

en the side next to the tank. The opening shall extend from 12 inches above the flow line to 12 inches below it on the grit chamber side of the wall and to 30 inches below the flow line on the tank side of the wall. The opening shall be so placed that there will be a section of end wall between them 24 inches wide on the tank side of the wall and 36 inches wide on the grit chamber side of the wall; the center of this section of wall to coincide with the center line of the tank North and South.

The top of the finished floor of the grit chamber shall be 4 feet below the flow line of the tank. The end wall shall be 18 inches thick and extend from the top of the floor to the level of the side walls of the tank. The side walls shall be 24 inches thick in order to conform with the side walls of the tank. The 36 inch division wall shall coincide with the 36 inch section of the end wall of the tank between the two openings provided, and shall extend from the floor of the chamber to 8 inches below the flow line for the central 36 inches of the wall and the remainder or 6 inches at each end, it shall be carried up to the level of the side walls of the tank, leaving an opening 36 inches wide between the two sections of the grit chamber extending from the top of the walls down to 8 inches below the flow line. The 10 inch iron inlet pipe shall enter vertically through the center of this 36 inch division wall and shall terminate 3 inches below the flow line of the tank. A cast iron elbow shall be furnished and placed in this vertical pipe beneath the floor of the grit chamber with which the main outlet sewer hereinafter described shall connect. The inlet section of the pipe to be furnished and built into the concrete as the walls are constructed.

In each section of the grit chamber there shall be furnished and inserted a piece of 8 inch cast iron pipe projecting through the wall into the chamber at its bottom and on each of these pipes, just outside the wall, shall be furnished and placed an 8 inch single gate brass-mounted hub and nut valve with which sludge pipes shall connect in the manner hereinafter described. Each valve shall have a cast iron extension valve box placed over it with the top of the box set at the surface of the ground.

There shall be furnished and constructed two wrought iron "T" frames consisting of 2 inches by 1 1/2 inch "T" bars; the frames shall be 36 inches long and 12 inches high, open at the top. These "T" frames shall be set in the 36 inch opening of the 3 foot wall between the two compartments of the tank, one on each side of the inlet pipe; the center of the frames being 3 inches from the edge of the wall. They shall be anchored in place as the wall is constructed and must remain tight when completed. There shall be furnished and constructed one stop gate made from a 12 inch by 3 inch pine plank with grooves in bottom and ends to slide down over the projecting "T"s of these frames for the purpose of closing the entrance to either of the compartments of the grit chamber while the other is being cleaned. A similar frame constructed in a similar manner and of same material shall be provided and set in each opening between the compartments of the chamber and the tank on the 6 inch ledge at the top of the 24 inch wall, except that the ends of the "T"s shall be carried up 15 inches instead of 12 inches, and the plank stop board shall be 18 inches wide instead of 12 inches.

A four foot section of 8 inch cast iron pipe shall be furnished and laid through the West wall of the septic tank at the North end. The center of the pipe being 24 inches South of the inside face of the end wall and the bottom of the pipe be flush with the bottom of the tank, and on this pipe outside the tank shall be furnished and

placed an 8 inch single gate brass mounted hub and nut valve supplied with an iron valve box carried to the surface of the ground. A section of sludge pipe shall connect with this valve and join the main sludge or by-pass pipe hereinafter described.

There shall be constructed across the tank, two trap walls, each 9 inches thick built of concrete extended from the level of the side walls or bottom of the cover, down a distance of 4 feet 6 inches, and in each of these trap walls shall be furnished and set two 3-4 inch steel bars bedded in the lower 4 inches of the wall to support its weight; these bars shall extend 12 inches into each of the side walls. One of these trap walls shall be placed with its center 4 feet 6 inches south of the inner face of the north end wall of the tank proper and the other shall be located with its center 6 feet North of the outer face of the south end of the tank.

There shall be constructed across the tank for the purpose of supporting the covering, four concrete beams, each 12 inches thick by 9 inches deep; one located with its center 8 feet 6 inches South of the North trap wall; one with its center 8 feet 6 inches North of the center of the South trap wall; and the other two between the last above mentioned; spaced 8 feet apart between centers, and 8 feet from the centers of the other two.

The entire tank, including the grit chambers and side walls, shall be covered with a flat concrete covering 6 inches thick resting upon the walls and beams herein provided. The covering shall be supported by proper frames until the concrete has thoroughly set; and in the lower 3 inches of this concrete shall be furnished and bedded a layer of expanded metal weighing 16 pounds to the square yard. The top of the covering shall be finished with a side-walk finish of Portland Cement Mortar with the outer corners rounded to a radius of 1 1/4 inches and the sides finished by plastering with Portland Cement to a distance of two feet below the top of the cover.

There shall be furnished and set in this concrete covering 10 iron frames made to receive iron grates which shall be furnished and placed in position therein. These frames shall have openings 36 inches long by 24 inches wide and be firmly bedded and anchored into the concrete with their tops flush with the surface of the covering. The iron grates shall be in one piece or be firmly bolted together with 1 inch space between the bars; each grate to weigh 100 pounds, or as near thereto as practicable. Seven of these frames shall be placed over the tank proper along the center line thereof, and each mid-way [between the trap walls and the end of the tank and between the beams; three shall be placed over the grit chamber; one directly over the inlet pipe and one over the center of each compartment.

After the tank has been constructed and the forms removed, the interior surfaces of all walls, including those of the grit chamber and the floors, shall be plastered 1/2 inch of Portland Cement mortar composed of 1 part of Portland Cement and two parts clean sharp sand. This plaster shall be thoroughly troweled down and all irregularities in the wall removed or filled, leaving the tank in a clean, smooth and workmanlike condition, throughout.

A 10 inch cast iron outlet pipe connecting with the outlet herein provided to be set in the outlet trough of the tank, by means of proper bends, shall be furnished and constructed connecting with the outlet pipe and be carried a distance of 20 feet due west of the center of the tank on a line 5 feet south of the south line thereof, where it shall terminate in a concrete bulk-head which shall be built around the end of said pipe. Said bulk-head being 3 feet wide and 3 feet deep and 3 feet long ex-

tending from 12 inches above the top of the pipe downward. It shall be built of concrete mixed as required in walls of tank with all exposed surfaces plastered. The outlet pipe shall connect with this bulk-head at an elevation of 56 feet above datum and shall rise at the rate of 1-8 inch to each foot in length thereof to a point opposite the center of the tank where it shall connect with a vertical pipe and bends to the tank.

A 10 inch cast iron sludge and by-pass shall be furnished connecting with this outlet pipe by means of a 'Y' branch and section curve pipe, and be laid North along the West side of the septic tank on a line 6 feet therefrom to a point 12 feet North of the North end of the tank where a bend shall be inserted, and the pipe shall continue to and connect with the 10 inch cast iron outlet sewer from the sewer system hereinafter provided for, at a point 24 feet North of the North end of the tank; an 8 inch branch shall be furnished and set in the main sludge pipe opposite the sludge pipe herein provided to be placed in the North end of the septic tank and connections be made therewith, and another 8 inch branch provided with the necessary pipe, fittings and bends shall connect with the two 8 inch sludge pipes from the grit chamber. A 10 inch valve shall be furnished and inserted in the by-pass pipe between its connection with the 10 inch outlet sewer from the sewer system, and the first 8 inch connection with the sludge valves of the grit chamber; this valve shall be a single gate brass mounted hub and nut valve with a valve box carried to the surface of the ground. All iron pipes and fittings hereinbefore mentioned shall be of standard weight gas pipe with leaded joints. They shall be laid and bedded in trenches or covered in fills made of excavated earth as may be required to serve the different purposes intended.

That an open trench shall be excavated in the ground leading from the bulk-head herein provided to be constructed, to the channel of the creek or stream. The said trench to be 4 feet wide on top, 2 feet deep and 12 inches wide at the bottom. The tank, grit chambers, sludge pipes with their valves and fittings, the outlet pipe and outlet ditch, shall be included with and be understood to form a part of the septic tank when hereinafter referred to.

That a main outlet sewer shall be constructed connecting with the septic tank and the by-pass pipe herein provided, and be laid along the center line of the septic tank extended to a point 20 feet south of the center line of Prairie avenue; thence east along a line 20 feet south of and parallel with the center line of Prairie avenue to a point within the city limits of Highwood 10 feet east of the West line of the east 1-2 section 15 aforesaid where it shall terminate in a brick manhole hereinafter described.

The said outlet sewer shall be constructed of cast iron pipe weighing 50 pounds per lineal foot and be connected with lead joints; it shall be laid with its inside bottom or grade line at an elevation of 57 feet above city datum where it connects with the septic tank and shall rise uniformly to 66.4 feet at a point 600 feet west of its eastern terminus. From thence it shall rise uniformly to an elevation of 64.4 feet at its eastern terminus in the above mentioned manhole.

That a brick manhole be constructed at the eastern terminus of the aforesaid described outlet sewer. The said manhole shall be 3 feet internal diameter and surrounded with a brick wall 8 inches thick constructed in all respects in the manner herein provided for other manholes, except it shall have a concrete bottom 12 inches thick, the top of which bottom shall be at an elevation of 62.4 feet above city datum and the interior of this manhole shall

be plastered with a 1-2 inch coat of Portland Cement mortar mixed as provided for the septic tank. Tile inlets shall be furnished and set in the walls of said manhole, one of 6 inches diameter looking south, with its bottom at an elevation of 66 feet; one of 10 inches diameter looking east, with its bottom at an elevation of 70 feet; and another of 12 inches diameter looking North for the purpose of connecting the present proposed and future sewers therewith.

There shall be a 10 inch by 6 inch cast iron "Y" branch furnished and set in the 10 inch iron outlet sewer at a point 12 feet West of its eastern terminus and a sufficient quantity of 6 inch cast iron water pipe shall be furnished connecting with the 6 inch opening in said "Y" branch and be laid in a trench 6 feet deep to and connect with the western terminus of the cast iron water pipe now laid in Prairie avenue to Jefferson avenue; a 6 inch double gate brass mounted hub and nut valve shall be furnished and set in this section of 6 inch pipe, with a cast iron extension valve box placed over it, the top of the box being flush with the surface of the road. This pipe shall be so connected that by opening the 6 inch valve the 10 inch outlet sewer can be flushed with water from the water mains of the city. A 10 inch single gate hub and nut valve with valve box provided, shall be set in the 10 inch sewer between the connection of the 6 inch water main and the manhole above specified.

That a main tile pipe sewer of 12 inches internal diameter be constructed connecting with the aforesaid manhole at the eastern terminus of the iron outlet sewer in Prairie avenue and be laid North in Jefferson avenue and along a line of 10 feet east of and parallel with the west line of the east 1-2 of aforesaid section 15 to center of North avenue; thence east along the center line of North Central avenue; thence north along the center line of north Central avenue; thence east along the center line of Burchell avenue to the east line of J. E. Burchell's subdivision of the Southwest 1/4 of the Northeast 1/4 of section 15 aforesaid; thence easterly through lot 50 of Highwood to a point in the center of Railway avenue 330 feet Southerly, measured along the center line of said Railway avenue from the South line of Forest avenue extended East; from thence it shall be laid easterly beneath the right-of-way of the Chicago and Northwestern Railway Company and of the Chicago and Milwaukee Electric Railway Company, and through lots 13 and 15 of Evert and Mears Subdivision of lands in sections 14 and 15 Township 43 North, Range 12, east of the Third Principal Meridian, to a point in the center of Waukegan avenue opposite the center of Clay avenue. It shall be laid with its grade line or inside bottom starting at an elevation of 67.6 feet where it connects with the manhole at the eastern terminus of the outlet sewer in Prairie avenue and shall rise uniformly at the rate of 0.4 feet to each 100 feet in length thereof to the center of North avenue, where a brick manhole shall be constructed in which a 10-inch section of pipe for future connections shall be inserted looking to the North, at an elevation of 73.1 feet. The main sewer shall leave the east side of this manhole at an elevation of 76.25 feet above datum; and shall rise uniformly to 78 feet above at the center of North Central avenue; from thence it shall rise uniformly to 79.75 feet at the center of North Central avenue and Burchell avenue; from thence it shall rise uniformly to 83 feet above datum at its eastern terminus in Waukegan avenue.

Work to be paid for in municipal bonds of the City of Highwood, bonds payable, One Thousand Dollars (\$1,000) per year for ten (10) years, interest at 5 per centum per annum.