STANDARDS

FOR

TEMPORARY CONSTRUCTION

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National Institutes of Health

The Design, Construction and
Alteration Branch
Division of Engineering Services

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Introduction

The National Institutes of Health (NIH) are in the midst of a five year, $850+ million construction program. Since every part of the campus will be affected, it is necessary to establish standards that will help ensure consistent temporary facilities are constructed on all projects. Standards for temporary fencing, barriers, walkways, roadways, parking lots, signage, lighting and environmental protection promote uniformity among the projects. This in turn will enhance the quality of life of NIH employees by having temporary facilities that allow efficient and safe movements, provide clear directions and information, and are visually compatible.

The Design, Construction and Alteration Branch (DCAB) of the Division of Engineering Services is responsible for the design and construction of facilities projects at the NIH. These DCAB Standards for Temporary Construction provide minimum criteria to assist project officers, contractors, architects, engineers, and planners in the completion of facility projects on the NIH Bethesda campus.

SECTION A *General Temporary Construction Guidelines*

Introduction

Before construction work begins in an area of a project, the contractor shall submit to the project officer the design and planned installation of temporary walkways, covered walkways, roads, foot bridges, fences, barriers and other facilities required in the project. Approval must be obtained before work is started.

Phasing plans must minimize disruption to the NIH campus. Continuation of normal activity on the campus is of the highest priority.

Roads

Temporary closure of a roadway shall be allowed only after submittal and approval of a "Request for Temporary Use/Closing of Road/Parking Lot/Sidewalks or other Paved Area" permit. (Appendix A)

Weekend and night work should be performed whenever possible to minimize disruptions to traffic flow, providing noise and light pollution does not impact the neighborhood community.

Walkways

Existing walkways should be maintained in a usable and safe condition at all times, unless changes are approved by the project officer. Temporary closure of a walkway shall be allowed only after submittal and approval of a "Request for Temporary Use/Closing of Road/Parking Lot/Sidewalks or other Paved Area" permit. Proposed changes to existing walkways must include a plan for temporary walkways to re-route pedestrians around the affected area.

Signage

Construction signs must be limited to the minimum required but not exceeding the allowances detailed in Section E. Excessive signage degrades the appearance of the campus.

Office Trailers

Office trailers should complement the appearance of the campus and each other'. The exterior color should be white, beige or off-white. Multiple office trailers on a project must be of consistent style and color. Skirting will be installed to enclose the area between the trailer and the ground.

SECTION B *Temporary Fencing, Barriers and Gates*

General

A shop drawing indicating the layout of all temporary construction fencing, barriers and gates shall be provided by the contractor to the project officer for approval. The placement of construction fencing and gates shall comply, throughout the life of the project, to the approved layout.

Temporary construction fencing and gates shall be of a similar style and color , and maintained in good order.

Construction sites shall be enclosed with a rigid barrier not less than six feet (1829 mm) high when:

1. excavation, greater than 18 inches (457 mm) in depth, is within six feet (1829 mm) of a roadway.
2. within five feet (1524 mm) of critical equipment as identified by the project officer.
3. construction vehicles will be operating within five feet (1524 mm) of a walkway. The barrier shall be a "jersey barrier" with galvanized chain link fence rigidly attached to the top (see Section D, Temporary Roads).

Other construction sites shall be enclosed with a barrier not less than six feet (1829 mm) high. The barrier shall be galvanized chain link fence with vinyl slats. Dark brown vinyl slats will be installed vertically on fencing except as identified by the project officer.

The construction site will be secured to prevent unauthorized entry when work is not in progress. Gates will have double padlocks with the contractor controlling one lock, and NIH (Police Branch, Fire Department, and Maintenance Engineering Section) having keys to the other.

Execution

Avoid excavating for fence posts above existing underground utilities. Verify, as required, the location and depth of surrounding utilities prior to excavation.

Fence posts shall be securely fastened to the ground or finished surface. Where fencing must be moved or opened frequently, the project officer may approve use of portable fencing sections. All other requirements for fencing apply to the portable sections.

Posts shall be placed approximately 10 feet (3048 mm) on center.

Gates for construction deliveries and construction equipment movement shall be placed to minimize adverse impacts to existing or temporary roadways. Flagmen shall be used when contractors are obstructing existing or temporary roadways, walkways, or parking lots.

SECTION C *Safety and Health*

General Project work shall be conducted in a safe manner while providing suitable protection for the general public.

Related Documents OSHA General Industry Safety and Health Standards (29 CFR 1910), Publication V2206; SHA Construction Industry Standards (29 CFR 1926). Source: OSHA Publication 2207. This document is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

NIH Standards, Codes and Regulations

The BOCA National Building Code, Thirteenth Edition 1996

Execution No work shall be performed in any area occupied by the public or NIH employees unless approved by the project officer.

All work areas shall be fenced, or barricaded from the public or building occupants to prevent unauthorized entry into the work area. Unfinished work in public areas, such as parking lots and grassed areas, must be covered, barricaded or cordoned off to protect the public.

When the project work requires crossing a walkway, stairway, road, or parking area; a safe pedestrian or vehicle passage must be maintained using rigid screens or barriers.

Fences and barricades shall be removed, and surfaces returned to prior condition upon completion of the project.

Storage or positioning of any equipment, tools, materials, scraps or waste must be behind rigid barriers to prevent a hazard to the public or building occupants by its accidental shifting, ignition, or general condition.

No hallway, emergency access, aisle, stairway, door, or exit shall be obstructed or constrained as to impede ingress or egress by the public or building occupants.

Maintain a minimum three foot (914 mm) clearance around fire hydrants and siamese connections.

SECTION D *Temporaty Traffic Control*

General Traffic control devices and construction shall conform to the requirements set forth below and in the contract documentation. Details not covered by the plans and specifications shall conform to the "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD).

Work performed at night must be properly illuminated to allow safe vehicular and pedestrian movements.

Temporary closures of roads, walkways, or parking areas shall be permitted only with an approved closure permit (Appendix A). The contractor must submit a detailed closure plan at least 10 working days prior to the closing of a facility.

Traffic control devices and services shall be provided and maintained by the contractor both inside and outside the project limits as needed to facilitate traffic guidance.

Steel plating shall be placed and secured over excavated trenches in roadways and parking areas when construction activities are not in progress.

Sign panels shall conform to Section 633 of the MUTCD and shall be orange with black legend.

Related Documents "Manual on Uniform Traffic Control Devices for Streets and Highways" published by the U.S. Department of Transportation, Federal Highway Administration.

Standard Specifications for Construction and Materials", Maryland Department of Transportation, State Highway Administration, October 1993.

Temporary Roads

Temporary roads will be constructed of hot mix bituminous concrete on an aggregate base and compacted subgrade. Cold mix bituminous concrete may be used in winter if hot mix is unavailable. Existing topsoil will be removed to a depth of three inches (76 mm). Imbedded stumps and roots will be removed to a depth of one foot (305 mm). Construction will be as shown in Appendix B.

"Jersey barriers" are required between construction sites and roads. Each barrier shall have galvanized steel fencing fastened to the top. The barriers should be in good condition and consistent in size and quality. Barriers will have a consistent color at each project site of natural concrete or white. Barriers should be fastened together wherever practical to prevent movement.

Temporary concrete barriers shall have three inch (76 mm) minimum length yellow retro reflectors mounted to the top or side of the barrier on 25 foot (7620 mm) centers. The retro- reflectors should be mounted at a uniform height of at least two feet (610 mm) above the pavement surface.

Damage to existing and temporary roads caused by the contractor shall be repaired at the contractor's expense.

Two traffic lanes each twelve feet (3658 mm) wide must be maintained at all times or as approved by the project officer.

Temporary stripes and pavement markings shall be painted. Temporary centerline markings for two-lane, two-way roadways shall be two stripes, each minimum of four inches (102 mm) wide, with four inches (102 mm) between them.

The contractor is responsible for removing temporary markings and returning pavements to their original condition.

All conflicting construction striping and other pavement markings shall be removed by a method that does not materially damage the surface or texture of the pavement.

Pedestrian Walkways

Existing and temporary walkways must be kept clear of dirt, mud, and construction debris at all times.

Temporary walkways shall be constructed of hot mix bituminous concrete at least three inches (76 mm) deep and five feet (1524 mm) wide (Appendix C). Cold mix bituminous concrete may be used in winter if hot mix is unavailable. The walkways must have a smooth surface free of holes, bumps and undulations. The edges of the walkways will transition evenly with the surrounding surface.

When both edges of the temporary sidewalk are confined the minimum width of the walkway is six feet (1829 mm) to allow clearance for snow removal.

Temporary walkways shall not exceed the Americans with Disabilities Act (ADA) standard of eight percent slope.

Where the ground is excavated under the walkway, a walkway bridge (minimum five foot, 1524 mm, width) shall be constructed, or the walkway must be rerouted around the excavation. The walkway bridge can be constructed of steel plating or wood, but must have handrails on both sides that are three feet (914 mm) high and securely fastened.

Covered walkways, underpinning and other temporary protective guards and devices shall not project onto the street except where required to ensure the safety of the public and where minimum roadway width is maintained.

When pedestrian traffic is routed away from an existing walkway, signs must be posted directing pedestrians in the most practical direction until an existing walkways is reached.

Any temporary outdoor stairs or steps shall be kept clear and maintained in good level condition. Each tread should have a no-slip material of 4 inches (1102 mm) minimum width applied to the horizontal surface.

Covered Walkways

A covered walkway must be provided whenever a project includes work, occurring greater than 10 feet above the ground, from which falling construction materials or equipment could create a hazard to pedestrians (Appendix D).

A lighted area at least five feet (11524 mm) wide and eight feet (2438 mm) clear height shall be maintained under all covered walkways. Ramps shall conform to ADA standards.

Covered Stairways

A temporary stairway should be covered when it is part of an emergency fire egress, or when a project creates a falling debris hazard as detailed in the "Covered Walkways" paragraph. (Appendix E).

Temporary parking lots will be constructed of hot mix bituminous concrete on compacted subgrade. Existing topsoil will be removed to a depth of three inches (76 mm). Imbedded stumps and roots will be removed to a depth of one foot (305 mm). Construction will be as shown in Appendix F.

SECTION E Signage

General

A compatible standard for all temporary construction signs will avoid visual clutter, improve public understanding of each project, and facilitate cost effective project sign production. The types and styles of signage will be in accordance with ***DCAB's Guide for Construction Site Signage.***

The number and type of signs required will be determined by the project's scope, visibility, and impact to the NIH campus. The construction contractor shall submit a signage plan to the project officer for approval.

The construction area shall be well marked with signs that both notify and protect the general public. No portion of the signage shall extend into the walkway.

Sign posts for 'project signs' shall be fabricated from 4"x4" pressure treated wood posts.

Sign posts for other types of signs shall be of metal or other suitable material.

Related Documents

The Design, Construction and Alteration Branch, ***Guide for Construction Site Signage*** DCAB Business Center, Building 13, NIH Bethesda, MD

1995 NIH Master Plan; Oudens & Knoop Architects, PC, Florance Eichbaum Esocoff King Architects; available through ORS/DES Facilities Planning and Programming Branch.

Traffic Control Signs and Markers

Traffic control signs and markings shall follow the minimum requirements set forth by DCAB's ***Guide for Construction Site Signage.***

Existing and temporary crosswalk striping and stop bars affected by construction traffic shall be installed and/or maintained to be legible to pedestrian and vehicular traffic.

Prior to the start of construction operations, and after approval of the site signage plan, the contractor shall erect such signs, barricades, and other traffic control devices as may be required. Traffic control devices shall be operated only when needed.

Devices provided under this section that are lost, stolen, destroyed or deemed unacceptable shall be replaced by the contractor at no additional cost to the Government.

Sign panels, cones, drums, vertical panels and flagger paddles shall have retro reflective sheeting meeting the minimum requirements for Type 11 retro reflective material.

Standards for height and lateral clearance of roadside signs are shown in the MUTCD. Signs mounted on barricades may be at a lower height but shall not be less than one foot (305 mm) above the pavement elevation.

Traffic cones shall be a minimum of 32 inches (813 mm) in height with a broadened base and must be capable of withstanding impact with no damage to vehicles. All cones shall be orange colored and highly visible in daylight and darkness. Cones shall be capable of

Type A - on barricades or drums (used alone) or on first and last when used in a series for delineation
Type B - on warning signs
Type C - on barricades or drums in a series for delineation

Existing traffic control signs made void during construction shall be removed, stored, and reinstalled by the contractor.

Project Signs

Projects with exterior construction sites must have at least one and no more than three site signs (four feet by eight feet) as described in ***Guide for Construction Site Signage.***

Directional signs are permitted to direct traffic to the construction site(s). These signs will be in accordance with the ***Guide for Construction Site Signage ,*** and will utilize existing posts (for directional signs) to the maximum extent possible. The bottom of directional signs should be at least 6.5 feet (1981 mm) above the ground.

Project signs shall be placed on site at least 14 calendar days prior to start of construction. Exterior construction signage shall be removed from the site no more than five workdays after completion of the project. The post holes should be filled in and the ground restored to its original condition.

Staging Area and Construction Sites

Contractor's staging areas and construction sites must be well marked to assist visitors and deliveries. Each staging area and each vehicle entrance to a construction site shall be allowed one company sign (no larger than 18 square feet). Individual trailers can have one company sign no larger than three square feet.

The sign(s) shall be mounted on the fencing, or inside the staging area or construction site.

SECTION F *Temporary Lighting*

Existing Campus Lighting

Campus roadway lights or walkway lights temporarily turned off or removed shall be replaced by temporary lighting of equal or greater intensity and coverage.

Temporary lighting shall be provided which does not create unnecessary glare to pedestrians and motorists.

Construction Site Lighting

The areas of construction adjacent to walkways or roadways shall be well lit and clearly defined at all times to ensure the safety of motorists and pedestrians.

Any temporary detours of vehicles or pedestrians around a construction site shall be clearly visible at all times.

Construction area fences and barricades located near existing roadways or walkways shall be well lit to help define the limits of construction for motorists and pedestrians.

Temporary walkways, roads and parking lots will be lighted to the same intensity

SECTION G *Temporary Environmental Protection*

General

Projects must to conform to the minimum requirements of the Maryland Department of the Environment.

Each contractor must ensure runoff from their site is not affecting the conditions of walkways or roadways.

Project officers should try to be aware of impending bad weather and ensure their construction area's environmental protection devices are functioning and operational.

Related Documents

Sediment Control Handbook based on the ***1994 Maryland Standards and Specifications for Soil Erosion and Sediment*** Control, Maryland Dept. of the Environment, Water Management Administration

Sediment and Erosion Control

The contractor shall protect all points of construction ingress and egress to prevent the deposition of materials onto traversed public thoroughfares. All materials deposited onto public thoroughfares shall be removed immediately.

It is the contractors responsibility to install and maintain an effective stone construction entrance at required points of ingress and egress. The location and number of construction entrances should be established during the design phase of the project.

The contractor shall inspect periodically and maintain continuously in effective operating condition, all erosion and sediment control measures until they are permitted to be removed by the project officer.

Appendix A

Request for Temporary Use / Closing of Roads / Parking / Sidewalks or Other Paved Area

Location (Describe and note on attached map):

Dates and Time of Usage Requested:

Extent of Usage (road width, no. of lanes, etc.):

Controls to be Provided (barricades, flagmen, etc.)

Requested By: _____ _____
Project Officer Date

****

Approved By: _____ _____
Grounds Maintenance and Landscaping Section, DES Date

_____ _____
Fire and Emergency Response Section (NIH Fire Dept.), DPS Date

_____ _____
Police Branch, DPS Date

Comments or Conditions Imposed by Approving Officials:

_____

_____

_____

_____

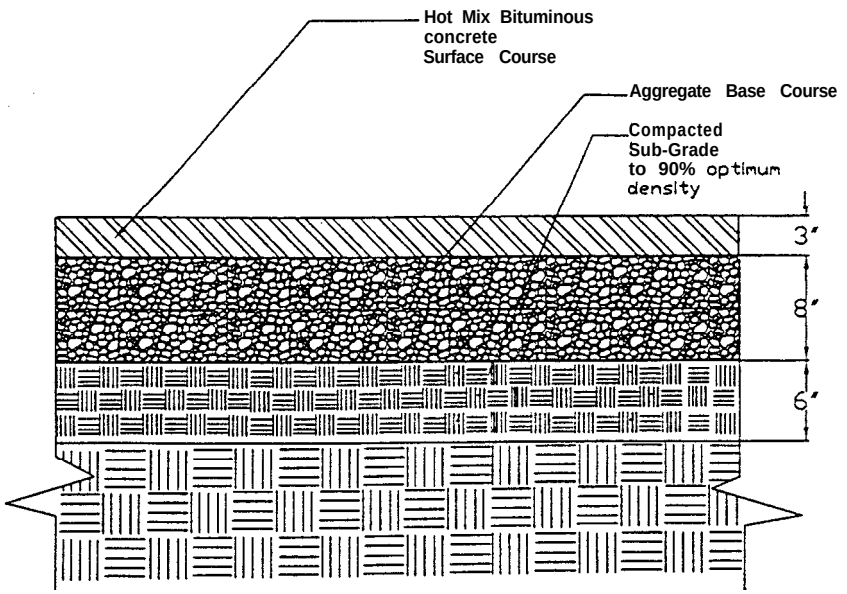
_____

_____

Appendix B

Temporary Roadway Section

Detour of less than 60 days



NOTE: Roadway should have a minimum slope for drainage of 1/4" per foot.

Section Detail

Temporary Roadway
Detour of Traffic
longer than 60 days

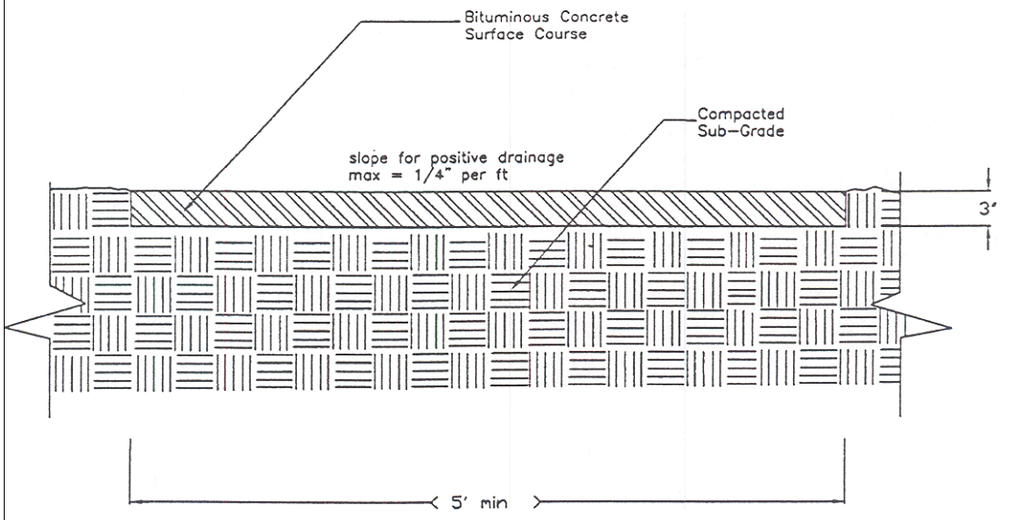
Scale

0 2FT

0 500mm

Appendix C

Temporary Walkway Section



Section Detail

Temporary Walkway
Asphalt paving on
compacted sub-grade

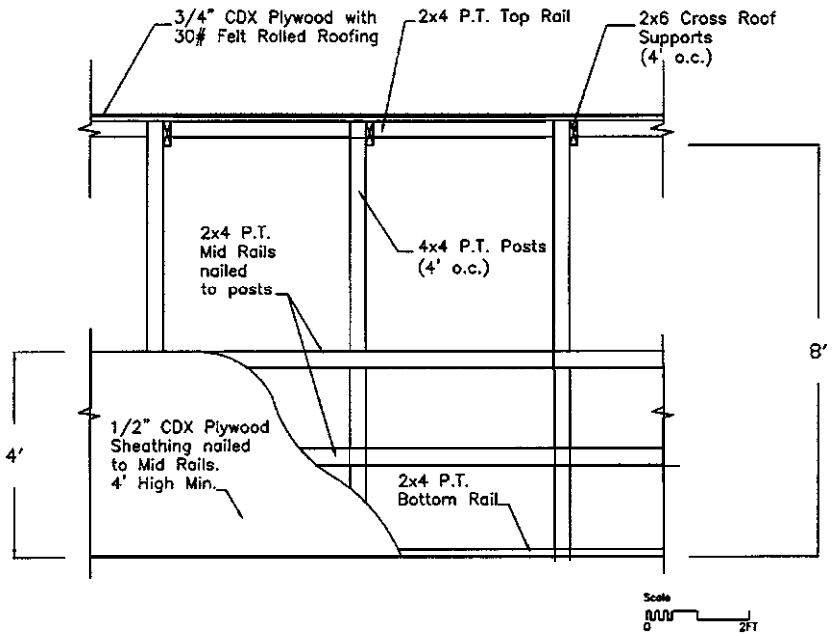
Scale

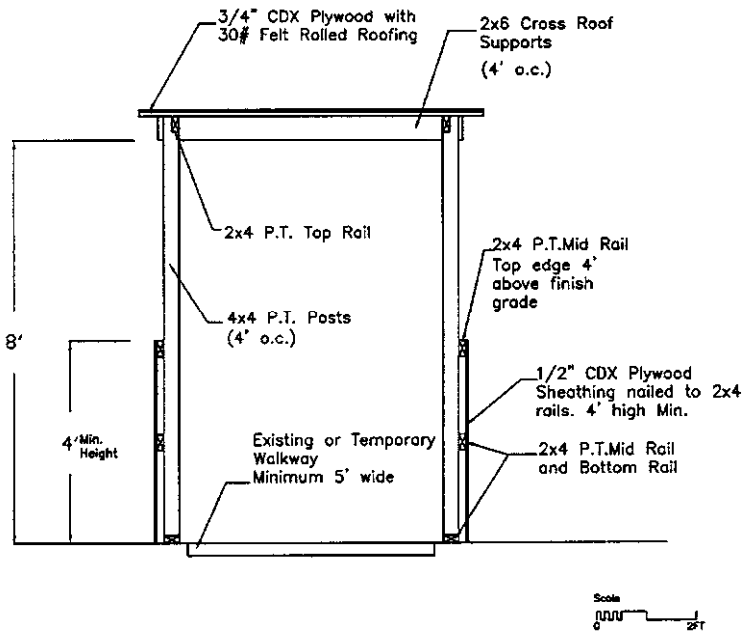
0 2FT

0 500 mm

Appendix D

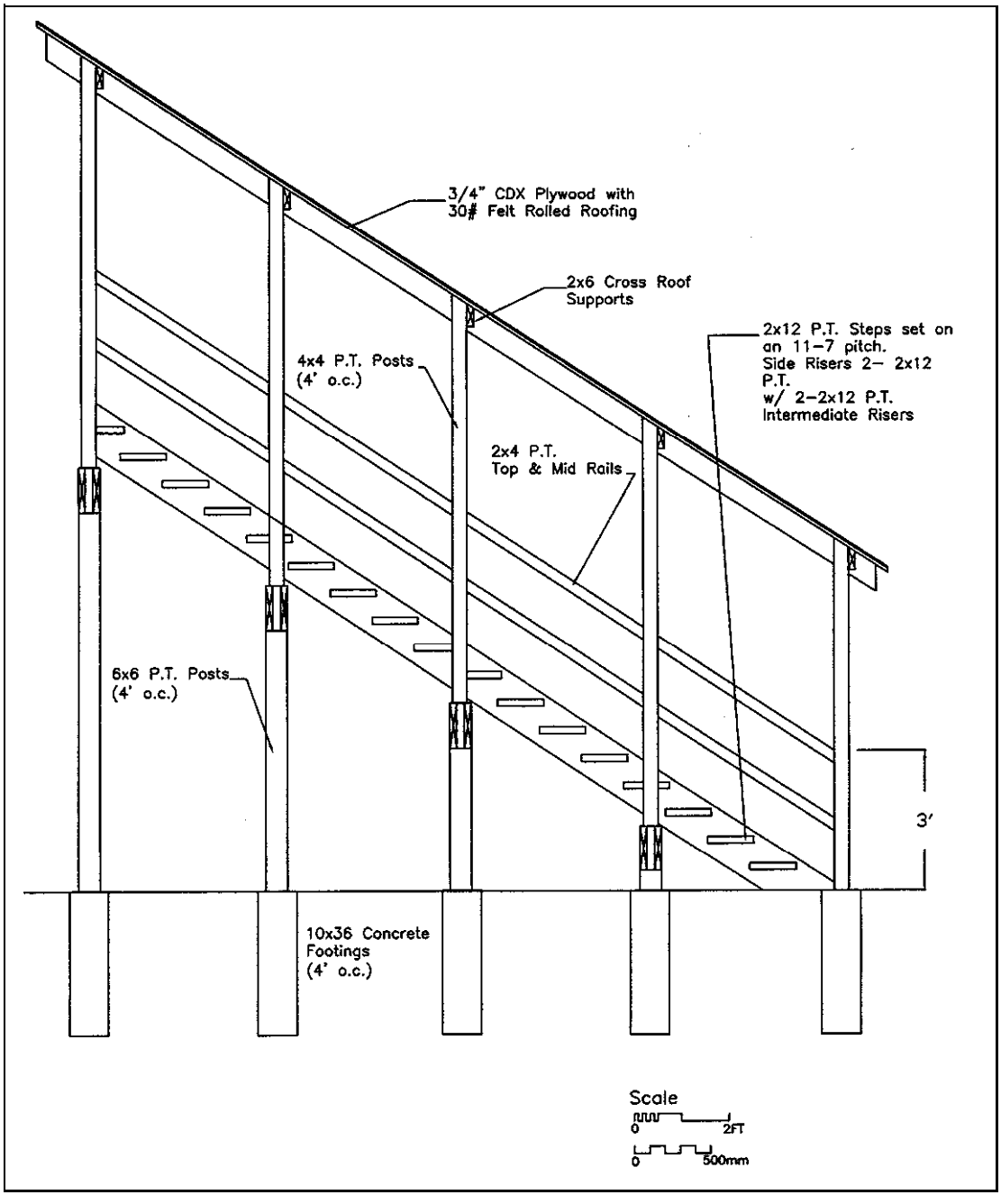
Temporary Covered Walkway Section





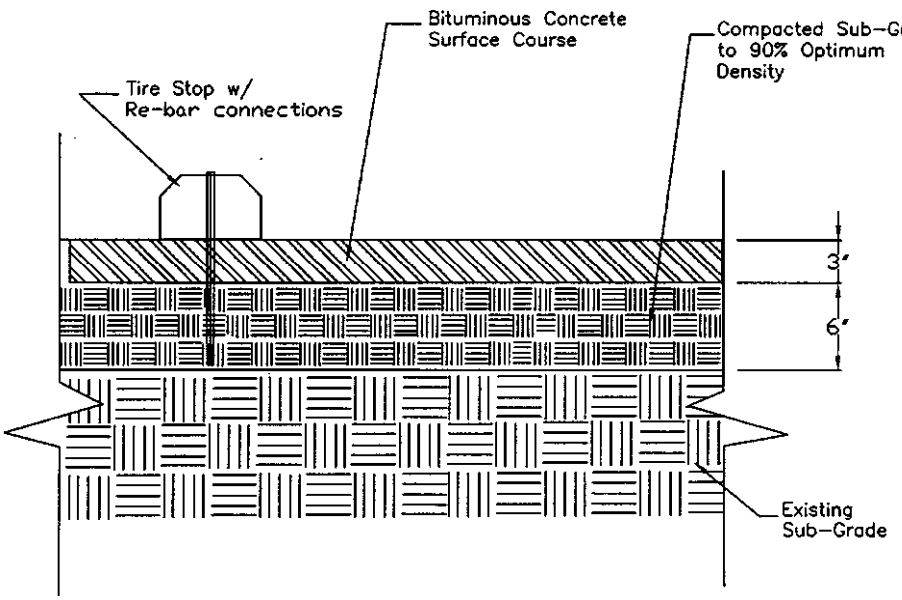
Appendix E

Temporary Covered Stairway Section



Appendix F

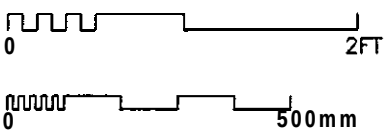
Temporary Parking Lot Section



Section Detail

Temporary Parking Lot
Bituminous Concrete poving
w/ concrete wheel stop
(typical)

Scale



Appendix G

Trailer Guidelines and Siting Procedures.

1.1 ***General Occupancy Use Guidelines.*** Trailers on the campuses are appropriate only when (a) there is no practical alternative and (b) when there is a requirement for construction-related trailers, with a need for immediate proximity to a construction site.

1.2. ***Occupancy Use Guidelines Specific To Certain Trailer Types***

1.2.1 ***Construction contractor's field office trailers and (on large jobs) subcontractor trailers.*** Occupancy and use is under contractor control. Trailers are located within contract limits for construction site/staging area.

1.2.2 ***Ready-issue materials storage trailers.*** There is no occupancy of these trailers. Use is under contractor control. Trailers are located within contract limits for construction site/staging area.

1.2.3 ***Field support trailers for A/E or CQM contractors or NIH construction project staff.*** Occupants should be limited to those absolutely needed for daily on-site interaction. Trailers are located within (or near) contract limits for construction site/staging area.

1.2.4 ***Office or laboratory trailers unrelated to a construction project. As a general policy, such trailers are not allowed.*** If an exception is sought, compelling cases should be addressed to the Associate Director for Research Services for consideration by the NIH Space Recommendation Board and subsequent siting by the Site Coordination Team. The request process is described in Attachment 2. This space is considered as temporary space as defined in the PHS Facilities Manual Vol. 1, Chapter 2-1 -10.E.

2. **Trailer Siting Procedures.** The selection of siting for trailers is established via the POR process or by sending a Site Selection Request to the Site Coordination Center. The request should be sent as soon as possible in the planning process so that site selection can be completed prior to the procurement process. Proposed trailer locations should be shown in accompanying documentation. Trailer site evaluation will include:

2.1 ***Neighborhood impact.*** No trailers are to be located in the buffer zones as defined by the NIH Master Plans. The trailer site should have minimal impact on properties/roadways adjoining NIH. Impacts to be considered include visual, noise pollution, and traffic (location of entrances/parking).

2.2 ***Emergency accessibly*** . Accessibility for Fire Department and other emergency equipment must be maintained.

2.3 ***Site modification.*** The modifications required to make a site suitable for location of a trailer should be minimal. Unless part of an approved construction site, there should be no permanent landscaping impact (e.g. removal of trees or extensive regrading).

2.4 ***Adjacency to existing structures.*** A minimum 40-foot distance should be maintained between the trailer and any existing NIH facility. In instances where this distance cannot be achieved, consultation with the NIH Fire Prevention Section (telephone 496-0487) will be required to identify additional fire safety features for the trailer and adjoining structures within the 40-foot perimeter.

2.5 ***Utilities.*** Electrical, water, sewer, and telephone hookups should be available nearby, with minimal impact to local capacities.

3. **Trailer Registration and Trailer Identification Numbers.** All trailers including contractor-owned or leased trailers must be registered with the Site Coordination Team, which will provide trailer identification numbers. One number will be assigned for every trailer "structure," which may consist of several modular units. A numbering scheme will be used that identifies the trailer location with a nearby building (e.g. TR-49). If a trailer is moved to a new location, a new number will be assigned. The trailer identification number must be displayed at all times on a clearly visible sign near the main trailer entrance. Format of the sign (size, lettering) will follow DES standards. Trailer numbers will be retired at the time of removal and reused only if future siting presents similar conditions.

4. **Operating Guidelines for Trailers.**

4.1 ***Sanitation services requirement*** . Custodial services in construction-related trailers are to be provided by the construction contractor as detailed in the DES Standard Specifications Section 01500 Series. Requests for custodial services in NIH leased or owned trailers (e.g. if approved as an exception under Section 2.4) should be addressed by memorandum to the Chief, Sanitation Services Branch, Division of Space and Facility Management. The following specific information should be addressed: Scope of work or description of housekeeping services to be performed; date or time frames requested for completion of work; total square feet to be serviced with copies of floor plans (when available); location of trailer and trailer identification number; proposed number of occupants; Common Accounting Number (CAN) to provide funding of requirement; contact person for coordination; and proposed period of performance (length of time trailer is expected to remain on site). A minimum of 60 days notice is required.

4.2 ***Landscape Maintenance.*** Landscape maintenance around contractor-furnished trailers is to be provided by the contractor as detailed in the DES Standard Specifications Section 01500 Series. Landscape maintenance around NIH leased or owned trailers (e.g. if approved as an exception under Section 2.4) will be provided by the Grounds Maintenance and Landscaping Section (GMLS).

4.3 ***Fire safe .*** Before a trailer may be occupied by a government employee, all items outlined in the DES Standard Specifications Section 0 1500 Series must be incorporated and approval obtained by the NIH Fire Prevention Section.

4.3 ***Trailer Removal.*** Upon conclusion or termination of a construction project, a contractor controlled trailer must be removed from the site. All utilities must be shut-off, capped, and the site restored. It is the responsibility of the contractor to follow removal procedures as detailed in the DES Standard Specifications Section 01500 Series. The DES Project Officer will coordinate utilities shut-down procedures with the Maintenance Engineering Section. Any delivery or removal of a trailer that will involve the blockage of an NIH road, parking area, or walkway requires prior clearance by NIH Police and Fire Departments.