

SVG
VENUE
INITIATIVE
WHITE PAPER

**RECOMMENDATIONS FOR
SPORTS VENUES:
Mobile Broadcast Unit /
Truck Compound
Infrastructure and Operations**

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SECTION A: MOBILE BROADCAST UNIT / TRUCK COMPOUND INFRASTRUCTURE AND OPERATIONS

PURPOSE

The Mobile Unit (M/U) is the core system infrastructure for the production and distribution of the event content outside the venue. M/Us are typically parked in or near the venue in a space referred to as the “truck compound.” The connections between the truck compound and M/U to the facility are temporary and event-specific in nature; therefore, the access and connectivity must be designed to accommodate this.

For multiple-camera broadcasts, typically, a television mobile unit (M/U) or remote truck is brought in to house the control room, producer, director, and the various technical operations, such as audio, replay, and graphics. The M/U can vary in size from a small Sprinter-type van to a large, 53-foot tractor-trailer with expanding sides. For championship games, there can be several to a dozen or more of the big rigs. The primary consideration here is parking with unimpeded access and designed distribution for the myriad of cables required to connect the cameras, microphones, and other devices between the venue interior and the M/U, basically without crossing traffic flows on the ground. (In-venue facilities for feeding scoreboard video displays use similar equipment permanently installed in a fixed control room location within the venue.)

The purpose of this section is to define the footprint, connectivity, power, and HVAC requirements necessary to complete the design, construction, and installation of the truck compound and the associated interfaces to the venue.

CONTENTS

- A1. TV Compound Location and Considerations
- A2. Power Requirements for M/U Truck Compound
- A3. Broadcast Cabling Connectivity/Infrastructure
- A4. Camera Requirements
- A5. Audio Requirements
- A6. Lighting Requirements
- A7. Other Requirements

A1. TV Compound Location and Considerations

The M/U or truck compound area must be adjacent to the broadcast-cable cross-connect area.

A M/U typically carries cables less than 150 feet long, so it is vital that the compound be less than 150 feet away from the cable cross-connect area.

The compound will ideally be located in an open-air area that is not located underneath roofs, overhangs, or roadways. However, if heat and the sun are an issue, sheltered or interior spots are preferred with minimum of 6 feet of clearance above the M/U.

Given the critical and transient nature of broadcast-content delivery, M/U parking area should not be “shared” with other facility services (e.g., concession deliveries, player parking).

Trucks typically appear one to seven days prior to an event and often remain on-site between events.

Team buses cannot be allowed to idle in close proximity to the M/U unit, to prevent exhaust fumes from affecting M/U personnel. M/U and event staff, players, or participants require separate parking facilities to facilitate ingress and egress.

Trash receptacles (dumpsters) or compactors should NOT be located in the M/U parking area or general workspace.

The surface should be concrete or asphalt and level, with less than 2-degree forward slope.

SIZE OF TRUCK COMPOUND (M/U PROGRAM AREA)

Unobstructed floor space for each M/U should measure 80 feet deep x 30 feet wide x 16 feet high, and the perimeter should be clear so that personnel can easily access storage areas in the lower portion of the trailer. In addition, the ability for the sides of the truck to expand should always be a consideration in terms of space.

Additional space for the following should also be available in the main compound area:

- Office-trailer space should be available and measure 50 feet deep x 15 feet wide x 16 feet high per trailer.
- Space for satellite and transmission vehicles should measure 30 feet deep x 15 feet wide and should be situated with an unobstructed view of the southern sky in order to maintain satellite connectivity.

RECOMMENDATIONS FOR NUMBER OF M/U / OFFICE TRAILER / SATELLITE UPLINK SPACES PER TYPE OF EVENT

- NFL
Regular season: 2 / 1 / 1
Playoff: 6 / 2 / 2
Super Bowl: 30 / 20 / 25
- MLB
Regular Season: 5 / 1 / 4 for home, away, & national broadcast
Playoff: 10 / 4 / 5
World Series: 25 / 15 / 20
- NBA
Regular Season: 5 / 1 / 4 for home, away, & national broadcast
Playoff: 10 / 4 / 5
NBA Finals: 25 / 10 / 20

- NHL
Regular Season: 5 / 1 / 4 for home, away, & national broadcast
Playoff: 10 / 4 / 5
Stanley Cup Finals: 25 / 10 / 20
- NCAA
College football: 3 / 1 / 1
College basketball: 2 / 0 / 1

CONSIDERATIONS FOR TV COMPOUNDS INSIDE THE VENUE

The HVAC unit on a typical M/U is 20-25 tons. Generally, in 80-degree ambient temperature, systems are typically loaded at 75% of capacity. It is a requirement of the M/U compound to exhaust this heat load continuously.

Adequate ventilation must be provided to discharge the heat load.

There should be one sanitary drain per M/U space for A/C runoff, positioned to provide the shortest distance for condensate to travel to the drain.

Facility HVAC or concession exhaust air should not be ducted into M/U parking area.

ON-THE-STREET M/U PARKING CONSIDERATIONS

M/Us should be able to park and depart M/U parking spaces independently of each other.

The M/U parking area should have adequate turning space and visibility to safely maneuver a 70-foot tractor-trailer combination without the driver's having to rely on assistance from others.

Preferable safety planning provides for the M/U to be able to pull straight into the M/U parking area and have adequate maneuvering space to back into the assigned parking space.

Access should not involve steep grades or "blind" turns.

Running clearance of a M/U is usually less than 12 feet. Access to the M/U parking area should be as level as practical to prevent the M/U's "high centering" on entry or exit.

AUXILIARY PARKING CONSIDERATIONS FOR LARGE EVENTS

An auxiliary M/U parking area should be within 250 feet of the primary M/U parking area to accommodate such events as All-Star Games, World Series, Super Bowls, and other marquee events.

This area requires the same typical connectivity and electrical power as the primary compound.

The auxiliary M/U parking site should have a clear and unobstructed view of the sky necessary for satellite transmission.

SERVICES FOR M/U PERSONNEL

Independent men's and women's restroom facilities capable of handling up to 10 persons at a time, located in the immediate M/U parking area (otherwise, portable toilets will be required)

A ramp for cart access into stadium (no stairs)

Service-elevator access readily available for vertical transportation of carts and cases

Drinking-water fountain

Utility-water faucet access
Ice machine
Floor drains

PERSONNEL SECURITY AND SAFETY

The area should have a fence or other means of securing the M/U compound overnight and to restrict interaction with event participants, guests, players, and other personnel.

Personnel access to the M/U parking area should have a dedicated security point in close proximity to the area, ensuring that event attendees are excluded and M/U equipment and personnel are secure.

M/U personnel are historically transient and require non-traditional hours of access to the facility. They should have access to no-charge car parking within reasonable proximity of the M/U parking area.

A2. Power Requirements for M/U Truck Compound

Power is provided at locations shown on electrical-riser diagram and/or other drawings/information in electrical drawings and specifications.

Power will be terminated to a panel within or near the enclosure.

The installer will be responsible for termination and distribution of electrical power from the panel to the equipment as required (including load center, breakers, etc.). This will include necessary conduit and cabling as required for a complete installation.

A ground point will be provided in each equipment room or enclosure electrical panel. The installer shall be responsible for connecting ground point to all equipment in accordance with NEC code, local codes, and standards specified herein.

Three-phase electrical-power fused-service disconnect will be provided for each M/U, with a minimum rating of 400 amps at 208 volts.

Service should be five-wire with double neutral conductors.

Connections provided should be industry-standard 400-amp 1016 Cam-Lok type.

Service disconnects should be no more than 50 feet from M/U parking space with clear cable access and bottom-protected cable opening.

For local M/U utility power, four 20-amp 120-VAC duplex receptacles should be serviced from the fused disconnect and mounted adjacent to the disconnect.

M/U, office-trailer, and miscellaneous connections should be 25-kVA, 120/240-volt, single-phase, three-wire.

No-load voltage at shore power service disconnects should be 120/240 volts with full-load voltage of 110/220 volts.

Two 60-amp 120/240-volt circuit-breaker service disconnects are required.

Service disconnects should have twist-lock power connections and be in a location accessible to the remote-broadcast technicians but protected from the weather and preferably in conditioned space.

REQUIREMENTS FOR SATELLITE UPLINK TRUCKS

- Satellite uplink trucks require 200-amp/single phase/208 volts per truck.
- Short power-cable runs are preferred.
- Cam-Lok connectors are the standard.

These services should be fed from dedicated transformers and not served from the same service as the facility lighting and general loads.

SITING REQUIREMENTS FOR GENERATOR TRAILER

- Exterior parking space for a minimum of one 53-foot generator trailer
- 8-foot x 60-foot minimum space with 4-foot clearance on all four sides
- Secure and shortest cabling path/entrance into building and to the primary M/U truck compound that does not require security

Consideration for access to generator trailer by fuel truck

A3. Broadcast Cabling Connectivity/Infrastructure

There should be permanently installed extensive cable connectivity for both the M/U truck compound and the scoreboard control room from throughout the entire venue, terminating in the M/U truck compound and the scoreboard control room. Example areas of connectivity:

- Locker rooms
- Press-conference rooms
- Announce-booth location
- Several key playing-area positions
- Exterior venue entrances, event areas, parking lot, rooftop
- Clubs, restaurants, and premium destinations within venue
- Team store

CABLING TYPES

- SMPTE fiber – 12mm
- Single-mode fiber with ST connectors
- Triax
- Audio pairs
- Coaxial
- Cat 6/6a

GENERAL CROSS-CONNECT REQUIREMENTS (ALSO REFERRED TO AS THE I/O ROOM OR PANEL)

A central structured location for the termination of the above cabling infrastructure

Located within 100 feet of each M/U parking location

Cross-connect I/O panels should to be weather-proofed, enclosed, or in a garage-doored room.

I/O panels should all be in one location easily accessible to all mobile units.

Graphic aids with laminated facility layouts and connection panel locations should be provided at the cross-connect I/O location.

Cabling amounts and panel labeling should follow league guidelines and nomenclature.

Facilities should also make the provision for multiple transmission services at their facility, requiring:

- A 24-strand single-mode fiber extension from the telco demarc point (wherever the local telco has inbound fiber circuits to the facility) to the truck compound cross-connect area.
- Provide an area for transmission-service providers (ATT, Level3, HTN, etc.) to occupy rack space at the truck compound or within 150 feet of the compound. The rack-space area should be configured so multiple vendors can be supported.
- If floor rack space is not available, then wall-mounted cabinets will suffice.
- Each rack should have two separate 30-amp circuits to it to provide power for the UPS systems typical with the newer providers.
- Necessary telco demarcations for phone, data, and transmission services should be terminated in the M/U parking area.

Other M/U / truck compound recommendations:

- Provide fiber-optic-test equipment in the I/O rack
- Provide test and measurement scopes and monitor in I/O rack
- Provide lighting on the front and back of racks
- Provide courtesy 20-amp power outlets on the front of each rack
- Pull and service loop an extra 20 feet of fiber-optic cable to allow for future cleaning/cutting/retermination
- Provide a patchable house cable TV, DSS, IPTV tuner
- Provide access to Internet via fiber and/or RJ45 connection
- Provide cross-connects of audio/video/data to scoreboard control via SMPTE, single-mode fiber, analog audio, and Ethernet for the sharing of house/truck cameras, replay, program feeds

A4. Camera Requirements

All primary manned camera positions MUST have a fully unobstructed view of the field of play and the sidelines; top-to-bottom and side-to-side.

Each primary camera location in the building should be sized to adequately permit a minimum of four studio or handheld cameras to operate under event conditions.

Position locations and number of positions in each location should follow each league's guidelines.

SPACE REQUIRED FOR PRIMARY CAMERA LOCATION

- Typical camera tripod at average height requires a radius of about 112 inches and, with the need for an operator, a space of approximately 6 x 6 feet per camera.
- If the lens does not need to be contained in the operating space (e.g., hanging over a wall), the space can be reduced to 4 x 6 feet.
- Should a standard camera tripod not be usable in any location, the facility should provide

an adequate number of camera-mounting devices for those locations (e.g., camera seats, mounting bases).

Each elevated camera location must have a safety railing and camera-operator tie-offs. Exterior camera wells/positions must have adequate drainage to protect equipment. Camera locations should allow cart and case access during setup/strike. Storage space(s) should be available for empty camera cases close to camera locations, with enough room to allow one case for each camera in the location and the carts. Netting/fencing should be provided under each camera and booth location to prevent items from falling into stands. Each camera location should have two 20-amp 120-VAC duplex utility power receptacles labeled with circuit-breaker–panel location and venue/house electrician contact information.

ANNOUNCER POSITIONS

- Positions for on-camera talent should be large enough to allow 20- to 25-foot width at opening.
- A minimum 8-foot setback from talent position is required for a camera shot.
- If space is too limited for a tripod hard camera, the stadium must provide permanent high hats (mounts) in the ceiling so that camera-mount pan heads can be attached.

Audio/Video connectivity and power for POV (Point of View) or robotic cameras should be provided in each bullpen, penalty box, dugout, etc.

A5. Audio Requirements

Fiber is essential.

There should be a minimum of 36 pairs of analog audio connections to all announce booths. There should be a minimum of 12 pairs of analog audio connections at each of the other locations (unless noted in parentheses below).

BASEBALL

- Behind home plate
- First-base dugout
- Third-base dugout
- Home bullpen
- Visitors bullpen
- Left field
- Right field
- Announce booth
- PA/AV room
- Press area (6 pairs)

- Baseball ops (6 pairs)
- Official stats area (6 pairs)
- National radio booths
- Home locker room, inside and out
- Visitors locker room, inside and out
- Player entrance/exit tunnels

FOOTBALL

- Near left 20
- Near right 20
- Far left 20
- Far right 20
- Each end zone
- Announce booth
- PA/AV room
- Press area (6 pairs)
- Official stats area (6 pairs)
- NFL control (6 pairs)
- National radio booths
- Home locker room, inside and out
- Visitors locker room, inside and out
- Player entrance/exit tunnels

BASKETBALL/HOCKEY

- Near-side center court announce position (24 pairs analog)
- Far-side center court (24 pairs analog)
- Each end of court (baskets/goals)
- PA/AV room
- Press area (6 pairs)
- National radio booths
- Home locker room, inside and out
- Visitors locker room, inside and out
- Player entrance/exit tunnels

A6. Lighting Requirements

Lighting grids require 1½-inch-OD pipe in broadcast booths with 12-16 120-VAC duplex receptacles at grid level with local switching in room.

3200K lighting should be provided in locker rooms, locker-room hallways, press rooms, or areas with special auxiliary lighting.

Lighting of bullpens/penalty boxes/dugouts/sidelines should be consistent with field/floor/ice conditions.

A7. Other Requirements

A single contact person should be available from stadium/arena side for maintenance purposes, and a single contact from each broadcast entity and facility should be listed in the SVG database.

Broadcast-rights holders' basic requirements for regular games and special events, such as playoff games, should be verified before construction.

Provisions of submissions for all components and postconstruction and full operational requirements

Installation in accordance with the applicable codes, the tenants' requirements, and contractual specifications

Provision of manuals, schematics, and graphic representations of as-built conditions

Provisions of maintenance

Provisions for upgrades, modifications, and renovations as required with advances in operating technology platforms