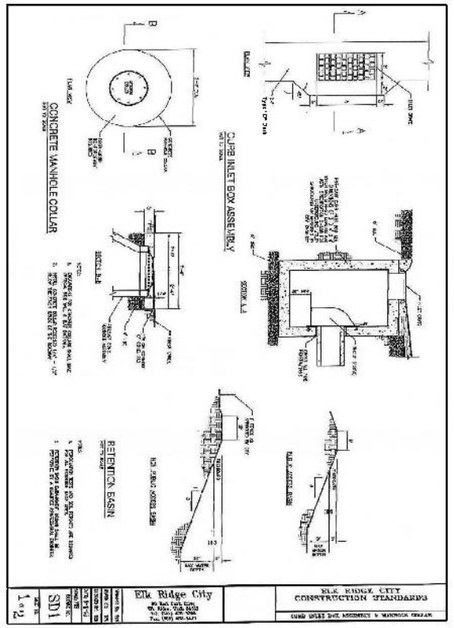
ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E 800 N SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)



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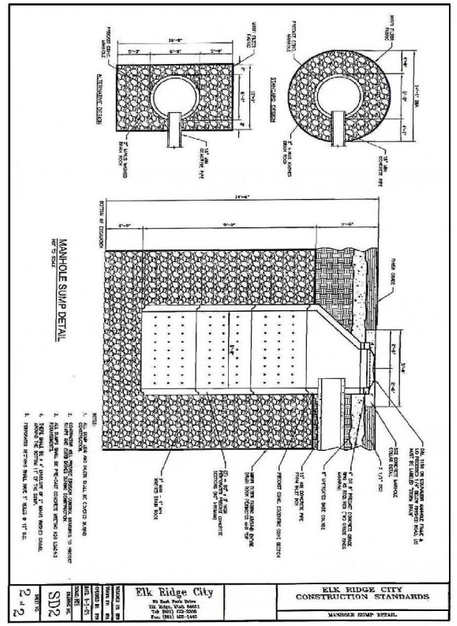

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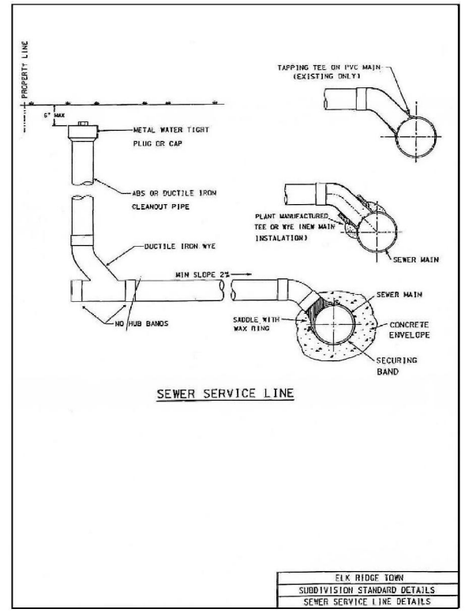

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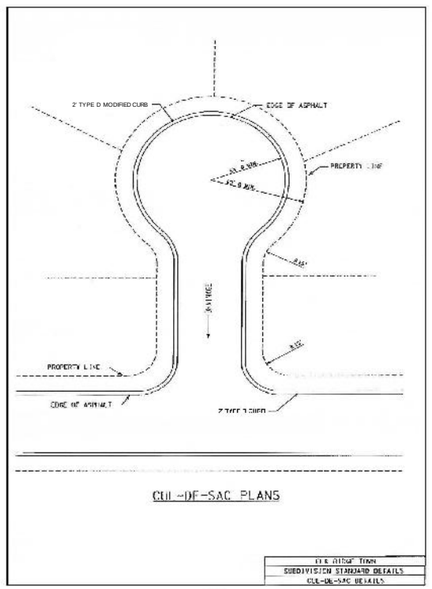

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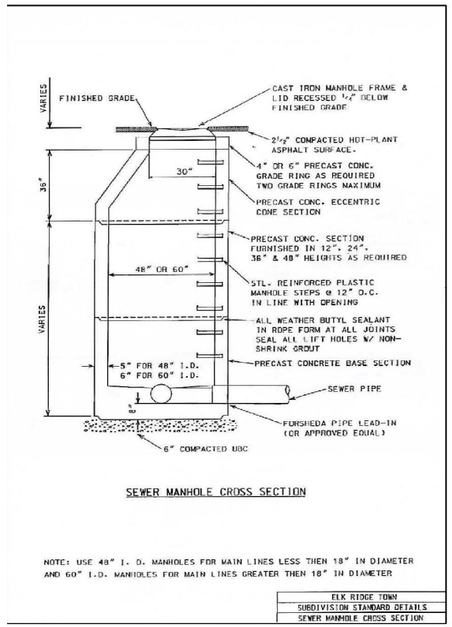

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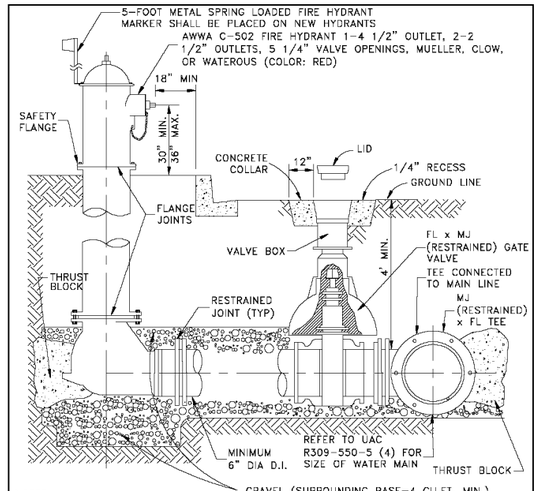
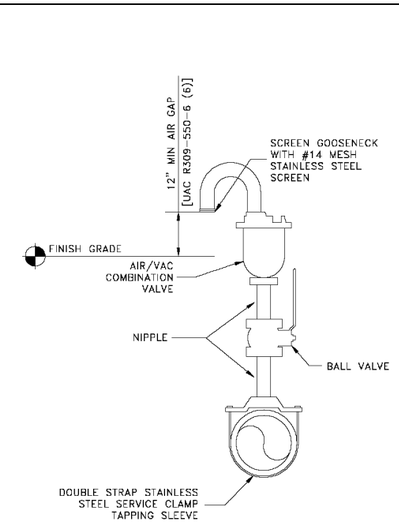


NOTES:

1. ALL FIRE HYDRANTS SHALL BE LOCATED AS SHOWN ON THE PLANS.
2. ALL FIRE HYDRANTS WILL STAND PLUMB WITH THE PUMPER NOZZLE FACING THE STREET.
3. THE VALVE WILL BE LOCATED AS APPROVED BY CITY. PIPE MATERIAL SHALL BE DUCTILE.
4. FOR DETAILED INFORMATION SEE SPECIFICATIONS.
5. RESTRAIN ALL JOINTS FROM MAIN TO FIRE HYDRANT.
6. CONCRETE VALVE COLLAR SHALL BE BROOM FINISHED IN RADIAL PATTERN.
7. ALL NEW OR REPLACED WATER LINES SHALL BE FLUSHED & DISINFECTED PER AWWA STANDARD C651 LATEST EDITION.
8. PROVIDE 3-FOOT CLEAR SPACE AROUND THE CIRCUMFERENCE OF FIRE HYDRANTS (IFC 507.5.5)
9. HYDRANT DRAINS SHALL NOT BE CONNECTED TO, OR LOCATED WITHIN, 10 FEET OF SANITARY SEWERS. WHERE POSSIBLE, HYDRANT DRAINS SHALL NOT BE LOCATED WITHIN 10 FEET OF STORM DRAINS. [UAC R309-550-6(5)(a)]

CITY OF ELK RIDGE
FIRE HYDRANT ASSEMBLY



NOTES:

1- ALL PIPES, FITTINGS & APPURTENANCES SHALL BE NSF-61 CERTIFIED AND CONFORM TO AWWA STANDARDS C104-A21.4 THROUGH C550, LATEST EDITIONS AND C900 THROUGH C905, LATEST EDITIONS. [UAC R309-550-6 (3)]

CITY OF ELK RIDGE
COMBINATION AIR RELEASE VALVE

NO.	REVISIONS	BY	DATE
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SHEET NO.
DT-04

DETAIL SHEET

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

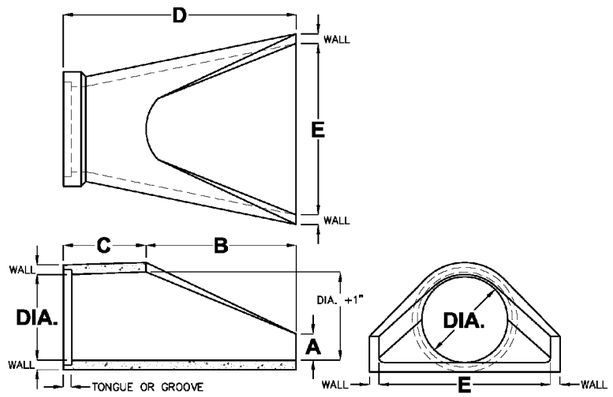
ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E 800 N SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)

J:\2019\19-003 Haskell Elk Ridge\CAD\FINAL\DT-01.dwg, 1/15/2021 4:08:05 PM, MST

REINFORCED CONCRETE PIPE FLARED END SECTIONS

15" TO 36" I.D.



DIA.	WALL	TONGUE OR GROOVE	WEIGHT	A	B	C	D	E
15"	2-1/4"	1-3/4"	970	6"	27"	46"	73"	30"
18"	2-1/2"	1-3/4"	1340	9"	27"	46"	73"	36"
24"	3"	1-3/4"	1820	9-1/2"	43-1/2"	30"	73-1/2"	48"
30"	4-1/4"	3-7/8"	2400	12"	54"	19-3/4"	73-3/4"	60"
36"	4-3/4"	3-7/8"	5500	15"	63"	34-3/4"	97-3/4"	72"

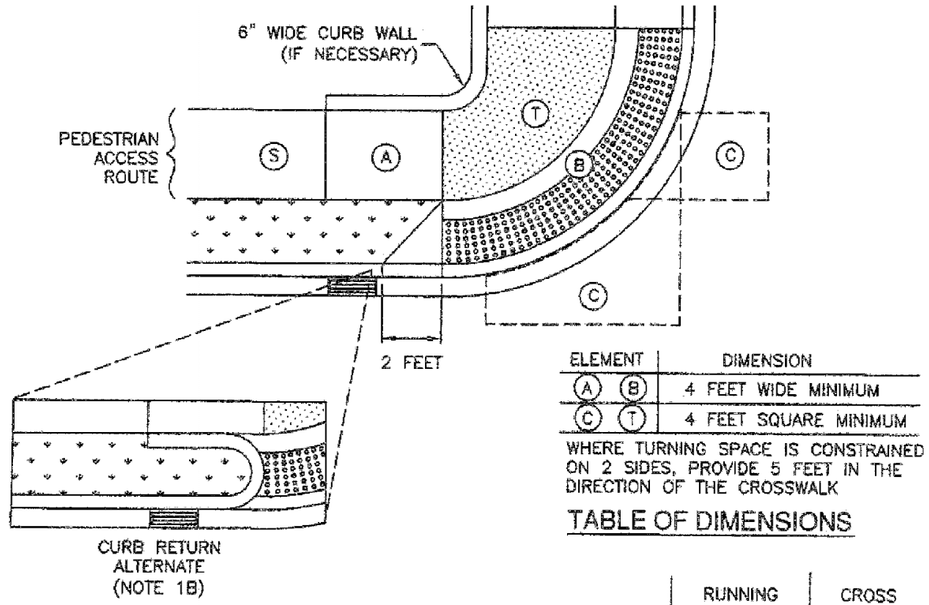
REINFORCED CONCRETE PIPE CONFORMS TO ASTM C-76, ASTM-C-443, AASHTO M-170, AND AASHTO M-198.

FOR COMPLETE DESIGN AND PRODUCT INFORMATION CONTACT JENSEN PRECAST.

Jensen Precast reserves the right to make changes to product design and/or dimensions without notice. Please contact Jensen Precast whenever necessary for confirmation or advice on product design.

JENSEN PRECAST

7/8/2009
RCP_FLARED END SECTION_NONV_A.DWG
©2009

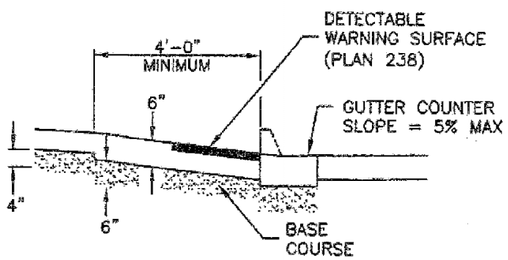


EXAMPLE C

ELEMENT	DIMENSION
(A) (B)	4 FEET WIDE MINIMUM
(C) (T)	4 FEET SQUARE MINIMUM

WHERE TURNING SPACE IS CONSTRAINED ON 2 SIDES, PROVIDE 5 FEET IN THE DIRECTION OF THE CROSSWALK

TABLE OF DIMENSIONS



MATERIALS

		RUNNING SLOPE (%) MAXIMUM	CROSS SLOPE (%) MAXIMUM
TURNING SPACE	(T)	2	2
BLENDED TRANSITION	(B)	5	2 (c)
CLEAR SPACE	(C)	5	2 (c)
SIDEWALK	(S)	STREET GRADE	2
FLARE	(F)	10	--
APPROACH	(A)	8.33	2

(a) RUNNING SLOPE IS IN THE DIRECTION OF PEDESTRIAN TRAVEL. RUNNING SLOPE OF FLARE IS PARALLEL TO BACK OF CURB

(b) CROSS SLOPE IS PERPENDICULAR TO DIRECTION OF PEDESTRIAN TRAVEL

(c) SLOPE MAY EQUAL STREET OR HIGHWAY GRADE AT CROSSWALKS THAT ARE WITHOUT VEHICULAR YIELD OR STOP CONTROL

SLOPE TABLE

APWA Utah Chapter

Corner curb cut assembly

Plan
235.2
September 2011

SHEET NO. DT-05

NO.	REVISIONS	BY	DATE
1			
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DETAIL SHEET

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

7a2019\19-003 Haskell Elk Ridge\CAD\FINAL\DT-01.dwg 1/15/2021 4:08:05 PM MST

ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E 800 N SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)

BMP: Building Repair, Remodeling, and Construction — BRRC

Objectives
- ☒ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Description:
Prevent or reduce the discharge of pollutants to storm water from building repair, remodeling and construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

Application:
- Use soil erosion control techniques if bare ground is temporarily exposed.
- Use permanent soil erosion control techniques if the remodeling clears buildings from an area that is not to be replaced.

Installation/Application Criteria:
- Enclose painting operations consistent with local air quality regulations and OSHA.
- Properly store materials that are normally used in repair and remodeling such as paints and solvents.
- Properly store and dispose of waste materials generated from the activity.
- Maintain good housekeeping practices while work is underway.

Limitations:
- This BMP is for minor construction only.
- Hazardous waste that cannot be re-used or recycled must be disposed of by a licensed hazardous waste hauler.
- Safer alternative products may not be available, suitable, or effective in every case.
- Be certain that actions to help storm water quality are consistent with OSHA and air quality regulations.

Maintenance:
None.

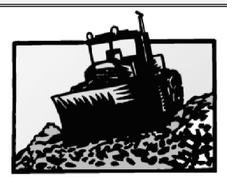
Targeted Pollutants
- ■ Sediment
- ☐ Nutrients
- ■ Toxic Materials
- ■ Oil & Grease
- ■ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements
- ☐ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☒ Training

■ High ☒ Medium ☐ Low

BMP: Contaminated or Erodible Surface Areas — CESA



Objectives
- ☒ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Description:
Prevent or reduce the discharge of pollutants to storm water from contaminated or erodible surface areas by leaving as much vegetation on-site as possible, minimizing soil exposure time, stabilizing exposed soils, and preventing storm water runon and runoff.

Application:
This BMP addresses soils which are not so contaminated as to exceed criteria but the soil is eroding and carrying pollutants off in the storm water.

Installation/Application Criteria:
Contaminated or erodible surface areas can be controlled by:
- Preservation of natural vegetation
- Re-vegetation
- Removal of contaminated soils
- Geosynthetics.

Limitations:
Disadvantages of preserving natural vegetation or re-vegetating include:
- Requires substantial planning to preserve and maintain the existing vegetation.
- May not be cost-effective with high land costs.
- Lack of rainfall and/or poor soils may limit the success of re vegetated areas.

Maintenance:
Maintenance should be minimal, except possibly if irrigation of vegetation is necessary.

Adapted from Salt Lake County BMP Fact Sheet

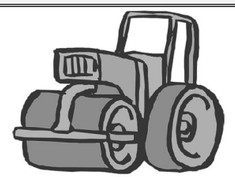
Targeted Pollutants
- ■ Sediment
- ☐ Nutrients
- ■ Toxic Materials
- ■ Oil & Grease
- ■ Floatable Materials
- ■ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements
- ☐ Capital Costs
- ☒ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Compaction — CP



Objectives
- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☒ Minimize Disturbed Areas
- ☒ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Description:
Use of rolling, tamping, or vibration to stabilize fill materials and control erosion by increasing the soil density. Increasing the density of soil improves soil strength, reduces long-term soil settlement, and provides resistance to erosion.

Applications:
- Stabilize fill material placed around various structures.
- Improve soil in place as foundation support for roads, parking lots, and buildings.

Installation/Application Criteria:
- Make sure soil moisture content is at optimum levels.
- Use proper compaction equipment.
- Install sediment control and storm water management devices below compacted areas and runon interceptor devices above these areas. Drainage from compacted areas must be carefully planned to protect adjacent uncompacted soils.
- The surface of compacted areas should be scarified and seeded or mulched and seeded to increase the effectiveness of compaction.

Limitations:
- Compaction tends to increase runoff.
- Over-compaction will hamper revegetation efforts.

Maintenance:
No maintenance required.

Adapted from Salt Lake County BMP Fact Sheet

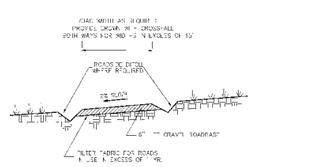
Targeted Pollutants
- ■ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements
- ☒ Capital Costs
- ☒ O&M Costs
- ☐ Maintenance
- ☒ Training

■ High ☒ Medium ☐ Low

BMP: Construction Road Stabilization — CR



Objectives
- ☒ Housekeeping Practices
- ☐ Contain Waste
- ☒ Minimize Disturbed Areas
- ☒ Stabilize Disturbed Areas
- ☒ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Description:
Temporary stabilization of on-site roadway by placement of gravel roadbase.

Application:
- On-site roadways used daily by construction traffic (may not apply to gravelly type soils)
- Parking or staging areas susceptible to erosion due to traffic use

Installation/Application Criteria:
- Grade temporary access road with 2% cross fall, for two-way width provide crown.
- Provide roadside ditch and outlet controls where required.
- Place 6 inches of 2-inch to 4-inch crushed rock on driving area

Limitations:
- May require removal of gravel roadbase at completion of activities if final cover is not impervious
- May require controls for surface storm water runoff

Maintenance:
- Inspect after major rainfall events and at least monthly.
- Place additional gravel as needed and repair any damaged areas.
- Maintain any roadside drainage controls.

Adapted from Salt Lake County BMP Fact Sheet

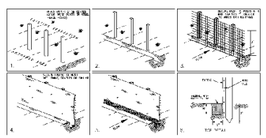
Targeted Pollutants
- ■ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements
- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Silt Fence — SF



Objectives
- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☒ Protect Slopes/Channels
- ☒ Control Site Perimeter
- ☒ Control Internal Erosion

Description:
A temporary sediment barrier consisting of entrenched filter fabric stretched across and secured to supporting posts.

Application:
- Perimeter control: place barrier at downgradient limits of disturbance
- Sediment barrier: place barrier at toe of slope or soil stockpile
- Protection of existing waterways: place barrier near top of stream bank
- Inlet protection: place fence surrounding catchbasins

Installation/Application Criteria:
- Place posts 6 feet apart on center along contour (or use preassembled unit) and drive 2 feet minimum into ground. Excavate an anchor trench immediately upgradient of posts.
- Secure wire mesh (14 gage min. With 6 inch openings) to upslope side of posts. Attach with heavy duty 1 inch long wire staples, tie wires or hog rings.
- Cut fabric to required width, unroll along length of barrier and drape over barrier. Secure fabric to mesh with twine, staples, or similar, with trailing edge extending into anchor trench.
- Backfill trench over filter fabric to anchor.

Limitations:
- Recommended maximum drainage area of 0.5 acre per 100 feet of fence
- Recommended maximum upgradient slope length of 150 feet
- Recommended maximum uphill grade of 2:1 (50%)
- Recommended maximum flow rate of 0.5 cfs
- Ponding should not be allowed behind fence

Maintenance:
- Inspect immediately after any rainfall and at least daily during prolonged rainfall.
- Look for runoff bypassing ends of barriers or undercutting barriers.
- Repair or replace damaged areas of the barrier and remove accumulated sediment.
- Reanchor fence as necessary to prevent shortcutting.
- Remove accumulated sediment when it reaches ½ the height of the fence.

Adapted from Salt Lake County BMP Fact Sheet

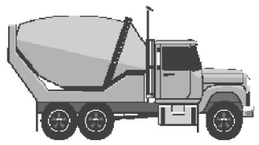
Targeted Pollutants
- ■ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements
- ☐ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Concrete Waste Management — CWM



Objectives
- ☐ Housekeeping Practices
- ☒ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Description:
Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout off-site, performing on-site washout in a designated area, and training employees and subcontractors.

Applications:
This technique is applicable to all types of sites.

Installation/Application Criteria:
- Store dry and wet materials under cover, away from drainage areas.
- Avoid mixing excess amounts of fresh concrete or cement on-site.
- Perform washout of concrete trucks off-site or in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on-site, except in designated areas.
- When washing concrete to remove fine particles and expose the aggregate, avoid creating runoff by draining the water within a bermed or level area. (See Earth Berm Barrier information sheet.)
- Train employees and subcontractors in proper concrete waste management.

Limitations:
- Off-site washout of concrete wastes may not always be possible.

Maintenance:
- Inspect subcontractors to ensure that concrete wastes are being properly managed.
- If using a temporary pit, dispose hardened concrete on a regular basis.

Adapted from Salt Lake County BMP Fact Sheet

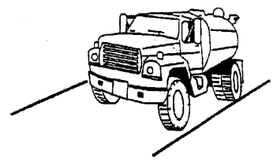
Targeted Pollutants
- ☐ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☒ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements
- ☐ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☒ Training

■ High ☒ Medium ☐ Low

BMP: Dust Controls — DC



Objectives
- ☒ Housekeeping Practices
- ☐ Contain Waste
- ☒ Minimize Disturbed Areas
- ☒ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Description:
Dust control measures are used to stabilize soil from wind erosion, and reduce dust by construction activities.

Application:
Dust control is useful in any process area, loading and unloading area, material handling areas, and transfer areas where dust is generated. Street sweeping is limited to areas that are paved.

Installation/Application Criteria:
- Two kinds of street sweepers are common: brush and vacuum. Vacuum sweepers are more efficient and work best when the area is dry.
- Mechanical equipment should be operated according to the manufacturers' recommendations and should be inspected regularly.
- Water may be sprayed on the ground surface to moisten dry soils, making it less susceptible to wind erosion.

Limitations:
- Street sweeping is labor and equipment intensive and may not be effective for all pollutants.
- Water sprayed from water trucks must be done at a rate such that the water is absorbed in the soil. If excessive amounts of water are used, it may run off, carrying soil with it.

Maintenance:
If excess water results from water spraying, dust-contaminated waters should not be allowed to run off site. Areas may need to be resprayed to keep dust from spreading.

Adapted from Salt Lake County BMP Fact Sheet

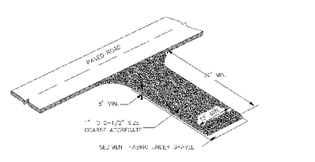
Targeted Pollutants
- ■ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements
- ☒ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☒ Training

■ High ☒ Medium ☐ Low

BMP: Stabilized Construction Entrance and Wash Area — SCEWA



Objectives
- ☒ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☒ Control Site Perimeter
- ☐ Control Internal Erosion

Description:
A stabilized pad of crushed stone located where construction traffic enters or leaves the site from or to paved surface. The area can be used to spray off vehicles before they leave the site.

Applications:
At any point of ingress or egress at a construction site where adjacent traveled way is paved. Generally applies to sites over 2 acres unless special conditions exist.

Installation/Application Criteria:
- Clear and grub area and grade to provide maximum slope of 2%.
- Compact subgrade and place filter fabric if desired (recommended for entrances to remain for more than 3 months).
- Place coarse aggregate, 1 to 2-1/2 inches in size, to a minimum depth of 8 inches.
- Provide water to the area that can be used to spray off vehicles as needed to prevent the tracking of mud off of the construction site. This may not be needed during dry periods of work, but is needed when construction is proceeding under wet conditions.
- Provide berming as needed to prevent sediment laden wash water from entering storm water facilities or other water bodies, or leaving the site.

Limitations:
- Requires periodic top dressing with additional stones.
- Should be used in conjunction with street sweeping on adjacent public right-of-way.
- Must be situated such that waste water does not run off site.

Maintenance:
- Inspect daily for loss of gravel or sediment buildup.
- Inspect adjacent roadway for sediment deposit and clean by shoveling and sweeping.
- Repair entrance and replace gravel as required to maintain control in good working condition.
- Expand stabilized area as required to accommodate traffic and prevent erosion at driveways.

Adapted from Salt Lake County BMP Fact Sheet

Targeted Pollutants
- ■ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

Implementation Requirements
- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

SHEET NO. BM-01

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BEST MANAGEMENT PRACTICES

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

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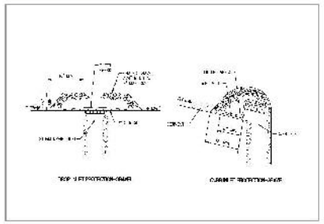
ATLAS ENGINEERING L.L.C.
PHONE: 801-655-0566
FAX: 801-655-0109
946 E 800 N SUITE A
SPANISH FORK, UT 84660

(DATE STAMP)

BMP: Inlet Protection-Gravel

IP-G
Construction



DESCRIPTION:
Placement of gravel filter over inlet to storm drain to filter storm water runoff.

APPLICATION:
Construct at inlets in paved or unpaved areas where upgradient area is to be disturbed by construction activities.

INSTALLATION/APPLICATION CRITERIA:
- Place wire mesh (with 1/2 inch openings) over the inlet grate extending one foot past the grate in all directions.
- Place filter fabric over the mesh. Filter fabric should be selected based on soil type.
- Place graded gravel, to a minimum depth of 12-inches, over the filter fabric and extending 18-inches past the grate in all directions.

LIMITATIONS:
- Recommended for maximum drainage area of one acre.
- Excess flows may bypass the inlet requiring down gradient controls.
- Ponding will occur at inlet.

MAINTENANCE:
- Inspect inlet protection after every large storm event and at a minimum of once monthly.
- Remove sediment accumulated when it reaches 4-inches in depth.
- Replace filter fabric and clean or replace gravel if clogging is apparent.

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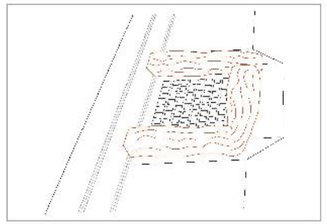
BMP: Inlet Protection – Wattle

IP-W
CONSTRUCTION



DESCRIPTION:
Sediment barrier erected around storm drain inlet.

APPLICATION:
Construct at storm drainage inlets located down-gradient of areas to be disturbed by construction.

INSTALLATION/APPLICATION CRITERIA:
- Provide up-gradient sediment controls, such as silt fence during construction of inlet
- When construction of curb and gutter and roadways is complete, install gravel filled wattles around perimeter of inlet

LIMITATIONS:
- Recommended maximum contributing drainage area of one acre
- Requires shallow slopes adjacent to inlet

MAINTENANCE:
- Inspect inlet protection following storm event and at a minimum of once every 14 days.
- Remove accumulated sediment when it reaches 4 inches in depth.
- Look for bypassing or undercutting and repair or realign as needed.

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BMP: Hazardous Waste Management

HWM

DESCRIPTION:
Prevent or reduce the discharge of pollutants to storm water from hazardous waste through proper material use, waste disposal, and training of employees. Another important aspect of this BMP is to insure the use of sub-consultants who are properly licensed and trained.

APPLICATION:
Many of the chemicals used on-site can be hazardous materials which become hazardous waste upon disposal. These wastes may include:
- Paints and solvents; petroleum products such as oils; fuels and greases; herbicides and pesticides; acids for cleaning masonry; and concrete curing compounds.

In addition, sites with existing structures may contain wastes which must be disposed of in accordance with federal, state and local regulations, including:
- Sandblasting grit mixed with lead, cadmium or chromium based paints, asbestos and PCBs.

INSTALLATION/APPLICATION CRITERIA:
The following steps will help reduce storm water pollution from hazardous wastes:
- Use all of the product before disposing of the container.
- Do not remove the original product label; it contains important safety and disposal information.
- Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried off-site by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with federal and state regulations.

LIMITATIONS:
Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste collector.

MAINTENANCE:
- Inspect hazardous waste receptacles and areas regularly.
- Arrange for regular hazardous waste collection.

PROGRAM ELEMENTS
- ☒ New Development
- ☒ Residential
- ☒ Commercial Activities
- ☒ Industrial Activities
- ☒ Municipal Facilities
- ☒ Illegal Discharges

Adapted from Salt Lake County BMP Fact Sheet

TARGETED POLLUTANTS
- ☐ Sediment
- ☐ Nutrients
- ☐ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ☒ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

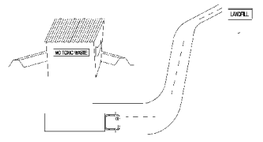
■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS
- ☐ Capital Costs
- ☒ O&M Costs
- ☒ Regulatory
- ☒ Training
- ☒ Staffing
- ☒ Administrative

■ High ☒ Medium ☐ Low

BMP: Waste Disposal

WD



DESCRIPTION:
Controlled storage and disposal of solid waste generated by construction activities.

APPLICATION:
All construction sites.

INSTALLATION:
- Designate one or several waste collection areas with easy access for construction vehicles and personnel. Ensure no waterways or storm drainage inlets are located near the waste collection areas.
- Construct compacted earthen berm (See Earth Berm Barrier BMP Fact Sheet), or similar perimeter containment around collection area for impoundment in the case of spills and to trap any windblown trash.
- Use water tight containers with covers to remain closed when not in use. Provide separate containers for different waste types where appropriate and label clearly.
- Ensure all on site personnel are aware of and utilize designated waste collection area properly and for intended use only (e.g. all toxic, hazardous, or recyclable materials shall be properly disposed of separately from general construction waste).
- Arrange for periodic pickup, transfer and disposal of collected waste at an authorized disposal location. Include regular Porto-potty service in waste management activities.

LIMITATIONS:
- On-site personnel are responsible for correct disposal of waste.

MAINTENANCE:
- Discuss waste management procedures at progress meetings.
- Collect site trash daily and deposit in covered containers at designated collection areas.
- Check containers for leakage or inadequate covers and replace as needed.
- Randomly check disposed materials for any unauthorized waste (e.g. toxic materials).
- During daily site inspections check that waste is not being incorrectly disposed of on-site (e.g. burial, burning, surface discharge, discharge to storm drain).

OBJECTIVES
- ☒ Housekeeping Practices
- ☒ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Adapted from Salt Lake City BMP Fact Sheet

TARGETED POLLUTANTS
- ☐ Sediment
- ☐ Nutrients
- ■ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ■ Other Waste

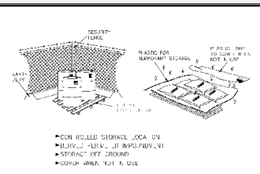
■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS
- ■ Capital Costs
- ■ O&M Costs
- ☐ Maintenance
- ■ Training

■ High ☒ Medium ☐ Low

BMP: Materials Storage

MS



DESCRIPTION:
Controlled storage of on-site materials.

APPLICATION:
- Storage of hazardous, toxic, and all chemical substances.
- Any construction site with outside storage of materials.

INSTALLATION/APPLICATION CRITERIA:
- Designate a secured area with limited access as the storage location. Ensure no waterways or drainage paths are nearby.
- Construct compacted earthen berm (See Earth Berm Barrier Information Sheet), or similar perimeter containment around storage location for impoundment in the case of spills.
- Ensure all on-site personnel utilize designated storage area. Do not store excessive amounts of material that will not be utilized on site.
- For active use of materials away from the storage area ensure materials are not set directly on the ground and are covered when not in use. Protect storm drainage during use.

LIMITATIONS:
- Does not prevent contamination due to mishandling of products.
- Spill Prevention and Response Plan still required.
- Only effective if materials are actively stored in controlled location.

MAINTENANCE:
- Inspect daily and repair any damage to perimeter impoundment or security fencing.
- Verify that materials are being correctly stored (i.e. standing upright, in labeled containers, tightly capped) and that no materials are being stored away from the designated location.

OBJECTIVES
- ☒ Housekeeping Practices
- ☒ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Adapted from Salt Lake City BMP Fact Sheet

TARGETED POLLUTANTS
- ☐ Sediment
- ☐ Nutrients
- ☒ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☒ Other Waste

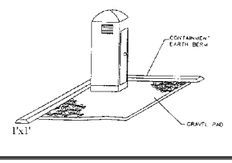
■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS
- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ■ Training

■ High ☒ Medium ☐ Low

BMP: Portable Toilets

PT



DESCRIPTION:
Temporary on-site sanitary facilities for construction personnel.

APPLICATION:
All sites with no permanent sanitary facilities or where permanent facility is too far from activities.

INSTALLATION/APPLICATION CRITERIA:
- Locate portable toilets in convenient locations throughout the site.
- Prepare level, gravel surface and provide clear access to the toilets for servicing and for on-site personnel.
- Construct earth berm perimeter (See Earth Berm Barrier Information Sheet), control for spill/protection leak.
- Stake toilets to prevent them from tipping.

LIMITATIONS:
No limitations.

MAINTENANCE:
- Portable toilets should be maintained in good working order by licensed service with daily observation for leak detection.
- Regular waste collection should be arranged with licensed service.
- All waste should be deposited in sanitary sewer system for treatment with appropriate agency approval.

OBJECTIVES
- ☒ Housekeeping Practices
- ☒ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Adapted from Salt Lake County BMP Fact Sheet

TARGETED POLLUTANTS
- ☐ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ■ Other Waste

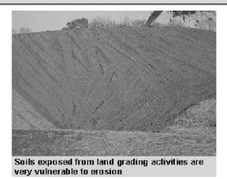
■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS
- ☐ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

BMP: Grading Practices

GP



Soils exposed from land grading activities are very vulnerable to erosion

DESCRIPTION:
Control soil erosion by minimizing the exposure of bare soil to erosive forces. This is done by
1) limiting the amount of land disturbed at one time in preparation for construction
2) limiting the amount of time between the disturbance of soil and protection or stabilization of disturbed soils, and
3) using grading practices to protect exposed soils susceptible to storm water runoff.

Related practices include construction sequencing, preservation of existing vegetation, erosion control practices and sediment control practices.

APPROACH:
- Limit the area of disturbance to those areas requiring grading. This preserves existing vegetation and reduces the vulnerability of soil to erosion.
- Based on erosion potential and sediment control measures on the site, establish what areas are to be graded at one time.
- An undisturbed buffer zone containing vegetation all the lowest elevation of the construction site can reduce the transport of sediment off site.
- Initiate soil protection measures during the course of work to minimize the length of time soil is exposed to erosive forces.
- Conduct work in stages so that construction or soil stabilization occurs promptly after disturbance of soil.
- Establish a schedule governing the stabilization of disturbed slopes, both in terms of passage of time since commencement and completion of disturbance and in terms of planting season.
- Leaving the surface of the disturbed soil graded in a roughened condition (not smooth) can reduce the quantity and velocity of storm water runoff.
- Prevent storm water runoff from running onto steep slopes from above.
- Avoid long, steep cut or fill slopes that allow runoff water of sufficient quantity or velocity to cut into and erode the slope.

LIMITATIONS:
- The specific approach to grading on a particular site depends on the conditions at the site and is a mounting land engineering judgment is required to design the approach best suited for each site.

MAINTENANCE:
- Practices may need to vary from the approved plan if erosion problems appear when storm water runoff occurs.

OBJECTIVES
- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☒ Minimize Disturbed Areas
- ☒ Stabilize Disturbed Areas
- ☒ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☒ Control Internal Erosion

Adapted from Salt Lake County BMP Fact Sheet

TARGETED POLLUTANTS
- ■ Sediment
- ☐ Nutrients
- ☐ Heavy Metals
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- ☐ Oil & Grease
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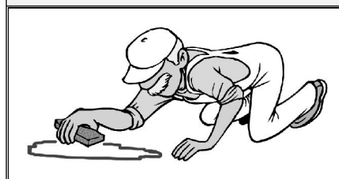
■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS
- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ■ Training

■ High ☒ Medium ☐ Low

BMP: Spill Clean-Up

SCU



DESCRIPTION:
Practices to clean-up leakage/spillage of on-site materials that may be harmful to receiving waters.

APPLICATION:
All sites

GENERAL:
- Store controlled materials within a storage area.
- Educate personnel on prevention and clean-up techniques.
- Designate an Emergency Coordinator responsible for employing preventative practices and for providing spill response.
- Maintain a supply of clean-up equipment on-site and post a list of local response agencies with phone numbers.

METHODS:
- Clean-up spills/leaks immediately and remediate cause.
- Use as little water as possible. NEVER HOSE DOWN OR BURY SPILL CONTAMINATED MATERIAL.
- Use rags or absorbent material for clean-up. Excavate contaminated soils. Dispose of clean-up material and soil as hazardous waste.
- Document all spills with date, location, substance, volume, actions taken and other pertinent data.
- Contact local Fire Department and State Division of Environmental Response and Remediation (Phone: (801) 536-4100) for any spill of reportable quantity.

OBJECTIVES
- ☒ Housekeeping Practices
- ☒ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Adapted from Salt Lake County BMP Fact Sheet

TARGETED POLLUTANTS
- ☐ Sediment
- ☐ Nutrients
- ■ Toxic Materials
- ☒ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

■ High Impact
☒ Medium Impact
☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS
- ☐ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ■ Training

■ High ☒ Medium ☐ Low

SHEET NO. BM-02

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BEST MANAGEMENT PRACTICES

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ELK RIDGE, UTAH

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ATLAS ENGINEERING L.L.C.
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SPANISH FORK, UT 84660

(DATE STAMP)

Stormwater Best Management Practice
Concrete Washout

EPA United States Environmental Protection Agency

NPDES

Minimum Measure
Construction Site Stormwater Runoff Control

Subcategory
Good Housekeeping/Materials Management

Description of Concrete Washout at Construction Sites

Concrete and its ingredients

Concrete is a mixture of cement, water, and aggregate material. Portland cement is made by heating a mixture of limestone and clay containing oxides of calcium, aluminum, silicon and other metals in a kiln and then pulverizing the resulting clinker. The fine aggregate particles are usually sand. Coarse aggregate is generally gravel or crushed stone. When cement is mixed with water, a chemical reaction called hydration occurs, which produces glue that binds the aggregates together to make concrete.

Concrete washout

After concrete is poured at a construction site, the chutes of ready mixed concrete trucks and hoppers of concrete pump trucks must be washed out to remove the remaining concrete before it hardens. Equipment such as wheelbarrows and hand tools also need to be washed down. At the end of each work day, the drums of concrete trucks must be washed out. This is customarily done at the ready mixed batch plants, which are usually off site facilities, however large or rural construction projects may have on-site batch plants. Cementitious (having the properties of cement) washwater and solids also come from using such construction materials as mortar, plaster, stucco, and grout.

Environmental and Human Health Impacts

Concrete washout water (or washwater) is a slurry containing toxic metals. It's also caustic and corrosive, having a pH near 12. In comparison, Drano liquid drain cleaner has a pH of 13.5. Caustic washwater can harm fish gills and eyes and interfere with reproduction. The safe pH ranges for aquatic life habitats are 6.5 – 9 for freshwater and 6.5 – 8.5 for saltwater.

Construction workers should handle wet concrete and washout water with care because it may cause skin irritation and eye damage. If the washwater is dumped on the ground (Fig. 1), it can run off the construction site to adjoining roads and enter roadside storm drains, which discharge to surface waters such as rivers, lakes, or estuaries. The red arrow in Figure 2 points to a ready mixed truck chute that's being washed out into a roll-off bin, which isn't watertight. Leaking washwater, shown in the foreground, will likely follow similar

Figure 1. *Chute washwater being dumped on the ground*

Figure 2. *Chute washwater leaking from a roll-off bin being used as a washout container*

paths to nearby surface waters. Rainfall may cause concrete washout containers that are uncovered to overflow and also transport the washwater to surface waters. Rainwater polluted with concrete washwater can percolate down through the soil and alter the soil chemistry, inhibit plant growth, and contaminate the groundwater. Its high pH can increase the toxicity of other substances in the surface waters and soils. Figures 1 and 2 illustrate the need for better washout management practices.

Best Management Practice Objectives

The best management practice objectives for concrete washout are to (a) collect and retain all the concrete washout water and solids in leak proof containers, so that this caustic material does not reach the soil surface and then migrate to surface waters or into the ground water, and (b) recycle 100 percent of the collected concrete washout water and solids. Another

objective is to support the diversion of recyclable materials from landfills. Table 1 shows how concrete washout materials can be recycled and reused.

Table 1 – Recycling concrete washout materials

Uses of Recycled Materials	Washwater	Cement fines	Fine aggregate	Coarse aggregate	Hardened concrete	Unused wet concrete
Reused to wash out additional mixer truck chutes or drums	x					
Reused as a ready mixed concrete ingredient	x	x[a]	x	x		
Reused as an ingredient of precast concrete products, e.g., highway barriers, retaining wall blocks, riprap	x	x	x	x		x
Reused as crushed concrete products, e.g., road base or fill		x	x	x	x	
Reused to pave the yards of ready mixed concrete plants						x
Returned back to a surface water, e.g., river, lake, or estuary	x[c]					

[illegible]

Washwater recycling, treatment, disposal

Washwater from concrete truck chutes, hand mixers, or other equipment can be passed through a system of weirs or filters to remove solids and then be reused to wash down more chutes and equipment at the construction site or as an ingredient for making site-mixed concrete. A three-chamber washout filter is shown in Figure 3. [illegible] The middle stage filters out the small grit and sand. The third stage has an array of fabric filters that filter out fines and reduces the pH. The filtered washwater is then discharged through a filter sock. An alternative is to pump the washout water out of the washout container (Fig. 4) and haul the washwater off site to remove metals and reduce its pH, so it can be delivered to a publicly owned treatment works (POTW), also known as a municipal wastewater treatment plant, which provides additional treatment allowing the wastewater to be discharged to a surface water. The POTW should be contacted to inquire about any pretreatment requirements [illegible] (40CFR 403.5) before discharging the washwater to the POTW. The washwater can also be retained in the washout container and allowed to evaporate, leaving only the hardened cementitious solids to be recycled.

Figure 3. *Concrete washout filter*

Figure 4. [illegible]

Solids recycling

The coarse aggregate materials that are washed off concrete truck chutes into a washout container can be either separated by a screen and placed in aggregate bins to be reused at the concrete plant or returned to the ready mixed plant and washed into a reclaimer (Fig. 5). When washed out into a reclaimer, the fine and coarse aggregates are separated out and placed in different piles or bins to be reused in making fresh concrete. [illegible]

Figure 5. *Ready mixed truck washing out into a reclaimer*

Hardened concrete recycling

When the washwater in a construction site's concrete washout container has been removed or allowed to evaporate, the hardened concrete that remains can be crushed (Fig. 6) and reused as a construction material. It makes an excellent aggregate for road base and can be used as fill at the construction site or delivered to a recycler. Concrete recyclers can be found at municipal solid waste disposal facilities, private recycling plants, or large construction sites.

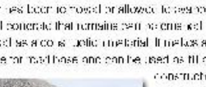

Figure 6. *Crushed concrete stockpile and crusher*

Wet concrete recycling

Builders often order a little more ready mixed concrete than they actually need, so it is common for concrete trucks to have wet concrete remaining in their drum after a delivery. This unused concrete can be returned to the ready mixed plant and either (1) used to pour precast concrete products (e.g., highway barriers, retaining wall blocks, riprap), (2) used to pave the ready mixed plant's yard, (3) washed into a reclaimer, or (4) dumped on an impervious surface and allowed to harden, so it can be crushed and recycled as aggregate. Unused wet concrete should not be dumped on bare ground to harden at construction sites because this can contribute to ground water and surface water contamination.

Washout Containers

Different types of washout containers are available for collecting, retaining, and recycling the washwater and solids from washing down mixed truck chutes and pump truck hoppers at construction sites.

Chute washout box

A chute washout box is mounted on the back of the ready mixed truck. If the truck has three chutes, the following procedure is used to perform the washout from the top down: (1) after the pour is completed, the driver attaches the extension chute to the washout box; (2) the driver then rotates the main chute over the extension chute (Fig. 7) and washes down the hopper first, then the main chute; (3) finally the driver washes down the flip-down chute and last the extension chute hanging on the box. All washwater and solids are captured in the box. After the washdown, washwater and solids are returned to the ready mixed plant for recycling. A filter basket near the top of the washout box separates out the coarse aggregates so they can be placed in a bin for reuse either at the construction site or back at the cement plant.

Figure 7. *Chute washout box*

Chute washout bucket and pump

After delivering ready mixed concrete and scraping the last of the customer's concrete down the chute, the driver hangs a washout bucket, shown in Figure 8 (see red arrow) on the end of the truck's chute and secures the hose to insure no leaks. The driver then washes down the chute into the bucket to remove any cementitious material before it hardens. After washing out the chute, the driver pumps (yellow arrow points to the pump) the washwater, sand, and other fine solids from the bucket up into the truck's drum to be returned to the ready mixed plant, where it can be washed into a reclaimer. A removable screen at the bottom of the washout bucket prevents coarse aggregate from entering the pump. This coarse aggregate can also be returned to the plant and added to the coarse aggregate pile to be reused. All the materials are recycled.

Figure 8. *Chute washout bucket and pump*

Hay bale and plastic washout pit

A washout pit made with hay bales and a plastic lining is shown in Figure 9. Such pits can be dug into the ground or built above grade. The plastic lining should be free of tears or holes that would allow the washwater to escape (Fig. 10). After the pit is used to wash down the chutes of multiple ready mixed trucks and the washwater has evaporated or has been vacuumed off, the remaining hardened solids can be broken up and removed from the pit. This process may damage the hay bales and plastic lining. If damage occurs, the pit will need to be repaired and relined with new plastic. When the hardened solids are removed, they may be bound up with the plastic lining and have to be sent to a landfill, rather than recycled. Recyclers usually accept only unmixed material. If the pit is going to be emptied and relined more than a few times, the hay bales and plastic will be generating additional solid waste. Ready mixed concrete

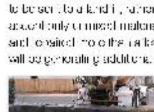

Figure 9. *Hay bale and plastic washout pit*

Figure 10. *Leaking washout pit [illegible]*

trucks can use hay bale washout pits, but concrete pump trucks have a low hanging hopper in the back that may prevent their being washed out into bale lined pits.

Vinyl washout container

The vinyl washout container (Fig. 11) is portable, reusable, and easier to install than a vinyl bale washout pit. The biodegradable filter bag (Fig. 12) assists in extracting the concrete solids and prolongs the life of the vinyl container. When the bag is lifted, the water is filtered out and the remaining concrete solids and the bag can be disposed of together in a landfill, or the hardened concrete can be delivered to a recycler. After the solids have been removed several times and the container is full of washwater, the washwater can be allowed to evaporate so the container can be reused. The washwater can be removed more quickly by placing another filter bag in the container and spreading water-gelling granules evenly across the water. In about five minutes, the water in the filter bag will turn into a gel that can be removed with the bag. Then the gel and filter bag can be disposed of together.

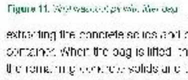

Figure 11. *Vinyl washout pit with filter bag*

Figure 12. *Extracting the concrete solids in a filter bag*

Metal washout container

The metal roll-off bin (Fig. 13) is designed to securely contain concrete washwater and solids and is portable and reusable. It also has a ramp that allows concrete pump trucks to wash out their hoppers (Fig. 14). Roll-off providers offer recycling services, such as picking up the roll-off bins after the washwater has evaporated and the solids have hardened, replacing them with empty washout bins, and delivering the hardened concrete to a recycler (Fig. 15) rather than a landfill. Some providers will vacuum off the washwater, treat it to remove metals and reduce the pH, deliver it to a wastewater treatment plant for additional treatment and

Figure 13. *Metal [illegible] washout container [illegible]*

subsequent discharge to a surface water. Everything is recycled or treated sufficiently to be returned to a natural surface water.

Figure 14. *Pump truck using the [illegible]*

Figure 15. *Delivering Hardened Concrete to a recycler*

Another metal portable washout container, which has a rain cover to prevent overflowing, is shown in Figure 16. It is accompanied by an onsite washwater treatment unit, which reduces the pH and uses a filtered water tank system to remove the coarse aggregate, fine aggregate, and cement fines. The washwater can then be reused at the construction site to wash out other mixer truck chutes and equipment. The solids are allowed to harden together and can be taken to a concrete recycler (Fig. 17) to be crushed and used as road base, aggregate for making precast products, such as retaining wall blocks. All metals are recycled.

Figure 16. *Washout container with onsite water treatment [illegible]*

Figure 17. *Delivering [illegible] to a recycler*

Siting Washout Facilities

Concrete washout facilities, such as washout pits and vinyl or metal washout containers, should be placed in locations that provide convenient access to concrete trucks, preferably near the area where concrete is being poured. However they

should not be placed within 50 feet of storm drains, open ditches, or waterbodies. Appropriate gravel or rock should cover approaches to concrete washout facilities when they are located on undeveloped property. On large sites with extensive concrete work, washouts should be placed at multiple locations for ease of use by ready mixed truck drivers. If the washout facility is not within view from the pour location, signage will be needed to direct the truck drivers.

Operating and Inspecting Washout Facilities

Concrete washout facilities should be inspected daily and after heavy rains to check for leaks, identify any plastic linings and sidewalls have been damaged by construction activities, and determine whether they have been filled to over 75 percent capacity. When the washout container is filled to over 75 percent of its capacity, the washwater should be vacuumed off or allowed to evaporate to avoid overflows. Then when the remaining cementitious solids have hardened, they should be removed and recycled. Damages to the container should be repaired promptly. Before heavy rains, the washout container's liquid level should be lowered or the container should be covered to avoid an overflow during the rain storm.

Educating Concrete Subcontractors

The construction site superintendent should make ready mixed truck drivers aware of washout facility locations and be watchful for improper dumping of cementitious material. In addition, concrete washout requirements should be included in contracts with concrete delivery companies.

Reference

NRMCA 2009. Environmental Management in the Ready Mixed Concrete Industry, 2PENVMM, 1st edition. By Gary M. Mullins. Silver Springs, MD: National Ready Mixed Concrete Association.

Websites and Videos

Construction Materials Recycling Association
www.concreterecycling.org

National Ready Mixed Concrete Association
www.nrmca.org

National Ready Mixed Concrete Research and Education Foundation
www.rmc-foundation.org

Additional information and videos on concrete washout containers and systems can be found by a web search for "concrete washout."

Photograph Credits

[illegible]

Disclaimer
[illegible]

Stockpile Management (SP) MM-2

Description

Stockpile management includes measures to minimize erosion and sediment transport from soil stockpiles.

Photograph SP-1. A topsoil stockpile that has been partially revegetated and is protected by silt fence perimeter control.

Appropriate Uses

Stockpile management should be used when soils or other erodible materials are stored at the construction site. Special attention should be given to stockpiles in close proximity to natural or manmade storm systems.

Design and Installation

Locate stockpiles away from all drainage system components including storm sewer inlets. Where practical, choose stockpile locations that that will remain undisturbed for the longest period of time as the phases of construction progress. Place sediment control BMPs around the perimeter of the stockpile, such as sediment control logs, rock socks, silt fence, straw bales and sand bags. See Detail SP-1 for guidance on proper establishment of perimeter controls around a stockpile. For stockpiles in active use, provide a stabilized designated access point on the upgradient side of the stockpile.

Stabilize the stockpile surface with surface roughening, temporary seeding and mulching, erosion control blankets, or soil binders. Soils stockpiled for an extended period (typically for more than 60 days) should be seeded and mulched with a temporary grass cover once the stockpile is placed (typically within 14 days). Use of mulch only or a soil binder is acceptable if the stockpile will be in place for a more limited time period (typically 30-60 days). Timeframes for stabilization of stockpiles noted in this fact sheet are "typical" guidelines. Check permit requirements for specific federal, state, and/or local requirements that may be more prescriptive.

Stockpiles should not be placed in streets or paved areas unless no other practical alternative exists. See the Stabilized Staging Area Fact Sheet for guidance when staging in roadways is unavoidable due to space or right-of-way constraints. For paved areas, rock socks must be used for perimeter control and all inlets with the potential to receive sediment from the stockpile (even from vehicle tracking) must be protected.

Maintenance and Removal

Inspect perimeter controls and inlet protection in accordance with their respective BMP Fact Sheets. Where seeding, mulch and/or soil binders are used, reseeding or reapplication of soil binder may be necessary.

When temporary removal of a perimeter BMP is necessary to access a stockpile, ensure BMPs are reinstalled in accordance with their respective design detail section.

Stockpile Management	
Functions	
Erosion Control	Yes
Sediment Control	Yes
Site/Material Management	Yes

SHEET NO.
BM-03

NO.	REVISIONS	BY	DATE
1			
2			
3			
4			
5			
6			

BEST MANAGEMENT PRACTICES

DRYLAND SUBDIVISION
ELK RIDGE, UTAH

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