



Version 5.0

January 1, 2026

winnipegconstruction.ca

Manitoba Trade Definitions

In 2018, the Winnipeg Construction Association (WCA), with support from numerous volunteers and organizations, undertook a comprehensive review of the Manitoba Trade Definitions (MTD). The goal was to publish an updated version by early 2019. Since then, the MTD has been reviewed every two years. The most recent review occurred in 2024/25, with the updated version released in January 2026.

The MTD establishes a mutual agreement among trades to identify the specific aspects of work for which each trade is responsible. This all-inclusive listing ensures no tasks or items are left unassigned.

Purpose of the Manitoba Trade Definitions Manual

The MTD Manual provides users with a clear understanding of local trade contractors' scopes of work, focusing only on the building elements included in bid or construction documents. It is important to note that the MTD does **not** provide guidance for building elements excluded from bid or construction documents, even if they are part of the trade definitions.

While the use of the Manitoba Trade Definitions is considered a recommended best practice, it is entirely voluntary. The Winnipeg Construction Association assumes no liability for the accuracy, completeness, or application of the MTD.

Trade Definitions vs. MasterFormat

The WCA's Trade Definitions and MasterFormat serve different purposes in the construction industry:

- **Manitoba Trade Definitions (MTD):** Focuses on clarifying roles, responsibilities, and scopes of work for specific trades. It helps to enhance communication and reduce misunderstandings among contractors, subcontractors, and project owners. The MTD is organized by individual trades (e.g., electrical, plumbing), highlighting their unique requirements.
- **MasterFormat:** A standardized classification system used to organize project manuals, specifications, and construction documents. It divides information into numbered divisions (e.g., Division 01: General Requirements, Division 03: Concrete), covering a broad range of project elements, from materials and methods to administrative procedures.

Key Difference

The MTD focuses on delineating responsibilities among trades, while MasterFormat provides a framework for organizing and documenting entire projects.

Instructions for Consultants

Design consultants or tender authorities referencing the Manitoba Trade Definitions in project specifications are advised to include the current version date.

In some cases, design consultants may explicitly override the MTD. Users should carefully review tender and project documents, as they may contain alternative scopes of work or task assignments for specific trades.

Acknowledgments

The following individuals have given generously of their time and expertise in the detailed review of this document, and many others have been consulted during its preparation. We acknowledge your contributions and thank you on behalf of our industry.

Dana Bell	Darryl Harrison	Chris Precourt
Peter Bernatsky	Dale Hendry	Teri Randall
Jacques Beaulieu	Chris Henry	Fernando Requeima
David Borys	Tim Hrycyna	Devyn Rolke
Dean Borys	Glen Jackson	Craig Ross
Toney Boxel	Adam Kaminski	Dave Rowe
Dan Christensen	James Kopec	Bryan Rychliski
Ramona Coey	Chris Kryschuk	John Schubert
Dennis Cruise	Harry Laarveld	Rob Semchyshyn
Darrell Driver	Brennan Laidlaw	Joel Simard
Henry Eismendi	Blain Laschuk	David Siwicki
John Enns	Rick Levesque	Ken Sleva
Norm Falk	Harry Loewen	Ken Smith
Brian Fedorchuk	Tony Mohammad	Randy Storoschuk
Adam Gallos	Rick Mostert	Paul Tougas
Brad Gauthier	Kurt Neudtaedter	Bryan Trottier
Robert Gray	Dan Nosaty	Roger Tuk
Peter Grose	John Peterson	John Warnica
Ron Hambley	Mike Plett	

The following Associations have hosted and facilitated discussions regarding specific trade sections and offered strong and continued support for the maintenance and use of Manitoba Trade Definitions.



Finally, the editors of this document also acknowledge and thank the **Alberta Trade Definitions Committee** and the Construction Associations of Alberta for allowing access and usage of several sections of their document.

Table of Contents

Trade Definition 01

01-1	Prime Contractor Requirements	Page 8
01-2	Trade Contractor Requirements	Page 9

Trade Definition 02

02-1	Building Demolition	Page 10
02-2	Selective Demolition for Alteration	Page 10
02-3	Hazardous Material Removal	Page 11
02-4	Earth Excavating	Page 12
02-5	Rock Excavating	Page 12
02-6	Backfilling	Page 12
02-7	Driven Piling	Page 13
02-8	Drilled Piling	Page 13
02-9	Steel Screw Piles	Page 14
02-10	Paving Works and Parking Areas	Page 15
02-11	Unit Paving	Page 15
02-12	Landscaping	Page 16
02-13	Chain Link Fence	Page 17

Trade Definition 03

03-1	Concrete Formwork	Page 18
03-2	Reinforcing Steel Supply	Page 18
03-3	Reinforcing Steel Placing	Page 19
03-4	Concrete Work	Page 20
03-5	Concrete Finishing and Curing	Page 21
03-6	Precast Concrete	Page 21

Trade Definition 04

04-1	Masonry	Page 22
04-2	Exterior Cleaning of Existing Buildings	Page 23

Trade Definition 05

05-1	Structural Steel	Page 24
05-2	Steel Decking	Page 26
05-3	Miscellaneous Ferrous Metal Custom Fabricated	Page 26
05-4	Non-Ferrous Metals Custom Fabricated	Page 28
05-5	Miscellaneous Sheet Metal Custom Fabricated	Page 28

Trade Definition 06

06-1	Rough Carpentry	Page 29
06-2	Finish Carpentry	Page 30
06-3	Heavy Timber Construction	Page 31
06-4	Glued Laminated Structural Wood	Page 32
06-5	Trussed Structural Wood	Page 33
06-6	Architectural Woodwork	Page 33

Trade Definition 07

07-1	Liquid Applied Waterproofing System	Page 35
07-2	Foundation Moisture Protection	Page 35
07-3	Thermal Building Insulation	Page 36
07-4	Sprayed Acoustic/Thermal Insulation	Page 36
07-5	Firestopping	Page 37
07-6	Sprayed Fire Rated Isolation	Page 37
07-7	Unit Roofing (Shingles and Roofing Tiles)	Page 38
07-8	Preformed Metal Panel Cladding	Page 38
07-9	Vinyl Siding, Metal Siding and Soffits	Page 39
07-10	Membrane Roofing	Page 40
07-11	Miscellaneous Roof Specialties	Page 40
07-12	EIFS (Exterior Insulation Finishing Systems)	Page 41
07-13	Cementitious Stucco	Page 41

Trade Definition 08

08-1	Special Doors	Page 42
08-2	Steel Hollow Metal Doors and Frames	Page 42
08-3	Wood Doors	Page 44
08-4	Glazed Wood/Plastic/Fiberglass Windows	Page 44
08-5	Glazed Aluminum Windows	Page 45
08-6	Glazed Architectural Aluminum	Page 46
08-7	Finish Hardware	Page 47
08-8	Glass and Glazing	Page 48

Trade Definition 09

09-1	Lath and Plaster	Page 49
09-2	Steel Stud and Drywall	Page 49
09-3	Tile, Terrazzo, Marble and Granite	Page 51
09-4	Acoustic Ceilings	Page 52
09-5	Wood Flooring	Page 52
09-6	Resilient Flooring	Page 53
09-7	Carpeting	Page 53
09-8	Special Flooring	Page 54
09-9	Special Coatings	Page 55
09-10	Stippled Finishes	Page 55
09-11	Painting and Wallcoverings	Page 56
09-12	Intumescent Coating	Page 56

Trade Definition 10

10-1	Access Flooring	Page 57
10-2	Demountable Partitioning	Page 57
10-3	Manufactured Specialties	Page 58

Trade Definition 11

11-1	Food Service Equipment	Page 62
11-2	Miscellaneous Architectural Equipment	Page 63
11-3	Miscellaneous Mechanical Equipment	Page 67

Trade Definition 12

12-1	Furnishings	Page 69
------	-------------------	---------

Trade Definition 13

13-1	Special Construction - Architectural	Page 72
13-2	Special Construction - Mechanical	Page 74
13-3	Special Construction - Electrical	Page 75

Trade Definition 14

14-1	Elevators	Page 76
14-2	Escalators	Page 77
14-3	Elevating Devices for the Handicapped	Page 77

Trade Definition 15 Mechanical

15-1	Mechanical Trade Contractor Requirements	Page 78
15-2	Mechanical Trade Contractor Requirements Tables	Page 79
15-3	Mechanical	Page 80
15-4	Definition for Plumbing Fixtures	Page 83
15-5	Insulating	Page 83
15-6	Fire Protection	Page 84
15-7	Refrigeration	Page 84
15-8	Ventilating	Page 87
15-9	Automatic Temperature Controls	Page 89
15-10	HVAC Testing and Balancing	Page 90
15-11	Exterior Sewer and Water Services	Page 91

Trade Definition 16 Electrical

16-1	Electrical General Requirements	Page 92
16-2	Electrical	Page 93
16-3	Common Electrical	Page 94
16-4	Electrical - Site Services	Page 95
16-5	Building and Interior Power Infrastructure	Page 96
16-6	Raceway Systems	Page 96
16-7	Lighting Systems and Control	Page 97
16-8	Life Safety: Emergency and Exit Lighting Systems	Page 97
16-9	Life Safety: Fire Alarm and Evacuation Systems	Page 98
16-10	Electrical - Mechanical Systems	Page 99
16-11	Electrical - Equipment and Other Systems	Page 101
16-12	Alternate and Uninterruptable Power Systems	Page 102
16-13	Photo-Voltaic (Solar) Systems	Page 103
16-14	Wind Turbine Power Generation	Page 104
16-15	Lightning Protections Systems	Page 104
16-16	Nurse Call, Patient Wandering Systems, Infant Protection and RFID Tracking	Page 105
16-17	Networked Intercommunication Systems including VOIP & Time Keeping	Page 105
16-18	Networked Paging and Digital Audio Systems	Page 106
16-19	Sound Masking Systems.....	Page 107
16-20	IP Video Surveillance and Video for Over IP Distribution	Page 107
16-21	Building Security and Intrusion Systems	Page 108
16-22	Structured Cabling Systems (Voice, Data and Cable)	Page 109
16-23	Networked Access Control Systems	Page 110
16-24	Building Automation and Integrated Building Control	Page 111
16-25	Audio Visual Systems, Digital Messaging	Page 112
16-26	Information Technology Networks, Wifi, Distributed Antenna Systems (DAS)	Page 112

Trade Definition 01

01-1 Prime Contractor Requirements

The Prime Contractor will provide the following shared job facilities and services for the general use of all trades. The Prime Contractor can be a General Contractor, Design Build Contractor, Project Manager or Construction Manager.

Including:

1. Building Permit.
2. Project insurance.
3. Basic Office Facilities c/w safety bulletins boards, eye wash stations and first aid kit.
4. Establish muster point on all sites, as applicable.
5. Sanitary Facilities.
6. Construction fencing and Safety enclosures including painting decorative hording.
7. Exterior hoarding and heating for trades which use materials that may be subject to damage due to freezing.
8. Survey and layout of base lines and elevations.
9. Foundations/piling layout and elevations.
10. Reasonable access to site and work areas including general traffic control.
11. Snow clearing.
12. Electrical power source within reasonable distance.
13. Lighting of general work areas.
14. Appropriate heating of general work areas within the building, sufficient to prevent damage of the project and/or finish components placed within the building.
15. Water supplied to building site for construction purposes.
16. Distribution and review of samples, shop drawings and other submissions.
17. General dewatering of excavations during construction if not by trade section.
18. General fire Protection during construction.
19. Final cleaning of the construction project.
20. Designated safety coordinator.
21. Access Panels for Mechanical and Electrical.
22. Responsibility for locating subsurface services and utilities whose exact location have been established prior to the commencement of excavating and piling.
23. Protection of building finishes.
24. Security of the project.
25. Independent inspections.
26. Cash allowances other than those identified in trade specifications only.
27. Temporary project construction signage.
28. GC will supply CAD drawings, as provided by consultants, to all trades except Mechanical and Electrical who will obtain CAD package directly from consultant and pay any associated fees.
29. Testing and inspections unless listed in other trade specifications.

01-2 Trade Contractor Requirements

Trade contractors are to include the following:

1. Patching and making good materials related to each trade to openings, which have been cut in a manner, which minimizes the patching requirements.
2. Delivery and hoisting of materials including traffic control if necessary.
3. Trades to advise the contractor of surface acceptability prior to commencement of work.
4. Trade clean up.
5. Remove and dispose of surplus materials and debris.
6. Keep job site free of personal garbage.
7. Provide reasonable protections of other trades work from damage during the normal course of construction.
8. Initial cleaning after installation.
9. Testing and inspections identified in trade specification.
10. Cash allowances identified in trade specifications only.
11. Guarantees and warranties.
12. Shop drawings, updated CAD if supplied, samples, mockups, as-built drawings, maintenance data, operating instructions to owners.
13. Scaffolding, lifts and related equipment specific to the trade.
14. Trade liability insurance and specified bonding.
15. Pre-marking the locations of penetrations through other trades' material.
16. Provision and/or installation of sleeves for penetrations through other trades' material.
17. Provision of fire stop materials at drilled holes, sleeves and other openings to maintain integrity of fire separations when no separate fire stopping trade specified on the project.
18. Material protection to be by trade contractor.
19. Caulking and sealants related to the respective trade definition.
20. Safety program in place, including own fire extinguishers, first aid kit, and all related safety equipment specific to the trade.
21. Trade specific lighting and ventilation requirements.
22. Task specific fire protections and fire watch requirements.
23. Inclusion of applicable Manitoba Retail Sales Tax.

Trade Definition 02

This scope for supply and/or installation includes the following items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, and 01-2 Trade Contractor Requirements, also apply.

02-1 Building Demolition

1. Systematic dismantling of structure(s) in a manner that achieves safe removal/disposal of hazardous material and maximum salvage/recycling of materials.
2. Salvage materials to be the responsibility of the demolition trade unless otherwise noted.
3. Salvage materials shall not be sold on-site without prior approval.
4. Salvage trade to arrange and pay for transportation offsite and disposal at landfill sites.
5. Provide suitable hoardings, fences, signage, barricades and other protection as necessary to protect persons and properties.
6. Remove below grade foundations or, if acceptable to the Consultant, break within 300 mm of grade and cover.
7. Make arrangements for disconnecting existing power, sewer, water and gas and other services prior to demolition.
8. Shoring as required to accomplish demolition.
9. Demolition permits.
10. Demolition insurance.

02-2 Selective Demolition for Alteration

1. Cut penetrations through walls, floors, and ceilings to accommodate pipes and ducts larger than 150 mm, which are being installed by the mechanical and electrical trades, which are identified on the plans.
2. Cut recesses for such items as hose cabinets, control cabinets, distribution boxes which exceed 800 mm x 800 mm.
3. Remove or open up ceilings and walls to accommodate pipes or ducts which cannot otherwise be fished or assembled and installed in short lengths.
4. Break and remove concrete floors to accommodate below grade service line runs.
5. Remove existing suspend ceiling systems to accommodate new work.
6. Demolish parapets where required.
7. Remove existing floor coverings to accommodate new work.
8. Remove existing masonry to accommodate new work.
9. Remove existing drywall, lath and plaster to accommodate new work.
10. Cut reglets in concrete to accommodate flashings.
11. Dispose of removed materials.

02-3 Hazardous Material Removal

This trade is responsible for the removal and disposal within the contaminated work area, of hazardous materials in accordance with the Regulations, including the hiring of subcontractors for related work, which is required within the contaminated work areas.

1. Provide airtight hoarding, protective barriers and signage.
2. Remove and dispose or clean and replace ceiling tiles.
3. Disconnect, cap and replace ductwork.
4. Remove and replace or wrap light fixtures.
5. Prepare all unmovable objects in work areas.
6. Remove all hazardous materials from surfaces.
7. Provide negative pressure.
8. Vacuum and wash all surfaces.
9. Dispose of hazardous waste in accordance with Regulations.
10. Obtain clearance certificate on site.
11. Clean exterior of ductwork and piping.

02-4 Earth Excavating

This trade shall include the following:

1. Clear site of brush, shrubs, trees, asphalt paving, curbs, walks, roads, fences and other appurtenances designated to be removed or salvaged.
2. Investigate known subsurface conditions and prevent damage to utility lines, etc., where affected by the excavation.
3. Excavate to elevations and dimensions indicated or as required for the installation, construction, and inspection of work, which is required for structural foundations.
4. Strip and stockpile topsoil and reusable materials.
5. Grade to defined lines to achieve all contours and to minimize quantity of fill materials.
6. Excavate for underpinning.
7. Excavate for weeping tiles, sump pits, and drainage channels.
8. Excavate for heating ducts and buried tanks, which require concrete foundations.
9. Remove underground foundations and footings.
10. Remove boulders, rocks, rubble or obstructions, which do not exceed one cubic metre.
11. Install and remove sheet piling and/or shoring and maintain safe working conditions.
12. Leave earth bottoms undisturbed, level and free from organic material.
13. Protect earth bottoms from freezing.
14. Do all hand excavation, hand trimmings, etc.
15. When complete, the excavation should be left for consultant verification of soil-bearing capacity.
16. Trees and landscaping shall be protected or replaced.
17. Grade exterior areas and make ready for landscape trade.
18. Over excavation shall be remedied by the placing and compaction of fill materials or concrete, to the Consultant's approval.

02-4 Earth Excavating Continued:

19. Excavation for drainage culverts, drainage channels, crossovers, access roads, gravel roadways, temporary facilities, etc. Remove and make good upon project completion
20. Excavating, backfilling and drainage for underground culvert pipe tunnels.
21. Removal of contaminated soil as specified, and in accordance with Regulations.
22. Removal and disposal of existing underground fuel tanks including excavation and disposal, backfill, removal of contaminated soil as specified, and applicable permits.
23. Additional excavating and backfilling required for precast pile cutter access.
24. Removal of excess materials including spoil including that from service trenches inside the building.

02-5 Rock Excavating

1. Remove boulders and rock, which exceed one cubic metre.
2. Rock blasting and removal.
3. Protection and safety.
4. Blasting insurance.

02-6 Backfilling

1. Provide imported materials.
2. Fill to existing basements including breaking.
3. Fill to footings, foundations, pits, drainage channels, weeping tiles, bases, aprons, curbs, crawl spaces. Fill under sidewalks, concrete bases and aprons, if attached to building. Fill under curbs on grade if no paving contractors on the project.
4. Bring grades up to the required levels, both interior and exterior.
5. Backfill and compaction to service trenches, within the confines of the building, which have been prepared by mechanical and electrical trades.
6. Backfill to heating ducts and buried tanks, which require concrete foundations.
7. Supply and install moisture barriers to slabs on grade, crawl spaces, etc. if no paving contractor.
8. Compact existing subgrade and new fill materials to specified grades and densities.
9. Backfill simultaneously each side of walls and structures to equalize soil pressures.
10. Place fill in lifts and compact.
11. Removal of excess materials.
12. Weeping tile, drainage piping, complete with necessary fittings, couplings, junctions, cleanouts, cleanout boxes, filter cloth, etc.

02-7 Driven Piling

Supply and installation of timber, pipe, steel, and sheet and precast concrete piling including:

1. Pile extensions including reinforcing steel, dowels and concrete.
2. Cutting to elevation.
3. Top Plate / connection steel piles
4. Maintenance of all line and levels as required.
5. Concrete within pipe piles.
6. Protection of concrete in piles from freezing.
7. Removal of tailings and excess piling material.
8. Drill and case elevator plunger holes for hydraulic elevator, if there is no drilled piling trade on the project.
9. Maintain a piling record.
10. Additional excavating and backfilling required for precast pile cutter access.
11. Load testing of piles.

Supply only:

1. Dowels set in piling

02-8 Drilled Piling

Supply and installation of drilled cast-in-place and/or expanded base concrete pilings Including:

1. Piling reinforcing.
2. Protection from freezing.
3. Facilities and equipment for inspection.
4. Removal of tailings.
5. Drill and case elevator plunger holes for hydraulic elevators.
6. Maintenance of all lines and levels as required.
7. Maintain a piling record.
8. Reinforcing steel in cast in place piles and dowels.
9. Drilling of rock and supply and setting of dowels embedded in rock for caisson end bearing piles.
10. Dewatering.
11. Rock socketing.
12. Piling for light standards.
13. Sleeving as required.

Install Only:

1. Setting of anchor bolts and dowels.

02-9 Steel Screw Piles

The supply and installation of steel screw pile foundations and all components necessary for a complete installation, including:

1. Steel screw piles or helical piles as specified;
2. Final trimming and/or cutting of pile tops and top treatment of piles, when specified as part of this work;
3. Field connections as detailed on drawings and specified to be provided by this trade;
4. Equipment necessary to install the piles;
5. Load testing of piles, when specified in the tender documents;
6. Engineered drawings;
7. Where a pile foundation is designed by a piling contractor, he shall be responsible for the adequacy of the surrounding services and/or structures to withstand the vibrations or other effects of the piling installation proposed by the piling contractor;
8. Provision and maintenance of all lines and levels as required;
9. Provision and maintenance of stakes indicating pile locations;
10. Concrete infill to pile bores when specified as part of this work;
11. Trade specific lighting to perform tasks;
12. Trade cleanup - cleanup for work carried out by this trade;
13. Warranty or Guarantee;
14. Submittals and Operation and Maintenance documentation as specified in the tender documents;
15. Cash allowances that apply to this trade scope when a specific dollar amount is listed in this trade's specification section;
16. Protection of other trades' work from damage when performing this trades scope of work;
17. Building Information Modeling (BIM) as it applies to this trade scope.

02-10 Paving Works and Parking Areas

Supply and installation of asphalt surfacing including:

1. Clear site of brush, shrubs, trees, asphalt paving, curbs, walks, roads, fences and other appurtenances designated to removed or salvaged.
2. Investigate known subsurface conditions and prevent damage to utility lines, where affected by the excavation.
3. Excavate to the elevations and dimensions indicated or as required for the installation of asphalt.
4. Strip topsoil.
5. Removal excess excavation material.
6. Rough grade.
7. Compact subgrade.
8. Sub base build up.
9. Base course.
10. Hot mix asphalt paving.
11. Parking lines on asphalt surfaces.
12. Precast parking bumper curbs.
13. Patch and make good to asphalt, which has been cut out in a manner, which minimizes the patching requirements.
14. Geotextile fabric and grids.
15. Remove boulders, rocks, rubble or obstructions which do not exceed one cubic metre in the immediate area of the asphalt paving.
16. Fill and gravel toppings to roads and parking lots including dust control.
17. Approaches, cast in place curbs and sidewalks, including reinforcing steel.

02-11 Unit Paving

The supply and installation of precast paving units, which are placed on a prepared base and are laid without the use of cementitious joining materials.

Including:

1. Excavate for subbase.
2. Removal of excess materials.
3. Subbase materials.
4. Compact subbase.
5. Levelling sand.
6. Precast pavers, interlocking pavers.
7. Edging strips which form the perimeter around the unit paving area.
8. Decorative gratings and retaining curbs, which form part of the paving system.

02-12 Landscaping

Supply and installation of:

1. Final grading of subgrade and scarifying.
2. Placing and spreading of topsoil obtained on or off-site as specified, providing soil mixes and soil screening.
3. Fertilizer and soil amendments are specified.
4. Fine grading of topsoil for seed and sod beds.
5. Excavation of shrub beds and tree pits.
6. Landscape ornamentals i.e. bark chips, cedar chips, pine cones, aggregates, ground covers, decorative wood posts and decorative rocks.
7. Pedestrian aggregate paths and trails.
8. Horticultural materials.
9. Seeding of lawns and other grass.
10. Protection of "seeded areas".
11. Sodding.
12. Plant material as specified.
13. Erosion control material.
14. Timber and precast concrete structures which retain landscape contours.
15. Existing trees: relocating, pruning, fertilizing and protection.
16. Changing grades around existing trees.
17. Tree grates, tree guards, precast concrete tree boxes, wooded and precast concrete planters.
18. Exterior wood screens or wood shutters, wood fences and rails, wood decks, wood seats, wood benches or wood planters including hardware and implanted rods in seats and benches.
19. Wood edging, wood retaining walls, screening, wood free standing or attached pagodas, pergolas, and gazebos.
20. External irrigation system:
 - a. Excavation, backfill and compaction to facilitate installation of work and repair of surface conditions to pre-excavation standard.
 - b. Suitably sized and accessible water service to a landscaped area, including such back-flow prevention devices, meters or other equipment as necessary to comply with all government codes and regulations will be supplied by Mechanical.
 - c. Exterior valves, lawn hydrants and tire boxes.
 - d. Pipe, valves and fittings starting from the exterior of the building wall.
 - e. Headers, manifolds, timers and specialty valves, components and fittings.
 - f. Backflow preventers attached to a device installed OUTSIDE of the building if required.
 - g. Shop drawings of all components.
 - h. Detailed layout drawings if layout differs from that shown in contract documents.
 - i. Operating and maintenance instructions.
21. Maintenance of new landscape construction as required and specified.
22. Exterior wood stairs, shop assembled, job conditions permitting, wood balustrades, guardrails and handrails (not cut to length).

02-13 Chain Link Fence

Supply and installation of permanent chain link fence: pipe, top rail, gates, mesh and fittings as well piling for fence posts including:

1. Excavate for post holes.
2. Supply/place concrete if required.
3. Line posts driven optional.
4. Excavated material to be spread on site unless requested by contractor/owner to have it removed.
5. Grading of fence line by General Contractor/owner before installation begins.
6. Gates with or without power operators.

Trade Definition 03

This scope for supply and/or installation includes the following items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, and 01-2 Trade Contractor Requirements also apply.

03-1 Concrete Formwork

Supply and installation of:

1. Formwork and related hardware.
2. Tubular formwork.
3. Void forms, protection board and polyethylene.
4. Form release agents.
5. Shoring related to formwork.
6. Architectural finishes, i.e. board form finish.
7. Keys, chases, reflects, chamfers, construction and expansion joints.
8. Clean out openings and concrete pouring ports.
9. Removal of formwork.
10. Patch tie holes
11. Retarding agents.

03-2 Reinforcing Steel Supply

Supply, including freight to site, of all reinforcing steel bars, welded mesh or structural wire fabric, including plain, stainless, epoxy, Glass Fiber Reinforced Polymer GFRP, or galvanized required for poured-in-place concrete.

1. Preparation of placing drawings and bar lists.
2. Engineering stamp if required in tender documents / separate price to be provided.
3. Fabrication of reinforcing steel bundled and tagged or color coded.
4. Fabrication of dowels.
5. Welded wire mesh or structural wire fabric.
6. Bars for concrete work and masonry work.
7. Supports and/or space bars for concrete work on formed surfaces.
8. Bar supports for the upper layer of steel in doubly reinforced slabs on grade.
9. Grout key, side tie and hairpin reinforcement cast into concrete or masonry for hollow core anchorages.
10. Reinforcing bars for du-al and similar type ICF block.

03-3 Reinforcing Steel Placing

Installation shall mean providing labour only to facilitate the receiving, handling, and storage of reinforcing steel materials at the project site, including moving to final location, assembling, pre- assembling, installation, initial correction and adjustment.

Installation of Reinforcing Steel including:

1. Take delivery and store reinforcing steel on-site.
2. Protect materials from corrosion and damage.
3. Touching up of epoxy coated bars.
4. Placing of reinforcing steel and welded wire fabric according to approved placing drawings.
5. Installation of bar supports and all material required for temporary and or permanent connection.
6. Placement of welded wire mesh including mesh reinforcing to V-rib pans and fireproofing mesh to columns and beams.
7. Leave reinforcing steel clean and free of foreign material.
8. Reinforcing for stair pan treads.

Supply and install:

1. All necessary tie wire, temporary support and bracing bars not shown on shop drawings.

03-4 Concrete Work

Supply and placement of architectural and structural cast-in-place concrete, including:

1. Place and consolidate concrete to the structure(s), housekeeping bases, slab and sidewalks if attached to the building.
2. Place concrete to equipment pads, inertia bases, housekeeping bases, lamp and parking plug bases, mechanical/electrical underground services, curbs and sidewalks (not attached to building.)
3. Clean and prepare piles prior to placement of concrete foundations.
4. Clean and prepare all construction joints prior to placement of adjacent concrete, including the use of bonding agents, cement slurry, etc.
5. Patch honeycomb holes.
6. Patch and make good to alterations, which have been properly cut out in a manner, which minimizes the patching requirements.
7. Grout structural members to elevation.
8. Concrete toppings.
9. Cementitious franchised toppings.
10. "Dual-Block" floor systems.
11. Install steel dowels in tops of piles.
12. Pile cap including reinforcing steel, dowels and concrete.
13. Install and grease smooth dowels.
14. Drill, place and grout dowels and/or threaded rods to adjacent structures.
15. Install anchors, bolts, embedded plates, angles, and other metal fabricated items.
16. Cooperate with other trades for installation of embedded items, i.e. mechanical/electrical sleeves, windows, etc.
17. Concrete accessories, i.e. dovetail slots, polyethylene, expansion joint materials, water stops, etc.
18. Isolation coatings to concrete, i.e. asphalt emulsion to expansion joints and under toppings.
19. Chemical admixtures.
20. Finishing vertical surfaces, i.e. carborundum, sack finish, exposed aggregate.
21. Decorative rocks set in landscape concrete.
22. Fiber Reinforcements.

Supply only:

1. Reinforcing steel supports for welded wire mesh, concrete walls and slabs on grade.

03-5 Concrete Finishing and Curing

1. Screed concrete to tolerances, float and provide finish, i.e. steel trowel, wire broom and wood float.
2. Cure concrete, i.e. membrane curing agent or water cure.
3. Supply and apply hardeners, colorings, sealers, exposed aggregates.
4. Remove irregularities and provide a level surface at locations of stubbed up pipes, ducts, conduits, etc.
5. Sawcut control joints; clean out and fill with sealant.
6. Hand finishing of stairs, bases, curbs, tops of walls, etc.
7. Install clean-out access.
8. Slopes for drains – drain elevations to be set by others.
9. Provide a smooth level surface suitable to receive floor finishes indicated including self levelling floor patching compounds.
10. Renovations: Resinous bonded concrete flooring.

03-6 Precast Concrete

Supply and installation of architectural and structural fabricated concrete units, including:

1. Precast panels and hollow-core.
2. Reinforcing.
3. Layout and shop drawings.
4. Supply cast in place hardware necessary for precast erection.
5. Bearing pads.
6. Installation of inserts in precast, provided by other trades.
7. Grout on hollowware.
8. Hollow-core grout key, side tie and longitude reinforcement cast into infill/grout.
9. Jointing materials including caulking, back up rod, gaskets, etc.
10. Openings in precast exceeding 175 mm.
11. Hoisting and Placing.

Supply only:

1. Precast concrete lintels.

Trade Definition 04

This scope for supply and/or installation includes the following items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, and 01-2 Trade Contractor Requirements, also apply.

04-1 Masonry

Supply and installation of masonry, e.g. bricks, concrete blocks, glazed blocks, glass blocks, clay tile, clay flue linings, mortar, stone (natural and artificial), granite, terracotta, and marble, which exceed 25mm thickness, anchors and ties, peephole devices, and masonry reinforcing wire, and similar materials.

Including:

1. Built-in non-rigid and fabric flashings.
2. Building papers, air/vapor barrier, and moisture protection used behind masonry facing.
3. Caulking masonry to masonry or to items where masonry is the last component to be installed.
4. Cavity wall insulation system complete with adhesives, air/vapor barrier, anchors, etc., behind masonry and where masonry is the last component to be installed.
5. Cleaning of new masonry.
6. Concrete fill, grout fill, and sand fill in masonry.
7. Loose fill insulation and foam insulation in masonry cores.
8. Dampproof course in masonry.
9. Expansion and control joints in masonry.
10. All masonry laid with mortar-containing bonding agents, regardless of being pre-laid or otherwise.
11. Place reinforcing steel in masonry.
12. Waterproofing of exterior masonry facing with water repellent.
13. Anti-Graffiti Coating
14. Masonry patching to existing buildings and in renovation work, for the mechanical, electrical and other trades and to building openings which have been cut out in a manner which minimizes the patching requirement.
15. Salvage and clean masonry for reuse.
16. Temporary wind bracing of masonry under construction and until permanent supports are in place.
17. Copings and Sills.
18. Fire rating material where masonry interferes with other materials and masonry is the last component to be installed.
19. Renovations:
 - a. Repointing of existing masonry.
 - b. Replace or repair with epoxy, all cracked masonry.

04-1 Masonry Continued:

Installation only:

1. Building in of miscellaneous metals, nailing plugs, anchorages supplied by others.
2. Precast concrete lintels, band courses and heads.
3. Built-in through-wall metal flashings.
4. Door Frames into masonry walls.

04-2 Exterior Cleaning of Existing Buildings

Supply and installation of:

1. Protection for all surroundings non-masonry surfaces.
2. Protection for pedestrian and auto traffic.
3. Routing and repointing mortar joints.
4. Cutting, altering and/or replacing damaged masonry or stone.

Methods of cleaning:

1. Sandblasting.
2. Chemical Cleaning.
3. High Pressure Water Cleaning

Trade Definition 05

This scope for supply and/or installation includes the following items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, and 01-2 Trade Contractor Requirements, also apply.

05-1 Structural Steel

This trade is to supply, fabricate, deliver and install structural steel made from ferrous metal only, 14 gauge and heavier. They shall include those items from the following list which are clearly indicated as being required in the tender documents and all material required for the temporary and permanent connection of the component parts of structural steel.

Supply and installation including:

1. Anchors for structural steel.
2. Base plates attached to structural steel members and bearings for support of steel deck.
3. Columns, beams, purlins, girts forming part of the structural steel frame.
4. Bracing for steel members, trusses or frames.
5. Brackets attached to the structural steel.
6. Cables for permanent bracing or suspension systems.
7. Girders.
8. Grillage beams of steel.
9. Monorail beams of standard structural rolled section.
10. Struts.
11. Shear connectors for composite beams, shop applied.
12. Shop fasteners or welds, and fasteners required to assemble parts for shipment.
13. Framing for mechanical openings of 400mm or greater.
14. Shop preparation and/or priming.
15. Steel trusses.
16. Welded anchors for masonry or precast concrete, shop applied.
17. Slab/hollow core support angles for floors.
18. Steel tubes or cores for composite columns or braces.
19. Steel to steel connections, including angles, tees, and clips complete with engineered drawings.
20. Material required for the temporary and for permanent connection of the component parts of the structural steel.
21. Open Web Steel Joists
 - a. Bridging, anchors, headers and trimmers.
 - b. Delta beams.
22. Floor plates, roof plates (raised pattern or plain) deck support angles and steel grating connected to the structural steel frame.

05-1 Structural Steel Continued:

23. Related structures which are attached to or form part of the structural steel frame of the building as follows:
 - a. Roof overhang structures, entrance canopies and supporting structures.
 - b. Canopy steel framing, including free standing types.
 - c. Conveyor galleries and supporting bents, other than conveyor stringers, deck plates and supporting posts which form part of the conveyor assembly.
 - d. Crane rail and stops.
 - e. Angle/channel frames for doors and wall openings.
 - f. Hangers related to structural steel including sag rods.
 - g. Lintels as detailed or specified if attached to structural steel
 - h. Shelf angles.
 - i. Structural supports for roof-mounted equipment.
 - j. Curtain wall, store front, and window framing not enclosed by architectural metal.
 - k. Miscellaneous support framing for ceiling mounted items such as bulkheads, operable walls, and surgical lights.
 - l. Glulam brackets when attached directly to structural steel, not including bolts and shear plates.
24. Shop preparation and/or priming.
25. Lifeline anchors attached to structural steel.
26. Field Bolts to connect structural steel components.
27. Supply/Include engineered shop drawings and erection diagrams.

Supply Only:

1. Anchors
2. Delta Beams or similar

05-2 Steel Decking

Supply and installation of steel decking, including:

1. Metal roof deck.
2. Metal floor deck.
3. Steel cell closures and metal cover plates.
4. Acoustic roof deck.
5. Reinforcing openings in deck from 150 mm to 400 mm in diameter.
6. Cutting of pre-marked openings in the metal deck during deck installation to accommodate penetrations by other trades.
7. Shear studs when shown through metal decking.

Supply Only:

1. Acoustic insulation for acoustic roof deck.

05-3 Miscellaneous Ferrous Metal Custom Fabricated

This trade shall be responsible for the **Supply Only** of miscellaneous steel custom fabricated from 2.0 mm **(14GA)** thickness and heavier ferrous metal, including galvanized, powder coated, cadmium or chromium plated, not including stainless steel or cast iron items.

Supply of items:

1. Access hatch and frames.
2. Angle and channels for door and wall openings.
3. Bench brackets.
4. Bolts, anchors and sleeves for miscellaneous steel items.
5. Bolts for glulam to masonry/concrete connections.
6. Bollards.
7. Bumper posts and rails.
8. Burglar / security bars – except within duct work.
9. Coat rods - pipe type.
10. Columns, non-load bearing.
11. Corner protection angles.
12. Fabricated convector frames and enclosures.
13. Covers and frames for manholes, catch basins, sumps, trenches, hatches and pits.
14. Deck support angles unrelated to open web steel joists.
15. Elevator hoist beams and divider beams not connected to structural steel.
16. Expansion joint angle/plate assemblies.
17. Flag poles, non-continuous tapered design.
18. Foot scrapers, mud and foot grilles and pans.
19. Gates.
20. Gratings and frames.
21. Hangers and connectors for structural wood framing.
22. Joist hangers, joist strap anchors, custom fabricated only.
23. Ladders and ladder rungs.

05-3 Miscellaneous Ferrous Metal Custom Fabricated Continued:

24. Ledger and shelf angles, bolted type.
25. Lintels (angles, plates or beam) unattached to structural steel frame.
26. Mat recess frames.
27. Miscellaneous framing and supports for architectural woodwork.
28. Sleeves.
29. Stair nosing.
30. Table and counter legs, frames and brackets.
31. Thresholds and sills.
32. Vanity and valance brackets.
33. Weather bars.
34. Steel plates unattached to structural steel and not identified in any other trade definition.
35. Security grille doors.
36. Rain water leaders.
37. Delta beams – shop welding of connections for installation.
38. Shop preparation and/or priming.

Supply and installation of items:

1. Curtainwall and storefront framing not enclosed by architectural metal.
2. Wire mesh and expanded metal partitions and screens.
3. Fire escapes.
4. Grating type floors, catwalks and service platforms complete with railings.
5. Railings and pickets (balcony, guard, and stair) include plastic handrail cover.
6. Shelf and ledger angles.
7. Monorail beams.
8. Ladders (roof, ship).
9. Stairs and landings (grating, pan and plate types).
10. Non-Structural canopies.
11. Window washing outrigger brackets and beams.
12. Handrails and plastic covers.
13. Wheel stop angles (e.g. garbage containers).
14. Security grilles.
15. Miscellaneous support framing for ceiling mounted items such as bulkheads, operable walls, and surgical lights.

05-4 Non-Ferrous Metals Custom Fabricated

Supply of miscellaneous items CUSTOM FABRICATED from 2.0 mm (14GA) thickness and heavier stainless steel, aluminum and brass, excluding “trades name” products.

Supply items:

As per Ferrous Metal Custom Fabricated, where applicable

Supply and installation items:

As per Ferrous Metal Custom Fabricated, where applicable.

05-5 Miscellaneous Sheet Metal Custom Fabricated

Supply of: sheet metal items CUSTOM FABRICATED from galvanized sheet steel, coil coated steel/aluminum sheet, stainless steel sheet, copper sheet, perforated metal, aluminum, of less than 2.0mm (14GA) thickness for the following:

1. Cabinetry.
2. Column covers.
3. Convector enclosures.
4. Corner guards.
5. Cornerstone boxes.
6. Work surfaces or countertops complete with backing including wood core.
7. Drapery pockets.
8. Hoods.
9. Lighting troughs.
10. Metal cladding of wood doors and frames.
11. Metal cladding of work counters.
12. Partition and column enclosures.
13. Perforated metal fabrications.
14. Planter box liners.
15. Window mullion covers.
16. Window stools and sills.
17. Drain/drip pans, troughs and liners for other than that required for Mechanical piping.

Trade Definition 06

This scope for supply and/or installation includes the following items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, and 01-2 Trade Contractor Requirements, also apply.

06-1 Rough Carpentry

Supply and installation of:

1. Wood framing including layout.
2. Miscellaneous wood blocking, grounds and backing required for structural integrity.
3. Wood sheathing.
4. Wood cants required for roofing.
5. Wood bridging and brand name metal hangers for wood trusses.
6. Temporary supports and shoring at masonry lintels.
7. Wood strapping.
8. Separate roof curbs for skylights and hatches.
9. Rough hardware and fasteners.
10. Wood columns, posts, brackets and stair landings.
11. Sound insulation when covered with paneling.
12. Security mesh when not covered by other material.
13. Parapet insulation where the parapet is plywood on both sides, or where it has drywall sheathing on one side and plywood on the other. (see 09-2-23(d))

Installation Only of:

1. Glulam beams, wood trusses and prefabricated stairs & landings.
2. Loose miscellaneous metal items not covered by other trades.

Alterations:

Patch framing, sheathing and finish wood materials, which have been cut out in a manner, which minimizes the patching requirements.

General work:

1. Joint sealants, backup rod and caulking.

06-2 Finish Carpentry

Supply and installation of:

1. Miscellaneous wood blocking and backing required for architectural finishes and fixtures.
2. Plywood backboards for electrical panels.
3. Interior wood stairs, shop assembled, job conditions permitting, wood baulsters, guardrails and handrails (not cut to length).
4. Alterations to existing millwork fixtures.
5. Wood Blocking around doors and windows.
6. Shop assembled notice boards, in wood frames or millwork fitments.
7. Wood moldings, base, casings, stools, thresholds, boxed beam and column members. (Boxed beams and columns supplied knocked down.)
8. Interior wood screens or wood shutters, wood fences, wood vents or wood louvres, wood grilles, wood sun baffles, wood seats, wood benches or wood planters including hardware and implanted rods in seats and benches.

Installation Only of:

1. Millwork, including the supply of fasteners and final adjustment of millwork hardware not covered under 06-6.
2. Standing and running trim and loose components supplied by Architectural Woodwork Trade, including cutting, assembling, and final sanding.
3. Finish hardware on doors.
4. Chalkboards and track boards, including dowelling or joining of units on site.
5. Manufactured specialty items.
6. Hollow metal frames not covered under other trades.
7. Hollow metal doors not covered under 08-2.

Alterations:

Patch finish wood materials, which have been cut out in a manner, which minimizes the patching requirements.

General work:

1. Joint sealants, backup rod and caulking.

06-3 Heavy Timber Construction

Supply and/or installation of pre-milled and pre-machined Heavy Timber components made of solid sawn timber of a minimum cross-sectional dimension of 125mm in cross section, including the connecting hardware for timber to timber members.

Supply only:

1. Delivery to site of pre-milled and pre-machined heavy timber components, including the connections of timber to timber members and specialty engineering limited to the complete heavy timber design scope within the project.
2. Timber grade compliance certification.
3. Drying certification if specified.
4. Pressure treatment, fire retardant pre-treatments if specified, with certification of compliance
5. Staining, oiling, painting and other finishes, specified as part of the shop fabrication
6. Timber columns, beams, rafters, purlins, knee braces, wind braces or other types of timber bracing forming parts of the structural and/or architectural design.
7. Timber ledgers supporting deck or deck members.
8. Connecting hardware, fasteners and pins as specified in shop drawings for:
 - a. Timber to timber connections.
 - b. Timber to concrete connection if the connection is drilled and epoxied or drilled and wedge anchored.
 - c. Timber to steel if the connector is a wood lag screw.
 - d. Provide sufficient bolts, nuts washers, and special fasteners, of suitable size, quality and quantity for all field connections of timber to timber, timber to concrete and timber to steel as required, plus an over-allowance of five (5) per cent of each size to cover waste.
9. Connecting metal plates as specified in shop drawings for:
 - a. Timber to timber connections.
 - b. Timber to concrete connection if the connection is drilled and epoxied or drilled and wedge anchored.
10. Shop drawings for supplied timber components.
11. Specialty engineering for timber components and connections.

06-3 Heavy Timber Construction Continued:

Install only:

Installation of pre-milled and pre-machined heavy timber components including all directly associated connection hardware to provide a complete structural system:

1. Layout, drilling, setting of anchor bolts which are not cast in place by others.
2. Offloading of timber package at job site.
3. Provision of a raising plan including temporary bracing provisions prior to handling heavy timber package.
4. All necessary rigging.
5. All necessary powered equipment for hoisting heavy timber.
6. All necessary man lifts and/or scaffolding to perform work by this trade scope.
7. Rigging and hoisting of heavy timber components into final position.
8. Supply, installation and removal of temporary bracing materials including miscellaneous incidentals required to perform the work.
9. All connection hardware.
10. Assist in the coordination of the layout and setting of anchor bolts applicable to this scope.

06-4 Glued Laminated Structural Wood

Supply of:

Glued Laminated structural wood members complete with glulam beam and glulam beam to masonry/concrete connections. Shop finish as specified. Including:

1. Engineering/layout drawings, including instructions for ties and bridging, which are supplied by the installer.
2. Protection of materials in transit.
3. Delivery to site F.O.B. truck.

06-5 Trussed Structural Wood

Supply of trussed wood units, including:

1. Engineering/layout drawings, including instructions for ties and bridging, which are supplied by the installer.
2. Protection of materials in transit.
3. Delivery to site F.O.B. truck.
4. Wood joists complete with metal cords.

06-6 Architectural Woodwork

Supply and install of custom fabricated Architectural Woodwork defined as clear, kiln dried, dressed or re-sawn material exposed to view in the interior of a finished building, including hardwood plywood, plastic laminate covered wall panels, and architecturally designed casework, built-up or knocked down, conditions F.O.B. truck at job site.

Custom Fabricated Woodwork includes:

1. Custom fabricated cabinetry.
2. Exterior custom window frames and sash, door frames complete with wood trim including integral panels and integral insulation to same. Wood sash to be shop fitted including finishing and installation of workable sash hardware, weatherstripping and fly screens to same.
3. Exterior and interior custom wood door frames, sidelight frames, borrowed light frames complete with wood trim and wood sash. NOTE: Frames limited by size or design or three- sided frames of 3/4" material to be supplied knocked down.
4. Wood melamine panel and plastic laminate-faced counters, cabinets and cupboards complete with wood base, counter tops, splash backs, drawers, shelves.
5. Wood, plastic laminate, fiberboard and cement fiber, cast marble, granite, and Corian counter tops, including backsplash, aluminum molding for same, or self-edge.
6. In shop fabricated millwork fitments supply and installation of all cabinet hardware specified including hinges, catches, pulls, metal feet, legs, metal drawer slides, coats rods and flanges, casters, shelf standards, pilaster strips, brackets, clips, guides, sliding door track, sheaves, and glides, locks and cylinders, and metal and plastic bins or drawer inserts. NOTE: Brackets and clips supplied loose. Metal reveals and/or trims within millwork fitments.
7. Wood tables, benches, wardrobes, desks, carrels, mobile or fixed wood room dividers, convertor covers (complete with plastic laminate covering and/or backing), wood lockers and shelving.
8. Wood, plastic or metal tote drawers or trays in millwork cabinets.
9. Custom fabricated wood and plastic laminate toilet partitions complete with hardware.
10. Shop assembled custom fabricated wood display cases including necessary hardware and glass.
11. Interior wood boards, interior siding, battens and moldings where exposed to view for decorative and display purposes.

06-6 Architectural Woodwork Continued:

12. Decorative hardwood plywood (unfinished or brand name pre-finished), wall or ceiling paneling, wood carvings, caps, trim, frame and turned work.
13. Melamine panel wall paneling or shop fabricated laminate wall paneling and windows stools when glued to core material or plywood, particleboard, or medium density fiberboard in mill. When job conditions or method of installation dictate that plastic laminate cannot be glued to core material in mill, the plastic laminate and core material shall be supplied in sheets and loose (glue for job site installation to be supplied by installer).
14. Custom manufactured furniture and fitments for churches and courtrooms, etc., such as altars, railings, pews, fonts, pulpits, and lecterns.
15. Plastic laminate.
16. Metallic laminate.
17. Melamine.
18. Glazed doors, sliding glass doors, glass shelves and mirrors within millwork fitments.
19. Acrylic or plastic, e.g. Plexiglas, Acrylite, Corian, etc. within millwork fitments.
20. Fabric or upholstery applied to architectural woodwork fixtures.
21. Custom fabricated wood push/pull door plates.
22. Miscellaneous wood, plastic laminate covered, or melamine open adjustable shelves complete with standards and brackets.
23. Wall paneling.
24. Wood, plastic laminate covered wall banding complete with any exposed blocking.
25. Shop finish as specified.
26. Cutting of millwork to accept installation of built in fixtures and fittings.

Trade Definition 07

This scope for supply and/or installation includes the following items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, and 01-2 Trade Contractor Requirements, also apply.

07-1 Liquid Applied Waterproofing System

Supply and installation, including:

1. Surface preparation of an acceptably patched surface.
2. Priming of the surface.
3. The Membrane Waterproofing System.
4. Poly slip sheet.
5. Rigid Insulation over Waterproofing System.
6. Filter Fabric.
7. Protection Boards.
8. Gravel or sand ballast over Waterproofing System.
9. Adhesive or fastening devices for insulation or protection boards.
10. Tack strips for termination points.
11. Sealants, caulks, and fitments related to Waterproofing Systems.
12. Metal flashings related to Waterproofing Systems.

07-2 Foundation Moisture Protection

Supply and installation of:

1. Damp-proofing.

07-3 Thermal Building Insulation

Supply and installation of the following materials, other than those which form part of other trade assemblies, e.g. masonry, drywall, steel siding, stucco.

1. Rigid expanded foam insulation.
2. Thermal batt insulation and sheet vapor barriers to studs/joists/truss systems when completely or partially covered with wood sheet materials.
3. Rigid Fibrous thermal insulation.
4. Butyl vapor barriers interfaced with poly vapor barriers.
5. Protection board to rigid insulation.
6. Rigid insulation to foundation walls and grade beams.
7. Mastic vapor barriers to foundation insulation.
8. Thermal stud insulation system (mechanically fastened).
9. Foamed in place and injected insulation.
10. Blown in insulation where covered by sheathing materials other than drywall.
11. Wire mesh to hold insulation between studs.
12. Foundation coating over board insulation.
13. Insulation to concealed spaces for void reduction.
14. Insulation stop.
15. Thermal insulation and air/vapor barrier behind spandrel glass when not part of the Glazed Architectural Aluminum system.

07-4 Sprayed Acoustic / Thermal Insulation

Supply and installation of spray applied acoustic/thermal insulation using cellulosic, cementitious, glass fibrous or mineral fibrous materials.

07-5 Firestopping

Supply and installation of tested and listed firestop systems consisting of a material, or combination of materials installed to retain the integrity of fire-resistance rated construction by maintaining an effective barrier against the spread of flame, smoke, and/or hot gases through penetrations, blank openings, construction joints, or at the gap that is created at the building perimeter of the horizontal fire resistance rated assembly and exterior wall and in or adjacent to fire-resistance rated barriers.

Firestop and smoke seal include to:

1. Joints at top and bottom of fire resistance rated concrete, masonry and gypsum board partitions.
2. Intersection of fire resistance rated concrete, masonry and gypsum board partitions.
3. Edge of fire resistance rated floor and exterior wall assembly.
4. Expansion joints in vertical and horizontal fire resistance rated masonry and gypsum board partitions.
5. Structural penetrations through fire resistance rated wall, floor and ceiling assemblies.
6. Mechanical and Electrical penetrations through fire resistance rated wall, floor and ceiling assemblies.
7. Openings and sleeves installed for future through fire resistance rated wall, floor and ceiling assemblies.
8. Rigid ductwork through fire resistance rated wall, floor and ceiling assemblies.
9. Cable Trays through fire resistance rated wall, floor and ceiling assemblies.
10. Mechanical and Electrical recessed boxes in fire resistance rated partitions.
11. Pass thru devices through fire resistance rated wall, floor and ceiling assemblies.
12. Cast-in place devices through fire resistance rated wall and floor assemblies.
13. Fire Separation Barrier Markings.
14. Assembly Identification Labels.

07-6 Sprayed Fire Rated Isolation

Supply and installation of sprayed fire rated isolation using cellulosic, cementitious, glass fibrous or mineral fibrous materials.

07-7 Unit Roofing (Shingles and Roofing Tiles)

Supply and installation of the following types of unit roofing: Asphalt Shingles, Clay Tiles, Concrete Tiles, Metal Tiles, Wood, Shingles and Shakes complete with:

1. Underlayment.
2. Eave protection.
3. Starter strips.
4. Valley flashing.
5. Metal edging.
6. Cement.
7. Fasteners.
8. Gutters and downspout systems when related to Unit Roofing.
9. Continuous type ridge vents.
10. Removal of existing roofing for installation of new Unit Roofing.
11. Gypsum board and plywood applied over a roof deck as part of the roofing assembly.
12. Plywood sheathing applied over the roof insulation as part of the roofing assembly.
13. Cleaning snow and ice from roof after acceptance of roof area.
14. Air/vapor barrier tie between wall and roof air barrier under parapets.
15. Closing of gaps around mechanical and electrical lines in roof penetration

Supply of:

1. Vent flashings for pipe penetrations on roof

07-8 Preformed Metal Panel Cladding

Supply and installation of wall and sloped roof cladding made from zinc coated (galvanized), coil coated (pre-painted) galvanized, stainless, or weathering steel sheet, or aluminum, and the necessary closures, gaskets, caulking, flashing and fasteners, including:

1. Exterior panel.
2. Liner panel.
3. Prefinished and galvanized flashings.
4. Internal sub-grits.
5. Thermal clip systems.
6. Insulation, vapor barrier, air barrier.
7. Plywood over the roof insulation as part of the insulated roof assembly.
8. Caulking and/or sealants.
9. Closures, fasteners.
10. Translucent panels.
11. Hanger systems.
12. Adhesives.
13. Perforated acoustic systems.
14. Pressure release panel systems.
15. Gutters and downspout systems related to wall and sloped roof cladding.
16. Drywall or plywood over a roof as part of the metal roof assembly.
17. Air/vapor barrier tie between wall and roof air barrier under parapets.
18. Closing of gaps around mechanical and electrical lines in roof penetrations.

07-8 Preformed Metal Panel Cladding Continued:**Supply of:**

1. Materials in sheet form (where in direct contact or related to metal cladding) for copings, cap flashing, cant flashings, parapet flashing, gutters, downspouts and scuppers, where finish, colour and gauge are required to match adjacent metal cladding. Does not include cleats or clips or angles to support the above-mentioned flashing and trims.
2. Vent flashings for pipe penetrations on roof

07-9 Vinyl Siding, Metal Siding, and Soffits**Supply and Installation of** siding fascia and soffits including residential type vinyl and metal, includes:

1. Cladding roll formed from sheet steel (pre-painted, galvanized, galvalume finish), stainless or weathering steel, aluminum or other metals.
2. Liner panel of materials listed forming part of a preformed metal wall and/or soffit cladding assembly.
3. Aluminum soffit, fascia, siding, gutter and downspouts.
4. Gutter and downspouts that form an integral part of the preformed metal or vinyl siding and soffit.
5. Related closures, caulking, flashings and fasteners incorporated into the system;
6. Internal sub-grits.
7. Related insulation, adhesives, vapor barriers and air barriers including other materials from the barriers to the finished metal surface.
8. Stationary louvers of matching materials (installed in cladding) including wire mesh or bird screens. (Does not apply to mechanical louvres)
9. Flexible sheet membrane which forms part of the building air barrier directly behind the vinyl and metal siding including connection work of the preceding trade where required.
10. Flashings for equipment openings as they pertain to wall penetrations.
11. Installation of flexible membranes around or onto window framing or openings.

Supply of:

1. Materials in sheet form (where in direct contact or related to metal cladding) for copings, cap flashing, cant flashings, parapet flashing, gutters, downspouts and scuppers, where finish, colour and gauge are required to match adjacent metal cladding.

07-10 Membrane Roofing

Supply and installation of built-up or single ply membrane roofing systems, including:

1. Adhesives and fasteners.
2. Cants of roof insulation.
3. Caulking and sealants.
4. Flashings of all types of materials, which form part of the roof system and are installed in conjunction with the roof system. When refinished metal flashing, eavestrough, conductor pipe, and accessories, are to match any refinished metal siding, metal for prefinished metal flashing, eavestrough, conductor pipe, and accessories, is to be supplied to the roofing contractor prior to forming and installation.
5. Gumpots and pitch pockets.
6. Gutters and downspout systems related to asphalt and membrane roofing.
7. Insulation applied over a roof deck as part of the roofing system.
8. Insulation and insulating protection board (i.e. fibreboard) to proof parapets where covered by roofing membrane or sheet metal.
9. Gypsum board or plywood applied over a roof deck as part of the roofing system to the interior edge of the parapets.
10. Plywood deck applied over the roof insulation as part of the roofing system.
11. Vapor retardants over roof decks to the interior edge of the parapets.
12. Granular, precast and other ballast for inverted roof systems.
13. Precast concrete and asphaltic roof tread walkway systems.
14. Seal and flashing and of curbs and sleepers for related roof mounted equipment and supports.
15. Closing of gaps around mechanical and electrical lines in roof penetrations
16. Removal of existing roofing for installation of new membrane roofing excluding demolition of parapets.
17. Cleaning snow and ice off roof after acceptance of roof area.
18. Insulation and insulating rigid protection board regardless of type, to roof parapets where covered by roofing membrane or sheet metals.
19. Install acoustic insulation for acoustic roof deck.

Supply of:

1. Vent flashings for pipe penetrations on roof

07-11 Miscellaneous Roof Specialties

The following manufactured items identified as “trade name” products are generally purchased by the General Contractor. These products are not supplied by trades, which normally fabricate to detail unless the Consultant gives specific instructions.

07-11 Miscellaneous Roof Specialties Continued**Trade Name Products (applicable to the following):**

1. Prefabricated curbs (except as identified under 15-1).
2. Roof hatches.
3. Fall Arrest Roof Anchors and Safety rails.
4. Gravity ventilators (except as identified under 15-14).
5. Prefabricated penthouse including ventilator type.
6. Smoke vents.
7. Prefabricated skylights.
8. Attic ventilators: goose necks or stacks when not connected to a duct and/or damper.

07-12 EIFS (Exterior Insulation Finishing Systems)**Supply and installation of:**

1. The substrate shall be one of the following:
 - a. Brick, masonry or concrete;
 - b. Fiber cement board;
 - c. Glass-mat faced gypsum board;
 - d. Plywood or OSB board. (Not approved for systems meeting CAN/ ULC-S134 and S101.)
2. Metal flashings as per drawings and best practices
3. Air/vapor barrier and moisture protection used behind EIFS facing including transition membranes to connect and overlap air/vapour membranes installed by preceding trades. If connection is required by any trade following the exterior insulated finish system installation, then this trade provides a minimum of 200 mm, unless otherwise specified, of overlap material beyond the exterior point of the exterior insulated finish system
4. Supply and Install insulation with starter strips pre-base coated starter strips)
5. Caulking EIFS to EIFS or to items where EIFS is the last component to be installed.
6. Exterior insulation complete with adhesives.
7. Trade cleanup – cleanup for work carried out by this trade
8. Expansion and control joints in EIFS as noted by design professionals and in manufacturer spec and building code.
9. Material handling, including unloading and hoisting;
10. Warranty or Guaranty;
11. Submittals and Operation and Maintenance documentation as detailed in the Contract Documents;

07-13 Cementitious Stucco**Supply and installation of:**

1. Stucco paper, wire, expanded wire mesh and 2 coat Cementitious stucco and parging.
2. Supply and install exterior insulation including cornices and build-outs.
3. Beads, stop, expansion joints, flashings, casing and trim which are an integral part of the stucco system.
4. Supply and installation of acrylic finisher (Sto, Dyvit, Insulcrete etc.)
5. Air and vapor seal between substrates and stucco.

Trade Definition 08

This scope for supply and/or installation includes the following items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, and 01-2 Trade Contractor Requirements, also apply.

08-1 Special Doors

Supply and installation of special doors to framed openings.

Supply and installation of special doors of following types complete with related hardware, track and running hardware, motorized devices, fire closure devices, labels to closures requiring fire rating, and infill panels (i.e. glass, aluminum, steel, wood).

Supply and installation of low voltage pathways and low voltage wire for termination and commissioning

Door Types:

1. Horizontal sliding, folding and coiling grilles.
2. Vertical coiling grilles.
3. Vertical sliding, folding and coiling shutters/doors.
4. Accordion folding doors.
5. Sectional overhead doors and vertical lift doors.
6. Operable walls and partitions.
7. Automatic sliding doors (electric/pneumatic) including transoms and sidelites, which are supported by the Automatic sliding door system.
8. Floor doors/hatch.
9. Safety glass doors.
10. Coiling Rubber doors.
11. Manual Sliding doors.

08-2 Steel Hollow Metal Doors and Metal Frames

Supply of hollow metal doors, wood doors, and frames of mild steel/galvanized steel/stainless steel:

1. Hollow metal doors, standard, fire-rated, insulated, soundproof, lead lined, access.
2. Hollow metal frames and screens, transform, sideline and borrowed lite, fire-rated, insulated (closed frames), soundproof, lead lined, access, welded, and knocked down.
3. Doors, frames and screens prepared with trimmed openings for glass, grilles/louvres, hardware, mail slot, monorail, and reinforcing as well as any surface applied material.
4. Doors/frames to suit existing conditions.
5. Labels to doors and frames requiring fire-rating.
6. View ports including "special" security glazing.

08-2 Steel Hollow Metal Doors and Metal Frames Continued:

7. Four-sided frames for access doors.
8. Anchors.
9. Field joints when required for shipping or job site access including necessary reinforcing and counter sinking.
10. Galvanizing, lite zinc galvanized wiped coated steel minimum.
11. Shop priming
 - a. Treat and fully shop prime cold rolled non-galvanized steel.
 - b. Shop touch up prime where welded or coating damaged, lite zinc wiped coated steel.
 - c. Treat and fully shop prime galvanized coated steel.
12. Filler and corner plates.
13. Door silencer - rubber mutes.
14. Steel reinforcement stiffeners inside hollow metal closed sections.

Reinforcing and Preparation:

1. Hinges, mortise type: mortise, reinforce, drill and tap and provide dust cover.
2. Hinges, surface type: provide reinforcing drill and tap in field.
3. Locks, cylindrical type: mortise, reinforce, drill and tap for latch bolt. Drill only and provide for rose fixing.
4. Locks, mortise type: mortise, reinforce for face plate, drill and tap. Provide lock pocket and stabilizer for lock body. Drill for cylinder thumb turn and spindles.
5. Panics, mortise and concealed vertical rod type: reinforce for active/inactive case, mortise, reinforce, drill and tap for active face plate, top and bottom latch bolt. Provide clearance pocket for concealed rods and latches.
6. Panics, rim or vertical rod surface type: reinforce for active/inactive case, top and bottom latch. Drill for cylinder, prepare active case functions and thumb piece.
7. Push and pull, surface type: reinforce doors only (Drill and tap by installer.)
8. Push and pull, mortise type: mortise, reinforce, drill and tap.
9. Door closers and overhead holders, surface type: reinforce only. Drill and tap by installer.
10. Door closers and overhead holders, concealed type: mortise, reinforce, drill and tap. Provide dust cover.
11. Kickplates: no reinforcing. Drill and tap by installer.
12. Spring bumpers: reinforce only. Drill and tap by installer.
13. Surface bolts: reinforce only. Drill and tap by installer.
14. Flush bolts, mortise type: mortise, reinforce, drill and tap. Include dust cover.
15. Weatherstrip, sweeps, astragals, surface type: all work by installer.
16. Weatherstrip, sweeps, astragals, mortise type: mortise and reinforce. Drill and tap by installer.
17. Electric hinges: provide reinforcement, drill-tap with dust box provision for electric conduit.
18. Electric locks and strikes: provide reinforcement, drill and tap with dust box provision for electric conduit. Provide electric conduit/sleeve through steel doors.
19. Door closers, electric monitored: provide reinforcement, drill and tap, mortise and concealed only. Reinforce surface type. Drill for electric conduit connection.
20. Electric magnetic locks: provide reinforcement for surface mounting. Drill and tap by installer. Drill for electric conduit connection.

08-3 Wood Doors

Supply of solid and hollow wood doors, and wood frames:

1. Wood doors and wood or plastic windows.
2. Machining and beveling of wood doors for installation of doors and hardware.
3. Exterior and interior wood doors, wood bifold doors, plastic laminate, overlay plywood or MDF faced, mineral core, sound-rated doors, complete with seals.
4. Door openings for glazing or metal cut to size. Wood stops for glazing or metal grilles supplied cut to size and loose. Wood grilles installed complete.
5. Wood bifold doors with bifold hardware.

08-4 Glazed Wood/Plastic/Fiberglass Windows

Supply of manufactured brand name sliding, awning, hopper, casement and fixed windows and sliding patio doors of milled wood/plastic/fiberglass extrusions, F.O.B. truck at job site:

1. Windows, fixed and operable sash and frames of milled wood/plastic/fiberglass extrusions complete with hardware for operable units.
2. Sliding patio/balcony doors of milled wood/plastic/fiberglass extrusions complete with hardware.
3. Single, double or multiple glazing.
4. Brickmold, sills and jamb extensions.
5. Fly screens to vents.
6. Factory cleaning.
7. Metal cladding on wood.
8. Finishes.

08-5 Glazed Aluminum Windows

Supply and installation of unit windows, continuous strip windows and sliding patio doors of anodized aluminum extrusions. (When applicable read “bronze” or “stainless steel” for “anodized aluminum”).

Supply and installation of:

1. Windows fixed and operable sash and frames of anodized aluminum extrusions complete with hardware for operable units.
2. Sliding patio or balcony doors of anodized aluminum extrusions complete with hardware.
3. Transparent, translucent or opaque panels insulated or otherwise framing systems.
4. Fly screens to vents.
5. Venetian blinds between glass.
6. Stiffeners inside aluminum extrusions.
7. Insulation within extrusions.
8. Sills and miscellaneous trim of extruded or brake formed anodized aluminum.
9. Anodized aluminum guard rails attached to aluminum extrusions.
10. Anchors: portion directly attached to aluminum extrusions.
11. Caulking (sealant, backup rod, perimeter insulation, exterior and interior).
12. All sealing, membranes and spray-foam to window frames, and to all preceding adjacent wall types.

Supply of:

Anchors: portion directly attached to structure.

Installation of:

Rails of wood, plastic laminate attached to extrusions.

Renovations:

Removal of existing windows of installation of new windows of same size.

08-6 Glazed Architectural Aluminum

Supply and installation of entrances and storefronts, curtain walls and skylights of anodized aluminum extrusions. (When applicable read “bronze” or “stainless steel” or “prefinished steel” for “anodized aluminum”)

Supply and installation of:

1. Anodized aluminum framing.
2. Transparent, translucent or opaque panels, including spandrels, insulated or otherwise, within storefront and curtain wall framing complete with air/vapor barrier.
3. Air/vapor barrier behind the insulation when behind spandrel glass.
4. Caulking (sealant, backup rod, perimeter insulation, exterior and interior).
5. Flashing and coping of anodized aluminum within curtain wall system.
6. Sills and miscellaneous trim extruded and brake formed.
7. Venting windows within storefront and curtain wall framing complete with fly screen and finishing hardware.
8. All sealing, membranes and spray-foam to window frames, and to all preceding adjacent wall types.
9. Venetian blinds between glass.
10. Steel reinforcement stiffeners inside aluminum extrusions.
11. Anchors: portion directly attached to aluminum extrusions.
12. Interlocking anodized aluminum facing systems.
13. Anodized aluminum swing doors and balanced doors.
14. Anodized aluminum sliding storefront doors complete with track system.
15. Anodized aluminum guard rails attached to aluminum extrusions.
16. Fixed partitions of anodized aluminum extrusions.
17. Insulation within the extrusions.
18. Preparation of extrusions to receive hardware.
19. Finishing hardware for aluminum swing door including electric or pneumatic door operator systems.
20. Cleaning between glass.
21. Firestop materials between curtain wall and structural frame.
22. Smoke Baffles.

Supply of:

Anchors: portion directly attached to structure.

Installation of:

Rails of wood, plastic attached to extrusions.

Renovations:

Removal, modification, and relocation of existing Glazed Architectural Aluminum.

08-7 Finish Hardware

Supply of finish hardware, including:

1. Butts, pivots, hinges, floor hinges, spring hinges (double and single acting).
2. Locksets, latches, privacy sets and exit or panic devices complete with standard or electric strikes.
3. Electrified locksets, throw bolts, hinges and panics.
4. Keyless or Card Access system that is built into the doors
5. Push and pull plates, push and pull bars, kick plates, armor, mop and stretcher plates.
6. Closing devices, including surface, concealed, overhead and floor type complete with brackets.
7. Stops, holders and bumpers, including the following types:
 - a. Overhead, surface and concealed
 - b. Wall and floor mounted.
 - c. Crash chain stops.
8. Weatherstripping, soundproofing and threshold:
 - a. Threshold - aluminum, brand name.
 - b. Weatherstripping for head, jamb, meeting stile and door bottom.
 - c. Automatic door bottoms.
9. Fire safety devices.
 - a. These devices are attached to or concealed in the door or the frame or both and are part of the door control system.
 - b. Electrically operated door holding devices and magnetically activated door closers.
 - c. Smoke and ionization detectors, which are an integral part of the holder/closer unit.
10. Door bolts - manual and automatic, including flush, surface, cane, cremone, barrel, chain and slide.
11. Coordinators.
12. Mullion-removeable type (Brand name).
13. Door viewers.
14. Letter box plates.
15. Keys, key blanks and key control cabinets.
16. Chain door guards.
17. Exit alarms, battery operated.
18. Pocket, by-pass and bi-fold door hardware, including frame, track and hangers.
19. Hardware for doors in demountable partitions.
20. The application of lead to finish hardware.
21. Lock cylinders including aluminum doors.
22. Finish Hardware for swing doors (other than Aluminum) including Electric or Pneumatic Door
23. Operator Systems.

08-8 Glass and Glazing

Supply and installation of glass and glazing to custom fabricated openings.

NOTE: Catalogue or brand name products **supplied by other trades** will be complete with the glazing components (e.g. brand name doors, windows, display cases, cabinets and framed mirrors, and demountable partition systems).

Supply and installation of:

1. Glass and plastic complete with glazing clips and glazing sealants, glazed into the following types of framework:
2. Custom fabricated wood frames.
3. Wood doors, which have been prepared to, specified openings.
4. Hollow metal.
5. Industrial sash, steel/aluminum.
6. On site fabricated display cases and related hardware.
7. Mirrors complete with adhesives, clips or J -moldings.
8. Open glass shelving including shelf standards, clips and brackets.
9. Grids or dividers other than wood applied to the glass (i.e. brass muntin, lead muntin, plastic muntin etc.)
10. Caulking (sealant, backup rod, perimeter insulation, exterior and interior).
11. All sealing, membranes and spray-foam to window frames, and to all preceding adjacent wall types.

Trade Definition 09

This scope for supply and/or installation includes the items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, and 01-2 Trade Contractor Requirements, also apply.

09-1 Lath and Plaster

Supply and installation of:

1. Lathing systems including suspension and metal furring for plaster, such as metal lath.
2. Steel stud framing for suspended plaster ceiling and soffits.
3. Plastering - plain, ornamental, cast or molded – excluding trowel-on or spray-on interior acoustical stucco.
4. Beads, plaster stop, expansion joints, casing and trim which are an integral part of the lath and plaster system.
5. Fire-rated enclosures of recessed fixtures in plaster ceilings.
6. Metal lath and scratch coat behind tile, terrazzo, marble, granite and cultured stone.
7. Plaster sound baffles.
8. Installation of plaster rings and access doors.
9. Building paper covered by lath and plaster.
10. Caulking of control and expansion joints.
11. Gyproc Lath and/or drywall sheathing used for plaster base when no Steel Studding and Drywalling trade definition on the project.

Renovations:

1. Patch and make good to plaster surfaces that have been cut out (generally saw cut) in a manner, which minimizes the patching requirement.

09-2 Steel Stud and Drywall

Supply and installation of:

1. Steel stud framing.
2. Exterior and interior drywall and/or cementitious wallboard sheathing.
3. Resilient sound bar.
4. Metal suspension and metal furring.
5. Joint treatment for drywall and plasterboard.
6. Drywall backing for glued acoustic tile.
7. Drywall metal accessories such as corner bead, stop, etc.
8. Drywall plasterboards and cementitious wallboard backing for ceramic tile. Joint treatment if required by the tile trade.
9. Sound attenuation baffles in ceiling plenums.
10. Fire-rated enclosures of recessed fixtures in drywall ceilings.
11. Luminous and translucent ceilings when there is no Unit Ceiling trade on the project.

12. Drywall fire-rating of ducts and duct shafts including fire-caulking internally in the system as required.
13. Factory laminated vinyl drywall when there is no Demountable Partition Trade on the project.
14. Where there is a Demountable Partition Trade on the project, and one side of a wall is plain drywall with the other side vinyl drywall, the entire wall is to be built by the Demountable Partition Trade.
15. Sheet lead where shown for x-ray or sound attenuation or both, in steel and wood stud partitions covered with drywall, and in drywall ceiling plenums.
16. Steel stud, sheet steel stud backing where backing has been specified as being steel.
17. Sound batt insulation where covered by drywall.
18. Security mesh/sheet metal when covered or partially covered by drywall.
19. Glass fiber reinforced plastic, gypsum, cement, column covers and/or bulkheads.
20. Thermal batt insulation, blown-in insulation and sheet vapor barriers to studs/joists/truss systems when completely or partially covered with drywall.
21. Poly only vapor barrier.
22. Gyproc Lath and/or drywall sheathing used for plaster base.
23. Drywall under steel stud parapets. Regarding parapets in general:
 - a. Where a membrane other than polyethylene is specified underneath a steel stud parapet this should be by the roofer
 - b. Where the material beneath the parapet is plywood, then the plywood and any membrane below it is by others (roofer if roofing membrane, carpentry if any other)
 - c. Where the back side of the parapet is sheathed with a roof decking material this is in the roofer's definitions
 - d. Where the parapet is plywood on both sides, or where it has drywall sheathing on one side and plywood on the other, the insulation should be supplied and installed by the carpentry scope.
24. Acoustical caulking at bottom and head of sound rated gypsum board wall assemblies.
25. Trowel-on or spray applied interior acoustical stucco.
26. Fire stopping / smoke sealing perimeter of gypsum partitions. (Unless a single fire stopping trade is specified.)

Installation of:

1. Access doors to drywall surfaces.
2. Welded steel frames in interior steel stud partitions.

Renovations:

1. Patch and make good drywall surfaces, which have been cut out in a manner, which minimizes patching requirement.

09-3 Tile, Terrazzo, Marble, and Granite

Supply and installation of:

1. The laying, cutting or setting and sealing of tile where used for floors, bases, walls, ceilings, walks, promenade roofs, exterior veneers, stair risers, stair treads, facings, hearths, fireplaces and decorative inserts, together with marble plinths, thresholds or window stools used in connection with tile work.
2. The application of a coat(s) of cement mortar, prepared to tolerance to receive tile on floors, walls and ceilings regardless of whether the cement is wet or dry at the time the tile is applied.
3. The setting of tile by the thin set method with organic and/or inorganic thin bed bonding materials where such bonding material is applied to the backing surface and/or the backing of the tile units or sheets of tile.
4. The setting of tile as herein provided shall include the insertion of decorative tile inserts in other materials.
5. The setting, sealing and installation of prefabricated tile systems.
6. "Tile" is herein defined as the following products, which are not to exceed 25 mm in thickness:
 - a. Burned clay products (including pavers), either glazed or unglazed, as used in the tile industry.
 - b. Composition materials, marble tile, terrazzo tiles, glass mosaics and all substitute materials for tile made in tile-like units.
 - c. Mixtures in tile-like form of cement, metals and other materials that are made for and intended for use as a refinished floor surface, stair treads, stair risers, stair base and stringer, promenade roofs, walks, walls, ceilings, swimming pools and all places where tile is used to form a finished interior or exterior surface.
7. Slate, where used as above in place of tile and less than 25 mm thick.
8. Terrazzo, where used as a finish for walls, floors, bases, curbs, stair treads, stair risers, stair base and stair stringer, which is poured in place, contains an aggregate.
9. Stone, (natural and artificial), marble, granite, slate, precast terrazzo or cultured marble, where used as a finish, and where same is less than 25 mm thick regardless of size or shape.
10. Cementitious wallboard if there is no Drywall Trade on the project.
11. Taping of cementitious wallboard when covered with material of this trade.
12. Caulking related to this trade.
13. Supply of nonslip tile nosing for poured concrete stairs.
14. Waterproofing membranes – when waterproofing membrane and mortar are components of the specified system.
15. Cleaning of installed products if required. (Acid wash for example.)

Install Only:

16. In-floor heating mats and cable - supplied by Electrical.

Renovations:

1. Patch and make good tile, terrazzo, marble and granite as above which have been cutout in a manner to minimize the patching requirements.

09-4 Acoustic Ceilings

Supply and installation of suspended acoustic ceilings, security ceilings, integrated ceilings (suspension and panels), metal/wood linear ceilings, luminous ceilings, acoustic tile, acoustic ceiling and wall panels, metal lay-in panels, and sound attenuation baffles.

1. Acoustic tile and lay-in panels, and no attenuation baffles.
2. Suspension systems: exposed grid – standard and fire rated – perforated metal pan and suspension, concealed or semi concealed, integrated ceiling systems, and linear metal ceiling complete with acoustic overlays where applicable.
3. Metal/wood linear ceilings, soffits and fascia.
4. Insulation batts laid over unit ceilings.
5. Adhesive and fasteners.
6. Inserts and hangers.
7. Fire protection to recessed fixtures in fire-rated unit ceilings.
8. Vinyl covered gypsum board and gypsum board used in lay-in suspended ceilings.
9. Perforated lay-in panels.
10. Premanufactured acoustic ceiling and wall panels such as not limited to, Tectum*, Soundsoak*, Sonotrol*, and Geocoustic*, unless part of a demountable partition.
11. Sound attenuation baffles, lead or acoustic units, in the unit ceiling plenum.
12. Luminous and translucent ceilings and valances, including suspension system and reflective foil. (e.g. Leaf-lite, egg crate and suspended translucent panels).

Renovations:

1. Removal of existing unit ceiling if reuse is required.
2. Patch and make good unit ceilings, which have been cut or removed in a manner to minimize patching.

09-5 Wood Flooring

Supply and installation of complete hardwood flooring systems, including:

1. Sleepers.
2. Wood flooring.
3. Fasteners and accessories.
4. Ventilation devices.
5. Sanding.
6. Finishing.
7. Overlays, game lines, etc.
8. Integral wood baseboard.
9. Embedded components. (for owner equipment).
10. Protection following installation as per manufacturers recommendations.

Renovations:

1. Patch and make good wood flooring that has been cut out in a manner, which minimizes the patching requirement.

09-6 Resilient Flooring

Supply and installation of:

1. Vinyl resilient sheet flooring, rubber, linoleum, cork, vinyl cork and polyvinyl chloride, tiles.
2. Vinyl, rubber, linoleum, and polyvinyl chloride sheet goods as used for floor coverings.
3. Vinyl conductive flooring.
4. Rubber and vinyl base and accessories.
5. Vinyl, rubber nosing, and molded stair treads.
6. Rubber sheet risers and strings or skirting.
7. Vinyl, rubber nosing, and metal when with resilient.
8. Vinyl or rubber runners.
9. Sheet vinyl, linoleum and polychlorides (as used for floors) on countertops, window sills and walls.
10. Vinyl plank flooring.
11. Primers.
12. Adhesives.
13. Perimeter caulking related to this trade.
14. Waxing.
15. Game lines on the above materials.
16. Subfloor preparation and patching: fill minor depressions not exceeding 6 mm exclusive of rain damage, equipment damage.
17. Renovations: patch and make good resilient flooring materials, which have been cut out in a manner, which minimizes the patching requirement.
18. Protection following installation as per manufacturers recommendations.

09-7 Carpeting

Supply and installation of:

1. Carpets including tacked, tackless, indoor-outdoor, wall, base in windows and display areas, carpet tiles for floors, walls and ceilings, ceiling carpets.
2. Mats and runners of carpet material.
3. Carpet underlay or cushion.
4. Carpet base and base cap.
5. Rubber/vinyl base, for carpet.
6. Binder bars.
7. Reducing strips.
8. Nosing.
9. Primers and adhesives.
10. Seaming diagram.
11. Carpet protection as recommended by the manufacturer.
12. Subfloor preparation and patching: fill minor depressions not exceeding 6 mm.

Renovations:

1. Patch and make good carpeting materials, which have been cut out in a manner, which minimizes the patching requirement.
2. Removal of existing carpeting if reuse is required.

09-8 Special Flooring

Supply and installation of flake, granular, rubber, and synthetic fillers, natural aggregates and compositions used with polyurethane, epoxy, polyacrylate, natural or synthetic binders, including:

1. The above material when it is applied to:
 - a. Floors
 - b. Bases
 - c. Curbs and gutters.
 - d. Treads, risers, stair base and stringers.
 - e. Walls
2. Liquid applied waterproofing membranes and levelling coats used as part of special flooring system.
3. Manufactured accessories such as: rubber, vinyl, wood, terrazzo base, stair treads, metal nosing, stringers and risers, for special flooring.

Renovations:

1. Patch and make good special floors, which have been cut out in a manner, which minimizes patching requirement.
2. Subfloor preparation: prepare subfloors including filling of depressions, which do not exceed 6 mm.

09-9 Special Coatings

Supply and installation of:

1. Special type coating systems having the following distinguishing characteristics:
 - a. Multi-coat system with or without special decorative features, e.g. rock aggregate, marble chips, colored ceramic granules, sound absorbing particles, reinforcing fiberglass.
 - b. All having published tests in reference to the following: incombustibility, chemical resistance, exceptional durability eliminating deterioration due to oxidation, moisture, and ultraviolet exposures, abrasion resistance, elasticity.
 - c. Applied by factory-trained applicators.
2. Included are:
 - a. Epoxies: 1 or 2 components, catalyst cured, and including filler coats.
 - b. Vinyl acrylics: interior, exterior - textured.
 - c. Neoprene - Hypalon.
 - d. Exposed aggregate coatings.
 - e. Textured coatings: inorganic coatings with acoustical properties
 - f. Clear, natural and pigmented sealants: were supplied only by franchise manufacturers.
 - g. Temporary ventilation for application of product.
 - h. Metalizing.

Renovations:

1. Re-coat and make good to surfaces, which have been cut out in a manner to minimize patching requirements.

09-10 Stippled Finishes

Supply and installation of spray applied cementitious texture/stipple including:

1. Sprayed texture to drywall and concrete surfaces, including cementitious products used for stippling.
2. Prime or seal surfaces.
3. Advise of any special surface condition requirements at the time of tender.

Renovations:

1. Patch and make good stippled surfaces that have been cut out in a manner, which minimizes the patching requirement.

09-11 Painting and Wallcoverings

Supply and install the following protective and/or decorative coatings:

1. Paints, stains, varnishes, emulsions, plastics (applied in the same manner as paint) epoxy paints not required to be applied by a franchised applicator.
2. Paper, cottons, muslins, burlaps, damasks, grass loth, fabric-backed wood veneers, paper- backed metal foils, textile wall covering.
3. Gold leaf, silver leaf.
4. Painted interior traffic markings to concrete paving, floors, walls, ceilings, columns and curbs.
5. Painting of mechanical and electrical pipe, ductwork and equipment.
6. Gas piping painting.
7. Painted decorative graphics and super graphics on walls, ceilings and floors.
8. Caulking of drywall to door frames/dissimilar material

Renovations:

1. Paint and make good surfaces which have been altered in a manner that minimizes the patching requirement.
2. Prepare existing surfaces prior to painting including removal of wall covering.
3. Remove materials of this trade where re-use is required.

09-12 Intumescent Coating

Supply and installation of fire-retardant paints.

Trade Definition 10

This scope for supply and/or installation includes the following items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, and 01-2 Trade Contractor Requirements, also apply.

10-1 Access Flooring

Supply and installation of access flooring systems, including:

1. Access floor support system including adhesives and fasteners.
2. Floor panels.
3. Factory applied access floor finishes.
4. Related accessories.
5. Panel lifting devices.
6. Perforated floor panels and dampers.
7. Air grilles.
8. Grounding connectors.
9. Cable cutout protection including cutting of same.
10. Plenum dividers.
11. Floor panel and fascia panel trim.
12. Access flooring layout.
13. Waxing

Renovations:

1. Patch and make good access flooring, which has been cut out in a manner, which minimizes the patching requirement.
2. Remove access flooring if re-use is required.

10-2 Demountable Partitioning

Supply and installation of readily demountable and re-erected partitions, which are composed of prefinished parts including:

1. Steel stud framing.
2. Prefinished panels.
3. Door and window frames which are an integral part of the system.
4. Sound insulation.
5. Glass and glazing.
6. Premanufactured acoustic units, which form part of the demountable partition system.

10-2 Demountable Partitioning Continued:

7. Matching perimeter trims and refinished panels on other surfaces when called for to be the same material as the demountable partition system components.
8. Sheet lead, which is incorporated into the demountable partition system.
9. When there are demountable partitions specified on a project, and one side of a wall is plain drywall and the other side is refinished vinyl board, the entire wall will be built by the Demountable Trade Definition.

Renovations:

1. Patch and make good demountable partitioning, which has been cut out in a manner, which minimizes the patching requirement.
2. Remove Demountable Partitioning if re-use is required.

10-3 Manufactured Specialties

The following manufactured items identified as “trade name” products are generally purchased by the General Contractor. These products are not supplied by trades, which normally fabricate to detail unless the Consultant gives specific instructions. Trade name products applicable to the following:

1. Chalkboard and backboards.
 - a. Chalkboards.
 - b. Tack boards.
 - c. Operable board units.
2. Compartments and cubicles.
 - a. Toilet compartments
 - i. Metal.
 - ii. Plastic laminate.
 - iii. Plastic.
 - iv. Particleboard.
 - v. Stone.
 - b. Shower and dressing compartments.
 - i. Cubicles.
 - ii. Cubicle curtains.
 - iii. Cubicle track and hardware.
3. Metal vents.
 - a. Soffit.
 - b. Wall.
4. Grilles and screens.
 - a. Architectural louvers (non-operable)
5. Service wall systems.
6. Wall and corner guards.
7. Specialty modules.
8. Pest control.

10-3 Manufactured Specialties Continued:

9. Fireplaces and stoves.
 - a. Prefabricated fireplaces.
 - b. Prefabricated fireplace chimneys.
 - c. Prefabricated fireplace accessories.
 - d. Fireplace specialties and accessories.
 - e. Dampers
 - f. Fireplace water heaters.
 - g. Screens and doors.
 - h. Stoves
10. Prefabricated exterior specialties.
 - a. Steeples
 - b. Spires
 - c. Cupolas
 - d. Weather Vanes
 - e. Benches
 - f. Garbage cans
11. Flagpoles.
 - a. Ground set flagpoles.
 - b. Wall-mounted flagpoles.
 - c. Automatic flagpoles.
 - d. Nautical flagpoles.
12. Identifying devices.
 - a. Directories.
 - b. Bulletin boards.
 - c. Plaques.
 - d. Exterior signs.
 - i. Dimensional letters.
 - ii. Illuminated.
 - iii. Non-illuminated.
 - iv. Post and panel/pylon.
 - e. Interior signs.
 - i. Dimensional letters.
 - ii. Door signs.
 - iii. Engraved signs.
 - iv. Illuminated.
 - v. Non-illuminated.
13. Pedestrian Control Devices.
 - a. Portable posts and railings.
 - b. Rotary gates.
 - c. Turnstiles.
 - d. Detection specialties.

10-3 Manufactured Specialties Continued:

14. Lockers.
 - a. Metal Lockers.
 - i. Basket.
 - ii. Box.
 - iii. Ceiling hung.
 - iv. Special purpose.
 - v. Ventilated.
 - vi. Wardrobe.
 - b. Wood lockers.
 - i. Plastic laminate faced.
 - c. Coin-operated lockers.
15. Fire protection specialties.
 - a. Fire extinguishers, cabinets and accessories.
 - b. Fire blankets.
 - c. Wheeled fire extinguishers units.
 - d. Safety storage cabinets.
16. Protective covers.
 - a. Walkway covers.
 - b. Car shelters.
 - c. Awnings.
 - d. Canopies.
17. Postal specialties.
 - a. Mail chutes.
 - b. Mailboxes.
 - c. Collection boxes.
18. Partitions.
 - a. Wire mesh partitions.
 - b. Folding gates.
 - c. Portable partitions, screens and panels.
 - i. Ceiling-hung.
 - ii. Floor-to-ceiling-pressure locked.
 - iii. Free-standing.
 - iv. Wall-mounted.
 - v. Smoke Baffles.
19. Storage shelving.
 - a. Metal storage shelving.
 - b. Storage shelving systems.
 - i. Automated/mobile.
 - ii. Manual.
 - c. Wire shelving.
 - d. Prefabricated wood storage shelving.
20. Exterior sun control devices.
21. Telephone specialties.

10-3 Manufactured Specialties Continued:

22. Telephone enclosures.
23. Telephone shelves.
24. Toilet and bath accessories.
 - a. Toilet accessories.
 - i. Commercial accessories.
 - ii. Detention accessories.
 - iii. Hospital accessories.
 - b. Bath accessories.
 - i. Residential.
 - ii. Shower and tub doors.
 - c. Metal framed mirrors.
25. Scales.
26. Wardrobe and closet specialties.
27. Coat rods and hangers.
28. Handrail brackets.
29. Vinyl/acrylic protection.
30. Tempered structural glass Baluster Systems.
 - a. Tempered glass.
 - b. Base support mechanism and finish.
 - c. Cap and finish.
 - d. Glazing compounds (i.e. grouting, silicone, etc.)
 - e. Fasteners.
31. Rolling and sliding pass windows.
32. Stair Nosing.
33. Expansion joint assemblies.
34. Precast concrete splash pads.
35. Fiberglass Reinforced Plastic Doors.
36. Fiberglass reinforced plastic (FRP) wall and ceiling panels.

Trade Definition 11

This scope for supply and/or installation includes the following items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, and 01-2 Trade Contractor Requirements, also apply.

11-1 Food Service Equipment

Supply and installation of the following equipment related to food service facilities:

1. Manufactured
2. Custom fabricated kitchen equipment.
3. Ventilators for cooking equipment and dishwashers.
4. Fire extinguishing systems for ventilators, including electric and fuel shut off devices.
5. Metal shelving for cold rooms, poor racks, dry and bulk food storage.
6. Cold rooms for food storage.

The following components are supplied with the equipment for interconnection by mechanical and electrical trades:

1. Refrigeration (Cold Rooms):
 - a. Blower coils
 - b. Compressor
 - c. Door lights and gasket heaters
 - d. Drain line heaters
 - e. Heat recovery unit
6. Hot water boosters
 - a. Pressure relief valve
 - b. Expansion chamber
 - c. Strainers
 - d. Blow off valves
5. Garburators
 - a. Solenoid valve
 - b. On/off switch
 - c. Vacuum breaker
4. Steam equipment
 - a. Strainer
 - b. Pressure relief valve
 - c. Steam traps
4. Ventilators
 - a. Control center and auxiliary control centers
 - b. Ventilation damper
 - c. Extinguishing systems
 - d. Connection point for ductwork

11-1 Food Service Equipment Continued

Work included:

1. Set equipment in place, level and make fastenings to wall, floor, and ceilings.
2. Provide openings in equipment for other trades.
3. Seal tables to adjacent wall surfaces.
4. Assemble metal storage shelving and set in place.
5. Test equipment and provide demonstrations.
6. Install ventilation equipment with provision for connection of ductwork.

11-2 Miscellaneous Architectural Equipment

The following components are supplied with the equipment for interconnection by mechanical and electrical trades:

1. Maintenance equipment.
 - a. Window washing systems.
 - b. Floor and wall cleaning equipment.
2. Security and vault equipment.
 - a. Vault doors and day gates.
 - b. Security and emergency systems.
 - c. Safes.
 - d. Safe deposit boxes.
3. Teller and service equipment.
 - a. Service and teller window units.
 - b. Package transfer units.
 - c. Automatic banking systems.
 - d. Teller equipment systems.
4. Ecclesiastical equipment.
 - a. Baptistries.
 - b. Chancel fittings.
5. Library equipment.
 - a. Book theft protection equipment.
 - b. Library stack systems.
 - c. Study carrels.
 - d. Book depositories.
6. Theater and stage equipment.
 - a. Stage curtains.
 - b. Rigging systems and controls.
 - c. Acoustical shell systems.
 - d. Folding and portable stages.

11-2 Miscellaneous Architectural Equipment Continued:

7. Instrumental equipment.
 - a. Organs.
 - b. Carillons.
 - c. Bells.
8. Registration Equipment.
9. Checkroom equipment.
10. Mercantile equipment.
 - a. Barber and beauty shop equipment.
 - b. Cash registers and checking equipment.
 - c. Display cases.
 - d. Refrigerated display.
 - e. Food processing equipment.
 - f. Weighing and wrapping equipment.
11. Commercial laundry and dry-cleaning equipment.
 - a. Washers and extractors.
 - b. Dry cleaning equipment.
 - c. Drying and conditioning equipment.
 - d. Finishing equipment.
 - e. Ironers and accessories.
12. Vending equipment.
 - a. Money changing machines.
 - b. Vending machines.
 - i. Beverage.
 - ii. Candy.
 - iii. Cigarette.
 - iv. Food.
 - v. Sundry.
 - vi. Stamp.
13. Audio-visual equipment.
 - a. Projection screens.
 - b. Digital Projectors.
 - c. Learning laboratories.
 - d. Meeting room sound systems.
14. Service station equipment.
 - a. Car washing equipment.
 - b. Fuel dispensing equipment.

11-2 Miscellaneous Architectural Equipment Continued:

15. Parking control equipment.
 - a. Parking gates.
 - b. Ticket dispensers.
 - c. Key and card control units.
 - d. Coin machine units.
16. Loading dock equipment
 - a. Dock levelers.
 - b. Dock lifts.
 - c. Portable ramps, bridges, and platforms.
 - d. Seals and shelters.
 - e. Dock bumpers.
17. Solid waste handling equipment.
 - a. Waste compactors.
 - b. Bins.
 - c. Chutes and collectors.
 - d. Refractory lined chimneys.
18. Detention equipment
 - a. Hollow Metal Doors and Frames
 - b. Windows.
 - c. Glazing.
 - d. Hardware.
 - e. Installation of Security Grille Doors.
19. Residential Equipment
 - a. Residential Appliances
 - b. Unit Kitchens
 - c. Disappearing stairs.
 - d. Built-in ironing boards.
20. Athletic, recreational and therapeutic equipment.
 - a. Scoreboards.
 - b. Backstops.
 - c. Gym dividers.
 - d. Bowling alleys.
 - e. Gymnasium equipment.
 - i. Volleyball equipment
 - ii. Badminton equipment
 - iii. Floor sockets
 - iv. Wall padding
 - v. Archery curtains
 - vi. Interior protective sports netting
 - f. Exercise equipment.
 - g. Therapy equipment.
 - h. Shooting ranges.

11-2 Miscellaneous Architectural Equipment Continued:

21. Industrial and process equipment.
 - a. Paint spray booth.
 - b. Power transmission equipment.
 - c. Weaving equipment.
 - d. Potter's wheels.
 - e. Winch.
 - f. Woodworking machines.
 - g. Workbenches.
 - h. Industrial tools and racks.
 - i. Educational tools and racks.
 - j. Vocational shop equipment.
22. Laboratory equipment.
 - a. Brand named fume hoods and flow hoods.
23. Planetarium equipment.
24. Observatory equipment.
25. Medical equipment.
 - a. Medical sterilizing equipment.
 - b. Examination and treatment equipment.
 - c. Patient care equipment.
 - d. Dental equipment.
 - e. Optical equipment.
26. Mortuary equipment.
 - a. Cadaver lifts.
27. Navigation equipment.

11-3 Miscellaneous Mechanical Equipment

The following components are supplied with the equipment for interconnection by mechanical and electrical trades:

1. Solid waste handling equipment.
 - a. Packaged incinerators.
 - b. Pulping machines and systems.
 - c. Pneumatic waste systems.
2. Water supply and treatment equipment.
3. Pumps.
 - a. Axial flow pumps.
 - b. Centrifugal pumps.
 - c. Deepwell turbine pumps.
 - d. Mixed flow pumps.
 - e. Vertical turbine pumps.
4. Mixers and flocculators.
5. Clarifiers.
6. Water aeration equipment.
7. Chemical feeding equipment.
 - a. Coagulant feed equipment.
8. Water softening equipment.
 - a. Base-exchange of Zeolite equipment.
 - b. Line-soda process equipment.
9. Disinfectant feed equipment.
 - a. Chlorination equipment.
 - b. pH equipment.
10. Fluoridation equipment.
11. Package water treatment equipment.
12. UV Equipment for water treatment.
13. Hydraulic gates and valves.
 - a. Hydraulic gates.
 - i. Bulkhead gates.
 - ii. High pressure gates.
 - iii. Hinged leaf gates.
 - iv. Radial gates.
 - v. Slide gates.
 - vi. Sluice gates.
 - vii. Spillway crest gates.
 - viii. Vertical lift gates.
 - b. Hydraulic valves.
 - i. Butterfly valves.
 - ii. Regulating valves.

11-3 Miscellaneous Mechanical Equipment Continued:

14. Fluid waste treatment and disposal equipment
 - a. Oil/water separators.
 - b. Sewage ejectors.
 - c. Packaged pump stations.
 - d. Sewage and sludge pumps.
 - e. Grit collecting equipment.
 - f. Screening and grinding equipment.
 - g. Sedimentation tank equipment.
 - h. Scum removal equipment.
 - i. Chemical equipment.
 - j. Sludge handling and treatment equipment.
 - k. Filter press equipment.
 - l. Trickling filter equipment.
 - m. Compressors.
 - n. Aeration equipment.
 - o. Sludge digestion equipment.
 - p. Digester mixing equipment.
 - q. Package sewage treatment plants.
 - r. UV Equipment for waste treatment.

Trade Definition 12

This scope for supply and/or installation includes the following items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, and 01-2 Trade Contractor Requirements, also apply.

12-1 Furnishings

The following components are to be supplied:

1. Artwork.
 - a. Murals.
 - b. Photo murals.
 - c. Wall hangings
 - d. Paintings
 - e. Carved or cast statuary.
 - f. Carved or cast relief work.
 - g. Custom chancel fittings.
 - h. Stained glass work.
2. Manufactured casework.
 - a. Metal and wood casework.
 - b. Plastic laminate-faced casework.
 - c. Bank fixtures and casework.
 - d. Library casework.
 - e. Restaurant and cafeteria casework.
 - f. Educational casework.
 - g. Dormitory casework.
 - h. Medical and laboratory casework.
 - i. Nurse server cabinets.
 - i. Pharmacy casework.
 - j. Laboratory casework.
 - i. Metal laboratory casework.
 - ii. Wood laboratory casework.
 - iii. Laboratory tops, sinks and accessories.
 - iv. Brand named fume hoods and flow hoods.
 - k. Hospital casework.
 - l. Dental casework.
 - m. Optical casework.
 - n. Veterinary casework.
 - o. Hotel and motel casework.
 - p. Ecclesiastical casework.
 - q. Display casework

12-1 Furnishings Continued:

- r. Residential casework.
 - i. Kitchen and bath cabinets
- 3. Window treatment.
 - a. Blinds.
 - i. Horizontal louver blinds.
 - ii. Vertical louver blinds.
 - b. Shades.
 - i. Insulating shades.
 - ii. Lightproof shades.
 - iii. Woven wood shades.
 - c. Solar control film.
 - d. Drapery and curtain hardware.
 - e. Draperies and curtains.
 - i. Curtains.
 - ii. Fabric draperies.
 - iii. Lightproof draperies.
 - iv. Vertical louver draperies.
 - v. Woven wood draperies.
- 4. Furniture and accessories.
 - a. Landscape partitions and components.
 - i. Room dividers and screens.
 - b. Furniture
 - i. Classroom furniture.
 - ii. Dormitory furniture.
 - iii. Ecclesiastical furniture.
 - iv. Hospital furniture.
 - v. Hotel and motel furniture.
 - vi. Laboratory furniture.
 - vii. Library furniture.
 - viii. Lounge furniture.
 - ix. Residential furniture.
 - x. Restaurant and cafeteria furniture.
 - xi. Specialized furniture.
 - c. Furniture systems.
 - i. Integrated work units.
 - d. Furniture accessories.
 - i. Desk accessories.
 - ii. Lamps.
 - iii. Wall clocks.
 - iv. Waste receptacles.
 - v. Magazine and literature racks.

12-1 Furnishings Continued:

5. Rugs and mats.
 - a. Rugs.
 - b. Foot grilles.
 - c. Floor mats and frames.
 - i. Floor mats.
 - ii. Floor runners.
 - iii. Matting.
 - iv. Mat frames.
 - v. Chair mats.
6. Multiple seating.
 - a. Chairs.
 - i. Interlocking.
 - ii. Portable folding.
 - iii. Stacking.
 - b. Auditorium and theatre seating.
 - c. Stadium and arena seating.
 - d. Booths and tables.
 - e. Multiple-use fixed seating.
 - i. Pedestal table armchairs.
 - f. Telescoping stands.
 - i. Telescoping bleachers.
 - ii. Telescoping chair platforms.
 - g. Pews and benches.
7. Interior plants and planters.
 - a. Interior plants.
 - b. Planters.
 - c. Interior plants maintenance.

Trade Definition 13

This scope for supply and/or installation includes the following items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, and 01-2 Trade Contractor Requirements, also apply.

13-1 Special Construction - Architectural

The following components are supplied with the equipment for interconnection by mechanical and electrical trades:

1. Air supported structures.
2. Integrated assemblies.
 - a. Medical walls.
3. Special purpose rooms.
 - a. Athletic rooms.
 - b. Audiometric rooms.
 - c. Clean rooms.
 - d. Cold storage rooms (including any associated heat recovery unit).
 - e. Hyperbaric rooms.
 - f. Insulated rooms.
 - g. Office shelters.
 - h. Planetariums.
 - i. Prefabricated rooms.
 - j. Saunas.
 - k. Steam baths.
 - l. Vaults.
 - m. Sports court wall system (i.e. squash racquet, etc.)
4. Sound, vibration, and seismic control.
5. Isolating floating floor system.
6. Radiation protection.
 - a. Radio frequency shielding.
7. Nuclear reactors.
8. Pre-engineered structures.
 - a. Pre-engineered buildings.
 - b. Metal buildings systems.
 - c. Greenhouse.
 - d. Portable and mobile buildings.
 - e. Modular mezzanines.
 - f. Grandstands and bleachers.
 - g. Observatories.
 - h. Cable supported structures.
 - i. Fabric structures.

13-1 Special Construction – Architectural Continued:

9. Pools.
 - a. Swimming pools.
 - i. Chemical treatment systems.
 - ii. Pool cleaning systems.
 - iii. Pool deck equipment.
 - b. Aquariums.
 - c. Hot tubs.
 - d. Therapeutic pools.
10. Ice rinks (including any associated heat recovery unit).
11. Kennels and animal shelters.
12. Site constructed incinerators.
 - a. Sludge incinerators.
 - b. Solid waste incinerators.
13. Liquid and gas storage tanks.
 - a. Ground storage tanks.
 - i. Prestressed concrete tanks.
 - b. Underground storage tanks.
 - i. Prestressed concrete tanks.
 - c. Tank cleaning procedures.
14. Filter underdrains and media.
 - a. Filter bottoms.
 - b. Filter media
 - i. Anthracite media.
 - ii. Charcoal media.
 - iii. Diatomaceous earth.
 - iv. Mixed media.
 - v. Sand media.
15. Digestion tank covers and appurtenances.
 - a. Fixed covers
 - b. Floating covers.
 - c. Gasholder covers.
16. Interior precast pits.
 - a. Sump Pits.
 - b. Sewage Pits.
 - c. Catch Basins
17. Playground equipment and structures.

13-2 Special Construction - Mechanical

The following components are supplied with the equipment for interconnection by mechanical and electrical trades:

1. Oxygenation systems.
 - a. Oxygen dissolution system.
 - b. Oxygen generators.
 - c. Oxygen storage facility.
2. Sludge conditioning systems.
3. Utility control systems.
 - a. Water supply plant operating and monitoring system.
 - i. Display panels.
 - ii. Metering devices (except magnetic flow meters are by Electrical when not connected to building automation system).
 - iii. Sensing and communication devices.
 - b. Wastewater treatment plant operating and monitoring system.
 - i. Control panels.
 - ii. Display panels.
 - iii. Metering devices (except magnetic flow meters are by Electrical when not connected to building automation system).
 - iv. Sensing and communication devices.
 - c. Power generating and transmitting control systems.
 - i. Control panels.
 - ii. Display panels.
 - iii. Meters.
 - iv. Relays.
4. Industrial and process control systems.
5. Solar energy systems.
 - a. Solar flat plate collectors.
 - i. Air collectors.
 - ii. Liquid collectors.
 - b. Solar concentrating collectors.
 - c. Solar vacuum tube collectors.
 - d. Solar collector components.
 - i. Solar absorber plates or tubing.
 - ii. Solar coatings and surface treatment.
 - iii. Solar collector insulation.
 - iv. Solar glazing.
 - v. Solar housing and framing.
 - vi. Solar reflectors.
 - e. Packaged solar systems.
6. Building automation systems.

13-2 Special Construction – Mechanical Continued:

7. Liquid and Gas Storage Tanks.
 - a. Ground Storage Tanks.
 - i. Galvanized Steel Tanks.
 - ii. Welded Steel Tanks.
 - b. Elevated Storage Tanks.
 - c. Underground Storage Tanks.
 - i. Fiber glass reinforced plastic tanks.
 - d. Tank lining systems.
 - i. Fiberglass reinforced plastic tanks lining system.
 - e. Tank cleaning procedures.
8. Supply and Install Central Vacuum cleaning systems.

13-3 Special Construction - Electrical

The following components are supplied with the equipment for interconnection by mechanical and electrical trades

1. Recording instrumentation.
 - a. Stress instrumentation.
 - b. Seismic instrumentation.
 - c. Meteorological instrumentation.
2. Transportation control instrumentation.
 - a. Airport control instrumentation.
 - b. Railroad control instrumentation.
 - c. Subway control instrumentation.
 - d. Transit vehicle control instrumentation.
3. Wind energy systems.
4. Fire suppression and supervisory systems.

Trade Definition 14

This scope for supply and/or installation includes the following items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, and 01-2 Trade Contractor Requirements, also apply.

14-1 Elevators

Supply and installation of elevator components into reconstructed hoist ways, which include adequate supports for both guide rails and machine beams.

Types of elevators:

1. Electric elevators.
2. Hydraulic elevators.
3. Parking garage hoists.
4. Dumbwaiters.

Including:

1. Elevator entrances.
2. Elevator doors and sills.
3. Door operating equipment.
4. Power wiring and conduit from controllers to signals and operating circuits. Hoistway and machine room wiring for elevator components to load side of controller. Elevator remote panels and systems including wiring between elevator and elevator remote panels and systems. Fixed conduits and fittings between elevators and elevator remote panels and systems are to be installed by the electrical trade.
5. Piping incidental to hydraulic elevators.
6. Components for a complete installation.
7. Demolition and removal of existing elevators where new elevators will be installed.
8. Licenses.
9. Hoisting of elevator equipment on reconstructed hoist beams and divider beams supplied by Miscellaneous Metal (05-3-15).
10. Lay out of plunger holes, which are completed by the piling contractors.
11. Drill and case plunger holes when no piling contractor is involved in the project.
12. Backfill sand fill for hydraulic elevator cylinders and buried oil lines.
13. Access door and frame for counterweight loading dumbwaiters where machine is located below.
14. Angle and channel frames for freight elevator openings.
15. Elevator cabs and cab finishes including walls, removable panels, ceiling, false ceiling, lighting troughs, handrails, bumper rails, base, doors and frames, finish hardware, signage, exhaust fans, service cabinet, console, and glazing.
16. Flooring for freight elevators.

14-2 Escalators

Supply and installation of escalator components to a reconstructed well way with sufficient supports including bearing plates:

Including:

1. Components including incidental items for a complete installation.
2. Electrical wiring and conduit from controllers to signals and operating circuits.
3. Licenses.
4. Hoisting of escalator equipment.
5. Backup for exterior finishes which are provided by finishing trades.

14-3 Elevating Devices for the Handicapped

Supply and installation of elevating into reconstructed runways, which include adequate supports for mechanisms intended, all in accordance with all current applicable Codes and Regulations.

Types of elevating devices:

1. Vertical Lifts:
 - a. Type D to be installed in a non-enclosed runway and limited to 2.5 meter (8'-0") of travel with no floor penetration allowed.
 - b. Type C to be installed in an enclosed runway with a limited travel of 7 meters (23'0") and suitable for penetration of one or more floors.
2. Inclined Lifts:
 - a. Type D unenclosed inclined lifts and stair chairs.
 - b. Type C inclined lift, which must have an enclosed runway.

Trade Definition 15 - Mechanical

This scope for supply and/or installation includes the following items regardless of where they may appear in the tender documents unless specifically noted otherwise.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, 01-2 Trade Contractor Requirements, and 15-1 Mechanical Trade Contractor Requirement will also apply.

15-1 Mechanical Trade Contractor Requirements

Responsibilities, which are common to Mechanical Trade:

1. Permits, fees, inspections and certificates required for the mechanical work as installed by each Sub-contractor.
2. Anchor bolts, supports, non-structural frames for mechanical equipment.
3. Clean up.
4. Protection of other trades work from damage.
5. Supply of shop drawings, fabrication drawings, Building Information Modeling (BIM), maintenance manuals and instruction manuals.
6. Rigging, hoisting and placing of equipment.
7. Scaffolding.
8. Supply of access panels or clean out covers or both for pipe, ducting and equipment where access is required.
9. Excavation within the building: each trade is responsible for their own excavation and backfilling as it pertains to their trade definition.
10. Identification, adhesive markers, valve tags, labels and framed directories.
11. As-built record drawings. Updated CAD drawings, supplied by others, will only be provided when called up in mechanical specifications.
12. Removal or relocation of existing mechanical.
13. Cut penetrations through walls, floors and ceilings, complete with scanning, for 150 mm and smaller pipes and ducts.
14. Cut recesses in walls which do not exceed 150 x 150 mm.
15. Supply and installation of prefabricated curbs for Roof Top Units.
16. Equipment vibration testing by equipment supplier.
17. Process equipment and piping requirements.
18. Excavation as required for underground lines within the confines of the building, including shoring, pumping, bedding and sand backfill up to 300mm to cover and provide necessary protection for the lines set in said excavation.

15-2 Mechanical Trade Contractor Requirements Tables

Table #1

Trade Definition will include the following allocations of Roof Top Units, HRVs, ERVs and Air Curtains

Responsible Trade	Filters	Oil	Gas	Electric	Cooling	Duct Connected
Mechanical	X	X	X		X	X
Ventilation	X			X		X

Table #2

Trade Definition will include the following allocations of packaged Air Handling Units.

Responsible Trade	Fans	Filters	Fan Heads	Electric Heating Coil	Water Cooling Coil	D.X. Refrig. Cooling Coil	Duct Connected
Ventilation	X	X	X				X
Mechanical	X	X		X	X	X	X

Table #3

Trade Definition will include the following allocations of build-up Air Handling Units/Systems Components.

Resp. Trade	Fans	Filters	Plenum Casings	Elec. Heating Coil	D.X. Refrig. Cooling Coil	Water Heat Coil	Water Cool Coil	Glycol Heat Coil	Glycol Cool Coil
Vent	X	X	X	X					
Mech						X	X	X	X
Refrig.					X				

15-3 Mechanical

A complete mechanical bid is comprised of the following basic categories:

1. Plumbing
2. Heating
3. Ventilation
4. Refrigeration (other than food processing)
5. Insulation
6. Automatic Temperature Controls
7. HVAC testing and Balancing
8. Fire Stopping (see 01-2-17)
9. Process Piping System
10. Exterior Sewer and Water Services
11. Fire Protection
12. Miscellaneous Mechanical Equipment
13. Special Construction - Mechanical section (13-2)

Including the Supply and Installation (excluding wiring) and commissioning of:

1. Cash allowances defined in the Mechanical Specifications.
2. Water wells, including piping, cross connection control devices and associated pumping systems.
3. Plumbing system, including hot water heaters, sewage pumps, sewage ejectors, sump pumps, drainage specialties, water conditioning and softener equipment, and storage tanks.
4. Plumbing fixtures (refer to 15-4 for definition).
5. Laboratory sinks faucets, gas, outlets, air and Vacuum outlets, when not included as part of Lab Furniture/Casework Trade.
6. Compressed air systems, including associated dryers, regulators and accessories.
7. Medical gas systems, including associated manifolds, terminal outlets, regulators, safety devices, and accessories.
8. Natural Gas System, including terminal outlets, regulators, safety devices and accessories.
9. Propane Gas System, including regulators, safety devices, accessories and storage tanks.
10. Pneumatic tube systems, including vacuum pumps, inlet stations, tubing and accessories. (Excluding messaging systems).
11. Piping connection to or termination of mechanical services for equipment, which has been set in place ready for connection.
12. Supports for equipment supplied by the Mechanical Sub-contractor unless indicated on the structural drawings.
13. Flexible hose connections, expansion joints, expansion compensators and guides.
14. External fuel oil tanks: supply and hookup and installation of piping, fuel and control systems when Automatic Temperature Control contractor is not monitoring and/or controlling.
15. Disconnecting of fuel tanks for demolition. (Inside building only)
16. Piping and Mechanical System identification (not painting) by associated mechanical trade.

15-3 Mechanical Continued:

17. Heating and Air conditioning systems consisting of components with hydronic steam, refrigeration, electric or gas fired units, or both. This is to include the following equipment, complete with manufacturers' supplied communication cards:
 - a. Gas fired, oil fired and electric boilers.
 - b. Factory assembled centrifugal packaged reciprocal and screw type water chillers complete with starters, factory start up and service.
 - c. Cooling towers, evaporative water coolers and fluid coolers.
 - d. Pumps other than those by the Refrigeration Sub-contractor and Fire Protection Sub- contractor.
 - e. Furnaces including gas and oil fired.
 - f. Gas and oil fired duct heaters and unit heaters.
 - g. Roof Top Units, Air Handling Units and components (listed under Tables 1, 2 and 3 Trade definition 15-2)
 - h. Reheat, preheat and air tempering coil, regardless whether they are water, steam or glycol.
 - i. Wall fin elements, induction units, fan coil units, infloor heating radiant panels, chilled/active beams, force flo, convectors, unit heaters and the associated metal enclosures.
 - j. Humidifiers: water, steam or electric
 - k. Self-contained packaged terminal heating or air conditioning units or both where not covered under other trade definitions.
 - l. Absorption chillers.
 - m. Energy storage tanks.
 - n. Packaged heat pumps.
18. Automatic Temperature Controls:
 - a. Boiler controls as defined in the boiler description or schedules or both.
 - b. Flow switches and/or differential pressure switches for sequencing and/or interlocking for chiller and boiler control.
 - c. Control dampers for motorized actuation, indoor and outdoor, where required.
 - d. Level alarms and remote readers.
 - e. Pipe mounted thermometers and pressure gauges for heating and cooling systems.
 - f. Self-contained radiator control valves and solenoid valves.
 - g. Control valves for domestic hot water control.
 - h. Thermostats not directly involving Automatic Temperature Control Systems.
 - i. Variable Speed Drives when specified to be factory supplied and wired with packaged equipment.
 - j. Manufacturer supplied communication cards.

15-3 Mechanical Continued:

19. Electric thermostats (Aquastats) for steam or Hot water, force flows and unit heaters when there is no Automatic Temperature Control Trade on the project. (Installation by Electrical)
20. Supply and Install Mechanical solar energy systems comprised of, but not limited to the following components: flat plate collectors storage tanks, heat sinks, coils pumps and self-contained collector/coil air handling units. Include combination systems utilizing solar and alternate energy sources. The inter-connecting piping, associated mechanical equipment (i.e. expansion tanks, valves, etc.) and the control components are included. (Excluding structural supports)
21. Steel Pipe Saddles
22. Storm collars and/or counter flashings for mechanical pipe penetrations through the roof when it does not form part of the roof system.
23. Supply and installation of piping and pipe to duct transition for waste gas scavenger exhaust air systems.

Including installation of:

1. Liquid flow measuring stations (Natural Gas/Propane)
2. Control valves.
3. Secondary (water) flow control switches for air conditioning equipment (supplied by Refrigeration Trade Definition).
4. Incinerators including pathology incinerators complete with gas or oil burners, draft inducers, breeching and stacks (excluding structural supports).

Including Supply of:

1. Access doors.
2. Insulation protection shields.
3. Transition coupling, material, and supervision to exterior site service contractor to bring sewer and/or storm to a maximum of 3 meters into the building. **Note:** Sewer and Water lines going through exterior wall into building, entry port and link seals are completed by mechanical trade.

15-4 Definition of Plumbing Fixtures

1. Lavatories: cast iron, steel china, complete with faucets and drains, and accessories.
2. Cast iron, steel fiberglass (one, two or three piece) baths including whirlpool and hydrotherapy baths complete with drains, showers, fittings and accessories.
3. All metal, fiberglass, plastic, one, two, or three-piece shower stalls including base, faucets, drains and accessories.
4. All urinals wall or floor mounted whether operated by flush valves or storage tank complete with all drains and fittings.
5. All water closets and bidets including tanks or flush valves and seats.
6. All sinks, regardless of material complete with faucets and traps when not supplied by Food Service or Laboratory Furniture/Casework Trade.
7. Garburators when not supplied by Food Service Trade.
8. Slop, mop and service sinks of every description and material complete with faucets, traps and accessories.
9. Grease interceptors of every description.
10. Acid dilution tanks made of polypropylene or PVC or any other plastic including any water supply or dilution device.
11. Cross connection control device complete with all necessary isolating valves, gauges and accessories.
12. Factory supplied integral brackets and supports for plumbing fixtures.
13. Drinking fountains.
14. Emergency showers, and eye wash basins.
15. Floor drains.
16. Roof drains.
17. Trap Primers.
18. Back Water Valves.

15-5 Insulating**Supply and installation of Mechanical insulation for:**

1. Plumbing, heating, cooling, refrigeration systems. Included but not limited to pipes, saddles, fittings, vessels and equipment.
2. The external application for the HVAC systems.
3. Equipment; including but not limited to boilers, hot water heater, water storage tanks and vessels, convertors, heat exchangers, breeching and chimneys, stacks, chillers and evaporators.
4. Genset exhaust pipe and mufflers.
5. Firewraps for grease ducts, plenums and support systems requiring a rated system.
6. Underground piping requiring form and pour systems.
7. Installation of pipe covering protection shields.
8. External sound attenuation for piping, ducting and equipment.
9. Process piping, ducting, vessels, tanks and equipment.
10. Insulation finishes and weatherproofing.

15-6 Fire Protection

Supply and installation of:

1. Wet, dry deluge and pre-action sprinkler systems associated detection control and alarm devices.
2. Fire standpipe system: standalone type when not connected to a combination sprinkler/standpipe system fire pump, and including:
 - a. Fire pump, controller, transfer switch, hose cabinets, and extinguisher when located in the fire hose cabinets.
3. Fire standpipe system when connected to a combination sprinkler/standpipe system with or without fire pump and including:
 - a. Fire pump, controller, transfer switch, hose cabinets, and extinguisher located in the fire hose cabinets.
4. Foam systems, including tanks, pumps, piping, outlets and associated detectors and control panels.
5. Fire pumps, control panels, motors, engine and fuel systems when pumps supply sprinkler system or combination sprinkler/standpipe system and stand alone standpipe system.
6. Carbon dioxide, dry chemical, clean agent and water-mist systems including piping outlets, associated detectors and control panels.
7. Start from downstream of incoming flange connection and/or upstream side of cross connection on fire line or when no cross connection required, as flanged connection at point of entry of service building.
8. Shop drawings approved by the authority having jurisdiction.
9. Fire Protection during construction; temporary standpipe system; including hose valves, control valve and fire department connection if required by the authority having jurisdiction.

15-7 Refrigeration

Supply and installation of:

1. Job site assembled split systems using primary refrigerants for air conditioning for comfort cooling critical cooling and process cooling. Primary refrigerants will be defined as all refrigerants except water. Include the complete refrigeration circuit and components as follows:
 - a. Refrigeration compressors complete with motors, starters and operating controls.
 - b. Condensers of the following types:
 - i. Evaporative.
 - ii. Water-cooled.
 - iii. Air-cooled.
 - c. Evaporators of the following types.
 - i. Primary liquid coolers (split primary refrigerant chillers)

15-7 Refrigeration Continued:

- d. Primary refrigerant pressure vessels and primary refrigerant piping.
- e. General and miscellaneous items as follows for equipment supplied and installed by this trade:
 - i. Primary refrigerants safety controls and wiring for these controls when they form an integral part of the factory assembled unit (known as a packaged unit).
 - ii. On Variable Refrigerant Flow (VRF) or packaged cooling equipment systems the control wiring is by this trade unless there is an automatic controls contractor involved in the project.
 - iii. Primary refrigerant operated water regulation valves.
 - iv. Labor and equipment to rig and place primary refrigeration.
 - v. Piping vibration elimination equipment.
 - vi. Specified Original Equipment Manufacturers (OEM) bases and supports.
 - vii. Special rack or steel bases and supports for equipment required by this trade.
 - viii. Charging and testing of all primary refrigerant circuits.
 - ix. Heat reclaim coil when associated with primary refrigerants for air conditioning for human comfort.
- 2. Packaged air conditioning units and refrigerated air dryers (other than control system air dryers):
 - a. Packaged air conditioning units with primary refrigeration circuits.
 - b. Packaged air conditioning units with OEM supplied or approved special accessories.
 - c. Packaged unit temperature and humidity controls and control wiring.
 - d. Fan coil units when part of the split air conditioning system containing DX coils, fans, filters, motors interconnecting refrigeration piping.
 - e. Split system heat pumps.
 - f. Roof Top/Air Handling Units and components as listed in Mechanical-2 Table #1, 2 and 3.
- 3. Evaporative condensers containing primary refrigerant coils:
 - a. Fans, motors, drivers and accessories.
 - b. Supports and installation of vibration isolation units.
 - c. Evaporate controls.
 - d. Water treatment equipment for evaporative condensers installed directly in unit and not fitted in the piping.
- 4. Product Refrigeration: The supply and installation of job site assembled systems (using primary refrigerants and product refrigeration, special cold rooms, water coolers, ice makers, process mechanical cooling) will include the complete refrigeration circuit and all components listed below.
 - a. Refrigeration compressors complete with motors, operating controls.
 - b. Condensers, complete with motors.
 - i. Evaporative type.
 - ii. Water-cooled.
 - iii. Air-cooled.

15-7 Refrigeration Continued:

- c. Evaporators complete with motors.
 - i. Force flow.
 - ii. Gravity.
 - iii. Pipe coil.
 - iv. Plate type.
- d. Primary refrigerant pressure vessels and refrigerant piping.
- e. The following items for equipment supplied and installed by this Sub-contractor noted:
 - i. Primary refrigerate safety controls, all devices other than automatic stop/start control contact.
 - ii. Primary refrigerant.
 - iii. Specified O.E.M. bases and supports.
 - iv. Special racks or steel bases and supports for equipment required by this trade.
 - v. Charging and testing of primary refrigerant circuits.
 - vi. Primary refrigerant pipe.
 - vii. Low temperature defrost systems and controls.
 - viii. Low temperature condensate drain line heaters.

Supply of:

- 1. Direct expansion coils mounted in ductwork. (installed by Ventilating Trade Definition)
- 2. Secondary (water) flow control switches for air conditioning equipment (installed by mechanical Trade Definition.)

15-8 Ventilating

Supply and installation of:

1. Sheet metal and non-metallic air handling ductwork of all types including hanger and supports.
2. Back draft dampers, manual dampers, fire dampers, ceiling fire flaps, motorized smoke dampers, registers, grilles, diffusers, screen and air troffer boots.
3. Plenums and casing.
4. Exhaust systems.
5. Air curtains as per Table #1, #2 and #3 of Trade Definition 15-2.
6. Exhaust hoods and canopies including kitchen type hoods when there is no Food Service equipment Trade on the project.
7. Brand named fume hoods and flow hoods.
8. Dust Collectors.
9. Paint spray booths.
10. Access doors pertaining to sheet metal works.
11. Internal duct insulation.
12. Freestanding or "dry" fans, including return air fans and exhaust fans.
13. Roof ventilators, gravity exhausters and intake hoods, duct connected and dampered or both including metal curbs when specified in mechanical section.
14. Induced draft fans.
15. Ceiling prop fans including guards and switches.
16. Supports for equipment required by this trade. (Non-structural supports)
17. Vibration isolation materials for equipment supplied by this trade.
18. Air filters and filter gauges.
 - a. Air Filters other than those identified under tables 1 and 2, under section 15-2
 - b. Air Filter Gauges other than those identified by under Automatic Temperature Control Definition.
19. Duct silencers and sound attenuation equipment.
20. Terminal reheat boxes, variable volume units, dual duct boxes, and pressure reducing air valves.
21. Solar energized forced air system.
22. Duct connected electric unit heaters.
23. Electric in line duct heaters, duct connected.
24. Packaged room cabinet type electric heating unit requiring air intake and distribution duct to be connected.
25. Completely assembled electric furnaces or disassembled multi-sectional electric heating furnaces whether or not duct connected, consisting of fan sections and/or mixing box section and/or electrical element section and/or filter section.
26. Burglar bars totally enclosed by ductwork.

15-8 Ventilating Continued:

27. Supply and install the following in relation to Automatic Temperature Controls:
 - a. Motorized fire and fire/smoke combination dampers including actuators.
 - b. Variable Speed Drives when specified to be factory supplied and wired with packaged equipment.
28. Install the following in relation to Automatic Temperature Controls.
 - a. Control dampers for motorized actuation.
 - b. Installation of Air Flow Measuring Stations.
 - c. Motorized fire smoke or smoke dampers
29. Wood burning furnaces, complete with Chimney
30. Ducted dehumidifiers.
31. Air blenders not included in Air Handling Units.
32. Drain/drip pans, troughs and liners where shown in ductwork, under fans, relief air openings.
33. Waste gas scavenger exhaust air systems.
34. Mechanical Louvres.
 - a. e.g. Pre-manufactured louvered penthouses.
35. Roof Top and Air Handling Units and components as listed under Tables 1, 2 and 3, 15-2.
36. Vacuum cleaning of new and existing ducts when specifically called for in Mechanical specifications.
 - a. New ducts should be kept clean, cover and seal off ends with poly.
37. HRVs and ERVs as per table #1, #2 and #3 Trade Def 15-2.

Supply of:

1. Packaged controls for Variable Air Volume (VAV) boxes.
 - a. Standard pneumatic VAV Box complete with actuator and controller
 - b. Standard electric VAV with electric packaged controls.
 - c. Standard VAV Box with airflow pick up only for DDC control.

Installation of:

1. Direct expansion coils mounted in ductworks.
2. Breechings, vents, chimneys, thimbles and steel chimneys not re-factory lined. Including draft regulators and clean outs (for fireplace chimneys) as supplied by Mechanical.

15-9 Automatic Temperature Controls

Definitions:

1. Packaged equipment (i.e. chillers, boilers, air handling units etc.): manufacturer wired equipment in a completely electrically operable state after one final connection of power wiring, including one communication point of connection. (Including but not limited to thermostats, humidistats, control panels, and discharge controller). Includes verification, start-up, commissioning of the unit and integration to BAS to be provided by the equipment supplier.
2. Integration shall be defined as a single point network connection supplied and installed by the Building Automation System (BAS) contractor, if a BAS contractor is involved in the project. All verification of the system being integrated to must be verified by the component supplier(s).

Supply and installation including wiring, connection and interconnection of equipment and remote control devices, which have been supplied for the building automation system by this trade.

1. Environmental Control
 - a. Heating controls.
 - b. Ventilation controls complete with actuators for fan volume control.
 - c. Cooling controls.
 - d. Humidification controls.
 - e. Refrigeration controls, (devices used for automatic system stop/start control contract only), ambient lockout control device unless supplied complete with packaged system.
 - f. Control compressor, air driers, PRV's filter and isolators.
 - g. Control air piping.
2. Building Centralization Control
 - a. Centralized temperature, humidity, pressure and flow indication and recorders connected to building automation system.
 - i. Shut-down safety devices forming part of automatic temperature control
 - ii. Flow switches for temperature control purposes only.
 - iii. Gas detection systems in relation to the ventilation system (i.e. CO2, NOX, propane and diesel)
 - b. DDC controllers for terminal units

Supply:

1. Control dampers for motorized actuation for temperature control for field fabricated air handling apparatus.
2. Flow measuring devices connected to the building automation system.
 - a. Natural Gas/Propane, steam, condensate, heating (hot water and Glycol) chilled water, domestic water.
 - b. Air flow measuring stations.
3. Electric thermostats/aquastats for steam or hydronic systems.
4. Filter gauges for control panels.

15-9 Automatic Temperature Controls Continued:**Supply and Control Wiring of:**

1. Variable speed devices shall be provided by the Automatic Temperature Control Trade Definition unless specified to be factory supplied and wired with packaged equipment.
2. Fuel oil control systems when monitoring and/or controlling.

Control Wiring of:

1. All packaged heating and cooling equipment units and VRFs.

15-10 HVAC Testing and Balancing

Labor and test reports for the complete HVAC testing and balancing.

Include the following:

1. Air and fluid flow measurements, testing and distribution (balancing) relevant to heating ventilation and air conditioning (HVAC) systems.
2. Air flow duct leakage tests.
3. Sound level testing.
4. Testing of Fire Dampers and Fire Smoke Dampers.
 - a. Verify the unit is fully accessible.
 - b. Unit has been successfully tested and reset.
 - c. Tag attached with name of tester and date tested.
 - d. Report including location, access, size, link rating and date unit tested successfully.
5. Indoor Air Quality Test.
6. Installation only of required drive and belt changes (supplied by equipment suppliers).

15-11 Exterior Sewer and Water Services

Supply and installation of:

1. Exterior Mechanical Services:
 - a. Domestic Water maximum 3 meters into building complete with cathodic protection and maximum 12" above grade complete with flange pipe, thrust blocks and frost box if required.
 - b. Sprinkler and Fire Protection maximum 3 meters into building and maximum 12" above grade complete with flange pipe, thrust blocks and frost box if required.
 - c. Storm and sanitary sewers complete with manholes and catch basins. Mechanical contractor to supply transition coupling, material, and supervision for sewer lines into the building to a maximum of 3 meters.
 - d. Yard/Parking area drainage complete with manholes and catch basins.
2. City, Town, Municipal utility service charges for street cuts, service connection as determined and applicable.
3. Precast concrete, fiberglass reinforced plastic or prefabricated septic tanks and fittings, complete with piping distribution and field.
4. Excavation, shoring, dewatering and backfill for service piping outside building confines.
5. Excavation, shoring, dewatering, backfill and manholes for temporary and permanent exterior heating lines installed by mechanical.
6. Surface restoration when excavated by this trade.
7. Relocation of any exterior sanitary sewer, storm sewer and domestic water.
8. Upgrading of any exterior sanitary sewer, storm sewer and domestic water.

Trade Definition 16 - Electrical

This scope includes the supply, installation and connection of all electrical components and services to provide a complete and fully functioning integrated system which incorporates power, lighting, life safety, and all other electrical divisions regardless of where they may appear in the tender documents.

Specific items listed in Trade Definition 01-1 General Contractor Requirements, 01-2 Trade Contractor Requirements, and 15-1 Mechanical Trade Contractor Requirement may also apply.

16-1 Electrical General Requirements

The following items and requirements are common to each separate scope in this section and shall include these items in their submitted tender, unless specifically noted otherwise in that individual trade definition.

Included:

1. Removal and storage of electrical and related equipment to each division scheduled to be salvaged for reuse, disconnection of line voltage by Electrical contractor.
2. Batteries - for systems under the electrical and subdivision scope.
3. Cash Allowances defined in the Electrical Specifications only
4. Wiring devices and plates - for systems under the electrical scope.
5. Fastenings - (screws, bolts, hangers, straps, etc.) for electrical equipment and systems.
6. Holes to be cut into floor duct systems for electrical devices.
7. Identification and labeling, other than painted conduits, including vinyl decals, metal tags, colored tape and/or secondary color banding, and precast concrete markers for underground location identification.
8. Inspection as per the authority having jurisdiction.
9. Instrument panels - for systems under electrical scope.
10. Electronic systems - for items in the electrical scope.
11. Mark out backing in walls as required for all equipment provided by Electrical scope.
12. Trade specific fire-stopping when there is no separate firestopping trade specified (01-2-17).
13. Protection of other trades' work from damage when performing Electrical trade's scope of work.
14. Material handling, including unloading of electrical items in Electrical scope.
15. Scaffolding/man lifts where required to perform work by Electrical trade scope.
16. Trade specific lighting to perform tasks.
17. Trade specific cleanup - cleanup for work carried out by this trade.
18. Commissioning as it applies to this trade scope.
19. Permits, inspections and licensing as it applies to different jurisdictions.
20. Surety requirements as required in the Specifications.
21. Warranty or Guaranty.
22. Manufacturer's warranty only, other than the normal one-year maintenance warranty.
23. Submittals and Operation and Maintenance documentation as specified.
24. Building Information Modeling (BIM) as it applies to this trade scope.

16-1 Electrical General Requirements Continued:

25. Cut penetrations through walls, floors and ceilings for 150 mm and smaller pipes and ducts. (complete with scanning if required).
26. Cut recesses in walls which do not exceed 200 x 200 mm for outlets; and 800 x 800 mm for junction boxes and panels (complete with scanning if required).

16-2 Electrical

A Electrical bid is comprised of the following subdivisions:

1. Common Electrical: Items common to all sections of the Electrical Division.
2. Site Services.
3. Building and Interior Power Infrastructure.
4. Raceway Systems.
5. Lighting Systems and Control.
6. Life Safety: Emergency and Exit Lighting Systems.
7. Life Safety: Fire Alarm and Evacuation Systems.
8. Mechanical Systems.
9. Equipment and Other Systems.
10. Alternate and Uninterruptable Power Sources.
11. Photo-Voltaic (Solar) Systems.
12. Wind Turbine Power Generation System.
13. Lightning Protection Systems.
14. Nurse Call and Patient Wandering Systems, Infant Protection and RFID Tracking.
15. Networked Communication Systems including VOIP & Time Keeping
16. Networked Paging and Digital Audio Systems.
17. Sound Masking Systems
18. IP Video Surveillance and Video Over IP Distribution
19. Building Security and Intrusion Systems
20. Structured Cabling Systems (Voice, Data Cable)
21. Networked Access Control Systems
22. Building Automation and Integrated Building Control
23. Audio Visual Systems, Digital Messaging
24. Information Technology Networks, Wifi, Distributed Antenna Systems (DAS)

Note: All items commonly associated with the above divisions which are normally laid out in the drawings and specifications and includes the supply and installation of all equipment, power panels, transformers, control panels, termination cabinets, racks, devices, raceway systems, back boxes, pull boxes, cables, conductors, supports, programming, commissioning, training where required for exclusive use of the system being installed and shall provide a fully functioning system.

Packaged equipment, so specified under the mechanical scopes, shall mean manufacturer pre-wired equipment supplied in a completely electrically operable state after one final connection of power wiring, and remote-control connections (such as thermostats, humidistats, control panel, and discharge controller) if specified.

16-3 Common Electrical

This includes the **supply and installation of** all line voltage electrical components, systems and their connection to electrical services to provide a complete fully functioning system including power, lighting, life safety and communication systems.

1. Coordination of all electrical trade subdivisions.
2. Disconnection of power of existing electrical installations when the materials are to be demolished, abandoned, re-used or salvaged, as specified.
3. Removal and storage of electrical and related equipment scheduled to be salvaged for reuse.
4. All underground, recessed or surface Conduits for all electrical systems.
5. Excavate and place under slab lines within the confines of the building and provide sand cover.
6. All empty raceway system, including underfloor and overhead distribution system, fish wire, terminal cabinets, outlet boxes, floor boxes, pull boxes, sleeves and caps, cable trays, service poles, miscellaneous and positioning material for all electrical systems.
7. Line voltage power requirements to energize all systems including receptacles or hard-wired connections for all electrical subdivisions.
8. Line Voltage electric connections to all equipment supplied by others, unless specified to be supplied and installed by others in the tender documents.
9. Grounding and bonding systems.
10. Poly vapor hats.
11. Relays for systems under the electrical scope.
12. Roughing-in and connecting, electrical only as shown on the tender documents, specialty items, cabinets or equipment supplied and installed by others.
13. Supports detailed on electrical drawings.
14. Sleeves, through poured-in-place concrete and masonry where required for electrical conduit, wire or equipment.
15. Core drilling - for electrical, except if provided for under pre-cast and post-tensioned slabs specifications.
16. Cash allowances and/or contingency funds when a specific dollar amount is listed in the Electrical Section for all electrical subdivisions to be carried by the Electrical contractor.

16-4 Electrical - Site Services

1. Precast Primary and Secondary transformer vaults, switching cubicles vaults, pull pits complete with extension rings to final elevation and covers for Main Site Utilities (primary power, telephone/cable, fiber optics) and installation as per the requirements of the local Utilities governing the installation, including:
 - a. Excavation, backfill and compaction of native (non-frozen) fill of the required excavation.
 - b. The approved conduit types, treated planking, cables, conductors and compaction.
 - c. Complete grounding system including approved brass clamps, copper conductors and ground rods/plates.
 - d. Underground conduit, insulated conductors, cables and connections;
 - e. Drainage pits and conduit perforations.
 - f. Installation only of concrete, sand beds, gravel and non-frost fill, supplied by others.
2. Services, aerial (other than utility owned), including all required poles.
3. Electrical substations including equipment, conduits, high, medium and low voltage cables, wiring and connections.
4. Excavation, conduit, cables, insulated conductors and connections for secondary power from alternate power sources to the building main distribution for Generators, Wind Turbines, Photo-Voltaic systems, and Central Heating Plants supplied by others. All related concrete pads, concrete piles, screw piles, bases, fencing, by others.
5. Excavation, conduit, cables, insulated conductors and connections for vehicle power pedestals, vehicle charging stations, exterior mounted electrical power and control cabinets, site lighting (pole or pedestal) and landscape power outlets. All related concrete pads, concrete piles, screw piles, bases, fencing, by others.
6. Excavation, conduit, cables, conductors, connections and power for gates and lot signage, (All equipment to be supplied and installed by others). All related concrete pads, concrete piles, screw piles, bases, fencing, by others.
7. Rough backfill (non-frost native fill) of trenches for system where trench is excavated by reciprocal chain mount trenching operation and is less than 200 mm (8 inches) wide.
8. Electrical Generators (diesel/gas) and Co-generation units complete with the means to interrupt or synchronization of the Utility power source and transfer by either manual and automatic transfer switches and the monitoring thereof– electrical.
9. Power plant equipment, (excluding external fuel tanks, vent ducting and piping for fuel, coolants and exhaust) complete with prime mover, flex connections, radiator and muffler when the major function is to drive electric generators.
10. Supply of fuel for the emergency generator system. Including fuel for generator testing and final fill for turnover to the Owner.
11. Electrical wiring from fuel fill panel to generator day tank, float wiring and any wiring required from the day tank to generator to be completed by the Electrical contractor.

16-5 Building and Interior Power Infrastructure

1. Main distribution panels, service panels, central distribution panel, switchboards and service centers and related electrical equipment such as capacitor banks, voltage surge suppression, in board metering, coordination and short circuit studies (as specified).
2. Wiring and equipment for interior transformer and substation vaults including the supply and installation of related electrical equipment, conduits, cables, insulated conductors, wiring and connections of high, medium and low voltage cables.
3. Motor control centers, magnetic starters, and motor starters.
4. Secondary and sub-distribution centers, transformers, capacitor banks, and related electrical equipment.
5. Secondary Electrical distribution system including relays, panels, breakers, conduits, supports and conductors.
6. Generators complete with control wiring and monitoring for remote fuel monitor, transfer switches, fire alarm monitoring and wiring of float switches.
7. Floor boxes for all systems and fire rated penetrations through assemblies.
8. Cathodic protection other than for domestic water services (Mechanical).
9. Cabling and insulated conductors for branch circuits, feeders - for all systems under this electrical scope.
10. Fixed conduits and fittings between elevators and elevator remote panels and systems
11. Protection devices, disconnects and breakers.
12. Circuit breakers and manual disconnect switches both non-fused and fused complete with fuses except when part of packaged mechanical equipment.
13. Meters - for systems under the electrical scope and all power meters requiring connection to the Automatic Temperature Control Systems, including:
 - a. Conduit and cabling wire from meter interface module to Facility Management Systems.
 - b. All network cabling, wiring and programming (including addressing and trend logs).
 - c. Commissioning of the meters.

16-6 Raceway Systems

1. Electrical flexible and surface raceways system.
2. Racking suspension and supports to support all raceway types.
3. Buss duct systems including all busways, splitters, gutters, supports, hangers, transitions and disconnecting means for main and sub feeders.
4. Floor duct and wireway systems including all supports, hangers and transitions.
5. Cable trays, including all supports, hangers and transitions.
6. In floor electrical and communications duct systems including all supports, hangers and transitions.

16-7 Lighting Systems and Control

1. All interior and exterior luminaires for the illumination within the building and the surrounding areas.
2. Connection only of operating room luminaire, hangers and supports to be provided by others;
3. Luminous ceilings: including electrical lighting fixtures and raceways only but excluding leaf-type reflectors, egg-crate reflectors, plastic or glass lenses, diffusers and supports for same.
4. Luminaires and fixtures including those which are surface, recessed, pendant and/or remote to drivers and ballasts.
5. Luminaires for site poles, exterior accent, security, walkway and landscape lighting complete with controls.
6. Obstruction lighting for tall buildings and structures near the operation of aircraft.
7. Luminaires for systems which require indications or warning signals.
8. Marine lighting.
9. Valance and cove lighting: including electrical lighting luminaires, fixtures and raceways only but excluding leaf-type reflectors, egg crate reflectors, plastic or glass lenses and diffusers and all supports for same.
10. Lighting control and dimmer systems, including line and low voltage switching, control cabinets, programmable dimming systems and equipment, integration with the building maintenance system and wireless lighting control systems.
11. Wireless switching and wireless lighting control systems.
12. Digital addressable lighting interfaces for building lighting control systems and integration with structured cabling.
13. Occupancy and daylight harvesting sensors including local control and integration into a low voltage lighting system controller.
14. Electrified glazing light curtain and control complete with building system integration.
15. Line voltage connections for electrified window blinds and control wiring for complete building system integration.
16. Lighting luminaires and fixtures (complete manufactured units): All luminous elements consisting of a light source (and ballasts if required) mounted separately or as components of an overall ceiling system including fixtures for coffered ceilings, air troffers and indoor or outdoor flood lighting, to include lamps ballasts, drivers for same, lenses, globes, guards and all types of diffusers (also supports if detailed on electrical drawings only, except for fluorescent fixtures larger than 610 mm x 1220 mm).

16-8 Life Safety: Emergency and Exit Lighting Systems

1. Emergency battery packs complete with remote direct current heads.
2. Remote direct current emergency lighting heads.
3. Exit lighting both powered and self-luminated.
4. Light fixtures with integral emergency power ballasts.
5. Conduit, cabling and wiring from lighting interface module to Facility Management Systems if specified.
6. All network cabling, wiring and programming (including addressing and trend logs).
7. Personnel for programming and networking.
8. Commissioning, testing and training of installed systems.

16-9 Life Safety: Fire Alarm and Evacuation Systems

Fire alarm systems - including fire phone systems, and fire alarm fan-shut-down and start-up relays and wiring. Also including wiring and connections only for fire protection systems and smoke or smoke/fire damper activation and monitoring including:

1. Conduit and wire from Fire Alarm interface module to Facility Management Systems.
2. All network wiring and programming (including addressing and trend logs).
3. Qualified personnel for programming and networking.
4. Commissioning of system.
5. Control panels, detection, alarm devices including the connection wiring required to control the fire suppression clean agent/gas piping systems provided by the sprinkler system contractor.
6. Wiring and connection of automatic sprinkler systems with associated detection, control panel and alarm devices.
7. Fire alarm fan shut-down and start-up relays and wiring.
8. Wiring of pool system controls.
9. All electrical connections for the Foodservice Fire Suppression Systems. Dry contacts to be provided by the Foodservice Fire Suppression contractor. Electrical contractor to tie-in the kitchen suppression system into base building Fire Alarm System as per code requirements.
10. Wiring and connections to disconnect electrical the power outlets during an emergency event.
11. Addressing of system.
12. Battery chargers - for systems under the electrical scope.
13. Medical gas alarm, and special fire protection systems - supply and install conduit, wire and connections only.
14. Fire and smoke detectors and interconnecting devices.
15. Signaling systems – for items under the electrical scope.
16. Alarm and detection systems - for systems under the electrical scope.
17. Standalone line voltage smoke detectors and carbon monoxide detectors (CO).
18. Audible devices for systems under the electrical scope.
19. Sprinkler enunciator systems, electrical.
20. Door release systems tied to Fire Alarm and associated key release and reset systems.
21. Door hold open device and release systems tied to fire alarm systems.
22. Network cabling between Facility Management Systems and other building systems such as:
 - a. Lighting.
 - b. Fire alarm.
 - c. Power Metering.
 - d. Access Control.
 - e. Building Management.
 - f. Networking components required by other building systems for own stand-alone operation.

16-10 Electrical - Mechanical Systems

1. Switches - all types of electrical switches including manual and automatic disconnects, for systems under the electrical scope except where part of packaged equipment supplied by others.
2. Line voltage connections to all packaged equipment including roof top units, chillers, air handling units, unit heaters, infrared heaters, and boiler units.
3. Line voltage wiring of control devices supplied by the mechanical.
4. Line voltage connections, splitters, fusible disconnects and variable speed rated cables for packaged units where they are not integral to the packaged unit.
5. Installation and connection of silicon-controlled rectifiers (S.C.R.) for control of electric duct heaters supplied under other trade definitions.
6. Variable frequency drives (VFD's) (for Plumbing and HVAC equipment) when there is no Automatic Temperature Controls subcontractor required on the project and the VFD's are not specified to be factory supplied and wired with packaged equipment.
7. VFD's (for process equipment) when not specified to be factory supplied and wired with packaged equipment.
8. Installation and line voltage wiring of Variable Speed Drives.
9. Motor starters - all motor starters and protection switches without exception other than that equipment which forms an integral part of packaged equipment requiring a power connection only.
10. Multi-speed controller switches including variable speed drives which are electrically initiated and operated.
11. Electric Heating:
 - a. Electrical base board
 - b. Line voltage electrical wiring and connections to electric in floor heating mats and cables installed by tile contractor, (heating mats supplied and installed by others).
 - c. Heater (a self-contained, forced air electric heater with enclosure requiring only electrical connections with no ductwork connections).
 - d. Electric unit heaters.
 - e. Heating cables, heating tape except when supplied by the mechanical scope.
 - f. Radiant electrical heating
 - g. Controls for above items unless forming part of Automatic Temperature Control Trade controls under mechanical scope.
 - h. Line voltage electrical wiring and connection for heat tracing, supplied by others.
12. Transformers, voltage regulators, controls and any wire connections associated with heat tracing.
13. All line and low voltage wiring for fire pumps, booster pumps, condensate pumps, sump pumps and associated floats and controls panels. Sump pump floats and panels are supplied by the mechanical contractor.
14. Line voltage electrical wiring and connection for Control consoles - except for Automatic Temperature Control Trade and pre-wired factory-packaged equipment.
15. Line voltage electrical wiring and connection for Control devices - for equipment under mechanical scope which constitute protective control or disconnecting as required by the Canadian Electrical Code.

16-10 Electrical - Mechanical Systems Continued:

16. Line voltage electrical wiring and connection for Control panels - except for Automatic Temperature Control Trade and pre-wired factory-packaged equipment.
17. Line voltage electrical wiring and connection for Control power supply outlets - provided at locations shown on the electrical drawings and terminated in terminal cabinets or outlet boxes. Alternatively, if no control power supply outlets are shown on the electrical drawings, the electrical contractor shall provide such outlets adjacent to the source where the power circuit originates. The wiring beyond control power supply shall fall under the scope of control wiring.
18. Control wiring - for motors, solenoids, relays and duct heaters under the mechanical scope, except pre-wired packaged equipment and controls that do not directly switch the power lines to the motors and duct heaters. Control wiring shall include all necessary wiring materials and connections, and the installations of controls that do not require mechanical connections.
19. Supply and wire magnetic flow meters when not connected to Automatic Temperature Control Systems.
20. Temperature control system and devices for electric heating supplied by the electrical trade.
21. Thermocouple wiring and thermocouple sensor wiring except for Automatic Temperature Control Trade controls.
22. Line voltage and low voltage electrical wiring and connection of electrically operated plumbing fixtures, placement and installation by others.
23. Solar powered heating systems (electrical).
24. Electrical load Balancing - for systems under the electrical scope.
25. Transformers required for an automated temperature control system when there is no building automation system, i.e. Stand alone controls
26. Electrical thermostats - except for equipment supplied under mechanical scope. (Thermostats supplied under mechanical scope, if to be installed by electrical contractor, must be complete with adapter plates).
27. Line voltage electrical wiring and connection only for automatic underground sprinkler and/or irrigation systems.
28. Line voltage electrical wiring and connection for gas detection systems.
29. Line voltage electrical wiring and connection for fire pumps, jockey pumps, circulation pumps, heat pumps and other related mechanical pumps and equipment required for a complete mechanical operated system.
30. Line voltage electrical wiring and connection for circulation fans, exhaust fans, intake fans and other related mechanical ventilation and equipment required for a complete mechanical operated system.
31. Line wiring and related control wiring for variable air volume (VAV) boxes, where there is no controls contractor.

16-11 Electrical - Equipment and Other Systems

1. Line voltage electrical wiring, disconnects, control and connections for overhead doors and automatic doors including interconnecting wiring, conduit and boxes. Supply, placement and installation at location for control, safety devices and electrically activated holding devices by others.
2. Line voltage electrical wiring and connection for door wiring for electric locking mechanisms including interconnecting wiring.
3. Line voltage electrical wiring and connection, disconnects and connections for automatic and handicap doors, including empty conduit and boxes for control devices and electrically activated holding devices by others; supply and installation of automatic and handicap doors by others.
4. Line voltage electrical wiring and connection for all washroom accessories as supplied by others.
5. Line voltage electrical wiring and connection only of medical, dental, and digital imaging equipment and other healthcare related equipment, hangers and supports to be provided by others.
6. Line and low voltage electrical wiring, control and connection for:
 - a. Clocks and clock systems.
 - b. Time recording system.
 - c. Timers and time clocks.
 - d. Watchman's clocking equipment.
 - e. Send/receiving devices - for systems under the electrical scope.
 - f. Telautograph devices.
 - g. Telephone systems, private automatic, supplied by others.
 - h. Appliances and furniture requiring a permanent electrical connection only.
 - i. Laboratory equipment except those items included in a factory assembled casework product.
7. Wall panels connections.
8. Elevator and Escalator power and related life safety work including.
 - a. Line voltage electrical wiring and connection.
 - b. Mainline disconnects for each elevator as required.
 - c. Disconnecting device to elevator equipment prior to activation of sprinkler system.
 - d. Installation of dedicated ground fault Ground Fault Circuit Interrupter receptacles in the elevator pit and overhead.
 - e. Lighting in controller area, elevator machine area and pit.
 - f. Wiring for elevator telephone service to controller.
 - g. Emergency generator for elevator operation.
 - h. Fire alarm detectors, relays and signal lines to contacts in the elevator machine area including requirements for elevator homing.
9. Line voltage electrical wiring and connection to movable dividers/work stations either base fed and/or with service and Pak-pole connections. Power whips and Service and Pak-poles as provided by others.

16-11 Electrical - Equipment and Other Systems Continued:

10. Transformers.
11. Electric meters (revenue meters) as indicated on the drawings and specifications, other than main Utility metering.
12. Line voltage electrical wiring and connection for equipment under the General Mechanical and Foodservice Equipment scopes, shall include, all necessary wiring materials and connections for motors requiring protective control by the Canadian Electrical Code, heaters, lamps, electro static filters, and controls that directly switch the power lines to such equipment. Wiring to solenoids shall fall in the category of control wiring.
13. Line voltage electrical wiring and connection for direct wired equipment and machinery including supply of loose magnetic starters.
14. Line voltage electrical wiring and connection only for direct wired Food Service Equipment.
15. Line voltage wiring for vacuum systems installed by the mechanical contractor.
16. Line voltage electrical wiring and connection only for food services refrigerated rooms, freezers and coolers including compressors, condensers, chillers, evaporators, lighting, controls, time clocks, thermostats, solenoids, door heat tracing and all other associated refrigerated equipment that requires line voltage connections.
17. Resistors and capacitor banks.
18. Line voltage electrical wiring and connection only for wet and dry sauna.
19. Line voltage electrical wiring and connection only for signs.
20. Snow melting cables, including related control devices.
21. Vehicle charging stations.

16-12 Alternate and Uninterruptable Power System

This scope includes the **supply and installation of** Alternate and Uninterruptible Power Supply (UPS) system that provides temporary and/or emergency power in the event of a power outage. This system allows power to be supplied to portions of a building infrastructure or equipment which maintains power for a period of time when the primary power source is lost. The uninterruptable power supply maintains a constant voltage and also provides protection from power surges.

Included:

1. Uninterruptible Power Supply complete with internal static bypass circuit for power diversion.
2. Rectifier for the conversation of power for battery charging capabilities and convert incoming power.
3. Manual or automatic power interruption switches.
4. Battery back-up assemblies and interconnecting cables and connectors.
5. Inverter complete with voltage regulation, frequency control, harmonic distortion control and overload controls.
6. Transient volt surge suppression, external maintenance by-pass controls and remote monitoring.

16-13 Photo-Voltaic (Solar) Systems

This scope includes the **supply and installation of** all equipment for Photo-Voltaic Solar system to provide a complete functioning system.

Included:

1. Photo-Voltaic (solar) racking systems complete with integrated roof supports, wall supports and ballasting/anchoring systems.
2. Power optimizers, string inverters, central inverters, micro inverters and communication connections.
3. Underground and above ground electrical conduit, flex and conductors for all AC and DC cabling and connections.
4. Modification to main power distribution and breakers if adding to an existing power distribution.
5. Photo-Voltaic modules and all related hardware.
6. Battery and energy storage systems and charging controllers.
7. Ballast weights for roof and ground mount systems.
8. Ground mount racking systems fixed, and multi-axis trackers mounted to structural framing members as provided by others, see Structural Steel, Included, see Piles, Included.
9. Arc fault protection.
10. Photo-Voltaic (PV) communication connection to client server.
11. Photo-Voltaic rodent protection for insulated conductors and cabling.
12. All work related to Photo-Voltaic racking system grounding and bonding.
13. Electrical engineering fees.
14. Submission of micro-generation application to the local Utility and metering.

16-14 Wind Turbine Power Generation

This scope includes the **supply and installation of** all equipment for wind turbine systems that converts the wind's kinetic energy into electrical energy and is the process by which the wind is used to generate electricity to provide a fully functioning system.

Included:

1. Horizontal-axis and the vertical-axis turbines.
2. Drive train including a gearbox and generator.
3. Tower and structure which supports the rotor and drive train.
4. Controls, cable twist counter, electrical cables, connections, ground support equipment, and interconnection equipment.
5. Rotor blades, hub, low and speed shafts and gearbox mechanical brake.
6. Electrical generator, yaw mechanism, electronic controller, hydraulics system, cooling unit, tower, anemometer and wind vane.
7. Transformers, inverters and battery storage units.

16-15 Lightning Protection Systems

This scope includes the **supply and installation of** all equipment for a Lightning Protection System (LPS) designed to protect a structure or building and contents from damage caused by the intensely high voltage currents of a lightning strike. A lightning protection system offers a lightning strike a low resistance path to ground where the enormous energy is then safely dispersed to protect buildings, property and persons to provide a fully functioning system.

Included:

1. Air termination system includes lightning rods, metal conductors and ground electrodes;
2. Horizontal or vertical conductors providing protection for the mesh method.
3. Interconnecting all isolated conducting parts of the installation including cables, conductors and surge protective devices.
4. Earth-termination system and lightning equipotential bonding system including ground rods, buried wires, foundation earthing, cables and conductors.
5. Lightning current arrestor and related components.
6. Device for protecting electrical/electronic equipment from transient voltage, power surges and over voltage damage.

16-16 Nurse Call, Patient Wandering Systems, Infant Protection and RFID Tracking

This scope includes the **supply and installation of** all equipment for a Nurse Call Systems that act as a means of communication between the nursing staff and patients within a healthcare type facilities either through wired or wireless call buttons or devices which can be activated in case of emergency or requests by patients who wish to receive attention from nurses which provides a fully functioning system and also includes the supply and installation of all equipment for a Patient Wandering Systems which tracks patients within set borders to guarantee their protection within hospitals, nursing homes and senior living homes to provide a fully functioning system.

Included:

1. Nurse main and desktop control console and controller complete with power supply.
2. Interface with paging, telephone systems, fire alarms and smoke detection systems.
3. Monitoring and computer software.
4. Networked nurse stations for centralized paging, alarm logging and event reporting.
5. Room controllers, Console receivers, staff room displays and door modules.
6. Wall mount call point, pull cords, washroom call units, plates and devices.
7. Bed indicators and bed/pillow speaker and call cords.
8. Wall mount nurse calling point and secondary stations.
9. Wander management system and control panels.
10. Roam alert door controllers, bracelets, and guard system.
11. Global positioning systems and radio frequency receivers and devices.
12. Roam alert controller and exciter complete with pendants and tags.
13. Provide wiring diagrams and schematics complete zone drawings to integrate design requirements.
14. Installation of all system plenum or non-plenum rated cables and interconnections of all system components.

16-17 Networked Intercommunication Systems including VOIP & Time Keeping

This scope includes the **supply and installation of** all equipment for an Intercom and Voice Communication and Intercom, time keeping systems used in one or more buildings to allow for communication across physical spaces by audio and video transmission which has the capability to make announcements to the entire system and also has the capability to integrate with other systems to provide a fully functioning system.

Included:

1. Intercoms system complete with a self-contained phone system.
2. Master or base station of an intercom system.
3. Sub-station intercom panels and components.
4. Exterior door station intercom panels and components.
5. Push-and-talk functioning microphone or a hand-held phone set.
6. Portable closed-circuit intercom system complete with headsets, handsets and intercom station belt mount with an earpiece.
7. Closed-circuit intercom messaging system that controls incoming intercom correspondence.

16-17 Networked Intercommunication Systems including VOIP & Time Keeping Continued:

8. System interface with intercom panel with or without connection to an outside phone system.
9. Interface with closed circuit television, telephone paging equipment and video equipment.
10. Master clock with provision to synchronize with SNTP (Simple Network Time Protocol)
11. Clock devices including 12h, 24hr analogue face and digital up to 6 digit (HH:MM:SS)
12. Provision for wired, POE and or wireless batter operated clocks
13. Provide wiring diagrams and schematics complete zone drawings to integrate design requirements.
14. Installation of all system plenum or non-plenum rated cables and interconnections of all system components.

16-18 Networked Paging and Digital Audio Systems

This scope includes the supply and installation of all equipment for a Public-Address System (PA system) comprising of microphones, amplifiers, loudspeakers, digital sound processing equipment and related hardware complete with speakers and stations throughout a building. The system allows administrators to provide announcements, music and signaling to occupants to provide a fully functioning system.

Included:

1. Public address loudspeaker system to incorporate ability for voice paging.
2. Provisions to broadcast programs from various digital sources
3. Voice paging from telephone set complete with overrides over broadcast or recorded music reproductions.
4. Provide selective area page to areas, emergency page to all areas.
5. Integrate Music from external or internal sources.
6. Ability to perform speaker selection through a multiplexed assembly.
7. Provision to distribute live digital audio over a network infrastructure via industry accepted digital audio signalling protocol (eg. Dante)
8. Provision Digital Sound Processing (DSP) for zoning, monitoring, source selection etc.
9. Provide programming services for DSP and provide a user touch or graphical interface with the ability to integrate with a global control system
10. Rack, to accommodate system components with mounting rails, wire and cable entrances.
11. Programmable timer system with battery backup.
12. Components such as Patch panels, pre-amplifier mixer, power amplifiers, power boosters and power supplies.
13. Tone signal generator for time and alarm signals.
14. Interface with closed circuit television, telephone paging equipment and video equipment.
15. Interface to use speaker system as listening devices to actuate relays to sound alarms and notifications.
16. Interface to Mass Notification systems including software and interfaces to life safety devices.
17. Provide wiring diagrams and schematics complete zone drawings to integrate design requirements.
18. Installation of all system plenum or non-plenum rated cables and interconnections of all system components.

16-19 Sound Masking Systems

This scope includes the **supply and installation of** all equipment for a Sound Masking System which provides digitally generated sound to reduce distractions or provide confidentiality within a space to provide a fully functioning system.

Included:

1. Network control panels, primary hubs, accessory/secondary hubs, and required racking.
2. Digital Signal Processing and programming.
3. Sound masking generation, equalizers, paging and integration.
4. Speaker assemblies, loud speakers and complete cabling.
5. Programmable keypads and infrared remote-control receivers.
6. Paging infrastructure, microphones.
7. Cable assemblies and couplers.
8. Power supplies and battery backup for fail safe.
9. Cabling, clips, chains, suspension and supports.
10. Provide wiring diagrams and schematics complete zone drawings to integrate design requirements.
11. Installation of all system plenum or non-plenum rated cables and interconnections of all system components.

16-20 IP Video Surveillance and Video for over IP Distribution

This scope includes the **supply and installation of** all equipment for a Video Surveillance System which provides monitoring with cameras of the building exterior and key locations throughout the building such as stairwells, entrance and exit points to allow for remote surveillance to a monitoring station.

Included:

1. IP Camera Hardware, Network Video Recorder (NVR) and terminations of equipment connections.
2. Provision Video Management Software (VMS) to control, view monitor camera systems via Web Browser, Mobile Interface (smart phone or tablet), and ability to display in control room or remote location via IP.
3. Termination Blocks and Patch Panels.
4. Communication Horizontal Cabling.
5. Servers for Surveillance systems and Monitor screens for the system.
6. Radio Equipment for television radio frequency.
7. Radio Frequency Termination Blocks and Patch Panels.
8. Distribution of video signal over network (eg. HD BaseT)
9. Faceplates, cabling connectors.
10. Remote monitoring station or software.
11. Interface with Card access and Intrusion system.
12. Interface with Structured cabling.
13. Provide wiring diagrams and schematics complete zone drawings to integrate design requirements.

16-20 IP Video Surveillance and Video for over IP Distribution Continued:

14. Installation of all system plenum or non-plenum rated cables and interconnections of all system components.
15. Wireless transmission devices for purpose of transmission of video signals.
16. Interfacing and configuration of storage for video footage including configuration in data centers.

16-21 Building Security and Intrusion Systems

This scope includes the supply and installation of all equipment for a Building Security and Intrusion Systems which allows controlled access for entry and exit for a building including keypads, scanners and related detection devices which allow for remote monitoring of the building including arming and disarming of the system for a fully functioning system.

Included:

1. Key pads and scanners.
2. Integration with door hardware to monitors the exit of the building.
3. Termination blocks and patch panels.
4. Intrusion and security control panels, main and auxiliary.
5. Recessed and surface door position switches and related magnets.
6. Glass break detection, infrared motion detection and beam detection devices and interconnection.
7. Audio, sonic, smoke, water and heat detection devices and interconnection.
8. Setup and configuration of GSM communication or others to Central Monitoring facilities.
9. Setup and configuration of intrusion systems to meet ULC standards.
10. Setup and configuration of software in collaboration with Monitoring facilities.
11. Integration with Card Access Systems with network interface, see Access Control Systems,
12. Interface with Video Surveillance system.
13. Provide wiring diagrams and schematics complete zone drawings to integrate design requirements.
14. Installation of all system plenum or non-plenum rated cables and interconnections of all system components.

16-22 Structured Cabling Systems (Voice, Data and Cable)

This scope includes the **supply and installation of** all equipment for a Structured Cabling System of cabling and associated hardware which provides a comprehensive telecommunications infrastructure. This infrastructure contains the cabling integration with the voice, data, video, and various management and network systems of a building for a fully functioning system.

Included:

1. Cabinets, racks, frames and enclosures.
2. Termination blocks and patch panels.
3. Cable management, cable terminations, labelling and cross connects.
4. Power strips, Uninterruptable Power Supply for this equipment and rack mounted power distribution units.
5. Communication copper backbone for interconnection between buildings, telecommunication closets, equipment rooms, point of demarcations and the cabling system structure.
6. Fiber backbone consisting of single mode, multimode and optical fiber cables.
7. Anti-static electricity devices and cable connections.
8. Faceplates, cabling connectors and patch cords.
9. Communication horizontal cabling.
10. Interface with Video surveillance.
11. Interface with lighting controls.
12. Cables for data and voice communications including optical fiber, twisted-pair copper, coaxial cable, single and or multi-conductor copper cabling.
13. Installation of all system plenum or non-plenum rated cables and interconnections of all system components.

16-23 Networked Access Control Systems

This scope includes the **supply and installation of** all required software and hardware for electronic access and egress systems, including management devices, integrated control credentials, card readers, control and monitoring equipment and systems for controlling access to a facility. A complete system includes operating systems, mobile applications and software interfaces, access control hardware devices and system integration and interconnection, for wood, hollow, aluminum doors and frames as well as demountable partitions.

Included:

1. Keypads.
2. Card Readers.
3. Biometric Readers.
4. Request to exit devices (motion sensor, push button, or other device) unless directed otherwise in the tender documents.
5. Door Position Switches.
6. Electronic Latch retraction panic sets.
7. Setup of Tablets-IPADs or other mobile devices interfaced with Access Control.
8. Setup of Emergency stations such as Code Blue devices.
9. Setup and configurations of Electronic Visitor kiosks.
10. Setup and configuration for interfacing to elevator systems for controlled access to floor.
11. Integrate with VMS and or Building Control System
12. Wi-Fi locks and required communications bridges.
13. POE wired locks.
14. Electrified Hardware.
15. Door Controllers.
16. Main Controllers.
17. Wireless Controllers.
18. Credentials (including ID cards, fobs).
19. Setup and programming Bluetooth technology credentials.
20. Programmers and Update Devices.
21. Setup of System.
22. Training of End User.
23. Door security and/or monitoring systems including remote devices, card access readers, enunciators, central processing unit, etc., as required by the system including wiring. Components of a trade name door security and/or monitoring system which is specified to be supplied by one supplier and which must be door and/or door frame mounted shall be supplied by the electrical contractor for installation by the door and/or frame supplier, otherwise, all door and/or door frame mounted components shall be supplied and installed by others; wiring for these components shall be by the electrical contractor in either case.
24. Submittals and Operation and Maintenance documentation as specified in the tender documents.
25. Commissioning as it applies to this trade scope.

16-24 Building Automation and Integrated Building Control

This scope includes the supply and installation of hardware, off -the-shelf and custom written to software to control any micro-processed building system including but not limited to lighting, AV, Security, HVAC, and Mechanical Systems. The integrated system offers monitoring and basic control through a graphical interface, that may be custom written depending on the application or via web-browser, touch-interfaces, touchless interfaces, smart phone, and or tablet to monitor systems vital signs and provide basic control. The intent is to provide a “dashboard” or control layer. This scope can be completed by a ‘Master Integrator’ as described in the WCA Best Practice: Design of Networked Equipment in Build Construction document.

Included:

1. Control Processor and related integration equipment
2. Custom Written Graphical Interface or Customizable Middleware (eg. Milestone)
3. Touch Interface (wired, wireless) as required
4. Programming Services
5. The Master Integrator will also provide guidance regarding:
 - a. Understanding of network building blocks topologies, architectures, bandwidth, quality of service, security, remote management, and general networking standards to ensure the IT Infrastructure will support the network driven devices.
 - b. Operation of Sub-Systems (e.g. lighting, AV, security etc) to select systems to meet the building’s performance and feature requirements.
 - c. Communication and network protocols specific to the systems being deployed in the building.
 - d. Integration of multiple subsystems, by providing a control layer or dashboard to manage and monitor multiple sub-systems.
 - e. Current networking standards and network security to protect the networks, devices and data from unauthorized access or criminal use and the practice of ensuring confidentiality, integrity, and availability of information.

16-25 Audio Visual Systems, Digital Messaging

The scope of this section is to the supply, and integration of Networked AV equipment required for collaborative activities, audio and video conferencing and the distribution of video signal to digital devices indoor and outdoor, including but not limited to projection, LED/LCD Commercial Displays, and Direct view LED.

Included:

1. Laser and LCD Projection & associated screen and mounting equipment
2. LCD/LED Commercial Display Panels and associated mounting equipment
3. Direct View LED and associated processing equipment
4. Networked Content Management Equipment for video and audio distribution endpoints (solid state media player, thin client PC, or displays with System on Chip)
5. TX/RX equipment to transmit audio and video over IP
6. AV Control, Matrix Switching and Processing equipment with provision and or capability to interface with Building Control System
7. Provisioning for integrated audio conference & mic system
8. Provisioning for wired and wireless BYOD integration
9. Programming & AV Specific IT Services
10. Provide system drawings, including but not limited to riser diagrams, rack elevations, system block diagrams, equipment layout

16-26 Information Technology Networks, Wifi, Distributed Antenna Systems (DAS)

The scope of this section is to **supply, install and configure** network solutions to support modern building systems including but not limited to building control and automation (lighting, HAVAC, Mechanical, Security, AV, VOIP, Paging and Communications). This includes active gear, access points, patching, trim-out devices, and configuration services to securely support, and provide quality of service (QOS) to support a wide ranged networked systems on single physical network or multiple networks.

Included:

1. Network Switches capable of supporting up to 1Gb ethernet and up to 10Gb ethernet for applications having high bandwidth requirements
2. Firewalls and patching
3. Wireless Access Points and associated controllers
4. DAS Antennas & associated head end equipment
5. End-Point Trim Out Equipment
6. Plenum, non-plenum rated, CAT6 shielded not shielded cabling to support data, audio, video
7. UPS power
8. Configuration services for managed switchers, VPNs, Firewall Configuration, QOS configuration to support applicable services
9. Provide heat mapping (signal strength) for coverage of Wifi and DAS
10. Provide system drawings



Architectural Woodwork Manufactures Association of Canada

1447 Waverley Street
Winnipeg, MB, R3T 0P9



Mechanical Contractors Association of Manitoba

320-830 King Edward Street
Winnipeg, MB, R3H 0P4



Manitoba Masonry Institute

1447 Waverley Street
Winnipeg, MB, R3T 0P9



Manitoba Wall and Ceiling Association Inc.

1447 Waverley Street
Winnipeg, MB, R3T 0P9



Roofing Contractors Association of Manitoba

1447 Waverley Street
Winnipeg, MB, R3T 0P9



winnipegconstruction.ca



(204) 775-8664



1447 Waverley Street, Winnipeg, MB, R3T 0P7



wca@winnipegconstruction.ca



Winnipeg Construction Association



[wca_build](#)