

| DESIGN DATA | | | |
|-----------------------------------|---------------|----------|-------|
| Traffic | Average Daily | | |
| Current: 2010 | | Total: | 4,140 |
| Forecast: 2035 | | Total: | 4,690 |
| | Design Speed: | 25 mph | |
| Minimum Sight Dist. for Stopping: | 155 | Bridges: | NONE |
| Pavement Design Life 20 (years) | | | |



| STATE | PROJECT NO. | PCN | SECTION NO. | SHEET NO. |
|-------|------------------|-------|-------------|-----------|
| N.D. | SU-8-992(035)036 | 19892 | 1 | 1 |

JOB # 42
CITY OF WEST FARGO,
NORTH DAKOTA

SU-8-992(035)036

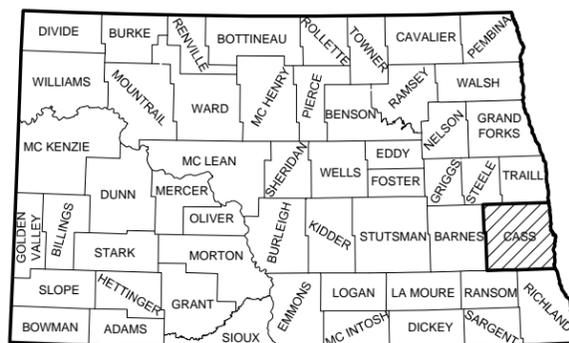
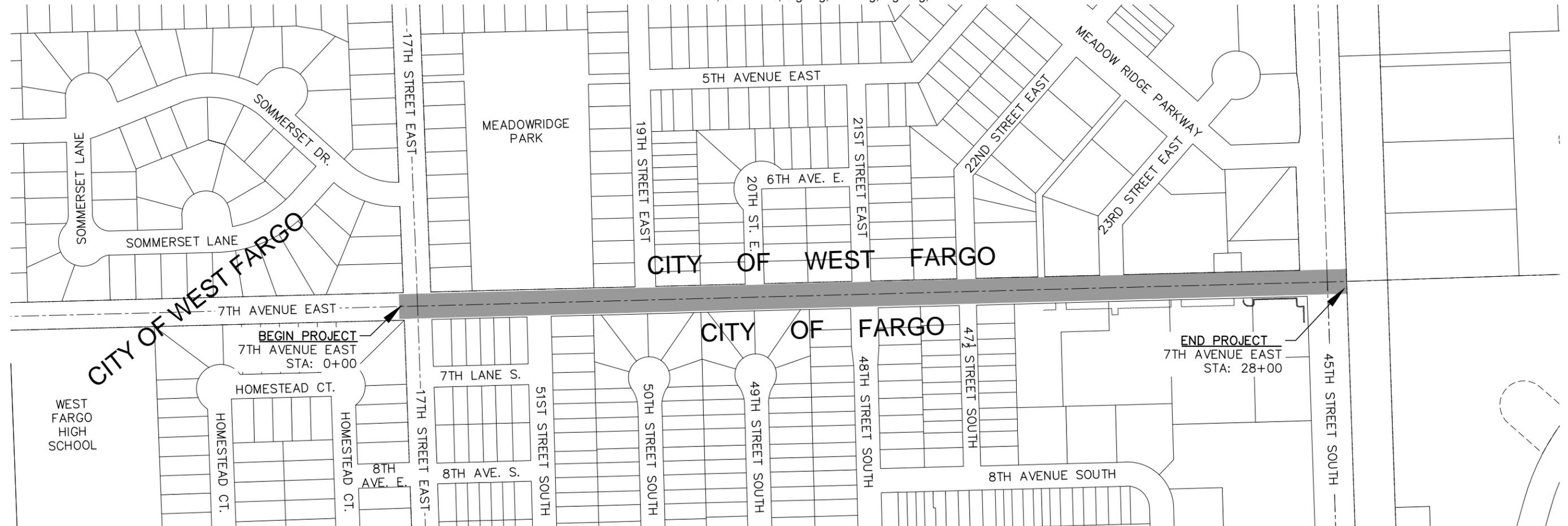
FHWA LIMITED INVOLVEMENT
 7th Avenue from 17th Street East to
 45th Street Southwest
 Cass County
 Section 9 T139N R49W

Grading, Aggregate Base, PCC Pavement, Storm Sewer, Water Main,
 Curb & Gutter, Sidewalks, Signing, Marking, Lighting, and Incidentals

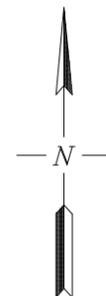
GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota
 Department of Transportation October 2008; Standard Drawings
 currently in effect; and other Contract Provisions submitted herein.

| PROJECT NUMBER / DESCRIPTION | NET MILES | GROSS MILES |
|-------------------------------|-----------|-------------|
| SU-8-992(035)036 / 7TH AVENUE | 0.47 | 0.47 |



STATE COUNTY MAP



| DESIGNERS |
|--------------------|
| Kyle McCamy, PE |
| Brandon Reber, EIT |
| Alex Larson |
| Kevin Gunderson |
| Kevin Kroke, PE |

APPROVED DATE 09/11/13
 Barry D. Johnson /s/
 Barry D. Johnson, PE
 CITY OF WEST FARGO

I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.
 APPROVED DATE 09/11/13
 Kyle J. McCamy /s/
 Kyle J. McCamy, PE
 MOORE ENGINEERING, INC.

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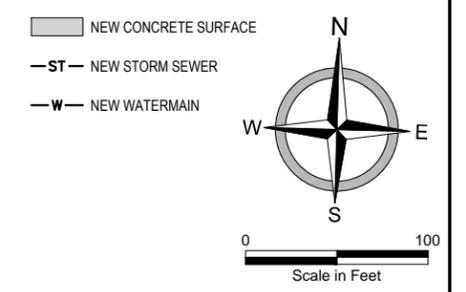
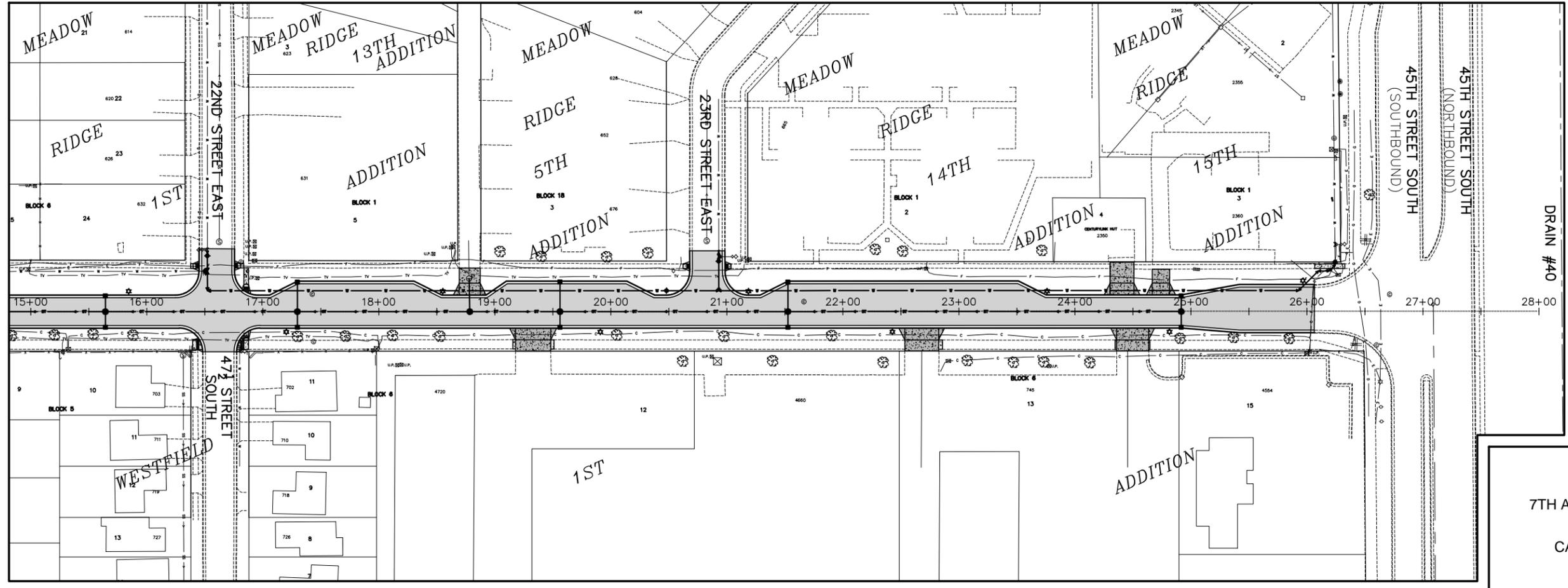
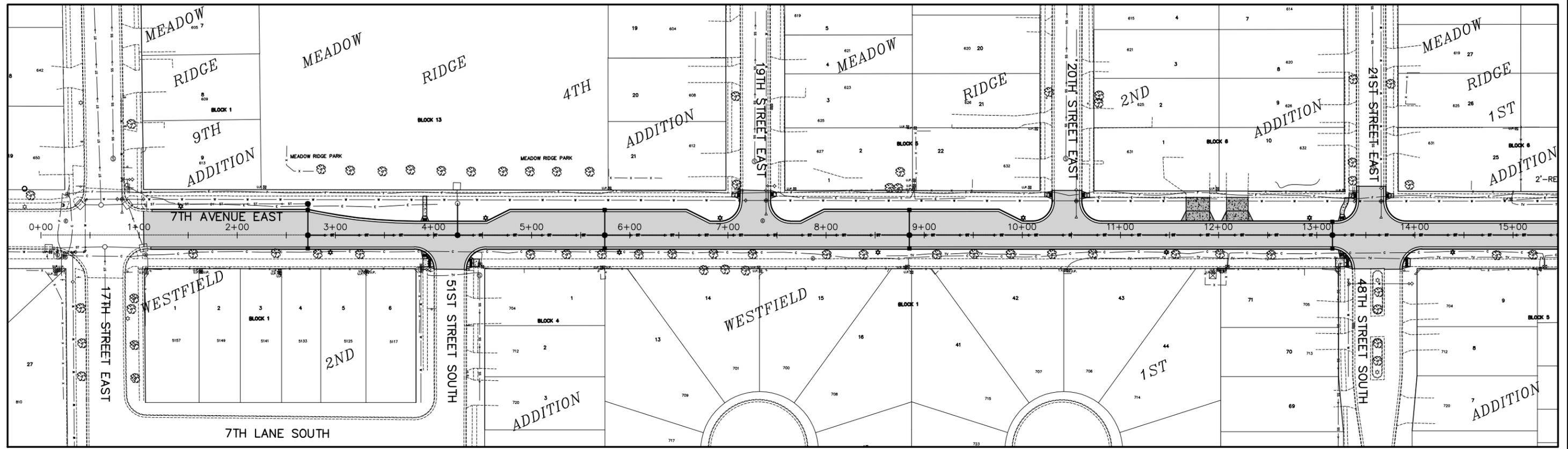
| SP # | DESCRIPTION |
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SCOPE OF WORK
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
SCOPE OF WORK

GENERAL NOTES



| | | | | |
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100-P01 PROTECTION OF EXISTING FACILITIES:

The contractor shall exercise care in his construction operations to ensure that trees, shrubs, grasses, fences, sod, signs, underground sprinklers and other site improvements located outside of the construction limits are not disturbed and adjacent properties are protected. The construction limits include road right of ways and permanent easements. Any damage caused by the contractor shall be repaired by the contractor at the contractor's expense.

100-P02 AIR POLLUTION REQUIREMENTS:

The Contractor will be required to conduct the construction activities in such a manner as to comply with the Air Pollution Control Regulations of the State of North Dakota. Water will be used to control dust on the construction site, see note 216.

100-P03 CONSTRUCTION TRAFFIC:

The contractor's construction traffic shall not park or operate on any sidewalk or multi-use path, either existing and scheduled to remain or that has been established. Side streets/accesses shall remain open during construction.

100-P04 INDIVIDUAL ITEMS:

The cost of those items shown on plans but not listed in the estimate of quantities shall be included in the unit price bid for other pay items.

100-P05 PAVEMENT PROTECTION:

The contractor shall exercise care in their construction operations to ensure that no damage is done to the existing facilities that are to remain in place. All costs to repair any damage shall be at the contractor's expense.

100-P06 CITY ADDRESS:

All items noted to become property of the City of West Fargo (i.e. spares, salvaged items, etc.) shall be delivered to the Public Works Building at 810 12th Avenue Northwest, unless specifically noted. All removed materials and items not needed to be reused to complete the project shall become property of the contractor for removal and disposal.

100-P07 CONSTRUCTION LIMITS:

Construction limits are a combination of right-of-way and permanent easements. No temporary construction limits are provided with the project. However the contractor may contact adjacent or nearby landowners to secure temporary construction easements.

100-P08 ON-SITE CONDITIONS:

It shall be the contractor's responsibility to investigate all on-site conditions, such as street grades, utility locations, subsurface conditions, etc. prior to submitting a bid. Location and elevation of existing sanitary/water/storm mains and service lines need to be verified in the field.

100-P09 DIMENSIONS:

All underground dimensions are to property line, center of pipe, center of structure, or back of curb unless noted.

105-200 UTILITY COORDINATION:

The contractor shall arrange a Post Bid Utility Coordination Meeting with affected Utility Companies, NDDOT District Office, and the Project Engineer. This meeting shall be in addition to the preconstruction meeting. The Post Bid Utility Coordination Meeting shall be held near the project area or at the District office and shall be held no later than two weeks after the Department and the Contractor have executed the contract, as approved by the Engineer. The contractor shall provide an agenda for the meeting, and be prepared to discuss the items on it. Items to discuss shall include, but not be limited to; plan for constructing the project, work schedule, utility adjustment/relocates needed prior to project start, utility adjustment/relocates that can be done concurrent with project, utility locates and site

access. The contractor shall publish meeting minutes and distribute the minutes to all attendees and the NDDOT Utilities Engineer within one week after the meeting.

105-P01 UTILITIES:

The contractor shall notify the local utility companies prior to the beginning of construction, so they may stake location and depth of all utilities in the project area. There may be some utility conflicts. Excavating over utility lines may be eliminated if, in the opinion of the engineer, a hazardous situation exists. However, most conflicts will have to address the relocation of utilities. Separate plans, if any, showing relocation or adjustment work to be performed by utility companies to accommodate the construction will be made available to the contractor, upon request to the engineer. At the preconstruction conference, a coordination meeting will be conducted to assist in eliminating conflicts between the contractor and utility companies. It shall be the contractor's responsibility to verify and coordinate his activities and schedule with all utility relocations. No claims shall be brought against the owner due to utility relocation activities. For underground locations the contractor shall call the N.D. One Call Center at 1-800-795-0555. The contractor shall be required to "pothole" all utility lines ahead of construction activities to verify depths so as to avoid conflicts with construction activities. Utility locations shown on the plan are for informational purpose only. Not all utilities may be shown. Contractor to call for locates prior to digging.

105-P02 PAVEMENT SWEEPING:

The contractor shall keep all adjacent pavements swept clean during construction up until final acceptance. The contractor shall sweep new pavements before opening to traffic and for final acceptance. For this sweeping, the contractor shall furnish and utilize a vacuum type sweeper to control the dust. All costs connected with this work shall be included in the price bid of other items. Chapter 12-11 of the city ordinances entitled "Littering of Public Places by Contractors" shall be followed by all contractors, subcontractors, suppliers, etc. engaged in work on the project. this ordinance will be strictly enforced by the police department and public works department.

105-P03 EXISTING TREE PROTECTION:

Maintain sufficient clearance around existing trees when excavating/stripping material, spreading topsoil, etc. to not damage the existing trunk or roots.

105-P04 PRIVATE UTILITY CONTACT INFO - CENTURYLINK:

Private vaults shown to be adjusted by CenturyLink shall be scheduled and coordinated with Brendan Christenson. His contact info is:

Brendan Christenson
 409 1st Ave. N.
 Fargo, ND 58102
 701-241-3771
 brendan.christenson@centurylink.com

107-P01 HAUL ROADS:

Overdimensional information is available at the public works website, including axle weights allowed on city streets, road class map, truck routes map, overdimensional policy, and overdimensional permit. Contact the City of West Fargo (701-433-5400) to obtain the necessary permits. Any permits required outside of the City of West Fargo shall be obtained by the contractor. The contractor shall take whatever steps are necessary to ensure that no overloading is done by himself, his subcontractors, or his suppliers. Any road damaged by the contractor, his subcontractors, or his suppliers shall be repaired to the original condition at the contractor's expense, to the satisfaction of the engineer.

107-P02 STORAGE OF MATERIALS ON CITY STREETS:

Storage of materials on city streets is not allowed unless approved by engineer. Contractor shall be responsible for obtaining any storage or staging areas as needed for their operations.

107-P03 CONSTRUCTION STANDARDS

Where specific details are not called for on certain construction items, the North Dakota Department of Transportation or City of West Fargo Standards shall be used in that order.

110-P01 WORK SCHEDULE:

In order to minimize interference with traffic operations, a detailed schedule shall be agreed to between the engineer, utility companies, city and the contractor prior to beginning work.

The Engineer shall approve any construction that alters traffic operation or access to businesses, public facilities and/or homes.

200-060 PAVEMENT REMOVAL:

All concrete and pavements paid for as removal has been deducted from the excavation quantity.

200-080 CONCRETE REMOVAL:

Removal of P.C. Concrete sidewalks and driveways shall be paid for as "Removal of Concrete."

200-P01 EXCESS MATERIALS:

All removed pipe, manholes, catch basins, valves, concrete, etc. and excess excavation shall become property of the contractor and must be disposed of by the contractor.

201-P01 TREE REMOVAL AND RESETTING:

Trees to be removed and reset shall be paid for under the "Removal of Trees-10IN" item regardless of size or type. Trees shall be removed in such a manner that they may be reset as soon as nearby pipe has been removed to minimize stress to the tree. Reset location shall be very near the removal location and provided by the engineer in the field.

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NOTES
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 WEST FARGO - FARGO
 CASS COUNTY, NORTH DAKOTA
GENERAL NOTES

GENERAL NOTES



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202-P01 SAWING CONCRETE:

The "Saw Concrete" item shall be payment for sawing existing sidewalks, multi-use paths, driveways, concrete pavement and curb & gutter to facilitate proper removal for connecting to existing hard surfaces. "Saw Bituminous Surfacing - Full Depth" item shall be payment for sawing existing asphaltic multi-use paths or pavement where new asphalt or concrete will butt up against the existing surface sawed. No payment shall be given for resawing areas that were previously sawed but damaged.

202-P02 SAWING ASPHALT:

Where the new pavement will abut existing pavement, a full-depth vertical saw cut shall be made along the entire length of the butt joint. The material to be removed shall then be removed without disturbing the material that is designated to remain in place. The new pavement shall be placed so as to match the existing pavement and so as to provide a satisfactory surface profile. Sawing shall be paid as "Saw Bituminous Surfacing-Full Depth".

202-P03 REMOVAL OF PIPE-ALL TYPES AND SIZES:

The "Removal of Pipe-All Types & Sizes" item shall be full compensation for all labor and materials necessary to excavate and remove any type of pipe and associated fittings/bends and backfill the vacated area if new pipe not installed in removed location. Backfill shall be done with existing excavated clays approved by the engineer. All removals shall become the property of the contractor. Refer to the "Pipe Trench Details" included in plans for specific requirements.

202-P04 REMOVAL OF MANHOLES/INLETS:

The "Removal Of Manholes" item shall be full compensation for all labor and materials necessary to saw pavement, excavate, remove manhole, plug any abandoned pipe, and backfill. All removals shall become the property of the contractor to be disposed of by the contractor. The "Removal of Inlets" item is the same as above, but applies to inlets.

202-P05 PAVEMENT REMOVAL:

All asphalt pavement shall be removed with a milling machine, or other methods as accepted by engineer. Millings shall be delivered to the City of West Fargo. Contact the City at (701) 433-5400 for scheduling. See Section 4 for core locations. The unit price bid for "Removal of Asphalt Surfacing" shall be considered full compensation for removing, loading, and stockpiling removed asphalt materials.

202-P06 ABANDONING EXISTING WATER MAIN AND STORM SEWER:

Water main abandonments shall be paid for under the "Removal of Pipe All Types and Sizes" item. Storm sewer abandonments shall be paid for under the "Removal of Pipe All Types and Sizes" item. This shall involve filling the existing pipe completely with controlled density fill or sand.

202-P07 REMOVAL OF WATER MAIN AND STORM SEWER:

Removing existing water main shall be paid for under the "Removal of Pipe All Types and Sizes" item. Removing existing storm sewer shall be paid for under the "Removal of Pipe All Types and Sizes" item. It shall involve removing the existing pipe from the site, disposing of the pipe and any appurtenances (i.e. fittings, bends, gaskets, joint restraints, etc.), and backfilling the trench with clay or sand according to the pipe backfill detail.

203-P01 EMBANKMENT CONSTRUCTION:

All roadway embankment shall be compacted to the requirements of sections 203.02 F and 203.02 G of the NDDOT standard specifications. The borrow material shall be provided by the contractor from an offsite source. Contractor is responsible for restoring any borrow site. "Borrow-Excavation" shall be paid at plan quantity.

203-P02 BOULEVARD TOPSOIL STRIPPING AND REMOVALS:

Stripping/excavating topsoil from the boulevards is necessary to allow for matching existing ground near the sidewalk (north) and multi-use path (south) during finish grading operations in the boulevards. This shall be paid for under the "Common Excavation-Waste" item. This shall involve excavating existing boulevard material to a depth of 4" below existing ground. Excavated material shall be loaded and hauled away for disposal of the material off-site. Boulevard excavation material shall not be used as fill in pipe trenches where pipe is being removed. Any miscellaneous material encountered in the boulevards (e.g. landscape rocks, woodchips, etc.) shall be paid for under the "Common Excavation-Waste" item.

203-P03 COMMON EXCAVATION-TYPE A:

Common excavation shall involve removing existing material to the top of subgrade elevation in the roadway section and to the bottom of the imported topsoil elevation in the boulevards. Excavated material shall be used to fill roadway subbase to the top of subgrade elevation (i.e. as embankment), fill boulevards to the bottom of topsoil elevation, or fill pipe trenches in boulevards or roadway section where pipe is being removed. Any excavated material remaining after on-site filling is complete shall become the contractor's property for removal from the site. All costs for labor, equipment and materials necessary to complete the work shall be included in the "Common Excavation-Type A" item.

203-P04 TOPSOIL IMPORT:

Topsoil shall be imported and spread at 4" thickness in areas shown. Boulevard excavation may not be used for finish topsoil (i.e. must import topsoil).

203-P05 EXCESS EXCAVATION:

All excess excavation shall become the property of the contractor. Excess excavation quantities are shown on the Summary of Earthwork Quantity Tables.

216-P01 WATER:

Water for compaction, turf establishment, and for use as a dust palliative, is available from The City of West Fargo per City policy. The city has an automatic water salesman (by Vernon Manufacturing) located at 1100 12th Avenue Northwest (mounted on south wall of northside regional sanitary lift station SA40). Method of payment is either prepaid debit card (issued at Public Works Building at 810 12th Avenue Northwest) or cash (cash machine on-site accepts \$1, \$5, \$10, \$20). Rate is established by the City and is subject to change without notice. Use of this facility is subject to disruption and may be shut down without notice. Contact Public Works at 701-433-5400 for current rate and availability.

216-P02 WATERING:

Watering shall be performed as needed to supplement natural rainfall and maintain plantings in a healthy, stress-free condition and/or as directed by the Engineer in the field. It shall include ensuring that plantings receive adequate water regardless of weather conditions. It shall include attaining water and applying water to seed/plantings. Damage caused to seeded areas, trees, shrubs, utilities, street lights, and other fixed objects during watering operations shall be repaired at the contractor's expense. It shall include notification to the Engineer a minimum of two hours before watering operations commence. All cost for labor, equipment and materials necessary to complete the work shall be included in the price bid for "Seeding-Hydro Mulch".

230-P01 SUBGRADE:

Prior to the placement of the base material the subgrade shall be prepared in accordance with the Standard Specifications. The fabric and compacted base shall be placed as soon as possible following the completion of the prepared subgrade. If additional moisture is absorbed in the subgrade as the result of inclement weather the subgrade shall be reworked at the contractor's expense. The density shall be 95% of the maximum dry density as determined by AASHTO T-99. The moisture shall be not less than 4 percentage points below, or more than 5 percentage points above optimum moisture content. The above shall be classified as "Subgrade Preparation-Type A" and shall be paid for by square yard per limits on typical section. Compaction and density controls shall be in accordance with Section 203.02 G of the Standard Specifications, T-99 method. The Contractor will be required to Spot check that the dirt grade is at the correct elevation prior to installing Fabric. Use of laser equipment will be accepted.

302-P01 SURFACE TOLERANCE:

Surface tolerance Type B (trimming equipment) shall be used on aggregate base material in all roadway areas. Contractor shall verify base depth and halt operation if depth does not meet typical section.

302-P02 AGGREGATE BASE COURSE:

NDDOT Class 5 material shall be used for leveling base per typical section with the additional constraint that the minimum percent passing the No. 200 sieve shall be 6%. All costs to complete the work and place material shall be included in the unit price bid for "Aggregate Base Course CI 5". Any material required for driveways, sidewalks, or multi-use paths shall be included under those items, i.e. will not be paid under this item.

550-050 PORTLAND CEMENT CONCRETE PAVEMENT:

The requirements for the transverse metal tine finish of Section 550.04 J 6 (Final Surface Finish) of the Standard Specifications shall be deleted.

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WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
GENERAL NOTES

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550-P01 TRANSVERSE JOINT SPACING (P.C.C. PAVEMENT):

15' Uniform Spacing. Contraction joints shall match curb and gutter joints or existing concrete joints. See Jointing Plan Sheets.

550-P02 PAVEMENT PROTECTION:

The contractor shall protect the existing or new pavement during the course of construction. Surface repair that is required because of the contractor's operations shall be repaired to the satisfaction of the engineer by the contractor at the contractor's expense.

550-P03 ABUTTING PAVEMENT:

Where the new P.C.C. pavement abuts existing pavement, a full depth vertical saw cut shall be made along the entire length of the butt joint. The material to be removed shall then be removed without disturbing the material that is designated to remain. The new pavement shall be placed to match the existing pavement and provide a satisfactory pavement surface profile. This joint shall be protected from damage. Any damage shall be repaired to the satisfaction of the engineer by the contractor at the contractor's expense.

550-P04 TIE BARS:

The tiebars shall be held in the specified position parallel to the slab surface and perpendicular to the centerline by a supporting device securely staked to the roadbed and shall hold the tiebars at the correct spacing, alignment, elevation, and within tolerance.

Tiebars will not require support if inserted into the side of the pavement during slip form paving of the longitudinal construction joint operation.

Tiebars shall be placed so that they are not within 15 inches of the intersection of the longitudinal joint and transverse joint.

All tie bars shall be epoxy coated and placed according to the tie bar bending detail shown on the joint details sheet.

550-P05 SURFACE QUALITY/RIDE QUALITY:

Section 550-04 P 2. shall be used to determine for all lanes.

550-P06 SAW CUTTING (P.C.C. JOINTING):

Soft cut will be required for the initial cut on concrete paving for contraction relief.

550-P07 FINAL SURFACE FINISH:

After surface irregularities have been removed and before the concrete attains an initial set, a seamless strip of stiff-fiber artificial grass carpet shall be dragged longitudinally along the full width of the pavement. The surface texture shall be uniformly roughened leaving corrugations in the surface that are uniform in appearance. The width of material in the drag shall be in contact with the full width of the pavement. The drag shall be operated with its leading edge attached to a bridge riding on the forms or adjacent slabs. The drag shall be maintained clean and free from uncrusted mortar. A drag that can not be cleaned shall be replaced with new fabric.

The texture achieved by the carpet drag shall be tested by the engineer in accordance with ASTM E 965, "Test Method for Measuring Surface Macro-texture Depth Using a Sand Volumetric Technique", to ensure the texture is adequate for skid resistance. The test shall be performed in the outside wheel path at random locations determined by the Engineer. The pavement surface texture shall be tested in lots equal to 500 lineal feet of paving. Each lot shall be tested once. A lot will not be carried over to the next day of paving.

The test results determined by ASTM E 965 shall have a minimum texture depth of 0.031 inches. Any lot having a result less than 0.031 inches will be accepted as substantial compliance, but the contractor shall take corrective action to achieve the required 0.031 inches minimum depth. (It is not the intent of this tolerance to allow the contractor to continue to pave with a texture depth of less than 0.031 inches. If the engineer determines the contractor is not taking adequate corrective action, paving operations will cease.) If 3 or more lots have texture depths of less than 0.031 inches but greater than or equal to 0.025 inches, diamond grinding shall be required of those lots. Any one lot having a texture depth of less than 0.025 inches shall require diamond grinding. All diamond grinding shall be in accordance with Section 550.04 P.3 at the contractor's expense. Limits of any failing test shall be determined by running additional tests at 100 foot intervals before and after the failing test.

704-P01 PORTABLE CHANGEABLE MESSAGE SIGN:

A portable changeable message sign shall be installed on each end of 7th Avenue for 2 weeks prior to road closure. The sign placement and message to be determined by field engineer. The portable changeable message sign shall conform to the requirements of the MUTCD. After road closure and detour are in place, the portable changeable message sign may be removed.

708-P01 SEEDING - HYDRO MULCH:

The rates of Class 5 seed shall be as follows:

| <u>SPECIES</u> | <u>POUNDS PURE LIVE SEED PER ACRE</u> |
|-------------------------------------|---------------------------------------|
| Kentucky Bluegrass | 75 |
| Perennial Rye Grass | 50 |
| Six-Week Fescue or Dura-hard Fescue | <u>10</u> |
| | 135 |

Seed shall be drilled into the topsoil, and then hydro mulch shall be applied. The hydro mulch shall be as specified in NDDOT spec. 708.02B.3.a. Seeding and Hydro mulch shall be paid for under the "Seeding-Hydro Mulch" item. Fertilizer shall be a mixture of 5-10-5 applied at a rate of 100 pounds per acre, and the cost shall be included in the seeding item. Seed shall be watered for 8 weeks minimum after placement in order to provide sufficient moisture for growth as determined by the engineer. Seeding will not be allowed from June 15th to August 15th. An application of a pre-emergence herbicide shall be applied 2 weeks before seeding and after tilling or a post-emergence herbicide shall be applied as needed to control weeds.

708-P02 MOWING:

The contractor shall be required to mow any seeded areas a minimum of two (2) times. Mowing shall be done within 48 hours of notification by the Engineer. Any clippings that land on sidewalk, driveways, roadway or any location other than the grassed area shall be removed prior to leaving the site. In areas that are less than 80% weed free as determined by the Engineer, weeds shall be sprayed at the contractor's expense prior to mowing operations. Damage caused to trees, shrubs, utilities, street lights, and other fixed objects during mowing operations shall be repaired at the contractor's expense. Mowing shall not be done more than once a week and shall be done when grass is longer than 3" and/or as directed by the Engineer. Grass shall not be cut more than 1/3 of length of planted grass at time of mowing. All cost for labor, equipment and materials necessary to complete the work shall be included in the price bid for "Seeding-Hydro Mulch".

708-P03 INLET PROTECTION:

Inlet protection devices shall be placed on all existing and new inlets as shown and remain in-place. Inlet protection devices will remain the property of the contractor. Existing inlets may require protection prior to pavement removal or grading activities that would result in sediment runoff entering the storm sewer system. The contractor shall be responsible for preventing unsafe or flooding conditions, ensuring the overflows are operational at all times, and shall clean and remove sediment on a routine basis so the devices are fully functional for the next rainstorm event. The contractor shall protect the devices and replace if damaged. The unit price bid for "Inlet Protection-Special" shall be considered full compensation for installing, cleaning, removing sediment, maintaining, replacing damaged devices and removing the devices from the project. Measurement will be made of the number of individual inlets, catch basins, and manholes protected for the life of the project regardless of the various types of devices required. All devices that are installed shall remain until the turf has been established. If the turf has not been established by November 1st, all devices that are installed in a street section and are determined to have the potential to cause damage to snow removal equipment shall be removed and reinstalled as directed by the Engineer in the spring. This work is considered normal maintenance and the contractor shall not be entitled to additional compensation.

708-P04 STABILIZED CONSTRUCTION ACCESS:

The stabilized construction access shall be constructed in accordance with Section 708.10 of the NDDOT standard specifications except for aggregate material for the "Stabilized Construction Access" item will meet the following requirements:

| <u>Sieve Size</u> | <u>Percent Passing</u> |
|-------------------|------------------------|
| 4 inch | 100 |
| 2 inch | 0 |

The aggregate shall have 90 percent fractured faces. The length of the access shall be 100 feet minimum.

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708-P05 EROSION AND SILTATION CONTROL:

The contractor shall be responsible to provide erosion and siltation control per detail D-708-2 and as listed in the plans and specifications. Storm sewer structures shall be protected until turf establishment is complete. This shall entail the installation of bale checks, sedimentation control fence, premanufactured geosynthetic curb inlet protection, etc. The contractor shall be required to submit any revised erosion control plan at the preconstruction conference and will also obtain a Construction Storm Water Discharge Permit from the North Dakota Department of Health by submitting a Notice of Intent with the ND Dept. of Health, Division of Water Quality. An approved permit must be obtained before work can begin on the project. The contractor will have to submit all the appropriate forms and erosion control plans with the Notice of Intent. The contractor will also be responsible for maintaining all erosion control measures throughout the project and after completion until all turf is established at 80% coverage as determined by the City of West Fargo. All installed erosion control measures shall be installed according to "A Guide to Temporary Erosion Control Measures" produced by the ND Dept. of Health. Temporary seeding will be required over ANY disturbed areas within fourteen days after grading activities have temporarily ceased. Temporary seeding shall consist of 10 lbs/acre of Oats and 20 lbs/acre of Annual Ryegrass. Any temporary seeding and permit application/compliance shall be included in other contract items, i.e. shall not be paid for separately.

709-P01 GEOTEXTILE FABRIC:

Fabric shall not be placed until material is tested and accepted and subgrade elevation verified by engineer.

714-P01 PIPE & STRUCTURE CLEANLINESS:

All pipes and structures shall be free of debris, dirt, etc. at the time of final acceptance. This shall be accomplished by erosion control measures and by protecting these facilities from other material deposition into them during construction. However, sewer jetting may be required in lines by the contractor at his/her expense before final acceptance with sediment being trapped and removed by the contractor at the downstream end of the jetting operation. This damage expense shall be borne by the Contractor. The City of West Fargo Public Works Department shall be contacted (701-433-5400) to inspect prior to final acceptance.

714-P02 DRAINAGE:

When the existing drainage system becomes inoperable, the contractor shall provide sufficient temporary pumping and/or drainage facilities to keep the right-of-way and the adjacent areas which drain to the right-of-way drained. The cost for maintaining the drainage shall be included in the price bid for other items.

722-P01 ADJUSTMENT OF EXISTING MANHOLES & INLETS:

At locations shown in the plans existing manholes and inlets are to be adjusted. Some revisions to the manhole, cone, cover, rings, and riser lengths may be required. Existing concrete rings may be reused if the contractor preserves their integrity. All work shall be approved by the Engineer. If concrete rings are used, grout shall be placed in between each ring and grout or concrete shall be placed around outside at a minimum of 4" thick and to 3" above bottom of casting (see details). Only steel shims will be allowed to be used for adjustments. All void spaces shall be filled completely with grout. Polyethylene rings may be used in lieu of concrete rings and shall be installed with manufacturer's approved sealant used between all rings and between the barrel and ring. All labor, materials, and equipment necessary to adjust an existing manhole shall be included in the price bid for "Adjust Manhole". This shall include new castings if noted on plan. All rings shall match existing ring sizes. All grout shall have a compressive strength at 28 days of 3000 psi, to be tested at the engineer's discretion. It shall be non-shrink, core-filled grout. Grout shall follow the time limits for placement of concrete as set by the NDDOT. All manholes shall be set so that they are 1/4" below finished grade. External chimney seals shall be installed on all manholes and inlets in grassed areas and shall be included in "Adjust Manhole" item. They shall be those manufactured by Cretex, Strike Products, or equal.

722-P02 ADJUSTMENT OF NEW MANHOLES & INLETS:

On any new manhole/inlet adjustment the maximum number of rings shall be 4 and the minimum 2. All manhole rings shall be 27" inside diameter. This shall be included in appropriate manhole or inlet items. Same construction techniques used for adjusting existing manholes/inlets shall be used. All floating manholes shall receive chimney seals which shall be included in the "Manhole 48In" item (See note 722-P01).

722-P03 MANHOLES AND INLETS:

The price bid for manholes or inlets shall include the base, casting (as specified or per detail) and grates, grouting, excavation - installed and complete. Only manholes shall have riser payment item (riser incidental to inlets). All grout shall have a compressive strength at 28 days of 3000 psi, to be tested at the engineer's discretion. Grout shall follow the time limits for placement for concrete as set by the NDDOT. All manhole rims shall be set so that they are 1/4" below finished grade.

722-P04 INLETS:

The price bid for "Inlet-Type 2" shall include the base, riser, casting and grate - complete. Monolithic bottoms will be allowed.

722-P05 MANHOLE RISERS:

Riser lengths shall be measured and paid as the length in lineal feet to the nearest hundredth from invert to rim minus 1.0'.

722-P06 CASTINGS, GRATES, AND COVERS - MANHOLES AND CATCH BASINS:

Castings, grates, and covers for structures in concrete pavement shall be Neenah R-1733 or East Jordan 1205 and follow the floating manhole casting detail. Castings, grates, and covers for structures in curb and gutter shall be Neenah R-3067-VB or East Jordan 7030-M6. Castings shall be grouted all around inside and outside and to structure. External chimney seals shall be installed on all floating manholes and shall be included in the manhole item.

722-P07 EXISTING STORM SEWER & WATER UTILITIES:

All existing storm sewer & water utility locations and elevations on the plans are approximate. The contractor will be responsible for locating any main line pipe for removal, abandonment, or connection purposes. This shall be included in the associated "Remove Pipe-All Types and Sizes" or "Connection to Existing Main" items. Coordination with city staff may be required.

722-P08 STORM SEWER PIPE:

Reinforced concrete storm sewer pipe shall be gasketed in accordance with ASTM C443-10.

722-P09 P.V.C. PENETRATION:

All P.V.C. storm sewer pipe penetrations to manholes or inlets shall utilize a sand collar or rubber boot.

722-P10 CONNECTION TO EXISTING MAIN:

Connecting new manhole to existing storm sewer main shall involve cutting into the existing main and installing the manhole. Pipe penetrations shall be grouted inside and outside with 3,000 p.s.i. concrete. This shall be incidental to installing the manhole.

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724-P01 WATERMAIN:

A. Mechanical Joint Fittings.

Ductile iron fittings with joint accessories are used as a basis for weight payment for all mechanical joint fittings. Weights are taken from the 2011 Tyler Utilities Union-Tite Class 153 catalog. All fittings shall be neatly wrapped with 8-mil polyethylene plastic and securely taped. Stainless steel bolts shall be used. All watermain joints shall be push-on fittings, except for the watermain adjustment detail or when a joint must be mechanically restrained in accordance with the contract documents or as directed by the engineer. Where applicable, mechanical joints shall consist of megalugs or equal, stainless steel bolts, and poly wrap.

B. Backfill.

Extra care will be required for pipe installed under the future paving. As shown on the plans, all watermain installed under future paving shall be backfilled with existing clays as approved by the engineer. Compaction shall be at 95% Standard Proctor (T-180 method for granular, T-99 otherwise).

C. Elevations

Elevations of existing water main shown on the plans are approximate.

D. Modifications to D-724-1

No cast iron piping shall be used. All gate valves shall be encased with 8 mil polyethylene plastic. All exterior bolts and nuts shall be 304 stainless steel.

E. Pipe

All PVC water main shall be C900 Class 150 SDR 18.

F. Water Main Shut Downs.

The contractor will be responsible for the following:

1. Coordination with city on gate valve locations.
2. Coordination with Public Works Department for cleaning and operating if required. Contact Bob Olson at 701-433-5400.
3. Notify all properties affected by shutdown a minimum of six hours prior to shutdown. Notification shall be in writing. Any shutdowns shall be after 9:00 am and prior to 4:00 pm. If shutdown exceeds 6 hours temporary services must be provided. Included in water items.
4. Any temporary lines shall be located to avoid walks and drives. If avoidance is not possible temporary ramps shall be provided to allow traffic over temporary lines. Included in water items.

G. Flushing Hydrants

Before putting shut down main line in service, the line shall be tested for bacteria twice within 48 hours per the ND State Health Department and pass both tests. Also, the line shall be flushed from both ends during City hours (7:00am - 4:00pm) and have a city representative there at time of flushing. All hydrant leads shall be flushed a minimum of 5 minutes or until water is clear. This shall be completed after flushing main line.

H. Top of Pipe Elevations

Top of water main shall be installed with a minimum depth of 7 1/2 feet from final grade to top of pipe.

724-P02 ADJUST GATE VALVES:

All gate valve boxes shall be adjusted to 1/4" below finished grade. The adjustment of existing gate valves shall be paid under "Adjust Gate Valve Box" item. This shall include any additional materials for bringing box to final grade. Newly installed gate valves shall be adjusted to final grade and paid under "Gate Valve & Box 8In" item.

724-P03 ABANDON GATE VALVES:

Abandoning existing gate valves along the water main abandonment shall be paid for under the "Remove Gate Valve Box" item. This shall involve removing the top section of the cast iron valve box and filling the valve box with controlled density fill or sand.

724-P04 REMOVE GATE VALVES:

Removing existing gate valves shall be paid for under the "Remove Gate Valve & Box" item. This shall involve removing the existing valve and box from the site and disposing of the valve and box.

724-P05 REMOVE WATERMAIN FITTINGS:

Removing existing watermain fittings shall be incidental to the "Removal Of Pipe All Types And Sizes" item.

724-P06 CONNECTION TO EXISTING MAIN:

All connections to existing water main shall involve cutting into the existing main and shall utilize Romac Macro couplings or gate valve where shown and shall be included in "Connection to Existing Main" item.

740-P01 POLYSTYRENE INSULATION BOARD:

Provide insulation per general details. Incidental to storm sewer item.

748-P01 EXPANSION JOINTS:

Dowel bars installed at expansion joints in the curb and gutter will not be paid for separately, but shall be included in the price bid for "Curb and Gutter - Type I".

748-P02 CURB AND GUTTER:

The gutter section shall match P.C.C. pavement thickness in P.C.C. pavement areas, otherwise follow detail. It shall have a 6" curb and 24" gutter. If sidewalk or median abuts, #4 x 1'-0" deformed tie bars @ 24" o.c. shall be drilled into the curb back to tie into the sidewalk or use ledge poured integral with the curb and gutter. Care should be taken not to spill off the curb or drill through. Any damage shall be repaired at the contractor's expense.

748-P03 CURB AND GUTTER:

Curb and gutter of any type shall be paid for under the "Curb & Gutter-Type I" item. Curb type will vary in curb ramp and driveway areas. See details.

750-P01 SIDEWALK/MULTI-USE PATH:

Sidewalk shall be a minimum of 4" thick, multi-use path shall be a minimum of 5" thick. Contraction joints shall be constructed every 4' on sidewalk, 5' on multi-use path. 1/2" expansion joints shall be placed at intervals not to exceed 200 feet at changes in alignment and at the top of ADA ramps. All sidewalk/multi-use path shall have #4 deformed reinforcing bars placed 24" o.c. both ways. The bar shall be six (6) inches shorter than the width of the slab and placed accurately at 1/2 the depth of the slab. Plastic chairs will be used. Sand bedding will be placed below all concrete per D-750-2. All longitudinal and transverse joints shall be sawed. All concrete abutting curb & gutter or other sidewalk/multi-use path shall be tied with #4 deformed bars at 24" o.c. except at expansion joints where 1/2" smooth dowels at 24" o.c. shall be used. All items listed shall be part of "Sidewalk Concrete 4in." and "Sidewalk Concrete 5in." item. When sidewalk/multi-use path and curb abuts, do not use expansion joint between curb & walk/path (as shown on D-750-2) and tie into curb with #4 x 12" dowels at 24" o.c. spacing.

750-P02 CURB RAMPS:

Curb ramps shall be a minimum of 6" thick, otherwise shall follow 750-P01 and shall be paid under "Sidewalk Concrete 6in." item.

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750-PO3 CLASS OF CONCRETE:

The class of concrete used for curb and gutter and concrete flatwork shall be AE with the option for the contractor to use coarse aggregate sizes No. 3, 4, or 5 as defined in Section 816.02 of the NDDOT Standard Specifications.

750-PO4 DECORATIVE PAVED BOULEVARD:

The decorative paved boulevard shall be constructed as shown on the proposed typical sections and plan sheets. The concrete shall be constructed in accordance with Section 750 of the Standard Specifications. The color pigments should meet the requirements of ASTM C979, Specification for Pigments for Integrally Colored Concrete. The pigment shall be Marigold by Solomon Colors, Inc., telephone number 1-800-624-0261 or an approved equal. Approved equals are Harvest Gold by Davis Colors, telephone number 1-800-356-4848 or R/M - St. Simon's Tan by Southern Color N.A. Inc., telephone number 1-800-297-3063. If an approved equal is chosen, the contractor shall provide a mock up sample to be approved by the Engineer prior to installation. The pigment shall be added as recommended by the manufacturer at a rate of 4.5 lbs per 100 lbs of cementitious material. Sandblasting shall be done to clean any colored concrete from the adjacent pavements.

All longitudinal and transverse joints shall be constructed to match joints in existing concrete pavement. Joints shall be sawed or tooled in a timely manner to prevent any uncontrolled random cracking. If random cracking occurs, the contractor shall be required to remove and replace all damaged panels at his own expense. Joint sealant is not required for the areas of colored concrete pavement.

For curing, the contractor shall use a clear, all resin-based curing compound within 24 hours. Sealant shall be used after 14 days with a maximum of 30 days.

All costs for the labor, equipment, and material necessary to construct the reinforced colored concrete pavement shall be included in the price bid for "Decorative Paved Boulevard".

750-PO5 DRIVEWAYS:

All driveways shall be reinforced with #4 bars @ 24" o.c. placed middepth in the slab. All driveways shall be tied to existing curb and gutter or existing sidewalk by use of keyways or #4 X 12" dowel bars placed middepth @ 24" o.c. Expansion joints with smooth dowel bars shall be placed at the top of each driveway when abutting existing concrete and on either side of the crossing plate. The concrete shall be a minimum 6" thickness for residential driveways, 7" thickness for commercial driveways. All above is included in "Driveway Concrete" item regardless of concrete thickness.

750-PO6 TIEBARS AND REINFORCEMENT MATS:

Tiebars and reinforcement mats that are installed shall be held in specified position parallel to the slab surface with transverse bars perpendicular to the centerline by metal or plastic support devices. These devices shall be securely staked to the subbase or provide adequate stability by providing an adequate base. These devices shall hold the tiebars and reinforcement mats at the correct spacing, alignment, and elevation. All rebar shall be placed with a tolerance of 1/4" inch vertically with respect to middepth of the concrete slab. Tiebars shall be placed at the bottom of all ADA ramps where they abut curb and gutter per details. All costs to be included in the appropriate bid item.

752-PO1 SAFETY FENCE:

Where excavations or open pits are to remain unbackfilled overnight, the contractor will be required to encircle the open area by a standard 4' high, orange safety fence, or equal-type fencing. 200 lf was estimated for this application. Other safety fence shall also be installed

per traffic control sheets. Some other fence may be required as directed by the engineer. All payment shall be under "Safety Fence" item. Safety fence shall be of the heavy-duty type. Tensor Corporation No. US405C or equal.

754-PO1 POLE/STANDARD MOUNTED SIGNS:

Signs listed as Light Standard Mounted, Pole Mounted, or Signal Pole Mounted shall be mounted with 2 stainless steel adjustable bands with stainless steel bolts/nuts such as "Band-Its" or equal. This shall be included in "Flat Sheet For Signs-Type IV Refl. Sheeting" item.

754-PO2 PEDESTRIAN CROSSING SIGNS:

The pedestrian crossing signs shall have a fluorescent yellow green background with black letters and border. The signs shall be furnished with sheeting consisting of prismatic lenses formed in a transparent synthetic resin, sealed, and backed with an aggressive pressure sensitive adhesive protected by a removable liner. The sheeting shall have a smooth surface with a distinctive interlocking diamond seal pattern and orientation marks visible on their face. The cost for furnishing the fluorescent yellow green background shall not be bid separately but shall be included in the price bid for the item "Flat Sheet For Signs-Type IV Refl Sheeting."

754-PO3 REMOVE AND RESET SIGNS:

Sign assemblies shown for resetting shall be paid for under the "Reset Sign Panel" and "Reset Sign Support" items. This includes taking care to not damage the sign post, anchor, and sign during removal, storage, and resetting. Sign assemblies to be removed but not reset shall no be paid for separately and the cost connected with this work shall be included in the price bid for other items.

754-PO4 SIGNS:

All signs and supports removed from the project, which will not be reset, shall become the property of the City of West Fargo.

762-020 PREFORMED PATTERNED PAVEMENT MARKING FILM:

The contractor shall provide Preformed Patterned Pavement Marking Film for longitudinal lines and messages and Plastic Pavement Marking Film for transverse lines. These materials shall be measured and paid for as "Preformed Patterned Pavement Marking--Lines or Message."

762-PO1 MARKINGS:

All pavement markings shall be preformed patterned extended season markings. Markings shall be grooved into pavement per 762.04 B.6 of the NDDOT Standard Specifications. Included in the pavement marking item shall be any preparatory work (i.e. brooming, blasting, grinding, grooving, and compressed air-blowing pavement) and traffic control necessary for the installation. Pavement markings shall be installed within 7 days of completion of paving operations.

770-PO1 LIGHTING STANDARDS:

Standards as furnished and installed by the contractor shall be a 16' high, one-piece construction, aluminum pole. The pole shall have a fluted shaft, with a classically curved base design. The base and anchor bolt cover material shall be heavy wall cast aluminum. The shaft material shall be extruded aluminum. All hardware shall be tamper resistant stainless steel. Anchor bolts shall be hot dipped galvanized with galvanized steel leveling plate.

The base diameter shall be as specified by the manufacturer. The pole shaft shall have a 5" outside diameter with a 3" diameter tenon at the top for luminaire mounting.

The pole shall be provided with four 3/4" diameter by 24" long L-type anchor bolts with (2) nuts, lock washer, and (2) flat washers to be installed on a bolt circle specified by the manufacturer. An oversized handhole (6" wide at top, 7.625" wide at bottom x 7.75" high) handhole shall be provided in the base for wiring access. A grounding screw shall be provided inside the base opposite the door for easy access. Pole finish shall be black enamel. The pole shall be a Holophane CH16F5/16-CA/BK Charleston Series. Leveling nuts shall be provided at the base of each pole.

770-PO2 LUMINAIRES:

The luminaire shall consist of three main components, an LED driver, a reflector with socket, and a prismatic glass optical assembly.

Sternberg LED Main Street Series MS805BLED without spikes. The LED source shall have a 4ARC45T3-CG series, 66 watt, 240 volt light source. It shall have a black finish, clear tempered glass refractor, LED roof mounted optics, 3" post fitter to fit specified Holophane pole, cast aluminum spiked finial, 10KV surge protection module, and provide Type III light distribution per the IESNA classifications. The LED driver shall be quick disconnect type and use high output, high brightness LED's.

All luminaires shall be paid for under the "LED Luminaire-100 Watt" item.

770-PO3 STREET LIGHT LOCATIONS:

All street light locations shall be field verified with field engineer prior to actual rough-in.

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770-P04 CABLE AND CONDUIT:

Electrical contractor to provide 30" deep trench or directional boring methods where required, backfill & compaction. Contractor shall use directional boring methods to install conduit under existing hard surfaces to remain. Electrical contractor shall also furnish & install 2" innerduct raceway, 2#6 AWG USE Cu. & #6 Grd. (typical). Route all trenches parallel to adjacent curb at an approximate distance of 24" from closest outside edge. The 2" innerduct raceway shall be paid for under the "2IN Diameter Rigid Conduit" item regardless of installation method (i.e. trench or bore) and the cabling shall be paid for under the "Underground Conductor No6-Type RHW" items.

770-P05 LIGHTING UNIT BASES:

Electrical contractor shall provide lighting unit base, 18" diameter sono-tube, conduits, conductors, ground rod, concrete, anchor bolts, reinforcing iron (cage), etc. per general details. Drilling of hole for concrete bases shall also be provided by electrical contractor. Center of concrete light base shall be 3'-0" from backside of street curb, or as staked by field engineer. Top of base shall be 3" above top of adjacent curb. Typical for all concrete bases. These shall be paid for under "Concrete Foundation-Highway Lighting" item.

770-P06 MISCELLANEOUS:

- A. All connections within standards bases, except ground conductor, shall be watertight and suitable for continuous submersion in water. All other conductor splices shall be UL listed with sealant type connections meeting all codes for desired applications.
- B. From the fuse holder in each standard base connect conductor to the luminaire with sufficient slack for removal of fuse holder beyond handhole or transformer base opening. Install 10 amp fuses in each fuse holder for luminaire. Provide 4" long heat shrink (600 Volt AC) on each end of each fuse holder.
- C. Stub conduits 3" above the top of concrete base with bell ends and seal around conductors with duct seal.

770-P07 EXISTING FEEDPOINT:

The existing feedpoint has two spare 50A, 2 pole, 240 volt, photocell controlled contactors. The new circuits shall commence at the existing feedpoint. Connect new circuit raceways to existing stub nuts at feedpoint. Provide all connections for complete operational system. The cost for connecting to the existing feedpoint shall be included in the price bid for other items.

770-P08 REMOVE LIGHT STANDARD:

Disconnect and remove light fixture and pole. The contractor shall arrange with the local utility company to have the circuits disconnected from the source of line power. Deliver pole and fixture to City of West Fargo. Remove concrete bases. Electrical contractor shall be responsible for disposal of concrete base. This shall be paid for under the "Remove Light Standard" item.

770-P09 ELECTRICAL SYMBOLS LEGEND:

The legend for symbols used on Section 140 sheets shall be:

| ELECTRICAL SYMBOLS LEGEND | | | |
|---------------------------|---|----------|----------------------------|
| SYM.: | DESCRIPTION: | SYM.: | DESCRIPTION: |
| A X LU#1 | NEW LIGHT STANDARD, CONCRETE BASE & LED LUMINAIRE | EC | ELECTRICAL CONTRACTOR |
| — | 2" PVC CONDUCTORS | EX, EXTG | EXISTING |
| X | EXISTING LIGHTING UNIT | LU #1,A | LIGHTING UNIT NUMBER, TYPE |
| | | □ | FEED POINT |

770-P10 DAMAGES TO EXISTING:

Any damage to existing city-owned electric utilities by the contractor's operations shall be repaired at the contractor's expense. The city's electrical contractor, Wayne's Electric (701-282-3904) shall do all repair work on city-owned electric utilities and repairs must be done immediately.

894-100 RETROREFLECTIVE SHEETING:

Provide Type IV retroreflective sheeting that meets ASTM D 4956, Type IV. Provide Type XI retroreflective sheeting that meets ASTM D 4956, Type XI.

900-P01 MATERIAL TESTING - MIX DESIGNS:

The contractor shall submit to the engineer sieve analysis on all materials used for sidewalk, multi-use path, curb and gutter, street light base, and pavement concrete along with mix designs for the Concrete by an Independent Testing Laboratory. These shall be furnished for approval before construction begins and will be incidental to the project cost. Material testing shall be done in accordance with the NDDOT Field Sampling & Testing Manual's frequency schedules and standards unless otherwise noted.

990-P01 TEMPORARY ACCESS:

This lump sum item shall be payment for all material, labor, and equipment necessary to provide temporary access to Meadow Ridge 15th Block 1 Lot 2 via a 20 foot wide access road extending from the end of the 45th Street concrete stub to 55 feet to the west in existing roadbed, then north over existing sidewalk to tie in with existing driveway located on the lot. This shall also include any maintenance required to maintain good drivability of access and shall include the removal of access. It shall include the placement and removal of such items as reinforcement fabric, 12" of Class 5 gravel or crushed concrete, pipe, curb and gutter blisters, etc. Seeding is required and will be paid for under separate item. Care shall be taken to preserve existing sidewalk, however if damaged, new sidewalk will be paid under separate item. The contractor shall be responsible for maintaining access to the residences. Plans to provide access shall be submitted to the Engineer for approval before implementation. All costs to be included in the lump sum cost for the "Temporary Access" item.

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NOTES
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
GENERAL NOTES



| | | | | |
|-------|------------------|-------|-------------|-----------|
| STATE | PROJECT NO. | PCN | SECTION NO. | SHEET NO. |
| N.D. | SU-8-992(035)036 | 19892 | 6 | 8 |

ENVIRONMENTAL COMMITMENTS

ENVIRONMENTAL COMMITMENTS: The City of West Fargo, North Dakota Department of Transportation and the Federal Highway Administration have made several environmental commitments to various agencies and the public to secure approval of this project. The environmental commitments are as follows:

Based on the NEPA documentation, no additional permits or environmental commitments have been identified beyond what is covered by the NDDOT's Standard Specification of Road and Bridge Construction.

| Wetland Number | Cowardin Classification | Wetland Type | Wetland Size (acres) | Wetland Feature | USACE Jurisdictional Wetlands | Impacts to Wetlands | |
|-------------------------|-------------------------|--------------|----------------------|-----------------|-------------------------------|---------------------|-------|
| | | | | | | Temp. | Perm. |
| **NO WETLANDS PRESENT** | | | | | | | |
| TOTALS: | | | 0.00 | | | 0.00 | 0.00 |

* A wetland Jurisdictional Determination was issued by the USACE on May 15, 2013: NWO-2012-0264-BIS.

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NOTES
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
ENVIRONMENTAL COMMITMENTS

QUANTITIES



| | | | | |
|-------|------------------|-------|-------------|-----------|
| STATE | PROJECT NO. | PCN | SECTION NO. | SHEET NO. |
| N.D. | SU-8-992(035)036 | 19892 | 8 | 1 |

| SPEC | CODE | ITEM DESCRIPTION | UNIT | ROADWAY | CITY FUNDING | TOTAL QUANTITY |
|------|------|---|--------|---------|--------------|----------------|
| 103 | 0100 | CONTRACT BOND | L SUM | 1 | | 1 |
| 201 | 0370 | REMOVAL OF TREES 10IN | EA | 3 | | 3 |
| 202 | 0112 | REMOVAL OF CONCRETE | SY | 507 | | 507 |
| 202 | 0119 | SAW CONCRETE | LF | 411 | | 411 |
| 202 | 0130 | REMOVAL OF CURB & GUTTER | LF | 4,903 | | 4,903 |
| 202 | 0133 | REMOVAL OF ASPHALT SURFACING | CY | 2,030 | | 2,030 |
| 202 | 0153 | SAW BITUMINOUS SURFACING-FULL DEPTH | LF | 331 | | 331 |
| 202 | 0174 | REMOVAL OF PIPE ALL TYPES & SIZES | LF | 2,557 | 1,047 | 3,604 |
| 202 | 0210 | REMOVAL OF MANHOLES | EA | 2 | | 2 |
| 202 | 0230 | REMOVAL OF INLETS | EA | 22 | | 22 |
| 203 | 0101 | COMMON EXCAVATION-TYPE A | CY | 5,392 | | 5,392 |
| 203 | 0113 | COMMON EXCAVATION-WASTE | CY | 505 | | 505 |
| 203 | 0119 | TOPSOIL-IMPORTED | CY | 632 | | 632 |
| 230 | 0300 | SUBGRADE PREPARATION-TYPE A | STA | 25 | | 25 |
| 302 | 0121 | AGGREGATE BASE COURSE CL 5 | CY | 2,799 | | 2,799 |
| 550 | 0110 | 8IN NON-REINF CONCRETE PAVEMENT CL YE | SY | 9,208 | | 9,208 |
| 550 | 0240 | DOWELLED CONTRACTION JOINT ASSEMBLY | LF | 5,526 | | 5,526 |
| 702 | 0100 | MOBILIZATION | L SUM | 1 | | 1 |
| 704 | 1000 | TRAFFIC CONTROL SIGNS | UNIT | 2,240 | | 2,240 |
| 704 | 1052 | TYPE III BARRICADE | EA | 83 | | 83 |
| 704 | 1060 | DELINEATOR DRUMS | EA | 29 | | 29 |
| 704 | 4011 | PORTABLE CHANGEABLE MESSAGE SIGN | EA | 1 | | 1 |
| 708 | 1540 | INLET PROTECTION-SPECIAL | EA | 43 | | 43 |
| 708 | 2900 | SEEDING-HYDRO MULCH | SY | 5,160 | | 5,160 |
| 708 | 8500 | STABILIZED CONSTRUCTION ACCESS | EA | 2 | | 2 |
| 709 | 0701 | GEOTEXTILE FABRIC-TYPE R1 | SY | 11,198 | | 11,198 |
| 714 | 9720 | UNDERDRAIN PIPE PVC PERFORATED 4IN | LF | 5,092 | | 5,092 |
| 722 | 0100 | MANHOLE 48IN | EA | 13 | | 13 |
| 722 | 3510 | INLET-TYPE 2 | EA | 18 | | 18 |
| 722 | 6140 | ADJUST GATE VALVE BOX | EA | | 2 | 2 |
| 724 | 0210 | FITTINGS-DUCTILE IRON | LBS | | 506 | 506 |
| 724 | 0270 | REMOVE GATE VALVE & BOX | EA | | 3 | 3 |
| 724 | 0310 | GATE VALVE & BOX 8IN | EA | | 5 | 5 |
| 724 | 0830 | WATERMAIN 8IN PVC | LF | | 1,054 | 1,054 |
| 724 | 0944 | CONNECTION TO EXISTING MAIN | EA | | 5 | 5 |
| 724 | 7014 | REMOVE GATE VALVE BOX | EA | | 2 | 2 |
| 748 | 0140 | CURB & GUTTER-TYPE I | LF | 5,092 | | 5,092 |
| 750 | 0111 | DECORATIVE PAVED BOULEVARD | SY | 3 | | 3 |
| 750 | 0115 | SIDEWALK CONCRETE 4IN | SY | 46 | | 46 |
| 750 | 0125 | SIDEWALK CONCRETE 5IN | SY | 35 | | 35 |
| 750 | 0140 | SIDEWALK CONCRETE 6IN | SY | 96 | | 96 |
| 750 | 1000 | DRIVEWAY CONCRETE | SY | 500 | | 500 |
| 750 | 2115 | DETECTABLE WARNING PANELS | SF | 240 | | 240 |
| 752 | 0910 | SAFETY FENCE | LF | 200 | | 200 |
| 754 | 0112 | FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING | SF | 79 | | 79 |
| 754 | 0206 | STEEL GALV POSTS-TELESCOPING PERFORATED TUBE | LF | 150 | | 150 |
| 754 | 0592 | RESET SIGN PANEL | EA | 6 | | 6 |
| 754 | 0593 | RESET SIGN SUPPORT | EA | 6 | | 6 |
| 762 | 0122 | PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED) | SF | 96 | | 96 |
| 762 | 1305 | PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED | LF | 1,918 | | 1,918 |
| 762 | 1309 | PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED | LF | 250 | | 250 |
| 762 | 1325 | PREFORMED PATTERNED PVMT MK 24IN LINE-GROOVED | LF | 159 | | 159 |
| 770 | 0020 | CONCRETE FOUNDATION-HIGHWAY LIGHTING | EA | 19 | | 19 |
| 770 | 0330 | 2IN DIAMETER RIGID CONDUIT | LF | 5,085 | | 5,085 |
| 770 | 0505 | UNDERGROUND CONDUCTOR NO6-TYPE RHW | LF | 15,404 | | 15,404 |
| 770 | 4090 | ORNAMENTAL LT STD 16FT MT HT | EA | 19 | | 19 |
| 770 | 4215 | LED LUMINAIRE-100 WATT | EA | 19 | | 19 |
| 770 | 4560 | REMOVE LIGHT STANDARD | EA | 9 | | 9 |
| 990 | 0230 | TEMPORARY ACCESS | L. SUM | 1 | | 1 |

OPTION 1 - REINFORCED CONCRETE PIPE

| SPEC | CODE | ITEM DESCRIPTION | UNIT | ROADWAY | CITY FUNDING | TOTAL QUANTITY |
|------|------|-------------------------------|------|---------|--------------|----------------|
| 714 | 4092 | PIPE CONDUIT 12IN-STORM DRAIN | LF | 60 | | 60 |
| 714 | 4097 | PIPE CONDUIT 15IN-STORM DRAIN | LF | 2,542 | | 2,542 |

OPTION 2 - FLEXIBLE PIPE (METAL OR PLASTIC)

| SPEC | CODE | ITEM DESCRIPTION | UNIT | ROADWAY | CITY FUNDING | TOTAL QUANTITY |
|------|------|-------------------------------|------|---------|--------------|----------------|
| 714 | 4092 | PIPE CONDUIT 12IN-STORM DRAIN | LF | 60 | | 60 |
| 714 | 4097 | PIPE CONDUIT 15IN-STORM DRAIN | LF | 2,542 | | 2,542 |

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QUANTITIES
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
QUANTITIES

BASIS OF ESTIMATE



| | | | | |
|-------|------------------|-------|-------------|-----------|
| STATE | PROJECT NO. | PCN | SECTION NO. | SHEET NO. |
| N.D. | SU-8-992(035)036 | 19892 | 10 | 1 |

Asphalt Removal

| Begin Station | End Station | Avg. Depth of Mill (in.) | Volume Of Mill (yd³) |
|---------------|-------------|--------------------------|----------------------|
| 0+00 | 8+00 | 7 | 580 |
| 8+00 | 16+00 | 7 | 689 |
| 16+00 | 24+00 | 6.5 | 637 |
| 24+00 | 28+00 | 5 | 124 |
| Total | | | 2,030 |

- Asphalt removal depths based on pavement coring information provided by Braun Intertec in a letter dated July 31, 2013 and titled "7th Avenue Pavement Coring." See Section 4 sheets for core locations.

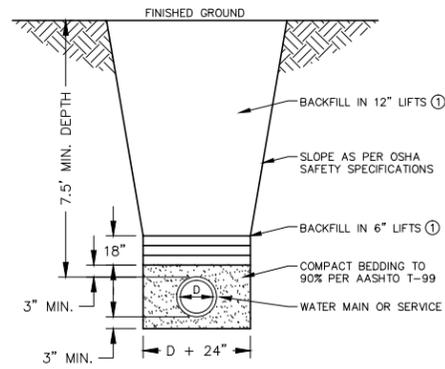
Earthwork Items

| Begin Station | End Station | Common Excavation-Waste (CY) | Common Excavation-Type A (CY) | Embankment (CY) | Subgrade Preparation-Type A (SY) | Topsoil-Imported (CY) |
|---------------|-------------|------------------------------|-------------------------------|-----------------|----------------------------------|-----------------------|
| 0+00 | 4+00 | 150 | 596 (P) | 73 (P) | 1,297 | 75 |
| 4+00 | 8+00 | | 918 (P) | 116 (P) | 1,882 | 107 |
| 8+00 | 12+00 | 171 | 735 (P) | 125 (P) | 1,753 | 105 |
| 12+00 | 16+00 | | 930 (P) | 96 (P) | 1,645 | 122 |
| 16+00 | 20+00 | 148 | 975 (P) | 72 (P) | 1,921 | 84 |
| 20+00 | 24+00 | | 886 (P) | 97 (P) | 1,861 | 91 |
| 24+00 | 28+00 | 36 | 352 (P) | 69 (P) | 839 | 48 |
| TOTAL | | 505 | 5,392 (P) | 648 (P) | 9,337 | 632 |

- All quantities are in place volumes and shall be paid for as such. No allowance for shrinkage has been made. Average end area method was used.
- (P) indicates plan quantity. Volume is to be paid at contract quantity unless profile grade is changed by the Engineer. Measurement is in place cubic yards.
- Topsoil stripping ("Common Excavation-Waste") is calculated at 4" thick.
- Excavated clay material shall be used for embankment in roadway section. Embankment shall be incidental to "Common Excavation-Type A" item.
- Excavation for sidewalks, paths, or curb ramps shall be included in respective sidewalk item.
- Upon completion of the curb and gutter installation, 4" minimum of imported topsoil shall be applied on the disturbed areas. See Section 60 sheets for approximate locations.
- All excess excavated material not utilized on site shall become property of the contractor and shall be removed from the site. See Section 6 sheets.

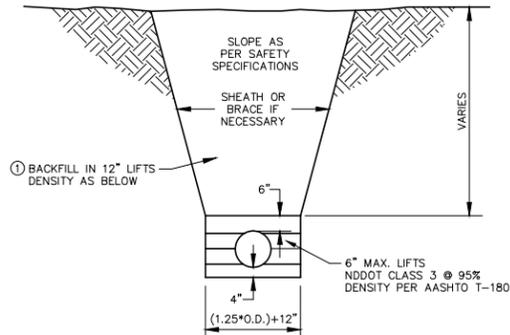
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BASIS OF ESTIMATE
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
BASIS OF ESTIMATE



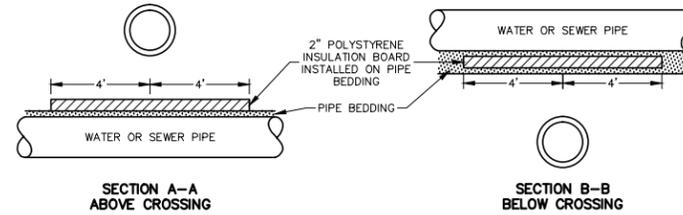
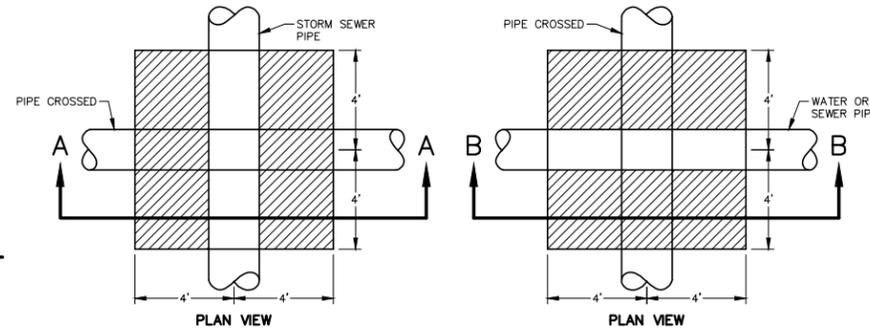
① COMPACT TO 95% MINIMUM STANDARD PROCTOR DENSITY.

WATER MAIN OR SERVICE TRENCH
NO SCALE



① DENSITIES (AS PERCENTAGES OF AASHTO STANDARD PROCTOR) SHALL BE 95%

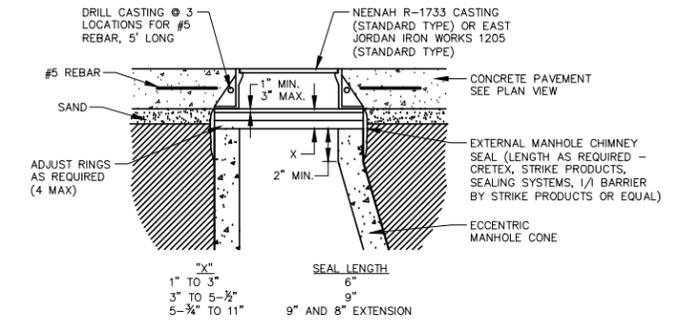
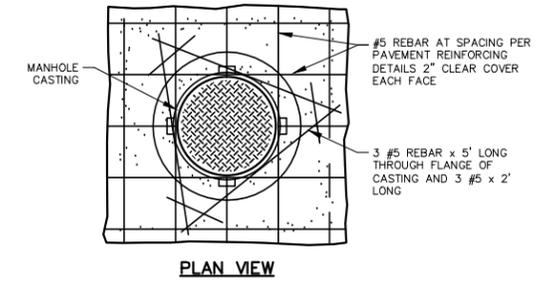
FLEXIBLE PIPE STORM SEWER TRENCH DETAIL
NO SCALE PER ASTM 2321



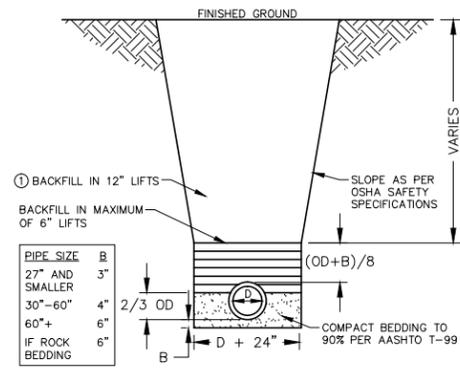
NOTES:

1. THIS DETAIL APPLIES TO BOTH MAINS & SERVICES WHERE CROSSING IS WITHIN 24".
2. IF AMOUNT OF CLEAR DISTANCE BETWEEN PIPES IS LESS THAN 1.0', 2 LAYERS OF 2" POLYSTYRENE INSULATION BOARD SHALL BE USED.
3. WATER SERVICES MAY BE INSULATED WITH AN APPROVED ENCASUREMENT INSULATION IN LIEU OF DETAIL.

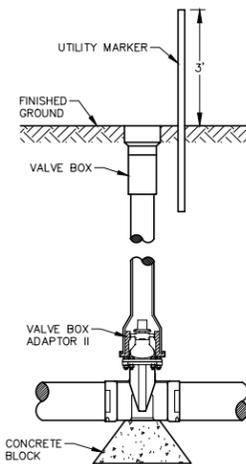
INSULATION FOR STORM CROSSING
NO SCALE



FLOATING MANHOLE CASTING DETAIL
NO SCALE



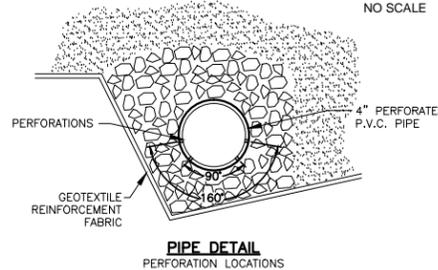
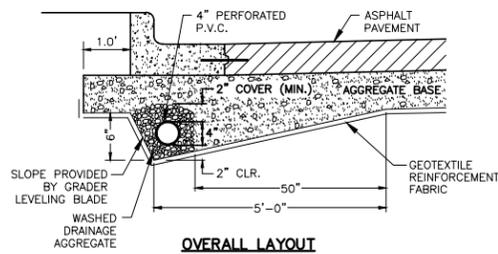
R.C.P. STORM SEWER TRENCH DETAIL
NO SCALE



NOTES:

1. WRAP ALL UNDERGROUND METAL ITEMS WITH 8 MIL POLYETHYLENE PLASTIC.
2. VALVE AND BOX SHALL BE BACKFILLED WITH GRANULAR MATERIAL TO TOP COMPACTED TO 95% DENSITY.
3. PROVIDE RISER FOR NUT ON ANY VALVE OVER 7-1/2' DEEP.
4. TOP OF VALVE BOX SHALL BE SET TO PROVIDE 12" OF UPWARD ADJUSTMENT.
5. A TEMPORARY UTILITY MARKER SHALL BE INSTALLED NEXT TO THE VALVE BOX. A PERMANENT UTILITY MARKER SHALL REPLACE THE TEMPORARY UTILITY MARKER ONLY AT VALVES IN OPEN FIELDS AFTER ALL CONSTRUCTION WORK IS COMPLETED.

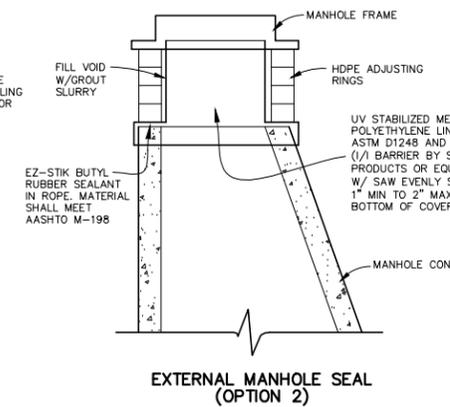
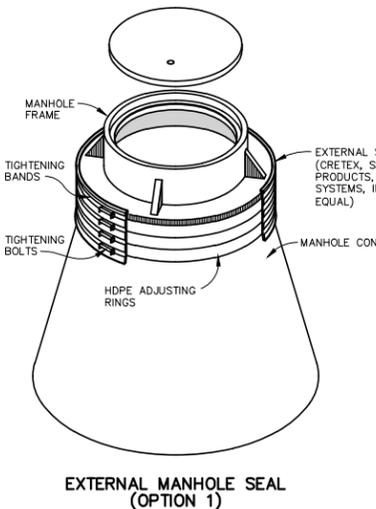
VALVE AND BOX
NO SCALE



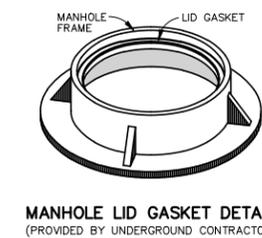
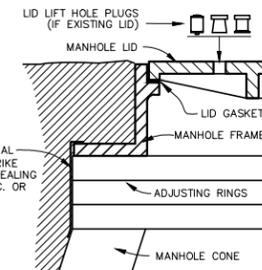
NOTES:

1. KNOCKOUTS SHALL BE PROVIDED IN INLETS TO ACCOMMODATE 4" PVC PERFORATED PIPE. COST OF KNOCKOUTS AND GROUTING IN PIPE SHALL BE INCLUDED IN THE PRICE BID FOR PERFORATED PVC PIPE.
2. NO BENDS OR FITTINGS SHALL BE USED UNLESS APPROVED BY THE ENGINEER. IF USED, SOLVENT WELD FITTINGS SHALL BE USED.
3. THE PIPE SHALL BE POLYVINYL CHLORIDE SEWER PIPE WITH SOLVENT CEMENTED JOINTS AS SPECIFIED IN ASTM SPEC. NO. 3034.
4. PERFORATIONS SHALL BE CIRCULAR AND 1/4" ± 1/16" IN DIAMETER. THEY SHOULD BE ARRANGED IN ROWS PARALLEL TO THE AXIS OF THE PIPE AND SHALL BE SPACED APPROXIMATELY 3" CENTER TO CENTER ALONG THE ROWS. THE SPIGOT END OF THE PIPE SHALL BE UNPERFORATED FOR A LENGTH EQUAL TO THE DEPTH OF THE SOCKET. THE PLACEMENT AND TOTAL NUMBERS OF THE ROWS SHALL BE AS SHOWN ABOVE WITH AN ALLOWABLE TOLERANCE OF ±10". THE SPIGOT AND BELL END SHALL BE UNPERFORATED FOR A LENGTH EQUAL TO THE DEPTH OF THE SPIGOT.
5. THE NOMINAL LAYING LENGTH OF THE PIPE SHALL BE 12.5'. SHORTER OR LONGER LAYING LENGTHS SHALL BE PROVIDED IF REQUIRED.
6. PIPE SIZE: 4"
7. ROWS OF PERFORATIONS: 4
8. PERFORATIONS PER ROW: 48 (FOR 12.5' PIPE LAYING LENGTHS)
9. DRAINAGE AGGREGATE SHALL BE WASHED CLEAN PRIOR TO USE. COST FOR DRAINAGE AGGREGATE MANUFACTURE, DELIVERY, AND PLACEMENT SHALL BE INCIDENTAL TO THE PERFORATED PIPE ITEM. THE ROCK SHALL BE 3/8" TO 3/4" ROCK.
10. 4" PERFORATED PIPE SHALL ALWAYS TERMINATE INSIDE OF INLETS OR MANHOLES AT LEAST 1" WITH A MAXIMUM OF 3" AND SHALL BE GROUTED INSIDE AND OUTSIDE OF BARREL.
11. PERFORATIONS SHALL BE PLACED FACING DOWN.
12. COST FOR EXTRA CLASS 5 GRAVEL IN THE EDGE DRAIN AREA SHALL BE PAID FOR USING PLAN QUANTITY BASED ON THE FOLLOWING CALCULATION: AREA OF TRIANGLE = (LENGTH OF PIPE X 50' X 6")/2.

PERFORATED PIPE DETAIL
NO SCALE

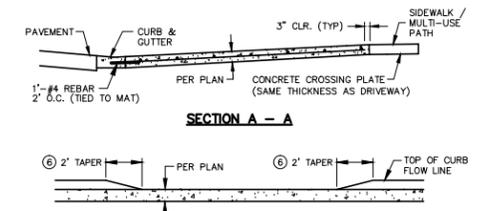
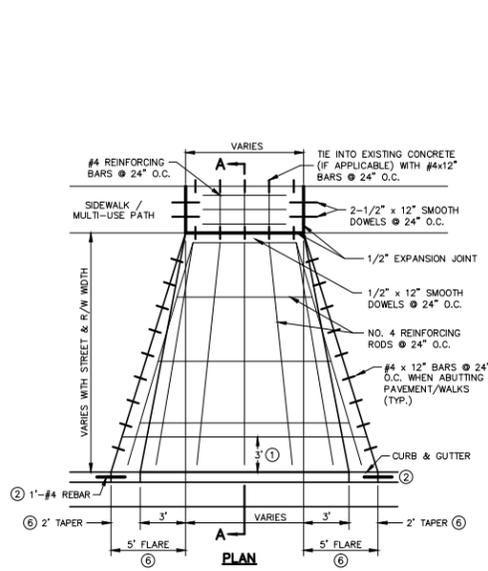


MANHOLE SEALS DETAIL
NO SCALE



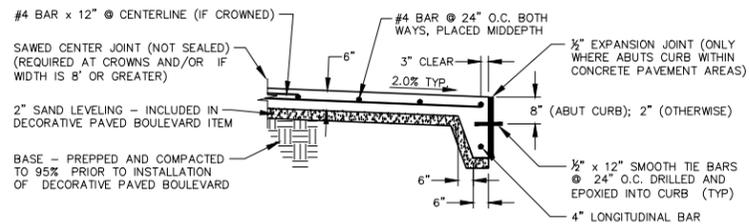
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GENERAL DETAILS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
GENERAL DETAILS



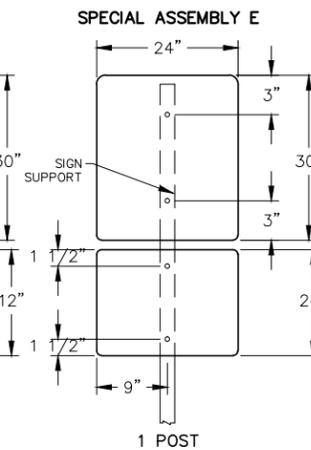
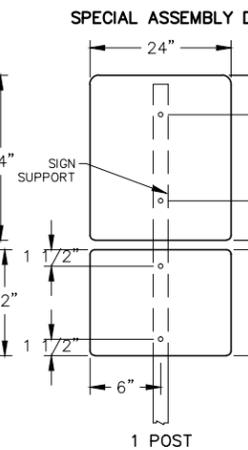
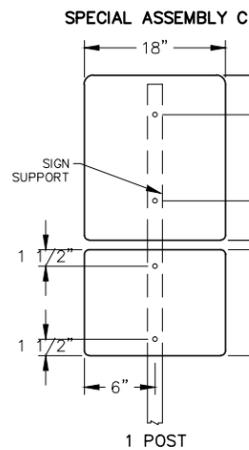
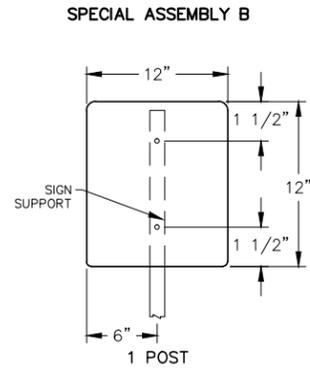
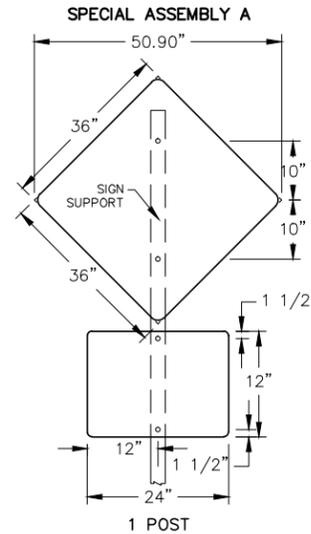
NOTES:

- SAW CUT, REMOVE AND REPLACE WHEN CURB & GUTTER IS BEING INSTALLED WITH EXISTING DRIVEWAY.
- WHEN DRIVEWAY IS BEING INSTALLED WITH EXISTING CURB AND GUTTER, THE CURB AND GUTTER IS REMOVED AND REPLACED. NO INTEGRAL DRIVEWAY/CURB & GUTTER POURS SHALL BE ALLOWED.
- THE DRIVEWAY SHALL BE TIED TO THE CURB AND GUTTER WITH #4 REBAR 12" LONG 24" ON CENTER.
- CHAIRS OR APPROVED SUPPORT DEVICES SHALL BE USED TO SUPPORT REINFORCEMENT BARS.
- SMOOTH DOWELS SHALL NOT BE TIED TO REINFORCING MATS.
- 60" TAPER WHEN SIDES OF DRIVEWAY ABUT PAVEMENTS/WALKS



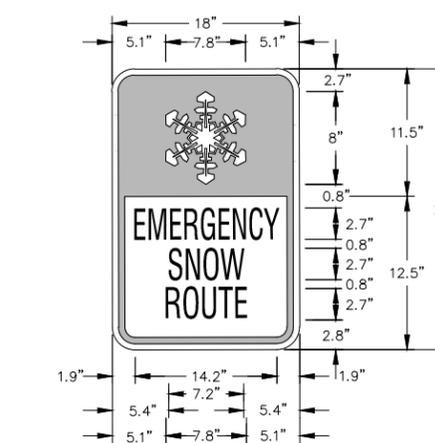
DECORATIVE PAVED BOULEVARD DETAIL
NO SCALE

- NOTE:
- SAWING SHALL BE PER SIDEWALK DETAILS AND MATCH CURB & GUTTER JOINTS.
 - SLOPE MAY NEED TO BE ADJUSTED BASED ON ADJACENT CURB & GUTTER HEIGHTS, I.E. CROWN MAY MOVE OR BE NON EXISTENT. PATTERN SHALL BE COBBLESTONE RANDOM INTERLOCKING PATTERN BY SCOFIELD SYSTEMS OR EQUAL AND COLOR SHALL BE MARIGOLD BY SOLOMON COLORS OR EQUAL.
 - THICKENED EDGE ONLY REQUIRED WHEN ABUTS CURB & GUTTER.
 - CURING SHALL BE DONE WITH A CLEAR (NON-PIGMENTED) PRODUCT WITHIN 24 HOURS. SEALANT SHALL BE USED AFTER 14 DAYS WITH A MAXIMUM OF 30 DAYS.

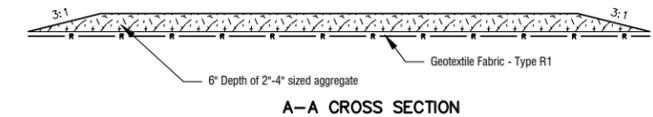
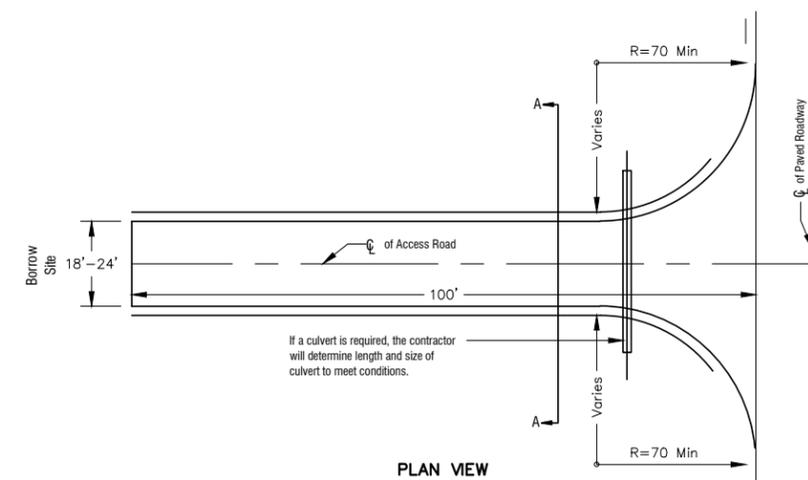


SPECIAL SIGN ASSEMBLY DETAILS
NO SCALE

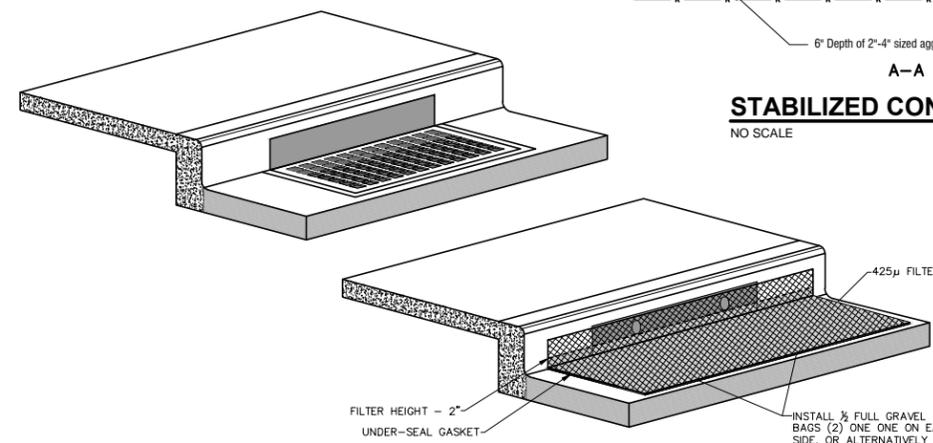
- NOTES:
- SEE STANDARD D-754-24 FOR MOUNTING DETAILS.
 - THE MINIMUM SIGN BACKING MATERIAL THICKNESS SHALL BE 0.100 INCH.
 - PERFORATED SQUARE TUBE STRINGER SHALL BE 1 1/2" x 1 1/2".
 - ALL HOLES SHALL BE PUNCHED ROUND FOR 3/8" BOLT.
 - SIGNS SHALL UTILIZE CLEARVIEW FONT.



R7-203 (SPECIAL) SIGN LAYOUT
NO SCALE



STABILIZED CONSTRUCTION ACCESS
NO SCALE

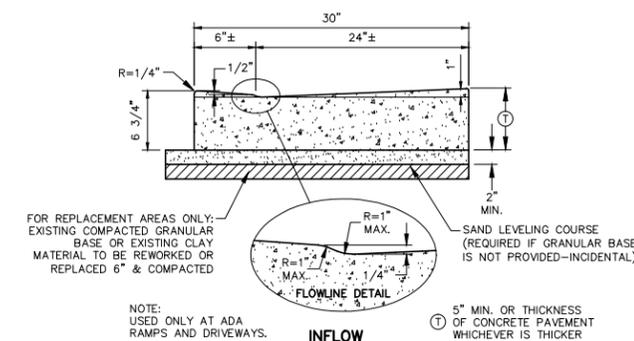


INLET PROTECTION DEVICE
NO SCALE

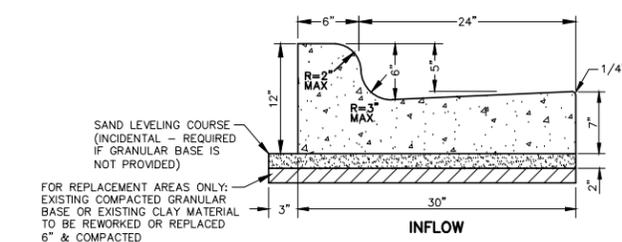
- NOTES:
- INLET PROTECTION SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE OWNER.
 - MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE MINNESOTA DEPARTMENT OF TRANSPORTATION'S EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.
 - WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

INSTALLATION NOTES:

- PLACE DEVICE TIGHTLY AGAINST DRAIN OPENING AND COVER ENTIRE GRATE. THE DEVICE SHOULD EXTEND AT LEAST 2 INCHES PAST GRATE TOWARD STREET.
- OVERLAP THE SEGMENTS AT LONGER OPENINGS.
- ANCHOR THE DEVICE SO THAT WATER CANNOT FLOW BEHIND IT.



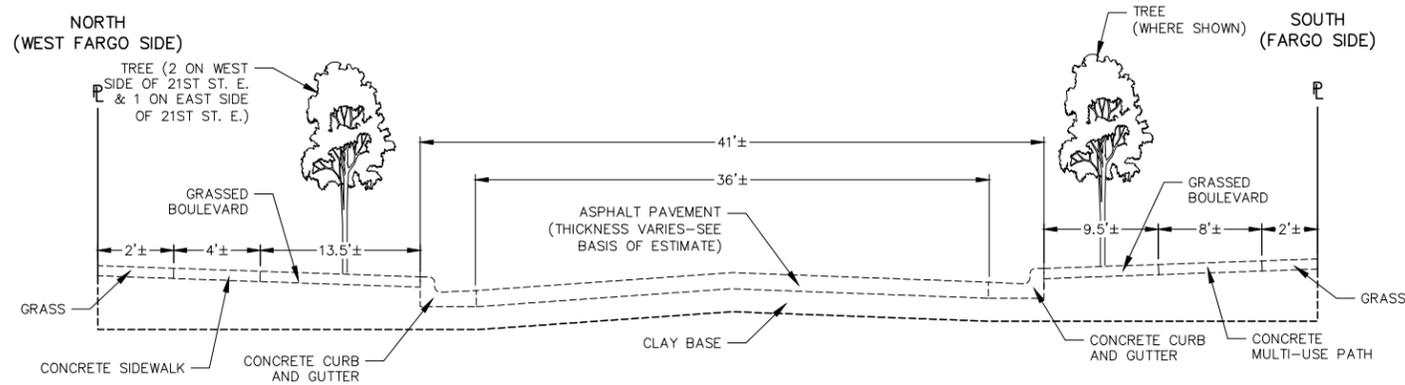
KNOCKDOWN CURB & GUTTER
NO SCALE



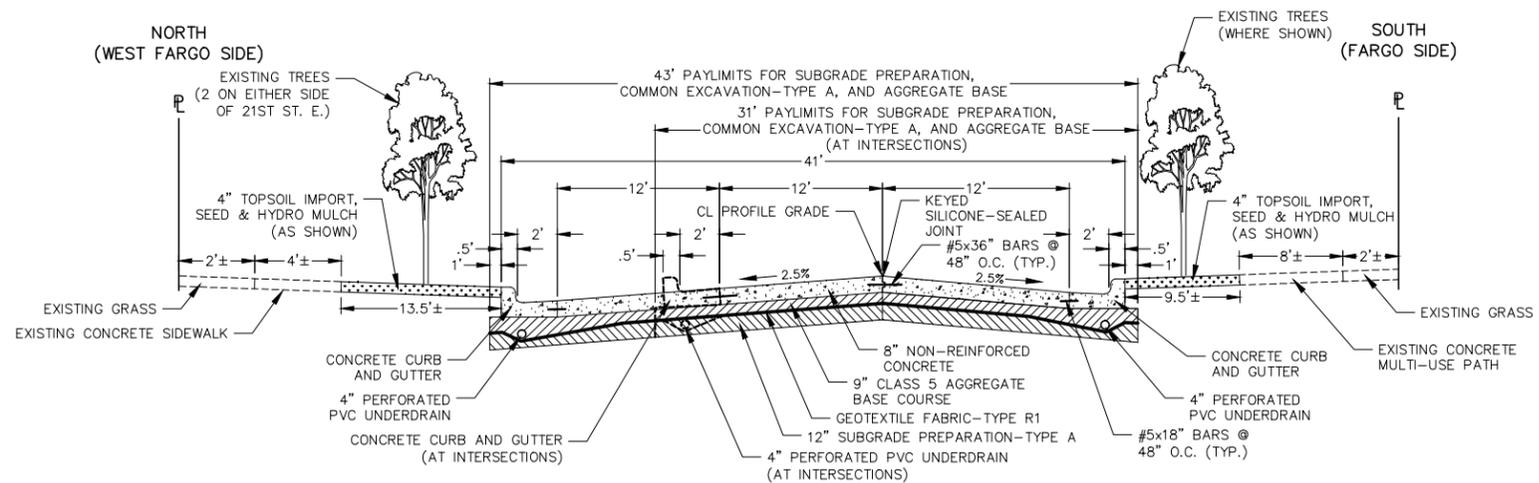
SEMI-ROLLED "HIGH BACK" CURB & GUTTER DETAIL
NO SCALE

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GENERAL DETAILS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
GENERAL DETAILS



EXISTING URBAN ASPHALT STREET SECTION DETAIL
NO SCALE

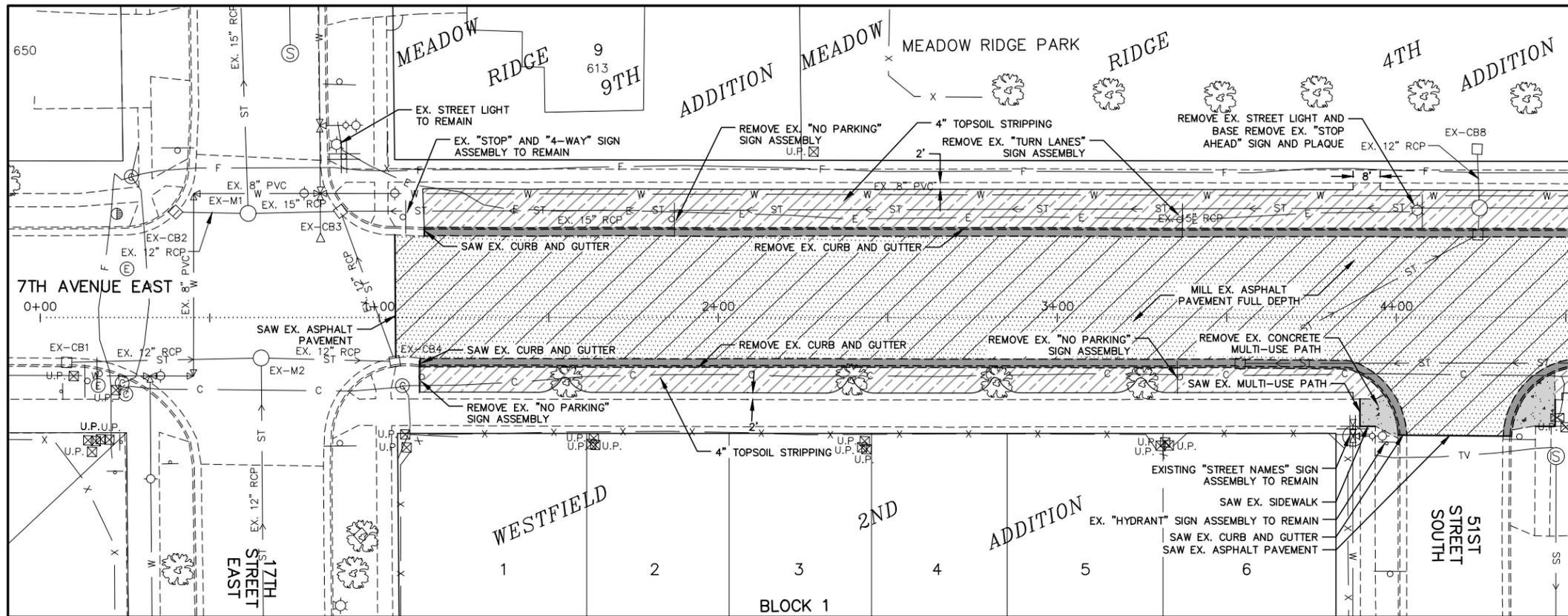


NOTE:
1. IF INTEGRAL CURB & GUTTER IS USED, #5x18" TIE BARS AND ASSOCIATED LONGITUDINAL JOINT MAY BE ELIMINATED.

PROPOSED 41' (OFFSET) URBAN STREET SECTION - CONCRETE
NO SCALE

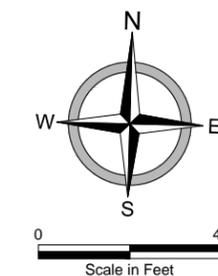
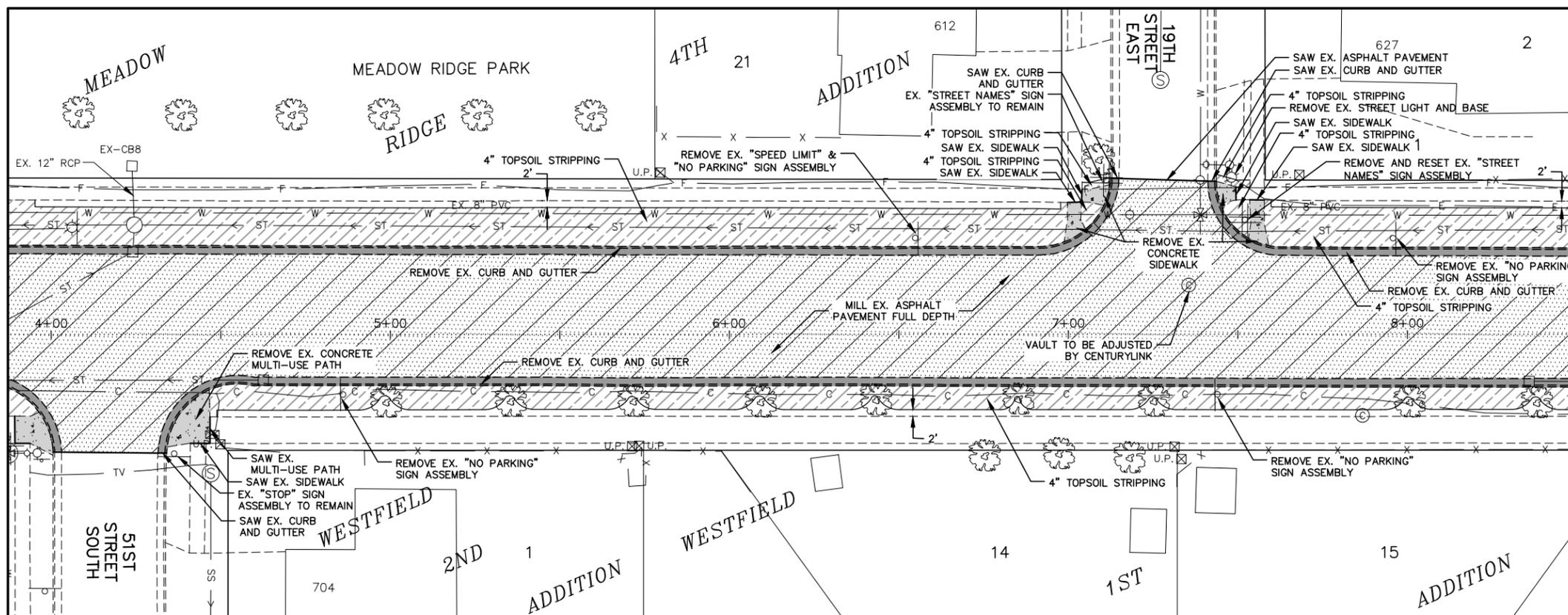
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TYPICAL SECTIONS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
TYPICAL SECTIONS



Estimate of Quantities:

| | |
|---|----------|
| REMOVAL OF CONCRETE | 202-0112 |
| 3+89 - 24' Rt to 4+01 - 35' Rt | 10 SY |
| 4+34 - 33' Rt to 4+47 - 32' Rt | 15 SY |
| 6+99 - 27' Lt to 7+05 - 31' Rt | 5 SY |
| 7+04 - 39' Lt to 7+12 - 44' Lt | 4 SY |
| 7+44 - 45' Lt to 7+49 - 40' Lt | 3 SY |
| 7+53 - 28' Lt to 7+59 - 26' Lt | 6 SY |
| SAW CONCRETE | 202-0119 |
| 3+89 - 24' Rt to 3+89 - 32' Rt | 8 LF |
| 3+89 - 32' Rt to 3+93 - 32' Rt | 4 LF |
| 4+47 - 24' Rt to 4+47 - 32' Rt | 8 LF |
| 4+43 - 32' Rt to 4+47 - 32' Rt | 4 LF |
| 7+00 - 39' Lt to 7+04 - 39' Lt | 4 LF |
| 7+04 - 39' Lt to 7+04 - 43' Lt | 4 LF |
| 7+49 - 40' Lt to 7+49 - 44' Lt | 4 LF |
| 7+54 - 40' Lt to 7+58 - 40' Lt | 4 LF |
| 1+13 - 24' Lt to 1+13 - 26.5' Lt | 2.5 LF |
| 1+12 - 12' Rt to 1+12 - 14.5' Rt | 2.5 LF |
| 4+00 - 35' Rt to 4+02 - 35' Rt | 2 LF |
| 4+31 - 35' Rt to 4+34 - 35' Rt | 3 LF |
| 7+12 - 46' Lt to 7+14 - 46' Lt | 2 LF |
| 7+41 - 45' Lt to 7+44 - 45' Lt | 3 LF |
| REMOVAL OF CURB & GUTTER | 202-0130 |
| 1+13 - 24' Lt to 7+15 - 46' Lt | 612 LF |
| 1+12 - 12' Rt to 4+03 - 34' Rt | 302 LF |
| 7+41 - 45' Lt to 8+00 - 23' Lt | 68 LF |
| 4+32 - 35' Rt to 8+00 - 13' Rt | 378 LF |
| REMOVAL OF ASPHALT SURFACING | 202-0133 |
| 1+05 to 8+00 | 580 CY |
| SAW BITUMINOUS ASPHALT SURFACING | 202-0153 |
| 1+05 - 24' Lt to 12' Rt | 36 LF |
| 4+03 - 34' Rt to 4+31 - 34' Rt | 28 LF |
| 7+15 - 45' Lt to 7+41 - 45' Lt | 26 LF |
| COMMON EXCAVATION-WASTE | 203-0113 |
| 1+05 to 8+00 | 150 CY |
| REMOVE LIGHT STANDARD | 770-4560 |
| 4+06 - 32' Lt | 1 EA |
| 7+48 - 46' Lt | 1 EA |



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REMOVALS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
REMOVALS - STA: 0+00 - 8+00

Estimate of Quantities:

| REMOVAL OF CONCRETE | 202-0112 |
|----------------------------------|----------|
| 16+32 - 26' Lt to 16+39 - 31' Lt | 5 SY |
| 16+38 - 37' Lt to 16+44 - 42' Lt | 3 SY |
| 16+76 - 43' Lt to 16+84 - 38' Lt | 4 SY |
| 16+82 - 30' Lt to 16+88 - 26' Lt | 5 SY |
| 16+38 - 18' Rt to 16+48 - 33' Rt | 11 SY |
| 16+78 - 32' Rt to 16+88 - 25' Rt | 9 SY |
| 18+66 - 24' Lt to 18+90 - 24' Lt | 31 SY |
| 19+16 - 24' Rt to 19+51 - 24' Rt | 84 SY |
| 20+62 - 37' Lt to 20+68 - 42' Lt | 3 SY |
| 20+99 - 42' Lt to 21+04 - 37' Lt | 3 SY |
| 22+39 - 15' Rt to 22+98 - 15' Rt | 73 SY |

| SAW CONCRETE | 202-0119 |
|----------------------------------|----------|
| 16+34 - 37' Lt to 16+38 - 37' Lt | 4 LF |
| 16+38 - 37' Lt to 16+38 - 41' Lt | 4 LF |
| 16+84 - 37' Lt to 16+84 - 41' Lt | 4 LF |
| 16+84 - 37' Lt to 16+88 - 37' Lt | 4 LF |
| 18+69 - 37' Lt to 18+87 - 37' Lt | 18 LF |
| 16+36 - 25' Rt to 16+39 - 25' Rt | 3 LF |
| 16+39 - 25' Rt to 16+39 - 33' Rt | 8 LF |
| 16+39 - 33' Rt to 16+43 - 33' Rt | 4 LF |
| 16+88 - 25' Rt to 16+88 - 33' Rt | 8 LF |
| 19+18 - 34' Rt to 19+64 - 34' Rt | 46 LF |
| 20+62 - 37' Lt to 20+62 - 41' Lt | 4 LF |
| 21+04 - 37' Lt to 21+04 - 41' Lt | 4 LF |
| 22+53 - 34' Rt to 22+98 - 34' Rt | 45 LF |
| 16+45 - 54' Lt to 16+47 - 54' Lt | 2 LF |
| 16+73 - 54' Lt to 16+76 - 54' Lt | 3 LF |
| 16+48 - 34' Rt to 16+50 - 34' Rt | 2 LF |
| 16+75 - 34' Rt to 16+78 - 34' Rt | 3 LF |
| 20+68 - 52' Lt to 20+70 - 52' Lt | 2 LF |
| 20+96 - 52' Lt to 20+99 - 52' Lt | 3 LF |

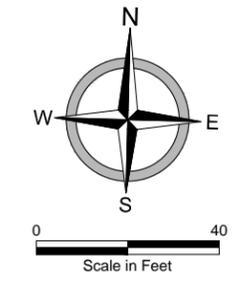
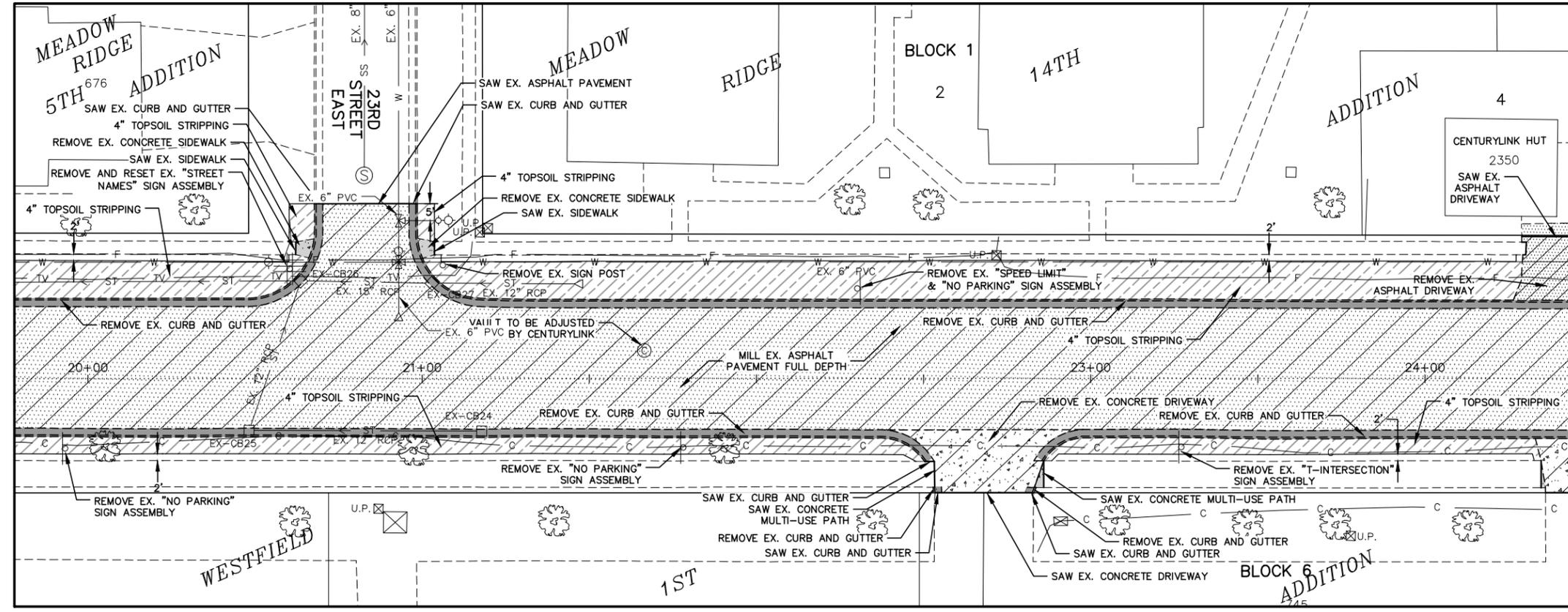
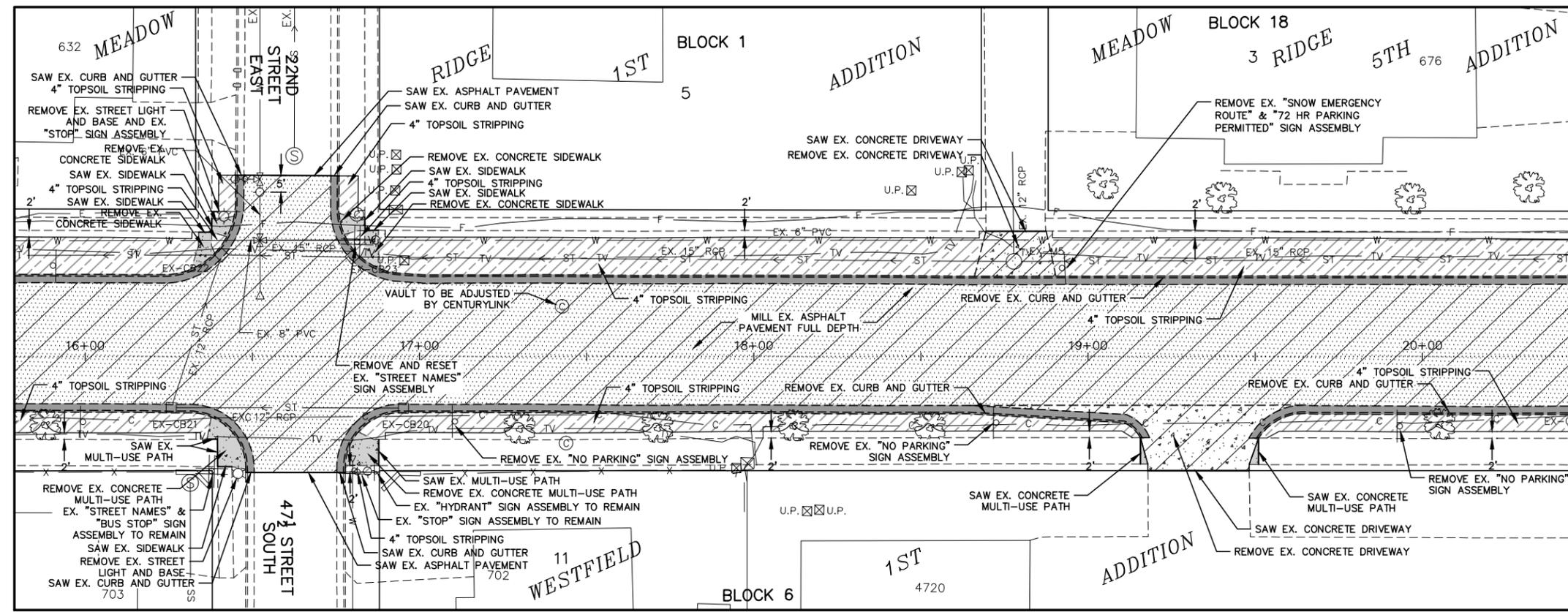
| REMOVAL OF CURB & GUTTER | 202-0130 |
|----------------------------------|----------|
| 16+00 - 22' Lt to 16+47 - 54' Lt | 66 LF |
| 16+73 - 54' Lt to 20+70 - 52' Lt | 436 LF |
| 16+00 - 14' Rt to 16+50 - 35' Rt | 60 LF |
| 16+75 - 34' Rt to 19+18 - 24' Rt | 254 LF |
| 19+48 - 24' Rt to 20+53 - 25' Rt | 308 LF |
| 20+96 - 52' Lt to 24+00 - 21' Lt | 322 LF |
| 22+84 - 23' Rt to 24+00 - 15' Rt | 117 LF |

| REMOVAL OF ASPHALT SURFACING | 202-0133 |
|------------------------------|----------|
| 16+00 to 24+00 | 637 CY |

| SAW BITUMINOUS ASPHALT SURFACING | 202-0153 |
|----------------------------------|----------|
| 16+47 - 54' Lt to 16+73 - 54' Lt | 26 LF |
| 16+50 - 35' Rt to 16+75 - 35' Rt | 25 LF |
| 20+70 - 52' Lt to 20+96 - 52' Lt | 26 LF |

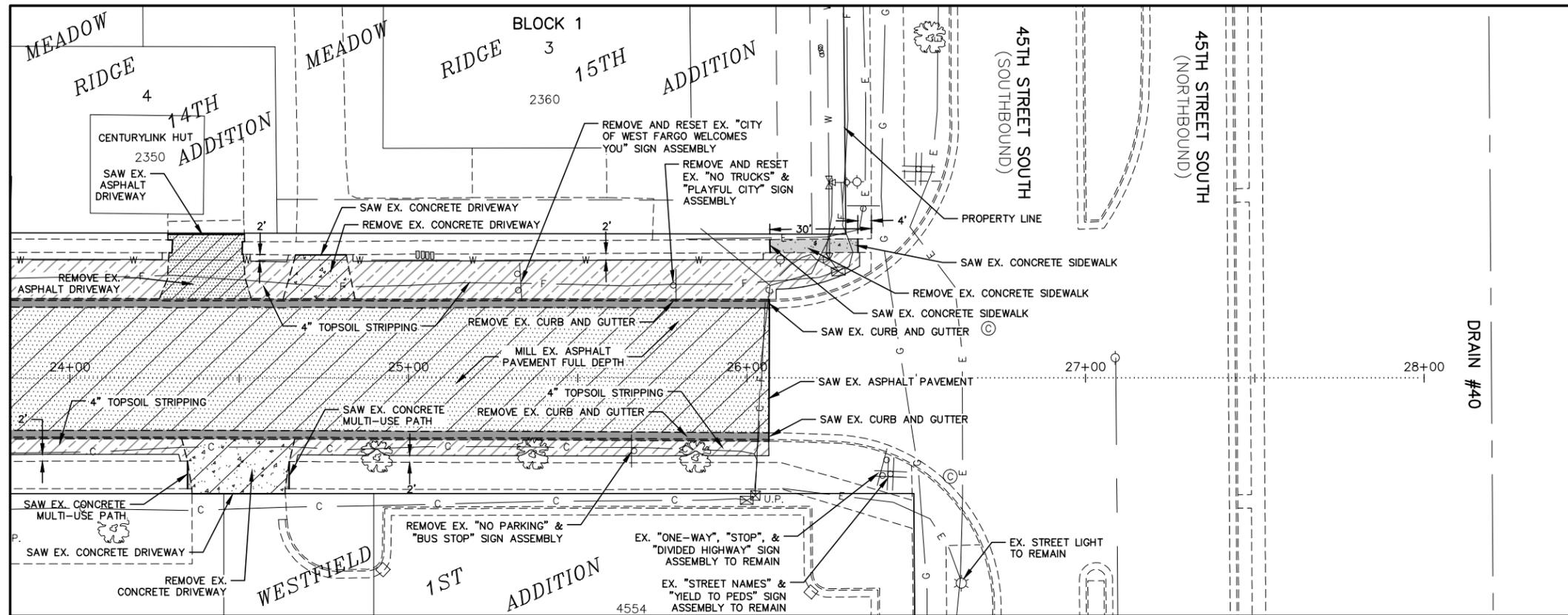
| COMMON EXCAVATION-WASTE | 203-0113 |
|-------------------------|----------|
| 16+00 to 24+00 | 148 CY |

| REMOVE LIGHT STANDARD | 770-4560 |
|-----------------------|----------|
| 16+41 - 42' Lt | 1 EA |
| 16+45 - 36' Rt | 1 EA |



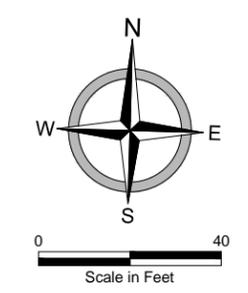
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REMOVALS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
REMOVALS - STA: 16+00 - 24+00



Estimate of Quantities:

| | |
|---|-----------------|
| REMOVAL OF CONCRETE | 202-0112 |
| 24+33 - 18' Rt to 24+66 - 18' Rt | 54 SY |
| 24+63 - 23' Lt to 24+84 - 23' Lt | 26 SY |
| 26+07 - 37' Lt to 26+33 - 37' Lt | 15 SY |
| SAW CONCRETE | 202-0119 |
| 24+35 - 24' Rt to 24+35 - 32' Rt | 8 LF |
| 24+36 - 34' Rt to 24+64 - 34' Rt | 28 LF |
| 24+65 - 24' Rt to 24+65 - 32' Rt | 8 LF |
| 24+67 - 36' Lt to 24+82 - 36' Lt | 15 LF |
| 26+07 - 37' Lt to 26+07 - 41' Lt | 4 LF |
| 26+40 - 37' Lt to 26+40 - 41' Lt | 4 LF |
| 26+07 - 21' Lt to 26+07 - 23.5' Lt | 2.5 LF |
| 26+07 - 16' Rt to 26+07 - 18.5' Rt | 2.5 LF |
| REMOVAL OF CURB & GUTTER | 202-0130 |
| 24+00 - 21' Lt to 26+07 - 21' Lt | 207 LF |
| 24+00 - 15' Rt to 26+06 - 15' Rt | 206 LF |
| REMOVAL OF ASPHALT SURFACING | 202-0133 |
| 24+00 to 26+06 | 124 CY |
| SAW BITUMINOUS ASPHALT SURFACING | 202-0153 |
| 24+29 - 42' Lt to 24+59 - 42' Lt | 30 LF |
| 26+06 - 21' Lt to 26+06 - 16' Rt | 37 LF |
| COMMON EXCAVATION-WASTE | 203-0113 |
| 24+00 to 26+07 | 36 CY |



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REMOVALS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
REMOVALS - STA: 24+00 - 28+00



| | | | | |
|-------|------------------|-------|-------------|-----------|
| STATE | PROJECT NO. | PCN | SECTION NO. | SHEET NO. |
| N.D. | SU-8-992(035)036 | 19892 | 50 | 1 |

| | | | | |
|--|---|---|--|--|
| Manhole No. M1 Manhole Size: 48 In. Northing: 459528.8657 Easting: 2875742.8453 Station: 2+72 Rim Elevation: 900.77 Frame Height: 0.58 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: 0.67 Ft. Invert Elevation: 892.08 15" S Invert Elevation: 892.08 15" W Bottom Elevation: 891.83 Riser Height: 7.27 Ft. | Manhole No. M4 Manhole Size: 48 In. Northing: 459504.9709 Easting: 2876046.0571 Station: 5+74 Rim Elevation: 900.24 Frame Height: 0.58 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: 0.67 Ft. Invert Elevation: 895.30 15" N Invert Elevation: 895.72 15" S Invert Elevation: 893.02 15" E Invert Elevation: 893.02 15" W Bottom Elevation: 892.77 Riser Height: 5.80 Ft. | Manhole No. M7 Manhole Size: 48 In. Northing: 459531.1080 Easting: 2877035.5478 Station: 15+64 Rim Elevation: 898.78 Frame Height: 0.58 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: 0.67 Ft. Invert Elevation: 895.79 15" S Invert Elevation: 895.79 15" N Invert Elevation: 895.79 15" E Invert Elevation: 895.79 15" W Bottom Elevation: 895.54 Riser Height: 1.57 Ft. | Manhole No. M10 Manhole Size: 48 In. Northing: 459541.4549 Easting: 2877427.2567 Station: 19+56 Rim Elevation: 899.96 Frame Height: 0.58 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: 0.67 Ft. Invert Elevation: 896.89 15" S Invert Elevation: 896.89 15" E Invert Elevation: 896.89 15" N Invert Elevation: 896.89 15" W Bottom Elevation: 896.64 Riser Height: 1.65 Ft. | Inlet No. CB1 Inlet Type: Type 2 Grate Style: VB Manhole Size: 48 In. Northing: 459522.4750 Easting: 2875743.0141 Station: 2+72 Rim Elevation: 899.70 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: 0.67 Ft. Invert Elevation: 892.10 15" S Invert Elevation: 892.10 15" N Bottom Elevation: 891.85 Riser Height: 6.43 Ft. |
| Manhole No. M2 Manhole Size: 48 In. Northing: 459496.9839 Easting: 2875743.6874 Station: 2+72 Rim Elevation: 900.38 Frame Height: 0.58 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: 0.67 Ft. Invert Elevation: 895.86 15" S Invert Elevation: 892.17 15" E Invert Elevation: 892.17 15" N Bottom Elevation: 891.92 Riser Height: 6.79 Ft. | Manhole No. M5 Manhole Size: 48 In. Northing: 459513.1692 Easting: 2876356.4275 Station: 8+85 Rim Elevation: 899.96 Frame Height: 0.58 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: 0.67 Ft. Invert Elevation: 895.44 15" S Invert Elevation: 895.02 15" N Invert Elevation: 893.89 15" E Invert Elevation: 893.89 15" W Bottom Elevation: 893.64 Riser Height: 4.65 Ft. | Manhole No. M8 Manhole Size: 48 In. Northing: 459535.4778 Easting: 2877200.9768 Station: 17+30 Rim Elevation: 899.20 Frame Height: 0.58 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: 0.67 Ft. Invert Elevation: 896.25 15" S Invert Elevation: 896.25 15" N Invert Elevation: 896.25 15" E Invert Elevation: 896.25 15" W Bottom Elevation: 896.00 Riser Height: 1.53 Ft. | Manhole No. M11 Manhole Size: 48 In. Northing: 459546.6428 Easting: 2877623.6582 Station: 21+53 Rim Elevation: 900.91 Frame Height: 0.58 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: 0.67 Ft. Invert Elevation: 897.44 15" E Invert Elevation: 897.44 15" S Invert Elevation: 897.44 15" N Invert Elevation: 897.44 15" W Bottom Elevation: 897.19 Riser Height: 2.05 Ft. | Inlet No. CB2 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459483.4886 Easting: 2875744.0439 Station: 2+72 Rim Elevation: 900.00 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 896.00 15" N Bottom Elevation: 895.75 Riser Height: 3.50 Ft. |
| Manhole No. M3 Manhole Size: 48 In. Northing: 459501.0116 Easting: 2875896.1679 Station: 4+25 Rim Elevation: 901.35 Frame Height: 0.58 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: 0.67 Ft. Invert Elevation: 892.60 15" N Invert Elevation: 892.60 15" E Invert Elevation: 892.60 15" W Bottom Elevation: 892.35 Riser Height: 7.33 Ft. | Manhole No. M6 Manhole Size: 48 In. Northing: 459524.5515 Easting: 2876787.3345 Station: 13+16 Rim Elevation: 899.80 Frame Height: 0.58 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: 0.67 Ft. Invert Elevation: 895.29 15" S Invert Elevation: 895.28 15" N Invert Elevation: 895.10 15" E Invert Elevation: 895.10 15" W Bottom Elevation: 894.85 Riser Height: 3.28 Ft. | Manhole No. M9 Manhole Size: 48 In. Northing: 459539.4019 Easting: 2877349.5340 Station: 18+78 Rim Elevation: 901.35 Frame Height: 0.58 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: 0.67 Ft. Invert Elevation: 896.67 12" N Invert Elevation: 896.67 15" E Invert Elevation: 896.67 15" W Bottom Elevation: 896.42 Riser Height: 3.26 Ft. | Manhole No. M12 Manhole Size: 48 In. Northing: 459555.5956 Easting: 2877962.5918 Station: 24+92 Rim Elevation: 902.24 Frame Height: 0.58 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: 0.67 Ft. Invert Elevation: 898.39 15" S Invert Elevation: 898.39 15" N Invert Elevation: 898.39 15" W Bottom Elevation: 898.14 Riser Height: 2.43 Ft. | Inlet No. CB3 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459530.4620 Easting: 2876045.3837 Station: 5+74 Rim Elevation: 899.56 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 895.56 15" S Bottom Elevation: 895.31 Riser Height: 3.50 Ft. |

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INLET & MANHOLE SUMMARY
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
INLET & MANHOLE SUMMARY



| | | | | |
|-------|------------------|-------|-------------|-----------|
| STATE | PROJECT NO. | PCN | SECTION NO. | SHEET NO. |
| N.D. | SU-8-992(035)036 | 19892 | 50 | 2 |

| | | | | |
|---|--|---|---|---|
| <p>Inlet No. CB4 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459491.4756 Easting: 2876046.4135 Station: 5+74 Rim Elevation: 899.86 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 895.86 15" N</p> <p>Bottom Elevation: 895.61 Riser Height: 3.50 Ft.</p> | <p>Inlet No. CB7 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459538.0468 Easting: 2876786.9781 Station: 13+16 Rim Elevation: 899.42 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 895.42 15" S</p> <p>Bottom Elevation: 895.17 Riser Height: 3.50 Ft.</p> | <p>Inlet No. CB10 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459517.6127 Easting: 2877035.9043 Station: 15+64 Rim Elevation: 898.40 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 894.40 15" N</p> <p>Bottom Elevation: 894.15 Riser Height: 3.50 Ft.</p> | <p>Inlet No. CB13 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459566.9460 Easting: 2877426.5833 Station: 19+56 Rim Elevation: 899.40 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 896.96 15" S</p> <p>Bottom Elevation: 896.71 Riser Height: 1.94 Ft.</p> | <p>Inlet No. CB16 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459533.1475 Easting: 2877624.0147 Station: 21+53 Rim Elevation: 900.53 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 897.48 15" N</p> <p>Bottom Elevation: 897.23 Riser Height: 2.55 Ft.</p> |
| <p>Inlet No. CB5 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459538.6603 Easting: 2876355.7542 Station: 8+85 Rim Elevation: 899.28 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 895.28 15" S</p> <p>Bottom Elevation: 895.03 Riser Height: 3.50 Ft.</p> | <p>Inlet No. CB8 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459511.0562 Easting: 2876787.6910 Station: 13+16 Rim Elevation: 899.42 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 895.42 15" N</p> <p>Bottom Elevation: 895.17 Riser Height: 3.50 Ft.</p> | <p>Inlet No. CB11 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459560.8509 Easting: 2877200.3066 Station: 17+30 Rim Elevation: 898.76 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 896.32 15" S</p> <p>Bottom Elevation: 896.07 Riser Height: 1.94 Ft.</p> | <p>Inlet No. CB14 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459527.9596 Easting: 2877427.6131 Station: 19+56 Rim Elevation: 899.58 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 896.93 15" N</p> <p>Bottom Elevation: 896.68 Riser Height: 2.15 Ft.</p> | <p>Inlet No. CB17 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459569.0909 Easting: 2877962.2353 Station: 24+92 Rim Elevation: 901.86 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 898.43 15" S</p> <p>Bottom Elevation: 898.18 Riser Height: 2.93 Ft.</p> |
| <p>Inlet No. CB6 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459499.6739 Easting: 2876356.7840 Station: 8+85 Rim Elevation: 899.58 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 895.58 15" N</p> <p>Bottom Elevation: 895.33 Riser Height: 3.50 Ft.</p> | <p>Inlet No. CB9 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459544.6033 Easting: 2877035.1913 Station: 15+64 Rim Elevation: 898.40 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 894.40 15" S</p> <p>Bottom Elevation: 894.15 Riser Height: 3.50 Ft.</p> | <p>Inlet No. CB12 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459521.9825 Easting: 2877201.3333 Station: 17+30 Rim Elevation: 898.82 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 896.29 15" N</p> <p>Bottom Elevation: 896.04 Riser Height: 2.00 Ft.</p> | <p>Inlet No. CB15 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459572.0159 Easting: 2877622.9880 Station: 21+53 Rim Elevation: 900.23 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 897.51 15" S</p> <p>Bottom Elevation: 897.26 Riser Height: 2.22 Ft.</p> | <p>Inlet No. CB18 Inlet Type: Type 2 Grate Style: VB Manhole Size: 3' x 2' Northing: 459542.1003 Easting: 2877962.9482 Station: 24+92 Rim Elevation: 901.86 Frame Height: 0.33 Ft. Adjusting Rings: 0.42 Ft. Cover Thickness: N/A Invert Elevation: 898.43 15" N</p> <p>Bottom Elevation: 898.18 Riser Height: 2.93 Ft.</p> |

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INLET & MANHOLE SUMMARY
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
INLET & MANHOLE SUMMARY



| | | | | |
|-------|------------------|-------|-------------|-----------|
| STATE | PROJECT NO. | PCN | SECTION NO. | SHEET NO. |
| N.D. | SU-8-992(035)036 | 19892 | 51 | 1 |

| Begin Station / Location | End Station / Location | Length (LF) | Pipe Conduit Storm Drain Pay Size (In) | OPTION 1 Allowable Material | OPTION 2 Allowable Material | Required Diameter (In) | Minimum Thickness (In) | OPTION 1 Applicable Backfill Detail | OPTION 2 Applicable Backfill Detail |
|--------------------------|------------------------|-------------|--|------------------------------------|--|------------------------|------------------------|-------------------------------------|-------------------------------------|
| M1 | CB1 | 6 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| CB1 | M2 | 26 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M2 | CB2 | 14 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M2 | M3 | 153 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M3 | EX-M3 | 32 | 12 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 12 | .167 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M3 | M4 | 150 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M4 | CB3 | 26 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M4 | CB4 | 14 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M4 | M5 | 310 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M5 | CB5 | 26 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M5 | CB6 | 14 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |

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ALLOWABLE PIPE LIST
 7TH AVENUE P.C.C. RECONSTRUCTION
 WEST FARGO - FARGO
 CASS COUNTY, NORTH DAKOTA
ALLOWABLE PIPE LIST



| | | | | |
|-------|------------------|-------|-------------|-----------|
| STATE | PROJECT NO. | PCN | SECTION NO. | SHEET NO. |
| N.D. | SU-8-992(035)036 | 19892 | 51 | 2 |

| Begin Station / Location | End Station / Location | Length (LF) | Pipe Conduit Storm Drain Pay Size (In) | OPTION 1 Allowable Material | OPTION 2 Allowable Material | Required Diameter (In) | Minimum Thickness (In) | OPTION 1 Applicable Backfill Detail | OPTION 2 Applicable Backfill Detail |
|--------------------------|------------------------|-------------|--|------------------------------------|--|------------------------|------------------------|-------------------------------------|-------------------------------------|
| M5 | M6 | 431 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M6 | CB7 | 14 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M6 | CB8 | 13 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M6 | M7 | 248 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M7 | CB9 | 14 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M7 | CB10 | 13 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M7 | M8 | 165 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M8 | CB11 | 25 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M8 | CB12 | 13 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M8 | M9 | 149 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M9 | EX-M5 | 28 | 12 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 12 | .167 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |

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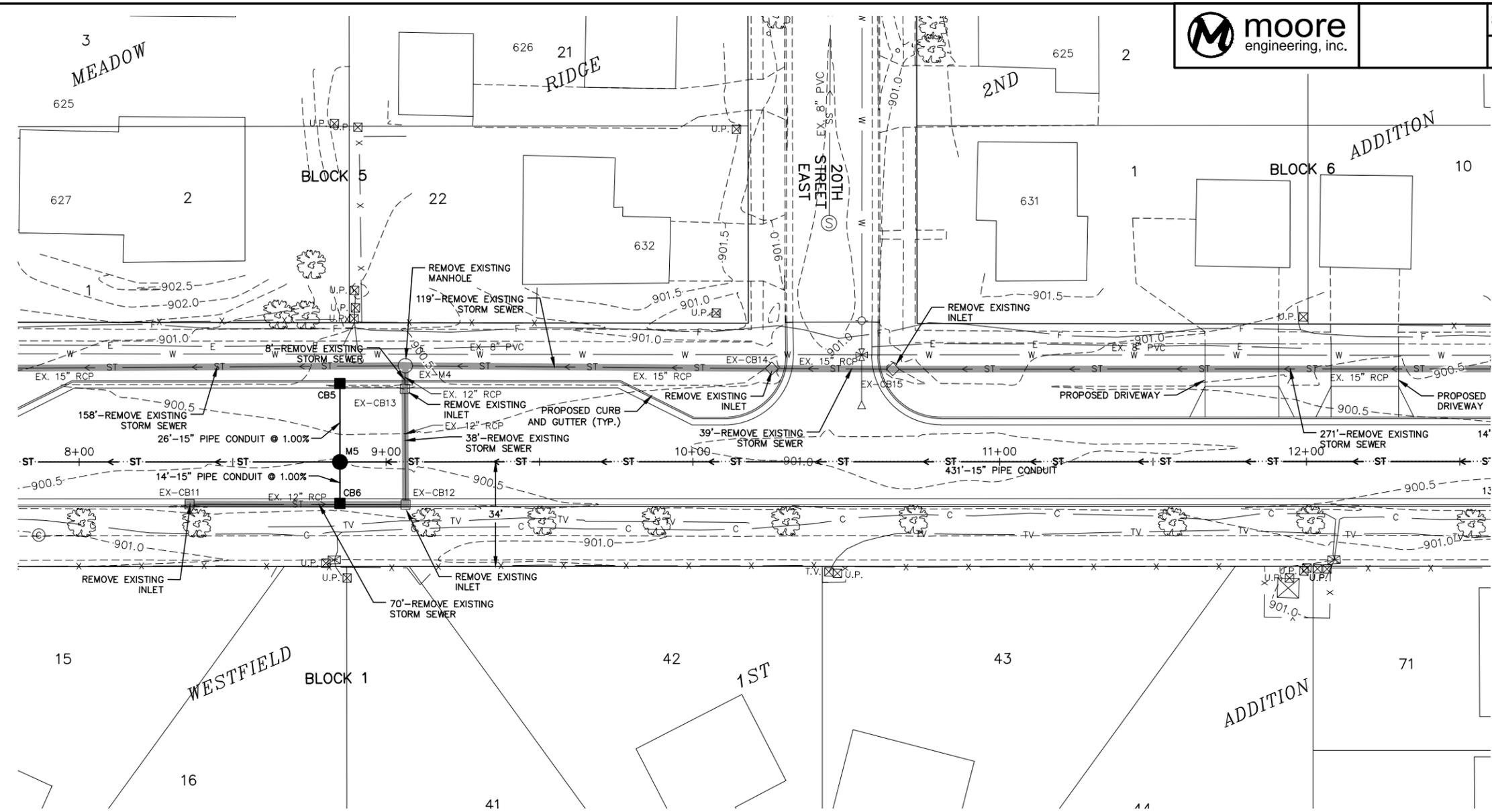
ALLOWABLE PIPE LIST
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
ALLOWABLE PIPE LIST



| Begin Station / Location | End Station / Location | Length (LF) | Pipe Conduit Storm Drain Pay Size (In) | OPTION 1 Allowable Material | OPTION 2 Allowable Material | Required Diameter (In) | Minimum Thickness (In) | OPTION 1 Applicable Backfill Detail | OPTION 2 Applicable Backfill Detail |
|--------------------------|------------------------|-------------|--|------------------------------------|--|------------------------|------------------------|-------------------------------------|-------------------------------------|
| M9 | M10 | 78 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M10 | CB13 | 26 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M10 | CB14 | 13 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M10 | M11 | 196 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M11 | CB15 | 25 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M11 | CB16 | 13 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M11 | M12 | 339 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M12 | CB17 | 14 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |
| M12 | CB18 | 13 | 15 | Reinforced Concrete Pipe Class III | Zinc Coated Corrugated Steel Aluminum Coated Corrugated Steel (Type 2) Polymeric Coated Steel (Over Zinc or Aluminum Coated Steel) Corrugated Aluminum Alloy Culverts High Density Polyethylene (HDPE) | 15 | .188 | R.C.P. STORM SEWER TRENCH DETAIL | FLEXIBLE PIPE STORM SEWER DETAIL |

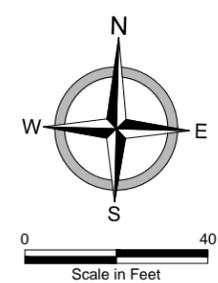
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ALLOWABLE PIPE LIST
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
ALLOWABLE PIPE LIST



Estimate of Quantities:

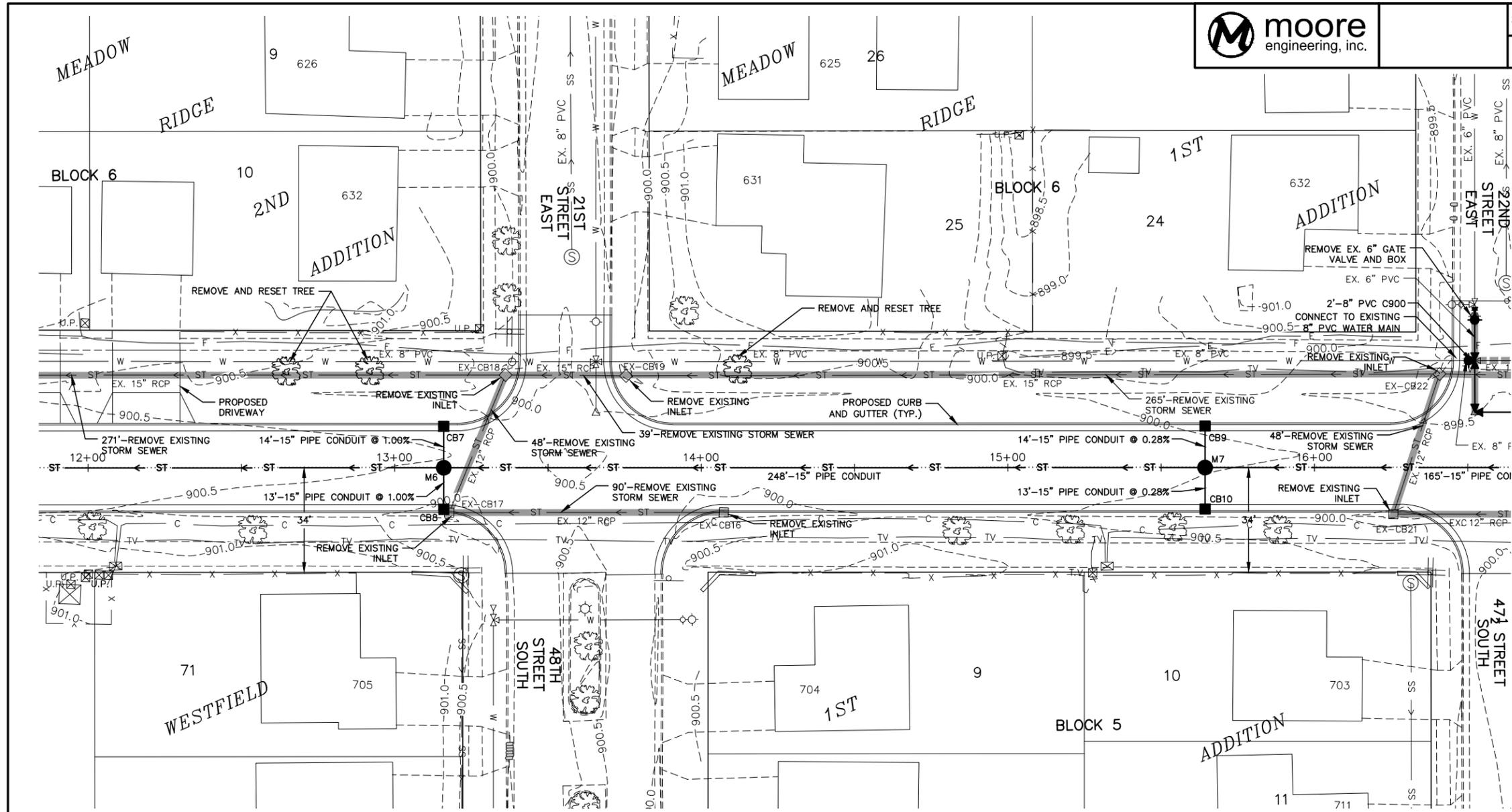
| | |
|--|-----------------|
| REMOVAL OF PIPE ALL TYPES AND SIZES | 202-0174 |
| 8+00 to 12+00 (Ex. 15" RCP) | 400 LF |
| Ex. CB11 - 8+36 to Ex. CB12 - 9+06 (Ex. 12" RCP) | 70 LF |
| Ex. CB12 to Ex. CB13- 9+06 (Ex. 12" RCP) | 38 LF |
| Ex. CB13 to Ex. M4 - 9+06 (Ex. 12" RCP) | 7 LF |
| REMOVAL OF MANHOLES | 202-0210 |
| Ex. M4 - 9+06 - 31' Lt | 1 EA |
| REMOVAL OF INLETS | 202-0230 |
| Ex. CB12 - 9+06 - 14' Rt | 1 EA |
| Ex. CB13 - 9+06 - 24' Lt | 1 EA |
| Ex. CB11 - 8+36 - 14' Rt | 1 EA |
| Ex. CB14 - 10+26 - 30' Lt | 1 EA |
| Ex. CB15 - 10+65 - 30' Lt | 1 EA |
| PIPE CONDUIT 15IN-STORM DRAIN | 714-4097 |
| 4+00 to 8+00 | 400 LF |
| M5 to CB5 - 8+86 | 26 LF |
| M5 to CB6 - 8+86 | 14 LF |
| MANHOLE 48IN | 722-0100 |
| M5 - 8+86 | 1 EA |
| INLET-TYPE 2 | 722-3510 |
| CB5 - 8+86 - 26' Lt | 1 EA |
| CB6 - 8+86 - 14' Rt | 1 EA |



| | | | | | | |
|-----|--|--|---|--|-------------|-----|
| 910 | | | | | | 910 |
| 905 | EX-CB11 STA. 8+36.13.7'R RIM: 900.01 E. INV: 895.00 | EX-CB12 STA. 9+06.13.9'R RIM: 900.20 W. INV: 893.27 N. INV: 893.15 | EX-CB13 STA. 9+06.23.8'L RIM: 899.98 S. INV: 892.87 N. INV: 892.87 | EX-M4 STA. 9+06.31.3'L RIM: 900.13 S. INV: 892.82 E. INV: 892.70 W. INV: 892.62 | | 905 |
| 900 | | | | | | 900 |
| 895 | EX. 15" RCP | EX. 12" RCP | EX. 15" RCP | EX. 15" RCP | EX. 15" RCP | 895 |
| 890 | | EX. 8" PVC | | | EX. 8" PVC | 890 |
| 885 | CB5 STA. 8+85.25.5'L RIM: 899.28 S. INV: 895.28 | M5 STA. 8+85.0.0' RIM: 899.96 S. INV: 895.44 N. INV: 895.02 | EX-CB14 STA. 10+26.30.3'L RIM: 900.35 E. INV: 893.09 W. INV: 893.07 | EX-CB15 STA. 10+65.30.1'L RIM: 900.40 E. INV: 893.02 W. INV: 893.03 | | 885 |
| 880 | CB6 STA. 8+85.13.5'R RIM: 899.58 N. INV: 895.58 | | | | | 880 |
| | 8+00 | 9+00 | 10+00 | 11+00 | 12+00 | |

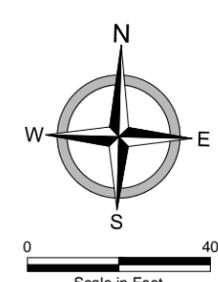
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**DRAINAGE LAYOUTS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
WATER AND STORM - STA: 8+00 - 12+00**



Estimate of Quantities:

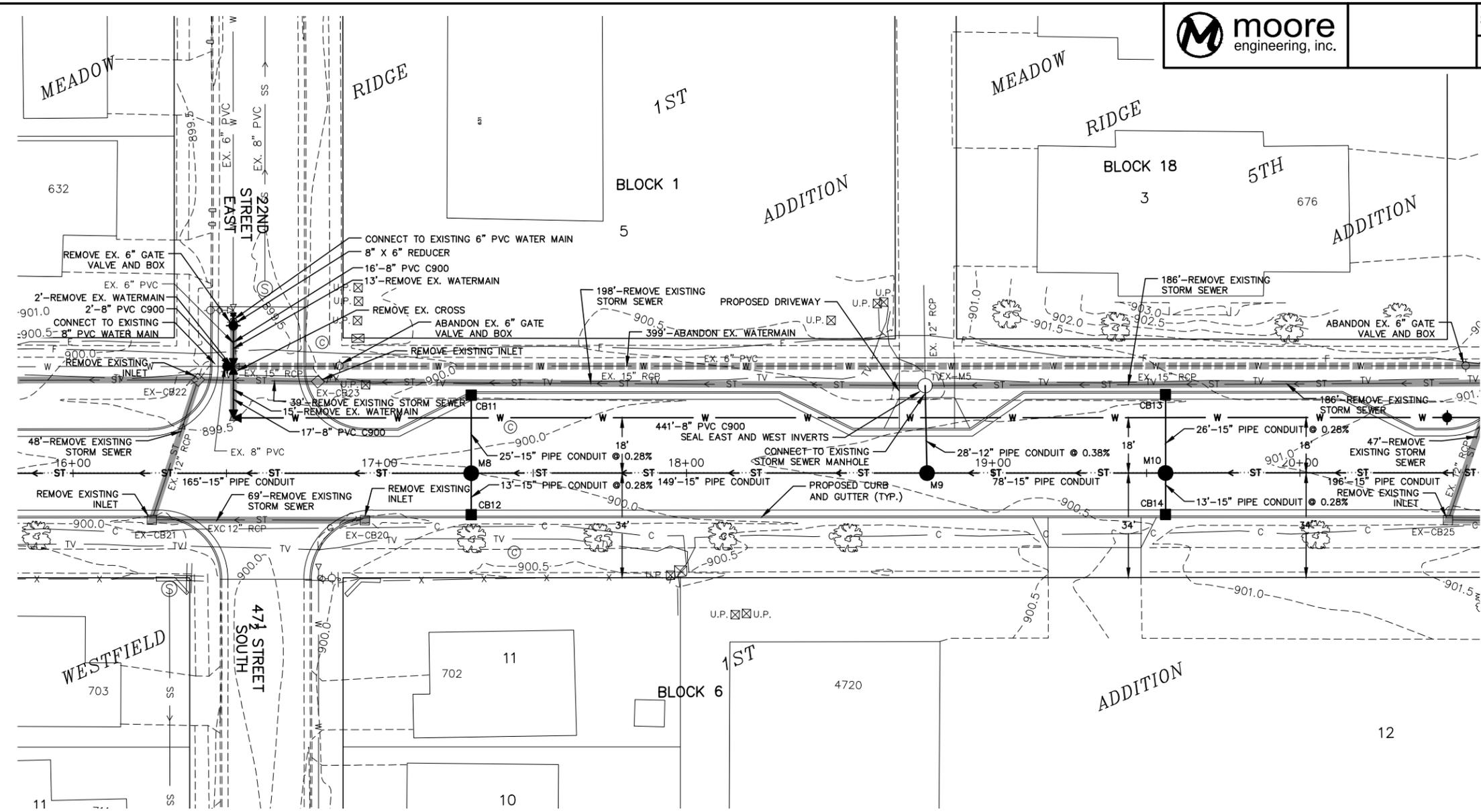
| | |
|--|-----------------|
| REMOVAL OF TREES-10IN | 201-0370 |
| 12+64 - 31.5' Lt | 1 EA |
| 12+92 - 32' Lt | 1 EA |
| 14+12 - 32' Lt | 1 EA |
| REMOVAL OF PIPE ALL TYPES AND SIZES | 202-0174 |
| 12+00 to 16+00 (Ex. 15" RCP) | 400 LF |
| Ex. CB17 - 13+18 to Ex. CB18 - 13+36 (Ex. 12" RCP) | 48 LF |
| Ex. CB17 - 13+18 to Ex. CB16 - 14+07 (Ex. 12" RCP) | 90 LF |
| REMOVAL OF INLETS | 202-0230 |
| Ex. CB16 - 14+07 - 15' Rt | 1 EA |
| Ex. CB17 - 13+18 - 15' Rt | 1 EA |
| Ex. CB18 - 13+36 - 30' Lt | 1 EA |
| Ex. CB19 - 13+75 - 30' Lt | 1 EA |
| PIPE CONDUIT 15IN-STORM DRAIN | 714-4097 |
| 12+00 to 16+00 | 400 LF |
| M6 to CB7 - 13+16 | 14 LF |
| M6 to CB8 - 13+16 | 13 LF |
| M7 to CB9 - 15+64 | 14 LF |
| M7 to CB10 - 15+64 | 13 LF |
| MANHOLE 48IN | 722-0100 |
| M6 - 13+16 | 1 EA |
| M7 - 15+64 | 1 EA |
| INLET-TYPE 2 | 722-3510 |
| CB7 - 13+16 - 14' Lt | 1 EA |
| CB8 - 13+16 - 13' Rt | 1 EA |
| CB9 - 15+64 - 14' Lt | 1 EA |
| CB10 - 15+64 - 13' Rt | 1 EA |



| | | | | | |
|-------|--|---|--|--|-----|
| 910 | EX-CB17 STA. 13+18.14.6'R RIM: 899.73 E. INV.: 893.64 N. INV.: 893.57 | EX-CB19 STA. 13+75.29.9'L RIM: 899.38 E. INV.: 893.27 W. INV.: 893.27 | EX-CB16 STA. 14+07.14.5'R RIM: 899.65 W. INV.: 894.09 | EX-CB20 STA. 16+95.15.3'R RIM: 899.38 W. INV.: 894.48 | 910 |
| 905 | EX-CB18 STA. 13+38.30.2'L RIM: 899.60 S. INV.: 893.36 E. INV.: 893.35 W. INV.: 893.35 | | | EX-CB21 STA. 16+28.15.1'R RIM: 899.32 E. INV.: 893.99 N. INV.: 893.89 | 905 |
| 900 | | | | | 900 |
| 895 | | | 248'-15" PIPE CONDUIT @ 0.28% | 165'-15" PIPE CONDUIT @ 0.28% | 895 |
| 890 | | | | | 890 |
| 885 | CB7 STA. 13+16.13.5'L RIM: 899.42 S. INV.: 895.42 | M6 STA. 13+16.0.0' RIM: 899.80 S. INV.: 895.29 N. INV.: 895.28 E. INV.: 895.10 | CB9 STA. 15+64.13.5'L RIM: 898.40 S. INV.: 895.83 | M7 STA. 15+64.0.0' RIM: 898.78 N. INV.: 895.79 S. INV.: 895.79 E. INV.: 895.79 W. INV.: 895.79 | 885 |
| 880 | CB8 STA. 13+16.13.5'R RIM: 899.42 N. INV.: 895.42 | | CB10 STA. 15+64.13.5'R RIM: 898.40 N. INV.: 895.83 | | 880 |
| 12+00 | 13+00 | 14+00 | 15+00 | 16+00 | |

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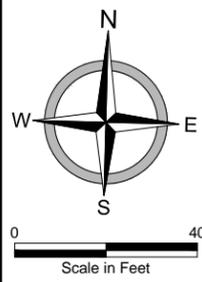
DRAINAGE LAYOUTS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
WATER AND STORM - STA: 12+00 - 16+00



Estimate of Quantities:

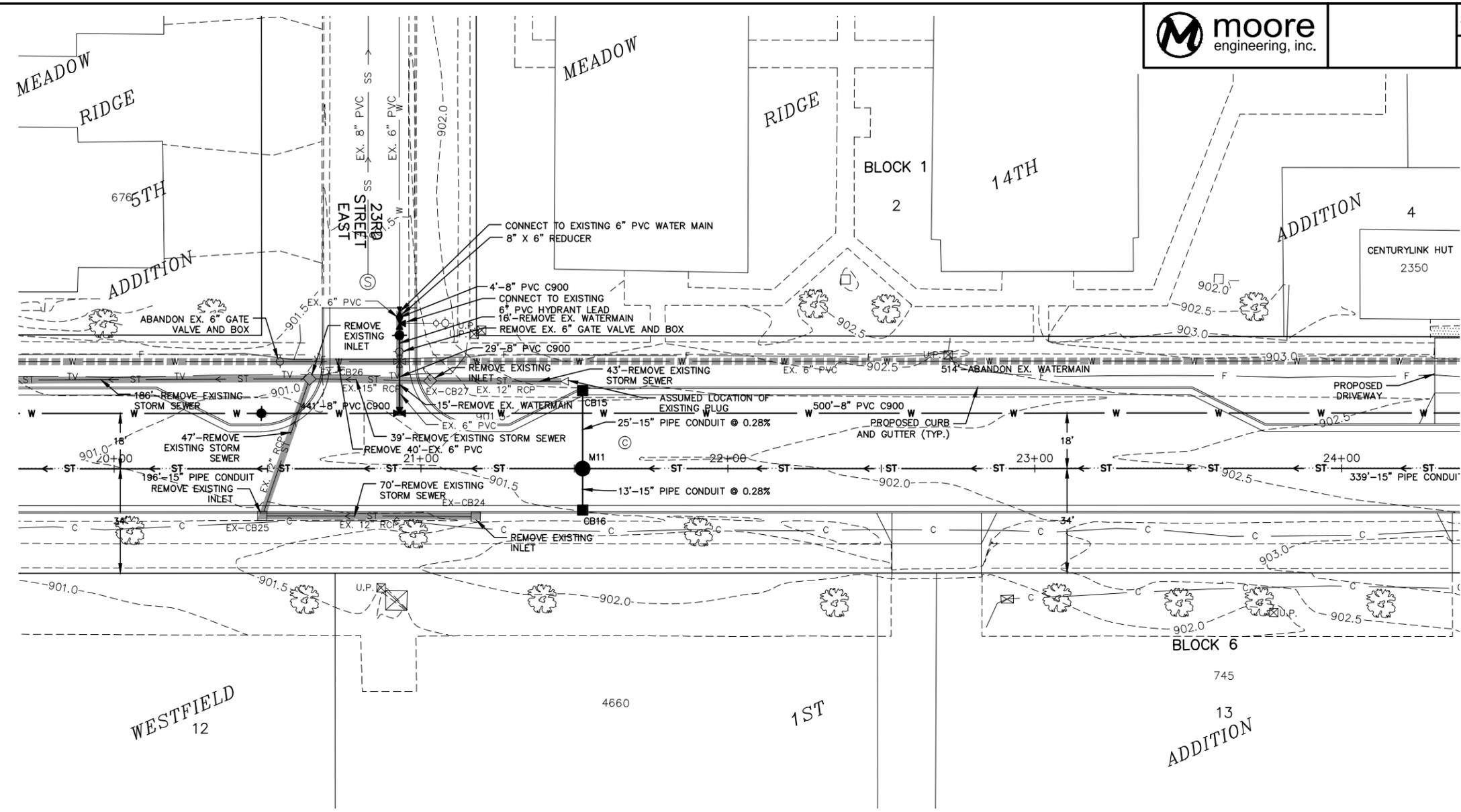
| | |
|--|-----------------|
| REMOVAL OF PIPE ALL TYPES AND SIZES | 202-0174 |
| 16+00 to 20+00 (Ex. 15" RCP) | 400 LF |
| 16+50 to 20+00 (Ex. 8" Watermain) | 350 LF |
| Ex. CB21-16+26 to Ex. CB22-16+41 (Ex. 12" RCP) | 48 LF |
| Ex. CB21-16+26 to Ex. CB20-16+95 (Ex. 12" RCP) | 69 LF |
| 16+52 (Ex. 8" Watermain Plug to Hydrant Tee) | 32 LF |
| REMOVAL OF INLETS | 202-0230 |
| Ex. CB20 - 16+95 - 14' Rt | 1 EA |
| Ex. CB21 - 16+26 - 14' Rt | 1 EA |
| Ex. CB22 - 16+41 - 30' Lt | 1 EA |
| Ex. CB23 - 16+80 - 30' Lt | 1 EA |
| PIPE CONDUIT 12IN-STORM DRAIN | 714-4092 |
| M9 to Ex. M5 - 18+78 | 28 LF |
| PIPE CONDUIT 15IN-STORM DRAIN | 714-4097 |
| 16+00 to 20+00 | 400 LF |
| M8 to CB11 - 17+30 | 25 LF |
| M8 to CB12 - 17+30 | 13 LF |
| M10 to CB13 - 19+56 | 26 LF |
| M10 to CB14 - 19+56 | 13 LF |
| MANHOLE 48IN | 722-0100 |
| M8 - 17+30 | 1 EA |
| M9 - 18+78 | 1 EA |
| M10 - 19+56 | 1 EA |
| INLET-TYPE 2 | 722-3510 |
| CB11 - 17+30 - 25' Lt | 1 EA |
| CB12 - 17+30 - 13' Rt | 1 EA |
| CB13 - 19+56 - 26' Lt | 1 EA |
| CB14 - 19+56 - 13' Rt | 1 EA |
| FITTINGS-DUCTILE IRON | 724-0210 |
| 8" Watermain 90° Bend - 16+52 - 18' Lt | 80 LBS |
| 8" Watermain 8x8 Tee - 16+52 - 35' Lt | 116 LBS |
| 8" Watermain 8x6 Reducer - 16+52 - 50' Lt | 49 LBS |
| REMOVE GATE VALVE & BOX | 724-0270 |
| 16+52 - 49' Lt | 1 EA |
| GATE VALVE & BOX 8IN | 724-0310 |
| 16+50 - 35' Lt | 1 EA |
| 16+52 - 48' Lt | 1 EA |
| WATERMAIN 8IN PVC | 724-0830 |
| 16+50 to 20+00 | 350 LF |
| 16+52 - 8x6 Reducer to 90° Bend | 35 LF |
| CONNECTION TO EXISTING MAIN | 724-0944 |
| 16+50 - 35' Lt | 1 EA |
| 16+52 - 50' Lt | 1 EA |
| REMOVE GATE VALVE BOX | 724-7014 |
| 16+87 - 35' Lt | 1 EA |

| | | | | | | | | |
|-----|---|--|--|---|---|---|---|-----|
| 910 | EX-CB20 STA. 16+95.15.3'R RIM: 899.38 W. INV.: 894.48 | EX-CB22 STA. 16+41.30.4'L RIM: 898.97 S. INV.: 893.64 E. INV.: 893.63 W. INV.: 893.63 | | | | | | |
| 905 | EX-CB21 STA. 16+26.15.1'R RIM: 899.32 E. INV.: 893.99 N. INV.: 893.89 | EX-CB23 STA. 16+80.29.8'L RIM: 899.18 E. INV.: 893.73 W. INV.: 893.69 | | | EX-M5 STA. 18+78.28.4'L RIM: 900.38 N. INV.: 895.45 E. INV.: 893.90 W. INV.: 893.91 NEW S. INV.: 896.78 | | EX-CB25 STA. 20+48.15.4'R RIM: 900.79 E. INV.: 894.93 N. INV.: 894.59 | 910 |
| 900 | | | | | | | | |
| 895 | 5'-15" PIPE CONDUIT @ 0.28% | | | | | | | |
| 890 | | | | | | | | |
| 885 | 8" PVC C900 REMOVE EX. 8" PVC | CB11 STA. 17+30.25.4'L RIM: 898.76 S. INV.: 896.32 | M8 STA. 17+30.0.0' RIM: 899.20 S. INV.: 896.25 N. INV.: 896.25 E. INV.: 896.25 W. INV.: 896.25 | M9 STA. 18+78.0.0' RIM: 901.35 N. INV.: 896.67 E. INV.: 896.67 W. INV.: 896.67 | CB13 STA. 19+56.25.5'L RIM: 899.96 S. INV.: 896.96 N. INV.: 896.89 E. INV.: 896.89 W. INV.: 896.89 | M10 STA. 19+56.0.0' RIM: 899.96 S. INV.: 896.89 N. INV.: 896.89 E. INV.: 896.89 W. INV.: 896.89 | | 885 |
| 880 | | CB12 STA. 17+30.13.5'R RIM: 898.82 N. INV.: 896.29 | | | CB14 STA. 19+56.13.5'R RIM: 899.58 N. INV.: 896.93 | | | 880 |



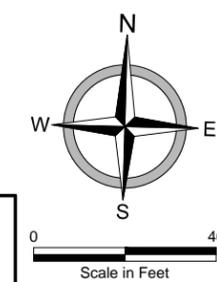
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DRAINAGE LAYOUTS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
WATER AND STORM - STA: 16+00 - 20+00



Estimate of Quantities:

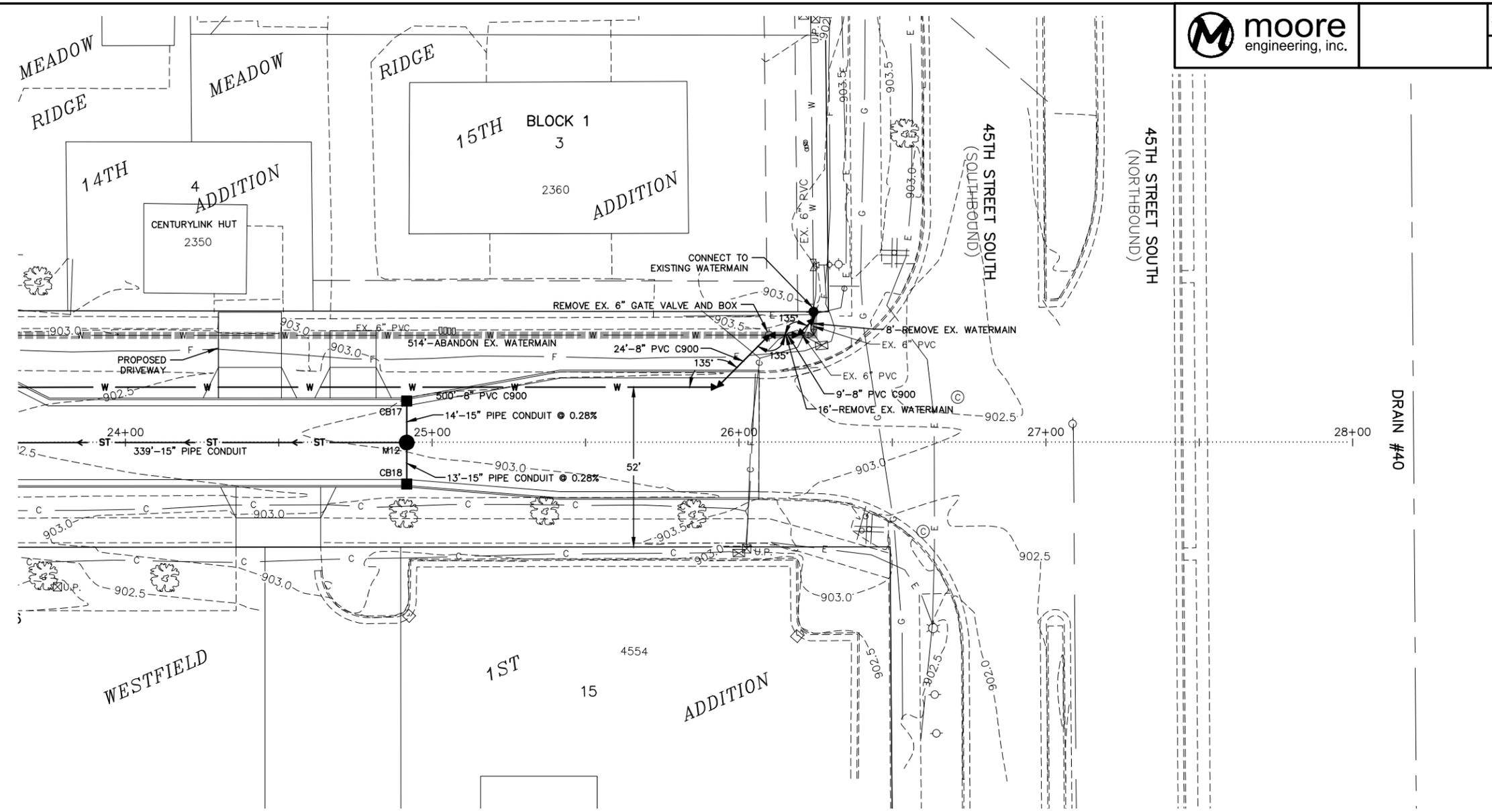
| | |
|--|-----------------|
| REMOVAL OF PIPE ALL TYPES AND SIZES | 202-0174 |
| 20+00 to 21+45 (Ex. 15" RCP) | 145 LF |
| Ex. CB25-20+48 to Ex. CB26-20+64 (Ex. 12" RCP) | 47 LF |
| Ex. CB25-20+48 to Ex. CB24-21+18 (Ex. 12" RCP) | 70 LF |
| 20+93 (Ex. 8" Watermain Plug to Hydrant Tee) | 33 LF |
| 20+00 to 24+00 (Ex. 8" Watermain) | 400 LF |
| REMOVAL OF INLETS | 202-0230 |
| Ex. CB24 - 21+18 - 16" Rt | 1 EA |
| Ex. CB25 - 20+48 - 16" Rt | 1 EA |
| Ex. CB26 - 20+64 - 29" Lt | 1 EA |
| Ex. CB27 - 21+03 - 29" Lt | 1 EA |
| PIPE CONDUIT 15IN-STORM DRAIN | 714-4097 |
| 20+00 to 24+00 | 400 LF |
| M11 to CB15 - 21+53 | 25 LF |
| M11 to CB16 - 21+53 | 13 LF |
| MANHOLE 48IN | 722-0100 |
| M11 - 21+53 | 1 EA |
| INLET-TYPE 2 | 722-3510 |
| CB15 - 21+53 - 25" Lt | 1 EA |
| CB16 - 21+53 - 13" Rt | 1 EA |
| FITTINGS-DUCTILE IRON | 724-0210 |
| 8" Watermain 8x8 Tee - 20+93 - 18" Lt | 116 LBS |
| 8" Watermain 8x6 Tee - 20+93 - 47" Lt | 96 LBS |
| 8" Watermain 8x6 Reducer - 20+93 - 51" Lt | 49 LBS |
| REMOVE GATE VALVE & BOX | 724-0270 |
| 20+93 - 38" Lt | 1 EA |
| GATE VALVE & BOX 8IN | 724-0310 |
| 20+48 - 18" Lt | 1 EA |
| 20+93 - 43" Lt | 1 EA |
| WATERMAIN 8IN PVC | 724-0830 |
| 20+00 to 24+00 | 400 LF |
| 20+93 - 8x8 Tee to 8x6 Reducer | 34 LF |
| CONNECTION TO EXISTING MAIN | 724-0944 |
| 20+93 - 51" Lt | 1 EA |
| 20+95 - 47" Lt | 1 EA |
| REMOVE GATE VALVE BOX | 724-7014 |
| 20+54 - 35" Lt | 1 EA |



| | | | | | | |
|-----|---|--|---|---|--------------------|-----|
| 910 | EX-CB25 STA. 20+48.15.4'R RIM: 900.79 E. INV.: 894.93 N. INV.: 894.59 | EX-CB26 STA. 20+64.29.2'L RIM: 900.72 S. INV.: 894.17 E. INV.: 894.12 W. INV.: 894.12 | EX-CB27 STA. 21+03.28.6'L RIM: 901.00 E. INV.: 895.47 W. INV.: 894.51 | EX-CB24 STA. 21+18.15.6'R RIM: 901.07 W. INV.: 895.72 | | 910 |
| 905 | | | | | | 905 |
| 900 | | | | | | 900 |
| 895 | EX. 15" RCP | EX. 12" RCP | EX. 12" RCP | EX. 12" RCP | 8" PVC C900 | 895 |
| 890 | ABANDON EX. 6" PVC | REMOVE EX. 6" PVC | CB15 STA. 21+53.25.4'L RIM: 900.23 S. INV.: 897.51 | M11 STA. 21+53.0.0' RIM: 900.91 E. INV.: 897.44 S. INV.: 897.44 | ABANDON EX. 6" PVC | 890 |
| 885 | | | CB16 STA. 21+53.13.5'R RIM: 900.53 N. INV.: 897.44 | | | 885 |
| 880 | | | | | | 880 |
| | 20+00 | 21+00 | 22+00 | 23+00 | 24+00 | |

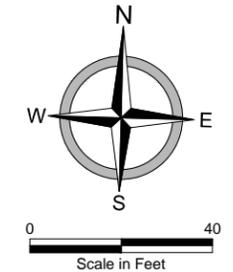
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DRAINAGE LAYOUTS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
WATER AND STORM - STA: 20+00 - 24+00



Estimate of Quantities:

| | |
|--|---|
| REMOVAL OF PIPE ALL TYPES AND SIZES 24+00 to 26+32 (Ex. 8" Watermain) | 202-0174 232 LF |
| PIPE CONDUIT 15IN-STORM DRAIN 24+00 to 24+92 M12 to CB17 - 24+92 M12 to CB18 - 24+92 | 714-4097 92 LF 14 LF 13 LF |
| MANHOLE 48IN M12 - 24+92 | 722-0100 1 EA |
| INLET-TYPE 2 CB17 - 24+92 - 13.5' Lt CB18 - 24+92 - 13.5' Rt | 722-3510 1 EA 1 EA |
| FITTINGS-DUCTILE IRON 8" Watermain 45° Bend - 25+93 - 18' Lt 8" Watermain 45° Bend - 26+10 - 35' Lt 8" Watermain 45° Bend - 26+19 - 35' Lt 8" Watermain 45° Bend - 26+24 - 40' Lt | 724-0210 66 LBS 66 LBS 66 LBS 66 LBS |
| REMOVE GATE VALVE & BOX 26+10 - 35' LT | 724-0270 1 EA |
| GATE VALVE & BOX 8IN 26+24 - 42' Lt | 724-0310 1 EA |
| WATERMAIN 8IN PVC 24+00 to 26+35 | 724-0830 235 LF |
| CONNECTION TO EXISTING MAIN 26+24 - 42' Lt | 724-0944 1 EA |



| | | | | | |
|-----|-------------------------------|------------|------------|--|-----|
| 910 | | | | | 910 |
| 905 | | | | | 905 |
| 900 | 339'-15" PIPE CONDUIT @ 0.28% | | | | 900 |
| 895 | 8" PVC C900 | 894.75 TOP | 895.95 TOP | | 895 |
| 890 | ABANDON EX. 6" PVC | | | | 890 |
| 885 | | | | | 885 |
| 880 | | | | | 880 |

EXISTING GROUND
● PROPOSED CROWN

PROPOSED GROUND
● PROPOSED CROWN

M12
STA. 24+92.00'
RIM: 902.24
S. INV.: 898.39
N. INV.: 898.39
W. INV.: 898.39

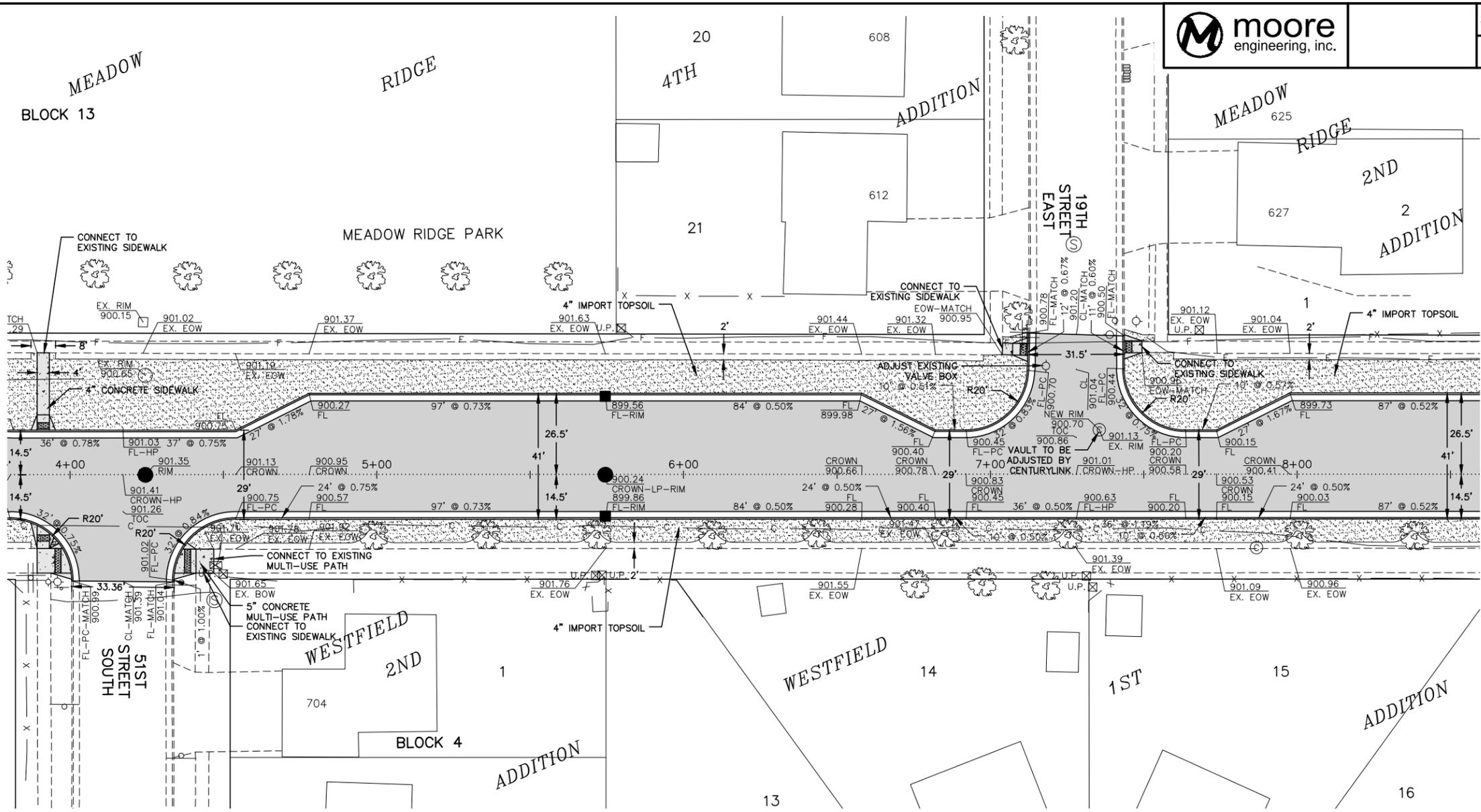
CB17
STA. 24+92.13.5'L
RIM: 901.86
S. INV.: 898.43

CB18
STA. 24+92.13.5'R
RIM: 901.86
N. INV.: 898.43

REMOVE EX. 6" PVC

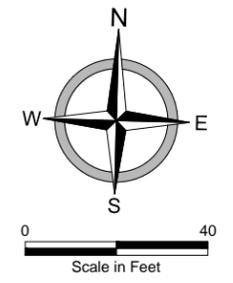
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DRAINAGE LAYOUTS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
WATER AND STORM - STA: 24+00 - 28+00



Estimate of Quantities:

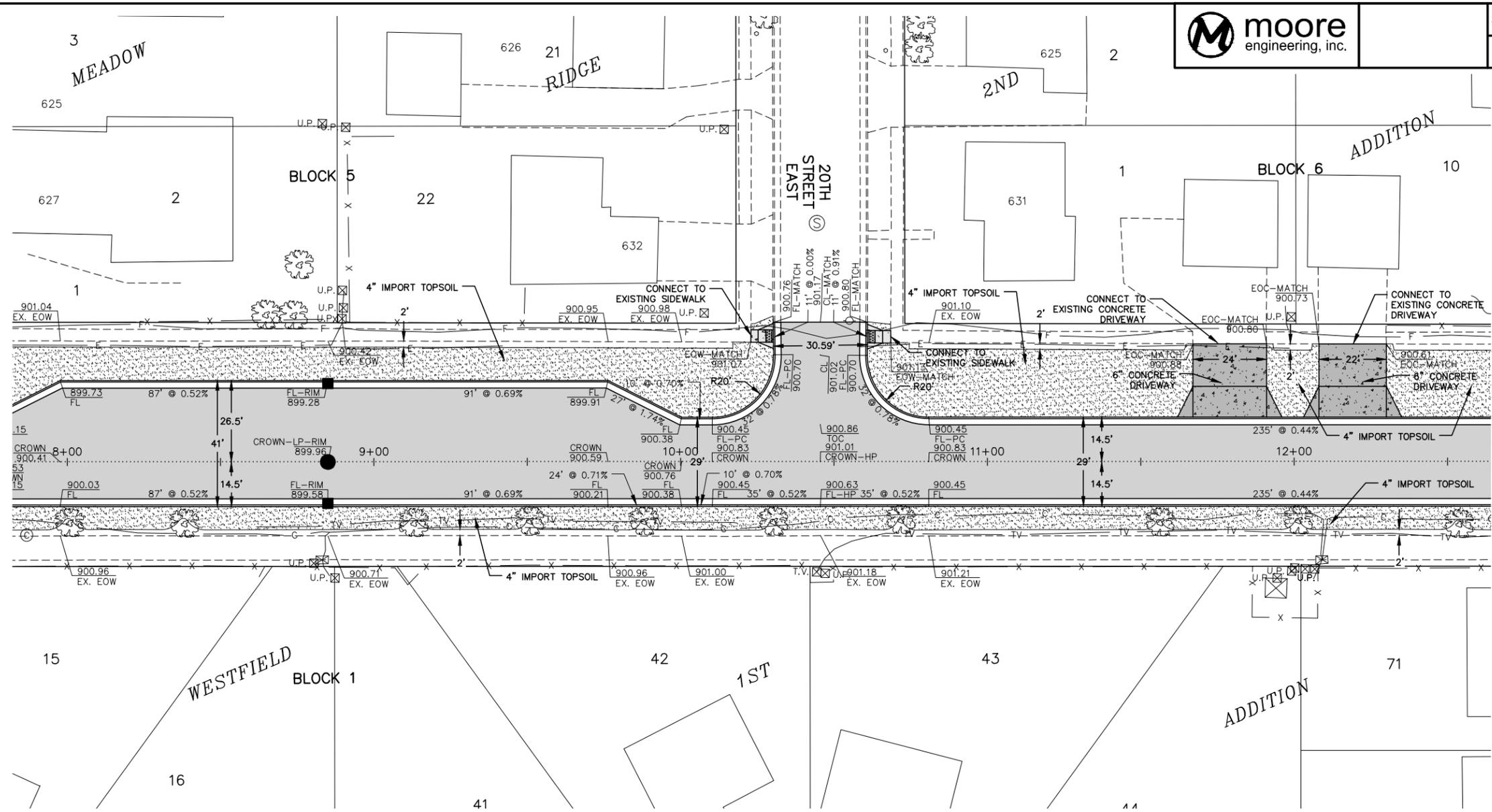
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|--|----------------------|
| COMMON EXCAVATION-TYPE A 4+00 to 8+00 | 203-0101 918 CY |
| TOPSOIL-IMPORTED 4+38 - 15' Rt to 8+00 - 15' Rt | 203-0119 35 CY |
| 4+00 - 27' Lt to 7+13 - 29' Lt | 59 CY |
| 7+43 - 29' Lt to 8+00 - 27' Lt | 13 CY |
| SUBGRADE PREPARATION-TYPE A 4+00 to 8+00 | 230-0300 4 STA |
| AGGREGATE BASE COURSE CL 5 4+00 to 8+00 | 302-0121 471 CY |
| 8IN NON-REINF CONCRETE PAVEMENT CL YE 4+00 to 8+00 | 550-0110 1,567 SY |
| GEOTEXTILE FABRIC-TYPE R1 4+00 to 8+00 | 709-0701 1,882 SY |
| UNDERDRAIN PIPE PVC PERFORATED 4IN 4+34 - 34' Rt to 8+00 14' Rt | 714-9720 379 LF |
| 4+00 - 14' Lt to 7+13 - 46' Lt | 341 LF |
| 7+43 - 46' Lt to 8+00 - 26' Lt | 82 LF |
| ADJUST GATE VALVE BOX 7+18 - 35' Lt | 722-6140 1 EA |
| CURB & GUTTER-TYPE I 4+34 - 34' Rt to 8+00 14' Rt | 748-0140 379 LF |
| 4+00 - 14' Lt to 7+13 - 46' Lt | 341 LF |
| 7+43 - 46' Lt to 8+00 - 26' Lt | 82 LF |
| SIDEWALK CONCRETE 4IN 7+04 - 40' Lt to 7+07 - 40' Lt | 750-0115 1 SY |
| SIDEWALK CONCRETE 5IN 4+41 - 24' Rt to 4+47 - 24' Rt | 750-0125 5 SY |
| SIDEWALK CONCRETE 6IN 4+36 - 24' Rt | 750-0140 7 SY |
| 7+07 - 39' Lt | 3 SY |
| 7+43 - 39' Lt | 3 SY |
| DETECTABLE WARNING PANELS 4+36 - 24' Rt | 750-2115 16 SF |
| 7+07 - 39' Lt | 8 SF |
| 7+43 - 39' Lt | 8 SF |



| | | | | | | | | | | | | | |
|-----|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|-----|
| 910 | STA = 3+80.54 ELEV = 901.13 | STA = 4+17.23 ELEV = 901.41 | STA = 4+53.91 ELEV = 901.13 | STA = 4+77.91 ELEV = 900.95 | STA = 5+74.49 ELEV = 900.24 | STA = 6+58.07 ELEV = 900.66 | STA = 6+82.07 ELEV = 900.78 | STA = 6+92.07 ELEV = 900.83 | STA = 7+28.05 ELEV = 901.01 | STA = 7+63.74 ELEV = 900.58 | STA = 7+73.74 ELEV = 900.53 | STA = 7+97.72 ELEV = 900.41 | 910 |
| 905 | <p>FINISHED GROUND ● CROWN</p> <p>EXISTING GROUND ● PROPOSED CROWN</p> | | | | | | | | | | | | 905 |
| 900 | <p>0.76% -0.76% -0.75% -0.74% 0.50% 0.50% 0.50% 0.50% -1.21% -0.50% -0.50%</p> | | | | | | | | | | | | 900 |
| 895 | | | | | | | | | | | | | 895 |
| 890 | | | | | | | | | | | | | 890 |
| 885 | | | | | | | | | | | | | 885 |
| 880 | | | | | | | | | | | | | 880 |
| | 4+00 | 5+00 | 6+00 | 7+00 | 8+00 | | | | | | | | |

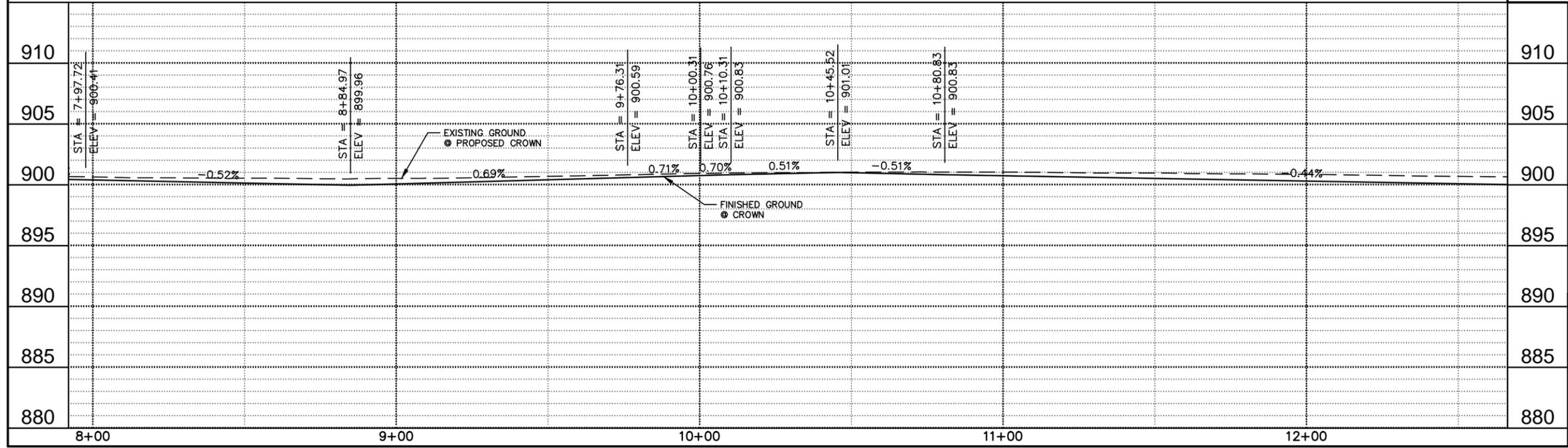
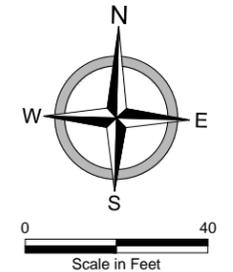
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PLAN & PROFILE SHEETS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
ROADWAY - STA: 4+00 - 8+00



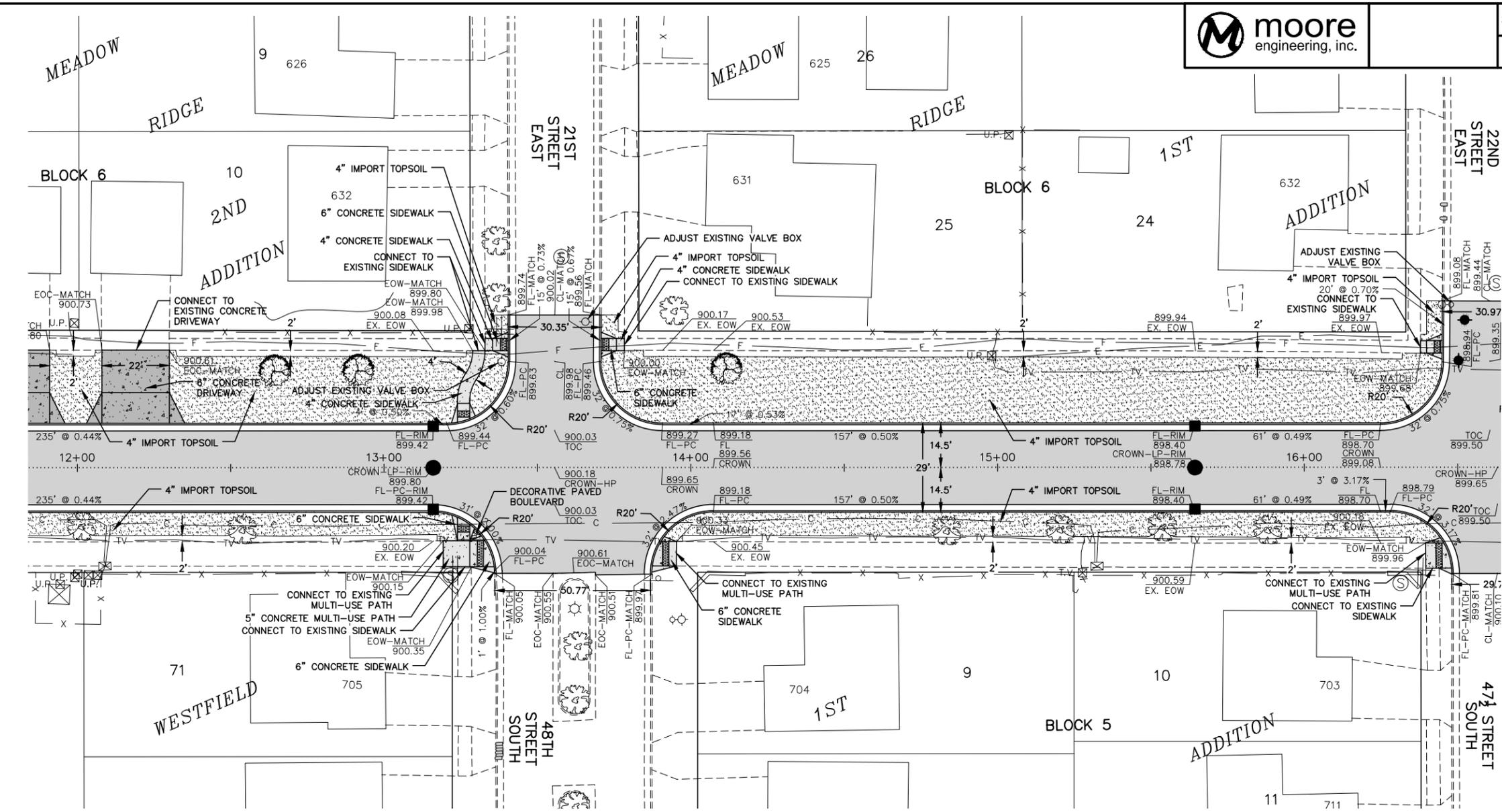
Estimate of Quantities:

| | |
|--|----------|
| COMMON EXCAVATION-TYPE A | 203-0101 |
| 8+00 to 12+00 | 735 CY |
| TOPSOIL-IMPORTED | 203-0119 |
| 8+00 - 15' Rt to 12+00 - 15' Rt | 39 CY |
| 8+00 - 27' Lt to 10+31 - 37' Lt | 36 CY |
| 10+62 - 37' Lt to 11+67 - 24' Lt | 28 CY |
| 11+91 - 24' Lt to 12+00 - 24' Lt | 2 CY |
| SUBGRADE PREPARATION-TYPE A | 230-0300 |
| 8+00 to 12+00 | 4 STA |
| AGGREGATE BASE COURSE CL 5 | 302-0121 |
| 8+00 to 12+00 | 438 CY |
| 8IN NON-REINF CONCRETE PAVEMENT CL YE | 550-0110 |
| 8+00 to 12+00 | 1,436 SY |
| GEOTEXTILE FABRIC-TYPE R1 | 709-0701 |
| 8+00 to 12+00 | 1,753 SY |
| UNDERDRAIN PIPE PVC PERFORATED 4IN | 714-9720 |
| 8+00 - 26' Lt to 10+31 - 45' Lt | 256 LF |
| 10+62 - 45' Lt to 12+00 - 14' Lt | 162 LF |
| 8+00 - 14' Rt to 12+00 - 14' Rt | 400 LF |
| CURB & GUTTER-TYPE I | 748-0140 |
| 8+00 - 26' Lt to 10+31 - 45' Lt | 256 LF |
| 10+62 - 45' Lt to 12+00 - 14' Lt | 162 LF |
| 8+00 - 14' Rt to 12+00 - 14' Rt | 400 LF |
| SIDEWALK CONCRETE 4IN | 750-0115 |
| 10+23 - 40' Lt to 10+26 - 40' Lt | 1 SY |
| 10+65 - 40' Lt to 10+68 - 40' Lt | 1 SY |
| SIDEWALK CONCRETE 6IN | 750-0140 |
| 10+31 - 38' Lt | 3 SY |
| 10+60 - 38' Lt | 3 SY |
| DRIVEWAY CONCRETE | 750-1000 |
| 11+62 - 15' Lt to 11+96 - 15' Lt | 69 SY |
| DETECTABLE WARNING PANELS | 750-2115 |
| 10+31 - 38' Lt | 8 SF |
| 10+60 - 38' Lt | 8 SF |



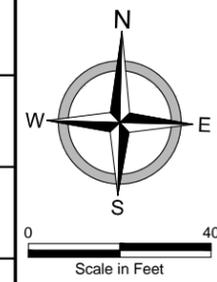
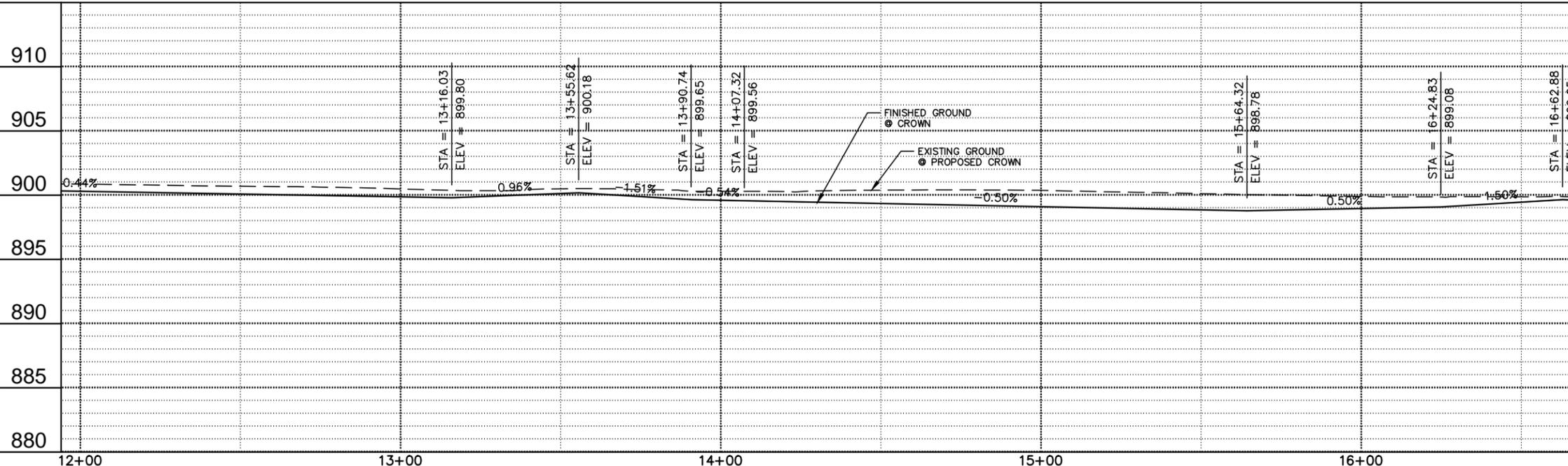
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PLAN & PROFILE SHEETS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
ROADWAY - STA: 8+00 - 12+00



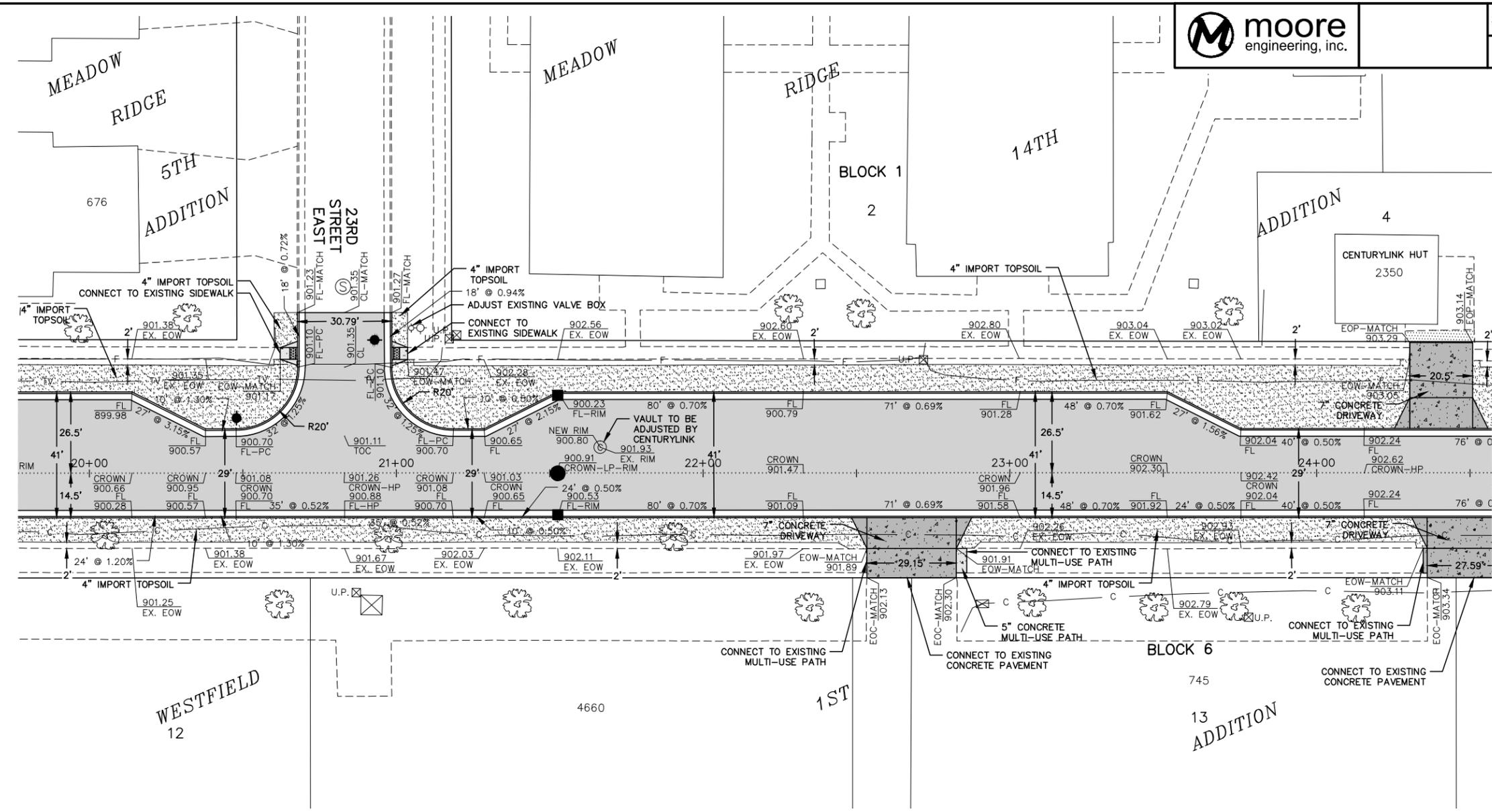
Estimate of Quantities:

| | |
|--|----------|
| COMMON EXCAVATION-TYPE A | 203-0101 |
| 12+00 to 16+00 | 930 CY |
| TOPSOIL-IMPORTED | 203-0119 |
| 12+00 - 24' Lt to 12+08 - 24' Lt | 2 CY |
| 12+00 - 15' Rt to 13+22 - 15' Rt | 12 CY |
| 12+30 - 24' Lt to 13+24 - 24' Lt | 25 CY |
| 13+28 - 24' Lt to 13+38 - 24' Lt | 2 CY |
| 13+75 - 24' Lt to 16+00 - 24' Lt | 60 CY |
| 13+92 - 22' Rt to 16+00 - 22' Rt | 21 CY |
| SUBGRADE PREPARATION-TYPE A | 230-0300 |
| 12+00 to 16+00 | 4 STA |
| AGGREGATE BASE COURSE CL 5 | 302-0121 |
| 12+00 to 16+00 | 411 CY |
| 8IN NON-REINF CONCRETE PAVEMENT CL YE | 550-0110 |
| 12+00 to 16+00 | 1,335 SY |
| GEOTEXTILE FABRIC-TYPE R1 | 709-0701 |
| 12+00 to 16+00 | 1,645 SY |
| UNDERDRAIN PIPE PVC PERFORATED 4IN | 714-9720 |
| 12+00 - 14' Lt to 13+41 - 50' Lt | 168 LF |
| 12+00 - 14' Rt to 13+36 - 35' Rt | 148 LF |
| 13+37 - 35' Rt to 16+00 - 14' Rt | 225 LF |
| 13+71 - 50' Lt to 16+00 - 14' Lt | 257 LF |
| CURB & GUTTER-TYPE I | 748-0140 |
| 12+00 - 14' Lt to 13+41 - 50' Lt | 168 LF |
| 12+00 - 14' Rt to 13+36 - 35' Rt | 148 LF |
| 13+37 - 35' Rt to 16+00 - 14' Rt | 225 LF |
| 13+71 - 50' Lt to 16+00 - 14' Lt | 257 LF |
| DECORATIVE PAVED BOULEVARD | 750-0111 |
| 13+30 - 20' Rt | 1 SY |
| SIDEWALK CONCRETE 4IN | 750-0115 |
| 13+24 - 21' Lt to 13+29 - 38' Lt | 8 SY |
| 13+33 - 38' Lt to 13+36 - 38' Lt | 1 SY |
| 13+76 - 38' Lt to 13+79 - 38' Lt | 1 SY |
| SIDEWALK CONCRETE 5IN | 750-0125 |
| 13+20 - 24' Rt to 13+29 - 24' Rt | 15 SY |
| SIDEWALK CONCRETE 6IN | 750-0140 |
| 13+24 - 15' Lt | 4 SY |
| 13+24 - 15' Rt | 4 SY |
| 13+29 - 24' Rt | 8 SY |
| 13+36 - 38' Lt | 3 SY |
| 13+71 - 38' Rt | 3 SY |
| 13+71 - 24' Rt | 7 SY |
| DRIVEWAY CONCRETE | 750-1000 |
| 12+03 - 15' Lt to 12+37 - 15' Lt | 64 SY |
| DETECTABLE WARNING PANELS | 750-2115 |
| 13+24 - 15' Lt | 8 SF |
| 13+24 - 15' Rt | 8 SF |
| 13+29 - 24' Rt | 16 SF |
| 13+36 - 38' Lt | 8 SF |
| 13+71 - 38' Rt | 8 SF |
| 13+71 - 24' Rt | 16 SF |



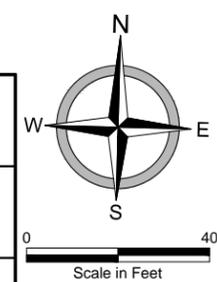
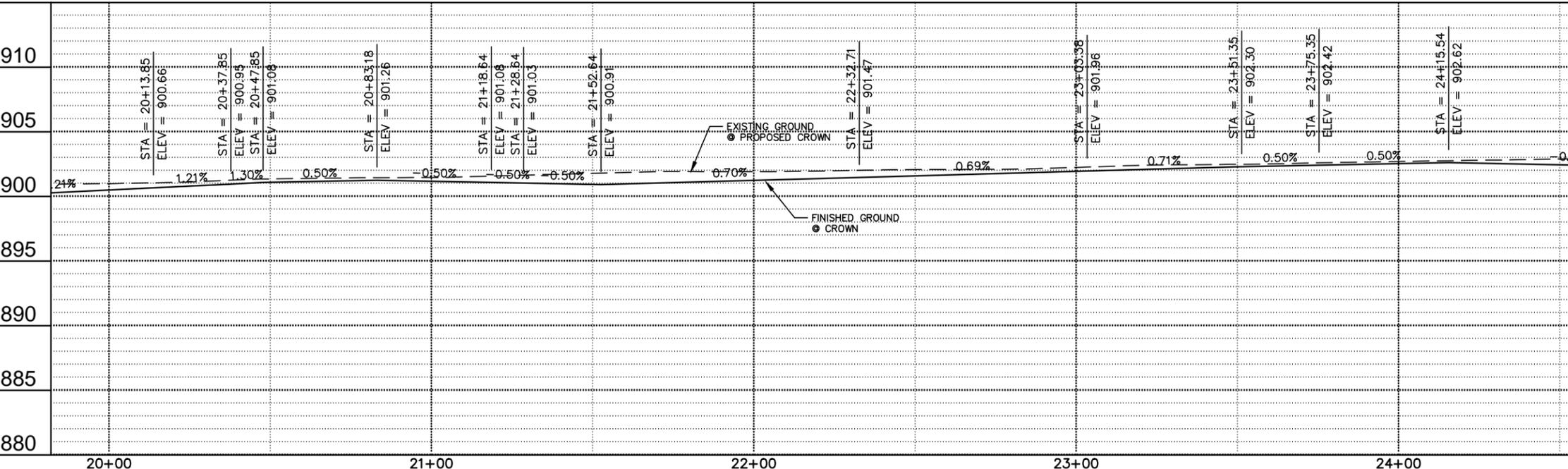
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PLAN & PROFILE SHEETS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
ROADWAY - STA: 12+00 - 16+00



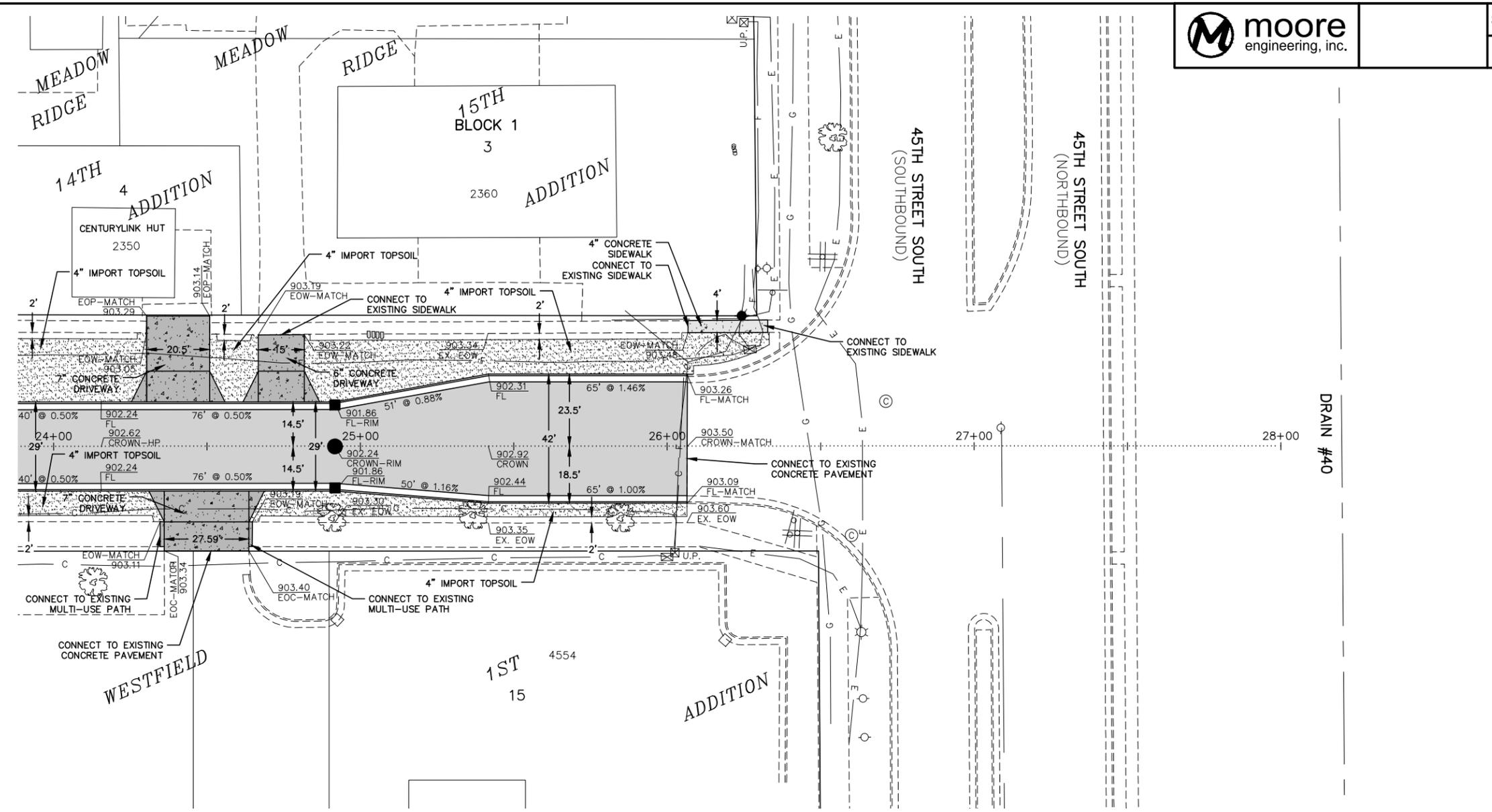
Estimate of Quantities:

| | |
|---|--|
| COMMON EXCAVATION-TYPE A 20+00 to 24+00 | 203-0101 886 CY |
| TOPSOIL-IMPORTED 20+00 - 27' Lt to 20+67 - 27' Lt 20+00 - 20' Rt to 22+51 - 20' Rt 21+01 - 27' Lt to 24+00 - 27' Lt 22+85 - 20' Rt to 24+00 - 20' Rt | 203-0119 13 CY 24 CY 43 CY 11 CY |
| SUBGRADE PREPARATION-TYPE A 20+00 to 24+00 | 230-0300 4 STA |
| AGGREGATE BASE COURSE CL 5 20+00 to 24+00 | 302-0121 465 CY |
| 8IN NON-REINF CONCRETE PAVEMENT CL YE 20+00 to 24+00 | 550-0110 1,534 SY |
| GEOTEXTILE FABRIC-TYPE R1 20+00 to 24+00 | 709-0701 1,861 SY |
| UNDERDRAIN PIPE PVC PERFORATED 4IN 20+00 - 14' Lt to 20+69 - 52' Lt 20+98 - 52' Lt to 24+00 - 14' Lt 20+00 - 14' Rt to 24+00 - 14' Rt | 714-9720 101 LF 337 LF 400 LF |
| CURB & GUTTER-TYPE I 20+00 - 14' Lt to 20+69 - 52' Lt 20+98 - 52' Lt to 24+00 - 14' Lt 20+00 - 14' Rt to 24+00 - 14' Rt | 748-0140 101 LF 337 LF 400 LF |
| SIDEWALK CONCRETE 5IN 22+83 - 25' Rt to 22+86 - 25' Rt | 750-0125 3 SY |
| SIDEWALK CONCRETE 6IN 20+63 - 37' Lt 21+00 - 37' Lt | 750-0140 4 SY 4 SY |
| DRIVEWAY CONCRETE 22+49 - 15' Rt to 22+88 - 15' Rt | 750-1000 69 SY |
| DETECTABLE WARNING PANELS 20+63 - 37' Lt 21+00 - 37' Lt | 750-2115 8 SF 8 SF |



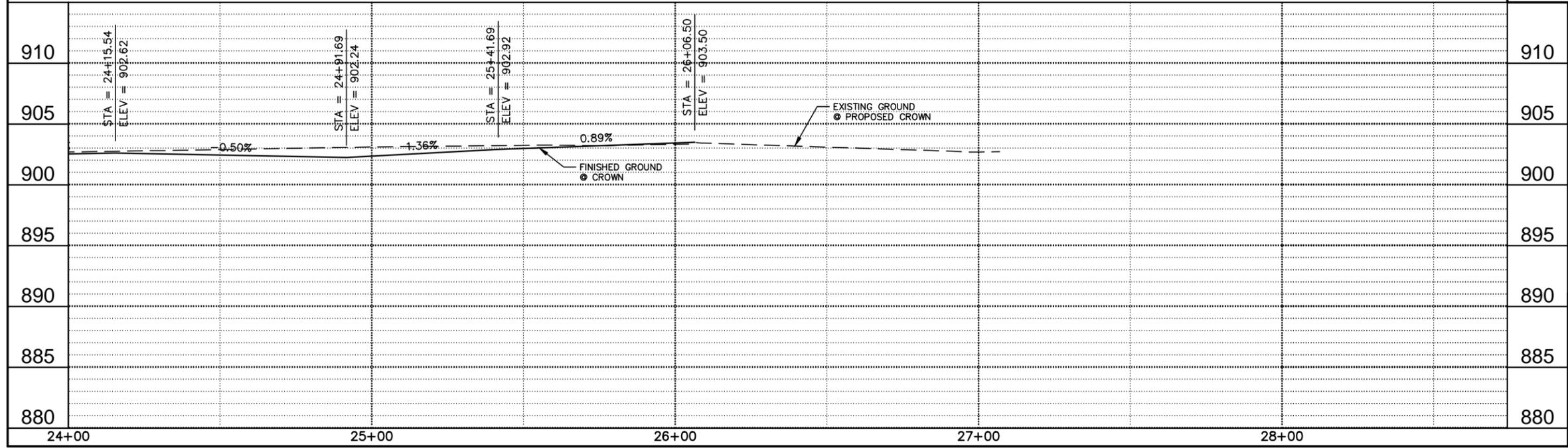
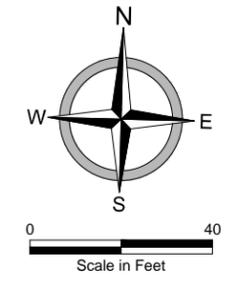
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PLAN & PROFILE SHEETS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
ROADWAY - STA: 20+00 - 24+00



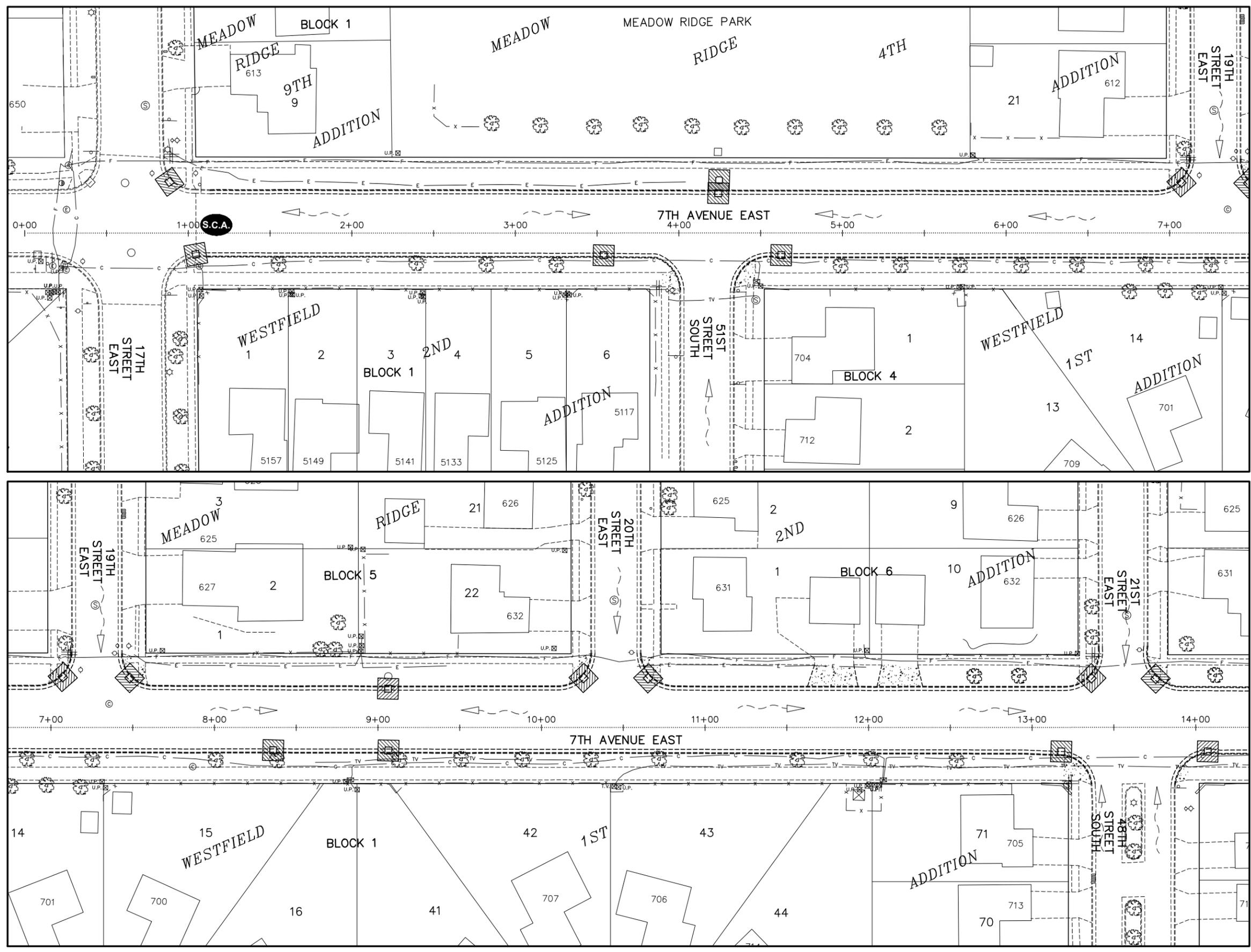
Estimate of Quantities:

| | |
|---|--|
| COMMON EXCAVATION-TYPE A 24+00 to 26+07 | 203-0101 352 CY |
| TOPSOIL-IMPORTED 24+00 - 27' Lt TO 24+31 - 27' Lt 24+00 - 20' Rt to 24+36 - 20' Rt 24+52 - 27' Lt to 24+68 - 27' Lt 24+67 - 20' Rt to 26+07 - 20' Rt 24+82 - 27' Lt to 33+37 - 27' Lt | 203-0119 7 CY 3 CY 3 CY 10 CY 25 CY |
| SUBGRADE PREPARATION-TYPE A 24+00 to 26+07 | 230-0300 2 STA |
| AGGREGATE BASE COURSE CL 5 24+00 to 26+07 | 302-0121 210 CY |
| 8IN NON-REINF CONCRETE PAVEMENT CL YE 24+00 to 26+07 | 550-0110 678 SY |
| GEOTEXTILE FABRIC-TYPE R1 24+00 to 26+07 | 709-0701 839 SY |
| UNDERDRAIN PIPE PVC PERFORATED 4IN 24+00 - 14' Lt to 26+07 - 23' Lt 24+00 - 14' Rt to 26+07 - 18' Rt | 714-9720 207 LF 207 LF |
| CURB & GUTTER-TYPE I 24+00 - 14' Lt to 26+07 - 23' Lt 24+00 - 14' Rt to 26+07 - 18' Rt | 748-0140 207 LF 207 LF |
| SIDEWALK CONCRETE 4IN 26+07 - 37' Lt to 26+33 - 37' Lt | 750-0115 16 SY |
| DRIVEWAY CONCRETE 24+26 - 15' Lt to 24+57 - 15' Lt 24+31 - 15' Rt to 24+69 - 15' Rt 24+62 - 15' Lt to 24+87 - 15' Lt | 750-1000 69 SY 42 SY 65 SY |



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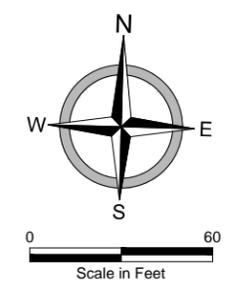
PLAN & PROFILE SHEETS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
ROADWAY - STA: 24+00 - 28+00



Estimate of Quantities:

| INLET PROTECTION-SPECIAL | 708-1540 |
|--------------------------|----------|
| 0+89 - 31' Lt | 1 EA |
| 1+05 - 13' Rt | 1 EA |
| 3+54 - 13' Rt | 1 EA |
| 4+25 - 32' Lt | 1 EA |
| 4+25 - 24' Lt | 1 EA |
| 4+65 - 13' Rt | 1 EA |
| 7+07 - 31' Lt | 1 EA |
| 7+48 - 30' Rt | 1 EA |
| 8+36 - 14' Rt | 1 EA |
| 9+06 - 24' Lt | 1 EA |
| 9+06 - 14' Rt | 1 EA |
| 10+26 - 30' Lt | 1 EA |
| 10+65 - 30' Lt | 1 EA |
| 13+18 - 14.5' Rt | 1 EA |
| 13+36 - 30' Lt | 1 EA |
| 13+75 - 30' Lt | 1 EA |

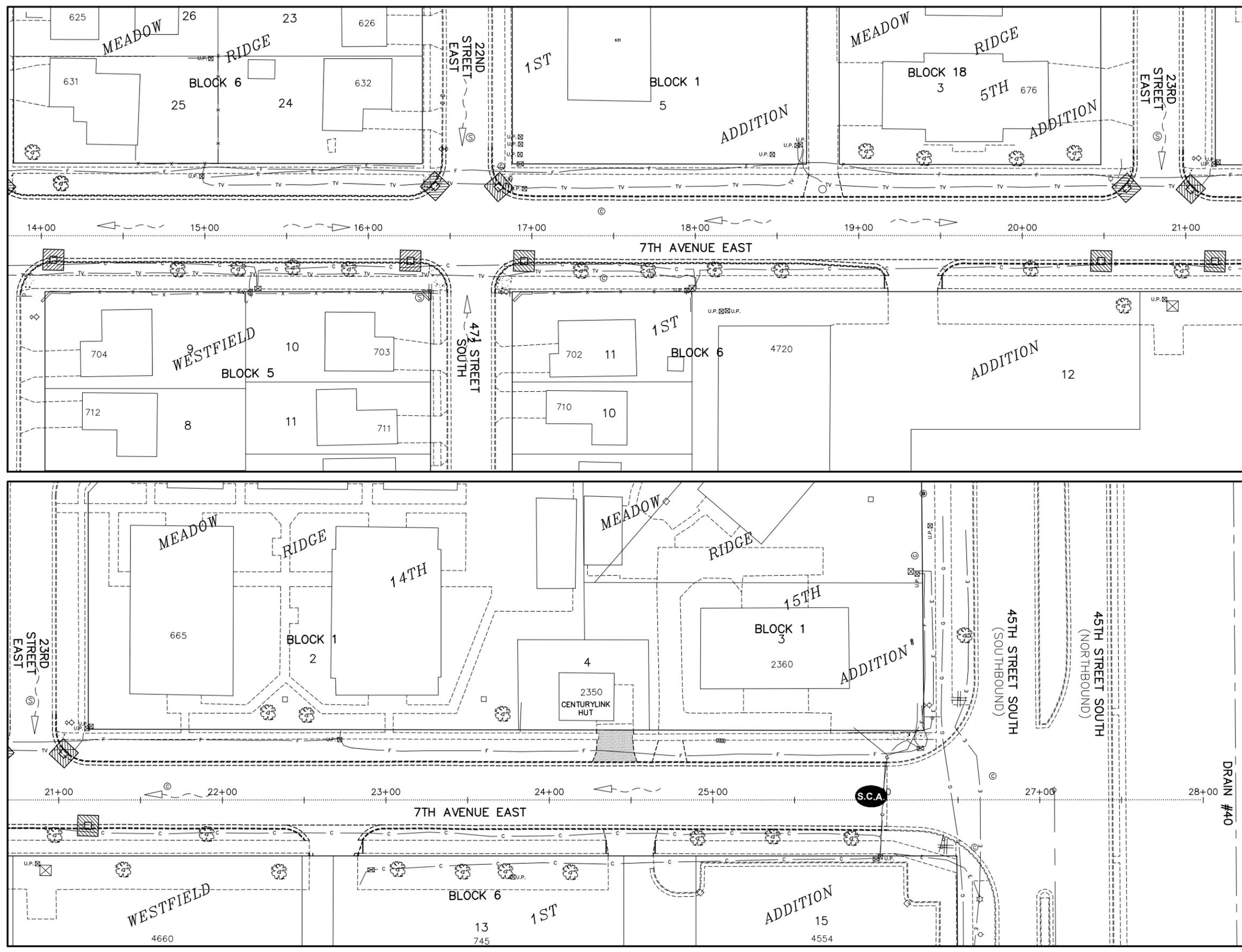
| STABILIZATION CONSTRUCTION ACCESS | 708-8500 |
|-----------------------------------|----------|
| 1+17 - 5' Lt | 1 EA |



- : INLET PROTECTION DEVICE ON EXISTING INLET
- : STABILIZED CONSTRUCTION ACCESS
- : EXISTING FLOW DIRECTION

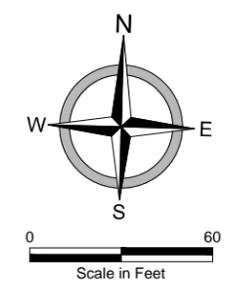
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**WETLANDS, EROSION CONTROL AND SEEDING
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
INITIAL EROSION CONTROL PLAN - STA: 0+00 - 14+00**



Estimate of Quantities:

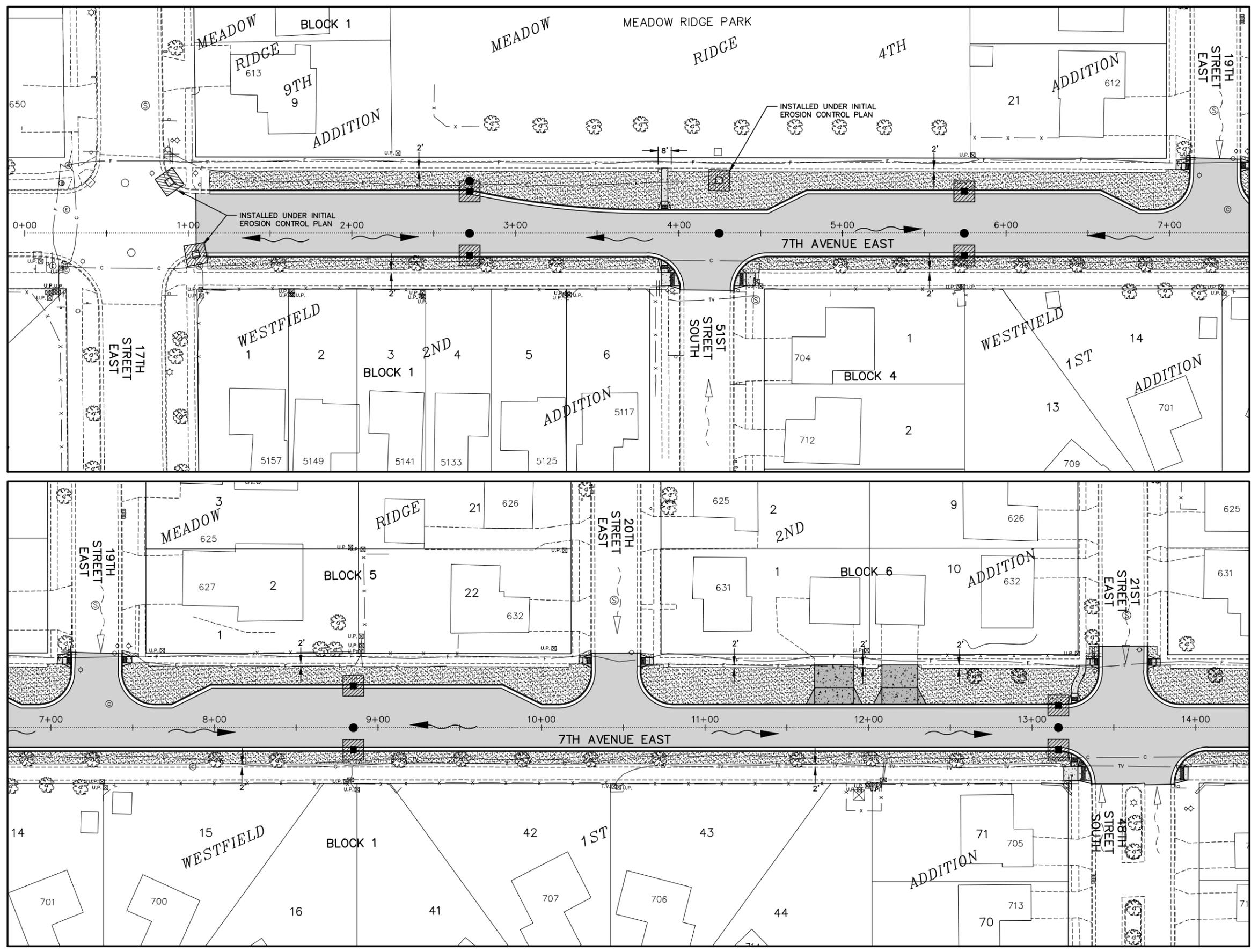
| | |
|--|-----------------|
| INLET PROTECTION-SPECIAL | 708-1540 |
| 14+07 - 14.5' Rt | 1 EA |
| 16+26 - 15' Rt | 1 EA |
| 16+41 - 30' Lt | 1 EA |
| 16+80 - 30' Lt | 1 EA |
| 16+95 - 15' Rt | 1 EA |
| 20+48 - 15' Rt | 1 EA |
| 20+64 - 29' Lt | 1 EA |
| 21+03 - 29' Lt | 1 EA |
| 21+18 - 15' Rt | 1 EA |
| STABILIZATION CONSTRUCTION ACCESS | 708-8500 |
| 25+90 - 2' Lt | 1 EA |



-  : INLET PROTECTION DEVICE ON EXISTING INLET
-  : STABILIZED CONSTRUCTION ACCESS
-  : EXISTING FLOW DIRECTION

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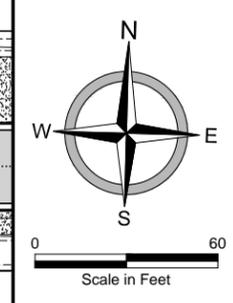
**WETLANDS, EROSION CONTROL AND SEEDING
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
INITIAL EROSION CONTROL PLAN - STA: 14+00 - 28+00**



Estimate of Quantities:

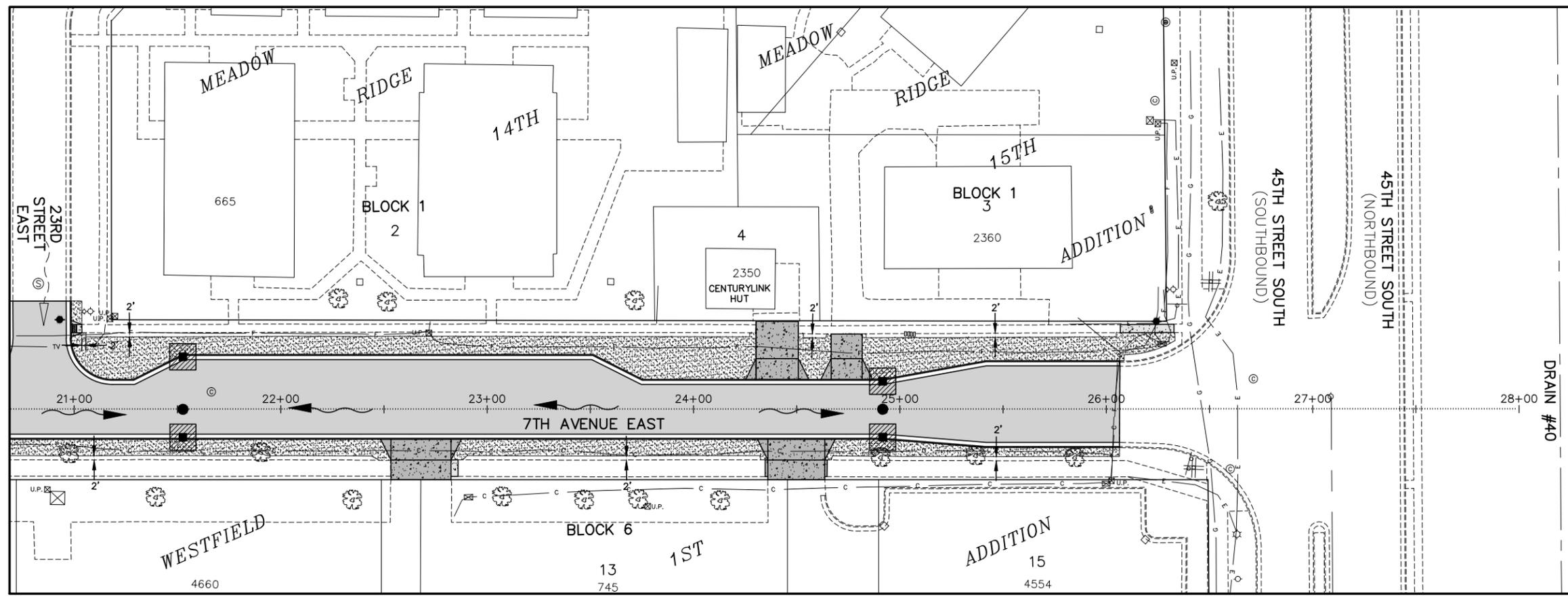
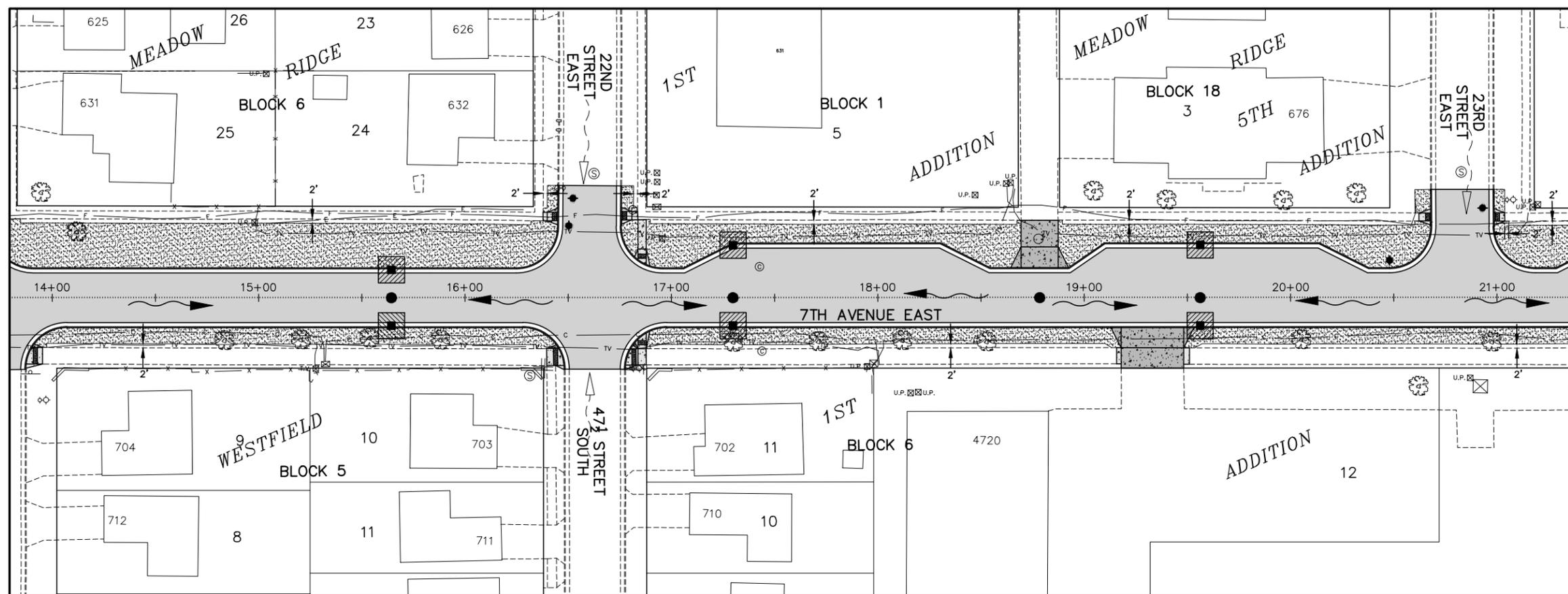
| | |
|----------------------------------|-----------------|
| INLET PROTECTION-SPECIAL | 708-1540 |
| 2+72 - 26' Lt | 1 EA |
| 2+72 - 14' Rt | 1 EA |
| 5+75 - 26' Lt | 1 EA |
| 5+75 - 14' Rt | 1 EA |
| 8+85 - 26' Lt | 1 EA |
| 8+85 - 14' Rt | 1 EA |
| 13+16 - 14' Lt | 1 EA |
| 13+16 - 14' Rt | 1 EA |
| SEEDING-HYDRO MULCH | 708-2900 |
| 1+12 - 14' Rt to 3+87 - 16' Rt | 221 SY |
| 4+38 - 22' Rt to 13+22 - 15' Rt | 713 SY |
| 1+13 - 26.5' Lt to 7+12 - 37' Lt | 529 SY |
| 7+44 - 38' Lt to 10+30 - 37' Lt | 441 SY |
| 10+61 - 37' Lt to 13+40 - 36' Lt | 515 SY |
| 13+71 - 36' Lt to 14+00 - 22' Lt | 64 SY |
| 13+91 - 22' Rt to 14+00 - 16' Rt | 4 SY |

- : INLET PROTECTION DEVICE ON EXISTING INLET
- : INLET PROTECTION DEVICE ON NEW INLET
- : SEEDING & HYDRO MULCH
- : EXISTING FLOW DIRECTION
- : FINAL FLOW DIRECTION



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**WETLANDS, EROSION CONTROL AND SEEDING
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
FINAL EROSION CONTROL PLAN - STA: 0+00 - 14+00**

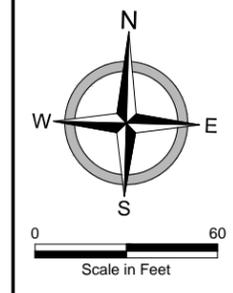


Estimate of Quantities:

| INLET PROTECTION-SPECIAL | 708-1540 |
|--------------------------|----------|
| 15+64 - 14' Lt | 1 EA |
| 15+64 - 14' Rt | 1 EA |
| 17+30 - 26' Lt | 1 EA |
| 17+30 - 14' Rt | 1 EA |
| 19+56 - 26' Lt | 1 EA |
| 19+56 - 14' Rt | 1 EA |
| 21+53 - 26' Lt | 1 EA |
| 21+53 - 14' Rt | 1 EA |
| 24+92 - 14' Lt | 1 EA |
| 24+92 - 14' Rt | 1 EA |

| SEEDING-HYDRO MULCH | 708-2900 |
|--------------------------------------|----------|
| 14+00 - 16' Rt to 16+44 - 23' Rt | 206 SY |
| 14+00 - 22' Lt to 16+45 - 54' Lt | 581 SY |
| 16+76 - 54' Lt to 20+68 - 52' Lt | 506 SY |
| 16+90 - 16' Rt to 19+13 - 14.5' Rt | 195 SY |
| 19+53 - 14.5' Rt to 22+48 - 14.5' Rt | 264 SY |
| 22+88 - 14.5' Rt to 26+06 - 18.5' Rt | 222 SY |
| 20+99 - 52' Lt to 26+33 - 33' Lt | 699 SY |

- : INLET PROTECTION DEVICE ON EXISTING INLET
- : INLET PROTECTION DEVICE ON NEW INLET
- : SEEDING & HYDRO MULCH
- : EXISTING FLOW DIRECTION
- : FINAL FLOW DIRECTION



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**WETLANDS, EROSION CONTROL AND SEEDING
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
FINAL EROSION CONTROL PLAN - STA: 14+00 - 28+00**



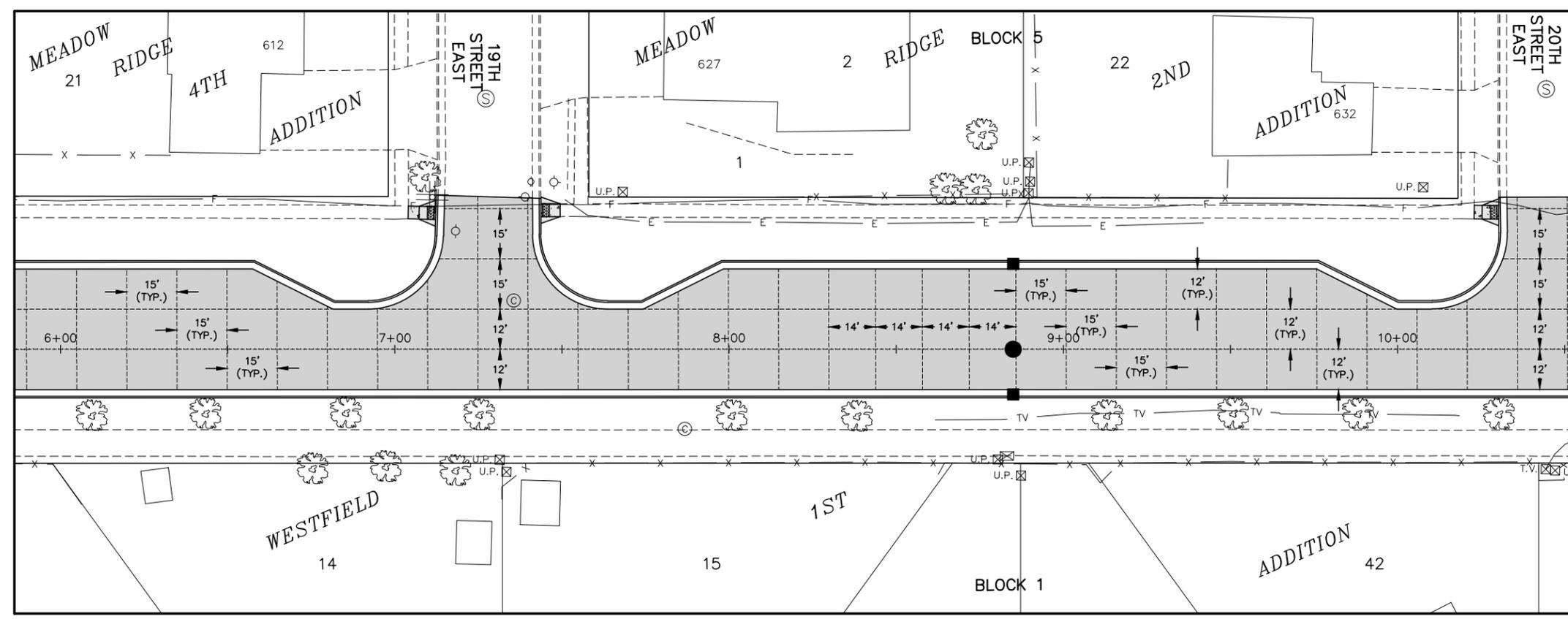
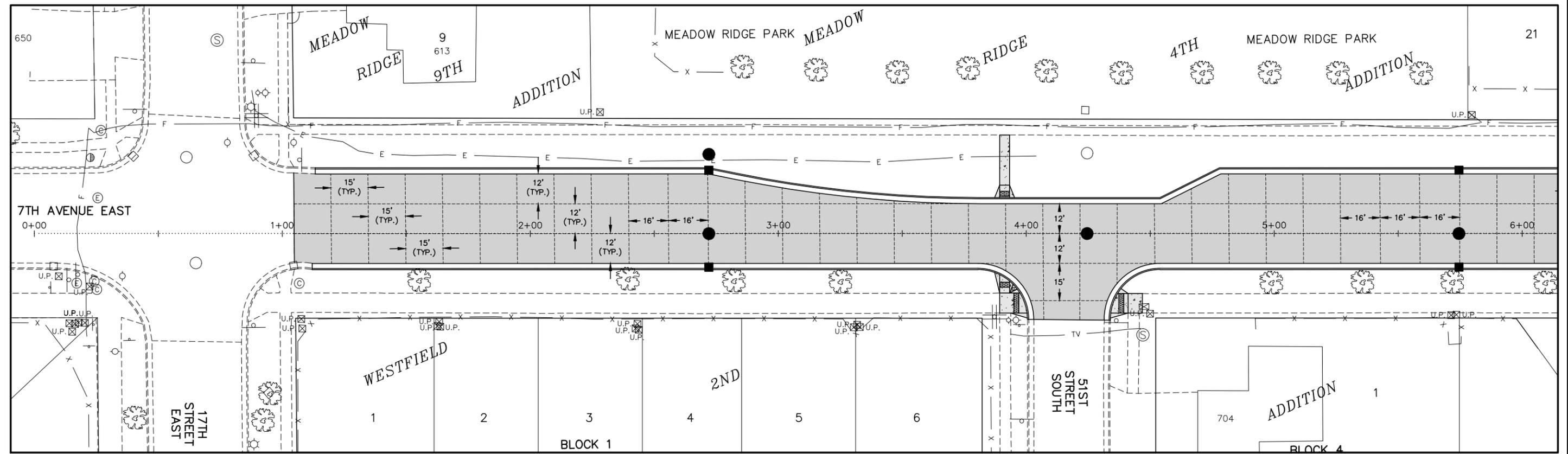
| | | | | |
|-------|------------------|-------|-------------|-----------|
| STATE | PROJECT NO. | PCN | SECTION NO. | SHEET NO. |
| N.D. | SU-8-992(035)036 | 19892 | 81 | 1 |

| 7TH AVENUE LINE AND CURVE TABLE | | | | | | | | |
|---------------------------------|---------|--------|-------|-------------|------------|----------|-----------------------------|-----------------------------|
| Number | Length | Radius | Delta | Bearing | Start Sta. | End Sta. | Start Point | End Point |
| L1 | 2800.00 | N/A | N/A | N88°29'13"E | 0+00 | 28+00 | N 459489.80 E 2875471.77 | N 459563.74 E 2878270.79 |

| BENCHMARK LIST - 1929 DATUM | | | |
|-----------------------------|--------------------|---|--------|
| NO. | DESCRIPTION | LOCATION | ELEV. |
| 1 | TOP NUT ON HYDRANT | NE QUADRANT OF 19TH STREET EAST & 7TH AVENUE EAST | 903.92 |

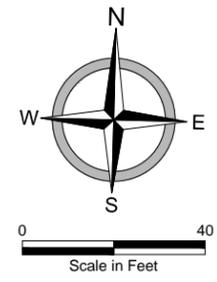
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SURVEY COORDINATE AND CURVE DATA
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
SURVEY COORDINATE AND CURVE DATA



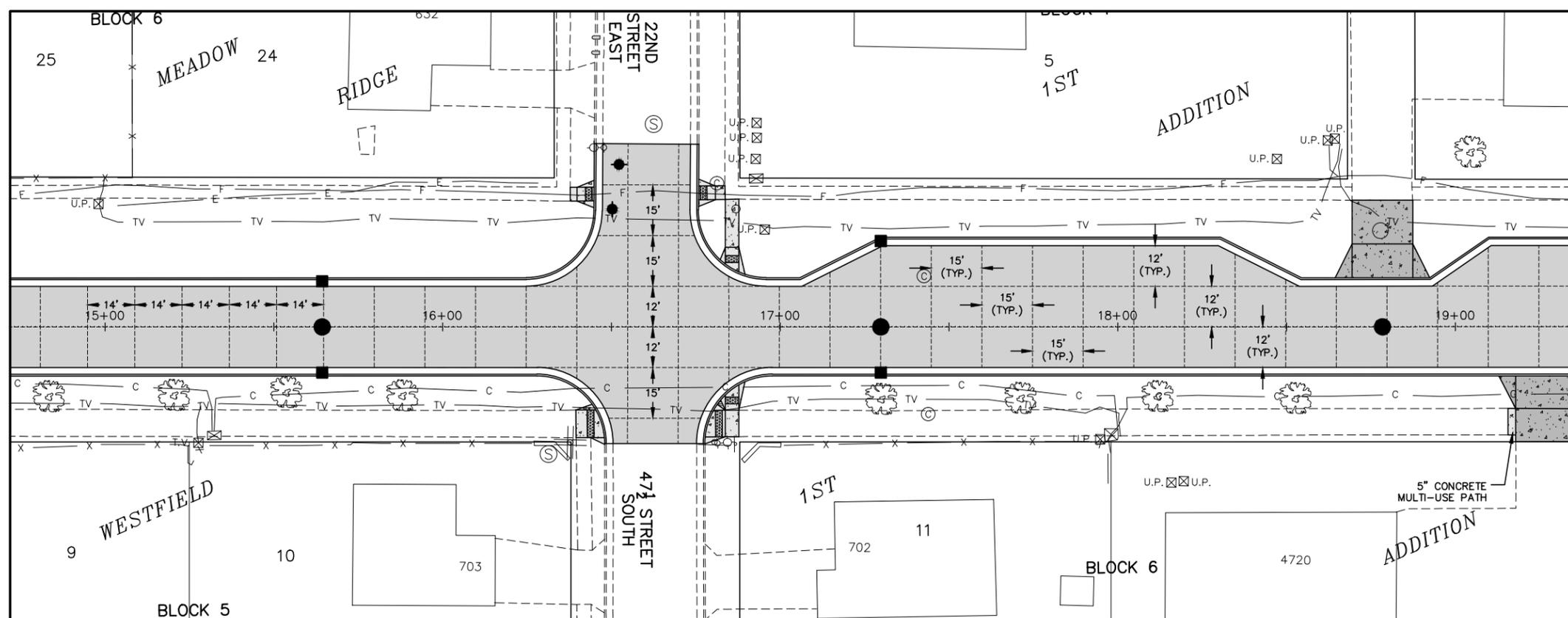
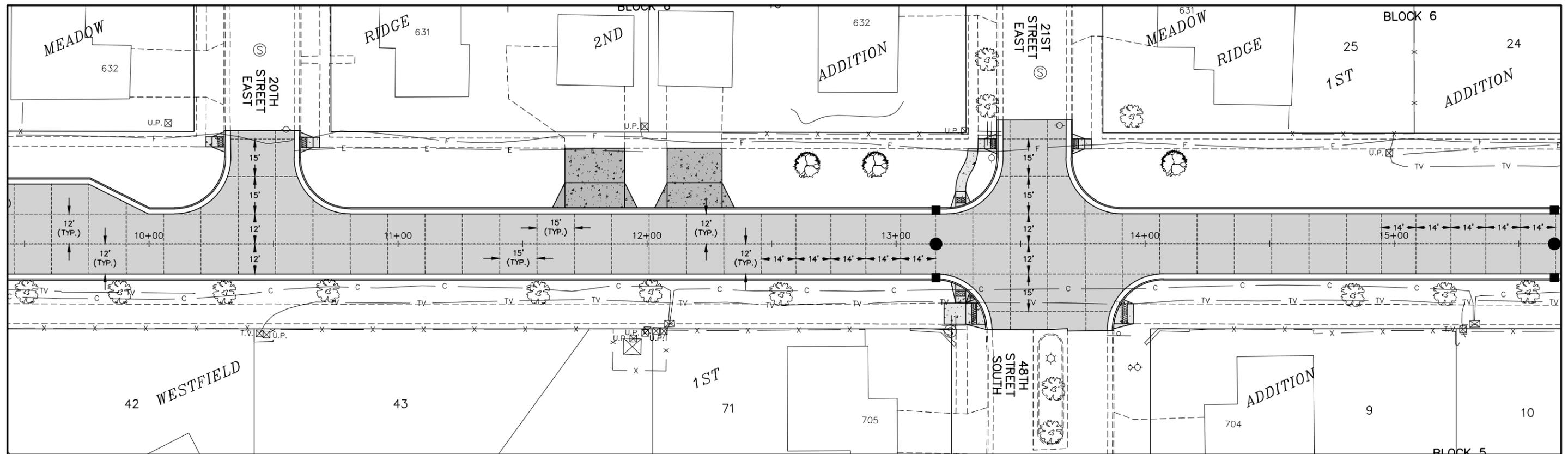
Estimate of Quantities:

| | |
|-------------------------------------|----------|
| DOWELLED CONTRACTION JOINT ASSEMBLY | 550-0240 |
| 1+05 to 10+00 | 2,023 LF |

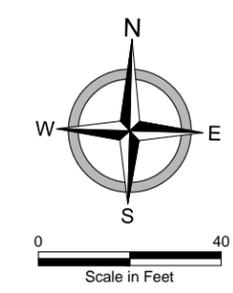


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PAVING LAYOUTS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
JOINTING PLAN - STA: 0+00 - 10+00

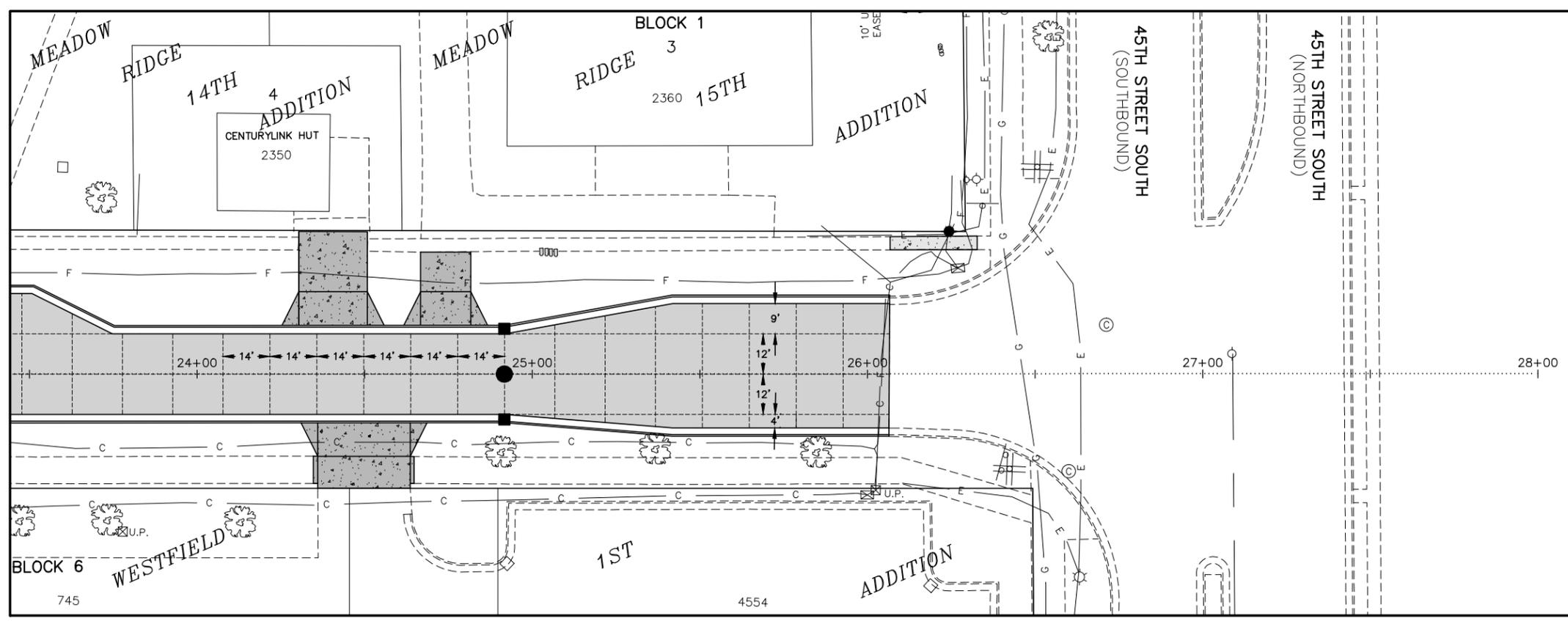
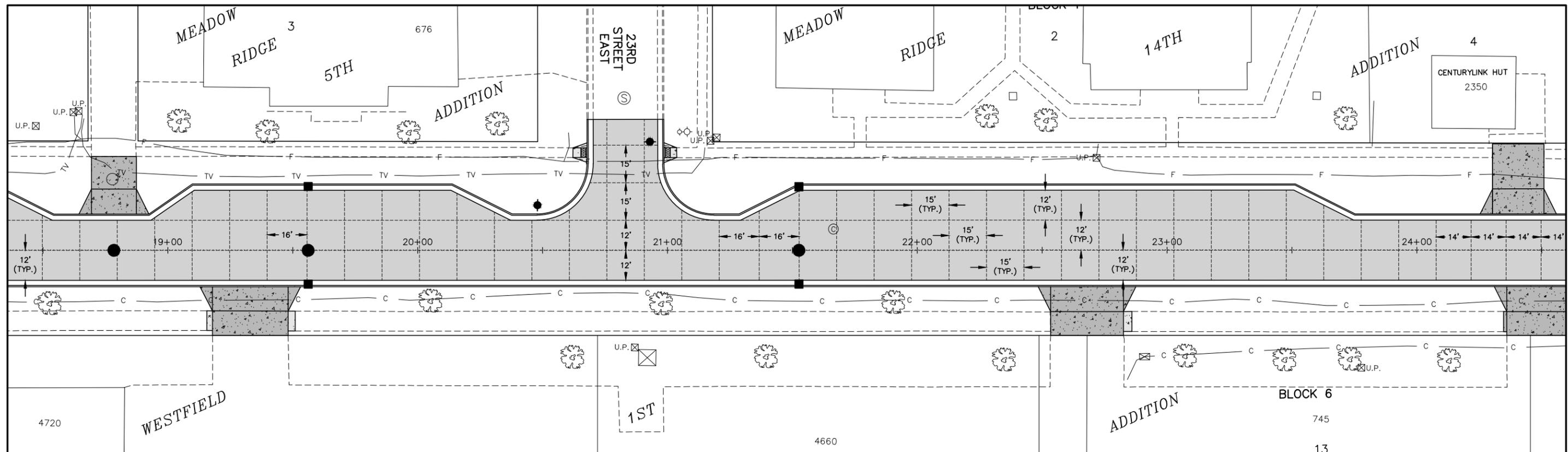


Estimate of Quantities:
DOWELLED CONTRACTION JOINT ASSEMBLY 550-0240
 10+00 to 19+00 1,942 LF



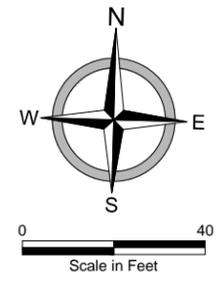
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PAVING LAYOUTS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
JOINTING PLAN - STA: 10+00 - 19+00



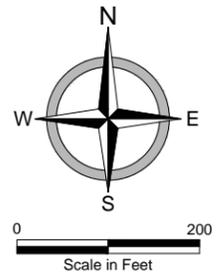
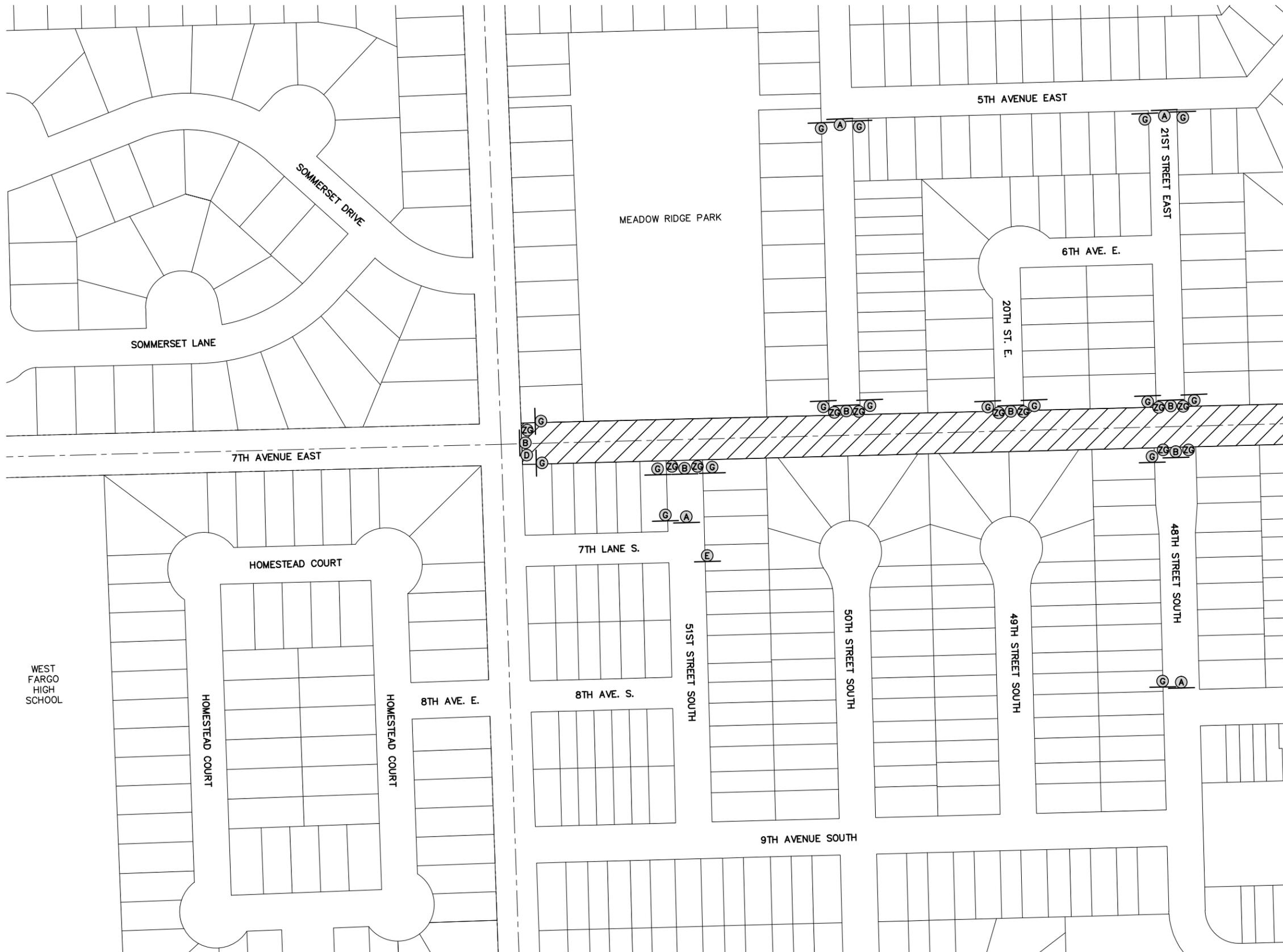
Estimate of Quantities:

| | |
|-------------------------------------|----------|
| DOWELLED CONTRACTION JOINT ASSEMBLY | 550-0240 |
| 19+00 to 26+06 | 1,561 LF |



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PAVING LAYOUTS
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
JOINTING PLAN - STA: 19+00 - 28+00



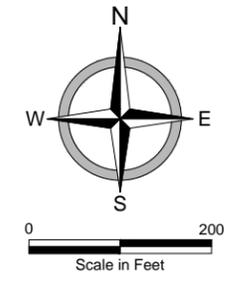
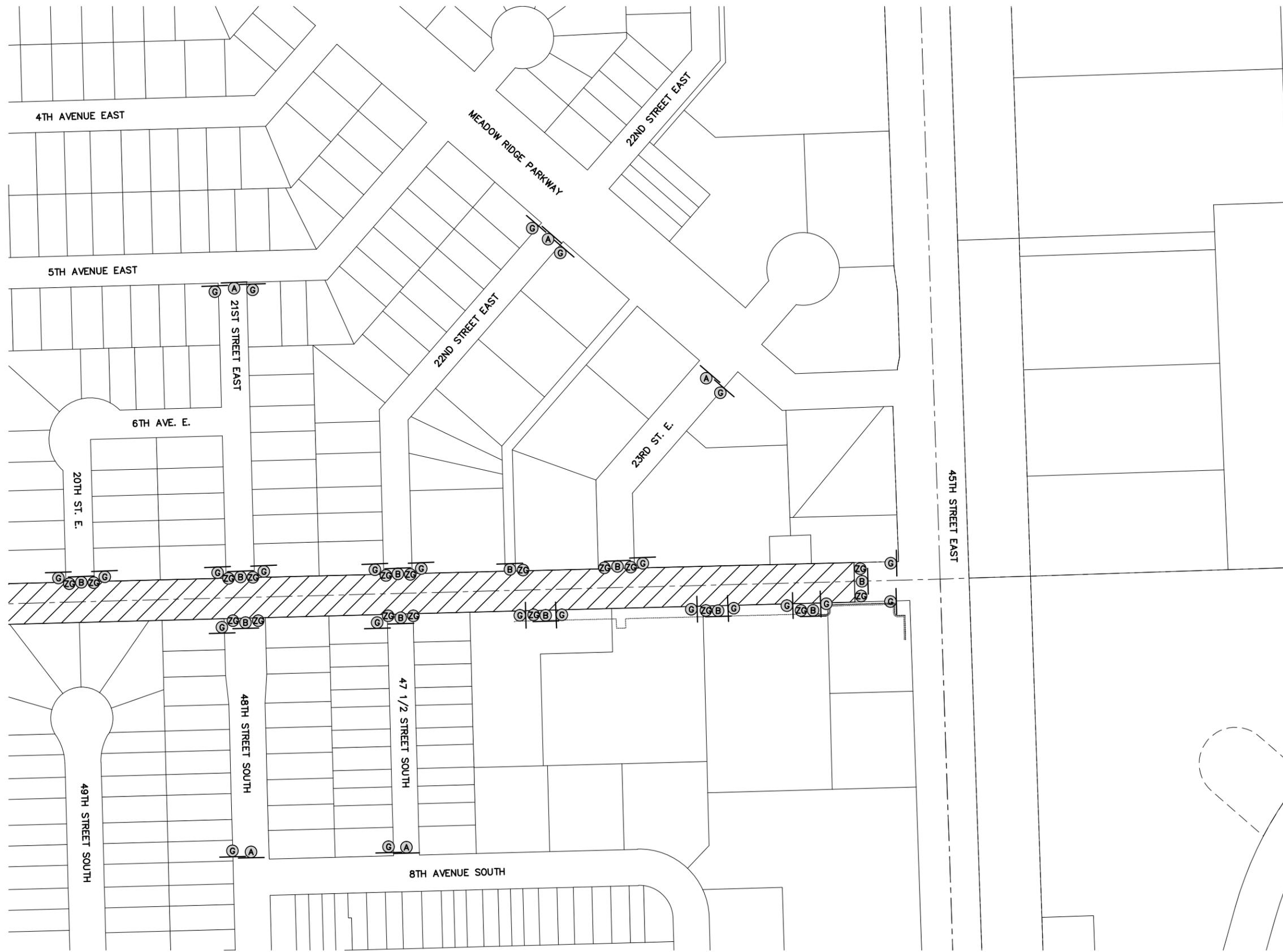
TRAFFIC CONTROL LEGEND

- DETOUR ROUTE
- DRUM
- FLAGGER
- CONSTRUCTION SITE
- 1 SIGN
- 2 SIGNS STACKED
- 3 SIGNS STACKED

NOTE:
TOP SIGN IN STACK IS SHOWN CLOSEST TO
THE LINE REPRESENTING THE SIGN FACE.

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**WORK ZONE TRAFFIC CONTROL
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
GENERAL TRAFFIC CONTROL**



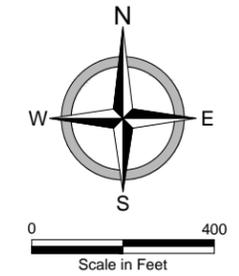
TRAFFIC CONTROL LEGEND

- DETOUR ROUTE
- DRUM
- FLAGGER
- CONSTRUCTION SITE
- 1 SIGN
- 2 SIGNS STACKED
- 3 SIGNS STACKED

NOTE:
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**WORK ZONE TRAFFIC CONTROL
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
GENERAL TRAFFIC CONTROL**



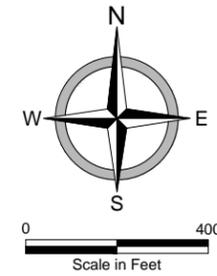
TRAFFIC CONTROL LEGEND

-  DETOUR ROUTE
-  DRUM
-  FLAGGER
-  CONSTRUCTION SITE
-  1 SIGN
-  2 SIGNS STACKED
-  3 SIGNS STACKED

NOTE:
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**WORK ZONE TRAFFIC CONTROL
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
NORTH DETOUR PLAN**



TRAFFIC CONTROL LEGEND

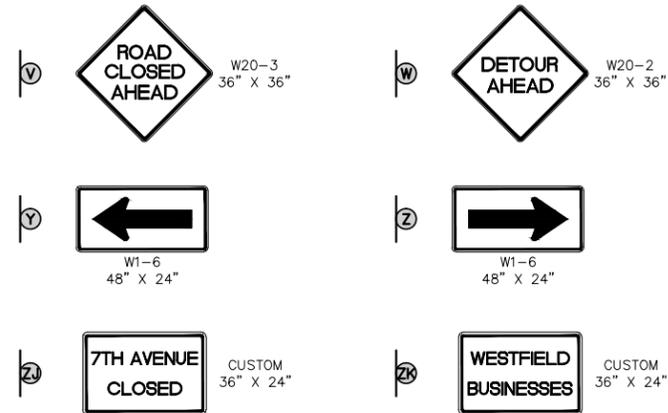
- DETOUR ROUTE
- DRUM
- FLAGGER
- CONSTRUCTION SITE
- 1 SIGN
- 2 SIGNS STACKED
- 3 SIGNS STACKED

NOTE:
TOP SIGN IN STACK IS SHOWN CLOSEST TO
THE LINE REPRESENTING THE SIGN FACE.

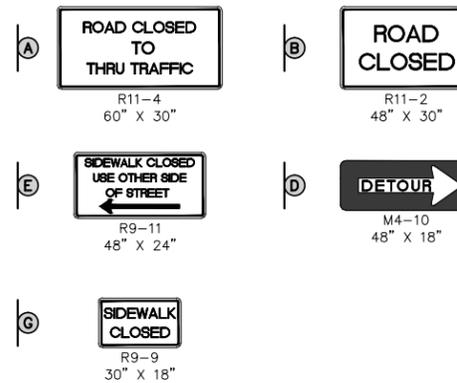
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**WORK ZONE TRAFFIC CONTROL
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
SOUTH DETOUR PLAN**

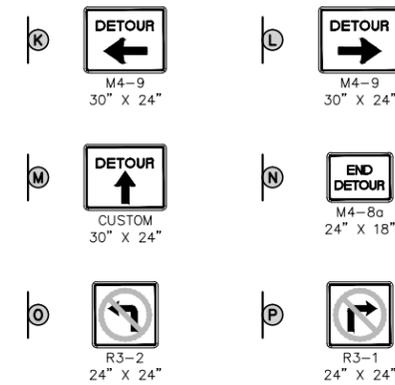
DOUBLE POST MOUNTED SIGNS



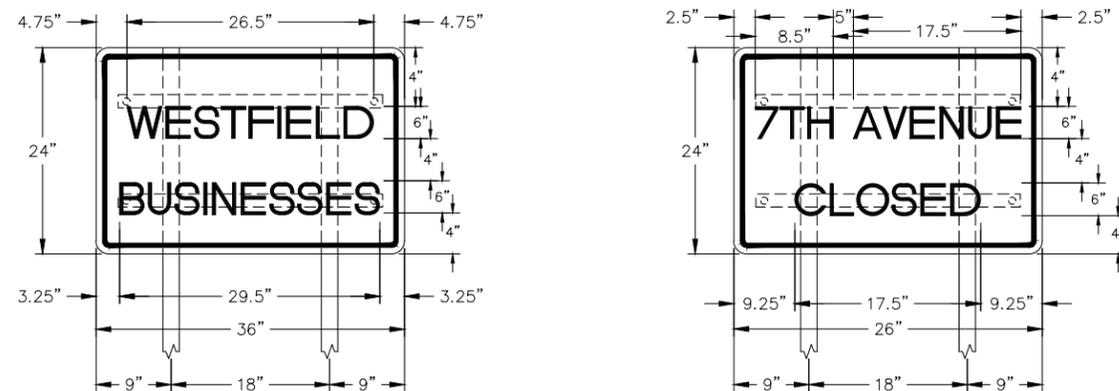
TYPE 3 BARRICADE MOUNTED SIGNS



SINGLE POST MOUNTED SIGNS

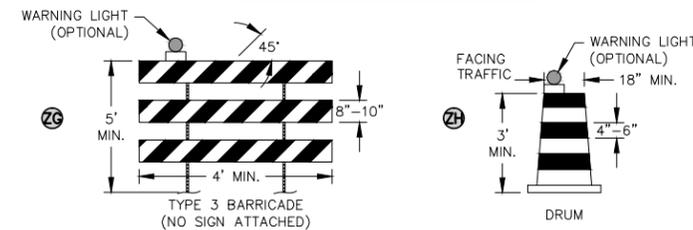


CUSTOM SIGN LAYOUTS



- NOTES:
1. BACKGROUND SHALL BE ORANGE, LEGEND/BORDER SHALL BE BLACK.
 2. MATERIAL SHALL BE WIDE ANGLE PRISMATIC FLUORESCENT RETROFLECTIVE SHEETING MEETING SECTION 894.02 6.

TRAFFIC CONTROL DEVICES



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**WORK ZONE TRAFFIC CONTROL
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
WORK ZONE TRAFFIC CONTROL LEGEND**



| | | | | |
|-------|------------------|-------|-------------|-----------|
| STATE | PROJECT NO. | PCN | SECTION NO. | SHEET NO. |
| N.D. | SU-8-992(035)036 | 19892 | 100 | 6 |

| SIGN NUMBER | SIGN SIZE | DESCRIPTION | AMOUNT REQUIRED | UNITS PER AMOUNT | UNITS SUB TOTAL |
|------------------|----------------|--|-----------------|------------------|-----------------|
| D3-36 | 36"x6" | STREET NAME SIGN (Sign and installation only) | | 6 | |
| G20-1-60 | 60"x24" | ROAD WORK NEXT ___ MILES | | 34 | |
| G20-1b-60 | 60"x24" | WORK IN PROGRESS/ NO WORK IN PROGRESS (Sign and installation only) | | 26 | |
| G20-2-48 | 48"x24" | END ROAD WORK | | 19 | |
| G20-4-36 | 36"x18" | PILOT CAR FOLLOW ME (Mounted to back of pilot car) | | 18 | |
| G20-10-108 | 108"x48" | CONTRACTOR SIGN | | 64 | |
| G20-50a-72 | 72"x36" | ROAD WORK NEXT ___ MILES RT & LT ARROWS | | 37 | |
| G20-52a-72 | 72"x24" | ROAD WORK NEXT ___ MILES RT or LT ARROW | | 30 | |
| G20-55-96 | 96"x48" | SPEED LIMIT ENFORCED - MINIMUM FEE \$80 WHEN WORKERS PRESENT | | 59 | |
| M1-1-36 | 36"x36" | INTERSTATE ROUTE MARKER (Post and installation only) | | 10 | |
| M1-4-24 | 24"x24" | U.S. ROUTE MARKER (Post and installation only) | | 10 | |
| M1-5-24 | 24"x24" | STATE ROUTE MARKER (Post and installation only) | | 10 | |
| M3-1-24 | 24"x12" | NORTH (Mounted on route marker post) | | 7 | |
| M3-2-24 | 24"x12" | EAST (Mounted on route marker post) | | 7 | |
| M3-3-24 | 24"x12" | SOUTH (Mounted on route marker post) | | 7 | |
| M3-4-24 | 24"x12" | WEST (Mounted on route marker post) | | 7 | |
| M4-8-24 | 24"x12" | DETOUR (Mounted on route marker post) | | 7 | |
| M4-9-30 | 30"x24" | DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT | 12 | 15 | 144 |
| M4-10-48 | 48"x18" | DETOUR ARROW RIGHT or LEFT | 1 | 23 | 23 |
| M5-1-21 | 21"x15" | ARROW AHD AND RT or LT (Mounted on route marker post) | | 7 | |
| M5-2-21 | 21"x15" | ARROW AHD UP & RT or LT (Mounted on route marker post) | | 7 | |
| M6-1-21 | 21"x15" | ARROW RT or LT (Mounted on route marker post) | | 7 | |
| M6-2-21 | 21"x15" | ARROW UP & RT or LT (Mounted on route marker post) | | 7 | |
| M6-3-21 | 21"x15" | ARROW AHD (Mounted on route marker post) | | 7 | |
| R1-1-48 | 48"x48" | STOP | | 32 | |
| R1-1a-18 | 18"x18" | STOP and SLOW PADDLE Back to Back | | 5 | |
| R1-2-60 | 60"x60" | YIELD | | 29 | |
| R2-1-48 | 48"x60" | SPEED LIMIT ___ | | 39 | |
| R2-1a-24 | 24"x18" | MINIMUM FEE \$80 (Mounted on Speed Limit post) | | 10 | |
| R3-7-48 | 48"x48" | LEFT or RIGHT LANE MUST TURN LEFT or RIGHT | | 35 | |
| R4-1-48 | 48"x60" | DO NOT PASS | | 39 | |
| R4-7-48 | 48"x60" | KEEP RIGHT SYMBOL | | 39 | |
| R5-1-48 | 48"x48" | DO NOT ENTER | | 35 | |
| R6-1-36 | 36"x12" | ONE WAY RIGHT or LEFT | | 13 | |
| R7-1-12 | 12"x18" | NO PARKING | | 11 | |
| R10-6-24 | 24"x36" | STOP HERE ON RED | | 16 | |
| R11-2-48 | 48"x30" | ROAD CLOSED | 14 | 28 | 392 |
| R11-2a-48 | 48"x30" | STREET CLOSED | | 28 | |
| R11-3a-60 | 60"x30" | ROAD CLOSED ___ MILES AHEAD LOCAL TRAFFIC ONLY | | 31 | |
| R11-3c-60 | 60"x30" | STREET CLOSED ___ MILES AHEAD LOCAL TRAFFIC ONLY | | 31 | |
| R11-4a-60 | 60"x30" | STREET CLOSED TO THRU TRAFFIC | 7 | 31 | 217 |
| W1-3-48 | 48"x48" | RIGHT or LEFT SHARP REVERSE CURVE ARROW | | 35 | |
| W1-4-48 | 48"x48" | RIGHT or LEFT REVERSE CURVE ARROW | | 35 | |
| W1-4b-48 | 48"x48" | DOUBLE RIGHT or LEFT REVERSE CURVE ARROW | | 35 | |
| W1-6-48 | 48"x24" | LARGE ARROW | 2 | 26 | 52 |
| W3-1-48 | 48"x48" | STOP AHEAD SYMBOL | | 35 | |
| W3-3-48 | 48"x48" | SIGNAL AHEAD SYMBOL | | 35 | |
| W3-4-48 | 48"x48" | BE PREPARED TO STOP | | 35 | |
| W3-5-48 | 48"x48" | SPEED REDUCTION AHEAD | | 35 | |
| W4-2-48 | 48"x48" | RIGHT or LEFT LANE TRANSITION SYMBOL | | 35 | |
| W5-1-48 | 48"x48" | ROAD NARROWS | | 35 | |
| W5-8-48 | 48"x48" | THRU TRAFFIC RIGHT LANE | | 35 | |
| W5-9-48 | 48"x48" | ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW | | 35 | |
| W6-3-48 | 48"x48" | TWO WAY TRAFFIC SYMBOL | | 35 | |
| W8-1-48 | 48"x48" | BUMP | | 35 | |
| W8-3-48 | 48"x48" | PAVEMENT ENDS | | 35 | |
| W8-7-48 | 48"x48" | LOOSE GRAVEL | | 35 | |
| W8-9a-48 | 48"x48" | SHOULDER DROP-OFF | | 35 | |
| W8-11-48 | 48"x48" | UNEVEN LANES | | 35 | |
| W8-12-48 | 48"x48" | NO CENTER STRIPE | | 35 | |
| W8-53-48 | 48"x48" | TRUCKS ENTERING HIGHWAY | | 35 | |
| W8-54-48 | 48"x48" | TRUCKS ENTERING AHEAD or ___ FT. | | 35 | |
| W8-55-48 | 48"x48" | TRUCKS CROSSING AHEAD or ___ FT. | | 35 | |
| W8-56-48 | 48"x48" | TRUCKS EXITING HIGHWAY | | 35 | |
| W9-3a-48 | 48"x48" | CENTER LANE CLOSED SYMBOL | | 35 | |
| W12-2-48 | 48"x48" | LOW CLEARANCE SYMBOL | | 35 | |
| W13-1-24 | 24"x24" | ___ MPH ADVISORY SPEED PLATE (Mounted on warning sign post) | | 11 | |
| W13-4-48 | 48"x60" | RAMP ARROW | | 39 | |
| W14-3-48 | 48"x36" | NO PASSING ZONE | | 23 | |
| W20-1-48 | 48"x48" | ROAD WORK AHEAD or _ FT or _ MILE | 5 | 35 | 175 |
| W20-2-48 | 48"x48" | DETOUR AHEAD or ___ FT. | 1 | 35 | 35 |
| W20-3-48 | 48"x48" | ROAD or STREET CLOSED AHEAD or ___ FT. | 1 | 35 | 35 |
| W20-4-48 | 48"x48" | ONE LANE ROAD AHEAD or ___ FT. | | 35 | |
| W20-5-48 | 48"x48" | RIGHT or LEFT LANE CLOSED AHEAD or ___ FT. | | 35 | |
| W20-7a-48 | 48"x48" | FLAGGING SYMBOL | | 35 | |
| W20-7k-24 | 24"x18" | ___ FEET (Mounted of warning sign post) | | 10 | |
| W20-8-48 | 48"x48" | STREET CLOSED | | 35 | |
| W20-51-48 | 48"x48" | EQUIPMENT WORKING | | 35 | |
| W20-52-54 | 54"x12" | NEXT ___ MILES (Mounted on warning sign post) | | 12 | |
| W21-1a-48 | 48"x48" | WORKERS SYMBOL | | 35 | |
| W21-2-48 | 48"x48" | FRESH OIL | | 35 | |
| W21-3-48 | 48"x48" | ROAD MACHINERY AHEAD or ___ FT. | | 35 | |

| SIGN NUMBER | SIGN SIZE | DESCRIPTION | AMOUNT REQUIRED | UNITS PER AMOUNT | UNITS SUB TOTAL |
|-------------|-----------|---|-----------------|------------------|-----------------|
| W21-5-48 | 48"x48" | SHOULDER WORK | | 35 | |
| W21-5a-48 | 48"x48" | RIGHT or LEFT SHOULDER CLOSED | | 35 | |
| W21-5b-48 | 48"x48" | RIGHT or LEFT SHOULDER CLOSED AHEAD or ___ FT. | | 35 | |
| W21-6a-48 | 48"x48" | SURVEY CREW AHEAD | | 35 | |
| W21-50-48 | 48"x48" | BRIDGE PAINTING AHEAD or ___ FT. | | 35 | |
| W21-51-48 | 48"x48" | MATERIAL ON ROADWAY | | 35 | |
| W22-8-48 | 48"x48" | FRESH OIL LOOSE ROCK | | 35 | |
| | 24"x24" | TAKE TURNS (6" D letters) (Mounted on stop sign post) | | 11 | |

| SPECIAL SIGNS | | | | | |
|---------------|----------------|---|-----------|-----------|------------|
| R9-9 | 30"x18" | SIDEWALK CLOSED | 33 | 11 | 333 |
| | 30"x24" | DETOUR ARROW STRAIGHT | 27 | 15 | 405 |
| R3-2 | 24"x24" | NO RT OR LT TURN | 3 | 11 | 33 |
| | 36"x24" | 7TH AVENUE CLOSED | 9 | 22 | 198 |
| | 36"x24" | WESTFIELD BUSINESSES | 3 | 22 | 66 |
| | 36"x24" | ACCESS OPEN | 3 | 22 | 66 |
| R9-11 | 48"x24" | SIDEWALK CLOSED USE OTHER SIDE OF STREET | 1 | 26 | 26 |
| M4-8A | 24"x18" | END DETOUR | 4 | 10 | 40 |

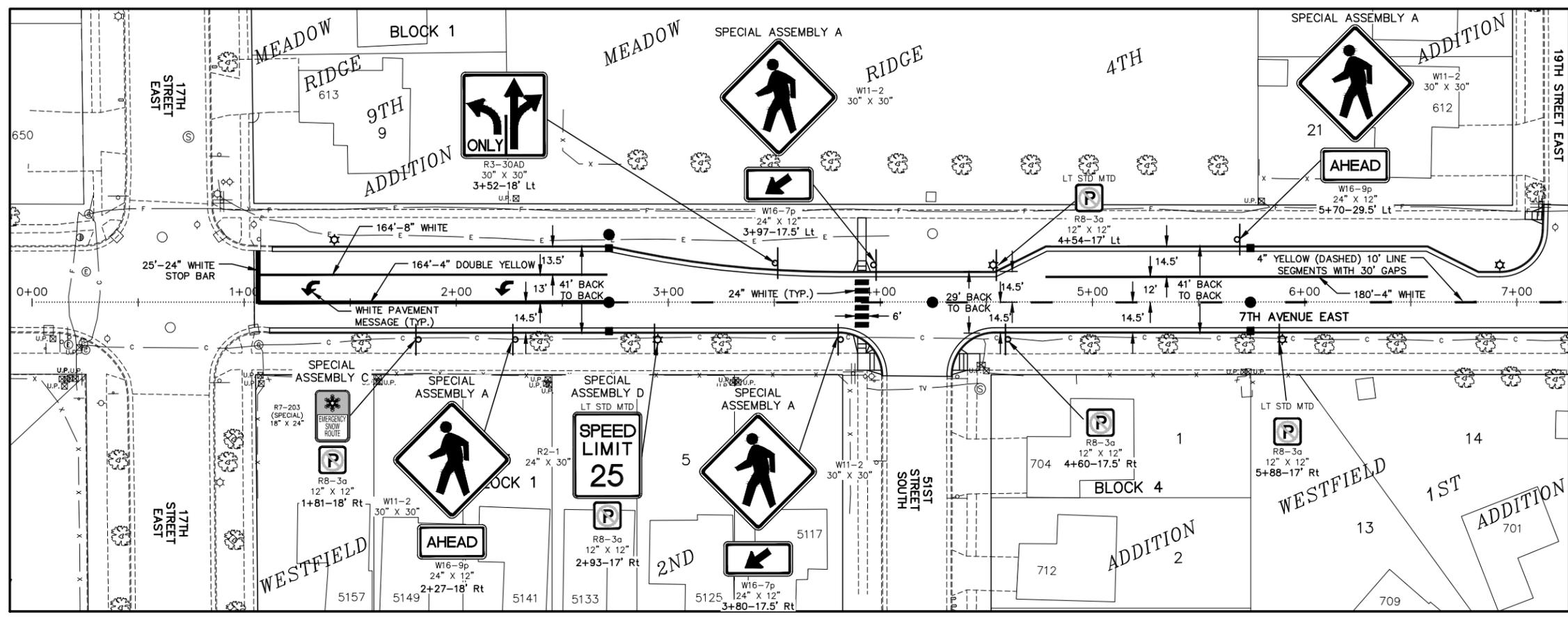
| SPEC & CODE | TRAFFIC CONTROL SIGNS | TOTAL UNITS |
|-----------------|-----------------------|--------------|
| 704-1000 | | 2,240 |

| SPEC & CODE | DESCRIPTION | UNIT | QUANTITY |
|-----------------|--|-------------|-----------|
| 704-0100 | FLAGGING | MHR | |
| 704-1041 | ATTENUATION DEVICE-TYPE B-55 | EACH | |
| 704-1043 | ATTENUATION DEVICE-TYPE B-65 | EACH | |
| 704-1044 | ATTENUATION DEVICE-TYPE B-70 | EACH | |
| 704-1050 | TYPE I BARRICADES | EACH | |
| 704-1051 | TYPE II BARRICADES | EACH | |
| 704-1052 | TYPE III BARRICADES | EACH | 83 |
| 704-1060 | DELINEATOR DRUMS | EACH | 29 |
| 704-1065 | TRAFFIC CONES | EACH | |
| 704-1067 | TUBULAR MARKERS | EACH | |
| 704-1070 | DELINEATOR | EACH | |
| 704-1072 | FLEXIBLE DELINEATORS | EACH | |
| 704-1081 | VERTICAL PANELS - BACK TO BACK | EACH | |
| 704-1085 | SEQUENCING ARROW PANEL - TYPE A | EACH | |
| 704-1086 | SEQUENCING ARROW PANEL - TYPE B | EACH | |
| 704-1087 | SEQUENCING ARROW PANEL - TYPE C | EACH | |
| 704-1088 | SEQUENCING ARROW PANEL - TYPE C - CROSSOVER | EACH | |
| 704-1095 | TYPE B FLASHERS | EACH | |
| 704-3501 | PORTABLE PRECAST CONCRETE MED BARRIER | LF | |
| 704-3510 | PRECAST CONCRETE MED BARRIER - STATE FURNISHED | EACH | |
| 762-0200 | RAISED PAVEMENT MARKERS | EACH | |
| 762-0420 | SHORT TERM 4IN LINE - TYPE R | LF | |
| 762-0430 | SHORT TERM 4IN LINE - TYPE NR | LF | |
| 762-1500 | OBLITERATION OF PVMT MK | SF | |
| 772-2110 | FLASHING BEACON - POST MOUNTED | EACH | |

NOTE:
If additional signs are required, units will be calculated using the formula from Section III-19.06 of the Design Manual.
<http://www.dot.nd.gov/>

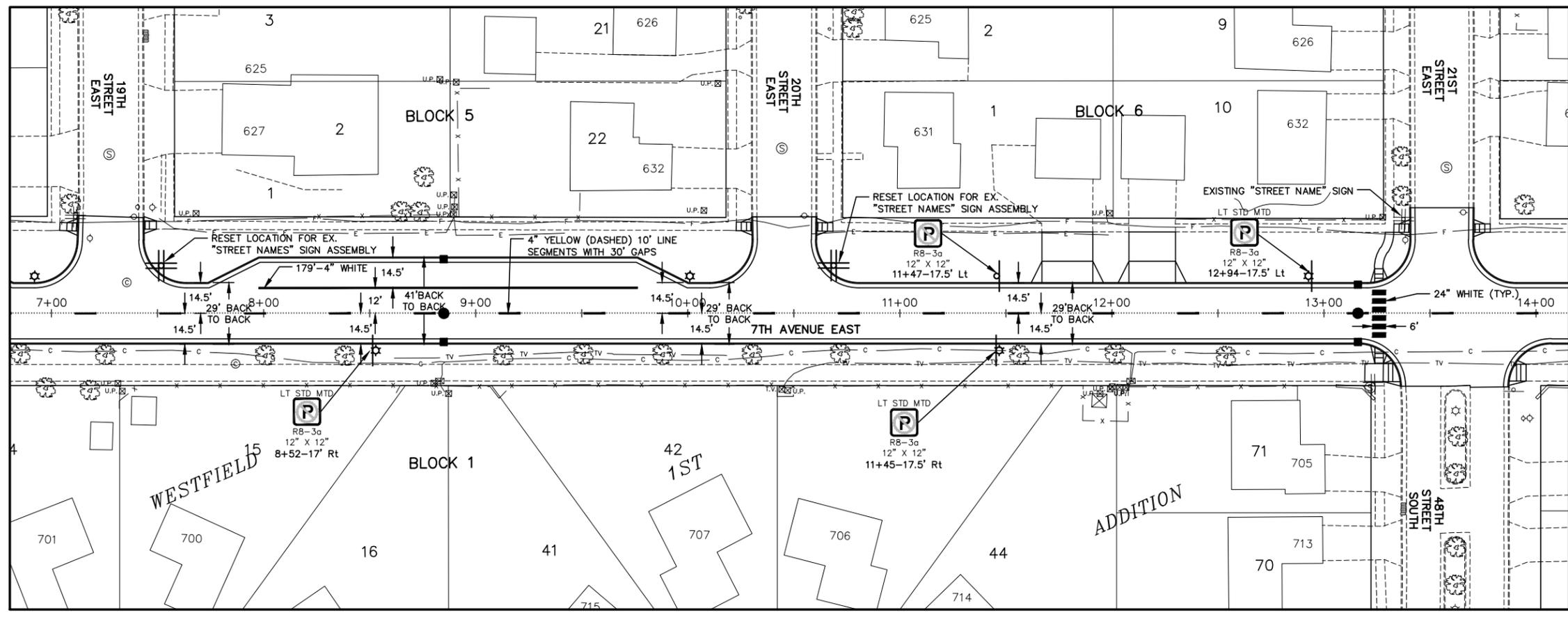
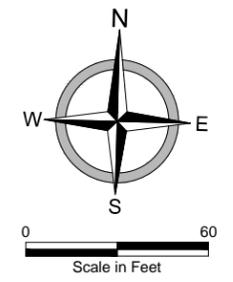
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TRAFFIC CONTROL DEVICES LIST
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
TRAFFIC CONTROL DEVICES LIST



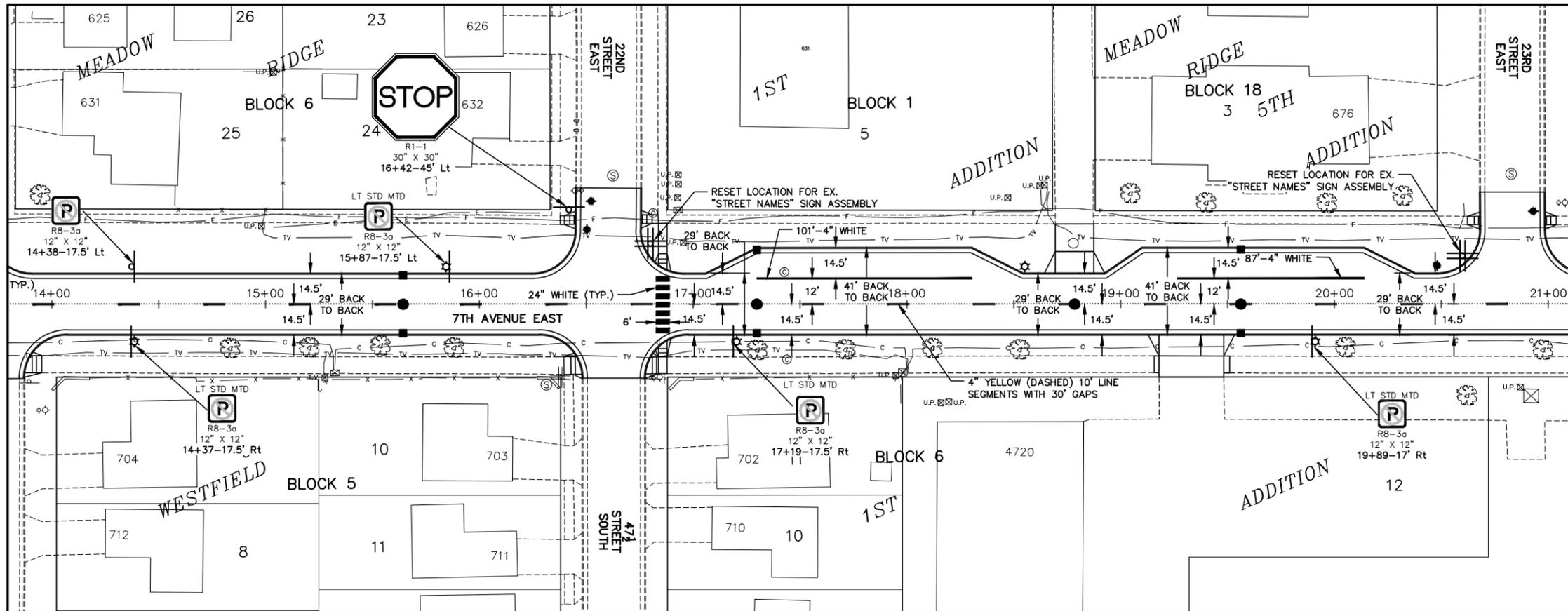
Estimate of Quantities:

| | |
|--|----------|
| RESET SIGN PANEL | 754-0592 |
| 7x52 - 22' Lt | 1 EA |
| 10x69 - 23' Lt | 1 EA |
| RESET SIGN SUPPORT | 754-0593 |
| 7x52 - 22' Lt | 1 EA |
| 10x69 - 23' Lt | 1 EA |
| PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED) | 762-0122 |
| 1x32 Lt (White Arrow) | 16 SF |
| 2x23 Lt (White Arrow) | 16 SF |
| PREFORMED PATTERNED PVMT MK 4IN-GROOVED | 762-1305 |
| 4' Yellow Dash Line | 300 LF |
| 4' White Line | 359 LF |
| 4' Double Yellow Line | 328 LF |
| PREFORMED PATTERNED PVMT MK 8IN-GROOVED | 762-1309 |
| 8' White Line | 164 LF |
| PREFORMED PATTERNED PVMT MK 24IN-GROOVED | 762-1325 |
| 24' White Line | 97 LF |



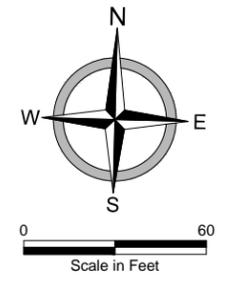
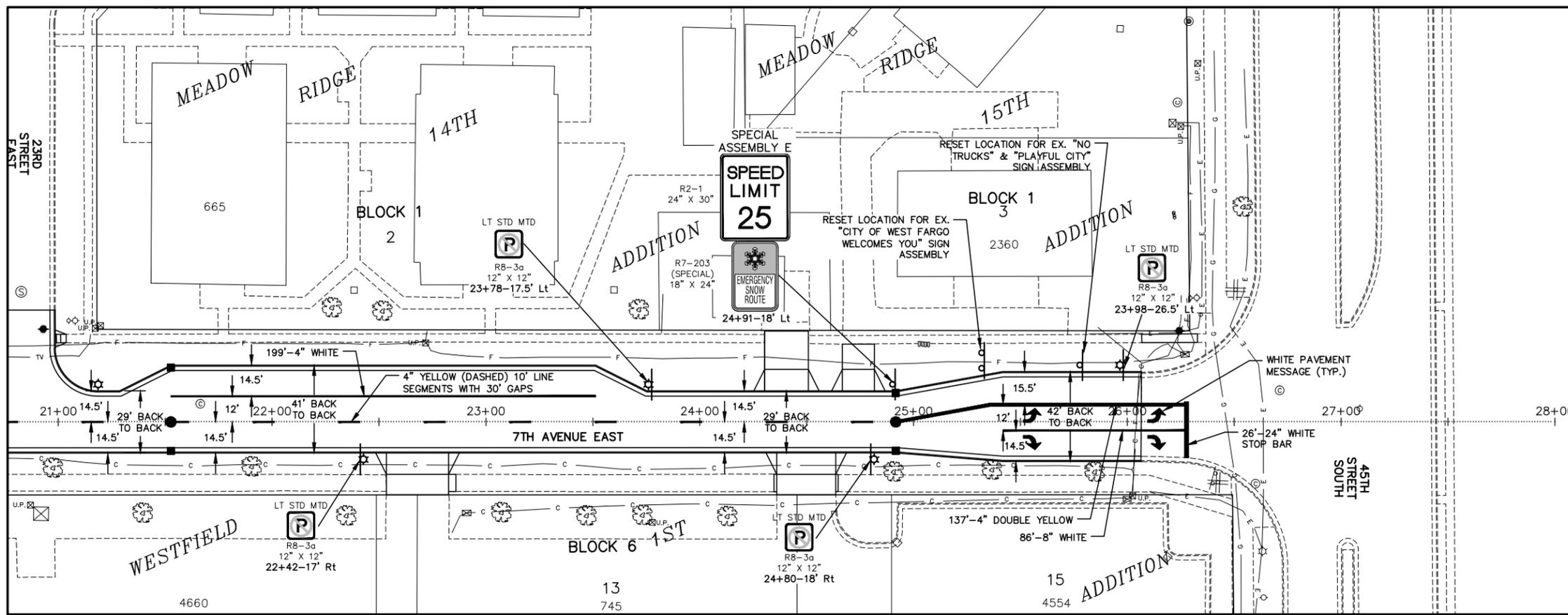
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**SIGNING & PAVEMENT MARKING
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
SIGNING & PAVEMENT MARKING PLAN**



Estimate of Quantities:

| | |
|---|----------|
| RESET SIGN PANEL | 754-0592 |
| 16+80 - 28' Lt | 1 EA |
| 20+60 - 23' Lt | 1 EA |
| 25+32 - 29' Lt | 1 EA |
| 25+80 - 27' Lt | 1 EA |
| RESET SIGN SUPPORT | 754-0593 |
| 16+80 - 28' Lt | 1 EA |
| 20+60 - 23' Lt | 1 EA |
| 25+32 - 29' Lt | 1 EA |
| 25+80 - 27' Lt | 1 EA |
| PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED) | 762-0122 |
| 25+55 Rt (White Arrow) | 16 SF |
| 25+55 Lt (White Arrow) | 16 SF |
| 26+14 Rt (White Arrow) | 16 SF |
| 26+14 Lt (White Arrow) | 16 SF |
| PREFORMED PATTERNED PVMT MK 4IN-GROOVED | 762-1305 |
| 4" Yellow Dash Line | 270 LF |
| 4" White Line | 387 LF |
| 4" Double Yellow Line | 274 LF |
| PREFORMED PATTERNED PVMT MK 8IN-GROOVED | 762-1309 |
| 8" White Line | 86 LF |
| PREFORMED PATTERNED PVMT MK 24IN-GROOVED | 762-1325 |
| 24" White Line | 68 LF |



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**SIGNING & PAVEMENT MARKING
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
SIGNING & PAVEMENT MARKING PLAN**

| | | | |
|-------|------------------|-------------|-----------|
| STATE | PROJECT NO. | SECTION NO. | SHEET NO. |
| N.D. | SU-8-992(035)036 | 110 | 3 |

| Sta/RP | Sign No. | Assembly No. | Flat Sheet For Signs | | Sign Support Length | | | | Support Size | Max Post Len | Sleeve Length | | | | Sleeve Size | Anchor EA | Anchor LF | Anchor Size | Reset Sign Panel EA | Reset Sign Support EA | Break-Away EA | Comments |
|--------------------|----------|--------------|----------------------|------|---------------------|--------|--------|--------|-----------------|--------------|---------------|--------|--------|--------|-------------|-----------------|-----------|-------------------|---------------------|-----------------------|---------------|------------------------------------|
| | | | 3A SF | 2 SF | 1st LF | 2nd LF | 3rd LF | 4th LF | | LF | 1st LF | 2nd LF | 3rd LF | 4th LF | | | | | | | | |
| 7th Avenue | | | | | | | | | | | | | | | | | | | | | | |
| 1+81 Rt | S.A.C | | 4.0 | | 10.1 | | | | 2 x 2 12 ga | 14.2 | | | | | | 1 | 4 | 2.25 x 2.25 12 ga | | | | Mount on New Street Light Standard |
| 11+45 Rt | S.A.B | | 1.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| 11+47 Lt | S.A.B | | 1.0 | | 8.1 | | | | 2 x 2 12 ga | 35.5 | | | | | | 1 | 4 | 2.25 x 2.25 12 ga | | | | Mount on New Street Light Standard |
| 12+94 Lt | S.A.B | | 1.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| 14+37 Rt | S.A.B | | 1.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| 14+38 Lt | S.A.B | | 1.0 | | 8.1 | | | | 2 x 2 12 ga | 35.5 | | | | | | 1 | 4 | 2.25 x 2.25 12 ga | | | | Mount on New Street Light Standard |
| 15+87 Lt | S.A.B | | 1.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| 16+42 Lt | 1 | 1 | 5.2 | | 9.7 | | | | 2 x 2 12 ga | 10.5 | | | | | | 1 | 4 | 2.25 x 2.25 12 ga | | | | Mount on New Street Light Standard |
| 17+19 Rt | S.A.B | | 1.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| 19+89 Rt | S.A.B | | 1.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| 2+27 Rt | S.A.A | | 8.3 | | 10.6 | | | | 2.5 x 2.5 12 ga | 12.4 | | | | | | 1 | 4 | 3 x 3 7 ga | | | | Mount on New Street Light Standard |
| 2+93 Rt | S.A.D | | 6.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| 22+42 Rt | S.A.B | | 1.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| 23+78 Lt | S.A.B | | 1.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| 24+80 Rt | S.A.B | | 1.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| 24+91 Lt | S.A.E | | 8.0 | | 11.6 | | | | 2.5 x 2.5 12 ga | 13.2 | | | | | | 1 | 4 | 3 x 3 7 ga | | | | Mount on New Street Light Standard |
| 25+98 Lt | S.A.B | | 1.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| 3+52 Lt | 15 | 15 | 6.3 | | 7.7 | | | | 2 x 2 12 ga | 8.9 | | | | | | 1 | 4 | 2.25 x 2.25 12 ga | | | | Mount on New Street Light Standard |
| 3+80 Rt | S.A.A | | 8.3 | | 10.6 | | | | 2.5 x 2.5 12 ga | 12.4 | | | | | | 1 | 4 | 3 x 3 7 ga | | | | Mount on New Street Light Standard |
| 3+97 Lt | S.A.A | | 8.3 | | 10.6 | | | | 2.5 x 2.5 12 ga | 12.4 | | | | | | 1 | 4 | 3 x 3 7 ga | | | | Mount on New Street Light Standard |
| 4+54 Lt | S.A.B | | 1.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| 4+60 Rt | S.A.B | | 1.0 | | 8.1 | | | | 2 x 2 12 ga | 35.5 | | | | | | 1 | 4 | 2.25 x 2.25 12 ga | | | | Mount on New Street Light Standard |
| 5+70 Lt | S.A.A | | 8.3 | | 10.6 | | | | 2.5 x 2.5 12 ga | 12.4 | | | | | | 1 | 4 | 3 x 3 7 ga | | | | Mount on New Street Light Standard |
| 5+88 Rt | S.A.B | | 1.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| 8+52 Rt | S.A.B | | 1.0 | | | | | | | | | | | | | | | | | | | Mount on New Street Light Standard |
| Sub Total | | | 78.7 | 0.0 | Total 106.0 | | | | | | | | | | | Total 44 | | | 0 | 0 | 0 | |
| Grand Total | | | 78.7 | 0.0 | Total 106.0 | | | | | | | | | | | Total 44 | | | 0 | 0 | 0 | |

Basis of Estimate
Sign Support Lengths

The sign support lengths have been calculated using the following vertical clearances:

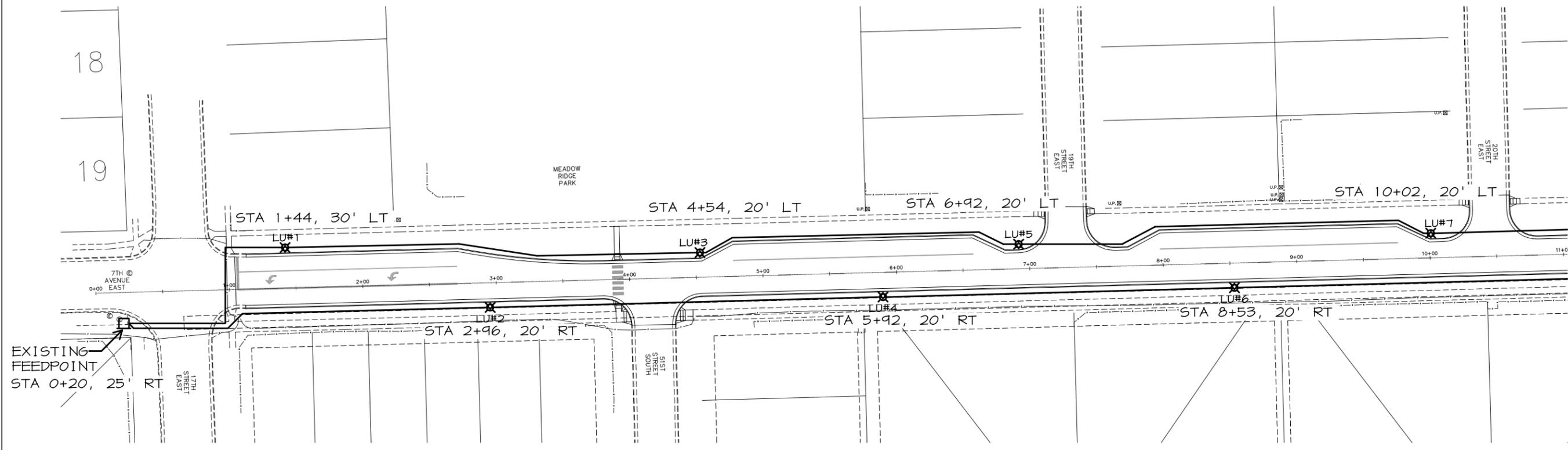
Areas where parking and/or pedestrian movement will occur - 84"
Bike route - 60"

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Sign Summary
Perforated Tube

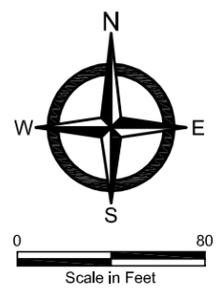
SIGNING & PAVEMENT MARKING
7TH AVENUE P.C.C. RECONSTRUCTION
WEST FARGO - FARGO
CASS COUNTY, NORTH DAKOTA
SIGN SUMMARY

| SPEC | CODE | ITEM DESCRIPTION | UNIT | QUANTITY |
|------|------|--|------|----------|
| 770 | 0020 | CONCRETE FOUNDATION - HIGHWAY LIGHTING | EA | 7 |
| 770 | 0330 | 2 IN DIAMETER RIGID CONDUIT | LF | 2210 |
| 770 | 0505 | UNDERGROUND CONDUCTOR NO6-RHW | LF | 6691 |
| 770 | 4090 | ORNAMENTAL LT STD 16FT MT HT | EA | 7 |
| 770 | 4215 | LED LUMINAIRE - 100 WATT | EA | 7 |



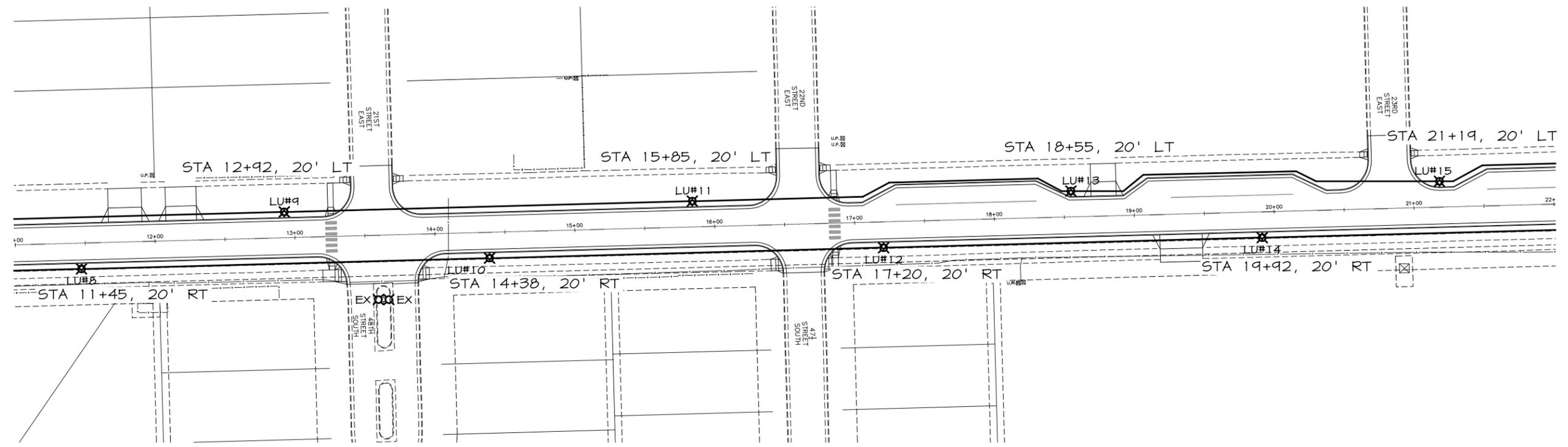
LIGHTING CONDUCTOR AND CONDUIT SCHEDULE

| ITEM | STATION OFFSET | CONDUIT RUN | | CONDUCTOR RUN | |
|-------------------|-------------------------------|-------------|-----------|---------------|-------------------------------------|
| | | TOTAL LF | SIZE (IN) | TOTAL LF | SIZE/TYPER |
| FEEDPOINT TO LU#1 | 0+20, 25' RT TO 1+44, 30' LT | 175' | 2 | 567' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#1 TO LU#3 | 1+44, 30' LT TO 4+54, 20' LT | 315' | 2 | 969' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| FEEDPOINT TO LU#2 | 1+44, 30' LT TO 2+96, 20' RT | 280' | 2 | 882' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#2 TO LU#4 | 2+96, 20' RT TO 5+92, 20' RT | 296' | 2 | 912' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#3 TO LU#5 | 4+54, 20' LT TO 6+92, 20' RT | 238' | 2 | 738' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#4 TO LU#6 | 5+92, 20' RT TO 8+53, 20' RT | 261' | 2 | 807' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#5 TO LU#7 | 6+92, 20' LT TO 10+02, 20' LT | 310' | 2 | 954' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |



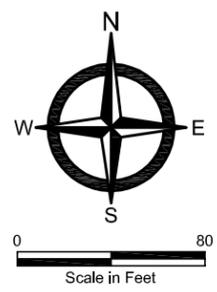
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| SPEC | CODE | ITEM DESCRIPTION | UNIT | QUANTITY |
|------|------|--|------|----------|
| 770 | 0020 | CONCRETE FOUNDATION - HIGHWAY LIGHTING | EA | 8 |
| 770 | 0330 | 2 IN DIAMETER RIGID CONDUIT | LF | 2190 |
| 770 | 0505 | UNDERGROUND CONDUCTOR NO6-RHW | LF | 6634 |
| 770 | 4090 | ORNAMENTAL LT STD 16FT MT HT | EA | 8 |
| 770 | 4215 | LED LUMINAIRE - 100 WATT | EA | 8 |



LIGHTING CONDUCTOR AND CONDUIT SCHEDULE

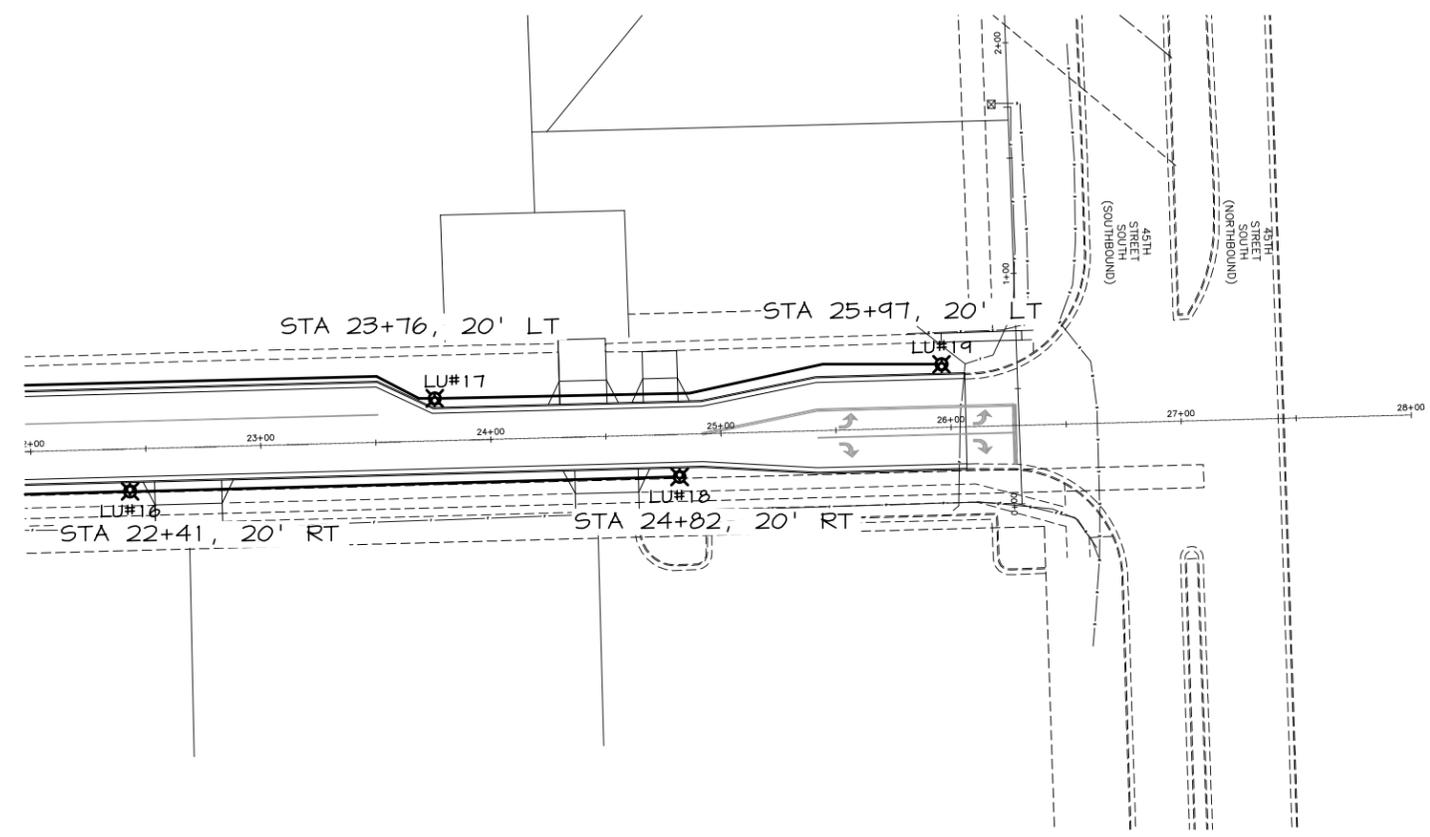
| ITEM | STATION OFFSET | CONDUIT RUN | | CONDUCTOR RUN | |
|----------------|--------------------------------|-------------|-----------|---------------|-------------------------------------|
| | | TOTAL LF | SIZE (IN) | TOTAL LF | SIZE/TYPE |
| LU#6 TO LU#8 | 8+53, 20' RT TO 11+45, 20' LT | 292' | 2 | 900' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#7 TO LU#9 | 10+02, 20' LT TO 12+92, 20' LT | 290' | 2 | 894' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#8 TO LU#10 | 11+45, 20' RT TO 14+38, 20' RT | 293' | 2 | 903' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#9 TO LU#11 | 12+92, 20' LT TO 15+85, 20' LT | 293' | 2 | 903' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#10 TO LU#12 | 14+38, 20' RT TO 17+20, 20' RT | 282' | 2 | 870' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#11 TO LU#13 | 15+85, 20' LT TO 18+55, 20' LT | 270' | 2 | 834' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#12 TO LU#14 | 17+20, 20' RT TO 19+92, 20' RT | 272' | 2 | 840' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#13 TO LU#15 | 18+55, 20' LT TO 21+19, 20' LT | 264' | 2 | 816' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |



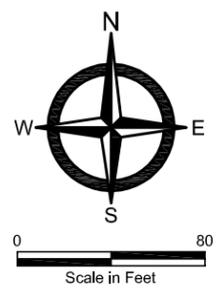
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LIGHTING
 7TH AVENUE P.C.C. RECONSTRUCTION
 WEST FARGO - FARGO
 CASS COUNTY, NORTH DAKOTA
LIGHTING - STA: 11+00 - 22+00

| SPEC | CODE | ITEM DESCRIPTION | UNIT | QUANTITY |
|------|------|--|------|----------|
| 770 | 0020 | CONCRETE FOUNDATION - HIGHWAY LIGHTING | EA | 4 |
| 770 | 0330 | 2 IN DIAMETER RIGID CONDUIT | LF | 685 |
| 770 | 0505 | UNDERGROUND CONDUCTOR NO6-RHW | LF | 2079 |
| 770 | 4090 | ORNAMENTAL LT STD 16FT MT HT | EA | 4 |
| 770 | 4215 | LED LUMINAIRE - 100 WATT | EA | 4 |

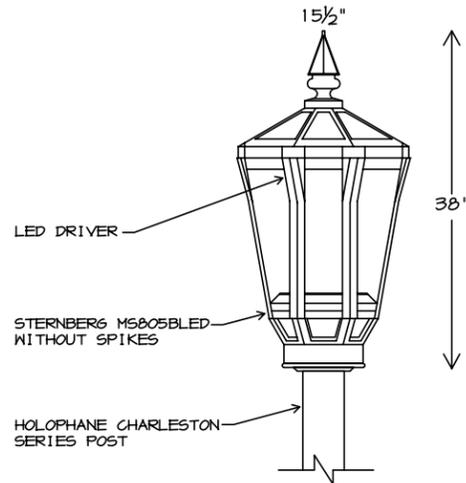


| ITEM | STATION OFFSET | CONDUIT RUN | | CONDUCTOR RUN | |
|----------------|--------------------------------|-------------|-----------|---------------|-------------------------------------|
| | | TOTAL LF | SIZE (IN) | TOTAL LF | SIZE/TYPE |
| LU#14 TO LU#16 | 19+92, 20' RT TO 22+41, 20' RT | 249' | 2 | 771' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#15 TO LU#17 | 21+19, 20' LT TO 23+76, 20' LT | 257' | 2 | 795' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#16 TO LU#18 | 22+41, 20' RT TO 24+82, 20' RT | 241' | 2 | 747' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |
| LU#17 TO LU#19 | 23+76, 20' LT TO 25+97, 20' LT | 221' | 2 | 687' | UNDERGROUND CONDUCTOR NO 6 TYPE RHW |

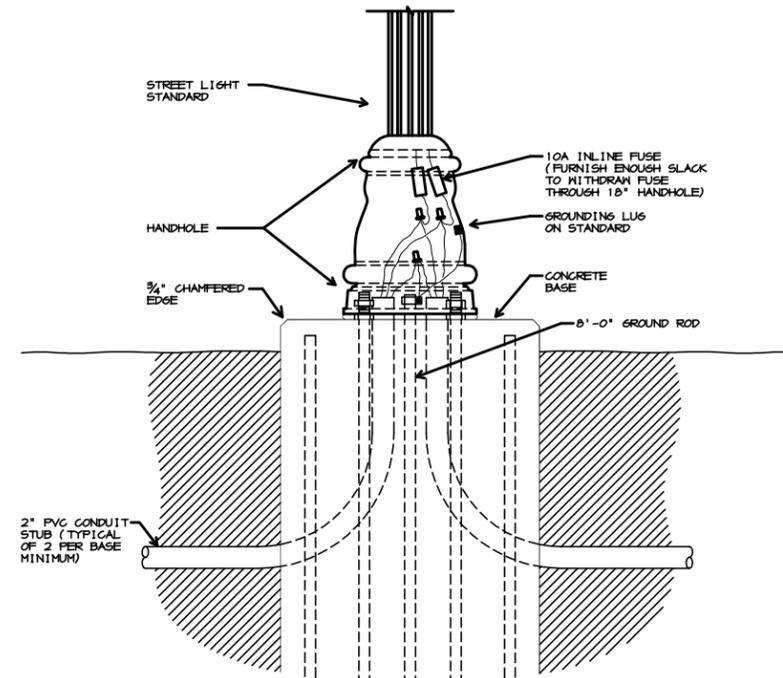


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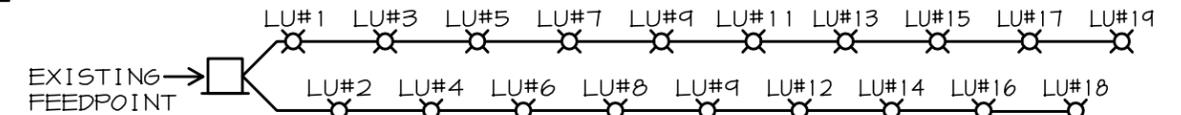
LIGHTING
 7TH AVENUE P.C.C. RECONSTRUCTION
 WEST FARGO - FARGO
 CASS COUNTY, NORTH DAKOTA
LIGHTING - STA: 22+00 - 26+00



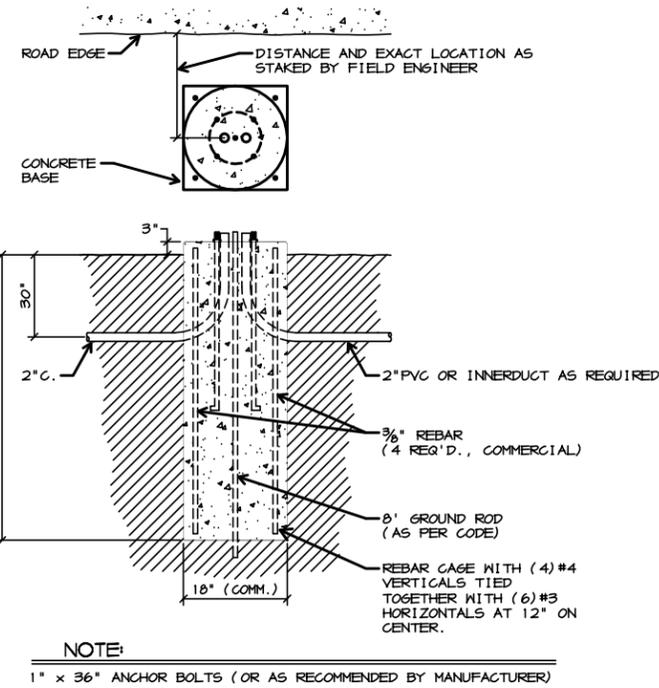
1 LIGHT FIXTURE
5 SCALE: NONE



2 STREET LIGHT STANDARD BASE
5 SCALE: NONE

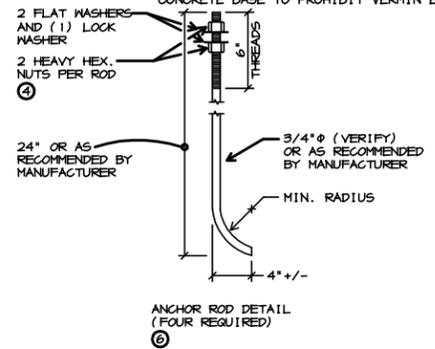


4 LIGHTING SCHEMATIC
5 SCALE: NONE



3 STREET LIGHTING CONCRETE BASE
5 SCALE: NONE

- LIGHT BASE NOTES:**
- CONCRETE SHALL BE CLASS AE PORTLAND CEMENT. (4000 LB)
 - CENTER OF CONCRETE BASE SHALL AS STAKED BY FIELD ENGINEER. CONCRETE BASE SHALL BE 3" ABOVE TOP GRADE (VERIFY WITH ENGINEER).
 - FOUNDATIONS MAY BE CONSTRUCTED IN AUGURED HOLES UNLESS THE NATURAL SOILS WILL NOT STAND OPEN. IN WHICH CASE FORMING WILL BE REQUIRED.
 - LOCATE HANDHOLE 180 DEG. FROM STREET SIDE WHERE APPLICABLE.
 - THE GROUND ROD SHALL BE PLACED INSIDE THE BASE WITH THE TOP EXTENDING 3" ABOVE THE TOP OF CONCRETE.
 - ANCHOR BOLTS AS RECOMMENDED BY MFG & PER SPECIFICATIONS. GALVANIZE TOP 1'-0" OF ANCHOR ROD & NUTS.
 - PVC CONDUIT AS PER SPEC. SHALL BE PROTECTED 4"+/- ABOVE THE FOUNDATION BEFORE THE CONCRETE IS PLACED & SHALL BE THE SIZE & NUMBER SHOWN IN THE PLAN OR AS SPECIFIED.
 - A TEMPLATE SHALL BE PROVIDED FOR ANCHOR ROD PLACEMENT & SHALL BE LEFT IN PLACE UNTIL CONCRETE HAS SET.
 - VERIFY EXACT BASE REQUIREMENTS WITH POLE MANUFACTURER.
 - PROVIDE WIRE MESH BOUNDARY BETWEEN POLE BASE FLANGE AND CONCRETE BASE TO PROHIBIT VERMIN ENTRY.



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NDDOT ABBREVIATIONS

| | | | | | | | |
|--------|----------------------------|------------------|-------------------------------------|----------|--------------------------|------------|--------------------------------|
| Abn | abandoned | BV | butterfly valve | Co | County | EL | electric locker |
| Abut | abutment | Byp | bypass | Crse | course | E Mtr | electric meter |
| Ac | acres | C Gdrl | cable guardrail | C Gr | course gravel | Elec | electric/al |
| Adj | adjusted | Calc | calculate | CS | course sand | EDM | electronic distance meter |
| Aggr | aggregate | Cd | candela | Ct | Court | Elev or El | elevation |
| Ahd | ahead | CIP | cast iron pipe | Xarm | cross arm | Ellipt | elliptical |
| ARV | air release valve | CB | catch basin | Xbuck | cross buck | Emb | embankment |
| Align | alignment | CRS | cationic rapid setting | Xsec | cross sections | Emuls | emulsion/emulsified |
| Al | alley | C Gd | cattle guard | Xing | crossing | ES | end section |
| Alt | alternate | C To C | center to center | Xrd | Crossroad | Engr | engineer |
| Alum | aluminum | Cl or C | centerline | Crn | crown | ESS | Environmental Sensor Station |
| A | ampere | Cm | centimeter | CF | cubic feet | Eq | equal |
| & | and | Ch | chain | M3 | cubic meter | Eq | equation |
| Appr | approach | Chnlk | chain-link | M3/s | cubic meters per second | Evgr | evergreen |
| Approx | approximate | Ch Blk | channel block | CY | cubic yard | Exc | excavation |
| ACP | asbestos cement pipe | Ch Ch | channel change | Cy/mi | cubic yards per mile | Exst | existing |
| Asph | asphalt | Chk | check | Culv | culvert | Exp | expansion |
| AC | asphalt cement | Chsld | chiseled | C&G | curb & gutter | Expy | Expressway |
| Assmd | assumed | Cir | circle | CI | curb inlet | E | external of curve |
| @ | at | Cl | class | CR | curb ramp | Extru | extruded |
| Atten | attenuation | Cl | clay | CS | curve to spiral | FOS | factor of safety |
| ATR | Automatic Traffic Recorder | Cl F | clay fill | C | cut | F | Fahrenheit |
| Ave | Avenue | Cl Hvy | clay heavy | Dd Ld | dead load | FS | far side |
| Avg | average | Cl Lm | clay loam | Defl | deflection | F | farad |
| ADT | average daily traffic | Clnt | clean-out | Defm | deformed | Fed | Federal |
| Az | azimuth | Clr | clear | Deg or D | degree | FHWA | Federal Highway Administration |
| Bk | back | Cl&gr | clearing & grubbing | DInt | delineate | FP | feed point |
| BF | back face | Co S | coal slack | DIntr | delineator | Ft | feet/foot |
| Bs | backsight | Comb. | combination | Depr | depression | Fn | fence |
| Balc | balcony | Coml | commercial | Desc | description | Fn P | fence post |
| B Wire | barbed wire | Compr | compression | Det | detail | FO | fiber optic |
| Barr | barricade | CADD | computer aided drafting & design | DWp | detectable warning panel | FB | field book |
| Btry | battery | Conc | concrete | Dtr | detour | FD | field drive |
| Brg | bearing | Cond | conductor | Dia | diameter | F | fill |
| BI | beehive inlet | Const | construction | Dir | direction | FAA | fine aggregate angularity |
| Beg | begin | Cont | continuous | Dist | distance | FS | fine sand |
| BM | bench mark | CSB | continuous split barrel sample | DM | disturbed material | FH | fire hydrant |
| Bkwy | bikeway | Contr | contraction | DB | ditch block | FI | flange |
| Bit | bituminous | Contr | contractor | DG | ditch grade | Flrd | flared |
| Blk | block | CP | control point | Dbl | double | FES | flared end section |
| Bd Ft | board feet | Coord | coordinate | Dn | down | | |
| BH | bore hole | Cor | corner | Dwg | drawing | | |
| BS | both sides | Corr | corrected | Dr | drive | | |
| Bot | bottom | CAES | corrugated aluminum end section | Drwy | driveway | | |
| Bldv | Boulevard | CAP | corrugated aluminum pipe | DI | drop inlet | | |
| Bndry | boundary | CMES | corrugated metal end section | D | dry density | | |
| BC | brass cap | CMP | corrugated metal pipe | Ea | each | | |
| Brkwy | breakaway | CPVCP | corrugated poly-vinyl chloride pipe | Esmt | easement | | |
| Br | bridge | CSES | corrugated steel end section | E | East | | |
| Bldg | building | CSP | corrugated steel pipe | EB | Eastbound | | |
| BLM | Bureau of Land Management | C | coulomb | Elast | elastomeric | | |

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|--|----------------------------|
| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
| 06-15-10 | |
| REVISIONS | |
| DATE | CHANGE |
| 04-20-11 03-15-13 | Added Items Added Items |

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NDDOT ABBREVIATIONS

D-20-2

| | | | | | | | |
|----------------|---------------------------------|---------|---------------------------|-------|---|----------|-------------------------------|
| F Bcn | flashing beacon | Hor | horizontal | Long. | longitude | NB | Northbound |
| FA | flight auger sample | HBP | hot bituminous pavement | Lp | loop | No. or # | number |
| FL | flow line | Hr | hour(s) | LD | loop detector | Obsc | obscure(d) |
| Ftg | footing | Hyd | hydrant | Lm | lumen | Obsn | observation |
| FM | force main | Ph | hydrogen ion content | Lum | luminaire | Ocpd | occupied |
| Fs | foresight | Id | identification | L Sum | lump sum | Ocpy | occupy |
| Fnd | found | In or " | inch | Lx | lux | Off Loc | office location |
| Fdn | foundation | Incl | inclinometer tube | ML | main line | O/s | offset |
| Frac | fractional | IMH | inlet manhole | M Hr | man hour | OC | on center |
| Frwy | freeway | ID | inside diameter | MH | manhole | C | one dimensional consolidation |
| Frt | front | Inst | instrument | Mkd | marked | OC | organic content |
| FF | front face | Intchg | interchange | Mkr | marker | Orig | original |
| F Disp | fuel dispenser | Intmdt | intermediate | Mkg | marking | O To O | out to out |
| FFP | fuel filler pipes | Intscn | intersection | MA | mast arm | OD | outside diameter |
| FLS | fuel leak sensor | Inv | invert | Matl | material | OH | overhead |
| Furn | furnish/ed | IM | iron monument | Max | maximum | PMT | pad mounted transformer |
| Gal | gallon | I Pn | Iron Pin | MC | meander corner | Pg | pages |
| Galv | galvanized | IP | iron Pipe | Meas | measure | Pntd | painted |
| Gar | garage | Jt | joint | Mdn | median | Pr | pair |
| Gs L | gas line | J | joule | MD | median drain | Pnl | panel |
| G Reg | gas line regulator | Jct | junction | MC | medium curing | Pk | park |
| GMV | gas main valve | K | kelvin | M | mega | PK | Parker-Kalon nail |
| G Mtr | gas meter | Kn | kilo newton | Mer | meridian | Pa | pascal |
| GSV | gas service valve | Kpa | kilo pascal | M | meter | PSD | passing sight distance |
| GVP | gas vent pipe | Kg | kilogram | M/s | meters per second | Pvmt | pavement |
| GV | gate valve | Kg/m3 | kilogram per cubic meter | M | mid ordinate of curve | Ped | pedestal |
| Ga | gauge | Km | kilometer | Mi | mile | Ped | pedestrian |
| Geod | geodetic | K | Kip(s) | MM | mile marker | PPP | pedestrian pushbutton post |
| GIS | Geographical Information System | LS | Land Surveyor (licensed) | MP | mile post | Pen. | penetration |
| G | giga | LSIT | Land Surveyor In Training | MI | milliliter | Perf | perforated |
| GPS | Global Positioning System | Ln | lane | Mm | millimeter | Per. | perimeter |
| Gov | government | Lg | large | Mm/hr | millimeters per hour | PL | pipeline |
| Grd | graded/grade | Lat | latitude | Min | minimum | PI | place |
| Gr | gravel | Lt | left | Misc | miscellaneous | P&P | plan & profile |
| Grnd | ground | L | length of curve | Mon | monument | PL | plastic limit |
| GWM | ground water monitor | Lens | lenses | Mnd | mound | PI | plate |
| Gdrl | guardrail | Lvl | level | Mtbl | mountable | Pt | point |
| Gtr | gutter | LB | level book | Mtd | mounted | PCC | point of compound curve |
| H Plg | H piling | LvIng | leveling | Mtg | mounting | PC | point of curve |
| Hdwl | headwall | Lht | light | Mk | muck | PI | point of intersection |
| Ha | hectare | LP | light pole | Mun | municipal | PRC | point of reverse curvature |
| Ht | height | Ltg | lighting | N | nano | | |
| HI | height of instrument | Lig Co | lignite coal | NGS | National Geodetic Survey | | |
| Hel | helical | Lig SI | lignite slack | NS | near side | | |
| H | henry | LF | linear foot | Neop | neoprene | | |
| H _z | hertz | Liq | liquid | Ntwk | network | | |
| HDPE | High Density Polyethylene | LL | liquid limit | N | newton | | |
| HM | high mast | L | litre | N | North | | |
| HP | high pressure | Lm | loam | NDDOT | North Dakota Department of Transportation | | |
| HPS | high pressure sodium | Loc | location | NE | North East | | |
| Hwy | highway | LC | long chord | NW | North West | | |

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| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
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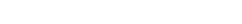
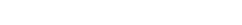
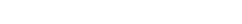
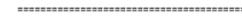
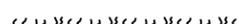
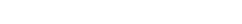
NDDOT ABBREVIATIONS

| | | | | | | | |
|----------|-----------------------------------|-----------|------------------------------------|-----------|----------------------------|-------|------------------------------------|
| PT | point of tangent | Rdbd | road bed | M2 | square meter | TP | traverse point |
| POC | point on curve | Rdwy | roadway | SY | square yard | Trtd | treated |
| POT | point on tangent | RWIS | Roadway Weather Information System | Stk | stake | Trmt | treatment |
| PE | polyethylene | Rk | rock | Std | standard | Qc | triaxial compression |
| PVC | polyvinyl chloride | Rt | route | N | standard penetration test | TERO | Tribal Employment Rights Ordinance |
| PCC | Portland Cement concrete | Salv | salvage(d) | Std Specs | Standard Specifications | Tpl | triple |
| Lb or # | pounds | Sd | sand | Sta | station | TP | turning point |
| PP | power pole | Sdy Cl | sandy clay | Sta Yd | station yards | Typ | typical |
| Preempt | preemption | Sdy Cl Lm | sandy clay loam | Stm L | steam line | Qu | unconfined compressive strength |
| Prefab | prefabricated | Sdy Fl | sandy fill | SEC | steel encased concrete | Ugrnd | underground |
| Prfmd | performed | Sdy Lm | sandy loam | SSD | stopping sight distance | USC&G | US Coast & Geodetic Survey |
| Prep | preparation | San | sanitary sewer line | SD | storm drain | USGS | US Geologic Survey |
| Press. | pressure | Sc | scoria | St | street | Util | utility |
| PRV | pressure relief valve | Sec | seconds | SPP | structural plate pipe | VG | valley gutter |
| Prestr | prestressed | Sec | section | SPPA | structural plate pipe arch | Vap | vapor |
| Pvt | private | SL | section line | Str | structure | Vert | vertical |
| PD | private drive | Sep | separation | Subd | subdivision | VC | vertical curve |
| Prod. | production/produce | Seq | sequence | Sub | subgrade | VCP | vitrified clay pipe |
| Prog | programmed | Serv | service | Sub Prep | subgrade preparation | V | volt |
| Prop. | property | Sh | shale | Ss | subsoil | Vol | volume |
| Prop Ln | property line | Sht | sheet | SE | superelevation | Wkwy | walkway |
| Ppsd | proposed | Shtng | sheeting | SS | supplement specification | W | water content |
| PB | pull box | Shldr | shoulder | Supp | supplemental | WGV | water gate valve |
| Qty | quantity | Sw | sidewalk | Surf | surfacing | WL | water line |
| Qtr | quarter | S | siemens | Surv | survey | WM | water main |
| Rad or R | radius | SD | sight distance | Sym | symmetrical | WMV | water main valve |
| RR | railroad | Sig | signal | SI | Systems International | W Mtr | water meter |
| Rlwy | railway | Si Cl | silt clay | Tan | tangent | WSV | water service valve |
| Rsd | raised | Si Cl Lm | silty clay loam | T | tangent (semi) | WW | water well |
| RTP | random traverse point | Si Lm | silty loam | TS | tangent to spiral | W | watt |
| Rge or R | range | Sgl | single | Tel | telephone | Wrng | wearing |
| RC | rapid curing | SC | slow curing | Tel B | Telephone Booth | Wb | weber |
| Rec | record | SS | slow setting | Tel P | telephone pole | WIM | weigh in motion |
| Rcy | recycle | Sm | small | Tv | television | W | West |
| RPCC | recycled Portland cement concrete | S | South | Temp | temperature | WB | Westbound |
| Ref | reference | SE | South East | Temp | temporary | Wrng | wiring |
| R Mkr | reference marker | SW | South West | TBM | temporary bench mark | W/ | with |
| RM | reference monument | SB | Southbound | T | tesla | W/o | without |
| Refl | reflectorized | Sp | spaces | T | thinwall tube sample | WC | witness corner |
| RCB | reinforced concrete box | Spcl | special | T/mi | tons per mile | WGS | World Geodetic System |
| RCES | reinforced concrete end section | SP | special provisions | Ts | topsoil | Z | zenith |
| RCP | reinforced concrete pipe | G | specific gravity | Twp or T | township | | |
| RCPS | reinforced concrete pipe sewer | Spk | spike | Traf | traffic | | |
| Reinf | reinforcement | SC | spiral to curve | TSCB | traffic signal control box | | |
| Res | reservation | ST | spiral to tangent | Tr | trail | | |
| Ret | retaining | SB | split barrel sample | Transf | transformer | | |
| Rev | reverse | SH | sprinkler head | TB | transit book | | |
| Rt | right | SV | sprinkler valve | Trans | transition | | |
| R/W | right of way | Sq | square | TT | transmission tower | | |
| Riv | river | SF | square feet | Trans | transverse | | |
| Rd | road | Km2 | square kilometer | Trav | traverse | | |

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Line Styles

| | | | | | |
|---|---|--|--|---|--------------------------------------|
|  | Subgrade Reinforcement |  | Existing Railroad Switch |  | Sheet Piling |
|  | Existing Down Guy Wire Down Guy |  | Overhead Sign Structure Cantilever |  | W-Beam w Posts |
|  | Existing Fence |  | 24 Inch Pipe |  | Existing W-Beam Guardrail with Posts |
|  | Existing Railroad |  | Reinforced Concrete Pipe |  | Exst Wet Area-Vegetation Break |
|  | Existing Sanitary Sewer |  | Signal Head with Mast Arm |  | Existing Wetland Delineated |
|  | Existing Sanitary Force Main |  | Existing Signal Head with Mast Arm | | |
|  | Existing Storm Drain |  | Tie Bar at Random Spacing | | |
|  | Existing Storm Drain Force Main |  | 3-Cable w Posts | | |
|  | Fence |  | Existing 3-Cable w Posts | | |
|  | Silt Fence |  | Site Boundary | | |
|  | Existing Field Line |  | Fiber Rolls | | |
|  | Exst Flow |  | Doweled Joint | | |
|  | Flow |  | Tie Bar 30 Inch 4 Foot Center to Center | | |
|  | Existing Culvert |  | Tie Bar 18 Inch 3 Foot Center to Center | | |
|  | Existing Curb |  | Existing Berm, Dike, Pit, or Earth Dam | | |
|  | Existing Valley Gutter |  | Existing Ditch Block | | |
|  | Existing Driveway Gutter |  | Depression Contours | | |
|  | Existing Curb and Gutter |  | Existing City Corporate Limits or Reservation Boundary | | |
|  | Existing Mountable Curb and Gutter |  | Gravel Pit - Borrow Area | | |
|  | Existing Double Micro Loop Detector |  | Existing Tree Boundary | | |
|  | Micro Loop Detector Double |  | Tree Row | | |
|  | Existing Overhead Sign Structure |  | Existing Brush or Shrub Boundary | | |
|  | Existing Micro Loop Detector |  | Existing Retaining Wall | | |
|  | Micro Loop Detector |  | Existing Planter or Wall | | |
|  | Existing Overhead Sign Structure Cantilever |  | Retaining Wall (Plan View) | | |

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| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
| 4-20-11 | |
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| DATE | CHANGE |
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Symbols

| | | | | | | | |
|--|--------------------------------------|--|---------------------------------|--|--|--|---|
| | North Arrow (Half Scale) | | Attenuation Device | | Existing Railroad Battery Box | | Existing Delineator Type E |
| | Truck Mounted Attenuator | | Diamond Grade Delineator Type A | | Existing Bush or Shrub | | Existing EFB Misc |
| | Type I Barricade | | Diamond Grade Delineator Type B | | Existing Gas Cap or Stub | | Existing Flashing Beacon |
| | Type II Barricade | | Diamond Grade Delineator Type C | | Existing Sanitary Cap or Stub | | Existing Pipe Mounted Flasher |
| | Type III Barricade | | Diamond Grade Delineator Type D | | Existing Storm Drain Cap or Stub | | Existing Pad Mounted Feed Point |
| | Catch Basin | | Diamond Grade Delineator Type E | | Existing Water Cap or Stub | | Existing Pipe Mounted Feed Point with Pad |
| | Cairn or Stone Circle | | Flexible Delineator | | Existing Sanitary Cleanout | | Existing Pole Mounted Feed Point |
| | Video Detection Camera | | Flexible Delineator Type A | | Existing Concrete Foundation | | Existing Railroad Frog |
| | Storm Drain Cap or Stub | | Flexible Delineator Type B | | Existing Traffic Signal Controller | | Existing Snow Gate 18 |
| | Corrugated Metal End Section 18 Inch | | Flexible Delineator Type C | | Existing Pad Mounted Signal Controller | | Existing Snow Gate 28 |
| | Corrugated Metal End Section 24 Inch | | Flexible Delineator Type D | | Existing Sixteenth Section Corner | | Existing Snow Gate 40 |
| | Corrugated Metal End Section 30 Inch | | Flexible Delineator Type E | | Existing Quarter Section Corner | | Existing Headwall |
| | Corrugated Metal End Section 36 Inch | | Delineator Type A | | Existing Section Corner | | Existing Pedestrian Head with Number |
| | Corrugated Metal End Section 42 Inch | | Delineator Type A Reset | | Existing Railroad Crossbuck | | Existing Signal Head |
| | Corrugated Metal End Section 48 Inch | | Delineator Type B | | Existing Satellite Dish | | Existing Sprinkler Head |
| | Concrete Foundation | | Delineator Type B Reset | | Existing Fuel Dispensers | | Existing Fire Hydrant |
| | Ground Connection Conductor | | Delineator Type C | | Existing Flexible Delineator Type A | | Existing Catch Basin Drop Inlet |
| | Neutral Connection Conductor | | Delineator Type D | | Existing Flexible Delineator Type B | | Existing Curb Inlet |
| | Phase 1 Connection Conductor | | Delineator Type E | | Existing Flexible Delineator Type C | | Existing Manhole Inlet |
| | Phase 2 Connection Conductor | | Delineator Drums | | Existing Flexible Delineator Type D | | Existing Junction Box |
| | Traffic Cone | | Spot Elevation | | Existing Flexible Delineator Type E | | |
| | Signal Controller | | Existing Access Control Arrow | | Existing Delineator Type A | | |
| | Pad Mounted Signal Controller | | Existing Artifact | | Existing Delineator Type B | | |
| | Alignment Data Point | | Existing Flashing Beacon | | Existing Delineator Type C | | |
| | Emergency Vehicle Detector | | Existing Benchmark | | Existing Delineator Type D | | |

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Symbols

D-20-31

| | | | |
|--|--|---|--|
|  Existing Light Standard |  Existing Manhole with Valve Water |  Existing Telephone Pole |  Existing Undefined Manhole |
|  Existing High Mast Light Standard 10 Luminaire |  Existing Water Manhole |  Existing Wood Pole |  Existing Undefined Pull Box |
|  Existing High Mast Light Standard 3 Luminaire |  Existing Mile Post Type A |  Existing Post |  Existing Undefined Pedestal |
|  Existing High Mast Light Standard 4 Luminaire |  Existing Mile Post Type B |  Existing Pedestrian Push Button Post |  Existing Undefined Valve |
|  Existing High Mast Light Standard 5 Luminaire |  Existing Mile Post Type C |  Existing Control Point CP |  Existing Undefined Pipe Vent |
|  Existing High Mast Light Standard 6 Luminaire |  Existing Reference Marker |  Existing Control Point GPS-RTK |  Existing Gas Valve |
|  Existing High Mast Light Standard 7 Luminaire |  Existing RW Marker |  Existing Control Point TRI |  Existing Water Valve |
|  Existing High Mast Light Standard 8 Luminaire |  Existing Utility Marker |  Existing Reference Marker Point NGS |  Existing Fuel Pipe Vent |
|  Existing High Mast Light Standard 9 Luminaire |  Existing Monument Found |  Existing Pull Box |  Existing Gas Pipe Vent |
|  Existing Overhead Sign Structure Load Center |  Existing Monument set |  Existing Intelligent Transportation Pull Box |  Existing Sanitary Pipe Vent |
|  Existing Luminaire |  Existing RW Property Monument Found |  Existing Water Pump |  Existing Storm Drain Pipe Vent |
|  Existing Light Standard Luminaire |  Existing RW Property Monument set |  Existing Slotted Reinforced Concrete Pipe |  Existing Water Pipe Vent |
|  Existing Federal Mailbox |  Existing Object Marker Type I |  Existing RR Profile Spot |  Existing Weather Station |
|  Existing Private Mailbox |  Existing Object Marker Type II |  Existing Fuel Leak Sensors |  Existing Ground Water Well Bore Hole |
|  Existing Meander Section Corner |  Existing Object Marker Type III |  Existing Highway Sign |  Existing Windmill or Tower |
|  Existing Meter |  Existing Electrical Pedestal |  Existing Miscellaneous Spot |  Existing Witness Corner |
|  Existing Electrical Manhole |  Existing Telephone Pedestal |  Existing Lighting Standard Pole |  Flashing Beacon |
|  Existing Gas Manhole |  Existing Fiber Optic Telephone Pedestal |  Existing Traffic Signal Standard |  Flagger |
|  Existing Sanitary Manhole |  Existing TV Pedestal |  Existing Transformer |  Pipe Mounted Flasher |
|  Existing Sanitary Force Main Manhole |  Existing Fiber Optic TV Pedestal |  Existing Large Evergreen Tree |  Sanitary Force Main with Valve |
|  Existing Sanitary Manhole with Valve |  Existing Fuel Filler Pipes |  Existing Small Evergreen Tree | |
|  Existing Storm Drain Manhole |  Existing Traverse PI Aerial Panel |  Existing Large Tree | |
|  Existing Force Main Storm Drain Manhole |  Existing Pole |  Existing Small Tree | |
|  Existing Force Main Storm Drain Manhole with Valve |  Existing Power Pole |  Existing Tree Trunk | |
|  Existing Telephone Manhole |  Existing Power Pole with Transformer |  Existing Pad Mounted Traffic Signal Control Box | |

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Symbols

D-20-32

| | | | |
|---|--|---|--|
|  Pad Mounted Feed Point  Pipe Mounted Feed Point with Pad  Pole Mounted Feed Point  Headwall  Double Headwall with Vegetation Barrier  Single Headwall with Vegetation Barrier  Pole Mounted Head  Sprinkler Head  Fire Hydrant  Inlet Type 1  Inlet Type 2  Double Inlet Type 2  Inlet Gate Type 2  Junction Box  High Mast Light Standard 10 Luminaire  High Mast Light Standard 3 Luminaire  High Mast Light Standard 4 Luminaire  High Mast Light Standard 5 Luminaire  High Mast Light Standard 6 Luminaire  High Mast Light Standard 7 Luminaire  High Mast Light Standard 8 Luminaire  High Mast Light Standard 9 Luminaire  Relocate Light Standard  Overhead Sign Structure Load Center  Light Standard 100 Watt High Pressure Sodium Vapor Luminaire |  Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire  Light Standard 150 Watt High Pressure Sodium Vapor Luminaire  Light Standard 175 Watt High Pressure Sodium Vapor Luminaire  Light Standard 200 Watt High Pressure Sodium Vapor Luminaire  Light Standard 250 Watt High Pressure Sodium Vapor Luminaire  Light Standard 310 Watt High Pressure Sodium Vapor Luminaire  Light Standard 35 Watt High Pressure Sodium Vapor Luminaire  Light Standard 400 Watt High Pressure Sodium Vapor Luminaire  Light Standard 50 Watt High Pressure Sodium Vapor Luminaire  Light Standard 70 Watt High Pressure Sodium Vapor Luminaire  Light Standard 700 Watt High Pressure Sodium Vapor Luminaire  Manhole  Manhole 48 Inch  Sanitary Force Main Manhole  Sanitary Sewer Manhole  Storm Drain Manhole  Storm Drain Manhole with Inlet  Reset Mile Post  Mile Post Type A  Mile Post Type B  Mile Post Type C  Right of Way Marker  Tubular Marker  Concrete Monument to Be Set  RW Property Monument to Be Set |  Object Marker Type I  Object Marker Type II  Object Marker Type III  Caution Mode Arrow Panel  Back to Back Vertical Panel Sign  Double Direction Arrow Panel  Left Directional Arrow Panel  Right Directional Arrow Panel  Sequencing Arrow Panel  Truck Mounted Arrow Panel  Power Pole  Wood Pole  Pedestrian Push Button Post  Property Corner  Pull Box  Intelligent Transportation Pull Box  Sanitary Pump  Storm Drain Pump  Reinforced Pavement  Reinforced Concrete End Section 15 Inch  Reinforced Concrete End Section 18 Inch  Reinforced Concrete End Section 24 Inch  Reinforced Concrete End Section 30 Inch  Reinforced Concrete End Section 36 Inch  Reinforced Concrete End Section 42 Inch |  Reinforced Concrete End Section 48 Inch  Reinforced Concrete End Section 54 Inch  Reset Right of Way Marker  Reset USGS Marker  Right of Way Markers  Riser 30 Inch  Continuous Split Barrel Sample  Flight Auger Sample  Split Barrel Sample  Thinwall Tube Sample  Highway Sign  SNOW GATE 18 FT  SNOW GATE 28 FT  SNOW GATE 40 FT  Standard Penetration Test  Transformer  Inclinometer Tube  Underdrain Cleanout  Excavation Unit  Water Valve |
|---|--|---|--|

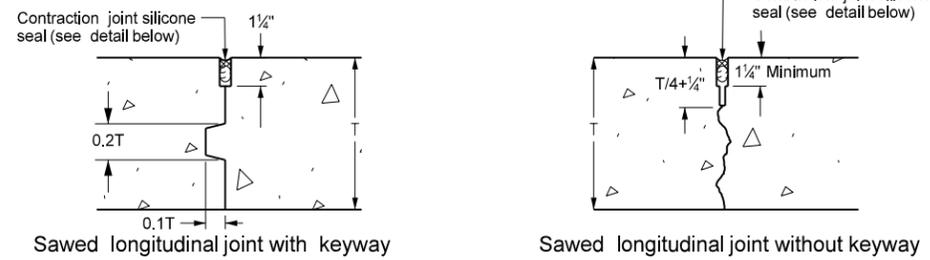
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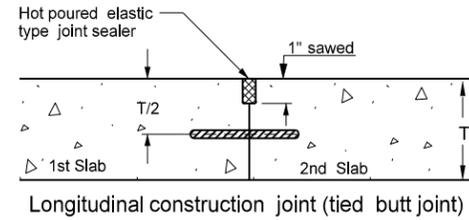
LONGITUDINAL JOINT DETAILS

D-550-2

UNTIED JOINTS (silicone seal)

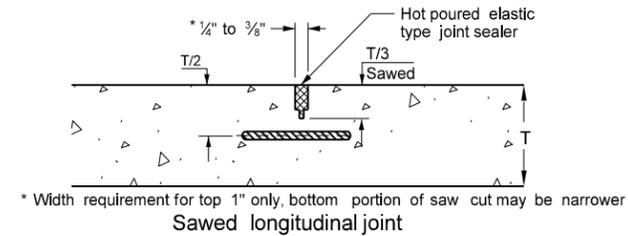
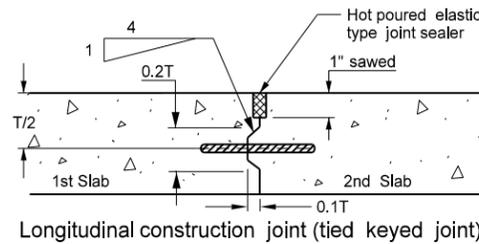
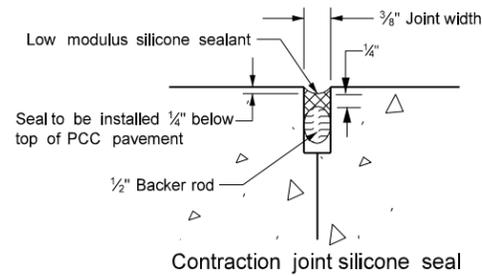


TIED JOINTS (hot poured elastic seal)



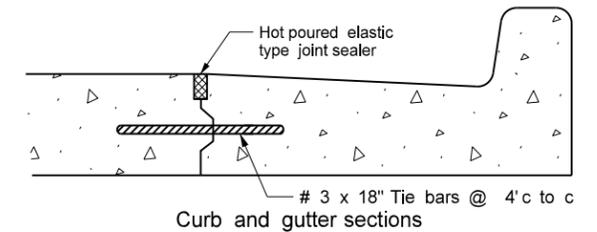
Notes:

1. The hot poured elastic type joint sealer shall be in accordance with Section 826.02A.2 of the Standard Specifications.
2. The longitudinal joint and seal shall be included in the price bid for the P.C.C. pavement.
3. Tie bars shall not be placed within 18 inches of a transverse skewed joint.
4. Where tie bars are installed bent and later straightened, Grade 40 steel shall be used.
5. Tie bar spacing can be increased up to 10% to facilitate construction.
6. Tie Bars shall be at a 48 inch maximum spacing.
7. A "Warp" joint is a sawed joint or a construction joint with a keyway.
8. A "Butt joint" is a construction joint with no keyway.

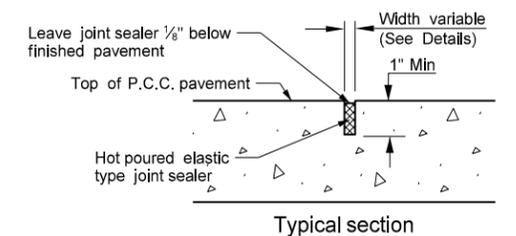


TIEBAR SPACINGS (In)

| DIST TO FREE EDGE (FT) | BAR SIZE | GRADE STEEL | TIEBAR SPACINGS (In) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------|----------|-------------|----------------------|----|----|----|----------|----|---------|----|----------|----|----|----|----------|----|----|----|----------|----|---------|----|----------|----|----|----|----------|----|----|----|----------|----|-----|----|----|----|----|----|-----|----|----|----|----|----|-----|----|----|----|----|----|----|----|----|----|----|
| | | | # 3 BAR | | | | | | # 4 BAR | | | | | | # 5 BAR | | | | | | # 6 BAR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | GRADE 40 | | | | GRADE 60 | | | | GRADE 40 | | | | GRADE 60 | | | | GRADE 40 | | | | GRADE 60 | | | | GRADE 40 | | | | GRADE 60 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 24" | | | | | | 30" | | | | | | 24" | | | | | | 36" | | | | | | 30" | | | | | | 42" | | | | | | 36" | | | | | | 48" | | | | | | | | | | |
| | | | 4 | 6 | 8 | 10 | 4 | 6 | 8 | 10 | 12 | 14 | 8 | 10 | 12 | 14 | 16 | 8 | 10 | 12 | 14 | 16 | 22 | 24 | 10 | 12 | 14 | 16 | 22 | 24 | 10 | 12 | 14 | 16 | 22 | 24 | 10 | 12 | 14 | 16 | 19 | 22 | 24 | 10 | 12 | 14 | 16 | 19 | 22 | 24 | | | | | |
| 6" | WARP | | 48 | 39 | 29 | 24 | 48 | 48 | 44 | 35 | 29 | 25 | 48 | 42 | 35 | 30 | 26 | 48 | 48 | 48 | 45 | 39 | 28 | 26 | 48 | 48 | 47 | 41 | 30 | 27 | 48 | 48 | 48 | 48 | 45 | 41 | 48 | 48 | 48 | 48 | 48 | 43 | 39 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | | | | | |
| | BUTT | | 37 | 27 | | | 48 | 42 | 31 | 25 | | | 37 | 29 | 24 | | | 48 | 44 | 37 | 32 | 27 | | | 46 | 39 | 33 | 29 | | | 48 | 48 | 48 | 43 | 32 | 29 | 48 | 48 | 48 | 48 | 35 | 30 | 27 | 48 | 48 | 48 | 48 | 48 | 45 | 41 | | | | | |
| 8" | WARP | | 48 | 37 | 28 | | 48 | 48 | 42 | 33 | 28 | 24 | 48 | 39 | 33 | 28 | 24 | 48 | 48 | 48 | 42 | 37 | 27 | 24 | 48 | 48 | 44 | 38 | 28 | 25 | 48 | 48 | 48 | 48 | 42 | 38 | 48 | 48 | 48 | 48 | 47 | 40 | 37 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | | | | | |
| | BUTT | | 39 | 26 | | | 44 | 39 | 29 | | | 35 | 27 | | | | 48 | 48 | 47 | 41 | 30 | 27 | | 44 | 36 | 31 | 27 | | | 48 | 48 | 47 | 41 | 30 | 27 | 48 | 48 | 45 | 39 | 33 | 28 | 26 | 48 | 48 | 48 | 48 | 48 | 48 | 42 | 39 | | | | | |
| 8 1/2" | WARP | | 48 | 35 | 26 | | 48 | 48 | 39 | 31 | 26 | | 47 | 37 | 31 | 26 | | 48 | 48 | 47 | 40 | 35 | 25 | | 48 | 48 | 42 | 36 | 26 | 24 | 48 | 48 | 48 | 48 | 40 | 36 | 48 | 48 | 48 | 48 | 44 | 38 | 35 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | | | | | |
| | BUTT | | 37 | 24 | | | 48 | 37 | 27 | | | 33 | 26 | | | | 48 | 40 | 33 | 28 | 25 | | | 41 | 34 | 29 | 25 | | | 48 | 48 | 44 | 39 | 28 | 25 | 48 | 48 | 42 | 37 | 31 | 26 | 24 | 48 | 48 | 48 | 48 | 47 | 40 | 37 | | | | | | |
| 9" | WARP | | 48 | 33 | 25 | | 48 | 48 | 37 | 30 | 25 | | 44 | 35 | 29 | 25 | | 48 | 48 | 44 | 38 | 33 | 24 | | 48 | 46 | 39 | 34 | 25 | | 48 | 48 | 48 | 48 | 38 | 34 | 48 | 48 | 48 | 48 | 42 | 36 | 33 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | | | | | |
| | BUTT | | 35 | | | | 48 | 35 | 26 | | | 31 | 25 | | | | 47 | 37 | 31 | 27 | | | | 39 | 32 | 27 | 25 | | | 48 | 48 | 42 | 37 | 27 | 24 | 48 | 47 | 40 | 35 | 29 | 25 | 48 | 48 | 48 | 48 | 44 | 38 | 35 | 48 | 48 | 48 | 48 | 44 | 38 | 35 |
| 9 1/2" | WARP | | 48 | 31 | | | 48 | 47 | 35 | 28 | | | 42 | 34 | 28 | 24 | | 48 | 48 | 42 | 36 | 31 | | | 48 | 44 | 37 | 33 | 24 | | 48 | 48 | 48 | 48 | 36 | 33 | 48 | 48 | 48 | 48 | 40 | 34 | 31 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | | | | | |
| | BUTT | | 33 | | | | 48 | 33 | 25 | | | 29 | 24 | | | | 45 | 36 | 29 | 25 | | | | 37 | 31 | 26 | 24 | | | 48 | 46 | 40 | 35 | 25 | | 48 | 45 | 38 | 33 | 28 | 24 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | 48 |
| 10" | WARP | | 45 | 30 | | | 48 | 45 | 34 | 27 | | | 40 | 32 | 26 | | | 48 | 48 | 40 | 34 | 30 | | | 48 | 42 | 36 | 31 | | | 48 | 48 | 47 | 34 | 31 | 48 | 48 | 48 | 45 | 38 | 33 | 30 | 48 | 48 | 48 | 48 | 48 | 48 | 48 | | | | | | |
| | BUTT | | 32 | | | | 48 | 32 | 24 | | | 28 | | | | | 42 | 34 | 28 | 24 | | | | 35 | 29 | 25 | | | | 48 | 44 | 38 | 33 | 24 | | 48 | 42 | 36 | 32 | 27 | | 48 | 48 | 48 | 48 | 40 | 34 | 31 | 48 | 48 | 48 | 48 | 40 | 34 | 31 |
| 10 1/2" | WARP | | 43 | 28 | | | 48 | 43 | 32 | 26 | | | 38 | 31 | 25 | | | 48 | 46 | 38 | 33 | 28 | | | 48 | 40 | 34 | 30 | | | 48 | 48 | 48 | 45 | 32 | 30 | 48 | 48 | 48 | 43 | 36 | 31 | 28 | 48 | 48 | 48 | 48 | 48 | 48 | 47 | | | | | |
| | BUTT | | 30 | | | | 46 | 30 | | | | 27 | | | | | 40 | 32 | 27 | | | | | 34 | 28 | 24 | | | | 48 | 42 | 36 | 32 | | | 48 | 40 | 35 | 30 | 25 | | 48 | 48 | 48 | 46 | 38 | 33 | 30 | 48 | 48 | 48 | 48 | 46 | 38 | 33 |
| 11" | WARP | | 41 | 27 | | | 48 | 41 | 31 | 24 | | | 48 | 36 | 29 | 24 | | 48 | 44 | 36 | 31 | 27 | | | 46 | 38 | 32 | 28 | | | 48 | 48 | 47 | 41 | 34 | 31 | 48 | 48 | 47 | 41 | 34 | 30 | 27 | 48 | 48 | 48 | 48 | 48 | 48 | 45 | | | | | |
| | BUTT | | 29 | | | | 44 | 29 | | | | 25 | | | | | 39 | 31 | 25 | | | | | 32 | 27 | | | | | 48 | 40 | 35 | 30 | | | 46 | 39 | 33 | 29 | 24 | | 48 | 48 | 48 | 44 | 37 | 31 | 29 | 48 | 48 | 48 | 48 | 44 | 37 | 31 |
| 11 1/2" | WARP | | 39 | 26 | | | 48 | 39 | 29 | | | 35 | 28 | | | | 48 | 42 | 35 | 30 | 26 | | | 44 | 36 | 31 | 28 | | | 48 | 48 | 47 | 41 | 30 | 27 | 48 | 48 | 45 | 40 | 33 | 28 | 26 | 48 | 48 | 48 | 48 | 48 | 48 | 43 | | | | | | |
| | BUTT | | 27 | | | | 42 | 27 | | | | 25 | | | | | 37 | 30 | 25 | | | | | 31 | 25 | | | | | 46 | 39 | 33 | 29 | | | 45 | 37 | 32 | 28 | | | 48 | 48 | 48 | 42 | 35 | 30 | 27 | 48 | 48 | 48 | 48 | 42 | 35 | 30 |
| 12" | WARP | | 38 | 25 | | | 48 | 38 | 28 | | | 33 | 27 | | | | 48 | 40 | 33 | 29 | 25 | | | 42 | 35 | 30 | 26 | | | 48 | 48 | 45 | 39 | 28 | 26 | 48 | 48 | 43 | 38 | 32 | 27 | 25 | 48 | 48 | 48 | 48 | 48 | 48 | 41 | | | | | | |
| | BUTT | | 27 | | | | 40 | 27 | | | | 35 | 28 | | | | 35 | 28 | | | | | | 29 | 25 | | | | | 44 | 37 | 32 | 27 | | | 42 | 35 | 30 | 27 | | | 48 | 48 | 45 | 40 | 34 | 29 | 26 | 48 | 48 | 48 | 48 | 40 | 34 | 29 |
| 12 1/2" | WARP | | 36 | 24 | | | 48 | 36 | 27 | | | 32 | 26 | | | | 48 | 39 | 32 | 27 | 24 | | | 40 | 33 | 29 | 25 | | | 48 | 48 | 43 | 38 | 27 | 25 | 48 | 48 | 41 | 36 | 30 | 26 | 24 | 48 | 48 | 48 | 48 | 46 | 40 | 36 | | | | | | |
| | BUTT | | 25 | | | | 38 | 25 | | | | 34 | 27 | | | | 34 | 27 | | | | | | 28 | | | | | | 42 | 35 | 30 | 27 | | | 41 | 34 | 29 | 25 | | | 48 | 48 | 44 | 38 | 32 | 28 | 25 | 48 | 48 | 48 | 48 | 44 | 38 | 32 |
| 13" | WARP | | 35 | | | | 48 | 35 | 26 | | | 31 | 25 | | | | 47 | 37 | 31 | 26 | | | | 39 | 32 | 28 | 24 | | | 48 | 48 | 42 | 36 | 26 | 24 | 48 | 47 | 40 | 35 | 29 | 25 | | 48 | 48 | 48 | 48 | 44 | 38 | 35 | | | | | | |
| | BUTT | | 25 | | | | 37 | 25 | | | | 33 | 26 | | | | 33 | 26 | | | | | | 27 | | | | | | 41 | 34 | 29 | 25 | | | 39 | 33 | 28 | 25 | | | 48 | 48 | 42 | 37 | 31 | 27 | 24 | 48 | 48 | 48 | 48 | 44 | 38 | 35 |
| 13 1/2" | WARP | | 34 | | | | 48 | 34 | 25 | | | 30 | 24 | | | | 45 | 36 | 30 | 25 | | | | 37 | 31 | 27 | | | | 48 | 47 | 40 | 35 | 25 | | 48 | 45 | 38 | 34 | 28 | 24 | | 48 | 48 | 48 | 48 | 43 | 37 | 34 | | | | | | |
| | BUTT | | 24 | | | | 35 | 24 | | | | 32 | 25 | | | | 32 | 25 | | | | | | 26 | | | | | | 38 | 32 | 27 | 24 | | | 38 | 32 | 27 | 24 | | | 48 | 47 | 40 | 35 | 30 | 26 | 23 | 48 | 48 | 48 | 48 | 40 | 34 | 29 |
| 14" | WARP | | 32 | | | | 48 | 32 | 24 | | | 29 | | | | | 43 | 35 | 29 | 25 | | | | 36 | 30 | 26 | | | | 48 | 45 | 39 | 34 | 24 | | 48 | 43 | 37 | 32 | 27 | | | 48 | 48 | 48 | 48 | 41 | 35 | 32 | | | | | | |
| | BUTT | | | | | | 34 | | | | | 30 | 25 | | | | 30 | 25 | | | | | | 25 | | | | | | 36 | 30 | 26 | | | | 36 | 30 | 26 | | | | 48 | 46 | 39 | 34 | 29 | 25 | | 48 | 48 | 48 | 48 | 41 | 35 | 32 |
| 14 1/2" | WARP | | 31 | | | | 47 | 31 | | | | 28 | | | | | 42 | 33 | 28 | 24 | | | | 35 | 29 | 25 | | | | 48 | 44 | 37 | 33 | 24 | | 48 | 42 | 36 | 31 | 26 | | | 48 | 48 | 48 | 47 | 40 | 34 | 31 | | | | | | |
| | BUTT | | | | | | 33 | | | | | 29 | | | | | 29 | | | | | | | 25 | | | | | | 35 | 29 | 25 | | | | 35 | 29 | 25 | | | | 48 | 44 | 38 | 33 | 28 | 24 | | 48 | 48 | 48 | 48 | 44 | 38 | 32 |



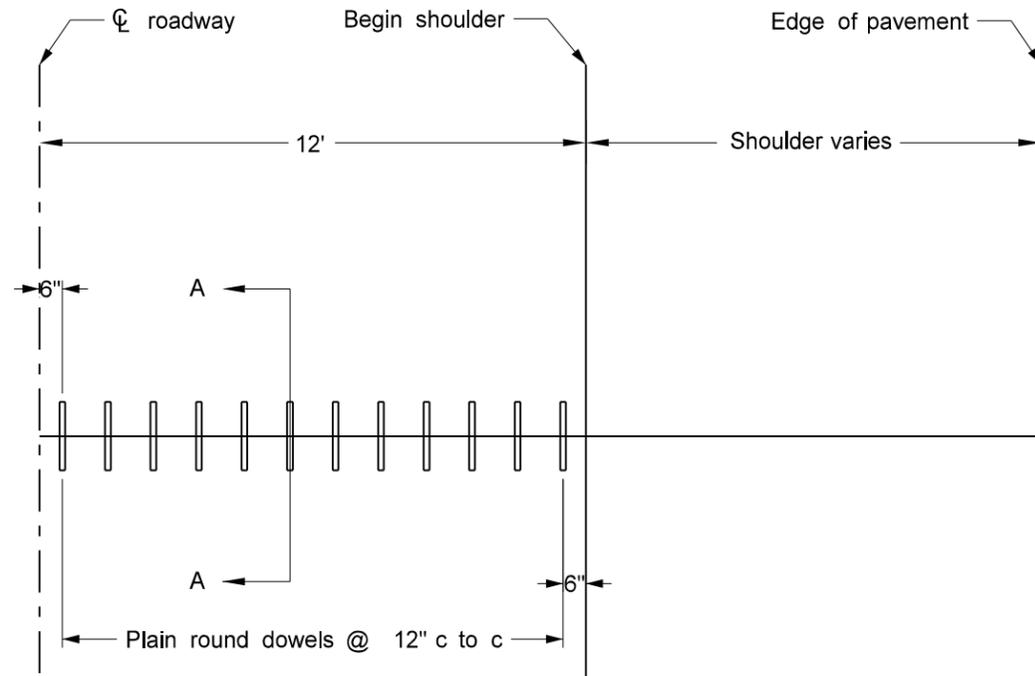
JOINT SEALER DETAILS



| | |
|--|------------------------|
| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
| 9-15-2010 | |
| REVISIONS | |
| DATE | CHANGE |
| 10/23/2012 | Expanded Tie Bar Table |

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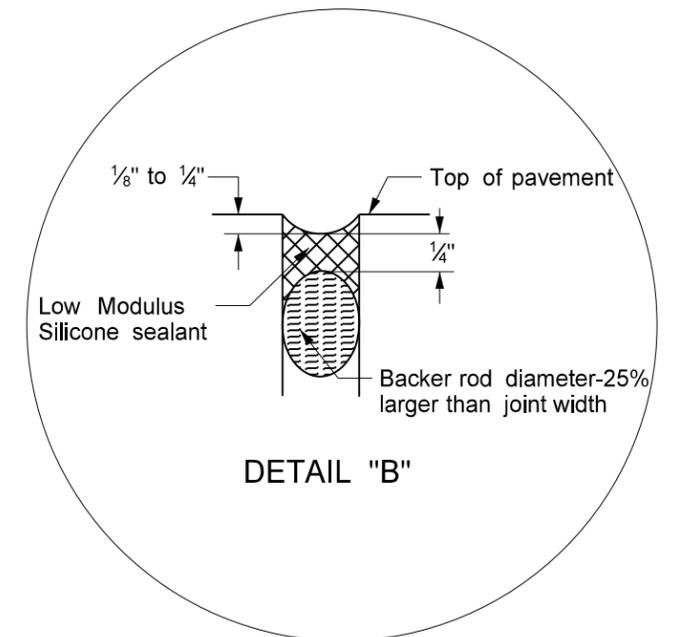
TRANSVERSE CONTRACTION JOINT DETAILS



CONTRACTION JOINT DOWEL ASSEMBLY
(1/2 roadway shown)

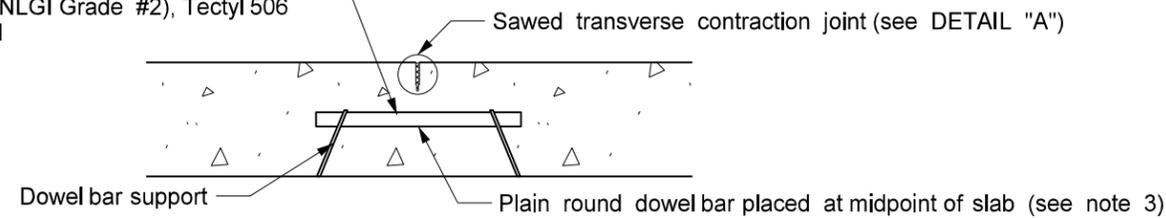
Notes

1. The joint seal details apply to both doweled and non-doweled (plain) transverse joints.
2. T = Thickness of pavement.
3. Dowels
 Pavement 10" or less: 1 1/4" X 18" plain round
 Pavement greater than 10": 1 1/2" X 18" plain round
4. B = T/4 + 1/4" for AE or YE non-doweled concrete pavement
 or T/3 for high early or doweled concrete pavement

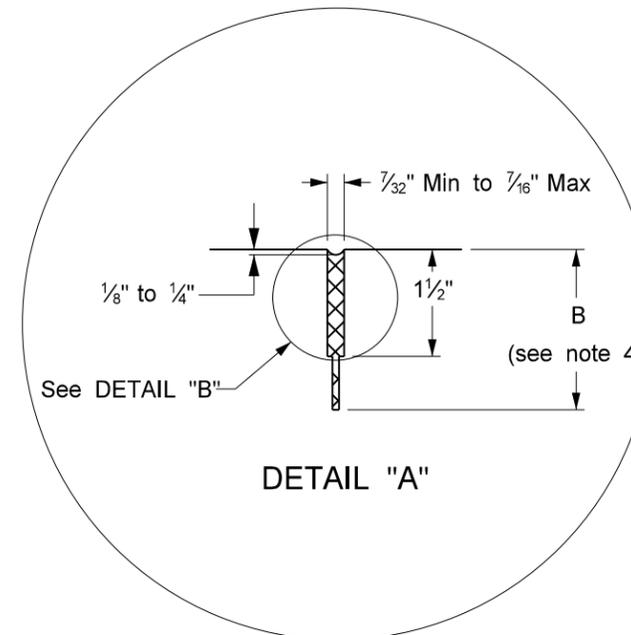


DETAIL "B"

Coat entire dowel bar length with Multipurpose Lithium Grease (NLGI Grade #2), Tectyl 506 or approved equal



SECTION A-A

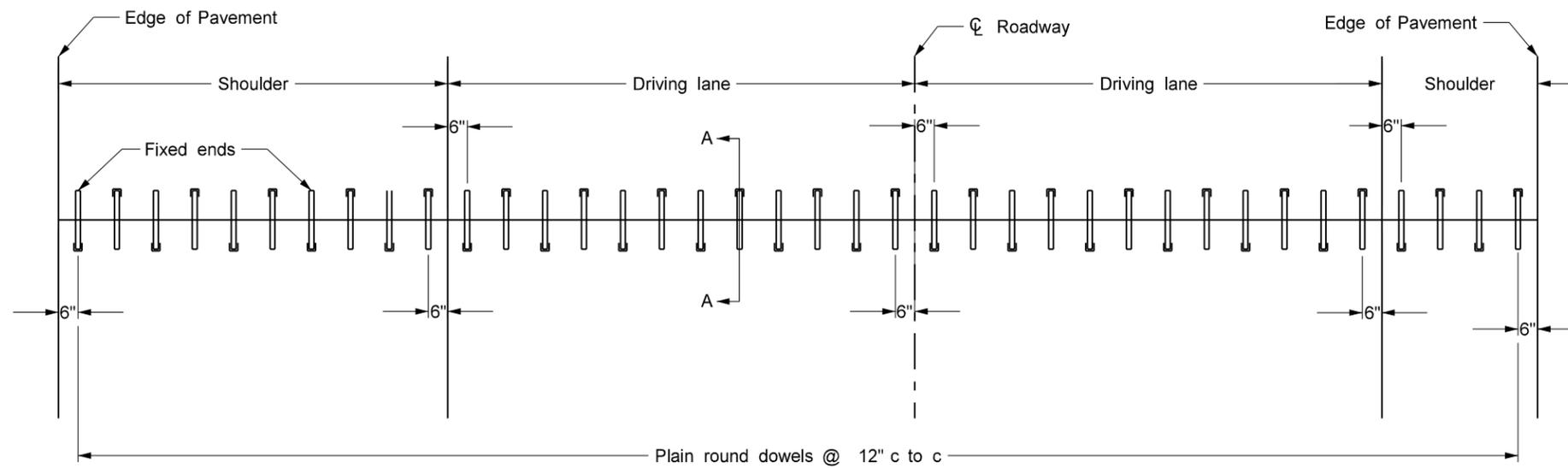


DETAIL "A"

| | |
|--|--------|
| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
| 9-15-2010 | |
| REVISIONS | |
| DATE | CHANGE |
| | |

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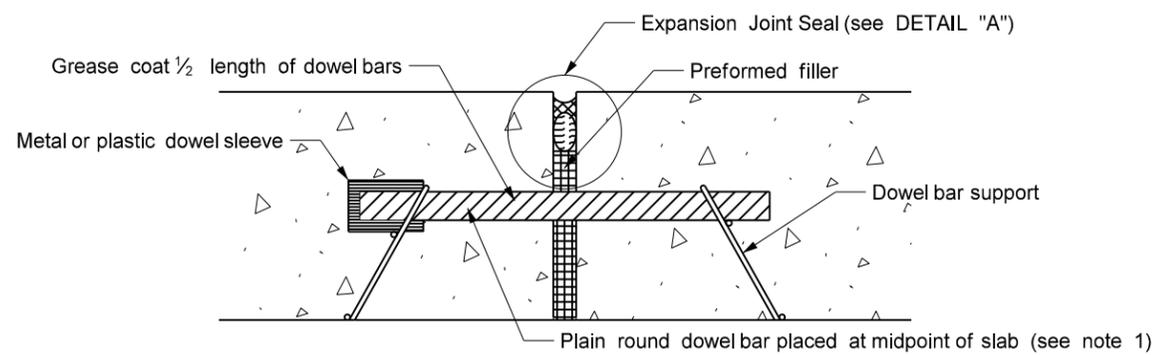
TRANSVERSE EXPANSION JOINT DETAIL



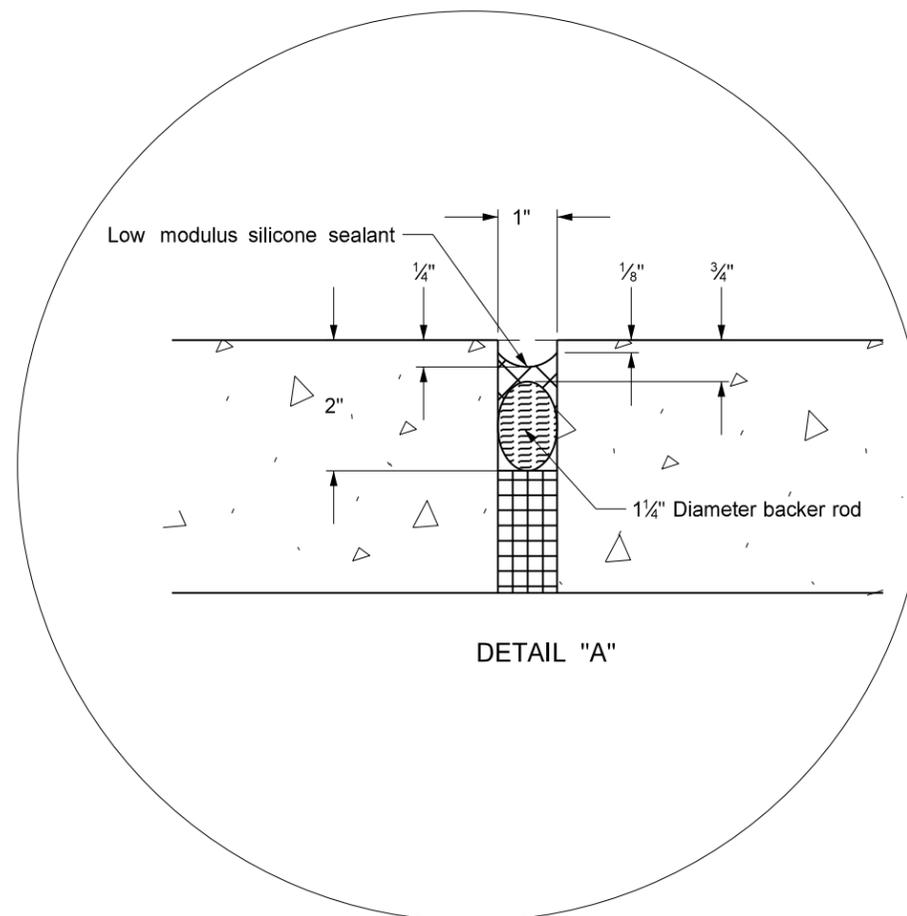
Notes

- 1. Dowels
 - Pavement thickness 10" or less: 1 1/4" X 18" plain round
 - Pavement thickness greater than 10": 1 1/2" X 18" plain round

DOWELED EXPANSION JOINT ASSEMBLY



SECTION A-A



DETAIL "A"

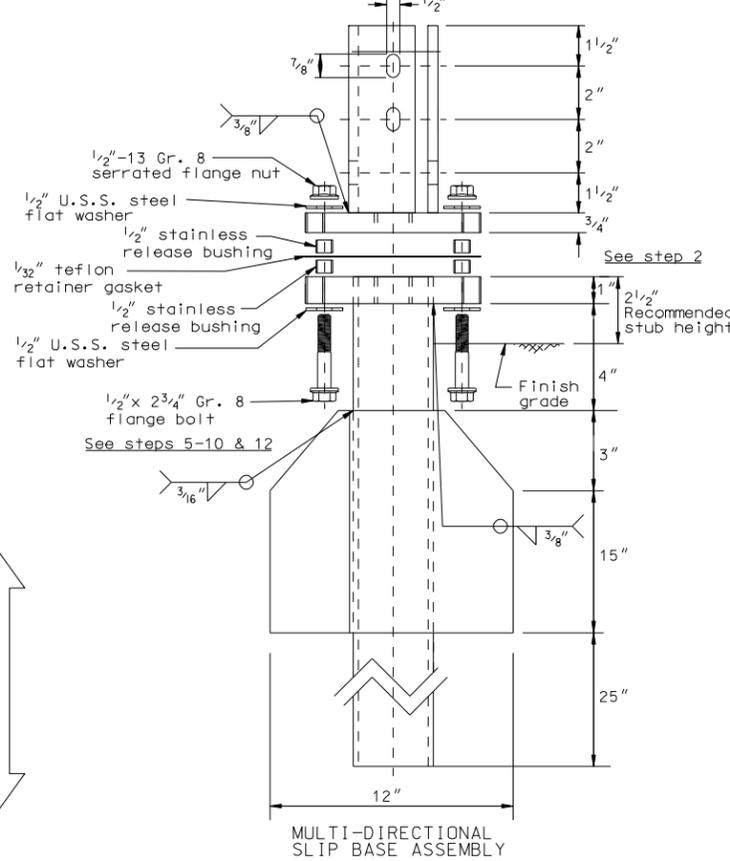
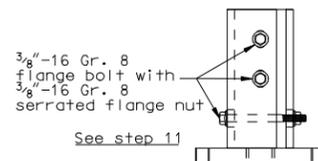
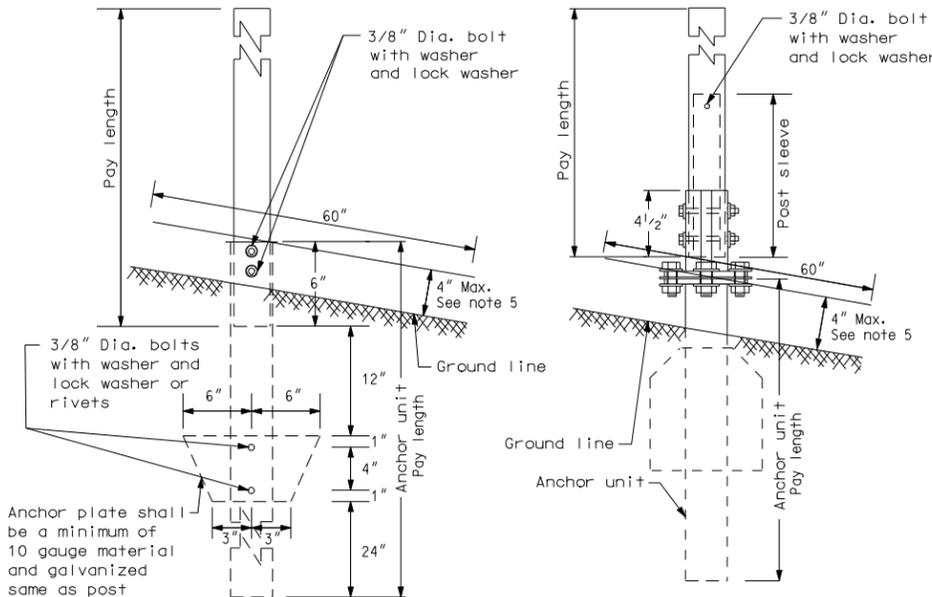
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| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
| 9-15-2010 | |
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| DATE | CHANGE |
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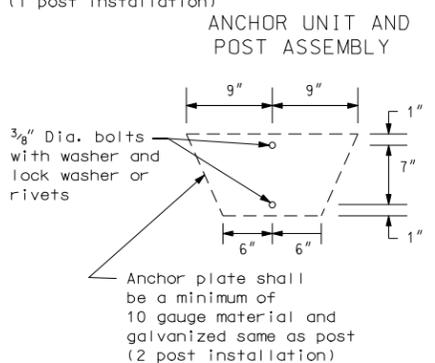
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-7

PERFORATED TUBE

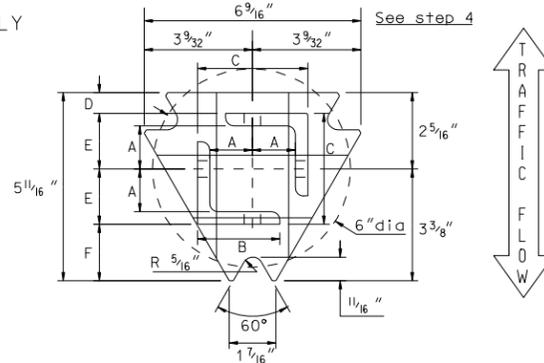


- Notes
1. Slip base bolts shall be torqued as specified by the manufacturer.
 2. The 2 3/16 inch size 10 gauge is shown as 2.19 inch size on the plans. The 2 1/2 inch size 10 gauge is shown as 2.51 inch size on the plans.
 3. Anchor for 2 inch, 2 1/4 inch, and 2 1/2 inch posts.
 4. Anchor material shall be 7 gauge H.R.P.O. Commercial quality ASTM A569 and 3 inch x 3 inch x 7 gauge ASTM A500 Grade B. Anchor shall have a yield strength of 43.9 KSI and tensile strength of 59.3 KSI. Anchor shall be hot dipped galvanized per ASTM A123/A153. All tolerances on anchor unit and slip base bottom assembly are ± 0.005 unless otherwise noted.
 5. 4 inch vertical clearance of anchor or breakaway base. The 4 inch x 60 inch measurement shall be made above and below post location and also back and ahead of post.
 6. When used in concrete sidewalk, anchor shall be the same except without the wings.
 7. Four post signs shall have over 8 feet between the first and fourth posts.



ANCHOR UNIT AND POST ASSEMBLY

SLIP BASE ANCHOR UNIT AND POST SLEEVE ASSEMBLY

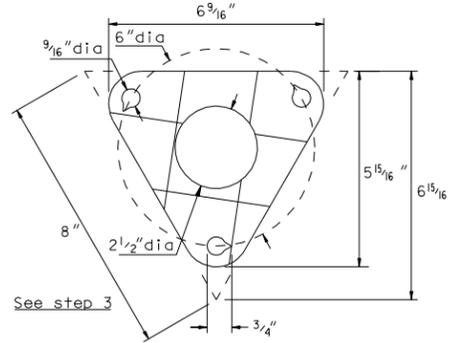


TOP POST RECEIVER

Materials: Plate - ASTM A572 grade 50
Angle receiver - 2 1/2 inch x 2 1/2 inch x 3/8 inch ASTM A36 structural angle

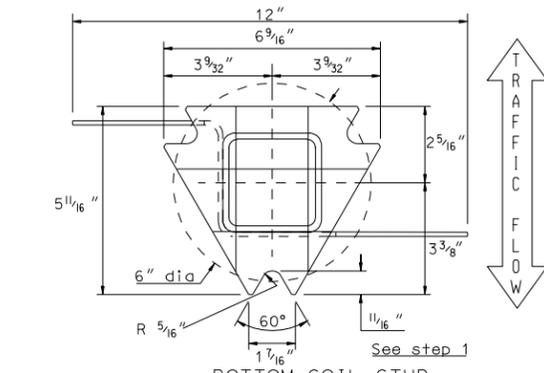
| TOP POST RECEIVER DATA TABLE | | | | | | |
|----------------------------------|-------------|------------|-------------|-------------|-------------|------------|
| Square Post Sizes | A | B | C | D | E | F |
| 2 3/16 inch x 10 Ga. Square Post | 1 3/64 inch | 2 1/2 inch | 3 1/32 inch | 2 5/32 inch | 1 3/64 inch | 1 7/8 inch |
| 2 1/2 inch x 10 Ga. Square Post | 1 3/32 inch | 2 1/2 inch | 3 5/16 inch | 5/8 inch | 1 2/32 inch | 1 3/4 inch |

2 3/16 inch x 10 gauge may be inserted into 2 1/2 inch x 10 gauge for additional wind load.



BOLT RETAINER FOR BASE CONNECTION
Materials: 1/32 inch reprocessed Teflon

| MULTI-DIRECTIONAL SLIP BASE ASSEMBLY | |
|--------------------------------------|--|
| STEP | INSTALLATION PROCEDURE |
| 1. | Install bottom soil anchor stub plumb and squared up with road, with point of plate facing oncoming traffic. |
| 2. | Depth of imbedment to leave 2 1/2 inch from grade to top of anchor plate. |
| 3. | Place teflon bolt retainer gasket on top of bottom plate (make sure that notches in holes are pointing counter clockwise). |
| 4. | Place top post receiver on to retainer gasket, properly indexed so that angle receivers are squared up with road. |
| 5. | Slide 1 each 1/2 inch flat washer on to 1 each inverted 1/2 inch - 13 gr. 8 flange bolt, followed by 1 each stainless steel release bushing. |
| 6. | Insert above bolt with washer and bushing up through notched points of top and bottom plates, passing through hole in gasket. |
| 7. | Slide second bushing down on to above bolt until it rests on top of gasket followed by second washer. |
| 8. | Complete by threading 1/2 inch - 13 gr. 8 serrated flange nut snugly down against top of washer. |
| 9. | Repeat steps 5,6,7 & 8 at the two remaining notched triangle points. |
| 10. | Insert sign post into angle receivers on top half until post(s) bottom out. *NOTE: Where higher wind load is desired, insert the next size smaller square post inside bottom of main upright post (Minimum of 48 inch, not to exceed beyond bottom edge of sign). |
| 11. | Secure posts into receivers using 3 each 3/8 inch - 16 gr. 8 flange bolts and 3 each 3/8 inch - 16 serrated flange nuts in receiver slots (top 2 bolts should be parallel to highway) do not tighten nuts until all bolts are in place. |
| 12. | After all sub-assembly hardware is tightened, then torque the three 1/2 inch - 13 nuts to 42 ft-lbs, in a circular pattern until all bolt assemblies reach the required torque. *NOTE: On multi-leg installations, be sure that all anchors are squared and lined up with each other. |



BOTTOM SOIL STUB
Materials: Tube - 3 inch x 3 inch x 7 gauge ASTM A500 Gr B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A 569
Plate - ASTM A572 grade 50

| Number of Posts | Telescoping Perforated Tube | | | | | |
|-----------------|-----------------------------|----------------------|-----------------|----------------------|-----------|-----------------------------------|
| | Post Size In. | Wall Thickness Gauge | Sleeve Size In. | Wall Thickness Gauge | Slip Base | Anchor Size Without Slip Base In. |
| 1 | 2 | 12 | | | No | 2 1/4 |
| 1 | 2 1/4 | 12 | | | No | 2 1/2 |
| 1 | 2 1/2 | 12 | | | B | 3 |
| 1 | 2 1/2 | 10 | | | Yes | |
| 1 | 2 1/4 | 12 | 2 | 12 | Yes | |
| 1 | 2 1/2 | 12 | 2 1/4 | 12 | Yes | |
| 2 | 2 | 12 | | | No | 2 1/4 |
| 2 | 2 1/4 | 12 | | | No | 2 1/2 |
| 2 | 2 1/2 | 12 | | | Yes | |
| 2 | 2 1/2 | 10 | | | Yes | |
| 2 | 2 1/4 | 12 | 2 | 12 | Yes | |
| 2 | 2 1/2 | 12 | 2 1/4 | 12 | Yes | |
| 3 & 4 | 2 1/2 | 12 | | | Yes | |
| 3 & 4 | 2 1/2 | 10 | | | Yes | |
| 3 & 4 | 2 1/2 | 12 | 2 1/4 | 12 | Yes | |
| 3 & 4 | 2 1/4 | 12 | 2 | 12 | Yes | |
| 3 & 4 | 2 1/2 | 10 | 2 3/16 | 10 | Yes | |

B - The 2 1/2 inch, 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.

| Telescoping Perforated Tubes | | | | | | |
|------------------------------|--------------------|---------------------|----------------------|-------------------------|------------------------|-----------------------|
| Tube Size In. | Wall Thickness In. | U.S. Standard Gauge | Weight Per Foot Lbs. | Moment of Inertia In. 4 | Cross Sect. Area In. 2 | Section Modulus In. 3 |
| 1 1/2 x 1 1/2 | 0.105 | 12 | 1.702 | 0.129 | 0.380 | 0.172 |
| 2 x 2 | 0.105 | 12 | 2.416 | 0.372 | 0.590 | 0.372 |
| 2 1/4 x 2 1/4 | 0.105 | 12 | 2.773 | 0.561 | 0.695 | 0.499 |
| 2 3/16 x 2 3/16 | 0.135 | 10 | 3.432 | 0.605 | 0.841 | 0.590 |
| 2 1/2 x 2 1/2 | 0.105 | 12 | 3.141 | 0.804 | 0.803 | 0.643 |
| 2 1/2 x 2 1/2 | 0.135 | 10 | 4.006 | 0.979 | 1.010 | 0.785 |
| 4 x 4 | 0.250 | 1/4 | 6.600 | 3.040 | 1.940 | 1.050 |

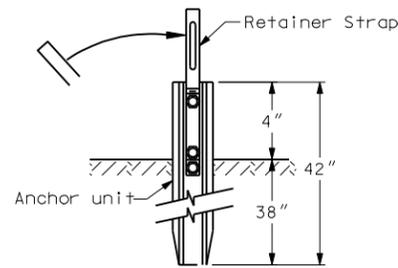
| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|----------------|
| 11-21-02 | |
| REVISIONS | |
| DATE | CHANGE |
| 12-01-04 | PE stamp added |

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BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

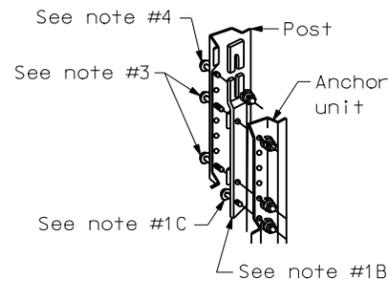
FLANGED CHANNEL



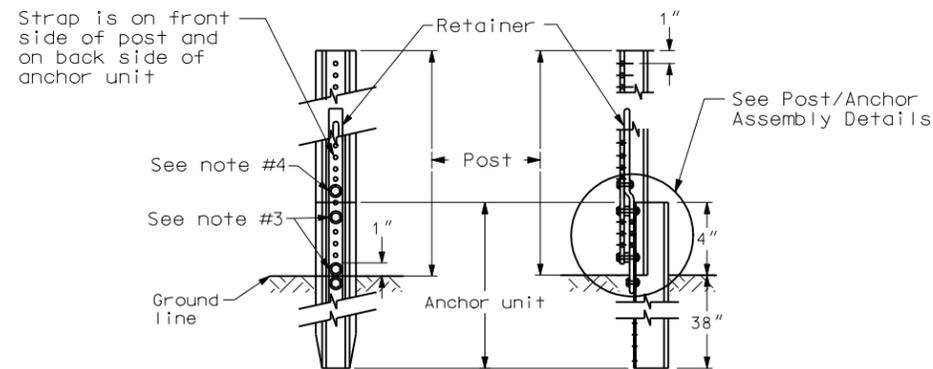
Anchor Unit & Strap Assembly Detail

STEPS OF INSTALLATION

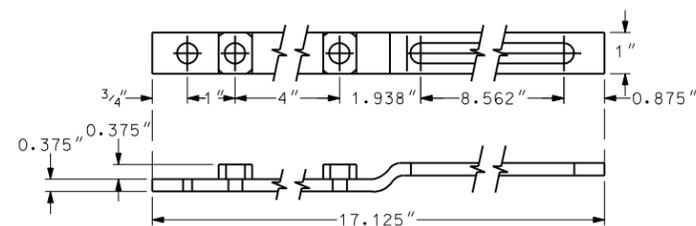
1. A) Drive anchor unit to within 12" of ground level.
B) Proper assembly established by lining up the top 3/4" slot of retainer spacer strap with top hole of anchor unit.
C) Assemble strap to back of anchor unit using 3/8"-16 UNC x 2.0" long bolt, lock washer and nut.
D) Rotate strap 90° to left.
2. A) Drive anchor unit to 4" dimension.
B) Rotate strap to vertical position.
3. A) Place 3/8"-16 UNC x 2" bolt, lock washer & nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit (this coincides with the bottom 3/4" slot in the strap).
B) Alternately tighten two connector bolts.
4. A) Complete assembly by tightening 3/8"-16 UNC x 2" long retainer bolt (this fastens sign post to retainer spacer strap).
5. The base post, strap & sign post shall be properly nested. Proper nesting occurs when all flat surfaces of the base post, strap and sign post at the bolts have full contact across the entire width.



Post/Anchor Assembly Details



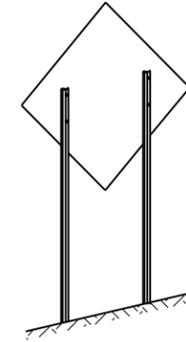
Front View Side View Sign Post Assembly Detail



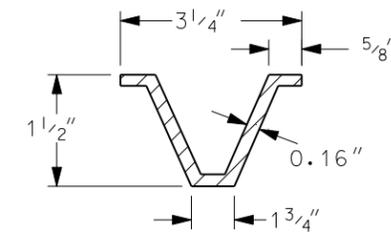
Retainer/Spacer Strap Detail

| CHANNEL SIZE IN. | WALL THICKNESS IN. | WEIGHT PER FOOT LBS. | MOMENT OF INERTIA IN. 4 | CROSS SECT. AREA IN. SQ. | SECTION MODULUS IN. 3 |
|------------------|--------------------|----------------------|-------------------------|--------------------------|-----------------------|
| 1.516 x 3.125" | .116 | 2.00 | .179 | .590 | .225 |
| 1.532 x 3.125" | .124 | 2.25 | .201 | .648 | .254 |
| 1.562 x 3.125" | .132 | 2.50 | .233 | .748 | .289 |
| 1.578 x 3.125" | .140 | 2.75 | .271 | .819 | .329 |
| 1.750 x 3.500" | .150 | 3.00 | .372 | .918 | .403 |
| 1.750 x 3.500" | .175 | 4.00 | .500 | 1.190 | .560 |

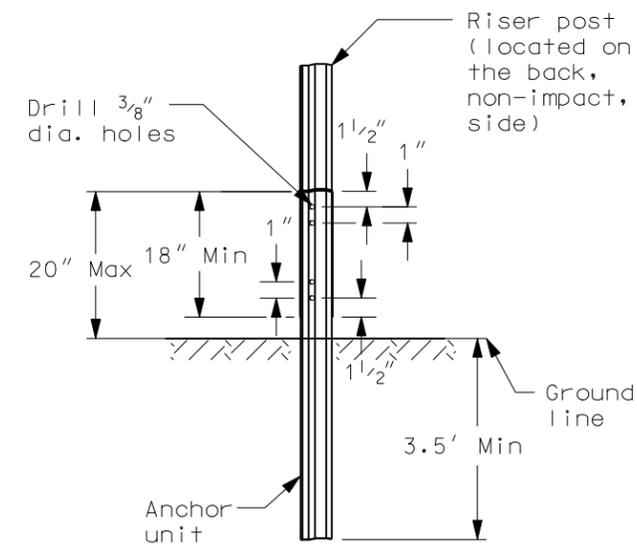
3 LB/FT U POSTS



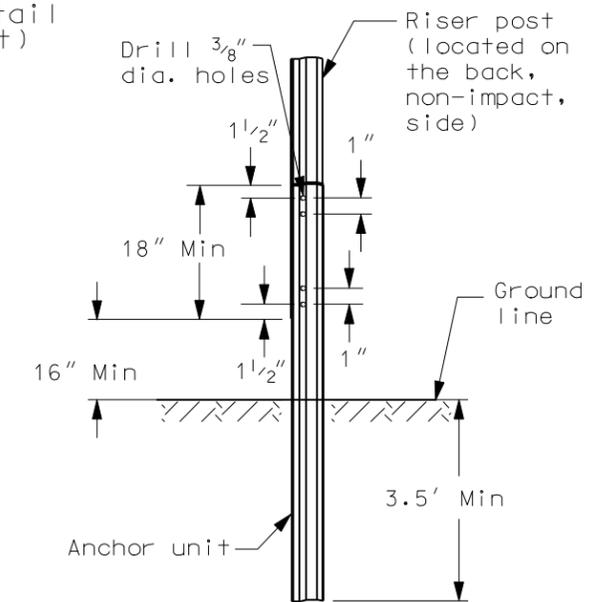
Typical Installation



U-Post Detail (3 lb/ft)



U-Channel Splice Option 1



U-Channel Splice Option 2

Notes

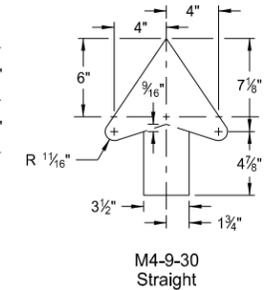
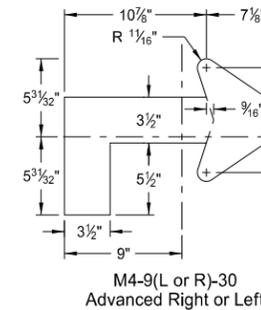
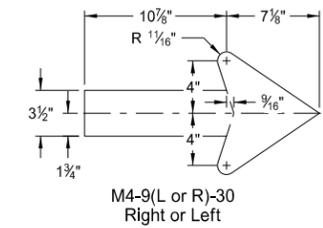
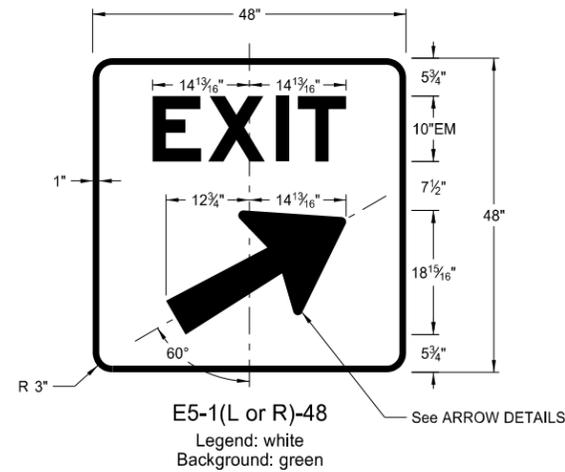
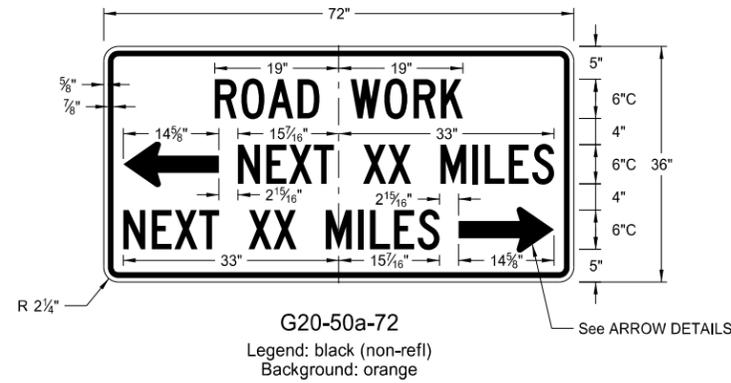
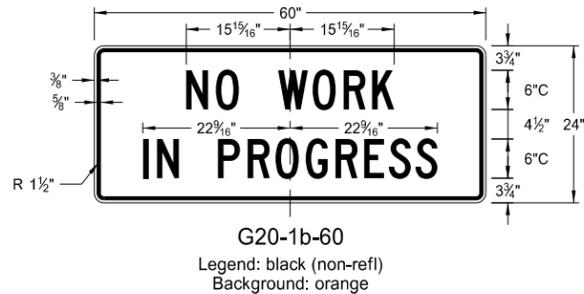
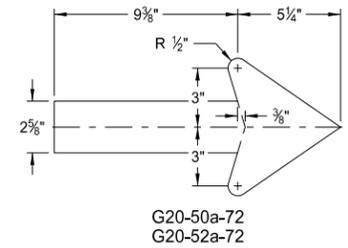
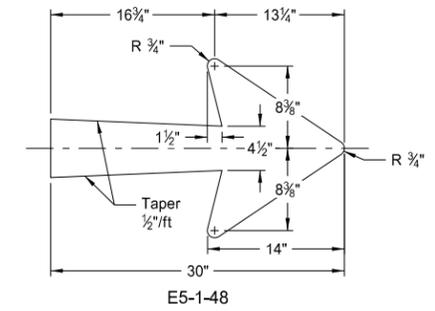
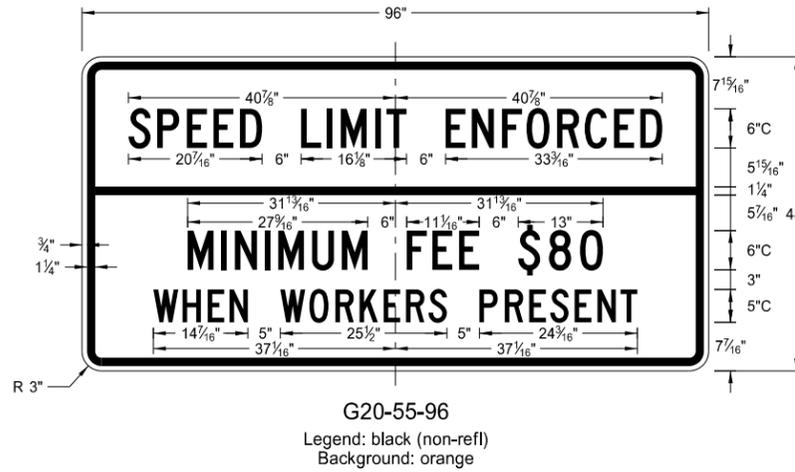
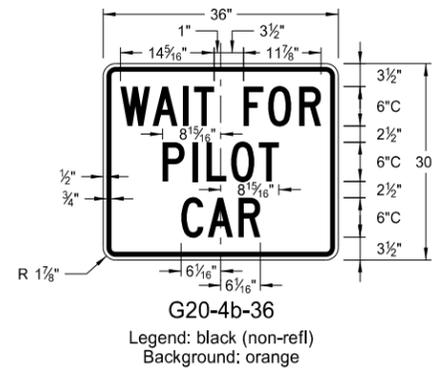
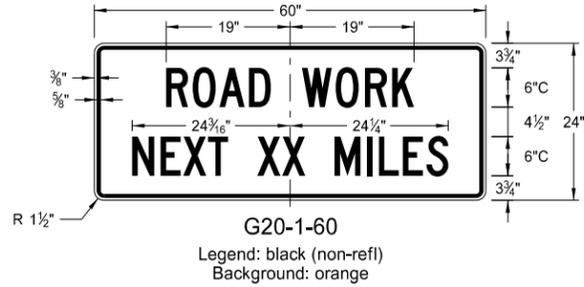
1. Use 3 lb/ft riser anchor units and risers
2. Driven riser posts shall be at least 7' long and embedded at least 3.5'.
3. A splice shall overlap a minimum of 18".
4. Use 4 bolts 5/16" diameter with washers and nuts. Two at top and two at bottom of splice.
5. Anchor unit for guy wires shall be no more than 4" above ground and embedded at least 3.5'.

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|------------------------------|
| 07-28-93 | |
| REVISIONS | |
| DATE | CHANGE |
| 03-07-01 | Revised U-post details |
| 11-21-02 | Deleted perforated tube |
| 05-08-03 | Revised U-Channel splice |
| 12-01-04 | PE stamp added |
| 06-29-05 | Revised flanged channel note |

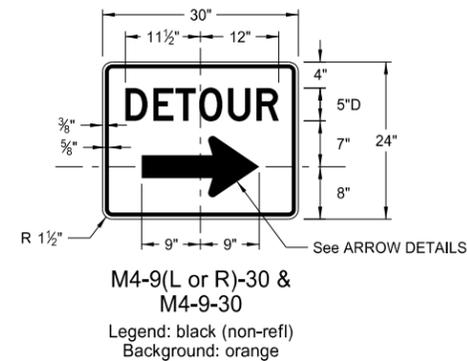
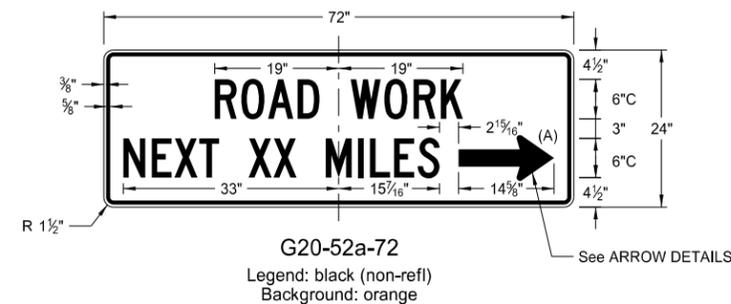
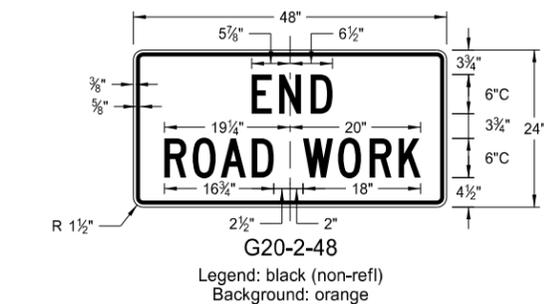
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CONSTRUCTION SIGN DETAILS
 TERMINAL AND GUIDE SIGNS

D-704-9



ARROW DETAILS



NOTES:

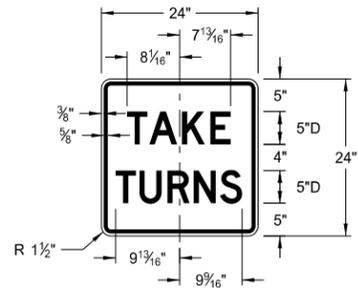
(A) Arrow may be right or left of the legend to indicate construction to the right or left.

| | |
|--|--------|
| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
| 8-13-13 | |
| REVISIONS | |
| DATE | CHANGE |
| | |

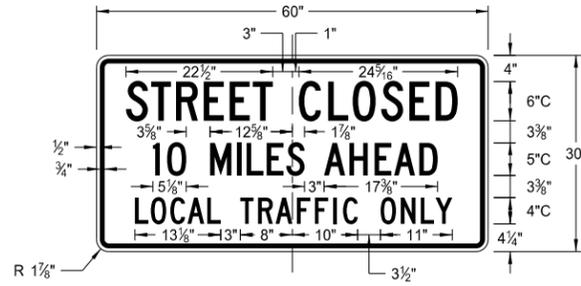
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CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS

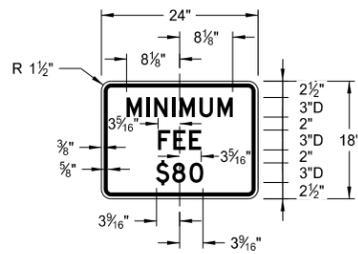
D-704-10



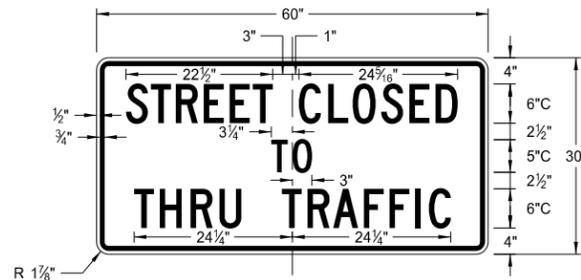
R1-50-24
Legend: black (non-refl)
Background: white



R11-3c-60
Legend: black (non-refl)
Background: white



R2-1a-24
Legend: black (non-refl)
Background: white



R11-4a-60
Legend: black (non-refl)
Background: white

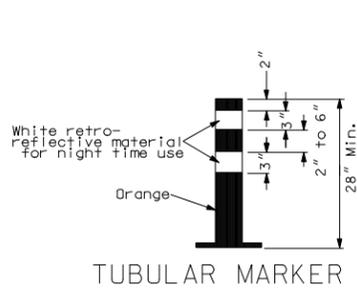


R11-2a-48
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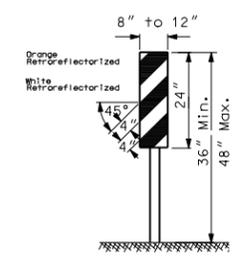
| | |
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| 8-13-13 | |
| REVISIONS | |
| DATE | CHANGE |
| | |

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BARRICADE DETAILS AND CHANNELIZING DEVICES

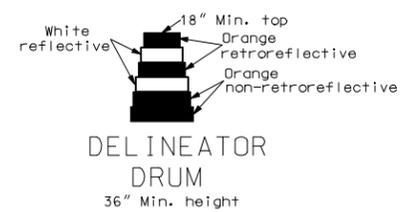


TUBULAR MARKER



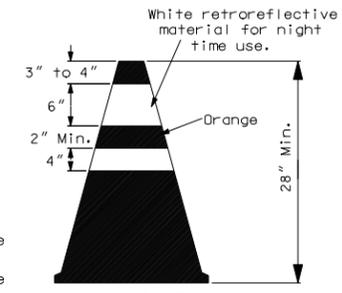
VERTICAL PANEL

(Retroreflective sheeting shall be placed on both sides)
 NOTE: Vertical panels used on the expressways or other high speed roadways shall be 12" by 24"

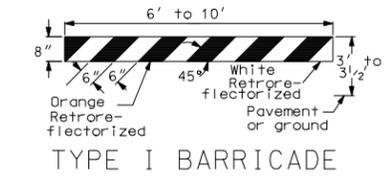


DELINEATOR DRUM
 36" Min. height

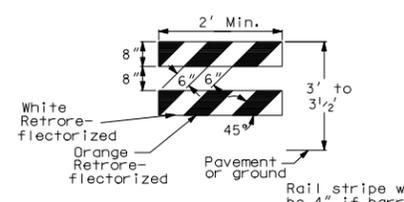
The markings on drums shall be orange and white stripes 4 to 6 inches wide. There shall be at least two orange and two white stripes. Where drums have ribs or indentations, there shall be no retroreflective sheeting in this area. This space shall be no more than 2 inches wide. The drum surface shall be prepared as recommended by the sheeting manufacturer before retro reflective sheeting is applied.



CONE

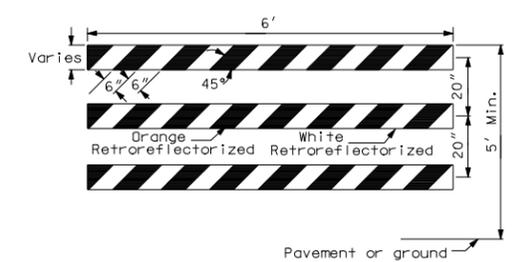


TYPE I BARRICADE



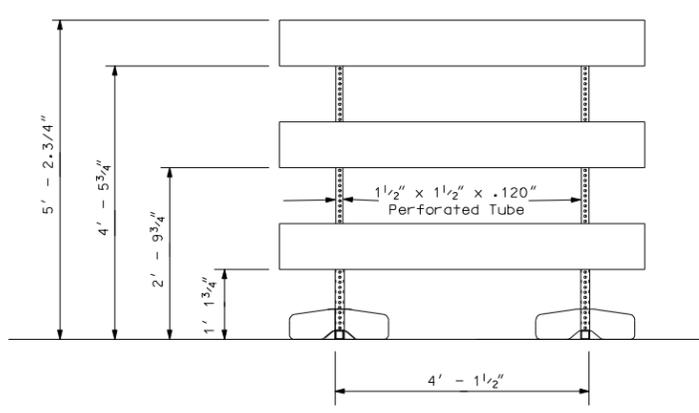
TYPE II BARRICADE

Rail stripe width shall be 4" if barricade length is less than 36".

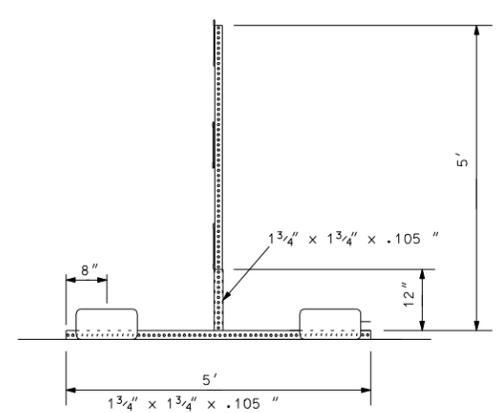


TYPE III BARRICADE

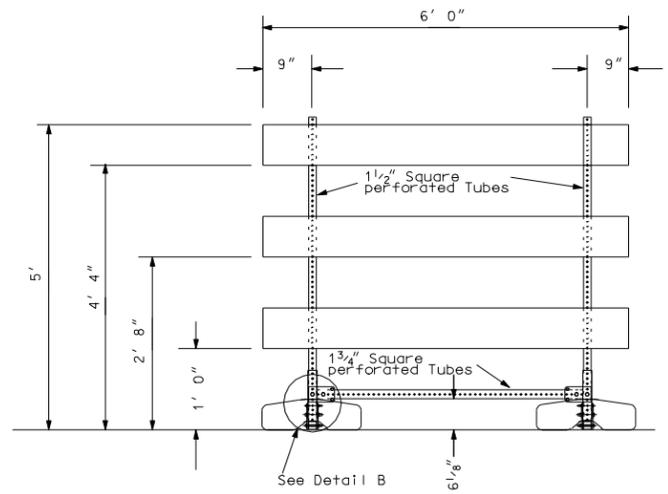
BARRICADES:
 Number of retroreflective rail faces:
 Type I - 2 (One each direction)
 Type II - 4 (Two each direction)
 Type III - 6 (Three in each direction)



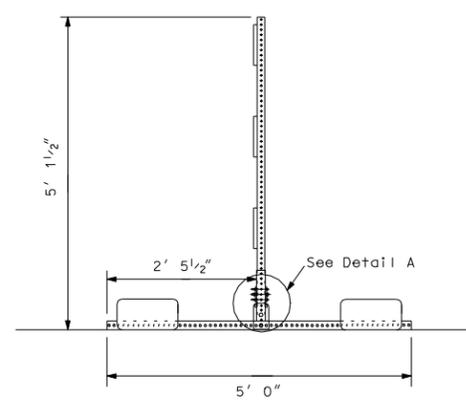
FRONT VIEW



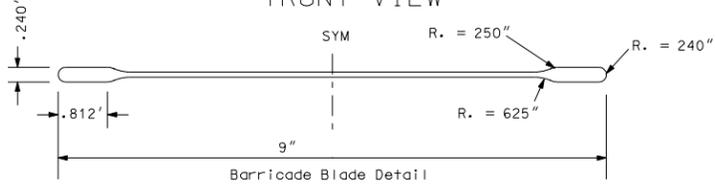
END VIEW



See Detail B



See Detail A



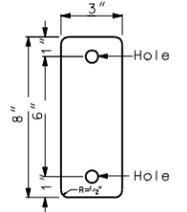
Ballast = 45lb sandbag at the end of each leg.
 Barricade blade fastened to vertical supports with 2" corner bolts.
 Vertical portion of leg is welded to horizontal portion on all four sides.
 Masts slide inside vertical portion of legs. No bolts or fastenings devices used.

BARRICADE ASSEMBLY DETAIL
 (Use when aluminum blade as detailed above)



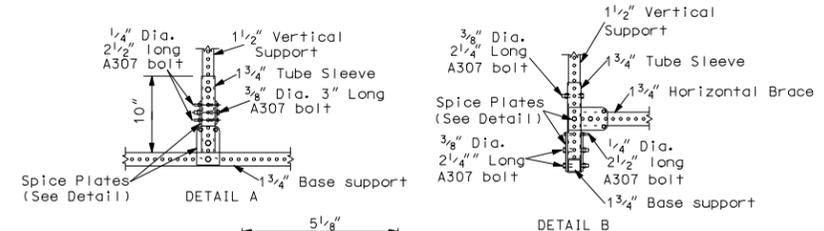
ACRYLIC PLASTIC REFLECTOR

Delineator reflector shall meet the requirements of section 894



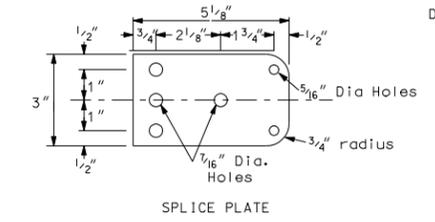
DELINEATOR REFLECTOR

3"x8"- 18 Gauge galvanized steel sheet or 0.080" aluminum plate with white retroreflective sheeting (Type 3A or 3B) as specified in section 894 of the Standard Specifications.



DETAIL A

DETAIL B



SPLICE PLATE

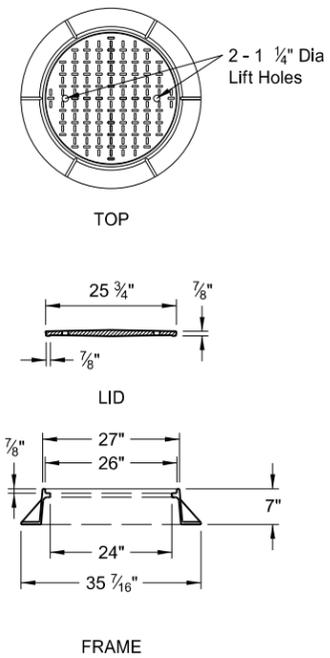
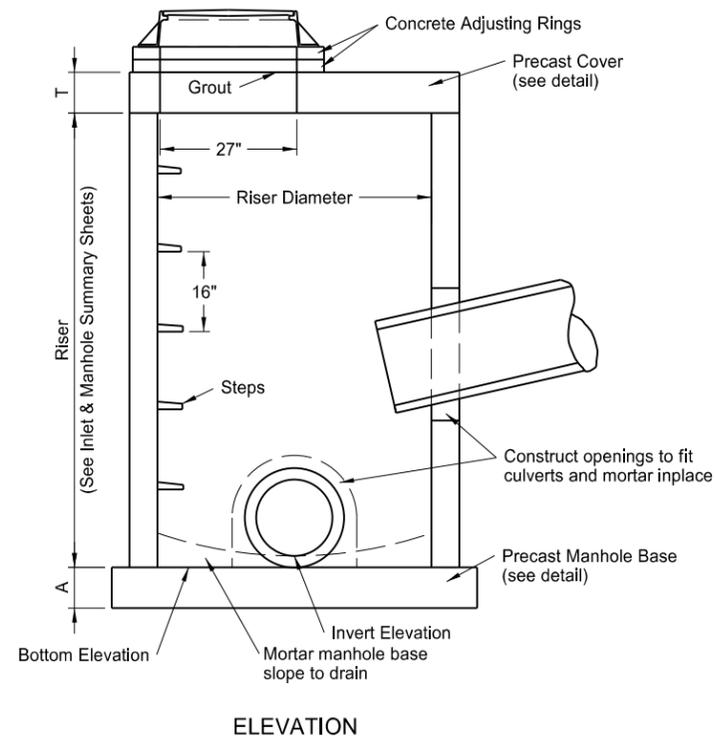
BARRICADE ASSEMBLY DETAIL
 (Use when Plastic I-Beam w/ 1 1/2" Hollow Core Flanges or 1" x 8" x 72" wood boards.)

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|-------------------------------------|
| 10-1-86 | |
| REVISIONS | |
| DATE | CHANGE |
| 08-03-87 | Type sheeting |
| 10-01-87 | Delineator drum note |
| 06-08-88 | Barricade type III |
| 06-01-92 | General revision |
| 06-10-93 | General revision |
| 09-23-93 | Vertical panel |
| 06-09-95 | Reflective sheeting |
| 03-01-02 | Barricade type III assembly details |
| 04-01-02 | Type III barricade |
| 12-01-04 | PE stamp added |
| 06-29-05 | Revised Type II barricade stripe |

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MANHOLE DETAILS

D-722-5



PRECAST MANHOLE COVERS

| RISER DIAMETER | COVER DIAMETER | WEIGHT OF SECTION | T | K | L | BOTTOM * BARS | TOP * BARS |
|----------------|----------------|-------------------|-----|-----|-----|---------------|------------|
| 48" | 58" | 1,080 Lb | 6" | 6" | 8" | #4 at 6" | — |
| 54" | 65" | 1,910 Lb | 8" | 6" | 8" | #4 at 6" | — |
| 60" | 72" | 2,430 Lb | 8" | 7" | 9" | #4 at 6" | #4 at 11" |
| 66" | 79" | 3,010 Lb | 8" | 7" | 9" | #4 at 6" | #4 at 11" |
| 72" | 86" | 3,640 Lb | 8" | 8" | 10" | #4 at 6" | #4 at 11" |
| 84" | 100" | 5,060 Lb | 8" | 9" | 11" | #5 at 6" | #5 at 11" |
| 96" | 114" | 6,695 Lb | 8" | 9" | 11" | #5 at 6" | #5 at 11" |
| 108" | 128" | 12,810 Lb | 12" | 10" | 12" | #5 at 6" | #5 at 11" |
| 120" | 142" | 15,900 Lb | 12" | 11" | 13" | #5 at 6" | #5 at 11" |

* - Reinforcement listed shall be placed in each direction.

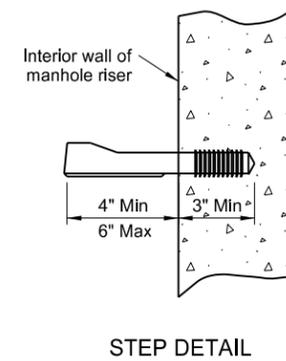
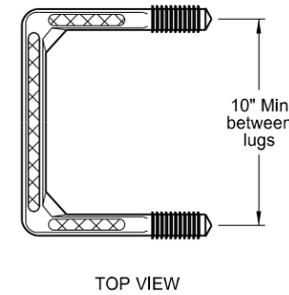
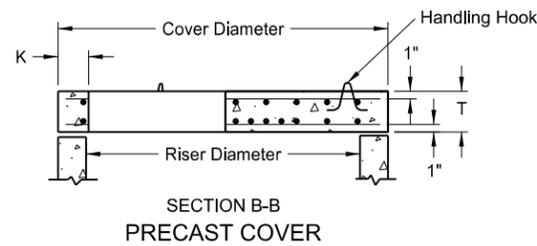
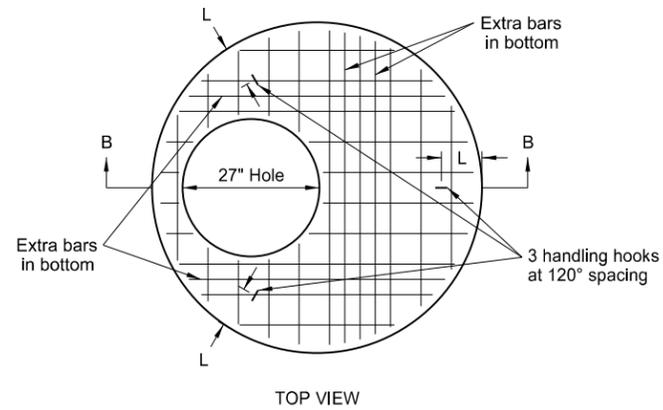
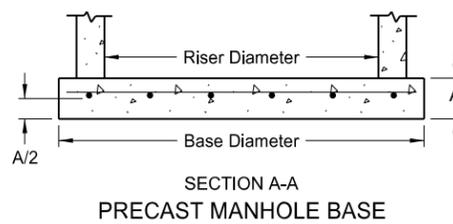
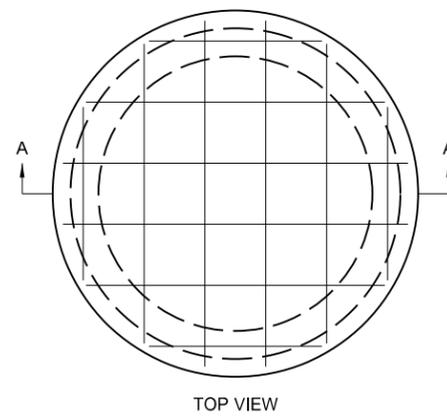
MANHOLE BASES

| RISER DIAMETER | BASE DIAMETER | WEIGHT OF SECTION | A | BARS * |
|----------------|---------------|-------------------|-----|-----------|
| 48" | 66" | 1,785 Lb | 6" | #4 at 12" |
| 54" | 72" | 2,830 Lb | 8" | #4 at 12" |
| 60" | 78" | 3,320 Lb | 8" | #4 at 12" |
| 66" | 86" | 4,035 Lb | 8" | #4 at 12" |
| 72" | 92" | 4,620 Lb | 8" | #4 at 12" |
| 84" | 107" | 6,245 Lb | 8" | #4 at 12" |
| 96" | 120" | 7,855 Lb | 8" | #4 at 12" |
| 108" | 132" | 14,255 Lb | 12" | #4 at 8" |
| 120" | 148" | 17,925 Lb | 12" | #4 at 8" |

* - Reinforcement listed shall be placed in each direction.

NOTES:

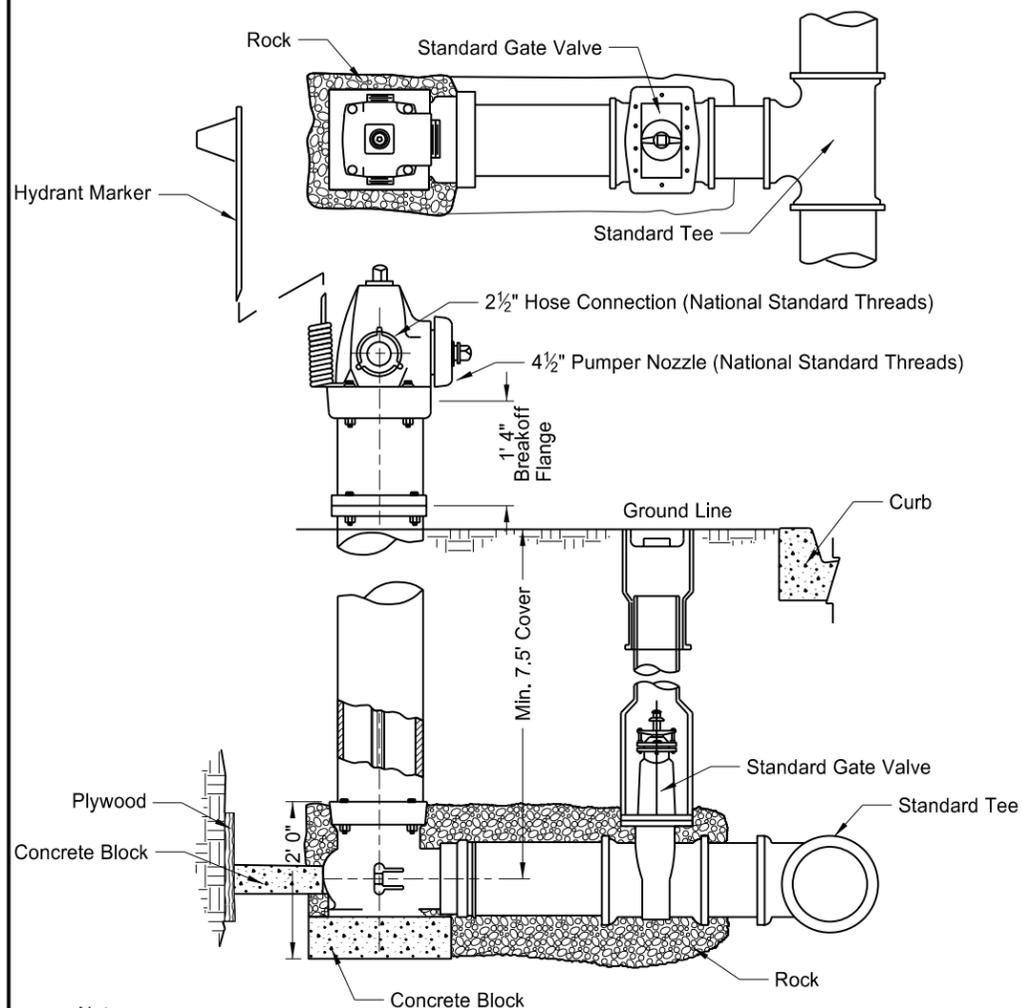
- The contractor shall have the option of using precast or cast-in-place bases. Class of concrete shall be AE. The aggregate size shall be approved by the engineer in the field. Construction shall be in accordance with section 722.03 of the Standard Specifications.
- Precast concrete manholes, risers and steps shall conform to AASHTO M199.
- Precast concrete bases and covers shall be reinforced as shown in the table for the corresponding riser diameter.
- All reinforcing steel shall be Grade 60 steel.
- Bottoms of manhole risers shall be cut or precast square to fit the manhole base. Grout joint between base and riser with cement mortar.
- The contractor may construct the manhole lower than plan grade and bring the casting to grade using precast adjusting rings in a manner satisfactory to the engineer in the field.
- Manhole steps shall be corrosion resistant and shall have a minimum vertical load resistance of 800 pounds and a minimum horizontal pull-out resistance of 400 pounds. Configuration of the steps shall be approved by the Engineer.
- Precast concrete manhole covers shown are designed for an HS-20 wheel load and a maximum fill height of 15'-0". Special design required for heavier wheel loads and/or greater fill heights.
- Other castings, similar in dimension, may be used if the casting conforms to the manhole cover and has a lid style as specified. If modifications to the manhole cover are required to facilitate similar castings the contractor must receive written approval from the engineer.
- Castings shall be manufactured in accordance with AASHTO M306-09. Metal used in the manufacture of castings shall conform to AASHTO M105 Class 35B.



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| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
| 05-14-2013 | |
| REVISIONS | |
| DATE | CHANGE |
| | |

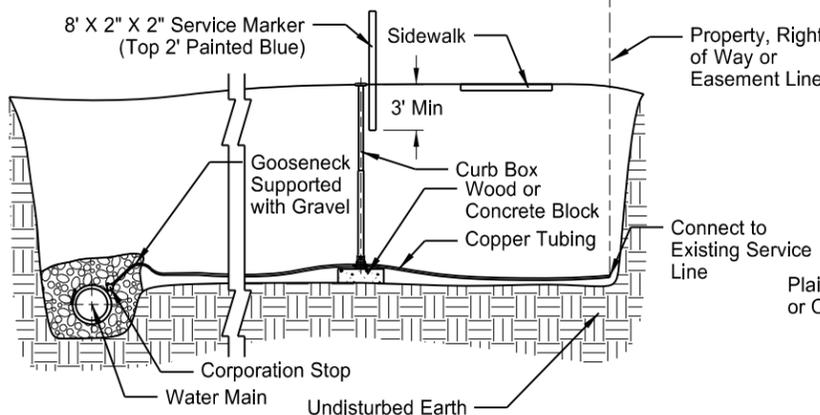
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WATERWORKS



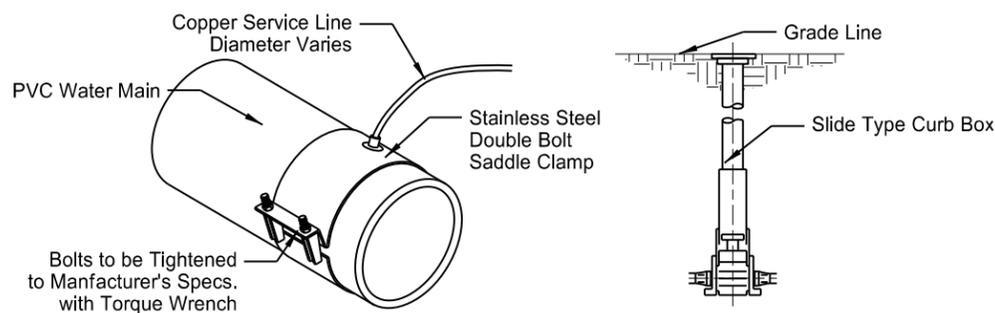
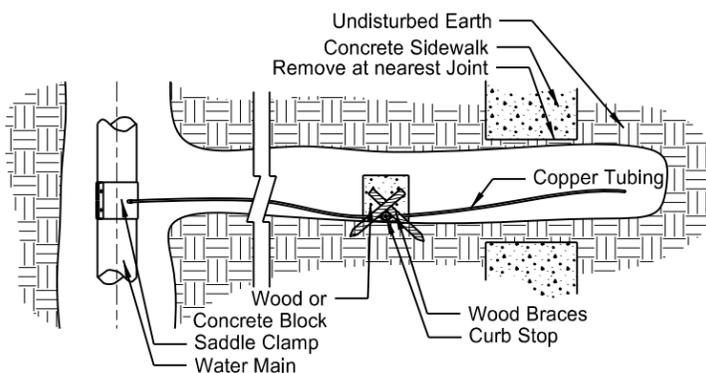
- Notes:
1. Operating & Cap Nuts: City Standards
 2. Supply and furnish and install hydrant marker. Cost will be included with the unit bid price for the hydrant. The hydrant marker shall be current with city standards or as approved by the engineer in the field.

STANDARD FIRE HYDRANT & CONNECTION

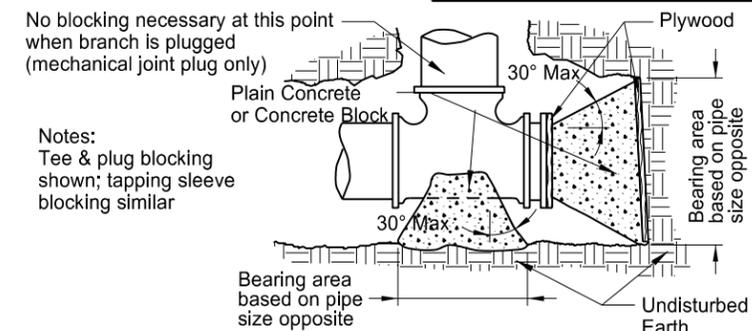


- Notes:
1. Service clamp are not required where small size service lines are connected to large cast iron or ductile iron pipe and three threads of the corporation stop make contact with the wall.
 2. Trench shall be gravel backfill from water main to back of curb line and under sidewalk areas or standard compaction of earth backfill where specified.

WATER CURB CONNECTION



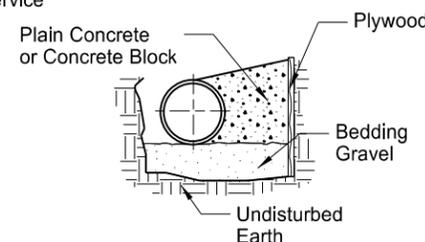
TYPICAL CORPORATION STOP AND CURB STOP



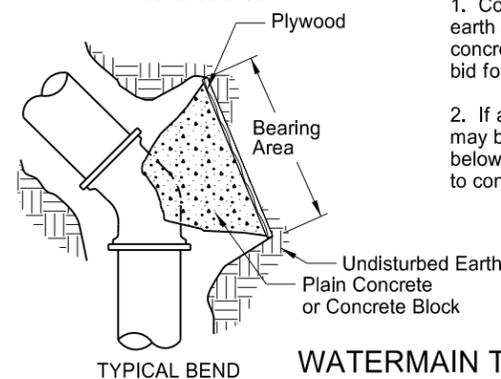
- Notes:
- Tee & plug blocking shown; tapping sleeve blocking similar

| Table of Required Bearing Areas | | | | | |
|---------------------------------|----------|----------|------------|-------------|-------------------------------|
| Size of Pipe | 90° Bend | 45° Bend | 22.5° Bend | 11.25° Bend | Tees, Plugs & Tapping Sleeves |
| 4" | 2' Sq | 2' Sq | 2' Sq | 2' Sq | 2' Sq |
| 6" | 3' Sq | 2' Sq | 2' Sq | 2' Sq | 3' Sq |
| 8" | 5' Sq | 3' Sq | 2' Sq | 2' Sq | 4' Sq |
| 10" | 8' Sq | 4' Sq | 3' Sq | 2' Sq | 6' Sq |
| 12" | 11' Sq | 6' Sq | 3' Sq | 2' Sq | 8' Sq |
| 16" | 20' Sq | 11' Sq | 6' Sq | 4' Sq | 15' Sq |
| 18" | 25' Sq | 14' Sq | 7' Sq | 4' Sq | 18' Sq |

- Notes:
1. Concrete blocking to be poured against undisturbed earth and plywood. Keep bells and bolts free of concrete. Concrete in place to be included in price bid for water main.
 2. If approved by the engineer, solid concrete blocks may be used for blocking on 8" Dia. pipe and below. 10" Dia. pipe and above will conform to concrete poured in place areas as shown above.

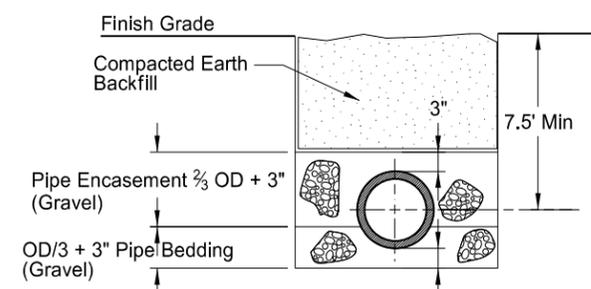


TYPICAL SECTION

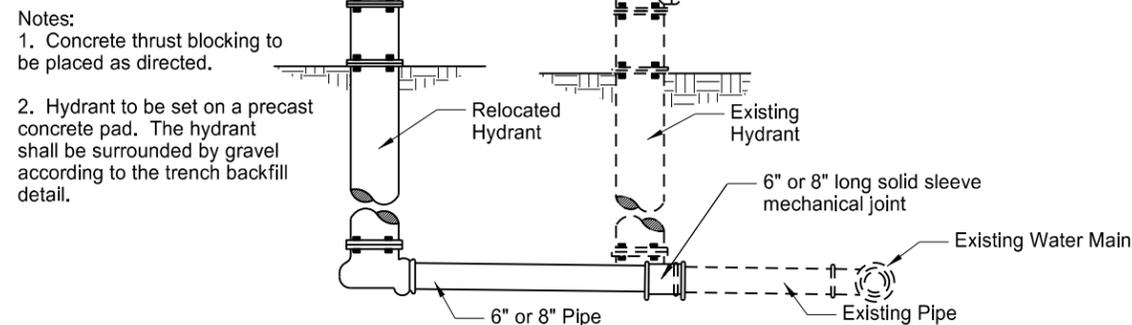


TYPICAL BEND

WATERMAIN THRUST BLOCK DETAILS



TRENCH BACKFILL



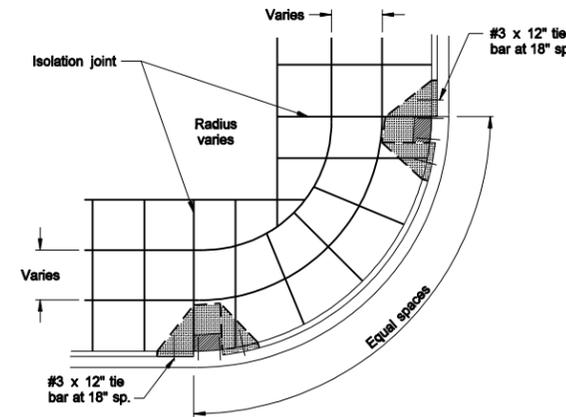
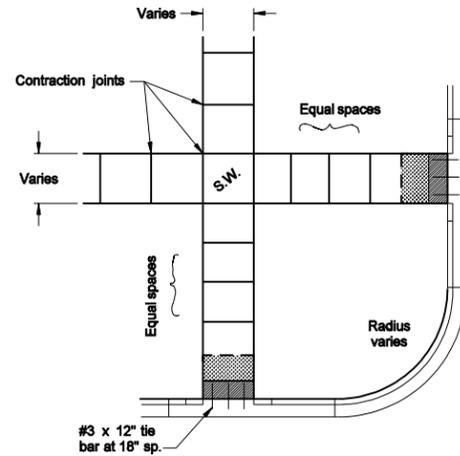
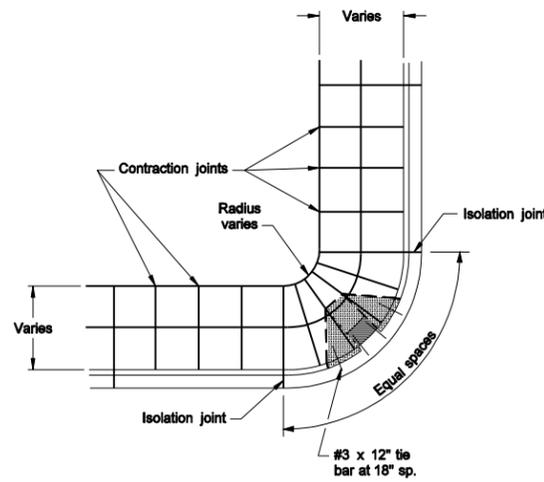
- Notes:
1. Concrete thrust blocking to be placed as directed.
 2. Hydrant to be set on a precast concrete pad. The hydrant shall be surrounded by gravel according to the trench backfill detail.

LAYOUT FOR RELOCATION OF HYDRANTS

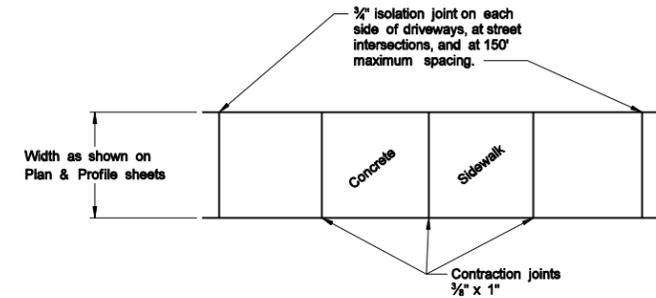
| | |
|--|--------|
| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
| 9-22-10 | |
| REVISIONS | |
| DATE | CHANGE |
| | |

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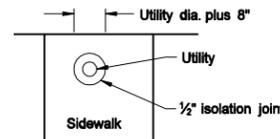
SIDEWALK



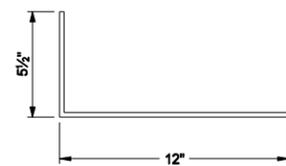
TYPICAL JOINT LAYOUTS



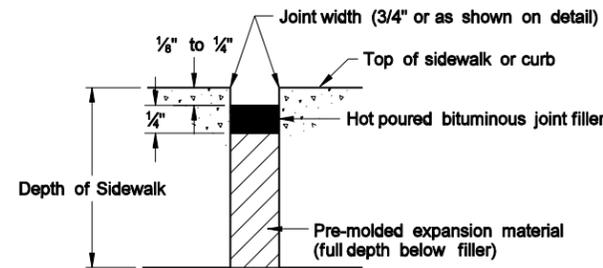
CONCRETE SIDEWALK DETAILS



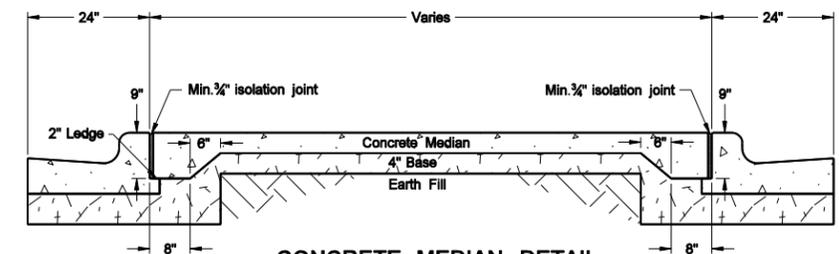
UTILITY BLOCKOUT



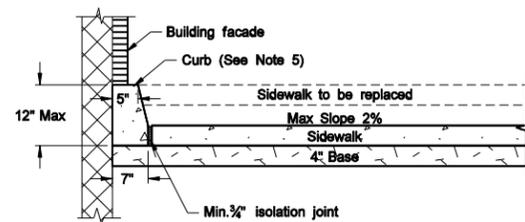
"L"BAR DETAIL #3 BAR



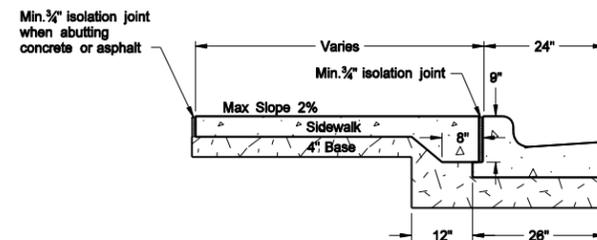
TYPICAL ISOLATION JOINT SEAL (longitudinal and transverse)



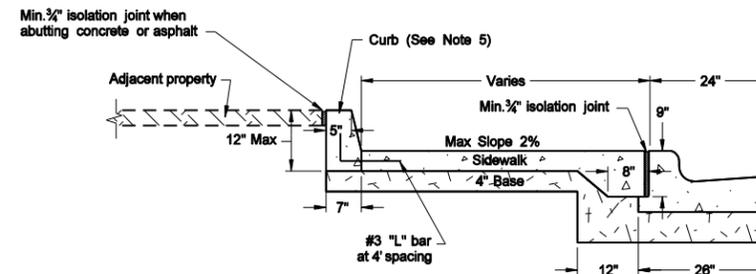
CONCRETE MEDIAN DETAIL



SIDEWALK WITH CURB DETAIL (Building face application)



SIDEWALK DETAIL (Installed adjacent to curb and gutter)



SIDEWALK WITH CURB DETAIL (Adjacent property application)

Notes:

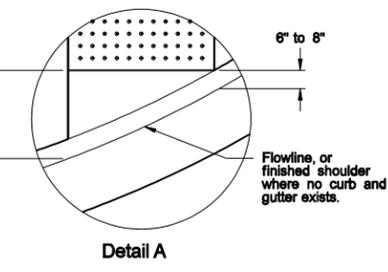
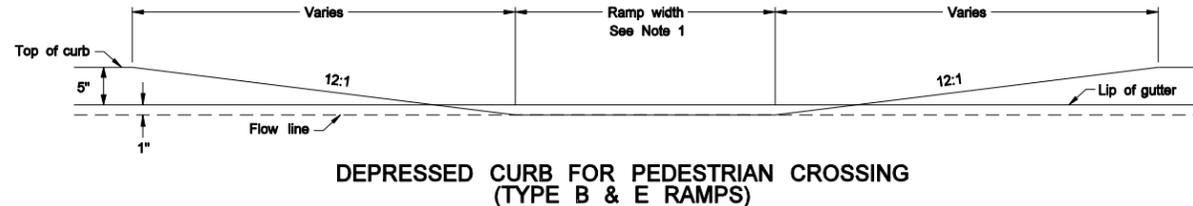
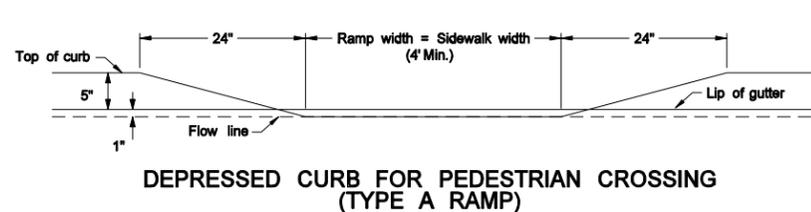
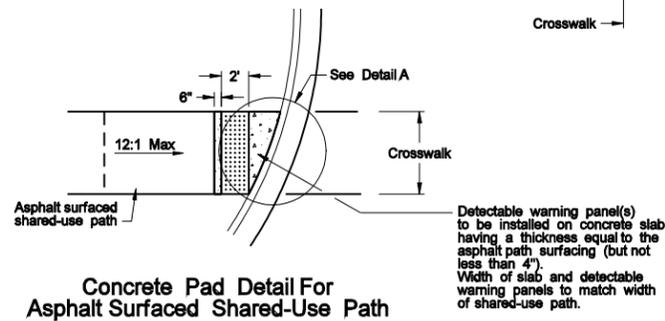
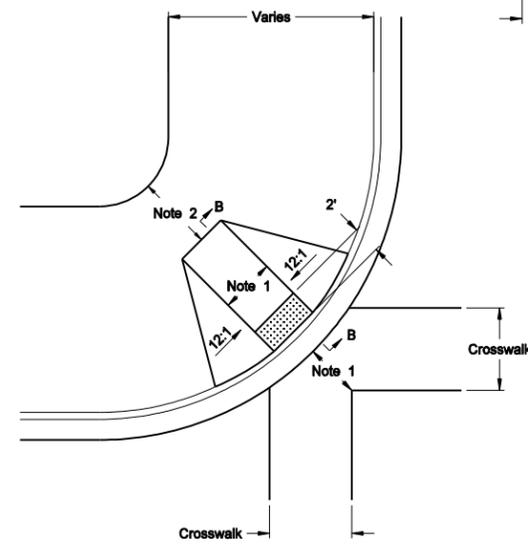
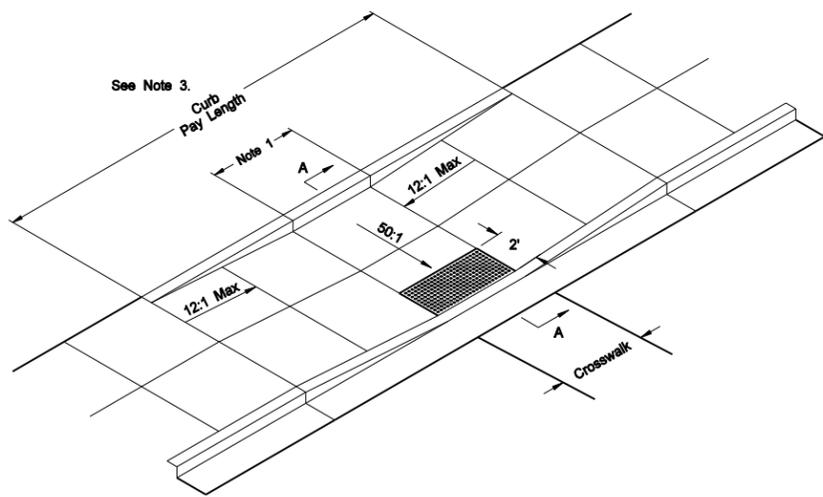
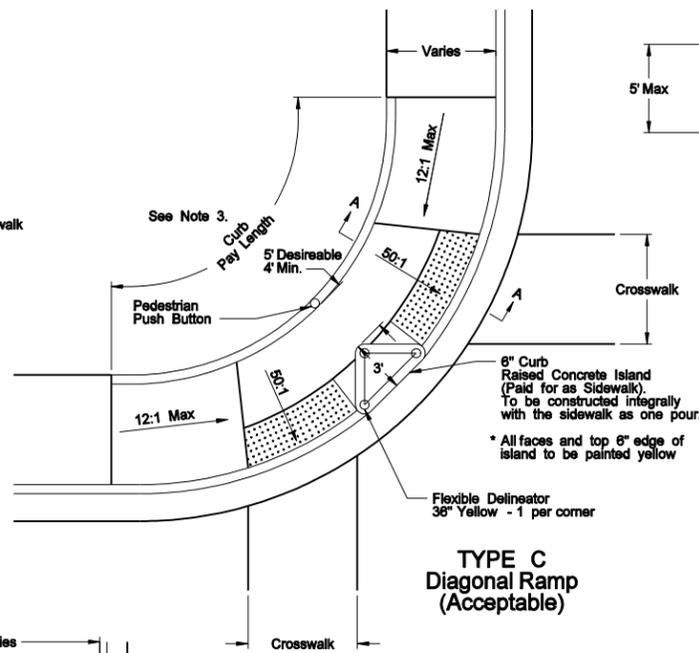
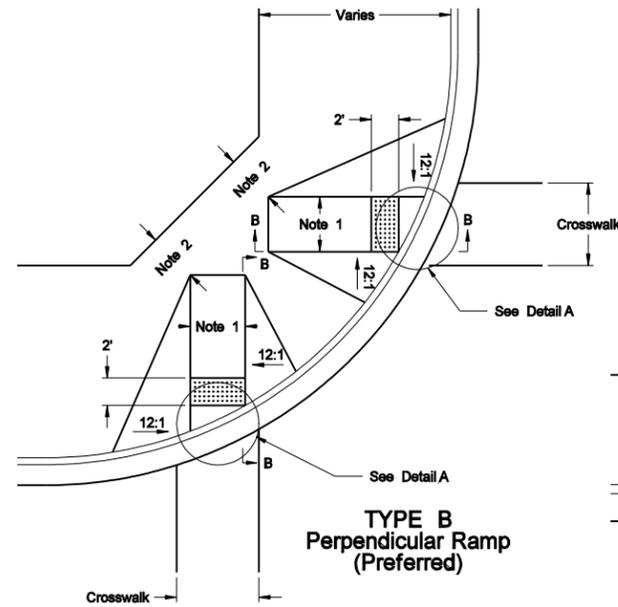
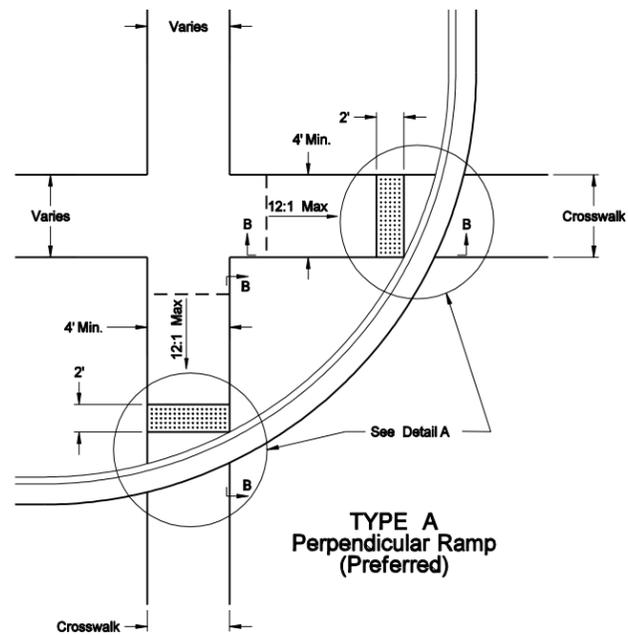
1. Method of payment: The curb ramp will not be paid for separately, but shall be included in the quantities & paid for at the unit price for concrete sidewalk and curb & gutter.
2. The cost for all labor, equipment, and material (pre-molded expansion material & hot bituminous joint filler) necessary to construct contraction and isolation joints shall be included in the price bid for sidewalk.
3. 4" base material shall be placed under the concrete sidewalk. All labor and materials necessary to place the base material shall be included in the price bid for Salvage Base Course or Aggregate Base Course CL 5.
4. Details showing curb ramps and detectable warning panels on this drawing are for joint and reinforcing layout purposes only. See Standard Drawing D-750-3 for curb ramp and detectable warning panel details.
5. As shown in the plans or as directed by the engineer, a curb shall be constructed where the existing sidewalk is to be lowered, or abuts a building or adjacent property. The curb will be paid for at the unit price bid for the item "Curb - Type I" per lineal foot.
6. Transverse sidewalk joint spacing shall vary from 4'-6" to create approximate square panels. When the sidewalk is adjacent to the curb & gutter, the sidewalk joint spacing shall be varied so that the sidewalk joints match up with the curb & gutter joints.
7. Longitudinal joints shall be used where the sidewalk width is 8' or greater, and shall be spaced at half the sidewalk width.

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|---|
| 10-1-88 | |
| REVISIONS | |
| DATE | CHANGE |
| 09-01-82 | Remove Detectable Warning |
| 09-23-82 | Revised Expansion Joint |
| 12-05-83 | Isolation Joint |
| 02-16-84 | General Revisions |
| 07-18-01 | Revised Joints |
| 03-11-02 | Revised Section A-A |
| 10-23-03 | Added detectable warning |
| 01-15-04 | Added Maximum Slopes |
| 01-24-04 | Rev notes - Added base |
| 12-01-04 | PE Stamp added |
| 09-12-07 | Major Revisions |
| 11-02-07 | Thickened sidewalk abutting curb & gutter, added concrete median detail |

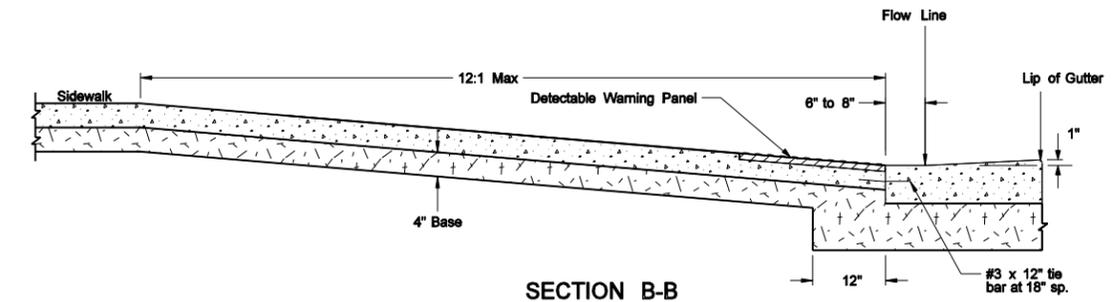
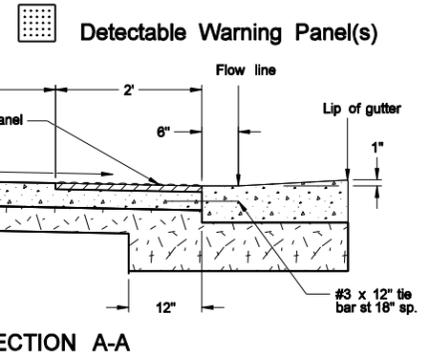
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CURB RAMP DETAILS

D-750-3



- Notes:**
- For sidewalk installations, a 5' ramp width should be used. Where site conditions do not allow a 5' ramp width, a 4' ramp width may be used. Detectable warning panels shall be installed to match the ramp width (Ramp width is defined as the useable portion of ramp, excluding flared aprons if used).
 - 5' is desirable but 4' is the minimum allowable distance. If the 4' minimum distance cannot be provided, Ramp Type C shall be used.
 - The curb shown in the details for Type C and D curb ramps shall be measured by the lineal foot, and paid for at the unit price bid for the item "Curb - Type I."



| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|--|--|
| 09-13-07 | |
| REVISIONS | |
| DATE | CHANGE |
| 09-20-07 | Revised detail A |
| 10-26-07 | Revised Section B-B, detail C, misc. labeling, Notes, and added concrete pad detail. |
| 12-18-07 | Revised Note 1. |

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 Registration Number
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NOTES:

1. Curbed Roadways: The clearance from the face of the curb should be 3' except where right of way or sidewalk width is limited, a minimum clearance of 2' shall be provided. The horizontal clearance may need to be increased to maintain a minimum sidewalk clear width of 4' from the sign support, not including any attached curb.

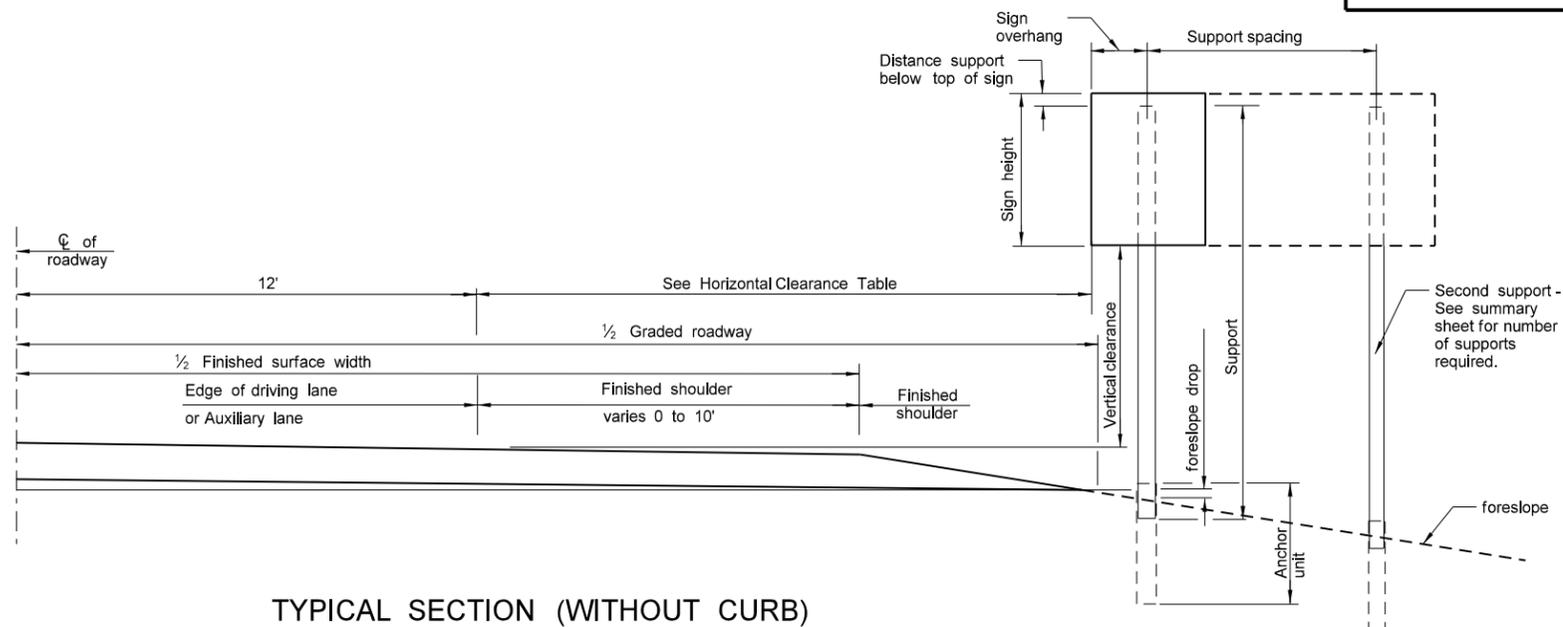
2. Minimum Vertical clearance: Signs installed at the side of the road in rural districts shall be at least 5' measured from the bottom of the sign to the edge of the driving lane or auxiliary lane. Where parking or pedestrian movements occur, the clearance to the bottom of the sign shall be at least 7'.

Directional signs on expressways and freeways shall be installed with a minimum height of 7'. If the secondary sign is mounted below another sign, the major sign shall be installed at least 8' and the secondary sign shall be installed at least 5' above the edge of the driving lane. All route signs, warning signs, and regulatory signs on expressways and freeways shall be at least 7' above the edge of the driving lane. Where signs are placed at least 30 feet or more from the edge of the traveled way, the height to the bottom of such sign shall be 5' above the edge of the driving lane.

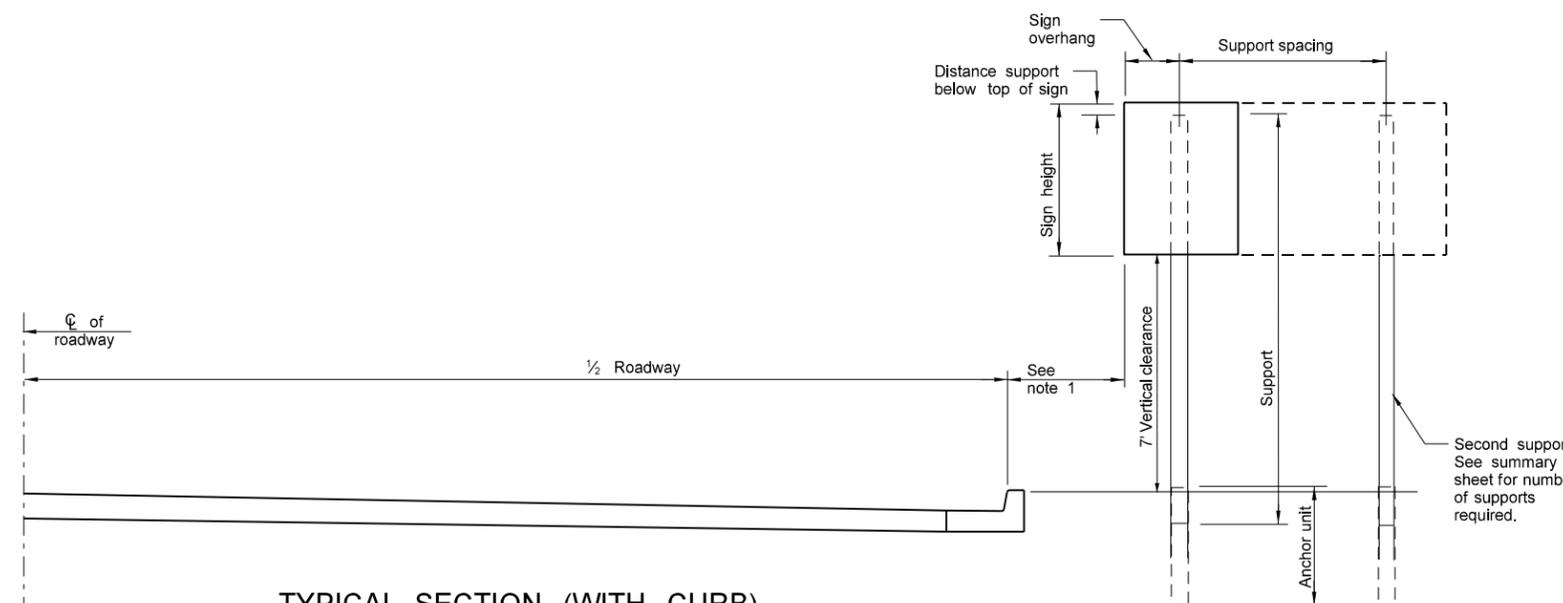
The vertical clearance shall have a maximum height of 6" above the vertical clearance specified above.

| HORIZONTAL CLEARANCE TABLE | |
|----------------------------|-----------|
| SHOULDER WIDTH ft | OFFSET ft |
| 0 to 2 | 16 |
| >2 to 4 | 18 |
| >4 to 6 | 20 |
| >6 to 8 | 22 |
| >8 to 10 | 24 |

ASSEMBLY DETAILS

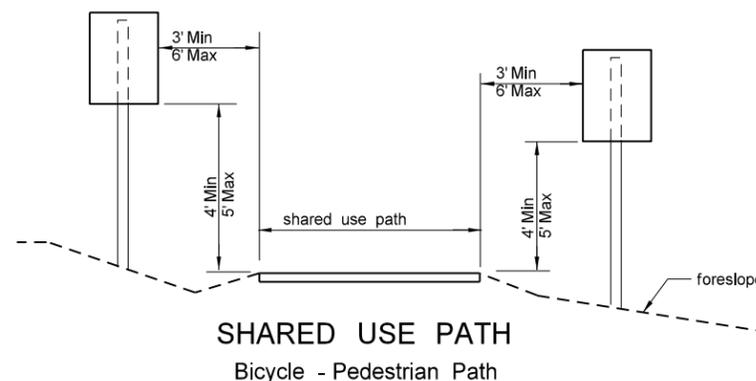


TYPICAL SECTION (WITHOUT CURB)



TYPICAL SECTION (WITH CURB)

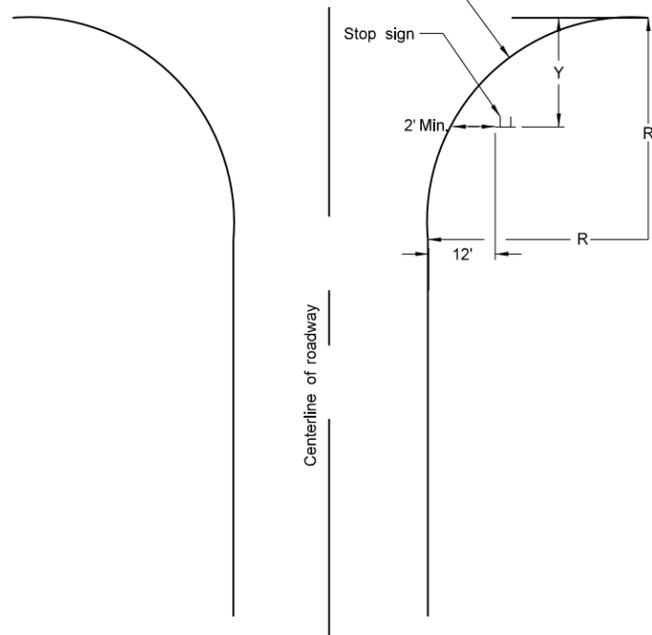
Residential or Business District



SHARED USE PATH

Bicycle - Pedestrian Path

Face of curb or edge of driving lane



STOP SIGN LOCATION WIDE THROAT INTERSECTION

Note: This layout is to be used for the placement of "Stop" signs.

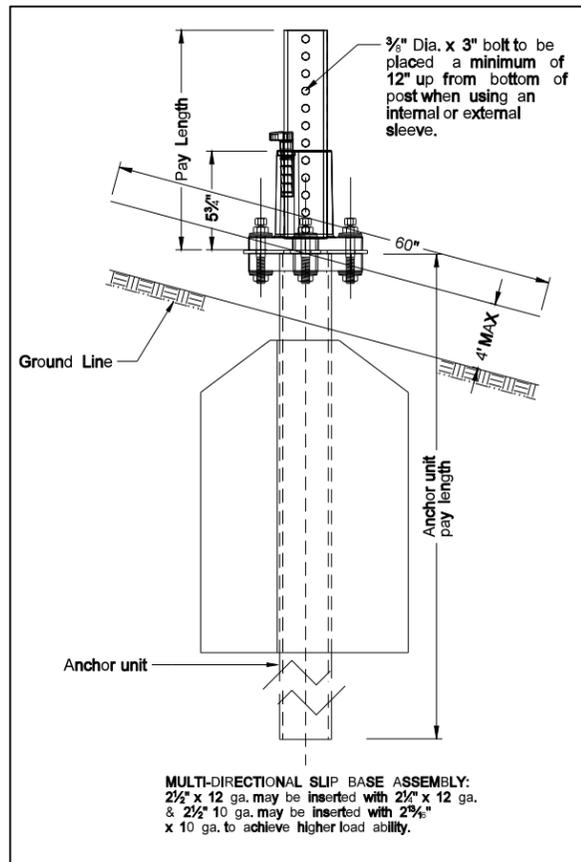
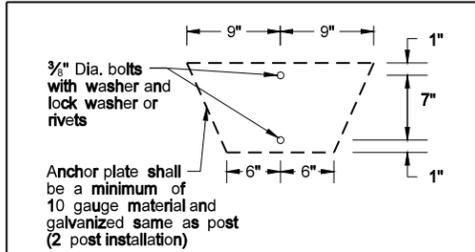
| R=Radius | Y-Max | Y-Min |
|----------|-------|-------|
| 40' | 50' | 15' |
| 45' | 50' | 18' |
| 50' | 50' | 21' |
| 55' | 50' | 25' |
| 60' | 50' | 28' |
| 65' | 50' | 32' |
| 70' | 50' | 35' |
| 75' | 50' | 39' |
| 80' | 50' | 43' |

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|--------|
| 12-1-10 | |
| REVISIONS | |
| DATE | CHANGE |
| | |

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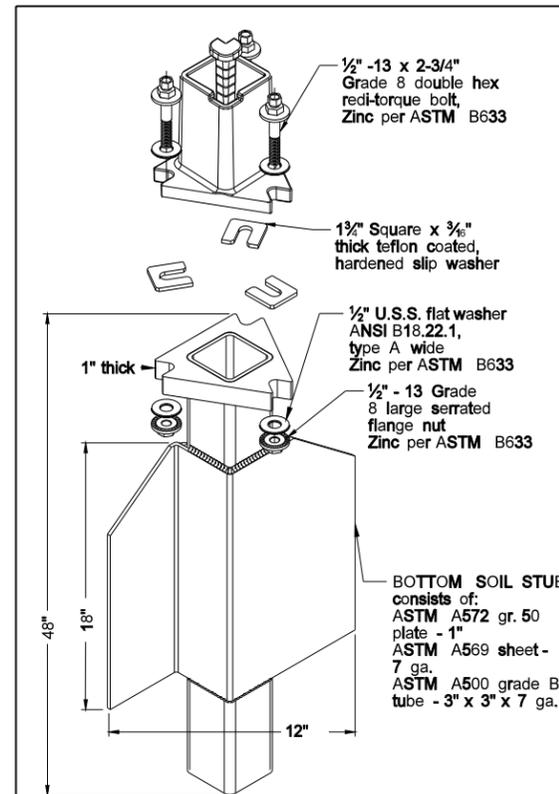
| Number of Posts | Telescoping Perforated Tube | | | | | | |
|-----------------|-----------------------------|----------------------|-----------------|----------------------|-----------|-----------------------------------|-----------------------------|
| | Post Size In. | Wall Thickness Gauge | Sleeve Size In. | Wall Thickness Gauge | Slip Base | Anchor Size Without Slip Base In. | Anchor Wall Thickness Gauge |
| 1 | 2 | 12 | | | No | 2 1/2 | 12 |
| 1 | 2 1/2 | 12 | | | No | 2 1/2 | 12 |
| 1 | 2 1/2 | 12 | | | (B) | 3(C) | 7 |
| 1 | 2 1/2 | 10 | | | Yes | | 7 |
| 1 | 2 1/2 | 12 | 2 1/2(D) | 12 | Yes | | 7 |
| 1 | 2 1/2 | 12 | 2 1/2 | 12 | Yes | | 7 |
| 2 | 2 1/2 | 10 | | | Yes | | 7 |
| 2 | 2 1/2 | 12 | 2 1/2(D) | 12 | Yes | | 7 |
| 2 | 2 1/2 | 12 | 2 1/2 | 12 | Yes | | 7 |
| 3 & 4 | 2 1/2 | 12 | | | Yes | | 7 |
| 3 & 4 | 2 1/2 | 10 | | | Yes | | 7 |
| 3 & 4 | 2 1/2 | 12 | 2 1/2 | 12 | Yes | | 7 |
| 3 & 4 | 2 1/2 | 12 | 2 1/2(D) | 12 | Yes | | 7 |
| 3 & 4 | 2 1/2 | 10 | 2 1/2 | 10 | Yes | | 7 |

(B) - The 2 1/2", 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.
 (C) - 3" anchor unit
 (D) - 2 1/2" x 12 ga. x 18" minimum length external sleeve required.

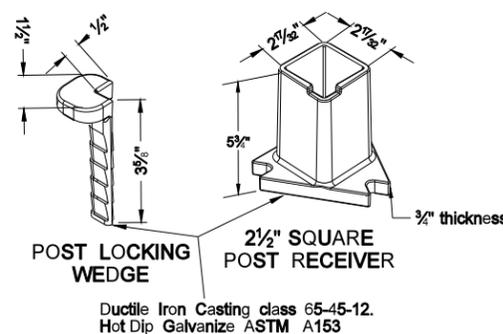


MULTI-DIRECTIONAL SLIP BASE ASSEMBLY:
 2 1/2" x 12 ga. may be inserted with 2 1/2" x 12 ga. & 2 1/2" 10 ga. may be inserted with 2 3/8" x 10 ga. to achieve higher load ability.

Mounting Details Perforated Tube



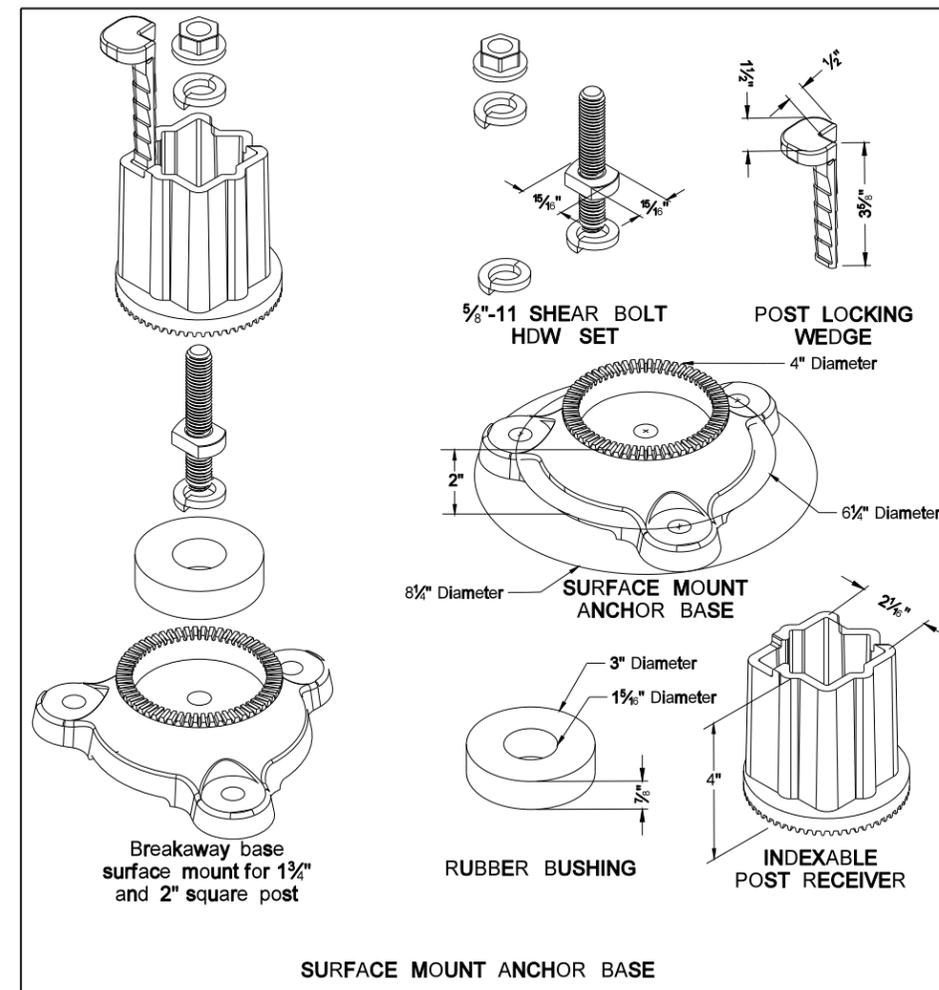
SLIP BASE FOR 2 1/2" POST



SLIP BASE DETAIL

| Properties of Telescoping Perforated Tubes | | | | | | |
|--|--------------------|---------------------|----------------------|------------------------------------|-----------------------------------|----------------------------------|
| Tube Size In. | Wall Thickness in. | U.S. Standard Gauge | Weight Per Foot Lbs. | Moment of Inertia In. ⁴ | Cross Sect. Area In. ² | Section Modulus In. ³ |
| 1 1/2 x 1 1/2 | 0.105 | 12 | 1.702 | 0.129 | 0.380 | 0.172 |
| 2 x 2 | 0.105 | 12 | 2.416 | 0.372 | 0.590 | 0.372 |
| 2 1/2 x 2 1/2 | 0.105 | 12 | 2.773 | 0.561 | 0.695 | 0.499 |
| 2 3/8 x 2 3/8 | 0.135 | 10 | 3.432 | 0.605 | 0.841 | 0.590 |
| 2 1/2 x 2 1/2 | 0.105 | 12 | 3.141 | 0.804 | 0.803 | 0.643 |
| 2 1/2 x 2 1/2 | 0.135 | 10 | 4.006 | 0.979 | 1.010 | 0.783 |

The 2 3/8" size 10 gauge is shown as 2.19" size on the plans; The 2 1/2" size is shown as 2.51" size on the plans.



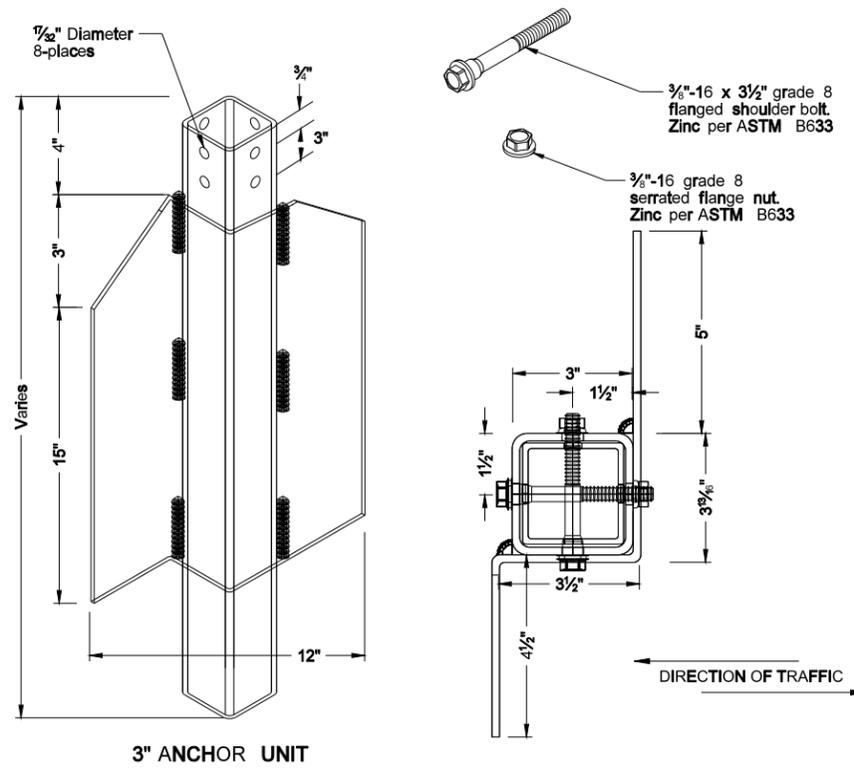
SURFACE MOUNT ANCHOR BASE

NOTE:

- 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.
- Anchor material shall be 7 gauge H.R.P.O. Commercial quality ASTM A569 and 3" x 3" x 7" gauge ASTM A500 grade B. Anchor shall have a yield strength 43.9 KSI and tensile strength of 59.3 KSI. Anchor shall be hot dipped galvanized per ASTM A123/153. All tolerances on anchor unit and slip base bottom assembly are +/- 0.005" unless otherwise noted.
- When used in concrete sidewalk, anchor shall be the same concept without the wings.
- Four post signs shall have over 8" between the first and fourth posts.
- Installation procedures as per manufacturers recommendation.
- Concrete fasteners for surface mount breakaway base shall be a minimum 1/2" diameter x 4" grade 8.

SHOULDER BOLT

Shimming agent to reduce tolerance between 3" anchor unit and 2 1/2" post. (standard 3/8" diameter grade 8 bolt may be used with proper shim)



3" ANCHOR UNIT

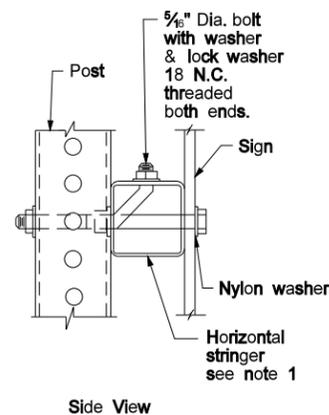
| | |
|---|--------|
| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
| 8-6-09 | |
| REVISIONS | |
| DATE | CHANGE |

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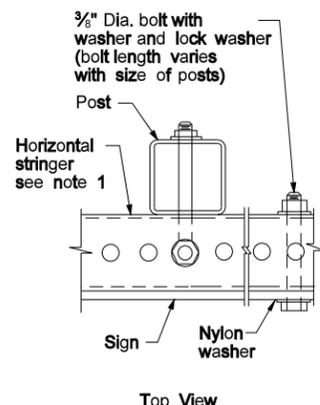
Mounting Details Perforated Tube

Note:

- Horizontal stringers - In lieu of perforated tubes, the contractor may substitute z bar stringers. The z bar stringers shall be 1 1/2" x 3/16" thick, 1.08 lbs./ft aluminum or 3.16 lbs./ft steel.
- Metal washers used on sign face shall have a minimum outside diameter of 5/8" ± 1/16" and 10 gauge thickness.
- No Parking Signs: All no parking signs with directional arrows shall be placed at a 30 to 45 degree angle with the line of traffic flow. No parking signs required at the above angles may have the support turned to the correct angle. If the no parking sign is placed with another sign that has to be placed at a 90 degree angle with the line of traffic flow, the detailed angle strap should be used to mount the no parking sign. Flat washers and lock washers shall be used with all nylon washers. Material used for the attachment strap shall be included in the price bid for "Flat sheet for signs."
- In lieu of using the bent bolt to attach the post to the stringer, the contractor may choose to punch the sign backing and place the bolt through the sign, the stringer and the post.
- 4" vertical clearance of anchor or breakaway base. The 4" x 60" measurement shall be made above and below post location and also back and ahead of post.

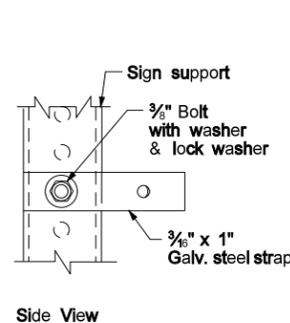


Side View

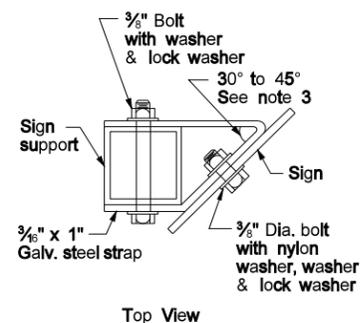


Top View

STRINGER MOUNTING
(WITH STRINGER IN FRONT OF POST)

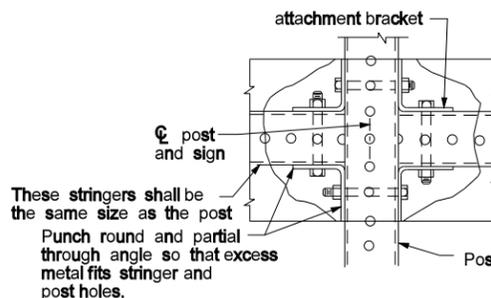


Side View



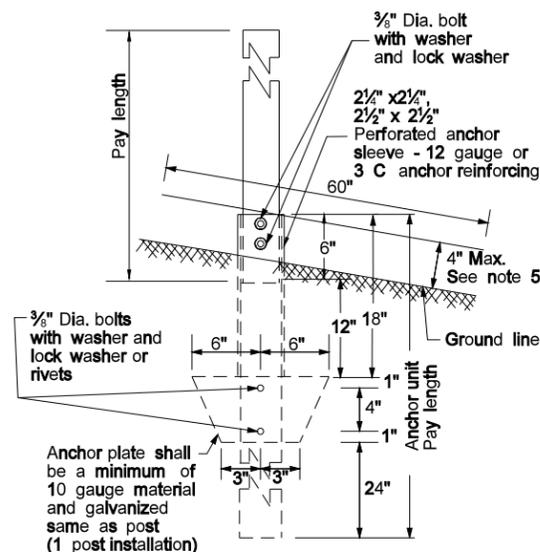
Top View

STRAP DETAIL

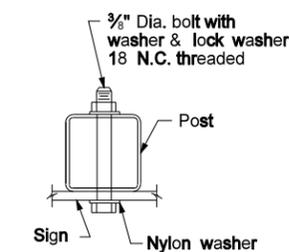
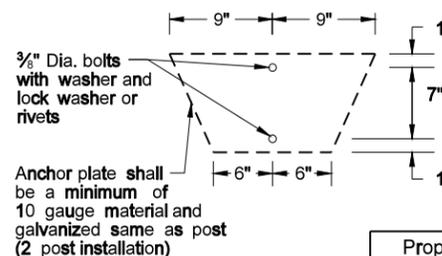


These stringers shall be the same size as the post. Punch round and partial through angle so that excess metal fits stringer and post holes.

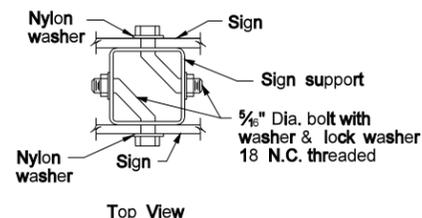
STREET NAME SIGNS
AND ONE WAY SIGNS
SINGLE POST ASSEMBLY
ONE STRINGER OR
BACK TO BACK MOUNTING



ANCHOR UNIT AND
POST ASSEMBLY



BOLT MOUNTING



Top View

BACK TO BACK
MOUNTING

| Properties of Telescoping Perforated Tubes | | | | | | |
|--|--------------------|---------------------|----------------------|------------------------------------|-----------------------------------|----------------------------------|
| Tube Size In. | Wall Thickness In. | U.S. Standard Gauge | Weight Per Foot Lbs. | Moment of Inertia In. ⁴ | Gross Sect. area In. ² | Section Modulus In. ³ |
| 1 1/2 x 1 1/2 | 0.105 | 12 | 1.702 | 0.129 | 0.380 | 0.172 |
| 2 x 2 | 0.105 | 12 | 2.416 | 0.372 | 0.590 | 0.372 |
| 2 1/4 x 2 1/4 | 0.105 | 12 | 2.773 | 0.561 | 0.695 | 0.499 |
| 2 3/8 x 2 3/8 | 0.135 | 10 | 3.432 | 0.605 | 0.841 | 0.590 |
| 2 1/2 x 2 1/2 | 0.105 | 12 | 3.141 | 0.804 | 0.803 | 0.643 |
| 2 1/2 x 2 1/2 | 0.135 | 10 | 4.006 | 0.979 | 1.010 | 0.783 |

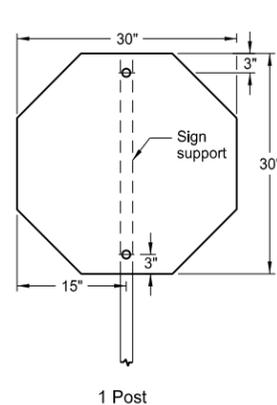
The 2 1/4" size 10 gauge is shown as 2.19" size on the plans.
The 2 1/2" size is shown as 2.51" size on the plans.

| Number of Posts | Telescoping Perforated Tube | | | | | | |
|-----------------|-----------------------------|----------------------|-----------------|----------------------|-----------|-----------------------------------|-----------------------------|
| | Post Size In. | Wall Thickness Gauge | Sleeve Size In. | Wall Thickness Gauge | Slip Base | Anchor Size Without Slip Base In. | Anchor Wall Thickness Gauge |
| 1 | 2 | 12 | | | No | 2 1/4 | 12 |
| 1 | 2 1/4 | 12 | | | No | 2 1/2 | 12 |
| 1 | 2 1/2 | 12 | | | (B) | 3(C) | 7 |
| 1 | 2 1/2 | 10 | | | Yes | | 7 |
| 1 | 2 1/4 | 12 | 2 1/2(D) | 12 | Yes | | 7 |
| 1 | 2 1/2 | 12 | 2 1/4 | 12 | Yes | | 7 |
| 2 | 2 1/2 | 10 | | | Yes | | 7 |
| 2 | 2 1/4 | 12 | 2 1/2(D) | 12 | Yes | | 7 |
| 2 | 2 1/2 | 12 | 2 1/4 | 12 | Yes | | 7 |
| 3 & 4 | 2 1/2 | 12 | | | Yes | | 7 |
| 3 & 4 | 2 1/2 | 10 | | | Yes | | 7 |
| 3 & 4 | 2 1/2 | 12 | 2 1/4 | 12 | Yes | | 7 |
| 3 & 4 | 2 1/4 | 12 | 2 1/2(D) | 12 | Yes | | 7 |
| 3 & 4 | 2 1/2 | 10 | 2 3/8 | 10 | Yes | | 7 |

(B) - The 2 1/2", 12 gauge posts do not need breakaway bases when placed in standard soils, but require a shim as specified by the manufacturer. The breakaway base is required when the support is placed in weak soils. The Engineer shall determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.
(C) - 3" anchor unit
(D) - 2 1/2" x 12 ga. x 18" minimum length external sleeve required.

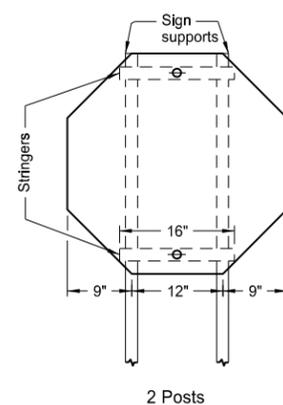
| | | |
|--|--------|---|
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| DATE | CHANGE | |
| | | |

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS

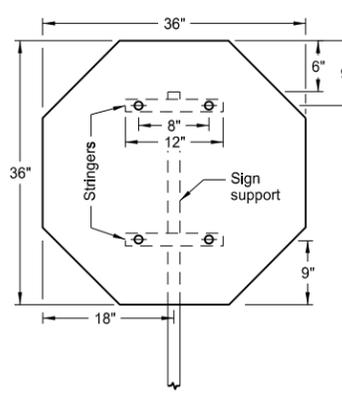


1 Post

Assembly No. 1

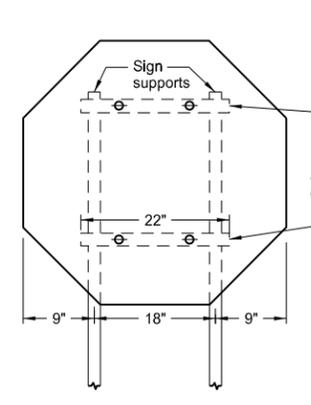


2 Posts

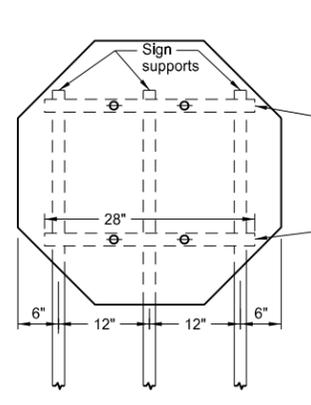


1 Post

Assembly No. 2



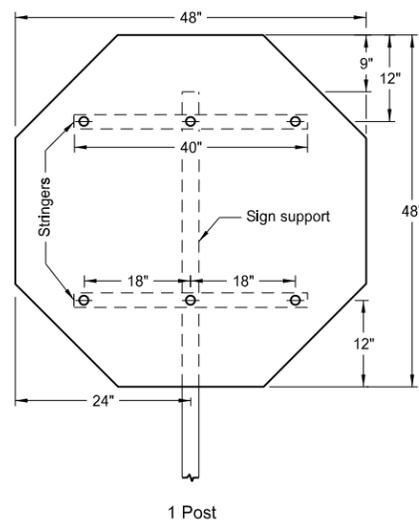
2 Posts



3 Posts

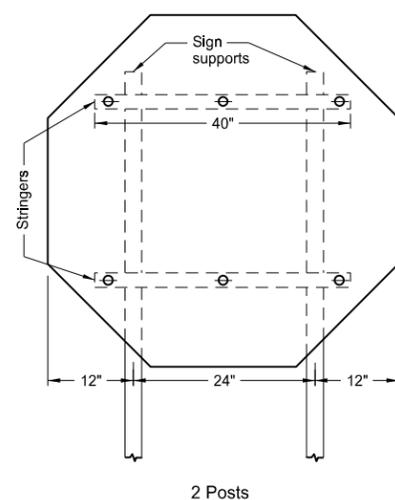
Notes:

1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thickness shall be 0.100 inch.
3. Perforated square tube stringer shall be 1½" x 1½".
4. All holes shall be punched round for ⅜" bolt.

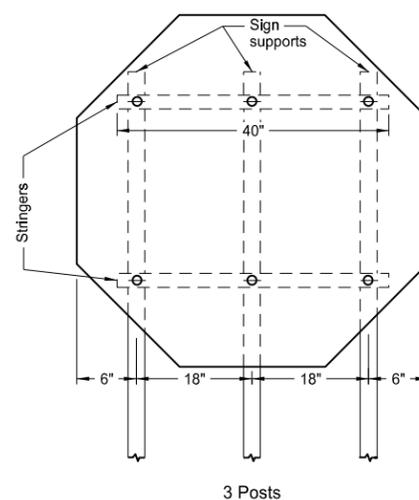


1 Post

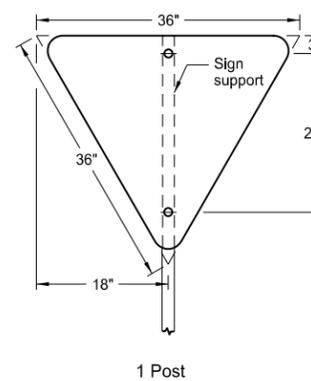
Assembly No. 3



2 Posts

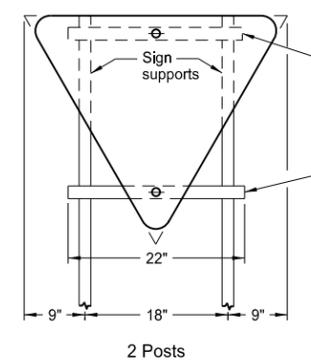


3 Posts

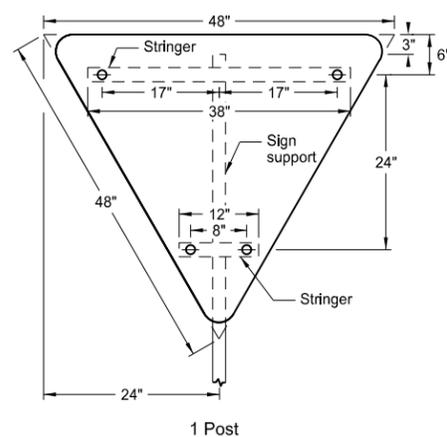


1 Post

Assembly No. 4

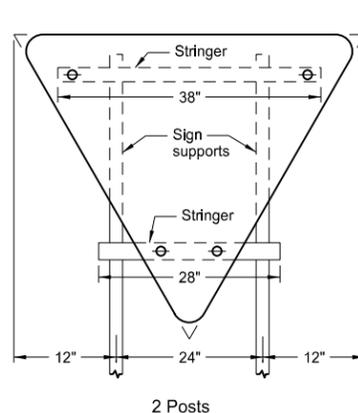


2 Posts

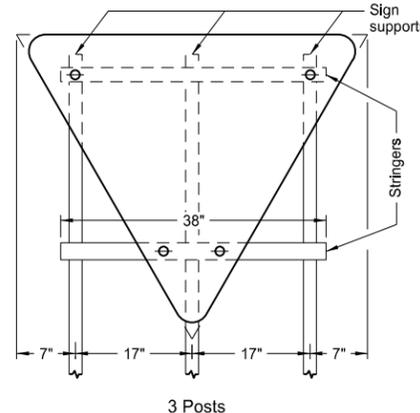


1 Post

Assembly No. 5



2 Posts

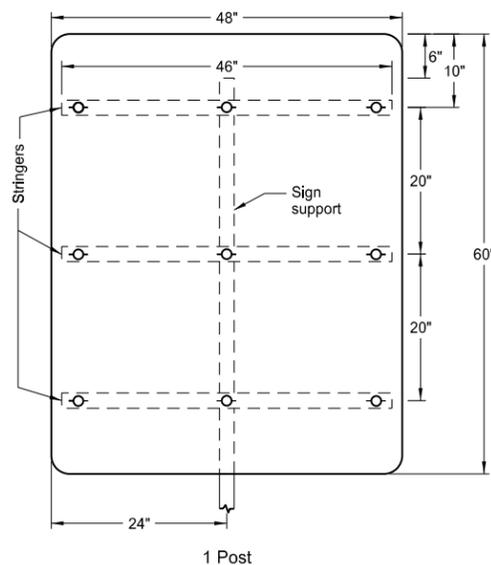


3 Posts

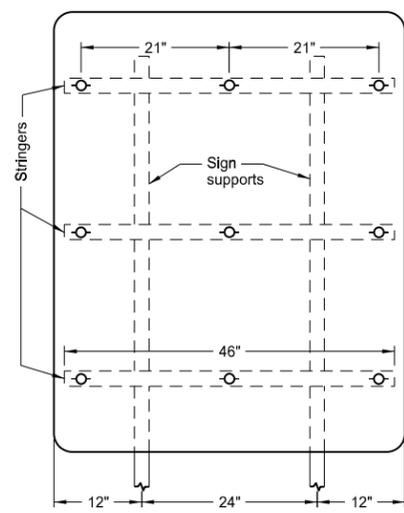
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| 12-1-10 | |
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| DATE | CHANGE |

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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION
DETAILS REGULATORY, WARNING AND GUIDE SIGNS

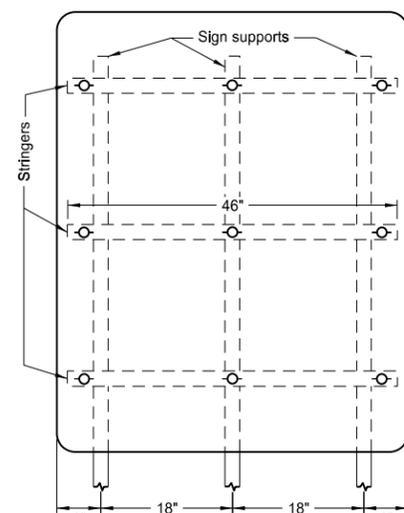


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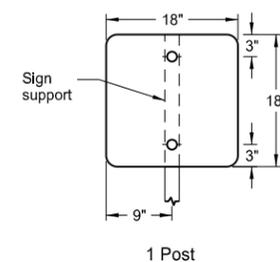


2 Posts

Assembly No. 12

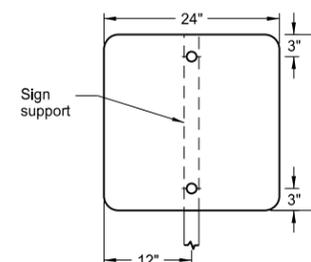


3 Posts



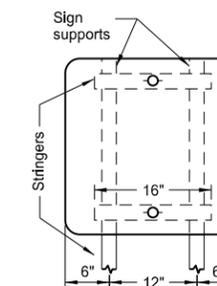
1 Post

Assembly No. 13

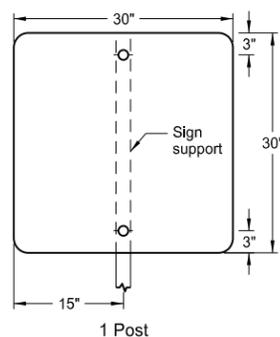


1 Post

Assembly No. 14

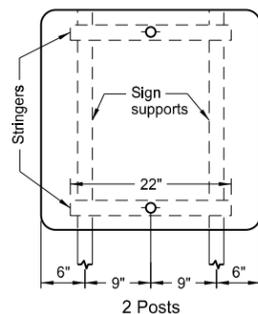


2 Posts

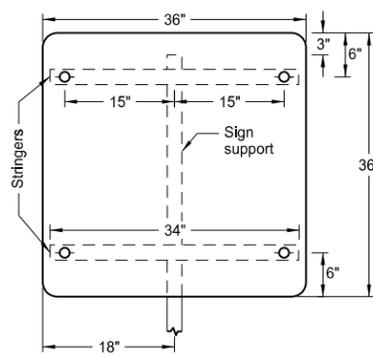


1 Post

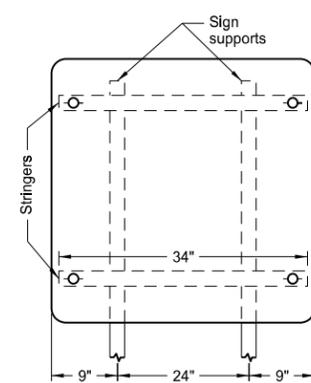
Assembly No. 15



2 Posts

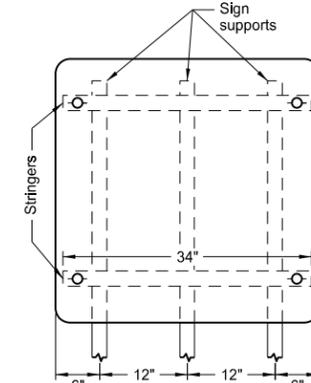


1 Post

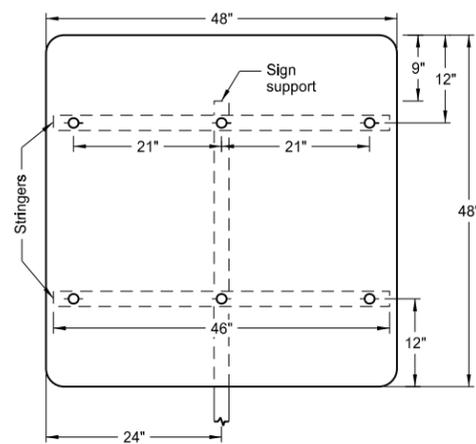


2 Posts

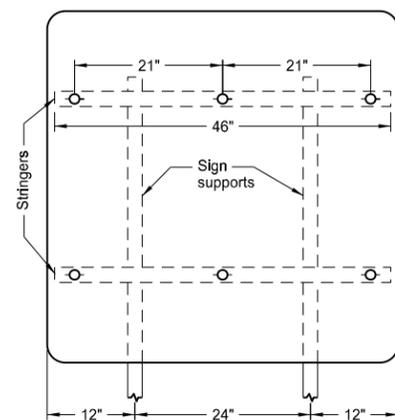
Assembly No. 16



3 Posts

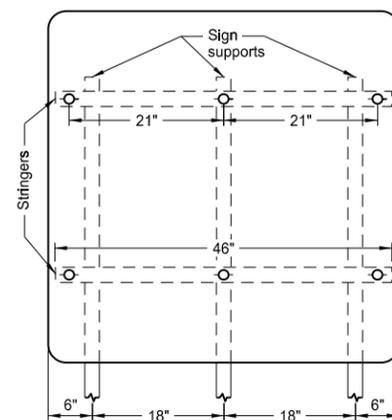


1 Post



2 Posts

Assembly No. 17



3 Posts

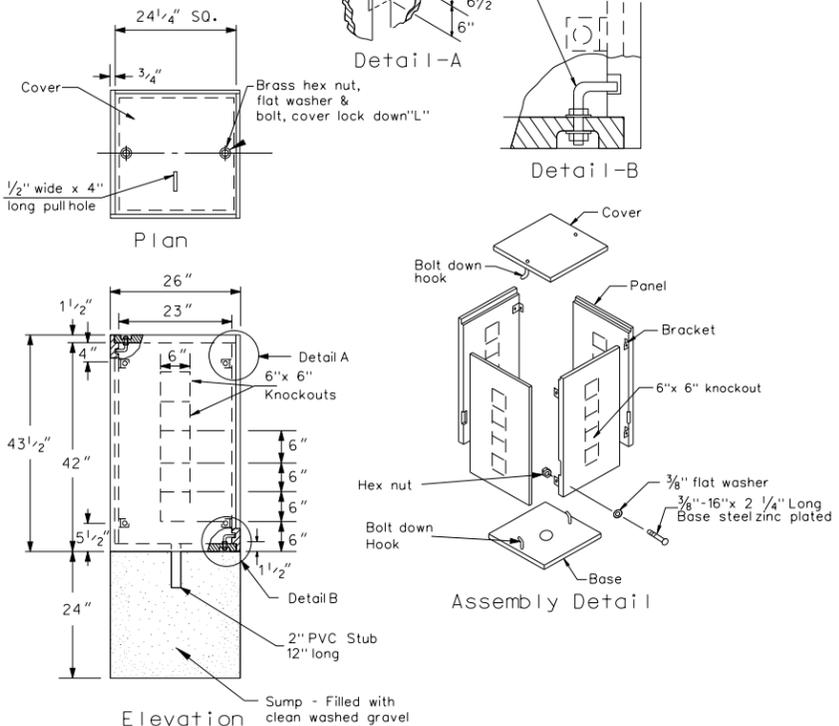
Notes:

1. See Standard D-754-25 for mounting details.
2. The minimum sign backing material thickness shall be 0.100 inch.
3. Perforated square tube stringer shall be 1½" x 1½".
4. All holes shall be punched round for ⅜" bolt.

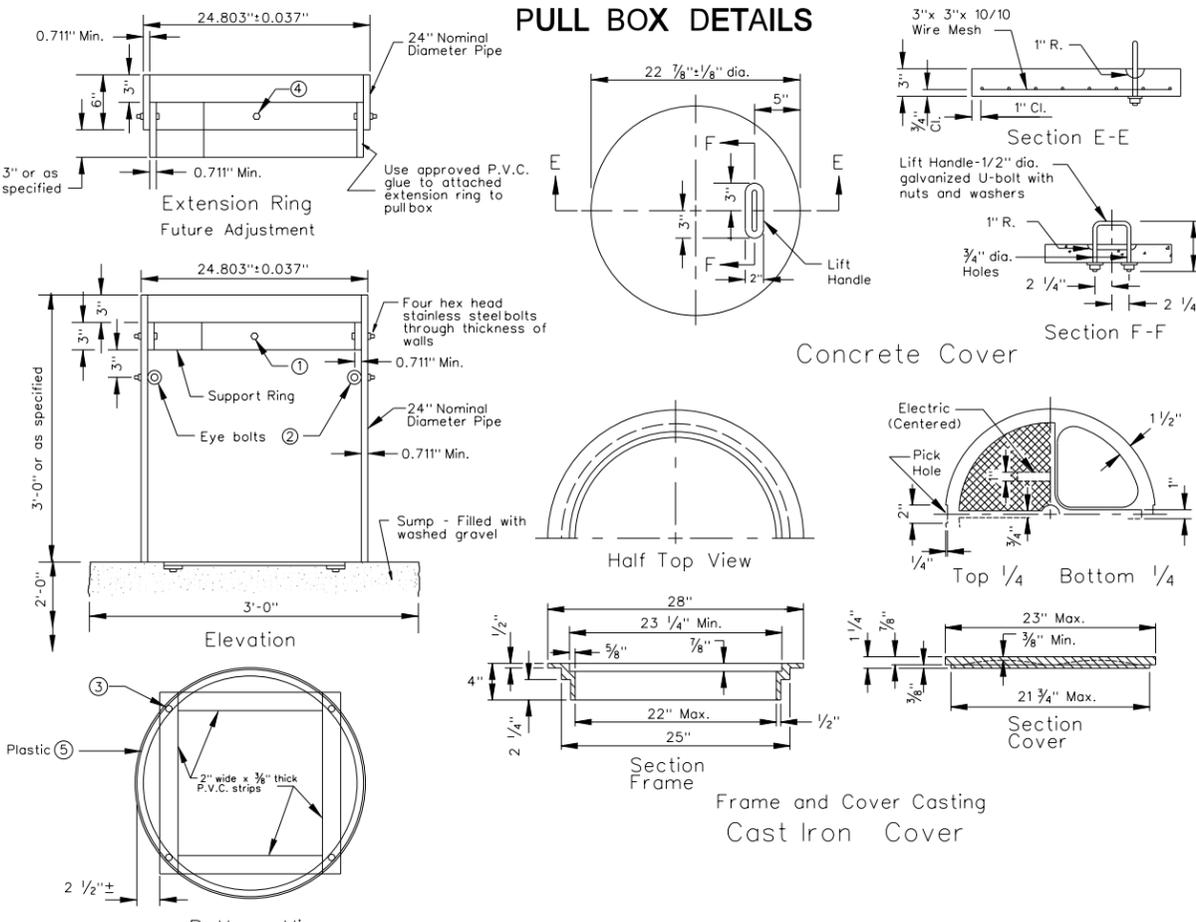
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| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
| 12-1-10 | |
| REVISIONS | |
| DATE | CHANGE |
| | |

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NOTE: Fiberglass pull box is composed of fiberglass skins and reinforced mortar structural elements in combination with polyurethane foam cells.

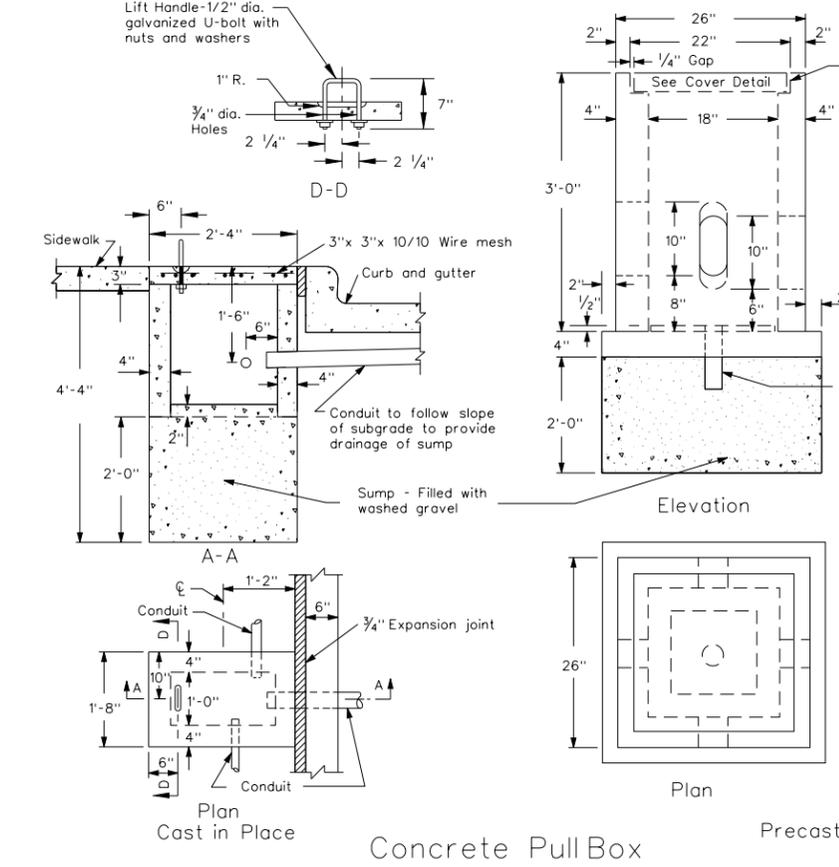


Fiberglass Pull Box

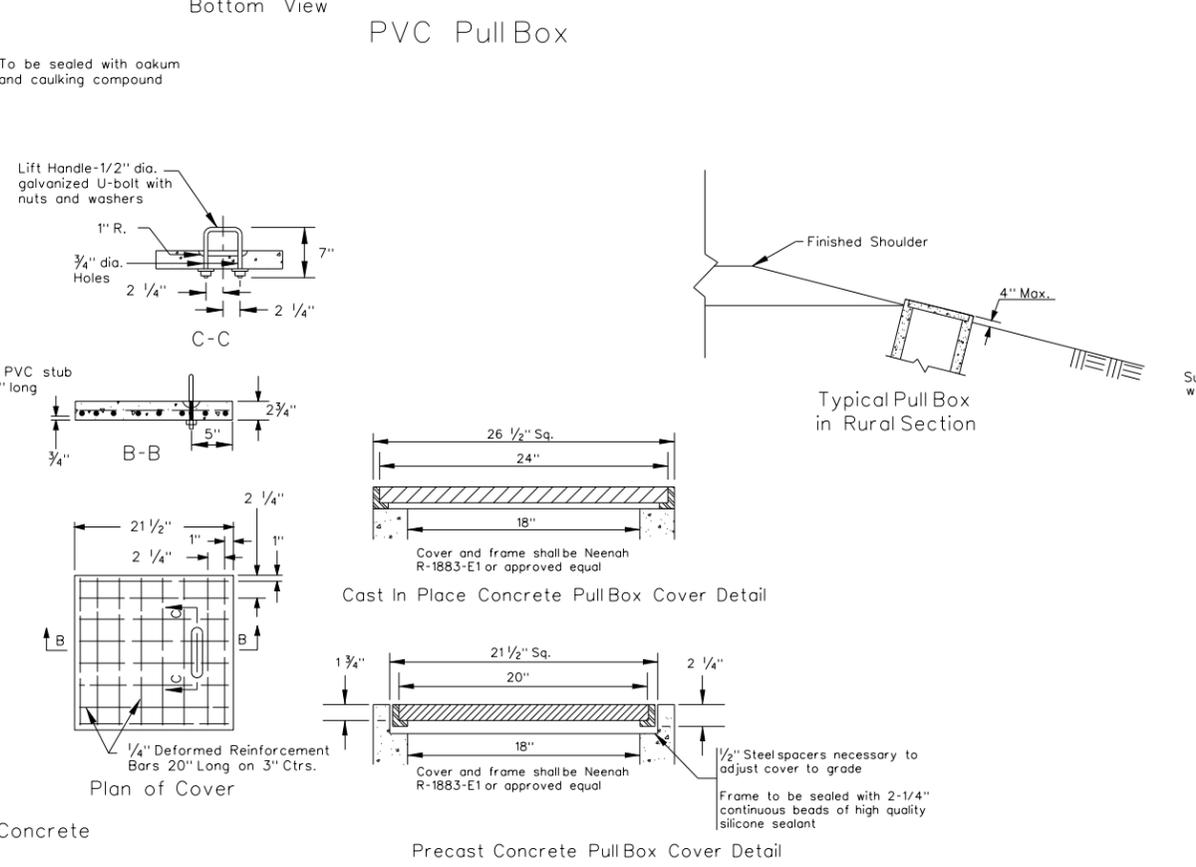


PVC Pull Box

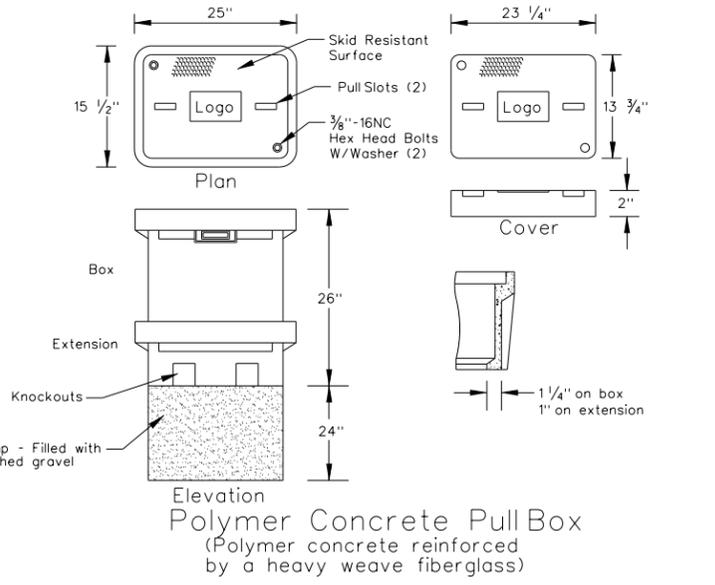
- PVC PULL BOX NOTES:**
- ① Attach split 24" nominal diameter PVC cover support ring with four 3/8" dia. x 2" long stainless steel hex head bolts with nuts at 90 degrees apart.
 - ② Two type 2 shoulder eye bolts, 3/8" dia. x 1 1/4" shank length with hex nuts 180 degrees apart (for lifting pull box and supporting electric cable).
 - ③ Four 1/4" x 1 1/4" long galvanized lag screws, screw assembly together.
 - ④ Attach split 24" nominal diameter PVC cover support extension ring with four 3/8" dia. x 2" long stainless steel hex. head bolts with nuts at 90 degrees apart.
 - ⑤ Bolt assembly together.
 - ⑥ Conduit holes located in barrel section shall be sized no more than 1" larger than size of conduit being used.
 - ⑦ After pull box & conduit installation all inside walls & cover shall be made water tight to the satisfaction of the Engineer.
 - ⑧ PVC pipe to meet requirements of ASTM F679T-1 or equal.
 - ⑨ Hex head bolts and nuts shall be austenitic stainless steel. Other fasteners to be galvanized as per AASHTO M-232.
 - ⑩ Concrete cover shall be coated on top and sides with and approved epoxy coating. The epoxy protective coating shall be light gray, clear, or neutral in color and shall be applied as recommended by the manufacturer. The surfaces of the concrete to which the epoxy protective coating is applied, shall be cleaned by wire brush and shall be dry before application.
 - ⑪ Cast Iron Cover: Cover castings shall be gray iron as per AASHTO M 105, class 35B.



Concrete Pull Box



Prestcast Concrete Pull Box Cover Detail



Polymer Concrete Pull Box

| NORTH DAKOTA DEPARTMENT OF TRANSPORTATION | |
|---|--------------------------|
| 10-1-86 | |
| REVISIONS | |
| DATE | CHANGE |
| 04-26-94 | Add NEENAH cover |
| 10-11-94 | Lift handle & polymer |
| 03-20-95 | Concrete pull box |
| | Add PVC pull box |
| 05-28-99 | Pull box cover thickness |
| 06-08-99 | Rural pull box detail |
| 09-14-99 | Added cast iron cover |
| 12-01-04 | PE Stamp added |

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