

STORM WATER SEWER TRUNK LINE DRAINAGE IMPROVEMENTS

TO SERVE

NEW MARKET SQUARE- PHASE 2

CITY OF WICHITA PRIVATE PROJECT NO. 1582 PPS (607861)

CITY OF WICHITA, KANSAS

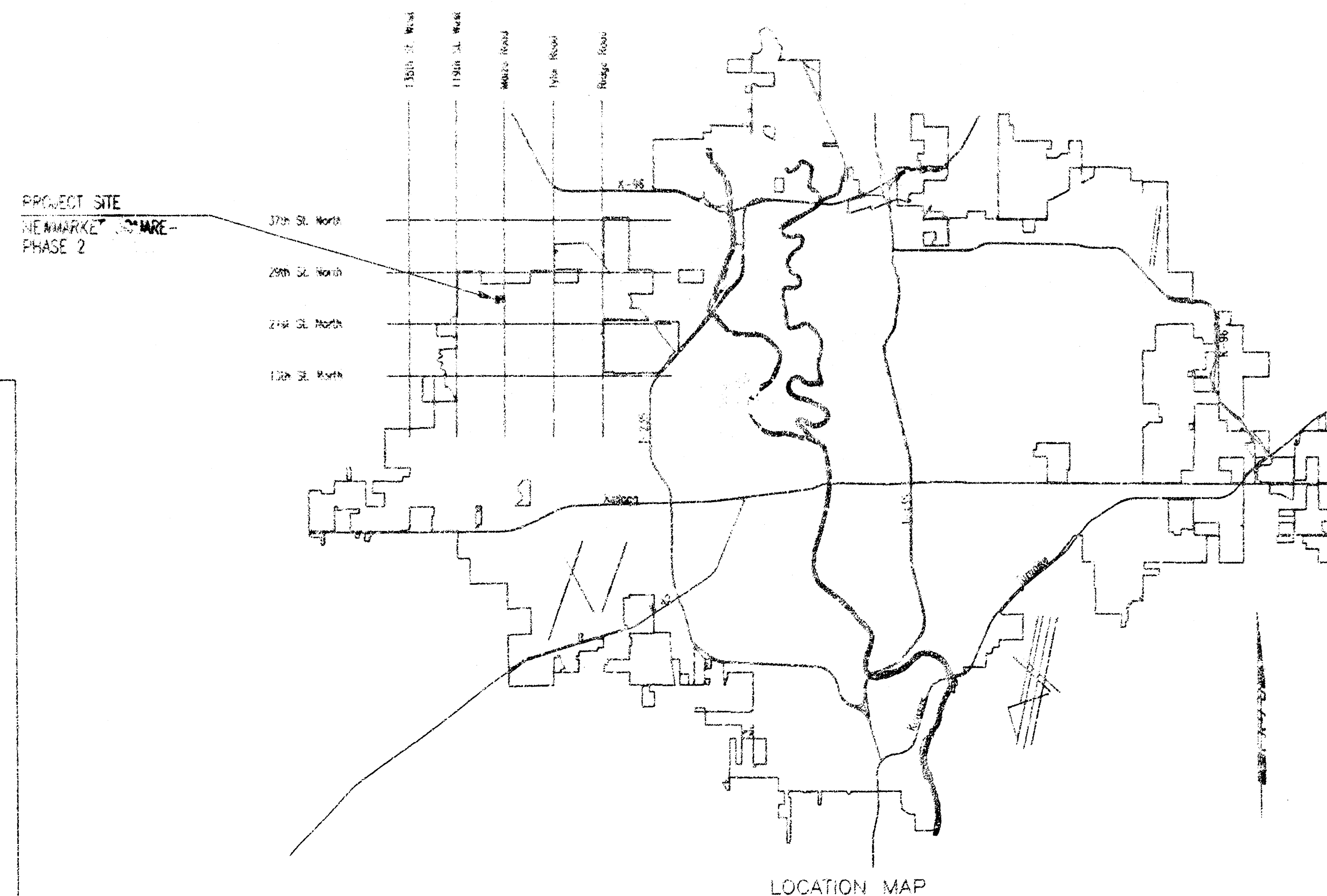
JAMES L. ARMOUR, P.E.-CITY ENGINEER

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GENERAL NOTES

1. EXISTING UTILITIES AND THEIR LOCATION AS SHOWN ON THE PLAN REPRESENT THE BEST INFORMATION OBTAINABLE FOR LOCATION. INFORMATION HAS BEEN OBTAINED FROM THE CITY OF WICHITA AND IS SUBJECT TO CHANGE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR WORKING AROUND EXISTING UTILITIES WHICH DO NOT CORRELATE WITH PROVIDED LOCATIONS.
2. PUBLIC FROM THE REMOVAL OF MISCELLANEOUS STRUCTURES SHALL BE OBTAINED AT THE SITE TO BE PROVIDED BY THE CONTRACTOR AND APPROVED AS NOTED BELOW.
3. ALL DISPOSAL SITES MUST BE APPROVED BY THE KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT. MATERIAL EITHER STOCKPILED OR DISPOSED OF IN A FLOOD PLAIN MUST HAVE A KANSAS STATE BOARD OF AGRICULTURE PERMIT. ANY MATERIAL DUMPED IN WATERS OF THE UNITED STATES OR WETLANDS IS SUBJECT TO U.S. CORPS OF ENGINEERS PERMITTING REGULATIONS. ANY MATERIAL DUMPED OR STOCKPILED BEYOND APPROVED CONSTRUCTION LIMITS MUST HAVE ADDITIONAL ARCHEOLOGICAL INVESTIGATIONS UNLESS DUMPED IN A PREVIOUSLY APPROVED BURROW LOCATION.
4. CONTRACTOR SHALL SAFETY ITSELF OF SURFACE AND SUBSURFACE CONDITIONS PRIOR TO BEGINNING.
5. AT LEAST 72 HOURS PRIOR TO BEGINNING CONSTRUCTION (EXCLUDING WEEKENDS AND HOLIDAYS) THE CONTRACTOR SHALL CONTACT THE KANSAS ONE-CALL SYSTEM AT (816) 268-4555 TO REQUEST THE LOCAL UTILITY COMPANIES TO MARK ANY EXISTING LINES WITHIN THE PROJECT AREA.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PRESERVING PROPERTY LINES. THE CONTRACTOR SHALL BE REQUIRED TO RE-ESTABLISH ANY PROPERTY LINES WHICH ARE DAMAGED OR DESTROYED BY HIS CONSTRUCTION OPERATIONS. SUCH LINES SHALL BE RE-ESTABLISHED BY A LICENSED LAND SURVEYOR IN ACCORDANCE WITH STATE LAWS.
7. THE WATER DEPARTMENT SHALL FIELD LOCATE WATER VALVES ONE TIME DURING CONSTRUCTION. WHEN REQUESTED BY THE CONTRACTOR, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PREPARE SUCH FIELD LOCATIONS DURING THE CONSTRUCTION PROCESS. WATER VALVES, WATER VALVE BOXES, OR FIRE HYDRANTS DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.
8. THE CONTRACTOR SHALL APPLY PERMANENT SEED AND BY COMPLEX BLANKET TO ALL UNPAVED AREAS DISTURBED BY HIS CONSTRUCTION OPERATIONS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. SEED SHALL BE A RESILIENT SEED WELL SUITED TO SOUTH CENTRAL KANSAS APPLIED AT THE RATE OF 2 LBS. PER 1,000 SQUARE FEET. THIS WORK SHALL BE SUBSIDIARY TO SITE CLEARING AND RESTORATION.
9. THE MANHOLE COVERS TO BE USED ON THIS PROJECT ARE TO BE STORMWATER SPECIFIC AND SHOULD INCLUDE THE FOLLOWING STATEMENT: "NO DUMPING, DRAINS TO RIVER."
10. AT LEAST 12 HOURS PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL CONTACT THE CITY OF WICHITA AT (316) 268-4555 TO COORDINATE THE POSSIBLE WATERLINE RELOCATION AT STATION 17+26.71.
11. ALL IRRIGATION, LANDSCAPING, AND FENCING DISTURBED DURING CONSTRUCTION SHALL BE REPAIRED AND RESET/REPLACED IN KIND. THE CONTRACTOR SHALL PROVIDE A MINIMUM ADVANCE NOTICE OF FORTY-EIGHT (48) HOURS TO THE AFFECTED PROPERTY OWNERS PRIOR TO BEGINNING CONSTRUCTION. THIS WORK SHALL BE CONSIDERED SUBSIDIARY TO SITE CLEARING AND RESTORATION.
12. SEQUENCE OF PUMP OPERATIONS:
CONTRACTOR SHALL PROVIDE A NEW FLOAT CONTROL SYSTEM FOR THE EXISTING PUMP TO ACHIEVE THE FOLLOWING OPERATIONS:
ELEV = 158.00 LOW-WATER PUMP ON/OFF
UNDER THESE OPERATIONS AND LOW-WATER CONDITIONS, THE PUMP WILL BE TRIGGERED TO TURN ON AT ELEV = 158.00 AND CONTINUE TO REMOVE WATER FROM THE RESERVOIR UNTIL STATIC WATER ELEVATION IS ATTAINED AT ELEV = 159.00.



SEPTEMBER 2005

PLANS PREPARED BY
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
ENGINEERS
WICHITA, KANSAS

APPROVED AS NOTED
By CITY ENGINEER OF WICHITA

Sanitary Sewers _____

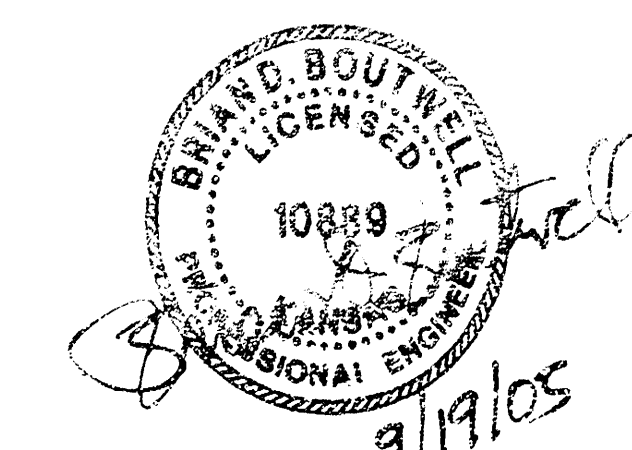
Storm Sewers ACK 9/20/05

Driveway Approaches _____

Paving _____

NOTE TO CONTRACTOR

INSPECTION AND TESTING FOR THIS PROJECT IS TO BE PROVIDED BY A LICENSED CONSULTING ENGINEERING FIRM CONTRACTED BY THE OWNER/DEVELOPER. SAID INSPECTION TO BE IN ACCORDANCE WITH THE CITY OF WICHITA STANDARD CONSTRUCTION ENGINEERING PRACTICES AND CERTIFIED BY A LICENSED PROFESSIONAL ENGINEER. NO WORK SHALL BE PERFORMED IN DEDICATED EASEMENTS OR PUBLIC RIGHT-OF-WAY BY THE CONTRACTOR UNTIL SUCH INSPECTION IS ARRANGED FOR AND REQUIRED BONDS HAVE BEEN SUBMITTED TO AND APPROVED BY THE CITY. NOW SHALL ANY WORK BE COMMENCED IN DEDICATED EASEMENTS OR PUBLIC RIGHT-OF-WAY WITHOUT WRITTEN AUTHORIZATION BY THE CITY ENGINEER. IMPROVEMENTS PERFORMED UNDER THIS PROJECT SHALL NOT BE ACCEPTED BY THE CITY UNTIL ALL APPLICABLE DOCUMENTATION HAS BEEN SUBMITTED TO THE CITY ENGINEER. THIS MAY INCLUDE: RECORD DRAWINGS, INSPECTION LOGS, TEST DOCUMENTATION, TV TAPES, AND A CERTIFICATE OF COMPLETION. THE ABOVE SHALL BE PERFORMED BY THE CONSULTING FIRM CONTRACTED TO INSPECT THIS PROJECT.

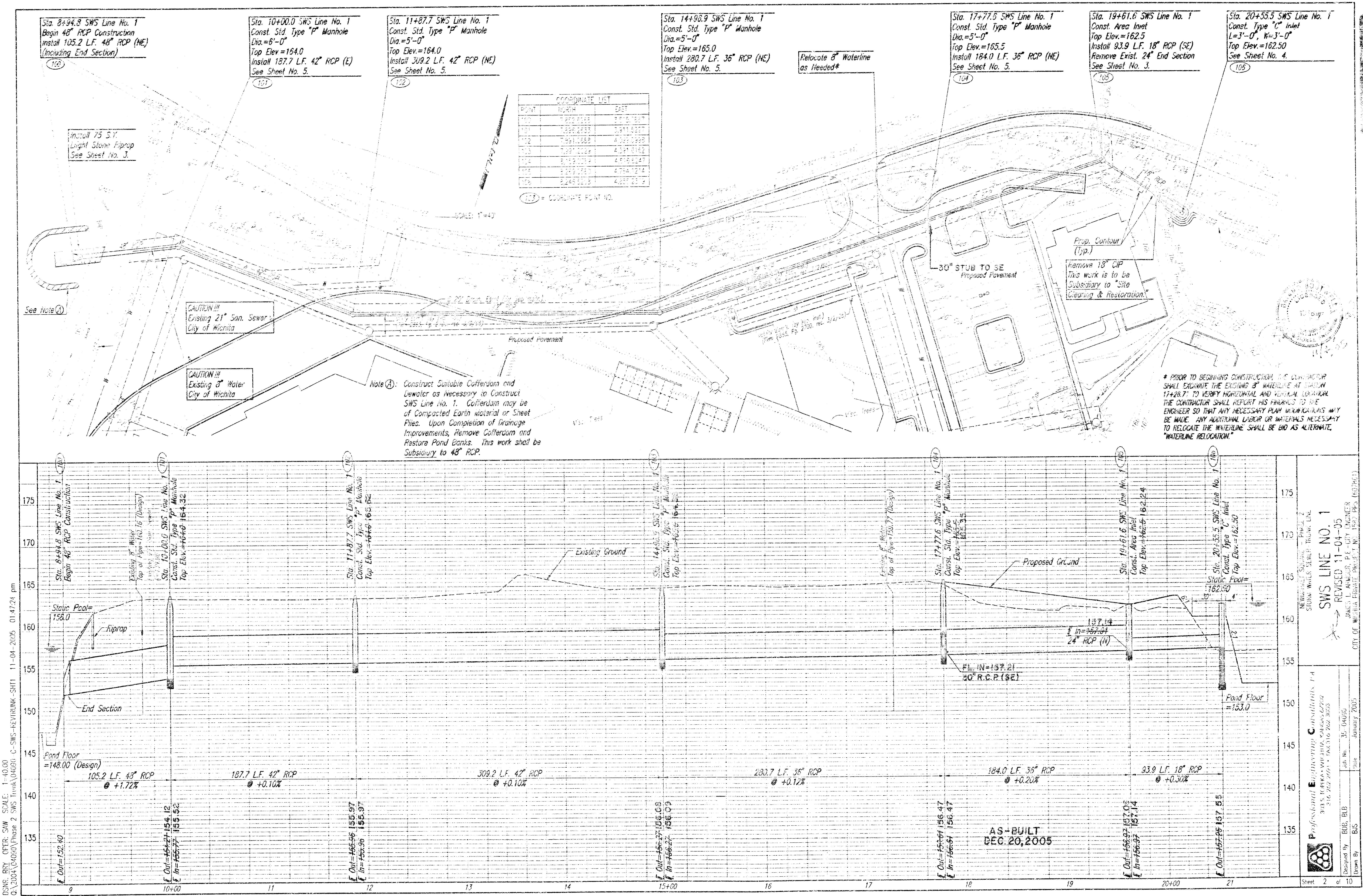


AS-BUILT DEC. 20, 2005

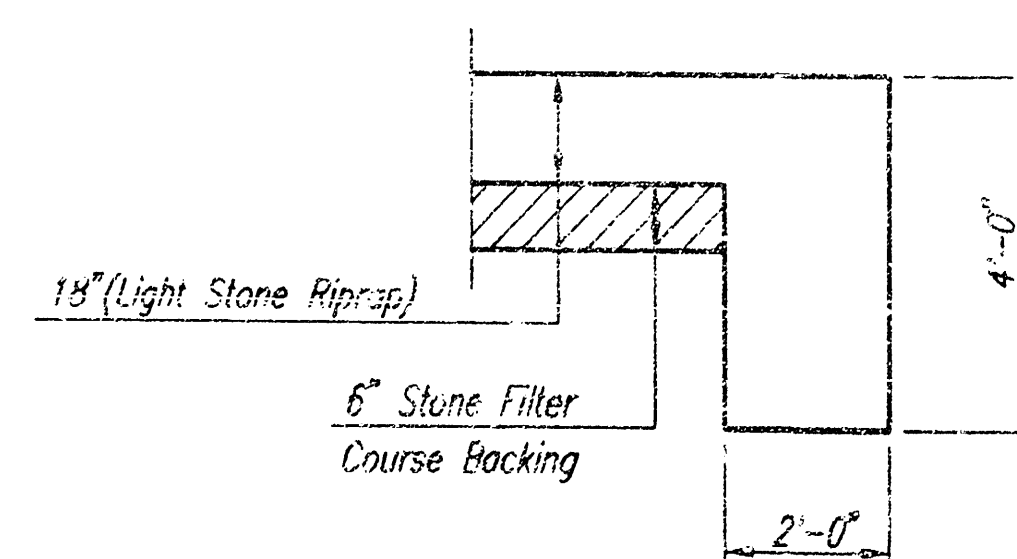
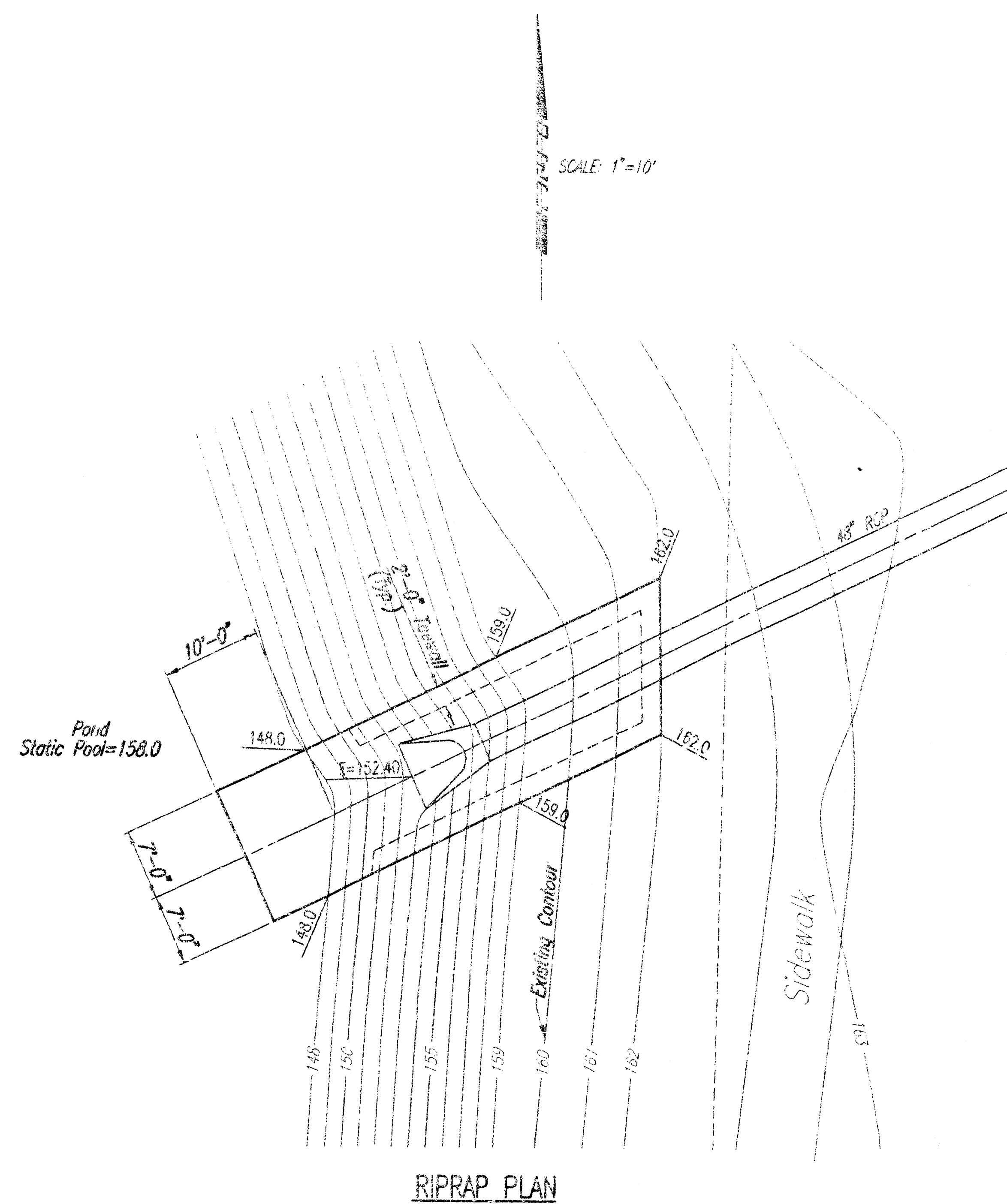
PLAN

PROFILE

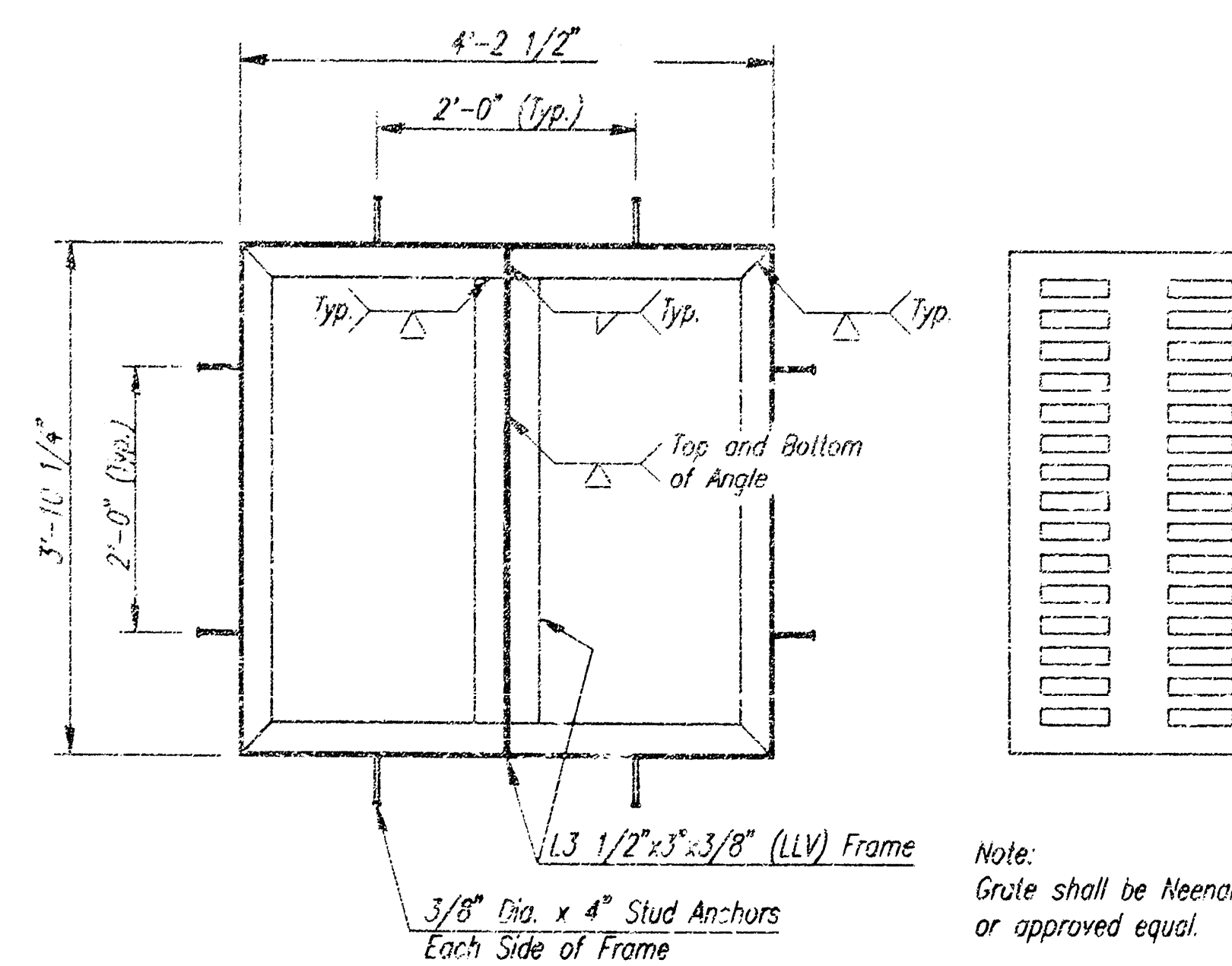
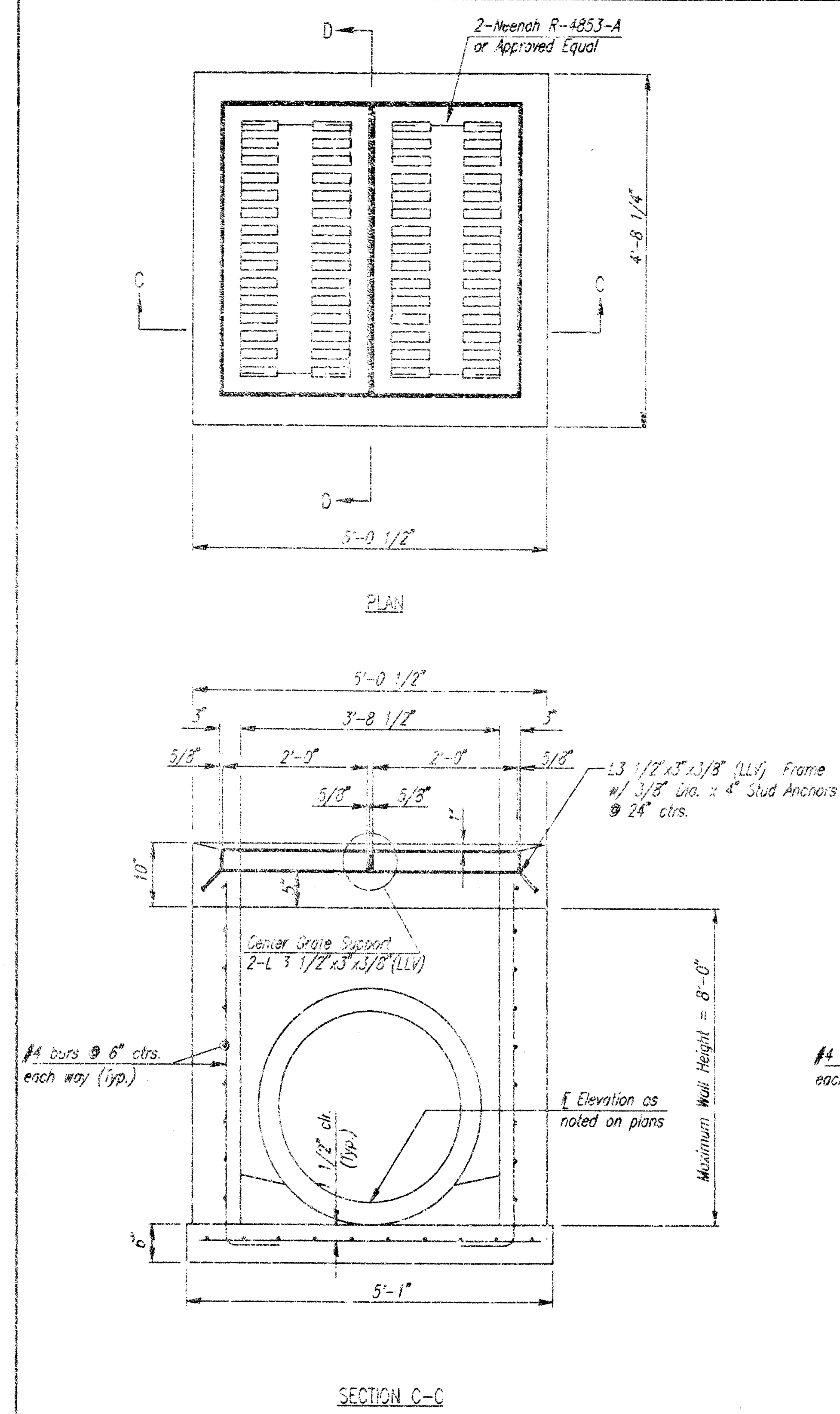
DSM, RY, QTR, SAW SCALE: 1"=40.00'



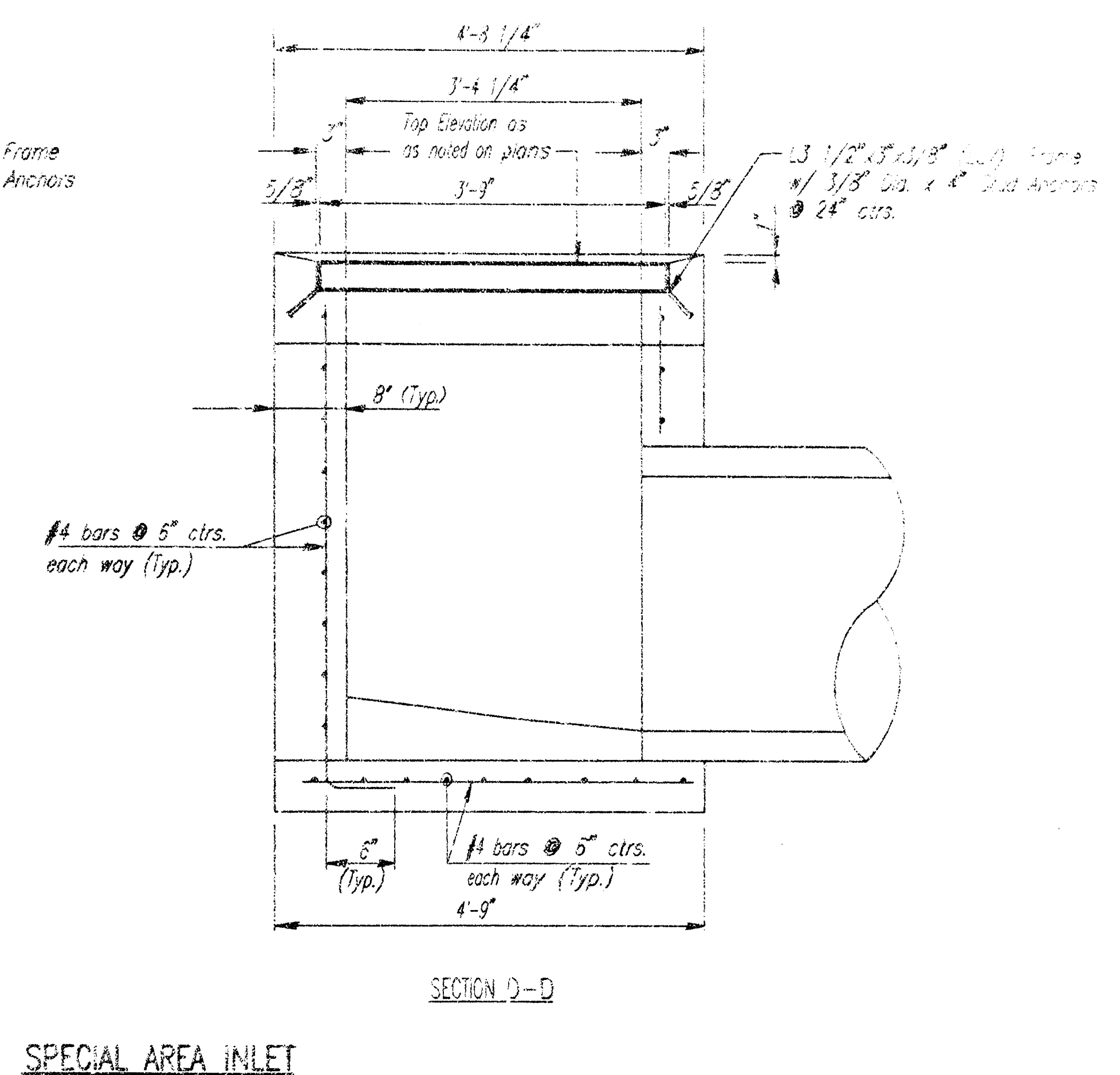
SWS LINE NO. 1
REVISED 11-04-05
CITY OF WICHITA
SHEET 2 OF 10



- ### NOTES
1. ALL RIPRAP FOR THIS PROJECT SHALL BE NATURAL STONE. NEITHER BROKEN CONCRETE, FABRIC ENVELOPE, NOR PREMIXED DRY PACKAGED CONCRETE BAG ALTERNATES WILL BE ALLOWED.
 2. TOWELMATS SHALL BE INSTALLED ALONG ALL EDGES OF STONE RIPRAP.
 3. GROUTING OF THE SURFACE OF THE RIPRAP SHALL NOT BE PERFORMED. GROUTING OF THE TOWELMATS SHALL BE PERFORMED PER CITY SPECIFICATIONS.
 4. DEPTH OF TOWELMATS SHALL NOT BE DEEPER THAN THE POND FLOOR (POND ELEV=148.0)



FRAME DETAIL
(For Special Area Inlet)
Note:
Frame to mate with 2 Neenoh R-4853-A Grotos
or approved equal.



GENERAL NOTES

CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4000 PSI
ALL PIPES SHALL BE FLUSH OUT PRIOR TO BEING CAST INTO WALLS

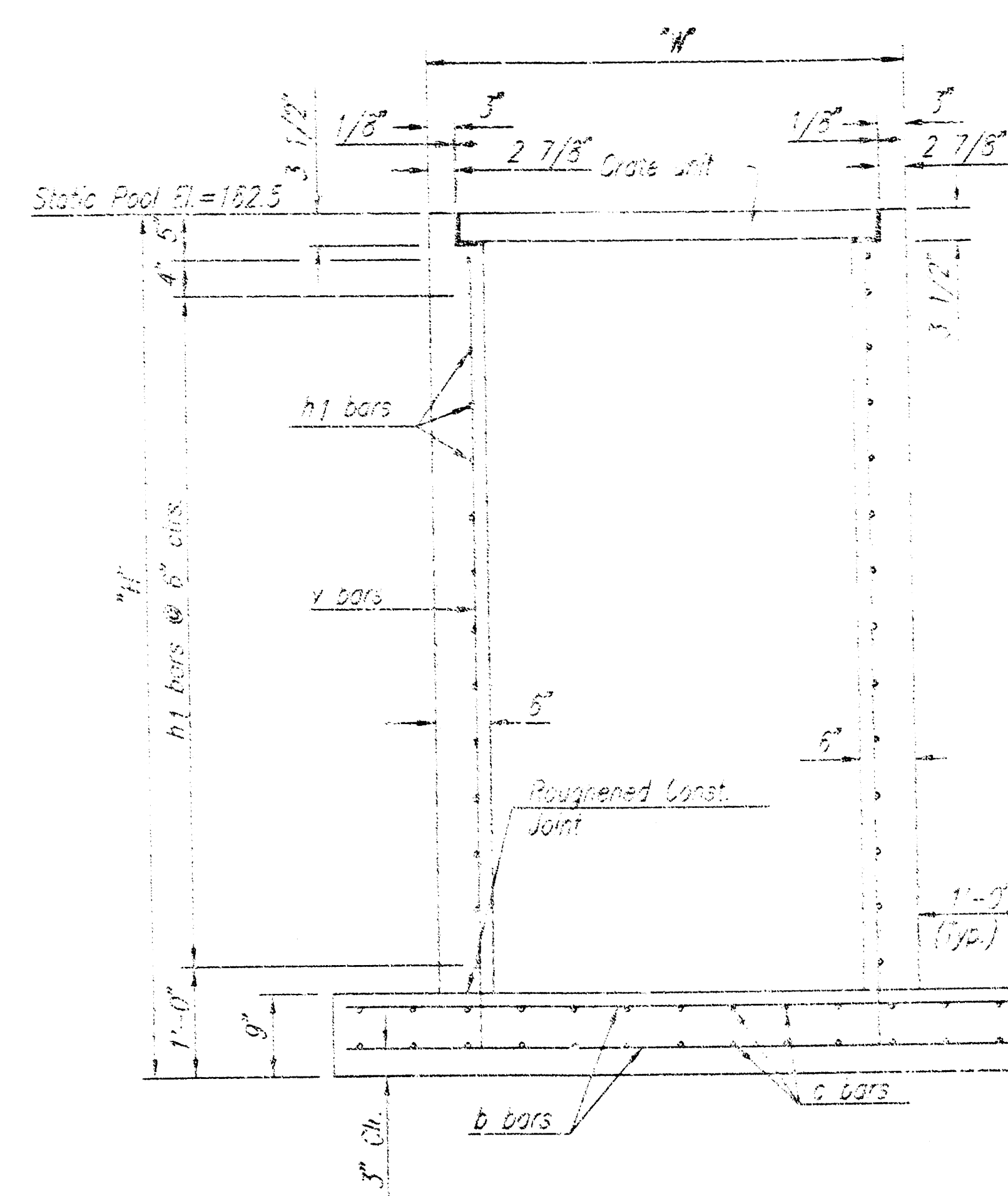
REINFORCING STEEL SHALL BE GRADE 60, A.S.T.M. A615.
ALL DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO THE
CENTERLINE OF BARS UNLESS OTHERWISE NOTED.

INLET CASTINGS SHALL BE MANUFACTURED USING DUCTILE IRON
CONFORMING TO ASTM A536-80, GRADE 65-45-12.
DIMENSIONS AND WEIGHTS SHOWN ON THE DETAILED DRAWINGS SHALL BE
CONSIDERED AS MINIMUM REQUIREMENTS AND ANY DEVIATIONS FROM THE
DIMENSIONS SHOWN MUST BE SPECIFICALLY APPROVED. THE FINISHED
CASTINGS SHALL BE OF UNIFORM QUALITY, FREE FROM BLOWHOLES,
POROSITY, HARD SPOTS, SHRINKAGE DISTORTIONS OR OTHER DEFECTS.

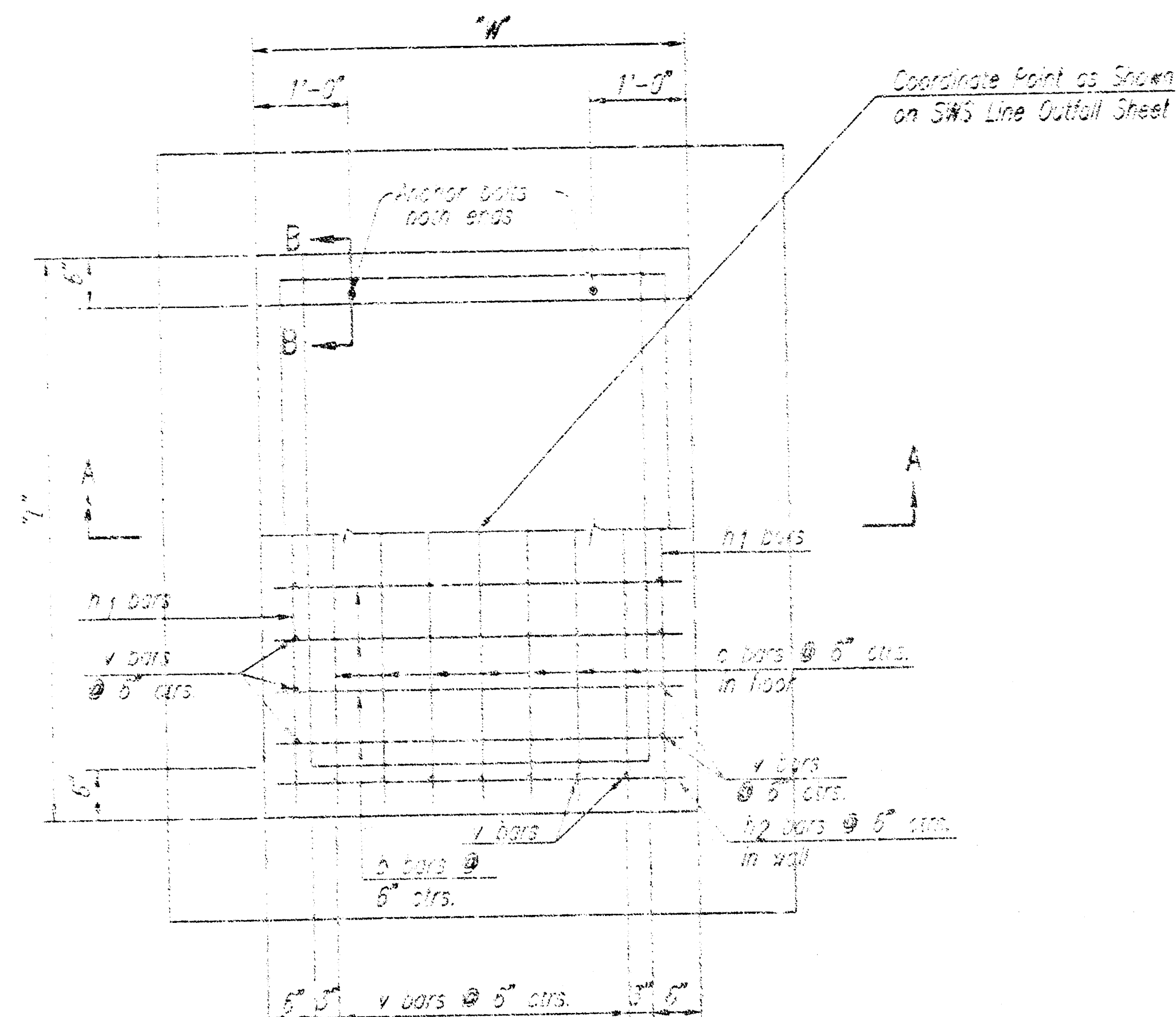
INLET FLOOR SHALL BE SHAPED WITH UNREINFORCED CONCRETE (3 JACK SAND MIX) TO CREATE FLOW CHANNELS AND TO INCREASE HYDRAULIC EFFICIENCY SUCH THAT THE INLET WILL BE SELF-CLEANING BETWEEN ALL INLET AND/OR OUTLET PIPES.

PIPES ENTERING EXISTING STRUCTURE SHALL BE CENTERED ON INSIDE
FACE OF WALL

ALL EXPOSED STRUCTURAL STEEL SHALL BE PAINTED WITH A COAT OF THUNDERBOLT PRIMER AND THEN WITH A TOP COAT OF AN APU COAT OF URGENTONE. EACH COAT TO BE 3 TO 4 MILS STRONGHOLD. THE COAT TO FABRICATE THE SPECIAL AREA INET FRAME SHALL COMPLY WITH ASTM A36. WELDING SHALL CONFORM TO THE STRUCTURAL WELDING CODE AWS D1.1-88.



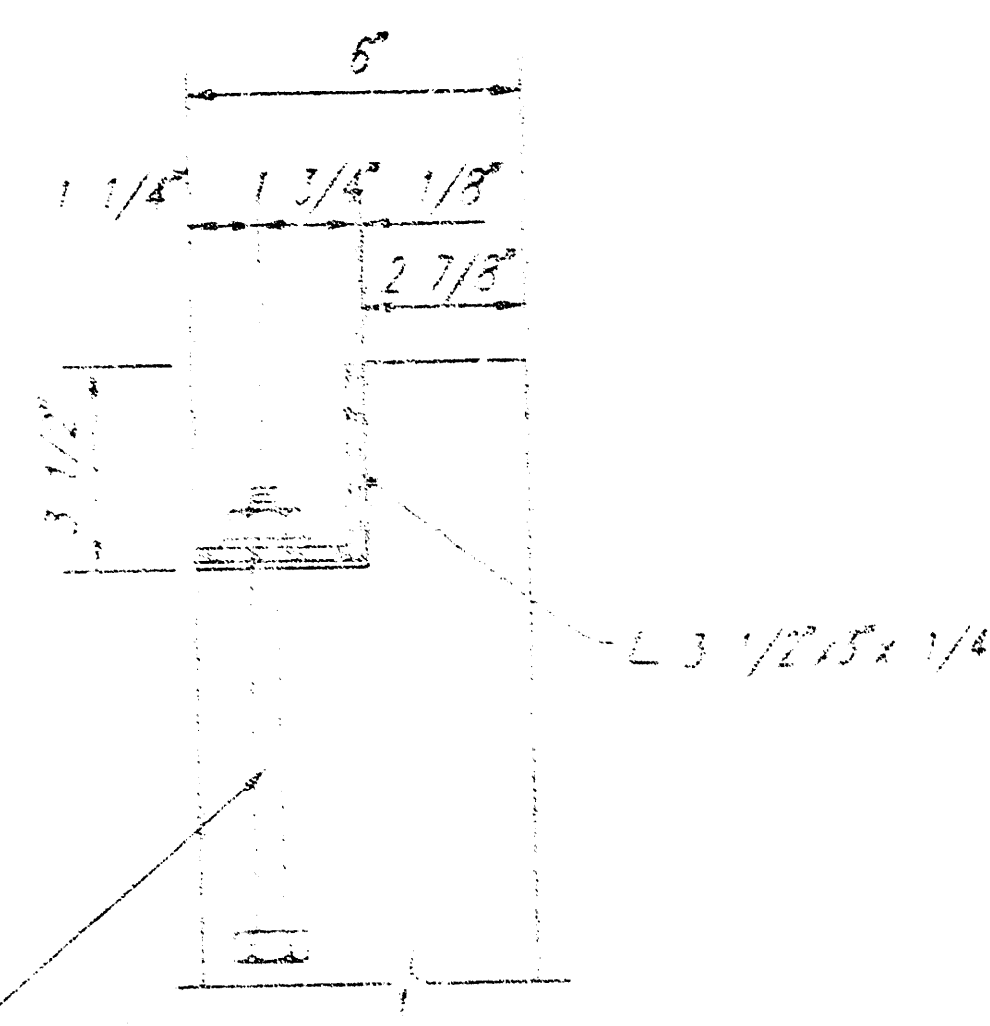
SECTION A-A



PLAN/SECTION

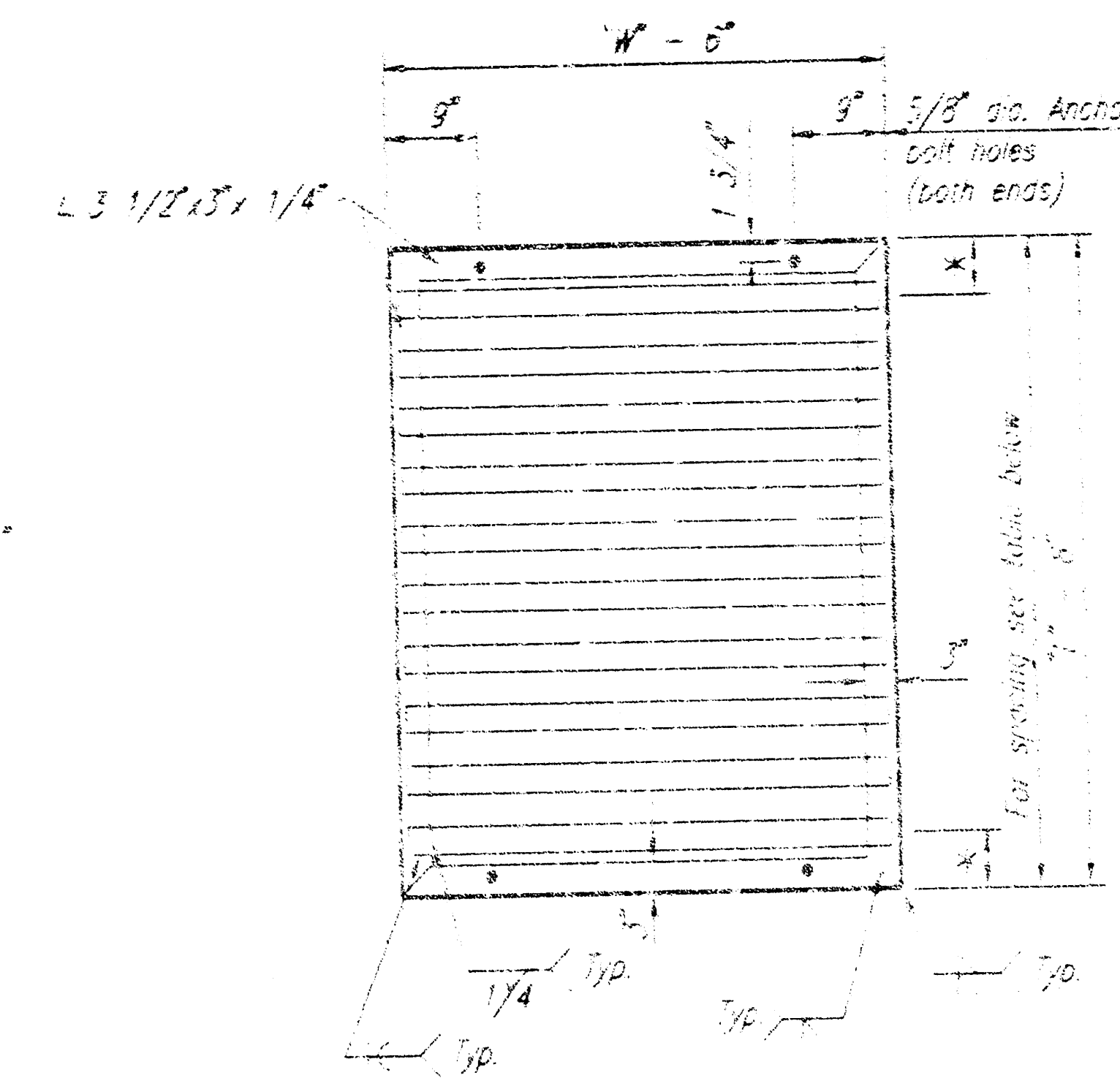
AREA INLET

See SWS Line Outfall Sheet for Inlet orientation.



SECTION B-B

Note: Anchor bolts are supplementary to the bid item "Inlet Type C".



GRATE UNIT DETAILS

BILL OF MATERIALS			
L	W	H	
3'-0"	3'-0"	10'-9"	(105)
Bar	No.	Size	Length
v	15	#4	10'-1"
c	20	#4	4'-9"
h1	40	#4	4'-9"
h2	40	#4	2'-9"
Clear	4" Conc.	2.52	Cu.Yd.
Reinf. steel		382	Lbs.
Struct. steel		91	Lbs.

Quantities are for information only.

PIPE DIMENSIONS AND SPACING (SCHEDULE 40)				
Location	L x W	No. of Pipes	Dia. x Length x Spacing	±
(105)	3'-0" x 3'-0"	3	2 1/2" x 2'-5 1/4" pipes @ 3' circ.	6"

GENERAL NOTES

Concrete shall be as per City of Wichita Standard Specifications for Concrete Paving Mix. Except that it shall have a minimum 28 day compressive strength of 4,000 p.s.i. All Pipes shall be flush cut prior to being cast into the inlet.

All dimensions relative to Reinforcing Steel are to centerline of bar unless otherwise noted. All Reinforcing Steel shall conform to A.S.T.M. Designation A615 Grade 60 and shall be Epoxy Coated.

All exposed edges shall be finished with an edging tool.

All external pipe to inlet joints shall be coated with an asphaltic tar to waterproof the joint interface.

Where possible bend bars around pipes.

Floor of inlet shall be shaped as shown. Concrete used for shaping shall be unreinforced concrete pavement mix. No addition in concrete quantities shall be made for shaping floor of inlet.

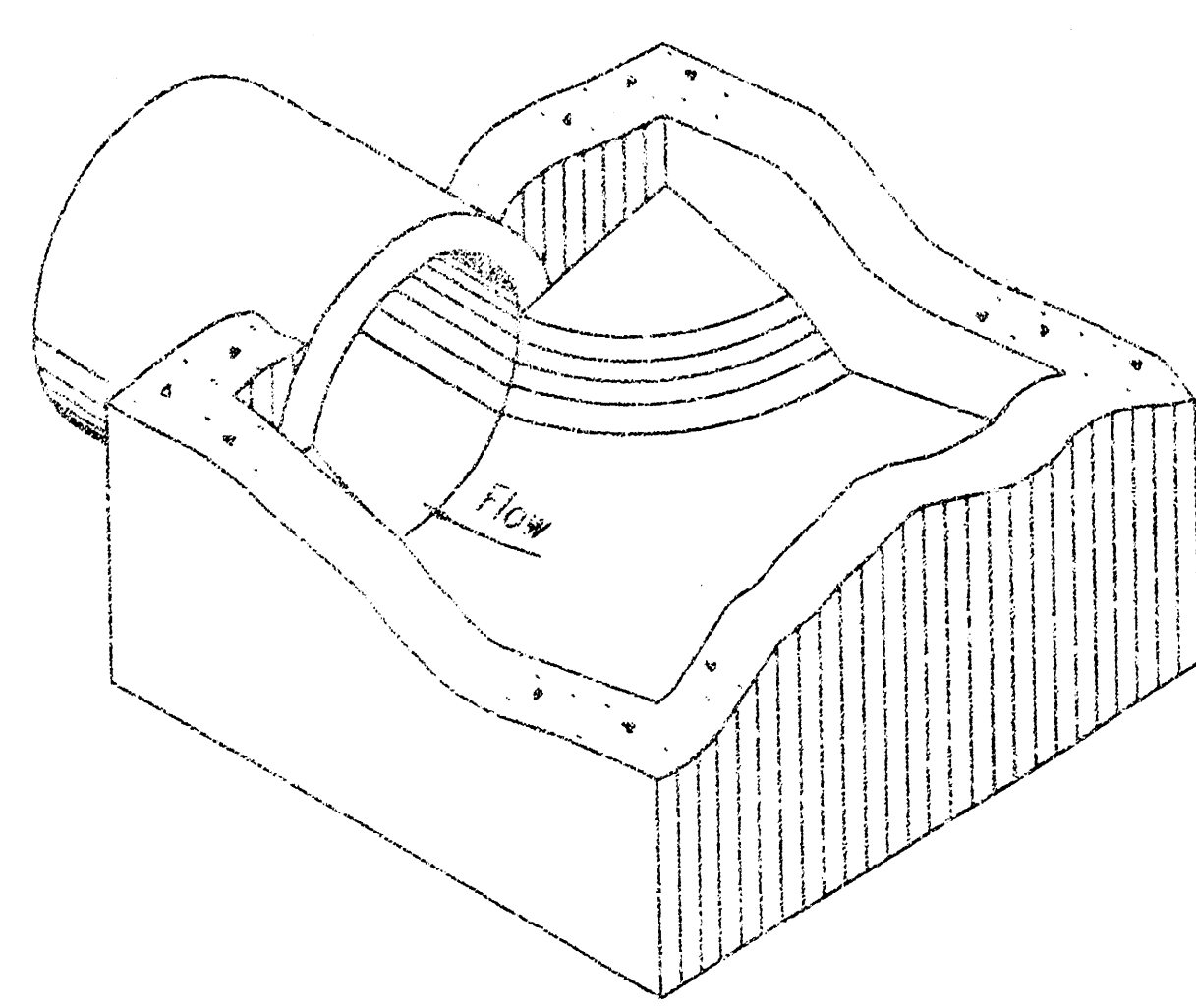
No deductions in concrete quantities shall be made for pipe openings.

All bars are #4 @ 6" spacing and shall have a minimum clearance of 1 1/2" unless otherwise noted on the plans.

The top of the inlet shall be set level.

The grate shall be fabricated from standard or commercial grade structural steel and black steel pipe. The unit shall be hot dipped, galvanized after fabrication, in accordance with ASTM A123 except the weight of coating shall average not less than 2.0 ounces per square foot of actual surface and no individual test shall show less than 1.8 ounces of coating per square foot of actual surface area.

Note: Inlet modified from KDOT Std. No. 648

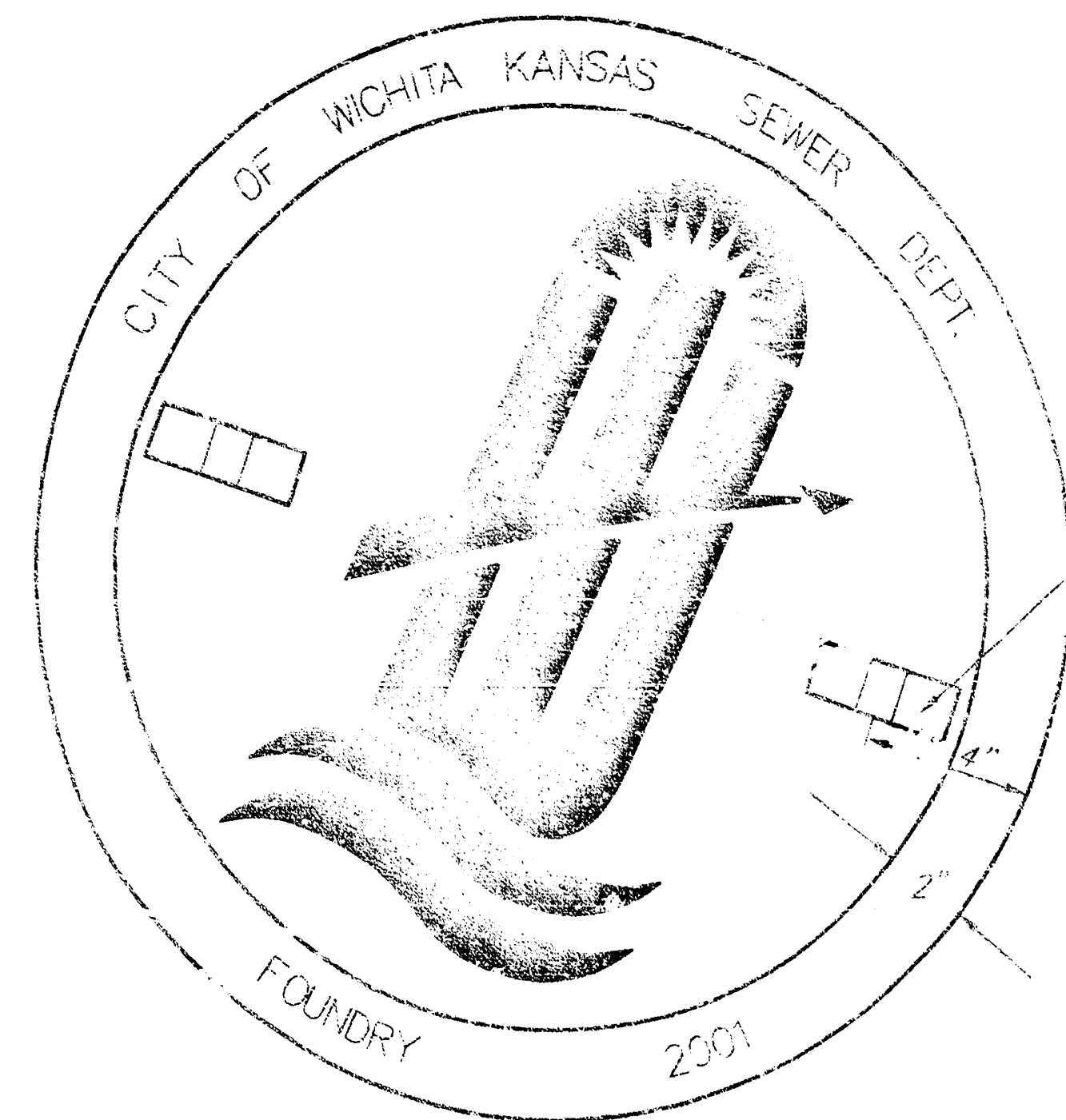


Floor of inlet or manhole shall be shaped as shown to increase hydraulic efficiency.

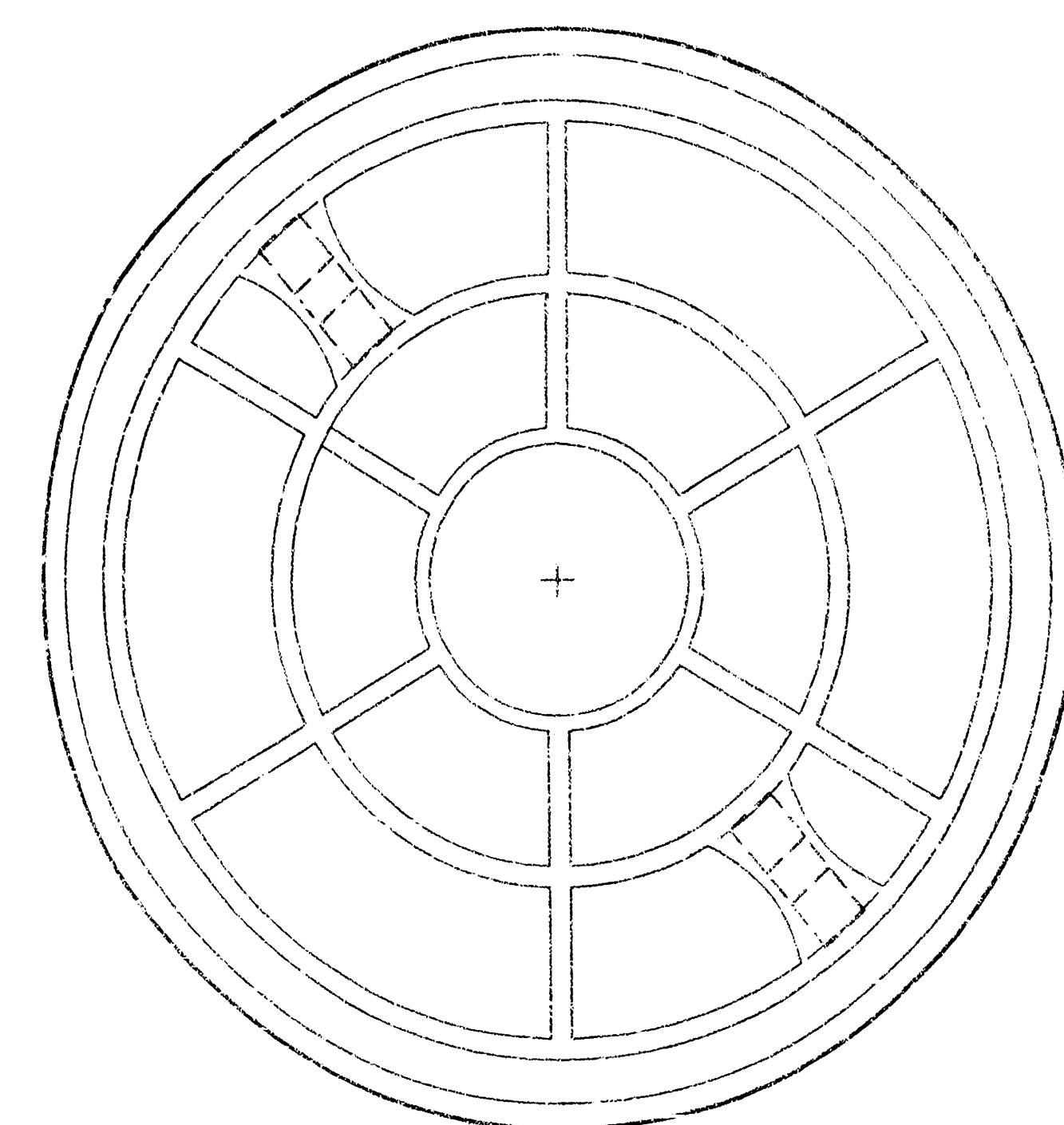
ISOMETRIC VIEW

	Revision		By	Date
	NEW MARKET SQUARE - PHASE 2 STORM WATER SEWER - TRUNK LINE			
	TYPE C INLET DETAILS			
	JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PRIVATE PROJECT NO. 1582 PPS (607861)			
Professional Engineering Consultants, P.A. 303 S. TOPEKA • WICHITA, KANSAS 67202 316-262-2691 • FAX 316-262-3002				
Designed by	BER, BLB	Job No.	35-04090	Sht. 4 of 10
Drawn by	BMM, BUS	Date	July 2005	

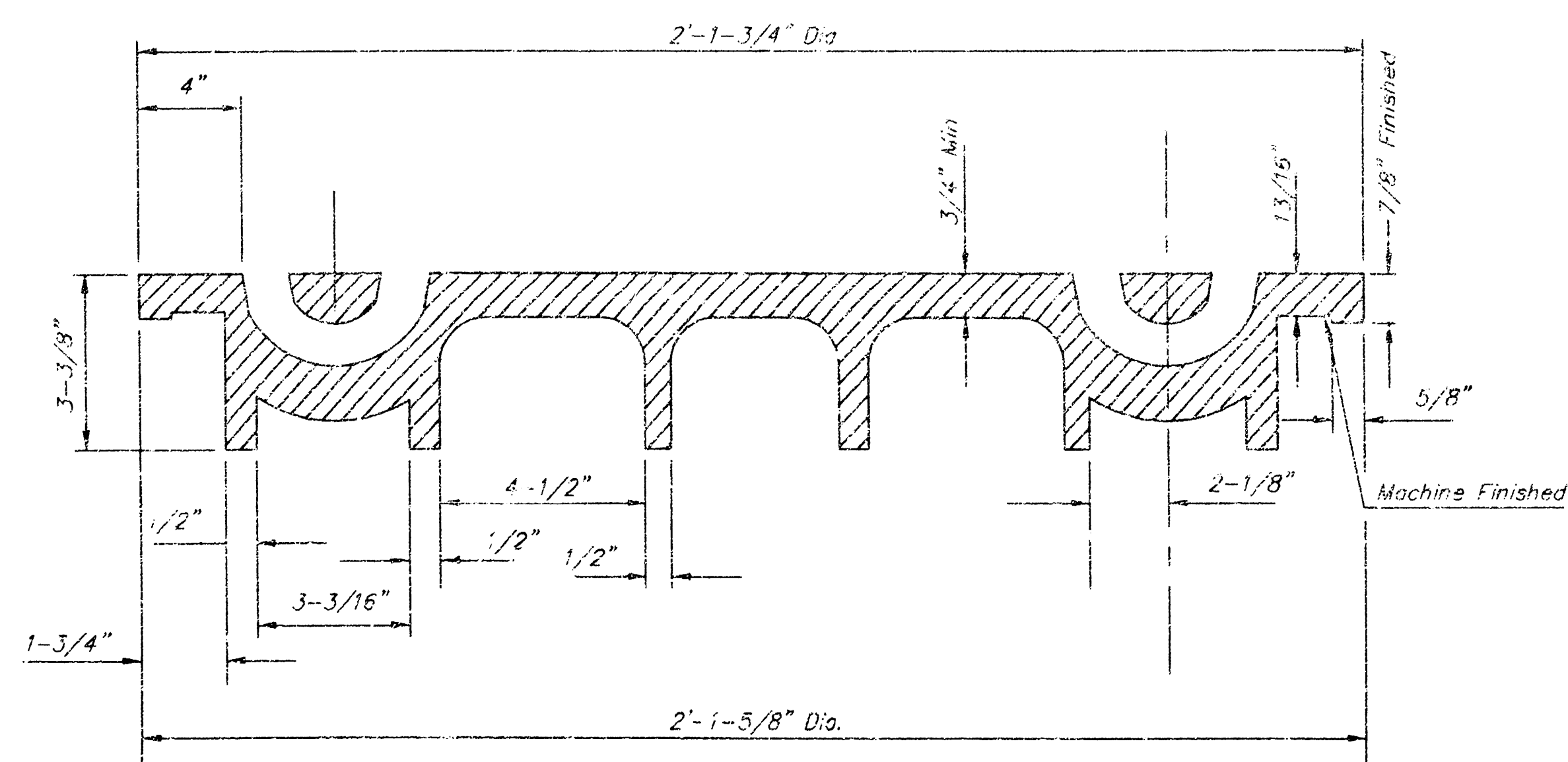
MANHOLE COVER
Weight = 180 Lbs.



TOP VIEW

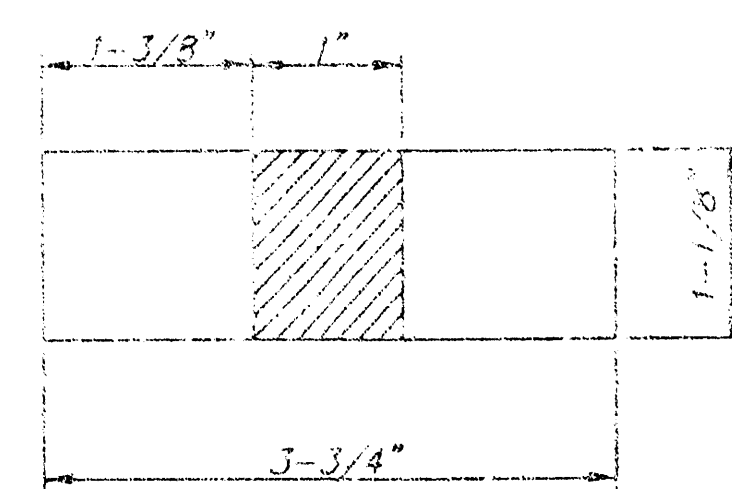


BOTTOM VIEW

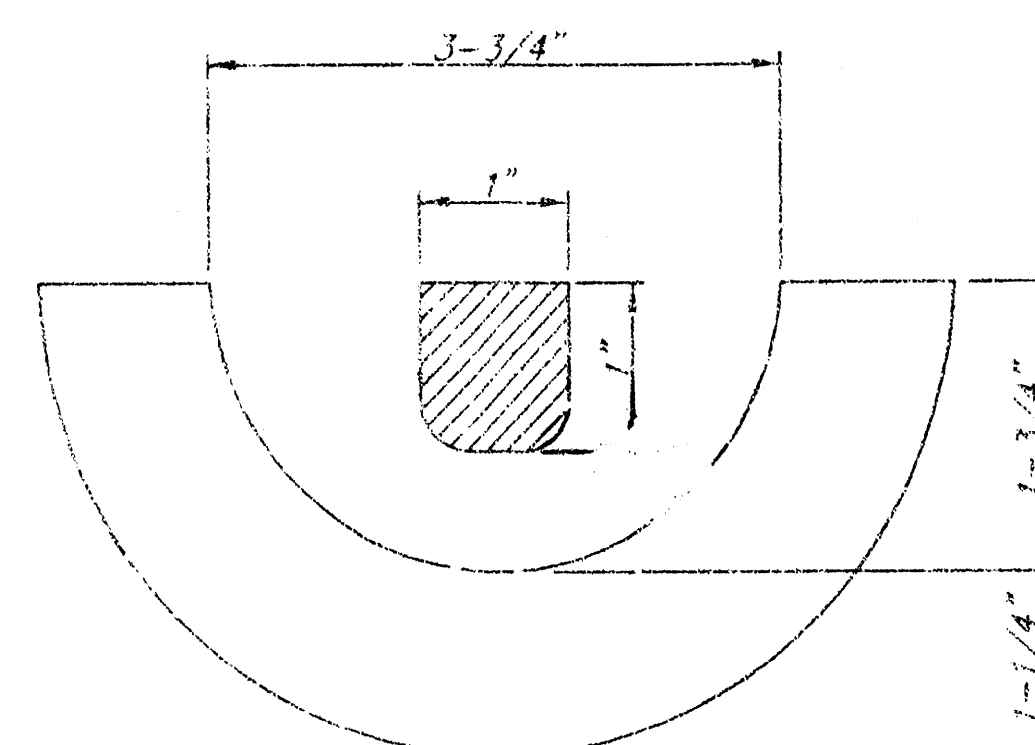


SECTION VIEW

PICKHOLE DETAIL



TOP VIEW

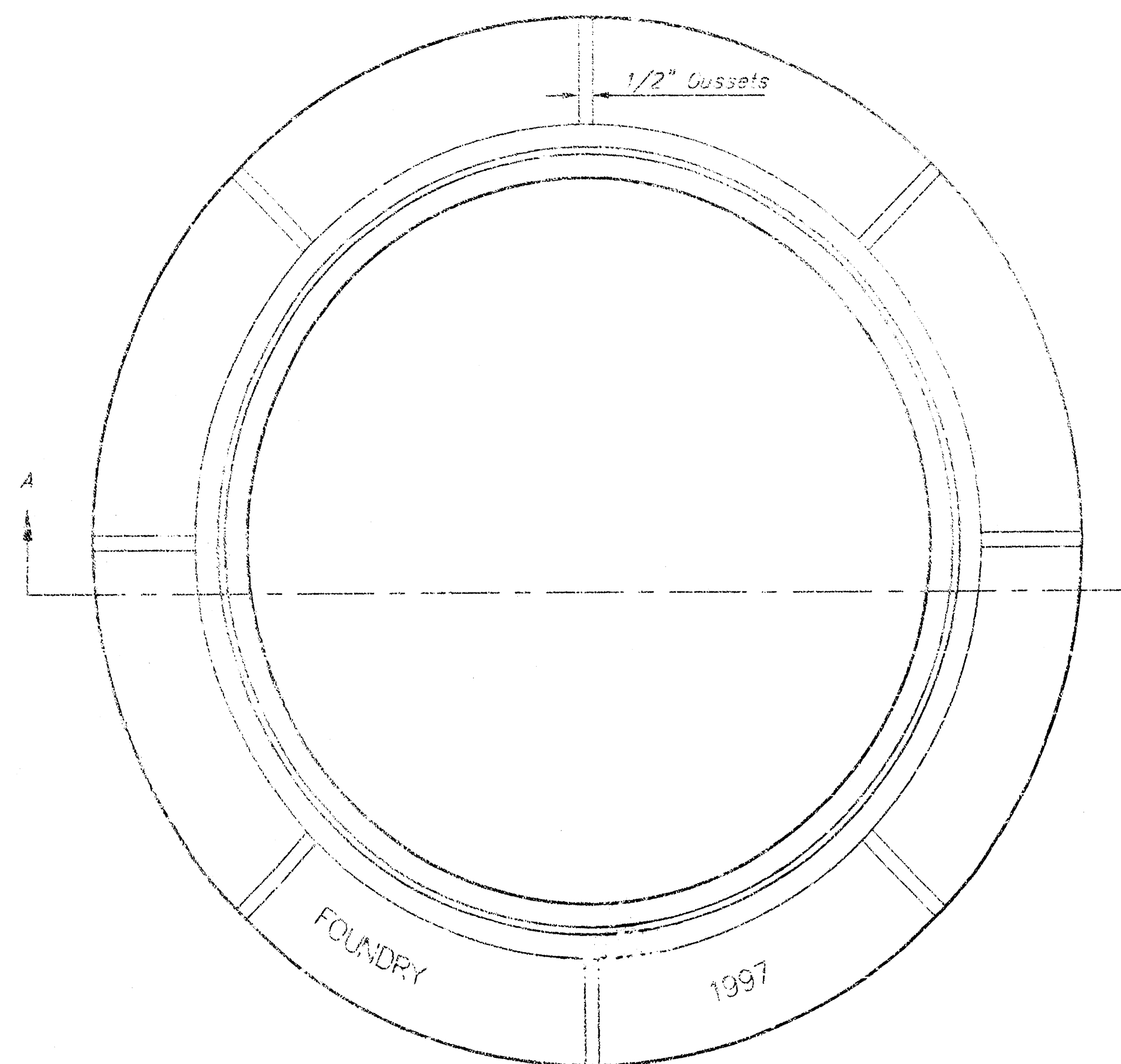


SECTION VIEW

MANHOLE FRAME AND COVER DETAIL

ADOPTED AS STANDARD DESIGN BY
CITY OF WICHITA, KANSAS

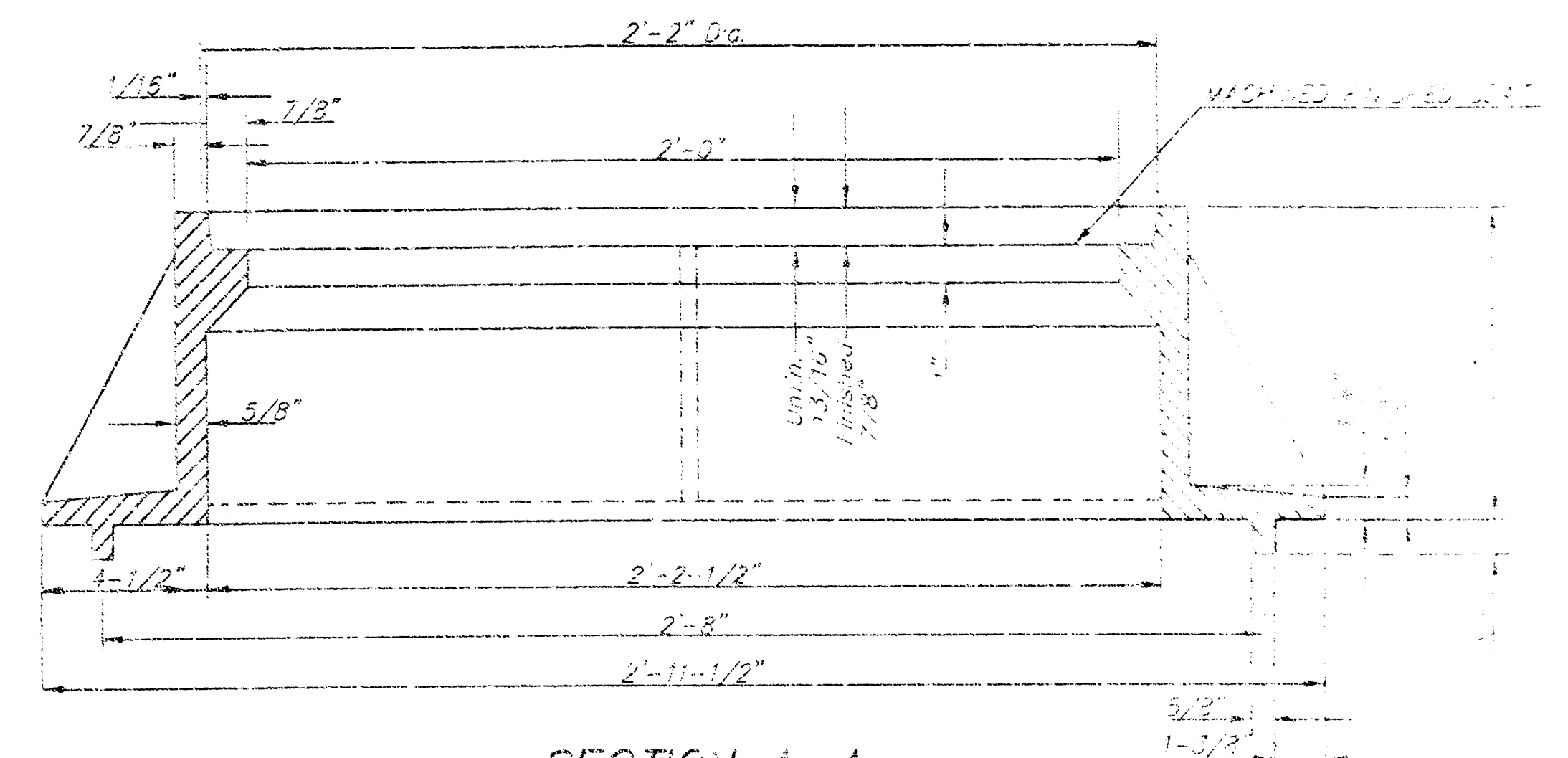
MANHOLE FRAME
Weight = 240 Lbs.



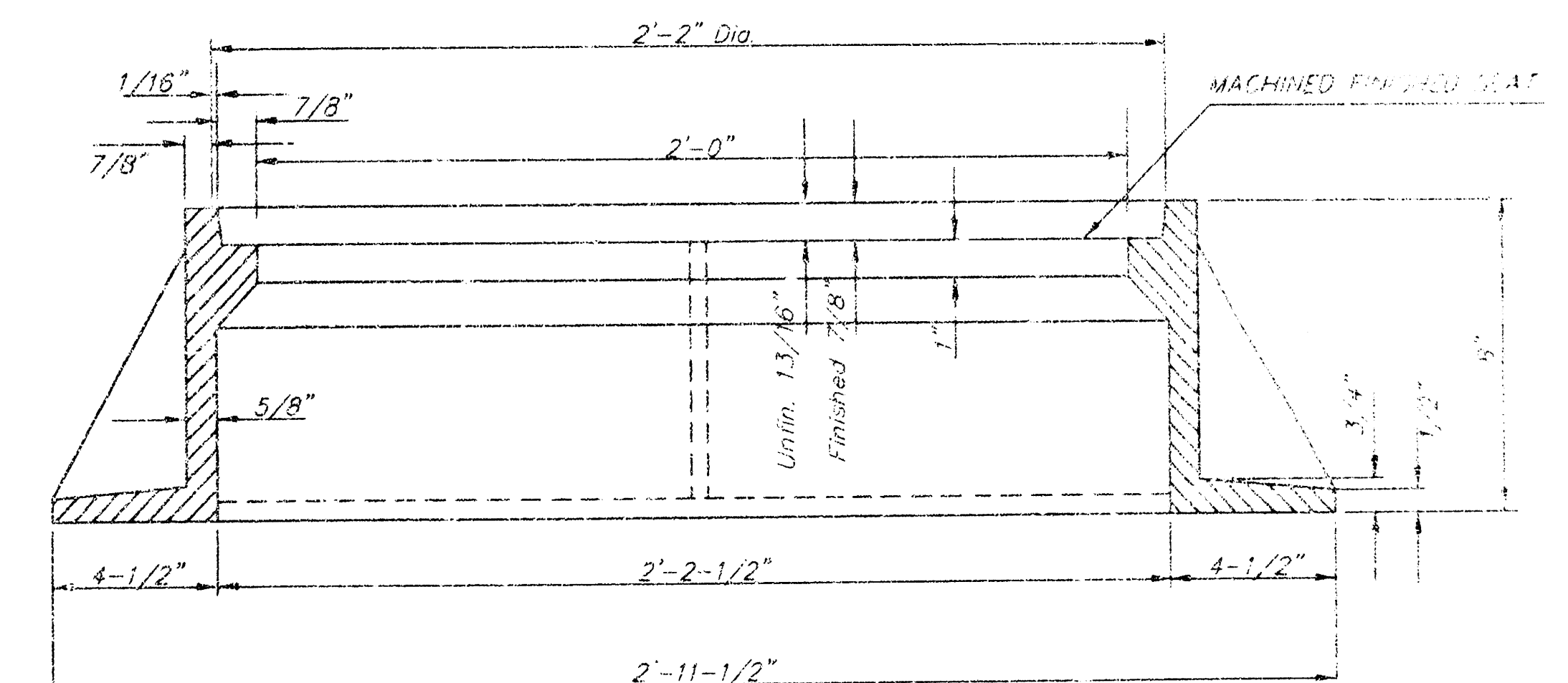
TOP VIEW

GENERAL NOTES

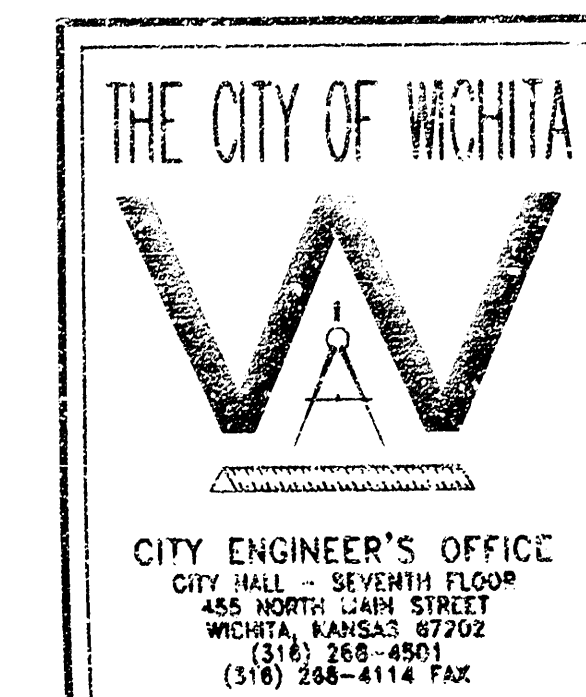
1. MANHOLE CASTINGS SHALL BE MANUFACTURED USING GOOD QUALITY GRAY IRON CONFORMING TO CLASS 30 OF A.S.T.M. DESIGNATION A-48. DIMENSIONS AND WEIGHTS SHOWN ON THE DETAILED DRAWINGS SHALL BE CONSIDERED AS MINIMUM REQUIREMENTS AND ANY DEVIATIONS FROM THE DIMENSIONS SHOWN MUST BE SPECIFICALLY APPROVED. THE FINISHED CASTINGS SHALL BE OF UNIFORM QUALITY, FREE FROM BLOWHOLES, POROSITY, HARD SPOTS, SHRINKAGE DISTORTIONS OR OTHER DEFECTS.
2. MANHOLE CASTINGS SHALL WEIGH A MINIMUM OF 180 POUNDS ON THE SOLID COVER AND 240 POUNDS ON THE MANHOLE RING. THIS IS A TOTAL OF 420 POUNDS ON A RING AND COVER SET. CASTINGS WEIGHING LESS THAN THE MINIMUM SPECIFICATIONS WILL NOT BE ACCEPTED.
3. MANHOLE CASTINGS SHALL BE MANUFACTURED SUCH THAT A COVER MANUFACTURED BY ANY ONE FOUNDRY WILL FIT INTERCHANGEABLY INTO A FRAME MANUFACTURED BY ANOTHER FOUNDRY AND STILL MEET ALLOWABLE CLEARANCES AND NON-ROCKING REQUIREMENTS. THIS WILL REQUIRE MANUFACTURING OF THE MATCHING FACES ON THE COVER AND THE FRAME TO CLOSE TOLERANCES.
4. THE OUTSIDE CIRCUMFERENCE OF THE VERTICAL FACE OF THE COVER AND THE INSIDE CIRCUMFERENCE OF THE VERTICAL FACE IN THE FRAME RECESS SHALL BE MANUFACTURED TO TOLERANCES SUCH THAT THE CLEARANCE BETWEEN THE COVER AND FRAME WILL NOT EXCEED 1/8" AT ANY POINT AROUND THE CIRCUMFERENCE OF THE COVER. THE SEATING SURFACES BETWEEN THE COVER AND FRAME SHALL BE MACHINED SUCH THAT THESE SEATING SURFACES SHALL MAKE FULL CONTACT FOR THEIR FULL CIRCUMFERENCE TO PRECLUDE THE COVER FROM ROCKING IN THE FRAME.
5. THE MANHOLE FRAME AND COVER SHALL BE MARKED WITH LETTERING INDICATING THE NAME OF THE MANUFACTURER AND THE YEAR WHEN THE COVER OR FRAME WAS CAST. THE COVER SHALL BE FURTHER IDENTIFIED WITH REGARDS TO OWNERSHIP USING LETTERS AT LEAST 1 INCH IN HEIGHT. THIS IDENTIFICATION SHALL BE "CITY OF WICHITA SEWER DEPARTMENT". THE WORD DEPARTMENT MAY BE ABBREVIATED. THE TEXTURE OF THE TOP SURFACE OF THE COVER SHALL BE MANUFACTURED WITH THE CITY OF WICHITA LOGO AS INDICATED ON THE DRAWINGS. SMOOTH BLOCKOUTS SHALL BE UTILIZED TO HIGHLIGHT THE LETTERING ON THE COVER SURFACE. THE TOTAL AREA OF SMOOTH SURFACE BLOCKOUT SHALL NOT EXCEED 5% AREA AS INDICATED ON THE DRAWING. POSITIONING OF SMOOTH BLOCKOUTS AND LETTERING MAY VARY FROM THAT SHOWN ON THE DETAILED DRAWING.



SECTION A-A
MUD RING



SECTION A-A

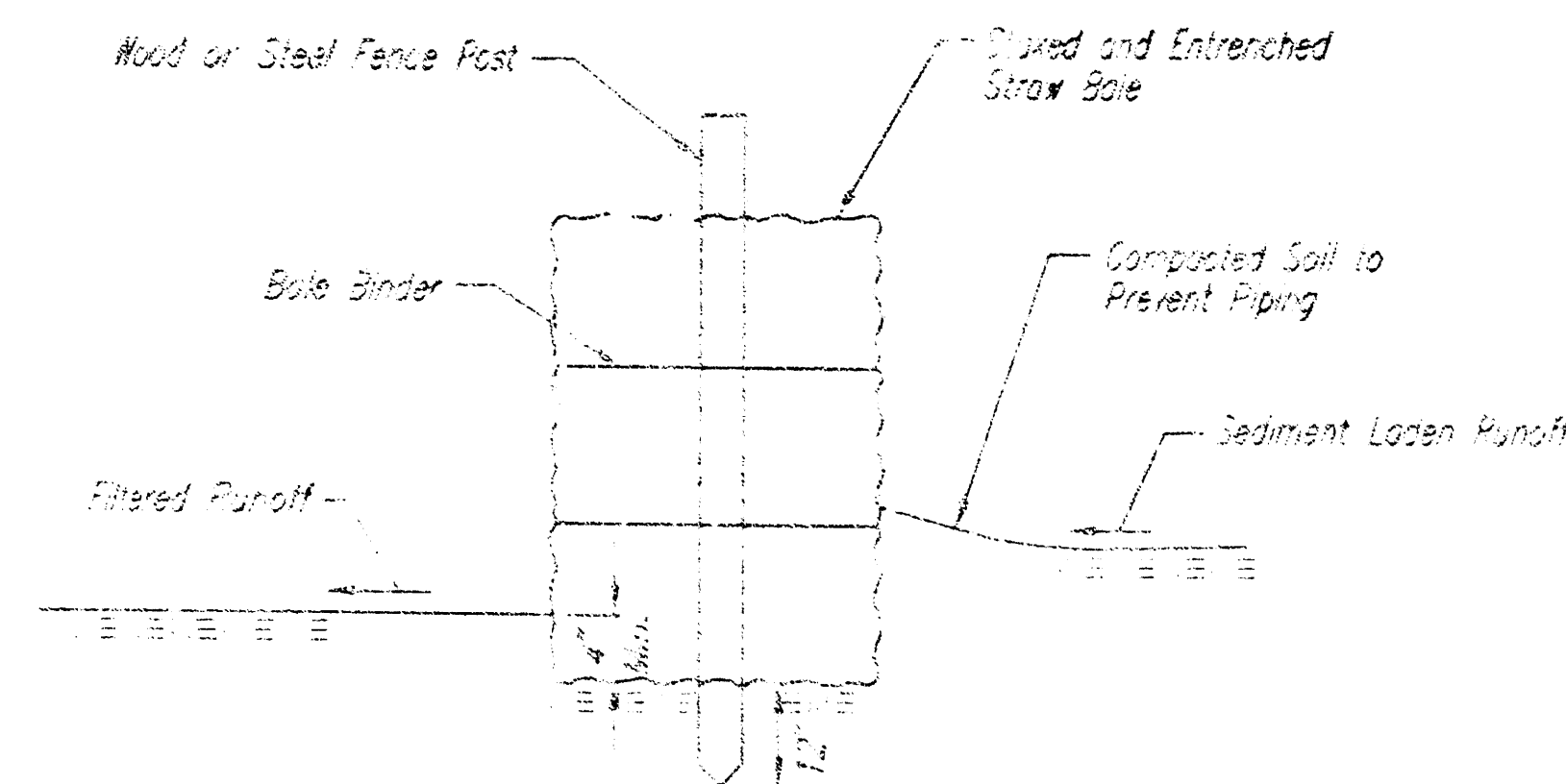


MANHOLE FRAME AND COVER

JAMES L. ARMOUR, P.E. - CITY ENGINEER

PROJECT NUMBER 1582 PPS DCA NO. (607851)

DATE MAR 96 SHEET 6 OF 10



STRAW BALE BARRIERS

Material Specification:

Bale slope barriers may be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture. The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.

Placement:

A slope barrier should be used at the toe of a slope when a ditch does not exist. The slope barrier should be placed on nearly level ground 5' to 10' away from the toe of a slope. The barrier is placed away from the toe of the slope to provide adequate storage for settling out sediment.

When practicable, bale slope barriers should be placed along contours to avoid a concentration of flow.

Bale slope barriers can also be placed along right-of-way fence lines to keep sediment from crossing onto adjacent property. When placed in this manner, the slope barrier will not likely follow contours.

Proper installation method:

Excavate a trench the length of the planned slope barrier that is 4" deep and a bale's width wide. Make sure that the trench is excavated along a single contour. When practicable, slope barriers should be placed along contours to avoid a concentration of flow. Place the soil on the upslope side of the trench for later use.

Place the bales in the trench, making sure that they are butted tightly. Two stakes should be driven through each bale along the centerline of the ditch check, approximately 6" to 8" in from the bale ends. Stakes should be driven at least 12" into the ground.

Once all the bales have been installed and anchored, place the excavated soil against the upslope side of the check and compact it. The compacted soil should be no more than 3" to 4" deep.

List of common placement/installation mistakes to avoid:

When practical, do not place bale slope barriers across contours. Slope barriers should be placed along contours to avoid a concentration of flow. Concentrated flow over a slope barrier creates a scour hole on the downslope side of the barrier. The scour hole eventually undermines the bales and the barrier fails.

Do not place bale slope barriers in areas with shallow soils underlain by rock. If the barrier is not anchored sufficiently, it will wash out.

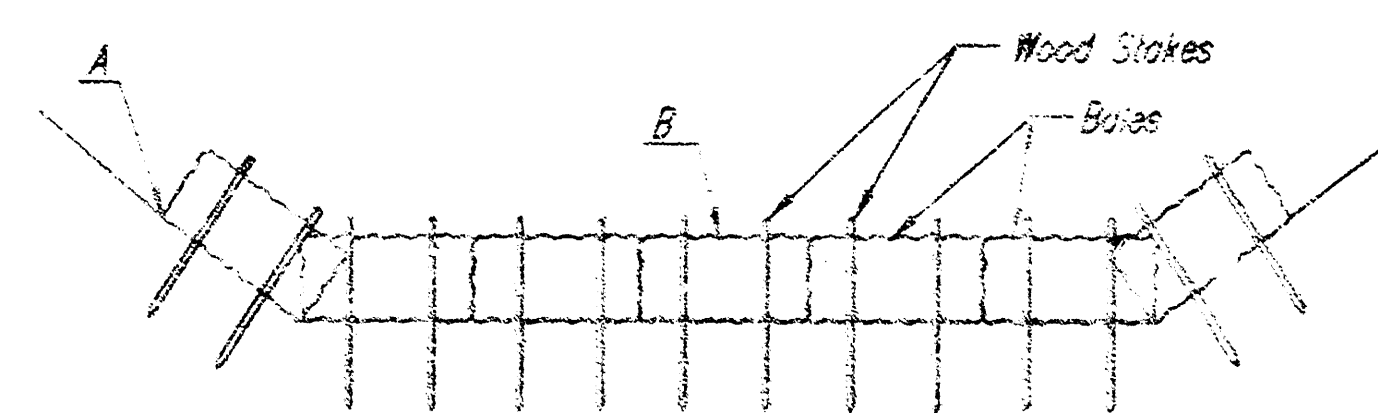
Bale slope barriers must be dug into the ground. Bales at ground level do not work because they allow water to flow under the barrier.

Inspection and Maintenance:

Bale slope barriers should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Are there any points along the slope barrier where water is concentrating?
- Does water flow under the slope barrier?
- Does water flow through spaces between abutting bales?
- Are any bales dislodged?
- Are bales decomposing due to age and/or water damage?
- Does sediment need to be removed from behind the slope barrier?

NOTE: Point A must be higher than Point B so that water flows over the bales and not around them.



STRAW BALE DITCH CHECKS

Material Specification:

Bale ditch checks may be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture. The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long. The downstream scour apron should be constructed of a double-rated straw erosion-control blanket at least 30' wide. The metal landscape staples used to anchor the erosion-control blanket should be at least 8" long.

Placement:

Bale ditch checks should be placed perpendicular to the flowline of the ditch. The ditch check should extend far enough so that the ground level at the ends of the check is higher than the top of the lowest center bale. This prevents water from flowing around the check.

Checks should not be placed in ditches where high flows are expected. Rock checks should be used instead.

Bales should be placed in ditches with slopes of 5% or less. For slopes steeper than 6%, rock checks should be used.

The following table provides check spacing for a given ditch grade:

Ditch Grade (%)	Check Spacing (Feet)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

Proper installation method:

Excavate a trench perpendicular to the ditch flowline that is 4" deep and a bale's width wide. Extend the trench in a straight line along the entire length of the proposed ditch check. Place the soil on the upslope side of the trench—it will be used later.

Optional: On the downstream side of the trench, roll out a length of erosion-control blanket (scour apron) equal to the length of the trench. Place the upstream edge of the erosion-control blanket along the bottom upstream edge of the trench. The erosion-control blanket should be anchored in the trench with one row of 8" landscape staples placed on 18" centers.

The remainder of the erosion-control blanket (the portion that is not lying in the trench) will serve as the downstream scour apron. This section of the blanket should be anchored to the ground with 8" landscape staples placed around the perimeter of the blanket on 18" centers. The remainder of the blanket should be anchored using two evenly spaced rows of 8" landscape staples on 18" centers placed perpendicular to the flowline of the ditch.

Place the bales in the trench, making sure that they are butted tightly. Two stakes should be driven through each bale along the centerline of the ditch check, approximately 6" to 8" in from the bale ends. Stakes should be driven at least 12" into the ground.

Once all the bales have been installed and anchored, place the excavated soil against the upstream side of the check and compact it. The compacted soil should be no more than 3" to 4" deep and extend upstream no more than 24".

List of common placement/installation mistakes to avoid:

Do not place a bale ditch check directly in front of a culvert outlet. It will not stand up to this concentrated flow.

Do not place bale ditch checks in ditches that will likely experience high flows. They will not stand up to concentrated flow.

Follow prescribed ditch-check spacing guidelines. If spacing guidelines are exceeded, erosion will occur between the ditch checks.

Do not allow water to flow around the ditch check. Make sure that the ditch check is long enough so that the ground level at the ends of the check is higher than the top of the lowest center bale.

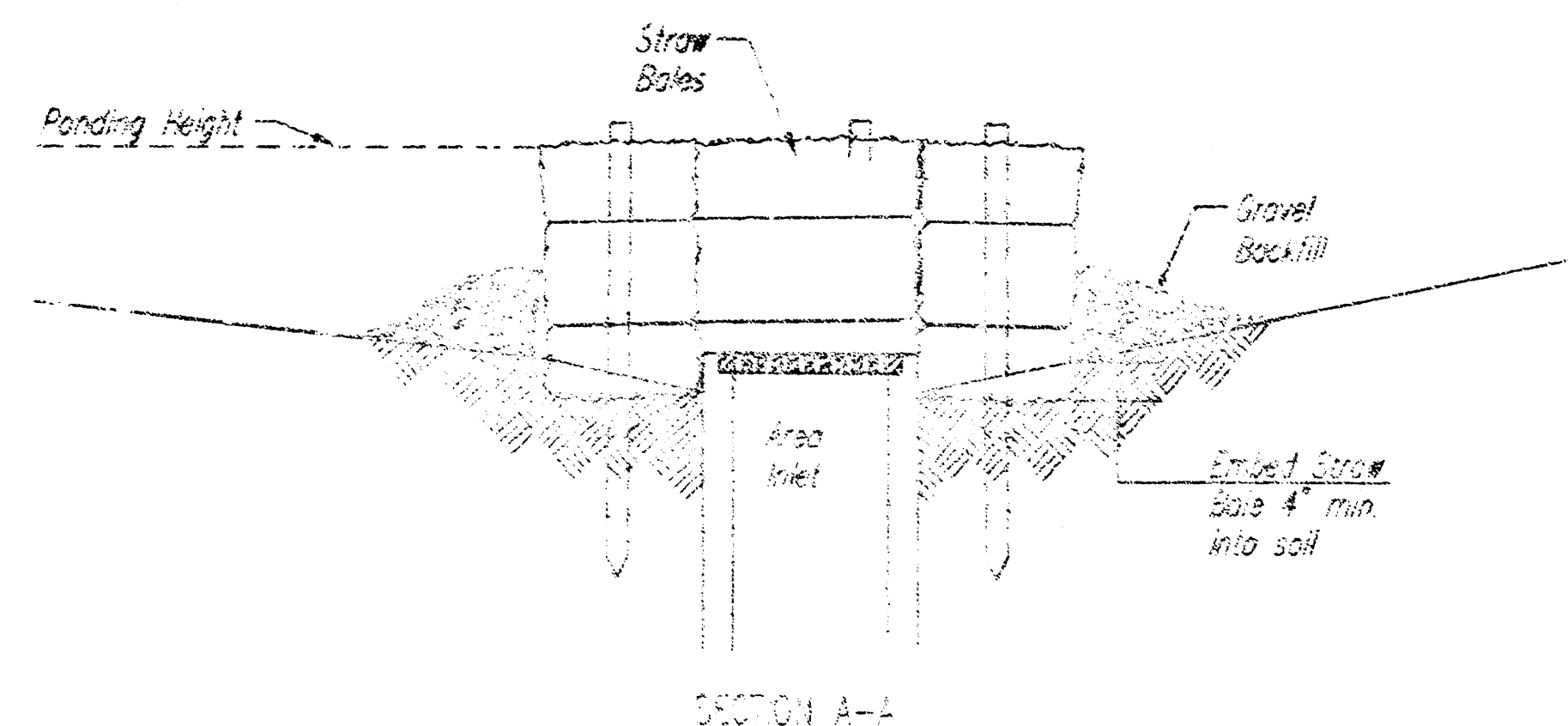
Do not place bale ditch checks in channels with shallow soils underlain by rock. If the check is not anchored sufficiently, it will wash out.

Bale ditch checks must be dug into the ground. Bales at ground level do not work because they allow water to flow under the check.

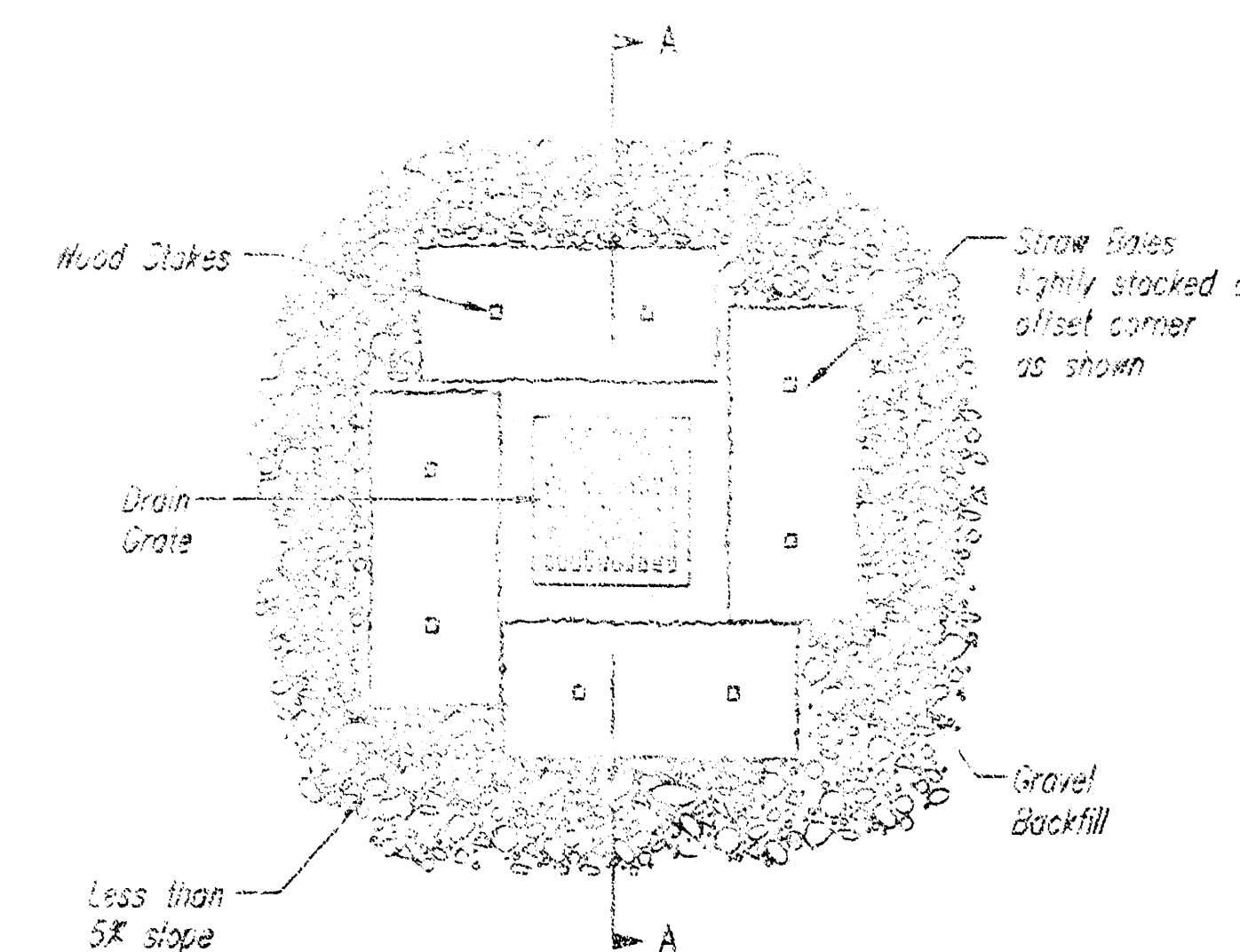
Inspection and Maintenance:

Bale ditch checks should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow around the ditch check?
- Does water flow under the ditch check?
- Does water flow through spaces between abutting bales?
- Are any bales and/or scour aprons (optional) dislodged?
- Are bales decomposing due to age and/or water damage?
- Does sediment need to be removed from behind the ditch check?



STRAW BALE BARRIERS FOR AREA INLETS (INLET PROTECTION)



Material Specification:

Bale area inlet barriers should be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture.

The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.

Placement:

Bale area inlet barriers should be placed directly around the perimeter of a drop inlet. When a bale area inlet barrier is located near an inlet that has steep approach slopes, the storage capacity behind the barrier is drastically reduced. Timely removal of sediment must occur for a barrier to operate properly in this location.

Proper installation method:

Excavate a trench around the perimeter of the area inlet that is at least 4" deep by a bale's width wide.

Place the bales in the trench, making sure that they are butted tightly. Some bales may need to be shortened to fit into the trench around the area inlet. Two stakes should be driven through each bale, approximately 6" to 8" in from the bale ends. Stakes should be driven at least 12" into the ground.

Once all the bales have been installed and anchored, place the excavated soil against the receiving side of the barrier and compact it. The compacted soil should be no more than 3" to 4" deep.

Note: When a bale area inlet barrier is placed in a shallow median ditch, make sure that the top of the barrier is not higher than the paved road. In this configuration, water may spread onto the roadway causing a hazardous condition.

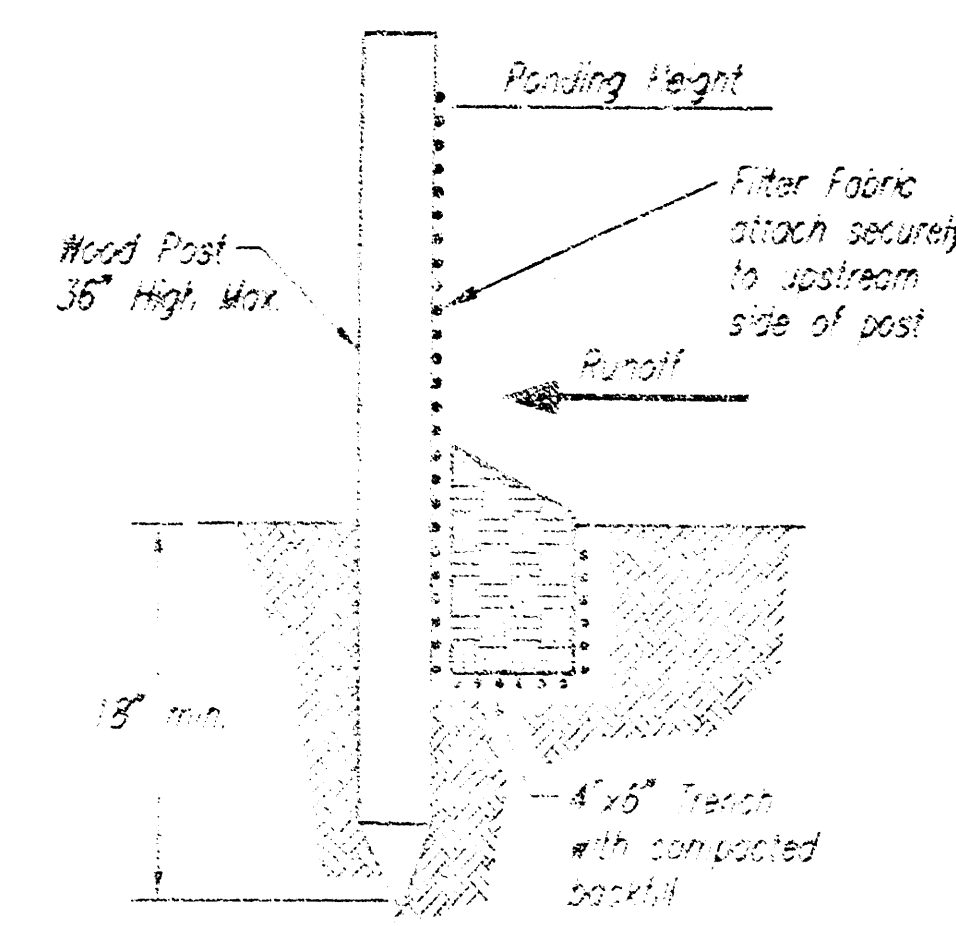
List of common placement/installation mistakes to avoid:

Bales should be placed directly against the perimeter of the area inlet. This allows overtopping water to flow directly into the inlet instead of onto nearby soil causing scour. Bale area inlet barriers must be dug into the ground. Bales at ground level do not work because they allow water to flow under the barrier.

Inspection and Maintenance:

Bale area inlet barriers should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow under the area inlet barrier?
- Does water flow through spaces between abutting bales?
- Are any bales dislodged?
- Are bales decomposing due to age and/or water damage?
- Does sediment need to be removed from behind the area inlet barrier?



SILT FENCE BARRIERS

SILT FENCE BARRIERS

Material Specification:

Silt fence fabric should conform to the ASTM D 4285 silt fence specifications. The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.

Silt fence fabric should be attached to the wooden posts with staples, wire, zip ties, or nails.

Placement:

A slope barrier should be used at the toe of a slope when a ditch does not exist. The slope barrier should be placed on nearly level ground 5' to 10' away from the toe of a slope. The barrier is placed away from the toe of the slope to provide adequate storage for settling out sediment.

When practicable, silt fence slope barriers should be placed along contours to avoid a concentration of flow.

Silt fence slope barriers can also be placed along right-of-way fence lines to keep sediment from crossing onto adjacent property. When placed in this manner, the slope barrier will not likely follow contours.

Proper installation method:

Excavate a trench the length of the planned slope barrier that is 6" deep by 4" wide.

Make sure that the trench is excavated along a single contour. When practicable, slope barriers should be placed along contours to avoid a concentration of flow. Place the soil on the upslope side of the trench for later use.

Roll out a continuous length of silt fence fabric on the downslope side of the trench. Place the edge of the fabric in the trench starting at the top upslope edge. Line all three sides of the trench with the fabric. Backfill over the fabric in the trench with the excavated soil and compact. After filling the trench, approximately 24" to 36" of silt-fence fabric should remain exposed.

Lay the exposed silt fence upslope of the trench to clear an area for driving in the posts.

Just downslope of the trench, drive posts into the ground to a depth of at least 18".

Place posts no more than 4' apart.

Attach the silt fence to the anchored post with staples, wire, zip ties, or nails.

List of common placement/installation mistakes to avoid:

When practicable, do not place silt fence slope barriers across contours. Slope barriers should be placed along contours to avoid a concentration of flow. When the flow concentrates, it overtops the barrier and the silt fence slope barrier quickly deteriorates. Do not place silt-fence posts on the upslope side of the silt fence fabric. In this configuration, the force of the water is not restricted by the posts, but only by the staples (wire, zip ties, nails, etc.). The silt fence will rip and fail.

Do not place silt fence slope barriers in areas with shallow soils underlain by rock. If the barrier is not sufficiently anchored, it will wash out.

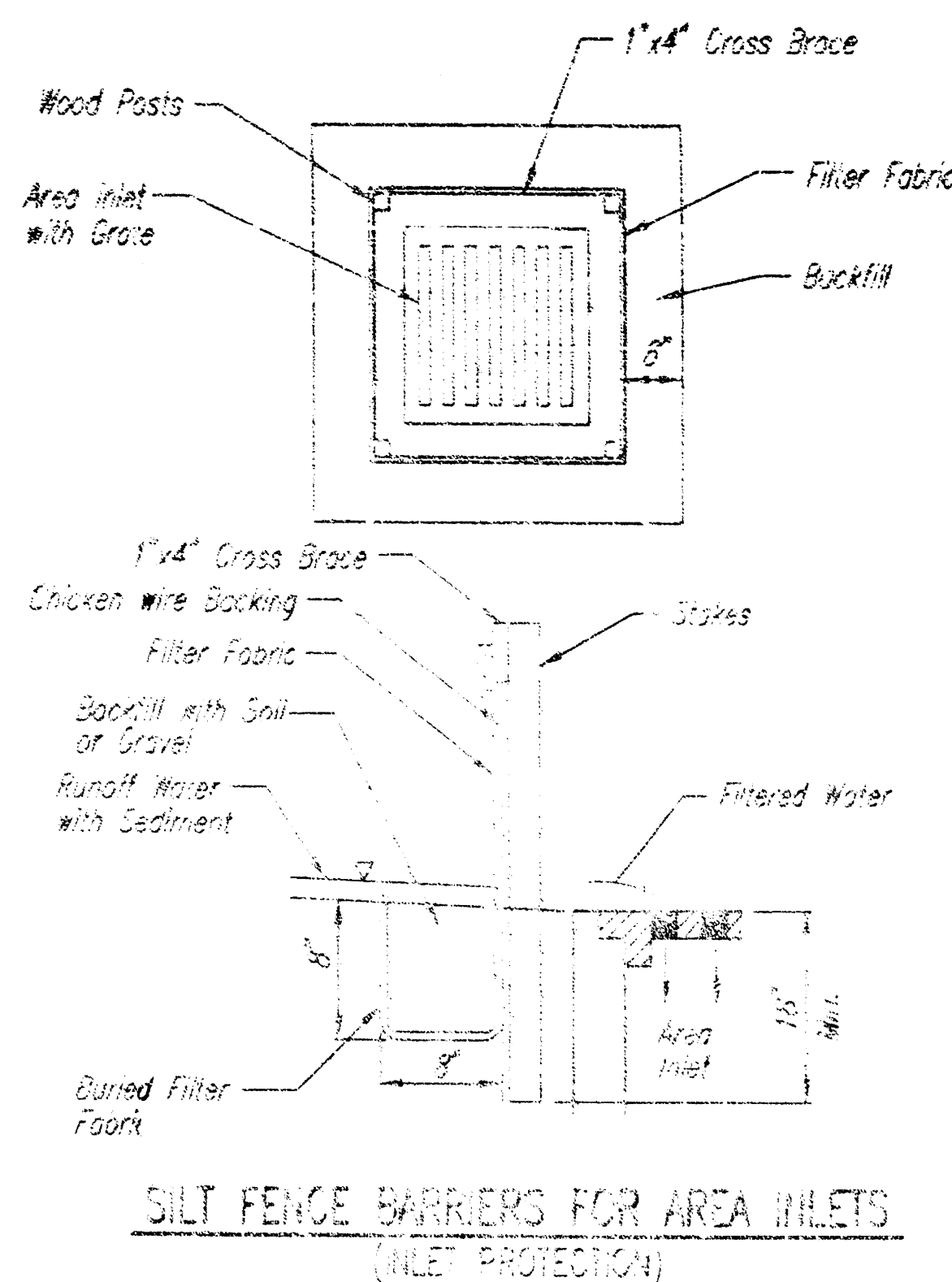
Silt fence slope barriers must be dug into the ground—silt fence at ground level does not work because water will flow underneath.

Inspection and Maintenance:

Silt fence slope barriers should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Are there any points along the slope barrier where water is concentrating?
- Does water flow under the slope barrier?
- Do the silt fences sag excessively?
- Has the silt fence torn or become detached from the posts?
- Does sediment need to be removed from behind the slope barrier?

	SOIL EROSION BMP DETAILS	
	JAMES L. ARMOUR, P.E. CITY ENGINEER	
	PROJECT NUMBER 1582 PPS	DCA NO. (907861)
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Material Specifications:

Silt fence fabric should conform to the MSMTQ M288 96 silt fence specification. The wire or polymeric mesh backing used to support the silt fence fabric should conform to the MSMTQ M288 96 silt fence specification. The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long. The material used to frame the tops of the posts should be 1" by 4" boards. Silt fence fabric and support backing should be attached to the wooden posts and frame with staples, wire, zip ties, or nails.

Placement:

Place a silt fence (trap inlet barrier) in a location where it is unlikely to be overtopped. Water should flow through silt fence, not over it. Silt fence barriers for area inlets often fail when repeatedly overtopped. When used as a barrier for area inlets, silt fence fabric and posts must be supported at the top by a wooden frame. When a silt fence barrier for area inlets is located near an inlet that has steep approach slopes, the storage capacity behind the barrier is drastically reduced. Timely removal of sediment must occur for a barrier to operate properly in this location.

Proper installation method:

Excavate a trench around the perimeter of the area inlet that is at least 8" deep by 8" wide. Drive posts to a depth of at least 18" around the perimeter of the area inlet. The distance between posts should be 4' or less. If the distance between two adjacent corner posts is more than 4', add another post(s) between them. Connect the tops of all the posts with a wooden frame made of 1" by 4" boards. Use nails or screws for fastening. Attach the wire or polymeric-mesh backing to the outside of the post/frame structure with staples, wire, zip ties, or nails. Roll out a continuous length of silt fence fabric long enough to wrap around the perimeter of the area inlet. Add extra length for overlapping the fabric joint. Place the edge of the fabric in the trench, starting at the outside edge of the trench. Line all three sides of the trench with the fabric. Backfill over the fabric in the trench with the excavated soil and compact. After filling the trench, approximately 24" to 36" of silt fence fabric should remain exposed. Attach the silt fence to the outside of the post/frame structure with staples, wire, zip ties, or nails. The joint should be overlapped to the next post.

Note: When a silt fence barrier for area inlet is placed in a shallow median ditch, make sure that the top of the barrier is not higher than the paved road. In this configuration, water may spread onto the roadway causing a hazardous condition.

List of common placement/installation mistakes to avoid:

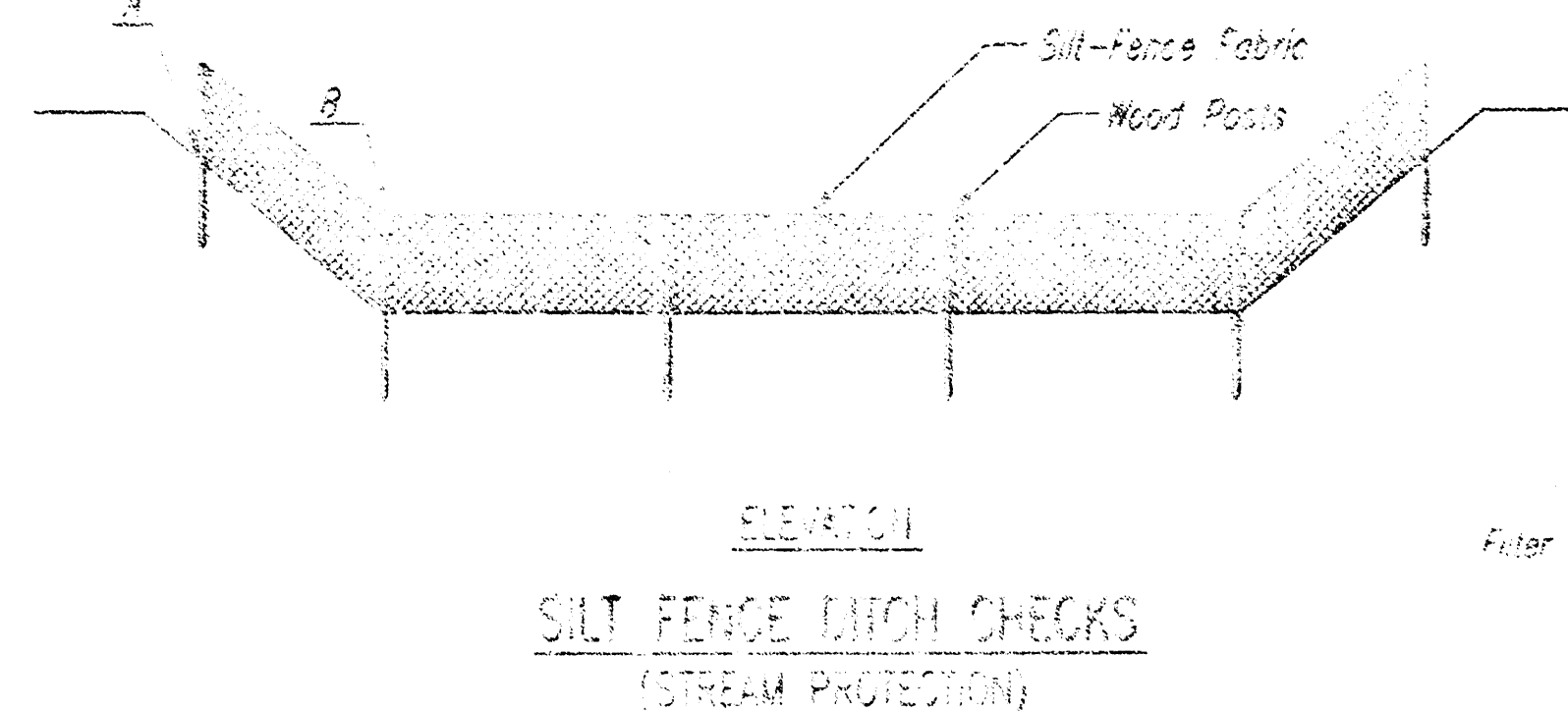
Water should flow through a silt fence barrier for area inlet—not over it. Place a silt fence barrier for area inlet in a location where it is unlikely to be overtopped. Silt fence barrier for area inlets often fail when repeatedly overtopped. Do not place posts on the outside of the silt fence barrier for area inlet. In this configuration, the force of the water is not resisted by the posts, but only by the staples (wire, zip ties, nails, etc.). The silt fence will rip and fail. Do not install silt fence barrier for area inlets without framing the top of the posts. The corner posts around area inlets are stressed in two directions whereas a normal silt fence is only stressed in one direction. This added stress requires more support.

Inspection and Maintenance:

Silt fence barrier for area inlets should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow under the silt fence?
- Does the silt fence sag excessively?
- Has the silt fence torn or become detached from the posts?
- Does sediment need to be removed from behind the area inlet barrier?

NOTE: Point A must be higher than Point B so that water flows over the silt fence fabric and not around it.



Material Specifications:

Silt fence fabric should conform to the MSMTQ M288 96 silt fence specification. The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long. Silt fence fabric should be attached to the wooden posts with staples, wire, zip ties, or nails.

Placement:

Place silt fence in ditches where it is unlikely that it will be overtopped. Water should flow through a silt fence ditch check, not over it. Silt fence ditch checks often fail when overtopped. Silt fence ditch checks should be placed perpendicular to the flowline of the ditch. The silt fence should extend far enough so that the ground level at the ends of the fence is higher than the top of the low point of the fence. This prevents water from flowing around the check. Checks should not be placed in ditches where high flows are expected. Rock checks should be used instead. Silt fence should be placed in ditches with slopes of 6% or less. For slopes steeper than 6%, rock checks should be used.

The following table provides check spacing for a given ditch grade:

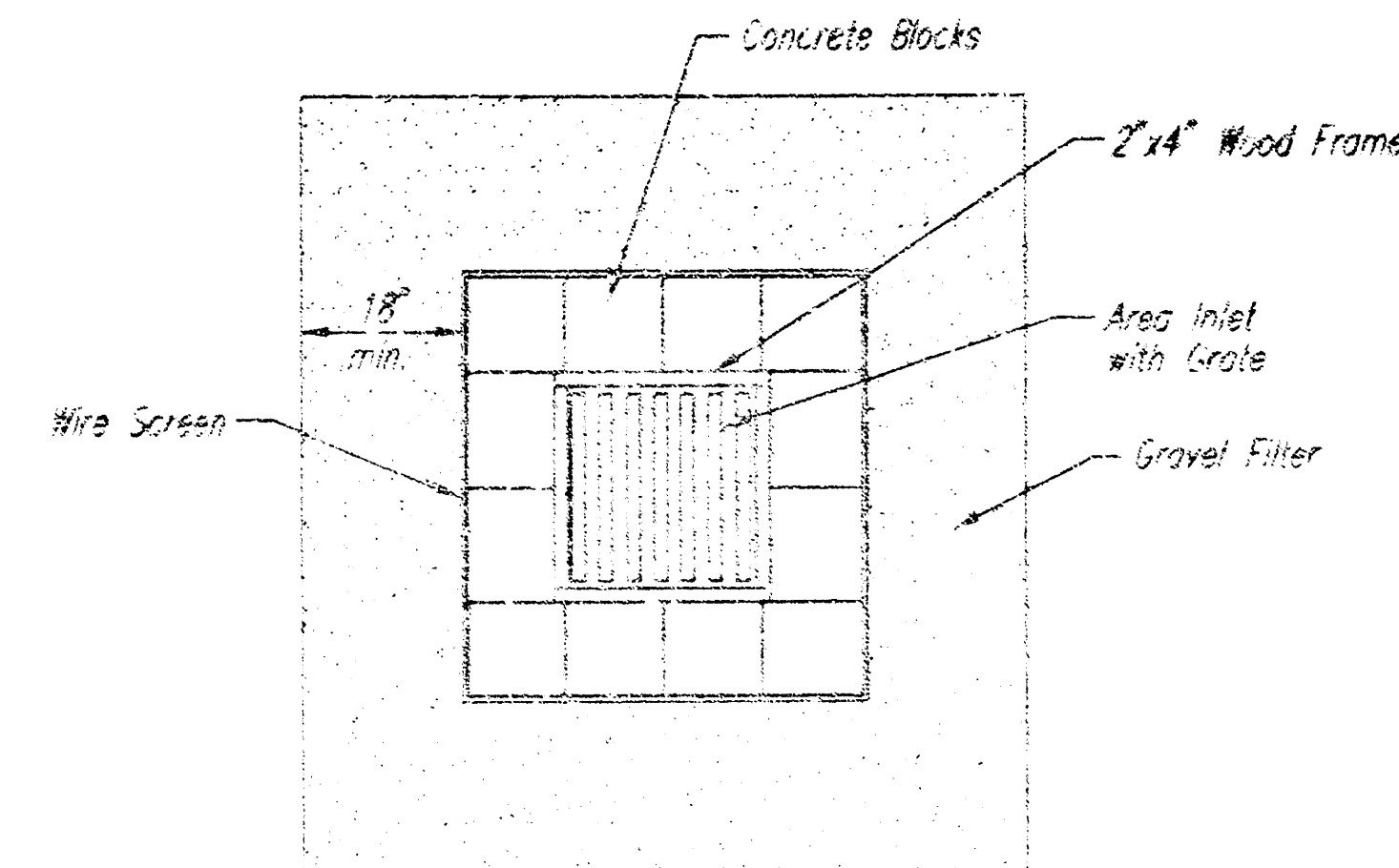
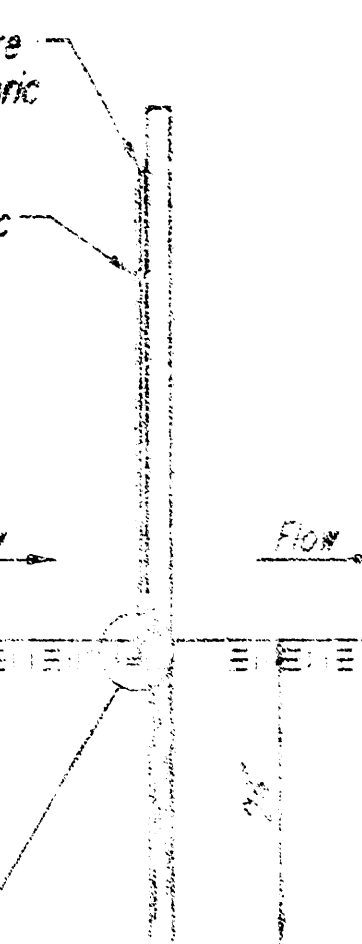
Ditch Check Ditch grade (%)	Spacing Check Spacing (feet)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

Proper installation method:

Excavate a trench perpendicular to the ditch flowline that is at least 12" deep by 6" wide. Extend the trench in a straight line along the entire length of the proposed ditch check. Place the soil on the upstream side of the trench for later use. Roll out a continuous length of silt fence fabric on the downstream side of the trench. Place the edge of the fabric in the trench starting at the top upstream edge of the trench. Line two sides of the trench with the fabric as shown on detail. Backfill over the fabric in the trench with the excavated soil and compact. After filling the trench, approximately 24" to 36" of silt fence fabric should remain exposed. Lay the exposed silt fence on the upstream side of the trench to clear an area for driving in the posts. Just downstream of the trench, drive posts into the ground to a depth of at least 24". Place posts no more than 4' apart. Attach the silt fence to the anchored post with staples, wire, zip ties, or nails.

List of common placement/installation mistakes to avoid:

Water should flow through a silt fence ditch check—not over it. Place silt fence in ditches where it is unlikely that it will be overtopped. Silt fence installations quickly deteriorate when water overtops them. Do not place silt fence posts on the upstream side of the silt fence fabric. In this configuration, the force of the water is not resisted by the posts, but only by the staples (wire, zip ties, nails, etc.). The silt fence will rip and fail. Do not place a silt fence ditch check directly in front of a culvert outlet. It will not stand up to the concentrated flow. Do not place silt fence ditch checks in ditches that will likely experience high flows. They will not stand up to concentrated flow. Follow prescribed ditch check spacing guidelines. If spacing guidelines are exceeded, erosion will occur between the ditch checks. Do not allow water to flow around the ditch check. Make sure that the ditch check is long enough so that the ground level at the ends of the fence is higher than the low point on the top of the fence. Do not place silt fence ditch checks in channels with shallow soils underlain by rock. If the check is not anchored sufficiently, it will wash out.



CONCRETE BLOCK FILTER FOR AREA DRAIN (INLET PROTECTION)

Gravel barriers provide little filtering of large inflow waters. However, when installed correctly and maintained, they can effectively treat low runoff flows.

Placement of gravel filters around area drains must be completed in a manner that will not cause local flooding.

Gravel filters can be used if the immediate and adjacent area to the area drain consists of soil or pavement.

Only gravel filters are to be installed on top of the pavement.

Instructions for installing:

- STEP 1: Place concrete blocks around the grate. The blocks can be stacked one or two high and should be supported by a 2" x 4" board.
- STEP 2: Wrap 1/2" mesh wire screen around the concrete blocks.
- STEP 3: Place 1" to 1-1/2" diameter rock around the blocks and wire screen. Be sure the rock extends down from the top of the concrete block.
- STEP 4: To prevent damage to vehicles, signs warning drivers about the structures may be necessary.

An alternative method is use of gravel bags that are supported to prevent collapsing.

Use of rock having diameters smaller than 1" may result in clogging of pores and reduce the amount of water flowing into an inlet.

Maintenance:

All gravel filters installed around area drains should be inspected and repaired after each runoff event. Sediment should be removed when material is within 3" of the top of any block. Periodically, the gravel should be raked to increase infiltration and filtering of runoff waters. Accumulated sediment is to be removed immediately from roads and streets after every runoff event.

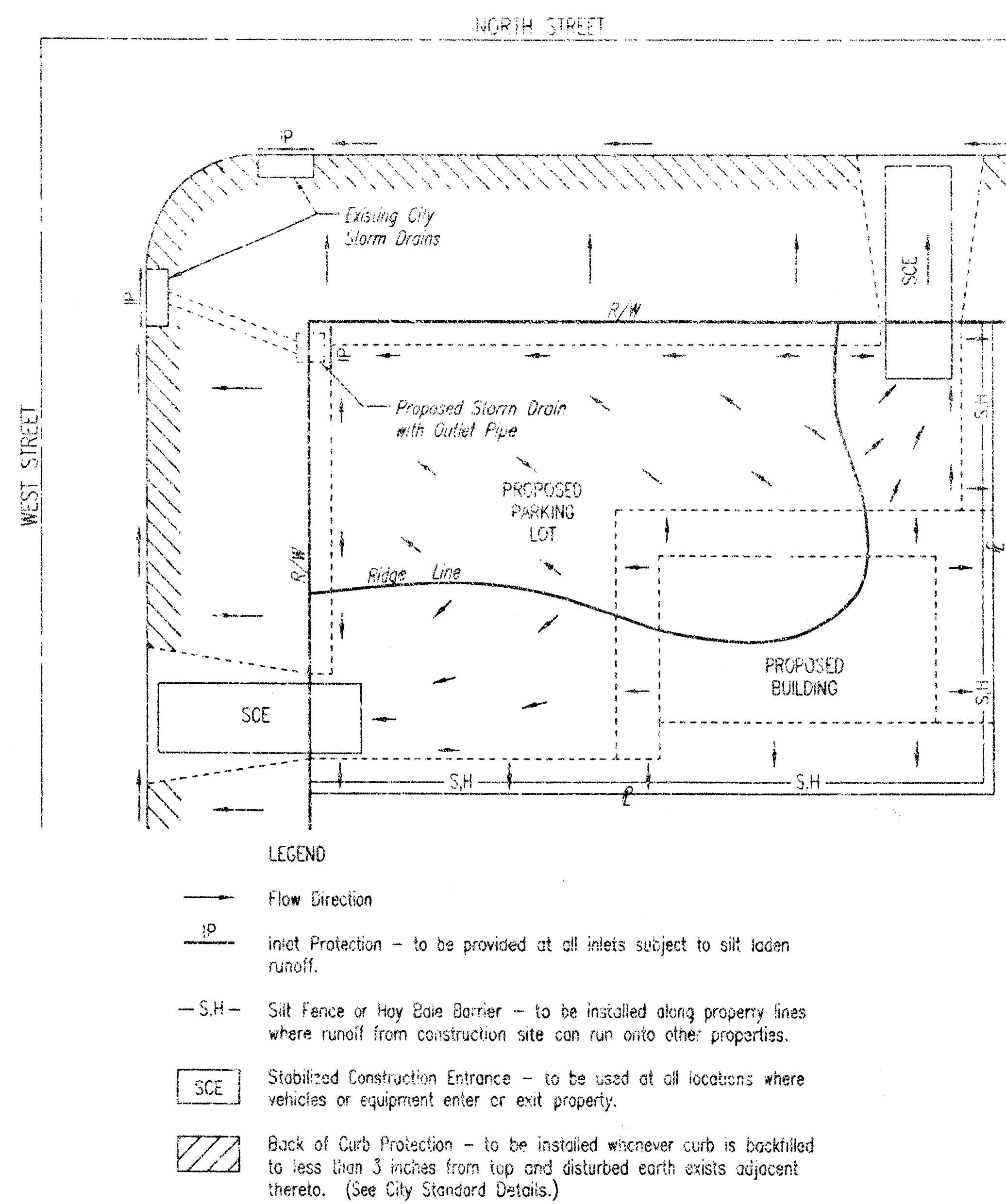
Inspection and Maintenance:

Silt fence ditch checks should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow around the ditch check?
- Does water flow under the ditch check?
- Does the silt fence sag excessively?
- Has the silt fence torn or become detached from the posts?
- Does sediment need to be removed from behind the ditch check?

	SOIL EROSION BMP DETAILS	
	JAMES L. ARMOUR, P.E. CITY ENGINEER	
	PROJECT NUMBER 1582 PPS	DECK NO. (607861)
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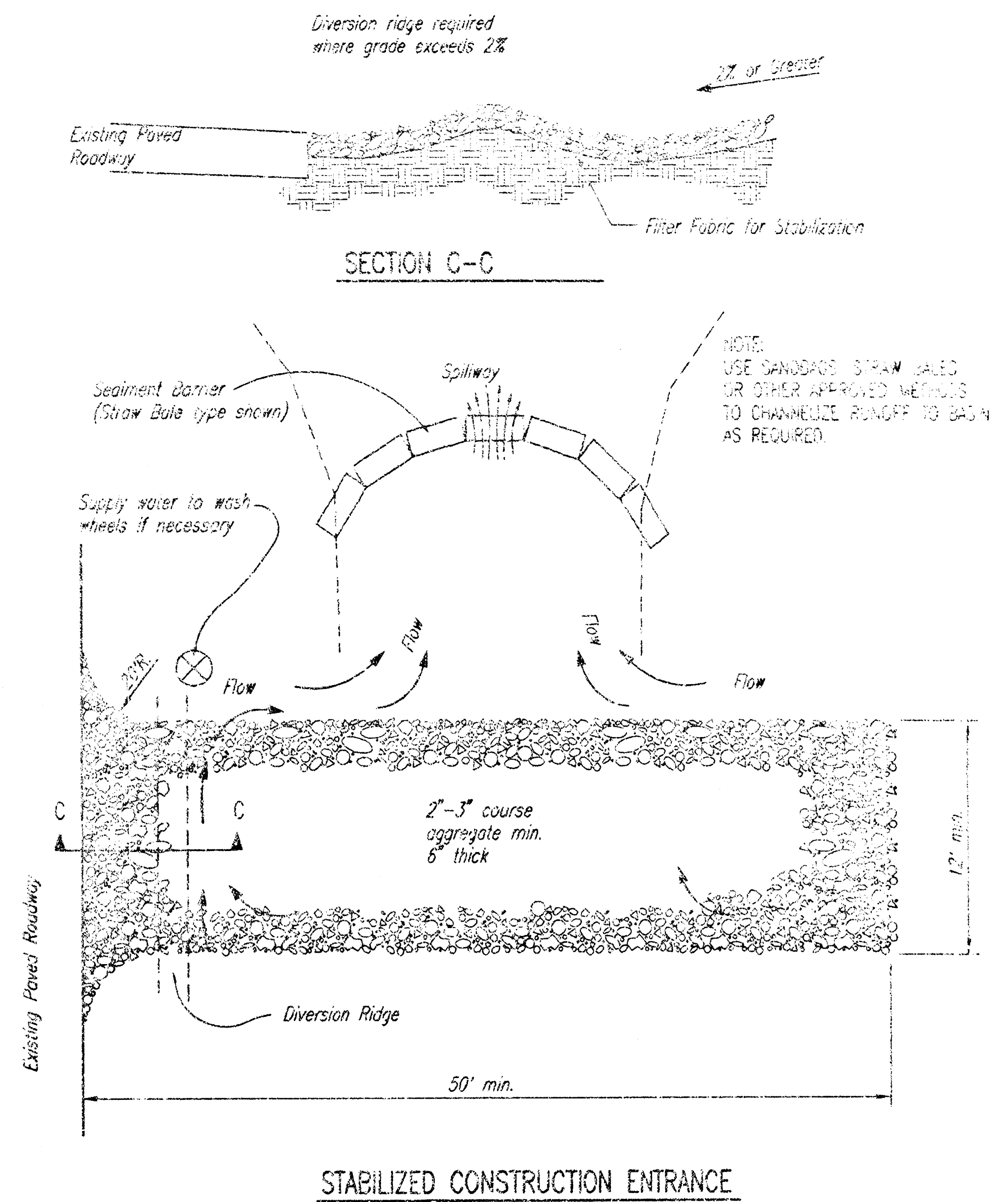
DSNR: BLB OPER: BJS SCALE: 1"=1.00
Q:\2004\04090\Phase 2 SWS Trunk\SEBMP-PEC-DTIS3-R14 09-19-2005 10:56:03 am



SOIL EROSION BMPs COMMERCIAL DEVELOPMENT SITES

General Notes

- This standard detail sheet is a part of your building permit. The BMP's shown on this sheet are considered minimum standards. Whenever sediment enters the streets, storm sewers, ditches, or ponds, contractor will install additional BMP's, as needed, to correct the problem.
- Follow these general principles on all commercial building sites.
- The soil erosion BMP's shown herein must be in place at all times during construction until such time as the site is re-excavated with paving or grass.
- Failure to install, protect, and maintain BMP's are violations of Section 16.02 of the City Code and will subject the contractor to the penalties provided therein. Included with your permit is an orange "notice" sign that must be posted on-site in a conspicuous place at all times during construction. This sign is provided to assist you in the maintenance of BMP's.
- Back of Curb Protection: Can include hay bale, silt fence, or Curlex barrier, as shown on City BMP Standard Details. This BMP must remain in place until the area between the curb and right-of-way line has been permanently stabilized.
- The General Contractor is responsible for the installation and maintenance of all BMP's.
- Should the site abut a lake, BMP's will be installed to prevent sediment from entering the lake.
- Any mud inadvertently tracked onto any street will be cleaned up by the general contractor at the end of each day's work.



NOTES:

- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
- WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
- WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN, AS SHOWN ABOVE.
- DRIVE ENTRANCES ONTO RESIDENTIAL LOTS WILL NOT BE REQUIRED TO HAVE THE SEDIMENT BARRIER SHOWN, BUT WHEEL WASHING MAY BE REQUIRED IF STABILIZED ENTRANCE IS NOT SUFFICIENT TO KEEP MUD FROM BEING TRACKED ONTO ADJACENT STREET. ENTRANCE SHALL EXTEND FROM BACK OF CURB TO DWELLING.



SOIL EROSION BMP DETAILS

JAMES L. ARMOUR, P.E.
CITY ENGINEER

PROJECT NUMBER
1532 PPS

DCA NO.
(607861)

DATE
MAY 2001

SHEET 9 OF 10

AN ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS



DSNR: ELB OPER: BJS SCALE: 1=100.00
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No.	Rev.	Dr.	Date
NEWMARKET'S "A" - PHASE 2 STORM WATER SEWER - TRUNK LINE PLAT (EVERGREEN) JAMES L. ARMOUR, P.E. - CITY ENGINEER CITY OF WICHITA PRIVATE PROJECT NO. 1582 PPS (8027861)			
Professional Engineering Consultants, P.A. 303 S. TOPKAP, WICHITA, KANSAS 67202 316-262-2991 • FAX 316-262-3003			
Designed by BER Drawn by BJS		Job No. 35-04090 Date July 2005	Sht. 10 of 10