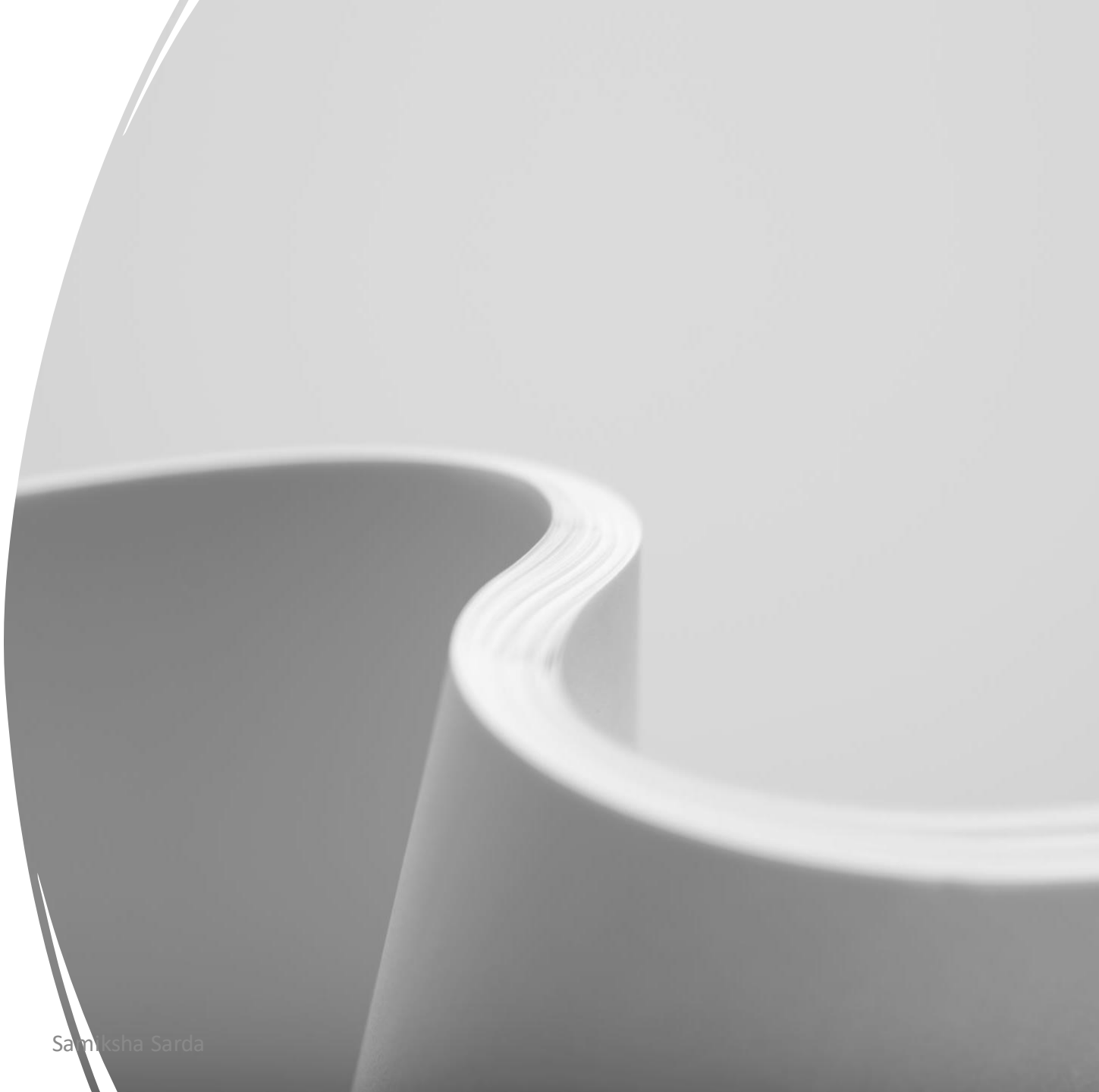
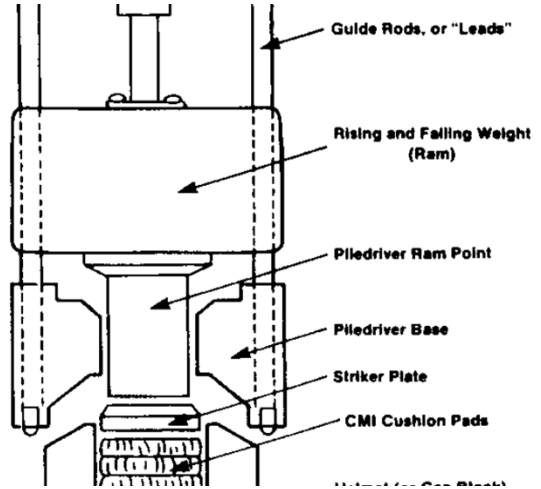
Curled Metal Case Analysis

- By Samiksha Sarda



What benefits do the CMI pads provide contractors like Kendrick Foundation or Corey Construction?



Cost Savings

- **Reduced Pad Replacement Costs:** Conventional pads require frequent replacements (480 for Kendrick, 600 for Corey), inflating pad-related expenses to $4,320–$5,400 per project. CMI pads need only 5–6 replacements per project, reducing pad costs by **48%–65%.**
- **Lower Downtime Costs:** Conventional pads require multiple set changes (20 for Kendrick, 50 for Corey), causing significant downtime (6.67–16.67 hours). Downtime costs drop from $4,764 (Kendrick) and $11,904 (Corey) to just $48 with CMI pads.

Increased Productivity

- **Faster Pile-Driving Performance:** CMI pads allow driving at 200 feet/hour compared to 150–160 feet/hour with conventional pads. Project times are reduced by **3.75 hours for Kendrick** and **3.38 hours for Corey**, lowering overall labor and equipment expenses.
- **Improved Efficiency:** Contractors spend less time handling and cooling pads. CMI pads generate less heat (250°F vs. 600–700°F for conventional pads), enabling immediate handling and minimizing project delays.

Enhanced Safety

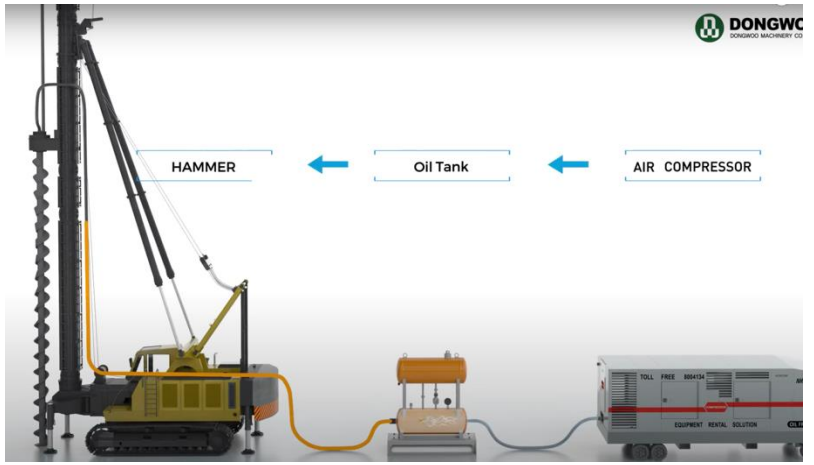
- **Safer Work Environment:** Conventional pads generate excessive heat, risking burns during handling. CMI pads stay cooler, reducing hazards and improving worker safety.

Superior Operational Performance

- **Durability:** One set of CMI pads lasts the entire project or requires minimal replacements, eliminating interruptions. Conventional pads fail frequently, leading to downtime and inefficiencies.
- **Consistency:** CMI pads transmit energy more effectively, ensuring smoother and more precise pile driving, reducing risks of pile vibration or cracking.

Improved Profit Margins for Contractors

- By reducing operational costs and increasing efficiency, contractors retain a larger share of project revenues. For example: Kendrick saves $16,800 in total costs, Corey saves $14,673 in total costs.
- These savings boost contractors' profitability and enhance their ability to bid competitively on future projects.



Estimate the economic value of these benefits to the customer based on the Kendrick and Corey tests data? Use the *11½ inch cushion CMI pad* as your unit of analysis

- **Pads Required & Costs:**
  - **Conventional Pads: Kendrick:** 480 pads × ($150/set ÷ 24 pads/set) = **$3,000**, **Corey:** 600 pads × ($120/set ÷ 12 pads/set) = **$6,000**
  - **CMI Pads: Kendrick:** 6 pads × ($300/pad) = **$1,800**, **Corey:** 5 pads × ($300/pad) = **$1,500**
  - **Savings: Kendrick:** $3,000 (Conventional) - $1,800 (CMI) = **$1200** , **Corey:** $6,000 (Conventional) - $1,500 (CMI) = **$4,500**
- **Equipment Costs Saved:**
  - **Equipment Rental Rates:** Diesel hammer: $102/hr, Crane: $156/hr, Leads: $24/hr (**Total Equipment Cost per Hour:** $282/hr)
  - **Savings: Kendrick:** 25 hours × $282/hr = **$7,050, Corey:** 16.88 hours × $282/hr = **$4,756**
- **Labor Costs Saved: Labor Rate $132/hr. Savings: Kedrick: 25*132 = 3,300, Corey: 16.88* 132 = $2,228**
- **Overhead Costs Saved : $300/hr. Savings: Kendrick: 25*300 = 7,500, Corey: 16.88*300 = 5,064**
- **Total Savings: Kendrick:** $1,200 (Pads) + $3,300 (Labor) + $7,050 (Equipment) +$7,500 (Overhead) = $19,050, **Corey:** $4,500 + $2,228 + $4,756 + $5,064 = **$16,584**
- **Per-Foot Savings: Kendrick:** $19050 ÷ 15,000 ft = **$1.27/ft**, **Corey:** $16,584 ÷ 13,500 ft = **$1.23/ft**

1. Inclusion of Overhead Costs: Factoring in $300/hour overhead increases total costs but significantly boosts cost savings when operational hours are reduced. Kendrick's 25-hour driving time saved results in **$19,050 saved**, while Corey's 16.88-hour savings yield **$16,548**.

2. Pad Durability Savings: Kendrick and Corey achieve **95–98% pad replacement reduction**, demonstrating that CMI pads' superior durability eliminates frequent replacements. This contributes to savings on pad purchases: $1,200 (Kendrick) and $4,500 (Corey).

3. Driving Speed Benefits: Faster driving speeds reduce total operational hours, amplifying labor, equipment, and overhead savings. Downtime reductions (e.g., pad replacements and equipment adjustments) contribute significantly to improved efficiency.

4. Economic Proof with Per-Foot Savings: Kendrick achieves **$1.27/foot**, and Corey achieves **$1.23/foot** savings. These metrics validate CMI pads as a cost-effective solution across projects, with considerable savings that justify the premium pricing of $300/pad.

Category	Kendrick (300 piles)	Corey (300 piles)	Key Insights
Pile Length	50 feet per pile (15,000 ft)	45 feet per pile (13,500 ft)	Both projects involve substantial pile driving efforts
Pads Required	480 pads (20 sets of 24 pads)	600 pads (50 sets of 12 pads)	CMI Pads replaced 95-98% of conventional pads.
CMI Pads Used	6 pads (1 set)	5 pads (1 set)	Demonstrates superior durability of CMI Pads
Driving Speed	150ft/hour to 200ft/hour (33%)	160ft/hour to 200ft/hour (25%)	Significant driving speed improvements in both cases
Downtime Saved	396 minutes	996 minutes	Major reduction in unproductive downtime
Driving Time Saved	25 hours	16.88 hours	Faster speed reduces operational hours significantly
Hourly Costs	$714 (Labor + Equipment + Overhead)	$714/hr	Includes labor, equipment, and $300/hr overhead
Labor Savings	$3,300	$2,228	High hourly labor costs amplify economic benefits
Equipment Savings	$7,050	$4,756	Less equipment usage due to reduced job duration
Overhead Cost Savings	$7,500	$5,064	High overhead costs amplify economic benefits
Pad Cost Savings	$1,200	$4,500	Significant savings on pad purchases
Total Savings	$19,050	$16,548	Economic value significantly outweighs pad costs.
Per-Foot Savings	$1.27/foot	$1.23/foot	Corey's project yields higher per-foot savings despite smaller size.

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- **Efficiency Gains from CMI Pads:** CMI pads significantly enhance project efficiency by improving driving speeds, reducing downtime, and minimizing costs. Kendrick achieved a 33% increase in speed (150 ft/hr to 200 ft/hr), while Corey saw a 25% increase (160 ft/hr to 200 ft/hr). These efficiency improvements saved **25 hours of driving time for Kendrick** and **16.88 hours for Corey**, cutting down operational durations and associated overhead costs of **$7,500 (Kendrick)** and **$5,064 (Corey)** at $300/hr. Downtime reductions of **396 minutes (Kendrick)** and **996 minutes (Corey)** further contributed to increased productivity. The superior durability of CMI pads eliminated the need for frequent replacements, with Kendrick using only 6 pads and Corey just 5 for the entire project, compared to 20–50 replacements with conventional pads. This reliability drastically minimized interruptions and maintenance costs.
- **Operational Benefits for Contractors** The faster driving speeds and downtime reductions led to substantial cost savings, including labor, equipment rental, and overhead. Kendrick achieved total savings of: **$3,300 in labor costs (at $132/hr) , $7,050 in equipment rental costs (at $714/hr)** , **$7,500 in overhead (at $300/hr)** Similarly, Corey achieved: **$2,297 in labor costs (at $132/hr), $4,756 in equipment rental costs (at $714/hr)**, **$5,064 in overhead (at $300/hr)** These combined savings, driven by reduced job durations and fewer equipment needs, not only minimize wear and tear but also allow contractors to manage additional projects within the same timeframe. Moreover, streamlined operations reduce labor fatigue and enhance overall workforce productivity, fostering a more sustainable operational model.
- **Strategic Advantages:** Contractors using CMI pads gain a competitive edge through lower overall project costs and enhanced efficiency. These savings enable contractors to bid more competitively without compromising profit margins, helping them secure more contracts. Furthermore, CMI pads align with modern sustainability standards by offering: Reduced heat generation and lower energy usage, Absence of hazardous materials, enhancing environmental safety, Lightweight design, simplifying handling and improving on-site safety, By adopting CMI pads, contractors improve their reputation for sustainable practices, operational efficiency, and safety, making them more attractive to clients in environmentally conscious markets.
- **Future-Proofing Contractor Operations:** CMI pads offer scalable solutions for projects of all sizes, delivering consistent performance and long-term value. Factoring in reduced labor, equipment, and overhead costs, these pads position contractors to meet deadlines, optimize resource usage, and build reputations for excellence. This fosters repeat business, customer loyalty, and the ability to handle increasing project volumes without compromising quality or efficiency.

What price would you recommend CMI charge per 11½ inch cushion CMI pad? Justify your answer

To recommend a price for the CMI 11½ inch cushion pad, I suggest setting the price at **$375 per pad**

1. Strong Contribution Margins Drive Profitability

- **Total Manufacturing Cost per Pad:** With permanent tooling: **$207.54 per pad**. Includes $81.84 variable cost (material + labor) and $125.70 fixed overhead.
- **Selling Price of $375:**

  Gross Profit per Pad: $375 – $207.54 = **$167.46 per pad**.

  Contribution Margin Ratio: $167.46 ÷ $375 = **44.65%**, a robust margin.

  This margin is critical for covering non-manufacturing expenses, such as marketing, administrative costs, and future R&D investment. At 44.65%, the contribution margin ensures **CMI remains profitable even if costs rise or sales volumes dip slightly**.

2. Break-Even and ROI Ensure Rapid Profitability

- **Initial Fixed Investment in Tooling:** $150,000.
- **Break-Even Volume:** $150,000 ÷ $167.46 ≈ **896 pads**.
  - At 250 pads/month, CMI achieves break-even in **less than 4 months**.
- After reaching the break-even point, **all additional pads sold contribute directly to profit**. For example: Annual Sales Volume: **3,000 pads (250/month)**., Post-Break-Even Pads: **3,000 – 896 = 2,104 pads/year**. **Annual Net Profit After Break-Even:** 2,104 × $167.46 = **$352,273 annually**.

3. High Scalability and Operational Efficiency

- The use of permanent tooling significantly reduces variable costs, particularly labor: Labor cost per pad drops from **$86.40** to **$34.92**, a **60% reduction**. Total variable cost per pad falls from **$133.32** to **$81.84**.
- This efficiency ensures **economies of scale** as sales grow: For every additional pad sold beyond break-even, 44.65% of the revenue directly enhances profitability. For example: If CMI scales production to 4,000 pads annually, additional profit = 1,000 × $167.46 = **$167,460**, with fixed costs unchanged.

4. Aligning with Market Value

- CMI pads offer exceptional durability and operational savings for clients: **Durability:** CMI pads replace **95–98% of conventional pads**, reducing downtime and pad changeovers. **Operational Savings for Clients:** Projects using CMI pads save up to **$16,000–$19,000** in total costs compared to conventional pads. Clients perceive the $375 price as **value-driven**, given the significant cost reductions: Per-foot savings: **$1.23–$1.27** with CMI pads, enabling clients to achieve higher project profitability. By setting a premium price, CMI reinforces its **market positioning as a superior, long-term cost-saving solution**, justifying the higher cost to clients who experience substantial savings and operational benefits.

5. Long-Term Financial Health for CMI

- **Sustaining Profit Margins Across Volumes:** At $375, CMI achieves **$167.46 in profit per pad** even at lower volumes, ensuring profitability under varying market conditions.
- **Reinvestment Potential:** With an annual gross profit of **$502,380 (at 3,000 pads)**, CMI can reinvest in R&D, marketing, and tooling upgrades to expand its product range or optimize costs further.
- **Brand Value:** Pricing at $375 ensures CMI sustains its image as a **premium supplier of high-performance, durable pads**, attracting clients willing to pay for superior quality and cost-effectiveness.