MONOLITHIC CONCRETE FORM

William H. Jenkins, El Monte, Calif.

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This invention relates to improvements in monolithic conduit forms.

The general object of this invention is to provide an improved form for constructing conduits.

Another object of the invention is to provide an improved form for constructing the portion of monolithic conduit above the invert.

Other objects and the advantages of this invention will be apparent from the following description taken in connection with the accompanying drawings, wherein:

Fig. 1 is an end view of a unit of my improved form showing it in position on the invert section of the conduit;

Fig. 2 is a side elevation of one unit of the form and a fragmentary side elevation of an adjoining unit;

Fig. 3 is a section taken on line 3—3 of Fig. 1;

Fig. 4 is a fragmentary top plan view of the unit shown in Fig. 1;

Fig. 5 is an enlarged fragmentary section taken on line 5—5 of Fig. 3;

Fig. 6 is an enlarged fragmentary section taken on line 6—6 of Fig. 3;

Fig. 7 is a view similar to Fig. 1 showing a crown member on the forms; and

Fig. 8 is an enlarged fragmentary section taken on line 8—8 of Fig. 3.

Referring to the accompanying drawings by reference characters I have indicated a unit of my improved form generally at 10. The form unit 10 is adapted to be positioned on the previously formed invert section 11 which, as shown, includes a base portion 12, spaced side return walls 13, and outer side steps 14. The unit 10 includes an inner form 15 which is formed of two opposed sections 16 and outer side forms 17. Each of the sections 16 includes a base plate 18 having a plurality of longitudinally spaced, upwardly extending ribs 19 thereon which are secured thereto as by nails. The outer surface of each of the ribs 19 is shaped to extend upwardly and inwardly in a parabolic curve. As shown each of the ribs 19 is formed of an inwardly inclined lower leg 20 and a more severely inwardly inclined upper leg 21 which are connected at their juncture by a block member 22 nailed to both the legs 20 and 21.

Adjacent the lower ends each of the ribs 18 is mortised as at 23 to receive a longitudinally extending stringer 24 which extends downwardly over a portion of the plate 18. At their upper ends each of the ribs 19 engages and is nailed to a longitudinally extending stringer 25. Positioned on the outer faces of the ribs 19 I provide sheathing 26 which is shown as formed of a plurality of longitudinally extending boards 27 nailed to the ribs. On the outer face of the sheathing 26 I provide a facing 28 preferably of thin metal which is nailed to the sheathing.

As clearly shown in Fig. 6 the stringer 24 is connected to the sheathing 26 by a plurality of carriage bolts and nuts 28, the head of the carriage bolts being countersunk in the sheathing.

Each of the outer side forms 17 includes a base plate 30 having a plurality of longitudinally spaced, upwardly extending ribs 31 thereon which are secured thereto as by nailing. The inner surface of each of the ribs 31 is shaped to extend upwardly and inwardly in a parabolic curve and the outer surface is somewhat similarly shaped. The inner upper ends of opposed ribs 31 when the unit is set up are spaced a predetermined distance apart and do not completely encompass the inner form 15.

The upper ends of the ribs 31 are connected by a longitudinally extending strainer 32 which is nailed to each of the ribs. Positioned on the inner faces of the ribs 31 I provide sheathing 33 which is shown as formed of a plurality of longitudinally extending boards 34 nailed to the ribs. On the outer face of the sheathing 33 I preferably provide a facing 35 of thin metal which is nailed to the sheathing. Alongside a plurality of the ribs 31 I provide a plurality of vertical timbers 36 which are nailed to adjacent ribs and the plate 30 and extend upwardly a predetermined distance above the ribs 31. Adjacent their lower ends the ribs 31 are connected by a longitudinally extending stringer 37 which is nailed to the ribs 31 and the vertical members 36.

In operation the two sections 16 of the inner form are secured together by bolts 38 and nuts 39 the bolts being positioned in previously formed apertures 40 in the stringers 25 (see Fig. 8). The inner form is positioned on the invert 12 with the metal facing 28 engaging the inner faces of the invert return walls 14. The form 15 is supported and leveled by means of a plurality of wedges 41 and block members 42.

Opposite vertical timbers 36 are connected by transverse timbers 43 which are secured to the vertical timbers by bolts and nuts 44. To prevent longitudinal movement of the vertical timbers 35 I provide planks 36' which rest on the transverse members 43 and are notched as at 36" to receive the vertical timbers 43. The upper ends of the outer forms 17 are retained in spaced relation to the inner form 15 by a plural-
ity of blocks 44 which are suspended from the transverse timbers 43 as by wires 45.

Adjacent the bottom on each side the inner form 16 and the outer form 17 are clamped together by a plurality of bolts 46 and wing nuts 47. As clearly shown in Fig. 5 the heads of the bolts 46 engage the longitudinal inner stringer 24 and the shank passes through previously formed apertures 48 in the stringer 24 similar apertures 49 in the inner sheathing 26 and facing 27. The stringers, similar apertures 50 in the outer sheathing 33 and facing 35 and through similar apertures 51 in the outer longitudinal stringer 37 with the wing nut 47 engaging the stringer 37. Between the facings 28 and 35 a sleeve member 52 surrounds each of the bolts 45. To prevent outward bulging of the outer forms when concrete is poured a longitudinal timber or support member 53 is positioned between the outer edge of the ribs 31 and the inner edge of the vertical timbers 38.

After the inner and outer forms are correctly positioned on the invert 12 concrete is poured into the space between the inner and outer forms up to the upper ends of the outer forms, the block members 44 being removed shortly before the level of the concrete reaches them.

When forming small conduits the crown of the conduit between the upper ends of the outer forms is finished by hand, but when forming large conduits a crown form may be provided such as indicated at 55 in Fig. 7. As shown the crown form 55 includes spaced longitudinal side stringers 56 which are adapted to engage the stringers 38 and a plurality of longitudinally spaced, transverse ribs 57 connected to a central longitudinal stringer 58.

Between the side stringers 56 the ribs 57 are formed in the shape of an arc and have a sheathing 59 thereon which is formed of a plurality of longitudinal boards 60 nailed to the ribs. The sheathing is preferably faced with a thin metal sheet 51 nailed to the sheathing. Adjacent the central stringer 58 the sheathing 59 has a plurality of apertures 62 therein. The crown form 55 is held down in engagement with the side stringers 17 by wedges 63 positioned between the central stringer 58 and the transverse timbers 43. After the crown form 55 is placed in position the crown concrete is forced into the space below the crown form and the top of the inner form by cement gun nozzles inserted in the apertures 62.

To strip the unit 10 from a completed conduit the bolts 46 are removed and then if convenient the entire outer mold assembly may be elevated from the conduit and removed to a desired location. The wedges 41 and blocks 42 are then knocked out from under the inner forms and the bolts 38 removed whereafter the inner form sections can be removed one at a time from within the conduit.

When the conduit is to be used as a storm drain, the sleeves 52 are driven out and the resulting aperture left open to form bleed holes but when the conduit is to be used for other purposes the apertures are plugged.

From the foregoing description it will be apparent that I have provided a novel form device for forming monolithic concrete conduits which is simple in construction and highly efficient in use.

Having thus described my invention I claim:

1. For use with an invert portion of a concrete conduit including spaced side return walls, an outer form including a pair of members each including a plurality of longitudinally spaced ribs, a longitudinal stringer member connecting the upper ends of said ribs at each side, said stringer member being spaced apart leaving an opening in the upper portion of the outer form, a longitudinal stringer member at each side adjacent the lower ends of said ribs and connected to the ribs, sheathing on the inner face of said ribs, vertically extending frame members connected to the rib members, transverse members connecting said vertical frame members, longitudinally extending members engaging the inner faces of said vertical members and engaging the outer faces of said rib members, and a crown member disposed between said pair of members.

2. For use with an invert portion of a concrete conduit including spaced side return walls, an outer form including a pair of members each including a plurality of longitudinally spaced ribs, a longitudinal stringer member connecting the upper ends of said ribs at each side, said stringer members being spaced apart leaving an opening in the upper portion of the outer form, a longitudinal stringer member at each side adjacent the lower ends of said ribs and connected to the ribs, sheathing on the inner face of said ribs, means passing through said stringer members and over the adjacent return wall and adapted to secure the outer mold member in position, and a crown member, said crown member including a pair of side stringers engaging the top stringers, said crown also including an intermediate stringer, ribs connecting said side and intermediate crown stringers, and a sheathing on the inner surface of said crown ribs.

3. For use with an invert portion of a concrete conduit including spaced side return walls, an outer form including a pair of members each including a plurality of longitudinally spaced ribs, a longitudinal top stringer member connecting the upper ends of said ribs at each side, said stringer members being spaced apart leaving an opening in the upper portion of the outer form, a longitudinal stringer member adjacent each side end of said ribs and connected to the ribs, sheathing on the inner face of said ribs, means passing through said stringer members and over the adjacent return wall and adapted to secure the outer mold member in position, vertically extending frame members connected to the rib members, transverse members connecting said vertical frame members and spacer blocks supported by said hanger members, said spacer blocks being disposed in engagement with the sheathing on the outer form member, longitudinally extending members engaging the inner faces of said vertical members and engaging the outer faces of said rib members, and a crown member, said crown member including a pair of side stringers engaging the top stringers, said crown member including an intermediate stringer, ribs connecting said side and intermediate crown stringers, and a sheathing on the inner surface of said crown ribs and wedge members engaging said frame transverse member and said intermediate crown stringers.

4. For use with an invert portion of a concrete conduit, an outer form member including a plurality of longitudinally spaced ribs, a longitudinal stringer member connecting the upper ends of said outer ribs at each side, a longitudinal stringer member adjacent the lower ends of said outer ribs and connected to the ribs at each side, a covering on the inner face of said outer form
ribs, spaced, upwardly directed, frame members disposed adjacent to said outer form rib members, transverse members connecting said frame members, hanger members suspended from said transverse frame members and spacer blocks supported by said hanger members, said spacer blocks being disposed within the outer form member.

5. For use with an invert portion of a concrete conduit including spaced side return walls, an outer form including a pair of members each including a plurality of longitudinally spaced ribs, connecting members joining the upper ends of said ribs at each side, said connecting members being spaced apart leaving an opening in the upper portion of the outer form, a longitudinal stringer member at each side adjacent the lower ends of said ribs and connected to the ribs, sheathing on the inner face of said ribs, upwardly directed frame members disposed adjacent to the rib members, means connecting said frame members, and support members engaging the frame members and the rib members.

6. For use with an invert portion of a concrete conduit including spaced side return walls, an outer form including a pair of members each including a plurality of longitudinally spaced ribs, a longitudinal stringer member connecting the upper ends of said ribs at each side, said stringer members being spaced apart leaving an opening in the upper portion of the outer form, a longitudinal stringer member at each side adjacent the lower ends of said ribs and connected to the ribs, sheathing on the inner face of said ribs, a frame including upwardly directed members disposed adjacent to said ribs, and releasable means engaging the upwardly directed members and the ribs to support the latter.

WILLIAM H. JENKINS.