

RIGID PAVING

General: Exterior walks and paved areas constructed in conjunction with new building projects shall conform to the requirements of these guidelines.

Snow Removal Considerations: The requirement for snow removal from all paved surfaces shall be recognized in the layout and construction of walks and paving. Areas which can only be cleaned by hand removal should be kept to an absolute minimum. Ramps should be provided between changes of level in paved areas to allow movement of tractor-mounted plows and/or blowers. Walks and steps with snow melt systems shall include provisions to intercept and remove melted water so that it will not refreeze on adjacent paved areas which do not have snow melt systems.

Walks:

A. Sidewalks shall be minimum of 7'-0" wide (narrower walks shall be approved by UNL Landscape Services and Facilities Planning and Construction), 5" thick, with ¼" per foot transverse slope.

B. Sidewalk shall be constructed on subgrade that has been scarified to a depth of 6" and compacted to a uniform density of not less than ninety-five percent (95%) of the maximum density (as determined by AASHTO standard method T-99) throughout its entire width. The moisture content of the subgrade shall be between two percent below (-2%) and four percent above (+4%) the optimum moisture content as determined by AASHTO standard method T-99. Up to a two inch (2") layer of crushed concrete may be placed on the subgrade as a leveling course. The crushed concrete shall be compacted with a plate compacter and moistened by light application of water prior to concrete placement. The width of the compacted subgrade shall extend 6" past the width of the sidewalk on both sides.

C. Welded wire reinforcing is required for all new sidewalk and ramp concrete. 6 X 6 W1.4xW1.4 wire shall be supported by epoxy coated bolsters so that it is held at mid-depth of the new concrete. Bolsters shall be spaced no more than 3 feet apart. Care shall be taken so that the welded wire reinforcing remains at mid-depth during concrete pouring operations

D. Walks designated as fire lanes shall be a minimum of 8" thick. Reinforcing steel for fire lanes shall be at a minimum of a single mat of #5 size deformed grade 40 reinforcing steel spaced at 12" on center each way. Additional reinforcing for fire lanes may be required.

E. The sidewalk shall extend above the adjacent finished grade by 2".

F. The concrete for the rigid paving shall be City of Lincoln (2011 Standard Specifications) LF-4000 mix producing a minimum compressive strength of 4000 psi at the end of the 28 day curing period. The concrete shall meet the following requirements when tested onsite:

1. Concrete shall be discharged from the mixer truck within 90 minutes of being batched.
2. Concrete temperature shall not exceed 90 deg F nor fall below 40 deg F when measured at the site of the pour. Ice or other cooling measures may be used at the batch plant but must be accounted for in the mix design and water/cement ratio.
3. Water/Cement ratio shall not exceed 0.45. If water is added in the field it shall not increase the water/cement ratio to more than 0.45
4. Air content must be between 4.5% and 8.0%. Contractor shall require concrete supplier to have measures in place to adjust air content in the field.

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5. Slump measured at point of placement shall have a tolerance of +/- 1.5" for specified (from mix design) slump greater than 4" and +/- 1" for specified slump of 4" or less. Specified slumps shall be permitted to be increased to a maximum of 9" by using mid-range water reducing agents or high-range water reducing agents.

G. All rigid paving shall receive a light broom finish unless otherwise noted. Broom lines are to run perpendicular to foot traffic. All exposed concrete edges to have one half inch (1/2") radius

H. Immediately after the concrete has been finished, the concrete surface shall be sealed with a uniform application, no less than 1 gallon per 200 square feet, of white pigmented membrane cure ASTM designation C309, Type 1, Class A.

I. Control joints shall be cut in green concrete (less than 24 hours old) using a diamond blade with a crack chaser. Depth shall be one-fourth (1/3) of slab depth. Joint locations shall be approved by UNL prior to placement. A longitudinal control joint is required if walk width is greater than 8'-0".

J. Full depth expansion joints are to be installed at 50' O/C. Preformed expansion joint material shall be 1/2" and meet ASTM D1751. Joint shall be sealed with polyurethane sealant. Joint shall be cleaned and inspected prior to sealing. Joint locations shall be approved by UNL prior to placement.

K. Sidewalk curves shall be formed true and smooth. Project specific jointing patterns may be required by UNL Landscape Services.

L. All curb ramps shall conform to 2011 City of Lincoln Standards (LSP 600) as well as 2002 ADA accessibility guidelines. Detectible warning panels shall be made cast iron and approved by UNL prior to installation. Warning plates must comply with ADA dimensions and shall be installed as per the manufacturer's instructions. All curb ramps shall have a minimum width of seven feet (7') measured at intersection with street/gutter line.

M. Curb and gutter construction shall meet 2011 City of Lincoln Standards (LSP 651).

N. When new concrete sidewalk is poured against existing concrete pavement or a concrete structure, the new concrete shall have a thickened edge of 7" transitioning back to 5" at the next control joint.

O. Contractor shall secure UNL representative's approval of subgrade, formwork, and reinforcing prior to placing concrete for each pour. Contractor and UNL representative shall sign off on the pre-pour checklist before concrete shall be discharged into forms.

P. Contractor shall be required to remove excess and waste material, trash, and debris and legally dispose of it off UNL property. Transit ready-mixed concrete trucks shall not be washed out on UNL property or adjacent property.

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Q. The following product and material submittals must be submitted to UNL for approval a minimum of 14 days prior to scheduled use. No unapproved products or materials shall be used.

1. Concrete mix design and compressive strength test results.
2. Any concrete admixture to be added either at the batch plant or work site.
3. Cure
4. Expansion joint material
5. Joint sealant
6. Reinforcing steel or mesh
7. Detectible warning panel

Exterior stairs and ramps:

A. Protection: All stairs and ramps associated with a building shall be covered by the building roof or an overhead canopy.

B. Stair Proportions: Exterior stairs, including those providing direct access to a building entrance, shall have a tread riser proportion of not more than 6:12.

C. Exterior Ramps: Exterior ramps shall conform to ADA requirements. Curb cuts shall not be less than 84" wide to allow mechanical snow removal. Smaller curb cuts must be approved by UNL Landscape Services.

D. Project specific reinforcing details shall be provided in contract documents.

E. Concrete specifications listed in the previous section (2. Walks) shall be followed for all concrete exterior stairs and ramps as a minimum standard.

Stoops and landings:

A. Provide structurally supported stoops where exit doors swing outward. Anchor stoops to structure in such a manner so as to prevent heaving from frost.

B. Provide 1/4" per foot slope on stoops and landings outside exit doors for drainage.

C. Project specific reinforcing details shall be provided in contract documents.

D. Concrete specifications listed in the previous section (2. Walks) shall be followed for all concrete exterior stairs and ramps as a minimum standard.

Driveways and parking lots:

A. General:

1. Application: Parking lots and driveways connecting parking lots to public street constructed in conjunction with new building projects or as independent projects shall conform to the requirements of these guidelines.
2. Snow Removal Considerations: The requirement for snow removal from all paved surfaces shall be recognized in the layout and construction of the parking lots and drives. Layouts shall be reviewed by UNL Landscape Services and UNL Parking and Transit Services for snow removal considerations.

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3. Litter Containers: Parking lots shall be designed with space for placement of litter containers.
4. Landscaping: Parking lot layout shall allow appropriate landscape enhancement.
 - a. Curb islands shall be a minimum of 10' with a minimum planting area of 100 sq. ft. The extent of the landscaping and landscape screening to be included within the scope of the project shall be established during the design process in conjunction with the UNL Project Manager, UNL Landscape Services and UNL Campus Landscape Architect.
5. Manholes in Paved Areas: Manhole rims or covers projecting more than ¼" above the surrounding paved surface create problems for snow plows and blowers. Project details and specifications shall require the correction of this defect when it occurs.

B. Drainage:

1. All parking lots shall be designed to develop proper site drainage, directed at the disposal of all storm water accumulated on the site.
2. Parking lots constructed on UNL campuses and other facility sites which contain an area of 2,500 square feet or more; and which are located within 150 feet of an existing storm sewer or other drainage way, including an open channel or creek, shall be designed to direct storm water runoff into such storm sewers or drainage ways. The parking lot shall be graded and surfaced such that storm water runoff from the site is collected on the site by a parking lot drainage system and carried to the storm sewer system, and not allowed to discharge through the driveway entrances and exits onto the public way. Proposed finished elevations of the parking lot must be indicated on appropriate plans. The calculations for storm runoff shall be designed in accordance with City of Lincoln Storm Sewer Design Criteria. All storm sewer construction procedures shall conform to the Construction and Material Specifications section of the Standard Specifications of the City of Lincoln, Nebraska.

C. Parking Barriers:

1. Approved parking barriers shall be provided around parking lots, to prevent the parking of vehicles overhanging the sidewalk space, public alley, or other public property, and adjacent residential property. Approved barriers are also required as necessary to protect any required landscaping or landscape screen planting and to prevent the parking of vehicles in a minimum front yard setback in which parking is prohibited.
2. Approved Barriers: Approved barriers include the following type barriers. Other barriers may be approved, subject to the approval of the UNL Project Representative.
 - a. Poured concrete curb, nominal 6" x 6" exposed.
 - b. Prefab barriers, firmly and permanently anchored. The use of prefabricated barriers must be approved by UNL Landscape Services and UNL Parking and Transit Services.
3. Location: Barriers shall be located to contain the parking with the approved parking lot. When a concrete curb is used as a barrier for perpendicular or angle parking, it shall be offset at least two (2) feet from the edge of the parking lot to allow for the front overhand of the vehicle. Other type barriers may be located at the edge of the parking lot.

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4. Curb Islands: The ends of parking rows in lots which exceed 40,000 square feet in area, shall be delineated with minimum 6 inch high curb islands. These islands may serve as planting areas for parking lot trees trimmed to the trunk up to a height of 6.0' or shrubbery below 30 inches in height, measured from the top of the pavement.

D. Parking Layout and Markings:

1. Layout: The project design drawings shall include a detailed and accurately scaled parking lot layout clearly showing the location of parking spaces and aisles. The dimensions of the parking spaces, aisles and driveways shall conform to the layout design standards included in this guideline. Parking lot layouts shall be approved by UNL Landscape Services and UNL Parking and Transit Services
2. Marking: The construction documents shall require the parking spaces to be marked on the parking lot surface according to layout shown on the project design drawings, using yellow pavement striping paint.

E. Lighting:

1. The purpose of parking lot lighting is to provide adequate visibility within parking lots and to deter crime. Lighting used to illuminate parking lots shall be arranged so not to cause visual interference on public thoroughfares or encroach on the visual privacy of adjacent building occupants.
2. Lighting systems shall be designed to conform to the following criteria:
 - a. Illumination Level: Not greater than 2.0 horizontal foot-candles, average initial nor less and 0.20 horizontal foot-candles, average maintained.
 - b. Illumination Level beyond Parking Lot Perimeter: Illumination attributable to a parking lot lighting system, beyond the perimeter of the parking lot, shall not exceed 0.50 horizontal foot-candles.
 - c. Uniformity Ratio: The illumination uniformity ratio shall not exceed 4:1, average to minimum.
 - d. Glare Control: Lighting adjacent to buildings and/or residential districts shall be so arranged so that the luminaires have a sharp cutoff at no greater than 78 degrees vertical angle above nadir, nor more than five (5) percent of the total lamp lumens shall project above 78 degrees vertical; or as an alternative, a luminaire shall emit no more than 500 foot lamberts per unit area above 78 degrees vertical angle from the luminous surface of the luminaire.
 - e. Fuse Installation: All ungrounded conductors on area lights and parking lot lights shall have fuses installed. Conductors and fuses feeding the light fixtures shall be accessible through the hand hole opening on the side of the pole.

F. Accessible Parking:

1. Accessible Parking Space Location: Accessible parking should be conveniently located near a main accessible building entrance, via the shortest accessible route. In buildings with multiple accessible entrances with adjacent parking, accessible parking spaces should be dispersed and located closest to the accessible entrances.
2. Layout: Accessible parking spaces may be either the traditional accessible space which is 8' wide with a 5' access aisle or a Universal Parking Spaces, which is 11' wide with a 5' access aisle. If the traditional spaces are used, the first space and 1 in every 8 additional spaces shall be van accessible. Van accessible spaces require an 8' wide space with an 8' accessible aisle.

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3. **Marking and Signage:** Signs displaying the international access symbol shall be provided at each accessible parking space. The signs shall be displayed on fixed mountings in an area where they are not hidden from view. Pavement marking symbols are not necessary but may be used to supplement signs. Spaces intended for van parking shall be marked accordingly. Refer to the Americans with Disabilities Act Accessibility Guidelines (ADAAG) for detailed requirements for marking and signs. Signage for campus parking lots shall be furnished by UNL Landscape Services.
4. **Number of Spaces:** Accessible parking stalls shall be provided in each parking lot in accordance with the following table:

Number of Accessible Spaces	
Total Parking Required In Lot	Accessible Spaces
1-25	1
26-50	2
51-75	3
76-100	4
101-150	5
151-200	6
201-300	7
301-400	8
401-500	9
501-1000	10

Parking lots with 1,001 or more spaces shall have 2% of total lot capacity (20), plus 1 for each additional 100 spaces over 1,000.

5. **Access Ramps:** Ramps shall be provided at curbs or other raised barriers to provide access to the accessible routes leading from the parking lot. Where only one manufacturer is listed, the words "or approved equal prior to the receipt of bids" shall apply.