MAIN STREET - WATER MAIN RELOCATION

KETCHUM, IDAHO

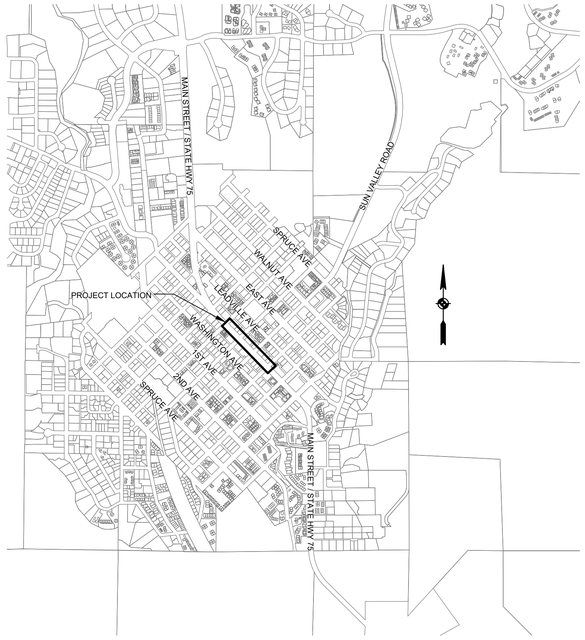
FEBRUARY 2024

CONSTRUCTION NOTES

1. ALL CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE MOST CURRENT EDITION OF THE "IDAHO REGULATIONS FOR PUBLIC DRINKING WATER SYSTEMS," THE CURRENT EDITION OF THE "IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION" (ISPWC), AND CITY OF KETCHUM STANDARDS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND KEEPING A COPY OF THE ISPWC ON SITE DURING CONSTRUCTION.
2. THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN ON THE PLANS IN AN APPROXIMATE WAY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING EXISTING UTILITIES PRIOR TO COMMENCING AND DURING THE CONSTRUCTION. THE CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH RESULT FROM HIS FAILURE TO ACCURATELY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. CONTRACTOR SHALL CALL DIGLINE (1-800-342-1585) TO LOCATE ALL EXISTING UNDERGROUND UTILITIES A MINIMUM OF 48 HOURS IN ADVANCE OF EXCAVATION.
3. CONTRACTOR SHALL COORDINATE RELOCATIONS OF DRY UTILITIES FACILITIES (POWER, CABLE, PHONE, TV) WITH THE APPROPRIATE UTILITY FRANCHISE.
4. THE CONTRACTOR SHALL CLEAN UP THE SITE AFTER CONSTRUCTION SO THAT IT IS IN A CONDITION EQUAL TO OR BETTER THAN THAT WHICH EXISTED PRIOR TO CONSTRUCTION, INCLUDING BUT NOT LIMITED TO, EPA'S NPDES CONSTRUCTION GENERAL PERMIT.
5. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION (THIS INCLUDES, BUT IS NOT LIMITED TO, ENCROACHMENT PERMITS AND NATIONAL POLLUTANT DISCHARGED ELIMINATION SYSTEMS (NPDES) CONSTRUCTION GENERAL PERMIT (CGP) PERMIT COVERAGE).
6. ALL CLEARING & GRUBBING SHALL CONFORM TO ISPWC SECTION 201.
7. ALL EXCAVATION & EMBANKMENT SHALL CONFORM TO ISPWC SECTION 202. EXCAVATED SUBGRADE SHALL BE COMPACTED AND ALL UNSUITABLE SECTIONS REMOVED AND REPLACED WITH STRUCTURAL FILL AS DETERMINED BY THE ENGINEER. MINIMUM COMPACTION OF PLACED MATERIAL SHALL BE 95% OF MAXIMUM LABORATORY DENSITY AS DETERMINED BY AASHTO T-99 OR ITD T-91.
8. ALL EDGES OF EXISTING ASPHALT PAVING SHALL BE SAW CUT 24" TO PROVIDE A CLEAN PAVEMENT EDGE FOR MATCHING. NO WHEEL CUTTING SHALL BE ALLOWED.
9. ALL 2" MINUS GRAVEL SHALL CONFORM TO ISPWC 802, TYPE II (ITD STANDARD 703.04, 2"), SHALL BE PLACED IN CONFORMANCE WITH ISPWC SECTION 801 AND COMPACTED PER SECTION 202. MINIMUM COMPACTION OF PLACED MATERIAL SHALL BE 90% OF MAXIMUM LABORATORY DENSITY AS DETERMINED BY AASHTO T-99.
10. ALL 3/4" MINUS CRUSHED GRAVEL SHALL CONFORM TO ISPWC 802, TYPE I (ITD STANDARD 703.04, 3/4" B), SHALL BE PLACED IN CONFORMANCE WITH ISPWC SECTION 802 AND COMPACTED PER SECTION 202. MINIMUM COMPACTION OF PLACED MATERIAL SHALL BE 95% OF MAXIMUM LABORATORY DENSITY AS DETERMINED BY AASHTO T-99 OR ITD T-91.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TRAFFIC CONTROL PER THE CURRENT EDITION OF THE US DEPARTMENT OF TRANSPORTATION MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) OR PER THE TRAFFIC CONTROL PLAN ASSOCIATED WITH MAIN STREET IMPROVEMENTS. THE TRAFFIC CONTROL PLAN SHALL BE APPROVED BY THE CITY OF KETCHUM AND THE IDAHO TRANSPORTATION DEPARTMENT (ITD) PRIOR TO CONSTRUCTION. SCHEDULED LANE CLOSURES SHALL BE CLEARLY IDENTIFIED ON THE TRAFFIC CONTROL PLAN.
12. ALL TRENCHING SHALL CONFORM TO ISPWC STANDARD DRAWING SD-301 AND CITY OF KETCHUM STANDARDS. TRENCHES SHALL BE BACKFILLED TO TOP OF ADJACENT ASPHALT FOR TEMPORARY VEHICULAR TRAFFIC AND COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99. SEE DETAIL 3 / C2.0.
13. TOPOGRAPHIC, SITE, SHOWN HEREON WERE CONDUCTED FOR THE CITY OF KETCHUM RECEIVED BY OPAL ENGINEERING, PLLC ON NOVEMBER 10, 2023. PROPOSED MAIN STREET IMPROVEMENTS SHOWN HEREON ARE PER A DESIGN BY JACOBS ENGINEERING RECEIVED BY OPAL ENGINEERING, PLLC ON NOVEMBER 10, 2023.
14. PER IDAHO CODE § 55-1613, THE CONTRACTOR SHALL RETAIN AND PROTECT ALL MONUMENTS, ACCESSORIES TO CORNERS, BENCHMARKS AND POINTS SET IN CONTROL SURVEYS; ALL MONUMENTS, ACCESSORIES TO CORNERS, BENCHMARKS AND POINTS SET IN CONTROL SURVEYS THAT ARE LOST OR DISTURBED BY CONSTRUCTION SHALL BE REESTABLISHED AND RE-MONUMENTED, AT THE EXPENSE OF THE AGENCY OR PERSON CAUSING THEIR LOSS OR DISTURBANCE AT THEIR ORIGINAL LOCATION OR BY SETTING OF A WITNESS CORNER OR REFERENCE POINT OR A REPLACEMENT BENCHMARK OR CONTROL POINT, BY OR UNDER THE DIRECTION OF A PROFESSIONAL LAND SURVEYOR.

WATER MAIN CONSTRUCTION NOTES

1. WATER MAIN AND SERVICE CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE CITY OF KETCHUM STANDARDS. NO WATER MAIN OR SERVICES SHALL BE BACKFILLED UNTIL THEY HAVE BEEN INSPECTED AND APPROVED BY THE CITY.
2. WATER MAINS AND SERVICES SHALL HAVE A MINIMUM COVER OF SIX FEET (6.0'), MEASURED FROM FINISHED GRADE.
3. ALL 4" AND LARGER WATER MAINS SHALL BE CONSTRUCTED WITH AWWA C-900, CLASS 235 PVC PIPE. ALL WATER MAINS SHALL BE PRESSURE TESTED IN CONFORMANCE WITH ISPWC SECTION 401.3.6 AND THE CITY OF KETCHUM STANDARDS. TRACER WIRE SHALL BE NO. 12 GAUGE COPPER LOCATING WIRE INSULATED PER ISPWC SECTION 401 AND THE CITY OF KETCHUM SPECIFICATIONS.
4. SEE FLUSHING AND DISINFECTION REQUIREMENTS THIS SHEET. ALL BACTERIA TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER AND THE CITY OF KETCHUM WATER AND SEWER DEPARTMENT FOR FINAL APPROVAL AND ACCEPTANCE PRIOR TO ACTIVATION OF THE WATER MAIN AND SERVICES.
5. ALL WATER DISTRIBUTION AND WATER SERVICE INSTALLATION MATERIALS AND CHEMICALS USED TO DISINFECT POTABLE WATER COMPONENTS MUST BE COMPLIANT WITH ANSI/NSF STANDARD 60/61. ALL MATERIALS MUST BE COMPLIANT WITH THE LOW LEAD RULE (<0.25%Pb BY WEIGHT).
6. ALL TEES, PLUGS, CAPS AND BENDS SHALL BE SECURED AND ANCHORED BY SUITABLE THRUST BLOCKING (MECHANICAL RESTRAINTS ARE NOT ALLOWED). THRUST BLOCKS SHALL CONFORM TO ISPWC SD-403 AND THE CITY OF KETCHUM STANDARDS.
7. ALL VALVES SHALL BE GATE VALVES WITH NON-RISING STEM, "O" RING SEALS, AND TWO-INCH OPERATING NUTS MEETING AWWA STANDARDS PER ISPWC SECTION 402. ALL GATE VALVES LOCATED IN PAVEMENT SHALL BE FITTED WITH CAST IRON VALVE BOXES WITH CONCRETE COLLARS PER ISPWC SD-406 AND THE CITY OF KETCHUM SPEFICIATIONS.
8. ALL WATER MAIN FITTINGS SHALL BE DUCTILE IRON CONFORMING TO THE REQUIREMENTS OF AWWA C-110 FOR 250 PSI WORKING PRESSURE. JOINTS ON BURIED VALVES SHALL BE MECHANICAL JOINTS UNLESS OTHERWISE NOTED. FLANGED JOINTS SHOULD, IN GENERAL, BE AVOIDED UNDERGROUND.
10. ALL TAPPING SADDLES SHALL BE CONSTRUCTED FROM T-304 STAINLESS STEEL WITH ANSI/AWWA C-207 CLASS 150 FLANGES. ALL WELDS SHALL CONFORM TO ASTM A-380. THE TEST OUTLET SHALL BE 3/4" NPT WITH 3/4" NPT PLUG.
11. ALL WATER MAINS SHALL COMPLY WITH IDAPA 58.01.08.542.07.a AND IDAPA 58.01.08.542.07.b WHICH ADDRESS THE REQUIREMENTS FOR SEPARATION DISTANCES BETWEEN POTABLE WATER LINES (INCLUDING MAINS AND SERVICE LINES) WITH NON-POTABLE LINES (SEE ILLUSTRATION OF THESE SEPARATION REQUIREMENTS ON THIS SHEET). IN ADDITION, WATER MAINS SHALL BE CONSTRUCTED WITH AT LEAST 25 FEET HORIZONTAL SEPARATION FROM INFILTRATION TRENCHES AND DRY WELLS.
12. ALL WATER SERVICES SHALL BE IN COMPLIANCE WITH ISPWC SECTION 404 AND THE CITY OF KETCHUM STANDARDS. A USC EC APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY (RPBA) SHALL BE INSTALLED ON PRIMARY SERVICE CONNECTIONS (INCLUDING FIRE SUPPRESSION SERVICES, IF APPLICABLE) IN ACCORDANCE WITH THE CITY OF KETCHUM WATER DEPARTMENT, FIRE MARSHAL, PLUMBING BUREAU, AND STATE OF IDAHO BACKFLOW PREVENTION REQUIREMENTS. IN AREAS WHERE MULTIPLE WATER SERVICE LINES ARE IN SAME TRENCH SEPARATE LINES BY 6".
13. THE CONTRACTOR SHALL KEEP THE EXISTING WATER DISTRIBUTION SYSTEM LIVE, TO THE GREATEST EXTENT POSSIBLE, WHILE INSTALLING THE NEW WATER MAIN AND SERVICES MINIMIZING DISRUPTION TO EXISTING WATER SYSTEM USERS. THE NEW WATER MAIN AND SERVICES SHALL BE INSTALLED, BACKFILLED, PRESSURE TESTED AND DISINFECTED AND FLUSHED PRIOR TO CONNECTING THE NEW MAIN TO THE EXISTING MAIN. THE MAXIMUM ALLOWABLE SERVICE OUTAGE FOR ANY SHUTDOWN IS 4 HOURS.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROMPTLY REMOVING AND DISPOSING OF WATER ENTERING THE TRENCH DURING THE TIME THE TRENCH IS BEING PREPARED FOR INSTALLATION OF THE UTILITY, INCLUDING COMPLETION OF BACKFILL OF THE PIPE ZONE, AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL DISPOSE OF THE WATER IN A SUITABLE MANNER WITHOUT CAUSING DAMAGE TO PROPERTY.
15. EXTRA FITTINGS MAY BE NECESSARY IN ADDITION TO THOSE SHOWN HEREON TO CONTROL ELEVATION AND AVOID UNDERGROUND CONFLICTS.



VICINITY MAP
N.T.S.

SHEET INDEX

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PURPOSE: ISSUE FOR BID (02/08/24)

REVISION NO.	DATE	DESCRIPTION

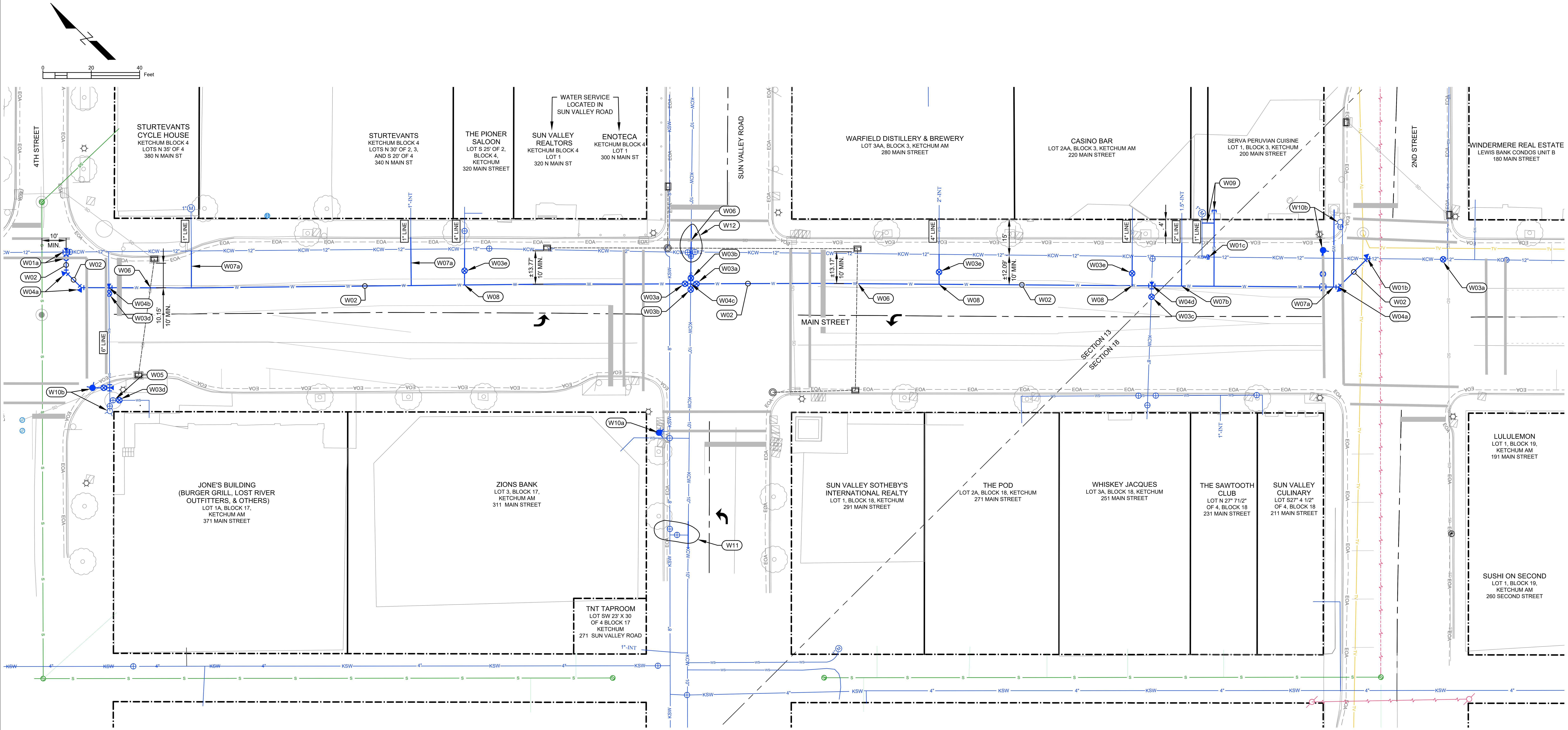
PROFESSIONAL ENGINEER
LICENSED
17618
02/08/2024
STATE OF IDAHO
SAMANTHA STAHLNECKER

COVER SHEET

MAIN STREET- WATER MAIN RELOCATION
PREPARED FOR CITY OF KETCHUM

22036-05
PROJECT NUMBER

C0.1



LEGEND

EXISTING CONDITIONS

- RIGHT-OF-WAY
- PROPERTY BOUNDARY
- CENTER LINE RIGHT OF WAY
- SECTION LINE
- CURB & GUTTER
- EDGE OF ASPHALT
- WATER SERVICE
- KETCHUM CITY WATER LINE (10")
- KETCHUM CITY WATER LINE (8")
- KETCHUM SPRING LINE (ABANDONED)
- K.S.L. WATER SERVICE
- FIRE HYDRANT
- WATER VALVE
- EXTERIOR WATER METER WITH VAULT
- INTERIOR WATER METER
- SEWER MAIN
- SEWER MANHOLE
- BURIES POWER LINE
- LIGHT
- POWER POLE
- POWER BOX
- CABLE TV BURIED
- SIGN
- TREE
- CATCH BASIN
- STORM PIPE
- STORM DRAIN MANHOLE

PROPOSED CONDITIONS

- CURB AND GUTTER (BY JACOBS, SEE CONSTRUCTION NOTE 12)
- EDGE OF ASPHALT REPAIR/ REPLACEMENT (BY JACOBS, SEE CONSTRUCTION NOTE 12)
- PAVEMENT MARKINGS (BY JACOBS, SEE CONSTRUCTION NOTE 12)
- WATER SERVICE
- WATER MAIN, SIZE PER PLAN
- WATER MAIN FITTING
- GATE VALVE
- FIRE HYDRANT
- IRRIGATION MAIN
- STORM LINE (BY JACOBS, SEE CONSTRUCTION NOTE 12)
- PROPOSED STORMWATER STRUCTURE (BY JACOBS, SEE CONSTRUCTION NOTE 12)
- PROPOSED TREE (BY JACOBS, SEE CONSTRUCTION NOTE 12)

GENERAL NOTES:

1. SEE SHEET C0.1 FOR CONSTRUCTION NOTES AND WATER MAIN CONSTRUCTION NOTES.
2. SEE SHEET C2.0 FOR STANDARD WATER DETAILS.

DEMOLITION NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAWCUTTING AND REMOVING EXISTING ASPHALT AND CONCRETE AS NECESSARY FOR THE INSTALLATION OF ALL WATER IMPROVEMENTS. ALL CONCRETE SHALL BE SAWCUT AND REMOVED TO THE NEXT NEAREST JOINT FOR CLEAN REMOVAL.

WATER KEY NOTES

W01 POINT OF WATER CONNECTION / DISCONNECTION. COORDINATE WITH CITY WATER DEPARTMENT.
  a. HOT TAP EXISTING 12" WATER MAIN W/ STAINLESS STEEL TAPPING SADDLE AND 12" GATE VALVE W/ TRUST BLOCK PER DETAIL 1 / C2.0.
  b. INSTALL 12"Ø D.I. 45° FITTING WITH THRUST BLOCK, REFER TO DETAIL 1 / C2.0.
  c. TEMPORARY CUT AND CAP FOR CONTINUED WATER SERVICE BETWEEN 2ND STREET AND 4TH STREET DURING MAIN LINE CONSTRUCTION. SEE DETAIL 1 / C2.0 FOR THRUST BLOCK DETAIL.

W02 INSTALL 12" Ø C-900 PVC WATER MAIN. SEE DETAIL 3 / C2.0 FOR TRENCH CONSTRUCTION.

W03 INSTALL GATE VALVE W/ THRUST BLOCK PER DETAIL 1 / C2.0.
  a. 12"
  b. 10"
  c. 8"
  d. 6"
  e. 4"

W04 INSTALL D.I. FITTING WITH THRUST BLOCK. (DETAIL 1 / C2.0)
  a. 12"Ø 45° BEND
  b. 12" X 12" X 6" TEE (RUN X RUN X BRANCH)
  c. 12" X 10" X 12" X 10" 4-WAY CROSS
  d. 12" X 12" X 8" TEE (RUN X RUN X BRANCH)

W05 REMOVE EXISTING WATER VALVE.

W06 POTABLE/ NON-POTABLE CROSSING. REFER TO DETAIL 2 / C2.0.

W07 LOCATE EXISTING SERVICE LINE (2" OR LESS). REMOVE 200 PSI POLY PIPE TO EXISTING CURB STOP AND INSTALL NEW 200 PSI POLY PIPE FROM CURB STOP TO PROPOSED MAIN LINE AND PROVIDE CONNECTION:
  a. 1" SERVICE: STAINLESS STEEL TAPPING SADDLE AND CORP STOP WITH COMPRESSION COUPLING FORD MODEL F-1100 OR APPROVED EQUAL AT CONNECTION TO MAIN LINE
  b. 2" SERVICE: STAINLESS STEEL TAPPING SADDLE AND MIP X PAC CORP STOP AT CONNECTION TO MAIN LINE

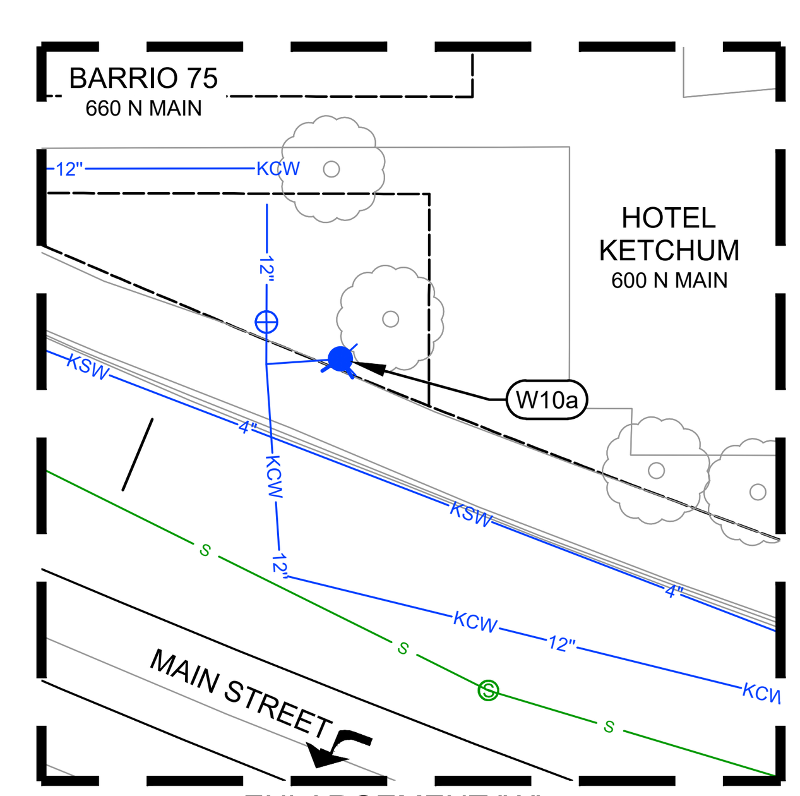
W08 LOCATE EXISTING 4"Ø SERVICE LINE, DISCONNECT FROM EXISTING MAIN LINE, INSTALL M.J. FLANGE, AND EXTEND TO PROPOSED MAIN LINE. INSTALL GATE VALVE PER PLAN AND CONNECT TO PROPOSED MAIN LINE WITH STAINLESS STEEL TAPPING SADDLE.

W09 6" FIRE WATER SERVICE FOR FUTURE USE. INSTALL 6" STAINLESS STEEL TAPPING SADDLE AND GATE VALVE AT PROPOSED MAIN LINE, SEE DETAIL 1 / C2.0 FOR THRUST BLOCK. EXTEND 6"Ø C-900 PVC SERVICE TO PROPERTY LINE AND CAP SERVICE FOR FUTURE CONNECTION. LOCATE EXISTING 1" SERVICE; REMOVE EXISTING SERVICE TO CURB STOP AND INSTALL NEW 1" 200 PSI POLY PIPE TO PROPOSED 6" SERVICE AND PROVIDE STAINLESS STEEL TAPPING SADDLE AND CORP STOP WITH COMPRESSION COUPLING FORD MODEL F-1100 OR APPROVED EQUAL.

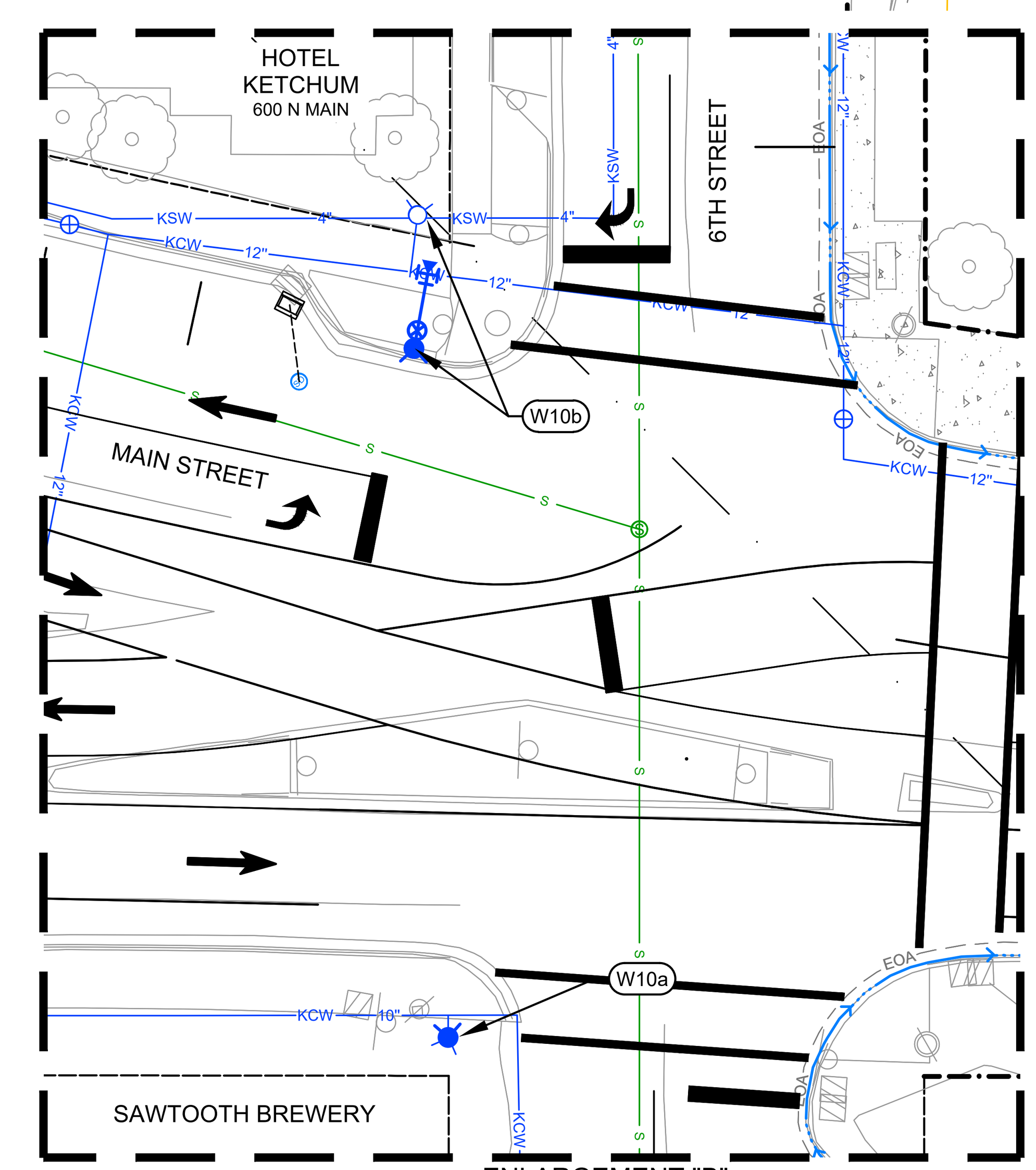
W10 REPLACE EXISTING FIRE HYDRANT PER DETAIL 4 / C2.0. HYDRANT LOCATION TO BE FIELD-VERIFIED BY CITY OF KETCHUM WATER DEPARTMENT.
  a. REPLACE EXISTING HYDRANT FIXTURE ONLY WITH NEW MOUNTAIN HYDRANT.
  b. REMOVE EXISTING HYDRANT AND GATE VALVE, AND REMOVE, CAP, OR ABANDON EXISTING TEE FITTING; INSTALL NEW MOUNTAIN HYDRANT ASSEMBLY.
  c. REMOVE EXISTING HYDRANT AND GATE VALVE; UTILIZE EXISTING 6" Ø PIPE FOR NEW GATE VALVE AND MOUNTAIN HYDRANT.

W11 REMOVE EXISTING CONNECTION BETWEEN ABANDONED KETCHUM SPRING LINE AND KETCHUM WATER MAIN. REMOVE EXISTING GATE VALVES AND INSTALL 10"Ø C-900 PVC PIPE.

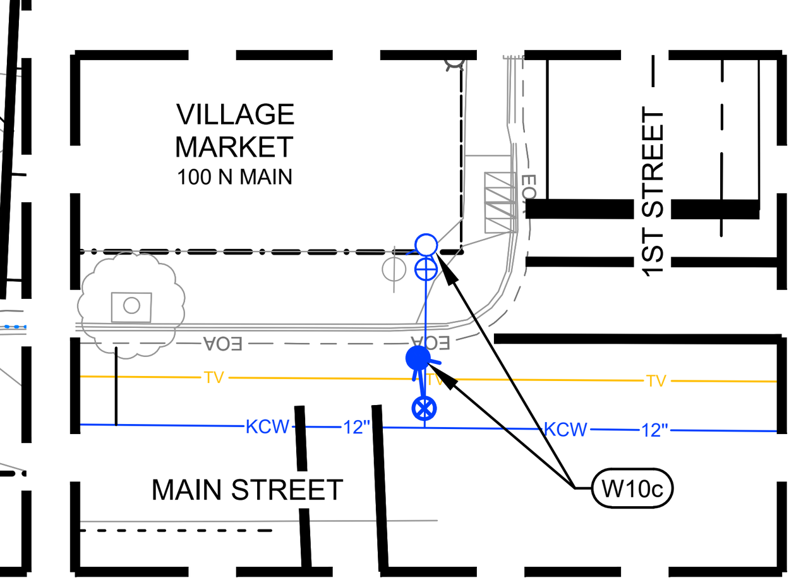
W12 REMOVE EXISTING CROSS FITTING AND ASSOCIATED GATE VALVES. INSTALL 10"Ø C-900 PVC PIPE.



ENLARGEMENT "A"
SCALE: 1" = 20'



ENLARGEMENT "B"
SCALE: 1" = 20'



ENLARGEMENT "C"
SCALE: 1" = 20'

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PURPOSE: ISSUE FOR BID (02/08/24)

REVISION NO.	DATE	DESCRIPTION

PROFESSIONAL ENGINEER
LICENSED
17618
02/08/2024
STATE OF IDAHO
SAMANTHA STAHLNECKER

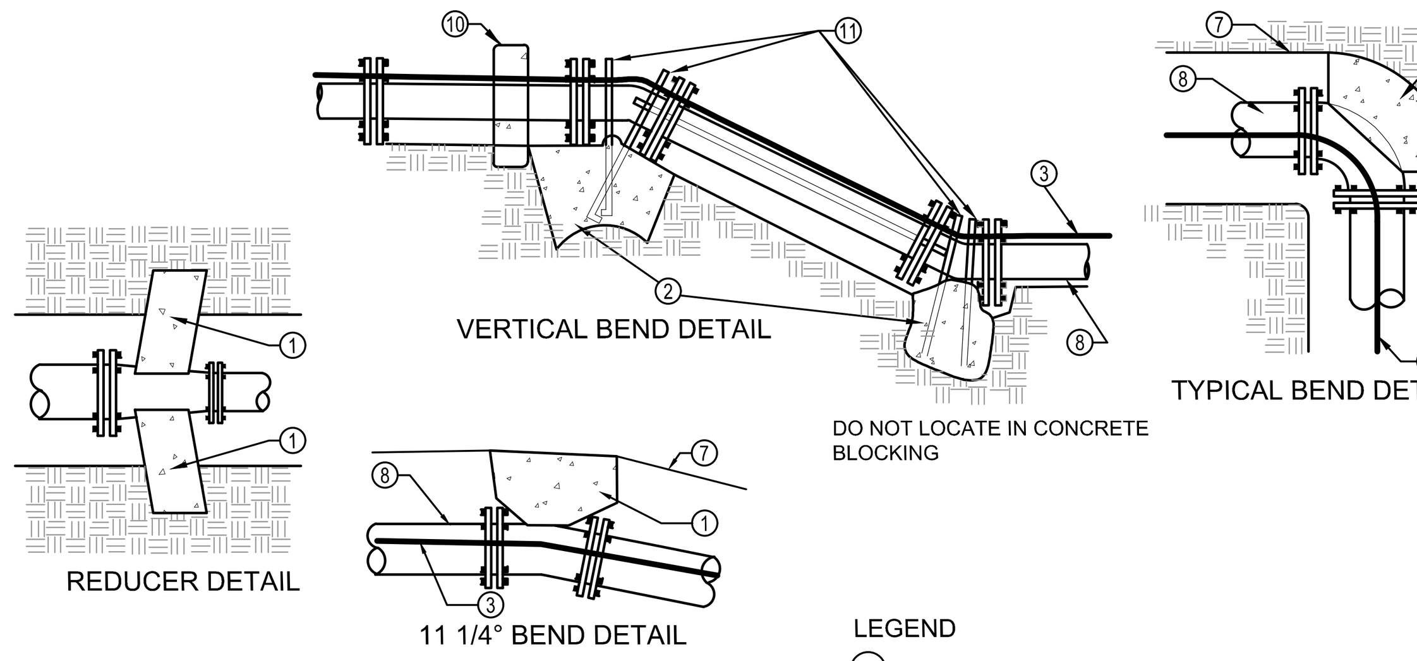
WATER RELOCATION PLAN

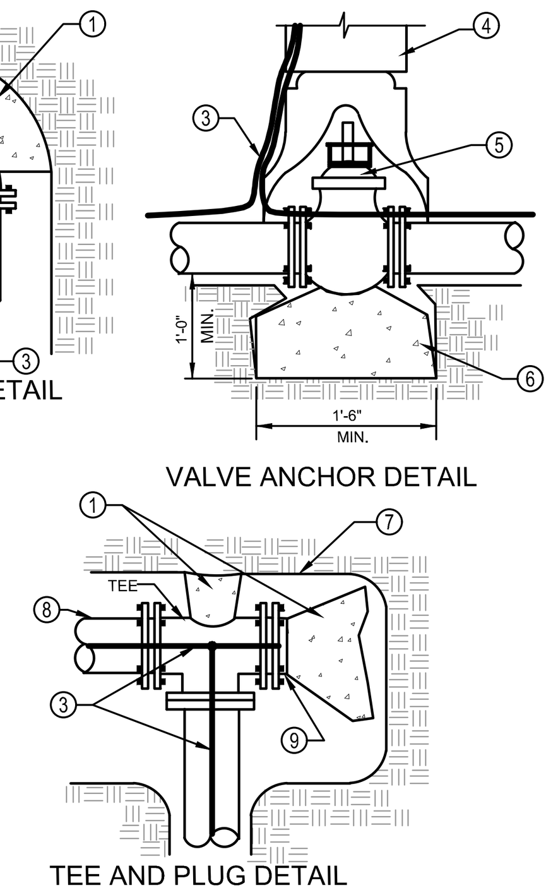
MAIN STREET - WATER MAIN RELOCATION

PREPARED FOR CITY OF KETCHUM

22036-05
PROJECT NUMBER

C1.0





LEGEND

1. FOR HORIZONTAL PIPE BENDS, BEARING THRUST BLOCKS MUST PROVIDE 2500 PSI CONCRETE POURED AGAINST UNDISTURBED EARTH PER TABLE 1.
2. FOR VERTICAL PIPE BENDS, GRAVITY THRUST BLOCKS MUST PROVIDE A VOLUME OF CONCRETE POURED AGAINST UNDISTURBED EARTH WHICH IS SIZED FOR EXPECTED FORCES WITH A MINIMUM 1.5 FACTOR OF SAFETY.
3. NO. 12 COPPER FINDER WIRE. SEE SD-514 FOR SPLICING.
4. C.I. VALVE BOX WITH COVER.
5. C.I. GATE VALVE (M.J.).
6. PRECAST BLOCK FOR CUT IN TEE AND VALVE OR CAST IN PLACE WITH 2-1/2"Ø MIN REBAR.
7. TRENCH SIDE.
8. PIPE.
9. PLUG.
10. HAMMERHEAD THRUST BLOCKING.
11. ANCHOR BARS (1/2"Ø MIN)

NOTES:

A. ANCHOR ALL VALVES CONNECTED TO P.V.C. PIPE AS SHOWN.
B. COVER BOLTS AND FLANGES WITH PLASTIC TO PROTECT FROM CONCRETE ADHERENCE DURING CONSTRUCTION OF THRUST BLOCKS.
C. SEE CHART FOR MIN THRUST BLOCKS BEARING AREAS.
D. ALL CONCRETE TO BE 2500 P.S.I. STRENGTH POURED AGAINST UNDISTURBED EARTH.
E. PROVIDE 6 MIL POLYPROPYLENE BETWEEN FITTINGS AND CONCRETE.
F. NOTIFY ENGINEER FOR ANY CONDITION OR PIPE SIZE NOT INDICATED.
G. ALL BLOCKS TO BE CENTERED AROUND PIPE SPRING LINE.

TABLE 1
THRUST AREA FOR HORIZONTAL BENDS***

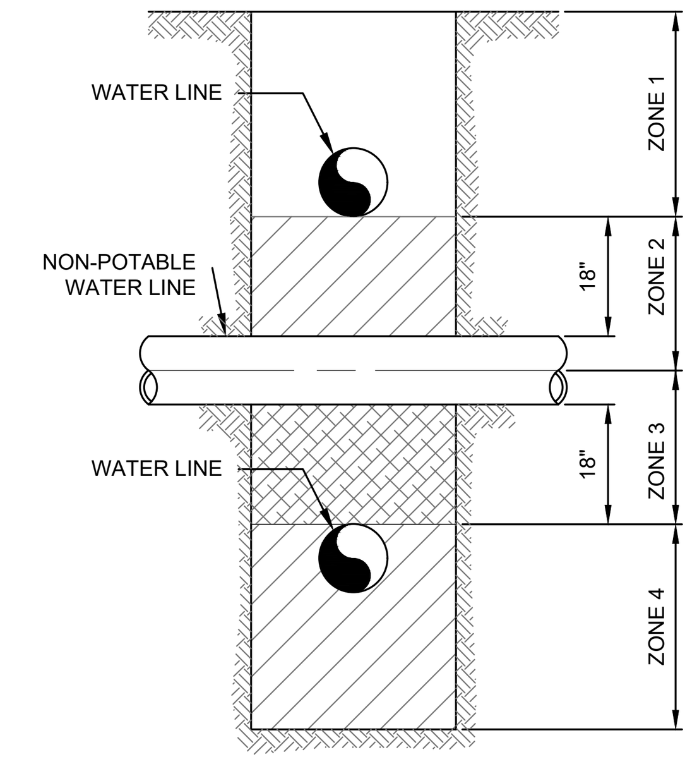
SOIL BEARING PRESSURE = 2000 PSF
WORKING PRESSURE RATING = 150 PSI
SAFETY FACTOR = 1.5

PIPE SIZE	MINIMUM SQUARE FEET OF THRUST AREA ONTO UNDISTURBED EARTH*			
	TEE, PLUG OF VALVE	90° BEND**	45° BEND	22.5°, 11.25° BENDS OR REDUCER
3"	0.8	1.1	0.6	0.3
4"	1.4	2.0	1.1	0.6
6"	3.2	4.5	2.4	1.2
8"	5.7	8.0	4.3	2.2
10"	8.8	12.5	6.8	3.4
12"	12.7	18.0	9.7	5.0
14"	17.3	24.5	13.3	6.8
16"	22.6	32.0	17.3	8.8
18"	28.6	40.5	21.9	11.2

* MUST BE INCREASED BASED ON DIFFERENT CONDITIONS (HIGHER WORKING PRESSURE OR LOWER SOIL BEARING STRENGTH).
** OR TEE ACTING AS A 90° BEND
***THRUST BLOCK DEPTH TO BE A MINIMUM PF 12" FOR PIPE SIZES 3"-8" AND 18" FOR PIPE SIZES 10"-18" OR THE SQUARE ROOT OF THE REQUIRED BEARING AREA, WHICHEVER IS GREATER.

1 / C2.0 — THRUST BLOCK AND ANCHOR DETAILS (ISPWC SD-403)
N.T.S.

THE TERM "LINE" APPLIES TO BOTH MAIN LINES AND SERVICE LINES



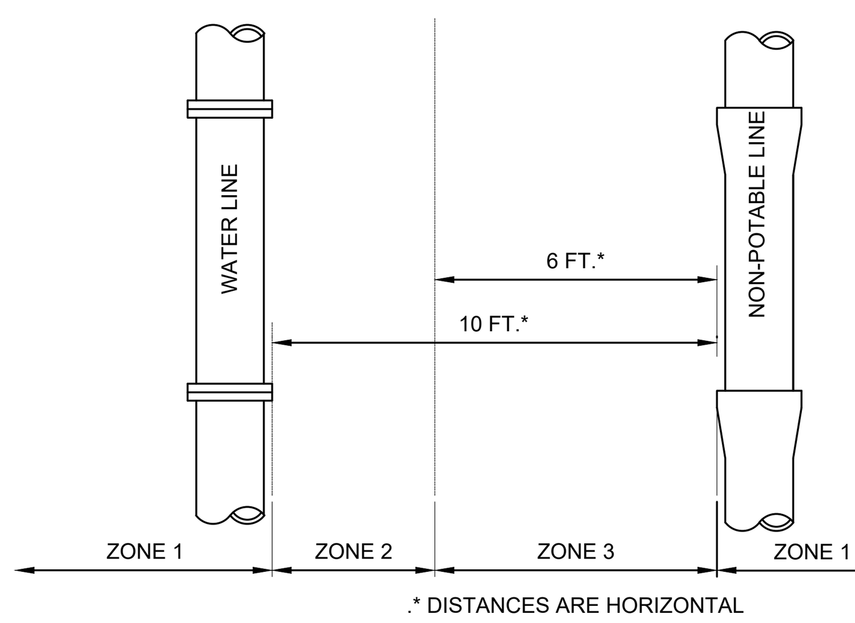
VERTICAL SEPARATION REQUIREMENTS

ZONE 1: A) WATER AND NPWL MUST BE SEPARATED BY AT LEAST 18"
AND
B) ONE FULL, UNCUT LENGTH OF BOTH PWL AND NPWL PIPE MUST BE CENTERED ON THE CROSSING SO THAT THE JOINTS ARE AS FAR AS POSSIBLE FROM THE CROSSING.

ZONE 2: A) ONE FULL, UNCUT LENGTH OF BOTH PWL AND NPWL PIPE MUST BE CENTERED ON THE CROSSING SO THAT THE JOINTS ARE AS FAR AS POSSIBLE FROM THE CROSSING.
AND EITHER
B) NPWL MUST BE CONSTRUCTED TO WATER MAIN STANDARDS AND PRESSURE TESTED FOR WATER TIGHTNESS FOR A HORIZONTAL DISTANCE OF 10 FEET ON BOTH SIDES OF CROSSING.
OR
C) EITHER THE NPWL OR WATER LINE OR BOTH MUST BE ENCASED WITH A SLEEVEING MATERIAL ACCEPTABLE TO DEQ FOR A HORIZONTAL DISTANCE OF 10 FEET ON BOTH SIDES OF THE CROSSING.

ZONE 3: SAME REQUIREMENTS AS ZONE 2 EXCEPT THE NPWL MUST ALSO BE SUPPORTED ABOVE THE CROSSING TO PREVENT SETTLING.

ZONE 4: SAME REQUIREMENTS AS ZONE 1 EXCEPT THE THE NPWL MUST ALSO BE SUPPORTED ABOVE THE CROSSING TO PREVENT SETTLING.



HORIZONTAL SEPARATION REQUIREMENTS

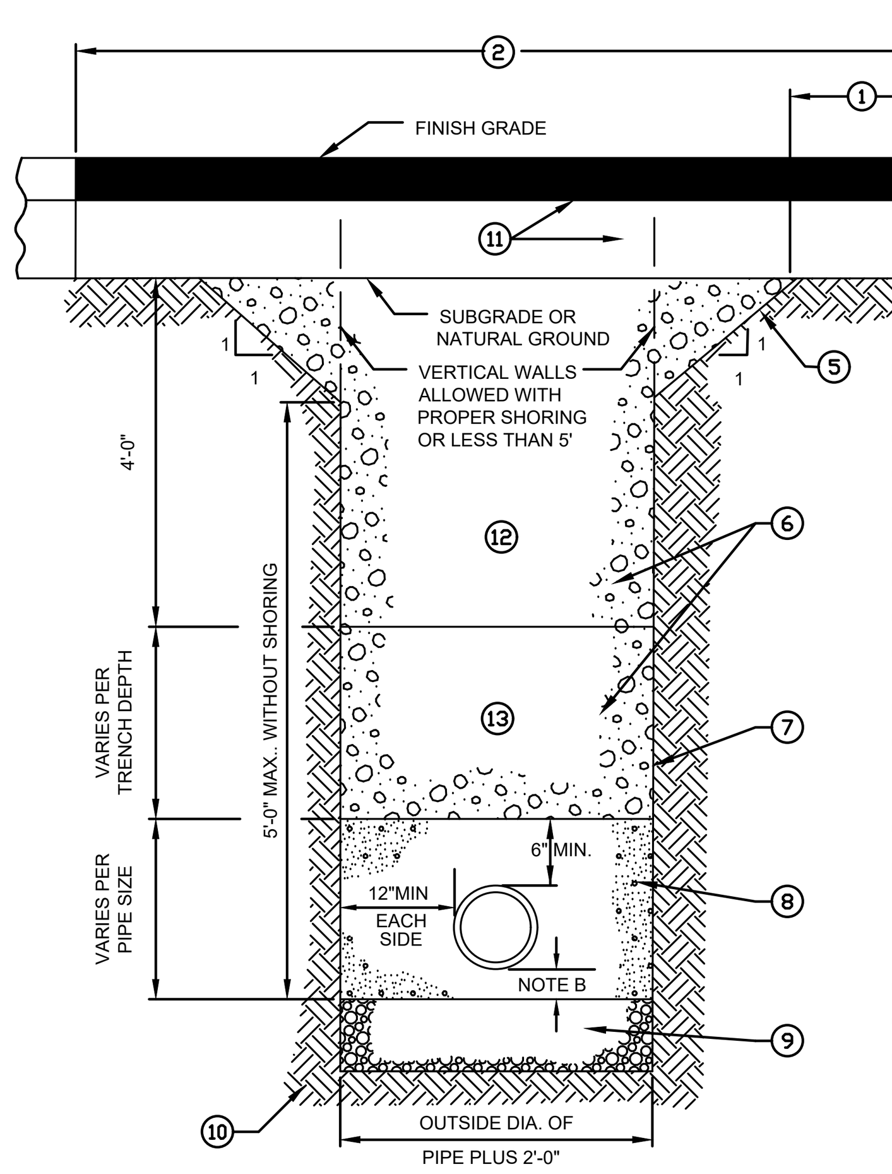
ZONE 1: A) NO SPECIAL REQUIREMENTS.

ZONE 2: A) NO SPECIAL REQUIREMENTS FOR POTABLE OR NON-POTABLE SERVICES
B) WATER AND NPWL SEPARATED BY AT LEAST 6 FEET AT OUTSIDE WALLS.
AND
C) WATER AT LEAST 18 INCHES HIGHER IN ELEVATION THAN THE NPWL.
AND EITHER
D) NPWL CONSTRUCTED TO POTABLE WATER MAIN STANDARDS AND PRESSURE TESTED FOR WATER TIGHTNESS.
OR
E) SITE SPECIFIC REQUIREMENTS APPROVED BY DEQ.

ZONE 3: NOT ALLOWED WITHOUT DEQ WAIVER.

NOTE: SANITARY SEWER FORCE MAINS MUST HAVE MIN. 10' HORIZONTAL SEPARATION AND 18" VERTICAL SEPARATION. ZONE 2 AND ZONE 3 PLACEMENTS ARE NOT ALLOWED WITHOUT A WAIVER GRANTED BY DEQ.

2 / C2.0 — POTABLE/ NON-POTABLE WATER LINE SEPARATION
N.T.S.



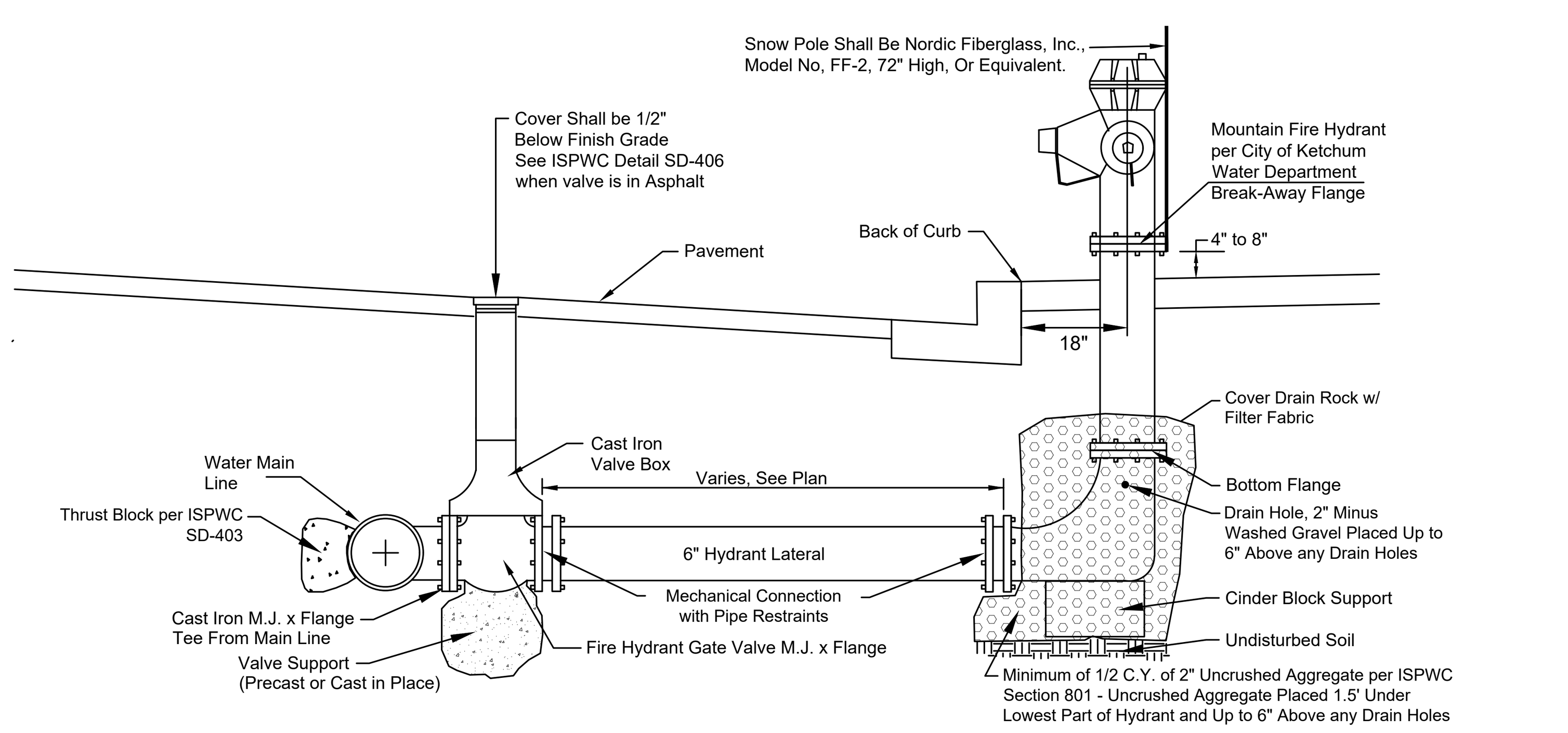
LEGEND

1. 6" MIN. REQUIRED BOTH SIDES, SAWCUT REQUIRED.
2. SURFACE REPAIR WIDTH, 4' MINIMUM.
3. EXISTING SURFACE.
4. EXISTING BASE.
5. TRENCH BACK SLOPE PER O.S.H.A. OR SUITABLE SHORING.
6. TRENCH BACKFILL PER SECTION-306.
7. VERTICAL TRENCH WALLS SHORING PER O.S.H.A..
8. PIPE BEDDING PER SECTION-305 (SEE SD-302).
9. FOUNDATION STABILIZATION MAY VARY PER SOIL TYPE AND STABILITY (PER SECTION-304).
10. UNDISTURBED SOIL (TYP).
11. REPAIRED SURFACE, BY OTHERS; BACKFILL TO TOP OF ADJACENT ASPHALT FOR TEMPORARY VEHICULAR ACCESS WITH TYPE I CRUSHED AGGREGATE PER ISPWC SECTION 802, COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99.
12. UPPER COMPACTION ZONE
13. LOWER COMPACTION ZONE

NOTES

A. TRENCH EXCAVATION PER SECTION-301.
B. PIPE BEDDING PER SECTION-305.
C. BACKFILL AND COMPACTION PER SECTION-306.
D. SURFACE REPAIR AND BASE NOT A PART. BACKFILL TO TOP OF SUBGRADE.

3 / C2.0 — TYPICAL TRENCH SECTION
N.T.S.



TYPICAL SECTION, FIRE HYDRANT ASSEMBLY
N.T.S.

NOTES

1. Hydrants shall have a 6' foot bury.
2. Hydrants shall be Waterous Pacer Model WB-67U-250 or Mueller Super Centurion 250 and conform to the following:
   - 2 ea.. 2-1/2" NST threaded nozzles
   - 1 ea.. 4-1/2" NST threaded nozzles
   - Dry Barrel type 6" barrel
   - Red in color
   - Traffic "breakaway" design
   - 250 PSI rated
   - UL Listed
   - Main valve size 5-1/4"
3. Mechanical Restraints shall be used. Restraints shall be Romac Industries RomaGrip or approved equivalent. No lug or set screw type restraints are to be used on PVC pipe.
4. City shall approve location and elevation of all Fire Hydrants. Fire Hydrants shall be located at street intersections and at a minimum spacing of 500 feet in residential zones and 450 feet in business and industrial zones. No obstructions shall be placed within 3 feet of the back and 15 feet of the sides and front of Fire Hydrants.
5. Auxiliary Gate Valve shall meet AWWA C509 (Total rubber encapsulated, resilient seat, waterous series or approved equal).
6. Valve Box shall be Tyler 664A or approved equal.
7. Hydrant break away flange elevation equal to street centerline or 4" to 8" above finished grade as approved.
8. Fire hydrant assemblies located on the opposite side of the roadway from the watermain shall have 2" Dow Board installed over the pipeline leading to the hydrant. The Dow Board shall extend from auxiliary gate valve to the hydrant.

HYDRANT VEHICULAR PROTECTION

Fire hydrants which may be exposed to vehicular damage or obstruction shall have an approved array of bollards or guard post installed to protect them from damage and maintain the minimum distance required for proper operation.

When they are installed, they shall be:
- Constructed of steel not less than (4) inches in diameter and concrete filled.
- Spaced not more than four (4) feet between posts on center.
- Set not less than three (3) feet deep in a concrete footing not less than (15) inches in diameter.
- Set with the top of the posts not less than (3) feet above the ground.
- The post shall be painted bright red, reflective markings are recommended.
- Located at least three feet from any portion of the hydrant and located so as not to create an obstruction to its use.

4 / C2.0 — FIRE HYDRANT
N.T.S.

FLUSHING AND DISINFECTION

A. FLUSHING PRIOR TO DISINFECTION
1. BEFORE CHLORINATION, FLUSH THE MAINS THOROUGHLY AFTER THE PRESSURE AND LEAKAGE TEST ARE COMPLETE.
2. USE A MINIMUM FLUSHING VELOCITY IN THE MAIN OF 2.5 FEET/SECOND.
3. IF NO HYDRANT IS INSTALLED AT THE END OF THE MAIN, PROVIDE A TAP OF THE SIZE SUFFICIENT TO PRODUCE A VELOCITY IN THE MAIN OF AT LEAST 2.5 FEET/SECOND.
4. TABLE 1 SHOWS THE RATES OF FLOW REQUIRED TO PRODUCE A VELOCITY OF 2.5 FEET/SECOND IN VARIOUS SIZE PIPES.
5. EXERCISE EXTREME CARE AND CONDUCT A THOROUGH INSPECTION DURING THE WATER MAIN LAYING TO PREVENT AND DETECT SMALL STONES, PIECES OF CONCRETE, PARTICLES OF MATERIAL, OR OTHER FOREIGN MATERIAL THAT MAY HAVE ENTERED THE MAINS.
6. CLEAN LARGE MATERIAL BY FLUSHING AND INSPECTING ALL HYDRANTS ON THE LINES TO ENSURE THAT THE ENTIRE VALVE OPERATING MECHANISM OF EACH HYDRANT IS IN GOOD CONDITION.

B. DISINFECTION OF WATER PIPES
1. GENERAL.
   a. COMPLY WITH ANSI/AWWA C 651: DISINFECTING WATER MAINS, THESE SPECIFICATIONS, AND ENGINEER'S DIRECTION.
   b. KEEP THE INTERIOR OF ALL PIPE, FITTINGS AND APPURTENANCES FREE FROM DIRT, HEAVY AND FOREIGN PARTICLES.
   c. DISINFECT ALL WATER PIPES AND APPURTENANCES PRIOR TO PLACING IN SERVICE.

2. FORM OF CHLORINE USED TO BE PRE-APPROVED BY THE ENGINEER.
   a. LIQUID CHLORINE.
      1) FORM: LIQUID CONTAINING 100% AVAILABLE CHLORINE UNDER PRESSURE IN STEEL CONTAINERS.
      2) STANDARD: ANSI/AWWA B 301.
      3) EXECUTION: USED ONLY BY TRAINED PERSONNEL WITH APPROPRIATE GAS-FLOW CHLORINATORS AND EJECTORS.
      4) AUTHORIZATION: ONLY WITH WRITTEN AUTHORIZATION OF THE ENGINEER.
   b. SODIUM HYPOCHLORITE.
      1) FORM: LIQUID CONTAINING APPROXIMATELY 5% TO 15% AVAILABLE CHLORINE.
      2) STANDARD: ANSI/AWWA B 300.
   c. CALCIUM HYPOCHLORITE.
      1) FORM: GRANULAR OR IN 5G TABLETS CONTAINING APPROXIMATELY 65% AVAILABLE CHLORINE BY WEIGHT.
      2) STANDARD: ANSI/AWWA B 300.

3. METHODS OF CHLORINATION USED TO BE PRE-APPROVED BY THE ENGINEER.
   a. TABLET OR GRANULE METHOD.
      1) SOLUTION STRENGTH: 25 MG/L MINIMUM.
      2) USE: ONLY IF THE PIPES AND APPURTENANCES ARE KEPT CLEAN AND DRY DURING CONSTRUCTION. DO NOT USE SOLVENT WELDED PLASTIC OR SCREWED JOINT STEEL PIPE.
      3) PLACEMENT WHEN USING GRANULES: DURING CONSTRUCTION, PLACE CALCIUM HYPOCHLORITE GRANULES AT THE UPSTREAM END OF EACH BRANCH MAIN, AND AT 500-FOOT INTERVALS.
      4) GRANULAR QUANTITY: REFER TO TABLE 2
         5) PLACEMENT WHEN USING TABLETS: DURING CONSTRUCTION, PLACE 5G CALCIUM HYPOCHLORITE TABLES IN EACH SECTION OF PIPE AND ALSO PLACE ONE TABLET IN EACH HYDRANT, HYDRANT BRANCH AND OTHER APPURTENANCES. ATTACH TABLETS TO THE INSIDE OF THE PIPE USING AN ADHESIVE SUCH AS PERMATEX NO. 2 OR APPROVED SUBSTITUTION. ASSURE NO ADHESIVE IS ON THE TABLET EXCEPT ON THE BROAD SIDE ATTACHED TO THE SURFACE OF THE PIPE. ATTACH ALL THE TABLETS AT THE INSIDE TIP OF THE MAIN, WITH APPROXIMATELY EQUAL NUMBERS OF TABLETS AT EACH END OF A GIVEN PIPE LENGTH. IF THE TABLES ARE ATTACHED BEFORE THE PIPE SECTION IS PLACED IN THE TRENCH, MARK THEIR POSITION ON THE SECTION SO IT CAN BE READILY DETERMINED THAT THE PIPE IS INSTALLED WITH THE TABLES AT THE TOP.
         6) TABLET QUANTITY: REFER TO TABLE 3
         (1) ADJUST FOR PIPE LENGTH OTHER THAN 18 FEET.
         (2) BASED ON 3.25G AVAILABLE CHLORINE PER TABLET.
         7) FILLING PROCEDURE: WHEN GRANULE OR TABLET INSTALLATION HAS BEEN COMPLETED, FILL THE MAIN WITH CLEAN WATER AT A VELOCITY NOT EXCEEDING 1 FPS. TAKE PRECAUTIONS TO ASSURE THAT AIR POCKETS ARE ELIMINATED. LEAVE THIS WATER IN THE PIPE FOR AT LEAST 24 HOURS. IF THE WATER TEMPERATURE IS LESS THAN 41° F, LEAVE THE WATER IN THE PIPE FOR AT LEAST 48 HOURS. POSITION VALVE SO THAT THE CHLORINE SOLUTION IN THE MAIN BEING TREATED WILL NOT FLOW INTO WATER MAINS IN ACTIVE SERVICE.

   b. CONTINUOUS FEED METHOD.
      1) SOLUTION STRENGTH: DOSE AT 25 MG/L FOR 4 HOURS.
      2) RESIDUAL: 10 MG/L AT 24 HOURS.
      3) DOSING METHODS:
         a) LIQUID CHLORINE: SOLUTION FEED VACUUM-OPERATED CHLORINATOR IN COMBINATION WITH A BOOSTER PUMP.
         b) DIRECT FEED: NOT ALLOWED.
         c) HYPOCHLORITE SOLUTION: CHEMICAL FEED PUMP DESIGNED FOR FEEDING CHLORINE SOLUTIONS.
         d) CALCIUM HYPOCHLORITE GRANULES: REFER TO PREVIOUS SECTION.
         4) FILLING PROCEDURE: USE APPROVED SOURCE TO FLOW CLEAN WATER AT A CONSTANT, MEASURED RATE INTO THE NEWLY LAID WATER MAIN. FILL AT A POINT NOT MORE THAN 10 FEET DOWNSTREAM FROM THE BEGINNING OF THE NEW MAIN. MEASURE THE CHLORINE CONCENTRATION AT REGULAR INTERVALS AND ENSURE A 25 MG/L DOES. POSITION VALVES SO THAT THE CHLORINE SOLUTION IN THE MAIN BEING TREATED DOES NOT FLOW INTO WATER MAINS IN ACTIVE SERVICE. DO NOT STOP CHLORINE APPLICATION UNTIL THE ENTIRE MAIN IS FILLED WITH CHLORINATED WATER. RETAIN THE CHLORINATED WATER IN THE MAIN FOR AT LEAST 4 HOURS, OPERATING ALL VALVES AND HYDRANTS IN THE SECTION TREATED. AT THE END ON THE 24 HOUR PERIOD, VERIFY THE TREATED WATER IN ALL PORTIONS OF THE MAIN HAS RESIDUAL OF 10 MG/L FREE CHLORINE.

   c. SLUG METHOD.
      1) SOLUTION STRENGTH: 100 MG/L.
      2) DOSING METHODS: PER ENGINEER'S DIRECTION.
         3) FILLING PROCEDURE: USE APPROVED SOURCE TO FLOW CLEAN WATER AT A CONSTANT, MEASURED RATE INTO THE NEWLY LAID WATER MAIN. FILL AT A POINT NOT MORE THAN 10 FEET DOWNSTREAM FROM THE BEGINNING OF THE NEW MAIN. MEASURE CONCENTRATION AT REGULAR INTERVALS TO ENSURE 100 MG/L DOSE. APPLY THE CHLORINE CONTINUOUSLY AND FOR THE TIME REQUIRED TO DEVELOP A SOLID COLUMN OR "SLUG" OF CHLORINATED WATER THAT WILL, AS IT MOVES THROUGH THE MAIN, EXPOSE ALL INTERIOR SURFACES TO A 100 MG/L FOR AT LEAST 3 HOURS. MEASURE THE CHLORINE RESIDUAL IN THE SLUG AS IT MOVES THROUGH THE MAIN. IF AT ANY TIME IT DROPS BELOW 50 MG/L, STOP FLOW AND RELOCATE CHLORINATION EQUIPMENT AT THE HEAD OF THE SLUG, AND AS FLOW IS RESUMED, ADD CHLORINE TO RESTORE THE FREE CHLORINE IN THE SLUG TO NOT LESS THAN 100 MG/L. AS THE CHLORINATED WATER FLOWS PAST FITTINGS AND VALVES, OPERATE VALVES AND HYDRANTS TO DISINFECT APPURTENANCES AND PIPE BRANCHES.

C. FINAL FLUSHING.
1. AFTER THE RETENTION PERIOD, FLUSH THE CHLORINATED WATER FROM THE MAIN UNTIL CHLORINE MEASUREMENTS SHOW THAT THE CONCENTRATION IN THE WATER LEAVING THE MAIN IS NO HIGHER THAN THAT IN THE SYSTEM, OR IS ACCEPTABLE FOR DOMESTIC USE.
2. DISPOSAL OF FLUSHING WATER TO BE DONE IN A MANNER SO THAT IT DOES NOT:
   a. REACH SURFACE WATERS OR WATERS OF THE STATE
   b. DAMAGE SURROUNDING PROPERTIES
   c. TAKE PLACE DURING PERIODS WHEN THE AMBIENT TEMPERATURE IS ABOVE 85° WITHOUT PRIOR APPROVAL OF THE ENGINEER
   3. IF WATER CAN NOT BE RETAINED ON SITE AND IF IT IS NOT ALLOWED TO ENTER THE SANITARY SEWER COLLECTION SYSTEM, WATER SHALL BE DECHLORINATED TO HAVE A MAXIMUM AVAILABLE CHLORINE CONCENTRATION OF 0.13 MG/L AND THE APPROPRIATE PRIVATE, FEDERAL AND STATE DISCHARGE AND DISPOSAL APPROVALS SHALL BE ACQUIRED PRIOR TO COMMENCEMENT OF FLUSHING ACTIVITIES. SHOULD THERE BE A POTENTIAL FOR THE GROUNDWATER RULE TO BE VIOLATED AS A RESULT OF A CHLORINATED DISCHARGE THE ENGINEER SHALL COORDINATE DISPOSAL WITH REGIONAL DEQ STAFF PRIOR TO FLUSHING.

D. BACTERIOLOGICAL TESTS.
1. AFTER FINAL FLUSHING AND BEFORE THE WATER MAIN IS PLACED IN SERVICE, TEST SAMPLES COLLECTED FROM THE MAIN(S) FOR COLIFORM BACTERIA. TAKE 2 SAMPLES FROM EACH LOCATION AT LEAST 24 HOURS APART.
2. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, COLLECT SAMPLES FROM EACH 1,200 FEET ON THE NEW MAIN AND ONE FROM EACH BRANCH.

E. REDISINFECTION.
1. IF THE INITIAL DISINFECTION FAILS TO PRODUCE APPROVED BACTERIOLOGICAL SAMPLES, REFLUSH AND RESAMPLE THE MAIN.
2. IF CHECK SAMPLES SHOW BACTERIAL CONTAMINATION, RE-CHLORINATE THE MAIN UNTIL APPROVED RESULTS ARE OBTAINED.

F. SWABBING.
1. IF CONNECTIONS ARE NOT DISINFECTED ALONG WITH THE NEWLY INSTALLED MAIN, SWAB OR SPRAY THE INTERIOR OF ALL PIPES AND FITTINGS USED IN MAKING THE CONNECTIONS WITH A 1% HYPOCHLORITE SOLUTION BEFORE INSTALLATION.

TABLE 1
REQUIRED FLOW AND OPENINGS TO FLUSH PIPELINES
40 PSI RESIDUAL PRESSURE IN WATER MAIN (1)

	Flow Required to Produce 2.5 fps (approx)	Size of Tap (inch)			Hydrant Outlets	
		(1)	(1-1/2)	(2)		
Pipe Diam. (inch)	Velocity in Main, (Gpm)	Number of taps on pipe (2)			Number	Size in (inch)
4	100	1			1	2-1/2
6	220		1		1	2-1/2
8	400		2	1	1	2-1/2
10	600		3	2	1	2-1/2
12	900			2	2	2-1/2
16	1600			4	2	2-1/2
1)	With a 40 psi pressure in the main with the hydrant flowing to atmosphere, a 2- 1/2 inch hydrant outlet will discharge approximately 1,000 gpm and a 4-1/2 inch hydrant will discharge approximately 2500 gpm.					
2)	Number of taps on pipe based on discharge through 5 feet of galvanized iron (GI) pipe with one 90° elbow.					

TABLE 2
OUNCES OF GRANULES

Pipe Diameter (inches)	Amount (ounces)
4	1.7
6	3.8
8	6.7
10	10.5
12	15.1
16	26.8
18	34.0
20	41.9
24	60.4

TABLE 3
NUMBER OF TABLETS (1)

Pipe Diameter (inches)	Number of 5g Tablets (2)
4	
6	
8	2
10	3
12	4
16	6
18	7
20	9
24	13

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PURPOSE: ISSUE FOR BID (02/08/24)

REVISION NO.	DATE	DESCRIPTION

PROFESSIONAL ENGINEER — LICENSED — 17618 — 02/08/2024 — STATE OF IDAHO — SAMANTHA STAHLNECKER

DETAIL SHEET AND FLUSHING AND DESINFECTION NOTES

MAIN STREET- WATER MAIN RELOCATION
PREPARED FOR CITY OF KETCHUM

22036-05
PROJECT NUMBER

C2.0