— BY DESIGN —

The Architect's Smart Home Pre-Wire Checklist

A room-by-room infrastructure planning guide
for architects, interior designers, and general contractors.

80+ verification items across 10 building systems.
Specify before drywall. Eliminate change orders.

TECHNOLOGY BY DESIGN
New York City · Philadelphia · Palm Beach · Miami
technologybydesign.net · (215) 631-2229

Why This Checklist Exists

The most expensive words in construction are **"we'll figure it out after drywall."** In our experience engineering technology systems for luxury residences, the vast majority of smart home failures trace back to infrastructure decisions that were made too late — or not at all.

This checklist provides 80+ verification items across 10 building systems, organized so each system fits on a single page for easy reference in the field. Walk through each section during pre-construction coordination. Check off items as confirmed. Flag items requiring RFIs. Share completed pages with your integrator, electrician, and low-voltage contractor.

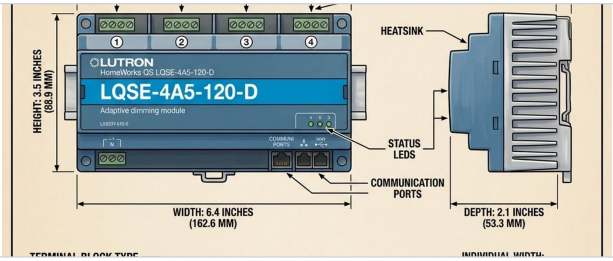
Luxury residential — gated entry with integrated lighting and security

SYSTEM	PAGE
01 Structured Cabling Infrastructure	3
02 Lighting Control Systems	4
03 Motorized Shading	5
04 Audio & Video Distribution	6
05 Security Cameras	7
06 Door Access & Intercom	8
07 WiFi & Network Infrastructure	9
08 Pool, Spa & Irrigation	10
09 Trade Coordination Checkpoints	11
10 Pre-Drywall Verification	12

MARKING LEGEND

■ = Not yet confirmed	■ = Confirmed in drawings
■ = Requires RFI or design input	● = Not applicable to this project

01 STRUCTURED CABLING INFRASTRUCTURE



MDF / Main Equipment Room

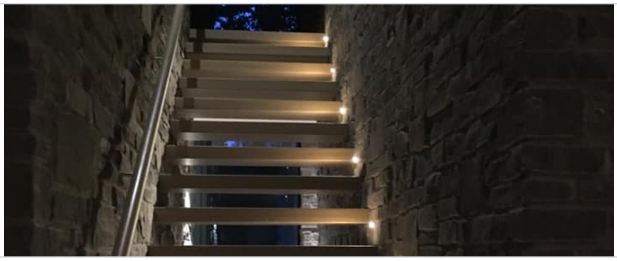
- Dedicated room or closet — minimum 6'×8' clear floor area
- Minimum two dedicated 20A circuits (NEMA 5-20R) for equipment power
- HVAC supply and return — active cooling required (target 68–72°F)
- ¾" AC plywood backboard on all usable walls (fire-rated where required)
- Overhead cable tray or ladder rack (12" min. width) — pathway planned
- Conduit pathways from MDF to all IDF locations — sized and routed
- Grounding bus bar per NEC Article 250 / TIA-607-C
- Lockable door — 36" clear width minimum for rack delivery

Home Runs & Specifications

- Cat6a plenum-rated (CMP) specified for all data/network runs
- Dedicated Cat6a home run from every outlet to MDF/IDF patch panel
- Minimum 2× Cat6a per bedroom, 4× per office/den, 6× per media room
- Fiber optic pathway for detached structures (pool house, guest house)
- Speaker wire: 14/2 CL2 minimum for distributed, 12/2 for subwoofers
- QS Link control bus cabling specified (Cat6a for Lutron HomeWorks QSX)
- All cable rated CL2/CL3 or CMP per code — no exceptions

> **PRO TIP**
> Locate the MDF on the same level as primary living spaces. Basements work but add vertical pathway costs. Avoid garages — temperature and humidity are uncontrolled.

02 LIGHTING CONTROL SYSTEMS



Panel & Processor Locations

- Lutron HomeWorks QSX or RadioRA 3 processor location confirmed
- Lighting panel locations identified (MDF, electrical room, or distributed)
- Panel count verified against total dimming/switching load count
- Dedicated 20A circuit for each lighting panel (one per panel minimum)
- QS Link bus cabling routed between all panels and processor
- Panel clearances per NEC: 36" front, 30" width, 78" headroom

Keypads & Devices

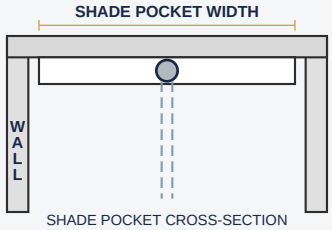
- Keypad locations marked on electrical plans (rooms, hallways, entries)
- Style and finish selected (Palladiom, Alisse, seeTouch, Horizon)
- Gang count confirmed per location — flush-mount housing specified
- Backbox depth verified for flush-mount (2.5"–3.5" typical)
- Custom engraving schedule prepared for all keypads
- Occupancy/vacancy sensor locations identified

Dimming Compatibility

- Fixture schedule reviewed for protocol (ELV, 0-10V, DALI, forward phase)
- LED driver compatibility confirmed with dimming module type
- Non-dim loads assigned to switched outputs
- Low-voltage power supply locations coordinated

> **PRO TIP**
> Request cut sheets for every fixture before finalizing the dimming schedule. No cut sheet = no protocol assignment = no panel order. Missing specs are the #1 cause of panel redesign.

03 MOTORIZED SHADING



SHADE POCKET CROSS-SECTION

Shade Pockets & Framing

- ■ Window schedule complete with exact rough opening dimensions (W × H)
- ■ Pocket/fascia depth confirmed (4" min. single roller, 8" min. dual)
- ■ Motor-side clearance verified (motors add 2"–3" beyond roller tube)
- ■ Ceiling/soffit blocking installed for recessed pockets
- ■ Inside-mount vs. outside-mount confirmed per window

Power & Control

- ■ Motor power type decided per location: hardwired vs. battery vs. PoE
- ■ 120V outlet or J-box in each shade pocket for hardwired motors
- ■ Low-voltage control wire (Cat5e/Cat6) from motor to panel/processor
- ■ Integration method confirmed (QS Link, RS-485, dry contact, IP)

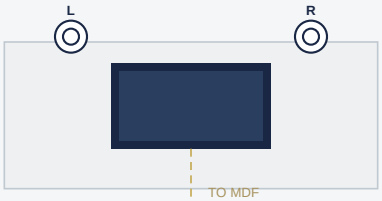
Fabric & Grouping

- ■ Shade fabric type specified per room (solar screen, blackout, sheer)
- ■ Coupled shade groups identified (large glass walls, corner windows)
- ■ Shade band specifications confirmed per interior design intent
- ■ Exterior wind/sun sensor requirements identified

PRO TIP

Coordinate pocket dimensions with the millwork contractor early. A pocket ½" too shallow requires a complete fascia redesign. Confirm all dimensions before framing.

04 AUDIO & VIDEO DISTRIBUTION



DISPLAY + DISTRIBUTED AUDIO LAYOUT

Distributed Audio

- Speaker locations marked on RCP (in-ceiling) or elevations (in-wall)
- Speaker model and cutout dimensions confirmed per location
- Backcan/enclosure requirements identified (fire-rated, outdoor-rated)
- Speaker wire home runs to MDF or amplifier (14/2 CL2 minimum)
- Outdoor speakers: weatherproof J-box, conduit, and drainage
- Subwoofer locations and dedicated power drops identified

Video & Displays

- TV locations on elevations with exact center-point and display size
- Recessed outlet box (power + data) behind each display location
- Conduit from display to MDF (1" min. for HDMI/fiber)
- Motorized lift/mount locations confirmed with structural backing
- Projector: power, HDMI/HDBaseT, control, structural ceiling support
- Motorized screen pocket: dimensions, power, and control wire

> **PRO TIP**
> Coordinate speaker and TV locations with furniture plans. A center-channel speaker behind a TV above a fireplace is only useful if the seating position aligns. Get the furniture plan first.

05 SECURITY CAMERAS

Camera Locations & Coverage

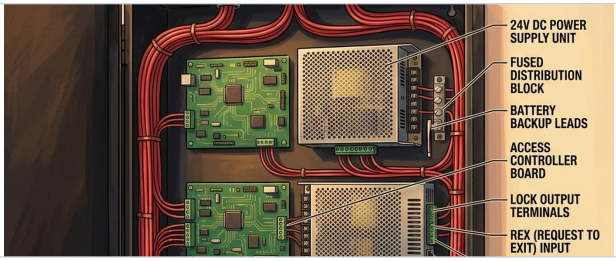
- Camera positions identified on site plan and all floor plans
- Minimum coverage: entries, garage, perimeter, pool, driveway, service areas
- Camera type specified per location (bullet, dome, turret, PTZ)
- Mounting method confirmed: wall, soffit, pole, or parapet
- Exterior cameras: 316 stainless steel mounting hardware (coastal)
- IR illumination range verified — supplemental IR where needed
- Privacy zones identified (neighbor sight lines, public areas)

Infrastructure

- Cat6a home run from each camera to NVR location (PoE powered)
- Conduit for all exterior runs (EMT or Schedule 40 PVC)
- NVR location in MDF with dedicated storage and UPS power
- Monitor location for security display (if separate from automation UI)
- Camera pole foundations specified and poured before hardscape
- Landscape coordination: root zone clearance, irrigation conflicts

> **PRO TIP**
> Plan camera pole foundations before hardscape installation. A camera added after pavers are laid costs 3× as much to install and never looks as clean.

06 DOOR ACCESS & INTERCOM



Access Control Hardware

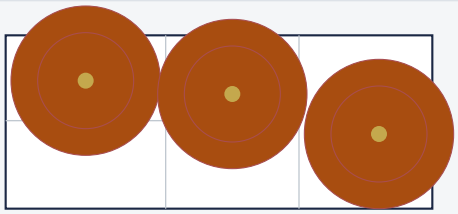
- Controlled doors identified (main entry, garage, service, pool gate)
- Lock type per door: electric strike, mag lock, or smart lock
- Power (12/24VDC) and data (Cat6a) run to each controlled door
- Card reader / keypad / biometric unit specified per entry point
- Door position sensor (DPS) wiring at each controlled door
- Request-to-exit (REX) device specified at interior side
- Access control panel location identified with UPS backup power
- Credential type selected (proximity card, mobile, biometric, PIN)

Video Intercom

- Intercom station locations: main gate, front door, service entry, garage
- Cat6a + power run to each intercom station
- Interior answer stations: wall-mount, touch panel integration, or mobile
- Intercom integration with automation system (Crestron, Lutron, Savant)
- Gate operator: power, data, and intercom pathway confirmed
- SIP/VoIP intercom requires network connectivity at each station

> **PRO TIP**
> Run Cat6a and 18/2 power to every exterior door during rough-in, even if access control isn't in the initial scope. Adding it later costs 5× more after walls are closed.

07 WIFI & NETWORK INFRASTRUCTURE



WIRELESS ACCESS POINT COVERAGE PLAN

Wireless Access Points

- WAP locations planned: 1 per 1,500 sq ft interior + outdoor zones
- Ceiling WAP locations coordinated with RCP (no speaker conflicts)
- Dedicated Cat6a (PoE) home run from each WAP to MDF switch
- Flush-mount housing (SeeLess) specified for finished ceilings
- Outdoor WAPs for pool, terrace, garden, and guest house coverage
- WAP model selected for environment (indoor, outdoor, high-density)

Core Network

- ISP service entrance and demarc point confirmed
- Fiber or Cat6a pathway from demarc to MDF
- Network switch port count: total wired devices + 30% growth margin
- UPS / battery backup for all network equipment (30-min. minimum)
- Cellular failover gateway for internet redundancy
- VLAN architecture planned (IoT, AV, security, guest, management)
- Managed switch with PoE+ budget sufficient for all endpoints

PRO TIP

Never place a WAP directly adjacent to an in-ceiling speaker — the metal driver magnet interferes with wireless signal. Maintain 4' minimum separation on the RCP.

08 POOL, SPA & IRRIGATION

Pool & Spa Automation

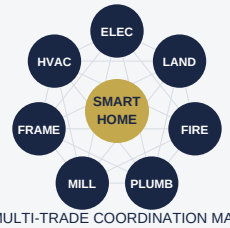
- Pool/spa controller model specified (Pentair, Jandy, Hayward)
- Automation interface: RS-485, IP, or relay contact to control system
- Cat6a or RS-485 cable from pool equipment pad to MDF
- Conduit pathway from equipment pad to house (direct burial or underground)
- Pool lighting control integrated with Lutron (120V relay or DMX)
- Spa jet, heater, and blower control integrated with automation
- Water feature controls (fountains, waterfalls) included in automation scope
- Pool cover motor: power, control wire, and safety interlock wiring

Irrigation Integration

- Irrigation controller location identified (garage, equipment room, exterior)
- Smart irrigation controller specified (Rachio, Hunter Hydrawise, or similar)
- Network connectivity to irrigation controller (WiFi or Cat6a)
- Integration with automation system for dashboard visibility
- Rain/freeze sensor wiring for automatic shutoff
- Zone map coordinated with landscape architect

> **PRO TIP**
> Run conduit from the pool equipment pad to the MDF during foundation work. Trenching after hardscape and landscaping are complete is extremely expensive and destructive.

09 TRADE COORDINATION CHECKPOINTS

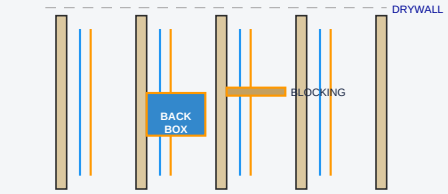


MULTI-TRADE COORDINATION MAP

These items require multi-trade coordination and are the most common sources of construction conflicts. Verify each item before rough-in begins.

- **ELECTRICAL:** Dedicated circuits for all LV systems on panel schedule
- **ELECTRICAL:** Dimming panel locations and circuit counts coordinated with EC
- **HVAC:** Equipment room cooling load calculated and ductwork routed
- **HVAC:** Smart thermostat locations coordinated (data drop required)
- **FRAMING:** Blocking at all TV, speaker, camera, and keypad locations
- **FRAMING:** Shade pocket headers and soffits framed to dimension
- **MILLWORK:** AV niche and equipment closet dimensions verified with integrator
- **MILLWORK:** Shade fascia, cable access, and wire chases coordinated
- **PLUMBING:** No conflicts between conduit pathways and plumbing runs
- **FIRE:** Sprinkler heads do not conflict with speakers, WAPs, or cameras
- **LANDSCAPE:** Exterior conduit avoids root zones and irrigation lines
- **LANDSCAPE:** Camera pole foundations poured before hardscape
- **POOL:** Equipment pad conduit to MDF completed before backfill

10 PRE-DRYWALL VERIFICATION



PRE-DRYWALL WALL CAVITY — VERIFY BEFORE CLOSE-UP

Schedule this walkthrough with your integrator **after rough-in and before insulation.** This is your last opportunity to verify pathways, add missing runs, and correct conflicts without demolition costs.

- All low-voltage cables pulled and labeled at both ends
- All conduit installed — bushings in place, pull strings in empty runs
- Backboxes installed at correct heights and depths for all devices
- Blocking verified behind all TV, speaker, camera, and mount locations
- Shade pockets framed to dimension with power and data in place
- Cable home runs tested for continuity (device location to MDF/IDF)
- Photo documentation of all concealed pathways — before close-up
- As-built cable routing marked on drawings for permanent record
- Door access power and data verified at every controlled opening
- WAP cables verified at every ceiling location on the RCP
- Pool/spa conduit verified from equipment pad to MDF
- Integrator sign-off obtained before insulation and drywall proceed

> **PRO TIP**
> The pre-drywall walkthrough is the single most valuable hour on any smart home project. Once insulation goes in, you cannot see what's behind the wall. Photograph everything. Confirm everything. This is your last chance.

Ready to Engineer Your Project?

Technology By Design provides complete systems engineering — from pre-construction advisory and shop drawings through installation, commissioning, and handover. We serve luxury residential, boutique hospitality, and high-end commercial projects across New York City, Philadelphia, Palm Beach, and Miami.

SCHEDULE A CONSULTATION

CALL	EMAIL	WEB
(215) 631-2229	Ryan@technologybydesign.net	technologybydesign.net

Authorized Crestron · Lutron · SeeLess Integration Partner