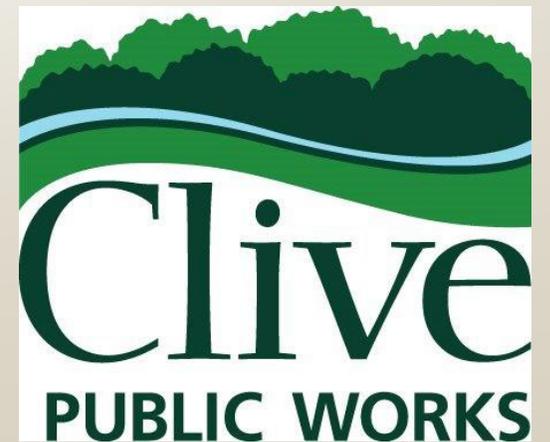


City of Clive

**2025 Municipal Streets Seminar
Clive's Pavement Specifications**

10/29/25



Why?

- We had issues with new streets. High maintenance costs on relatively new streets
- We couldn't afford to replace streets every 30-40 years

City Streets

- Developer constructs infrastructure
- City accepts improvements with obligation to maintain in perpetuity
- City requires a 4-year maintenance bond
- City provides all maintenance
- City is responsible for reconstruction when necessary
 - Currently Clive does not use assessments, but use of assessments may have big impact on homeowners (up to 25% of value of home)
 - Future reconstruction costs include removal of existing pavement in addition to reconstruction costs.
 - Future projects impact residents

Dellwood Drive – 3 years old

(west of Berkshire)



167th Court – 4 years old



Tanglewood Drive – 10 years old



Hammontree Court – 15 years old



Sheridan Avenue (20 years old)

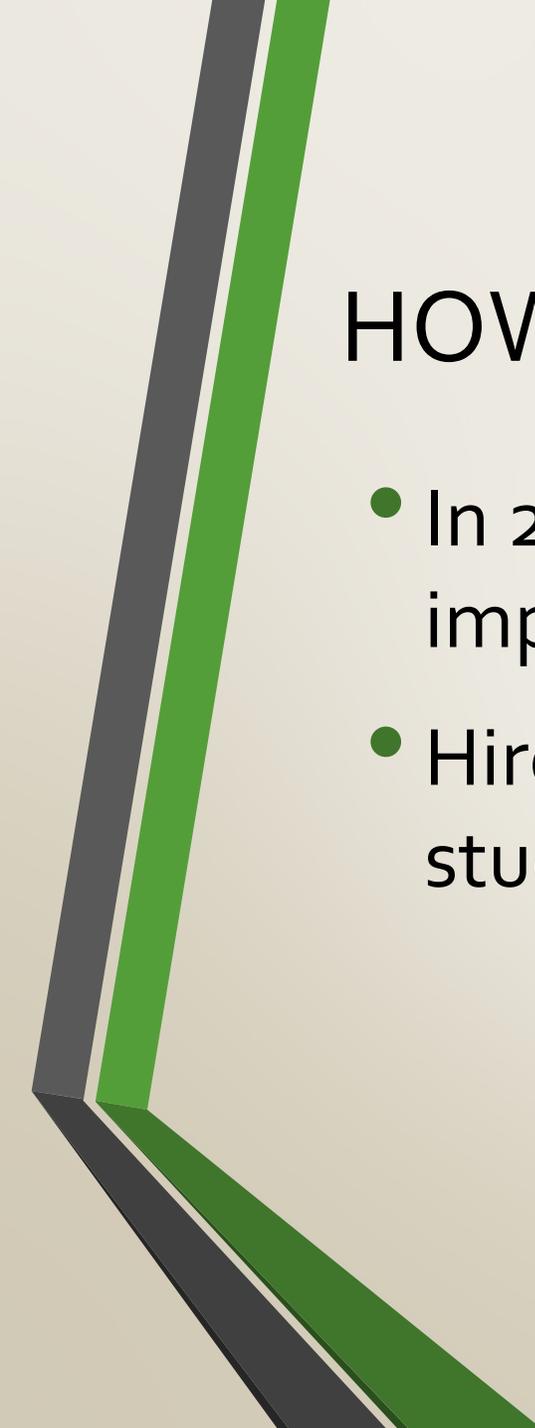


Woodcrest Drive – 25 years old



Issues are not unique to Clive

- American Society of Civil Engineers (ASCE) 2025 Report Card gave the U.S. a “D+” grade for its roads
- That same report also identified a \$684 billion funding gap over the next 10 year.
- This kind of failing infrastructure threatens not only people's safety, but also the American economy, Business Insider
- In fact, according to ASCE's 2025 Infrastructure report, 39% or over one-third of major urban roads in the U.S. are in poor condition



HOW DO WE MAKE STREETS LAST LONGER?

- In 2017 Clive decided to research what it would take to improve the life of streets being built in the City.
- Hired HR Green to review our specs and complete a study of our streets.

STUDY WITH REPORT

- **HR Green**
 - Larry Stevens
- **SUDAS - Statewide Urban Design and Specifications**
- **Other Relevant Research**

Analysis of the following components

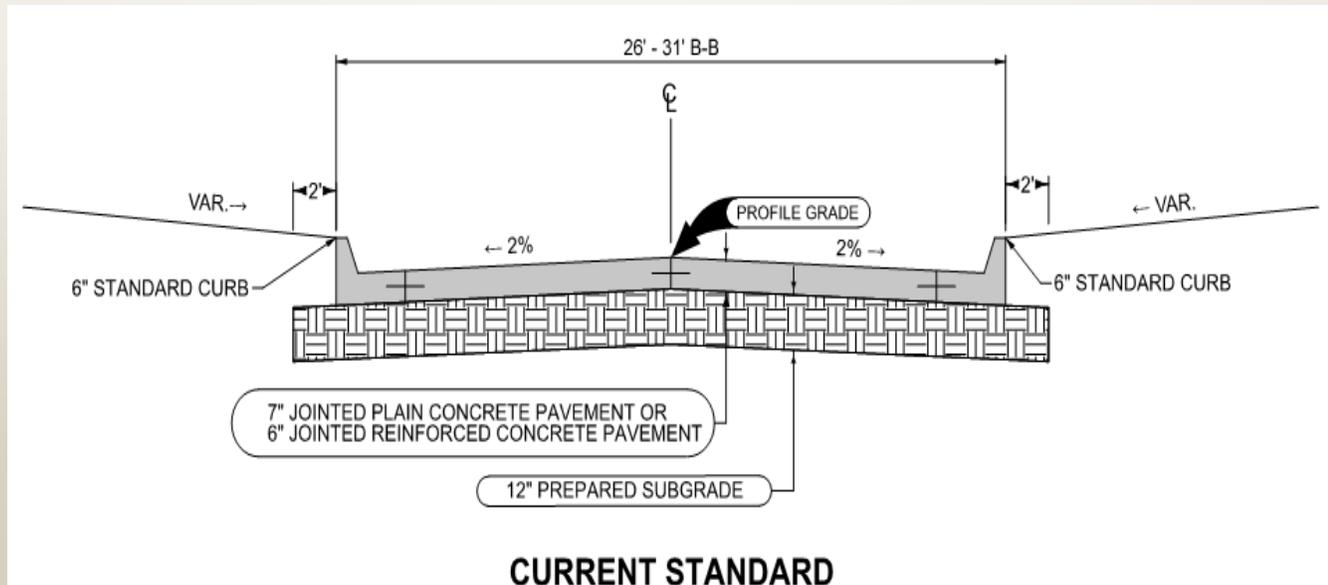
- PCC Pavement foundation – why and how
- PCC Pavement – proper design principles
- Current Clive design standards for pavements
- Recommended Clive design standards
- Cost/Benefit Comparisons



WHAT IS A PAVEMENT?

Specifications 2017

- Pavement Foundation
 - 12" prepared subgrade below pavement
- Pavement
 - Concrete – Varies (C-mix)
 - 7" Jointed Plain Concrete Pavement (JPCP) w/ CD baskets or 6" Jointed Reinforced Concrete Pavement (JRCP)
- Gutterline Jointing



Pavement Foundation

- **Existing Standards**
 - Subgrade – 95% of Modified Proctor
 - Subbase - None
- **How do we improve**
 - Subgrade
 - Typical Iowa soils have CBR of 1 to 3
 - Subbase
 - Drainable, stable subbase
 - Longitudinal subdrains

PCC Pavement Foundation

Performance of pavements depends on the quality of its subgrade and subbase layers

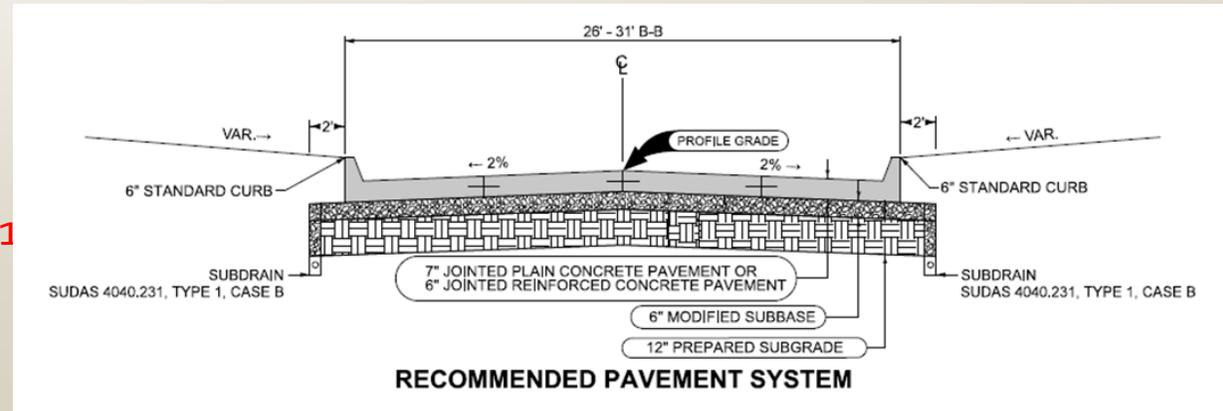
- Subgrade soils
 - Iowa soils generally provide poor support
 - Need Stabilized uniform subgrades – chemical or reinforced
- Subbases
 - Necessary for subsurface drainage in Iowa's cold, wet climate
 - Longitudinal subdrains necessary
 - Drainage helps to prevent early pavement joint deterioration

PCC Pavement

- Existing Standards
 - Thickness – 7" unreinforced or 6" Jointed Reinforced Concrete Pavement (JRCP)
 - Jointing – Gutter Joint, but transverse spacing not specified
 - Mix – Various C Mixes

Recommended Pavement Specification

- Pavement Foundation
 - Geotechnical Investigation – Improve Subgrade to obtain a CBR of 10
 - 12" M&D below subbase
 - Subbase with Subdrains (unless geotechnical report determines soil is free draining)
- Pavement
 - Concrete - Class C mix (~~C-SUD~~) (~~2017~~) **C3WR20 (2025) w/ minimum of 590 lbs of cement**
 - Air - 6% to 8% after placement
 - Water to cement (w/c) - 0.40 with a max of 0.45.
 - Supplementary Cementitious Materials (SCMs)
 - Flyash – ~~20-25% Class F or 30-35% Class C (2017)~~ **20% for Class F or Class C (2025)**
 - Thickness - 7" JPCP ~~or 6" JRCP~~
 - 1/4 point jointing (26' and 31')
 - Transverse Joint Spacing
 - 7" pavement – ~~14' (2017)~~ **12'**
 - ~~6" pavement – 12'~~





HOW DO WE CHANGE OUR STANDARDS?



COUNCIL DISCUSSION

- They had questions
 - What will this cost
 - What will the homebuilders say
 - What are neighboring communities' standards

11 year Street – Current



12 year Street – Proposed (2017)



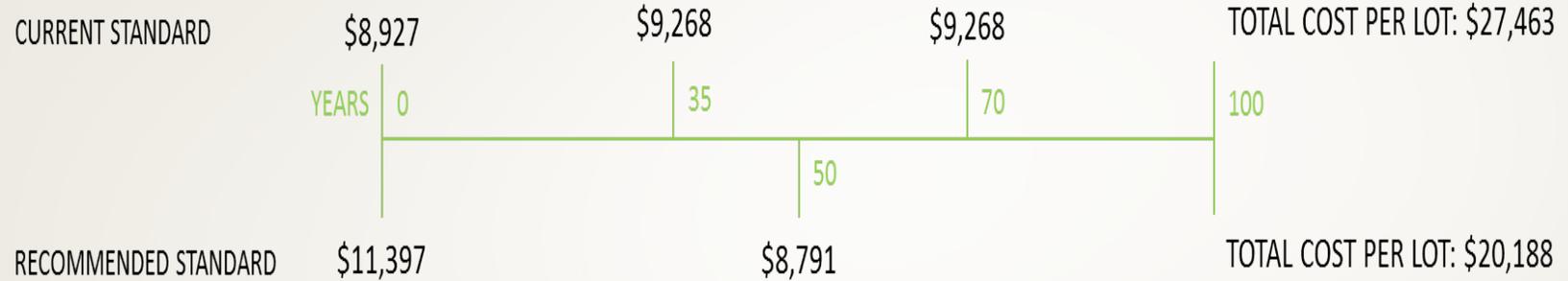
Costs and Benefits

- Typical residential street segments analyzed
- Average cost of pavement system increase approx. 24.3% due to higher standards
 - \$56.11/SY to \$71.63/SY
- Life expectancy of pavement increased by 42.8%
 - 35 years to 50 years
- B/C of 1.8:1
- Average cost to each lot about \$2500 for improved standards, initially
 - Over a 100-year cycle, this additional investment reduces future reconstruction costs by \$9,745 per lot, in present day dollars
 - NOTE: We presented this to the homebuilders. After reviewing our proposed changes, they estimated the additional cost per lot to \$1,800 per lot.

Cost/Benefit Analysis

- Projected Pavement Construction and Reconstruction Timelines – 100-year Cycle

- Cost Per Lot for Pavement



- Total Cost for the Segment (approximately 900')



- An initial \$2,500 per lot investment reduces future reconstruction costs by \$9,745, in present day dollars
 - A savings of \$130,971 for the 900' segment
 - This equals a savings of \$768,363 per mile of pavement

TO THE FINISH LINE

- Why should we make the changes?
 - Longer life pavements
 - Sustainable
 - Prolonged higher service level reduces traveling public's cost of vehicle maintenance
 - Reduced disturbance to property owners due to reconstruction and maintenance
 - Reduced Maintenance Cost
- Council approved the new on 6/22/17

Clive 11-year Street 2017



12-year Street – Proposed (2017)



Same Street 2025 (20-years old)



Dayton Street

2006



2017



2025