

# **CHAPTER V**

## **TECHNICAL DESIGN & PERFORMANCE STANDARDS**



## Table of Contents

<b><u>DIVISION 1 - GENERAL REQUIREMENTS</u></b>	<b><u>5</u></b>
<b><u>01030 Alternates</u></b>	<b><u>5</u></b>
<b><u>01045 Cutting and Patching</u></b>	<b><u>5</u></b>
Cutting and Patching Generally	5
Cutting and Patching Pavement	5
<b><u>01060 Regulatory Requirements</u></b>	<b><u>5</u></b>
GENERAL	5
<b><u>01095 Reference Standards &amp; Definitions</u></b>	<b><u>6</u></b>
Installation	6
<b><u>01315 Standard Scheduling and Reporting Requirements</u></b>	<b><u>6</u></b>
<b><u>01316 Scheduling Requirements for Complex Projects</u></b>	<b><u>6</u></b>
Responsibility of Project Expediter and Other Prime Contractors	6
Project Schedule and Analysis System	7
Schedule Approval	8
Other Requirements	8
Material & Equipment Procurement	8
Testing & Inspection Activities	8
Incorporating Change Orders & Holidays	8
Historically Predictable Weather	8
Monthly Updates	8
Response to Lack of Progress	9
As-built Schedule	9
<b><u>01340 Shop Drawings, Product Data, and Samples</u></b>	<b><u>9</u></b>
Departures for Plans & Specifications	9
Shop Drawings at Project Site	9
Return of Samples	9
<b><u>01400 Quality Control Services</u></b>	<b><u>10</u></b>
Special Inspections	10
<b><u>01500 Temporary Facilities</u></b>	<b><u>10</u></b>
Temporary Electrical and/or Steam Service	10
Temporary Water Service	11
<b><u>01505 Construction Waste Management</u></b>	<b><u>11</u></b>
Required Specifications: 01505 Construction Waste Management	11
WASTE MANAGEMENT DEFINITIONS	11
WASTE MANAGEMENT GOALS	12
DRAFT WASTE MANAGEMENT PLAN	13
FINAL WASTE MANAGEMENT PLAN	14
IMPLEMENTATION AND DOCUMENTATION OF WASTE MANAGEMENT PLAN	15
<b><u>01631 Product Substitutions</u></b>	<b><u>16</u></b>
Requests for Substitutions	16
<b><u>01700 Project Close-out</u></b>	<b><u>16</u></b>
Certificates	16
<b><u>01720 Project Record Documents</u></b>	<b><u>16</u></b>
As Built Drawings	16
<b><u>01730 Operating and Maintenance Data</u></b>	<b><u>16</u></b>
Operating and Maintenance Manuals	16
<b><u>01740 Warrantees and Bonds</u></b>	<b><u>17</u></b>
Guarantee	17
<b><u>01800 UNC-CH Supplementary General Conditions (for use with GC, 23d Edition, January 2002 as Revised March 2002)</u></b>	<b><u>17</u></b>



## **DIVISION 1 - GENERAL REQUIREMENTS**

### **01030 Alternates**

The University prefers to avoid deduct-alternates unless circumstances justify their use and special permission is obtained. On the other hand, carefully selected add-alternates are desirable to fully use the available funds. Add-alternates are items which can be added to the "base bid" design without causing major changes in the "base bid" design package.

### **01045 Cutting and Patching**

#### **Cutting and Patching Generally**

The cutting of chases, openings, or similar holes in walls, floors, and ceilings shall be done in a manner so as not to endanger the stability of any part of the structure. The Contractor shall not in any case cut or alter the work of any other contractor without the approval of--and under the direction of--the Designer. Flowable fill will be used as a standard unless noted otherwise to reduce settlement caused by lack of compaction.

#### **Cutting and Patching Pavement**

Prior to any pavement cut all necessary NCDOT, Town and UNC\_DPS permits and approvals must be acquired. Where any paving is cut for placing new utility lines, neatly cut the asphalt with straight edges, even if this requires enlarging the size of the trench, and remove with an asphalt cutter. Breaking the asphalt out with a backhoe or other means is not acceptable. Place boards or other suitable material under the backhoe outrigging to prevent damage to the asphalt. Thoroughly compact the backfill placed in the opening, as described in Division 2, and immediately replace the pavement after the opening is backfilled. In parking lots, replace pavement with a minimum of 6 inches of coarse aggregate base course, followed by a minimum of 3 inches of Type I-1 asphalt.

On streets and on parking lot travel lanes which experience frequent transit bus traffic, compact subgrade as described in Division 2, and replace pavement with a minimum of five (5) inches of Type HB asphalt base, two (2) inches of Type H binder, and 2" of Type I-1 asphalt surface course. Where possible, compact each course of asphalt paving material with a steel-wheeled roller. Where patched areas are too small to allow rolling of the base courses, manually compact areas in a manner approved by the University Construction Manager.

Repair any minor settlement which occurs during the 12 months warranty period by removing all failed material, recompacting the subgrade and patching as described above.

### **01060 Regulatory Requirements**

This section MUST be included in Project Specs. An up-to-date and downloadable version of this section can be found on the OWRR Guidelines website [www.fac.unc.edu/OWRRGuidelines/](http://www.fac.unc.edu/OWRRGuidelines/). Related sections: 01505 Construction Waste Management, 02070 Selective Demolition.

#### **GENERAL**

The Contractor shall be responsible for knowing and complying with regulatory requirements - Federal, State and Local - pertaining to legal disposal of all construction and demolition waste materials, including but not limited to the following:

[N.C. General Statute 130A](#)

- Whole Tires as of March 1, 1990 banned in landfills.
- Used Oil as of October 1, 1990, banned in landfills.
- Yard Waste as of January 1, 1993, banned in landfills.
- Aluminum Cans as of July 1, 1994, banned in landfills or incinerators.
- White Goods as of January 1, 1991, banned in landfills. Incineration banned as of July 1, 1994.

Orange County Regulated Recyclable Materials Ordinance requires cardboard, clean wood, scrap metal and pallets to be either source separated or taken in mixed loads to a permitted facility (contact OWRR or [Orange County Solid Waste](#) at 919/968-2788 for a list of facilities). It also requires that anyone hauling these wastes in a vehicle that is 9,000 lb. or greater within Orange County must have a license. Contact Orange County Solid Waste to obtain a license.

[Town of Chapel Hill Noise Ordinance](#) (Ordinance Number 2001-09-24/O-8): Once on the Town's Code of Ordinance site, click on Code of Ordinances of the Town of Chapel Hill hyperlink. Then search by "noise" and go to Noise Ordinance Article III . See Section 11-40 Exemptions items (b) Construction and (o) Sanitation.

University policy regarding hazardous materials, [UNC-Chapel Hill Design Guidelines](#), Chapter IV (Supplemental Guidelines): Hazardous and Universal Waste Issues. Contact: [UNC-Chapel Hill Office of Environment, Health and Safety](#)

## **01095 Reference Standards & Definitions**

### **Installation**

Where the words "Provide", "Furnish", and/or "Furnish and Install" are used, it is intended that this Contractor shall purchase and install completely any materials as required unless otherwise noted. All materials shall be appropriate for the intended service. Install all materials and equipment in complete accordance with the manufacturer's recommendations.

## **01315 Standard Scheduling and Reporting Requirements**

Refer to Supplementary General Conditions of the Construction Contract - Conduct of the Work.

## **01316 Scheduling Requirements for Complex Projects**

Many projects, because of their magnitude and complexity, may require a more sophisticated scheduling and reporting effort on the part of the Contractor than is described in the Supplementary General Conditions of the Contract. This determination is made jointly by the Designer and the UNC-CH's Construction Administration Department during the design phase of the project. In these cases, the standard Scheduling requirements in the Supplementary General Conditions of the Contract - Conduct of the Work, are replaced by the following:

### **Responsibility of Project Expediter and Other Prime Contractors**

It is the responsibility of the Project Expediter to prepare and maintain a critical path schedule (CPM) for the work of all prime contractors and trades on this project, and to notify the Designer of any changes in this schedule. The Designer is responsible for providing adequate notice to all prime contractors to insure the efficient continuity of all phases of the project work.

The Project Expediter shall employ an independent Scheduling Consultant to perform all scheduling for this project. The Scheduling Consultant shall be acceptable to the Designer and to the University's Department of Construction

Administration. The Scheduling Consultant shall have personnel who can visit the site weekly, if necessary, and shall have provided independent construction scheduling services for a minimum of five (5) years prior to the date of this construction contract.

Designation as "Project Expediter" entails an additional project control responsibility and does not alter in any way the responsibility of the prime contractor so designated to the Designer and to all other prime contractors as stipulated in the General Conditions of the Contract.

All of the other prime contractors on this project shall provide their own list of CPM-sequenced activities to the Project Expediter's Scheduling Consultant within 15 days after the Notice to Proceed. The Project Expediter shall present to the Designer and to the Owner, within 21 days after Notice to Proceed, a preliminary, computerized, critical Path Method scheduling system for completion of the Project, as described below:

### **Project Schedule and Analysis System**

The schedule is in the form of an activity oriented, time scaled network diagram (Critical Path Method) and the principles and definition of the terms used herein are as set forth in the Associated General Contractors of America (AGC) publication, The Use of CPM In Construction, Copyright 1976, or the latest revised issue.

Within 21 calendar days after the effective date of the Notice To Proceed, the Contractor shall submit six (6) copies of a preliminary, computer-generated, time-scaled, Critical Path Method (CPM) network covering the activities planned to be in progress during the project. No application for payment is processed until this schedule is received. These activities shall be resource- and cost-loaded as described below. No activity shall have a duration exceeding 15 working days.

Within 30 calendar days after the effective date of the Notice To Proceed. The Contractor shall submit six (6) copies of all documents utilized in his or her CPM analysis system. These documents shall include, as a minimum, the following:

A Time-Scaled CPM Network Diagram utilizing the precedence diagramming technique. Ninety (90) percent of the activities (except Fabricate and Deliver) must have durations of between three (3) and fifteen (15) working days. (Note that a working day is defined here as an eight (8) hour, non-holiday, Monday through Friday day. A work day shall conform to UNC daylight operational hours of 6 am to 6 pm.) The activities on the network must carry the following information:

- a) Activity identification number
- b) Activity description
- c) Remaining activity duration
- d) Activity value in dollars
- e) Activity manpower in man-days

A Computerized Schedule Analysis reflected in the following reports:

- a) A monthly report listing, for each activity, the activity identification number, the activity description, the original duration, the remaining duration, the responsible organization, the earliest and latest start and completion dates, and the total slack.
- b) A monthly report showing, for each activity, the amount of the activity cost which has been earned to date. This report shall provide subtotals by responsible organization and overall totals of contract amount and amount earned to date.
- c) A monthly cash flow curve graph. This graph shall indicate the total percentage of activity dollar value scheduled to be place for early and late finish dates with actuals plotted out monthly.

- d) A report showing, for each activity, the amount of the activity cost which has been earned to date. This report shall provide subtotals by responsible organization and overall totals of contract amount and amount earned to date.
- e) A narrative report which provides an interpretation of the results of the computer analysis and outlines the means by which schedule problems are to be resolved.

### **Schedule Approval**

All the Prime Contractors shall attest and sign a copy of the CPM network diagram. The signatures shall attest the CPM as the "approved schedule for construction". All network diagram updates are also attested and signed as "approved updated schedule". Forward the signed and approved copies of the diagram to the Owner and Designer promptly upon approval.

### **Other Requirements**

#### **Material & Equipment Procurement**

The CPM analysis system shall include a Submittal, and Approval, and a Fabrication and Delivery activity for each item of major equipment and for each materials item agreed upon by the Contractor and the Owner's representative as having the potential to affect the schedule.

#### **Testing & Inspection Activities**

The CPM analysis system shall include testing, commissioning, clean-up, debugging, final inspection, and punch list completion activities for each major element of the facility's mechanical and electrical systems. The CPM shall finalize and provide O&M manuals for each major element of the facility's mechanical and electrical systems, schedule and conduct operator training, and finalize as-builts drawings. All the preceding work items are shown as occurring within the contract duration.

#### **Incorporating Change Orders & Holidays**

Incorporate the impact of all occurring Change Orders into the CPM schedule. Accompany any request for contract time extension with a proposed updated CPM substantiating any delay caused by the changed work. The impact of all incurred holidays is incorporated into the CPM schedule. Quantify and state explicitly the impact in the narrative report and graphically on the CPM diagram.

#### **Historically Predictable Weather**

Incorporate the impact of historically predictable weather delays into the CPM schedule. Quantify the impact and state explicitly in the narrative report. The historical weather data source is the monthly summaries of the previous 35 years correlated by the National Climatic Data Center, Asheville, NC (Data sheets: "Normals, Means, Extremes" and "Climatology of the United States," No. 20 - Chapel Hill, 1951-1980.

#### **Monthly Updates**

Update the CPM analysis system monthly. At each monthly update of the CPM analysis system, the earned value, and man-hours expended, to date, of each activity undertaken during the past month, is listed by Prime Contractor. Each prime contractor payment certification shall include and correlate to the above activity costs.



Each prime contractor is held responsible for keeping the project expeditor fully informed as to the work progress, including immediate notification of any work progress changes. Report work progress in man-hours per activity.

The project expeditor shall hold contractual meetings with the various Contractors, Architect, Scheduling Consultant and Owner as required to coordinate work and provide work progress reports.

### **Response to Lack of Progress**

Where any scheduled man-hour progress has fallen 5% or greater behind, each affected Prime Contractor shall increase the scheduled resources and/or re-sequence the work to maintain timely contract completion. Such resourcing and re-scheduling is considered a normal and ordinary contract requirement within the General Conditions, Article 14 and 23. Such response is considered normal and expected for ordinary weather-related impacts on the schedule.

### **As-built Schedule**

The Project Expediter shall at the time of Final Completion submit as part of the required completion documents an "as-built" schedule and reports incorporating the actual duration and activities which occurred during the project.

## **01340 Shop Drawings, Product Data, and Samples**

The Contractor shall submit, for the Designer's approval, shop drawings and/or product data for all equipment and special construction used on the project. Contractors shall keep records of the total running cost of all project purchases. Submittals shall document the product criteria tracked under the LEED checklist. This includes post-consumer and post-industrial recycled content, distance from the project site to the manufacturer, use of rapidly renewable materials, and the volatile organic compound (VOC) content of paints, coatings, adhesives, sealants, carpet, and composite wood products. The Contractor shall simultaneously submit one copy of each submittal to the University's Construction Manager. Submittals related to LEED criteria shall simultaneously be submitted to the University's Sustainability Coordinator.

The Contractor, if possible, shall provide all submittals at one time, after he or she has verified that they conform to plans and specifications and after he or she has stamped them as approved. Order materials only after the Designer approve submittals.

### **Departures for Plans & Specifications**

The Contractor must indicate on his or her submittals any departures from the plans and specifications. Approval granted on shop drawings is rendered as a service only and is not considered a guarantee of measurements, building conditions, quantities, or dimensional verification, nor is it construed as relieving the Contractor of his or her basic responsibility to construct the work in accordance with the contract drawings and specifications. In the event that materials that do not meet the specifications are erroneously approved, replace the materials with approved materials--at the expense of the Contractor--when the error is discovered.

### **Shop Drawings at Project Site**

Keep a complete set of shop drawings at the project site at all times.

### **Return of Samples**

In cases where submittal of material samples is required for approval, the Contractor or manufacturer may request their return.

## **01400 Quality Control Services**

Refer to Supplementary General Conditions of the Contract - Conduct of the Work.

### **Special Inspections**

Special Inspections, per Section 1704 of the North Carolina State Building Code, will be required on all projects reviewed by the State Construction Office (SCO). The SCO may grant a waiver for a project that is limited in structural complexity. Indication of this waiver must be presented in writing to the University with either the DD or CD review submittal.

The requirement for Special Inspections on projects not reviewed by the State Construction Office will be determined by University personnel. The design team shall engage in these discussions with the Facilities Planning Project Manager prior to the design development phase. As with the SCO criteria, projects with limited structural complexity may be granted a waiver.

For all projects requiring Special Inspections, a detailed Statement of Special Inspections must be submitted as part of the project documents. This Statement shall be written by the structural engineer of record.

## **01500 Temporary Facilities**

Each Contractor--at his or her own expense and during the entire construction period--shall install, operate, protect and maintain temporary services as described in the following paragraphs. Where permanent utilities are available and accessible, the University may decide to allow use of these rather than having additional temporary services installed. All costs for utilities and services provided by the University are charged to the Contractor at established rates.

The Facilities Services Division must approve temporary or permanent connections made to existing University systems. Request approval through the University's Construction Manager. Where such connections require shutdown of an existing system, the shutdown is made by University personnel at a time agreed upon by the Facilities Services Division as suitable to ongoing operations. The Contractor must submit a written request for a planned shutdown at least 15 calendar days before shutdown is required. Directly after completion of the connection by the Contractor, reinstatement of normal service is performed by the Facilities Services. When temporary service lines are no longer required, the Contractor shall remove the lines. The Contractor shall restore any part or parts of permanent service lines, grounds, and buildings disturbed by the installation and/or removal of temporary service lines, to their original condition.

### **Temporary Electrical and/or Steam Service**

Electric and/or steam service is provided to the Contractor after an application for service is filed with the UNC Utilities Accounting, (919) 962-1158, Giles F. Horney Building, Room 116, CB# 1810, Electric and/or steam service charges are billed to the Contractor monthly at University rates.

## **Temporary Water Service**

The Orange Water and Sewer Authority (OWASA) provide water and sewer services to the University campus. Contractors requiring water and sewer services shall apply for such services directly to OWASA, at the following address:

Orange Water and Sewer Authority  
400 Jones Ferry Road  
Carrboro, NC 27510  
(919) 968-4421

All OWASA charges for water and sewer services are paid by the Contractor.

## **01505 Construction Waste Management**

This section MUST be included in Project Specs. An up-to-date and downloadable version of this section can be found on the OWRR Guidelines website [www.fac.unc.edu/OWRRGuidelines/](http://www.fac.unc.edu/OWRRGuidelines/). Related sections: 01060 Regulatory Requirements, 02070 Selective Demolition.

### **Required Specifications: 01505 Construction Waste Management**

#### **Part I - General Information**

- [Waste Management Definitions](#)
- [Waste Management Goals](#)
- [Draft Waste Management Plan](#)
- [Final Waste Management Plan](#)
- [Implementation and Documentation of Waste Management Plan](#)

## **WASTE MANAGEMENT DEFINITIONS**

Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

Commingling: Mixing recyclable C/D material in one waste container. Materials Recovery Facilities (MRF) exist to sort and recycle commingled materials off-site.

Construction and Demolition Waste: Includes all non-hazardous solid wastes resulting from construction, renovations, alterations, repair, and demolition.

Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitability, corrosiveness, toxicity or reactivity.

Material Recovery Facility (MRF): A processing facility designed to sort and separate recyclables based on market needs and material components.

Non-hazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitability, corrosiveness, toxicity, or reactivity.

Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

**Recyclable:** The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

**Recycling:** The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste. Can be conducted on-site (as in the grinding of concrete and reuse on-site).

**Return:** To give back reusable items or unused products to vendors for credit.

**Reuse:** To reuse a construction waste material without altering its form on the Project site or elsewhere.

**Salvage:** To remove a waste material from the Project site to another site for resale or reuse by others.

**Sediment:** Soil and other debris that has been eroded and transported by storm or well production runoff water.

**Source Separation:** The act of keeping different types of waste materials separate beginning from the first time they become waste in order to reuse or recycle them.

**Toxic:** Poisonous to humans either immediately or after a period of exposure.

**Trash:** Any product or material unable to be reused, returned, recycled, or salvaged.

**Volatile Organic Compounds (VOCs):** Chemical compounds common in and emitted by many building products over time through offgassing: solvents in paints and other coatings; wood preservatives; strippers and household cleaners; adhesives in particleboard, fiberboard, and some plywood; and foam insulation. When released, VOCs can contribute to the formation of smog and can cause respiratory tract problems, headaches, eye irritations, nausea, damage to the liver, kidneys, and central nervous system, and possibly cancer.

**Waste:** Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

**Waste Management Plan:** A Project-related plan for the collection, transportation, and disposal of the waste generated at the construction site. The purpose of the plan is to ultimately prolong the useable life of waste materials and reduce the amount of material being landfilled.

## **WASTE MANAGEMENT GOALS**

Within the limits of the construction schedule, contract sum, and available materials, equipment, products and services, the Owner has established that this Project shall generate the least amount of waste possible and employ processes that ensure the generation of as little waste as possible. This expectation is consistent with:

- The 1997 “Statement on Voluntary Measures to Reduce, Recover, and Reuse Building Construction Site Waste” released by the American Institute of Architects and the Associated General Contractors of America
- Federal Executive Order 13101
- EPA Comprehensive Procurement Guidelines (CPG)
- North Carolina Executive Order 156—State Government Environmental Sustainability, Reduction of Solid Waste, and Procurement of Environmentally Preferable Products.

The Contractor shall develop, for the Architect's and owner's review, a [Waste Management Plan](#) for this Project consistent with these goals.

- Minimize the amount of C/D (construction and demolition) waste initially generated by such methods as efficient use of materials, appropriate planning, proper storage, prevention of breakage and damage to materials, avoidance of excess packaging and source separation of waste.
- Of the inevitable waste that is generated, as many of the waste materials as economically feasible shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized. Consistent with LEED criteria, the project goal is to reuse, salvage, or recycle a minimum of 50% of the wastes generated by weight on demolition/renovation projects and 75% on new construction.
- Use recycled, salvaged, renewable and recyclable building materials.

#### **DRAFT WASTE MANAGEMENT PLAN**

The Contractor shall provide, to the Owner and Architect, a Draft Waste Management Plan within 5 business days after receipt of Notice to Proceed or prior to any waste removal, whichever occurs sooner. Consistent with Orange County ordinances and in order to achieve the waste diversion goals listed above, the Contractor may choose to separate waste and recyclables on-site or use a combination of source separation and a C/D sorting facility permitted by Orange County. The Contractor will submit the draft and final plans electronically on forms provided by OWRR. See [www.fac.unc.edu/OWRRGuidelines](http://www.fac.unc.edu/OWRRGuidelines) (C/D Forms and Printed Materials).

The Draft Waste Management Plan shall contain the following:

Waste assessment: An analysis of the proposed jobsite wastes to be generated, including types and estimated quantities. This includes salvageable materials as well as recyclables and trash.

Materials for reuse in project: (Designer modifies list as appropriate.)

- Slate roof
- Wood flooring
- Brick pavers
- Stone walls
- Architectural details
- Building equipment
- Program equipment

Materials for reuse on campus: Contractor delivers to Owner. (Designer lists materials here)

Materials which must be recycled by law (also see Section 01060 Regulatory Requirements):

- Beverage containers
- Cardboard
- Clean dimensional wood and pallets
- Scrap metal, including but not limited to metals from banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze
- White goods

Materials to be recycled (project specific): Designer lists materials here.

Suggested salvageable materials: Designer lists materials here.

- Slate roof
- Wood flooring
- Brick pavers
- Stone walls
- Architectural details
- Building equipment
- Program equipment

Other recyclable materials to be considered include (but are not limited to):

- Asphalt
- Bricks
- Ceiling tile
- Concrete
- Concrete Masonry Units (CMU)
- Drywall
- Paint
- Plastic buckets

Landfill options: The name of the landfill(s) where trash will be disposed of, the applicable landfill tipping fee(s), and the estimated cost of disposing of all Project waste in the landfill(s). This estimate will be used as a baseline for recycling/salvage cost comparison.

Waste Diversion Economic Analysis: A list of each material proposed to be salvaged, reused, or recycled during the course of the Project, the proposed local market for each material, and the estimated net cost savings or additional costs resulting from separating and recycling (versus landfilling) each material. "Net" means that the following have been subtracted from the cost of separating and recycling:

- revenue from the sale of recycled or salvaged materials
- landfill tipping fees saved due to diversion of materials from the landfill
- replacement value of materials reused in the project
- For a list of markets and resources, see [www.fac.unc.edu/OWRRGuidelines](http://www.fac.unc.edu/OWRRGuidelines) (C/D Resources and Links).
- Also see Specification 02070 Selective Demolition for information regarding items to be salvaged.

## **FINAL WASTE MANAGEMENT PLAN**

Once the Owner has determined which of the recycling options addressed in the [Draft Waste Management Plan](#) are acceptable, the Contractor shall provide a Final Waste Management Plan within 5 business days.

The Final Waste Management Plan shall contain the following:

- Contact information: The name and contact information of who will be responsible for implementing the Solid Waste Management Plan.
- Meetings/instruction: A description of the regular meetings to be held to address waste management.
- Waste assessment: An analysis of the proposed jobsite wastes to be generated, including types and estimated quantities.
- Alternatives to landfilling: A list of each material proposed to be salvaged, reused, or recycled during the course of the Project.
- Landfilling information: The name of the landfill(s) where trash will be disposed of, the applicable landfill tipping fee(s), and the estimated quantity of waste to be landfilled.

- **Materials Handling Procedures:** A description of the means by which any waste materials identified in items 4 and 5 above will be protected from contamination, and a description of the means to be employed in handling the above materials consistent with requirements for acceptance by designated facilities.
- **Transportation:** A description of the means of transportation of recyclable materials and waste (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site) and destination of materials.
- **Cost estimate summary:** The estimated cost of implementing the final solid waste management plan, broken down by material.
- **Copy of Orange County RRMO hauling license:** This license is required for any vehicle over 9000 lbs GVW hauling RRMO materials (see 01060). It must be renewed annually. Contact Orange County Solid Waste Management at 968-2800 ext. 163 for more info.

## **IMPLEMENTATION AND DOCUMENTATION OF WASTE MANAGEMENT PLAN**

- **Manager:** The Contractor shall designate an on-site party (or parties) responsible for instructing workers and overseeing and documenting results of the Waste Management Plan for the Project. This contact will notify OWRR immediately should any deviance from the Final Waste Management plan be necessary.
- **Distribution:** The Contractor shall distribute copies of the Waste Management Plan to the Job Site Foremen, Subcontractors, the Owner, and the Architect.
- **Instruction:** The Contractor shall provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the Project.
- **Separation facilities:** The Contractor shall designate and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, and return. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.
- **Hazardous wastes:** Hazardous wastes shall be separated, stored, and disposed of according to local regulations.
- **Documentation:** The Contractor shall submit with each Application for Progress Payment a Summary of Waste Generated by the Project. Failure to submit this information shall render the Application for Payment incomplete and shall delay Progress Payment. The Summary shall be submitted on a form acceptable to the Owner and shall contain the following information. For electronic forms see [www.fac.unc.edu/OWRRGuidelines](http://www.fac.unc.edu/OWRRGuidelines) (C/D Forms and Printed Materials).
  - **Disposal information:**
    - amount (in tons or cubic yards) of material landfilled from the Project
    - identity of the landfill
    - total amount of tipping fees paid at the landfill
    - total disposal cost (including transportation and container rental)
    - weight tickets, manifests, receipts, and invoices (attach copies)
  - **Recycling information:**
    - amount (in tons or cubic yards)
    - date removed from the jobsite
    - receiving party
    - transportation cost
    - amount of any money paid or received for the recycled or salvaged material
    - net total cost or savings of salvage or recycling each material
    - manifests, weight tickets, receipts, and invoices (attach copies)
  - **Reuse and salvage information:**
    - list of items salvaged for reuse on project or campus
    - amount (in tons or cubic yards)
    - receiving party or storage location
    - net savings (avoided tip fee and cost difference of item purchased new)
- **Revenues:** Revenues or other savings obtained from recycled, reused, or salvaged materials shall accrue to contractor unless otherwise noted in the contract documents

## **01631 Product Substitutions**

### **Requests for Substitutions**

Consideration of material and equipment substitutions is given only if a list of substituted materials is submitted to the Designer within twenty (20) days after the award of the contract. If such material list is not submitted, the Contractor shall furnish the specified materials and equipment. In all cases the burden of proof of equality of substitute materials rests upon the Contractor, and he or she shall pay for any extra cost incurred because of dimensional differences, or differences in other equipment characteristics. It is the responsibility of the Contractor to assure that proper access for equipment maintenance is provided.

## **01700 Project Close-out**

### **Certificates**

Prior to final inspection and final payment the Contractor shall furnish all necessary inspections and operating certificates required for the entire system. This includes all control diagrams, wiring diagrams, piping diagrams, color code charts, etc., and any other information necessary to the operation of the system. Display certificates in a suitable glass frame in an area designated by the Designer.

## **01720 Project Record Documents**

### **As Built Drawings**

The Contractor shall retain one set of drawings and specifications for the express purpose of recording accurately any and all changes or modification made which involve relocation of piping, or equipment or any changes of piping, ductwork, or equipment. Upon completion of the project, deliver this set of drawings to the Designer to use in the preparation of as-built drawings.

## **01730 Operating and Maintenance Data**

### **Operating and Maintenance Manuals**

The Contractor shall provide four (4) sets of operating and maintenance manuals, indexed and bound into D style three ring binders, upon substantial completion of the project and prior to final payment. The manual should not exceed the capacity of the binder, making it hard to turn pages. Additionally, the manuals should have a table of contents and the separation tabs between sections shall have reinforced holes. These shall include information on finishes; heating, cooling, and ventilating equipment; electrically operated equipment; and switchgear. These maintenance manuals shall contain: manufacturer's certified prints of all major equipment giving all major dimensions and cross-sectional views of important details along with complete and comprehensive instructions for operation; detailed piping arrangements; charts; wiring diagrams; illustrations; parts identification and ordering information; recommended spare parts list; fan and pump curves; guides for trouble shooting electrical circuit wiring diagrams; air and water balance information; and any other pertinent information necessary for operating, adjusting, servicing, maintaining, and repairing all mechanical equipment, including frequency and type of maintenance and lubrication required. This is not sales brochure information. Complete and detailed information is essential to repair or later match materials such as bricks, block tile, terrazzo and roofing. The manuals must contain a master listing of the name, address, and telephone number of each sub-contractor, and the name, address and telephone number of the local representative for each piece of material and equipment installed in the building.

In addition, furnish two sets of service manuals for specialty items such as autoclaves, glassware washers, dishwashers, cage washers, emergency generators, etc., which are provided under the construction contract.



The Contractor shall also instruct the Owner's designated representatives in the complete operation of the system. Give the Owner one week's notice prior to the time of instructions.

## **01740 Warranties and Bonds**

### **Guarantee**

Refer to the General Conditions Article 41: Guarantee. Where extended warranties, or guarantees, are available from the manufacturer the Contractor shall prepare the necessary contract documents to validate those warranties as required by the manufacturer and present them to the Owner.

## **01800 UNC-CH Supplementary General Conditions (for use with GC, 23d Edition, January 2002 as Revised March 2002)**

### **Owners' Representative**

The UNC-CH Department of Construction Management represents the Owner in all matters pertaining to contract construction. The Department will designate a Construction Manager, who will be the single spokesperson for the University. All official contact, decisions, direction, problem resolution and coordination to/from the University will be through the assigned Construction Manager and the Designer. This does not alleviate any of the Designers' responsibilities as stated in the General Conditions.

### **Inspections and Testing**

The University will arrange for independent testing agencies to make tests and conduct inspections of work in progress. The contractors will give reasonable notice of construction activities to be tested/inspected so that the testing agency may be present.

In addition to the normally-anticipated inspections, the University intends to conduct the following inspections, which contractors should allow for in their schedules: above-ceiling inspections, pre-final inspections, 100% test of fire protection systems, and final inspections. Any of these inspections which are not completed satisfactorily will be repeated at no cost to the owner and without time extension.

**Above-Ceiling Inspections:** The above-ceiling inspection will be conducted by the University after above-ceiling systems have been completed and verified by the Designer. The following general guidelines will apply to this inspection:

- a. All above ceiling systems will be completed including, but not limited to, controls, insulation, labeling of systems, wiring, light fixtures, diffusers, ductwork, piping, fire proofing, and sealing of wall penetrations through fire walls.
- b. Framing for hard ceiling will be completed and access door locations will be framed to assure accessibility to control valves, equipment requiring maintenance, etc. Ceiling grid will be in place and equipment (light fixtures, diffusers, etc.) will be in place in the grid.
- c. Under no circumstances will any ceiling area be covered up until this inspection is done by the owner. The contractor shall give the Designer and the University two weeks notice to assure owner personnel are available.

**Fire Protection Systems:** The installation contractor must conduct a 100% performance test, which shall be ensured by the designer/engineer. When this test is completed and deficiencies corrected, the owner/engineer will conduct a 100% test of the system, which shall be scheduled through the University's Construction Manager. At

least three days prior to the owner's test, the contractor will furnish the completed NFPA Record of Completion, with a printout of the installed database and a floor plan with database information and room numbers. These documents shall be updated and reissued prior to each additional test and final inspection.

### **Construction Schedule**

Tentative dates for interruption of utilities services and traffic disruptions shall be incorporated into the project schedule. The schedule will include UNC and State inspections, punch list correction, cleanup, and final inspection, and shall anticipate 5-year-average weather delay and the extra restrictions required for University operations as outlined in Paragraph 4 below. The schedule will also include the time allotted for commissioning the MEP system. Unless otherwise stipulated in the project construction documents the schedule will indicate 100% commissioning of the MEP systems. The schedule will include all the necessary activities and contractor and subcontractor resources to support the commissioning as well as time and resources for correction of contract required punch list items generated by the commissioning agent.

### **Working Hours**

The contractor may establish a work schedule of his own choosing. The contractor shall submit to the UNC Construction Manager and to the designer his regular daily work schedule, and shall notify the Construction Manager in advance of any deviations from the schedule. The University reserves the right to limit the contractors' activities when they conflict with University operations.

For most situations the contractor will comply with the Town of Chapel Hill Noise Ordinance.

Extra restrictions will be enforced by the University during certain periods of the year. The contractors must allow for these restrictions in their project schedule. No time extensions will be granted for these restrictions. In general, these periods are:

- a. During examination periods, generally occurring in December and April for two weeks each, and June and August for four days each.
- b. Graduation, generally on a Sunday in mid-May and a Sunday in mid-December
- c. Approximately 15 home basketball games per year
- d. Approximately 7 home football games per year
- e. University Day, October 12
- f. Student move-in/move-out days, generally twice a year for one week each.

Examples of the extra restrictions include, but are not limited to:

- a. During examination periods the contractor will restrict noise-making activities to the hours of 8:00am - 5:00pm. If the project involves work in or near a residence hall or a building in which an examination is being conducted, the contractor will be required to restrict further those operations which are disturbing to students, to include stopping work if necessary.
- b. Work will not be permitted on Graduation Day, or the day preceding it (Saturday), nor on University Day. Extra cleanup and warning signs and barricades will be provided by the contractor.

- c. Work is normally permitted on the days of sporting events and concerts, but traffic is extremely heavy on those days, and contractors may have difficulty and experience delays getting to and from the job site.
- d. Work is normally permitted on student move-in/move-out days, but traffic is heavier than normal, parking is restricted, and some campus roads are temporarily closed or designated one-way.

### **Underground Utilities**

Each contractor who does excavation work will be responsible for locating underground utilities prior to excavation. The contractor may obtain the services of a commercial utilities locator and/or call the various utility companies who may have lines in the area. In addition, they should notify UNC Facilities Services at least 5 days prior to excavation. The contractor will be responsible for utility interruptions caused by excavation.

The General Statutes of North Carolina requires contractors to notify NOCUTS at least two days but not more than 10 days prior to excavation on a public right of way.

### **Temporary Interruptions of Utilities and Traffic Movement**

Procedures for making temporary disruptions to existing utilities, and roads and pedestrian walks shall be planned well in advance of the work and the work shall be executed in a manner to provide reasonably continuous service throughout the construction period. Connections shall be made only at times approved by the University. For interruption of service in major utility systems, the Contractor must submit to the UNC Construction Manager a step-by-step sequence of operations planned to accomplish the work. Outline must show tentative dates and times of day for shut-off and restoration of services. Upon approval of the planned operations, the Construction Manager will make arrangements with appropriate University personnel for interruption of services.

Road and sidewalk cuts shall be scheduled in advance, and made only after they have been approved by the University. Contractors shall plan and coordinate their work to minimize the duration of such disruptions. Appropriate detours shall be planned, subject to the approval of the University, giving consideration to the handicapped. Warning barricades and signs shall be installed by the contractor, as well as informational signs indicating detours. No service disruptions nor excavations may be made until barricades and signs are in place to protect the public. If the nature of the site does not allow barricades to be in place prior to excavation, the barricade materials must be physically present on site before excavation begins, in order that they may be erected as soon as it is possible to do so.

Barricades and signs must meet OSHA, NCDOT, and University approval, and be substantial enough to deter bypassing, vandalizing or theft. In addition to meeting all applicable codes and regulations, signs must be neat and legible at all times. Hand-made signs are not acceptable.

Caution to Bidders: Bidders are cautioned that the University will probably schedule interruption of services at times other than the contractors' normal working hours and that only designated University personnel are authorized to interrupt services. Frequently, outages are scheduled to reduce disruption of classes and special events.

Contractors are reminded of the presence on campus of students, staff, and faculty with disabilities: particularly mobility impaired, visually impaired, and hearing impaired. All barricades, temporary walkways, excavation, and stockpiles of materials shall be formed in such a manner as to accommodate access, adequately warn and prevent injury to this segment of the University population.

### **Parking and Storage**

Parking is extremely limited at the University of North Carolina at Chapel Hill. Contractors must confine their parking and storage to that which they can accommodate within the limits of the construction site. There will be no parking spaces provided in the vicinity of the project for construction workers. Contractors are encouraged to locate fringe parking areas and shuttle their workers to and from the job site. If a construction fence has been erected the contractor may allow his employees to park inside the fence.

Parking for large storage trailers is limited to within the construction site. If additional trailer parking is required the Department of Public Safety maintains an off-campus facility near the Horace Williams Airport for such trailers. There is a monthly fee for use of the storage area. It is currently \$70 per trailer. All materials in this storage yard must be kept inside the storage trailer, and not on the ground.

### **Cleanliness and Site Maintenance**

Campus streets, parking lots, walks and grounds connecting to the project area shall be protected from deposits of mud, sand, stone, litter, or debris in any form, and this protection shall be the responsibility of the Contractors. All mud collected on vehicle wheels must be cleaned off before leaving the construction area. Should any mud or debris collect on the streets from the construction project, this shall be removed immediately before becoming a traffic hazard or being carried into the surrounding buildings.

Where equipment must cross walks, lawns, and other transitional areas used by pedestrian and vehicular traffic, the Contractor shall provide minimum 3/4" thick plywood protective sheets for equipment to roll over.

The construction site including adjacent campus areas will be kept free of trash, litter or debris at all times. Trash cans/dumpsters shall be emptied and the contents removed from campus before they overflow.

Grass and other vegetation on the construction site shall be trimmed/mowed to maintain a neat appearance.

A landscape protection area shall extend to at least the drip line of any trees or shrubs that are to remain.

The landscape protection fence shall be installed prior to the initial stage of grading, excavation or tree removal. No storage, access or activity of any kind will be permitted in the landscape protection areas. The Contractor shall give the Designer two (2) weeks notification in advance for the Owner to remove trees and shrubs that will be retained by the Owner for use elsewhere.

### **Request for Payment**

The first sentence only of Article 31a, General Conditions, is revised to read as follows: "Not later than the last day of the month, the contractors shall submit to the Designer a request for payment for work done through the 25th day of the month. The Owner will make payment by the end of the following calendar month, as described in Articles 31 through 33, General Conditions."

The financing arrangements on some projects require that pay applications from all vendors be submitted simultaneously and only once per calendar month. Therefore, failure to follow the above schedule may result in a contractor not being paid until the next pay application period. The only way to insure timely payment is to submit complete, accurate and timely pay applications with all supporting documents.

### **Stored Materials**

Add the following sentence to Article 31d, General Conditions: "No payment may be made for stored materials which are stored outside the State of North Carolina."

### **Selection of Brick or Cast Panel for Exterior Walls**

The manufacturers shall present samples to the designer for his selection from which sample patterns are to be erected or shown on the job site, after consultation with the Facilities Planning Office. The Construction Management Department will notify the architect's representative where to locate these panels. The University Buildings and Grounds Committee will review these panels and make the selection. At the time the brick panels are viewed by the committee, the contractor shall also have available samples of all significant exterior materials, including but not limited to pre-cast stone or limestone, window and door frames, glass and metal panels. The Construction Management Office will notify the designer of the final selection. In the case of cast stone panels, small samples may be submitted for selection purposes.

Completed panels must cure for at least three weeks before they are reviewed by the Building and Grounds and Committee. In addition, three weeks are required to schedule this review. Therefore the panels must be completed by the contractor a minimum of six weeks before the brick selection is needed.

### **Owner's Right To Do Work**

Notwithstanding the notification requirements of the General Conditions, Article 28, should the contractor fail to respond within 24 hours, or such other time as may be prescribed by the designer or by the University's assigned Construction Manager (see paragraph 1 above), to correct a deficiency which the University determines to be endangering trees or other landscaping; or to correct any other defects where time is of the essence to prevent further damage or ensure personal safety; or to correct any impediment to University operations including access by handicapped, fire department, or operational personnel; then the owner may immediately take corrective action to prevent further endangerment or damage. The cost of the work performed by the owner shall be deducted from any amount due or to become due to the contractor, as provided for in GC, Article 28. Verbal notice shall be provided to the contractor's superintendent or project manager, followed by written confirmation.

### **Commissioning**

Unless otherwise stated in the contract documents the project will include 100% commissioning of the MEP work. The owner will provide a third party commissioning agent for oversight of the commissioning process. See contract documents for detailed commissioning requirements. See paragraph 3 above for scheduling requirements of the contractor for the executing the commissioning work.

### **Erosion Control Inspections for General Permit NCG010000 – Land Disturbing Activities**

Where an erosion permit is required for the project the contractor will keep on file a record of the required inspection reports filled out two times a week (twice because UNC is on 303(d) listed stream) or within 24 hours of a rain event or as the permit requires and provide one copy of each report to the Universities' EH&S (Geologist) representative (919 962-9752) in addition to other agencies as the permit may require.

### **Construction Manager at Risk**

The payment of the General Conditions costs to the Construction Manager at Risk will terminate 30 days after project completion and acceptance. During this 30 day period all punch list items shall be completed as stipulated in Article 25 of the General Conditions of the Contract. The time for completion and liquidating damages will be as stipulated in the Form of Construction Manager at Risk Contract and Supplementary General Conditions of the Contract.

### **O&M Manuals**

All required O&M manuals and attic stock shall be approved and submitted to the owner before final inspection and acceptance of the project.





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*at* CHAPEL HILL

DEPARTMENT OF FACILITIES PLANNING & CONSTRUCTION







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