

CONTOUR INTERVAL: 1.0'

PROJECT BENCHMARK - VERTICAL

CONTROL SURVEY NOTE

NORTHING= 1,491,183.352 FEET EASTING= 1,539,872.655 FEET ELEVATION = 5230.633 FEET

AN AGRS 1 3/4" METALLIC DISK STAMPED "ACS BM 15-J17", EPOXIED TO THE SOUTHWEST CORNER OF A CONCRETE TRAFFIC SIGNAL MAST ARM BASE LOCATED IN THE SOUTHEAST QUADRANT OF THE INTERSECTION OF WASHINGTON STREET N.E. AND INDIAN SCHOOL ROAD N.E. ELEVATION = 5191.802 FEET

A CONTROL SURVEY WAS CONDUCTED AT THE SITE ON SEPTEMBER 26, 2018. CONTROL WAS PROJECTED ONTO THE SUBJECT SITE UTILIZING RTK GPS OBSERVATIONS COMBINED WITH GEOID MODEL 12B TO ESTABLISH HORIZONTAL AND VERTICAL POSITIONS BASED

UPON NAD 83/NAVD 88 DATUM. THE RTK OBSERVATIONS WERE USED TO ESTABLISH THE TEMPORARY BENCHMARKS AT THE PROJECT

THE POINTS OBSERVED HAVE BEEN QUALITY CONTROLLED FOR RELATIVE ACCURACY. AN AGRS BENCHMARK "15-J17" AND A SEPARATE HORIZONTAL CONTROL STATION "19-J18" IN THE VICINITY OF THE PROJECT WERE OBSERVED IN ORDER TO PROVIDE REFERENCE TIES TO THE SITE. ALL HORIZONTAL COORDINATES ARE MODIFIED NAD 83 GRID VALUES AND HAVE BEEN ADJUSTED TO

THE ELEVATIONS ARE BASED UPON THE NAVD DATUM AND REQUIRE NO FURTHER ADJUSTMENT.

THE GROUND AT THE PROJECTION POINT (THE SCALE FACTOR USED IS 1/CF=1.0003354069). THE CONTROL STATION USED TO PROJECT FROM GRID TO GROUND FOR THIS PROJECT IS THE PROJECT BENCHMARK "7-K19" WITH NAD GRID COORDINATES OF:

PROJECT BENCHMARK - HORIZONTAL

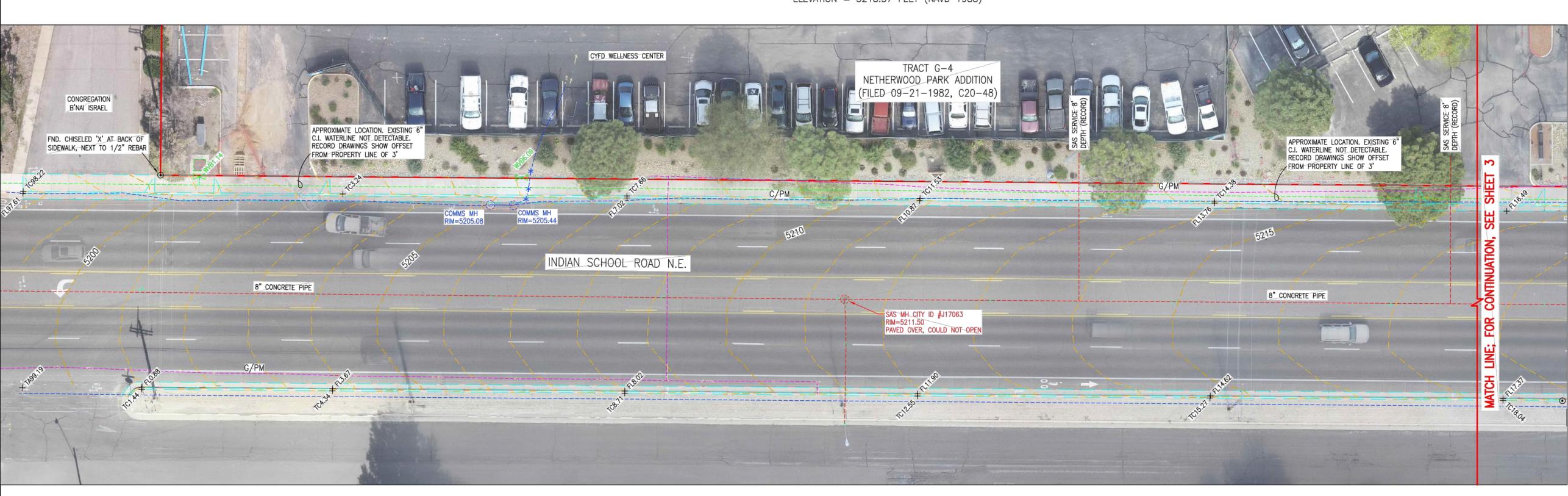
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TEMPORARY BENCHMARK #1 (T.B.M.)

A MAG NAIL, SET IN THE TOP OF CURB NEAR THE SOUTHEAST CORNER OF THE CYFD PROJECT SITE, AS SHOWN ON SHEET 3. ELEVATION = 5222.79 FEET (NAVD 1988)

TEMPORARY BENCHMARK #2 (T.B.M.)

A MAG NAIL, SET IN THE TOP OF CURB NEAR THE MIDPOINT OF THE CYFD PROJECT SITE, AS SHOWN ON SHEET 3. ELEVATION = 5218.57 FEET (NAVD 1988)



GENERAL NOTES

NOT TO SCALE

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- 2. ALL DISTANCES ARE GROUND DISTANCES.
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LEGEND

CONC CONCRETE C/PM COMM BY PAINT MARK FIRE HYDRANT FLOWLINE GAS BY PAINT MARK TOP OF ASPHALT TOP OF CURB TOP OF CONCRETE VALLEY GUTTER WATERLINE BY PAINT MARK WATERLINE BY RECORD DRAWING WATER METER BOX WATER VALVE BOX

RECORD DRAWING

SURVEYORS CERTIFICATION

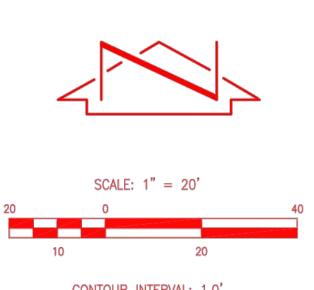
I. CHARLES G. CALA, JR., NEW MEXICO PROFESSIONAL SURVEYOR NO. 11184, DO HEREBY CERTIFY; THAT THIS TOPOGRAPHIC AND UTILITY SURVEY AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO, AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.





10/11/2018 DATE

2018.044.4 HIGH MESA Consulting Group 6010-B Midway Park Blvd. NE • Albuquerque, New Mexico 87109 Phone: 505.345.4250 • Fax: 505.345.4254 • www.highmesacg.com CITY OF ALBUQUERQUE PUBLIC WORKS DEPARTMENT ENGINEERING DEVELOPMENT GROUP CYFD WELLNESS CENTER
OFFSITE PUBLIC WATER LINE IMPROVEMENTS
TOPOGRAPHIC AND UTILITY SURVEY TITLE: Design Review Committee City Engineer Approval



CONTOUR INTERVAL: 1.0'

VICINITY MAP

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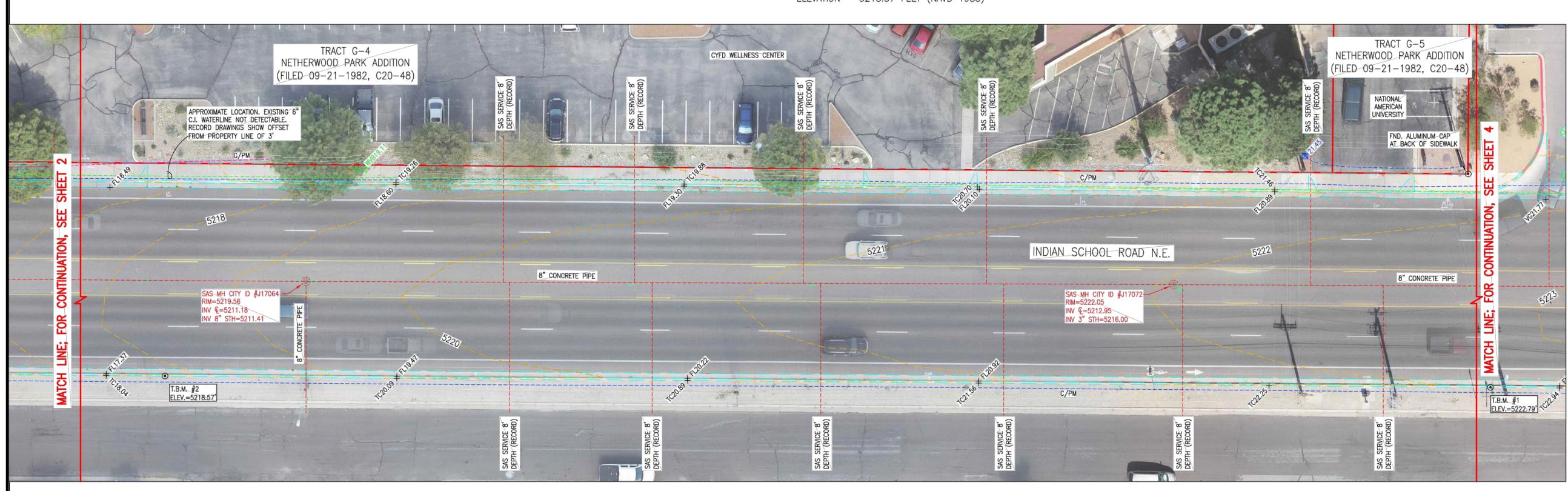
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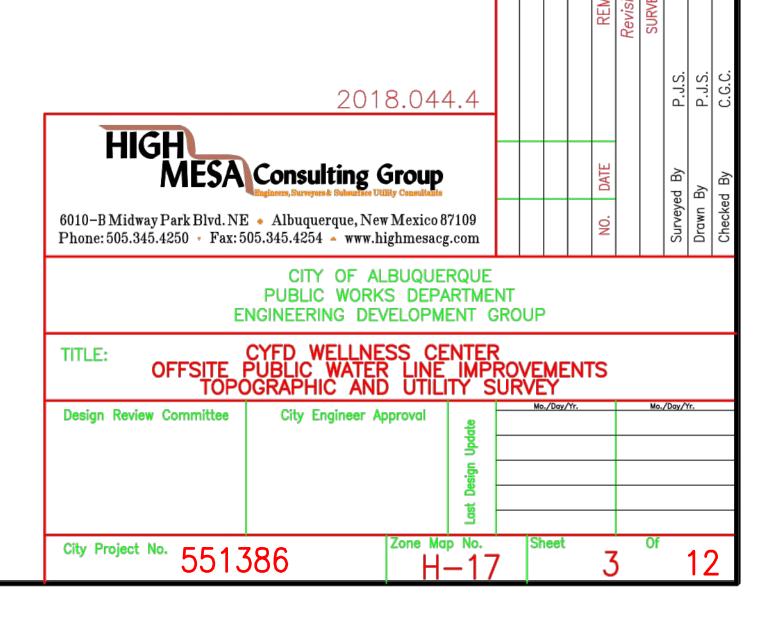
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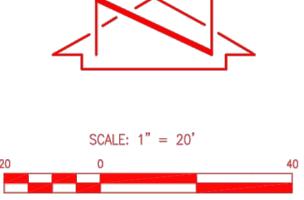
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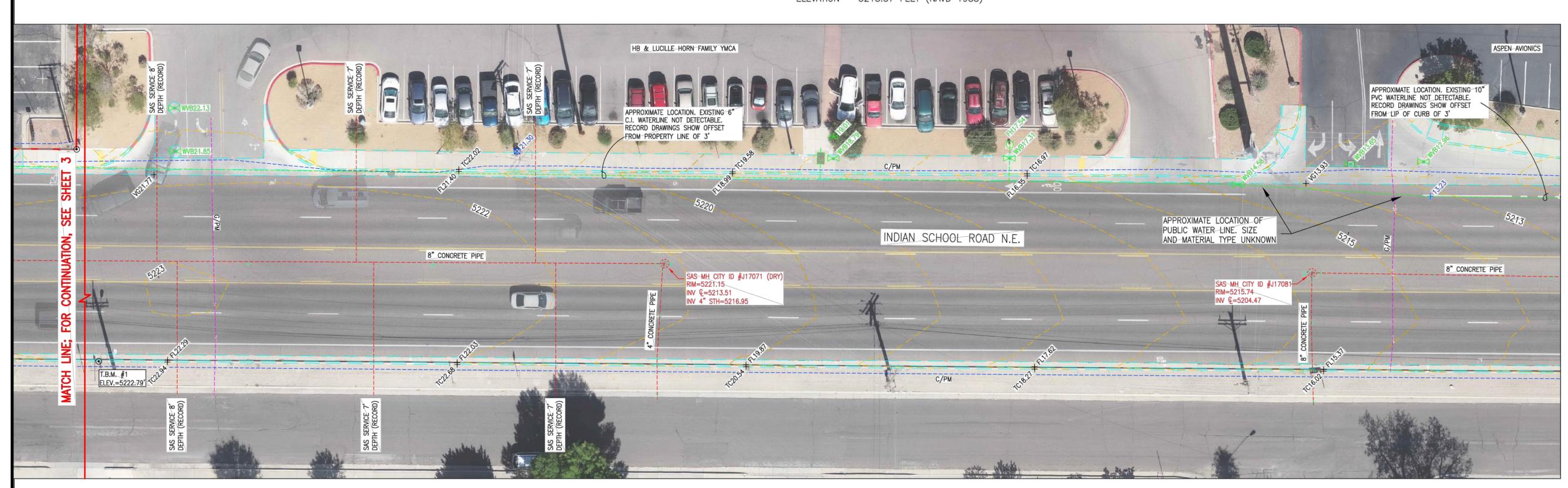
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LEGEND

CONC

CONCRETE

C/PM

COMM BY PAINT MARK

FH

FIRE HYDRANT

FL

FLOWLINE

G/PM

GAS BY PAINT MARK

TA

TOP OF ASPHALT

TC

TOP OF CURB

TCO

TOP OF CONCRETE

VG

VALLEY GUTTER

WL/PM

WATERLINE BY PAINT MARK

WL/RCD

WATERLINE BY RECORD DRAWING

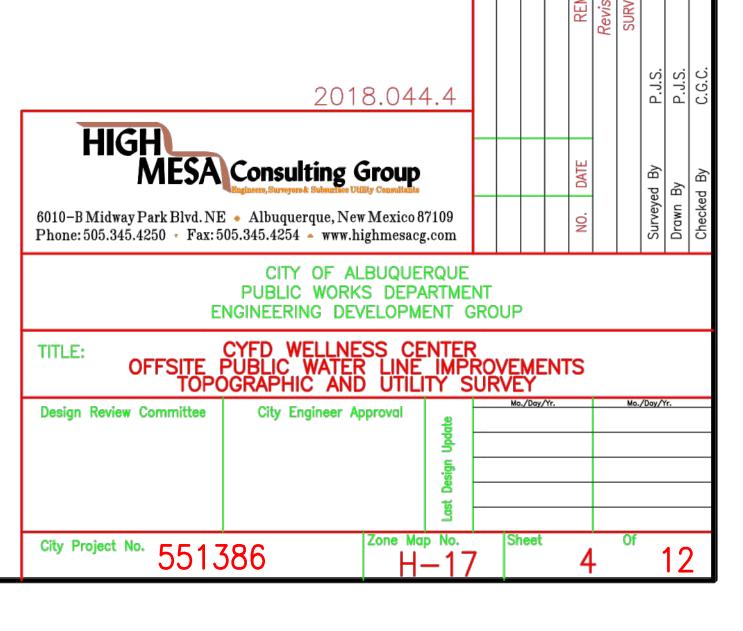
WMB

WATER METER BOX

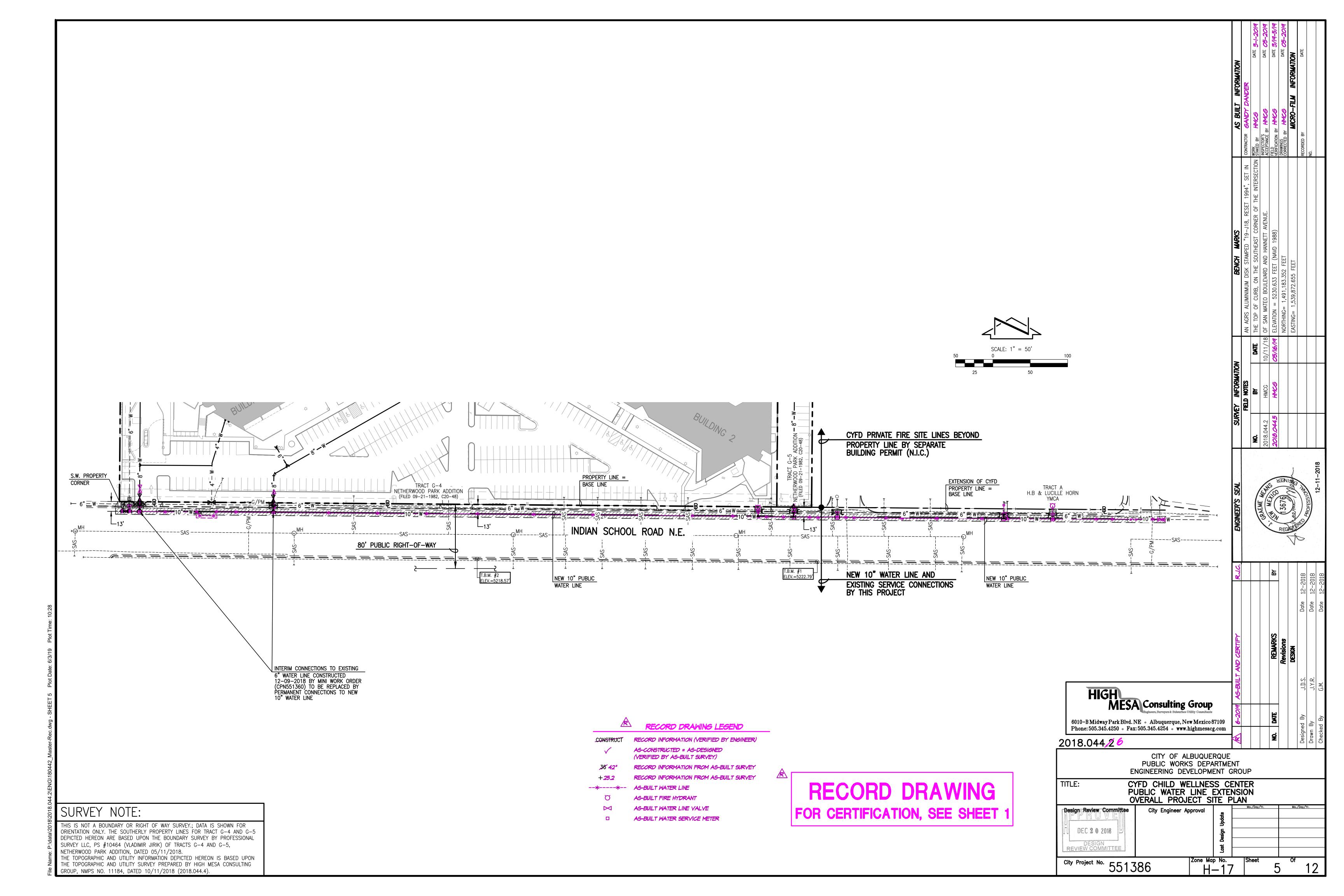
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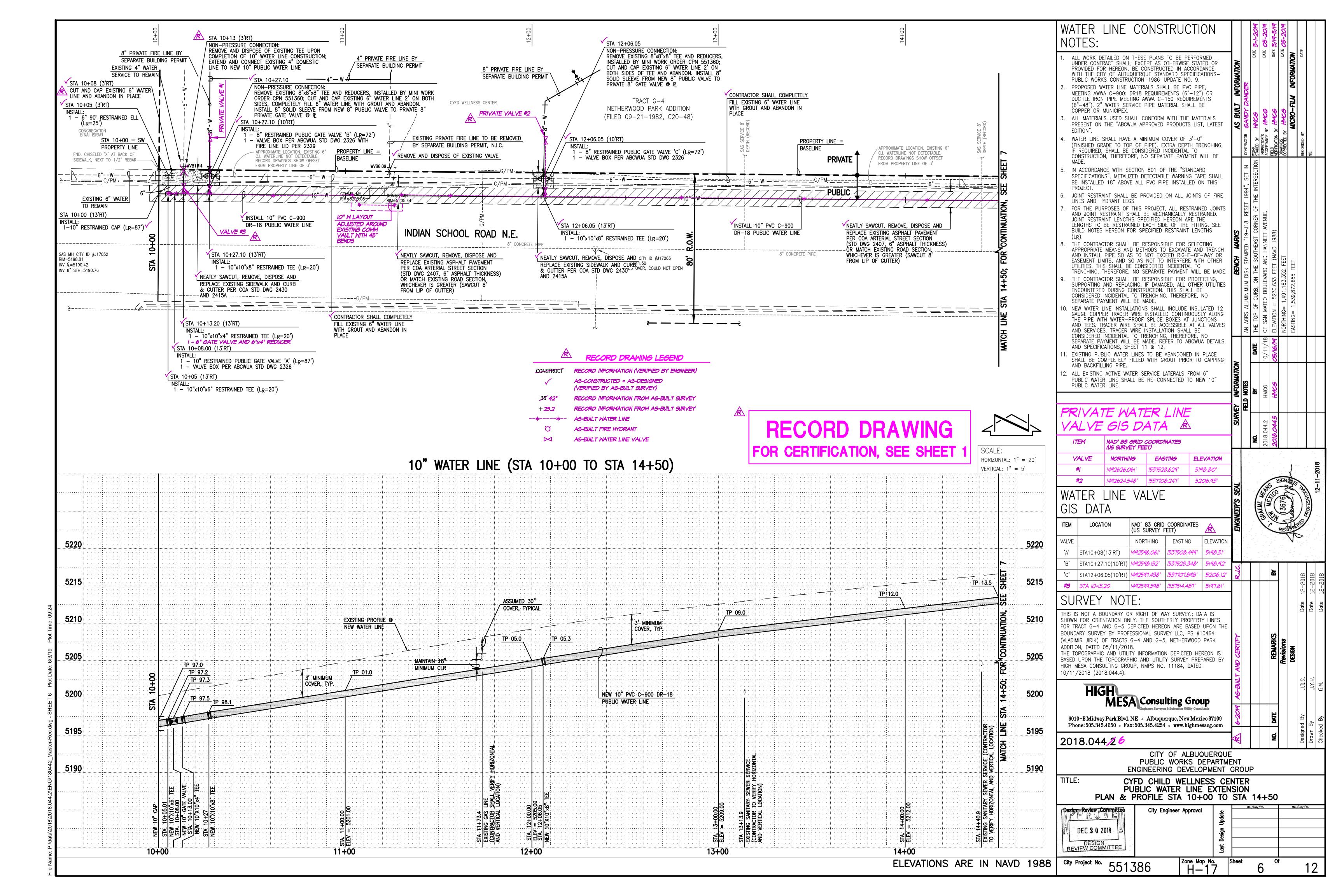
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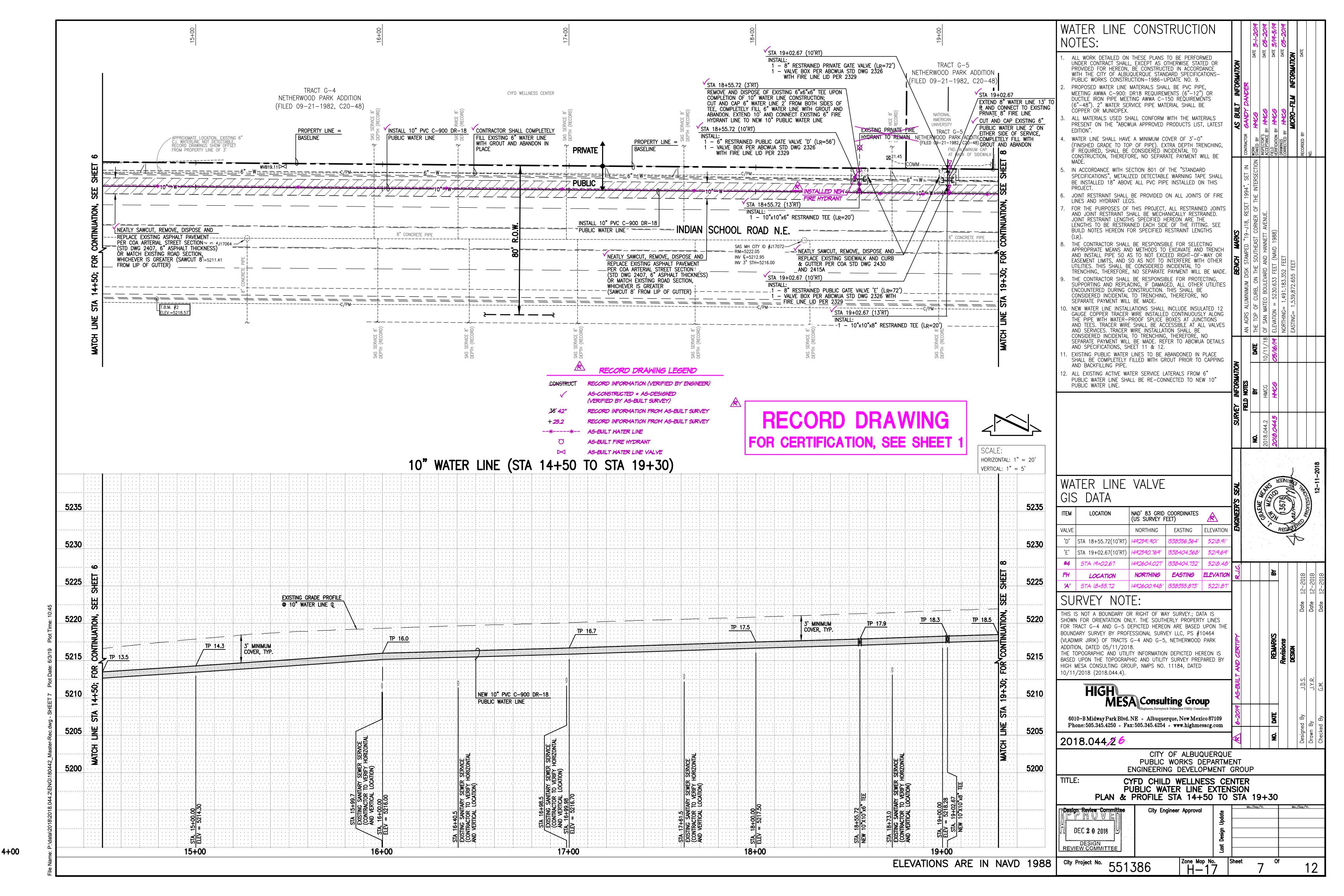
RECORD DRAWING

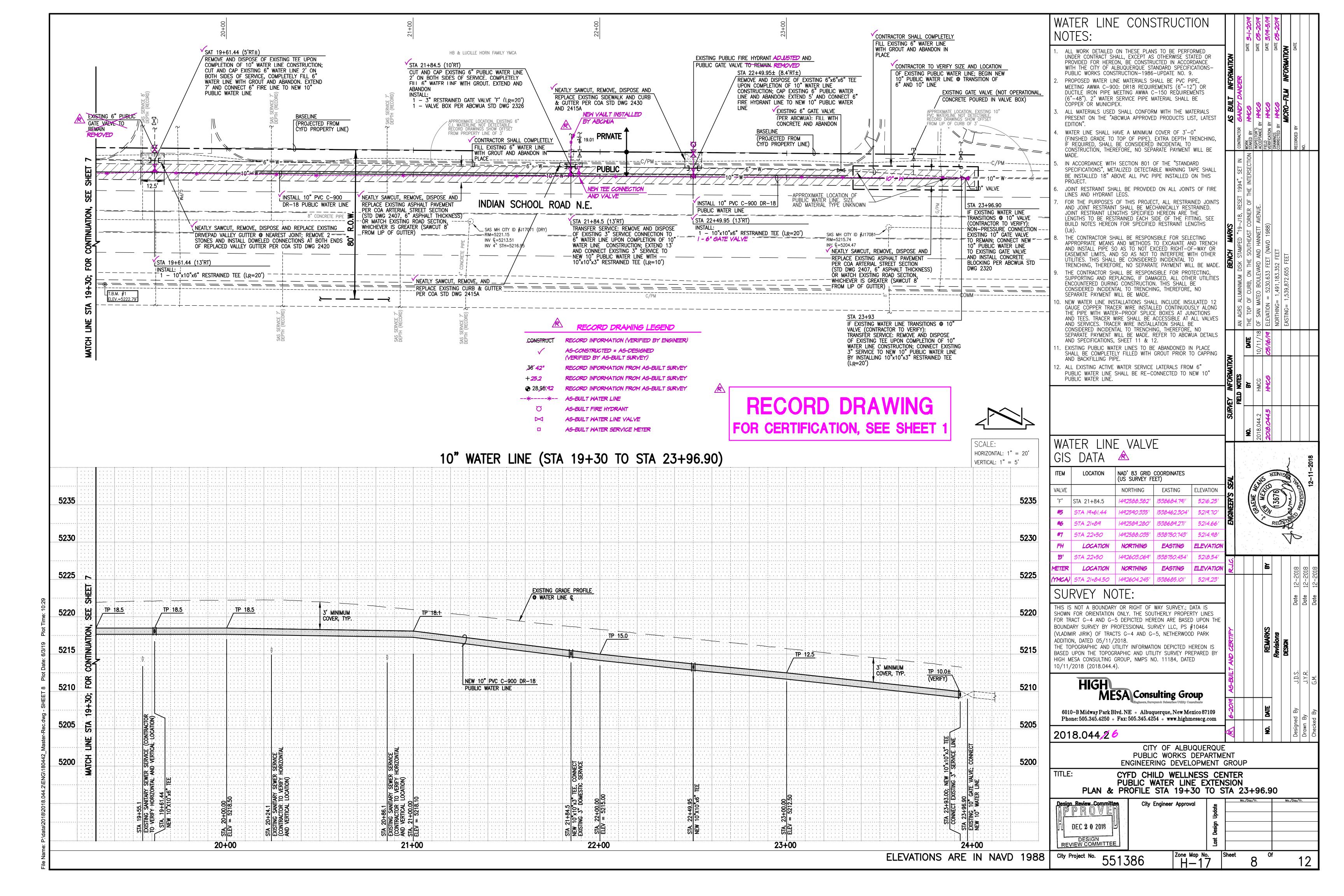


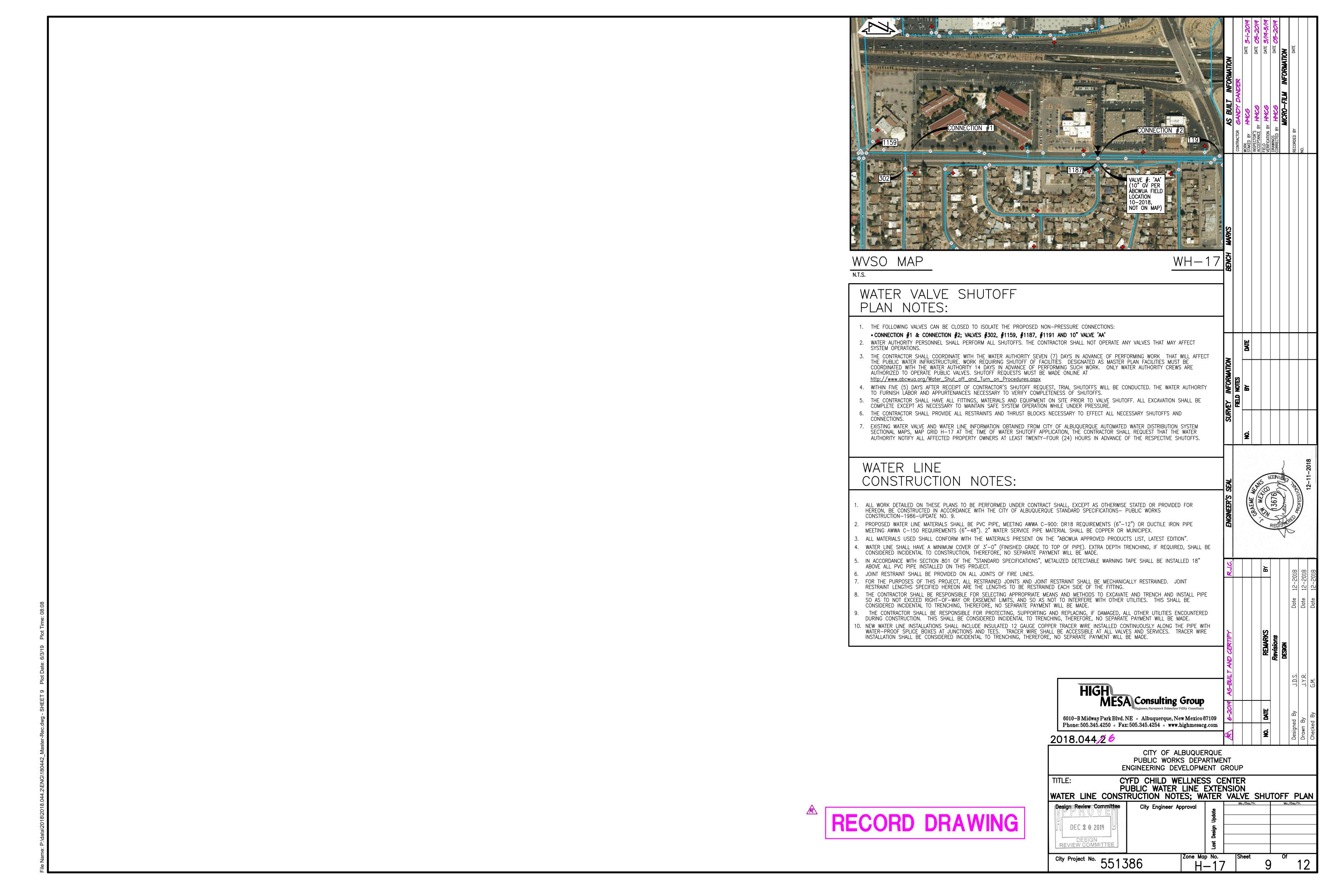
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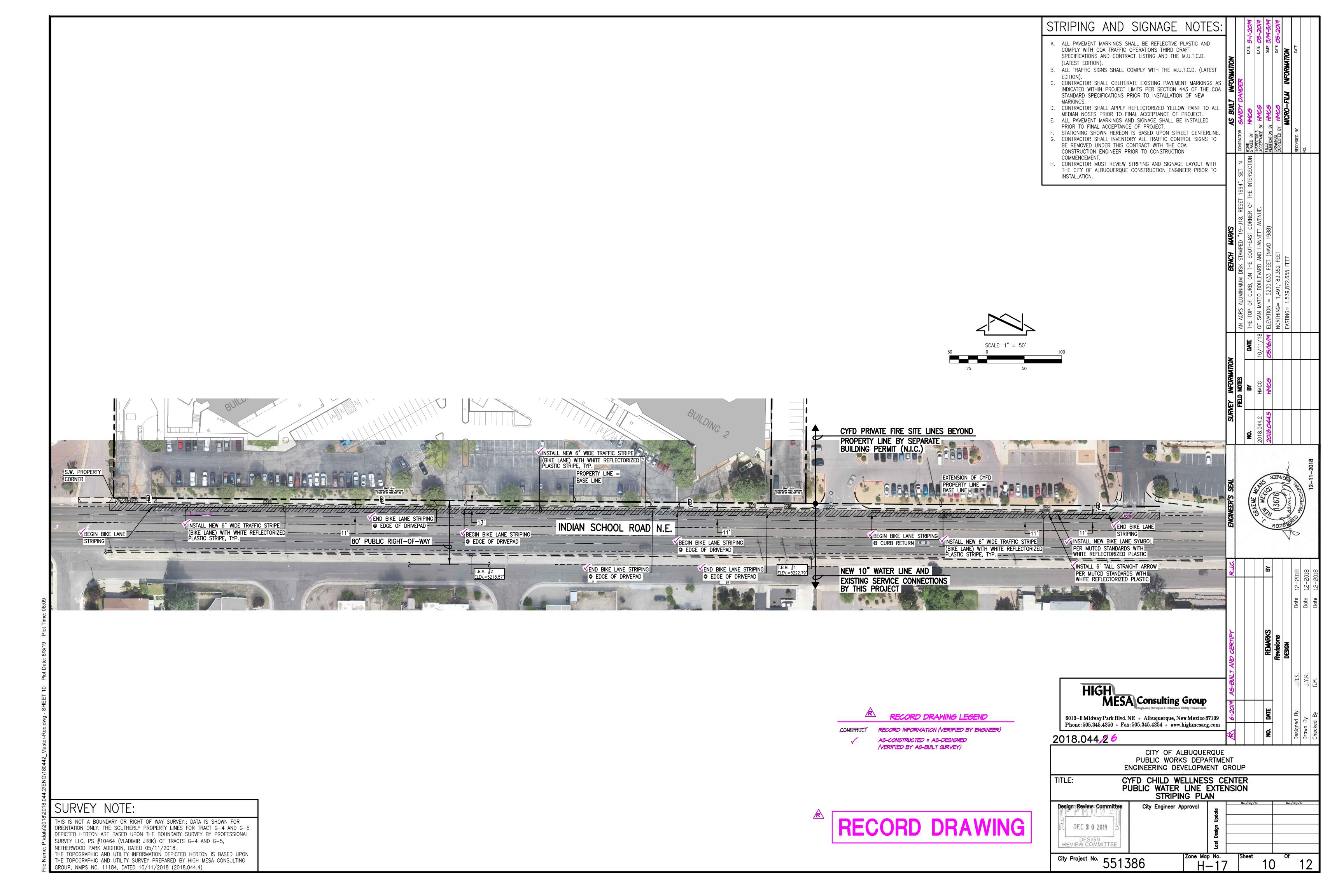












UTILITY IDENTIFICATION TRACE WIRE

PART 1 GENERAL

1.1 SUMMARY

A. This technical specification covers the requirements for the installation of a conductive trace wire during the installation of water, sewer and reuse pipelines and appurtenances. The trace wire will be used for locating the pipelines, laterals, services and appurtenances with an electronic trace wire locator after installation.

1.2 MEASUREMENT AND PAYMENT

A. The work in this section shall be considered incidental to the installation cost of the pipeline being traced.

1.3 REFERENCES

A. Where all or part of a Federal, ASTM, ANSI, AWWA, City of Albuquerque Standard Specifications for Public Works Construction, etc. is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

1.4 SUBMITTALS

- A. The Contractor shall submit the manufacturer's data on materials to be furnished that indicate compliance with the specifications regarding materials used.
- B. The Contractor shall submit a project specific plan showing the proposed trace wire equipment locations.

PART 2 PRODUCTS

2.1 ACCEPTABLE PRODUCTS

A. Only products listed on the Albuquerque Bernalillo County Water Utility Authority's Approved Product List shall be used.

2.2 TRACE WIRE

- A. Open Trench Installation #12 AWG high strength copper clad steel (CCS) wire with minimum 450 pound break load and minimum 30 mil HDPE insulation thickness.
- Directional Drilling/Boring Installation #12 AWG high strength CCS wire with minimum 1,150 pound break load and minimum 30 mil HDPE insulation thickness.
- C. Pipe Bursting Installation High strength 7 x 7 stranded CCS wire with 4,700 pound break load and minimum 50 mil HPDE insulation thickness.

2.3 CONNECTORS

- A. Tee Connections Single 3-way locking waterproof connector for 12 AWG. Connectors shall be approved by manufacturer for direct burial.
- Cross Connections Two 3-way locking waterproof connectors for 12 AWG with a short jumper wire. Connectors shall be approved by manufacturer for direct burial.
- Necessary Splice Connections Single 3-way direct bury lug locking connector or twiston connector with strain relief rated up to 50 volts filled with dielectric silicone sealant to seal out moisture and corrosion and prevent uninsulated wire exposure. Connectors shall be approved by manufacturer for direct burial. Splices shall only be used on the main line at the end of a trace wire spool or when a Tee Connection cannot be used. Contractor shall
- D. Non-locking friction fit, twist on or taped connectors are prohibited.

2.4 TEST STATIONS

- A. All trace wire test stations shall be made of corrosion-resistant materials and shall be equipped with two terminals, a roadway-rated flange to prevent the test station from sinking, and a locking cast iron cap with an encapsulated magnet for ease of locating the test station. The test station shall be specifically manufactured for trace wire access/testing.
- All grade level/in-ground test stations shall be appropriately identified with "Test Station" and with "Water" for water installations, "Sewer" for sewer installations, and "Test" for reuse installations cast into the cap and color coded per Section 2.5 of this specification.
- All trace wire test stations must include a manually interruptible conducting/connection link (terminal jumper) between the terminal for the trace wire connection and terminal for the grounding anode wire connection.

2.5 GROUNDING ANODE

A. All grounding anodes shall be made of magnesium, with a pointed end to enable direct driving into the ground, specifically manufactured for this purpose. The anode shall come factory equipped with an HDPE cap and 20 feet of factory installed #12 AWG CCS wire with 30 mil HDPE coating rated for direct burial at 30 volts with 21% conductivity. The wire shall have a minimum 282 pound break load.

2.6 COLOR CODING

A. Trace wire and test station caps shall be color coded per APWA standards for the specific utility being marked as outlined in the table below.

| APWA Color Code Standards | | |
|---------------------------|-------------------------|--------|
| | <u>Utility:</u> | Color: |
| | Potable Water | Blue |
| | Sewer | Green |
| | Reuse (Reclaimed Water) | Purple |

PART 3 EXECUTION

3.1 OVERVIEW

- A. Trace wire shall be installed in such a manner as to be able to properly trace all pipelines and services, as applicable, without loss or deterioration of signal and without the transmitted signal migrating off the trace wire. Trace wire shall be installed in the locations outlined below.
 - 1. Water: On all water mains, laterals, services and hydrants per the Standard
 - Sewer: On all sewer mains per the Standard Drawings.
 - Reuse: On all effluent mains and services per the Standard Drawings.

3.2 INSTALLATION

Trace Wire:

- Trace wire shall be installed in the same trench and inside bored holes and casing with pipe during pipe installation.
- The trace wire shall be securely bonded together at all wire joints with a locking waterproof connector that complies with this specification to provide electrical continuity.
- Trace wire connectors shall be installed in a manner that prevents any uninsulated
- Except for spliced-in repair or replacement connections, trace wire shall be continuous and without splices between each trace wire access point. For required splices, use splice connectors per this specification. Spliced wires must be knotted prior to being inserted in the connector to prevent separation from the connector in case the trace wires are stretched during backfilling operations.
- Trace wire systems must be installed as a single continuous wire. No looping or coiling of wire is allowed.
- No breaks or cuts in the trace wire or trace wire insulation shall be permitted. Trace wire installation shall be performed in such a manner that allows proper access for connection of line tracing equipment, proper locating of wire without loss or deterioration of low frequency (512 Hz) signal for distances in excess of 1,500 linear feet, and without distortion of signal caused by multiple wires being installed in close proximity to one another.
- Any damage occurring during installation of the trace wire must be immediately repaired by removing the damaged wire, and installing a new section of wire with connectors that comply with this specification. Taping and/or spray coating to repair trace wire or trace wire insulation shall not be allowed.
- Trace wire shall be laid flat on top of the pipe and securely affixed in 6-foot intervals with tape or plastic ties to prevent shifting or damage during backfilling and excavation operations. Attach trace wire to PEXa (cross-linked polyethylene: peroxide process) service piping per the manufacturer's recommendations with plastic (zip) ties. Do not use adhesive tape on PEXa pipe.
- In occurrences where an existing trace wire is encountered on an existing utility that is being extended or tied into, the new trace wire and existing trace wire shall be connected using splice connectors that comply with this specification.
- Trace wire shall be attached to all appurtenances on the north or east side. At service saddles, the trace wire shall not be placed between the saddle and the
- For sanitary sewer systems, lay mainline trace wire continuously, by-passing
- around the outside of manholes/structures on the north or east side. For main line intersections and for service line connections, the main line trace
- wire shall not be cut. All main line trace wires must be interconnected at intersections, at main line tees and main line crosses. At tees, the three wires shall be joined using a single 3-way locking connector. At crosses, the four wires shall be joined using two 3-way
- connectors with a short jumper wire between them. All conductive and non-conductive water and reuse service lines shall include trace wire with a grounding anode installed in the meter box.
- All trace wire termination points shall be terminated with a grounding anode. For repairs and rehabilitations, trace wire shall be installed on the new line per this specification. The ends of rehabilitated/replaced pipeline segments shall be connected if existing trace wire exists or shall be terminated with a grounding
- 19. If repairs are made to a line with a trace wire, Contractor must ensure trace wire is connected with twist-on splice connector and test the trace to the next existing test

Test Stations:

- Test Stations shall be installed at the following locations as outlined in the Standard
 - At fire hydrants on water lines. If hydrants do not exist on a waterline, test stations shall be installed at water valves.
 - At sewer manholes and sewer wet wells on sewer lines
 - At sewer force main valves on sewer lines
- At valves, and as standalone test stations approximately every 1,000 feet in locations where valve spacing exceeds 1,500 feet on reuse lines.
- 2. A minimum of 2 feet of excess/slack wire is required in all trace wire test stations after meeting final elevation. Group and zip-tie excess wire. Do not coil.
- Test stations shall be spaced approximately every 1,000 feet and shall not be spaced greater than 1,500 feet apart. Test stations do not need to be installed at each location identified above provided that the spacing between test stations does not exceed 1,500 feet.

C. Grounding:

- Trace wire must be properly grounded at all termination points and at the edge of right-of-way for water lines that do not have a meter.
- Grounding of trace wire shall be achieved by use of a drive-in magnesium grounding anode rod buried at the same depth as the trace wire.
- Where the grounding anode wire will be connected to a trace wire test station, a minimum of 2 feet of excess/slack wire is required after meeting final elevation.
- When grounding the trace wire in areas where the trace wire is continuous and neither the mainline trace wire nor the grounding anode wire will be terminated at/above grade, install grounding anode directly beneath and in-line with the trace wire. Do not coil excess wire from grounding anode. The grounding anode wire shall be trimmed to an appropriate length before connecting to trace wire with a splice connector. The splice shall be made in the test station or in the meter box if possible.

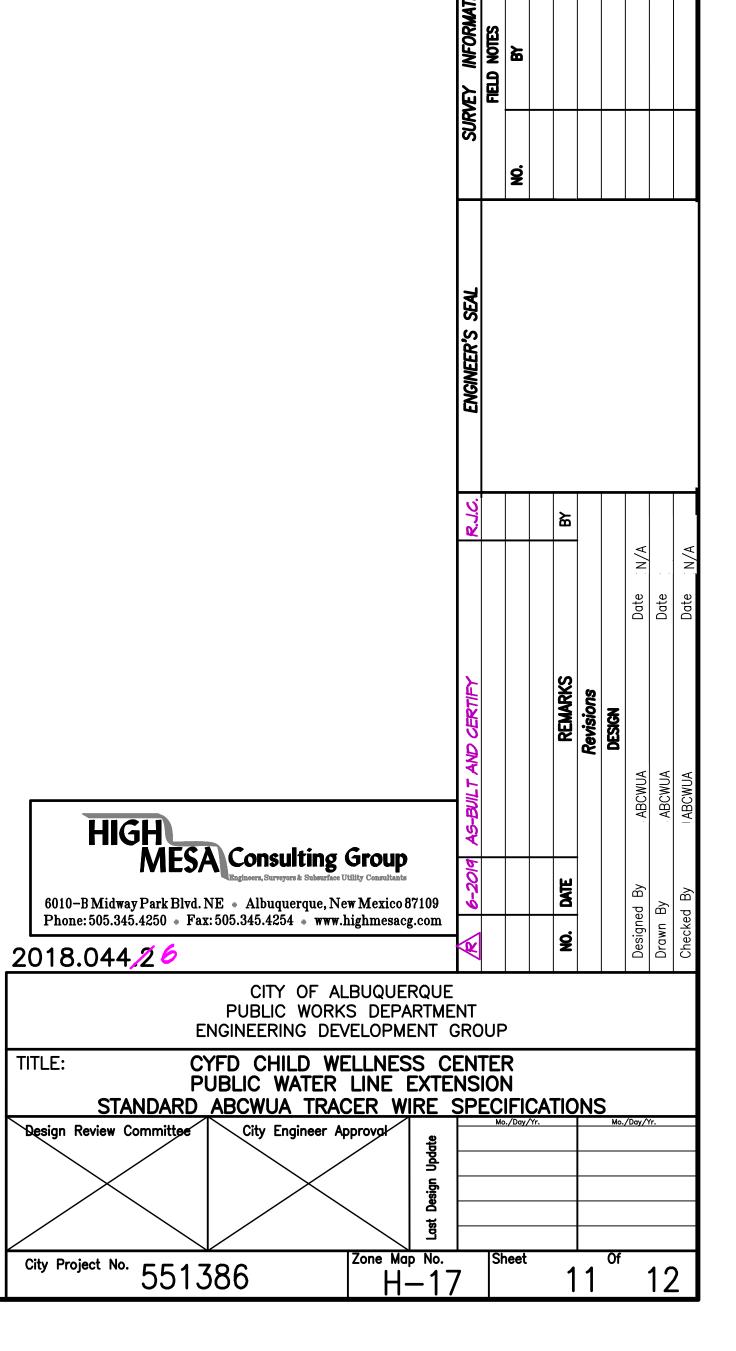
3.3 TESTING REQUIREMENTS

- A. Contractor shall provide equipment for trace test and shall perform a trace test on all trace wire in the presence of the Engineer and Water Authority Inspector. If the trace wire is found to be not continuous upon testing, the Contractor shall repair or replace the failed segment of the wire, and shall be responsible for the cost of any trenching, backfill, repaying and other improvements necessary to complete the trace wire repair. Contractor is encouraged to test trace wire prior to backfill so any issues can be addressed prior to backfill. Passing test results shall be provided for all pipe segments within the Engineer of Record's as-built data and plan set. To pass the continuity test, the following conditions
 - Trace test shall be performed by using a metallic locator with audible tone and numeric values for certification of the facility locations and shall be identifiable
 - The wire shall be accessible at all access points and be identifiable between access
 - Depth readings must be accurate and consistent to within 15 (depth to diameter

3.4 WARRANTY

The product(s) and work shall be warranted against defects in material and workmanship for a period of one year. The warranty period shall begin after final inspection and acceptance by the Engineer and Owner.

END OF SECTION



RECORD DRAWING

