TECHNICAL GUIDE
APPENDIX: CORE
The CORE is the temporary housing unit for the RAPIDO Demonstration Project. The CORE contains essential living facilities. Families will reside in their core until resources and time allow for expansion, at which point, homes will be added upon to accommodate long-term family needs and desires (referred to as the “expanded home”).

The RAPIDO CORE meets the following requirements:

- **Cost Effective**: the CORE is reused as part of the permanent housing solution reducing waste in funds and materials.
- **Size**: At 480 sq.ft., the CORE is compact enough to be placed in diverse homeowner sites but including enough space for everyday activities.
- **Ease of Construction and Assembly**: CORE panels are easy to construct making them ideal for disaster recovery. Each panel is built from lumber which can be managed by local labor.
- **Ease of Deployment**: The flat-pack design of the CORE allow contractors to deploy the CORE easily in a standard flatbed trailer.
- **Quality of Space**: Within its timeline, families will be living in the CORE for at least 4 months. The outdoor design of the CORE ease the interior crowdedness of temporary units and also provide a space for the family to gather.
- **Accessibility**: COREs will exceed visitability standards.
- **Quality of Space**: Families will be living in the CORE for at least 4 months. The outdoor design of the CORE ease the interior crowdedness of temporary units and also provide a space for the family to gather.
- **Expandability**: The CORE facilitates expansion, accommodating the families long term spatial needs and aesthetic preferences.
CORE FEATURES

SAFE HOUSE
Core built as "safe house" with extra rigid shear walls and connections should "aftershock" disaster occur while families are particularly vulnerable.

WALL ASSEMBLIES
Simple, repetitive assemblies use stick framing methods able to be constructed by local builders. Panels can be removed to accommodate wide variety of home designs.

ELECTRICAL
Electrical chases built into wall panels to ensure flexibility of core design. Families and contractors are able to modify at any point of addition.

WET WALL
Plumbing and majority of electrical components located in wet wall. Cabinets installed last to allow for final connections.

ELEVATED CONSTRUCTION
Elevated construction allows flexibility if flood plain elevations are revised post-disaster. Reduces environmental risk for families.
PRE-FAB - ASSEMBLE - EXPAND
The CORE design is flexible to adapt its outdoor design (porch space, storage space and ramp/stair) to the local context. The aesthetic preference of the residents will vary, depending on the economic resources available in the local jurisdiction prior the disaster. The materials used in the outdoor design should be durable and designed to be part of the CORE flat-pack. The outdoor space should be easy to remove to allow expansion construction.
The CORE furniture kit is part of the CORE’s flatpack and it remains as closets for the bedrooms of the CORE’s addition. The furniture kit allows for storage and an additional bed space.
CORE PRE-FAB & ASSEMBLY CONSTRUCTION DRAWINGS

COMPONENT SCHEDULE

WALL PANELS

EXCEPTION: MAKE ALL EXTERIOR WALL PANELS TO MEET R-15. FASTEN ALL OTHER PANELS TO BE FASTEN AT TOP HEAD SQUARE CROWN SCREW 1/2" LENGTH.

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>DESCRIPTION</th>
<th>WIDTH</th>
<th>HEIGHT</th>
<th>EXTERNAL WWRAP</th>
<th>WEIGHT</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>10&quot; 6# BC Plywood</td>
<td>4&quot; x 8&quot;</td>
<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>INSTALL 3D PANELS PER MANUFACTURER SPECIFICATIONS.</td>
</tr>
<tr>
<td>P2</td>
<td>6# BC Plywood</td>
<td>4&quot; x 8&quot;</td>
<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>FLOOR TO BE RIGHT PANEL.</td>
</tr>
<tr>
<td>P3</td>
<td>6# BC Plywood</td>
<td>4&quot; x 8&quot;</td>
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<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>INSTALL MEASURED TYPICAL ALL CAST IN THE FALLER.</td>
</tr>
<tr>
<td>P4</td>
<td>6# BC Plywood</td>
<td>4&quot; x 8&quot;</td>
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<tr>
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<td>INSTALL MEASURED TYPICAL ALL CAST IN THE FALLER.</td>
</tr>
<tr>
<td>P6</td>
<td>6# BC Plywood</td>
<td>4&quot; x 8&quot;</td>
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<td>INSTALL MEASURED TYPICAL ALL CAST IN THE FALLER.</td>
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<td>P8</td>
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<td>10.5&quot;</td>
<td>10.5&quot;</td>
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<tr>
<td>P9</td>
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<td>10.5&quot;</td>
<td>10.5&quot;</td>
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<tr>
<td>P10</td>
<td>6# BC Plywood</td>
<td>4&quot; x 8&quot;</td>
<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>INSTALL MEASURED TYPICAL ALL CAST IN THE FALLER.</td>
</tr>
</tbody>
</table>

FLOOR PANELS

1" X 8 TRIM BOARDS

STRAP OF ZIP WALL PANEL, REFER TO FRAME DRAWINGS.

CEILING PANELS

INCLINATION NOTE: PROVIDE WITH INCLINATION ALTERNATIVES (1% TO 6%).

<table>
<thead>
<tr>
<th>COMPONENT</th>
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<th>EXTERNAL WWRAP</th>
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<tbody>
<tr>
<td>C1</td>
<td>3 1/2&quot; W DECK TYPICAL</td>
<td>4&quot; x 8&quot;</td>
<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>INSTALL TO MEASURED TYPICAL ALL CAST IN THE FALLER.</td>
</tr>
<tr>
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<td>3 1/2&quot; W DECK TYPICAL</td>
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<td>10.5&quot;</td>
<td>10.5&quot;</td>
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<td>4&quot; x 8&quot;</td>
<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>INSTALL TO MEASURED TYPICAL ALL CAST IN THE FALLER.</td>
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<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>INSTALL TO MEASURED TYPICAL ALL CAST IN THE FALLER.</td>
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<td>C5</td>
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<td>10.5&quot;</td>
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<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>INSTALL TO MEASURED TYPICAL ALL CAST IN THE FALLER.</td>
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<td>3 1/2&quot; W DECK TYPICAL</td>
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<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>INSTALL TO MEASURED TYPICAL ALL CAST IN THE FALLER.</td>
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<tr>
<td>C8</td>
<td>3 1/2&quot; W DECK TYPICAL</td>
<td>4&quot; x 8&quot;</td>
<td>10.5&quot;</td>
<td>10.5&quot;</td>
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<td>INSTALL TO MEASURED TYPICAL ALL CAST IN THE FALLER.</td>
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<tr>
<td>C9</td>
<td>3 1/2&quot; W DECK TYPICAL</td>
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<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>INSTALL TO MEASURED TYPICAL ALL CAST IN THE FALLER.</td>
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<tr>
<td>C10</td>
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<td>10.5&quot;</td>
<td>10.5&quot;</td>
<td>INSTALL TO MEASURED TYPICAL ALL CAST IN THE FALLER.</td>
</tr>
</tbody>
</table>

FOUNDATION DRAWINGS

FOOTING TO BE FLOOR FRAMES. REFER TO FRAME DRAWINGS.

WINDOW SCHEDULE

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>DESCRIPTION</th>
<th>WIDTH</th>
<th>HEIGHT</th>
<th>NOTES</th>
</tr>
</thead>
</table>
| W1        | 2 1/2" 1" X 4" | 4" x 8" | 10.5" | 10.5" | ALL WINDOWS SHALL BE INSTALLED WITH 1" X 4" FIXED TYP.
| W2        | 2 1/2" 1" X 4" | 4" x 8" | 10.5" | 10.5" | ALL WINDOWS SHALL BE INSTALLED WITH 1" X 4" FIXED TYP.
| W3        | 2 1/2" 1" X 4" | 4" x 8" | 10.5" | 10.5" | ALL WINDOWS SHALL BE INSTALLED WITH 1" X 4" FIXED TYP.
| W4        | 2 1/2" 1" X 4" | 4" x 8" | 10.5" | 10.5" | ALL WINDOWS SHALL BE INSTALLED WITH 1" X 4" FIXED TYP.
| W5        | 2 1/2" 1" X 4" | 4" x 8" | 10.5" | 10.5" | ALL WINDOWS SHALL BE INSTALLED WITH 1" X 4" FIXED TYP.
| W6        | 2 1/2" 1" X 4" | 4" x 8" | 10.5" | 10.5" | ALL WINDOWS SHALL BE INSTALLED WITH 1" X 4" FIXED TYP.
| W7        | 2 1/2" 1" X 4" | 4" x 8" | 10.5" | 10.5" | ALL WINDOWS SHALL BE INSTALLED WITH 1" X 4" FIXED TYP.
| W8        | 2 1/2" 1" X 4" | 4" x 8" | 10.5" | 10.5" | ALL WINDOWS SHALL BE INSTALLED WITH 1" X 4" FIXED TYP.
| W9        | 2 1/2" 1" X 4" | 4" x 8" | 10.5" | 10.5" | ALL WINDOWS SHALL BE INSTALLED WITH 1" X 4" FIXED TYP.
| W10       | 2 1/2" 1" X 4" | 4" x 8" | 10.5" | 10.5" | ALL WINDOWS SHALL BE INSTALLED WITH 1" X 4" FIXED TYP.

STRUCTURAL DRAWINGS

FOUNDATION REFER TO STRUCTURAL.
04 R1 ASSEMBLY DIAGRAM

ADD BLOCKING WHERE SHEATHING JOINTS.

2X6 X 12

12’-0’

INSULATION TO MEET R-30

03 R1 FRAMING

PLAN/SECTION - 1' = 1"
1X12 TO BE ADDED ON-SITE

2X12 X 8" STAGGER JOINTS 4' FROM PANEL JOINTS, STAGGER NAULING PATTERN TOP AND BOTTOM TO CREATE CONTINUOUS (2) 2X12 RM JOIST

CAST IN PLACE CONCRETE PIERS

SEE TO STRUCTURAL FOR FOUNDATION DETAILS.

INSULATE CLAD PANELS

1/2" BC PLYWOOD FOR INTERIOR SHEATHING.

1/2" ZIP WALL PANEL INSTALLED PER MFG SPEC.

2X4 BOTTOM PLATE

(2) 2X12 GIRDERS, OUTER
2X12 INSTALLED ON SITE.

JOIST HANGER

2 X 12 JOISTS

TERMITE SHIELD TO EXTENDING
PAST CONCRETE PIER ON BOTH SIDES.

HETA 10 HURRICANE TIE DOWN @
EACH CONCRETE PIER, REFER TO
STRUCTURAL

CAST IN PLACE CONCRETE PIER,
REFER TO STRUCTURAL FOR REBAR
AND TIES DETAILS.

FOAM GASKET UNDER BOTTOM PLATE-SEAL
BOTTOM PLATE TO FLOOR WI CAULK, TYP.

INSULATION TO MEET R-30

01 FLOOR & FOUNDATION ASSEMBLY
01 ROOF PANELS ASSEMBLY

02 ROOF TO WALL CONNECTION SECTION

CUT 2½" WIDE STRIP OF ZIPWALL TO FILL GAP

2½" STRIP OF ZIP WALL TO FILL GAP LEFT BY WALL PANELS.

WALL PANELS EXTERIOR SHEATHING EXTEND 6" TO THE ROOF.
01 FINAL INSTALLATION [WATERPROOFING AND CORNERS]

INSTALL WINDOW UNIT PER MFG SPEC.

INSTALL HETA18 HURRICANE TIE DOWN AT EACH PIER AFTER INSTALLING ZIP SYSTEM TAPE. REFER TO STRUCTURAL.

02 LOW SLOPE ROLL ROOFING & CEILING PANEL SECTION

WATERPROOF ROOF WITH LOW SLOPE SELF ADHESIVE ROLL ROOFING

ZIP SYSTEM TAPE OR APPROVED EQUAL AND APPLY TO PANEL JOINTS 48" O.C.

PROVIDE W/ CONCEALED 2X8 DOUBLE JOIST HANGER FOR OUTDOOR DESIGN SUPPORT.

LAP JOINTS PER MANUFACTURER SPECS.
ELECTRICAL LEGEND

- **Z**: Security light, wall mounted
- **O**: Outlet
- **GFI**: Outlet, ground fault interrupter
- **V**: Bathroom vanity light, wall mounted
- **W**. **E**: Exhaust fan
- **AEP**: Electrical panel
- **LS**: Light switch
- **TV**: TV & phone connection
- **IN**: Hardwired audio smoke detector
- **A.C. UNIT**: A.C. window unit

ELECTRICAL SCHEDULE

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Qty</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>DF-5415-WH</td>
<td>3</td>
<td>LIGHTING 2 LIGHT WALL MOUNTED</td>
</tr>
<tr>
<td>V</td>
<td>PROGRESS LIGHTING</td>
<td>1</td>
<td>WALL MOUNTED, CENTERED OVER</td>
</tr>
<tr>
<td>EF</td>
<td>HAMPTON BAY</td>
<td>1</td>
<td>WALL MOUNTED, CENTERED OVER</td>
</tr>
<tr>
<td>SD</td>
<td>TBD</td>
<td>2</td>
<td>WHITE</td>
</tr>
<tr>
<td>WU</td>
<td>GE AEN100-AD</td>
<td>1</td>
<td>10,000 BTU ROOM AIR CONDITIONER</td>
</tr>
</tbody>
</table>

ELECTRICAL/LIGHTING NOTES

1. All work must comply with 2012 International Residential Code and all other applicable codes.
2. All electrical penetrations through wall bottom plate to be sealed with fire rated sealant.
3. Top of all switches to be located 48” above finish floor, U.N.O.
4. Bottom of all outlets to be located 15” above finish floor, U.N.O.
5. Outlets located near windows are to be centered under window openings.
6. Bottom of outlets located above kitchen cabinetry to be 42” above finish floor, U.N.O.
7. All light fixtures shall be fitted with compact fluorescent bulbs and shall be 100W equiv. per style bulbs.
8. All electrical fixtures shall be energy star rated.
9. Breakers in electrical panel to be located 48” above finish floor, U.N.O.
10. All outdoor outlets to be weatherproof.
FLOORS: Finish grade 3/4" plywood, sanded and finish with low V.O.C. water based polyurethane, light sand after last coat.

Walls & Ceilings: Sand and prime in 2 coats low V.O.C. commercial flat paint, refer to 42A for color application.

Color: 1 - on ceiling and from plywood joint to ceiling, color 2 - match floor from floor to plywood joint.

Trim: Mitre all corners, all trim to be finished to match floor, base trim to be 1x4 continuous solid wood base installed tight to finish floor, door trim to be 1x2 continuous solid wood, windows to have 1x4 painted sill.

Bathroom Walls: To be fiberglass bathtub/shower insert, seal all joints behind bathtub/shower insert and screw fasteners with redgard water proofing membrane or approved equal.

### PLUMBING FIXTURES

<table>
<thead>
<tr>
<th>Description</th>
<th>QTY</th>
<th>MFR</th>
<th>Model</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen Faucet</td>
<td>1</td>
<td>Glacier Bay</td>
<td>85487</td>
<td>Chrome, single handle wi spray, topmount</td>
</tr>
<tr>
<td>Kitchen Sink</td>
<td>1</td>
<td>Kohler Glostone</td>
<td>20278-8834-1</td>
<td>25&quot; x 22&quot; x 8&quot; 4-Hole, Drop In, Single Bowl, Stainless</td>
</tr>
<tr>
<td>Lavatory Faucet</td>
<td>1</td>
<td>Glacier Bay</td>
<td>72202C-B9101</td>
<td>Masqueau, Two Handle, 4 In Centerset, Chrome</td>
</tr>
<tr>
<td>Lavatory Sink</td>
<td>1</td>
<td>Glacier Bay</td>
<td>13-9013-404</td>
<td>18&quot;x36&quot; wall mount, rectangle shape, white</td>
</tr>
<tr>
<td>Toilet</td>
<td>1</td>
<td>Kohler</td>
<td>K2316</td>
<td>Dual flush, elongated seat, white vitreous china</td>
</tr>
<tr>
<td>Bathtub</td>
<td>1</td>
<td>Bozicek Industries</td>
<td>Alpha 911-2304</td>
<td>White, right hand</td>
</tr>
<tr>
<td>Tub/Shower Faucet</td>
<td>1</td>
<td>Delta</td>
<td>T19887-CULB</td>
<td>Chrome</td>
</tr>
<tr>
<td>Showerhead</td>
<td>1</td>
<td>Kohler</td>
<td>P85-423</td>
<td>Chrome</td>
</tr>
<tr>
<td>Water Heater</td>
<td>1</td>
<td>TBD</td>
<td>TBD</td>
<td>Energy factor to be 0.54, capacity: 10 gal.</td>
</tr>
</tbody>
</table>

* ALL PLUMBING FIXTURES SHALL BE EPA WATERSENSE CERTIFIED OR BETTER. TOILETS 1.6 GPF, SHOWER HEADS 2.0 GPM, KITCHEN FAUCET 2.2 GPM.

### BATH FIXTURES

<table>
<thead>
<tr>
<th>Description</th>
<th>QTY</th>
<th>MFR</th>
<th>Model</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet Tissue Holder</td>
<td>1</td>
<td>Muir</td>
<td>IPISO</td>
<td>Chrome</td>
</tr>
<tr>
<td>Bath Towel Holder</td>
<td>1</td>
<td>Franklin Brass</td>
<td>02424RC</td>
<td>Teflon, chrome, 24&quot;, install 48&quot; A.F.F.</td>
</tr>
<tr>
<td>Shower Rod</td>
<td>1</td>
<td>Franklin Brass</td>
<td>336</td>
<td>60&quot;, Chrome</td>
</tr>
</tbody>
</table>

INSTALL Rough-in Plumbing in wetwall panel prior arriving to site, provide with manifold for plumbing distribution.

**APPENDIX - CORE**

**01 PLUMBING FIXTURES PLAN**

**02 BATHROOM INTERIOR ELEVATIONS**
CORE: focus group results

CORE ACTIVITIES
Based on community input from five workshops conducted in Cameron County, Texas, the following activities have been identified as being essential to the home after a disaster. In descending order, beginning with the activity that was the most frequently selected, activities are: eat, sleep, wash, toilet, cook, shower, gather, laundry, and work (dance, grill, party, garden, and study were also provided options but were not selected). These nine critical activities, as identified by residents, will be accommodated within the home’s initial core and will be deployed immediately after a disaster occurs.

ORGANIZATION OF CORE
Within the core, different activities require access to different resources. Grouping activities that require similar resources together, creates areas that are spatially efficient, cost less to build, and are faster to construct. The nine core activities can be divided into the following three resource categories: no resources required, water source required, or water and heat sources required. These categories break down as follows:

1. No resources required (therefore the easiest activities to relocate): eat, sleep, gather, work
2. Water source required (therefore the activities that cannot be easily relocated): wash, toilet, shower, laundry
3. Water and heat sources required (therefore the activities that are the hardest to relocate): cook

Overlapping spatial activity patterns within the home (as dictated by feedback from community workshops in which residents were asked to locate activities within their ideal home) and within each category, reveals trends in activity adjacencies and location. Each of the three categories above have strong spatial associations:

1. No resources required: these activities tend to take place evenly throughout the home yet are most concentrated around the home’s edges.
2. Water source required: these activities are most frequently located within the back two corners of the home.
3. Water and heat sources required: these activities predominantly take place along the home’s two sides.

The general organization of interior spaces will adhere to these layout patterns.

CORE EXPANSION
The most ‘permanent’ of the nine core activities, those that require access to water and/or heat, will be deployed within the core and will be designed and placed as permanent fixtures within the home. Home expansion will take place around the core as additional activities are added, based on the family’s needs and individual design consultation. The location and program of these spaces will be derived from resident input.

Design Intentions

1| SOCIAL
This project should contribute to families’ well-being by creating a living environment that accommodates the needs of residents; taking into consideration family structure, social patterns, and community interactions. This project should also contribute positively to its surroundings and neighborhood by adapting to various site conditions and connect to the existing neighborhood.

2| ECONOMIC
This project should enable families to incrementally improve and expand upon their living conditions as resources and time permit. The design should be affordable for those within the lowest income bracket.

3| ENVIRONMENTAL
This project should achieve a high degree of environmental sustainability with an emphasis on the health of its inhabitants and the success of local ecosystems.

4| DURABILITY
This project should increase a neighborhood’s sense of security by providing housing that exceeds local code requirements and is durable enough to withstand future natural disasters with minimal damage.
Sizing Program

ALL THREE SPECIFICATIONS - FEMA, HUD | IRC, AND CDCB COLONIAS TYPICAL CONSTRUCTION - ARE SIZED TO SLEEP A FAMILY OF FOUR ADULTS. SPATIAL BREAK-DOWNS ARE BASED ON THE CORE PROGRAM'S NEED TO ACCESS THE SPECIFIC RESOURCES BELOW.

ACCESS TO RESOURCES

1. NO RESOURCES REQUIRED: EAT, SLEEP, GATHER, WORK  
   DINING ROOM, BEDROOM, LIVING ROOM

2. WATER SOURCE REQUIRED: WASH, TOILET, SHOWER, LAUNDRY  
   BATHROOM

3. WATER AND HEAT SOURCES REQUIRED: COOK  
   KITCHEN

FEMA MINIMUM REQUIREMENTS

1) EAT | SLEEP | GATHER | WORK

<table>
<thead>
<tr>
<th>OBJECTS</th>
<th>SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>BED SPACE: 1: 1 FULL BED</td>
<td>28SF</td>
</tr>
<tr>
<td>BED SPACE: 2: 1 FULL SLEEPER-SOFA</td>
<td>28SF</td>
</tr>
<tr>
<td>TABLE SPACE: TABLE FOR FOUR</td>
<td>12SF</td>
</tr>
</tbody>
</table>

ASSOCIATED SPACES

BEDROOM: SLEEPS 2
LIVING AREA: SLEEPS 2

2) WASH | TOILET | SHOWER | LAUNDRY

<table>
<thead>
<tr>
<th>OBJECTS</th>
<th>SF</th>
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<tbody>
<tr>
<td>SINK: WALL SUPPORTED 13&quot;X13&quot;</td>
<td>1SF</td>
</tr>
<tr>
<td>TOILET: RESIDENTIAL NO HOLDING TANK</td>
<td>3.5SF</td>
</tr>
<tr>
<td>SHOWER: TRANSFER SHOWER 36&quot;X36&quot;</td>
<td>9SF</td>
</tr>
<tr>
<td>BATHTUB: NOT REQUIRED</td>
<td>--</td>
</tr>
<tr>
<td>LAUNDRY: NOT REQUIRED</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OBJECTS</th>
<th>SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>sink: yes</td>
<td>1SF</td>
</tr>
<tr>
<td>toilet: residential</td>
<td>3.5SF</td>
</tr>
<tr>
<td>shower: transfer shower 30&quot;X30&quot;</td>
<td>9SF</td>
</tr>
<tr>
<td>bathtub: not required</td>
<td>--</td>
</tr>
<tr>
<td>laundry: washer and dryer</td>
<td>18SF</td>
</tr>
</tbody>
</table>

3) COOK

<table>
<thead>
<tr>
<th>OBJECTS</th>
<th>SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOK TOP: ELECTRIC 2-BURNER 12&quot;X20&quot;</td>
<td>1.5SF</td>
</tr>
<tr>
<td>REFRIGERATOR: 14CU RESIDENTIAL 28&quot;X32&quot;</td>
<td>6SF</td>
</tr>
<tr>
<td>SINK: NOT REQUIRED</td>
<td>--</td>
</tr>
<tr>
<td>MICROWAVE: 1.2CU 9&quot;X15&quot;</td>
<td>1.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OBJECTS</th>
<th>SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>cook top and oven: 4-burner 29&quot;X36&quot;</td>
<td>7SF</td>
</tr>
<tr>
<td>refrigerator: 14cu 28&quot;X32&quot;</td>
<td>6SF</td>
</tr>
<tr>
<td>sink: double bowl 33&quot;X22&quot;</td>
<td>5SF</td>
</tr>
<tr>
<td>microwave: not required</td>
<td>--</td>
</tr>
</tbody>
</table>

TOTAL

<table>
<thead>
<tr>
<th>SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>240SF</td>
</tr>
</tbody>
</table>

864SF

IRC**

FINAL HOMES (RFP)

2 BEDROOM/1-2 BATH: 1,000-1,330SF
3 BEDROOM/1-2 BATH: 1,331-1,425SF
4 BEDROOM/2 BATH: 1,426-1,500SF

IRC**

R304.1 MINIMUM AREA: EVERY DWELLING UNIT SHALL HAVE AT LEAST ONE HABITABLE ROOM THAT SHALL HAVE NOT LESS THAN 120SF OF GROSS FLOOR AREA.
R304.2 OTHER ROOMS: OTHER HABITABLE ROOMS SHALL HAVE A FLOOR OF NOT LESS THAN 70SF (EXCEPTION KITCHEN)
R304.3 MINIMUM DIMENSIONS: HABITABLE ROOMS SHALL NOT BE LESS THAN 7FT IN ANY HORIZONTAL DIMENSION (EXCEPTION KITCHEN)
Activity

Community members were asked to place activities on a lot representative of their ‘ideal new home’s layout’. Residents were given 17 activities commonly performed around the house and were instructed to add additional activities that are pertinent to their family’s lifestyle. While placing activities, people thought about activity adjacencies, position within lot, position within home, the number of people who engage in each action, and issues of privacy.

This activity took approximately 25 minutes. This included time to discuss activity placement and priorities.

Activities provided (most to least used):

- **Sleep|Dormir**
- **Eat|Comer**
- **Gather|Reunion**
- **Garden|Jardin**
- **Shower|Banar**
- **Cook|Cocinar**
- **Play|Jugar**
- **Relax|Relajar**
- **Party|Fiesta**
- **Wash|Banar**
- **Cook|Cocinar**
- **Pray|Rezar**
- **Work|Trabajar**

Activity placement diagram:

- **Inside**
  - Center: 100|0%
  - Back: 0|100%
  - Side: 0|100%
  - Front: 0|100%

- **Outside**
  - Back: 96|4%
  - Side: 92|8%
  - Front: 84|16%

Activity placement frequency:

- 0 - 20%
- 20 - 40%
- 40 - 60%
- 60 - 80%
- 80 - 100%
- 100%

- **Sleep|Dormir**: 100|0%
- **Eat|Comer**: 100|0%
- **Gather|Reunion**: 63|37%
- **Garden|Jardin**: 0|100%
- **Shower|Banar**: 0|100%
- **Cook|Cocinar**: 0|90%
- **Play|Jugar**: 0|100%
- **Relax|Relajar**: 96|4%
- **Party|Fiesta**: 9|91%
- **Wash|Banar**: 92|8%
- **Cook|Cocinar**: 97|3%
- **Pray|Rezar**: 96|4%
- **Work|Trabajar**: 84|16%

- **Most Commonly Referenced as the Most Private Activity within the Home**: 100|0%
- **Most Public Indoor and Outdoor Activity. Neighbors Gather Across Yards**: 0|100%
- **Second Most Private Activity. Private Areas Tend to Occur Along Back and Side of Homes**: 0|100%
- **Play Typically Occurs in the Back, as Far From Street Traffic as Possible. Safety Concerns**: 0|100%
- **Most Important Activity within the Home**: 96|4%
- **Large Gatherings Are Accommodated in Either the Front or Back Yard**: 92|8%
- **Most Commonly Referenced as the Activity That People Spend the Most Time Doing at Home**: 97|3%
- **Occurs Throughout the Home, Praying Is Not Location Based**: 84|16%
### Activities Added by Community (Most to Least Used)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Inside</th>
<th>Outside</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dance/Bailar</strong></td>
<td>100</td>
<td>0</td>
<td>LARGE GATHERINGS ARE ACCOMMODATED IN EITHER THE FRONT OR BACK YARD.</td>
</tr>
<tr>
<td><strong>Study/Estudiar</strong></td>
<td>94</td>
<td>6%</td>
<td>READING ISN'T TIED TO A SPECIFIC LOCATION. IT TAKES PLACE IN BOTH PUBLIC AND PRIVATE AREAS.</td>
</tr>
<tr>
<td><strong>Read/Leer</strong></td>
<td>100</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td><strong>Work/Trabajar</strong></td>
<td>6</td>
<td>94%</td>
<td></td>
</tr>
</tbody>
</table>

| Porch/Portico | 5 | 95% | COMMONLY REFERRED TO AS A CARPORT OR ANY EXTERIOR SPACE THAT HAS A SHADING STRUCTURE |
| Wash/Lavadero | 64 | 36% | OCCURS BOTH INDOORS AND OUTDOORS. LAUNDRY IS PREFERRED TO BE CLOSE TO CLOTHES LINE. |
| Garage/Garaje | 0 | 100% | GARAGE MAY HOUSE A CAR OR SERVE AS ADDITIONAL CLOSED IN LIVING SPACE. |
| Drive/Entrada | 0 | 100% | ACCESS TO HOME IS IMPORTANT. HANDICAPPED ACCESSIBILITY IS A PRIORITY FOR SOME. |
| Shed/Cobertizo | 33 | 67% |                                                                      |
| Weight/Gimnasia | 100 | 0% |                                                                      |
| TV/Television | 100 | 0% |                                                                      |
| Deck/Cubierta | 0 | 100% |                                                                      |
| Spa/Balneario | 100 | 0% |                                                                      |
| Bar/Cantina | 100 | 0% |                                                                      |
| Sew/Coser | 100 | 0% |                                                                      |
| Storage/Almace | 80 | 20% |                                                                      |
Activity

Community members were asked to place activities on a lot representative of their ideal new home’s layout. Residents were given 17 activities commonly performed around the house and were instructed to add additional activities that are pertinent to their family’s lifestyle. While placing activities, people thought about activity adjacencies, position within lot, position within home, the number of people who engage in each action, and issues of privacy.

This activity took approximately 25 minutes. This included time to discuss activity placement and priorities.

Board Games
Survey

Community members were asked survey questions in relation to demographic information and their expectations in the case of a natural disaster.

**Demographic Information**

**People in Family**
- 1 - 5 People: 12 | 31 Participants
- 6 - 10 People: 4 | 31 Participants
- 11 - 20 People: 15 | 31 Participants

**People Who Live in Home**
- 1 - 3 People: 17 | 31 Participants
- 4 - 8 People: 14 | 31 Participants
- 9 - 12 People: 0 | 31 Participants

**Children Who Live in Home**
- 0 - 2 Children: 23 | 31 Participants
- 3 - 6 Children: 7 | 31 Participants
- 7 - 10 Children: 1 | 31 Participants

**Natural Disaster Event**

In the event of a natural disaster, how long would you expect to be displaced for?
- 1 - 8 Weeks: 26 | 33 Participants
- 2 - 6 Months: 3 | 33 Participants
- 6+ Months: 4 | 33 Participants

**After a disaster occurs, what are the three functions that are most essential to your home life?**

1. Sleep
2. Eat
3. Wash
4. Work
5. Shower
6. Gather
7. Repair
8. Modo
9. Cook
10. Toilet
11. Lost

**People Who Live in Home**
- 1 - 5 People: 12 | 31 Participants
- 6 - 10 People: 4 | 31 Participants
- 11 - 20 People: 15 | 31 Participants

**Children Who Live in Home**
- 0 - 2 Children: 23 | 31 Participants
- 3 - 6 Children: 7 | 31 Participants
- 7 - 10 Children: 1 | 31 Participants
**Transportation Weight Limits**

**PERSONAL TRUCK + TRAILER CARRYING CAPACITY**

<table>
<thead>
<tr>
<th>Type</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pickup Truck</td>
<td>10,000 LBS</td>
</tr>
<tr>
<td>Pickup Truck Towing Capacity</td>
<td>30,000 LBS</td>
</tr>
<tr>
<td>Bumper Pull Trailer</td>
<td>12,000 LBS</td>
</tr>
<tr>
<td>Goose Neck Trailer</td>
<td>30,000 LBS</td>
</tr>
<tr>
<td>Fifth Wheel Trailer</td>
<td>30,000 LBS</td>
</tr>
<tr>
<td>Bumper Pull Tilt Bed Trailer</td>
<td>5,000 LBS +</td>
</tr>
</tbody>
</table>

**PERSONAL TRAILER SIZES**

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bumper Pull</td>
<td>Up to 40' long</td>
</tr>
<tr>
<td>Goose Neck</td>
<td>Up to 40' long</td>
</tr>
<tr>
<td>Fifth Wheel</td>
<td>Up to 40' long</td>
</tr>
<tr>
<td>Tilt Bed Trailer</td>
<td>Up to 40' long</td>
</tr>
</tbody>
</table>

**SEMI TRUCK + TRAILER CARRYING CAPACITY**

<table>
<thead>
<tr>
<th>Type</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform Flatbed</td>
<td>N/A</td>
</tr>
<tr>
<td>Drop Deck Flatbed</td>
<td>N/A</td>
</tr>
<tr>
<td>Flatbed w/Moffett</td>
<td>5500 LB FORK LIMIT</td>
</tr>
</tbody>
</table>

**SEMI TRAILER DIMENSIONS**

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform Flatbed</td>
<td>48’ X 102” STANDARD</td>
</tr>
<tr>
<td>Drop Deck Flatbed</td>
<td>48’ X 102”</td>
</tr>
<tr>
<td>Flatbed w/Moffett</td>
<td>45’ X 102”</td>
</tr>
</tbody>
</table>

**FORKLIFT CARRYING CAPACITY**

* Weight is not much of an issue; depending on size can handle up to 160,000 LBS
* Fork must extend past halfway point in lifting load
* 96”-144” forks available
* Machinery boom available – lift from above
* 26” vertical lift
* 12-14” horizontal extension
* Require flat hard pack surface or will get stuck, not good on bare earth
* Require one operator and one person to guide
## DOT Size + Weight Restrictions

### MAXIMUM WIDTH LIMITS
- **INTERSTATE**: 16’ EXCEPT FOR MANUF. HOUSING
- **WITHOUT A ROUTE AND TRAFFIC STUDY AND CERTIFICATION**: 20’
- **MANUFACTURED HOUSING**: NO LIMIT

* ONE ESCOURT REQUIRED FOR LOADS BETWEEN 14’ AND 16’; TWO ESCOURTS REQUIRED FOR LOADS EXCEEDING 16’

### MAXIMUM HEIGHT LIMITS
- **LEGAL HEIGHT LIMIT**: 14’
- **WITHOUT A ROUTE AND TRAFFIC STUDY AND CERTIFICATION**: < 19’

* ESCOURT REQUIRED FOR LOADS EXCEEDING 17’ IN HEIGHT

### MAXIMUM LENGTH LIMITS
- **TRUCK OR SINGLE VEHICLE**: 45’
- **TRUCK AND TRAILER**: 65’
- **SEMI + TRAILER WITHOUT ROUTE AND TRAFFIC STUDY AND CERTIFICATION**: 125’
- **SEMI MAXIMUM OVERALL LENGTH**: 180’

*ONE ESCOURT REQUIRED FOR LOADS BETWEEN 110’ AND 125’; TWO ESCOURTS REQUIRED FOR LOADS EXCEEDING 125’

### MAXIMUM WEIGHT LIMITS
- **PER AXLE**: 20,000 LBS
- **GROSS WEIGHT**: 80,000 LBS
Comparison of Overall Sizes of Varying Temporary Housing Solutions

Data: ABT Associates 2009c

Graphic: GCCDS, edited by bcWORKSHOP
Precedent Studies

Flat-Pack Construction
- Units are easy to construct, by unskilled labor, making them ideal solutions for disaster recovery
- Units are easy to move, expand, or repair
- Exterior frame can be built in 3.5 hours
- Most flat-packs can be delivered on one trailer
- Most are configurable to any site
- Menu of components
- Configuration options

EVALUATION CRITERIA | LOW | HIGH | RECOMMENDATIONS
--- | --- | --- | ---
EASE OF CONSTRUCTION | | ★★★ | *meets all criteria, with more than half on the mid-high spectrum
SPEED OF CONSTRUCTION | | ★★★ |
EASE OF TRANSPORT | | | ★★★
OFF-SITE LABOR REQUIREMENTS | | | ★★★
LOCAL LABOR REQUIREMENTS | | | ★★★
EASE OF FUTURE ADAPTABILITY | | | ★★★
USE OF LOCAL BUILDING MATERIALS | | | ★★★
USE OF AVAILABLE MATERIALS POST-DISASTER | | | ★★★
CONSISTANCE WITH LOCAL BUILDING PRACTICES | | | ★★★
ABILITY TO RELOCATE | | | ★★★
PREDICTED COST | | | ★★★

Modular Construction, kit of parts
- Affordable, easy to build, and highly customizable
- Units can be built individually, or combine modules to create larger spaces
- Domestic shipping is relatively inexpensive
- Modules are manufactured in bulk, reducing cost price
- Most are configurable to any site
- Configuration options

EVALUATION CRITERIA | LOW | HIGH | RECOMMENDATIONS
--- | --- | --- | ---
EASE OF CONSTRUCTION | | ★★★ | *meets all criteria, with more than half on the mid-high spectrum
SPEED OF CONSTRUCTION | | ★★★ |
EASE OF TRANSPORT | | | ★★★
OFF-SITE LABOR REQUIREMENTS | | | ★★★
LOCAL LABOR REQUIREMENTS | | | ★★★
EASE OF FUTURE ADAPTABILITY | | | ★★★
USE OF LOCAL BUILDING MATERIALS | | | ★★★
USE OF AVAILABLE MATERIALS POST-DISASTER | | | ★★★
CONSISTANCE WITH LOCAL BUILDING PRACTICES | | | ★★★
ABILITY TO RELOCATE | | | ★★★
PREDICTED COST | | | ★★★
Mobile Construction
- Self sustaining housing solutions
- Can be instaled in hours
- Requires minimal crew, tools, or skills
- Rapid on-demand deployment
- Most are configurable to any site
- Fully transportable

**EASE OF CONSTRUCTION**
- Low
- High

**SPEED OF CONSTRUCTION**
- Low
- High

**EASE OF TRANSPORT**
- Low
- High

**OFF-SITE LABOR REQUIREMENTS**
- Low
- High

**LOCAL LABOR REQUIREMENTS**
- Low
- High

**EASE OF FUTURE ADAPTABILITY**
- Low
- High

**USE OF LOCAL BUILDING MATERIALS**
- Low
- High

**CONSISTANCE WITH LOCAL BUILDING PRACTICES**
- Low
- High

**ABILITY TO RELOCATE**
- Low
- High

**PREDICTED COST**
- Low
- High

**RECOMMENDATIONS**
- *meets all criteria, with more than half on the mid-high spectrum
- *large increase in local labor, and use of local materials
- *very low off-site labor required
- *very low chance of re-locating

On-Site Construction
- Less chances of construction happening in a controlled environment
- Can take 2-3 months to complete construction
- Requires high percentage of use of local materials
- Decrease in transportation costs

**EASE OF CONSTRUCTION**
- Low
- High

**SPEED OF CONSTRUCTION**
- Low
- High

**EASE OF TRANSPORT**
- Low
- High

**OFF-SITE LABOR REQUIREMENTS**
- Low
- High

**LOCAL LABOR REQUIREMENTS**
- Low
- High

**EASE OF FUTURE ADAPTABILITY**
- Low
- High

**USE OF LOCAL BUILDING MATERIALS**
- Low
- High

**CONSISTANCE WITH LOCAL BUILDING PRACTICES**
- Low
- High

**ABILITY TO RELOCATE**
- Low
- High

**PREDICTED COST**
- Low
- High

**RECOMMENDATIONS**
- *meets all criteria, with more than half on the mid-high spectrum
- *large increase in local labor, and use of local materials
- *very low off-site labor required
- *very low chance of re-locating

---

APPENDIX - CORE