

八、 Types of Overlays and Their Functions

Resurfacing

Some common overlay design problems :

1. Use minimum overlay thickness, inadequate
2. lack of pre-overlay repairs
3. lack of reflection cracking consideration

Scope : (four parts)

Types & functions, overlays design for PCC, overlays design for AC, reflection cracking

Types and Functions

Types, functions, timing, advantages / disadvantages

Functional and Structural Deficiencies

Functional Deficiencies:

surface polishing /decreased friction resistance, roughness, poor cross slope / surface drainage, climate-related deterioration (blocking cracking, trans. / longit. cracking, raveling and weathering)
==> overlay + cold milling / surface recycling

Structural Deficiencies:

AC (alligator cracking, rutting, patches);
AC/PCC (reflection cracking); JCP
(corner breaks, trans. cracking, patches);
CRCP (punchouts, patches)

Types of Overlays

AC Overlays : AC/AC, AC/PCC

PCC Overlays :

1. PCC / PCC : (Figure 16)

JPCP or JRCP (unbonded, partially,
and fully bonded); CRCP
(unbonded only); bonded plain
concrete overlays; others (fibrous or
pre-stressed concrete overlays)

2. PCC / AC :

JPCP or JRCP; CRCP; others
(fibrous or pre-stressed concrete
overlays)

Pre-overlay Treatment / Repair

Factors to consider in determining the
extent of overlay repairs : overlay types,
structural adequacy, distress types, future
traffic, various constraints (e.g., traffic
control), overall costs

Two Approaches:

1. repair deteriorated areas prior to overlaying
2. place a thicker overlay (greater rutting potential under heavy traffic, N/G)

Related Works:

localized repair, surface leveling, loss of support under rigid pavements, poor load transfer across joints and cracks

Most Feasible and Cost-effective Overlay Types

Factors to Consider: (Figure 2)

existing type and design, existing pavement condition, structural adequacy, materials deterioration, future traffic, climatic, subdrainage adequacy, presence of swelling soils

Advantages / Disadvantages of Alternative

Overlays :

traffic control, overhead vertical clearances or elevation changes, successive AC overlays, reflection cracking, rutting

Timing of Resurfacing

consequences when overlay is deferred, cost and benefit between rehabilitation strategies (Figures 3 ~ 7)