INTRODUCTION

This manufacturer's guide specification is intended for use by design and construction professionals in the development of project specifications. By referring to the manufacturer's **("Notes to Specifier" in parentheses and bolded)**, the specifier may easily select the portions of the comprehensive guide specification which are pertinent to their project. "Notes to Specifier" should then be deleted from the final specification document. This guide specification follows the Construction Specification Institute's MasterFormat® and SectionFormat® protocols.

WARNING AND RECOMENDATIONS

Nudura Insulating Concrete Forms (ICFs) are used as stay-in-place formwork for containing structural concrete for the design and formation of load-bearing and non load-bearing, below-grade and above-grade walls. The forms are used in construction of plain and reinforced concrete beams, lintels, exterior and interior walls, and foundation and retaining walls. The Nudura system must be designed by a qualified structural engineer designated as the Engineer of Record (EOR) in accordance ACI 318 in the US and CSA A23.3 in Canada. Under no circumstance should the EOR delegate the structural design to an ICF Manufacturer and ICF Installation Contractor.

For special structural design applications, such Seismic Design, FEMA/ICC 500 Storm Shelters, UFC 4-010-01 Antiterrorism Standards or UFC 4-023-03 Progressive Collapse, ensure thge ICF system being specified has been testing for conformity the following test or evaluation standards.

- ASTM E2126 Standard Test Methods for Cyclic Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings
- Impact Resistance (Missile Test) - ICC/NSSA Standard for the Design and Construction of Storm Shelters

The forms remain in place after the concrete cures and must be covered by an approved interior and exterior wall-finish material, as per building code requirements. The forms may be used in fire-resistance-rated construction, provided installation is in accordance with Section 4.3. of Nudura's ICC-ES Evaluation Report ESR-2092. The forms may be used in Type V construction. For use in buildings of Types I, II, III or IV (noncombustible) construction, installation must be in accordance with Section 4.4 of ESR-2092. Any Nudura or ICF wall designed as fire separation wall should provide Underwriters Laboratories (UL) testing in accordance with UL-263 and maintained UL listing for applicable design application specific to the manufacturer's ICF system. The Architect as the Designer of Record (DOR) is responsible for ensuring that all design detailing, specification and ICF design integration conforms to all applicable design and building code requirements.

It will be prudent to cross reference and place certain parts of the Insulating Concrete Forming Specification in other parts of the projects total specification, such as, air and water-resistive barrier membrane, accessory materials, sealants, masonry veneer, and other cladding system, where applicable. The project design professionals are responsible for verifying that the project specifications are suitable for the project. For assistance in preparing your specification, please contact your Nudura Technical Representative at www.nudura.com

DISCLAIMER

It is the responsibility of both the specifier, DOR and the purchaser to determine if a product is suitable for its intended use. The designer selected by the purchaser is responsible for all decisions pertaining to design, detail, structural capability, attachment details, shop drawings and the like including Limitations as outlined herein below. The ICF Manufacturer has prepared guidelines in the form of specifications, design and installation details, application instructions and product testing data sheets to facilitate the design process only. The Manufacturer is not liable for any errors or omissions in design, detail, structural capability, attachment details, shop drawings, or the like, whether based upon the information prepared by the Manufacturer or otherwise, or for any changes which purchasers, specifiers, designers, or their appointed representatives may make to the Manufacturer's published comments.

SECTION 03 11 19

INSULATING CONCRETE FORMING

PART 1 GENERAL

1.01 SUMMARY

A. Comply with the requirements for Division 1.

B. Supply & installation of insulated concrete forms, installation of reinforcing steel and placement of concrete within formwork.

C. Adequate bracing and falsework shall be provided by the Installing Contractor to comply with all applicable Codes.

1.02 SCOPE OF WORK

A. ICF installation Contractor to furnish all labor, materials, tools and equipment to perform the installation of insulated concrete form wall assembly as per the construction documents and specification.

B. Furnish all labor to include placement of reinforcing steel within forms, placement of concrete into forms, and final cleanup.

1.03 PRODUCTS SUPPLIED BUT NOT SPECIFIED OR INSTALLED UNDER THIS SECTION

A. *EPS* compatible modified bituminous sheet waterproofing membrane.
B. *EPS* compatible fluid applied waterproofing membrane.
C. *EPS* compatible parge coat.
D. *EPS* compatible Fluid-Applied Air and Water-Resistive Membrane Barrier (AWRB)

1.04 PRODUCTS INSTALLED BUT NOT SPECIFIED OR SUPPLIED UNDER THIS SECTION

A. Sleeves
B. Inserts
C. Anchors
D. Bolts
E. Reinforcing Steel
F. Window & Door Opening Bucks
G. Concrete

1.05 RELATED SECTIONS

(Note to Specifier: Delete any sections below not relevant to the project and add others as required specifically to define acceptable to the project.)

A.	Section 03 20 00	Concrete Reinforcement
B.	Section 03 30 00	Cast-In-Place Concrete
C.	Section 03 40 00	Precast Concrete
D.	Division 04 00 00	Masonry
E.	Division 05 00 00	Metals
F.	Division 06 00 00	Wood & Plastics
G.	Section 06 17 00	Engineered Framing Systems

Note to Specifier: Engineered framing system components such as parapet cap nailer and rough opening buck framing are available from Prebuck LLC, a division of Tremco Construction Products Group (CPG). Coordinated specification of these items can be incorporated into the overall Tremco CPG limited warranty.)

H.	Section 07 13 00	Modified Bituminous Sheet Waterproofing
I.	Section 07 14 00	Fluid-Applied Membrane Waterproofing
J.	Section 07 24 00	Exterior Insulation Finishing Systems (EIFS)
K.	Section 07 27 26	Fluid-Applied Membrane Air Barriers, Vapor Permeable
L.	Section 07 46 00	Siding
M.	Division 08 00 00	Doors & Windows
N.	Section 09 22 00	Portland Cement Plaster (Stucco) & Gypsum Board
O.	Section 09 70 00	Wall Finishes/Acoustical Treatments
P.	Section 09 96 00	Textured Acrylic Finishes (TAFS)

1.06 ALTERNATES

A. Materials shall be only as specified in Paragraphs 1.02 & 2.02 as per Manufacturer specified in Paragraph 2.01. No alternate materials shall be accepted for this Section unless pre-approved by architect, ten (10) days prior to bid date. The cost of any changes in reinforcing details and/or architectural details that are necessitated by the selection of an alternate ICF system with varying dimensions (other than basis of design) shall be the sole responsibility of the contractor. Any alternate ICF system select for the project must comply with the performance specifications outlined within 03 11 19 Insulation Concrete Forms.

1.07 REFERENCES

A.	ACI 318	Building Code Requirements for Reinforced Concrete
B.	ACI 332	Guide to Residential Cast-in-Place Concrete Construction
C.	ASTM C236	Steady State Thermal Performance of Building Assemblies
D.	ASTM C473	Physical Testing of Gypsum Board Products & Gypsum Lath
E.	ASTM D1761	Mechanical Fasteners in Wood
F.	ASTM E84	Surface Burning Characteristics of Building Materials
G.	UBC 26-3	Uniform Building Code Standard Room Fire Test
H.	ASTM 2634	Flat Wall Insulating Concrete Form (ICF) Systems
I.	ASTM D4541	Standard Test Method for Pull-Off Strength of Coatings
J.	ASTM E2126	Standard Test Methods for Cyclic Load Test for Shear Resistance of Vertical Elements of the Lateral Force Resisting Systems for Buildings

1.08 DEFINITIONS

A. *EPS*- Acronym for “Expanded Polystyrene” when referencing the insulating foam component of the insulated concrete form.

B. *ICF*- Acronym for “Insulated Concrete Form”

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C. *ICF Alignment System*- a form alignment & scaffold system designed exclusively for use with insulated concrete forms.

D. *Trained Installer*- An installation contractor, who has received instructional training in the installation of insulated concrete forms.

E. *Technical Advisor*- A technical representative, usually a staff member of a ICF Manufacturer or Distribution Firm or ICF Installation Contractor, who has received instructional training in the installation of insulating forms (as administered by manufacture) and is in the capacity of supervising or providing technical assistance during the ICF installation process.

F. *Window or Door Opening Buck*- a pre-manufactured or site constructed frame assembly consisting of engineered wood, plastic or metal material (or combination thereof) used to

frame a rough opening within the forming system that will retain concrete around the opening. The frame can also provide for subsequent anchorage of doors and windows within the wall assembly.

1.09 SYSTEM DESCRIPTION / PERFORMANCE REQUIREMENTS

A. Insulated concrete wall forming system shall consist of 2 flame resistant panels of expanded polystyrene (*EPS*) connected by either high-density polypropylene hinged pin foldable webs or EPS embedded polystyrene fastening strips interconnected with slide in format - high density polypropylene web connectors.

B. Insulating concrete form system shall provide a minimum insulation panel thickness of 2 5/8-inches (66.7mm) throughout ALL forms and panels forming the form system product inventory (with exception of variance required for brick ledge, tapered top forms and wall areas requiring a one-sided ICF with exposed concrete finish on one face of wall).

C. All web fastening strips to run full height of form and be fitted top and bottom with reversible fitting, “triple-tooth” interlocking mechanisms to enable positive vertical interlocking of forms with each other. Wall system webs to provide min. 1 ½” (38mm) wide fastening strips @ 8” (200mm) o/c approximately 1/2” (13mm) below wall face for full wall height to facilitate finish fastening of both interior and exterior finishes.

D. Full height fastening strips also to be positioned within corner forms to provide capability of connecting finishes full height within 4” (100mm) or less of all corner conditions.

E. All form units shall be capable of being shipped to site in folded condition to minimize shipping cost and site storage space requirement and be capable of being deployed to installation ready condition by simply unfolding the unit in a single pull motion or pull motion combined with insertion of a single web (at corner condition).

F. EPS foam panels shall be molded with single socket 1” (25mm) wide reversible tooth interlocks positioned in pairs along top of all panels.

G. Wall system to provide min. 4”, 6”, 8”, 10” or 12” (100, 160, 200,250 or 300 mm) wall sections (as required) at all locations throughout wall area.

H. Wall system to provide accurate positioning of steel within form cavity to conform to reinforcing requirements of ACI 318.

I. *EPS* foam panels with concrete to provide min. insulation level of R 22.4 across full line of form unit cavity widths:

I. *EPS* foam to provide maximum vapor permeation of 3.5 Perm-in. (200 ng/Pa.s.m^2)/25mm

J. Finished wall assembly to provide min. rating of STC sound attenuation performance as follows:

   a. 4” (100mm) core form STC 45 (when installed without finish)
   b. 6” core and above - STC 50

1.10 SUBMITTALS

A. Submit relevant laboratory tests or data that validate product compliance with performance criteria specified prior to commencement of work under this Section.

B. Submit copy of manufacturer’s product installation manual

E. Submit copy of valid product ICC evaluation report to the applicable 2021 building code jurisdiction or as indicated by construction specifications Ref: ICC-ES ESR-2092

F. Submit 3rd party agency certification stating that product supplied meets the requirements of ASTM E2634.

G. Submit copy of current Underwriters Laboratories Inc (UL) listing for proposed ICF wall assembly Ref: BXUV.U930

H. Submit 3rd party agency certification stating that product supplied has been tested in accordance with ASTM E2126 to demonstrate ICF wall systems ability to resist in-plane dynamic seismic loading when designed as a concrete shear wall.

I. Submit copy of ICF installer qualification per Section 3.01 prior to commencement of work under this Section

J. Submit copy of Technical Advisor qualification per Section 1.11 prior to commencement of work under this Section.

K. Submit steel reinforcement shop drawings: Shop and placement plan, elevation drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement. Shop and placement drawings for all reinforcing steel and related accessories shall be submitted to the architect/engineer for review. Prior to submitting drawings for review, the Contractor shall thoroughly check all drawings for completeness and accuracy. Any additional cost that may arise due to errors on the shop and placement drawings is the sole responsibility of the Contractor.

L. General Contractor to coordinate and submit dimensioned shop drawings (Plans, elevations and sections) to show all ICF walls, openings, penetrations and structural embeds from associated trades. All associated trades are required to provide information to verify locations of openings, penetrations or structural embeds, etc. which may affect the execution of their scope of work.

1.11 QUALITY ASSURANCE

A. Contractor shall engage the services of a *Trained ICF Contractor* "*Installer* " for the duration of the work under this Section who has been trained in procedures pertaining to the correct installation of the specified ICF form system *ICF Installer* to show experience of successful completion of at least 3 projects similar to the proposed project in size, scope, and complexity as specified in Section 3.01 below.

B. The ICF manufacturer to assign a *Technical Advisor*, usually a staff member who has received instructional training in the installation of the ICF system forms (as administered by the ICF manufacturer used for the project) and is in the capacity of providing periodic technical assistance during the installation process. *Technical Advisor* to show experience of providing similar assistance for at least 3 projects similar to the proposed project in size, scope, and complexity as specified in Section 3.01 below. The *Technical Advisor* may be assigned by the ICF Install contractor, provided they can meet the requirements noted above.

C. *Trained ICF Contractor* "*Installer* " *and Technical Advisor* shall furnish proof of training documentation to Contractor prior to commencement of work under this Section.

D. The completed ICF surface shall be plane and plumb, and shall conform to the applicable tolerances specified in ACI 117. For wall sections with one sided ICF or one side of

exposed concrete finish, provide Class B finish per ACI 347. Note: For wall sections requiring concrete finish surface, no plastic webs, furring's or metal ties should visible at finish surface.

E. Variation of Linear Building Line: For position shown in plan and related portion of ICF walls, and partitions, do not exceed 1/2 inch in 20 feet (12 mm in 6 m), nor 3/4 inch in 40 feet (19 mm in 12 m) or more.

F. Variation in Cross-Sectional Dimensions: For thickness of ICF walls, from dimensions shown, do not exceed minus 1/4 inch (6 mm) nor plus 1/4 inch (6 mm).

G. Site Mock-up: If required, construct sample wall mock-up panel to include full wall system and details, located where directed by Consultant. Panel may form part of finished work if approved by Consultant.

H. *Trained ICF Contractor* "*Installer* " *and Technical Advisor* to meet with Contractor prior to material delivery on site to co-ordinate provision of access, storage area, and protection of ICF product and spatial requirements for form alignment placement steel storage & forming.

I. Submit a copy of the ICF concrete mix design.

1.12 DELIVERY STORAGE & HANDLING

A. Deliver products in original factory packaging, bearing identification of product, manufacturer and batch/lot number.

B. *Trained Installer* shall furnish product packaging labels to contractor as required to maintain traceability of product for duration of contract.

C. Handle and store products in location to prevent damaging and soiling.

D. Ensure that UV protection is provided for material, should on-site storage extend beyond 30 days.

1.13 PROJECT CONDITIONS

A. Use appropriate measures for protection and supplementary heating when required to ensure proper curing conditions in accordance with manufacturer's recommendations if installation is carried out during periods of weather where temperatures are below minimum specified by governing Building Code for concrete and masonry.

1.14 COORDINATION

A. Ensure those materials listed under Sub-Section 1.03 & 1.04 are provided to *Contract Installer* prior to commencement of work under this Section.

1.15 WARRANTY

A. Contact Manufacturer for supply of written copy of specific warranties of the product.

PART 2 PRODUCTS

2.01 MANUFACTURER

A Subject to compliance with requirements in this section and the basis of design, manufacturers offering products that may be considered to be incorporated in the Work are limited to the following:

1. **Basis of Design:** NUDURA (Tremco CPG Inc)
   Phone: (866) 468-6299 Fax: (705) 726-2110
   E-Mail: info@nudura.com Web Page: www.nudura.com

2. Amvic - www.amvicsystem.com
3. Logix – www.logixicf.com
4. Alternates as previously pre-approved by architect per Section 1.06

2.02 MATERIALS

A. Insulated Concrete Form units to be supplied through an authorized distributor.

B. Substitutes and alternates will per Section 1.06 above.

2.03 CONCRETE

A. Concrete supplied under Section 03 30 00 shall be of strength as specified by the design engineer (measured at 28 days). Recommended maximum aggregate size to be 1/2" (13mm) aggregate for 4" & 6" (100 & 160mm) cavity forms and, ¾" (19mm) aggregate for the 8" (200 mm) cavity forms and higher.

B. Recommended concrete slump is 6" +/- 1" (150mm +/- 25mm) (subject to design revision to suit application).

C. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures. Discharge (drop) height for concrete placement, shall not exceed 12 feet (3.9 m) with total placement height not exceeding 16 feet (4.8 m) per placement or less as may be limited by the allowable formwork design pressures. As soon as the first concrete placement has cured adequately. If concrete cannot be placed in a continuous pour, provide construction joints as approved by the Designer of Record. Consolidate placed concrete with mechanical vibrating equipment conforming to ACI 301.

2.04 REINFORCING STEEL

A. Reinforcing steel shall be as specified in Section 03 20 00 and shall be supplied under that Section for placement by the *Trained Installer*.

2.05 WALL ALIGNMENT SYSTEM

A. Form Alignment System:
1. The Trained Installer shall furnish and utilize the Wall Access and Form Alignment System (as supplied by the Manufacturer or approved equivalent) to facilitate construction of the wall assembly, and to provide adjustment for ensuring plumbness and straightness of the wall system during construction, just prior to concrete placement and immediately after concrete placement while form system is still adjustable to final finished position.
2. Form Alignment System shall be OSHA compliant. Technical Advisor shall supply engineering documentation pertaining to the "base" Form Alignment System components to verify compliance upon request.
3. For wall heights above 12 feet (3.6 m), the contractor shall provide scaffold engineering for Form Alignment System support or shall ensure this engineering is included by the engineer of record for support of the form system during construction.

(Note to Specifier: This specification contains guidance for substrate preparation for application of Fluid-Applied Air and Water-Resistive Membrane Barrier (AWRB), Sheet and Fluid Applied Waterproofing options. Coordinate relevant specification Sections within the Division 07 00 00 and as outlined herein below in Section 2.06 to 2.10. Coordinated performance tested specification of these materials and systems can be provide Tremco Construction Products Group (Tremco CPG Inc)

2.06 WATERPROOFING

A. Where specified, waterproofing shall be self-adhesive modified bituminous sheet waterproofing membrane as supplied by concrete form system manufacturer specific to the form system specified under this section. Material to be supplied under this Section & installed as specified under Section 07 13 52 (Modified Bituminous Sheet Waterproofing). Liquid Applied Membranes may be used provided manufacturer can provide warranty when used over ICF system, see Section 2.08 below.

B. Waterproofing and Sealant materials shall tested compatibility with *EPS* foam..

2.07 PARGING

A. Where called for on drawings, parging (stucco type) shall be Prep Coat B 2000 as supplied by NUDURA under this section and installed as specified under Section 09 22 00 (Portland Cement Plaster).

. B. Alternate EIFS supplied and installed under Section 07 24 00 (Exterior Finishing Systems).

2.08 FLUID-APPILED WEATHER/AIR BARRIER MEMBRANE

A. Where a fluid-applied air/water-resistive barrier (AWRB) is to be directly adhered to the ICF substrate, the EPS surface should be prepped per recommendations in section 2.09 below. Additionally, vertical and horizontal joints 1/16” or greater in the ICF surface should be filled level with surface using a compatible low expansion foam, slivers of EPS and/or joint sealant compatible with the EPS foam and as recommended by the AWRB manufacturer

All flashing, sealants and barrier membranes must provide compatibility and adhesion testing with the ICF system in accordance with ASTM D4541. Adhesion testing results must achieve a minimum of 16 PSI pull-off resistance in accordance with Air Barrier Association of America (ABAA) recommendations. Additional surface and joint preparation may be required in accordance with manufacturer’s or supplier’s recommendations

2.09 UV SURFACE PREPARATION

A. The expanded polystyrene (EPS) foam used in the manufacture of ICF systems will oxidize when exposed to prolong periods of ultra violet (UV) light, typically 60 to 120 days. The oxidization manifests on the exposed surface of the ICF form as a chalky dust film. It is recommended that the oxidized layer (chalky dust) remain undisturbed until just prior to the application of any direct applied materials or finish system. The EPS surface should be lightly brushed and washed (hosed down) with clean water to remove the oxidized layer. The EPS surface should be left to fully dry before application of any direct applied materials or finish system, e.g. fluid applied membranes, EIFS system or direct TAFS applications. Additional surface preparations such as but not limited to rasping the surface, may be required as recommended by the fluid applied membrane, EIFS system or direct TAFS supplier or manufacturer

2.10 TERMITE TREATMENT – FOAM BELOW GRADE

A. For ICF walls below grade, use ICF forms manufactured with termite resistant EPS, Preventol TM Preservative Insecticide ICC-ES ESR-2918 (500 ppm). The termite resistant forms should extend up form top of footing, to at least a min 6" above the concrete floor slab elevation.

PART 3 EXECUTION

3.01 INSTALLERS

A. Installer List:

1. Per Section 1.05 Submittals – Bid Submittal requirements, the installing contractor for this section shall be:

   a) An experienced ICF Contractor (*trained installer*) with minimum 3 years of experience in supervising at least 3 commercial ICF projects with gross wall areas over 40,000 ft^2 (3,761 m^2) or;

   b) A qualified mason~~ry~~ or traditional concrete forming contractor with minimum 5 years of experience in commercial construction applications. Contractor shall engage the services of a *Trained Installer* or *Technical Associate* for the duration of the work under this Section.

2. The installing contractor shall have demonstrated experience with supervising at least 3 commercial construction projects of with gross wall areas of 40,000 ft^2 (3,761 m^2) or greater. (Submit project name(s)/ location(s)).

3. Prior to commencement of ICF installation and associated work, conduct a meeting at project site with the General Contractor, ICF Installer, ICF Technical Advisor, and trades responsible for installing any associated works interfacing directly with the ICF wall assembly to ensure coordination across all trades.

3.02 EXAMINATION

A. Inspect all areas included in Scope of Work to establish extent of work and verify site access conditions.

3.03 SITE VERIFICATION OF CONDITIONS

A. Verify that site conditions are as set out in Part 1- General Conditions.

B. Examine footings installed under Section 03 30 00 are within +/-¼" (6mm) of level and that steps footing increments are 18" (457 mm) in height. Where partial or half course is intended for starting course elevation, ensure step footing increment is equal to cut form unit less ½" (13mm).

C. If specified, ensure reinforcing steel dowels are in place at specified centers along footing lengths.

3.04 PREPARATION

A. Clean all debris from top of footings prior to commencing work.

3.05 INSTALLATION

A. General contractor and ICF installation company shall develop and implement an Installation Quality Control Plan (QCP) based on the ICF manufacturer's recommended means and methods. The quality control plan (QCP) shall provide an outline for monitoring the Pre-Installation and Post-Installation process to ensure the work is performed in accordance with the drawings and specifications. The quality control plan shall include the pre-pour inspection check list (See Attachment A) to inspect erected formwork, reinforcement placement, door and window opening construction/locations, steel embed placement, and alignment and bracing systems. The quality control plan shall also include the post pour inspection check list (See Attachment B). The ICF installation company shall ensure that the cast-in-place concrete walls are level, plumb, square, and straight with all dimensions conforming to the drawings and within required tolerances. Notify the designer of record in writing of defective formwork within 7 working days of the date of ICF inspection. Include the fully initialed and signed pre-pour and post pour checklists as part of the appropriate QC Daily Reports.

B. The ICF Installation shall be in accordance with the ICF manufacturer's installation and technical manual or approved means and methods. Provide bracing and alignment system to ensure stability of ICF form unit. Anchor formwork to supporting surfaces to prevent upward or lateral movement of the ICF units during concrete placement. Place sleeves, inserts, anchors, ISF, and embedded items required for adjoining work or for support of adjoining work before concrete placement. Align fastener strips to facilitate interior and exterior wall finishes including control joints required in the gypsum board in accordance with Section 09 29 00 GYPSUM BOARD. Install concrete reinforcement according to the structural drawings at all walls, lintels, beams, and around openings. Install window and door bucks at each location where an opening is required. Install alignment bracing around the entire wall of the structure to ensure the ICF system is straight and plumb before and during concrete placement.

(a) First Course Placement
(b) Horizontal Reinforcement Placement
(c) Successive Course Placement
(d) Door & Window Opening Construction
(e) Form Alignment & Scaffolding Installation
(f) Vertical Reinforcement Placement
(g) Pre-Concrete Placement Inspection to QCP
(h) Concrete Placement
(i) Access & Form Alignment Assembly Removal

3.06 SERVICE PENETRATIONS

A. Service penetrations (e.g.- electrical service conduits, water service pipes, air supply and exhaust ducts etc.) shall be installed at the required locations as indicated by the appropriate trade.

B. Service penetrations exceeding 16” x 16” (400mm x 400mm) in area shall be reinforced.

C. Prior to concrete placement, install service penetration sleeves (supplied by others) at designated locations to create voids where services can be passed through at later date.

3.07 CLEANUP

A. Clean up and properly dispose of all debris remaining on job site related to the installation of the insulated concrete forms.

ATTACHMENT A

ICF Pre Pour Checklist

The following checklist shall be initialed and signed/dated, in order, by the following:
ICF Installation Company (ICF Sub),
Contractor's Quality Control System Manager (CQCSM),
Special Inspector as required by code

Concrete pours shall not begin until each item is initialed, AND each person has signed this checklist.

Checklist Item:	ICF Sub	CQC SM	Sp Insp
a. Have ICF walls been installed according to drawing dimensions and verified field survey marks?	_____	_____	_____
b. Has ICF alignment system and shoring been installed per accepted plan and manufactures recommendations?	_____	_____	_____
c. Has wall rebar been installed per construction drawings and specifications in all locations?	_____	_____	_____
d. Has lintel reinforcement been installed per construction drawings and specifications?	_____	_____	_____
e. Are all openings installed and in correct location?	_____	_____	_____
f. Are all rough openings level, plumb and of correct dimensions per construction documents?	_____	_____	_____
g. Has proper anchorage for buck material been used?	_____	_____	_____
h. Have construction joint forms and reinforcement been installed per agreed details?	_____	_____	_____
i. Have all service penetration sleeves been installed?	_____	_____	_____
j. Have all T junctions, pilasters or columns been shored or braced adequately?	_____	_____	_____
k. Have all beam pockets, steel embeds, or face plates been installed and locations verified?	_____	_____	_____
l. Have all string lines for wall line verification been installed around perimeter of building?	_____	_____	_____
m. Have walls been straightened?			
n. Have all corners and openings been verified for level and plumbness	_____	_____	_____
o. If applicable, has the Cold/Hot Weather Concreting Plan been accepted and followed?	_____	_____	_____
p. If no protection was provided, have measures been taken to remove all snow and ice from the forms?	_____	_____	_____
q. Confirm vibrators for internal concrete consolidation are correct size and length and are operational?	_____	_____	_____

r. Are there back up materials in case of blowout? (i.e. blow-out kits and screw gun available) _____ _____ _____

s. Ensure concrete ordered and delivered to site conforms to pre-approved mix design as specified. _____ _____ _____

t. Has the quantity of concrete been properly calculated and checked against the build? _____ _____ _____

u. Have concrete deliveries and interval timing for trucks been coordinated with concrete supplier? _____ _____ _____

v. Ensure concrete pump operator reviews site condition prior to day of pour and concrete placement plan. _____ _____ _____

w. Ensure concrete pump discharge line has been configured with proper reducers and flexible placement hose. _____ _____ _____

x. Ensure ICF Subcontractor has appropriate number of personnel onsite to manage concrete placement and has assigned crew members to manage post placement wall alignment and plumb checks. _____ _____ _____

_____ _____

ICF Installation Company Rep Date

_____ _____

Project CQCSM Date

_____ _____

Special Inspector Date

ATTACHMENT B

ICF Post Pour Checklist

The following checklist shall be initialed, in order, by the following.
ICF Installation Company (ICF Sub),
Contractor's Quality Control System Manager (CQCSM),
Special Inspector as required by code

Work covering or enclosing the ICF System on either side of the walls shall only occur after each item is initialed AND each person has signed this checklist.

Checklist Item:	ICF Sub	CQC SM	Sp Insp
a. Have all walls been properly consolidated?	_____	_____	_____
b. Ensure properly consolidated at all beam pockets steel embed or face plates.	_____	_____	_____
c. Ensure properly consolidated at locations of possible rebar congestions, i.e. lintels, pilasters, columns, etc.	_____	_____	_____
d. Check wall areas for possible voids by probe testing to depth gauge at possible rebar congestion locations.	_____	_____	_____
e. Have the walls been preliminarily straightened to plumb?	_____	_____	_____
f. For final pour, has the top of wall been screeded level?	_____	_____	_____
g. For wall continuing up, is all cold joint reinforcement in place with proper lap splice and top of concrete left rough?	_____	_____	_____
h. Ensure final fine adjustment of all walls been completed using installed string lines tape measure and laser level.	_____	_____	_____
i. Ensure all opening dimensions have been maintained, headers and sills are level and jambs are plumb.	_____	_____	_____
j. Ensure all wall areas are within planer tolerances.			
k. Confirm all structural embeds, face plates and beam pockets installed correctly, and location/elevation verified by surveyor.	_____	_____	_____
l. Cold weather pouring – has top of wall been protected from freezing i.e. Thermal blanket, etc.	_____	_____	_____
m. Has alignment system been cleaned of all excess concrete?	_____	_____	_____
n. Has all excess concrete been clear from job site area?	_____	_____	_____

_____ _____
ICF Installation Company Rep Date

_____ _____
Project CQCSM Date

_____ _____
Special Inspector Date

-- End of Section