

THE WINTER BUILDING SYSTEM

As practiced in Europe, 'Winter Building,' as the system is called, is primarily a matter of awareness and planning. For the successful pursuance of winter building, the planner must first be aware of the critical portions of the activity and how they may be accomplished. He then must plan for their occurrence within the schedule of the construction.

Among the critical operations of winter building in Europe are the concrete work and the masonry work. These are critical because they are subject to harm if not properly accomplished. Because they are widely used, their term and location are important to the schedule and completion of the structure. It is also true that masonry and concrete are usually employed together in a building or structure, making their successful use independent. For these reasons, this discussion will include the techniques and methods for both of these materials as they are practiced.

Planning and Scheduling: It is the practice, especially in Scandinavia, to plan and schedule the entire building operation from start to finish prior to beginning work. The length of operations and tasks are estimated and the critical areas, portions, or times are thus pinpointed. This is much like Program Evaluation Review Technique (PERT) and Critical Path Method (CPM) systems.

When the critical points of the building sequence are known and the starting date is established, it is immediately apparent which operations will have to be done in the questionable weather period. Thus plans can be made for protection or suitable working methods. At this point, the contractor places orders for materials and their delivery to fit the schedule and assure continuous operation.

Site.—A site plan of the operations is suggested in all cases and is required in Denmark. Preparation of this plan includes study for drainage, access roads, parking, workers' warm-up shacks, power sources, lighting, material storage, site operations, and heating. An example of a typical winter building site plan is shown in Fig. 1. This plan was adapted from the Danish Brick Association publication on winter building.

As shown in Fig. 1, the roads, parking area, stockpile of each material, the batching plant, material hoists, tower crane, office, and warming sheds are all carefully located. In addition, where snowfall can be expected to be considerable, there will be designated areas for the snow to be pushed and piled to keep from disturbing the building activity, the access, or parking.

The power source is located and installed, and the lighting and heating requirements are estimated. Also, the site is provided with any necessary drainage and roads to maintain access for men, materials, and equipment.

Excavations and foundations.—Every attempt is made to complete necessary excavations and foundations prior to the onset of winter, since building on frozen ground is not permitted. When this is not possible, the excavations are carefully dug, formed and dried out. Then, the excavation is covered with insulating mats to keep it dry and the earth unfrozen until foundation material is placed.

Figure 2 shows the foundation of an apartment building near Stockholm, formed and insulated, awaiting the placement of heated concrete. Attention is directed to the partially enclosed masonry apartment building in the background. Figure 3 shows a slab on grade being placed near Copenhagen, Denmark. As indicated by the steam, the concrete is batched with heated materials, placed, and immediately covered with 4-in. thick mineral wool enclosed in polyvinyl chloride waterproofing. The insulating blankets are approximately 40 inches wide and 10 feet long. These are called 'winter mats' and are widely used to hold heat in walls, slabs, and other building elements during construction.

Scheduling and Storage of Materials. One of the first acts of a contractor upon being awarded a contract is to place orders for his material needs and his expected delivery schedule. In some instances, penalty clauses are written into orders to assure continuous supplies of brick, mortar, aggregate, etc., as needed throughout the project. Also, in some instances, there is a winter discount for certain materials delivered between set dates. This suggests increased efficiency of the manufacturing process and of the transportation facilities.

Figures 4 and 5 show small job-site enclosures for the fabrication of formwork and reinforcing steel on an apartment near Copenhagen. Also, note the covered stockpiles of material.

Material delivery schedules may be altered from time to time, but there are required minimum notices for such changes.