

**Request for Proposal
Commercial Irrigation System
Winnebago Avenue Sports Complex
425 Winnebago Ave.**

The City of Fairmont is requesting proposals for a commercial irrigation system installed at the Winnebago Avenue Sport Complex. The complex consists of 3 regulation softball fields and 1 regulation baseball field. See attached plans and specifications for additional requirements. The proposal shall include a lump sum total cost to complete the following scope of work.

- A. Irrigate all areas identified on the plans to include equipment identified in the specifications.
- B. Provide pump station at location identified on plans. Contractors work shall include:
 - 1. Booster pump to meet system pressure requirements and provide a minimum of 220 gallons per minute.
 - i. Flow test results on hydrant located on Winnebago/Hampton.
Static: 60 psi – Residual: 41 psi @ 500 gpm.
 - 2. RPZ to meet backflow requirements. Installed per City specifications.
 - 3. Blowout connection for winterization.
 - 4. Lockable weatherproof housing for all elements of both the pump station.
 - 5. Concrete base adequate to support the structure. (6” min. thickness)
 - 6. **Installation of water meter.
 - 7. **Connection to service riser.
 - 8. **Connection of power to pump motor, VFD, and system controls.
- C. Provide system controller with ET sensor and 120V power outlet to be installed in a separate lockable weatherproof housing adjacent to the pump station location.
- D. Provide Variable Frequency Drive (VFD) for pump controls installed with system controller.
- E. Provide 5 individual 1-1/2” hose connections at each field and west of concession stand for watering fields and maintaining the facility. This system should be zoned appropriately to allow for on-demand usage. Connections should be at grade inside lockable valve box or equivalent.
- F. Install separate irrigation zones for watering of ag-lime at each of the four fields.
- G. Restoration of all disturbed areas to include topsoil and turf seeding.
- H. System provides a minimum of 220 gallons per minute and should operate to allow for fields to be ready for play by 7:00 a.m. each day.
- I. Costs for all material and labor to be included in the lump sum amount.
- J. Work may commence after September 15th and all installation will be completed by December 1, 2014. Spring system start-up completed by May 1, 2015.
- K. Providing a detailed sketch of the proposed irrigation system with the proposal.

In addition to the above scope of work, the successful contractor shall be responsible for:

- A. Providing evidence of insurance of a combined single limit policy for:
 - a. Commercial general liability - \$500,000 each occurrence/\$1,000,000 aggregate and
 - b. Automobile comprehensive liability - \$1,000,000 each occurrence.

**The City of Fairmont shall be responsible for:

- A. Providing the required size water meter based on the final design requirements.
- B. Providing a 6" diameter ductile iron pipe riser with flange located approximately 9-10" above existing grade.
- C. Providing 3-phase power to the pump station location and 120V power to system controller and outlet.

Proposals shall be submitted in a sealed envelope **before 2:00 pm CDT on September 3, 2014** to:

City of Fairmont
Attn: Troy Nemmers, PE
100 Downtown Plaza
Fairmont, MN 56031

**CITY OF FAIRMONT, MN
WINNEBAGO AVENUE SPORTS COMPLEX
IRRIGATION SYSTEM SPECS**

PART 1 GENERAL

1.01 SUMMARY

- A. Provide complete underground irrigation system for areas indicated on Drawings, including:
 - 1. Excavation and backfilling.
 - 2. Plumbing and electrical work.
 - 3. Installation of pipe, equipment, and appurtenances.
 - 4. Field quality control.
 - 5. Fall winterization and spring startup service.
 - 6. Restoration of site.

- B. Payment:
 - 1. Irrigation System: Lump sum
 - 2. Retainage: 10% retainage will be held until Spring system start-up is completed.
 - 3. Costs associated with furnishing and installing the service tap, valve, riser, and water meter will provided by the City.

1.02 DEFINITIONS

- A. Mainline: All pressurized supply pipe and fittings between the water meter and the irrigation control valves.

- B. Lateral Lines: All supply pipe and fittings between the irrigation control valves and the connections to the irrigation heads. Swing joints, funny pipe flexible risers, rigid pipe or cutoff risers, and associated fittings are not considered part of the lateral line but incidental components of the irrigation heads.

1.03 SUBMITTALS

- A. Design: Provide scaled drawing of irrigation system and proposed equipment layout for owner approval.
- B. Manufacturer's Product Data: Include sleeving, pipe, fittings, mainline components, sprinkler and bubbler components, drip irrigation components, control system components, pipe sealant, wire, wire connectors, ID tags; catalog cuts, specifications, allowable operating pressures of each component, installation instructions, and operating instructions.

- C. Shop Drawings: Show installation details, products required for proper installation, their relative locations, and critical dimensions; and wiring diagrams of all mechanical and electrical equipment.

- D. Operation and Maintenance Manual.

- E. Field record drawings for City staff to input into GIS.

1.04 QUALITY ASSURANCE

- A. Meet latest edition of National Electric Code, the Uniform Plumbing Code, and applicable laws and regulations of the City of Fairmont.

- B. Supply all materials from a single source distributor and as a complete unit.
- C. Water Source: Municipal water supply.
- D. Testing: Notify Engineer and Parks staff 48 hours in advance of testing.
- E. Inspection:
 1. Notify Engineer at start of project, each day on site, and completion, so Engineer can inspect as necessary.
 2. 48 hours prior to connection, contact the Water department at 507-235-6789 to schedule the work for water taps and inspections.
 3. Provide minimum 2 week notice for installation which will require meters or backflow devices.
- F. Qualifications:
 1. Installer: Minimum 5 years experience installing underground sprinkler systems of comparable size.
 2. Irrigation Contractor: Licensed Power Limited Technician Contractor with State of MN.

1.05 COORDINATION

- A. Coordinate with Fairmont Water Department for meter and hookup to water supply.

1.06 DELIVERY, STORAGE, HANDLING

- A. Store and handle materials to prevent damage and deterioration.
 1. Protect pipe from oil and grease and from prolonged exposure to sunlight and excessive heat.
 2. Support to prevent sagging and bending.
- B. Deliver plastic piping in bundles, packaged to provide adequate protection of pipe ends.
- C. Deliver irrigation system components in manufacturer's original undamaged and unopened containers with labels intact and legible.
- D. Provide secure, locked storage for valves, sprinkler heads, and similar components that cannot be immediately replaced, to prevent installation delays.

1.07 PROTECTION

- A. Protect curbs, utilities, drain tile, light poles, scoreboards, fencing, trees, and other existing features from damage.
- B. Maintain safe traffic and pedestrian routes around construction areas.

1.08 WARRANTY

- A. Warranty irrigation materials, equipment, and workmanship against defects for a period of 1 year from date of acceptance.
 1. Fill and repair depressions and settlement of more than 1/2 inch. Adjust, restore, or replace pipes, valves, sprinkler heads, planting, paving, or other improvements or damages caused by settlement.
 2. Repair damage to premises caused by a defective sprinkler system item.
 3. Make repairs within 7 days of notification from the City's representative.
 4. Make replacements at no additional cost to the City.

5. Warranty applies to originally installed materials and equipment and replacements made during the warranty period.

PART 2 PRODUCT

2.01 MANUFACTURER

- A. Standard of Quality: Design is based on products of Hunter.
- B. Other acceptable manufacturers, subject to compliance with requirements:
 1. Hunter
 2. RainBird
 3. Toro
 4. Equal approved by Engineer.

2.02 MATERIALS

- A. Irrigation Tap and Water Meter: As required by local codes and requirements. Completed by City staff.
- B. Sleeving:
 1. Provide beneath pedestrian pavements, driveways, and streets.
 2. PVC Class 160 pipe with solvent welded joint.
 3. Diameter: Equal to twice that of the pipe and/or wiring bundle.
 4. Install separate sleeve beneath hard surface areas to route each run or irrigation pipe or wiring bundle.
 5. All sleeving to be bored beneath hard surface areas and be restored to pre-existing conditions.
- C. Pipe and Fittings:
 1. Pipe sizes are minimum sizes and may be increased at the option of the Contractor.
 2. All pipe to be homogeneous throughout and free from visible cracks, holes, foreign materials, blisters, wrinkles, and dents.
 3. Mark pipe continuously and permanently with manufacturer's name or trade mark, size, schedule, type, working pressure, SDR number, products standard number, and NSF approval.
 4. Do not use excessive solvent so as to cause an obstruction on inside of pipe.
 5. Mainline:
 - a. Rigid, unplasticized polyvinyl chloride (PVC) Class 200 approved pipe, extruded from virgin material, with an integral belled end.
 - b. Nominal diameter 4 inches or greater:
 - 1) Rubber-gasketed pipe equipped with factory installed reinforced gaskets for joints to conform to tests of ASTM D3139.
 - 2) Rubber-gasketed deep bell ductile iron fittings meeting ASTM A536 and F477.
 - 3) Lubricant approved by pipe manufacturer.
 - c. Nominal diameter equal to or less than 4 inches or where pipe connection occurs in a sleeve:
 - 1) Schedule 40, Type 1, PVC solvent weld fittings conforming to ASTM D2466 and D1784.
 - 2) Primer approved by pipe manufacturer.
 - 3) Solvent cement to conform to ASTM D2564.
 6. Lateral Pipe and Fittings:
 - a. Class 160, SDR26, rated at 160 PSI, conforming to dimensions and tolerances in ASTM D2241.
 - b. Solvent weld, UV radiation resistant Schedule 40, Type 1, PVC fittings for PVC pipe.
 - 1) Primer approved by pipe manufacturer.
 - 2) Solvent cement approved by pipe manufacturer.
 - c. Flexible polyethylene (PE) pipe:

- 1) Acceptable alternate to rigid PVC pipe for spray sprinkler laterals.
- 2) SDR15, rated at 100 PSI, NSF approved, conforming to ASTM D2239.
- 3) Type 1 PVC insert fittings designed for use with flexible PE pipe.
- 4) Stainless steel wormgear clamps, including stainless steel screw, to join pipe and fittings.
- d. Drip irrigation laterals downstream of zone control valves:
 - 1) UV radiation resistant polyethylene pipe with a minimum of 2 percent carbon black.
 - 2) PVC/compression line fittings compatible with drip lateral pipe.
 - 3) Tubing stakes or landscape fabric staples to hold above-ground pipe in place.
7. Specialized Pipe and Fittings:
 - a. Copper pipe:
 - 1) Type K rigid conforming to ASTM B88.
 - 2) Wrought copper or cast bronze fittings, soldered or threaded per installation details.
 - b. Galvanized steel pipe:
 - 1) Schedule 40 conforming to ASTM A53.
 - 2) Galvanized, threaded, standard weight, malleable iron fittings.
 - c. Ductile iron pipe:
 - 1) Class 50 conforming to ANSI A21.51.
 - 2) Use a minimum of Class 53 thickness pipe for flanged piping.
 - 3) Mechanical joints conforming to ANSI A21.10 and A21.11 or flanged fittings conforming to ANSI C110 and B16.1.
 - d. Use a dielectric union wherever a copper-based metal is joined to an iron-based metal.
 - e. Low density polyethylene hose: Pipe specifically intended for use as a flexible swing joint. Commonly known as Funny Pipe.
 - 1) Inside diameter: 0.490 ± 0.010 inch.
 - 2) Wall thickness: 0.100 ± 0.010 inch.
 - 3) Color: Black
 - 4) Use spiral barb fittings designed for such use.
 - f. Assemblies for flanged connections: Studs, nuts and rubber gaskets.
 - g. Assemblies for threaded pipe connections: PVC Schedule 80 nipples and PVC Schedule 80 threaded fittings.
 - h. Joint sealant: Nonhardening, nontoxic pipe thread sealant formulated for use on threaded connections and approved by the pipe fitting manufacturer.
8. Thrust Blocks:
 - a. Use for fittings on pipe 4-inch diameter or greater, or any diameter rubber gasketed pipe.
 - b. 3000 PSI concrete.
9. Joint Restraint Harness:
 - a. Use wherever joints are not positively restrained by flanged fittings, threaded fittings, and/or thrust blocks.
 - b. Use on pipe 4-inch diameter or greater, or any diameter rubber gasketed pipe.
 - c. Use with transition fittings between metal and PVC pipe, where weak trench banks do not allow the use of thrust blocks, or where extra support is required to retain a fitting or joint.
 - d. Bolts, nuts, retaining clamps, all-thread, or other joint restraint harness materials to be zinc plated or galvanized.

D. Mainline Components:

1. Main System Shutoff Valve: Comply with local code and requirements.
2. Winterization: Comply with local code and requirements.
3. Backflow Prevention Assembly
4. Master Valve Assembly
5. Flow Sensor Assembly

6. Isolation Gate Valve Assembly: Provide a separate valve box over a 3-inch depth of 3/4 inch gravel for each assembly.
7. Quick Coupling Valve Assembly: Double swing joint arrangement.
8. Manual Drain Assembly: Provide a separate sump consisting of 3 cubic feet of 3/4-inch gravel for each drain valve.

E. Sprinkler Irrigation Components:

1. Remote Control Valve (RCV) Assembly for Sprinkler Laterals:
 - a. Hunter PGV series automatic control valve or equal.
 - b. Use wire connectors and waterproofing sealant to join control wires to solenoid valves.
 - c. Install a separate valve box over a 3-inch depth of 3/4 -inch gravel for each assembly.
2. Athletic Field Rotary Sprinkler Head
 - a. Hunter I-25 sprinkler head or equal.
 - b. Use on turf spacing of 40-60 feet.
 - c. Use stainless steel where turf borders ag-lime areas.
3. Rotary Sprinkler Head
 - a. Hunter PGP Rotary Sprinkler Head or equal.
 - b. Use on turf spacing of 25-40 feet.
 - c. Connect with cut-off risers or funny pipe flexible tubing.
4. Mini-Rotary Sprinkler Head
 - a. Hunter PGJ Rotary Sprinkler Head or equal.
 - b. Use on turf spacing of 15-25 feet.
 - c. Connect with cut-off risers or funny pipe flexible tubing.
5. MP Rotator Nozzles for Fixed Spray Sprinkler Head
 - a. Hunter MP Rotator Nozzle or equal.
 - b. Use on turf spacing of 10-25 feet.
 - c. Connect with cut-off risers or funny pipe flexible tubing.
6. Fixed Spray Sprinkler Head
 - a. Hunter Pro Spray Fixed Spray Sprinkler Head or equal.
 - b. Use on turf spacing of 5-15 feet.
 - c. Connect with cut-off risers or funny pipe flexible tubing.

2.03 CONTROL SYSTEM COMPONENTS

A. Irrigation Controller Unit:

1. Hunter I-CORE controller with DUAL module (two-wire) or equal approved by Engineer.
2. Mounted in vandal-proof and weatherproof boxes.
3. Primary surge protection arrestors: As recommended by controller manufacturer.
4. Valve output surge protection arrestors: As recommended by controller manufacturer.
5. Electrical line conditioner: As recommended by controller manufacturer.
6. Lightning protection: Provide 8-foot copper-clad grounding rod at controller location. Use AWG 8 bare copper wire between the controller and grounding rod.
7. Wire markers: Prenumbered or labeled with indelible nonfading ink, made of permanent, nonfading material.
8. Switch/outlet: 120 VAC, 15 amp combination switch/GFCI outlet.

B. Control Wire (2-wire system):

1. AWG 14 solid copper, Type UF or PE cable, UL approved for direct underground burial from the controller unit to each remote control valve.
2. Color:
 - a. Common wire: White

- b. Control wires: Red and any other easily distinguished and different colors.
 - c. Color continuous over entire length.
 - 3. Splices: Provide 3M DBY/DBR plastic wire connector with waterproof sealant. Provide connectors in 2 pieces that snap lock together.
 - 4. Zone control valve wire connections: Use King waterproof wire nuts or equal approved by Engineer. Use only 3M DBY/DBR connectors on 2-wire systems.
- C. Instrumentation:
- 1. Rain Sensor: Provide Hunter Wireless Rain-Click or equal approved by Engineer.
 - 2. ET Sensor: Provide Hunter Solar Sync.
- D. Power Wire:
- 1. Wire from power source to satellite control unit: Solid or stranded copper, Type UF single conductor cable or multi-conductor with ground cable, UL approved for direct underground burial.
 - 2. Power wire colors: Black, white, and green.
 - 3. Size: See Drawings. Verify sizes shown are compatible and adequate for the control system being used.
 - 4. Splices: 3M DBY connectors.
 - 5. Conduit: PVC Schedule 40.
 - 6. Warning tape: Inert plastic film highly resistant to alkalis, acids, or other destructive chemical components likely to be encountered in soils. 3 inches wide, yellow, and imprinted with "CAUTION: BURIED ELECTRIC LINE BELOW."

2.04 OTHER COMPONENTS

- A. Tools and Spare Parts: Provide operating keys, servicing tools, test equipment, spare parts, and other items indicated on the Drawings.
- B. Other Materials: Provide other materials or equipment which are part of the complete irrigation system, even though such items may not be referenced in these specifications.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify site conditions and note irregularities affecting work of this section. Beginning work implies acceptance of existing conditions.
- B. Check and verify all pertinent dimensions before proceeding with the Work. Carefully note all finish grades in order to restore terrain to conform to finish grades.
- C. Verify the locations and sizes of stubouts for water sources indicated on the Drawings as the source of water supply to the irrigation system.
- D. Discrepancies: Immediately notify Engineer. Do not proceed with installation in areas of discrepancy until fully resolved.
- E. Notify Engineer if uncharted or incorrectly charted utilities are encountered during excavation that conflicts with this work.

- F. Notify Engineer if rock layers or other unanticipated conditions are encountered underground.

3.02 PREPARATION

- A. Take precaution to ensure equipment and vehicles do not disturb or damage existing site grading, walks, curbs, pavements, utilities, plants, tree protection zones, and other existing items and elements of the Site.
- B. Stake sprinklers, pipe, control valves, manual drains, pumping plant, controller, and isolation valves.
- C. After staking has been completed, conduct irrigation system layout review with Engineer. Modifications will be identified by the Engineer at this review.
- D. Alterations of the design and changes in the layout may be expected in order to conform to ground conditions and to obtain full and adequate coverage of sprinkler water. Inform Engineer of any anticipated coverage inadequacies. No changes in the system as planned shall be made without the prior authorization of the Engineer.
- E. Install all mainline pipe and mainline components inside of project property lines.

3.03 EXISTING UTILITIES

- A. Protect all in-place utilities including, but not limited to; electrical, storm sewer, sanitary sewer, and watermain.

3.04 EXCAVATION, TRENCHING, BACKFILLING

- A. Mainline or lateral pipes consisting of either PVC or PE pipes may be pulled into soil utilizing a vibratory plow device specifically manufactured for pipe pulling.
- B. Minimize trenching to avoid settling.
 - 1. If possible, all trenches shall be on a straight line between sprinkler heads or other appurtenances and shall be without abrupt changes in grade.
 - 2. Excavate to permit pipes to lay at intended elevations and to permit work space for installing connections and fittings.
- C. Do not lay pipe in water or when trench or weather conditions are unsuitable for the Work.
- D. Where utilities conflict with trenching and pipe work, contact Engineer for trench depth adjustments.
- E. Minimum cover from top of pipe or control wire to finish grade:
 - 1. 12 inches over 2-inch or less mainline pipe and over electrical conduit.
 - 2. Minimum 16 inches on pipe greater than 2 inches.
 - 3. 12 inches over control wire.
 - 4. 12 inches over communication cable.
 - 5. 12 inches over lateral pipe to sprinklers and over manifold pipe to drip system zone control valves.
 - 6. 8 inches over drip lateral pipe in turf or paved areas downstream of drip system zone control valves.
 - 7. 3 inches minimum mulch cover over drip lateral pipe in planting beds downstream of drip system zone control valves.
 - 8. PVC UV radiation resistant lateral pipe shall be installed directly on the soil surface.

- F. Maintain minimum 15 feet clearance from the centerline of any tree.
 1. Where roots are 2 inches or more in diameter, the pipe trench shall be hand-excavated and tunneled.
 2. When 2-inch or larger tree roots are exposed, wrap with heavy burlap for protection and keep moist to prevent drying. Remove burlap prior to backfilling.
 3. No cutting of tree roots larger than 2 inches will be allowed.
 4. Roots less than 2 inch diameter may be clean cut at the trench wall.
 5. Backfill trenches with exposed tree roots within 24 hours.

- G. Backfill:
 1. Only after lines have been reviewed by Engineer.
 2. Excavated material may be used if free from rubbish, vegetable matter, frozen materials, and stones larger than 2 inches in dimension.
 3. Ensure material is free of sharp objects near or next to pipe.
 5. Backfill by depositing backfill material equally on both sides of the pipe in 6-inch layers and compacting to density of surrounding soil.
 6. Dress backfilled areas to original grade.

- H. Enclose pipe and wiring beneath roadways, walks, curbs, etc. in sleeves.
 1. Minimum compaction of backfill for sleeves is 95 percent Standard Proctor Density ASTM D698.
 2. Use of water for compaction around sleeves (puddling) is not permitted.

3.05 IRRIGATION TAP AND WATER METER

- A. Comply with city regulations for installation.

3.06 SLEEVING AND BORING

- A. Install at depth that permits encased pipe or wiring to remain at specified burial depth.
- B. Extend sleeve ends 24 inches beyond edge of paved surface.
- C. Cover pipe ends and mark with stakes.
- D. Mark pavement with chiseled “x” at sleeve end locations.
- E. Bore for sleeves under obstructions that cannot be removed.

3.07 ASSEMBLING PIPE AND FITTINGS

- A. General:
 1. Keep pipe free from dirt and pipe scale.
 2. Cut pipe ends square and debur.
 3. Clean pipe ends.
 4. Keep ends of assembled pipe capped. Remove caps only when necessary to continue assembly.
 5. Trenches may be curved to change direction or avoid obstructions within the limits of the curvature of the pipe. Minimum radius of curvature and offset per 20 foot length of pipe by pipe size are shown below. All curvature results from the bending of the pipe lengths. No deflection will be allowed at a pipe joint.

SIZE	RADIUS	OFFSET PER 20' LENGTH
1.5"	25'	7'8"
2"	25'	7'8"
2.5"	100'	1'11"
3"	100'	1'11"
4"	100'	1'11"
6"	150'	1'4"
8"	200'	1'0"
10"	250'	9"
12"	300'	8"

B. Mainline Pipe and Fittings:

1. Use only strap-type friction wrenches for threaded plastic pipe.
2. PVC rubber-gasketed pipe:
 - a. Use pipe lubricant. Join pipe in manner recommended by manufacturer.
 - b. Ductile iron fittings: Do not strike with metallic tool. Cushion blows with a wood block or similar shock absorber.
3. PVC solvent weld pipe:
 - a. Use primer and solvent cement. Join pipe in manner recommended by manufacturer.
 - b. Cure for 30 minutes before handling and 24 hours before allowing water in pipe.
 - c. Snake pipe from side to side within the trench.
4. Cross type fittings: Not permitted.

C. Lateral Pipe and Fittings:

1. Use only strap-type friction wrenches for threaded plastic pipe.
2. PVC solvent weld pipe:
 - a. Use primer and solvent cement. Join pipe in manner recommended by manufacturer.
 - b. Cure for 30 minutes before handling and 24 hours before allowing water in pipe.
 - c. Snake pipe from side to side within the trench.
3. Polyethylene (PE) Pipe:
 - a. Joint pipe in manner recommended by manufacturer.
 - b. Snake pipe from side to side within the trench.
4. UV Radiation Resistant Polyethylene Pipe:
 - a. Joint pipe in manner recommended by manufacturer.
 - b. Snake pipe from side to side within the trench on the soil surface, and hold in place with tubing stakes or landscape fabric staples spaced every 5 feet.
 - c. Do not compress or crimp pipe by the stake or staple or other construction activity
5. Cross type fittings: Not permitted.

D. Specialized Pipe and Fittings:

1. Copper pipe:
 - a. Buff surfaces to be joined to a bright finish. Coat with solder flux.
 - b. Solder so that a continuous bead shows around the joint circumference.
2. Galvanized steel pipe:
 - a. Join pipe as recommended by manufacturer.
 - b. Use factory-made threads whenever possible. Field-cut threads will be permitted only where absolutely necessary. Cut threads on axis using clean, sharp dies.
 - c. Apply Teflon-type tape or pipe joint compound to the male threads only.
3. Ductile iron pipe: Join pipe as recommended by manufacturer.

4. Insert a dielectric union wherever a copper-based metal and an iron-based metal are joined.
5. Low density polyethylene hose: Install per manufacturer's recommendations.
6. Flanged connections: Install stainless steel studs and nuts and rubber gaskets per manufacturer's recommendations.
7. PVC threaded connections:
 - a. Use only factory-formed threads. Field-cut threads are not permitted.
 - b. Use only non-hardening, non-toxic thread sealant.
 - c. When connection is plastic-to-metal, the plastic component shall have male threads and the metal component shall have female threads.
8. Make metal-to-metal, threaded connections with non-hardening, nontoxic pipe sealant applied to the male threads only.

E. Thrust Blocks:

1. Provide at all direction changes and termination points or at any point of the system that will result in an unbalanced thrust.
2. Provide cast-in-place concrete against undisturbed soil.
3. Size, orientation, and placement are shown on installation details.
4. Wrap fitting with plastic to protect bolts, joint, and fitting from concrete.
5. Install rebar with mastic coating as shown on installation details.

F. Joint Restraint Harness: Install according to manufacturer's recommendations.

3.08 INSTALLATION OF MAINLINE COMPONENTS

- A. Install backflow prevention assembly so that its elevation, orientation, access, and drainage conform to the manufacturer's recommendations and applicable health codes. Obtain approval of devices and location by Water department prior to installation.
- B. Install isolation gate valve assembly at least 12 inches from and align with adjacent walls or edges of paved areas.

3.09 INSTALLATION OF SPRINKLER IRRIGATION COMPONENTS

- A. Install per manufacturer's recommendations.
- B. Remote Control Valve (RCV) Assembly for Sprinkler Laterals:
 1. Flush mainline before installation of RCV assembly when possible.
 2. Use wire connectors and waterproof sealant to connect control wires to remote control valve wires.
 3. Locate valve box at least 24 inches from and align with nearby walls or edges of paved areas.
 4. Group RCV assemblies together where practical.
 5. Arrange grouped valve boxes in rectangular patterns. Allow at least 12 inches between valve boxes.
 6. Attach ID tag with controller station number to control wiring.
- C. Sprinkler Assembly:
 1. Flush lateral pipe before installing sprinkler assembly when possible.
 2. Locate rotary sprinklers 6 inches from adjacent walls, fences, or edges of paved areas.
 3. Install sprinklers perpendicular to the finish grade.
 4. Supply appropriate nozzle or adjust arc of coverage of each sprinkler for best performance.
 5. Adjust the radius of throw of each sprinkler for best performance.

3.10 INSTALLATION OF CONTROL SYSTEM COMPONENTS

- A. Install per manufacturer's recommendations.
- B. Irrigation Controller Unit:
 - 1. Location on Drawings is approximate. Engineer will determine exact site location during sprinkler layout review.
 - 2. Lightning protection:
 - a. Drive 8-foot copper-clad grounding rod into the soil.
 - b. If rock prevents driving, bury at least 4 feet deep.
 - c. Use 1 rod for each controller.
 - d. Connect controller to grounding rod with AWG 8 solid conductor copper wire.
 - e. Secure wire to grounding rod with brass or bronze clamp.
 - f. Locate the connection in a separate valve box.
 - g. Install primary surge protection arrestors on incoming power lines.
 - h. Attach wire markers to the ends of control wires inside the controller unit housing. Label wires with the identification number of the remote control valve to which the control wire is connected.
 - i. Install combination switch/GFCI outlet inside the controller pedestal or unit housing.
 - j. Connect control wires to the corresponding controller terminal.
- C. Control Wire:
 - 1. Control wiring may be chiseled into the soil with a vibratory plow device specifically manufactured for pipe pulling and wire installation. Use appropriate chisel to feed wire into a chute on the chisel. Do not subject wire to pulling tension. Minimum burial depth must equal minimum cover.
 - 2. Provide a 24-inch excess length of wire in an 8-inch diameter loop at each 90 degree change of direction, at both ends of sleeves, and at 100-foot intervals along continuous runs of wiring. Do not tie wiring loop. Coil 24-inch length of wire within each remote control valve box.
 - 3. Install common ground wire and 1 control wire for each remote control valve. Multiple valves on a single control wire are not permitted.
 - 4. If a control wire must be spliced, make splice with 3M DBY wire connectors and waterproof sealant, installed per the manufacturer's instructions. Locate splice in a valve box that contains an irrigation valve assembly, or in a separate 10-inch minimum round valve box.
 - 5. Use same procedure for connection to valves as for in-line splices.
 - 6. Unless noted on Drawings, install wire parallel with and below PVC mainline pipe.
- D. Instrumentation: Install electrical connections between central control unit components and sensors per manufacturer's recommendations.
- E. Power Wire:
 - 1. Route power wire as directed.
 - 2. Install with a minimum number of field splices. Make required splices with manufacturer's recommended connector. Locate all splices in a separate 12-inch standard valve box. Coil 2 feet of wire in valve box.
 - 3. Lay all power wire in trenches. Vibratory plow is not permitted.
 - 4. Use green wire as common ground wire from power source to all satellites.
 - 5. Carefully backfill around power wire to avoid damage to wire insulation or wire connectors.
 - 6. Unless noted otherwise on Drawings, install wire parallel with and 2 inches below top of mainline pipe.
 - 7. Encase wire not installed with PVC mainline pipe in electrical conduit with a continuous run of warning tape placed in the backfill, 6 inches above the wiring.

- F. Communication Cable:
 - 1. Install with a minimum of field splices. Make required splices with manufacturer's recommended connector. Locate all splices in housing afforded by other control system components or a separate 12-inch standard valve box. Coil 2 feet of communication cable in valve box.
 - 2. Lay in trenches and install in conduit. Vibratory plow is not permitted.
 - 3. Carefully backfill around communication cable to avoid damage to wire insulation or wire connectors.
 - 4. Unless noted otherwise on Drawings, install wire parallel with and below mainline pipe.
 - 5. Encase wire not installed with PVC mainline pipe in electrical conduit.

3.11 TESTING AND OPERATION

- A. Run tests in the presence of Engineer and/or Parks and Forestry staff. Schedule tests a minimum of 48 hours in advance.
- B. Repeat of tests, replacement of components, and correction of deficiencies to be at no additional cost to City.
- C. Operational Test:
 - 1. Activate each remote control valve in sequence from controller or remote in presence of Engineer and/or Parks and Forestry staff.
 - 2. Replace defective remote control valve, solenoid, wiring, or appurtenance to correct operational deficiencies.
 - 3. Replace, adjust, or move water emission devices to correct operational or coverage deficiencies.
 - 4. Replace defective pipe, fitting, joint, valve, sprinkler, or appurtenance to correct leakage problems. Cement or caulking is prohibited.
 - 5. Repeat tests until each lateral passes.
- D. Communication Cable:
 - 1. Test for leaks to ground per manufacturer's recommendations.
 - 2. Test results must meet or exceed manufacturer's guidelines for acceptance.
 - 3. Replace defective wire, underground splices, or appurtenances.
 - 4. Repeat test until manufacturer's guidelines are met.
- E. Control System Grounding:
 - 1. Test for proper grounding of control system per manufacturer's recommendations.
 - 2. Test results must meet or exceed manufacturer's guidelines for acceptance.
 - 3. Replace defective wire, grounding rod, or appurtenances.
 - 4. Repeat test until manufacturer's guidelines are met.

3.12 FIELD QUALITY CONTROL

- A. Ensure complete coverage of the areas shown on the Drawings to be irrigated, without excessive overthrow onto streets, driveways, sidewalks, and buildings.
- B. Flush all lines and ensure all air is expelled from the system.
- C. Ensure the satisfactory operation of the entire system, and that it is complete and perfect in every detail.

3.13 PROJECT RECORD DRAWINGS

- A. Document changes to the design.
- B. Do not permanently cover work until as-built information is recorded.
- C. Record pipe, head, and wiring network alterations.
- D. Record accurate locations of each irrigation system valve, each backflow prevention device, each controller or control unit, each sleeve end, each stub-out for future pipe or wiring connections, and other irrigation components enclosed within a valve box.
- E. Operations and Maintenance Manual to include:
 - 1. Catalogues of materials used.
 - 2. Parts list.
 - 3. Summary of all operations (spring startup, winterization techniques, controller programming, valve cleaning, sprinkler adjustment, backflow prevention, etc.).
 - 4. Names and address of local distributors.

3.14 WINTERIZATION AND SPRING START-UP

- A. Winterize the system in the first fall after installation and start-up the system in the first spring after installation.
- B. Repair any damage caused by improper winterization at no additional cost to the City.
- C. Coordinate the winterization and start-up with Engineer and/or Parks staff.
- D. Provide training and familiarization of the irrigation system to the Engineer and/or Parks staff.

3.15 FINAL ACCEPTANCE

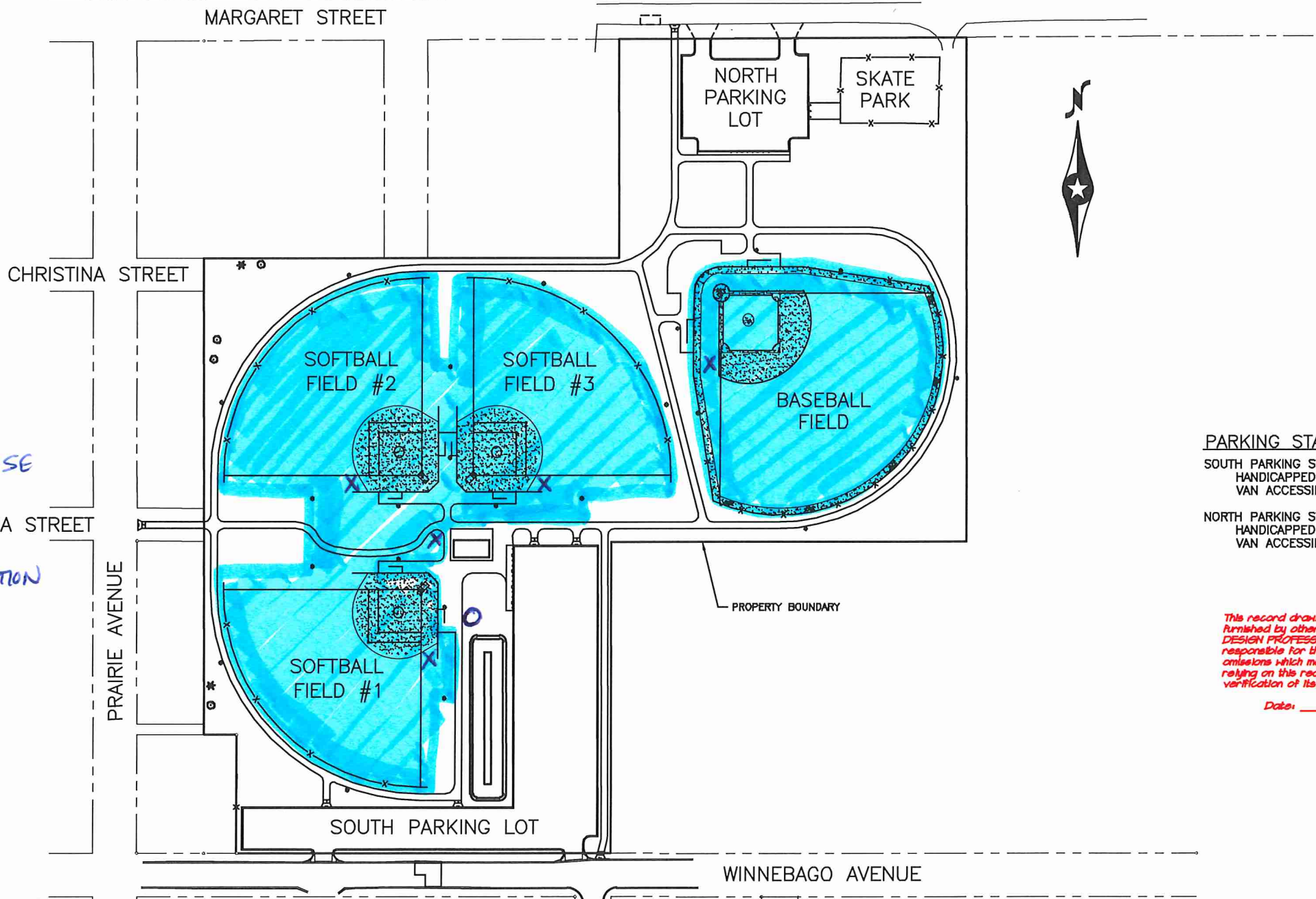
- A. Request final acceptance inspection from the Parks at least 30 days before the end of the one year maintenance period.
- B. Provide Parks staff with operating keys, servicing tools, warranties, and maintenance manuals. Deliver to the Engineer and/or Parks office; delivery at the project site is not acceptable.

3.16 CLEAN-UP

- A. Continuously keep a neat and orderly area.
- B. Dispose of rubbish and waste material resulting from the installation on a continual basis.
- C. Upon completion of the system, remove all temporary structures, rubbish, waste material, tools, and equipment.
- D. Cleaning of the project site is considered incidental and is not a pay item.

END OF SECTION

Record drawings from construction of the fields in 2011.
See plan sheets for details of previous installation.
All areas in BLUE should be included in the design of the irrigation system.



X - 1/2" AT GRADE HOSE CONNECTIONS

o - PROPOSED PUMP STATION LOCATION

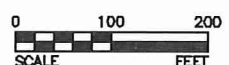
PARKING STALLS

SOUTH PARKING STALLS PROVIDED: 262
HANDICAPPED ACCESSIBLE: 8
VAN ACCESSIBLE: 8

NORTH PARKING STALLS PROVIDED: 73
HANDICAPPED ACCESSIBLE: 4
VAN ACCESSIBLE: 4

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Date: 1/2/13 By: Jason Zinter



I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Gregory A. Mitchell
GREGORY A. MITCHELL
LIC. NO. 23467 DATE: JULY 15, 2011

DESIGNED: JVZ
DRAWN: MKC
CHECKED: GAM

BOLTON & MENK, INC.
Consulting Engineers & Surveyors

MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN WILLMAR, MN BURNSVILLE, MN
CHASKA, MN RAMSEY, MN MAPLEWOOD, MN BRAINERD, MN AMES, IA

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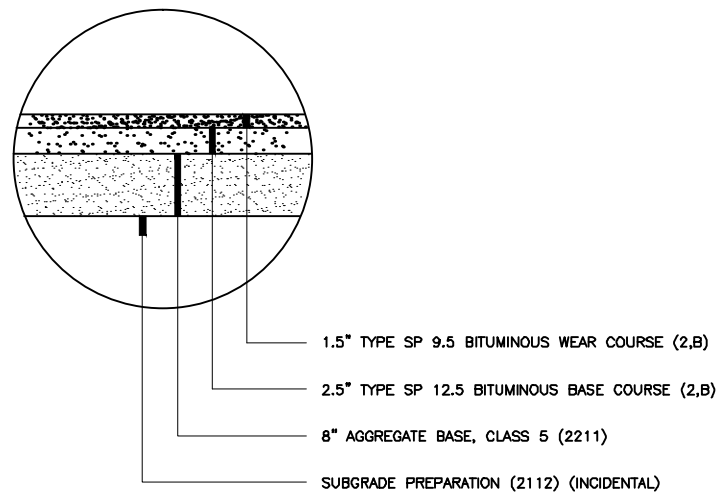
CITY OF FAIRMONT, MINNESOTA
WINNEBAGO AVENUE SPORTS COMPLEX

SITE SCHEMATIC

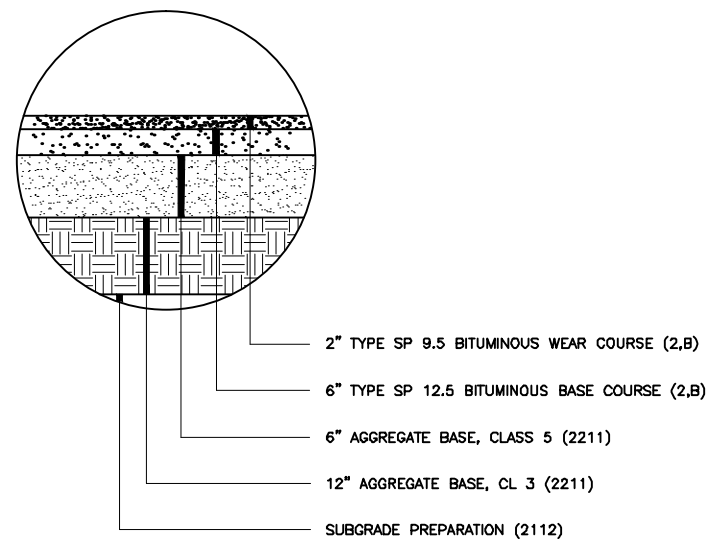
SHEET
1.3

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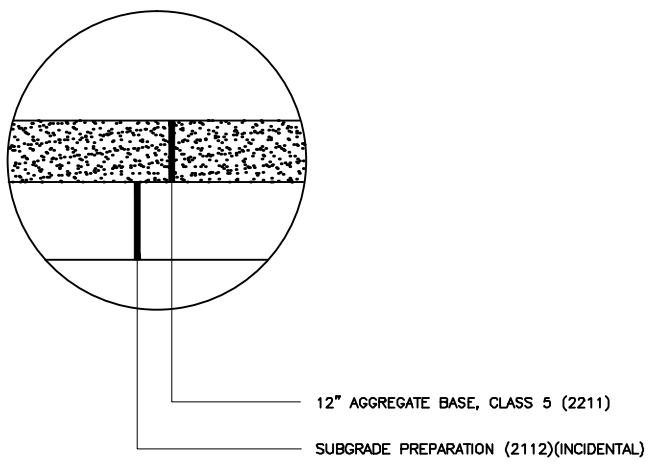
Date: 1/2/13 By: Jason Zinter



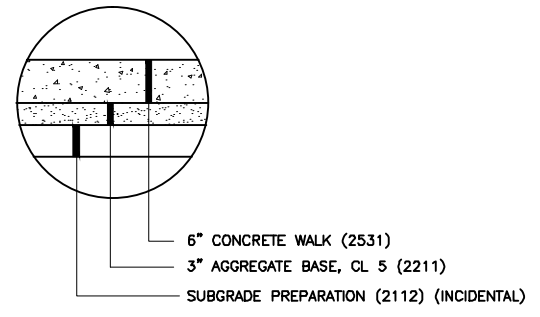
PARKING LOT PAVEMENT SECTION
NOT TO SCALE



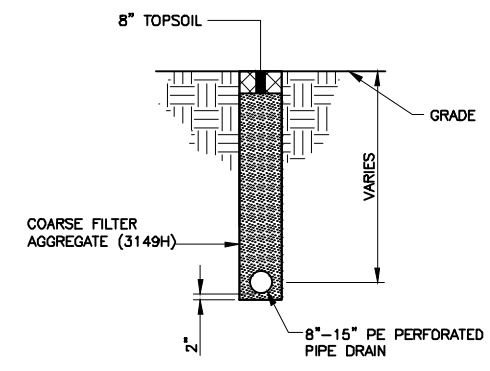
WINNEBAGO AVENUE BITUMINOUS PATCH SECTION
NOT TO SCALE



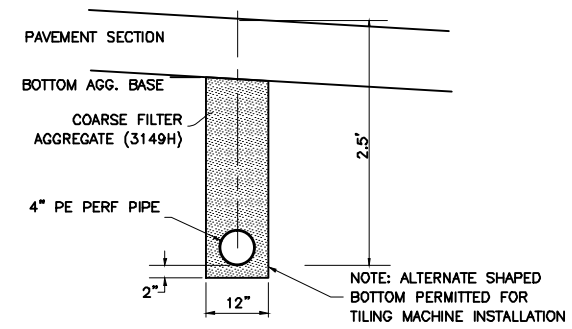
GRAVEL SURFACING SECTION
NOT TO SCALE



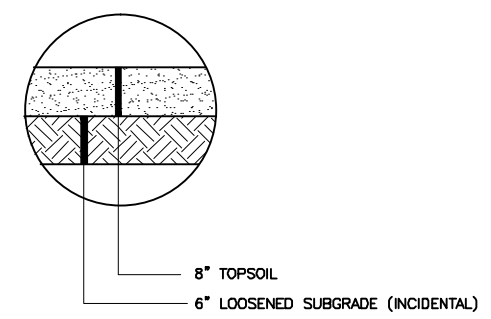
CONCRETE SIDEWALK
NOT TO SCALE



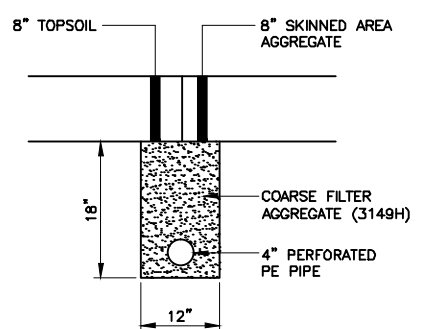
SUBSURFACE DRAIN PIPE
NOT TO SCALE



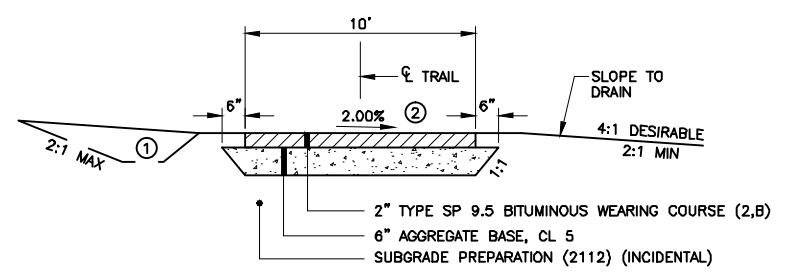
PARKING LOT SUBSURFACE DRAIN PIPE
NOT TO SCALE



TURF AREA SECTION
NOT TO SCALE

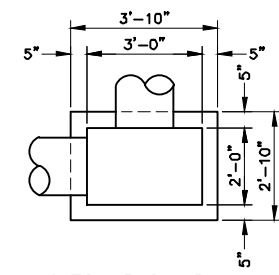


BALL FIELD SUBSURFACE DRAIN PIPE
NOT TO SCALE

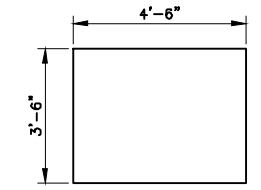


- ① DITCH IF REQUIRED FOR DRAINAGE
- ② SLOPE TOWARDS INSIDE OF CURVE

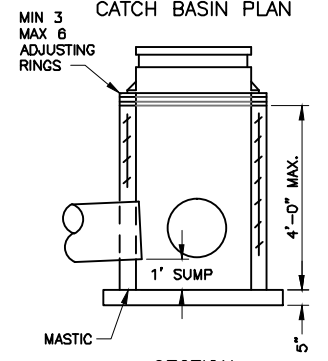
BITUMINOUS TRAIL
NOT TO SCALE



CATCH BASIN PLAN



BASE SLAB PLAN



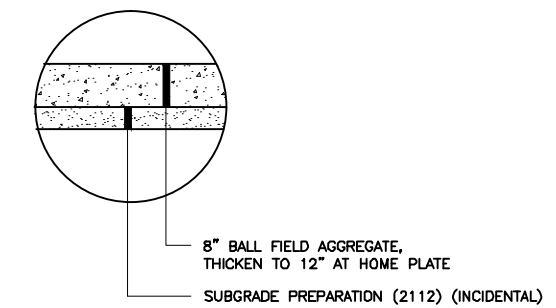
SECTION

CATCH BASIN STRUCTURE DESIGN R-1 (2'x3')

NOT TO SCALE

NOTES:

- 1. CASTING PER CONSTRUCTION DOCUMENTS
- 2. PIPE CUT-OUTS PER CONSTRUCTION DOCUMENTS
- 3. ALTERNATE CAST-IN-PLACE BASE CAN BE USED
- 4. MIN REINFORCING SHALL BE WIRE FABRIC HAVING AN AREA OF NOT LESS THAN 0.12 SQ IN PER FOOT IN BOTH DIRECTIONS



BALL FIELD SKINNED AREA SECTION
NOT TO SCALE

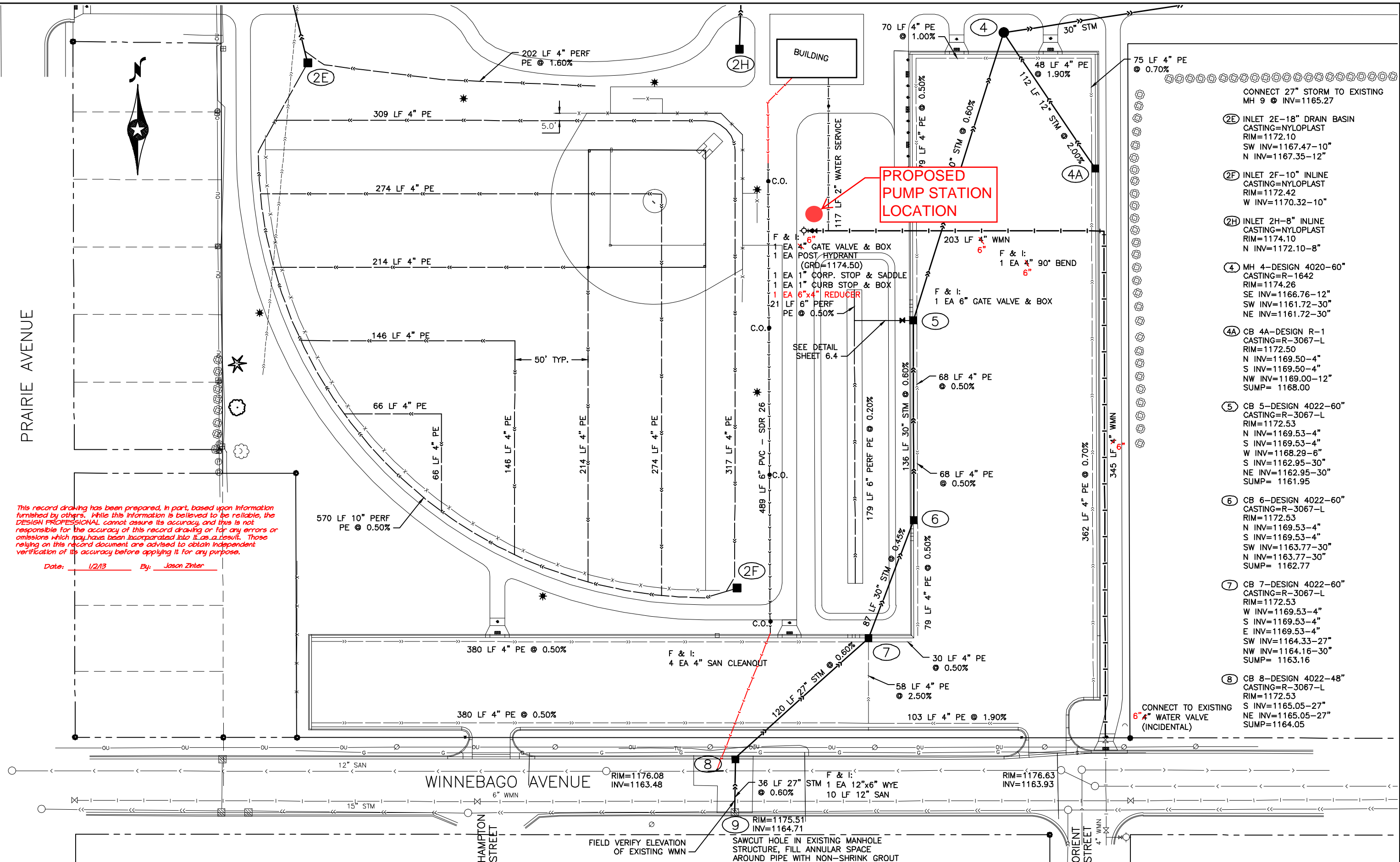


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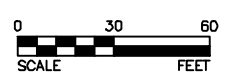
PRAIRIE AVENUE

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Date: 1/2/13 By: Jason Zinter



- CONNECT 27" STORM TO EXISTING MH 9 @ INV=1165.27
- ②E INLET 2E-18" DRAIN BASIN
CASTING=NYLOPLAST
RIM=1172.10
SW INV=1167.47-10"
N INV=1167.35-12"
- ②F INLET 2F-10" INLINE
CASTING=NYLOPLAST
RIM=1172.42
W INV=1170.32-10"
- ②H INLET 2H-8" INLINE
CASTING=NYLOPLAST
RIM=1174.10
N INV=1172.10-8"
- ④ MH 4-DESIGN 4020-60"
CASTING=R-1642
RIM=1174.26
SE INV=1166.76-12"
SW INV=1161.72-30"
NE INV=1161.72-30"
- ④A CB 4A-DESIGN R-1
CASTING=R-3067-L
RIM=1172.50
N INV=1169.50-4"
S INV=1169.50-4"
NW INV=1169.00-12"
SUMP= 1168.00
- ⑤ CB 5-DESIGN 4022-60"
CASTING=R-3067-L
RIM=1172.53
N INV=1169.53-4"
S INV=1169.53-4"
W INV=1168.29-6"
S INV=1162.95-30"
NE INV=1162.95-30"
SUMP= 1161.95
- ⑥ CB 6-DESIGN 4022-60"
CASTING=R-3067-L
RIM=1172.53
N INV=1169.53-4"
S INV=1169.53-4"
SW INV=1163.77-30"
N INV=1163.77-30"
SUMP= 1162.77
- ⑦ CB 7-DESIGN 4022-60"
CASTING=R-3067-L
RIM=1172.53
W INV=1169.53-4"
S INV=1169.53-4"
E INV=1169.53-4"
SW INV=1164.33-27"
NW INV=1164.16-30"
SUMP= 1163.16
- ⑧ CB 8-DESIGN 4022-48"
CASTING=R-3067-L
RIM=1172.53
S INV=1165.05-27"
NE INV=1165.05-27"
SUMP=1164.05



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DESIGNED: JVZ
 DRAWN: MKC
 CHECKED: GAM

GREGORY A. MITCHELL
 LIC. NO. 23497 DATE JULY 15, 2011

BOLTON & MENK, INC.
 Consulting Engineers & Surveyors

MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN WILLMAR, MN BURNSVILLE, MN
 CHASKA, MN RAMSEY, MN MAPLEWOOD, MN BRAINERD, MN AMES, IA

REV.	BY	DATE

CITY OF FAIRMONT, MINNESOTA
 WINNEBAGO AVENUE SPORTS COMPLEX
 UTILITY PLAN
 SOUTH PARKING LOT & SOFTBALL FIELD

SHEET 8.1

- ② MH 2-DESIGN-4020-60"
CASTING=R-2573
RIM=1170.00
W INV=1157.30-15"
S INV=1157.16-30"
NE INV=1157.16-30"
SUMP=1156.16
- ②A MH 2A-DESIGN 4020-48"
CASTING=R-2573
RIM=1170.37
S INV=1159.49-8"
W INV=1158.09-15"
E INV=1158.09-15"
SUMP=1157.09



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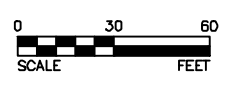
Date: 1/2/13 By: Jason Zinter

CHRISTINA ST

- ②B MH 2B-DESIGN 4020-48"
CASTING=R-2573
RIM=1168.65
S INV=1163.51 -8"
W INV=1159.50-12"
E INV=1159.32-15"
SUMP=1158.32
- ②C INLET 2C-18" DRAIN BASIN
CASTING=NYLOPLAST
RIM=1170.09
SW INV=1163.68-12"
NW INV=1163.68-12"
- ②D INLET 2D-18" DRAIN BASIN
CASTING=NYLOPLAST
RIM=1171.08
S INV=1166.71-12"
N INV=1166.71-12"
- ②G INLET 2G-18" DRAIN BASIN
CASTING=NYLOPLAST
RIM=1172.80
S INV=1170.77-8"
N INV=1170.77-8"
- ②I INLET 2I-8" INLINE
CASTING=NYLOPLAST
RIM=1169.15
N INV=1167.15-8"
- ③ MH 3-DESIGN 4020-72"
CASTING=R-2573
RIM=1169.00
E INV=1161.91-12"
W INV=1160.14-30"
N INV=1160.14-30"
SUMP=1159.14

PRAIRIE AVENUE

ANNA ST



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Gregory A. Mitchell
GREGORY A. MITCHELL
LIC. NO. 23497 DATE JULY 15, 2011

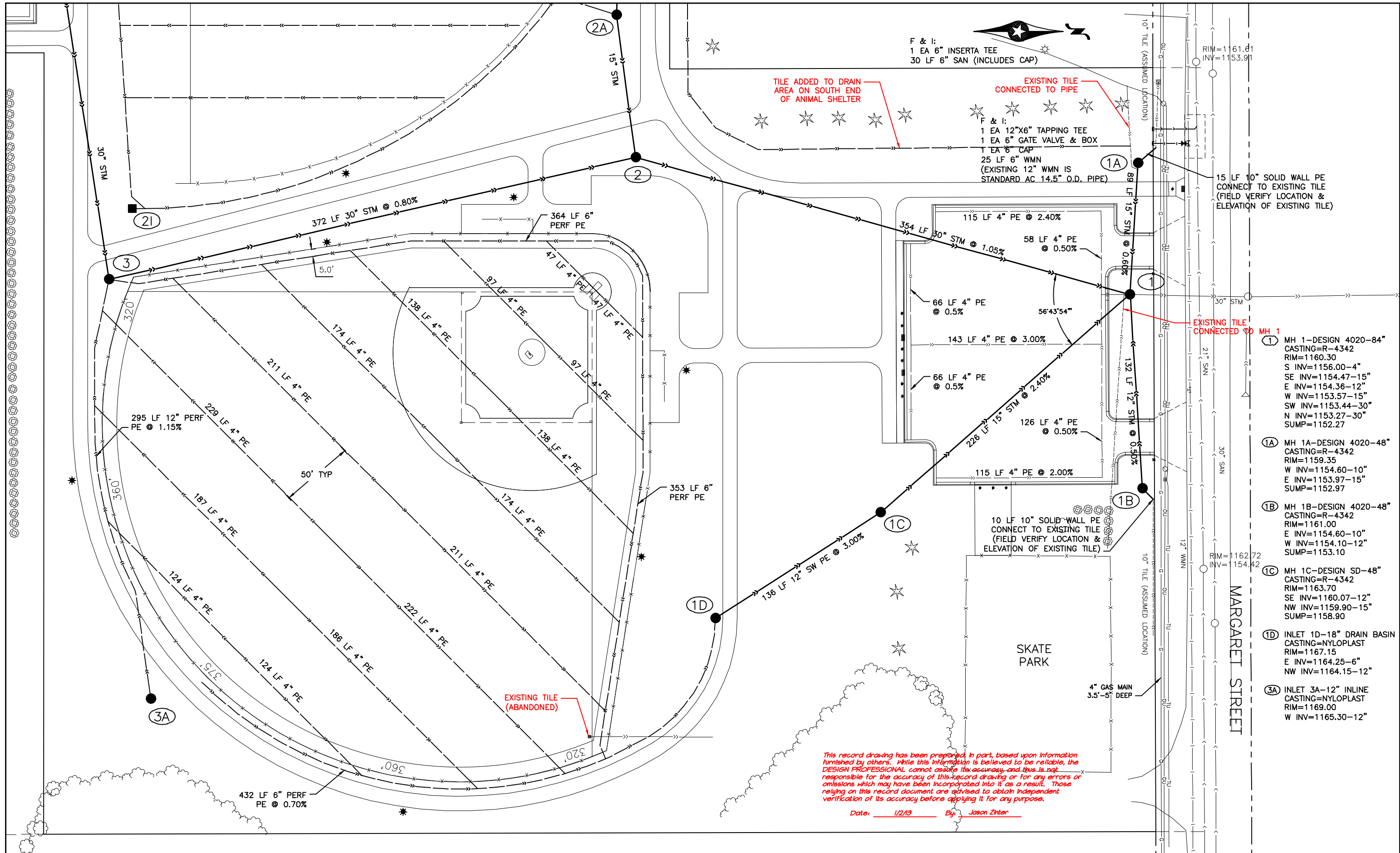
DESIGNED
JVZ
DRAWN
MKC
CHECKED
GAM

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Consulting Engineers & Surveyors
MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN WILLMAR, MN BURNSVILLE, MN
CHASKA, MN RAMSEY, MN MAPLEWOOD, MN BRAINERD, MN AMES, IA

REV.	BY	DATE

CITY OF FAIRMONT, MINNESOTA
WINNEBAGO AVENUE SPORTS COMPLEX
UTILITY PLAN
SOFTBALL FIELD

SHEET
8.2



F & I:
1 EA 6" INSERTA TEE
30 LF 6" SAN (INCLUDES CAP)

TILE ADDED TO DRAIN
AREA ON SOUTH END
OF ANIMAL SHELTER

EXISTING TILE
CONNECTED TO PIPE

F & I:
1 EA 12"x6" TAPPING TEE
1 EA 6" GATE VALVE & BOX
1 EA 6" CAP
25 LF 6" WMN
(EXISTING 12" WMN IS
STANDARD AC 14.5" O.D. PIPE)

RIM=1161.81
INV=1153.91

15 LF 10" SOLID WALL PE
CONNECT TO EXISTING TILE
(FIELD VERIFY LOCATION &
ELEVATION OF EXISTING TILE)

EXISTING TILE
CONNECTED TO

MH 1
MH 1-DESIGN 4020-84"
CASTING=R-4342
RIM=1160.30
S INV=1156.00-4"
SE INV=1154.47-15"
E INV=1154.36-12"
W INV=1153.57-15"
SW INV=1153.44-30"
N INV=1153.27-30"
SUMP=1152.27

MH 1A-DESIGN 4020-48"
CASTING=R-4342
RIM=1159.35
W INV=1154.60-10"
E INV=1153.97-15"
SUMP=1152.97

MH 1B-DESIGN 4020-48"
CASTING=R-4342
RIM=1161.00
E INV=1154.60-10"
W INV=1154.10-12"
SUMP=1153.10

MH 1C-DESIGN SD-48"
CASTING=R-4342
RIM=1163.70
SE INV=1160.07-12"
NW INV=1159.90-15"
SUMP=1158.90

INLET 1D-18" DRAIN BASIN
CASTING=NYLOPLAST
RIM=1167.15
E INV=1164.25-6"
NW INV=1164.15-12"

INLET 3A-12" INLINE
CASTING=NYLOPLAST
RIM=1169.00
W INV=1165.30-12"

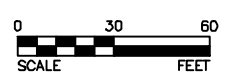
10 LF 10" SOLID WALL PE
CONNECT TO EXISTING TILE
(FIELD VERIFY LOCATION &
ELEVATION OF EXISTING TILE)

SKATE
PARK

4" GAS MAIN
3.5'-5" DEEP

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Date: 1/2/13 By: Jason Zinter



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Gregory A. Mitchell
GREGORY A. MITCHELL
LIC. NO. 23487 DATE JULY 15, 2011

DESIGNED: JVZ
DRAWN: MKC
CHECKED: GAM

BOLTON & MENK, INC.
Consulting Engineers & Surveyors
MANKATO, MN FAIRMONT, MN SLEEPY EYE, MN WILLMAR, MN BURNSVILLE, MN
CHASKA, MN RAMSEY, MN MAPLEWOOD, MN BRAINERD, MN AMES, IA

REV.	BY	DATE

CITY OF FAIRMONT, MINNESOTA
WINNEBAGO AVENUE SPORTS COMPLEX
UTILITY PLAN
NORTH PARKING LOT & BASEBALL FIELD

SHEET
8.3