SECTION 11 61 38 – WIRE MESH GRID

Tgrid+® WIRE MESH GRID SYSTEM

PART 1 – GENERAL

1.1 SUMMARY

The Tgrid+® Wire Mesh Grid System is a modular overhead walking and lighting grid consisting of framed woven wire mesh panels, suspension and support components, perimeter attachments, and accessories. The system provides a serviceable walking surface for technical personnel to access performance equipment and hanging locations while allowing performance lighting fixtures to shine through the grid with minimal apparent shadowing.

Section Includes:

- Fixed structural support frames and modular woven wire mesh panels spanning the dimensions indicated on the drawings.
- Suspension rods, support pipes, suspension plates, wall brackets, and associated structural connections.
- Fixed and operable guardrails, toe boards, access hatches, transition pieces, and self-closing gates where indicated.
- Lighting pipes, clamps, couplers, and associated accessories where indicated.
- Grid bracing, panel-to-panel connections, fasteners, signage, and all components, labor, and accessories necessary for a complete system.

Related Sections:

– Division 01 – General Requirements
– Division 05 – Metals
– Division 23 – Mechanical
– Division 26 – Electrical

1.2 PROPRIETARY PRODUCT

Basis of Design: Tgrid+® Steel Mesh Wire Grid System manufactured by Productions Unlimited, Inc., Roebuck, South Carolina.

The Tgrid+® Steel Mesh Wire Grid System was designed by Brian Phillips, President of Productions Unlimited, Inc., and is protected by U.S. Patent Nos. 9,631,385 and 10,221,581 and Canadian Patent No. 2,933,878.

This is a closed proprietary specification. Substitutions are not permitted unless specifically authorized in writing by the Owner and Architect and accepted by Productions Unlimited, Inc.

1.3 SYSTEM DESCRIPTION

Provide a complete Tgrid+® system engineered for the project conditions and configured to the dimensions, support locations, access requirements, and equipment requirements shown on the Drawings.

The system shall use modular framed woven wire mesh panels connected to one another and suspended from the building structure through engineered suspension and support components. Panel sizes and hanger locations may be customized to accommodate existing structures, fixed obstructions, access requirements, and project-specific conditions.

Loads shall be transferred through the engineered grid support system to designated building attachment points. No unintended horizontal loads shall be imposed on the building structure except loads specifically identified by the structural design, including applicable seismic or personnel-induced sway loads.

1.4 PERFORMANCE REQUIREMENTS

- Grid Floor Live Load: 20 pounds per square foot (PSF).
- Allowable Concentrated Load: 300 pounds applied over a 1-foot by 1-foot area.
- Maximum Allowable Deflection of Support Structure: L/360 of span.
- Maximum deflection under the specified 300-pound concentrated load: 3 inches.

- Uniformly distributed and concentrated loads shall be non-concurrent.
- Cables, fittings, and load-bearing components supporting overhead loads: minimum safety factor of 8, or a 1.75 impact factor, whichever is greater.
- Steel structural components: allowable stress not exceeding one-fifth of applicable yield strength unless a more restrictive project-specific engineering criterion applies.
- Grid panels and frames shall resist applicable horizontal loads without imposing unintended horizontal loads on the building.
- Frame construction shall not create sharp edges, shearing conditions, or sharp bending of the wire walking surface.
- Walking surfaces and access openings shall comply with OSHA 29 CFR 1910 Subpart D and applicable adopted codes.

Design the system to anticipate normal use, foreseeable misuse, human error, and reasonable misjudgment without relieving the Contractor, Manufacturer, or installer of their respective Contract responsibilities.

1.5 STRUCTURAL ENGINEERING AND COORDINATION

- Manufacturer's Structural Engineering: Engineering for panel frames, suspension components, connections, attachment requirements, and project-specific conditions will be provided. Shop Drawings and structural calculations shall be prepared and sealed by a professional engineer licensed in the project jurisdiction.
- Standard Product Engineering: Previously engineered and sealed standard components may be incorporated within their established design parameters and approved applications.
- Existing Structures: Verify existing structural conditions at proposed attachment locations. Where existing construction is inadequate, provide or coordinate structural reinforcement or modifications required to support the Tgrid+ system and its specified design loads. Required reinforcement shall be designed and detailed by a professional structural engineer licensed in the project jurisdiction.
- Project Structural Engineer Coordination: Involve the Project Structural Engineer or Engineer of Record where required by the Contract Documents, project review procedures, or structural conditions that require coordination beyond information reasonably available to the Manufacturer's engineer.
- Do not install the system until required supporting structural modifications have been completed and accepted by the responsible structural engineer.

1.6 SUBMITTALS

- Product Data and manufacturer's technical information.
- Manufacturer's installation instructions.
- Complete, fully dimensioned Shop Drawings showing panel layout, panel sizes, frame construction, suspension locations, support pipes, suspension plates, wall brackets, connections, railings, toe boards, access hatches, lighting pipes, gates, bracing, signage, and all other system components.
- Structural calculations demonstrating compliance with the design criteria specified herein.
- Shop Drawings and calculations signed and sealed by a professional engineer licensed in the project jurisdiction.
- Product Data for lighting accessories and components not specifically identified as part of the proprietary Tgrid+® system.
- Sample Tgrid+® panel, minimum 1 foot by 1 foot, showing proposed frame and woven wire mesh construction, or arrange for inspection of a completed installation of similar scope.
- Operation and Maintenance Manuals.
- Parts Manual identifying replaceable components.
- Closeout documentation including warranty and As-Built Drawings.

1.7 QUALITY ASSURANCE

- Manufacturer: Productions Unlimited, Inc., Roebuck, South Carolina.
- Manufacturer shall be experienced in the design, manufacture, and installation of theatrical wire mesh grid systems.

- Installer shall be experienced in theatrical performance and stage rigging and shall be authorized in writing by Productions Unlimited, Inc. to install the Tgrid+® system.
- Manufacturer shall be capable of providing field service representation during construction and approving installation methods.
- Installation by an unauthorized installer is prohibited.

1.8 WARRANTY

- Provide a special Manufacturer's warranty for two years from Owner acceptance against defects in materials and workmanship and improper adjustment of Manufacturer-furnished components.
- Paint and exterior finishes are excluded except as otherwise stated in the Contract Documents.
- Replace or repair defective Manufacturer-furnished components within 30 days after notification, subject to warranty terms.
- Correct conditions presenting a hazard to human life, well-being, or property promptly after notification.
- Warranty exclusions include misuse, abuse, unauthorized modification or alteration, damage caused by others, failure to maintain, normal wear and deterioration, improper installation by an unauthorized party, and operation outside specified conditions.
- Exclusions apply only to the extent the excluded condition caused or contributed to the claimed defect or damage.
- Unauthorized cutting, drilling, welding, alteration, modification, or other changes shall void the Manufacturer's warranty to the extent affected by such work.

1.9 MAINTENANCE SERVICE

- Provide maintenance services for one year after final acceptance.
- Provide at least two scheduled maintenance visits at approximately six-month intervals, with the first visit approximately 60 days after acceptance.
- Inspect and adjust system components, connections, support hardware, railings, access hatches, gates, and other operating components as applicable.

1.10 FIELD CONDITIONS

- Verify actual locations and dimensions of walls, ceiling structure, and contiguous construction by field measurement before fabrication.
- Verify overhead structure and attachment conditions before installation.
- Protect grid components from corrosion, deformation, contamination, and other damage during delivery, storage, and handling.
- Do not fabricate final project-specific components until field dimensions and attachment conditions have been verified.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- Productions Unlimited, Inc., Roebuck, South Carolina.

2.2 MATERIALS

- Lighting Pipe Battens: 1-1/2-inch nominal Schedule 40 seamless black steel pipe or engineered equivalent approved as part of the Tgrid+® system.
- Steel Shapes and Plates: ASTM A36 structural steel unless otherwise indicated by the approved structural design.
- Woven Wire Mesh: Black woven wire mesh sized and configured for the specified design loads and application.
- Mesh openings shall not exceed 2 inches unless otherwise specifically engineered and approved.

- Mesh and welded connections shall be tested or engineered for the specified loads; where project load testing is required, provide test documentation.
- Panel frames shall be structural tubing, shapes, or other engineered framing members selected by the Manufacturer's structural engineer.
- Provide heavier-gauge woven wire mesh where required for increased load capacity or project-specific use.

2.3 SUSPENSION AND SUPPORT COMPONENTS

- Threaded suspension rods sized and spaced in accordance with approved structural design.
- Lighting support pipes and suspension plates.
- Slotted wall mounting brackets designed for applicable substrate and loads.
- Intermediate support rods, support plates, spreader bars, and load-distribution components where required.
- Panel-to-panel connectors and suspension brackets that tie adjacent panels together and provide required structural continuity.
- Fasteners rated for anticipated loads with vibration-resistant or positive-locking features.

2.4 LIGHTING PIPE ACCESSORIES

Provide pipe clamps, couplers, sidearms, swivel couplers, right-angle couplers, and related accessories indicated on the Drawings or required for a complete installation. Components shall be compatible with specified lighting pipe and rated for their intended application.

2.5 GUARDRAILS, TOE BOARDS, HATCHES, AND GATES

- Provide fixed and operable guardrails, toe boards, transition pieces, access hatches, and self-closing gates where indicated.
- Design openings and guardrail systems to comply with applicable OSHA and building code requirements.
- Where an access hatch is provided, incorporate safety interlocks or other protective features where indicated by the approved design.

2.6 FINISHES

- Prepare steel surfaces in accordance with the Manufacturer's approved finishing process.
- Provide factory-applied protective coating or powder coat finish as indicated.
- Standard color: Matte black unless otherwise indicated.
- Custom color may be selected by the Architect during submittal process where available.

2.7 SIGNAGE

- Provide fire-retardant signs at grid access locations.
- Signage shall identify maximum live load, maximum point load, pertinent hazards, avoidance procedures, and consequences associated with the equipment.
- Provide a minimum of two engraved black laminate plaques with white characters 3/8 inch high, installed adjacent to grid entrances or as directed by the Architect.

2.8 SOURCE QUALITY CONTROL

The Owner, Architect, or Design Consultant may review the system at the point of manufacture during fabrication. The manufacturer shall provide access for reasonable inspection, including final factory checkout before shipment, unless an alternate inspection date is mutually agreed upon.

PART 3 – EXECUTION

3.1 EXAMINATION

- Examine substrates, overhead structure, attachment conditions, and work prepared by others. Report conditions affecting installation before proceeding.
- Verify mounting surfaces and structural attachment points are ready to receive the Work.
- Verify flatness, plumbness, and level of mounting conditions.
- Inspect components for damage from shipping or storage.
- Do not proceed where discrepancies remain unresolved.

3.2 PREPARATION

- Verify field measurements and overhead structural conditions before fabrication and installation.
- Coordinate material routing and access to the theatre.
- Deliver equipment after the building has been closed in and protected from weather.
- Coordinate storage and protect materials and components from damage.
- Clean surfaces as necessary before commencing work.

3.3 INSTALLATION

- The Manufacturer or Manufacturer's authorized representative shall be on site for the duration of grid installation to direct and oversee proper installation.
- Install suspension rods, support pipes, suspension plates, wall brackets, intermediate supports, and other structural support components in accordance with approved Shop Drawings.
- Establish grid elevation with a rotary laser or other approved leveling method.
- Install modular panels on engineered support points and connect adjacent panels as shown on approved Shop Drawings.
- Install panel-to-panel and support connections without fully tightening until panels are aligned and level; then tighten in the sequence directed by the Manufacturer.
- Install perimeter panels using wall brackets and engineered support components.
- Install intermediate supports and adjust rods, brackets, and hardware to establish a level, plumb, and rigid grid.
- Install toe boards, railings, access hatches, gates, transition pieces, and lighting accessories where indicated.
- Install components plumb, straight, square, and level.
- Do not cut, drill, weld, alter, modify, or otherwise change system components except as specifically permitted by approved Shop Drawings or authorized in writing by the Manufacturer.
- Installation practices shall comply with OSHA requirements and applicable local codes.
- Perform structural welding in accordance with the applicable AWS Structural Welding Code.
- Coordinate structural attachment with the responsible structural engineer.
- Coordinate electrical conduit routing through hangers with Division 26.
- Coordinate connection of lighting fixtures and electrical distribution with Division 26.
- Touch up finishes disturbed during shipping and installation to match the original finish.

3.4 SIGNAGE

- Install signage using mechanical fasteners at locations indicated on the Drawings and approved Shop Drawings.

3.5 FIELD QUALITY CONTROL

- Verify installation, connections, support conditions, panel alignment, guardrails, access hatches, gates, and other system components before Owner training.
- Correct deficiencies attributable to the Manufacturer or authorized installer.
- Where required by the Contract Documents, provide field load testing or other verification in accordance with approved engineering.

3.6 TESTING, DEMONSTRATION, AND INSTRUCTION

- Provide a total of four hours of training on use, inspection, and routine maintenance of the Tgrid+® system.
- Training shall be scheduled at a time agreed upon by the Owner and shall not be concurrent with system commissioning and testing.
- Demonstrate safe access to the grid, use of access hatches and gates, installation/use of railings and toe boards, and applicable load limitations.
- Provide instruction and maintenance manuals pursuant to Division 01.

3.7 PROTECTION AND CLEANING

- Protect completed Work from damage until Owner acceptance.
- Remove debris, packaging, temporary supports, and construction materials from the grid and surrounding work areas.
- Leave the completed system clean and ready for use.

END OF SECTION