

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

### SECTION INCLUDES

Site Improvements  
Fences and Gates  
Railings  
Retaining Walls  
Seating  
Signage  
Site Lighting  
Traffic Control Devices  
Security  
Trash Management  
Snow Removal  
Drying Yards  
Recreational Facilities  
Playground Equipment

### RELATED SECTIONS

03 30 00 Concrete  
22 00 00 Plumbing  
26 00 00 Electrical  
31 00 00 Earthwork  
32 10 00 Asphalt Paving  
32 80 00 Irrigation  
32 90 00 Landscaping  
33 00 00 Site Utilities

## FENCES AND GATES

### DESIGN

Provide concrete footings, to frost depth, for chain link and wrought iron fence and gate posts. Top of footing must be tooled so as to slope away from fence post. For wrought iron fencing, flange mounted posts anchored to the footings are preferred to sleeve mounting. Chain link fence posts may be directly embedded in the footing. Where used, sleeve mountings should be filled with non-shrink grout and tooled in a weathered joint at the post to shed water. Except for chain link fence posts, avoid setting metal posts directly into the footings. Wood posts should be anchored in concrete footings with strap anchors. They may also be directly buried on a crushed stone footing or encased in a concrete collar with the end of the post in 4 to 6 inches of gravel below, to allow moisture to drain and avoid rot.

Set height of fence appropriate to its function on the site. Barrier fences should not exceed 6ft, domestic fences 4ft, and delineation fences 30in.

Standard 2in diamond mesh is acceptable for most chain link fence uses. Close weave (1in) mesh may be used for more decorative applications.

Avoid rail fences and any type of fence design with horizontal members that allow or encourage climbing. Vertical pickets should not project above the

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

top rail. Fence posts may be flattened, weathered or rounded, but must not be pointed. Spacing of fence pickets must follow the opening limitations specified in the Mass. State Building Code.

Provide top and bottom rails.

Provide diagonal bracing and latching or locking hardware for all gates.

Chain link mesh selvages must be knuckled into top and bottom rails. Exposed selvages are not acceptable. Pickets may not project above the top rail of the fence.

Provide continuous concrete mowing strips for protection and weed control along the length of wrought iron fences, and crushed stone mow strips along the length of chain link fences. Install mow strips over post footings.

Check local planning/zoning regulations governing fence height, placement, design and installation. Permits and/or approvals may be required.

### MATERIALS

Chain link should have a fused vinyl coating for durability and appearance. Specify a minimum 9 gauge mesh fabric exclusive of coating. Specify matching vinyl coated or color galvanized posts and rails and precise minimum size and weight. Avoid mesh insert strips.

Metal picket fences may be steel, wrought iron or heavy duty aluminum. Avoid light aluminum fences as they are not as durable. Weld pickets to top and bottom rails. Secure rails to posts with tamperproof mechanical fasteners.

Wood board and picket fences must be sealed or stained. Posts may be pressure-treated or cedar. Metal fittings and fasteners must be hot-dipped galvanized or stainless steel.

Wood stockade fences are acceptable where privacy is needed, but are not as durable as chain link. Posts may be cedar or pressure treated pine directly buried, or metal pipe in concrete footings. Fence panels are usually spruce and may either be treated with preservative or left to weather naturally. Secure panels to posts with galvanized metal fasteners.

PVC fence systems are an acceptable substitute for wood only where they are not exposed to impact damage. Do not use in situations where such damage is likely to occur. PVC is also subject to ultraviolet light deterioration over long periods of time and will eventually become brittle under prolonged exposure to direct sunlight unless manufactured with a high content of Titanium Dioxide as a UV inhibitor.

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

### RAILINGS

#### INVESTIGATION

Refer to Mass State Building Code and MAAB/UFAS design standards for design applications.

#### DESIGN

Flange or side mounted railing supports anchored into concrete are preferred to sleeve mountings. Where used, sleeve mountings should be filled with non-shrink grout and tooled in a weathered joint at the support to shed water. Do not set metal supports directly into the footings.

Exterior stair railing design shall conform to all regulations and standards governing interior stair railing design.

#### MATERIALS

Use Schedule 40 galvanized steel pipe, 1 1/4in min diameter for rails and supports. Guard rail pickets to be Schedule 40 galvanized steel pipe, 5/8in diameter.

Galvanizing is required on all metal railings. Where galvanized railings are to be painted, they shall always be shop-primed and then either shop painted or field painted depending on project requirements. Proprietary color coating processes may also be applied in lieu of shop painting. Field touch-up only with paint specially formulated for galvanized surfaces.

Fused, vinyl pipe rail coatings are acceptable but costly. Metal reinforced, vinyl railing systems are acceptable for elderly housing use but lack sufficient durability for family housing use.

### RETAINING WALLS

#### DESIGN

Retaining walls must be designed to withstand earth load and hydrostatic pressure to insure a long lasting installation. Depending on the installation, they may be either of flexible (unit assemblies requiring no frost footings) or rigid (monolithic structures carried to frost depth) construction. Design for retaining walls over six feet in height must be stamped by a Massachusetts registered Structural Engineer.

Flexible retaining wall construction should not exceed 8ft in height, subject to manufacturer's limitations.

Face of rigid walls may be vertical or slightly battered. Flexible walls should be battered to a vertical slope of 1:6.

Provide a drainage swale or an impervious gutter at the foot of all slopes above surcharged walls to direct runoff away from the top of the wall.

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

Submit engineering calculations to DHCD for all retaining walls during design.

Provide expansion joints no farther than 30ft apart in rigid construction.

Provide 12in min drainage layer of crushed stone backfill behind rigid walls only for the grade-to-grade height of the wall with continuous perforated PVC underdrain or weepholes at 6ft on center. Seal top of drainage layer with 4in layer of clay and 6in of topsoil. For flexible walls, provide 18in min drainage layer for the full height of the wall with the underdrain at the lowest point of the drainage layer. Isolate drainage layers and pipes from surrounding soil with filter fabric. Connect underdrains to the local storm drainage system or to a suitable outfall.

Design should carefully consider termination details that meet the grade in such a way as not to leave the ends of retaining walls exposed.

Install guard rails at locations where retaining wall height exceeds 30 inches.

Consider installing aluminum clips at retaining wall edges for protection at locations subject to skateboarding damage.

### MATERIALS

Acceptable materials include:

- reinforced concrete (4000 psi recommended)
- interlocking precast units
- landscape timbers (crib wall construction) pressure-treated with a non-toxic solution conforming to AWPA P9-74 (not recommended as a long-term solution due to potential for eventual rot and insect infestation)
- galvanized wire mesh basket systems
- on-site field stone for riprap or walls

### SEATING

#### DESIGN

Location criteria:

- Convenience and views
- Sheltered from wind and sun
- Set back from circulation paths
- Coordinated with landscaping
- Accessible for the disabled

Settings:

- Formal groupings
- Informal conversation areas
- Single benches
- Steps, stoops, seat walls

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

Seating should be anchored to or integral with walks, walls or foundations. Where possible, provide a paved base around seating area.

Bench design should incorporate arm rests, back supports and sufficient heel space to facilitate use by individuals with limited strength. Allow for proper seat drainage.

Seating design should discourage undesirable uses. Provide arm rests at intervals to deter napping.

Structures intended to serve as seating should allow a seat width of 15in to 18in. Seat surface should be a minimum of 18 inches above grade and pitched slightly to shed water.

### MATERIALS

Benches: Metal frame and slats preferred. Mesh seating and composite slats are acceptable. Avoid wood slats and contoured plastic. Finishes should be graffiti, flame and weather resistant.

## SIGNAGE

### DESIGN

Signage is required for traffic control, direction finding and identification. Information should be displayed for quick, easy and understandable viewing by either motorists or pedestrians. Simplicity, clarity and visibility are the three criteria for design.

Consult local public safety authorities for any specific local requirements relating to size, location and display of building address numbers.

Traffic control signage and pavement markings shall conform to the official standards of the Federal Highway Administration, U.S. Department of Transportation, as described in the most recent edition of the Manual on Uniform Traffic Control Devices (MUTCD).

<http://mutcd.fhwa.dot.gov>

Signage required for handicap accessibility under 521 CMR23.6 shall conform to the Massachusetts Office of Disabilities (MOD) publication "Handicapped Parking Regulations".

Consult the most recent edition of MAAB Rules and Regulations (521 CMR) for any ADA related signage height limitations and visibility requirements.

### MATERIALS

Metal signs shall be 18ga galvanized reflective steel with a graffiti resistant finish.

Signposts may be galvanized U-channel or galvanized square tube for adjustable height signs, or galvanized Schedule 40 tubular steel for fixed height signs. Breakaway bases may be considered for certain signposts subject to vehicular impact.

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

Wood signposts are not allowed for traffic control signs, but may be used for directional or informational signage at the discretion of the designer.

### SITE LIGHTING

#### INVESTIGATION

Effective site lighting facilitates the safe movement of pedestrians and vehicles, assists in creating a secure environment and minimizes the risk of property damage and personal injury after dark.

The designer should thoroughly analyze the lighting requirements of the site before developing a lighting plan. The analysis should address security as well as visibility and environmental concerns. The local electrical power provider should also be engaged in the investigative phase to determine if any rate savings programs apply.

The designer should consult recommended practices for exterior lighting developed by the Illuminating Engineering Society of North America (IESNA) in the preparation of site lighting designs ([www.iesna.org](http://www.iesna.org)).

Site Lighting design submissions must include product cuts with photometric charts for each type of light fixture proposed.

#### DESIGN

The following are considered acceptable levels of illumination in footcandles:

- Active building entries: 5.0 avg.
- Inactive entries: 1.0 avg.
- Roadways: 0.4 to 0.9
- Walkways along roadside: 0.6 to 1.0
- Residential walkways: 0.2 to 0.5
- Parking areas: 0.6 to 2.4
- Playgrounds: 1.0 to 5.0
- Basketball courts: 5.0 to 10.0

Maintain uniformity ratios of 4:1 or lower [avg. illumination (fc) / min illumination (fc)] at all walkways and parking lots to ensure a consistent level of illumination and avoid “hot spots”.

Locate light fixtures at regular intervals to reinforce circulation paths with a clearly defined lighting pattern.

Mounting heights should be between 10-15ft (walkway and pedestrian lighting), 20-30ft (parking lot) and 20-50ft (roadway). Pedestrian and parking lot lighting may be either building or pole mounted. Walkway and roadway lighting should be pole mounted to maintain a uniform and consistent level of illumination. Avoid low mounting heights (under 12ft) in family housing developments.

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

Vertical light spreads of walkway fixtures should overlap at a height of 7ft above the walkway surface to enable visual recognition.

Avoid shadows, glare and light pollution by proper selection, placement, shading and shielding of light fixtures.

Focus light downward and away from buildings and window/door openings to minimize glare. Avoid outside light spill into building interiors and adjacent properties.

Coordinate lighting design with site security requirements. Direct light away from points of surveillance. Highlight building entrances. Illuminate vertical surfaces to generate silhouettes.

Design submissions should include a photometric plan for any site lighting that may be proposed.

### MATERIALS

Street luminaires shall be high intensity discharge (HID) fixtures of the following types:



1. Light Emitting Diode (LED) lamps are preferred.
2. Metal Halide (MH) lamps are acceptable, but problematic due to higher cost and excessive light intensity

Avoid High Pressure Sodium (HPS) lamps due to poor light quality.

Mercury vapor lamps are prohibited under the Energy Policy Act of 2005. They should be replaced by LED luminaires wherever possible.

All luminaires are to be of the high angle cutoff type to minimize light pollution. Fully shielded luminaires with downward facing reflectors are preferred.

Building-mounted luminaires should be accessible for easy lamp changing and maintenance. Specify fully shielded wall packs for wall applications and flush mounted fixtures for canopy applications to minimize light pollution. Avoid drop-lens canopy fixtures.

Utilize automatic “shut-off” controls (sensors, timers, motion activated devices, etc.) wherever possible. Select fixtures compatible with Instant start compact fluorescent lamps for all automatic control applications.

Avoid reusing or remounting existing luminaires that may not comply with current DHCD standards.

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

### TRAFFIC CONTROL

#### DESIGN

**Fixed Pipe Bollards:** Set in concrete footings to frost depth, with the post buried a minimum of 3ft. Fill with concrete and provide a reinforcement cage in the footing around the pipe when used for parking and vehicular control. Provide a 4in min white reflective band 6in from top where required for visibility. Crown the bollard with 1in of concrete to shed moisture. Parking bollards should be tall enough to be seen from a backing vehicle. Avoid linking bollards with chains.

**Removable Pipe Bollards:** Set in sleeved concrete footings to frost depth. Provide locking mechanism and lifting handles. Coordinate placement with site requirements for emergency and public safety access.

**Guard Rails:** Use only when necessary at the head of steep embankments and as protection against vehicular impact damage to structures and landscaping.

**Wheel Stops:** These may be used in the absence of curbs at the head of parking stalls, but may impede snow removal. Avoid unless requested by the Housing Authority. Anchor with 12 inch long rebar 2ft 6in min from head of stall.

**Security Gates:** Specify only as part of a comprehensive site security and access/circulation control plan developed with local police and fire department approval. Gate booms and stanchions must have 12in wide bands of reflective tape applied 18in on center over their entire length. Provide locking mechanisms at both open and closed positions of the gate. Provide lock box for each gate.

**Traffic Islands:** Avoid where possible. When used, minimum dimension should not be less than 22ft and sloped granite curbing provided.

**Medians:** Avoid where possible. When used, provide sloped granite curbing around the entire median. Do not landscape or seed medians under 5ft in width; instead, pave with cobbles, Belgian block or similar paving material. Decorative fencing and lighting along the centerline may be added where appropriate. Consult local planning and zoning regulations for any required approvals or design guidelines.

#### MATERIALS

**Fixed bollards:** Concrete filled schedule 80 galvanized or painted steel pipe. Bury pipe 3ft min in 4000 psi concrete footing. Crown the concrete at the top for drainage.

**Removable Metal Bollards:** Schedule 80 galvanized (shop painted) steel pipe with formed steel cap inserted in Schedule 40 flanged metal sleeve set in 4000 psi concrete footing.

**Guard Rails:** galvanized metal or heavy timber rails on steel posts as specified in the Mass DPW Standard Specifications.



# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

**Wheel stops:** Precast concrete, 6in high by 8ft long with two galvanized steel anchor rods per stop. Plastic stops are also acceptable.

**Security Gates:** Gate booms, stanchions and pivot posts to be galvanized steel pipe. Footings are to be cast-in-place concrete, 6ft min deep. Bury pivot post 3ft min into footing.

### SECURITY

#### INVESTIGATION

LHAs should thoroughly investigate and analyze their own particular security requirements. If necessary, a comprehensive security master plan should be developed with the assistance of a security specialists and the cooperation of local law enforcement agencies. Case studies of successful security plans implemented by other LHAs should be central to the preparation of the master plan.

LHAs should be prepared to devote the necessary resources to maintain sufficient staffing and enforcement means to support the implementation of the master plan.

Refer to CPTED (Crime Prevention Through Environmental Design) design strategies in preparing the security master plan.

[www.cpted.net/home.html](http://www.cpted.net/home.html)

#### DESIGN

Identify and illuminate all building entrances.

Maintain proper illumination levels and placement of site lighting.

Provide identification for the addresses of buildings and units that is clearly visible from the street or parking lot. Coordinate with local police and fire department requirements.

Keep parking areas visible from units where possible.

Use landscaping to highlight building entrances and screen private areas. Avoid opportunities for concealment.

Utilize site security cameras only in conjunction with established LHA security protocols and in consultation with a security design specialist. Consider tenant privacy concerns when planning camera layouts.

#### MATERIALS

Lettering for building identification should be of non-reflective material and no less than 5 in. high.

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

Site security cameras may be a combination of fixed and PTZ (pan-tilt-zoom) and may be mounted on security camera poles, utility poles or building walls. Mounting height should be no less than 16ft above grade.

### TRASH MANAGEMENT

#### INVESTIGATION

Coordinate design and location of trash collection areas and receptacles with LHA trash collection operations. Development of a comprehensive waste collecting plan may be necessary.

Determine whether waste collecting vehicles (WCVs) are front loading, side loading or rear loading. Most large housing developments utilize dumpsters that are emptied by front loading WCVs. Developments not serviced by dumpsters usually rely on individual pickups by rear loading WCVs.

Review the routes through and points of access into the site used by WCVs. These may have to be altered to support a more efficient or less disruptive waste collection process.



Incorporate locally mandated recycling policies into the waste collecting plan. Provide separate collection areas for recyclable goods containers and review access and loading requirements for recycling WCVs.

#### DESIGN

- Locate dumpsters and outside trash container storage areas where they will be accessible to WCVs with a minimum of turning and maneuvering. Locations should also be convenient to residents, and travel distances minimized as much as possible.
- Avoid locating dumpsters next to Community Buildings or where they will conflict with snow removal operations.
- Enclose dumpsters with screens sufficiently high to conceal them from view. Consult local planning or zoning regulations for any requirements or design guidelines.
- The loading side should be left open. Provide gates only if required by local regulations. Where used, gates should be equipped with latches and cane bolts to avoid uncontrolled swinging, and the enclosure provided with separate resident access for easy trash disposal. Design of screens and gates should be able to withstand considerable abuse.
- Dumpsters must be set on reinforced concrete pads.
- Provide fenced or screened trash barrel collection areas for each residential unit or unit group where dumpsters are not used.
- Provide adequate WCV access to buildings that are serviced by internal trash collecting means.

#### MATERIALS

Dumpsters and trash receptacles are furnished by the LHA and should not be included in capital projects.

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

Use heavy duty steel pipe (Sched 80) or steel posts for enclosure screen supports. Masonry enclosure walls may be used if subject to heavy use.

Provide fixed metal pipe bollards at rear of dumpster pad and at all impact points to protect enclosure from damage.

### SNOW REMOVAL

#### INVESTIGATION

Interview LHA to determine existing snow removal procedures, on-site retention/disposal areas and the type of equipment used. Discuss any improvements that may be incorporated into the design.

Evaluate LHA de-icing materials and practices and design accordingly.

Conduct site analysis to identify snow stockpiling areas and locations where winter icing is a problem. Avoid manholes and drainage structures.

#### DESIGN

Avoid potential plow obstructions (curb stops, permanent speed bumps, parking lot peninsulas, traffic islands, etc.).

Avoid circular or sharply curved roadway configurations.

Use sloped granite curbing where impact damage from snow plows is likely.

Design walkways with straight runs and adequate width for the LHA's snow removal equipment.

Provide impervious areas of adequate size for snow retention. Where possible, locate these areas at the ends of straight snow plow runs. Do not locate snow retention areas where accumulated snow will obstruct drainage structures or surface drainage channels.

### DRYING YARDS

#### DESIGN

Drying yards are no longer utilized except when specifically requested by the LHA. Size and location vary according to demand.

Locate drying yards on level pavement within clear view of the buildings they are serving. Do not locate drying yards in unpaved areas.

Clothesline rails should be no higher than 6ft above grade and supported by posts set in concrete footings to frost depth. Locate posts no more than 12ft apart on center. Provide intermediate posts where rails are greater than 12ft in length.

Weld eyelets for clothesline to rail at 15in to 18in on center.

When demolished, drying yard posts should be completely removed, including the foundation. Cutting the post off at the base and leaving the foundation in place is not acceptable.

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

### RECREATIONAL FACILITIES

#### MATERIALS

Use galvanized steel pipe for posts and rails.

Clothesline is furnished by the LHA.

#### INVESTIGATION

Conduct a site and user analysis for potential locations of all recreational facilities being considered. The analysis should include, but not be limited to, target users, maintenance, lighting and security requirements, times of use, topographical and solar orientation, proximity to vehicular traffic, potential noise disruption to residents and neighbors, and possible hazards and liabilities.

#### REFERENCE STANDARDS

While each professional sports association has its own rules and regulations governing the layout, delineation and construction of their respective facilities, the standard design guidelines found in reference books such as *Timesaver Standards for Landscape Architecture* by Harris and Dines and *Architectural Graphic Standards* are sufficient for the level of performance required.

Recreational facilities are defined as public areas and as such shall be considered barrier free locations subject to ADA/MAAB regulations.

#### DESIGN

Recreational facilities at public housing sites are usually limited to basketball (full or half court) and handball courts, though other uses, such as softball, soccer, volleyball, shuffleboard, lawn bowling or bocce may be considered.

Hard surfaced playing courts should be level, drained side to side, end to end or corner to corner diagonally (full court), or front to end (half-court) at 1in per10ft.

A north-south orientation of the long axis is preferred for most playing courts.

Basketball hoops should be mounted at a rim height of 10ft above the court surface.

Handball courts should allow an overhead clearance of 20ft.

#### MATERIALS

Playing courts (basketball and handball) may be paved with bituminous concrete and delineated with color coat or traffic paint.

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

Basketball hoops should be secured to metal poles set in concrete footings to frost level.

Walls of handball courts should be concrete laid plumb to the playing surface.

### PLAYGROUND EQUIPMENT

#### INVESTIGATION

Determine what age groups will be served and what activities and type of play will be encouraged.

Conduct site analysis to determine the location and extent of play area as well as the size and placement of play structures.

Integrate play area with other site features (walks, seating, lighting, water service, recreational facilities).

Research specific play structure manufacturers and equipment to determine use zones, fall zones, play sequences and safety requirements.

Include a playground design specialist on the design team.

Consider a proprietary specification for play structures to ensure adherence to specific design and performance criteria.

#### REFERENCE STANDARDS

Playground design in the U.S. is not governed by any specific code or regulation. The following are the accepted standards for equipment design, installation and maintenance:

- *Handbook for Public Safety*, U.S. Consumer Product Safety Commission, Publication No. 325
- ASTM F 1487-95 (Standard Consumer Safety Performance Specification for Playground Equipment for Public Use).

#### PLAY STRUCTURE DESIGN

Play structures may be freestanding or system-designed.

Locate play structures in central, visible, common-use areas away from roads and moving vehicles. Avoid locating at exit discharge points from buildings. Allow for maximum surveillance by residents.

Identify appropriate age groups within the Development's population. The Development's recreational needs are specific to its population, so not all age groups necessarily have to be accommodated or separated.

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

Play structures are generally designed to be age-appropriate for the following age groups:

- Infants (0 - 1½ years)
- Toddlers (1½ - 3 years)
- Pre-school (3 - 5 years)
- Elementary (5 - 8 years)
- Pre-teen (8 – 12 years)

Play structures may be designed for the following combinations of age groups:

- Infant/pre-school (0 – 5 years)
- Toddler/pre-school (2 – 5 years)
- Older children (5 – 12 years)

Set support posts in sleeved concrete footings carried to frost depth.

Sill plates must rest on leveled subgrade, stone drainage course or resilient play surface.

All play surfaces must meet accessibility standards and be compatible with an accessible route through the site.

Provide curbing or other edge containment for play surface where it meets unpaved grade.

Paved surfaces must not encroach into the fall zones of play structures.

Provide seating for parents and adult supervisors.

Enclose play areas with a fence 48in min in height provided with latchable gates. Fence design should allow for maximum visibility to be maintained.

### PLAY STRUCTURE MATERIALS

Do not install play equipment on hard or paved surfaces. Do not use wood bark mulch or wood chips. Rubber safety surfacing is preferred. Avoid engineered mulch (fibar or similar), as it must be maintained regularly and may offer concealment for weapons, drug paraphernalia and other hazardous materials.

Safety surfacing should be thickened at all impact areas.

Fabricate structural components of play structures from heavy steel tubing (11ga), steel pipe, channel, angle, plate and flat stock, galvanized and powder coated prior to installation.



Use composite plastic, cellulose-polymer material (Trex or equal) for platform planks, stair treads or other dimensional material. Encourage use of materials with recycled content.

# DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS

DIVISION 32 • EXTERIOR IMPROVEMENTS

## 32 30 00 • SITE IMPROVEMENTS

Use tamperproof stainless steel fasteners and hardware.

Plastic components, where used, shall be polyethylene with UV light inhibitor, and installed according to manufacturer's specifications.

Do not use wood or treated wood on any play structure or equipment, or as a containment curb for the play surface.

### PLAY STRUCTURE INSTALLATION

Play structures should be installed according to manufacturer's specifications, either by the site contractor, certified installer or in a Community Build event initiated and organized by the LHA and supervised by the Playground Design Specialist.

### SPRAY PARK/SPLASH PARK DESIGN

Determine area requirements. Allow 20SF per child based on an estimate of the LHA as to the typical number of children housed at the development.

Locate spray and splash parks in central, visible, common-use areas away from roads and moving vehicles. Isolate from areas adversely impacted by water. Allow for maximum surveillance by residents.

Utilize potable water system design. Tie-in to potable irrigation system (if present) is acceptable. Avoid recirculating systems.



Install operation controls to conserve water use as much as possible. Button operated activation is preferred. A timed water shutoff is recommended.

Surface may be broom finished concrete, colored concrete, poured in place rubber, or an applied skid resistant coating system.

Follow equipment manufacturer's instructions for proper installation and maintenance.